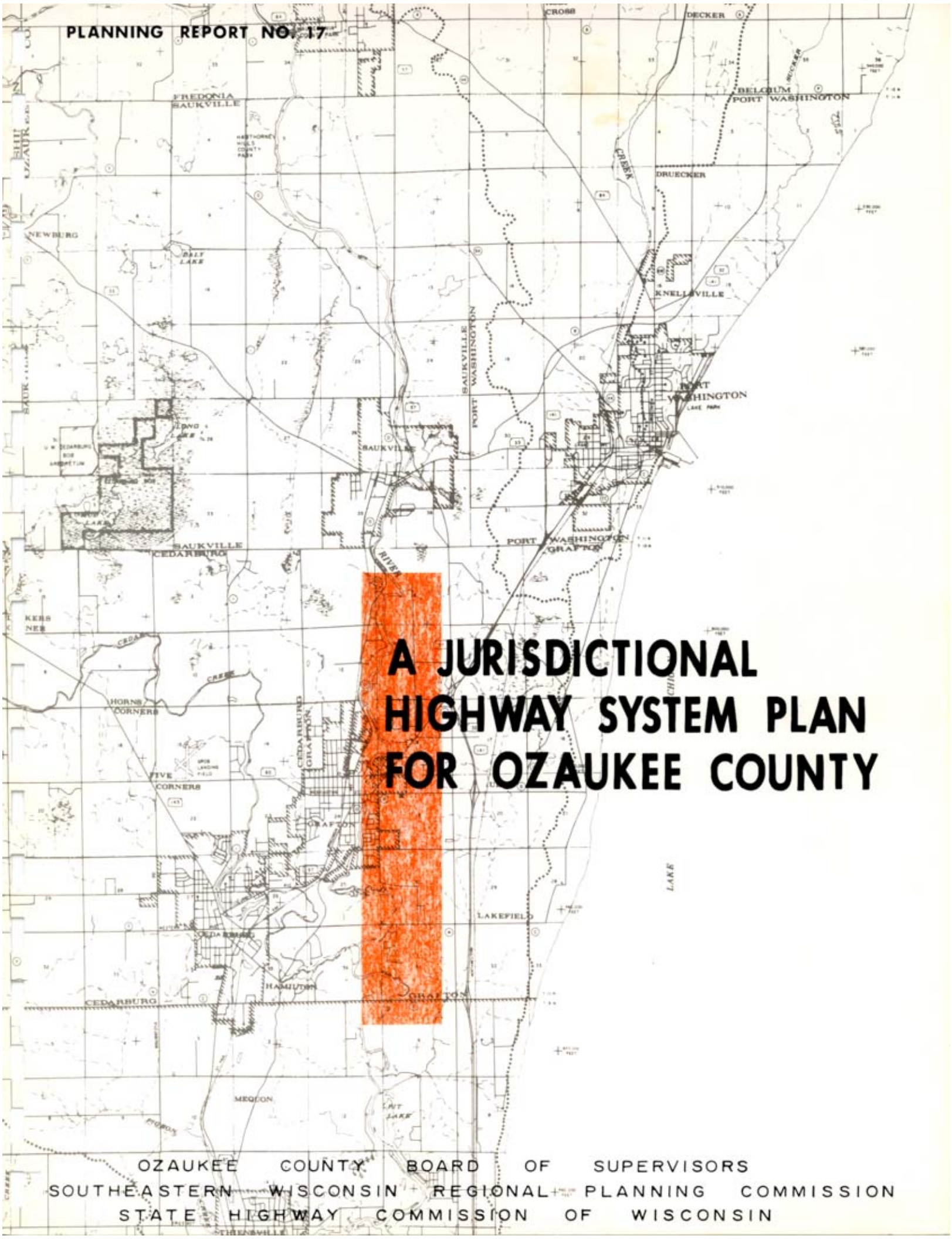
PLANNING REPORT NO. 17



# A JURISDICTIONAL HIGHWAY SYSTEM PLAN FOR OZAUKEE COUNTY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PLANNING REPORT
NUMBER 17

# A JURISDICTIONAL HIGHWAY SYSTEM PLAN FOR OZAUKEE COUNTY

Ozaukee County Board of Supervisors
Southeastern Wisconsin Regional Planning Commission
Wisconsin Department of Transportation

Southeastern Wisconsin Regional Planning Commission
Continuing Regional Land Use-Transportation Study
Old Courthouse
P. O. Box 769
Waukesha, Wisconsin
53186

The preparation of this report was financed in part through a joint planning grant from the Wisconsin Department of Transportation, Division of Highways; the U. S. Department of Transportation, Federal Highway Administration; and the U. S. Department of Housing and Urban Development under the provisions of the Federal Aid Highway legislation and Section 701 of the Housing Act of 1954, as amended. The necessary local financing was provided by Ozaukee County.

December 1973

(All technical work on this report was completed in August 1971; publication was deferred, however, until approval of the plan by the Ozaukee County Board on December 5, 1973.)

Inside Region: $ 5.00
Outside Region: $10.00

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# Ozaukee County Highway Commission

410 S. Spring Street
Port Washington, Wisconsin 53074

Phones:
(414) 284-4426 or 284-4427

SYLVESTER N. WEYKER
Highway Commissioner

January, 1974

TO: Ozaukee County Board of Supervisors
Southeastern Wisconsin Regional Planning Commission
State Highway Commission of Wisconsin

The Ozaukee County Board of Supervisors on June 29, 1967, directed that a comprehensive study be made of the jurisdictional responsibility for the construction, maintenance, and operation of arterial streets and highways in Ozaukee County and that such study culminate in the recommendation of a long-range plan for integrated state, county, and local highway system development within the County. In order to carry out the study, an interagency planning staff was assembled with representation of the County, the Regional Planning Commission, and the State Highway Commission. In order to actually involve the local units of government within the County in this important study, a Technical Coordinating and Advisory Committee was appointed by the Chairman of the County Board to assist and advise the County Highway Committee and the interagency staff. The Advisory Committee had membership from the U. S. Department of Transportation; the Wisconsin Department of Transportation; the Regional Planning Commission; and representatives of all local units of government from within the County having planning or engineering staffs.

This report contains the findings and recommendations of almost five years of study by the interagency staff and the Technical Coordinating and Advisory Committee. The report sets forth a recommended plan for state trunk highway, county trunk highway, and local trunk highway system development within Ozaukee County to the year 1990, and contains specific recommendations for carrying out that plan.

The findings and recommendations contained in this report were carefully reviewed and unanimously approved by the Technical Coordinating and Advisory Committee. On December 5, 1973, the Ozaukee County Board of Supervisors, upon the recommendation of its Highway Committee, adopted the recommended plan. Certain amendments to the plan, made by the Board of Supervisors in their plan adoption action, have been incorporated in this report. Further adoption and implementation of the recommended plan, by all units and agencies of government concerned, would, in the Committee's opinion, provide the County with an integrated highway transportation system which would effectively serve and promote a desirable land use pattern within the County, abate traffic congestion, reduce travel time and costs, and reduce accident exposure. It would also serve to concentrate appropriate resources and capabilities on corresponding areas of need, assuring the most effective use of the total public resources in the provision of highway transportation and providing a sound basis for the establishment of long-range fiscal policies and for the systematic programming of arterial street and highway improvements within Ozaukee County.

The report and plan are hereby respectfully submitted for use by all concerned over the years ahead as a useful guide to highway system development within Ozaukee County.

Respectfully submitted,

Sylvester N. Weyker

Sylvester N. Weyker, Chairman
Technical Coordinating and Advisory Committee on Jurisdictional Highway Planning for Ozaukee County

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# Chapter I

## INTRODUCTION

On December 1, 1966, the Southeastern Wisconsin Regional Planning Commission, pursuant to its statutory responsibilities and after four years of intensive study, adopted two key elements of a comprehensive plan for the physical development of the seven-county Southeastern Wisconsin Region: a land use plan and a transportation plan. On March 17, 1967, in accordance with its advisory role, the Commission certified these plans to the constituent counties, cities, villages, and towns, as well as to certain state and federal agencies, for adoption and implementation. On July 31, 1967, after careful consideration and upon the recommendation of the Ozaukee County Highway Committee, the Ozaukee County Board of Supervisors adopted the recommended transportation plan as a guide to be used in making decisions concerning transportation facility development within the County.

The adopted regional land use and transportation plans, as well as the salient findings and recommendations of the comprehensive regional land use-transportation study upon which the plans are based, are set forth in SEWRPC Planning Report No. 7, Volume 1, Inventory Findings—1963; Volume 2, Forecasts and Alternative Plans—1990; and Volume 3, Recommended Regional Land Use and Transportation Plans—1990. The regional transportation plan recommends a threefold approach to the solution of the growing transportation problems of the rapidly urbanizing Region. First, it recommends the development of an expanded, fully integrated regional freeway system which would serve to remove heavy volumes of fast, through traffic from the existing surface arterial street and highway system. Second, it recommends the development of an integrated regional modified rapid transit and rapid transit system designed to complement and supplement the transportation services provided by the regional freeway and standard arterial systems and to provide, efficiently and economically, a high level of transit service to the most intensely urbanized areas of the Region. Third, and of direct concern to this report, it recommends improvements and additions to the existing surface arterial street and highway system in order to provide an areawide system of standard arterials properly related to the recommended freeway and modified rapid transit and rapid transit systems.

The regional transportation plan thus contains, as an integral element, a functional arterial street and highway system plan. This functional plan consists of recommendations concerning the general location, type, capacity, and service levels of the arterial street and highway facilities required to serve the rapidly developing Southeastern Wisconsin Region to the year 1990. Except for freeways the functional plan does not, however, contain recommendations as to which levels and agencies of government should assume responsibility for the construction, operation, and maintenance of each of the various facilities included in the functional plan.[1]

As a logical sequel to the adoption of the recommended regional transportation plan and pursuant to specific implementing recommendations contained in that plan, the Ozaukee County Board of Supervisors, on June 29, 1967, directed that the County Highway Committee, in cooperation with the U. S. Department of Transportation, Federal Highway Administration; the State Highway Commission of Wisconsin; the Southeastern Wisconsin Regional Planning Commission; and the local units of government concerned, proceed with the conversion of the functional highway system plan contained in the adopted regional transportation plan to a jurisdictional highway system plan. The jurisdictional highway system plan was to contain specific recommendations as to the level and agency of government which should assume responsibility for the construction, maintenance, and operation of each segment of the total arterial street and highway system. Such a plan was also to contain concomitant recommendations for the realignment

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[1] *The regional transportation plan recommends that the Wisconsin Department of Transportation, Division of Highways, assume jurisdictional responsibility for all proposed freeway facilities shown on the regional transportation plan within Ozaukee County.*

of the federal aid highway systems, as well as of the state and county trunk highway systems, and, if warranted, propose necessary changes in the various state and federal aid formulae.

## NEED FOR A COMPREHENSIVE REVISION OF HIGHWAY JURISDICTION

Although implementation of the adopted regional transportation plan is an important reason for proceeding with a jurisdictional highway planning study, other important reasons exist. Among the most important of these is the fact that the location and extent of the state and county trunk highway systems in Ozaukee County, as well as of the related federal aid highway systems, have become increasingly obsolete in light of changing areawide land use development patterns and accompanying areawide changes in traffic demand. The rapid conversion of land from rural to urban use and the rapid development of automotive transportation within Ozaukee County and the Region, of which Ozaukee County is a part, have placed new and greatly increased demands on the existing arterial street and highway system in the county. As documented in the regional land use-transportation study, Ozaukee County can expect to continue to experience substantial residential, commercial, and industrial growth in the next two decades; and this growth will be accompanied by still greater increases in motor vehicle registrations and in the demand for improved highway transportation facilities. Moreover, a rapidly changing regional land use pattern has brought about, and will continue to bring about, important changes in the manner in which the increased traffic demand is effected upon the total street and highway system so that the existing jurisdictional highway systems can no longer function as effective subsystems on their present alignment and in their present extent.

Another reason for proceeding with a jurisdictional highway planning study at this time is the fact that land use development has in some cases severely affected the ability of the existing jurisdictional highway systems to perform their intended functions on their existing alignment. As land use and traffic patterns developed over the years within developed areas of Ozaukee County, those streets and highways which carried the heaviest volumes of traffic have become lined with extensive "strip" commercial land use development. Thus, altogether too often, a poor relationship was established between the arterial street system and the adjacent land uses which served not only to increase traffic demand and impede the operating capacity of the existing arterials but at the same time to make major capacity improvements in the existing facilities extremely difficult and expensive. Consequently, arterial traffic is, in many locations within the County, confined to facilities which were originally constructed to provide for a much lower level of traffic demand and which are difficult and expensive to improve. While these conditions have not grown to the proportions that exist in more highly urbanized counties, they do exist in Ozaukee County and may, in the absence of sound local land use planning, be expected to increase as the County continues to develop. Under these circumstances, either rerouting of the arterial traffic is required or the necessary resources must be made available to adequately improve the existing facilities. Realignment of the jurisdictional highway systems is necessary to achieve subsystems which will adequately serve the daily demand for the movement of persons and goods without adversely affecting desirable land use patterns.

In some instances localized improvements, such as adjustments in vertical and horizontal alignment, provision of additional pavement width, control of access, signalization of intersections, and the signing and marking of intersections for channelization of traffic, may provide temporary relief from growing traffic congestion. The proper integration of these improvements into a broad, areawide, and long-range effort to improve traffic operations and service also demands realignment of the existing jurisdictional highway systems into more fully integrated subsystems.

Another very important reason for proceeding with a jurisdictional highway planning study at this time is to avoid the kind of fragmented deletions from the county trunk highway system that have been made in some other counties of the Region as land has been converted from rural to urban use and concomitantly incorporated and which have complicated the construction, operation, and maintenance of the remaining portions of the system and have destroyed the necessary system continuity. A need exists to assure the maintenance of an integrated county trunk highway system to serve the growing urban transportation needs of the County, particularly in the southern

portion of Ozaukee County, where rapid urbanization and the corresponding growth in travel demand is most prevalent.

Finally, the construction of an areawide freeway system within the Region has radically altered traffic patterns on certain parallel and cross arterials in and near freeway corridors. The existing traffic patterns in Ozaukee County will continue to change in the future as additional segments of the regional freeway system are completed and opened to traffic. Adjustment of the jurisdictional street and highway systems to these changes is essential if both the freeway and the surface arterial systems are to function properly and will require the realignment of jurisdictional subsystems.

In summary, a jurisdictional highway planning effort is required at this time in order to cope with the growing and changing traffic demands; to adjust the existing jurisdictional systems to changes in land use development along their alignment; to assure the maintenance of an integrated network of county trunk highways as urban development proceeds within the County and large areas of the County are incorporated; and to adjust the jurisdictional systems to reflect the major changes in traffic patterns resulting from freeway utilization. The need for such a jurisdictional planning effort is, consequently, becoming increasingly more urgent with Ozaukee County.

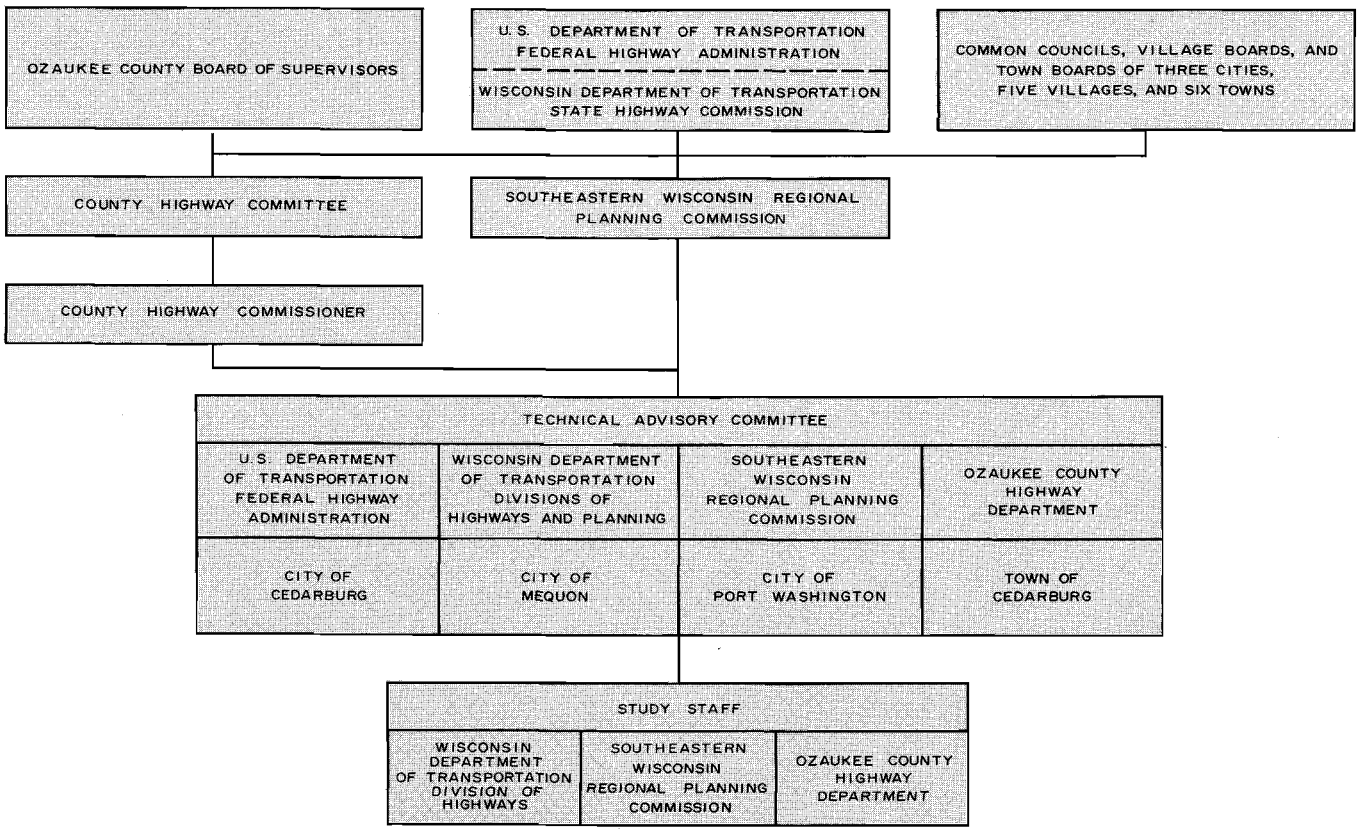
## STUDY ORGANIZATION

### Staff Requirements

The organization created for the necessary jurisdictional highway planning study is shown in Figure 1. Since the necessary jurisdictional highway planning effort was preceded by an intensive, comprehensive, areawide functional highway planning study, a large staff was not required to

Figure 1

ORGANIZATIONAL STRUCTURE FOR THE JURISDICTIONAL HIGHWAY SYSTEM PLANNING PROGRAM, OZAUKEE COUNTY, WISCONSIN




*Source: SEWRPC.*

carry out the effort. This preceding study provided almost all of the necessary basic planning and engineering data, as well as the basic traffic simulation models, essential to any meaningful jurisdictional highway system planning effort. Thus, only a very small staff of experienced regional transportation planning engineers closely associated with the development of the functional highway system plan and having a thorough understanding of the traffic and land use data and simulation models used in the preparation of that plan was required to convert the functional highway system plan to a jurisdictional highway system plan from a technical standpoint.

Advisory Committee Structure

Because any realignment in the jurisdictional highway systems would affect the federal, state, and local units of government concerned in many ways, it was considered essential to actively involve these units of government in the jurisdictional highway planning process. Such participation had been previously obtained within the County in connection with the regional land use-transportation study through the use of a Technical Coordinating and Advisory Committee on Regional Land Use-Transportation Planning, with technical representation from the Cities of Mequon and Cedarburg, as well as from the federal, state, and county levels. Consultation with the elected heads of the local units of government indicated that a similar arrangement for the jurisdictional highway planning effort would be considered desirable and that the technical, not policy-making, local officials should be represented on the advisory committee. A Technical Coordinating and Advisory Committee was, therefore, incorporated into the jurisdictional highway planning study organization to provide guidance and assistance to the staff during the course of the study. Specifically, this Committee was charged with assisting and advising the study staff on technical methods, procedures, and interpretations; assisting in the assembly and evaluation of planning and engineering data; assisting in the establishment, definition, and review of criteria; appraising alternative plans; and resolving any conflicts which might arise in plan preparation and selection. The Committee was intended to be a working committee and to actively involve the federal, state, and local technical officials in the planning process, an objective which it has fully met.

Membership on the Advisory Committee was drawn to include representation from the U. S. Department of Transportation, Federal Highway Administration; the State Highway Commission; the Southeastern Wisconsin Regional Planning Commission; the Ozaukee County Highway Department; the Cities of Cedarburg, Mequon, and Port Washington; and the Town of Cedarburg.

A complete committee membership list is set forth in Appendix A of this report. The Committee was responsible for the detailed review and ultimate approval of the completed work of the study staff and for transmittal of the recommended jurisdictional plan to the constituent and cooperating agencies for adoption and implementation.

## STUDY PURPOSE AND PLAN OBJECTIVES

The primary purpose of the jurisdictional highway planning study was to identify, and subsequently group into subsystems, classes of arterial streets and highways serving similar functions and providing similar levels of service, utilizing criteria established for this purpose, and, further, to assign jurisdictional responsibility over the subsystems so established to the appropriate level of government having the greatest basic interest so as to achieve the following objectives:

1. Promote implementation of the adopted regional transportation plan.

2. Provide a sound basis for the efficient multi-jurisdictional management of the total arterial street and highway system and for the attainment of the necessary intergovernmental coordination in that management; and thereby to avoid conflicts over, and duplication in, the administration, financing, design, construction, maintenance, and operation of the individual facilities which must comprise the total arterial street and highway system.

3. Provide a sound basis for the efficient design and improvement of the total arterial street and highway system by combining into subsystems those facilities which, because of the type and level of service provided, should have similar standards for design, construction, operation, and maintenance.

4. Provide a basis for the establishment of a sound, long-range fiscal policy and for the systematic programming of arterial street

and highway improvements; and thereby to assure the most effective use of the total public resources in the provision of highway transportation, focusing the appropriate resources and capabilities on the corresponding areas of need.

5. Provide a basis for the more equitable distribution of highway system development costs and revenues among the levels and agencies of government concerned.

## FORMAT OF PRESENTATION

The findings and recommendations of the jurisdictional highway study, as presented in this report, have been unanimously approved by the Technical Coordinating and Advisory Committee on Jurisdictional Highway Planning for Ozaukee County established for the study. The report briefly traces the historic development of the present state trunk, county trunk, county aid, and federal aid highway systems; describes the techniques and procedures used to prepare a plan for the realignment of these systems; and presents the recommended jurisdictional highway system plan so prepared. Existing financing formulae are described, proposals advanced for the revision of these formulae, and the financial feasibility of the recommended plan determined and documented. Finally, means for implementation of the study findings are provided, together with recommended staging of major improvements.

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## Chapter II

## THE JURISDICTIONAL HIGHWAY PLANNING PROCESS

### INTRODUCTION

The establishment, proper improvement, and efficient operation and maintenance of an arterial highway system are important to the orderly growth and development of any area. Such a system is particularly important to the orderly growth and development of a large metropolitan region and to the orderly growth and development of a county, such as Ozaukee County, which is an integral and rapidly urbanizing part of such a large metropolitan region (see Map 1). A well-conceived arterial highway system, delineated on the basis of sound planning and engineering principles, will provide a framework upon which good land use development can progress and, if properly improved and maintained, will stimulate and foster the social and economic, as well as the physical, development of the County and of the entire region of which the County is a part.

The arterial highways of an urbanizing region must function as a single, integrated system over the entire region; yet many levels and agencies of government are responsible for the design, construction, maintenance, and operation of various parts of that total system. The identification of jurisdictional subsystems within the total arterial highway system is, therefore, essential to the attainment of an efficient, workable, and fully integrated highway transportation system and to the avoidance of inefficiencies and duplication of effort. The planning of the total arterial highway system and the identification of the various jurisdictional subsystems on an objective, rational basis are highly complex, technical tasks requiring not only the prerequisite planning and engineering skills and data but also the active participation of the several levels and agencies of government concerned with the provision of highway transportation services within the urbanizing region.

### BASIC CONCEPTS

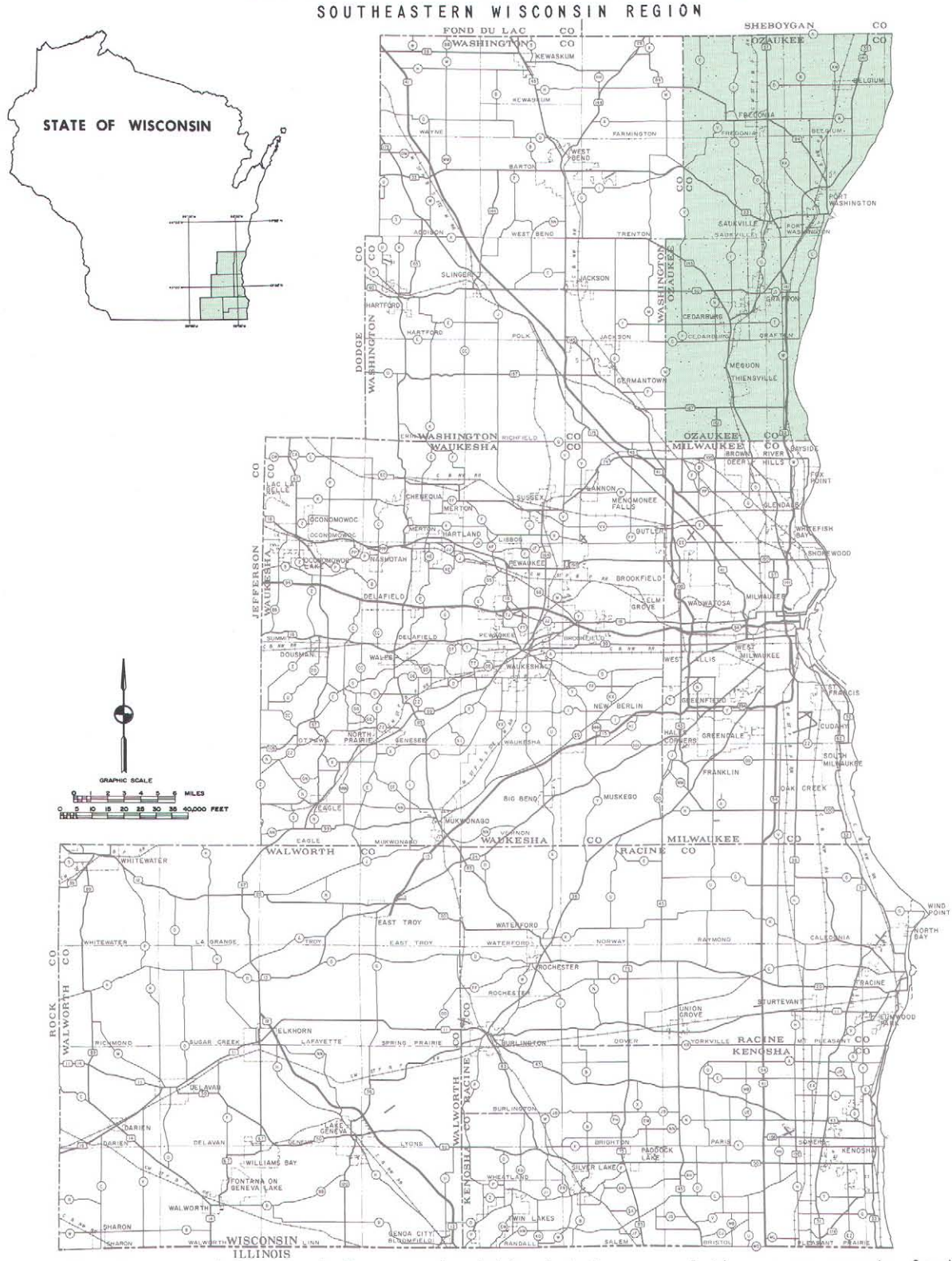
Any planning for coordinated highway system development must involve a comprehensive determination of the character of the individual facilities needed to provide an adequate highway transportation system. Such planning cannot be done effectively on an uncoordinated, "one-road-at-a-time" basis since individual streets and highways do not serve travel independently in any significant way. Rather, most travel involves movement through a total system of highway facilities. Consequently, the planning of highway system development must begin with a consideration of the trips to be served by the facilities and the land uses which generate these trips.

Since it is impossible to provide direct-line highway connections for all travel desires existing within an urbanizing region, the trips must be channelized into a system of arterial streets and highways in a logical and efficient manner. The functional classification of highway facilities defines the nature of this traffic channelization process by identifying the function which each particular street or highway should serve in the total highway system. The functional classification of the total arterial street and highway system thus becomes one of the important elements of the comprehensive transportation planning process. It provides the means for defining travel paths through the total highway network and thereby provides the basis for estimating the amount and character of traffic which each facility in the total system may be expected to carry. The functional classification also provides the means for establishing desirable levels of service to be provided by each of the facilities comprising the total system and a basis for determining the predominant travel distances served by various segments of the total system.

The singularly most important basic concept underlying the jurisdictional highway planning process, therefore, is that the jurisdictional highway planning process must be preceded by a functional highway planning process; that is, a jurisdictional highway system plan must be based upon, and derived from, a prior functional highway system plan. The development of a sound and viable jurisdictional highway system plan, therefore, can properly proceed only within the context of a comprehensive areawide transportation planning process which has identified

Map 1

LOCATION OF OZAUKEE COUNTY WITHIN THE SOUTHEASTERN WISCONSIN REGION




Ozaukee County comprises about 9 percent of the total area of the seven-county Southeastern Wisconsin Region, contains about 3 percent of the Region's population, employs about 3 percent of the labor force, and contains about 4 percent of its tangible wealth as measured by equalized assessed valuation. The county, which is still a rich agricultural resource area, is one of the fastest growing counties in the Region and the state and is experiencing heavy pressures of urbanization. Consequently, the county can expect to experience increasing transportation problems.

*Source: SEWRPC.*

the transportation needs of the entire urbanizing region to a selected design year and which has provided definitive recommendations for meeting those needs through the improvement of both arterial highway and mass transit facilities in the form of a functional transportation plan.

The functional arterial street and highway system established in the initial regional land use-transportation study effort for the Southeastern Wisconsin Region accordingly became the point of departure for the preparation of the jurisdictional highway system plan within Ozaukee County. The jurisdictional highway planning problem was thus one of identifying jurisdictional subsystems within the total arterial system on an objective and rational basis, with the character of the trips served, the character of the land use activities served, and the service level of each subsystem becoming the basis for the subclassification.

Functional Classifications

In the initial regional land use-transportation study effort, all of the existing streets and highways within the Region were classified, on the basis of existing function, into two categories: arterial and all other. The latter category included the collector and local (land access) street subcategories. The initial classification was based upon the function which the facilities were actually performing at the time of the classification in the considered opinion of experienced, knowledgeable state and local public works engineers responsible for the construction, maintenance, and operation of the total street and highway system. This initial classification was subsequently verified by application of traffic simulation models and comparison of the resulting simulated traffic flows with actual traffic volume counts.

An arterial facility was defined, in the initial regional land use-transportation study effort, as a facility intended to serve the movement of heavy volumes of through traffic. Its primary function, therefore, must be to facilitate the expeditious movement of vehicular traffic. A secondary function may be the provision of access to abutting land, but this function should always be subordinate to the primary function of traffic movement.

Arterial facilities include freeways, expressways, certain types of parkways, and standard surface arterial streets and highways. Freeways and expressways do not provide direct access to abutting land uses and are intended to provide safe, convenient, economical, and expeditious movement of the heaviest volumes of traffic involving the longest trip lengths. The standard arterials and certain parkways are intended to serve through traffic, the volumes and trip length characteristics of which do not warrant the use of freeways or expressways.

The collector streets, which were not categorized as arterials in the initial land use-transportation study, provide the transitional connection from the arterial system to the local (land access) street system. As the name implies, the function of collector streets is to collect and distribute traffic, as well as to provide access to abutting land uses. Since arterial routes serve longer trip lengths with a higher level of service, the traffic on a collector street will usually turn onto an arterial wherever the collector intersects an arterial.

In a rectangular grid street pattern, it may be difficult to distinguish clearly between the arterial and collector functions as these functions relate to existing facilities. Straight and continuous collector streets several miles in length may carry significant volumes of traffic, thus appearing to serve as arterials, even though the predominant use of the streets may be to carry traffic to the next junction with an arterial so that the major portion of the trip can be made over arterial facilities. Collector streets, moreover, may serve industrial and commercial, as well as residential, land uses. In industrial and commercial areas, the collector streets may properly be used by both trucks and buses serving tributary land uses. In residential areas collector streets may properly be used by buses serving tributary land uses. In some instances roadway widths of some collector streets may, in response to the character and volume of traffic, be wider than the roadway widths of some arterials. Traffic control devices may be installed to protect or facilitate traffic movement on collectors, as well as on arterials.

Functional Classification Criteria

In the delineation of an arterial system, it is important to promote sound future land use development or redevelopment, as well as to protect existing desirable forms of development, by recognizing the diverse needs of the various types of existing and proposed land use development, both rural and urban, in the County. The proper spacing and location of arterial facilities, existing and proposed, are most important to the attainment of this end. The majority of the existing land uses

within the northern two-thirds of the County are still rural in nature, with such urban development as exists occurring primarily in and around the rural communities located throughout this part of the County. Conversely, the southern one-third of the County is undergoing rapid urbanization as a contiguous part of the Milwaukee urbanized area.

In the rural areas of the County, as in the urban areas, arterial facilities must be located to support the everyday activities of families residing in these areas, including work, personal business, shopping, recreation, and social intercourse, and, therefore, must facilitate reasonably fast, safe, and convenient travel between existing rural communities containing commercial, industrial, institutional, and recreational, as well as residential, development and between farmsteads and such communities. In rural areas, however, the arterial facilities must also be located to promote the economic viability and vitality of productive rural enterprises. It is important to recognize that such enterprises include active farmsteads, as well as food processing industries, fowl and fur farms, gravel and stone quarries, nurseries, and orchards. Thus, farmsteads, unlike urban residential areas, represent productive enterprises and are only incidentally utilized as residential areas for farm labor and management. As productive enterprises, these farmsteads require arterial facilities to be located so as to provide ready access to sources of labor, material, and markets. The rural arterial system should also be located to provide direct connections to the regional freeway system in order to provide ready access to regional commercial, industrial, and recreational activities and to the more highly urbanized areas of the Region. Finally, in order to provide full flexibility to adapt to changing conditions, arterials in rural areas should be so located as to permit future conversion of land from rural to urban use and, in so doing, promote the sound development of planned development units, particularly residential neighborhood units, at various population densities. In order to meet this last requirement, rural arterials should be placed no closer than two miles.

Within urban areas the penetration of residential neighborhoods by heavy volumes of fast, through, vehicular traffic is one of the surest means of destroying the desirable characteristics of such neighborhoods. Arterial routes should, therefore, be located on the periphery of residential neighborhoods. To this end the Regional Planning Commission, in formulating regional development objectives, principles, and standards, has recommended the following minimum spacings for arterial routes in urban areas:

1. High-density[1] urban development—one-half mile spacing.

2. Medium-density[2] urban development—one-mile spacing.

3. Low-density[3] urban development—two-mile spacing.

Accepting the premise that a well-planned and properly maintained arterial street and highway system should not only serve the traffic demands but do so with minimal disruption of residential development, the location and spacing of arterial facilities becomes unusually important. The arterial system should be clearly identifiable so that it is readily apparent which routes should be carrying the heaviest volumes of through traffic and so that these routes can serve to provide boundaries between planned development units rather than to penetrate and divide these units. Finally, the component parts of the arterial system should be so located that the number of intersections with other arterials allows for good traffic progression and efficient system operation.

Scenic Drives

A third category of facility, normally not considered in the jurisdictional highway planning process but considered as both a special functional and jurisdictional classification under the Ozaukee County jurisdictional highway planning program, is the scenic drive. For the purposes of this report, a scenic drive is defined as a marked and signed route over existing streets and highways that traverses particularly pleasing landscapes, including areas of topographic, vegetative, and

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[1] *High-density urban development is defined as development at a gross density ranging from 10,000 to 25,000 persons per square mile (4.8 to 11.8 dwelling units per gross acre).*

[2] *Medium-density urban development is defined as development at a gross density ranging from 3,500 to 9,999 persons per square mile (1.8 to 4.7 dwelling units per gross acre).*

[3] *Low-density urban development is defined as development at a gross density ranging from 350 to 3,499 persons per square mile (0.2 to 1.7 dwelling units per gross acre).*

geological interests and areas containing sites of scientific, cultural, or historic interest. Such scenic drives are normally heavily utilized only during summer weekend and holiday periods, and are routed over existing facilities that perform arterial, collector, and land access functions during the remainder of the time. Although not all, or even a majority of, the facilities and facility mileage over which the scenic drives are routed function as arterials with respect to the weekday travel demand, the areawide nature of the recreational travel demand served by the scenic drive facilities during seasonal weekend and holiday periods dictates that scenic drives be given careful consideration in the jurisdictional highway planning process. The areawide nature of the recreational travel demand served, the need to maintain intercommunity and intercounty continuity in the network of scenic drives through proper marking and signing, and the need to relate such drives properly to the natural resource base all indicate the need for a special functional and jurisdictional classification relating to such drives. Consequently, all existing and proposed scenic drives within Ozaukee County were identified as a special functional category and assigned a jurisdictional classification as a part of the Ozaukee County highway system planning process.

## FUNCTIONAL NETWORK REFINEMENT

As a prerequisite to the actual jurisdictional highway planning process, the functional arterial street and highway system prepared under the initial regional land use-transportation planning effort was refined and updated for Ozaukee County to reflect changes in traffic patterns and to better accommodate future land use development. This refinement and updating of the functional arterial system included a careful review of the existing and desirable future functions of each route included in the original system. This review was made in cooperation with local planning and engineering staffs and included consideration of existing and proposed land uses along the facilities, as well as of the location, spacing, and operational characteristics of the facilities themselves.

The review indicated that the original functional arterial system for Ozaukee County included some facilities, particularly in urban areas, which actually served collector, rather than true arterial, functions, and that, particularly in rural areas, some facilities which were orginally considered as collector and local streets were actually performing an arterial function, even though traffic volumes on such facilities were relatively low. It indicated also that the original classification had placed too much emphasis upon the functions actually being served by the various components of the total street and highway system at the time of the original classification and too little emphasis upon the desirable changes in these functions over time. Just because a given street or highway functions as an arterial at the present time does not necessarily mean that it should, in light of changing land use and traffic patterns, continue to perform this function in the future.

Accordingly, certain changes in the functional classification of the total street and highway system within Ozaukee County were made. As a result, 11 miles of facilities were removed from the arterial system. The revised arterial system was once more reviewed by experienced county and municipal engineers most intimately acquainted with the construction, maintenance, and operation of the total street and highway system; and the revised arterial street and highway system was then adopted as a basis for the jurisdictional highway planning effort.

## THE JURISDICTIONAL HIGHWAY PLANNING PROCESS

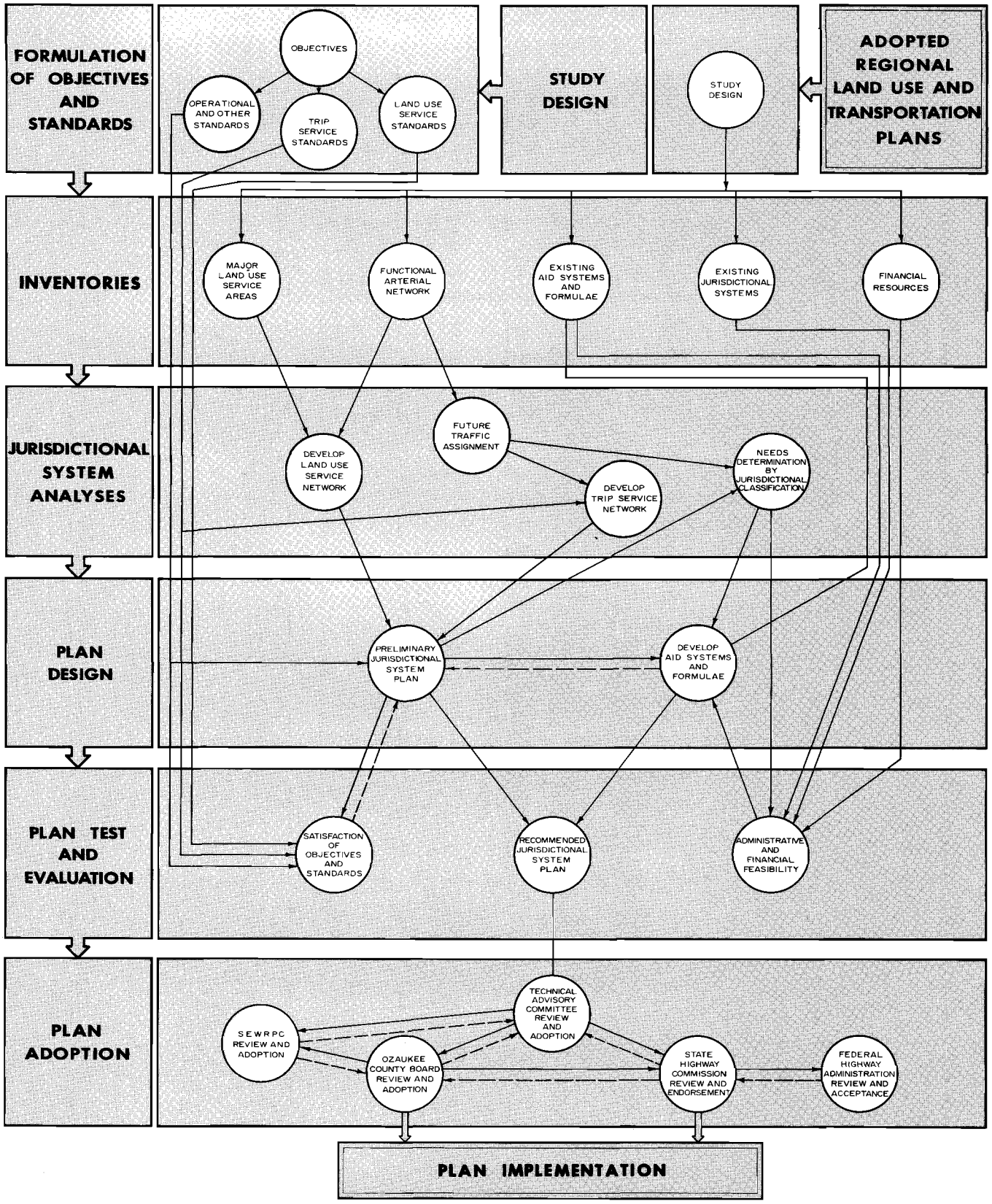
Based upon the preceding basic concepts, a seven-step planning process was employed in the development of a jurisdictional highway system plan for Ozaukee County. The seven steps constituting the process were: 1) study design; 2) formulation of objectives and standards; 3) inventory of existing systems, aid formulae, and financial resources; 4) jurisdictional systems analyses; 5) plan design; 6) plan test and evaluation; and 7) plan adoption. A brief description of each of these seven steps follows (see Figure 2).

### Study Design

Every planning program must embrace a formal structure or study design so that the program can be carried out in a logical, consistent, and efficient manner. A statement of policy and procedure, setting forth the routine for the conduct of the study, was, therefore, prepared as the initial work element of the Ozaukee County jurisdictional highway planning study. This statement provided a sequential overview of the major work elements of the study; provided for the establishment of the Technical Advisory Committee necessary to assist in the conduct of the study and in the provision of

Figure 2

THE JURISDICTIONAL HIGHWAY SYSTEM PLANNING PROCESS FOR OZAUKEE COUNTY




*Source: SEWRPC.*

technical policy guidance; established time schedules and a critical path diagram to assist in expediting the completion of the study; and provided for the documentation of the study results in detailed staff memoranda, the minutes of the Technical Coordinating and Advisory Committee meetings, and, ultimately, in this published report.

Formulation of Objectives and Standards

In its most basic sense, planning is a rational process for establishing and meeting objectives. The formulation of objectives is, therefore, an essential task to be undertaken before plans can be prepared. The basic transportation system development objectives governing the preparation of the jurisdictional highway plans are set forth in the adopted regional transportation plan[4] and relate to the provision of an integrated transportation system which effectively serves the existing and proposed land use pattern; to the provision of a balanced transportation system providing appropriate types and levels of transportation service to the various subareas of the Region; to the alleviation of traffic congestion and the reduction of travel time; to the reduction of accident exposure and the provision of increased travel safety; to the provision of a more economical and efficient transportation system; to the minimization of disruption of desirable development and of deterioration or destruction of the natural resource base; and to the promotion of a high aesthetic quality in the transportation system. That the functional arterial highway system recommended in the adopted regional transportation plan, and upon which the jurisdictional plan is based, met these objectives was demonstrated in the regional transportation study and documented in the planning reports issued under that study.

The conversion of the arterial highway system to a jurisdictional system, however, required the formulation and application of additional standards in the form of functional criteria for the jurisdictional classification of highway systems. These criteria, relating each jurisdictional subclassification to three basic functional characteristics—trip service, land use service, and the operational characteristics of the facilities themselves—formed the basis for plan preparation and evaluation by providing a rational and objective basis for the classification of the total arterial street and highway system into jurisdictional subsystems.

Inventory

Reliable data collected on a uniform, areawide basis are absolutely essential to the formulation of workable development plans. Consequently, inventory becomes the first operational step in any planning process, growing out of the study design. The crucial nature of factual information in the planning process should be evident, since no intelligent forecasts can be made or alternative courses of action selected without knowledge of the current state of the system being planned.

The sound formulation of a jurisdictional highway system plan for Ozaukee County required that factual data be developed on the location and configuration of the existing jurisdictional highway systems, including the supporting federal aid routes; on the existing route mileage of each major jurisdictional type by civil division; on the attendant construction and maintenance aid formulae and related plan implementation policies and practices; and on historic patterns of highway revenues and expenditures by level and agency of government concerned. In addition, as already noted, the functional arterial highway network and the major land use service areas, as identified and delineated in the initial regional land use-transportation planning effort, were reviewed under the inventory phase and, in some cases, refined and detailed.

Since the jurisdictional highway planning process in Ozaukee County had been preceded by a comprehensive, areawide regional transportation planning process, the inventory operations could be confined to the collection of data relating directly to jurisdictional classification. This limited inventory operation and the economies and efficiencies associated therewith were feasible only because the initial regional land use-transportation study had provided the necessary data on the existing and committed transportation facilities and their utilization and, most importantly, had also provided data on the existing travel habits and patterns, including a complete origin and destination study. The initial regional land use-transportation plan had, moreover, provided a full battery of calibrated and operable traffic simulation models essential to the analysis of existing and probable future traffic flows required for proper execution of the jurisdictional highway planning process.

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

Jurisdictional Systems Analyses

Inventories provide factual information about the existing state of the system being planned, but analyses and forecasts are necessary to provide estimates of future needs. These future needs are determined by a sequence of interlocking forecasts. Economic activity and population forecasts set the general scale of future growth, which can, in turn, be translated into future demand for land use and travel. These future demands can then be scaled against the existing supply of land and transportation system capacity and plans formulated to meet any deficiencies. The necessary economic activity, population, land use, and travel demand forecasts were all prepared under the initial regional land use-transportation planning effort. Under the jurisdictional highway planning study, it remained only to utilize these forecasts in the application of the jurisdictional criteria (see Figure 3). This required analyses of the lengths and volumes of trips to be served by each link in the total arterial street and highway system, an identification of the land use areas to be served by each jurisdictional facility type, and an investigation of the operational characteristics of the arterial facilities themselves. Essential to these analyses was the availability of the battery of traffic simulation models formulated and maintained by the Regional Planning Commission.

Plan Design

Plan design forms the heart of the planning process. The outputs of each of the previously described planning operations become inputs to the design problem of plan synthesis. No substitute for intuition and professional judgment in plan design has so far been found, much less developed, to a practical level. Means do exist, however, for reducing the gap between the necessary intuitive and integrative grasp of the problem and its magnitude; and these were fully applied in the Ozaukee County jurisdictional highway planning study. They center primarily on the application of systems engineering techniques to the quantitative test of the jurisdictional highway system plans evolved from the functional highway network through the application of intuition and professional judgment. These quantitative tests assure the technical adequacy of the plan design but are of limited usefulness in actual plan synthesis. Consequently, it was still necessary to develop the jurisdictional highway subsystem plans by traditional graphic and analytical "cut and try" methods, then to test quantitatively the resulting design by application of the simulation model techniques, and make necessary adjustments in the design until a workable plan was evolved.

In order to overcome the limitations of individual intuitive grasp of the design problem, maximum resort was made to team effort in the actual plan synthesis; and the knowledge and experience of federal, state, and local highway engineers familiar with the geographic and functional areas concerned were applied to the plan synthesis process through careful Technical Advisory Committee review, interagency staff assignments, and interagency staff conferences. Final determination with respect to the inclusion or exclusion of any facilities in a jurisdictional subsystem which met only marginally the criteria established for that subsystem was made by the Technical Coordinating and Advisory Committee. The plan design procedure thus provided for careful review of the application of the criteria by local, county, regional, state, and federal technical staffs and thereby provided a practical jurisdictional highway system delineation, as well as a practical estimate of plan implementation costs and feasible proposals for plan implementation.

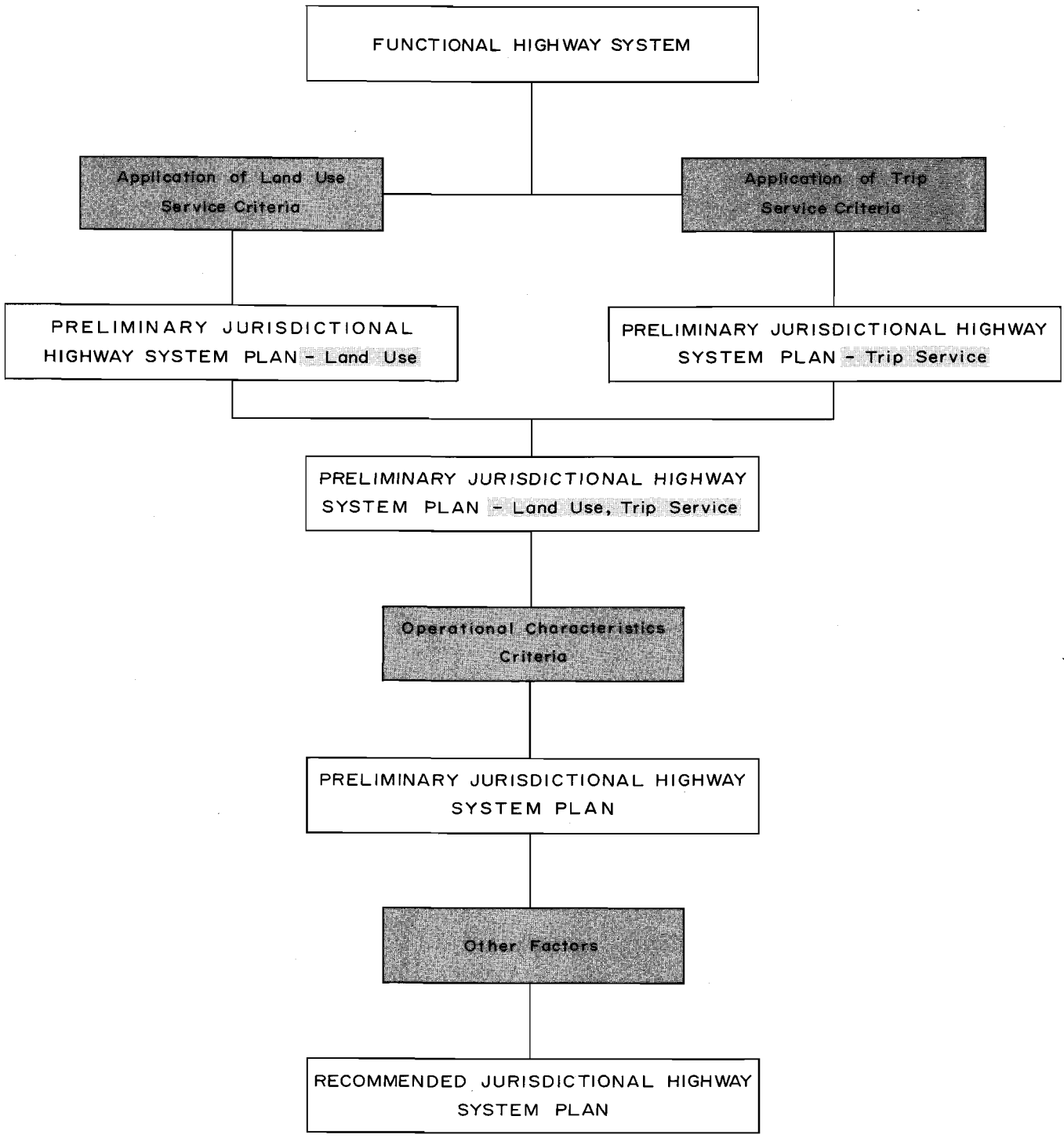
Plan Test and Evaluation

If the plans developed in the design stage of the planning process are to be realized in terms of actual transportation system development, some measures must be applied to quantitatively and qualitatively test the plans in advance of their adoption and implementation. The plan test and evaluation process must ascertain whether or not the plans are realistic in scope; consistent with the desirable advancement of the public interest; technically, legally, and financially feasible; and readily comprehendible by knowledgeable elected public officials, engineers, and technicians who will be ultimately charged with implementation.

As already noted, simulation procedures were used to test and verify the technical workability and efficiency of the proposed total arterial highway network. Satisfaction of objectives could be ascertained through application of the jurisdictional criteria in concert with the simulation techniques. These simulation techniques also permitted the determination of future link capacity and accompanying right-of-way and curb-to-curb pavement widths and improvement requirements. A total plan implementation cost could then be assigned to the resulting system configuration by the application of unit construction and main-

Figure 3

PROCEDURE FOR THE APPLICATION OF CRITERIA IN THE DEVELOPMENT OF A JURISDICTIONAL HIGHWAY SYSTEM PLAN




*Source: SEWRPC.*

tenance costs. From a composite summary of all existing highway aids and revenues prepared under the planning study, a forecast of the public financial resources available for arterial highway improvements could be provided. By comparing the forecast revenues with the forecast needs, the financial feasibility of the proposed plan could be determined and evaluated.

Plan Adoption

In a practical sense, any plan is not complete until the steps required for its implementation—that is, the steps necessary to convert the plan into action policies and programs—are specified. Plan implementation must begin with plan adoption by the responsible implementing agencies, including particularly the Ozaukee County Board of Supervisors, the Highway Commission of the Wisconsin Department of Transportation, and the Federal Highway Administration. All other implementation recommendations, including the schedule for realignment of jurisdictional responsibilities, proposals for capacity protection and right-of-way reservation, staged construction, and capital improvements programming, must follow and flow from such plan adoption.

Chapter III

# HISTORICAL DEVELOPMENT AND PRESENT STATE OF THE JURISDICTIONAL HIGHWAY SYSTEMS

## HISTORICAL DEVELOPMENT

The earliest European settlers in southeastern Wisconsin traveled "highways" consisting of a network of Indian trails and rivers, which connected the many Indian villages in the territory. It was near these Indian villages at strategic points along the trails and rivers that trading posts were established by the settlers, and many of the present cities and villages within the Region were built on or near the sites of these trading posts and nearby Indian villages. As settlement became more widespread, several forts were constructed for frontier defense against hostile Indians within the territory of which southeastern Wisconsin was then a part. In order to facilitate the transportation of troops and supplies between these forts, the U. S. Army developed and constructed a system of military roads. Map 2 depicts the two military roads that traversed Ozaukee County. The north-south route comprised part of the road from Fort Howard, at what is now Green Bay, to Fort Dearborn, at what is now Chicago. Portions of this road within Ozaukee County are now STH 33 and STH 57, with the segment north of Port Washington paralleling what is now the Chicago and Northwestern Railroad right-of-way. The east-west route comprised part of the military road between Sauk Harbor (Port Washington) and Dekorra on the Wisconsin River, portions of which are now STH 33. Thus, the earliest roads within the Region were federal roads, roads which are still in use today.

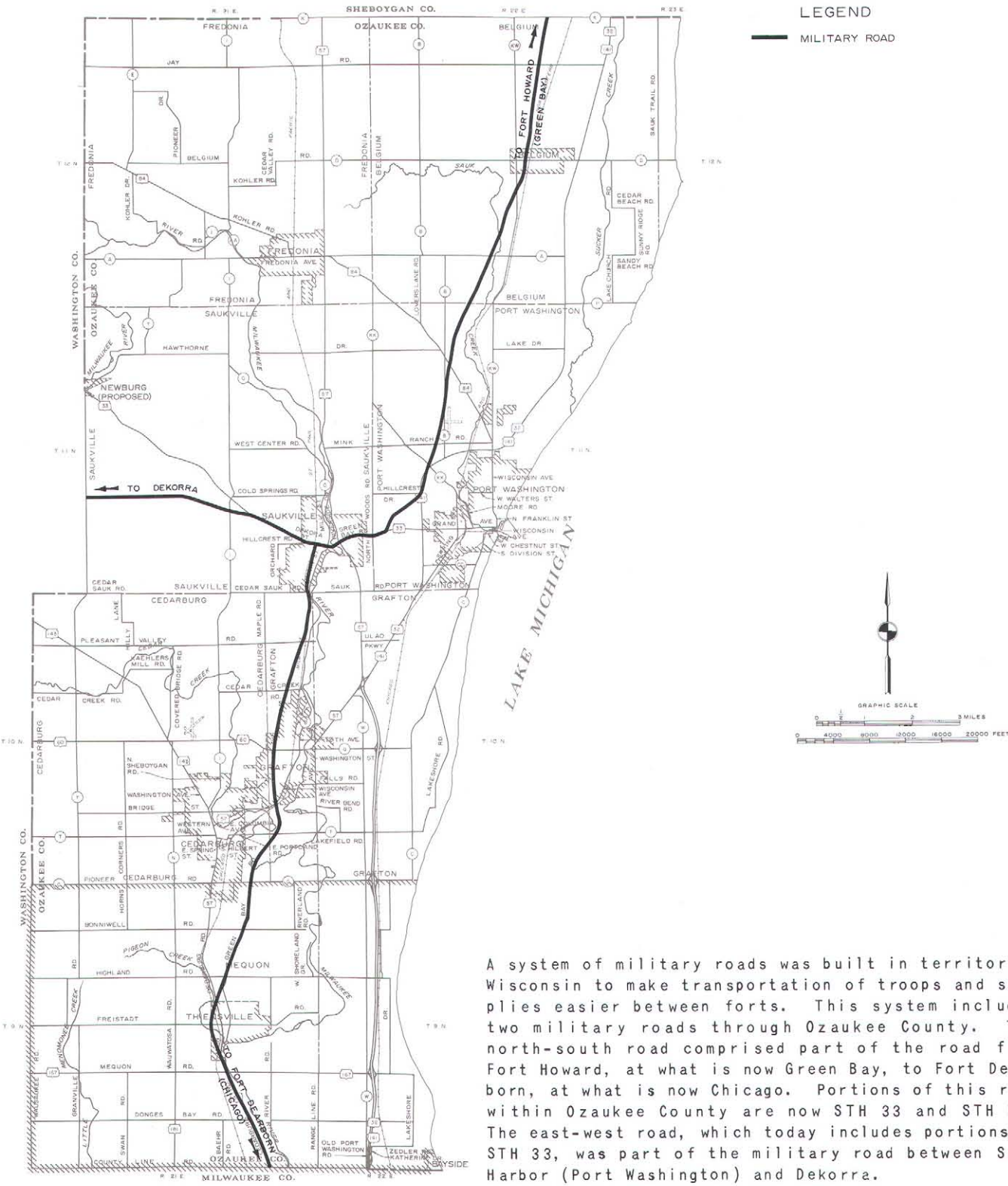
In 1836 the Territorial Legislature established a system of territorial roads. Although these roads were surveyed and located by commissions appointed by the Legislature, construction costs were assumed by the towns or by local private interests. A road tax was levied on real estate to finance construction of these territorial roads. Map 3 depicts the one territorial road that traversed Ozaukee County. This territorial road extended northerly from Milwaukee County to the City of Port Washington and had portions of its alignment located along what is now CTH W and the Lake Shore Road.

Since many of the territorial roads were poorly constructed and did not provide the transportation service required, demand soon developed for the construction of plank roads. About the time Wisconsin attained statehood in 1848, a number of plank roads were chartered by the territorial and state governments. These roads were to be constructed with private capital as toll roads. The receipts from the tolls were expected to recover the capital investment in construction, keep the roads in repair, and pay a profit to the road-building company. Map 4 depicts the one plank road constructed in Ozaukee County. Known as the Milwaukee and Fond du Lac Road, it was planked as far north as Cedarburg, located in part along what is now STH 57. A combination of high maintenance costs, low profits, and competition from railroads caused the eventual abandonment of the plank roads within the Region. In 1869 the State Legislature authorized and directed town supervisors to declare the remaining plank roads public highways.

After Wisconsin became a state in 1848, all public roads laid out and opened by authorization of the State Legislature were designated as state roads. Commissions were appointed by the State Legislature to establish such roads and were authorized, in addition to opening new roads, to adopt any part of previously established town, county, or territorial roads as state roads. Map 3 depicts the single State Road which traversed Ozaukee County from Cedarburg to West Bend, generally following what are now CTH I, STH 60, STH 143, and CTH Y in Ozaukee County. State roads so laid out and opened were a direct charge to the towns through which the roads traversed because of the constitutional provision prohibiting the state government from participation in works of internal improvement. The State Statutes required that the right-of-way for all state roads be established at a width of four rods (66 feet). Later legislation also required all county roads to be laid out with a right-of-way width of not less than four rods. Town roads could be laid out with right-of-way widths of three rods (49.5 feet). The maintenance of state, county, and town roads was made the responsibility of the towns. The success of the

Map 2

## MILITARY ROADS IN OZAUKEE COUNTY: 1835-1870

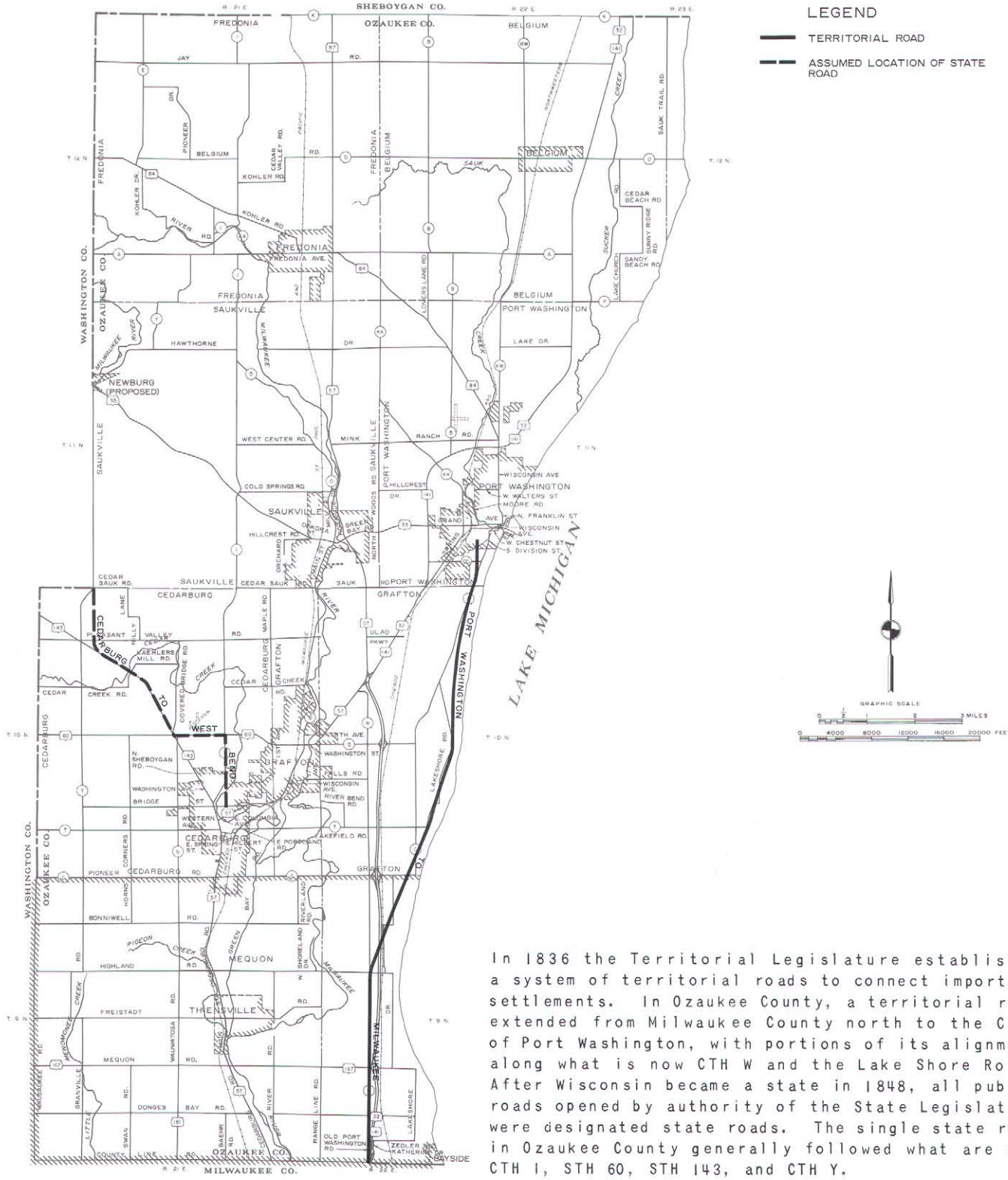



A system of military roads was built in territorial Wisconsin to make transportation of troops and supplies easier between forts. This system included two military roads through Ozaukee County. The north-south road comprised part of the road from Fort Howard, at what is now Green Bay, to Fort Dearborn, at what is now Chicago. Portions of this road within Ozaukee County are now STH 33 and STH 57. The east-west road, which today includes portions of STH 33, was part of the military road between Sauk Harbor (Port Washington) and Dekorra.

*Source: SEWRPC.*

Map 3

## STATE AND TERRITORIAL ROADS IN OZAUKEE COUNTY: 1835-1886

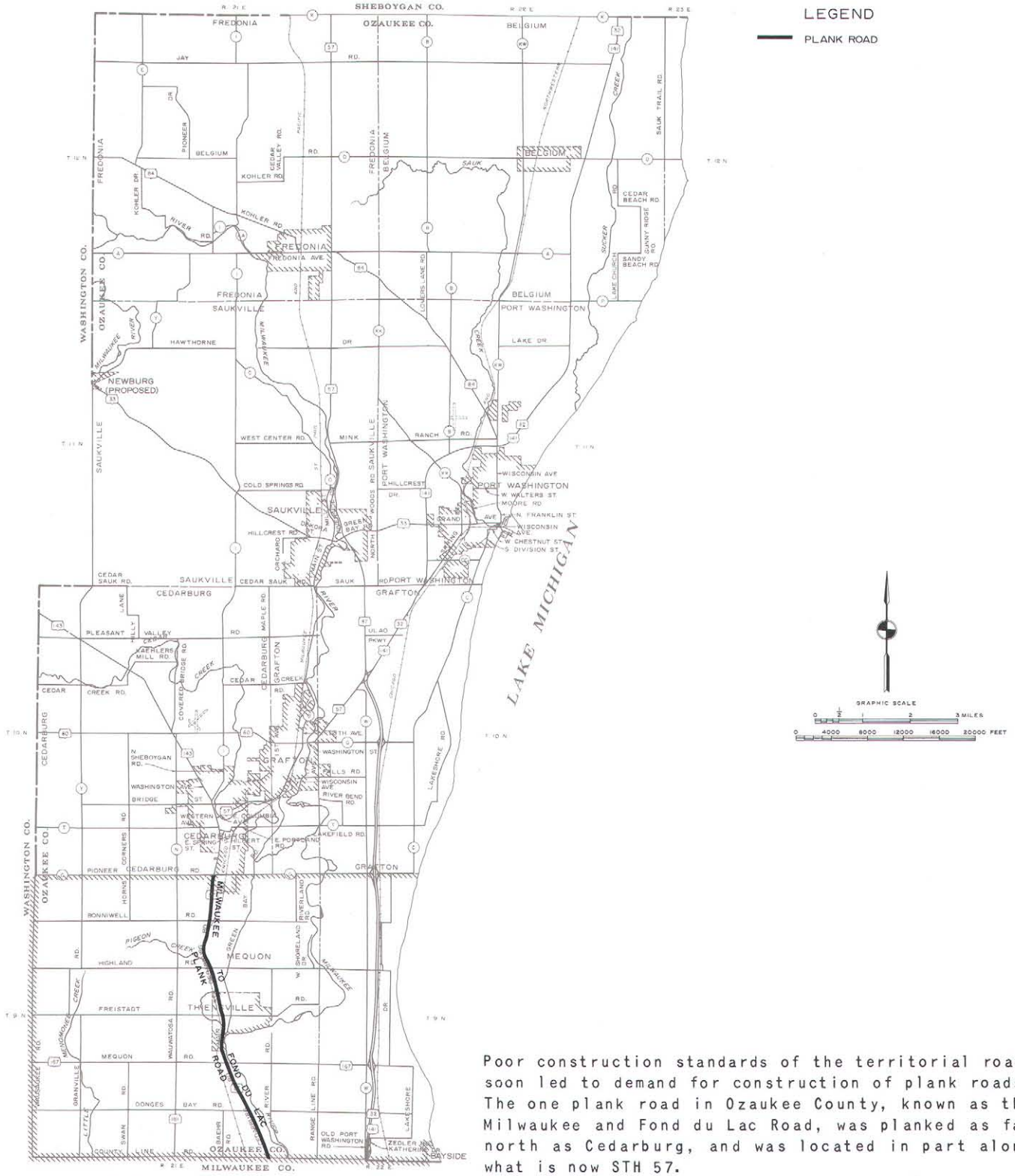



In 1836 the Territorial Legislature established a system of territorial roads to connect important settlements. In Ozaukee County, a territorial road extended from Milwaukee County north to the City of Port Washington, with portions of its alignment along what is now CTH W and the Lake Shore Road. After Wisconsin became a state in 1848, all public roads opened by authority of the State Legislature were designated state roads. The single state road in Ozaukee County generally followed what are now CTH I, STH 60, STH 143, and CTH Y.

*Source: SEWRPC.*

Map 4

## PLANK ROADS IN OZAUKEE COUNTY: 1846-1854




Poor construction standards of the territorial roads soon led to demand for construction of plank roads. The one plank road in Ozaukee County, known as the Milwaukee and Fond du Lac Road, was planked as far north as Cedarburg, and was located in part along what is now STH 57.

*Source: SEWRPC.*

steam railroad in the late 1800's caused highway transportation to be neglected. Private road-building companies passed out of existence; and, since the state could not directly participate in road construction, very little progress in highway improvement was realized.

About the turn of the century, the motor vehicle became a practical means of transportation and revived the demand for improved highways to connect and serve the growing population centers. As a result the Legislature enacted the first county aid highway laws in 1907. These county aid highway laws provided that any town could, by appropriating money from town funds, secure matching funds from the county for highway improvements; the county was to select a system of highways on which improvements utilizing town and county funds were to take place; and the county was to elect a county highway commissioner to administer the improvement of the system of highways selected by the county.

In the general election of 1908, the people of the state approved a constitutional amendment which provided:

> ... that the State may appropriate the money in the treasury or to be thereafter raised by taxation for the construction or improvement of public highways ....[1]

In the period between 1907, when the county aid highway laws were enacted, and 1911, when the first state aid highway law was passed, it had become increasingly apparent that local units of government alone would not be able to construct and maintain the highway facilities which were needed and being demanded. In addition, public opinion was becoming crystallized in favor not only of a much higher level of highway improvement but also of a more centralized regulation and financing of highway construction and maintenance.

Under Chapter 52, Laws of Wisconsin 1911, the State Legislature created the State Highway Commission, which was given authority over all matters pertaining to the expenditure of the state highway fund for the improvement of public highways and bridges in the state. The Highway Commission, in turn, organized a State Highway Department to provide the engineering staff necessary for the proper performance of its duties and functions. A chief engineer, designated the State Highway Engineer, was appointed; and within two years several division offices were established throughout the state.

In 1916 the United States Congress, realizing the necessity of a national system of highways for interstate transportation and national economic development, passed the first federal aid highway law. The benefits accruing to Wisconsin under this law made it possible for the State Highway Commission, already a well-established agency, to proceed with the development of an integrated system of state highways, a vast improvement over the aggregation of the discontinuous, and often illogical, county highway systems then existing. One requirement of the federal aid highway law was that the state assent to the provisions of the federal act and provide for the maintenance of the highways improved with state and federal aid.

The State Legislature of 1917 directed the State Highway Commission to establish a state trunk highway system not to exceed 5,000 miles, which would interconnect every county seat and every city with a population of 5,000 or more. The system was laid out after due investigation and public hearings by the Highway Commission. The new law also provided for the proper marking and signing of the system by the Highway Commission and for the publication and sale of maps for the guidance of travel. Maintenance of this system was assigned to the counties under the general supervision of the State Highway Commission. Map 5 depicts the location and numbering of the original state trunk highway system as established statewide in 1918, totaling about 4,999 miles of facilities. Map 6 depicts this system as established in Ozaukee County in 1918, totaling about 35 miles of facilities.

The 1921 Federal Aid Highway Act provided that the states could designate a system of highways, comprising not more than 7 percent of the total road mileage of the state at that time, which would be eligible for federal aid. Wisconsin acted to designate a federal aid system in 1921. This system consisted of a total of 5,516 route-miles of facilities. The Federal Aid Highway Act of 1921 provided that this total mileage be divided into two classes of routes—one known as primary, or interstate, highways and the second known as secondary, or intercounty, highways. The former were not to exceed three-sevenths of the total

[1] *Wisconsin Constitution, Article VIII, Section 10.*

Map 5

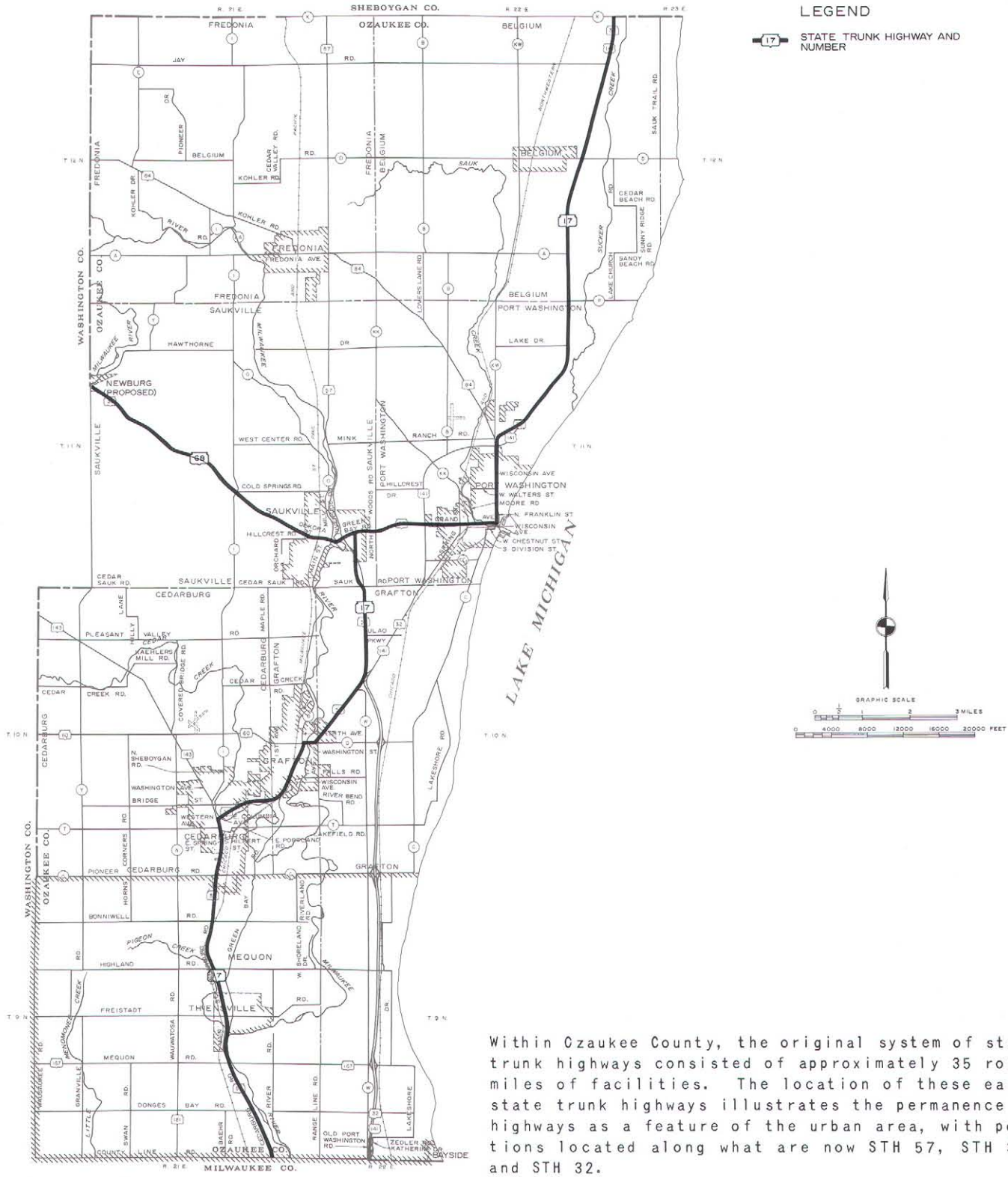
# ORIGINAL STATE TRUNK HIGHWAY SYSTEM IN WISCONSIN: 1918


The original state trunk highway system in Wisconsin in 1918 totaled 5,000 miles, and interconnected every county seat and every city in the state with a population of 5,000 persons or more.

*Source: Wisconsin Department of Transportation.*

Map 6

## ORIGINAL STATE TRUNK HIGHWAY SYSTEM IN OZAUKEE COUNTY: 1918




Within Ozaukee County, the original system of state trunk highways consisted of approximately 35 route miles of facilities. The location of these early state trunk highways illustrates the permanence of highways as a feature of the urban area, with portions located along what are now STH 57, STH 33, and STH 32.

*Source: Wisconsin Department of Transportation and SEWRPC.*

federal aid route mileage designated within the state and the latter, the remaining four-sevenths of that mileage. The primary routes were selected by the State Highway Commission as an integrated system of major intercity traffic carriers totaling 2,364 route-miles of facilities. The secondary system was selected by the State Highway Commission, in cooperation with local officials, and consisted of, in addition to farm-to-market roads, rural mail routes, rural public school routes, and county trunk highways and totaled 3,152 route-miles of facilities. The total original designation of 5,516 route-miles of federal aid primary and secondary highways under the 1921 Federal Aid Highway Act basically comprises the federal aid primary system within Wisconsin today.

During the period from 1918 to 1924, in addition to the state trunk highway system which the counties were required by law to maintain under the supervision of the Highway Commission, each county voluntarily assumed the responsibility for the improvement and maintenance of an additional number of miles of highways. This was done through the broad statutory general powers of the counties to construct and improve any highway within the county boundaries. The facilities so established were called county trunk highways. The 1925 Legislature validated and confirmed as county trunk highways those highways previously selected by the county boards. These highways were to be marked, maintained, and signed by the counties. The county trunk highway systems were also required to join and be continuous between counties. A map of the selected county system was to be filed with the county clerk and copies forwarded to the State Highway Commission for review and approval. After this initial system was approved, the system could be altered only by the county board through its highway committee, with the approval of the State Highway Commission. Allotments were also to be set aside for the improvement of the county trunk highway system, including construction, repair, and maintenance of highways and bridges under supervision of the county highway committee. Map 7 depicts the system of county trunk highways in Ozaukee County which was validated by the Legislature in 1925, totaling about 86 miles of facilities.

With the establishment of the county trunk highway system in 1925, the original jurisdictional classification of highways in Ozaukee County was completed. The state trunk highway system, which by 1923 had been increased to 10,000 miles statewide and to approximately 76 miles within the County, became the primary system of highways; the county trunk highway system, which then totaled approximately 86 miles within the County, the secondary system; and other roads, more local in nature, the tertiary system.

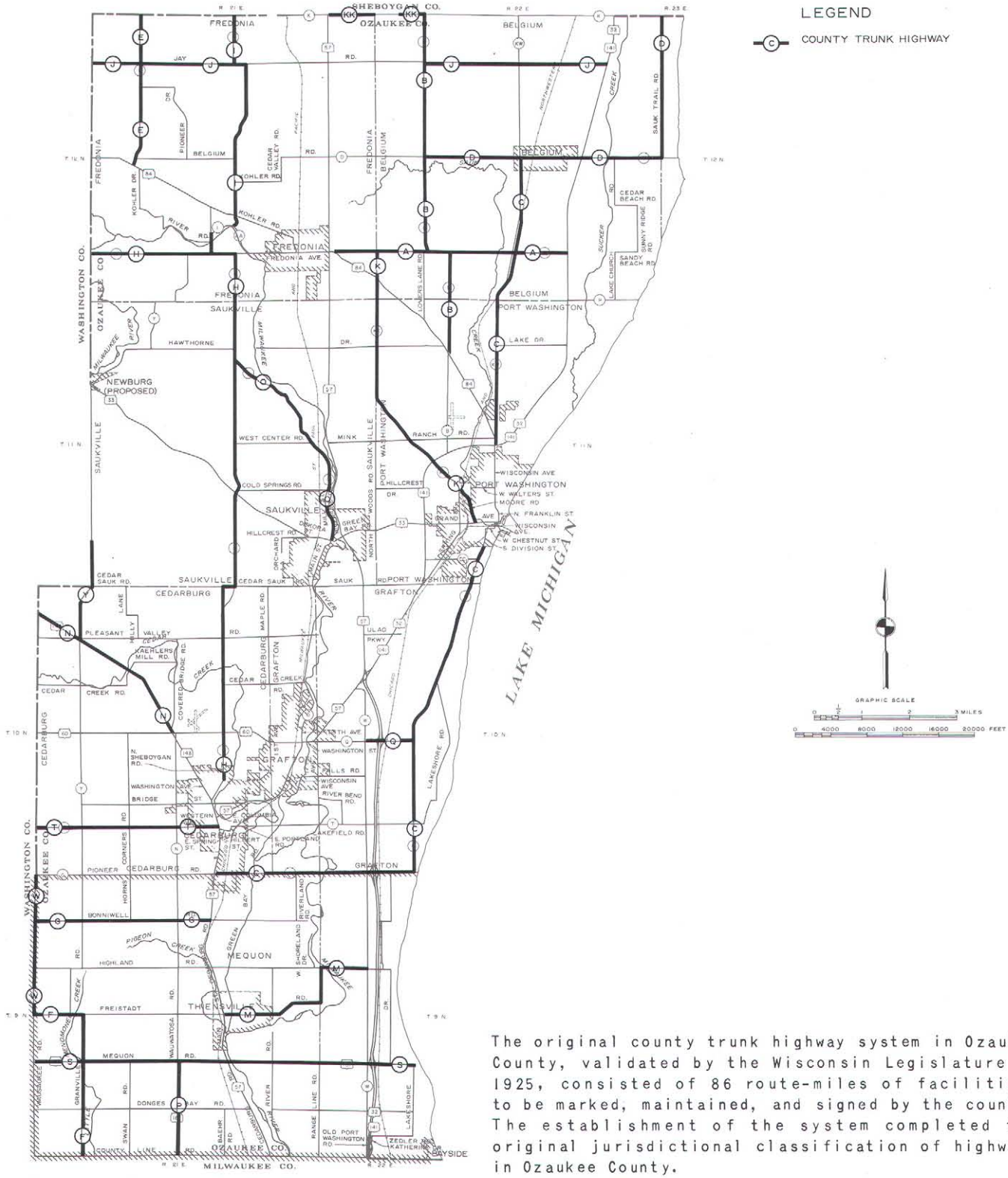
In 1931 the Ozaukee County Board revised the county trunk highway system, decreasing the system from 109 miles to approximately 87 miles of facilities, and established a county aid highway system, totaling an additional 99 miles of facilities (see Map 8 ). The county aid highway system was established by County Board resolution to aid the various villages and towns within the County in the construction and maintenance of the arterial highway facilities on the designated system. Improvement of the system as designated by the County Board was to be jointly financed by the County and the villages and towns, as permitted under Chapter 83 of the Wisconsin Statutes. Maintenance of the system was to be accomplished by the County, under the supervision of the County Highway Committee, acting in cooperation with town and village boards. Revenues for such maintenance were to be derived by charging the towns and villages at the rate of the local road and street allotment established by the State Legislature for town and village roads on the designated mileage of the county aid highways within each town and village ($50.00 per mile in 1931 for both towns and villages), with the County providing any balance required.

While the mileage of county aid highways within Ozaukee County has been decreased over the years, the purpose, administration, and financing of the county aid highway system has not been changed. Section 83.14 of the Wisconsin Statutes still permits town boards, upon approval at a town meeting, and village boards to levy a tax and appropriate money to improve designated portions of county aid highways and to petition the county board for funds to at least match such town and village appropriations. In addition, the county board is authorized by Section 83.03(1) of the Wisconsin Statutes to "...construct or improve or repair or aid in constructing or improving or repairing any highway or bridge in the county."[2]

[2] *Thus, the county apparently may, under Section 83.03(1), aid in the improvement of any street or highway within the county, including streets and highways within cities; but only villages and towns may appropriate monies and request matching county funds under Section 83.14 for such improvement.*

Map 7

## COUNTY TRUNK HIGHWAYS IN OZAUKEE COUNTY: 1925

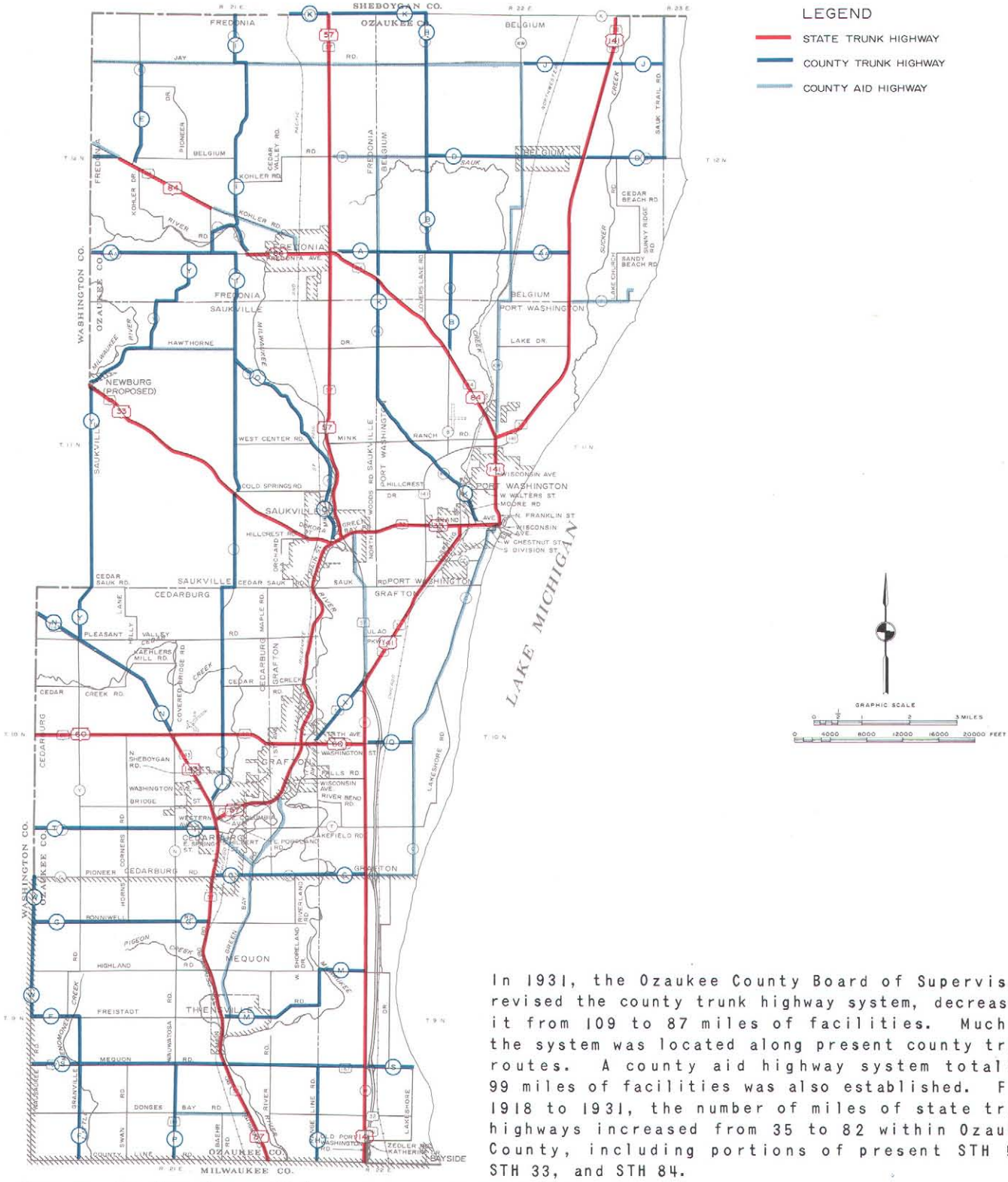



The original county trunk highway system in Ozaukee County, validated by the Wisconsin Legislature in 1925, consisted of 86 route-miles of facilities, to be marked, maintained, and signed by the county. The establishment of the system completed the original jurisdictional classification of highways in Ozaukee County.

*Source: Historic Proceedings of the Ozaukee County Board of Supervisors and SEWRPC.*

Map 8

## STATE TRUNK, COUNTY TRUNK, AND COUNTY AID HIGHWAYS IN OZAUKEE COUNTY: 1931




In 1931, the Ozaukee County Board of Supervisors revised the county trunk highway system, decreasing it from 109 to 87 miles of facilities. Much of the system was located along present county trunk routes. A county aid highway system totaling 99 miles of facilities was also established. From 1918 to 1931, the number of miles of state trunk highways increased from 35 to 82 within Ozaukee County, including portions of present STH 57, STH 33, and STH 84.

*Source: Ozaukee County Highway Department and SEWRPC.*

The Statutes further provide that all streets and highways improved with county aid shall be maintained by the cities, towns, and villages in which they lie, with the exception that the county is not relieved of its responsibilities with respect to the county trunk highway system nor is the county board prohibited from entering:

> ...into contracts with cities, villages, and towns within the county borders to enable the county to construct and maintain streets and highways in such municipalities.[3]

In practice, the town and village boards concerned annually appropriate a sum of money to be used for improvements, such as grading, draining, and the construction of gravel base and asphalt surfaces on the county aid highway system. At a subsequent county board meeting, said towns and villages petition the county board to appropriate a matching sum of money for county aid improvements.[4] In this manner each town or village in effect establishes a non-lapsing county aid highway construction fund to be used for construction improvements on the county aid highways within its jurisdiction. Maintenance of the county aid highway system is accomplished by the county with county highway maintenance monies and, in turn, charged to the towns and villages at the rate equal to the local road and street allotment ($65.00 per mile for towns and villages) plus supplemental aids as established by the State Legislature, with the county providing any balance required. Over the past eight years, the local road and street allotment plus supplemental aids have amounted to about 50 percent of the total cost of maintaining the county aid highway system. Ozaukee County is the only county within the seven-county Southeastern Wisconsin Region to utilize a county aid highway system.

Beginning in 1933 federal aids were made available for the ad hoc improvement of farm-to-market roads not on any federal aid system. The Federal Aid Highway Act of 1944, recognizing the need to improve farm-to-market roads but also recognizing the need to integrate these roads into a system of secondary highways, provided for the creation of a new federal aid secondary system. This federal aid secondary system in Wisconsin was subsequently delineated by the State Highway Commission in cooperation with local officials and consisted of approximately 14,000 miles of secondary state trunk highways and major county trunk highways. These 14,000 miles were designated, in addition to the original federal aid highways which now became the federal aid primary system, as the federal aid secondary system. The 1944 Federal Aid Highway Act also provided for the establishment of a third system of highways, known as the federal aid urban system. This system was not a true continuous highway system but, rather, consisted of the extensions of federal aid primary and federal aid secondary routes into urban areas having populations of 5,000 or more.

The Wisconsin Statutes specified that the state trunk highway system was to exclude streets or highways in all incorporated areas having a population of 2,500 or more by the last federal census. However, those portions of streets or highways along which houses were spaced at an average distance of more than 200 feet could be included in the state trunk highway system at the option of the State Highway Commission. This provision of the Wisconsin Statutes permitted the projection of the state trunk highway system into the more sparsely developed areas of cities of over 2,500 population to points known as the "construction limits." The streets over which the state trunk highway system was routed between the construction limits were designated "connecting streets" and were not legally a part of the state trunk highway system. The cities and villages were assigned the maintenance responsibility for the connecting streets. The same maintenance allotment was provided to the cities and villages for the connecting streets as was provided the counties for state trunk highways. In 1943 the Legislature changed the definition of the construction limits to those points on the state trunk highways where development had assumed "a predominantly urban characteristic."

From these beginnings the highway network in Wisconsin and in Ozaukee County developed over the years, with minor additions and revisions, to the present state and county trunk systems. Table 1 sets forth highway and street mileages in

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[3] *Section 83.035 of the Wisconsin Statutes.*

[4] *It should be noted that counties, under Section 83.14(4) of the Wisconsin Statutes, are not required to appropriate more than $2,000 in any one year for the construction, improvement, or repair of streets and highways in any town or village. Counties, however, may elect to appropriate greater amounts. For example, the average annual appropriation to towns in Ozaukee County over the past eight years was $6,000.*

Table 1

STREET AND HIGHWAY MILEAGE
IN OZAUKEE COUNTY:
SELECTED YEARS 1918-1969

| Year | State Trunk Highways (Including Connecting Streets) | | County Trunk Highways | | Local Streets | | Total Miles |
|---|---|---|---|---|---|---|---|
| | Number of Miles | Percent of Total | Number of Miles | Percent of Total | Number of Miles | Percent of Total | |
| 1918 | 35 | -- | 0 | -- | --[a] | -- | --[a] |
| 1924 | 76 | -- | 86 | -- | --[a] | -- | --[a] |
| 1930 | 84 | 15.7 | 109 | 20.3 | 343 | 64.0 | 536 |
| 1935 | 83 | 15.5 | 87 | 16.3 | 365 | 68.2 | 535 |
| 1940 | 83 | 15.3 | 103 | 19.0 | 355 | 65.7 | 541 |
| 1945 | 86 | 15.7 | 103 | 18.8 | 358 | 65.5 | 547 |
| 1950 | 99 | 17.6 | 101 | 18.0 | 361 | 64.4 | 561 |
| 1955 | 94 | 16.0 | 134 | 22.8 | 361 | 61.2 | 589 |
| 1960 | 98 | 15.8 | 108 | 17.4 | 414 | 66.8 | 620 |
| 1965 | 98 | 15.2 | 110 | 17.1 | 436 | 67.7 | 644 |
| 1969 | 99 | 14.4 | 121 | 17.6 | 467 | 68.0 | 687 |

[a] *The number of miles of local streets in Ozaukee County for the years 1918 and 1924 is not available.*

*Source: Wisconsin Department of Transportation and SEWRPC.*

Ozaukee County at various periods of time from 1918 to 1969. The state trunk highway mileage shown in the table includes connecting streets. Figure 4 indicates that the mileage of each of these three jurisdictional systems has steadily increased to accommodate the growth in motor vehicle registrations and vehicle-miles of travel within the County. The exceptions to this general trend are decreases in county trunk highway mileage in the 1930's, when about 22 miles of the existing county trunk highway system were placed on the county aid highway system and the 1950's, when county trunk highways were unilaterally removed from the system by incorporated municipalities.

After World War II, the large increase in motor vehicle utilization brought about a public demand for further improvements in highway system

Figure 4

TOTAL MILES OF STREETS AND HIGHWAYS
IN OZAUKEE COUNTY: 1918-1969


[a] *Includes connecting street mileage.*

*Source: Wisconsin Department of Transportation and SEWRPC*

development. To improve the safety and level of service on heavily traveled routes, the State Legislature in 1949 authorized the Highway Commission to designate, as controlled-access highways, rural portions of the state trunk highway system on which the average traffic potential was found to be in excess of 2,000 vehicles per day. Once a highway had been so designated, the Highway Commission could, in the public interest, limit the number of driveways and other access points to abutting land. The total statewide controlled-access highway mileage was limited by State Statute to 1,500 miles. To date, (January 1, 1969) 379.0 miles have been so designated, of which 9.8 miles, comprised of portions of STH 141, are within Ozaukee County (see Map 9).

In 1955 the State Legislature provided, in Section 84.025 of the Wisconsin Statutes, for the creation of the state arterial system as an integrated, statewide, interregional, and intercommunity network of highways. The purpose of the State Statute was to facilitate the improvement of the most important portions of the total state trunk highway system. The Statute specifically designated the arterial system by route description and limited it to 2,200 miles. The route designated in Ozaukee County is STH 141, from the south county line to the north county line, and is 26.44 miles in length (see Map 10). Aside from the requirements of public hearings for changes, no differences significant to jurisdictional highway system planning or plan implementation exist between ordinary state trunk highways and state arterial highways; and throughout the remainder of this report, state arterial highways will be treated as integral and ordinary parts of the total state trunk highway system.

In 1961 the Legislature authorized the designation of 300 miles of state trunk highways as freeways or expressways. Those highway segments carrying sufficient traffic to warrant ultimate construction of four or more moving lanes could be so designated. To date, (January 1, 1969) 287.3 miles have been designated as freeways or expressways, of which 10.2 miles, comprised of portions of STH 141, have been so designated within Ozaukee County (see Map 11).

In the Federal Aid Highway Act of 1956, the U. S. Congress provided for the development of a national system of interstate and defense highways to connect principal highways, major ports, and major military installations. This system within Wisconsin provides for 569 miles of interstate highways to be constructed to freeway standards. At the time this report was prepared, Ozaukee County had no interstate highway mileage designated. Subsequent to the preparation of this report and prior to its publication, however, about 13 miles of interstate highway had been designated in Ozaukee County. These 13 miles are located on USH 141 between the Ozaukee-Sheboygan County line and the interchange of USH 141 with the proposed Stadium Freeway, which interchange is located northeast of the Village of Saukville, and comprise a portion of a designated interstate highway route between Milwaukee and Green Bay.

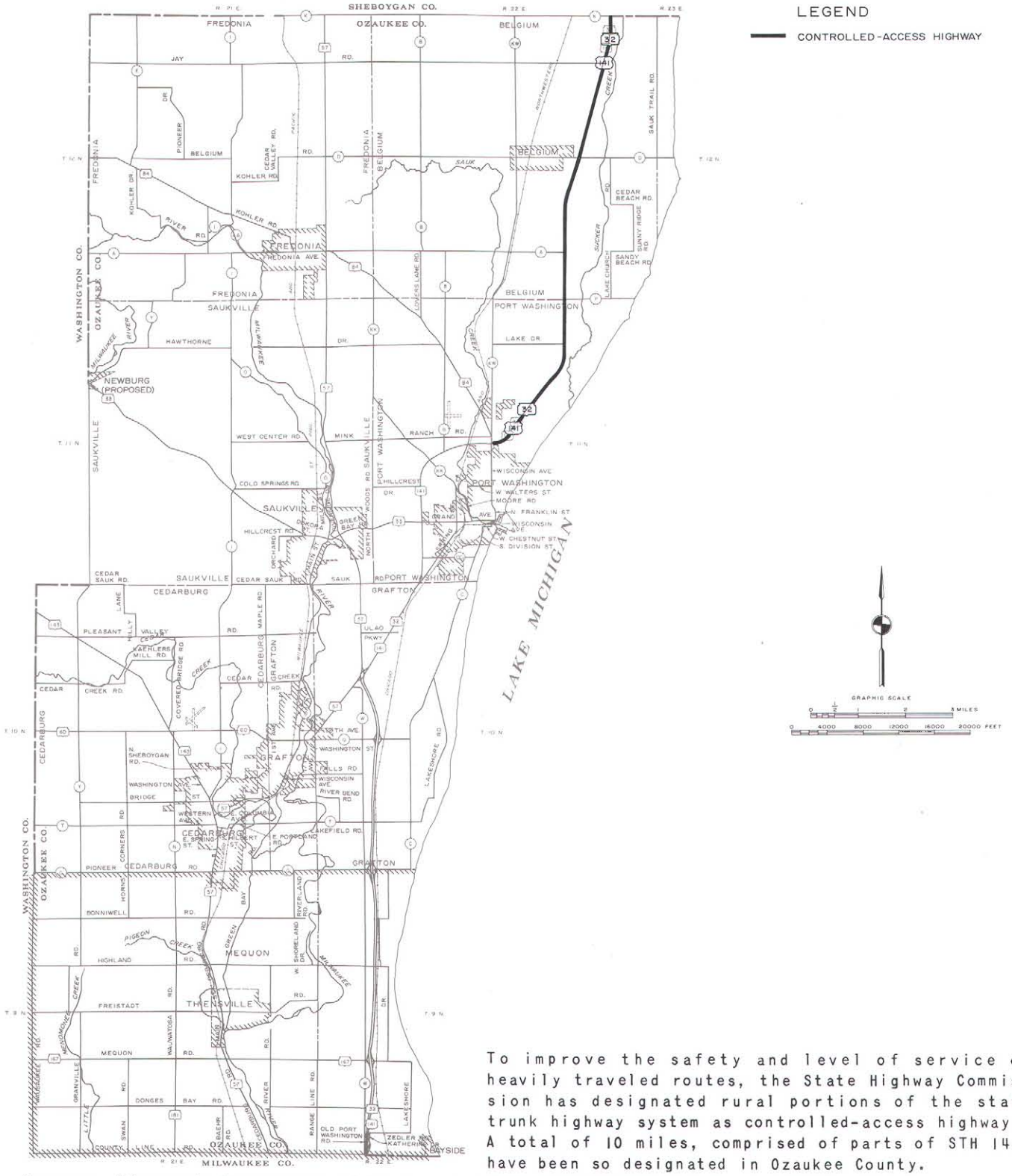
In 1967 the U. S. Department of Transportation, Federal Highway Administration, initiated a program of federal aid to urban areas having a population of 5,000 or more persons known as TOPICS, an acronym standing for the compound term, "Traffic Operations Program to Increase Capacity and Safety." The program was developed in order to encourage municipalities to accelerate their efforts to reduce traffic congestion, facilitate the flow of traffic, and reduce accidents on streets other than those principal streets already on the federal aid highway systems by means of such traffic engineering techniques as intersection channelization, signalization, widening of approaches, and upgrading of lighting.

The Federal Aid Highway Act of 1970 provided for the establishment of an entirely new system of federal aid routes within the urbanized areas of the United States. This system is intended to supplement the existing federal aid highway systems within urbanized areas, which formerly consisted only of the extensions of the federal aid primary and secondary systems into such urbanized areas. As such, the new system is intended to include the most heavily traveled elements of the urban street and highway system.

Subject to certain statutory limitations, changes to the state trunk highway system may be made by the State Highway Commission if the Commission deems that the public interest is best served by the changes. Procedures for making changes to the state trunk highway system are specified in Section 84.02(3) of the Wisconsin Statutes. The requirements vary, depending upon the mileage involved, whether or not federal aid systems are involved, and whether the proposed changes are on the state trunk highway system or the state arterial system. Table 2 summarizes these requirements.

Map 9

## STATE HIGHWAY COMMISSION DESIGNATED CONTROLLED-ACCESS HIGHWAYS IN OZAUKEE COUNTY: 1969

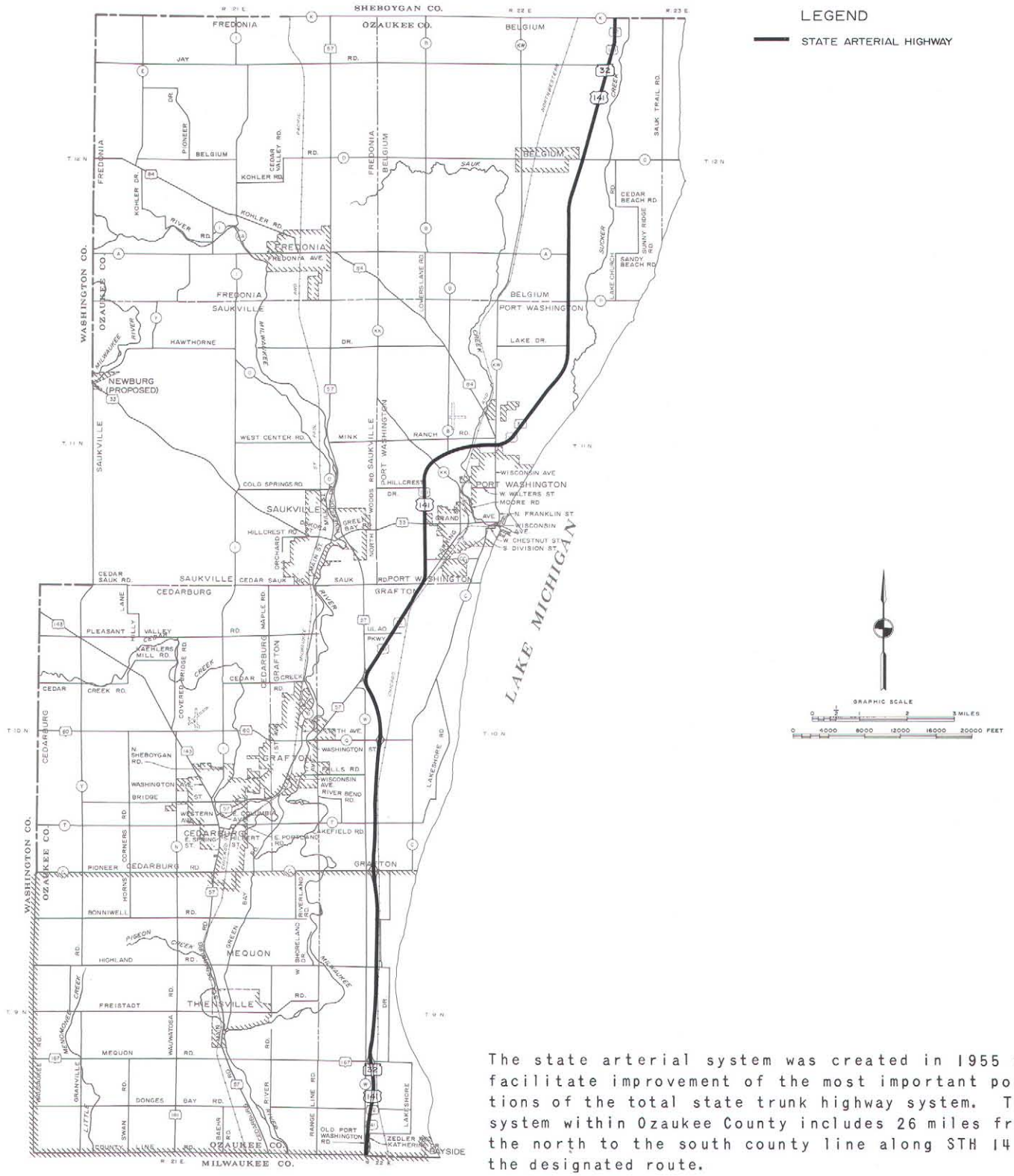



To improve the safety and level of service on heavily traveled routes, the State Highway Commission has designated rural portions of the state trunk highway system as controlled-access highways. A total of 10 miles, comprised of parts of STH 141, have been so designated in Ozaukee County.

*Source: Wisconsin Department of Transportation and SEWRPC.*

Map 10

## STATE LEGISLATURE DESIGNATED ARTERIAL HIGHWAYS IN OZAUKEE COUNTY: 1969

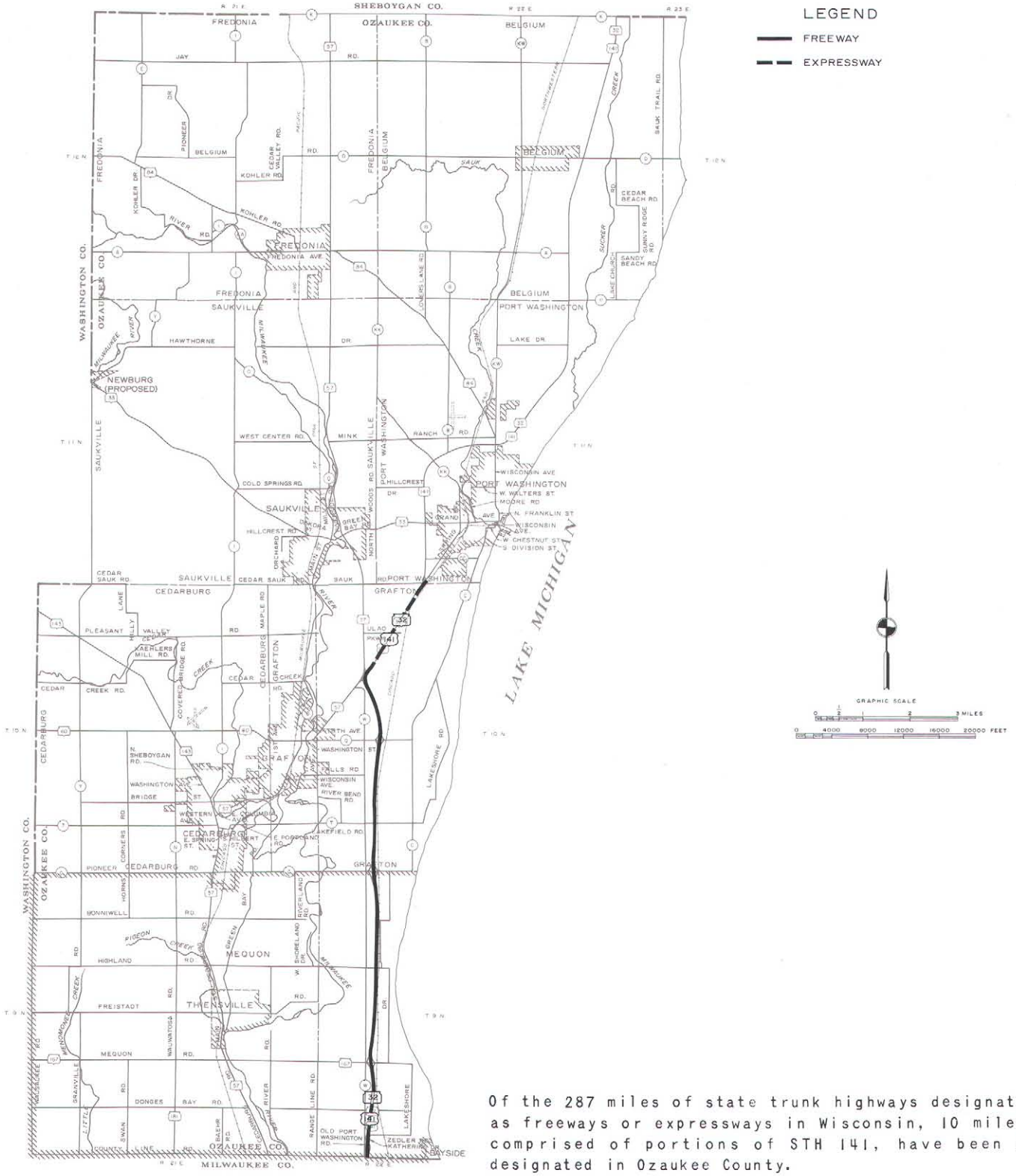



The state arterial system was created in 1955 to facilitate improvement of the most important portions of the total state trunk highway system. The system within Ozaukee County includes 26 miles from the north to the south county line along STH 141, the designated route.

*Source: Wisconsin Department of Transportation and SEWRPC.*

Map 11

## STATE HIGHWAY COMMISSION DESIGNATED FREEWAYS AND EXPRESSWAYS IN OZAUKEE COUNTY: 1969




Of the 287 miles of state trunk highways designated as freeways or expressways in Wisconsin, 10 miles, comprised of portions of STH 141, have been so designated in Ozaukee County.

*Source: Wisconsin Department of Transportation and SEWRPC.*

Table 2

LEGAL CONSTRAINTS GOVERNING CHANGES TO THE STATE TRUNK HIGHWAY (STH) AND STATE ARTERIAL HIGHWAY SYSTEMS: JANUARY 1, 1969

| Highway System | Statutory References[a] | Length Constraint | Public Hearing Required | County Board Approval Required |
|---|---|---|---|---|
| STH | 84.02(3)(a) | Less Than 2 1/2 Miles | No | No |
| STH | 84.02(3)(a) | 2 1/2 Miles or More | Yes | Yes |
| STH & State Arterial | 84.02(3)(a) | More Than 5 Miles | Yes | Yes |
| State Arterial | 84.025(3) | Less Than 5 Miles | No | No |
| State Arterial | 84.025(3) | More Than 5 Miles But No Removal From State Trunk Highway System | Yes | No |
| State Arterial | 84.025(3) | More Than 5 Miles And Any Removal From State Trunk Highway System | Yes | Yes |

[a]*All references are to the 1969 Wisconsin Statutes.*

*Source: Wisconsin Department of Transportation and SEWRPC.*

The county board is authorized, under Section 83.027 of the Wisconsin Statutes, to designate as controlled-access highways those rural portions of the county trunk highway system having an average traffic potential of 2,000 vehicles per day. By cooperative agreement with city or village governing bodies, this authority may be extended into incorporated areas. The total mileage of such designated controlled-access highways in any county is limited to 10 percent of the county trunk mileage. The Ozaukee County Board has not chosen to designate any portions of the county trunk highway system as controlled-access facilities.

Streets within corporate areas not on the state trunk or county trunk highway systems are under local jurisdiction for planning, design, construction, maintenance, and operation. Responsibility for administration of the municipal programs generally is assigned to the city or village engineer or to an engineering consultant acting in this capacity. Those streets and highways within unincorporated areas of the County which are not on the state trunk or county trunk highway system are under the jurisdiction of the towns who either contract with the County or a consultant for planning, design, construction, maintenance, and operation. The exception to this method of operation is the Town of Cedarburg, which now operates a highway department in lieu of contracting work with the County.

## CURRENT STATUS

### Current Jurisdictional Highway Mileage

As of January 1, 1969, in Wisconsin there were 11,859.87 miles of state trunk highways, of which 417.83 miles, or 3.5 percent, consisted of interstate highways; 76.58 miles, or 0.6 percent, consisted of other freeways currently open to traffic; 10,854.72 miles, or 91.6 percent, consisted of standard arterials; and 510.74 miles, or 4.3 percent, consisted of connecting streets. In Ozaukee County there were 98.70 miles of state trunk highways, of which 10.23 miles, or 10.4 percent, were freeways currently open to travel; 77.16 miles, or 78.1 percent, were standard arterials; and 11.31 miles, or 11.5 percent, were connecting streets over which state trunk highways were routed (see Map 12). There were also 120.60 miles of county trunk highways (see Map 13) and 464.45 miles of local streets and highways. Of the 464.45 miles of local streets and highways, 81.18 miles, or 17.5 percent, were county aid highways (see Map 13). Thus, there were, as of January 1, 1969, a total of 683.75 miles of streets and highways open to traffic in Ozaukee County. Of this total, 244.0 miles, or 35.7 percent, were determined to comprise the functional arterial street and highway system; and these 244.0 miles were jurisdictionally categorized as shown in Table 3. The configuration of the arterial system within Ozaukee County is shown on Map 14. Table 4 summarizes existing mileages by municipality.

### Current Federal Aid Mileage

As of January 1, 1969, there were a total of 194.15 miles of federal aid routes designated within Ozaukee County. Of this total, 67.71 miles

Table 3

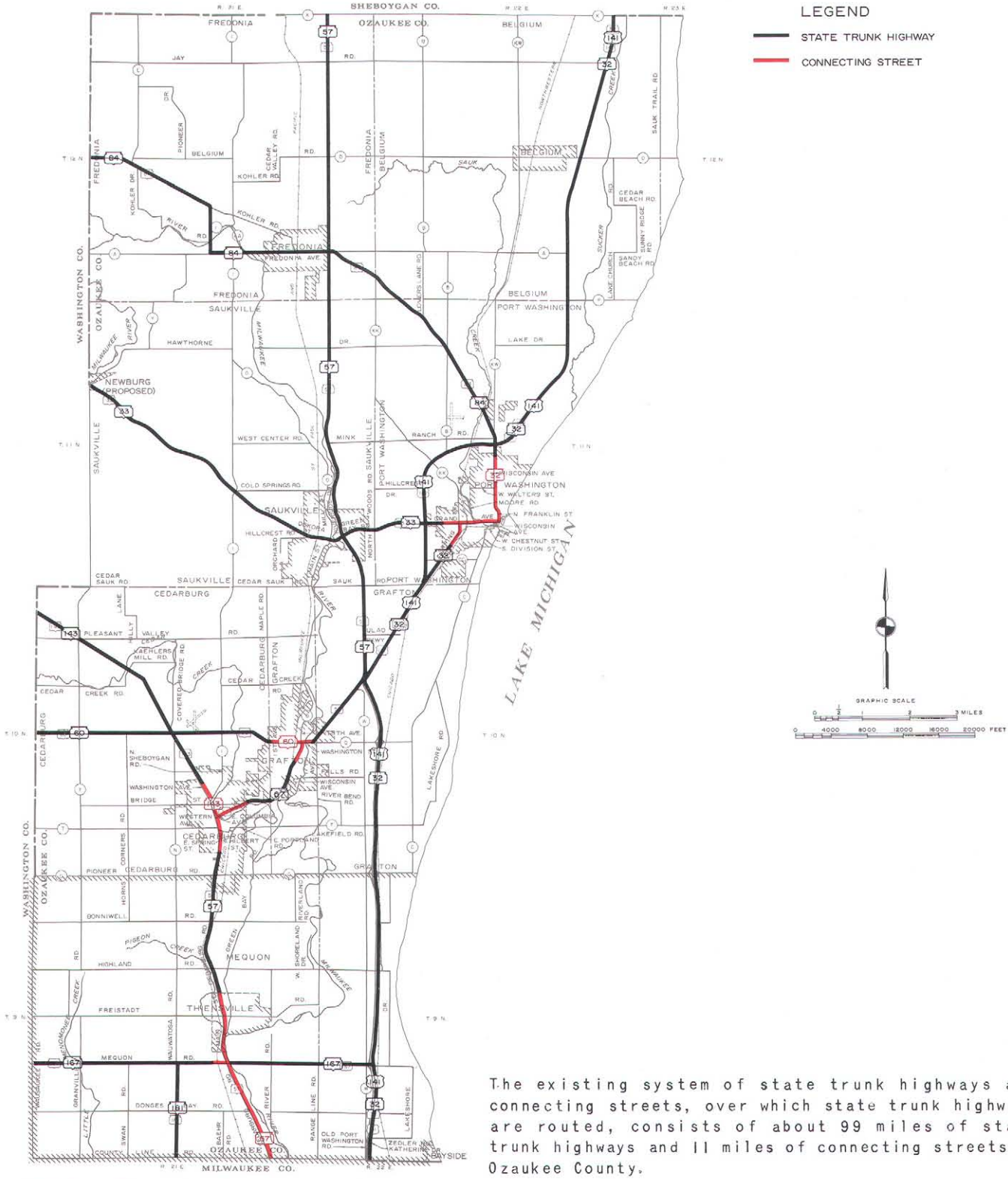
PERCENTAGE DISTRIBUTION OF EXISTING ARTERIAL STREET AND HIGHWAY MILEAGE IN OZAUKEE COUNTY BY JURISDICTIONAL CATEGORY: JANUARY 1, 1969

| Jurisdictional Category | Arterial System | |
|---|---|---|
| | Number Of Miles | Percent of Total |
| State Trunk Highways | 87.39 | 35.9 |
| Connecting Streets | 11.31 | 4.6 |
| County Trunk Highways | 96.66 | 39.6 |
| Local Arterial Streets and Highways | 48.60 | 19.9 |
| Total | 243.96 | 100.0 |

*Source: Wisconsin Department of Transportation and SEWRPC.*

Map 12

## STATE TRUNK HIGHWAYS AND CONNECTING STREETS IN OZAUKEE COUNTY: 1969

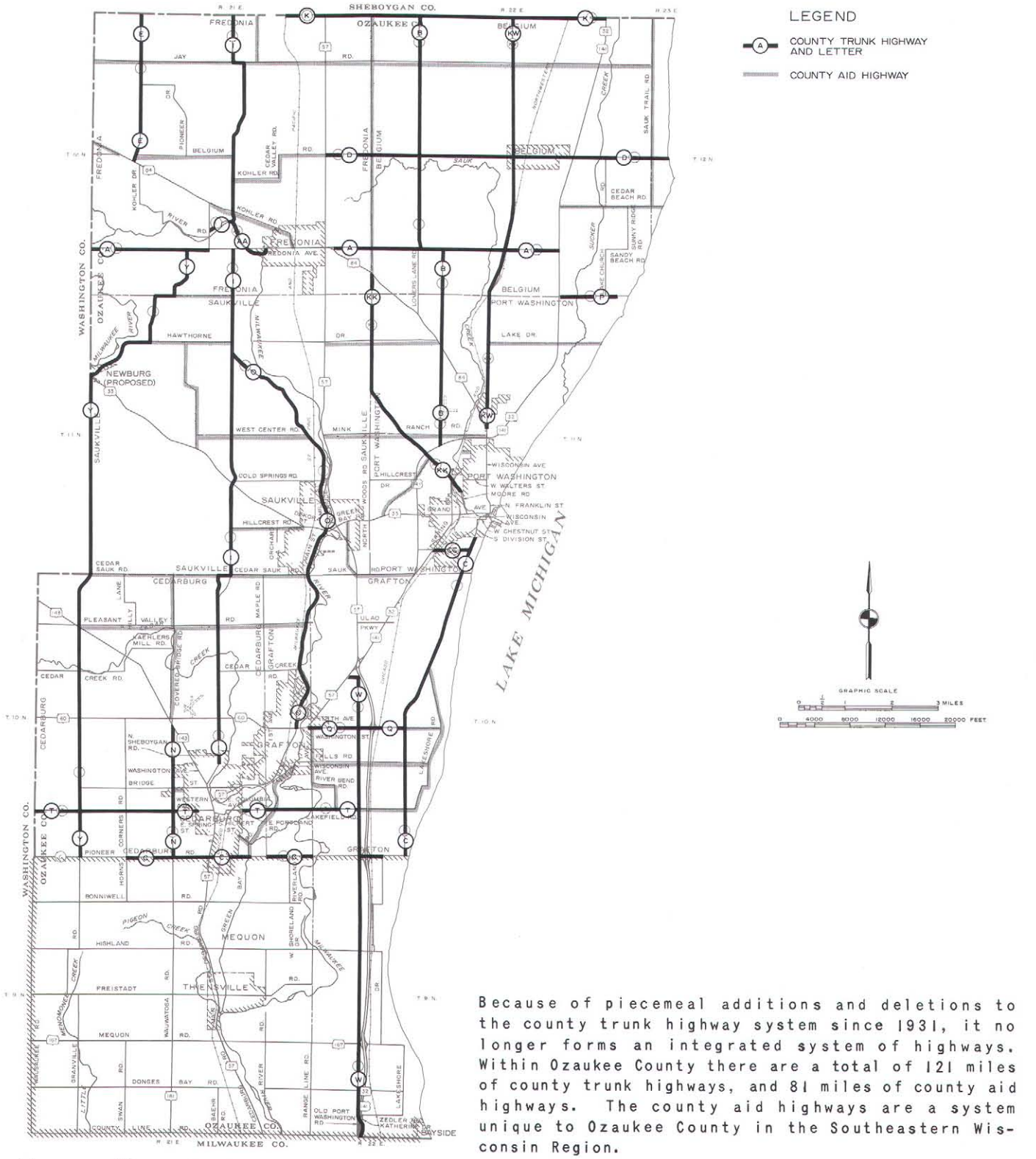



The existing system of state trunk highways and connecting streets, over which state trunk highways are routed, consists of about 99 miles of state trunk highways and 11 miles of connecting streets in Ozaukee County.

*Source: Wisconsin Department of Transportation and SEWRPC.*

Map 13

## COUNTY TRUNK AND COUNTY AID HIGHWAYS IN OZAUKEE COUNTY: 1969

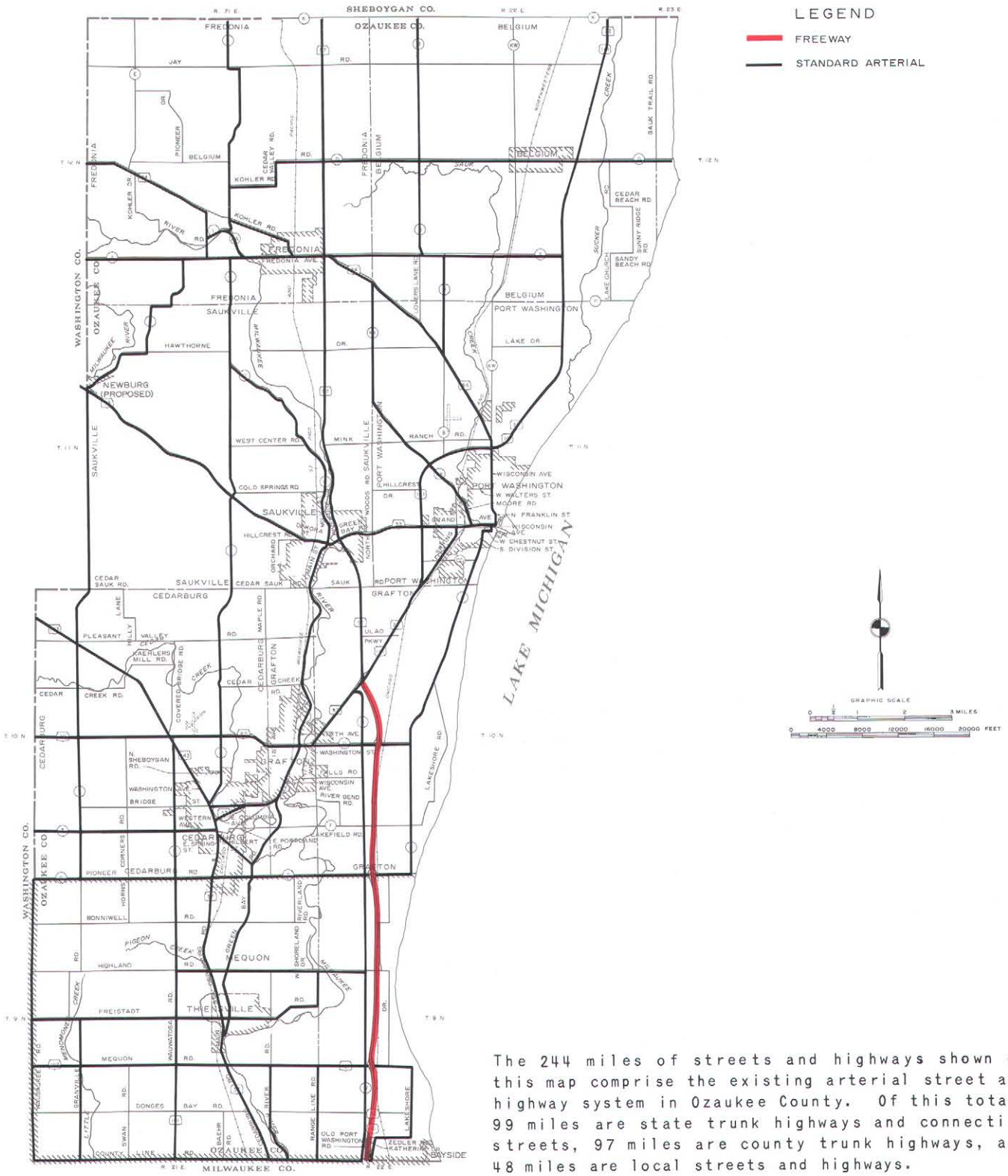



Because of piecemeal additions and deletions to the county trunk highway system since 1931, it no longer forms an integrated system of highways. Within Ozaukee County there are a total of 121 miles of county trunk highways, and 81 miles of county aid highways. The county aid highways are a system unique to Ozaukee County in the Southeastern Wisconsin Region.

*Source: Wisconsin Department of Transportation, Ozaukee County Highway Department, and SEWRPC.*

Map 14

## ARTERIAL HIGHWAY SYSTEM IN OZAUKEE COUNTY: 1969




The 244 miles of streets and highways shown on this map comprise the existing arterial street and highway system in Ozaukee County. Of this total, 99 miles are state trunk highways and connecting streets, 97 miles are county trunk highways, and 48 miles are local streets and highways.

*Source: SEWRPC.*

were located on the federal aid primary system and 126.44 miles were located on the federal aid secondary system. The total federal aid system mileage open to traffic as of January 1, 1969, was 188.55. Of this mileage, 62.11 miles consisted of federal aid primary system mileage and 126.44 miles consisted of federal aid secondary system mileage. The difference between the designated mileage on the federal aid systems and the miles open to travel is accounted for by new routes, primarily freeways, which have been officially designated as being on federal aid systems and which are in various stages of planning, preliminary design, or construction but are not yet open to traffic. The configurations of these federal aid systems within Ozaukee County are shown on Map 15, the sections on the federal aid systems which are not open to traffic being indicated by broken lines. Table 5 sets forth the designated federal aid system mileages by municipality.

Table 4

EXISTING JURISDICTIONAL HIGHWAY SYSTEM MILEAGE IN OZAUKEE COUNTY BY CIVIL DIVISION: JANUARY 1, 1969

| Civil Division | Existing Arterials (Miles) | | | | | | | Existing Nonarterials (Miles) | | | | Total (Miles) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | State Trunk Highway | | Connecting Street | County Trunk Highway | County Aid Highway | Local Trunk Highway | Total | County Trunk Highway | County Aid Highway | Other Local Streets | Total | |
| | Freeway | Non-Freeway | | | | | | | | | | |
| Belgium (Town) | -- | 6.78 | -- | 15.47 | -- | -- | 22.25 | 8.81 | 15.13 | 29.81 | 53.75 | 76.00 |
| Belgium (Village) | -- | -- | -- | 1.19 | -- | -- | 1.19 | 0.50 | -- | 2.66 | 3.16 | 4.35 |
| Cedarburg (City) | -- | 0.53 | 2.32 | 1.11 | -- | 1.85 | 5.81 | -- | -- | 22.55 | 22.55 | 28.36 |
| Cedarburg (Town) | -- | 10.76 | -- | 18.64 | 1.25 | -- | 30.65 | 0.50 | 9.12 | 31.75 | 41.37 | 72.02 |
| Fredonia (Town) | -- | 11.74 | -- | 12.68 | 3.48 | -- | 27.90 | 4.60 | 13.60 | 31.11 | 49.31 | 77.21 |
| Fredonia (Village) | -- | 1.80 | -- | -- | 0.50 | -- | 2.30 | 0.79 | -- | 3.13 | 3.92 | 6.22 |
| Grafton (Town) | 4.11 | 5.86 | -- | 16.88 | 0.97 | -- | 27.82 | 1.98 | 11.80 | 19.17 | 32.95 | 60.77 |
| Grafton (Village) | -- | 1.15 | 1.40 | 0.81 | -- | -- | 3.36 | -- | 0.59 | 17.57 | 18.16 | 21.52 |
| Mequon (City) | 6.12 | 10.83 | 3.11 | 6.08 | -- | 36.70 | 62.84 | -- | -- | 102.59 | 102.59 | 165.43 |
| Port Washington (City) | -- | 0.40 | 3.18 | -- | -- | 1.30 | 4.88 | 0.41 | -- | 28.19 | 28.60 | 33.48 |
| Port Washington (Town) | -- | 13.75 | -- | 5.65 | -- | 0.35 | 19.75 | 6.35 | 9.82 | 13.08 | 28.25 | 48.00 |
| Saukville (Town) | -- | 11.57 | -- | 16.56 | -- | -- | 28.13 | -- | 15.73 | 24.84 | 40.57 | 68.70 |
| Saukville (Village) | -- | 1.99 | -- | 1.59 | -- | -- | 3.58 | -- | 0.19 | 3.04 | 3.23 | 6.81 |
| Thiensville (Village) | -- | -- | 1.30 | -- | -- | 2.20 | 3.50 | -- | -- | 11.38 | 11.38 | 14.88 |
| Total | 10.23 | 77.16 | 11.31 | 99.66 | 6.20 | 42.40 | 243.96 | 23.94 | 74.98 | 340.87 | 439.79 | 683.75 |

*Source: Wisconsin Department of Transportation and SEWRPC.*

Table 5

FEDERAL AID PRIMARY AND SECONDARY ROUTE MILEAGE IN OZAUKEE COUNTY BY CIVIL DIVISION: JANUARY 1, 1969

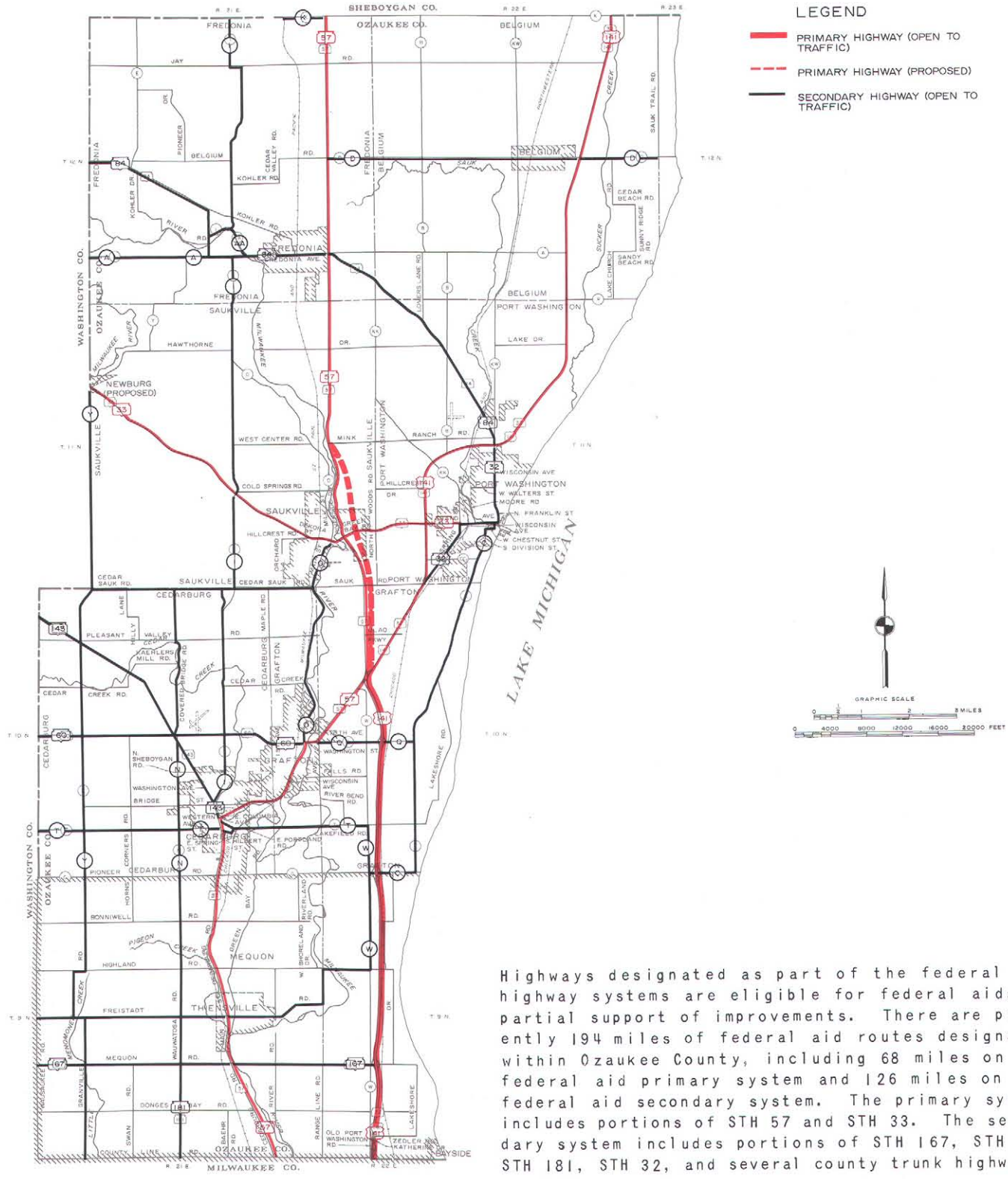
| Civil Division | Federal Aid System[a] | | | | | | | | | | | Total (Miles) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Primary (Miles) | | | | | | Secondary (Miles) | | | | | |
| | State Trunk | | Connecting Street | County Trunk | Local Street | Total | State Trunk | Connecting Street | County Trunk | Local Street | Total | |
| | Freeway | Non-Freeway | | | | | | | | | | |
| Belgium (Town) | -- | 6.15 | -- | -- | -- | 6.15 | 0.63 | -- | 4.79 | -- | 5.42 | 11.57 |
| Belgium (Village) | -- | -- | -- | -- | -- | -- | -- | -- | 1.12 | -- | 1.12 | 1.12 |
| Cedarburg (City) | -- | 0.53 | 1.39 | -- | -- | 1.92 | -- | 0.93 | 0.54 | 1.45 | 2.92 | 4.84 |
| Cedarburg (Town) | -- | 0.82 | -- | -- | -- | 0.82 | 9.94 | -- | 16.93 | 4.94 | 31.81 | 32.63 |
| Fredonia (Town) | -- | 5.68 | -- | -- | -- | 5.68 | 6.06 | -- | 11.07 | -- | 17.13 | 22.81 |
| Fredonia (Village) | -- | 0.44 | -- | -- | -- | 0.44 | 1.36 | -- | -- | -- | 1.36 | 1.80 |
| Grafton (Town) | 5.83 | 5.84 | -- | -- | -- | 11.67 | -- | -- | 14.78 | 0.47 | 15.25 | 26.92 |
| Grafton (Village) | -- | 1.13 | 0.73 | -- | -- | 1.86 | 0.02 | 0.67 | 0.81 | -- | 1.50 | 3.36 |
| Mequon (City) | -- | 2.33 | 2.50 | -- | -- | 10.93 | 8.52 | 0.61 | 2.00 | 16.68 | 27.81 | 38.74 |
| Port Washington (City) | 6.10 | 0.23 | 0.31 | -- | -- | 0.54 | 0.17 | 2.87 | -- | 0.73 | 3.77 | 4.31 |
| Port Washington (Town) | 3.90 | 8.94 | -- | -- | -- | 8.94 | 4.81 | -- | 0.80 | -- | 5.61 | 14.55 |
| Saukville (Town) | -- | 11.57 | -- | -- | -- | 15.47 | -- | -- | 8.59 | 2.05 | 10.64 | 26.11 |
| Saukville (Village) | -- | 1.99 | -- | -- | -- | 1.99 | -- | -- | 0.87 | 0.16 | 1.03 | 3.02 |
| Thiensville (Village) | -- | -- | 1.30 | -- | -- | 1.30 | -- | -- | -- | 1.07 | 1.07 | 2.37 |
| Total | 15.83 | 45.65 | 6.23 | -- | -- | 67.71 | 31.51 | 5.08 | 62.30 | 27.55 | 126.44 | 194.15 |

[a] *Includes mileage on officially designated routes not yet constructed.*

*Source: Wisconsin Department of Transportation and SEWRPC.*

Map 15

## FEDERAL AID HIGHWAY SYSTEMS IN OZAUKEE COUNTY: 1969




Highways designated as part of the federal aid highway systems are eligible for federal aids in partial support of improvements. There are presently 194 miles of federal aid routes designated within Ozaukee County, including 68 miles on the federal aid primary system and 126 miles on the federal aid secondary system. The primary system includes portions of STH 57 and STH 33. The secondary system includes portions of STH 167, STH 60, STH 181, STH 32, and several county trunk highways.

*Source: Wisconsin Department of Transportation and SEWRPC.*

## SUMMARY

As of January 1, 1969, there were a total of 683.75 miles of streets and highways open to traffic within Ozaukee County. Of this total, 244.0 miles, or 35.7 percent, comprised the functional arterial street and highway system. The responsibility for the design, construction, operation, and maintenance of this arterial street and highway network rested with three levels of government: the state, the county, and the local municipalities. Approximately 98.7 miles, or 40 percent of the arterial street and highway system, were under state jurisdiction, being comprised of state trunk highways and connecting streets. About 96.7 miles, or an additional 40 percent, were under county jurisdiction, being comprised of county trunk highways; and about 48.6 miles, or 20 percent, were under city, village, or town jurisdiction, being comprised of local arterial streets and highways. Of the local arterial streets and highways, about 6.2 miles, or 13 percent, were on the county aid highway system, a system unique within the Southeastern Wisconsin Region to Ozaukee County. An additional 75.0 miles of streets and highways performing collector and land access functions were on the county aid highway system.

Superimposed on the state, county, and local trunk highways and arterial streets were 188.55 miles of federal aid routes, of which about 62 miles, or 33 percent, consisted of federal aid primary routes and 126 miles, or 67 percent, consisted of federal aid and secondary routes.

The location and configuration of these jurisdictional highway systems and supporting aid routes were the result of a long process of historic evolution influenced by many complex political, administrative, financial, and engineering considerations and constraints. The state trunk and county trunk highway networks were originally conceived by the State Legislature as integrated highway systems and were originally so delineated and mapped. The state trunk highway network, however, was last studied and revised as an integrated system by the State Legislature in 1923; and the county trunk highway system was last studied and revised by the State Highway Commission of Wisconsin and the Ozaukee County Board in 1931. Many piecemeal additions and deletions have been made to these two jurisdictional highway networks since 1923 and 1931. Consequently, these two important networks no longer represent fully integrated and continuous arterial highway systems capable of serving, in the most efficient manner possible, the areawide land use and traffic service functions originally intended. Moreover, since the federal aid highway networks are intended to assist in implementing the state and county trunk highway systems and, therefore, reflect the pattern of these systems, these federal aid networks are also in need of revision.

It is, therefore, appropriate at this time to study and analyze the jurisdictional highway systems within Ozaukee County and, guided by the functional transportation system plan prepared by the Southeastern Wisconsin Regional Planning Commission and adopted by the State Highway Commission of Wisconsin and the Ozaukee County Board, to recommend changes necessary to reclassify and regroup these networks into complete, fully coordinated, and continuous systems able to meet the present and expected future arterial highway traffic demands within Ozaukee County.

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Chapter IV

# FUNCTIONAL CRITERIA FOR JURISDICTIONAL CLASSIFICATION

## INTRODUCTION

A total street and highway system must serve several important functions. It must provide for the safe and efficient movement of traffic throughout the area served; provide for the access of this traffic to the various land uses to be served; provide integral parts of the storm water drainage system; provide rights-of-way for various utility facilities; and provide space for the admittance of light and air to individual building sites. Because the two most important of these functions—safe and efficient traffic movement and land access—are basically conflicting, street and highway systems are, for planning purposes, divided into functional subsystems according to the primary character of service which the individual facilities comprising the subsystems are expected to provide. This functional subdivision of street and highway systems is done on an areawide basis without regard to governmental jurisdiction or fiscal responsibility. Such a functional grouping or classification is essential to sound transportation planning, not only because it identifies the primary function which any particular facility should serve, but also because it provides a means for defining travel paths for the flow of trips through the total system. The definition of such paths is essential to any traffic assignment made to determine the ability of the system to carry existing and probable future traffic loads.

Three functional groups of street and highway facilities are normally recognized in functional classification for planning purposes: arterial, collector, and local (land access). Only the first of these groups is of direct concern in areawide planning. The primary function of the arterial facilities is to expedite the movement of vehicular traffic. Access to abutting property is a secondary function of some types of arterials and should always be subordinate to the primary function of traffic movement. Arterial streets and highways include freeways, expressways, and certain parkways, as well as those facilities commonly termed "standard" arterials. Together the individual arterial facilities must form an integrated, areawide system, the geographic configuration and capacity of which are adequate to carry the traffic loads generated by the existing and probable future land use pattern to be served.

Arterial street and highway facilities must form an integrated system over relatively large areas comprised of many local units of government. The degree of areawide importance of the individual facilities comprising the total system varies, with several levels, as well as many units of government, having interests in, and responsibilities for, the planning, construction, maintenance, and operation of the total arterial street and highway system. Consequently, it becomes necessary to assign jurisdictional responsibility for the various facilities, existing and proposed, comprising the total system to the various levels and units of government involved.

Just as the functional classification of highway facilities is essential to transportation plan preparation, the jurisdictional classification of such facilities is essential to plan implementation. In addition, the assignment of jurisdictional responsibility for the various portions of the total arterial street and highway system is essential to achieving the important objectives already set forth in Chapter I of this report.

As previously noted, the preparation of an areawide plan for the physical development of the total transportation system must necessarily precede any assignment of jurisdictional responsibility. A plan for the physical improvement of the transportation system is required to identify the existing arterial street and highway system, determine its existing deficiencies, and recommend specific additions and improvements required to serve existing and forecast traffic demands. Such a transportation plan having been prepared, it then becomes necessary, as the first step toward plan implementation, to specify the governmental level and unit which should have responsibility for acquiring, constructing, maintaining, and operating each of the existing and proposed facilities which comprise the total physical system. That is, the functional highway plan must be converted to a jurisdictional plan if plan implementation is

to be achieved. It, therefore, becomes necessary to develop a set of criteria which may be used as a basis for the assignment of jurisdictional responsibility for the various facilities comprising the total arterial street and highway system. Functional variations within the total arterial system provide a logical basis for the establishment of such criteria.

## PURPOSE AND OBJECTIVE OF THE CRITERIA

The purpose of the jurisdictional classification criteria is to provide an objective and rational basis for the assignment of jurisdictional responsibility for the various segments of an existing and proposed arterial street and highway system to the various levels of government concerned. The system is represented by an adopted functional arterial street and highway system plan. The objective of the recommended criteria is to identify subsystems within the total arterial street and highway system which are integral parts of the overall system and which are, within themselves, continuous or are continuous in conjunction with other "higher" subsystems but which vary with respect to the degree of traffic mobility provided, the types of land use areas served, and the types of trips served. The arterial street and highway network maps prepared by the Southeastern Wisconsin Regional Planning Commission under the regional land use-transportation study completed in 1966 were reviewed and updated to represent the necessary definition of the total arterial street and highway system within Ozaukee County to which the jurisdictional criteria were to be applied.

## ARTERIAL SUBCLASSIFICATION

Three levels of government—state, county, and local (municipal)—have direct jurisdictional responsibility for the planning, design, construction, operation, and maintenance of highway facilities within Ozaukee County. It is, therefore, proposed that all segments of the total (existing and proposed) arterial street and highway system be classified into one of three categories: Type I (state trunk), Type II (county trunk), and Type III (local trunk). Two of these three categories—Type I and Type II—were, in turn, given two subcategories: rural and urban. The third category—Type III—was given one subcategory: urban. Urban arterials were defined as those arterial streets and highways located within the present corporate limits of existing cities or villages or within the recommended areas of future urban development within the county, as shown on the adopted regional land use plan, whichever encompasses the greater area. All other arterials were defined as rural.

1. Type I (State Trunk) Arterials—Urban and Rural

   Type I arterials shall include all those routes within the urban or rural areas of the county which are intended to provide, within each respective area, the highest level of traffic mobility; that is, the highest speeds and lowest degree of traffic congestion, the minimum degree of land access service, and which must have regional or interregional system continuity. Ideally, these Type I arterials, because of their function and state- and region-wide importance, should comprise the state trunk highway system.

2. Type II (County Trunk) Arterials—Urban and Rural

   Type II arterials shall include all those routes within the urban or rural areas of the county which are intended to provide, within each respective area, an intermediate level of traffic mobility, an intermediate level of land access service, and which must have intercommunity system continuity. Ideally, these Type II arterials, because of their function and subregional importance, should comprise the county trunk highway system of an area.

3. Type III (Local Trunk) Arterials—Urban

   Type III arterials shall include all those routes within the urban areas of the county which are intended to provide the lowest level of arterial traffic mobility, the highest degree of arterial land access service, and which must possess intracommunity system continuity. These Type III arterials are intended to comprise the local arterial system of an area.

A rural subcategory for the Type III arterials was not provided. Analysis of the average trip length occurring on arterial highway facilities in the rural areas of Ozaukee County indicated that the

"break point" for a third category of rural arterial highway facilities, should such a category be used, would occur at an average trip length of less than 5 miles (see Figure 6). This fact, together with the fact that an analysis of origin-destination data for Ozaukee County indicated that 70 percent of the vehicle trips originating in rural areas of the County have one trip end located in a rural community (town) and the other trip end in a small urban community (city or village), indicates that rural travel within Ozaukee County is primarily of an intercommunity nature. The findings reflect the socioeconomic relationships that exist between farms which are economic enterprises, as well as residences, and small urban communities which act as farm market and service centers. The Technical Coordinating and Advisory Committee, moreover, was of the opinion that the township governments within the County were not well staffed and equipped to carry out the planning, design, construction, operation, and maintenance of arterial highways nor should they be required to be so staffed and equipped. Consequently, the Committee concluded that the jurisdictional responsibility for all rural arterial highway facilities within Ozaukee County should be assigned to either the Type I, state trunk, or the Type II, county trunk, arterial street and highway subsystems.

The urban and rural arterial subclassification types are generally intended to correspond with jurisdictional responsibility by the state, county, and local levels of government. It should not be assumed, however, that the intended correspondence can be rigidly applied in all cases, since certain factors, including legal constraints, boundary line facility coordination, financial resource capabilities, and system mileage limitations, may influence the assignment of jurisdictional responsibility for certain arterials regardless of the type of classification determined solely by strict application of the criteria.

## CRITERIA

Criteria for the functional subclassification of the total arterial street and highway system can be developed from three basic characteristics of the arterial facilities: 1) the trips served, 2) the areas served, and 3) the operational characteristics of the facilities themselves. In light of the differences between urban and rural land use development, the differences in the characteristics of the traffic generated by these two types of land use development, and the differences between rural and urban highway facility development, separate jurisdictional classification criteria must be developed for rural and urban areas. Generally, the different kinds of urban land uses are not only more intensely developed, but areas devoted to different kinds of land uses are located much closer together in urban, rather than in rural, areas. Moreover, economically productive rural land uses, such as extractive and agricultural operations, which by their very nature require large land areas and a relatively small labor force and, therefore, generate less concentrated traffic with relatively long trip lengths and low traffic volumes, nevertheless require good arterial highway facilities to remain economically productive and competitive.

In Ozaukee County the situation is further complicated by the fact that travel on urban arterial facilities in the northern two-thirds of the County is, to a great extent, comprised of travel between the relatively small urban communities located in this part of the County, the surrounding rural areas, and the Milwaukee urbanized area, of which the southern one-third of the County is a part. Consequently, the average trip lengths on these urban arterials are more characteristic of rural, rather than urban, travel. In addition, the traffic volumes on these urban facilities are substantially lower than traffic volumes on urban facilities in the southern one-third of the County due to differences in the amount and intensity of urban land use development and activities served.

Therefore, the area service and operational criteria for system continuity, spacing, traffic mobility, and land access developed for jurisdictional classification of the arterial streets and highways were separately developed for, and applied to, the urban and rural arterials as previously defined herein. The trip service and operational characteristics criteria, or, more specifically, the avererage trip length and traffic volume, respectively, were separately developed for, and applied to, all arterials in the southern one-third of the County and to all arterials in the northern two-thirds of the County. It is important to note, then, that the definitions of the terms "urban" and "rural," as applied to arterial highway facilities with respect to these two criteria, relate to two arbitrarily defined geographic areas of the County and are,

therefore, different than the definitions otherwise used herein, which relate to existing and probable future land use development.

### Trip Service Criteria

Trip service criteria for a functional subclassification of arterials could include specific criteria concerning trip length, trip purpose, and trip peaking. Trip length was selected for use as being the most significant of these three. It is, moreover, believed that trip purpose and trip peaking are reflected in the other criteria adopted and should, therefore, not be explicitly considered under criteria relating to trip service. The average trip length ranges adopted as criteria for arterial subclassification are presented in Table 6.

The following procedure was used to develop the recommended values for the trip service criteria. An interzonal trip table of trip distance volumes[1] (TDV) was produced by multiplying the number of trips expected to be made between pairs of traffic analysis zones, as contained in the regional land use-transportation study 1990 interzonal trip table, by the respective over-the-road distances as measured along the least-time-paths between the zones of origin and destination. The resulting TDV table was assigned to the 1990 arterial network on a least-time-path basis. The assigned TDV for each link was then divided by previously assigned link volumes to obtain average trip lengths. A curve was plotted to provide a graphical representation of the relationship existing between the link average trip lengths and cumulative arterial system mileage for both urban and rural areas (see Figures 5 and 6). Break points were identified on these curves and used to select trip length ranges representative of each jurisdictional classification type. The break points identified the trip length ranges which should be served by each facility type and did so because they marked the points beyond which a relatively high increase in facility type mileage would accommodate only a relatively small increase in trip length range.

[1] *The term "trip distance volume," as used herein, is synonymous with the term "volume trip length index," as used by the U. S. Department of Transportation, Federal Highway Administration, in its manual entitled 1968 National Highway Functional Classification Study Manual.*

Table 6

AVERAGE TRIP LENGTH CRITERIA FOR ARTERIAL SUBCLASSIFICATION

| Arterial Type | Average Trip Length (Miles) | |
|---|---|---|
| | Urban Area | Rural Area |
| I (State Trunk) . . . | 16.00 or More | 21.00 or More |
| II (County Trunk) . . | 10.00 to 15.99 | 5.00 to 20.99 |
| III (Local Trunk). . . | 2.00 to 9.99 | --[a] |

[a] *A rural subcategory for Type III arterials is not provided.*

*Source: SEWRPC.*

### Area Service Criteria

Area service criteria for a functional subclassification of arterials should relate to the land use activities to be connected and served by the various arterial subclassifications. For the purpose of such criteria, the term "connect and serve" was defined as follows for each of the three arterial types:

#### Type I Arterials

A Type I urban arterial facility shall be considered to "connect and serve" given land uses when direct access from the facility to roads serving the land use area is available within a maximum over-the-road distance of one mile from the main vehicular entrance to the land use to be served.

A Type I rural arterial facility shall be considered to "connect and serve" given land uses when direct access from the facility to roads serving the land use area is available within a maximum over-the-road distance of two miles from the main vehicular entrance to the land use to be served.

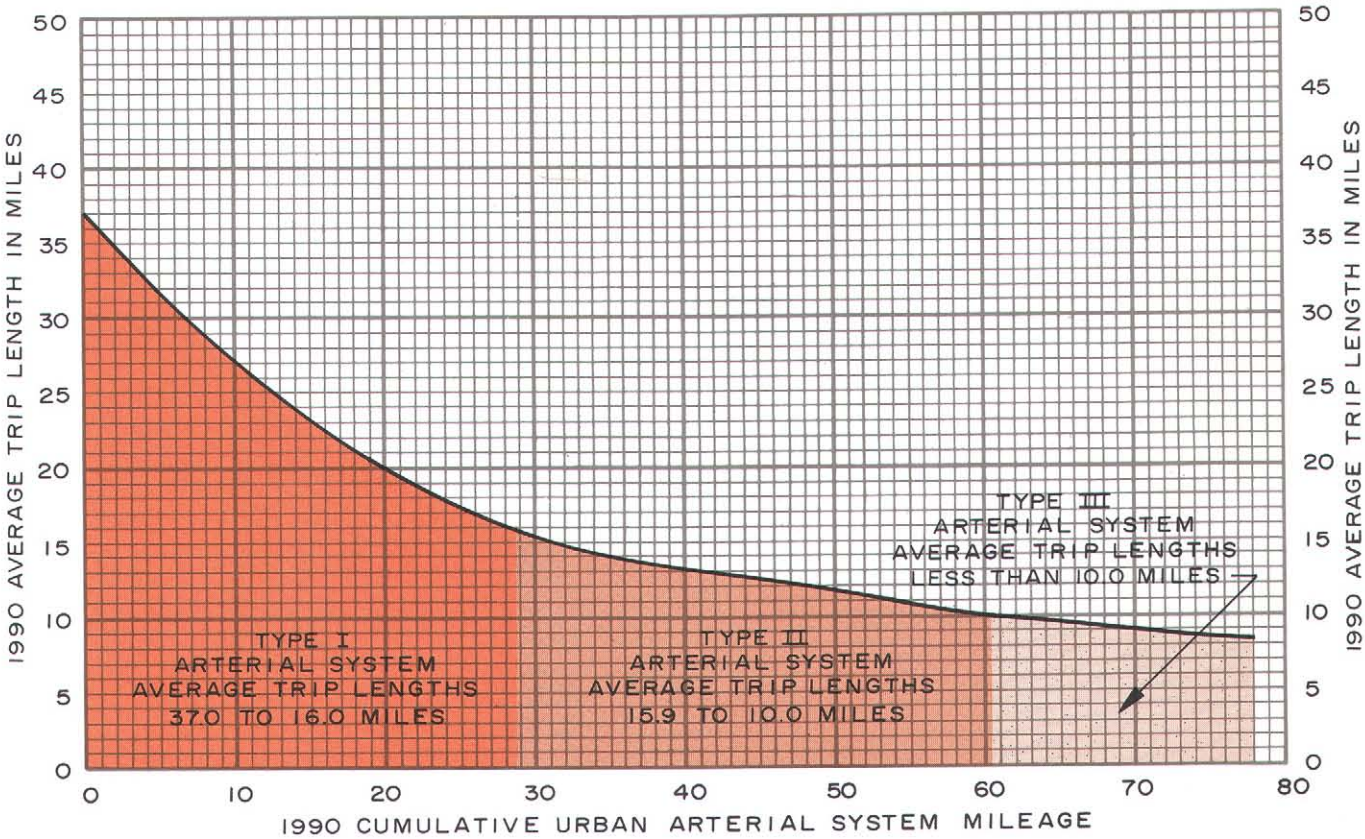
#### Type II Arterials

A Type II urban arterial facility shall be considered to "connect and serve" given land uses when direct access from the facility to roads serving the land use area is available within a maximum over-the-road distance of one-half mile of the main vehicular entrance to the land use to be served.

A Type II rural arterial facility shall be considered to "connect and serve" given land uses when direct access from the facility to roads serving the land use area is available

Figure 5

RELATIONSHIP BETWEEN AVERAGE TRIP LENGTH AND CUMULATIVE URBAN ARTERIAL MILEAGE FOR THE OZAUKEE COUNTY JURISDICTIONAL HIGHWAY SYSTEM: 1990




*Source: SEWRPC.*

within a maximum over-the-road distance of one mile of the main vehicular entrance to the land use to be served.

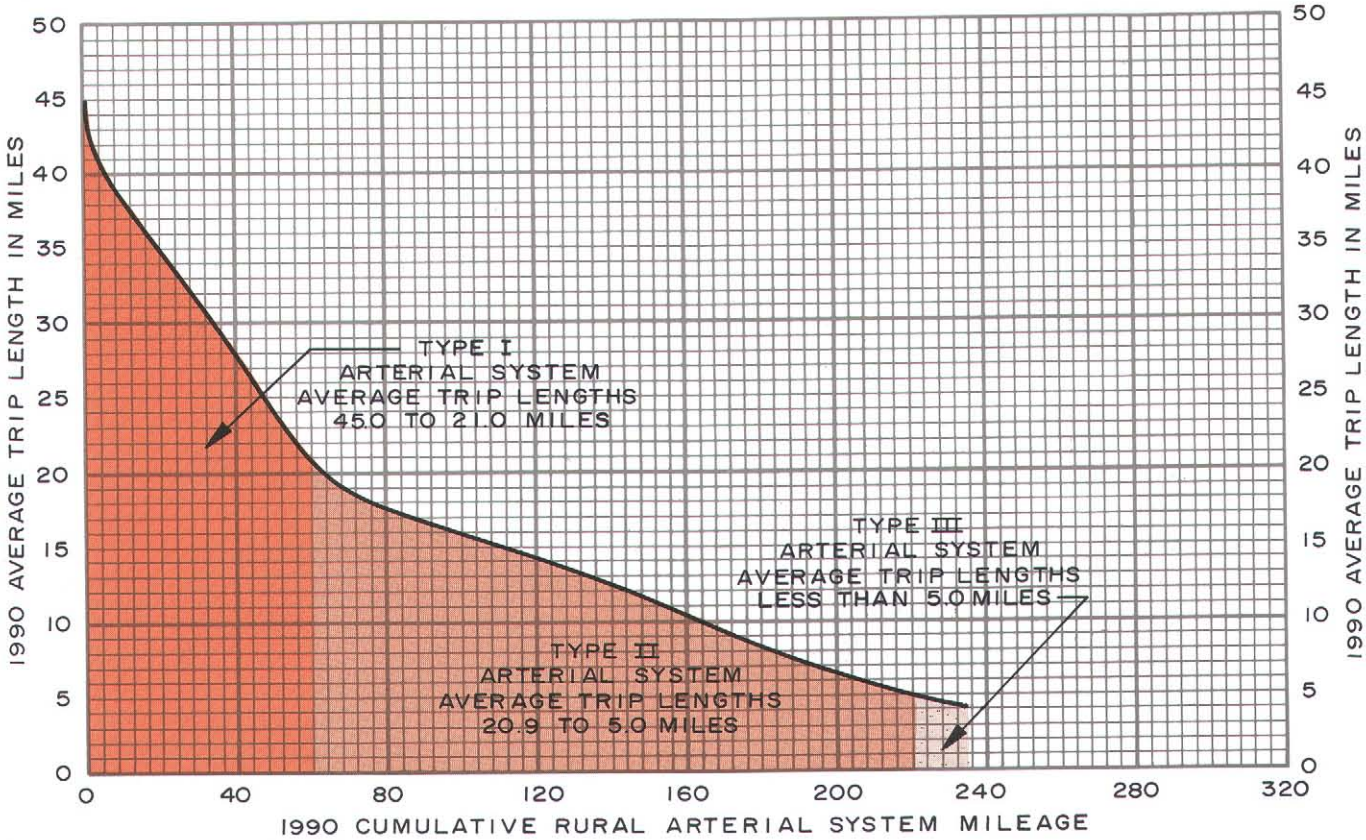
Type III Arterials

A Type III urban arterial facility shall be considered to "connect and serve" given land uses when direct access from the facility to roads serving the land use area is available within a maximum over-the-road distance of one-quarter mile of the main vehicular entrance to the land use to be served.

The land use activities to be considered as properly influencing jurisdictional classification to arterial highway systems should be those which, either through their individual or aggregate effects, interact strongly with the need for transportation facilities and which, by their nature, are normally grouped into concentrations which form major traffic generators. These include major transportation terminals, major recreational facilities, regional commercial centers, major industrial centers, certain types of institutional uses, and urban areas. The following criteria, with respect to each of these land use classifications, were adopted for the Ozaukee County jurisdictional highway planning study.

Figure 6

RELATIONSHIP BETWEEN AVERAGE TRIP LENGTH AND CUMULATIVE RURAL ARTERIAL MILEAGE FOR THE OZAUKEE COUNTY JURISDICTIONAL HIGHWAY SYSTEM: 1990




*Source: SEWRPC.*

1. Transportation Terminals[2]

Type I Arterials (Urban and Rural)

Type I arterial facilities shall connect and serve interregional rail, bus, and major truck terminals;[3] air-carrier airports;[4] and seaports.

Type II Arterials (Urban and Rural)

Type II arterial facilities shall connect and serve freeway interchanges, general-aviation airports,[5] pipeline terminals, major intraregional truck terminals,[6] and rapid transit and modified rapid transit system loading and unloading points not served by Type I arterials.

Type III Arterials (Urban)

Type III arterial facilities shall connect and serve truck terminals generating 250 or more truck trips per average weekday and off-street parking facilities having minimum of 150 parking spaces not served by Type I and Type II arterials.

[2] *A transportation terminal shall be defined as a complex of contiguous, concentrated land uses the purpose of which is to effect a change of transportation mode or a transshipment of goods.*

[3] *A major interregional truck terminal shall be defined as a complex of contiguous, concentrated land uses generating 250 or more interregional truck trips per average weekday.*

[4] *An air-carrier airport shall be defined as a public airport intended to serve primarily commercial local service and truck-line air-carrier aircraft providing service to the general public on a regularly scheduled basis between major cities of the country.*

[5] *A general-aviation airport shall be defined as an airport, either publicly or privately owned, open to public use and intended to serve smaller training, business, charter, agricultural, recreation, and air-taxi aircraft.*

[6] *A major intraregional truck terminal shall be defined as a complex of contiguous, concentrated land uses generating 250 or more intraregional truck trips per average weekday.*

2. Recreational Facilities

Type I Arterials (Urban and Rural)
Type I arterial facilities shall connect and serve all state parks having a gross area of 500 acres or more.

Type II Arterials (Urban and Rural)
Type II arterial facilities shall connect and serve regional parks[7] and special recreational use areas of county-wide significance, such as zoological and botanical gardens, arenas and stadia seating a minimum of 10,000 persons not served by Type I arterials, and public recreation areas providing onsite parking for a minimum of 250 vehicles.

Type III Arterials (Urban)
Type III arterial facilities shall connect and serve community parks[8] not served by Type I and Type II arterials.

3. Commercial Centers

Type I Arterials (Urban and Rural)
Type I arterial facilities shall connect and serve major retail and service (regional shopping) centers.[9]

Type II Arterials (Urban and Rural)
Type II arterial facilities shall connect and serve community retail and service centers[10] not served by Type I arterials.

Type III Arterials (Urban)
Type III arterial facilities shall connect and serve neighborhood retail and service commercial centers[11] not served by Type I and Type II arterials.

4. Industrial Centers

Type I Arterials (Urban and Rural)
Type I arterial facilities shall connect and serve regional major industrial centers.[12]

Type II Arterials (Urban and Rural)
Type II arterial facilities shall connect and serve community major industrial centers[13] not served by Type I arterials.

Type III Arterials (Urban)
Type III arterial facilities shall connect and serve community minor industrial centers[14] not served by Type I and Type II arterials.

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[7] *A regional park shall be defined as an outdoor recreation area having a broad range of recreational facilities on one site having a minimum gross size of 250 acres serving a multi-community population.*

[8] *A community park shall be defined as an outdoor recreation area having a broad range of recreational facilities on one site having a gross size ranging from 30 to 250 acres and which is intended to meet the basic outdoor recreation needs of the population within a community of 10,000 to 25,000 population, consisting of two to five residential neighborhoods.*

*A residential neighborhood shall be defined as a physically self-contained area which provides housing for the population served by one elementary school and one neighborhood park; an internal street system which discourages penetration of the unit by through traffic; and all of the community and commercial facilities necessary to meet the day-to-day living requirements of the family within the immediate vicinity of its dwelling unit. (See SEWRPC Planning Report No. 7, Volume 2, Page 15.)*

[9] *A major retail and service center shall be defined as an existing or officially designated concentration of retail and service uses having a minimum gross site area of 60 acres, intended to serve areawide retail and service needs for a multi-community population ranging from 75,000 to 150,000 persons located within a 10-mile radius. The term "officially designated," as applied to concentrations of various land uses, shall be defined as an area shown on adopted regional or local land use plans or recognized in local zoning district maps.*

[10] *A community retail and service center shall be defined as an existing or officially designated concentration of retail and service uses having a gross site area ranging in size from 20 to 60 acres, intended to serve the retail and service use needs of a community of 10,000 to 25,000 population consisting of a group of two to five residential neighborhoods.*

[11] *A neighborhood retail and service commercial center shall be defined as an existing or officially designated concentration of retail and service uses having a gross site area ranging in size from 5 to 20 acres, intended to serve the retail and service needs of the population of one residential neighborhood.*

[12] *A regional major industrial center shall be defined as an existing or officially designated concentration of manufacturing, wholesaling, and related use establishments having a minimum gross site area of 320 acres or providing employment for over 5,000 persons.*

[13] *A community major industrial center shall be defined as an existing or officially designated concentration of manufacturing, wholesaling, and related use establishments having a gross site area ranging in size from 100 to 320 acres or providing employment for 1,500 to 5,000 persons.*

[14] *A community minor industrial center shall be defined as an existing or designated concentration of manufacturing, wholesaling, and related use establishments ranging in size from 20 to 100 acres or providing employment for 300 to 1,500 persons.*

5. Institutional

Type I Arterials (Urban and Rural)
Type I arterial facilities shall connect and serve universities, county seats, and state institutions.

Type II Arterials (Urban and Rural)
Type II arterial facilities shall connect and serve county institutions; accredited, degree-granting colleges; public vocational schools; and community hospitals not served by Type I arterials.

Type III Arterials (Urban)
Type III arterial facilities shall connect and serve city and village halls and high schools not served by Type I and Type II arterials.

6. Urban Areas

Type I Arterials (Rural)
Type I rural arterial facilities shall connect and serve urban areas of 2,500 or more population.

Type II Arterials (Rural)
Type II rural arterial facilities shall connect and serve developed areas of 500 or more population.

Criteria Relating to Operational Characteristics
Criteria for a functional subclassification of arterials relating to operational characteristics include consideration of system continuity, facility spacing, traffic volume, traffic mobility, and land access.

1. System Continuity

The various arterial subsystems shall form integrated systems within themselves or in conjunction with the other subsystems. The individual facilities comprising any given subsystem shall be directly routed between facility termini so as to provide the shortest travel paths practicable through the arterial network. The following criteria, with respect to system continuity, were adopted for the Ozaukee County jurisdictional highway planning study:

Type I Arterials (Urban and Rural)
Type I arterial facilities shall have interregional or regional continuity comprising total systems at the regional and state level.

Type II Arterials (Urban and Rural)
Type II arterial facilities shall have intermunicipality and intercounty continuity comprising integrated systems at the county level.

Type III Arterials (Urban)
Type III arterial facilities shall have intracommunity continuity comprising an integrated system at the city or village level.

2. Spacing

The location and geometric configuration of highway systems must be properly related to the land uses to be served and should be determined from areawide traffic analyses which consider both existing and probable future traffic loadings derived from existing and proposed land use patterns. Nevertheless, some general criteria may be established with respect to the minimum spacing of various types of facilities based upon good land use planning principles, as well as operational characteristics and engineering constraints. The following criteria, with respect to minimum spacing, were adopted for the Ozaukee County jurisdictional highway planning study.

Type I Arterials (Urban and Rural)
Type I arterial facilities shall generally be located no closer than two miles to, and approximately parallel with, another Type I facility.

Type II Arterials (Urban and Rural)
Type II arterial facilities shall generally be located no closer than one mile to, and approximately parallel with, a Type I facility or another Type II facility.

Type III Arterials (Urban)
Type III arterial facilities shall generally be located no closer than one-half mile to, and approximately parallel with, a Type I, Type II, or another Type III facility.

3. Volume

Although traffic volume alone provides little indication of the function of an arterial facility, it can, in conjunction with other criteria, become an important jurisdictional criteria. It is important, when considering volume as a criteria for a jurisdictional subclassification of arterials, to recognize that both existing and probable future traffic volumes must be considered, with the latter being given the most weight in the classification process. Table 7 summarizes the criteria, with respect to future (1990) traffic volume, expressed as vehicles per average weekday, adopted for the Ozaukee County jurisdictional highway planning study.

Future potential traffic volumes shall be derived from a system traffic assignment based on an areawide land use plan or projection. Such a traffic assignment exists for Ozaukee County as a part of the Southeastern Wisconsin Regional Transportation Plan and reflects anticipated 1990 average weekday traffic volumes.

The following procedure was used to develop the recommended values for the traffic volume criteria. The regional land use-transportation study traffic assignment link volumes for 1990 were first arrayed in descending rank order, and a cumulative sum of link length computed for each link place in the descending rank order for both urban and rural areas. From these data curves were plotted to provide a graphical representation of the relationship existing between traffic volume and cumulative arterial system mileage (see Figures 7 and 8). Break points were identified on these curves and used to select traffic volume ranges representative of each jurisdictional classification type. The break points identified on the traffic volume curves tended to substantiate, in terms of cumulative jurisdictional subsystem mileage, the trip length criteria previously established.

Table 7

TRAFFIC VOLUME CRITERIA
FOR ARTERIAL SUBCLASSIFICATION

| Arterial Type | Average Weekday Traffic Volume (Vehicles) | |
|---|---|---|
| | Urban Area | Rural Area |
| I (State Trunk) . . . | 6,500 or More | 4,500 or More |
| II (County Trunk) . . | 3,500 to 6,499 | 1,000 to 4,499 |
| III (Local Trunk). . . | Less Than 3,500 | --[a] |

[a] *A rural subcategory for Type III arterials is not provided.*

*Source: SEWRPC.*

4. Traffic Mobility

Traffic mobility criteria for a functional subclassification of arterials could be established in terms of speed, volume-to-capacity ratios, or other measures of traffic density. In recognition of the fact that the longer the trip the more critical the time of travel, however, it is an accepted practice to provide higher speeds on the routes of highest arterial function. As a result, the following criteria, shown in Table 8, with respect to traffic mobility, were adopted for the Ozaukee County jurisdictional highway planning study.

Table 8

TRAFFIC MOBILITY CRITERIA
FOR ARTERIAL SUBCLASSIFICATION

| Arterial Type | Average Overall Travel Speed (Miles Per Hour)[a] | |
|---|---|---|
| | Urban Area | Rural Area |
| I (State Trunk) . . . . | 30 to 70 | 40 to 70 |
| II (County Trunk) . . . | 25 to 50 | 30 to 60 |
| III (Local Trunk). . . . | 20 to 40 | --[b] |

[a] *Average overall travel speed is the total of the distances traveled by all vehicles using a given section of highway during an average weekday, divided by the total of the actual travel times, including traffic delays. Average overall travel speeds have the following approximate relationships to average operating speeds:*

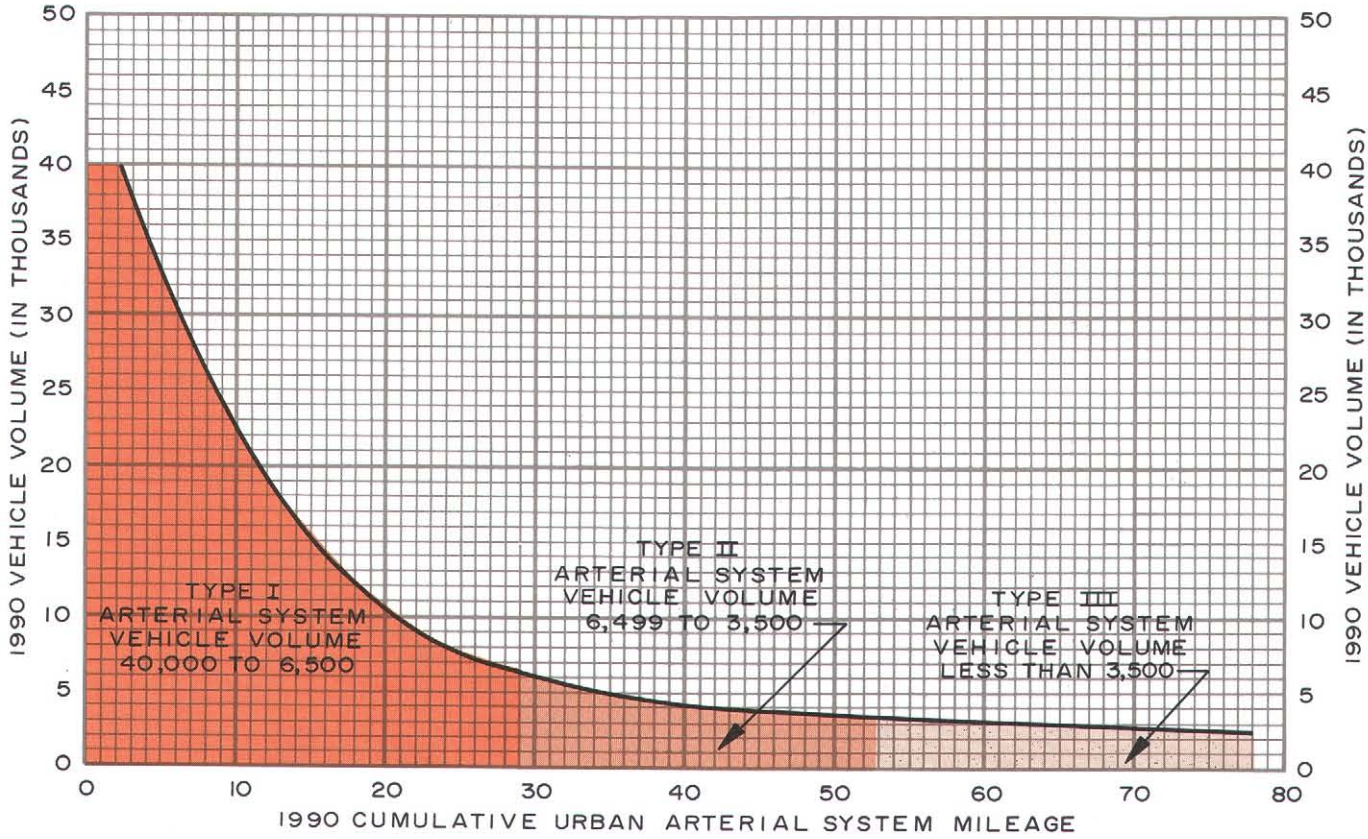
| *Equivalent Average Operating Speed* | *Average Overall Travel Speed* |
|---|---|
| *20 MPH* | *10 MPH* |
| *30 MPH* | *21 MPH* |
| *40 MPH* | *32 MPH* |
| *50 MPH* | *43 MPH* |
| *60 MPH* | *54 MPH* |
| *70 MPH* | *65 MPH* |

[b] *A rural subcategory for Type III arterials is not provided.*

*Source: SEWRPC.*

Figure 7

RELATIONSHIP BETWEEN AVERAGE WEEKDAY VEHICLE VOLUME AND CUMULATIVE URBAN ARTERIAL MILEAGE FOR THE OZAUKEE COUNTY JURISDICTIONAL HIGHWAY SYSTEM: 1990




*Source: SEWRPC.*

5. Land Access

It has already been noted that two of the basic functions performed by street systems—namely, traffic mobility and land access—are basically conflicting and that the land access function of arterial facilities must be subordinate to the traffic mobility function. Therefore, a degree of access control which is related to the subclassification of the arterial facility should be exercised over arterials by means of some restriction of direct access. The following criteria, with respect to land access control, were adopted for the Ozaukee County jurisdictional highway planning study:

Type I Arterials (Urban and Rural)

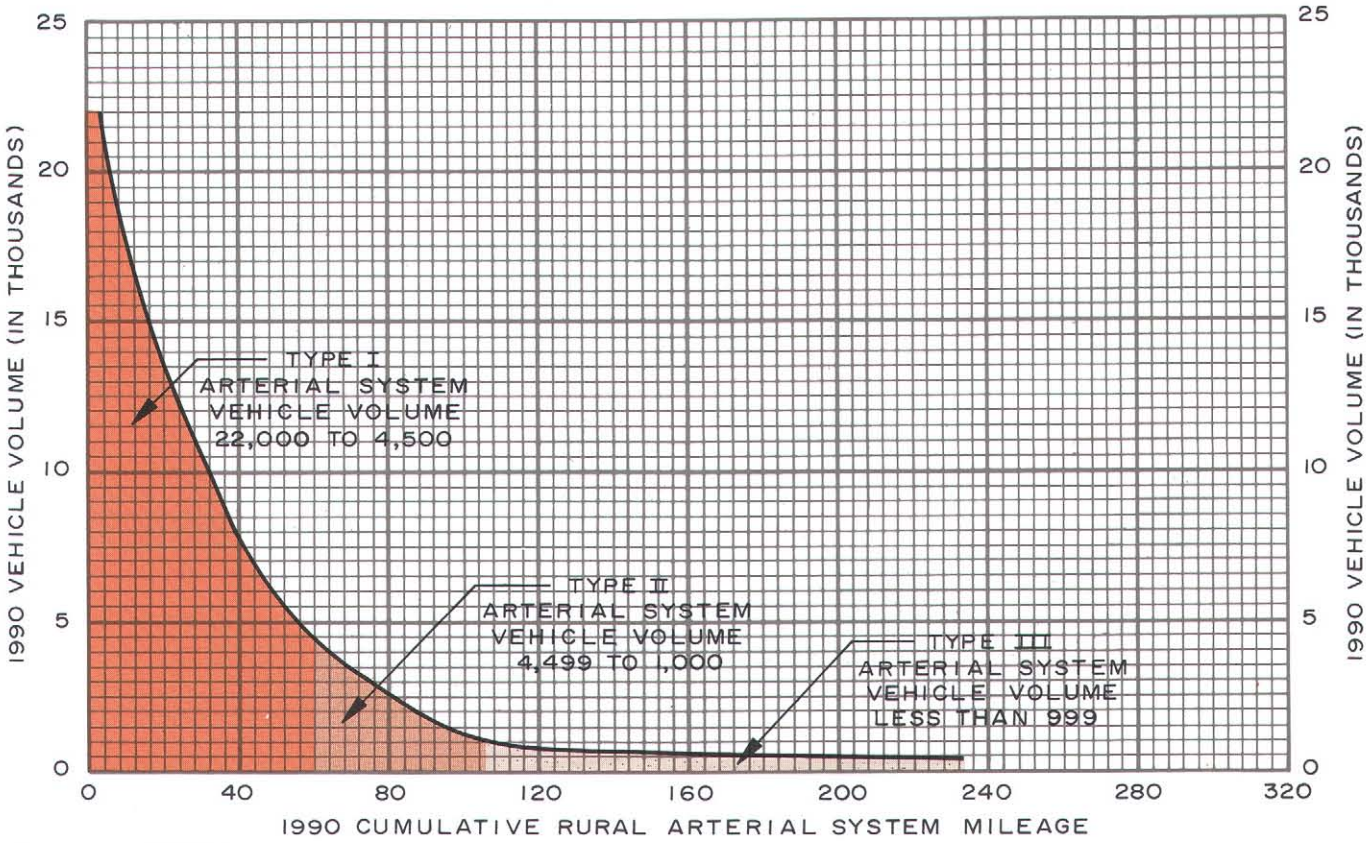
All Type I arterials shall have full or partial control of access.[15]

[15] *Full control of access shall be defined as the exercise of eminent domain or police power to control access so as to give preference to the movement of through traffic by providing access connections only at selected public roads via grade-separated interchanges.*

*Partial control of access shall be defined as the exercise of eminent domain or police power to control access so as to give preference to the movement of through traffic to a degree that, in addition to access connections at selected public roads, there may be some direct access to abutting land uses, with generally one point of reasonably direct access to each parcel of abutting land as these parcels existed at the time of an official declaration that partial control of access shall be exercised.*

Figure 8

RELATIONSHIP BETWEEN AVERAGE WEEKDAY VEHICLE VOLUME AND CUMULATIVE RURAL ARTERIAL MILEAGE FOR THE OZAUKEE COUNTY JURISDICTIONAL HIGHWAY SYSTEM: 1990




*Source: SEWRPC.*

Type II Arterials (Urban and Rural)

All Type II arterials shall have at least partial control of access.[16]

Type III Arterials (Urban)

All Type III arterials shall have at least minimum control of access.[17]

Table 9 summarizes the functional criteria used for the jurisdictional classification of arterial highways in Ozaukee County.

OTHER FACTORS

In the application of the foregoing criteria to the delineation of a jurisdictional highway system, several other factors must be considered, particularly legal and financial constraints. Federal, state, county, and local legislative and financial resource limitations limit the mileage allotment available for state trunk, county trunk, and related federal aid routes and must, therefore, be considered as important constraints on any jurisdictional classification scheme. Evaluation of these legal and financial constraints may show that the jurisdiction for certain facility types must be assumed by a different level of government than might otherwise be indicated by type classification alone. It must also be recognized that certain intergovernmental coordination requirements necessitated by road location along or across civil division boundaries may require, as practical plan implementation measures, the assumption of jurisdictional responsibility for certain facilities by a higher level of government than might otherwise be indicated by type classification alone.

[16] *See the definition of partial control access, as stated in footnote 15.*

[17] *Minimum control of access shall be defined as the exercise of eminent domain or police power to regulate the placement and geometrics of direct access roadway connections as necessary for safety.*

Table 9

SUMMARY OF FUNCTIONAL CRITERIA FOR JURISDICTIONAL CLASSIFICATION OF ARTERIAL HIGHWAYS IN OZAUKEE COUNTY

| | Criteria | Arterial Type | | |
|---|---|---|---|---|
| | | I (State Trunk) | II (County Trunk) | III (Local Trunk)[a] |
| TRIP SERVICE | Average Trip Length (Miles) | Urban<br>More than 16<br>Rural<br>More than 21 | Urban<br>10 to 16<br>Rural<br>5 to 21 | Urban<br>2 to 10 |
| LAND USE SERVICE | Transportation Terminals | Urban[b] and Rural[c]<br>Connect and Serve Interregional Rail, Bus, and Major Truck Terminals; Air-Carrier Airports; and Seaports. | Urban[b] and Rural[c]<br>Connect and Serve Freeway Interchanges, General Aviation Airports, Pipeline Terminals, Major Intraregional Truck Terminals, and Rapid Transit and Modified Rapid Transit System Loading and Unloading Points Not Served by Type I Arterials. | Urban[b]<br>Connect and Serve Truck Terminals Generating 250 or More Truck Trips Per Average Weekday, and Off-Street Parking Facilities Having a Minimum of 150 Parking Spaces Not Served by Type I and II Arterials. |
| | Recreational Facilities | Urban and Rural<br>Connect and Serve All State Parks Having a Gross Area of 500 Acres or More. | Urban and Rural<br>Connect and Serve Regional Parks and Special Recreational Use Areas of County-wide Significance, such as Zoological and Botanical Gardens, Arenas and Stadia Seating a Minimum of 10,000 Persons Not Served by Type I Arterials, and Public Recreation Areas Providing Onsite Parking for a Minimum of 250 Vehicles. | Urban<br>Connect and Serve Community Parks Not Served by Type I and II Arterials. |
| | Commercial Centers | Urban and Rural<br>Connect and Serve Major Retail and Service Centers. | Urban and Rural<br>Connect and Serve Community Retail and Service Centers Not Served by Type I Arterials. | Urban<br>Connect and Serve Neighborhood Retail and Service Commercial Centers Not Served by Type I and II Arterials. |
| | Industrial Centers | Urban and Rural<br>Connect and Serve Major Regional Industrial Centers. | Urban and Rural<br>Connect and Serve Major Community Industrial Centers Not Served by Type I Arterials. | Urban<br>Connect and Serve Minor Community Industrial Centers Not Served by Type I and II Arterials. |
| | Institutional | Urban and Rural<br>Connect and Serve Universities, County Seats, and State Institutions. | Urban and Rural<br>Connect and Serve Institutions; Accredited, Degree-Granting Colleges; Public Vocational Schools; and Community Hospitals Not Served by Type I Arterials. | Urban<br>Connect and Serve City and Village Halls and High Schools Not Served by Type I and II Arterials. |
| | Urban Areas | Rural<br>Connect and Serve Urban Areas of 2,500 or More Population. | Rural<br>Connect and Serve Developed Areas of 500 or More Population. | |

Table 9 (continued)

| | Criteria | Arterial Type | | |
|---|---|---|---|---|
| | | I (State Trunk) | II (County Trunk) | III (Local Trunk)[a] |
| OPERATIONAL CHARACTERISTICS | System Continuity | Urban and Rural<br>Interregional or Regional Continuity Comprising Total Systems at the Regional and State Level. | Urban and Rural<br>Intermunicipality and Intercounty Continuity Comprising Integrated Systems at the County Level. | Urban<br>Intracommunity Continuity Comprising an Integrated System at the City, Village, or Town Level. |
| | Spacing | Urban and Rural<br>Minimum 2 Miles. | Urban and Rural<br>Minimum 1 Mile. | Urban<br>Minimum 0.5 Mile. |
| | Volume | Urban<br>Minimum 6,500 Vehicles Per Average Weekday (1990 Forecast).<br>Rural<br>Minimum 4,500 Vehicles Per Average Weekday (1990 Forecast). | Urban<br>3,500 to 6,500 Vehicles Per Average Weekday (1990 Forecast).<br>Rural<br>1,000 to 4,500 Vehicles Per Average Weekday (1990 Forecast). | Urban<br>3,500 Vehicles Per Average Weekday (1990 Forecast). |
| | Traffic Mobility | Urban<br>Average Overall Travel Speed[d]<br>30 to 70 Miles Per Hour.<br>Rural<br>Average Overall Travel Speed[d]<br>40 to 70 Miles Per Hour. | Urban<br>Average Overall Travel Speed[d]<br>25 to 50 Miles Per Hour.<br>Rural<br>Average Overall Travel Speed[d]<br>30 to 60 Miles Per Hour. | Urban<br>Average Overall Travel Speed[d]<br>20 to 40 Miles Per Hour. |
| | Land Access Control | Full or Partial Control of Access.[e,f] | Partial Control of Access.[f] | Minimum Control of Access.[g] |

[a] *A rural subcategory for Type III arterials is not provided.*

[b] *Urban arterial facilities are considered to "connect and serve" given land uses when direct access from the facility to roads serving the land use area is available within the following maximum over-the-road distances from the main vehicular entrance to the land use to be served. Type I arterial facility, 1 mile; Type II arterial facility, 0.5 mile; Type III arterial facility, 0.25 mile.*

[c] *Rural arterial facilities are considered to "connect and serve" given land uses when direct access from the facility to roads serving the land use area is available within the following maximum over-the-road distances from the main vehicular entrance to the land use to be served. Type I arterial facility, 2 miles; Type II arterial facility, 1 mile.*

[d] *Average overall travel speed is defined as the sum of the distances traveled by all vehicles using a given section of highway during an average weekday divided by the sum of the actual travel times, including traffic delays.*

[e] *Full control of access is defined as the exercise of eminent domain or police power to control access so as to give preference to movement of through traffic by providing access connections only at selected public roads via grade-separated interchanges.*

[f] *Partial control of access is defined as the exercise of eminent domain or police power to control access so as to give preference to the movement of through traffic to a degree that, in addition to access connections at selected public roads, there may be some direct access to abutting land uses with generally one point of reasonably direct access to each parcel of abutting land as these parcels existed at the time of an official declaration that partial control of access shall be exercised.*

[g] *Minimum control of access is defined as the exercise of eminent domain or police power to regulate the placement and geometrics of direct access roadway connections as necessary for safety.*

*Source: SEWRPC.*

SUMMARY

For planning purposes, street and highway systems are divided into functional subsystems according to the primary type of service individual facilities within the subsystems provide. Such a classification is essential to sound transportation planning because it identifies the primary function which a particular facility should serve, as well as providing a means for defining travel paths for trip flow through the total system. Jurisdictional classification criteria are intended to provide an objective and rational basis for assigning jurisdictional responsibility for various segments of an existing and proposed arterial street and highway system to the various government levels concerned. The state, county, and local levels of government have direct jurisdictional responsibility for the planning, design, construction, operation, and maintenance of highway facilities in Ozaukee County.

It is proposed that all segments of the total arterial street and highway system in Ozaukee County be classified into one of three categories: Type I (state trunk), Type II (county trunk), and Type III (local trunk). The Type I and Type II categories include urban and rural subcategories; the Type III category was given one subcategory, that of urban. Based on data which indicated that rural travel within Ozaukee County is primarily between communities, the Technical Coordinating and Advisory Committee decided that town governments in Ozaukee County were not staffed and equipped to carry out the planning, design, construction, operation and maintenance of arterial highways, nor should they be required to do so.

Because of the differences in the characteristics of traffic generated by urban and rural land use development and highway facility development, separate jurisdictional classification criteria were developed for these two areas. Generally, urban land use areas are more intensely developed and located closer together than in rural areas. The rural areas, by their nature, require large land areas and a relatively small labor force, therefore generating less concentrated traffic. Also, in Ozaukee County, travel on urban arterial facilities in the northern two-thirds of the County includes travel between small communities in that part of the County, surrounding rural areas, and the Milwaukee urbanized area to the south. Traffic volumes in the southern one-third of the County, however, are higher due to greater urban land use development and activities served.

The criteria developed were based on the trips served, the areas served, and the operational characteristics of the facilities themselves. Trip length ranges which should be served by each facility type were delineated under the trip service criteria. Area service criteria should relate to land use activities to be connected and served by the various arterial subclassifications. These include major transportation terminals, major recreational facilities, commercial centers, industrial centers, certain types of institutional uses, and urban areas. Criteria relating to operational characteristics include consideration of system continuity, facility spacing, traffic volume, traffic mobility, and land access. Other factors, such as legal and financial constraints, were also considered.

Chapter V

# APPLICATION OF FUNCTIONAL CRITERIA TO DEVELOP JURISDICTIONAL SYSTEMS

## INTRODUCTION

In Chapter II of this report, it was indicated that the preparation of a jurisdictional highway system plan for Ozaukee County involved a seven-step planning process. The fourth step in this process consisted of the application of functional criteria specifically developed for this purpose in order to separate the total functional arterial street and highway system into rational jurisdictional subsystems. The criteria were applied to the total arterial street and highway system for Ozaukee County, as proposed in the adopted regional transportation plan, and refined through a careful review of the arterial system conducted as a part of the planning process by experienced public works engineers responsible for the design, construction, operation, and maintenance of arterial highway facilities within the County. The total functional system of arterial street and highway facilities to which the classification criteria were applied is shown on Map 16. It should be noted that this system does not include the extension of the Stadium Freeway from the Saukville Interchange north within the STH 57 corridor to the Ozaukee-Sheboygan County line.

The application of the functional criteria for jurisdictional highway classification, as set forth in Chapter IV of this report, required an analysis of the trip lengths and traffic volumes to be served by each link in the total arterial system, an inventory of the existing and proposed land uses to be served by each of the jurisdictional subsystems, and an investigation of the operational characteristics of the arterial facilities themselves. The procedure developed to establish the jurisdictional classification of each arterial street and highway facility in Ozaukee County involved three major steps.

In the first step, each arterial facility was classified in terms of the trip service criteria previously established. Three trip service subsystems were thus identified, each related to a jurisdictional classification. In the second step, each arterial facility was classified in terms of the land use criteria previously established. Three land use service subsystems were thus identified, each related to a jurisdictional classification. Finally, these two sets of jurisdictional subsystems were combined and refined through the application of system continuity and facility spacing criteria to produce a preliminary jurisdictional highway system plan. The preliminary jurisdictional classification of the arterial facilities was thus further refined by staff and Committee consideration and evaluation of the administrative, financial, and legal factors concerned. This entire classification process is illustrated in Figure 3.

## TRIP SERVICE JURISDICTIONAL SUBSYSTEMS

It was stated earlier that the functional arterial street and highway system proposed in the adopted regional transportation plan was refined and updated in order both to incorporate the effects of any changes in land use and highway system development which had occurred within Ozaukee County since the adoption of the functional plan and to incorporate certain changes in the functional plan indicated to be desirable since its adoption. For this reason it was necessary to modify the computer description of that portion of the regional arterial network affected by these changes before average trip lengths could be determined for each link[1] in the functional system. Both the structure and the operational characteristics of the arterial network description were analyzed by plotting and checking the minimum time travel paths connecting selected major trip generators located both inside and outside Ozaukee County with all traffic analysis zone[2] centroids affected by the network modification. Once this network editing was completed and the computer description of the system deemed satisfactory,

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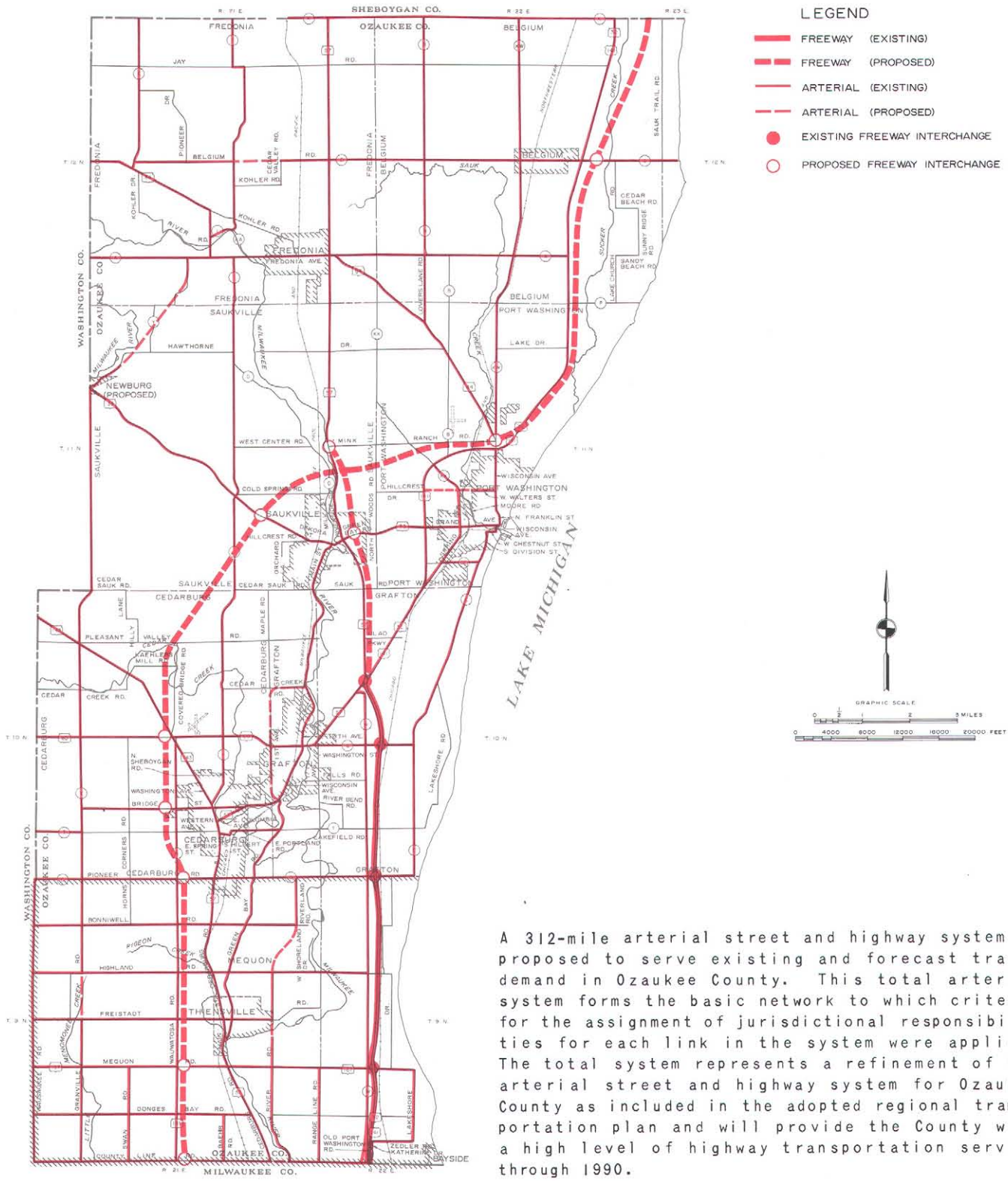
[1] *A link consists of a section of the arterial street and highway network, defined at each end by a node point located at the intersection of two arterials. A link is the smallest arterial segment used to describe the total arterial system in the mathematical model used to simulate traffic flows on the arterial street and highway network.*

[2] *A traffic analysis zone consists of a homogeneous grouping of trip generation activities, such as a residential neighborhood unit, a regional shopping center, or a contiguous industrial area. Such a zone is shown on the arterial network diagram by a centroid representing the point where trips generated within the zone are assumed to enter and leave the arterial network.*

Map 16

ARTERIAL STREET AND HIGHWAY SYSTEM IN OZAUKEE COUNTY: 1990




A 312-mile arterial street and highway system is proposed to serve existing and forecast travel demand in Ozaukee County. This total arterial system forms the basic network to which criteria for the assignment of jurisdictional responsibilities for each link in the system were applied. The total system represents a refinement of the arterial street and highway system for Ozaukee County as included in the adopted regional transportation plan and will provide the County with a high level of highway transportation service through 1990.

*Source: SEWRPC.*

the effect of the forecast 1990 travel demand on the network was simulated by a computer traffic assignment of the matrix of 1990 interzonal trips,[3] developed in the regional land use-transportation study, to the 1990 interzonal least-time-travel paths through the arterial network. The accumulated forecast 1990 volumes on each section of the arterial system resulting from the traffic assignment were then analyzed on a link-by-link basis for reasonableness by comparison with existing traffic volumes and previous assignments of forecast traffic volumes.

In the development of the trip service subsystems, the average trip length which could be expected to occur on each link was calculated in the manner previously described in Chapter IV of this report. Using the calculated trip length data, each link was classified as a Type I, Type II, or Type III arterial facility, in accordance with the previously established trip service criteria. The resulting subsystems are shown on Map 17, the jurisdictional classification for each link being indicated by color code. Continuous segments of lengths of the same color tended to focus attention to routes of similar function which could be combined to form jurisdictional subsystems.

The subsystems delineated by the application of the trip service criteria were found generally to parallel the stratification of the total arterial system into subsystems by relative levels of service. For example, the arterial facilities providing the highest level of service, characterized by free flow traffic conditions—that is, the freeways—exhibited the longest average trip lengths, ranging from 25 miles up to 41 miles, and were, therefore, classified into the highest trip service facility type. Similarly, the facilities providing the lowest level of service—that is, the at-grade arterials in areas with high land use intensities—exhibited the shortest average trip lengths, less than 3 miles, and were, therefore, classified into the lowest trip service facility type.

## LAND USE SERVICE JURISDICTIONAL SUBSYSTEMS

In preparation for the development of the land use service jurisdictional subsystems, the existing and proposed Type I, Type II, and Type III land use areas, as defined in the previously established criteria, were delineated on a county base map. The existing transportation terminals, recreational facilities, commercial centers, industrial centers, and institutional land uses were identified from existing land use inventories and categorized, through application of the criteria, by the study staff and then reviewed by knowledgeable local planners and engineers. Future land uses were identified from the adopted regional land use plan,[4] adopted community land use plans and zoning ordinances, and current planning data provided by local planners and engineers and similarly categorized by application of the criteria. The land use areas for Type I, Type II, and Type III jurisdictional categories, as delineated for the study, are shown on Map 18.

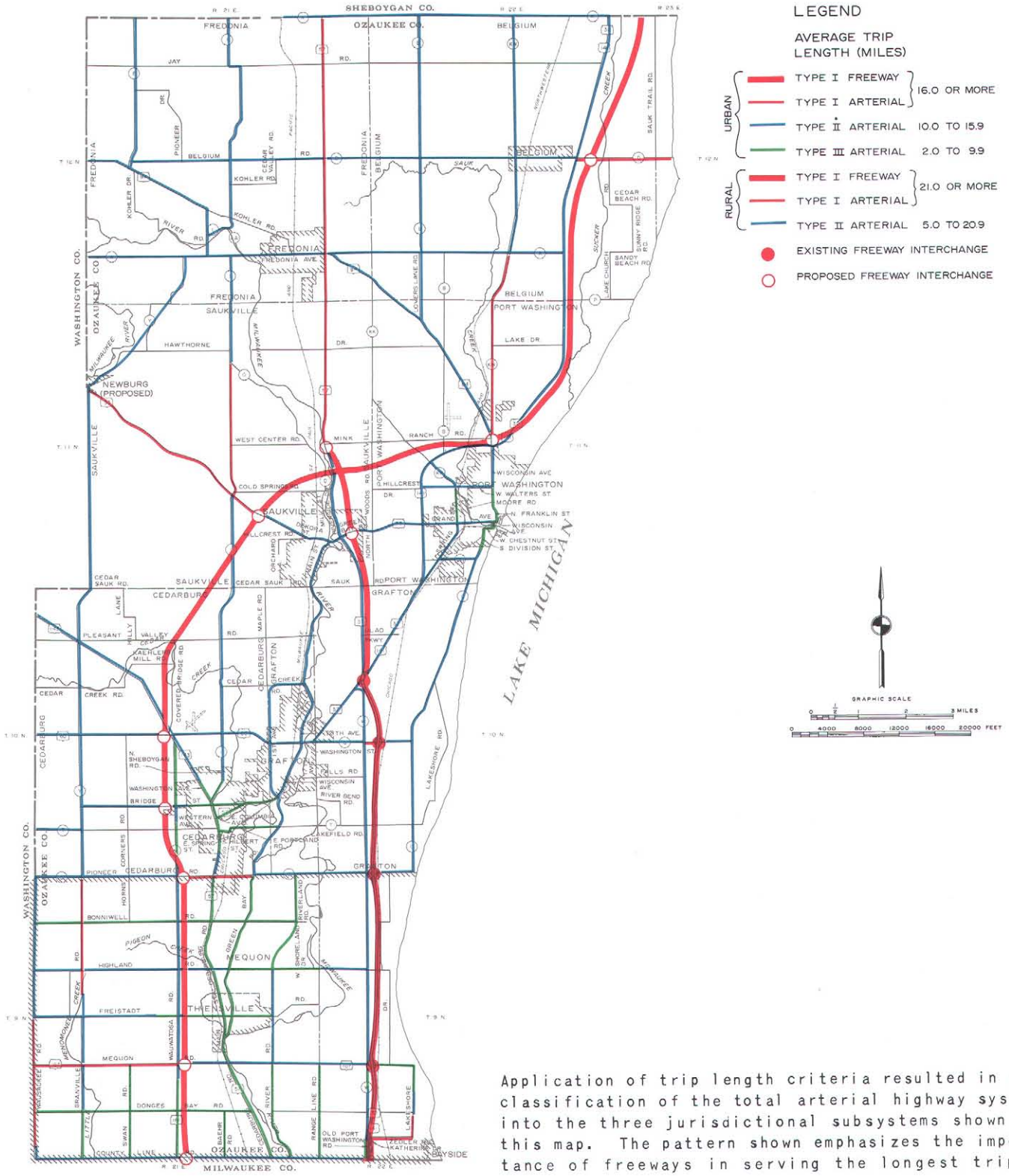
Utilizing the resulting land use patterns and the land use service criteria previously developed, the total arterial street and highway system was classified into three land use service subsystems. This was accomplished through a series of system classifications. First, those arterial facilities which best connected and served each of the Type I land use areas were carefully determined and delineated to form a continuous Type I subsystem. A second arterial subsystem was then established to interconnect with the Type I land use service subsystem and to provide the service required by the established criteria for all Type II land use areas not already served by the Type I arterial highway system. The remaining arterial facilities were classified into a third subsystem to serve the Type III land uses. The resulting jurisdictional subsystems are also shown on Map 18.

[3] *The matrix of 1990 interzonal trips is a table of the zone-to-zone trip movements showing the quantity of 1990 trips by direction between each pair of zones.*

[4] *The regional land use plan, which was adopted by the SEWRPC on December 1, 1966, and certified shortly thereafter to the constituent county and local units of government, has not, to date, been adopted by the Ozaukee County Board of Supervisors. The plan, however, has been formally adopted by five of the 14 cities, villages, and towns in the County, including the Cities of Cedarburg and Mequon and the Towns of Belgium, Cedarburg, and Fredonia. Together these five local communities comprise nearly 64 percent of the total land area of Ozaukee County. It is important to note in this regard that Ozaukee County is the only county in the Southeastern Wisconsin Region that has the authority to exercise land use controls, such as zoning and subdivision regulations, in unincorporated areas but that has chosen not to do so, preferring instead to leave such control with the town units of government. The only exception to this historical nonparticipation by Ozaukee County in land use control matters was the recent enactment of a shoreland regulatory ordinance to satisfy state floodplain and shoreland zoning requirements.*

Map 17

# JURISDICTIONAL CLASSIFICATION OF THE ARTERIAL STREET AND HIGHWAY SYSTEM IN OZAUKEE COUNTY BASED ON AVERAGE TRIP LENGTH: 1990

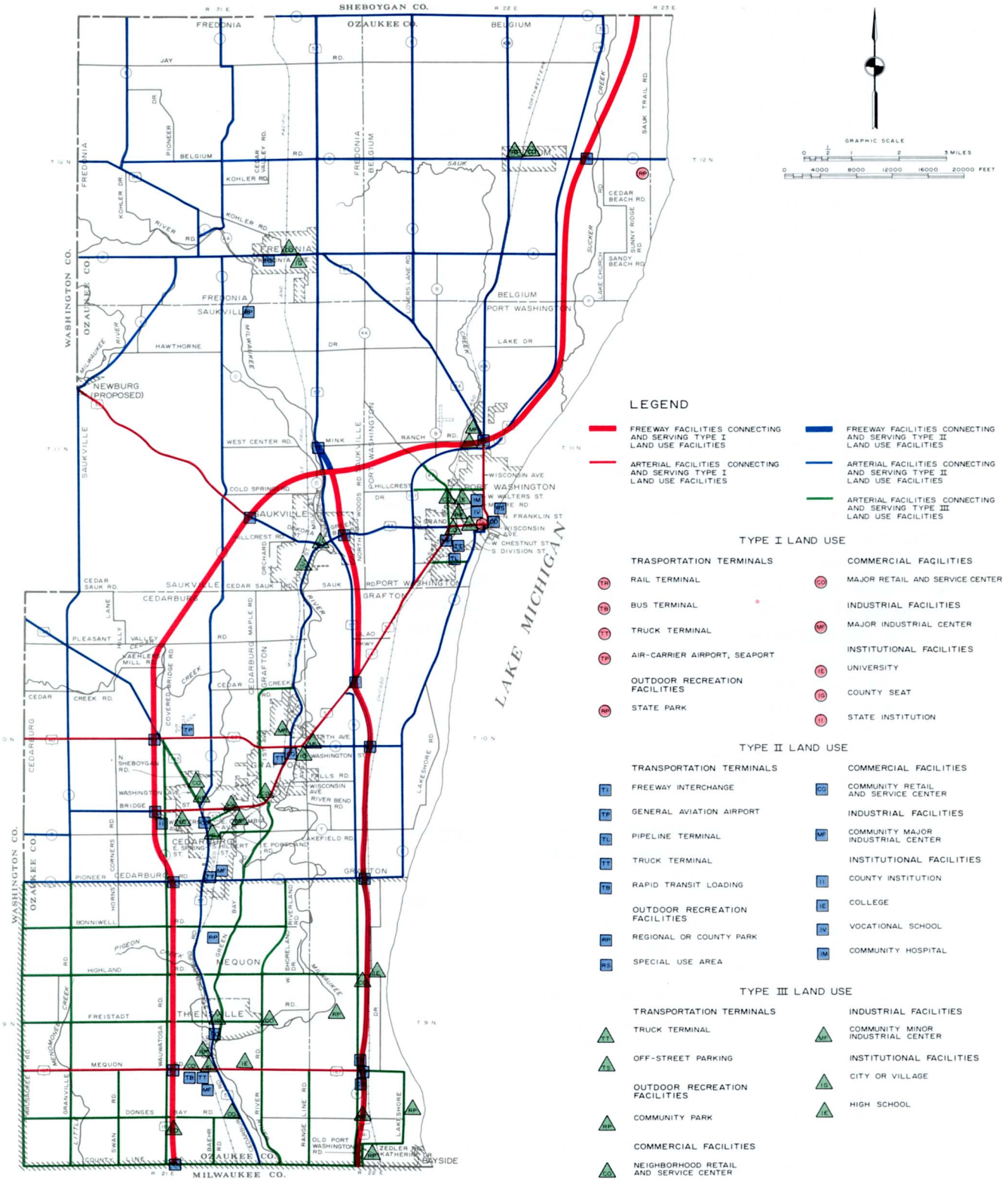



Application of trip length criteria resulted in the classification of the total arterial highway system into the three jurisdictional subsystems shown on this map. The pattern shown emphasizes the importance of freeways in serving the longest trips.

*Source: SEWRPC.*

Map 18

## JURISDICTIONAL CLASSIFICATION OF THE ARTERIAL STREET AND HIGHWAY SYSTEM IN OZAUKEE COUNTY BASED ON LAND USE: 1990




Application of the land use service criteria resulted in the classification of the total arterial highway system into the three jurisdictional subsystems shown on this map. The pattern emphasizes the close relationship which exists between land use development and arterial highway needs.

*Source: SEWRPC.*

## DEVELOPMENT OF THE JURISDICTIONAL HIGHWAY SYSTEM PLAN

Through the procedures previously described, two separate groups of Type I, Type II, and Type III subsystems were established—one group developed by application of the trip service criteria and the other by application of the land use service criteria. Generally, the same individual facilities were found to be included within each of the corresponding subsystems. Further refinement of the jurisdictional classification of the total arterial street and highway system was necessary, however, to establish a recommended jurisdictional highway system plan. This refinement was accomplished through the application of the previously established criteria relating to the operational characteristics of each facility, including system continuity, facility spacing, traffic volume, traffic mobility, and land access, to the two groups of subsystems. Other factors considered in this synthesis were legal and financial constraints and intergovernmental coordination requirements.

In order to facilitate the application of the traffic volume criteria, a third group of subsystems, shown on Map 19, was identified by application of the traffic volume criteria previously established. This third group of subsystems, based only upon traffic volume considerations, together with the system continuity and facility spacing criteria, was found to be most useful in the refinement of the application of the trip service and land use service criteria necessary to develop the final classification of the entire arterial system into recommended jurisdictional systems.

By comparing the three separate groups of subsystems—trip service, land use service, and volume—most of the arterial facilities were found to fall clearly into one of the three jurisdictional type categories—Type I, state trunk; Type II, county trunk; and Type III, local trunk—by virtue of meeting all of these criteria for a majority of the route length. Some judgment, however, had to be exercised in the case of a limited number of marginal facilities which did not fall clearly into one category or another because not all of the criteria were met for the majority of the route length. These marginal facilities are listed in Table 10, together with a summary of the manner in which they met the established criteria. Final determination with respect to the inclusion or exclusion of these marginal facilities was made by the Technical Advisory Committee, and this disposition is also noted in Table 10.

Subsequent to the Technical Advisory Committee's action, and after a series of informational meetings with local public officials and interested citizens held throughout the County concerning the plan recommendations, the Ozaukee County Board of Supervisors incorporated certain amendments to the plan in its resolution adopting the jurisdictional highway system plan on December 5, 1973. A summary of the amendments to the recommended plan as made by the County Board is set forth in Table 11. These changes to the plan are incorporated on Map 20 and in all subsequent maps and tables included in this report. The amendments to the plan made by the County Board involved three existing county trunk highway facilities, and in each case the Board, in adopting the plan, amended the plan to include retention of the existing county trunk highway facility functionally on the 1990 arterial street and highway system and jurisdictionally on the Type II county trunk highway subsystem.

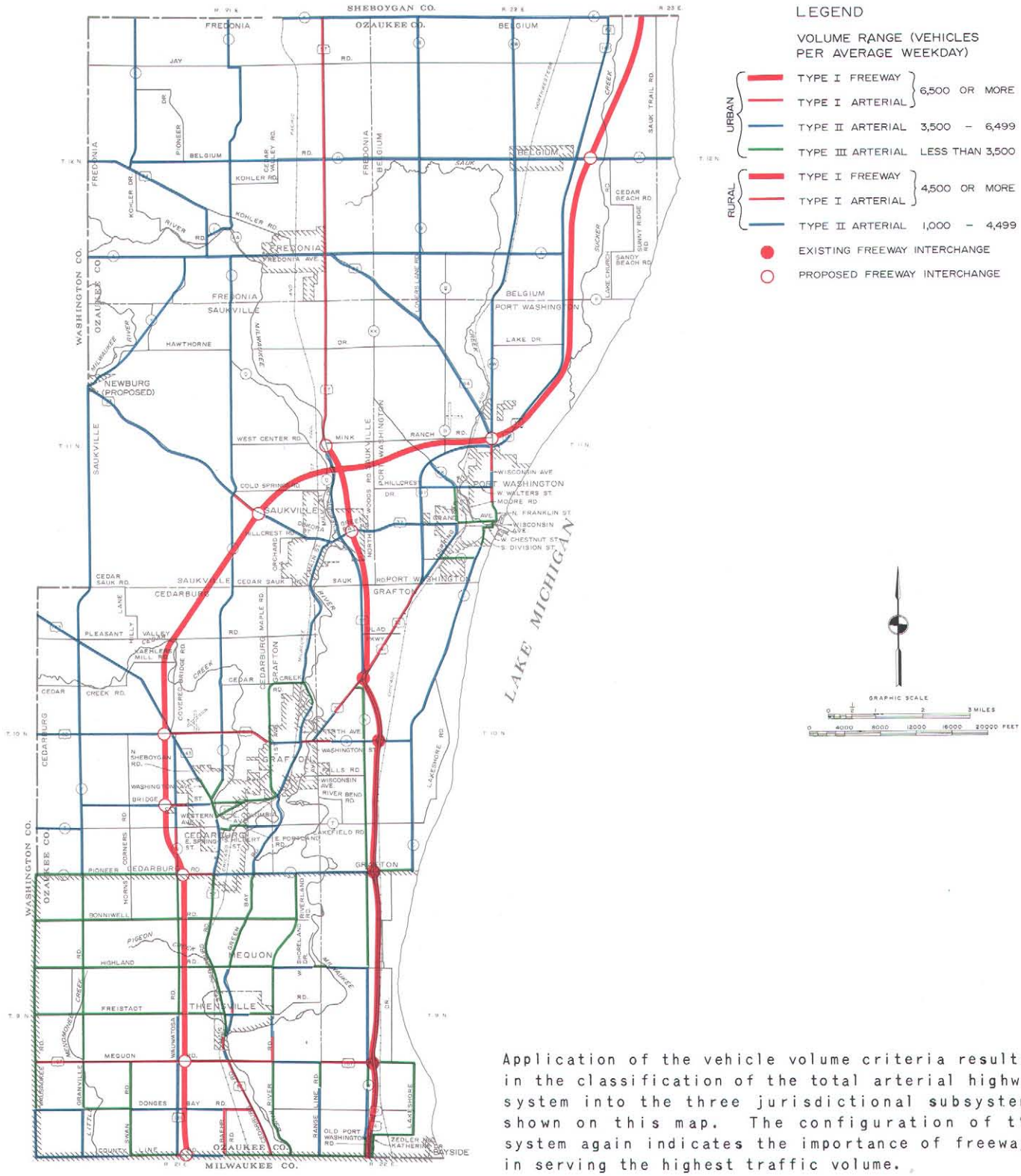
The total arterial street and highway system for Ozaukee County for 1990 is, then, shown on Map 20, and reflects not only the recommendations of the Technical Advisory Committee but also the Ozaukee County Board action. The total highway system was objectively and rationally classified as Type I state trunk; Type II county trunk; and Type III local trunk subsystems, which are integral parts of the overall system and which are in themselves continuous, but which vary with respect to the types of trip lengths served, the types of land use areas served, and the degree of traffic mobility provided.

## SUMMARY

The application of functional criteria for jurisdictional highway classification required analysis of the trip lengths and traffic volumes to be served by each link in the total arterial street and highway system, an inventory of existing and proposed land uses to be served by each of the jurisdictional subsystems, and investigation of the operational characteristics of the arterial facilities. This procedure involved three major steps: classification of each arterial facility in terms of the trip service criteria previously established; classification of each arterial facility in terms of the land use criteria previously established; and the combining and refinement of these two sets of jurisdictional subsystems through the application of system continuity and facility spacing criteria.

Map 19

## JURISDICTIONAL CLASSIFICATION OF THE ARTERIAL STREET AND HIGHWAY SYSTEM IN OZAUKEE COUNTY BASED ON VEHICLE VOLUME: 1990




Application of the vehicle volume criteria resulted in the classification of the total arterial highway system into the three jurisdictional subsystems shown on this map. The configuration of the system again indicates the importance of freeways in serving the highest traffic volume.

*Source: SEWRPC.*

Table 10

SUMMARY OF TECHNICAL COORDINATING AND ADVISORY COMMITTEE ACTION CONCERNING MARGINAL FACILITIES AND SYSTEM MODIFICATION

| Proposed Change | Considerations | Study Staff Action | Committee Action |
|---|---|---|---|
| Reclassify STH 57 as a Type II Facility From STH 167 to STH 60 | The Routing of STH 57 Historically Connected Such Incorporated Places as Thiensville, Cedarburg, Grafton, Saukville, and Port Washington. With Completion of the North-South and Stadium Freeways, STH 57 would no Longer be Required to Serve Type I Arterial Travel. The Following Portions of the 8.3 – Mile Route Length Meet the Major Type II Criteria—13 Percent for Trip Length, 68 Percent for Land Use, and 50 Percent For Vehicle Volume. Spacing as a Type II Facility is Violated Along Several Portions of the Facility. | Recommended Approval of Proposed Change | Rejected Proposed Change |
| Reclassify STH 33 as a Type II Facility From the Stadium Freeway to STH 32 | As a Part of the Original State Trunk Highway System, STH 33 Connected the City of Port Washington and the Village of Saukville With Other Urban Areas, Such as Newburg, West Bend and Beaver Dam. With Completion of the North-South and Stadium Freeways, That Portion of STH 33 From the Stadium Freeway to STH 32 Would no Longer be Required to Serve Type I Arterial Travel. The Following Portions of the 4.3-Mile Route Length Meet the Major Type II Criteria—81 Percent for Trip Length, 100 Percent for Land Use, and 93 Percent for Vehicle Volume. | Recommended Approval of Proposed Change | Rejected Proposed Change |
| Reclassify Wausaukee Road as a Type II Facility From the Milwaukee County Line to Freidstadt Road | Located on the Ozaukee-Washington County Line. Classification of Wausaukee Road as a Type II Facility Would Provide Good System Continuity From CTH F (Washington County) to W. County Line Road. | Recommended Approval of Proposed Change | Rejected Proposed Change, Reclassified Granville Road as a Type II Facility From CTH C to W. County Line Road. |
| Reclassify Donges Bay Road as a Type II Facility From The Washington County Line to STH 57 | The Following Portions of the 4.7-Mile Route Length Meet the Major Type II Criteria—64 Percent for Trip Length, 0 Percent for Land Use, and 21 Percent for Vehicle Volume. In Addition, 79 Percent of the 4.7-Mile Route Length Meets the Type I Criteria for Vehicle Volume. | Recommended Approval of Proposed Change | Rejected Proposed Change |
| Reclassify Highland Road as a Type II Facility From the Washington County Line to CTH W | The Facility Provides Good Route Continuity Across the County. The Following Portions of the 7.2-Mile Route Length Meet the Major Type II Criteria—100 Percent for Trip Length, 0 Percent for Land Use, and 46 Percent for Vehicle Volume. | Recommended the Proposed Change Because the Facility Nearly Met the Type II Criteria | Unanimously Approved Proposed Change |

*Source: SEWRPC.*

Table 11

SUMMARY OF AMENDMENTS TO THE RECOMMENDED JURISDICTIONAL HIGHWAY SYSTEM PLAN MADE BY THE OZAUKEE COUNTY BOARD OF SUPERVISORS

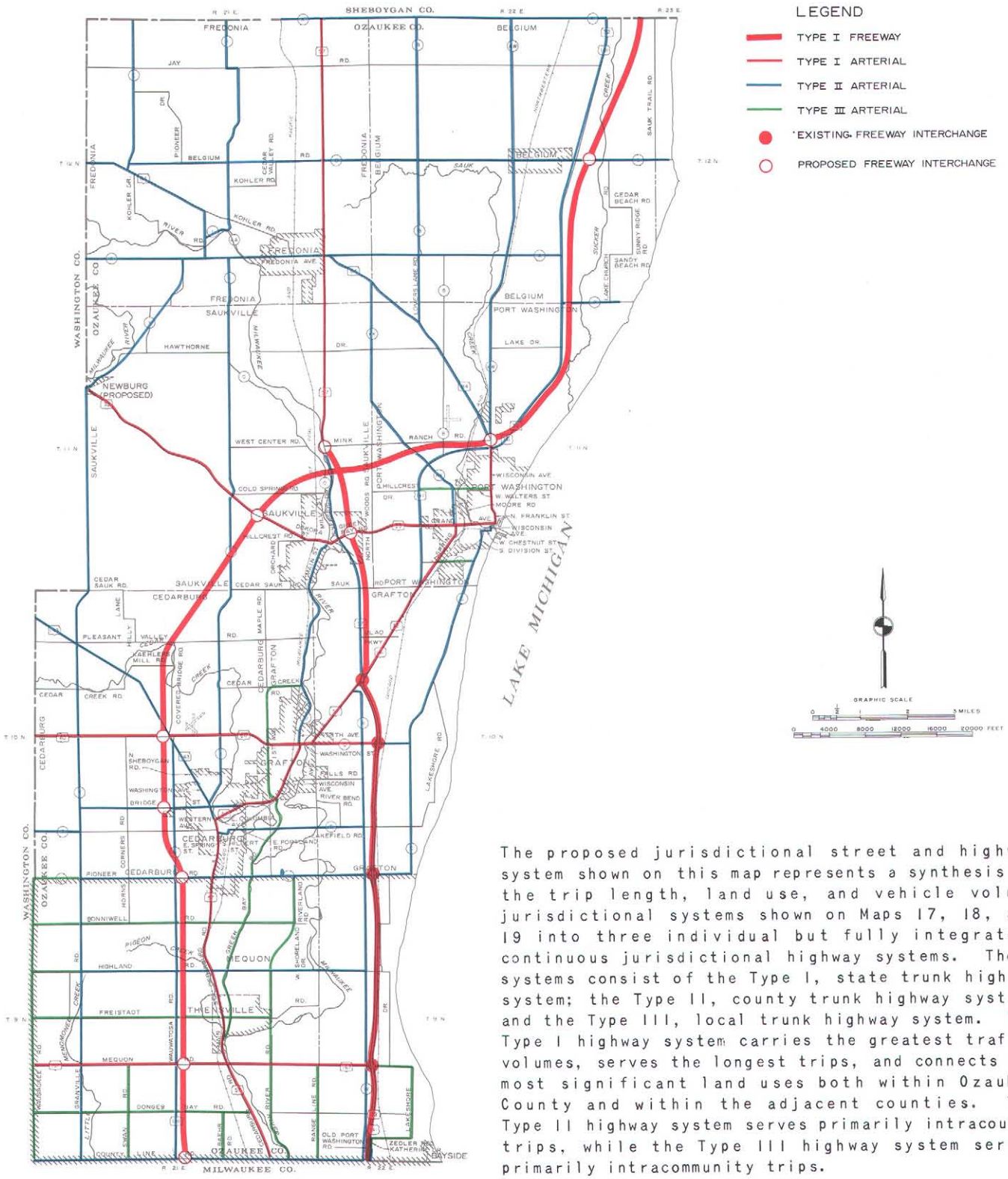
| Facility | | Technical Coordinating and Advisory Committee Recommendation | County Board Action |
|---|---|---|---|
| Name | Length (Miles) | | |
| Existing CTH KK from present STH 84 to present USH 141 | 4.3 | Reclassify facility as local collector street and remove from CTH system | Retain facility as arterial highway on CTH system |
| Existing CTH KK from present USH 141 to N. Spring Street in Port Washington | 0.9 | Retain facility as arterial street, remove from CTH system, and place on local trunk highway system | Retain facility on CTH system |
| Existing CTH P from present USH 141 to Forest Beach Lane | 1.3 | Reclassify facility as local collector street and remove from CTH system | Retain facility as arterial highway on CTH system |
| Existing CTH T from Green Bay Road to CTH W | 1.9 | Remove from CTH system | Classify facility as arterial highway and retain on CTH system |
| Existing CTH T from Cedarburg city limits to Green Bay Road | 0.6 | Classify facility as arterial highway, remove from CTH system, and place on local trunk highway system | Classify facility as arterial highway and retain on CTH system |

*Source: Ozaukee County Board of Supervisors and SEWRPC.*

By comparing trip service, land use service, and volume, it was found that most of the arterial facilities fell into one of the three jurisdictional type categories: Type I, state trunk; Type II, county trunk; and Type III, local trunk. A limited number of marginal facilities did not fall into one category or another, and final determination with respect to their inclusion or exclusion was made by the Technical Coordinating and Advisory Committee. Finally, the Ozaukee County Board of Supervisors, in adopting the recommended jurisdictional highway system plan, amended the plan to include retention on the functional arterial street and highway system and on the county trunk jurisdictional subsystem three existing county trunk highway facilities.

Map 20

## PROPOSED JURISDICTIONAL CLASSIFICATION OF THE ARTERIAL STREET AND HIGHWAY SYSTEM IN OZAUKEE COUNTY: 1990




The proposed jurisdictional street and highway system shown on this map represents a synthesis of the trip length, land use, and vehicle volume jurisdictional systems shown on Maps 17, 18, and 19 into three individual but fully integrated, continuous jurisdictional highway systems. These systems consist of the Type I, state trunk highway system; the Type II, county trunk highway system; and the Type III, local trunk highway system. The Type I highway system carries the greatest traffic volumes, serves the longest trips, and connects the most significant land uses both within Ozaukee County and within the adjacent counties. The Type II highway system serves primarily intracounty trips, while the Type III highway system serves primarily intracommunity trips.

*Source: SEWRPC.*

Chapter VI

# THE RECOMMENDED JURISDICTIONAL HIGHWAY SYSTEM PLAN

## INTRODUCTION

Previous chapters of this report have described the jurisdictional highway planning process; the criteria developed for this process; and the application of these criteria to develop a jurisdictional highway system plan for Ozaukee County. This chapter describes the resulting recommended jurisdictional highway systems—Type I, state trunk; Type II, county trunk; and Type III, local trunk—which together comprise the total arterial street and highway system required to serve the growing travel demands within Ozaukee County and its constituent cities, villages, and towns through the plan design year of 1990. The recommended jurisdictional highway system plan recommends an alignment of governmental responsibility for each of the various facilities comprising the total arterial street and highway system in the plan design year, including an alignment of the federal aid highway systems. The recommended plan also constitutes a refinement of the functional arterial street and highway system plan prepared by the Southeastern Wisconsin Regional Planning Commission under the initial regional land use-transportation study and, as such, is intended, upon its adoption, to constitute a functional, as well as a jurisdictional, arterial street and highway system plan for Ozaukee County to the plan design year 1990.

Because certain major arterial street and highway facilities proposed in the functional arterial street and highway system plan will not be constructed and operative until some time beyond the year in which the plan may be expected to be adopted and its implementation initiated, the jurisdictional plan has been staged to the plan design year 1990 through the interim years of 1975 and 1980. The effect of this staging has been to retain temporarily on the proposed Type I (state trunk) arterial system certain routes ultimately proposed as Type II (county trunk) routes by 1990. One of these routes parallels a proposed freeway, and the higher jurisdictional classification is recommended for the existing standard arterial until such time as the recommended paralleling freeway is constructed in the corridor served. The other two routes duplicate the arterial traffic service provided by recommended Type I facilities already serving travel corridors and are recommended to become Type II facilities at such time as the recommended freeways have been completed within Ozaukee County. The staging is thus intended to provide the best possible trip service, land use service, and system continuity during the interim period required to fully implement the functional highway system plan.

The jurisdictional highway systems within Ozaukee County as these systems are anticipated to exist in the year 1975, shown on Map 22, reflect the completion by that time of the North-South Freeway from its interchange with existing STH 57 to the Ozaukee-Sheboygan County line and the concomitant change in the jurisdictional classification of existing USH 141 and STH 57. The proposed configuration of these systems in 1980, shown on Map 23, reflects the completion of the proposed Stadium Freeway from the Milwaukee County line to the North-South Freeway (proposed USH 141), and the concomitant changes in the jurisdictional classification of STH 84, STH 143, STH 181, CTH T, and Bridge Street. The recommended jurisdictional highway system plan for the year 1990 is shown on Map B-1, contained in Appendix B to this report. The proposed configuration of the jurisdictional systems in 1990 is the same as in 1980, with the exceptions of: County Line Road between River Road and USH 141, which is recommended for addition to the Type II arterial highway system with construction of a bridge over the Milwaukee River; and Kohler and Cedar Valley Roads, which are recommended to revert to local jurisdiction with the construction of the extension of Belgium Road between CTH I and Cedar Valley Road.

## THE RECOMMENDED TYPE I (STATE TRUNK) ARTERIAL HIGHWAY SYSTEM

The arterial street and highway system recommended to serve the arterial traffic demand in Ozaukee County through the plan design year 1990 totals 318.9 route-miles of facilities, or about 35 percent of the estimated 912.2 route-miles of facilities expected to comprise the total street and highway system within the County in 1990. Of this total arterial system, 96.5 route-miles, or about

30 percent, are proposed to comprise the Type I (state trunk) arterial highway system. This represents a reduction of 2.2 miles in the existing state trunk highway and connecting street mileage within Ozaukee County. The recommended Type I system includes 51.4 miles of standard arterial facilities, as well as all of the 45.1 miles of existing, committed, and proposed freeways serving Ozaukee County through the plan design year 1990 (see Table 12).

Table 12

FUNCTIONAL COMPOSITION OF RECOMMENDED TYPE I (STATE TRUNK) ARTERIAL HIGHWAY SYSTEM IN OZAUKEE COUNTY: 1990

| Functional Facility Type | Number of Miles | Percent of Total |
|---|---|---|
| Freeways | | |
| Existing | 10.2 | 10.6 |
| Committed | 17.4 | 18.0 |
| Proposed | 17.5 | 18.1 |
| Subtotal | 45.1 | 46.7 |
| Standard Surface Arterials | | |
| Existing | 51.4 | 53.3 |
| Committed | 0.0 | 0.0 |
| Proposed | 0.0 | 0.0 |
| Subtotal | 51.4 | 53.3 |
| Total | 96.5 | 100.0 |

*Source: Wisconsin Department of Transportation and SEWRPC.*

The proposed Type I (state trunk) arterial system for 1990 is shown on Map B-1, contained in Appendix B to this report. The recommended Type I arterial system includes the following standard arterials, in addition to the North-South and Stadium Freeways:

1. STH 57 from the Milwaukee County line over the Cedarburg Road (City of Mequon), Main Street (Village of Thiensville), S. Washington Avenue and E. Columbia Avenue (City of Cedarburg), Wisconsin Avenue and Washington Street (Village of Grafton) to the North-South Freeway (USH 141), and from the North-South Freeway and its interchange with the Stadium Freeway over existing STH 57 to the Ozaukee-Sheboygan County line.

2. STH 32 from the North-South Freeway (USH 141) over S. Spring Street, W. and E. Grand Avenue, N. Franklin, and N. Wisconsin, all in the City of Port Washington, to the North-South Freeway (USH 141).

3. STH 167 from the Washington County line to the North-South Freeway over the Mequon Road.

4. STH 60 from the Washington County line over Washington Street and Ulao Road (Village of Grafton) to the North-South Freeway (USH 141).

5. STH 33 from the Washington County line over Dekora Street and Green Bay Avenue (Village of Saukville) and W. Grand Avenue (City of Port Washington) to S. Spring Street (STH 32).

All 14 municipalities within Ozaukee County would be connected and served by the proposed Type I arterial system, as the term "connect and serve" was defined in Chapter IV of this report, although not all such municipalities would necessarily have Type I facilities actually located within their corporate limits. The recommended mileages in the total Type I arterial system within each municipality for the years 1975, 1980, and 1990 are indicated in Table 13.

The recommended Type I arterial system is intended to provide the basic framework of the total arterial street and highway system required to serve the existing and probable future traffic demand within Ozaukee County to the plan design year of 1990; and the relative degree of efficiency with which each link in the proposed Type I arterial system accomplishes its intended function will, therefore, significantly affect the total operation of the entire arterial street and highway system. Code numbers indicating typical roadway cross sections having right-of-way and pavement widths adequate to serve the forecast 1990 traffic demand for each segment of facility in the recommended Type I arterial system are shown on the plan map contained in Appendix B to this report. The cross sections related to each code number are set forth in Figure B-1, contained in Appendix B to this report, and contain, in addition to recommended typical dimensions, estimated representative unit construction and maintenance costs and service volume ranges at various levels of service.

Table 13

RECOMMENDED DISTRIBUTION OF TYPE I (STATE TRUNK) ARTERIAL SYSTEM MILEAGE IN OZAUKEE COUNTY BY CIVIL DIVISION: 1975, 1980, and 1990

| Civil Division | 1975 Number of Miles | | | 1980 Number of Miles | | | 1990 Number of Miles | | |
|---|---|---|---|---|---|---|---|---|---|
| | Freeway | Standard Arterial | Total | Freeway | Standard Arterial | Total | Freeway | Standard Arterial | Total |
| CITIES | | | | | | | | | |
| Cedarburg | -- | 2.8 | 2.8 | 2.1 | 2.2 | 4.3 | 2.1 | 2.8 | 4.9 |
| Mequon | 6.1 | 13.9 | 20.0 | 12.0 | 12.0 | 24.0 | 12.0 | 12.0 | 24.0 |
| Port Washington | -- | 3.6 | 3.6 | -- | 4.1 | 4.1 | -- | 4.1 | 4.1 |
| Subtotal | 6.1 | 20.3 | 26.4 | 14.1 | 18.3 | 32.4 | 14.1 | 18.9 | 33.0 |
| VILLAGES | | | | | | | | | |
| Belgium | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Fredonia | -- | 1.8 | 1.8 | -- | 0.5 | 0.5 | -- | 0.5 | 0.5 |
| Grafton | -- | 3.1 | 3.1 | -- | 3.5 | 3.5 | -- | 4.4 | 4.4 |
| Saukville | -- | 1.1 | 1.1 | -- | 1.1 | 1.1 | -- | 1.1 | 1.1 |
| Thiensville | -- | 1.3 | 1.3 | -- | 1.3 | 1.3 | -- | 1.3 | 1.3 |
| Subtotal | -- | 7.3 | 7.3 | -- | 6.4 | 6.4 | -- | 7.3 | 7.3 |
| TOWNS | | | | | | | | | |
| Belgium | 6.2 | 0.6 | 6.8 | 6.2 | -- | 6.2 | 6.2 | -- | 6.2 |
| Cedarburg | -- | 10.8 | 10.8 | 4.8 | 5.1 | 9.9 | 4.8 | 4.5 | 9.3 |
| Fredonia | -- | 11.7 | 11.7 | -- | 5.7 | 5.7 | -- | 5.7 | 5.7 |
| Grafton | 5.8 | 5.1 | 10.9 | 5.8 | 5.1 | 10.9 | 5.8 | 4.2 | 10.0 |
| Port Washington | 6.4 | 2.6 | 9.0 | 6.4 | 2.1 | 8.5 | 6.4 | 2.1 | 8.5 |
| Saukville | 4.1 | 8.7 | 12.8 | 7.8 | 8.7 | 16.5 | 7.8 | 8.7 | 16.5 |
| Subtotal | 22.5 | 39.5 | 62.0 | 31.0 | 26.7 | 57.7 | 31.0 | 25.2 | 56.2 |
| Total | 28.6 | 67.1 | 95.7 | 45.1 | 51.4 | 96.5 | 45.1 | 51.4 | 96.5 |

*Source: Wisconsin Department of Transportation and SEWRPC.*

The typical cross sections recommended in the plan are based upon analyses of land use impacts, as well as upon analyses of forecast traffic volumes; desirable levels of service; and an assessment of the probable development cost, including cost of right-of-way acquisition. As such, the suggested cross sections will provide traffic capacities required to meet the forecast travel demand at the level of service indicated in the cross-section code shown on the plan map. The Type I arterial facilities constructed to such cross sections will thus form a workable subsystem able to carry satisfactorily the existing and probable future traffic demand and will be properly related to the other arterial subsystems and to existing and probable future land use development within the County and within the Region of which the County is a part. Further consideration and refinement of the suggested typical cross sections, in light of changing geometric and structural design standards, as well as of changing traffic and land use patterns, will be required as each segment of the system is considered for actual improvement.

## THE RECOMMENDED TYPE II (COUNTY TRUNK) ARTERIAL HIGHWAY SYSTEM

The proposed Type II (county trunk) arterial highway system includes 176.4 route-miles of facilities, or about 55 percent of the total arterial mileage proposed to serve Ozaukee County in the plan design year of 1990. The proposed Type II arterial system is comprised entirely of standard arterials, since all freeways are included in the proposed Type I arterial system. The total of 176.4 route-miles of county trunk highways proposed represents an increase of 55.8 miles over

the existing county trunk mileage. The proposed system is shown on Map B-1; and the distribution of the system mileage by municipality for the years 1975, 1980, and 1990 is indicated in Table 14.

Table 14

RECOMMENDED DISTRIBUTION OF TYPE II (COUNTY TRUNK) ARTERIAL SYSTEM MILEAGE IN OZAUKEE COUNTY BY CIVIL DIVISION: 1975, 1980, and 1990

| Civil Division | Standard Surface Arterial (Miles) | | |
|---|---|---|---|
| | 1975 | 1980 | 1990 |
| CITIES | | | |
| Cedarburg | 3.0 | 7.3 | 11.0 |
| Mequon | 28.6 | 30.1 | 31.2 |
| Port Washington | 1.5 | 2.7 | 4.6 |
| Subtotal | 33.1 | 40.1 | 46.8 |
| VILLAGES | | | |
| Belgium | 1.8 | 1.8 | 1.8 |
| Fredonia | -- | 1.7 | 1.7 |
| Grafton | 0.8 | 0.8 | 1.2 |
| Saukville | 1.8 | 1.8 | 2.5 |
| Thiensville | -- | -- | -- |
| Subtotal | 4.4 | 6.1 | 7.2 |
| TOWNS | | | |
| Belgium | 30.4 | 31.0 | 31.0 |
| Cedarburg | 18.4 | 20.2 | 17.4 |
| Fredonia | 20.9 | 26.5 | 26.0 |
| Grafton | 18.4 | 18.4 | 17.5 |
| Port Washington | 19.7 | 18.5 | 16.6 |
| Saukville | 14.6 | 14.6 | 13.9 |
| Subtotal | 122.4 | 129.2 | 122.4 |
| Total | 159.9 | 175.4 | 176.4 |

*Source: Wisconsin Department of Transportation and SEWRPC.*

As shown on Map B-1, Appendix B, all but one of the 15 surface arterials connecting to freeway interchanges are included in either the Type I or Type II arterial systems. The adequate improvement, maintenance, and operation of these routes are essential to the efficient operation of the freeway system. These routes include the following existing and proposed Type I arterial facilities: STH 32, STH 33, STH 57, STH 60, STH 167, and CTH Q; the following existing and proposed Type II arterial facilities: STH 84, CTH D, CTH C, CTH Q, Bridge Street, and the south County Line Road; and the following existing Type III arterial facility: Mequon Road east of the North-South Freeway. In addition, certain routes of countywide significance, formerly designated as state trunk highways but which have, with the construction of paralleling freeways in the corridors served, assumed lesser importance as arterials, are recommended for inclusion in the proposed Type II system. These facilities include existing STH 143; existing USH 141 from STH 32 to the Sheboygan County line; existing STH 57 from USH 141-STH 32 to the interchange of STH 57 with the North-South Freeway (USH 141); STH 84 from USH 141 to the Washington County line; and STH 181 from the Milwaukee County line to Mequon Road. Also included in the Type II system are certain county and municipal boundary line roads. These include CTH K, CTH KK, CTH P, CTH T, CTH Y, and the County Line Road; and their inclusion is intended to reduce the number of governmental agencies having primary responsibility for the improvement, maintenance, and operation of these facilities and thereby reduce the problems involved in achieving the intergovernmental coordination necessary to the cooperative development of these arterials.

The recommended Type II arterial system complements the recommended Type I system and is intended, together with the latter system, to include all major arterials within Ozaukee County having areawide significance. In addition, the recommended Type II arterial system is, in the rural areas of the County, intended to serve all of the arterial travel demand which is not served by the Type I arterial system.

Code numbers indicating typical roadway cross sections with right-of-way and pavement widths adequate to serve the forecast 1990 traffic demand for each segment of facility in the recommended Type II arterial system are shown on the plan map contained in Appendix B to this report. The typical cross sections related to each code number are set forth in Figure B-1, Appendix B, and contain, in addition to the recommended typical dimensions, estimated representative construction and maintenance unit costs and service volume ranges at various levels of service. The typical cross sections recommended in the plan are based upon analyses of land use impacts, as well as upon analyses of forecast traffic volumes, desirable levels of service, and an assessment of the probable development cost, including cost of right-of-way acquisition. As such, the suggested

cross sections will provide the traffic capacities required to meet the forecast travel demand at the level of service indicated in the cross-section code shown on the plan map. The Type II arterial facilities constructed to such cross sections will thus form a workable subsystem able to carry satisfactorily the existing and probable future travel demand and will be properly related to the other arterial subsystems and to existing and probable future land use development within the County and within the Region of which the County is a part. Reconsideration and refinement of the suggested typical cross sections will be required in light of changing geometric and structural design standards, as well as of changing land use and traffic patterns, as each segment of facility in the system is considered for actual improvement.

## THE RECOMMENDED TYPE III (LOCAL TRUNK) ARTERIAL HIGHWAY SYSTEM

The proposed Type III (local trunk) arterial highway system includes 46.0 route-miles of facilities, or about 15 percent of the total arterial mileage proposed to serve Ozaukee County in the plan design year of 1990. The proposed system is shown on Map B-1, Appendix B; and the distribution by municipality for the years 1975, 1980, and 1990 is indicated in Table 15. The proposed Type III arterial system is intended to serve the lowest level of arterial traffic demand within the urban areas of Ozaukee County and, as such, to complement the proposed Type I and Type II subsystems. Even though the Type III system is intended to serve primarily local arterial street and highway needs, this subsystem must, nevertheless, perform efficiently as an integral part of the total arterial street and highway system if that total system is to properly serve the growing traffic demand within the County. The location and configuration of the recommended Type III system, when considered in conjunction with the recommended Type I and Type II systems, are such as to generally permit sound urban land use development to proceed in the form of planned residential development units without penetration of the units by arterial streets and highways.

Code numbers indicating typical cross sections with right-of-way and pavement widths adequate to serve the forecast 1990 traffic demand for each link in the recommended Type III arterial system are shown on the plan map contained in Appendix B to this report. The typical cross sections related to each code number are set forth in Figure B-1,

Table 15

RECOMMENDED DISTRIBUTION OF TYPE III (LOCAL TRUNK) ARTERIAL SYSTEM MILEAGE IN OZAUKEE COUNTY BY CIVIL DIVISION: 1975, 1980, and 1990

| Civil Division | Standard Surface Arterial (Miles) | | |
|---|---|---|---|
| | 1975 | 1980 | 1990 |
| CITIES | | | |
| Cedarburg | -- | -- | 1.2 |
| Mequon | 37.2 | 37.7 | 36.7 |
| Port Washington | -- | -- | 2.3 |
| Subtotal | 37.2 | 37.7 | 40.2 |
| VILLAGES | | | |
| Belgium | -- | -- | -- |
| Fredonia | -- | -- | -- |
| Grafton | -- | 2.9 | 3.6 |
| Saukville | -- | -- | -- |
| Thiensville | 2.2 | 2.2 | 2.2 |
| Subtotal | 2.2 | 5.1 | 5.8 |
| TOWNS | | | |
| Belgium | -- | -- | -- |
| Cedarburg | -- | -- | -- |
| Fredonia | -- | -- | -- |
| Grafton | -- | -- | -- |
| Port Washington | -- | -- | -- |
| Saukville | -- | -- | -- |
| Subtotal | -- | -- | -- |
| Total | 39.4 | 42.8 | 46.0 |

*Source: Wisconsin Department of Transportation and SEWRPC.*

Appendix B, and contain, in addition to recommended typical dimensions, estimated representative construction and maintenance unit costs and service volume ranges at various levels of service. The typical cross sections suggested in the plan are based upon analyses of land use impacts, as well as analyses of forecast traffic volume, desirable level of service, and preliminary assessment of the probable development cost, including cost of right-of-way acquisition. As such, the suggested cross sections will provide the traffic capacity required to meet the forecast travel demand at the level of service indicated in the cross-section code shown on the plan map. The Type III arterial facilities constructed to such cross sections will thus provide a workable subsystem able to carry satisfactorily the existing and probable future traffic demand and will be

properly related to the other arterial subsystems and to existing and probable future land use development within the County and the Region of which the County is a part. Further consideration and refinement of the suggested typical cross sections, in light of changing geometric and structural design standards, as well as of changing traffic and land use patterns, will be required as each segment of facility in the system is considered for improvement.

## PROSPECTIVE ARTERIAL HIGHWAYS

In addition to the Type I, Type II, and Type III arterial systems, the creation of a system of prospective arterial highways, consisting of 61.5 route-miles of facilities, is herein recommended. All but approximately 10 miles of the 61.5 miles of prospective arterials already exist and presently function as land access or collector facilities. While these prospective arterial facilities will not be required to serve existing or forecast arterial traffic demand through the plan design year, urban development may be expected to continue to occur in Ozaukee County beyond the design year of the plan; and such development may be expected to require additional arterial facilities to serve the travel demand generated by it. To this end, those routes which could logically serve the demand generated by such urban development have been identified and are shown on Map B-1, Appendix B.

In the interim period of time to 1990, the prospective arterial highways will continue to serve as collector or land access facilities and, as such, are of direct concern in areawide planning only to the extent that they may be required to serve arterial traffic needs beyond the plan design year. The cross section assigned to the prospective arterials is intended to permit the proper control of access and the reservation of sufficient right-of-way to accommodate a typical, desirable Type III arterial facility cross section. The refinement of the cross section for each prospective arterial highway can only be accomplished at such time as further urban development is planned or committed and the arterial travel demand generated by such development can be quantified.

The prospective arterials are of direct concern in areawide planning not only because of the need to reserve right-of-way for future arterials, but also because their location and alignment may affect future land use development. The spacing selected for prospective arterials, generally one mile, is such as to provide a sound, basic framework of arterial facilities around which the development of planned residential development units at medium population densities can proceed, while not precluding such development at a lower or at a higher density. The preservation of the right-of-way for these potential traffic carriers will ensure system continuity in the extension of the recommended 1990 arterial street and highway system as urban development continues beyond the forecast 1990 level, and is essential to protect the traffic-carrying capacity of these facilities by controlling access and thereby the degree of conflict between abutting land uses and the basic function of the arterial facilities.

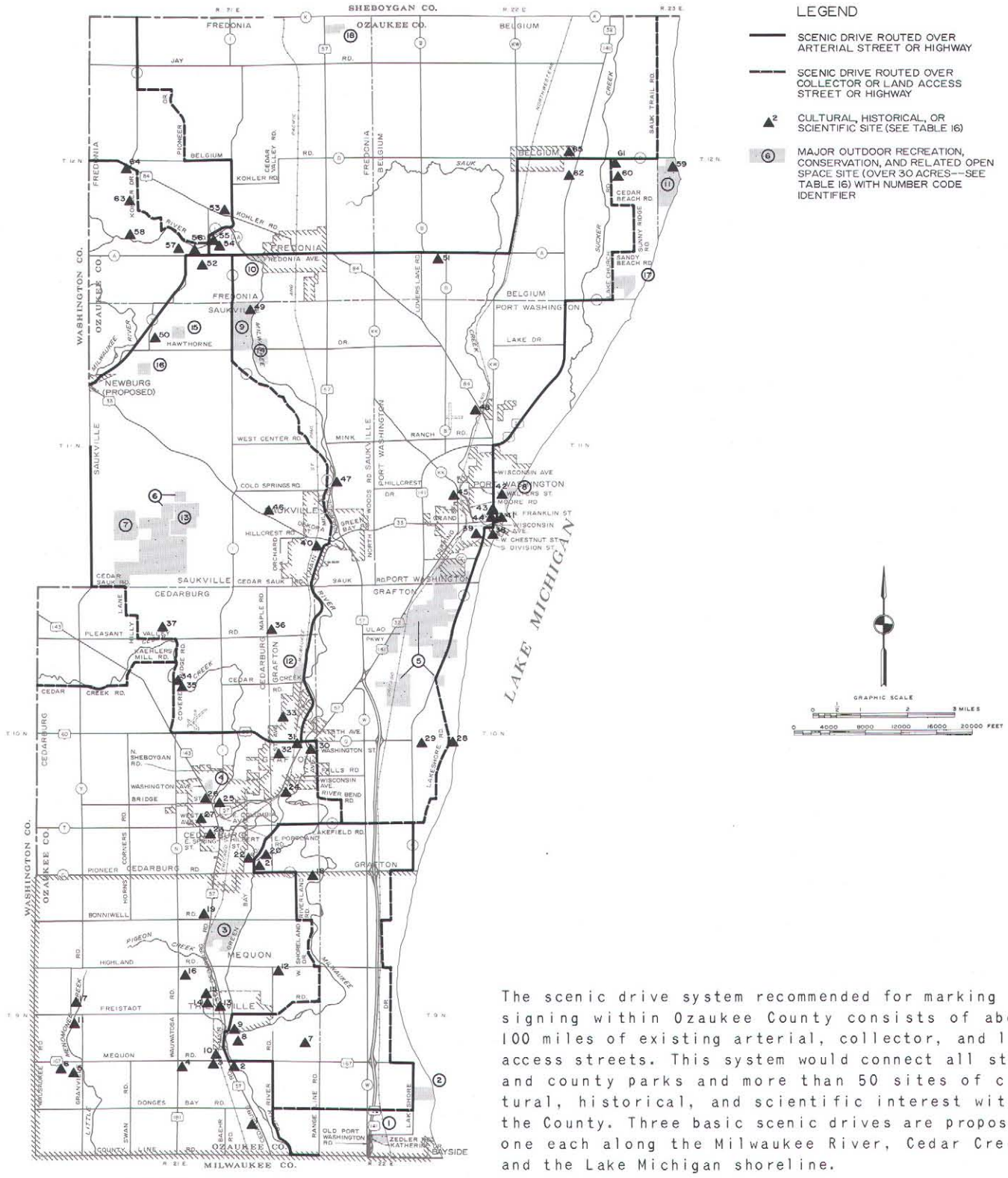
## SCENIC DRIVES

One of the most popular outdoor recreational activities within Ozaukee County and within the Region of which Ozaukee County is a part is pleasure driving, as evidenced by the estimated 10,000 average seasonal Sunday participants in such pleasure driving within Ozaukee County in 1969. Forecasts, moreover, indicate that a substantial increase in the demand for this recreational pursuit may be expected, with the average seasonal Sunday participation within the County increasing to over 18,000 participants by 1990. To provide facilities for this activity, the marking and signing of a system of scenic drives routed over existing roadways within the County are herein recommended. The scenic drives recommended to be marked and signed within Ozaukee County are shown on Map 21. These drives are routed over 100.4 miles of streets and highways, of which all but 0.3 mile are comprised of existing arterial, collector, and land access facilities. The 0.3 mile exception consists of a short segment of a new facility which would have to be constructed for system continuity. Of the total of 100.4 miles of proposed scenic drives, 57.8 miles, or about 58 percent, would normally perform arterial street and highway functions; and the remaining 42.6 miles, or about 42 percent, would normally perform collector and land access functions during weekdays through the plan design year 1990.

The recommended scenic drive system within Ozaukee County consists of three basic drives. The first drive would extend northerly along the Milwaukee River from the Milwaukee County line in the City of Mequon to the Village of Fredonia, separating there into three branches. The first branch, extending westerly along the main stem

Map 21

RECOMMENDED SCENIC DRIVE SYSTEM IN OZAUKEE COUNTY: 1990




The scenic drive system recommended for marking and signing within Ozaukee County consists of about 100 miles of existing arterial, collector, and land access streets. This system would connect all state and county parks and more than 50 sites of cultural, historical, and scientific interest within the County. Three basic scenic drives are proposed, one each along the Milwaukee River, Cedar Creek, and the Lake Michigan shoreline.

*Source: SEWRPC.*

of the Milwaukee River to the West Bend and the Paradise Valley areas in Washington County, would join the Kettle Moraine Scenic Drive just west of the City of West Bend. The second branch, extending westerly along the North Branch of the Milwaukee River and Stony Creek, would join the Kettle Moraine Scenic Drive, which drive extends northerly to the Greenbush area and the Old Wade House State Historic Site, at New Fane in Fond du Lac County. This second branch eventually would lead westerly to Mayville and the Horicon Marsh. The third branch would extend northerly from the Village of Fredonia through the Random Lake and Cascade areas of Sheboygan County. The second scenic drive would extend westerly from the Village of Grafton along Cedar Creek to the Slinger area in Washington County, where it would join the existing Kettle Moraine Scenic Drive, with a branch extending from the Covered Bridge County Park to the scenic drive leading west from Fredonia to West Bend. The third scenic drive would extend northerly along the shoreline of Lake Michigan from the City of Mequon through the City of Port Washington, past the Harrington Beach State Park site, and into Sheboygan County to the Terry Andrae State Park site. This third drive would connect with the previous drives via a route connecting the Village of Fredonia with the Harrington Beach State Park site.

The location and configuration of the proposed scenic drive system within the County was based upon analyses of the recreational and natural resource base of the Region and the County carried out by the Regional Planning Commission and, as shown on Map 21, would connect all existing county and state parks within Ozaukee County, as well as 55 of the 65 sites of cultural, historical, and scientific interest within the County. Each of the 65 sites, as well as all major outdoor recreation, conservation, and related open-space sites, are identified in Table 16. In order to attain the necessary intercommunity and intercounty continuity in the scenic drives; to assure the proper relationship of the scenic drives to the natural resource base; to assure uniformity in the marking and signing of the scenic drives; and, most importantly, to assure the attainment of an equitable fiscal policy for the maintenance of the scenic drives, the functional classification categories established under the study were expanded to include, as a special category, the scenic drive.

## EVALUATION OF THE PROPOSED JURISDICTIONAL HIGHWAY SYSTEMS

One of the most important objectives of the jurisdictional highway planning process is to attain the most effective use of the total public resources in the provision of highway transportation by focusing the appropriate resources and capabilities on corresponding areas of need. That the recommended jurisdictional highway system plan accomplishes this objective is indicated by the fact that the proposed Type I arterial system may be expected to carry approximately 1.21 million of the 1.80 million arterial miles of travel anticipated to occur daily within Ozaukee County by the year 1990. Thus, approximately 30 percent of the total arterial street and highway mileage within the County may be expected to carry approximately 67 percent of the total arterial travel demand. The proposed Type II arterial may be expected to carry an additional 440,000 arterial vehicle miles of travel. Thus, an additional 55 percent of the total arterial street and highway mileage may be expected to carry an additional 25 percent of the total arterial travel demand. The remaining 150,000 arterial vehicle miles of travel, or 8 percent of the total demand, would be carried on the proposed Type III arterial system. Thus, the proposed Type I and Type II systems combined may be expected to carry approximately 92 percent of the total arterial vehicle miles of travel expected to take place within the County by the year 1990, leaving only 8 percent to be carried by Type III arterials. This concentration of travel demand on the various arterial subsystems is indicated in Figure 9.

The total vehicle miles of travel which may be expected to occur daily on all streets and highways within Ozaukee County by the year 1990 is similarly estimated as 1.99 million vehicle miles. The proportionate share of this total load which each of the recommended jurisdictional subsystems may be expected to carry by 1990 is summarized in Table 17 and in Figure 10. The proposed jurisdictional systems thus clearly focus the available resources on the areas of greatest need; and their adoption and improvement should serve to relieve the local units of government of much of the cost attendant to the movement of heavy volumes of fast, through traffic of areawide importance within the County.

Table 16

CULTURAL, HISTORICAL, SCIENTIFIC, AND MAJOR OUTDOOR RECREATIONAL SITES IN OZAUKEE COUNTY: 1970

| Cultural, Historical, or Scientific Site | | |
|---|---|---|
| 1. Trinity Evangelical Lutheran Church | 23. Fred Hilgen Home | 45. Norwegian Cemetery |
| 2. Butcher Shop and Icehouse | 24. Lime Kilns on Milwaukee River | 46. Highway 33 Military Road |
| 3. Opity and Zimmerman Brewery | 25. William Schroeder Home | 47. Dam and Spillway of Old Mill Site |
| 4. Landmark Tavern | 26. Wittenberg Woolen Mills | 48. Druecker's Home |
| 5. Blacksmith Shop | 27. Cedarburg Mill | 49. Log Cabin |
| 6. Half Timber House | 28. Piers to load wood fuel on ships | 50. St. Finbar's Settlement |
| 7. Church | 29. First Macadam Road | 51. Holy Cross |
| 8. Seyfert's Drug Store | 30. Grafton Woolen Mills | 52. Cigrand's Birthplace |
| 9. Mill Dam Headgates | 31. Woods Hotel | 53. Stoney Hill School |
| 10. Opitz Cemetery | 32. Blacksmith Shop | 54. Cigrand Memorial |
| 11. Trinity Lutheran Church | 33. Raymond Van Longen's Home | 55. Mill and Dam |
| 12. Holstein School | 34. Covered Bridge Park | 56. Robert Cooley Home |
| 13. Henry Hayssen House | 35. Covered Bridge | 57. Indian Village Site |
| 14. Indian Village | 36. Ruins of Onion Steeple Catholic Church | 58. Indian Mounds |
| 15. Indian Graves | 37. Octagonal School | 59. Lake Shore Stone Company Quarry |
| 16. Poeschel Home | 38. Ship Anchor | 60. St. Mary's of the Lake Church |
| 17. Old Schneider Home | 39. Pebble House | 61. Inn-Hotel |
| 18. Woodworth Farm | 40. Saukville Settlement | 62. Cheese Factory and Other Buildings |
| 19. Clark Home | 41. Port Washington Piers | 63. Half Timber House |
| 20. Old Mill | 42. Lighthouse | 64. Little Kohler |
| 21. Turner Hall | 43. Leland Stanford Law Office | 65. Old Stone House |
| 22. Hamilton-New Rublin Irish Settlement | 44. Civil War Era Homes | |

| Major Outdoor Recreation, Conservation, and Related Open-Space Sites | |
|---|---|
| 1. Katherine Kearney Carpenter Park | 10. Waubedonia County Park |
| 2. Virmond Park | 11. Harrington Beach State Park |
| 3. Mee-quon County Park | 12. Edgewater Golf Club |
| 4. Ozaukee County Fair Grounds | 13. Duck Puddle Club |
| 5. Ulao Hunting Grounds | 14. Girl Scout Camp |
| 6. Cedarburg Bog | 15. Ducks Unlimited |
| 7. U. W. Cedarburg Bog Arboretum | 16. Saukville Rifles Pistol Club |
| 8. Lake Park | 17. Port Washington Country Club |
| 9. Hawthorne Hills County Park | |

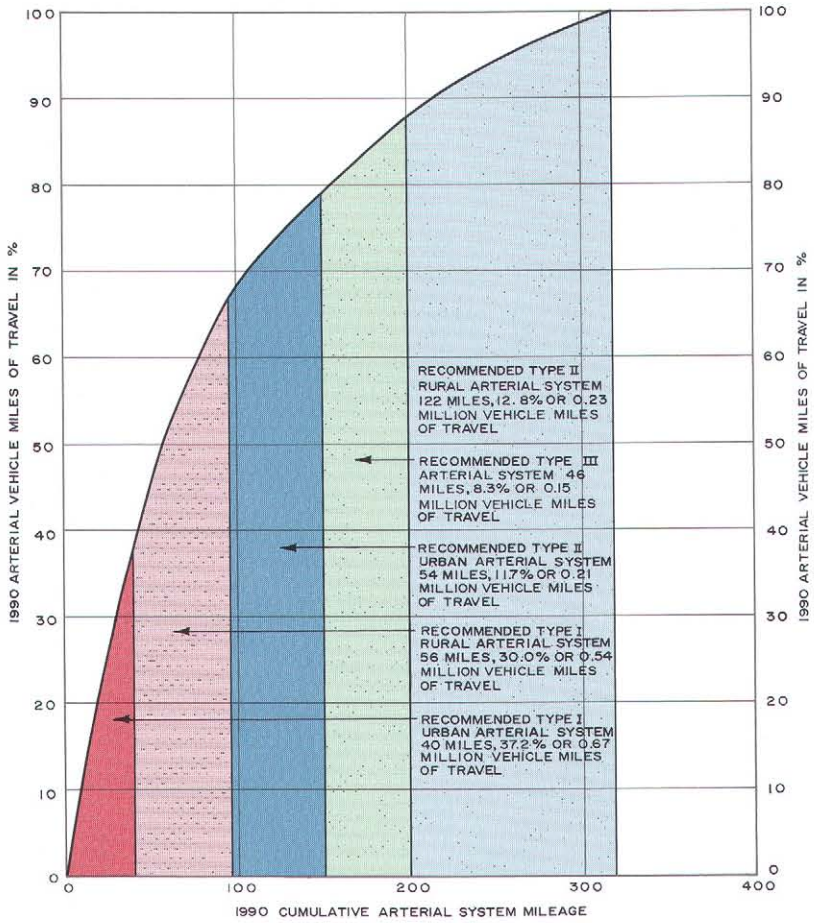
*Source: SEWRPC.*

## STAGING OF THE PROPOSED JURISDICTIONAL HIGHWAY STUDIES

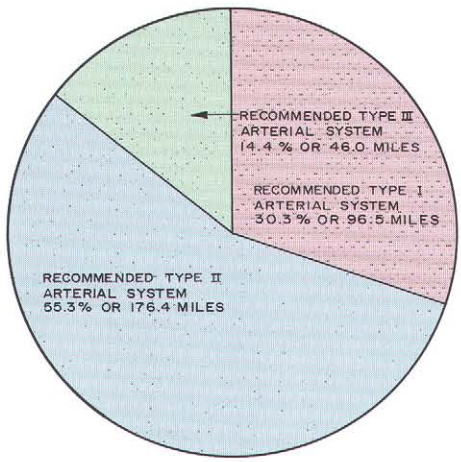
As indicated earlier, not all of the arterial facilities comprising the functional system considered in the jurisdictional classification will be open to traffic by 1975. In order to accommodate traffic demand in corridors to be served by freeways proposed to be constructed after 1975, it is recommended that certain arterial facilities, which should ultimately be designated as Type II routes, be maintained as Type I routes; and certain facilities, which should serve as collector and local-land access-streets and highways, be maintained as Type II routes until such time as the paralleling freeways intended to serve the corridors are constructed. Upon completion of these freeways, the interim Type I facilities would revert to Type II facilities; and the interim Type II facilities would revert to collector and local-land access-streets and highways. This staged development, in addition to providing improved traffic service, would facilitate system continuity and arterial route-marking during the interim plan implementation period. The recommended 1975 and 1980 stages of the Ozaukee County jurisdictional highway system plan are shown on Maps 22 and 23, respectively.

Figure 9

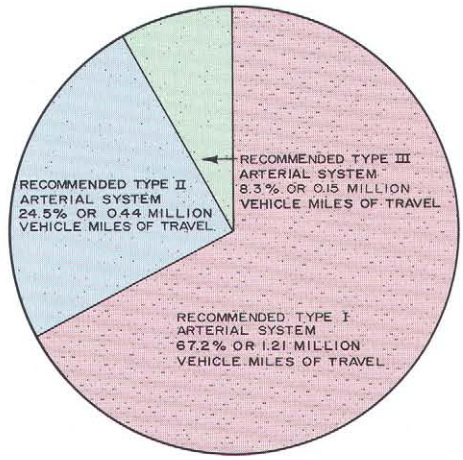
RELATIONSHIP BETWEEN PERCENT OF ARTERIAL VEHICLE MILES OF TRAVEL AND CUMULATIVE ARTERIAL MILEAGE
RECOMMENDED OZAUKEE COUNTY JURISDICTIONAL HIGHWAY SYSTEM: 1990




DISTRIBUTION OF MILEAGE
ON THE TYPE I, TYPE II, AND TYPE III ARTERIAL SYSTEMS
1990




DISTRIBUTION OF ARTERIAL VEHICLE MILES OF TRAVEL
ON THE TYPE I, TYPE II, AND TYPE III ARTERIAL SYSTEMS
1990




*Source: SEWRPC.*

Table 17

ANTICIPATED DISTRIBUTION OF TRAVEL ON THE TOTAL STREET AND HIGHWAY SYSTEM IN OZAUKEE COUNTY: 1990

| Type of Street or Highway | Miles | | Travel Demand Served | |
|---|---|---|---|---|
| | Number | Percent of Total | Millions of Vehicle Miles Per Day | Percent of Total |
| Arterial | | | | |
| Type I (State Trunk) . . . | 96.5 | 10.6 | 1.21 | 60.8 |
| Type II (County Trunk) . . | 176.4 | 19.3 | 0.44 | 22.1 |
| Type III (Local Trunk). . . | 46.0 | 5.0 | 0.15 | 7.5 |
| Subtotal | 318.9 | 34.9 | 1.80 | 90.4 |
| Existing and Proposed Collector and Minor Streets . . . . . | 593.3 | 65.1 | 0.19 | 9.6 |
| Total | 912.2 | 100.0 | 1.99 | 100.0 |

*Source: SEWRPC.*

Table 18

PROPOSED FREEWAYS AND TEMPORARY ALTERNATE ROUTING OVER STATE TRUNK HIGHWAYS IN OZAUKEE COUNTY: 1971-1990

| Proposed Freeway | Temporary Alternate Routing |
|---|---|
| 1. North-South Freeway from STH 57 to Sheboygan County Line | USH 141 from STH 57 to Sheboygan County Line |
| 2. Stadium Freeway from Milwaukee County Line to Saukville Interchange with North-South Freeway | STH 181 from Milwaukee County Line to STH 167, STH 167 from STH 181 to STH 57, and STH 57 from STH 167 to Saukville Interchange with North-South Freeway |

*Source: SEWRPC.*

A summary of the proposed freeway construction, as set forth in the adopted regional transportation plan, is presented in Table 18, together with a listing of the corresponding surface arterials required to fulfill the Type I needs in the corridor on an interim basis. Existing USH 141 from STH 57 to the Sheboygan County line and STH 57 from USH 141 to the Saukville Interchange are recommended to retain their Type I (state trunk) classification until 1975. With the completion of the North-South Freeway from the Grafton Interchange to the Sheboygan County line, these facilities would revert to the Type II (county trunk) arterial system. Existing STH 143 from STH 57 to the Washington County line and STH 84 from USH 141 to the Washington County line are recommended to remain Type I arterials until such time as the Stadium Freeway is open to traffic from the Milwaukee County line to the North-South Freeway, anticipated between 1975 and 1980. At such time as the freeway is completed and open, these facilities would revert to the Type II (county trunk) arterial system.

Existing CTH T from CTH Y to STH 57 is recommended to remain a Type II facility until 1980. With the completion of the Stadium Freeway from the Milwaukee County line to the Sheboygan County line, this segment of existing CTH T would revert to the collector and local land access street and highway system; and Bridge Street from CTH Y to present STH 143 would be removed from the collector and local land access street and highway system and placed on the Type II (county trunk) arterial system.

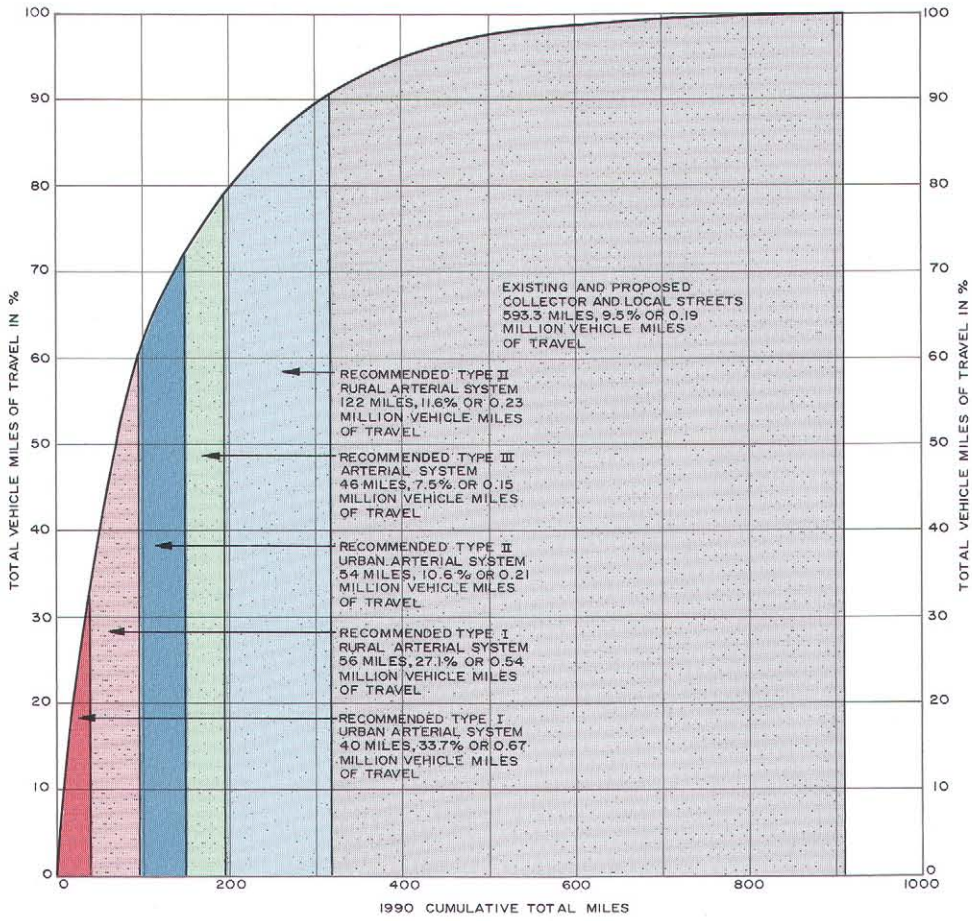
The proposed Type I system is recommended to include 95.7 route-miles of facilities in 1975; and the proposed Type II system, 159.9 route-miles. Thus, the total mileage for the combined Type I and Type II systems in 1975 is 255.6 miles, somewhat less than the proposed 1980 and 1990 equivalent mileages, as shown in Tables 13 and 14. With the completion of the freeway system by 1980, the proposed Type I system is recommended to include 96.5 route-miles of facilities; and the proposed Type II system is recommended to include 175.4 route-miles of facilities. In 1990, the proposed Type I system is recommended to include 96.5 route-miles of facilities, complemented by a proposed Type II system comprised of 176.4 route-miles of facilities.

## SUMMARY

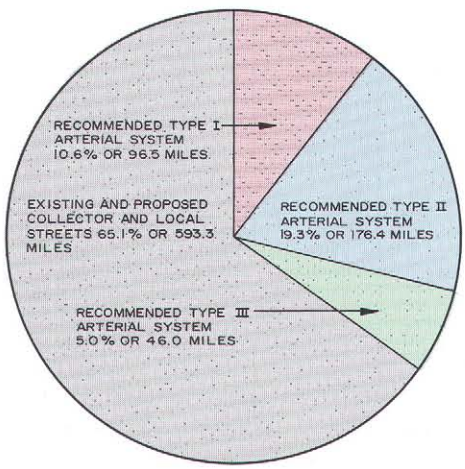
This chapter has described the recommended jurisdictional highway plan developed for Ozaukee County. The plan provides for three jurisdictional highway systems—Type I, state trunk; Type II, county trunk; and Type III, local trunk—which together comprise the total arterial street and highway system required to serve the growing travel demands in Ozaukee County and its constituent cities, villages, and towns to the plan design year 1990. The recommended plan also constitutes a refinement of the functional arterial street and highway system plan prepared by the Southeastern Wisconsin Regional Planning Commission under the initial regional land use-transportation study and, as such, is intended, upon its adoption, to constitute a functional, as

Figure 10

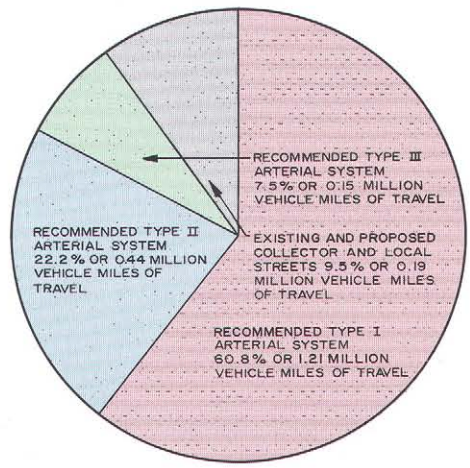
RELATIONSHIP BETWEEN PERCENT OF TOTAL VEHICLE MILES OF TRAVEL AND CUMULATIVE TOTAL MILEAGE RECOMMENDED OZAUKEE COUNTY JURISDICTIONAL HIGHWAY SYSTEM: 1990




DISTRIBUTION OF MILEAGE ON THE TYPE I, TYPE II, AND TYPE III ARTERIAL SYSTEMS 1990



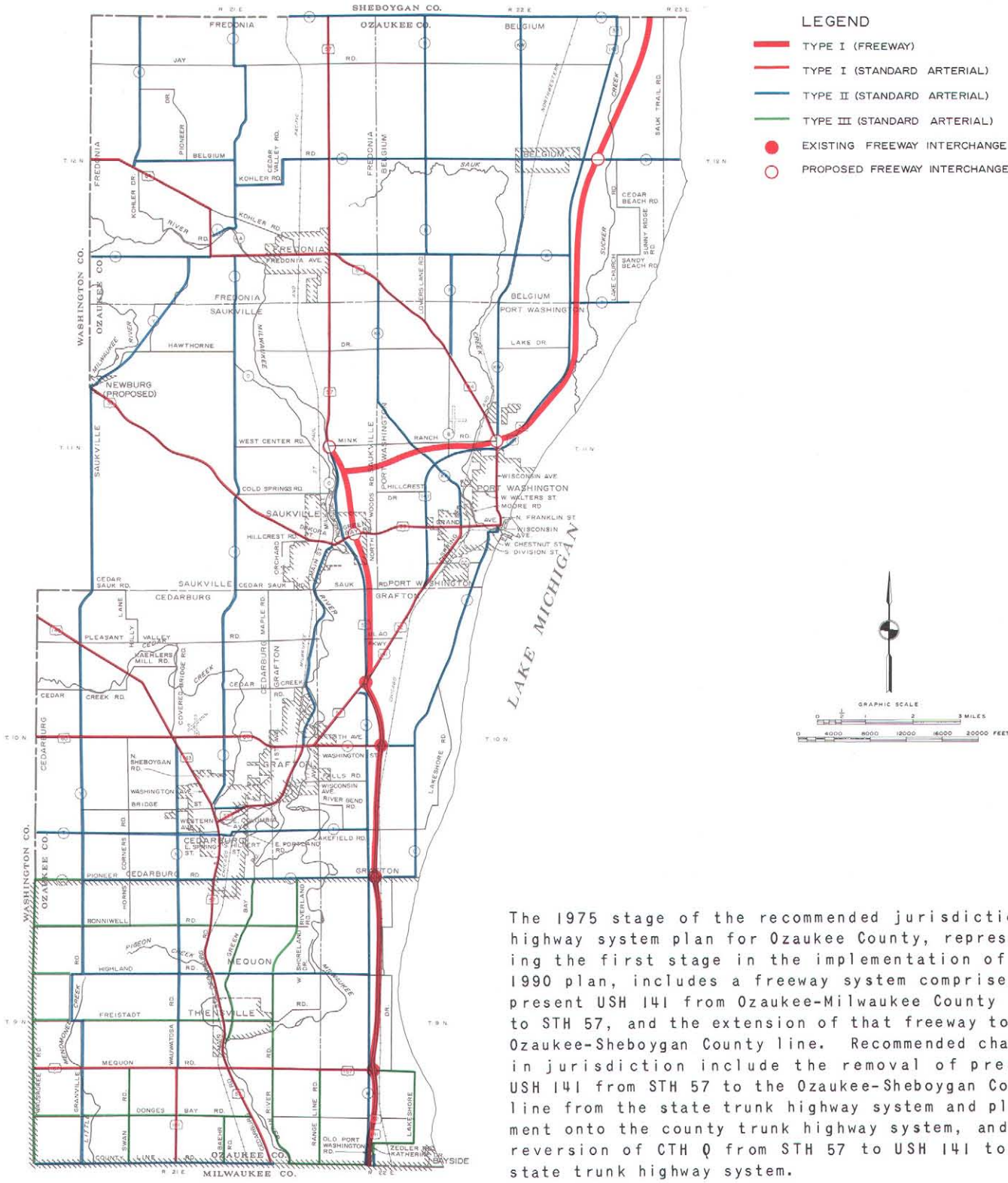

DISTRIBUTION OF ARTERIAL VEHICLE MILES OF TRAVEL ON THE TYPE I, TYPE II, AND TYPE III ARTERIAL SYSTEMS 1990




*Source: SEWRPC.*

Map 22

RECOMMENDED JURISDICTIONAL HIGHWAY SYSTEM PLAN FOR OZAUKEE COUNTY
1975 STAGE

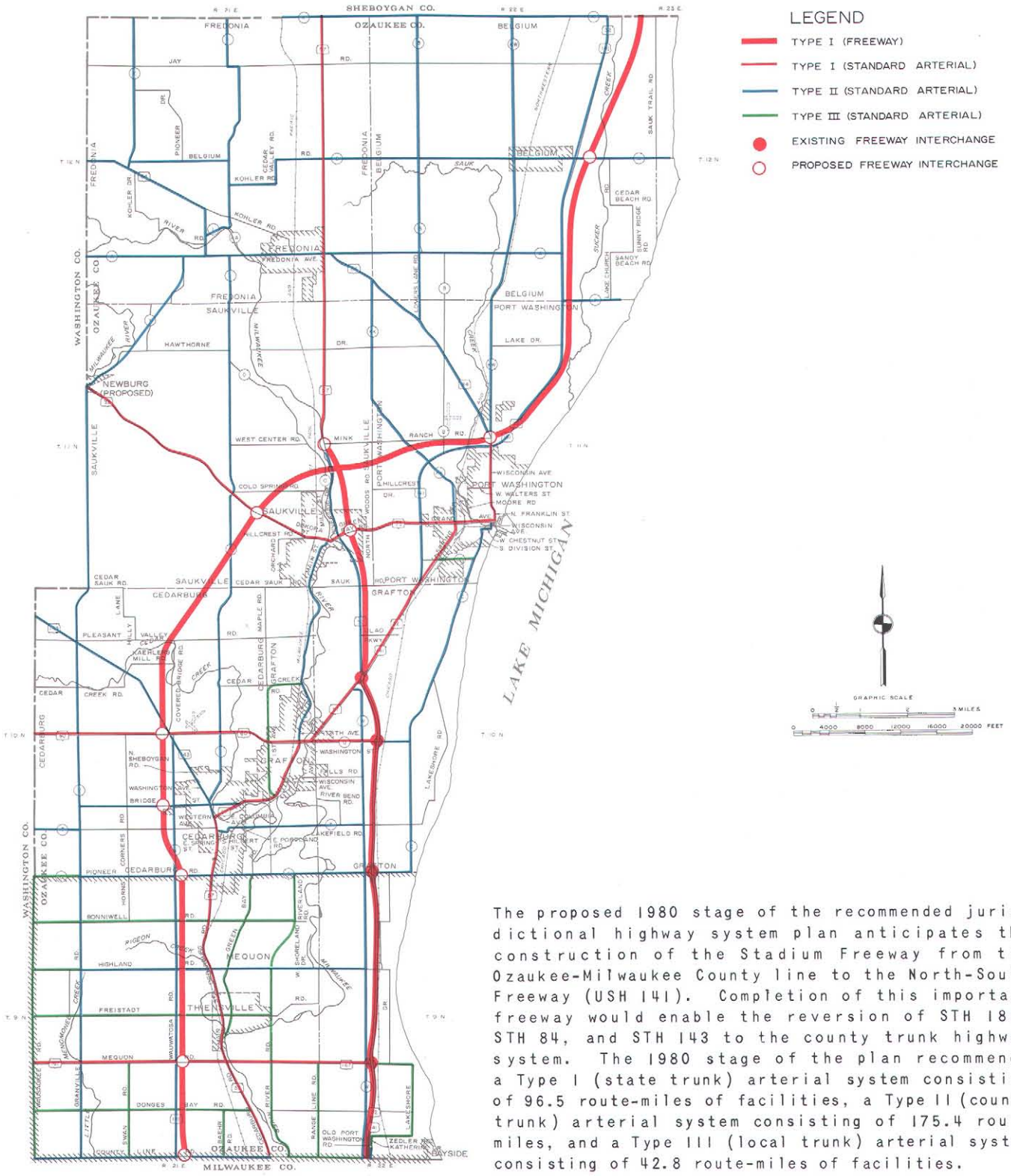



The 1975 stage of the recommended jurisdictional highway system plan for Ozaukee County, representing the first stage in the implementation of the 1990 plan, includes a freeway system comprised of present USH 141 from Ozaukee-Milwaukee County line to STH 57, and the extension of that freeway to the Ozaukee-Sheboygan County line. Recommended changes in jurisdiction include the removal of present USH 141 from STH 57 to the Ozaukee-Sheboygan County line from the state trunk highway system and placement onto the county trunk highway system, and the reversion of CTH Q from STH 57 to USH 141 to the state trunk highway system.

*Source: SEWRPC.*

Map 23

RECOMMENDED JURISDICTIONAL HIGHWAY SYSTEM PLAN FOR OZAUKEE COUNTY
1980 STAGE




The proposed 1980 stage of the recommended jurisdictional highway system plan anticipates the construction of the Stadium Freeway from the Ozaukee-Milwaukee County line to the North-South Freeway (USH 141). Completion of this important freeway would enable the reversion of STH 181, STH 84, and STH 143 to the county trunk highway system. The 1980 stage of the plan recommends a Type I (state trunk) arterial system consisting of 96.5 route-miles of facilities, a Type II (county trunk) arterial system consisting of 175.4 route-miles, and a Type III (local trunk) arterial system consisting of 42.8 route-miles of facilities.

*Source: SEWRPC.*

well as a jurisdictional, arterial street and highway system plan for Ozaukee County to the plan design year 1990.

The arterial street and highway system recommended to serve the traffic demand within Ozaukee County through the plan design year 1990 totals 318.9 route-miles of facilities, or about 35 percent of the estimated 912.2 route-miles of facilities expected to comprise the total street and highway system within the County in 1990. Of this total arterial system, 96.5 route-miles, or about 30 percent, are proposed to comprise the Type I, or state trunk highway, system, a reduction of 2.2 miles in the present system. This Type I system is anticipated to carry approximately 67 percent of the arterial travel demand and approximately 61 percent of the total travel demand expected to be generated in the County by the year 1990. The Type I system is recommended to include all of the existing, committed, and proposed freeway facilities within Ozaukee County, as well as certain important standard arterials and, as such, to comprise the basic framework of the total highway transportation system for the County.

The recommended plan further proposes a Type II, or county trunk highway, system consisting of 176.4 route-miles of arterial facilities, or an additional 55 percent of the total arterial mileage required to serve Ozaukee County in the plan design year 1990. This Type II system represents an increase of 55.8 route-miles over the present system; would serve to complement the recommended Type I, or state trunk, system; is intended to include all major arterial facilities having areawide significance; and is intended to provide for all arterial travel demand generated within the rural areas of the County not served by the Type I system. The Type II system could be expected to carry an additional 25 percent of the arterial travel demand and an additional 22 percent of the total travel demand expected to be generated within Ozaukee County by the year 1990.

The Type III, or local trunk highway, system recommended in the plan consists of the remaining 46.0 route-miles of arterial facilities, or about 15 percent of the total arterial mileage proposed to serve Ozaukee County in the plan design year 1990. This Type III system is intended to primarily serve the local arterial street and highway needs of the urbanized areas of Ozaukee County, while comprising an integral part of the total arterial street and highway system.

The recommended plan also designates 61.5 route-miles of prospective arterials which, although recommended to remain as collector and local streets through the plan design year 1990, may be required to serve the arterial travel demand generated by continued urban development within the County beyond the plan design year. The purpose of designating these prospective arterials is twofold. First, these facilities are designated to provide a basis for the reservation of the right-of-way required to permit the future development of these facilities as safe and efficient traffic carriers and thereby to economically, as well as efficiently, serve the travel demand which may be generated by urban development occurring within Ozaukee County beyond the design year of the plan. To this end, right-of-way widths are recommended for each prospective arterial shown in the plan. Second, these facilities are designated to assure that the location and spacing of the prospective arterials is such as to provide a sound framework for future urban expansion in the form of planned residential development units, while assuring arterial system continuity beyond the design year of the plan.

Finally, the plan recommends the marking and signing of a system of scenic drives within the County. This system, consisting of 100.4 route-miles of streets and highways, would be comprised of 57.8 miles of local, county, and state trunk highways and 42.6 miles of local collector and land access streets. The scenic drive system would accommodate the anticipated 18,000 average seasonal Sunday participants in pleasure driving forecast for 1990 in Ozaukee County. The recommended scenic drive system would consist of three basic drives: one along the Milwaukee River, one along Cedar Creek, and one along the Lake Michigan shoreline.

Adoption and implementation of the jurisdictional highway system plan recommended in this report would serve to concentrate appropriate resources and capabilities on corresponding areas of need, assuring a more effective use of the total public resources in the provision of highway transportation, and to provide a sound basis for the establishment of long-range fiscal policies and for the systematic programming of arterial street and highway improvements within Ozaukee County. It would also provide a basis for the more efficient planning and design of the total arterial street and highway system by combining into subsystems those facilities which should, because of the type and extent of service provided, have similar

standards for design, construction, operation, and maintenance. The adoption and implementation of the jurisdictional highway system plan recommended in this report should provide a sound basis for the efficient multi-jurisdictional management of the total arterial street and highway system and for the attainment of the intergovernmental coordination necessary to the cooperative development of this system. Finally, it should, as demonstrated in a following chapter of this report, provide a more equitable distribution of highway improvement, maintenance, and operating costs among the various levels and agencies of government concerned.

# Chapter VII

# FINANCIAL EVALUATION

## INTRODUCTION

In order to assure practicality and acceptability, any plan must be evaluated on the basis of financial feasibility. Such an evaluation may show that the attainment of the objectives expressed through one or more of the criteria used to prepare the plan are beyond the financial reach of the implementating agencies. Under such circumstances it would be necessary to either revise the criteria on which the plan is based and thereby revise the plan, or to seek new means of financing plan implementation.

To this end a careful evaluation was made of the financial feasibility of the jurisdictional highway system plan as produced by the application of the planning criteria set forth in this report. Total plan construction and maintenance costs were estimated and compared to anticipated revenues over a 20-year plan implementation period. As a necessary part of this analysis of financial feasibility, the existing structure of highway revenues and expenditures was examined, and construction and maintenance formulae and policies were analyzed.

## EXISTING HIGHWAY AID STRUCTURE

### Federal Highway Aids[1]

Federal aids for highway construction are derived from federal highway-user excise taxes and the federal motor fuel tax, presently established at 4 cents per gallon, and are administered by the U. S. Department of Transportation, Federal Highway Administration, as a segregated fund which can be used only for highway and highway-related purposes. Federal aids are provided for approved construction projects on the interstate system, the federal aid primary and secondary systems, and extensions of these latter two systems through urban areas of over 5,000 population known as the federal aid urban system. The latter three categories of federal aid systems—primary, secondary, and urban—are commonly called the "ABC" systems.

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[1] *The Federal Aid Highway Act of 1973 was enacted by the Congress of the United States subsequent to completion of all of the technical work on preparation of the jurisdictional highway system plan for Ozaukee County. This Act contains certain provisions having important implications for jurisdictional highway system planning. Important among these provisions is a major realignment of the federal aid highway systems. More specifically, the Act provides, basically, for three federal aid systems: a primary system consisting of rural arterial routes and their urban extensions, including interstate highway routes and their urban extensions, to be designated by each state through its state highway department in accordance with comprehensive, areawide transportation plans; a secondary system consisting of rural "major collector" routes designated by the state highway department and concerned local officials; and an entirely new urban system consisting of urban arterials designated by local officials with concurrence of the state highway department and in accordance with comprehensive, areawide transportation plans. The federal share of projects on these various systems will be 90 percent for interstate facilities and 70 percent for all other facilities.*

*The systems concepts expressed in the 1973 Federal Aid Highway Act are consistent with the jurisdictional plans being prepared within southeastern Wisconsin and, indeed, were envisioned and recommended in the jurisdictional highway system plan for Milwaukee County prepared in 1969. Accordingly, the systems realignment included in the 1973 Federal Aid Highway Act will, with respect to the recommended jurisdictional highway plan for Ozaukee County as documented in this report, affect only the plan implementation recommendations concerning the placement of highway segments on the various federal aid systems. The recommended Type I (state trunk) highway facilities would, under the new Act, be underlain and supported by federal interstate and federal aid primary routes; the recommended Type II (county trunk) highway facilities in rural areas of the counties would be underlain and supported by federal aid secondary routes; while the recommended Type II (county trunk) and Type III (local trunk) facilities in urban areas would be underlain and supported by the new federal aid urban routes.*

*Since, under the new Act, the level of funding for the federal aid secondary system was not changed substantially and since the level of funding for the new federal aid urban system represents a substantial increase in federal aid for highway development in urban areas, the net effect of the changes incorporated in the 1973 Federal Aid Highway Act on the financial aspects of the recommended Ozaukee County jurisdictional highway system plan is one of a potential increase in federal aid in partial support of necessary arterial highway improvements, with a concomitant potential decrease in the required local funding as estimated in the original technical work presented herein.*

Although a different formula was used prior to the fiscal year beginning July 1, 1960, federal aid interstate funds are presently (fiscal years 1960 through 1976) apportioned among the states on the basis of the ratio which the federal share of the estimated cost of completing the Interstate System in each state, bears to the sum of the federal shares of the estimated cost of completing the Interstate System in all of the States.[2]

Federal aid primary funds, or "A" funds, are apportioned to the states on the basis of the following formula:

> One-third in the ratio which the area of each State bears to the total area of all the States; one-third in the ratio which the population of each State bears to the total population of all the States as shown by the latest available Federal census; one-third in the ratio which the mileage of rural delivery routes and star routes[3] in each State bears to the total mileage of rural delivery and star routes in all the States at the close of the next preceding calendar year, as shown by a certificate of the Postmaster General, which he is directed to make and furnish annually to the Secretary. No State shall receive less than one-half of 1 per centum of each year's apportionment.[4]

Federal aid secondary funds, or "B" funds, are apportioned to the states on the basis of the following formula:

> One-third in the ratio which the area of each State bears to the total area of all the States; one-third in the ratio which the rural population of each State bears to the total rural population of all the States as shown by the latest available Federal census; and one-third in the ratio which the mileage of rural delivery and star routes, certified as above provided, in each State bears to the total mileage of rural delivery and star routes in all the States. No State shall receive less than one-half of 1 per centum of each year's apportionment.[5]

Federal aid funds, for improvements on extensions of the federal aid primary and secondary systems into urban areas, or "C" funds, are apportioned to the states on the basis of the following formula:

> In the ratio which the population in municipalities and other urban places, of five thousand or more, in each State bears to the total population in municipalities and other urban places of five thousand or more in all the States, as shown by the latest available Federal census.[6]

In addition to the aforementioned federal aid systems, the Congress in 1967 authorized the U. S. Department of Transportation, Federal Highway Administration, to initiate a program known as TOPICS, utilizing presently available highway funds to provide additional federal aid to urban areas having a population of 5,000 or more persons.[7] TOPICS is an acronym standing for the compound term, "Traffic Operations Program to Increase Capacity and Safety." Federal aid funds authorized by the Congress for TOPICS are apportioned to the states on the same basis as federal aid funds for improvements on extensions of the federal and primary and secondary systems into urban areas, or "C" funds.[8]

As a counterpart to the urban-oriented TOPICS program, the Congress, also in 1967, authorized the U. S. Department of Transportation, Federal Highway Administration to initiate a special rural aid program, utilizing presently available highway funds. Federal aid funds for this special rural aid program are apportioned to the states on the same basis as regular federal aid primary and secondary funds, and must be expended for projects on the federal aid primary and secondary systems, exclusive of these systems extentions into urban areas.

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[2] *Title 23, United States Code, 104.*

[3] *A "star route" is defined by Title 23, United States Code, 104, as any route, usually in a thinly populated region, other than railroad, steamboat, and rural service routes, over which mail is carried under contract; so-called from the star or asterisk used to designate these routes in postal publications.*

[4] *Title 23, United States Code, 104.*

[5] *Ibid.*

[6] *Ibid.*

[7] *Title 23, United States Code, 135.*

[8] *Ibid.*

The Federal Aid Highway Act of 1970 provides for the establishment of an entirely new system of federal aid routes within the urbanized areas of the United States. This system is intended to supplement the existing federal aid highway systems within urbanizing areas, which, until the 1970 Act, consisted only of the extensions of the federal aid primary and secondary systems into such urbanizing areas. The new urban aid system is intended to include those arterial streets and highways not on the interstate system or on urban extensions of the federal aid primary and secondary systems. The federal aid urban funds are apportioned to the states on the basis of the following formula:

> In the ratio which the population in urbanized areas, or parts thereof, in each State bears to the total population in such urbanized areas, or parts thereof, in all the States as shown by the latest available Federal census.[9]

Federal Highway Aid Revenues: Federal aid funds are received from the Federal Highway Administration by the Wisconsin Department of Transportation, Division of Highways, as reimbursements for previously expended funds on approved federal aid projects. Federal aid may be used for preliminary engineering surveys, design, right-of-way acquisition, and construction. Federal funds may not be used for maintenance or administration. Table 19 indicates federal aid apportionments to Wisconsin during the 10-year period extended from fiscal year 1959 through fiscal year 1968.

Federal Highway Aid Disbursements: The federal aids received into the State Highway Fund are administered by the Wisconsin Department of Transportation, Division of Highways. Federal aid interstate funds received by Wisconsin are distributed throughout the state on the basis of the interstate highway construction schedule established by the State Highway Commission. The construction of these interstate highways is accomplished with 90 percent of the costs being paid for with federal interstate funds and the remaining 10 percent being paid for with state funds.

Federal aid primary funds, including rural primary funds, received by Wisconsin are distributed on the basis of statewide highway construction needs, as determined by the State Highway Commission, a manner quite similar to that in which the federal aid interstate funds are distributed. Since construction is scheduled on a statewide basis and varies annually on a county basis, Ozaukee County has received varying annual amounts of such aids, as shown in Table 20, which sets forth the annual amounts of federal aid primary funds expended in Ozaukee County during the fiscal years 1959 through 1968.

The distribution of the federal aid secondary funds, including the rural secondary funds, received by Wisconsin is made to the 72 counties on the basis of the following formula: 60 percent on the basis of the rural federal aid secondary miles in the County as compared with the total statewide rural federal aid secondary mileage, and 40 percent on the basis of the number of motor vehicles registered within the County as compared with the total number of motor vehicles registered within the state. Based on this formula, Ozaukee County has received about $44,000 annually, or about 0.6 percent of the total federal aid secondary funds received annually by the state. If a county does not utilize its federal aid secondary apportionment, the funds revert to the State Highway Commission and may be reapportioned to other counties which apply for such reverted funds or may be used by the State Highway Commission at its discretion anywhere in the state on the federal aid secondary system. Ozaukee County, along with other populous counties in the state, has been the recipient of such reverted funds. The annual amounts of federal aid secondary funds expended in Ozaukee County during the fiscal years 1959 through 1968 are shown in Table 20.

Federal aid urban funds ("C" funds) to be used on the extensions of federal aid primary and secondary routes into urban areas are distributed throughout the state on the basis of need, as determined by the State Highway Commission. During the fiscal years 1959 through 1968, Ozaukee County received no such federal aid urban funds.

Federal aid funds for TOPICS received by Wisconsin are apportioned by the State Highway Commission to the cities and villages with a population of 5,000 or more on the basis of population. For

[9] *Title 23, United States Code, 104(b)(6).*

Table 19

FEDERAL HIGHWAY AID APPORTIONMENTS TO WISCONSIN
BY AID CATEGORY: FISCAL YEARS 1959-1968

| Fiscal Year[a] | Aid Category | | | | | | | | Total Apportionments |
|---|---|---|---|---|---|---|---|---|---|
| | Interstate | | Primary | | Secondary | | Urban | | |
| | Apportionment | Percent of Total | Apportionment | Percent of Total | Apportionment | Percent of Total | Apportionment | Percent of Total | |
| 1959 | $ 49,734,830 | 63.2 | $13,332,038 | 17.0 | $ 9,312,993 | 11.8 | $ 6,256,742 | 8.0 | $ 78,636,603 |
| 1960 | 26,193,375 | 56.2 | 9,409,770 | 20.2 | 6,572,828 | 14.1 | 4,409,572 | 9.5 | 46,585,545 |
| 1961 | 18,764,460 | 49.8 | 8,651,381 | 23.0 | 5,957,388 | 15.8 | 4,298,531 | 11.4 | 37,671,760 |
| 1962 | 22,804,031 | 54.6 | 8,688,009 | 20.8 | 6,034,452 | 14.4 | 4,264,732 | 10.2 | 41,791,224 |
| 1963 | 21,164,100 | 51.4 | 9,109,799 | 22.1 | 6,431,738 | 15.6 | 4,471,619 | 10.9 | 41,177,256 |
| 1964 | 22,927,775 | 52.5 | 9,484,657 | 21.7 | 6,690,955 | 15.3 | 4,588,651 | 10.5 | 43,692,038 |
| 1965 | 23,689,058 | 53.0 | 9,592,323 | 21.4 | 6,770,585 | 15.1 | 4,685,560 | 10.5 | 44,737,526 |
| 1966 | 24,691,450 | 52.6 | 10,230,422 | 21.8 | 7,207,143 | 15.3 | 4,849,228 | 10.3 | 46,978,243 |
| 1967 | 24,733,350 | 52.3 | 10,390,974 | 22.0 | 7,313,176 | 15.5 | 4,836,951 | 10.2 | 47,274,451 |
| 1968 | 28,144,962 | 55.3 | 10,491,840 | 20.6 | 7,381,920 | 14.5 | 4,856,594 | 9.6 | 50,875,316 |
| Total | $262,847,391 | -- | $99,381,213 | -- | $69,673,178 | -- | $47,518,180 | -- | $479,419,962 |
| 10-Year Average | $ 26,284,739 | 54.8 | $ 9,938,121 | 20.7 | $ 6,967,318 | 14.5 | $ 4,751,818 | 9.9 | $ 47,941,996 |

[a]*The federal fiscal year 1959 extends from July 1, 1958 through June 30, 1959.*

*Source: Wisconsin Department of Transportation and SEWRPC.*

Table 20

FEDERAL HIGHWAY AID ALLOTTED TO OZAUKEE COUNTY
BY AID CATEGORY: FISCAL YEARS 1959-1968

| Fiscal Year | Aid Category | | | | Total Allotment | Percent of Total Allotment Received by State |
|---|---|---|---|---|---|---|
| | Primary | | Secondary | | | |
| | Allotment | Percent of Total | Allotment | Percent of Total | | |
| 1959 | $ 3,070 | 100.0 | $ -- | -- | $ 3,070 | 0.004 |
| 1960 | -- | -- | 7,101 | 100.0 | 7,101 | 0.015 |
| 1961 | -- | -- | 8,523 | 100.0 | 8,523 | 0.023 |
| 1962 | -- | -- | 36,052 | 100.0 | 36,052 | 0.086 |
| 1963 | 6,507 | 11.3 | 51,176 | 88.7 | 57,683 | 0.140 |
| 1964 | -- | -- | 107,825 | 100.0 | 107,825 | 0.246 |
| 1965 | 623 | 100.0 | -- | -- | 623 | 0.001 |
| 1966 | 857,000 | 99.6 | 3,209 | 0.4 | 860,209 | 1.831 |
| 1967 | -- | -- | -- | -- | -- | -- |
| 1968 | 9,719 | 2.6 | 361,070 | 97.4 | 370,789 | 0.728 |
| Total | $876,919 | -- | $574,956 | -- | $1,451,875 | -- |
| 10-Year Average | $ 87,692 | 60.4 | $ 57,496 | 39.6 | $ 145,188 | 0.302 |

*Source: Wisconsin Department of Transportation and SEWRPC.*

eligibility in the program, a city or village must prepare a plan documenting the operational improvements required to improve the safety and the capacity of the existing arterial street and highway system. To date, no communities within Ozaukee County have elected to participate in the program. Table 21 indicates the annual amounts of federal aids which would have been available annually to the cities within Ozaukee County had they chosen to participate in the program.

Table 21

FEDERAL HIGHWAY AID APPORTIONED TO URBAN AREAS IN OZAUKEE COUNTY FOR TOPICS PROGRAM FISCAL YEARS 1970 and 1971

| Urban Area | 1970 | 1971 |
|---|---|---|
| City of Cedarburg . . . . | $ 7,700 | $ 7,700 |
| City of Mequon . . . . . | 12,700 | 12,700 |
| City of Port Washington. . . | 8,900 | 8,900 |
| Total | $29,300 | $29,300 |

*Source: Wisconsin Department of Transportation.*

The Federal Aid Highway Act of 1970 provided for the establishment of an entirely new system of federal aid routes within the urbanized areas of the United States named the Federal Aid Urban System. This system is intended to supplement the existing federal aid highway systems within urbanized areas, which formerly consisted only of the extensions of the federal aid primary and secondary systems into such urbanized areas, including the most heavily traveled elements of the urban street and highway system. The distribution of funds for the federal aid urban system is based on the ratio of the population within the urbanized area to the total population of all urbanized areas within the state. At the time of the writing of this report, no funds had been distributed for use within Ozaukee County.

State Highway Aids

State highway aids for construction, operation, and maintenance are derived from the state motor vehicle fuel taxes, motor vehicle registration and driver licensing fees, and motor carrier fees. These funds are administered by the Wisconsin Department of Transportation, Division of Highways, as a segregated fund which can be used only for highway and highway related purposes.

State Highway Aid Revenues: The state motor fuel tax, accounting for almost two-thirds of the total motor vehicle tax revenues, was initiated in 1925 at two cents per gallon, increased to four cents in 1931, to six cents in 1955, and to seven cents per gallon in 1966. The second largest source of motor vehicle tax revenues are the fees collected for motor vehicle registration and operator licensing, which contribute almost all of the remaining one-third of the revenues. Motor carrier fees, imposed on owners of trucks and buses for regulatory purposes, amount to less than 1 percent of the state motor vehicle revenues. Table 22 indicates the state motor vehicle revenues collected in Wisconsin during the fiscal years 1959 through 1968.

State Highway Aid Disbursements: The total annual net motor vehicle revenues, a result of deducting the annual collection and enforcement expenses from the total annual gross motor vehicle revenues, are distributed by the Wisconsin Department of Transportation, Division of Highways, in accordance with the provisions of Section 20.395 and Chapters 83, 84, and 86 of the Wisconsin Statutes. Table 23 indicates the statewide distribution of net motor vehicle revenues for the fiscal years 1959 through 1968. It may be noted from this table that for the fiscal year 1968, nearly 50 percent of the net motor vehicle revenues were allocated to state trunk highways; 44 percent were returned to local units of government, including counties, cities, villages, and towns; and nearly 6 percent were utilized for miscellaneous purposes, such as administration and park roads.

Of the 44 percent returned to local units of government, 12 percent was distributed to the counties within the state. Annually on June 30, a fixed sum of $3,500,000 is apportioned among the counties, 60 percent on the basis of the proportion which the total highway mileage within the county, exclusive of city and village streets, comprises of the total of such mileage within the state;[10] and 40 percent on the basis of the proportion which the motor vehicle registered within the county comprises of the total motor vehicles registered within the state. In addition, each county receives

[10] *Counties having a population of 500,000 or more are to include 25 percent of the city and village street mileage within the county in computing the total highway mileage within the county for the purpose of apportioning the $2,100,000 allotment.*

Table 22

WISCONSIN MOTOR VEHICLE REVENUES FISCAL YEARS 1959-1968

| Fiscal Year | Revenue Source | | | Total Gross Revenues[a] Less Refunds | Total Net Revenues[b] to be Distributed |
|---|---|---|---|---|---|
| | License Fees | Fuel Taxes | Carrier Fees | | |
| 1959 | $ 40,562,168 | $ 69,363,068 | $ 467,963 | $ 110,393,199 | $ 103,390,896 |
| 1960 | 42,891,073 | 72,240,756 | 498,724 | 115,630,553 | 107,783,055 |
| 1961 | 44,151,641 | 75,185,674 | 555,014 | 119,928,635 | 111,607,597 |
| 1962 | 44,049,978 | 75,905,152 | 476,666 | 120,433,316 | 112,015,442 |
| 1963 | 47,955,404 | 78,527,005 | 594,285 | 127,076,694 | 117,317,129 |
| 1964 | 48,714,763 | 81,009,598 | 571,404 | 130,295,765 | 119,723,280 |
| 1965 | 51,697,611 | 84,934,763 | 600,815 | 137,233,239 | 125,832,518 |
| 1966 | 54,762,427 | 90,054,602 | 580,363 | 145,397,392 | 134,258,165 |
| 1967 | 60,304,239 | 108,385,059 | 622,176 | 169,312,014 | 153,319,292 |
| 1968 | 64,111,550 | 115,395,320 | 641,279 | 180,148,577 | 163,705,169 |
| Total | $499,200,854 | $851,000,997 | $5,608,689 | $1,355,849,384 | $1,248,952,543 |
| 10-Year Average | $ 49,920,085 | $ 85,100,100 | $ 560,869 | $ 135,584,938 | $ 124,895,254 |

[a] *Total gross revenues include adjustments pursuant to Section 84.01(25)(d) of the Wisconsin Statutes.*

[b] *Net motor vehicle revenues are defined as gross revenues minus the collection and enforcement costs.*

*Source: Wisconsin Department of Transportation.*

Table 23

PERCENTAGE DISTRIBUTION OF NET MOTOR VEHICLE REVENUES BY THE STATE OF WISCONSIN: FISCAL YEARS 1959-1968

| Net Motor Vehicle Revenue Distribution | Annual Percent Distributed | | | | | | | | | 1968 Distribution | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 | Amount | Percent |
| Allotted and Apportioned to Local Units of Government | | | | | | | | | | | |
| Counties | 14.2 | 14.2 | 14.1 | 14.1 | 14.2 | 14.1 | 14.1 | 14.0 | 12.5 | $ 20,312,439 | 12.4 |
| Cities | 16.6 | 16.7 | 16.7 | 16.7 | 16.8 | 17.0 | 17.1 | 17.1 | 15.5 | 25,477,146 | 15.6 |
| Villages | 2.9 | 2.9 | 3.1 | 3.1 | 3.2 | 3.2 | 3.2 | 3.2 | 3.0 | 4,920,788 | 3.0 |
| Towns | 15.1 | 15.0 | 15.0 | 15.0 | 15.1 | 15.1 | 15.1 | 15.0 | 13.5 | 22,051,817 | 13.5 |
| Flood Damage Aid | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4 | 0.0 |
| Subtotal | 48.8 | 48.8 | 49.0 | 49.0 | 49.4 | 49.4 | 49.5 | 49.6 | 44.7 | $ 72,790,093[a] | 44.5 |
| Allotted and Apportioned for State Trunk Highways | | | | | | | | | | | |
| Construction | 20.8 | 19.0 | 19.9 | 17.3 | 19.3 | 20.4 | 19.5 | 20.1 | 25.2 | $ 50,713,319 | 31.0 |
| Urban Street Improvement | 3.7 | 3.5 | 3.4 | 3.4 | 3.2 | 3.2 | 3.0 | 2.8 | 2.5 | 3,800,000 | 2.3 |
| Bond Retirement and Improvement | 7.8 | 7.5 | 7.2 | 7.2 | 6.9 | 6.7 | 6.4 | 6.0 | 5.2 | 8,052,481 | 4.9 |
| Maintenance, Traffic Service | 10.5 | 11.2 | 12.1 | 11.6 | 11.6 | 11.3 | 11.2 | 11.1 | 10.7 | 16,500,000 | 10.1 |
| Snow Removal | 4.1 | 5.1 | 3.3 | 6.2 | 4.5 | 3.5 | 4.6 | 3.7 | 4.7 | -- | -- |
| Safety Improvement | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.9 | 1.4 | 2,329,456 | 1.4 |
| Subtotal | 46.9 | 46.3 | 45.9 | 45.7 | 45.5 | 45.1 | 44.7 | 44.6 | 49.8 | $ 81,395,256 | 49.7 |
| Miscellaneous Allotments[b] | 4.3 | 4.9 | 5.1 | 5.3 | 5.1 | 5.5 | 5.8 | 5.8 | 5.5 | $ 9,520,139 | 5.8 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | $163,705,488 | 100.0 |

[a] *Includes $27,899 supplemental privilege allotment to be distributed at a later date.*

[b] *Miscellaneous allotments include appropriations for administrative expenses of the Division of Highways; topographic maps; institution roads; bridge maintenance and operation; special bridges not on the state trunk highway system; state park, forest, and access roads; roadside improvements; and railroad grade crossing protection.*

*Source: Wisconsin Department of Transportation and SEWRPC.*

an annual allotment of $65 per mile of county trunk highway. Finally, at the close of each fiscal year, supplemental aids consisting of 15 percent of the revenue raised by the two-cent-a-gallon increase effected in 1955 and 18 percent of the net motor carrier fees and original four-cent-a-gallon motor fuel tax which remain after the payment of previously committed allotments are apportioned among the counties on the basis of the annual county trunk allotments. The remaining 32 percent returned to local units of government was allocated as follows: nearly 14 percent to towns, 3 percent to villages, and nearly 16 percent to cities. This return comprised the local road and street allotment and supplemental aids. The basic local road and street allotment, made annually on March 10 to the towns, villages, and cities, is apportioned on the basis of a fixed rate per mile for the number of miles of local roads and streets, exclusive of state trunk highways, county trunk highways, and connecting streets, which are open and used for travel. Table 24 shows the rate per mile at which the towns, villages, and cities are paid their respective local road and street allotments. The supplemental aids, consisting of 35 percent of the revenue raised by the two-cent-a-gallon gas tax increase effected in 1955, are distributed as follows: 15 percent to towns, about 8 percent to villages and cities with a population of 10,000 or less, and 12 percent to cities with a population over 10,000; and 42 percent of the net motor carrier fees and original four-cent-a-gallon motor fuel tax which remain after the payment of previously committed allotments are distributed as follows: 18 percent to towns, 9 percent to villages and cities with a population of 10,000 or less, and 15 percent to cities with a population over 10,000. The supplemental aids are apportioned on the basis of the amount of the local road and street allotments to the towns and cities with a population over 10,000. Supplemental aids to villages and cities with a population of 10,000 or less are apportioned on the basis of local road mileage.

Finally, on December 15 there is allotted to each town, village, and city in the state an amount equal to 11 percent of the net registration fees collected from commercial vehicles and 20 percent of the net registration fees from all other motor vehicles customarily kept in such town, village, or city. This allotment, known as the highway privilege tax allotment, is supplemented by an additional $0.40 per registered vehicle which resulted from the $2.00 increase in fees effected in 1966, and is apportioned on the basis of motor vehicle registrations.[11]

Table 24

LOCAL ROAD AND STREET ALLOTMENTS TO TOWNS, VILLAGES, AND CITIES IN OZAUKEE COUNTY[a]

| Level of Government | Rate Per Mile |
|---|---|
| Towns | $ 65 |
| Villages | 65 |
| Cities with Population of | |
| 0 - 10,000 | 130 |
| 10,001 - 35,000 | 260 |
| 35,001 - 150,000 | 390 |
| 150,001 or More | 520 |

*[a]The local road and street allotment is made on March 10 to towns, villages, and cities pursuant to Section 20.395(2)(WB) and Section 86.31 of the 1969 Wisconsin Statutes.*

*Source: 1969 Wisconsin Statutes.*

County Highway Aids

County highway aids are aids provided by the county for the construction and maintenance of town and village roads on a designated county aid highway system. Such county aids are unique within the Southeastern Wisconsin Region to Ozaukee County. These aids are administered by the Ozaukee County Board as two separate funds, namely, the Local Roads and Streets Construction fund and the Maintenance of Local Roads fund.

County Highway Aid Revenues: County highway aids for both the construction and maintenance of local streets and highways on the county highway aid system are derived from property taxes. County aids for the construction of county aid highways are raised and appropriated annually by the County Board at the request of partici-

[11] *Subsequent to the completion of the financial analyses for this study, the Wisconsin Legislature enacted Chapter 125 of the Wisconsin Laws of 1971 which modified Sections 86.35(1) and 20.395(2)(wd) of the Wisconsin Statutes relating to the privilege highway tax allotment and its supplement, respectively, such that the revenues associated with these two sections of the Statutes are no longer paid directly to the respective cities, villages, and towns, but are placed in the municipal and county shared tax account for distribution essentially on a per capita basis pursuant to Chapter 79 of the Wisconsin Statutes.*

pating municipalities on a fifty-fifty matching basis. County aids for the maintenance of county aid highways are raised and appropriated by the County Board annually on the basis of estimated costs per mile of the maintenance of the entire county aid highway system, after such costs have been adjusted for anticipated state aids and allotments.

County Highway Aid Disbursements: County aids for construction, apportioned as already noted on the basis of need, are credited annually to the account of each town and village[12] participating in the fund. Any unused portions of the amounts so credited are carried over to the next year in the accounts for each respective participating town or village. County aids for maintenance, apportioned as already noted on a mileage basis, are expended directly by the county in the maintenance of local streets and highways on the county aid system, with the difference between the county aids and the total maintenance costs being paid to the county by the local units of government. The county maintenance aids are intended to offset the difference between the cost of maintaining facilities on the county aid highway system[13] and the state aids and allotments apportioned for these facilities. Since maintenance costs have increased at a relatively rapid rate over the recent past and since the state aids and allotments have not been increased proportionally, the county aid for maintenance has increased each year. Table 25 indicates the annual amounts of county highway aids expended for construction and maintenance for the years 1959 through 1968.

Table 25

COUNTY HIGHWAY AID ALLOTMENTS TO THE TOWNS BY OZAUKEE COUNTY FOR CONSTRUCTION AND MAINTENANCE: FISCAL YEARS 1959-1968[a]

| Fiscal Year | Construction | | Maintenance | | Total Allotments |
|---|---|---|---|---|---|
| | Allotment | Percent of Total | Allotment | Percent of Total | |
| 1959 | $ 30,000 | 69.2 | $ 13,326 | 30.8 | $ 43,326 |
| 1960 | 20,000 | 54.5 | 16,697 | 45.5 | 36,697 |
| 1961 | 36,000 | 80.2 | 8,881 | 19.8 | 44,881 |
| 1962 | 36,000 | 62.6 | 21,511 | 37.4 | 57,511 |
| 1963 | 36,000 | 75.0 | 11,997 | 25.0 | 47,997 |
| 1964 | 31,000 | 77.4 | 9,069 | 22.6 | 40,069 |
| 1965 | 36,000 | 59.0 | 25,033 | 41.0 | 61,033 |
| 1966 | 36,000 | 58.1 | 25,940 | 41.9 | 61,940 |
| 1967 | 36,000 | 59.4 | 24,650 | 40.6 | 60,650 |
| 1968 | 36,000 | 51.5 | 33,862 | 48.5 | 69,862 |
| Total | $333,000 | -- | $190,966 | -- | $523,966 |
| 10-Year Average | $ 33,300 | 63.6 | $ 19,097 | 36.4 | $ 52,397 |

[a] *The county fiscal year 1959 extends from January 1, 1959 to December 31, 1959.*

*Source: Ozaukee County Highway Department.*

State Trunk Highway Improvement and Maintenance Funding

Revenues: Revenues for the construction and maintenance of state trunk highways and the construction of connecting streets and derived from two principal sources: federal aids and state sources. State sources can further be divided into two categories: apportionments made directly from the net motor vehicle revenues and bonds issued for construction. Table 26 indicates the combined state and federal aid funds allocated to Ozaukee County for the fiscal years 1959 through 1968 for the construction of state trunk highways and connecting streets.

Expenditures: In rural areas, construction expenditures on state trunk highways which are not on the federal aid systems are funded entirely from state revenues. Construction expenditures for state trunk highways on federal aid systems are funded on a fifty-fifty or ninety-ten federal-state revenue basis on federal aid primary or secondary and on federal aid interstate routes, respectively.

In urban areas, construction expenditures on state trunk highways and connecting streets which are not on the federal aid systems are usually funded with 85 percent state and 15 percent city or village monies. Such expenditures on state trunk highways and connecting streets, which are also on the federal aid primary or secondary systems, are usually funded with 50 percent federal, 35 percent state, and 15 percent city or village monies. In either instance, the amount of the local contribution is determined as 15 percent of the construction costs, which costs are, in turn,

[12] *Since 1963 only the six townships within Ozaukee County have participated in the County Aid Highway Construction Fund.*

[13] *Since 1963 only five of the six townships within Ozaukee County have participated in the County Aid Highway Maintenance Fund, the exception being the Town of Cedarburg.*

Table 26

STATE OF WISCONSIN EXPENDITURES AND REVENUES FOR HIGHWAY AND HIGHWAY-RELATED PURPOSES IN OZAUKEE COUNTY: FISCAL YEARS 1959-1968

| Fiscal Year | Expenditures[a] | | | Revenues[a] | | |
|---|---|---|---|---|---|---|
| | Maintenance | Construction | Total | State Funds[c] | Federal Aids | Total |
| 1959[b] | $ 144,731 | $ 63,000 | $ 207,731 | $ 204,661 | $ 3,070 | $ 207,731 |
| 1960 | 168,782 | 141,500 | 310,282 | 310,282 | -- | 310,282 |
| 1961 | 100,053 | 82,900 | 182,953 | 182,953 | -- | 182,953 |
| 1962 | 139,755 | 200,700 | 340,455 | 340,455 | -- | 340,455 |
| 1963 | 128,817 | 150,200 | 279,017 | 272,510 | 6,507 | 279,017 |
| 1964 | 121,377 | 545,200 | 666,577 | 666,577 | -- | 666,577 |
| 1965 | 128,509 | 736,000 | 864,509 | 863,886 | 623 | 864,509 |
| 1966 | 147,560 | 1,769,400 | 1,316,960 | 459,960 | 857,000 | 1,316,960 |
| 1967 | 183,747 | 5,695,400 | 5,879,147 | 5,879,147 | -- | 5,879,147 |
| 1968 | 196,957 | 340,900 | 537,857 | 528,138 | 9,719 | 537,857 |
| Total | $1,460,288 | $9,125,200 | $10,585,488 | $9,708,569 | $876,919 | $10,585,488 |
| 10-Year Average | $ 146,029 | $ 912,520 | $ 1,058,549 | $ 970,857 | $ 87,692 | $ 1,058,549 |

[a] *The accounting procedure used in the jurisdictional highway system planning program assumed that total revenues were equal to total expenditures.*

[b] *The state fiscal year 1959 extends from July 1, 1958 through June 30, 1959.*

[c] *Due to the accounting of state monies on a statewide basis, state funds in Ozaukee County were set equal to the difference between total revenues and federal aids.*

*Source: Wisconsin Department of Transportation, Ozaukee County Highway Department, and SEWRPC.*

determined for each individual project on the basis of the cost of the participating or eligible items, as negotiated and agreed upon between the Wisconsin Department of Transportation, Division of Highways, and the local unit of government. The participating items usually, but not always, include right-of-way acquisition; grading; construction of the pavement base and surface, culverts and bridges, curb and gutter, and inlets for surface water drainage with connections to storm sewers; and engineering services. The Wisconsin Department of Transportation, Division of Highways, will, in addition, place and maintain signs and markers for approved detours and maintain such detours during the construction period. The city or village must bear the cost of all utility relocation and storm sewer construction costs not required for purely highway drainage purposes. Therefore, the total contribution by the city or village to a state trunk highway or connecting street improvement project, whether on a federal aid system or not, may actually vary from 15 percent to 50 percent of the total cost of the project, depending on the relative costs of the various items on the project and the agreement arrived at between the state and local unit of government concerning the definition of participating items.

Maintenance expenditures on the state trunk highway system have increased steadily over the past 10 years and now exceed 15 percent of the net motor vehicle revenues. Maintenance costs for state trunk highways are borne entirely by the state, although most of the maintenance work is actually performed by county forces under contract to the state. For facilities on the connecting street system, the state partially reimburses the local municipality which is responsible for performing such maintenance. This reimbursement is made at the rate of $500 per mile per year, which is much less than the actual cost of maintenance.

Table 26 summarizes state expenditures in Ozaukee County for the construction and operation and maintenance of the state trunk highway and connecting street systems for the fiscal years 1959 through 1968.

County Trunk Highway Funding

Revenues: Counties in Wisconsin receive highway revenues from three principal sources: federal aids, state aids, and county property taxes. In addition, counties are authorized by Section 67.04(1)(c) and (d) of the Wisconsin Statutes to issue general obligation bonds for highway construction purposes. Ozaukee County, however, has not to date utilized bonding for highway purposes. Local property taxes for highway purposes may not exceed two mills (0.002 percent) per dollar of assessed valuation and are paid into the county road and bridge fund. Although the proportion of county highway revenues derived from federal aids, state aids, and local sources varies greatly from county to county and from year to year, an average county within Wisconsin receives about 10 percent of its total highway revenues from federal aid, about 36 percent from state aid, and about 54 percent from local sources. Table 27 indicates the revenues received by Ozaukee County for highway purposes for the fiscal years 1959 through 1968.

Expenditures: Construction expenditures on the county trunk highway system consist of: 1) direct expenditures of county funds by the respective counties, administered through the county highway committees of the county boards, and 2) federal aid funds matched by county funds, administered by the State Highway Commission on those county trunk highways which are also on the federal aid system. Construction expenditures on county trunk highways which are also federal aid routes are usually financed with 50 percent federal funds and 50 percent county funds. The amount of the county contribution is determined as 50 percent of the construction costs, which costs are, in turn, determined by the cost of the participating or eligible items. These participating items are set by federal policy and generally include right-of-way acquisition; grading; construction of the pavement base and surface, culverts and bridges, curb and gutter, outlets for surface drainage, and storm sewer mains adequate for drainage of the pavement surfaces and the right-of-way; replacement of walks and private driveways; repair of

Table 27

OZAUKEE COUNTY EXPENDITURES AND REVENUES FOR HIGHWAY AND HIGHWAY-RELATED PURPOSES: FISCAL YEARS 1959-1968

| Fiscal Year | Expenditures[a] | | | Revenues[a] | | | |
|---|---|---|---|---|---|---|---|
| | Maintenance | Construction | Total | Local Funds[c] | State Aids | Federal Aids | Total |
| 1959[b] | $ 113,640 | $ 44,815 | $ 158,455 | $ 63,695 | $ 94,760 | $ -- | $ 158,455 |
| 1960 | 117,530 | 55,739 | 173,269 | 66,349 | 99,819 | 7,101 | 173,269 |
| 1961 | 100,957 | 93,106 | 194,063 | 81,196 | 104,344 | 8,523 | 194,063 |
| 1962 | 123,328 | 199,731 | 323,059 | 183,019 | 103,988 | 36,052 | 323,059 |
| 1963 | 105,533 | 191,218 | 296,751 | 134,597 | 110,978 | 51,176 | 296,751 |
| 1964 | 108,620 | 260,382 | 369,002 | 147,225 | 113,952 | 107,825 | 369,002 |
| 1965 | 139,486 | 116,638 | 256,124 | 135,671 | 120,453 | -- | 256,124 |
| 1966 | 158,022 | 163,433 | 321,455 | 189,619 | 128,627 | 3,209 | 321,455 |
| 1967 | 162,311 | 277,922 | 440,233 | 307,868 | 132,365 | -- | 440,233 |
| 1968 | 217,560 | 627,632 | 845,192 | 339,088 | 145,034 | 361,070 | 845,192 |
| Total | $1,346,987 | $2,030,616 | $3,377,603 | $1,648,327 | $1,154,320 | $574,956 | $3,377,603 |
| 10-Year Average | $ 134,699 | $ 203,061 | $ 337,760 | $ 164,833 | $ 115,432 | $ 57,495 | $ 337,760 |

[a] *The accounting procedure used in the jurisdictional highway system planning program assumed that total revenues were equal to total expenditures.*

[b] *The county fiscal year 1959 extends from January 1, 1959 through December 31, 1959.*

[c] *Due to the accounting methods utilized by the county, local funds were assumed to equal the difference between total revenues and the sum of state and federal aids.*

*Source: Ozaukee County Highway Department and SEWRPC.*

damages to other roads by reason of their use in hauling materials needed for the improvement; and engineering services. Construction expenditures for county trunk highways which are not on the federal aid system are usually financed entirely with county funds.

The cost of the construction of county trunk highways through cities or villages is determined on the basis of cost of construction of the county trunk highway as it enters the municipality. In Wisconsin a county is not required to construct a wider roadway through a city or village than it constructs on either side of that city or village. Any additional pavement width required is to be paid for by the city or village through which such additional construction is required.

Maintenance and operation costs for the county trunk highway system are paid for by the county, and maintenance is performed by county forces. Table 27 indicates the county highway funds expended by Ozaukee County for highway construction and maintenance and operation during the fiscal years 1959 through 1968.

Local Street and Highway Funding

Revenues: Like counties, local units of government receive highway revenues from three principal sources: federal aids, state aids, and local revenues. Although the proportion of highway revenues received from each source will vary from municipality to municipality and from year to year, the average city, village, or town in Wisconsin receives about 17 percent of its total highway revenues from federal aids, about 43 percent from state aids, and about 40 percent from local revenues. The local revenues are derived from several sources: local tax receipts, accounting for approximately 77 percent, which include special assessments, property taxes from the general fund, and miscellaneous sources, and bonding, which accounts for about 23 percent. Table 28 indicates the highway and highway-related revenues for all cities and villages in Ozaukee County for the fiscal years 1962 through 1968. In addition to the federal, state, and local revenue sources, the towns in the county have received aid from the county for the construction, improvement, and repair of town roads on the county aid highway system. Table 29 indicates

Table 28

CITY AND VILLAGE EXPENDITURES AND REVENUES FOR HIGHWAY AND HIGHWAY-RELATED PURPOSES IN OZAUKEE COUNTY: FISCAL YEARS 1962-1968

| Fiscal Year | Expenditures[a] | | | Revenues[a] | | | |
|---|---|---|---|---|---|---|---|
| | Maintenance | Construction | Total | Local Funds[c] | State Aids | Bonds | Total[d] |
| 1962[b] | $ 580,417 | $ 221,141 | $ 801,558 | $ 484,040 | $ 317,518 | $ 20,000 | $ 801,558 |
| 1963 | 595,401 | 180,172 | 775,573 | 432,148 | 343,425 | -- | 775,573 |
| 1964 | 686,552 | 164,119 | 850,641 | 494,417 | 356,224 | 30,000 | 850,641 |
| 1965 | 690,937 | 129,106 | 820,043 | 439,160 | 380,883 | -- | 820,043 |
| 1966 | 825,492 | 221,650 | 1,047,142 | 628,410 | 418,732 | -- | 1,047,142 |
| 1967 | 806,630 | 385,724 | 1,192,354 | 745,556 | 446,798 | -- | 1,192,354 |
| 1968 | 684,912 | 433,997 | 1,118,909 | 657,445 | 461,464 | 90,000 | 1,118,909 |
| Total | $4,870,311 | $1,735,909 | $6,606,220 | $3,881,176 | $2,725,044 | $140,000 | $6,606,220 |
| Seven-Year Average | $ 695,759 | $ 247,987 | $ 943,746 | $ 554,454 | $ 389,292 | $ 20,000 | $ 943,746 |

[a] *The accounting procedure used in the jurisdictional highway system planning program assumed that total revenues were equal to total expenditures.*

[b] *The municipal fiscal year 1962 extends from January 1, 1962 through December 31, 1962.*

[c] *Due to the accounting methods utilized by individual municipalities, local funds were assumed to equal the difference between total revenues and state aids.*

[d] *Bond issues are not included in total revenues.*

*Source: Wisconsin Department of Administration and SEWRPC.*

Table 29

TOWN EXPENDITURES AND REVENUES FOR HIGHWAY AND HIGHWAY-RELATED PURPOSES IN OZAUKEE COUNTY: FISCAL YEARS 1962-1968

| Fiscal Year | Expenditures[a] | | | Revenues[a] | | | |
|---|---|---|---|---|---|---|---|
| | Maintenance | Construction | Total | Local Funds[c] | County Aids | State Aids | Total |
| 1962[b] | $ 171,923 | $ 77,757 | $ 249,680 | $118,622 | $ 57,511 | $ 73,547 | $ 249,680 |
| 1963 | 161,713 | 54,563 | 216,276 | 99,543 | 47,998 | 68,735 | 216,276 |
| 1964 | 107,479 | 99,593 | 207,072 | 82,694 | 40,069 | 84,309 | 207,072 |
| 1965 | 146,784 | 91,155 | 237,939 | 95,689 | 61,033 | 81,217 | 237,939 |
| 1966 | 172,403 | 71,017 | 243,420 | 96,957 | 61,941 | 84,522 | 243,420 |
| 1967 | 167,959 | 121,626 | 289,585 | 139,149 | 60,650 | 89,786 | 289,585 |
| 1968 | 276,056 | 127,054 | 403,110 | 243,875 | 69,682 | 89,553 | 403,110 |
| Total | $1,204,317 | $642,765 | $1,847,082 | $876,529 | $398,884 | $571,669 | $1,847,082 |
| Seven-Year Average | $ 172,045 | $ 91,824 | $ 263,869 | $125,218 | $ 56,983 | $ 81,667 | $ 263,869 |

*[a]The accounting procedure used in the jurisdictional highway system planning program assumed that total revenues were equal to total expenditures.*

*[b]The town fiscal year 1962 extends from April 1, 1961 through March 31, 1962.*

*[c]Due to the accounting methods utilized by individual municipalities, local funds were assumed to equal the difference between total revenues and state and county aids.*

*Source: Wisconsin Department of Administration and SEWRPC.*

the highway and highway-related revenues for the towns in Ozaukee County for the fiscal years 1962 through 1968.

Expenditures: Construction costs for streets and highways under the jurisdiction of a city or village are paid for entirely by the respective city or village unless the local street is on a federal aid route. Maintenance and operation costs for all city and village streets, regardless of federal aid designation, are also paid for by the respective city or village, with the unit of government involved generally performing its own maintenance work. Table 28 summarizes the expenditures for construction and operation and maintenance by all cities and villages in Ozaukee County for the fiscal years 1962 through 1968.

Construction costs for streets and highways under the jurisdiction of a town in Ozaukee County are borne entirely by the respective town, with the exception of those town roads which are on a county aid or federal aid route. The total cost of maintaining and operating town roads is paid for by the towns, with the exception of those town roads which are on the county aid highway system. Maintenance costs for town roads on the county aid highway system are borne entirely with state aid allotment and county aid monies. Presently, all of the towns within Ozaukee County, except the Town of Cedarburg, contract with the County for the maintenance of town roads. The annual expenditures by all towns in Ozaukee County for construction and for operation and maintenance are summarized for the fiscal years 1962 through 1968 in Table 29.

Summary of Expenditures

Table 30 provides a summary of all expenditures for highway construction, operation, and maintenance in Ozaukee County for the calendar years 1962 through 1968. The present participation of the various levels of government in highway construction and maintenance costs is summarized in Table 31. It should be noted that the actual local share of the construction costs of state trunk highways and connecting streets, although nominally set at 15 percent of the cost, may vary considerably, depending on the definition of eligible work items. Local participation in past construction projects within Ozaukee County has varied from none to as high as 26 percent of the total cost.

Table 30

EXPENDITURES BY FEDERAL, STATE, COUNTY, AND LOCAL GOVERNMENTS FOR HIGHWAY CONSTRUCTION, OPERATION, AND MAINTENANCE IN OZAUKEE COUNTY: 1962-1968

| Calendar Year[a] | Level of Government | | | | | |
|---|---|---|---|---|---|---|
| | Federal | | | State | | |
| | Construction[b] | Operation and Maintenance[c] | Total | Construction | Operation and Maintenance[d] | Total |
| 1962 | $ 46,868 | $ -- | $ 46,868 | $ 175,250 | $ 131,886 | $ 307,136 |
| 1963 | 82,755 | -- | 82,755 | 347,700 | 125,748 | 473,448 |
| 1964 | 54,225 | -- | 54,225 | 640,600 | 117,006 | 757,606 |
| 1965 | 430,417 | -- | 430,417 | 953,300 | 140,012 | 1,093,312 |
| 1966 | 430,105 | -- | 430,105 | 3,432,400 | 155,107 | 3,587,507 |
| 1967 | 185,395 | -- | 185,395 | 3,018,150 | 212,385 | 3,230,535 |
| 1968 | 186,108 | -- | 186,108 | 554,450 | 181,528 | 735,978 |
| Total | $1,415,873 | $ -- | $1,415,873 | $9,121,850 | $1,063,672 | $10,185,522 |
| Seven-Year Average | $ 202,268 | $ -- | $ 202,268 | $1,303,121 | $ 151,953 | $ 1,455,075 |

| Calendar Year[a] | Level of Government | | | | | |
|---|---|---|---|---|---|---|
| | County | | | Local | | |
| | Construction[b] | Operation and Maintenance[c] | Total | Construction | Operation and Maintenance[d] | Total |
| 1962 | $ 199,731 | $ 123,328 | $ 323,059 | $ 281,502 | $ 751,817 | $ 1,033,319 |
| 1963 | 191,218 | 105,533 | 296,751 | 272,258 | 718,635 | 990,893 |
| 1964 | 260,382 | 108,620 | 369,002 | 253,633 | 811,507 | 1,065,140 |
| 1965 | 116,638 | 139,486 | 256,124 | 205,158 | 856,255 | 1,061,413 |
| 1966 | 163,433 | 158,022 | 321,455 | 330,624 | 995,530 | 1,326,154 |
| 1967 | 277,922 | 162,311 | 440,233 | 511,420 | 1,048,867 | 1,560,287 |
| 1968 | 627,632 | 217,560 | 845,192 | 556,920 | 936,302 | 1,493,232 |
| Total | $1,836,956 | $1,014,860 | $2,851,816 | $2,411,525 | $6,118,913 | $ 8,530,438 |
| Seven-Year Average | $ 262,422 | $ 144,980 | $ 407,402 | $ 344,504 | $ 874,130 | $ 1,218,634 |

[a] *Calendar year data are derived for the federal, state, and town units of government according to the percent of a fiscal year which corresponds to each calendar year.*

[b] *Construction includes such items as expenditures for engineering costs and right-of-way acquisition, and outlay for roads and streets, bridges and culverts, sidewalks, and storm sewers.*

[c] *Operation and maintenance includes such items as expenditures for general administration; snow and ice removal; street cleaning, oiling, and sprinkling; street machinery; signs and guideboards; traffic control and regulation devices; and expense for roads and streets, bridges and culverts, sidewalks, and storm sewers.*

[d] *The state expenditures for operation and maintenance do not include the highway maintenance allotment, a partial reimbursement to municipalities for the maintenance of connecting streets at the rate of $500 per mile per year and costs of pavement marking and signing.*

*Source: Wisconsin Department of Administration; Wisconsin Department of Transportation; Ozaukee County Highway Department; and SEWRPC.*

Table 31

RELATIONSHIP BETWEEN JURISDICTIONAL HIGHWAY CLASSIFICATION AND AID FORMULAE FOR CONSTRUCTION AND MAINTENANCE IN OZAUKEE COUNTY: 1970

| Jurisdictional Classification | Number of Miles (1970) | Percent of Total Miles | Participation in Construction Costs | Participation in Maintenance Costs |
|---|---|---|---|---|
| State Trunk Highways (excludes connecting streets) | 90.68 | 13.01 | Freeways and Rural Highways - 100 percent state<br><br>Urban Highways - 85 percent state and 15 percent city or village | 100 percent state under contract with the county, county is reimbursed on basis of actual machine rental, labor, and material costs incurred |
| Connecting Streets (portions of the state trunk system in urban municipalities) | 8.02 | 1.15 | 85 percent state, 15 percent city or village | State aid at the rate of $500 per mile to the maintaining municipality, with satisfactory documentation of maintenance and balance of cost borne by municipality |
| County Trunk Highways | 120.44 | 17.27 | Rural Highways - 100 percent county<br><br>Urban Highways - 100 percent of 18 feet plus a share of any additional width required by the city or village through which such construction takes place by county, with remainder by city or village | Rural Highways - state aid consisting of basic $65 per mile, annual apportionment of $3,500,000 on basis of motor vehicle registrations and noncity, nonvillage mileage, and supplemental aids apportioned on the basis of aforementioned aids, with county funds providing the balance of costs<br><br>Urban Highways - state aids as noted above, with city or village maintaining width in excess of that which exists on highway outside of corporate limits |
| Local Streets and Roads | 478.02 | 68.57 | 100 percent municipal funds | State aid provided at variable rate based on size and class of municipality |
| Total | 697.16 | 100.00 | -- | -- |

| Federal Aid Classification | Number of Miles (1970) | Percent of Total Miles | Participation in Construction Costs | Participation in Maintenance Costs[a] |
|---|---|---|---|---|
| Interstate (as of 1970 no routes existing within Ozaukee County) | -- | -- | 90 percent federal, 10 percent state | 100 percent nonfederal |
| Primary System (comprised of 63 percent of state trunk highway mileage in Ozaukee County) | 62.11 | 8.91 | 70 percent federal, 30 percent nonfederal[b] | 100 percent nonfederal |
| Secondary System (includes 37 percent of the state trunk highway mileage, 49 percent of the county trunk highway mileage, and 6 percent of the local street and road mileage) | 122.22 | 17.53 | 70 percent federal 30 percent nonfederal[b] | 100 percent nonfederal |
| Topics (at the present time no city or village within Ozaukee County is participating in the Topics program) | -- | -- | 70 percent federal, 30 percent city or village | 100 percent nonfederal |
| Total | 184.33 | 26.44 | -- | -- |

| County Aid Classification | Number of Miles (1970) | Percent of Total Miles | Participation in Construction Costs | Participation in Maintenance Costs |
|---|---|---|---|---|
| County Aid Highway | 81.18 | 16.98 | 50 percent county, 50 percent local | 55 percent county, 45 percent local (1970)[c] |

Table 31 (continued)

[a]Federal aids are not available for maintenance purposes. Participation in maintenance for routes on the federal aid systems is based on the jurisdictional classification of those routes.

[b]Participation in construction costs is based on the jurisdictional classification of the route, with the federal share being applied to the participation of the unit of government under whose jurisdiction the facility lies.

[c]Maintenance on county aid highways is accomplished and paid for by the county with the respective jurisdictions reimbursing the county at the rate of the state highway aid per mile received for the facility.

Source: Wisconsin Department of Transportation and SEWRPC.

## PLAN RECOMMENDATIONS AFFECTING HIGHWAY FINANCING

Analysis of the existing highway aid policies and formulae indicates that three major revisions in these policies and formulae would be desirable in order to meet certain of the basic objectives of the jurisdictional highway planning effort, namely: 1) abolition of the connecting street concept; 2) establishment of uniform construction aid formulae and policies; and 3) revision of the county aid highway system within Ozaukee County. These revisions would affect any financial analysis and, therefore, are considered here.

### Proposed Abolition of Connecting Streets

If each of the jurisdictional highway systems is to function as an integrated subsystem, then the responsibility for the operation and maintenance of each of the individual facilities comprising the subsystem, as well as the design and construction of these facilities, must ultimately rest with the level and agency of government having the greatest basic interest in these facilities. It was, therefore, considered essential that the state and county trunk highway systems each be made continuous throughout the county and its incorporated municipalities. The attainment of this subsystem continuity and the attendant unification of operation and maintenance, as well as design and construction responsibilities, dictated the need for abandoning the connecting street concept. In addition to introducing undesirable discontinuities into the state trunk highway system and thereby violating the principles of sound system management, the connecting street concept creates inequities in the distribution of maintenance costs. These inequities result in a shift from the state to the local units of government of nearly the full burden of maintaining facilities designed to serve heavy volumes of fast, through traffic.

The concept of a connecting street dates back to 1917, when a special committee of the State Legislature was appointed by the Governor to establish a state trunk highway system. At this time, the law required "the system to be laid out exclusive of any street and road in a municipality having a population of 2,500 or more by the last federal census, except that portion of any such street or highway along which the houses averaged more than 200 feet apart." Through this provision the state trunk highway system was made continuous through cities and villages with a population of less than 2,500 but not through cities and villages having a population greater than 2,500, extending into such cities and villages only to the point where residential structures existed at an average spacing of less than 200 feet. Thus, these arterial streets, while being marked and signed as routes for state trunk highways and carrying heavy volumes of primarily through traffic, are not a part of the state trunk highway system within the more densely populated portions of such cities and villages in Ozaukee County as Cedarburg, Mequon, Port Washington, Grafton, and Thiensville. Those streets which form the connections between state trunk highways through cities and villages are entitled to receive certain allotments from the net motor vehicle revenues. These allotments were originally intended as a reimbursement to cities and villages for the expenses incurred in maintaining the connecting streets.

In 1929, the amount of the allotment for the maintenance of connecting streets was established by the State Legislature at $500 per mile for any portion of a connecting street on the original 1921 federal aid primary system, $400 per mile for any portion of a connecting street on the original 1921 federal aid secondary system, and $300 per mile for all other connecting streets. In 1943, the Legislature established the present allotment rate of $500 per mile for all connecting streets regardless of federal aid classification. While the cost of maintaining connecting streets within Ozaukee County has increased on an average to more than six times the $500 allotment over the past 25 years, the maintenance allotment rate per mile has remained the same. Thus, a major portion of

the burden of maintaining facilities of areawide importance has been shifted to the local units of government. Of the eight cities and villages within Ozaukee County, only five have connecting street mileage, with the Villages of Belgium, Fredonia, and Saukville being the three municipalities which have no connecting street mileage. Of the eight cities and villages, only six have state trunk highway mileage, with the Villages of Belgium and Thiensville being the two exceptions. Table 4 indicates the present distribution of state trunk highway and connecting street mileage within Ozaukee County by municipality. State trunk highways within Ozaukee County are maintained by the County under a maintenance contract with the state, and all maintenance costs actually incurred are reimbursed by the state. All connecting streets within Ozaukee County are maintained by the local municipality, and, as already noted, an allotment of $500 per mile is paid to the municipality by the state upon submittal of proper evidence of maintenance expenditures.

In the previous chapter, the establishment within Ozaukee County of a Type I (state trunk) highway system totaling 96.5 route-miles has been recommended. Of this total, approximately 45.1 miles would consist of freeways and the remaining 51.4 miles of standard arterials. It is proposed that all freeways remain and become state trunk highways and be maintained by Ozaukee County for the Wisconsin Department of Transportation, Division of Highways. The remaining proposed Type I arterials should be constructed and maintained so that adequate capacity, desirable operating conditions, and responsible control of access are provided and preserved. Toward this end and in order to ensure a continuous, uniformly desirable cross section and operating conditions along all Type I arterials, it is recommended that the ultimate responsibility for the maintenance and operation of the Type I arterials rest with the Wisconsin Department of Transportation, Division of Highways. All operations or actions that will have a long-term effect on the traffic capacity and level of service should be encompassed within this responsibility.

It is, therefore, recommended that the state trunk highway system be made continuous through all incorporated areas within the county and that the connecting street concept be abandoned. Under this proposal the State Highway Commission would continue to contract with the county for maintenance of Type I facilities, with the added option of contracting directly with the cities and villages concerned for Type I nonfreeway facility maintenance. It is further recommended that the state reimburse the county, city, or village on a contractual basis for the cost of the following "eligible" maintenance items on the Type I, state trunk, highway facilities:

1. Physical maintenance of the roadway pavement surfaces and structures, including crack sealing, patching, resurfacing, and curb and gutter repair.

2. Physical maintenance of storm sewers located within the highway right-of-way, including cleaning.

3. Snow plowing and ice control between curbs, including removal of snow at bus stops, intersections, and at other locations as required to maintain traffic service.

4. Physical maintenance of traffic control devices, including signs, signals, safety lights, and pavement markings. The cost of maintaining safety lighting shall be determined by a proration of costs based upon the proportion of fixtures installed for traffic service at intersections of two Type I facilities or at intersections of Type I with Type II facilities to the total fixtures along the Type I route.

5. Physical maintenance of existing trees located within the highway right-of-way, and mowing grass on medians.

The state would not participate in the maintenance of sidewalks or driveways, the care of new trees planted under permit, the care of ornamental flowers and shrubs, nor in the maintenance of sprinkler systems or attendant water service.

It is also recommended that the state assume or continue direct administration of the following operational control devices on Type I highway facilities:

1. Issuance of driveway permits.

2. Control of advertising signs.

3. Maintenance of route signing.

4. Establishment of speed zoning.

5. Issuance of special permits.

6. Prohibition of parking, as required, to provide necessary traffic capacity.

7. Installation of traffic control signals.

The state may, at its option, delegate the administration of the aforelisted operational controls to the local municipalities concerned. Such delegation would normally parallel the contracting for maintenance service.

Implementation of these recommendations would not only provide for a more equitable distribution of the burden of maintaining arterial facilities of areawide importance, but would also place the operational control of these facilities in the level and agency of government that has the greatest interest in, and the resources available for, these facilities. In all cases, the decision to delegate operational and maintenance responsibilities authority on the Type I arterial system should rest with the State Highway Commission.

Because of the close parallel which exists between the function of the Type I and Type II arterial systems, it is recommended that county trunk highways also be made continuous through all incorporated areas. The county would continue to maintain the Type II facilities, with the option of contracting with the cities and villages concerned for such maintenance on a full-cost reimbursement basis. Eligible maintenance items and operational control devices would be identical to those set forth above for the Type I arterials, with the decision to delegate responsibilities and authority on the Type II arterial system resting with the County Highway Committee.

Proposed Revision of Construction Aid Formulae and Policies

Analysis of the existing aid policies and formulae also revealed certain inconsistencies and inequities in the financing of state and county trunk highway construction projects. As noted previously, these inconsistencies and inequities relate to the definition of construction items eligible for federal and state aids and, in effect, serve to create varying local cost participation rates for identical facility-type construction projects. It is, therefore, considered desirable to modify existing construction aid policies in order to obtain a uniform, as well as more equitable, cost-sharing between the various levels and units of government concerned.

Recognizing that urban municipalities, due to the character of urban land use development, generally realize certain nontransportation-related benefits from the construction or reconstruction of Type I or Type II highway facilities located within their boundaries, and recognizing that a greater proportion of the travel on such urban facilities will be of an intracommunity nature than in rural areas, it is considered equitable to require the cities and villages to participate in the cost of both state and county trunk highway improvements. Conversely, because rural municipalities, due to the character of rural land use development, generally do not realize the same nontransportation-related benefits from Type I and Type II highway facilities located within their boundaries, and, moreover, because a greater proportion of the travel on such rural facilities is of an intercommunity nature, it is not considered necessarily equitable to require such communities to participate in the cost of state and county trunk highway improvements.

It is further considered desirable, in the interest of equity and sound management practices, to establish the local participation rate within the cities and villages of Ozaukee County at the same fixed percentage level for both state trunk nonfreeway and county trunk facility construction and to determine eligible work items on a uniform basis throughout the County. These modifications would not only result in a more equitable distribution of construction costs but would also serve to simplify programming, scheduling, and financing of improvements and assist city and village units of government in budgeting for major highway improvements.

Thus, after careful consideration of alternatives, it is recommended that a uniform policy of construction aid be adopted for both the Type I and Type II highway facilities within cities and villages. This policy should provide for a fixed city or village contribution of 15 percent of the cost of all state and county trunk highway construction projects, with the cost of the construction project being determined on the basis of the following participating work items:

1. Right-of-way acquisition.

2. Grading.

3. Construction of pavement base and surface, curb and gutter, retaining walls, and culverts and bridges.

4. Construction of inlets for surface water drainage, together with connection to storm sewer mains.

5. Construction of storm sewer mains necessary for pavement and right-of-way drainage.

6. Engineering services.

Furthermore, it is recommended that the cost of construction of the Type I and Type II highway facilities in unincorporated areas be borne entirely by the state and county, respectively.

These recommendations are based, however, on the assumption that all state and county trunk highways in cities and villages will be constructed or improved utilizing urban cross sections, while all such highways in towns will be constructed or improved utilizing rural cross sections. Any departure from this assumption will require an adjustment in the recommended policy concerning local contribution, that is, cities and villages would not be required to contribute to the cost of the construction of state and county trunk highways having rural cross sections within their corporate limits. Conversely, the construction of state and county trunk highways having urban cross sections within a town would require that the town contribute 15 percent of the participating cost of the improvement.

### Proposed Revision of the County Aid Highway System

Historically in Ozaukee County, the towns have been able to request matching funds from the County for the improvement of town roads on the county aid highway system. It was to the end of equalizing urban and rural tax efforts to meet transportation needs that the county aid highway system was established within Ozaukee County and policies set forth for the construction and maintenance of the county aid highway system. As shown in Table 25, Ozaukee County has over the last 10 years appropriated an average of $52,397 per year for both construction and maintenance operations on the 81-mile County Aid Highway System. In order to provide greater flexibility in the improvement of the local, nonarterial highway facilities, however, it is recommended that the existing county aid highway system be abolished and that the County Board act to establish a town road improvement fund which may be used for the reconstruction of any existing town road on a seventy-thirty (county-local) matching basis. Under this recommendation, any town within Ozaukee County could petition the County on a need basis for matching funds to the limit of the town road improvement funds in its account for the improvement of any town road within its jurisdiction. The town road improvement monies would accumulate in a nonlapsing construction fund maintained for each town, with county contributions to such fund being made annually by the County Board on a varying, but uniform, basis. At such time as a town was prepared to expend money for the reconstruction of an existing town road, matching county monies could be applied for from the town road improvement fund. To fully implement the recommended plan the County would have to appropriate an average of $150,600 per year for county highway aids over a 20-year plan implementation period. Annual maintenance of town roads would become the financial responsibility of the respective towns. The towns could, by agreement with the County, contract with the County for the maintenance of town roads, reimbursing the County for the full cost of such maintenance.

The public financial resource analysis conducted under the jurisdictional highway planning program indicated that, given the same relative local tax effort for highway transportation purposes as cities and villages, the towns within Ozaukee County would not be financially capable of providing the required level of highway service. The local tax effort to implement the recommended jurisdictional highway system plan within the cities and villages of the county is estimated to approximate $12.91 per capita per year over the 20-year plan implementation period, an amount which is $6.59 less than the present average per capita tax effort within the cities and villages for street and highway purposes. To fully implement the recommended plan, the average local tax effort within towns would have to approximate $28.18 per capita per year over the 20-year plan implementation period, about a 75 percent increase over the present average effort of $16.00 per capita, and more than $15.00 in excess of the per capita tax effort required in the cities and villages. With the establishment of the recommended town road improvement fund, the local tax effort required of the towns for the 20-year plan implementation period would be reduced by $14.39 to $13.79 per capita per year, $2.21 less than the present rate of $16.00 per capita per year. Furthermore, in addition to making the recommended plan financially fea-

sible at all levels of government, the establishment of the town road improvement fund would result in the equalizing of urban and rural transportation-related tax efforts, the purpose for which the original County Aid Highway System was established.

## FINANCIAL ANALYSIS AND FEASIBILITY

### Financial Analysis

Having determined that three basic changes in highway aid policies and formulae were necessary to achieve the basic objectives of the jurisdictional highway planning effort, a detailed financial analysis of the recommended jurisdictional highway system plan was made based upon the assumption that these changes would be effected. The analysis included consideration of the effects of the proposed plan on highway aids and allotments to the municipalities comprising Ozaukee County, as well as consideration of the costs of plan implementation and the total revenues which may be expected to become available over the plan implementation period.

The Wisconsin Statutes provide for the payment of certain basic aids and allotments to counties and municipalities for street and highway purposes. These are apportioned on the basis of formulae, involving the type of incorporated area, population, jurisdictional and total street and highway mileage, and motor vehicle registration. The proposed realignment of the jurisdictional highway systems in Ozaukee County will affect the mileage of state trunk and county trunk facilities within each municipality in Ozaukee County and will, consequently, result in changes in the basic aids and allotments for street and highway purposes paid to each municipality and to the County itself.

The effect of the proposed realignment of the jurisdictional highway systems within Ozaukee County on highway aids and allotments is summarized in Table 32. This table indicates the recommended change in jurisdictional highway mileage within each municipality within the County, corresponding changes in basic aids and allotments, and the changes resulting from the proposed abandonment of the connecting street concept. It should be noted that the table provides comparative data for the existing (1970) situation and for the existing street and highway system as the implementation of the jurisdictional highway system plan would have affected the distribution of state aids in 1970. The table also shows comparative figures for the final (1990) stage in the implementation of the recommended jurisdictional highway system plan, and includes estimates of the probable effects of anticipated increases in local street mileage resulting from new land use development within the County and of anticipated increases in motor vehicle registrations.

Table 32 indicates that, as a result of the recommended jurisdictional realignment for 1971 as the initial step toward the 1975 stage of the plan, a reduction in the local street aids and allotments paid to units of government in Ozaukee County of approximately $33,900 per year could be expected. This reduction in local street aids and allotments is due to two factors: a statewide reduction in the amount of monies available for supplemental aids sufficient to pay for the maintenance cost of the connecting street system mileage within the state, and changes in the jurisdictional classification of several facilities within the County with concomitant changes in the rate of local street aids and allotments paid for those facilities. In addition to the reduction in local street aids and allotments, the proposed abolition of the connecting street system and the concomitant elimination of the connecting street allotment of $500 per mile would result in a further reduction in allotments received by Ozaukee County of $4,000 per year. Thus, the total reduction in aids and allotments would be $37,900 per year.

With the abolishment of the connecting street concept and the establishment of a continuous state trunk highway system through incorporated areas, it is proposed that the state would reimburse the units of government within Ozaukee County for the full cost incurred in maintaining state trunk highways, in an effort to offset this reduction in aids and allotments. As shown in Table 32, it is anticipated that about $40,100 per year would be paid to the various municipalities formerly having connecting street miles for the maintenance of those segments of the proposed state trunk highway system which were on the connecting street system. Thus, implementation of the recommended jurisdictional highway system plan could be expected to result in a net increase of highway aids and allotments paid to local units of government of approximately $3,200 per year with implementation of the initial stage of the recommended jurisdictional highway system plan.

It was recognized that policy change affecting the status of the connecting streets would have to be administratively feasible on a statewide basis. In

Table 32

HIGHWAY AND HIGHWAY-RELATED AIDS AND ALLOTMENTS RETURNED TO MUNICIPALITIES IN OZAUKEE COUNTY
1970, 1975, and 1990

Current Jurisdictional Highway System - 1970

| Civil Division | Number of Miles | | | | | Local Street Aids and Allotments | Privilege Highway Tax[a] | Connecting Street Allotments | State Trunk Highway Maintenance |
|---|---|---|---|---|---|---|---|---|---|
| | State Trunk | | Connecting Street | County Trunk | Local Street | | | | |
| | Freeway | Nonfreeway | | | | | | | |
| CITIES | | | | | | | | | |
| Cedarburg | -- | 0.63 | 2.22 | 1.28 | 25.54 | $ 46,064 | $ 15,201 | $1,110 | $ -- |
| Mequon | 6.12 | 13.59 | 0.35 | 6.08 | 141.59 | 253,389 | 54,901 | 175 | -- |
| Port Washington | -- | 0.43 | 3.18 | 0.41 | 30.32 | 54,685 | 15,153 | 1,590 | -- |
| Subtotal | 6.12 | 14.65 | 5.75 | 7.77 | 197.45 | 354,138 | 15,256 | 2,875 | -- |
| VILLAGES | | | | | | | | | |
| Belgium | -- | 0.00 | -- | 1.75 | 2.66 | $ 4,625 | $ 4,326 | $ -- | $ -- |
| Fredonia | -- | 1.81 | -- | 0.79 | 3.85 | 6,693 | 2,301 | -- | -- |
| Grafton | -- | 1.16 | 1.40 | 0.90 | 21.81 | 37,920 | 12,862 | 700 | -- |
| Saukville | -- | 1.99 | -- | 1.67 | 3.69 | 6,416 | 3,940 | -- | -- |
| Thiensville | -- | 0.43 | 0.87 | 0.00 | 13.58 | 23,611 | 7,110 | 435 | -- |
| Subtotal | -- | 5.39 | 2.27 | 5.11 | 45.59 | 79,265 | $ 30,539 | 1,135 | -- |
| TOWNS | | | | | | | | | |
| Belgium | -- | 6.78 | -- | 24.22 | 44.94 | $ 15,886 | $ 3,553 | $ -- | $ -- |
| Cedarburg | -- | 10.75 | -- | 18.94 | 45.68 | 16,148 | 7,188 | -- | -- |
| Fredonia | -- | 11.73 | -- | 17.28 | 48.74 | 17,229 | 3,959 | -- | -- |
| Grafton | 4.11 | 5.86 | -- | 18.77 | 32.70 | 11,560 | 5,484 | -- | -- |
| Port Washington | -- | 13.72 | -- | 12.00 | 22.25 | 7,865 | 3,663 | -- | -- |
| Saukville | -- | 11.57 | -- | 16.35 | 40.67 | 14,378 | 3,379 | -- | -- |
| Subtotal | 4.11 | 60.41 | -- | 107.56 | 234.98 | 83,066 | 27,226 | -- | -- |
| Ozaukee County | -- | -- | -- | -- | -- | $ 158,737 | $ -- | $ -- | $228,541 |
| Total | 10.23 | 80.45 | 8.02 | 120.44 | 478.02 | $ 675,206 | $143,021 | $4,010 | $228,541 |

Initial Jurisdictional Realignment - 1975

| Civil Division | Number of Miles | | | | | Local Street Aids and Allotments | Privilege Highway Tax[a] | Connecting Street Allotments | State Trunk Highway Maintenance |
|---|---|---|---|---|---|---|---|---|---|
| | State Trunk | | Connecting Street | County Trunk | Local Street | | | | |
| | Freeway | Nonfreeway | | | | | | | |
| CITIES | | | | | | | | | |
| Cedarburg | -- | 2.8 | -- | 3.0 | 23.9 | $ 41,806 | $ -- | $ -- | $ 11,100 |
| Mequon | 6.1 | 13.9 | -- | 28.6 | 121.3 | 211,528 | -- | -- | 1,750 |
| Port Washington | -- | 3.6 | -- | 1.5 | 29.2 | 51,076 | -- | -- | 15,900 |
| Subtotal | 6.1 | 20.3 | -- | 33.1 | 174.4 | 304,410 | -- | -- | 28,750 |
| VILLAGES | | | | | | | | | |
| Belgium | -- | -- | -- | 1.8 | 2.7 | $ 4,547 | $ -- | $ -- | $ -- |
| Fredonia | -- | 1.8 | -- | 0.0 | 4.6 | 7,747 | -- | -- | -- |
| Grafton | -- | 3.1 | -- | 0.8 | 21.4 | 36,041 | -- | -- | 7,000 |
| Saukville | -- | 1.1 | -- | 1.8 | 4.5 | 7,579 | -- | -- | -- |
| Thiensville | -- | 1.3 | -- | 0.0 | 13.6 | 22,905 | -- | -- | 4,350 |
| Subtotal | -- | 7.3 | -- | 4.4 | 46.8 | 78,819 | -- | -- | 11,350 |

Table 32 (continued)

Recommended Jurisdictional Highway System - 1990

| Civil Division | Number of Miles | | | | | Local Street Aids and Allotments | Privilege Highway Tax[a] | Connecting Street Allotments | State Trunk Highway Maintenance |
|---|---|---|---|---|---|---|---|---|---|
| | State Trunk | | Connecting Street | County Trunk | Local Street | | | | |
| | Freeway | Nonfreeway | | | | | | | |
| TOWNS | | | | | | | | | |
| Belgium | 6.2 | 0.6 | -- | 30.4 | 45.0 | $ 15,481 | $ -- | $ -- | $ -- |
| Cedarburg | -- | 10.8 | -- | 18.4 | 46.2 | 15,895 | -- | -- | -- |
| Fredonia | -- | 11.7 | -- | 20.9 | 45.9 | 15,791 | -- | -- | -- |
| Grafton | 5.8 | 5.1 | -- | 18.4 | 32.7 | 11,250 | -- | -- | -- |
| Port Washington | 6.4 | 2.6 | -- | 19.7 | 25.7 | 8,842 | -- | -- | -- |
| Saukville | 4.1 | 8.7 | -- | 14.6 | 46.9 | 16,135 | -- | -- | -- |
| Subtotal | 22.5 | 39.5 | -- | 122.4 | 242.4 | 83,394 | -- | -- | -- |
| Ozaukee County | -- | -- | -- | -- | -- | $ 174,717 | $ -- | $ -- | $254,431 |
| Total | 28.6 | 67.1 | -- | 159.9 | 463.6 | $ 641,340 | $ -- | $ -- | $294,531 |

Recommended Jurisdictional Highway System - 1990

| Civil Division | Number of Miles | | | | | Local Street Aids and Allotments | Privilege Highway Tax[a] | Connecting Street Allotments | State Trunk Highway Maintenance |
|---|---|---|---|---|---|---|---|---|---|
| | State Trunk | | Connecting Street | County Trunk | Local Street | | | | |
| | Freeway | Nonfreeway | | | | | | | |
| CITIES | | | | | | | | | |
| Cedarburg | 2.1 | 2.8 | -- | 11.0 | 46.6 | $ 137,600 | $ -- | $ -- | $ 14,000 |
| Mequon | 12.0 | 12.0 | -- | 31.2 | 262.6 | 655,700 | -- | -- | 72,100 |
| Port Washington | -- | 4.1 | -- | 4.6 | 34.7 | 102,500 | -- | -- | 19,600 |
| Subtotal | 14.1 | 18.9 | -- | 46.8 | 343.9 | 895,800 | -- | -- | 105,700 |
| VILLAGES | | | | | | | | | |
| Belgium | -- | -- | -- | 1.8 | 5.9 | $ 17,000 | $ -- | $ -- | $ -- |
| Fredonia | -- | 0.5 | -- | 1.7 | 7.8 | 22,500 | -- | -- | |
| Grafton | -- | 4.4 | -- | 1.2 | 31.9 | 92,100 | -- | -- | 16,900 |
| Saukville | -- | 1.1 | -- | 2.5 | 8.6 | 24,800 | -- | -- | 5,500 |
| Thiensville | -- | 1.3 | -- | -- | 13.6 | 39,300 | -- | -- | 8,800 |
| Subtotal | -- | 7.3 | -- | 7.2 | 67.8 | 195,700 | -- | -- | 31,200 |
| TOWNS | | | | | | | | | |
| Belgium | 6.2 | -- | -- | 31.0 | 45.3 | $ 25,700 | $ -- | $ -- | $ -- |
| Cedarburg | 4.8 | 4.5 | -- | 17.4 | 39.5 | 22,400 | -- | -- | -- |
| Fredonia | -- | 5.7 | -- | 26.0 | 48.0 | 27,200 | -- | -- | -- |
| Grafton | 5.8 | 4.2 | -- | 17.5 | 26.7 | 15,100 | -- | -- | -- |
| Port Washington | 6.4 | 2.1 | -- | 16.6 | 22.8 | 12,900 | -- | -- | -- |
| Saukville | 7.8 | 8.7 | -- | 13.9 | 45.3 | 25,700 | -- | -- | -- |
| Subtotal | 31.0 | 25.2 | -- | 122.4 | 227.6 | 129,000 | -- | -- | -- |
| Ozaukee County | -- | -- | -- | -- | -- | $ 341,100 | $ -- | $ -- | $250,100 |
| Total | 45.1 | 51.4 | -- | 176.4 | 649.5 | $1,561,600 | $ -- | $ -- | $387,000 |

[a] *Beginning in late 1972, that allotment known as the privilege highway tax was no longer returned directly to the city, village, or town in which the vehicle for which licensing fees are paid is garaged, but rather will be co-mingled in the municipal and county shared tax account with other shared taxes for distribution as a shared revenue essentially on a per capita basis. It is estimated in 1975 that the net effect of this change in the method of distributing the privilege highway tax will result in a slight reduction—about 14 percent—in the amount of aid from this source received by Ozaukee County and its constituent local units of government. This reduction is due to the fact that the distribution of population throughout the state is not identical to the distribution of motor vehicles. By 1990 it is estimated that this change in the method of distributing the privilege highway tax will result in a net loss of about 31 percent to the county and its communities. In addition, these funds will be co-mingled with other revenue sharing funds and will not, therefore, be specifically identified as the local government share of the privilege highway tax. The effect of this change in the method of distributing the privilege highway tax does not affect the financial analyses relating to the Ozaukee County jurisdictional highway system plan presented in this chapter, since revenue forecasts for highway purposes do not include an estimate of either highway privilege tax receipts or shared revenues for the 20-year plan period.*

*Source: Wisconsin Department of Transportation and SEWRPC.*

order for the state to reimburse the maintaining agencies for actual maintenance costs on all state trunk highways, sufficient monies for this purpose would have to be withheld prior to the allotment of supplemental aids. Figure 11 provides a graphic summary of the distribution of total motor vehicle revenues in Wisconsin, as provided by the State Statutes. It is evident from the summary diagram that, with the exception of a portion of the supplemental motor fuel tax,[14] the supplemental aids are apportioned after all other disbursements from the total highway fund have been made. Thus, the portion of the supplemental aids affected by changes in the connecting street concept actually consists of the remainder of highway revenues after all other statutory disbursements have been made and, as such, are shown as disbursements from the bottom of the pooled revenue depository. It is further evident from the diagram that, as changes in other statutory disbursements are made, the resulting remainder available for distribution will change. The effect of such changes on the aids and allotments available to municipalities in Ozaukee County may be expected to result in a reduction of $17,300 per year. Because this process of redistribution provides for the withholding of sufficient funds to reimburse actual maintenance costs accrued on all state trunk highways, the net effect of the plan recommendations on Ozaukee County would be to increase aids by $3,200 per year, as previously stated.

It should be noted that the forecast of aids and allotments returned to municipalities for 1990, as shown in Table 32, is based upon forecast 1990 city and village corporate limits and a conservative estimate of increased motor fuel taxes collected due to increased travel within the state.

Financial Feasibility

The financial feasibility of the recommended jurisdictional highway system plan was evaluated by comparing estimated plan implementation costs with anticipated highway revenues. The evaluation was based upon four assumptions: 1) that the preceding recommendations concerning the abandonment of the connecting street concept will be adopted and implemented, 2) that the preceding recommendations concerning the adoption of uniform construction aid formulae and policies will be adopted and implemented, 3) that the preceding recommendations concerning the revisions of the county aid highway system will be adopted and implemented, and 4) that the recommendations concerning the realignment of the federal aid systems set forth in Chapter VI of this report will be adopted and implemented.

Estimates of the cost of constructing and maintaining the total street and highway system within Ozaukee County through the plan design year of 1990 were prepared by applying unit improvement and maintenance costs to the existing and proposed arterial, collector, and local (land access) street mileage. These cost estimates were then compared with a forecast of highway revenues which could reasonably be expected to be received over the plan implementation period. The revenue forecasts were based upon an extrapolation of historical highway expenditures within Ozaukee County. Because the historical record of highway expenditures at the local level did not permit accurate separation of the costs attendant to the construction and maintenance of arterial facilities from those attendant to nonarterial facilities, construction and maintenance costs for nonarterial facilities were estimated and included in the total plan implementation cost.

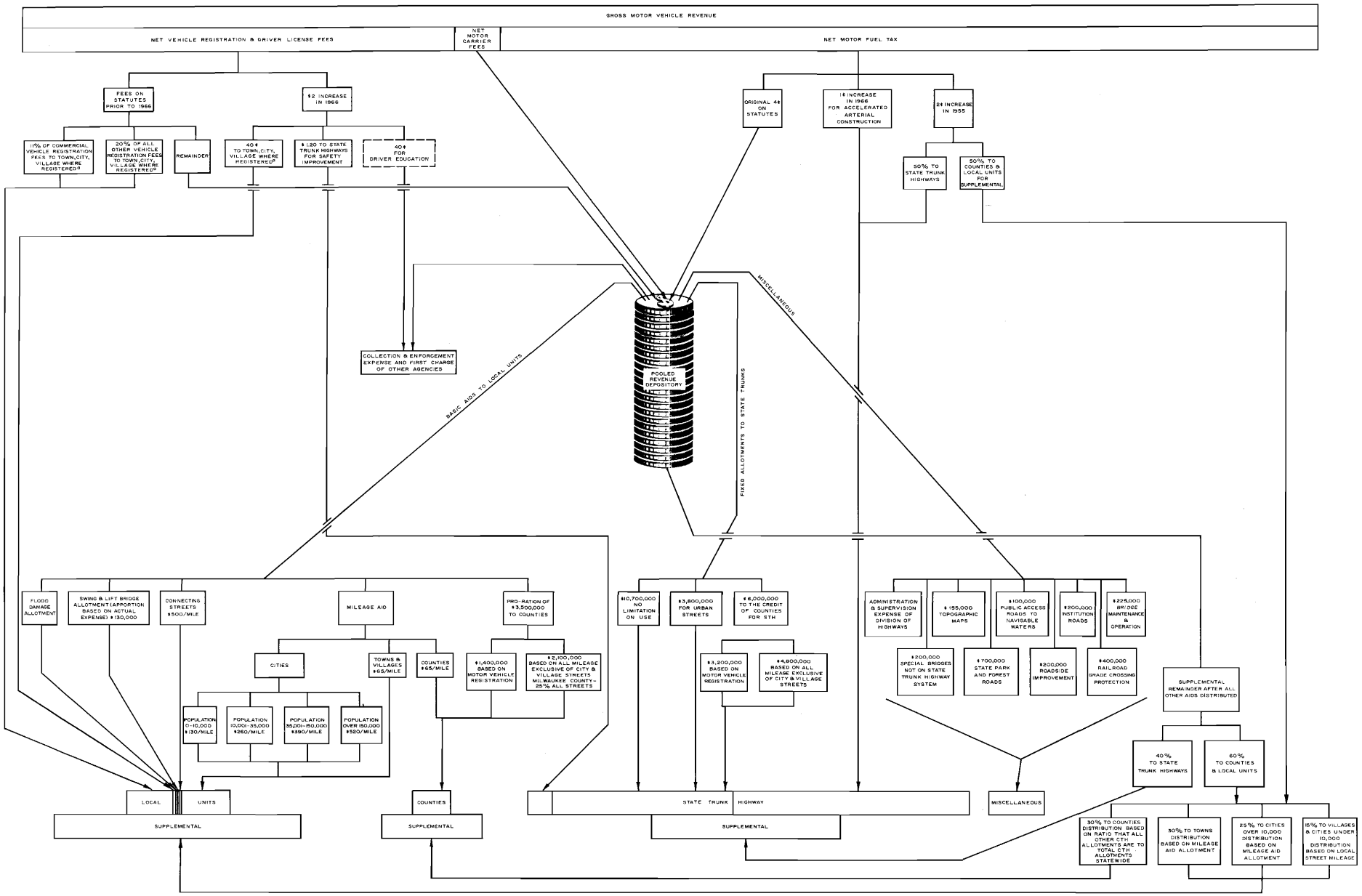
Estimated Cost of Arterial System: As described in Chapter VI of this report, the jurisdictional highway system plan recommends a typical cross section for each link in the total arterial street and highway system. Representative unit construction and maintenance costs were prepared for each typical cross section used, as shown in Appendix B of this report. The jurisdictional highway system plan, by incorporation of these recommended typical cross sections, reflects estimated arterial highway needs through the plan design year of 1990. The total cost of plan implementation could thus be calculated by totaling, from the coded network maps, the route mileage of each typical cross section included in the plan, multiplying this mileage by the unit construction and maintenance costs attendant to the typical cross sections, and adding special costs for major railroad or highway grade separation and river crossing structures, as shown on the jurisdictional highway system plan map.

The unit cost data for each typical cross section were developed from analyses of actual cost data provided by the District Office of the Division of

[14] *Section 20.420 of the Wisconsin Statutes provides that 50 percent of the net receipts of the two-cent-a-gallon supplementary motor fuel tax enacted in 1955 be apportioned to local units of government as a part of the supplemental aids.*

Figure 11

# DISTRIBUTION OF TOTAL MOTOR VEHICLE REVENUE IN WISCONSIN: 1970




[a]*Beginning in 1972, those portions of the motor vehicle registration fees historically returned to local units of government known as "privilege highway taxes" will be placed in the municipal and county shared tax account for distribution essentially on a per capita basis pursuant to formulas set forth in Chapter 79 of the Wisconsin Statutes.*

*Source: Wisconsin Department of Transportation.*

Table 33

PLAN IMPLEMENTATION COSTS FOR THE OZAUKEE COUNTY JURISDICTIONAL HIGHWAY SYSTEM PLAN BY JURISDICTIONAL SUBSYSTEM: 1970-1990

| Jurisdictional Subsystem | Plan Implementation Costs | | |
|---|---|---|---|
| | Construction | Maintenance | Total |
| Arterial | | | |
| Type I (State Trunk) | $51,849,000 | $ 6,556,600 | $ 58,405,600 |
| Type II (County Trunk) | 17,999,000 | 6,280,500 | 24,279,500 |
| Type III (Local Trunk) | 4,205,000 | 2,302,600 | 6,507,600 |
| Subtotal | 74,053,000 | $15,139,700 | $ 89,192,700 |
| Nonarterial | $10,649,200 | $20,552,600 | $ 31,201,800 |
| Total Street and Highway System | $84,702,200 | $35,692,300 | $120,394,500 |

*Source: SEWRPC.*

Highways, and reflect recent experience in areas of development similar to Ozaukee County. It should be noted that these unit costs, in 1970 dollars, range from 10 percent to 30 percent lower than comparable unit costs inflated to 1970 dollars for construction and maintenance of comparable cross sections in Milwaukee County, as shown in Appendix A of SEWRPC Planning Report No. 11, A Jurisdictional Highway System Plan for Milwaukee County. The principal reasons for these lower unit costs in Ozaukee County are: lower traffic volumes, resulting in lower maintenance costs, and lower right-of-way acquisition and utility relocation costs in construction of new facilities or the improvement of existing facilities.

The resulting total arterial plan implementation costs are summarized by jurisdictional subsystem in Table 33. These plan implementation costs are expressed in terms of 1970 unit prices and total approximately $89 million for the entire arterial system, including approximately $74 million for construction and $15 million for maintenance costs. The breakdown of these costs by level of government is shown in Table 34.

Estimated Cost of Nonarterial System: Construction and maintenance needs for nonarterial streets and highways, collector, and local (land access) streets over the plan implementation period were also estimated, utilizing unit construction and maintenance cost data developed from information provided by local units of government. These unit cost data were expressed separately for the urban (cities and villages) and rural (towns) areas of the County, as shown in the typical cross sections for urban and rural nonarterials in

Table 34

PLAN IMPLEMENTATION COSTS FOR THE OZAUKEE COUNTY JURISDICTIONAL HIGHWAY SYSTEM PLAN BY LEVEL OF GOVERNMENT: 1970-1990

| Level of Government | Plan Implementation | | |
|---|---|---|---|
| | Construction | Maintenance | Total |
| Arterial System | | | |
| State | | | |
| State Trunk | $50,178,800 | $ 6,556,600 | $ 56,735,400 |
| State Trunk[a] | 3,368,300 | -- | 3,368,300 |
| Subtotal | 53,547,100 | 6,556,600 | 60,103,700 |
| County | | | |
| County Trunk | $13,180,600 | $ 6,280,500 | $ 19,461,100 |
| City-Village | | | |
| State Trunk | $ 1,670,200 | $ -- | $ 1,670,200 |
| County Trunk | 1,450,100 | -- | 1,450,100 |
| Local Trunk | 4,205,000 | 2,302,600 | 6,507,600 |
| Subtotal | 7,325,300 | 2,302,600 | 9,627,900 |
| Total | $74,053,000 | $15,139,700 | $ 89,192,700 |
| Nonarterial System | | | |
| City-Village | $ 6,346,400 | $16,825,100 | $ 23,171,500 |
| Town | 4,302,800 | 3,727,500 | 8,030,300 |
| Total | $10,649,200 | $20,552,600 | $ 31,201,800 |
| Total Street and Highway System | $84,702,200 | $35,692,300 | $120,394,500 |

[a] *The cost of construction or reconstruction of those state trunk highways proposed to be reverted to the county trunk highway system are anticipated to be borne by the state.*

*Source: SEWRPC.*

Appendix B. The mileage of new facilities was calculated by applying the appropriate factors representing the portion of land normally devoted to collector[15] and local (land access)[16] streets under good land subdivision practice to the total land area to be converted from rural to urban use within each municipality in Ozaukee County over the plan design period. It should be noted that all new collector and land access mileage forecast for construction through the plan design year 1990 was forecast to fall within the forecast 1990 city and village corporate limits. Since there is relatively no difference between collector and local (land access) street cross sections in rural areas, the same unit costs were utilized for the aggregate of all rural nonarterial mileage. Although different collector and local (land access) street cross sections are used within the various cities and villages in Ozaukee County, these differences were not considered significant; and the same unit costs were utilized for the aggregate of all urban nonarterial mileage.

The construction cost estimates for nonarterial streets within cities and villages were based on the following assumptions: all new nonarterial facilities would be constructed at the cost of the developer; approximately 10 percent of all existing nonarterial facilities would require reconstruction; and all of the existing nonarterial mileage would require resurfacing during the planning period. This latter assumption was predicated on the existence of a high percentage of bituminous pavements which would require more than one resurfacing during the planning period.

[15] *Collector streets were assumed to occupy 2.3 percent of high-density and 1.5 percent of medium- and low-density fully developed urban areas, and have a recommended right-of-way width of 80 feet. Accordingly, a factor of 1.5 miles per square mile was applied to anticipated new high-density development, and 1.0 mile per square mile to anticipated new medium- and low-density development to obtain corresponding collector street mileage.*

[16] *Local (land access) streets were assumed to occupy 17.8 percent of high-density, 17.0 percent of medium-density, and 14.2 percent of low-density fully developed urban areas, and have a recommended right-of-way width of 60 feet. Accordingly, factors of 15.7 miles per square mile, 15.0 miles per square mile, and 12.5 miles per square mile were applied to anticipated new high-, medium-, and low-density development, respectively, to obtain corresponding local (land access) street mileage.*

The assumptions upon which estimates of construction costs for nonarterial streets and highways within the towns were based are as follows: all new nonarterial facilities would be constructed at the cost of the developer; approximately 25.0 percent of all existing nonarterial facilities would require reconstruction; and approximately 75 percent of all existing nonarterial facilities would require resurfacing.

The estimated construction and maintenance costs for new and existing nonarterial facilities through the plan design year of 1990 are summarized in Table 33. Expressed in terms of 1970 prices, these costs total approximately $32 million, of which $11 million is for construction and $21 million is for maintenance. The breakdown of these costs by level of government is shown in Table 34.

Thus, the total cost of full plan implementation over the 20-year plan implementation period extending from 1970 to 1990 was estimated at $121 million, based upon 1970 prices, of which $85 million was for construction and $36 million was for maintenance. The share of these implementation costs to be borne by each local unit of government is shown in Table B-1, Appendix B.

Estimated Revenues: Anticipated revenues available for highway purposes within Ozaukee County over the plan implementation period were estimated from an analysis of the rate of expenditure for highway and highway-related purposes within Ozaukee County for the period extending from 1962 through 1968. A summary of the seven-year expenditures for highway construction and maintenance within Ozaukee County was presented in Table 30 of this report. An estimate of anticipated revenues was prepared by projecting the current rate of expenditure, as developed for local sources on a per capita basis, over the plan implementation period. Assuming that no new revenue sources would become available for highway purposes and that recommended changes in policy with respect to the connecting street concept and the town road improvement fund were implemented, revenue forecasts indicated that sufficient revenues would be available to reduce annual per capita local tax effort within the towns and the cities and villages by slightly more than $2.00 and $6.00, respectively, from the present local tax effort.

It should be noted that neither appreciated plan implementation costs nor appreciated revenues were used in the comparison, a valid procedure,

since any inflation of implementation costs may be expected to be offset by a corresponding inflation in revenues. The amount of monies available for highway expenditures may be expected to increase, not only because of the effects of inflation but also with increasing motor vehicle registrations and motor vehicle utilization.

## SUMMARY

This chapter has explored the financial feasibility of the recommended jurisdictional highway plan for Ozaukee County. This exploration has required a description of the existing highway aid structure and of three major revisions in this structure being recommended in order to meet the basic objectives of the jurisdictional highway planning effort; namely, the abandonment of the connecting street concept, the adoption of uniform construction aid formulae and policies for state and county trunk highways, and the modification of the county aid highway system in Ozaukee County. The analysis indicated that the recommended plan is financially feasible without new sources of highway revenues for the County as a whole.

Total plan implementation costs, including construction and maintenance of collector and minor land access, as well as of arterial, facilities, was estimated at $121 million over the 20-year plan implementation period. Anticipated revenues for highway purposes over this same period were estimated at $121 million, indicating a reduction of tax effort at the local level of government.

It should be further noted in this respect that it is extremely difficult to forecast revenues which may become available for highway purposes over the 20-year plan implementation period. This difficulty is due not only to the length of the forecast period involved and the unpredictable changes which may occur during this period in such important factors affecting highway revenues as the general level of economic activity, a shifting of priorities in the expenditures of public funds to such items as housing and mass transit, and major changes in the structure of highway aid formulae which will come about upon expiration of the massive interstate highway construction program, but also the changing of corporate limits and concomitant changes of responsibilities for those existing town roads which would fall within the new city or village corporate limits. Because of these difficulties, the historic trend of expenditures for highway purposes within Ozaukee County had to be used to forecast future revenues. On this basis the historic participation, on the federal level, in construction aids for secondary and primary federal aid routes and the anticipated 90 percent financing of the Stadium Freeway as an interstate highway was included in the analysis.

It should be noted that, while the financial analysis indicates that the plan is feasible for the County as a whole, a disparity in the distribution of resources may exist within the individual municipalities comprising the County; but these would relate primarily to the nonarterial streets and highways within the municipality and the level of service required by its populace.

Chapter VIII

# PLAN IMPLEMENTATION

## INTRODUCTION

Implementation of the recommended jurisdictional highway system plan described in the preceding chapters of this report would provide Ozaukee County with integrated state, county, and local trunk highway systems able to meet existing and anticipated future travel demands effectively at an adequate level of service. It would, in addition, assist in achieving a more efficient design, construction, maintenance, and operation of the total arterial street and highway system; a more equitable distribution of highway improvement and maintenance costs; and the intergovernmental coordination necessary to the efficient and effective provision of highway transportation facilities and services within Ozaukee County.

In a practical sense, the recommended plan is not complete until the steps required for its implementation are specified. This chapter is, therefore, presented as a guide for use in the implementation of the recommended jurisdictional highway system plan. Basically, it outlines the actions which must be taken by the various levels and agencies of government concerned if the recommended jurisdictional highway system plan is to be fully carried out. Those units and agencies of government which have plan adoption and plan implementation powers applicable to the recommended plan are identified, necessary formal plan adoption actions are specified, and specific implementation actions are recommended with respect to development of the jurisdictional subsystems comprising the total arterial street and highway system within Ozaukee County.

The plan implementation recommendations are, to the maximum extent possible, based upon, and related to, existing governmental programs and predicated upon existing state-enabling legislation. Certain changes in the state-enabling legislation, however, are recommended as deemed necessary to implement fully the recommended plan. Because of the ever-present possibility of unforeseen changes in economic conditions, state- and federal-enabling legislation, and governmental and fiscal policies, it is not possible to declare once and for all time exactly how a process as complex as highway plan implementation should be administered and financed. It will, therefore, be necessary to update periodically not only the recommended jurisdictional highway system plan itself but the recommendations contained herein for implementation of this plan.

## 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 be preceded by plan adoption and should emphasize the most important and essential elements of the plan and those areas of action which will have the greatest impact on achieving the objectives expressed in the plan. With respect to the recommended jurisdictional highway system plan, primary attention in plan implementation should accordingly be focused upon coordinated development of the Type I (state trunk) highway and Type II (county trunk) highway networks. These two arterial subsystems together provide the basic framework for the provision of essential highway transportation services within Ozaukee County, not only satisfying almost 83 percent of the total traffic demand within the County but also providing the highest level of highway transportation service and accommodating the longest trips. Plan implementation, therefore, should focus primarily on these two subsystems, particularly with respect to the attainment of the recommended location, capacity, and timing of improvements, leaving implementation of the Type III (local trunk) system to the local units of government. This is not to be interpreted as meaning, however, that improvement of the Type III facilities need not be fully coordinated with development of the Type I and Type II highway systems, but only that primary attention in plan implementation should be focused on facilities of areawide importance—the state and county trunk highways—leaving greater flexibility for the improvement of facilities of primarily local importance.

## PLAN IMPLEMENTATION ORGANIZATIONS

Full implementation of the recommended jurisdictional highway system plan will be dependent

upon coordinated action by 17 agencies of government: the U. S. Department of Transportation, Federal Highway Administration; the Wisconsin Department of Transportation; the Ozaukee County Board; and the governing bodies of the 14 cities, villages, and towns located within Ozaukee County. Substantial implementation of the recommended plan, however, in the form of integrated state and county trunk highway system development, will involve only three agencies of government: the U. S. Department of Transportation, Federal Highway Administration; the Wisconsin Department of Transportation; and the Ozaukee County Board. A brief discussion of the duties and functions of these three agencies as they relate to the jurisdictional highway system plan implementation follows. Although the three agencies are for convenience discussed separately, the interdependence between the various levels of government represented and the need for close interagency cooperation cannot be overemphasized.

U. S. Department of Transportation, Federal Highway Administration

The U. S. Department of Transportation, Federal Highway Administration, administers all federal highway aid programs, working through the Wisconsin Department of Transportation, Division of Highways. The Federal Highway Administration must approve all changes in the federal aid systems and will, in this respect, have an important role in implementation of the recommended jurisdictional highway system plan for Ozaukee County.

Wisconsin Department of Transportation

The Highway Commission of the Wisconsin Department of Transportation, Division of Highways, is broadly empowered to provide the state with a 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, the federal aid urban system, and the TOPICS systems, the latter five functions all being subject to federal review and regulation. The State Highway Commission is also responsible for reviewing county trunk highway routes in order to assure that these routes form an integrated system of county trunk highways between adjoining counties. The State Highway Commission is authorized to enter into cooperative agreements with the governing bodies of any county, city, village, or town, or with the federal government, respecting the financing, planning, establishment, improvement, maintenance, use, regulation, or vacation of highways within their respective jurisdiction.

Specifically, three sections of the Wisconsin Statutes, 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 by the State Highway Commission, acting pursuant to the provisions of Chapter 84 of the Wisconsin Statutes, or by the State Legislature itself, as provided by Chapter 518, Laws of 1947; Chapter 475, Laws of 1949; Chapter 75, Laws of 1953; Chapters 369 and 371, Laws of 1955; Chapter 596, 597, and 598, Laws of 1961; and Chapter 348, Laws of 1967. 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 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, includ-

ing necessary mapping; preliminary engineering; implementation of legal changes in the state trunk highway routes, including necessary public hearings; 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, the procedure 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 Wisconsin Division of Highways, 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 single most important agency to highway system plan implementation.

Ozaukee County Board

At the county level of government within Wisconsin, county highway committees, operating under the aegis of the county boards, are made 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, subject to the approval of the State Highway Commission, 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.

## PLAN ADOPTION

Adoption or endorsement of the recommended jurisdictional highway system plan by the three major plan implementation agencies is essential, not only to assure a common understanding between the several governmental agencies and to enable their staffs to program the necessary implementation work, but also to meet certain statutory requirements. In addition to adoption or endorsement of the jurisdictional highway system plan by the implementing agencies, plan adoption by the Southeastern Wisconsin Regional Planning Commission, in accordance with Section 66.945(10) of the Wisconsin Statutes, will be essential in order to continue to qualify the implementing agencies for federal grants in partial support of highway improvement projects within Ozaukee County.

It is extremely important to understand that adoption or endorsement of the recommended jurisdictional highway system plan by any unit or agency of government pertains only to the statutory duties and functions of the adopting or endorsing agency, and such adoption or endorsement does not and cannot in any way preempt action by another unit or agency of government within its jurisdiction. Thus, adoption or endorsement of the jurisdictional highway system plan by the state and county would make the plan applicable as a guide to state and county highway system development and not to local trunk highway system development. To make the plan applicable as a guide to local highway system development would require its adoption by the municipalities concerned.

The Ozaukee County Board, upon recommendation of the Ozaukee County Highway Committee and as authorized by Section 66.945(12) of the Wisconsin Statutes, did on December 5, 1973, formally adopt the recommended jurisdictional highway system plan with amendments as a guide to future highway facility development within the County. The following additional specific plan adoption actions are hereby recommended:

1. That the State Highway Commission formally act to endorse and integrate the recommended jurisdictional highway system 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, 84.025, 84.29, and 84.295 of the Wisconsin Statutes, as a guide to highway system development within Ozaukee County.

2. That the U. S. Department of Transportation, Federal Highway Administration, through the Wisconsin Division of Highways, formally acknowledge the recommended jurisdictional highway system plan as a guide to the realignment of the various federal aid systems and to the administration and granting of federal aids for highway improvement within Ozaukee County.

3. That the Southeastern Wisconsin Regional Planning Commission, in accordance with Sections 66.945(9) and (10) of the Wisconsin Statutes, act to formally adopt the recommended jurisdictional highway system plan as an integral part of the master plan for the Region, constituting an amendment to the regional transportation plan adopted by the Commission on December 1, 1966.

It is suggested that, to supplement the aforelisted recommended federal, state, regional, and county actions, the three city common councils, five village boards, and six towns within Ozaukee County act to adopt the recommended jurisdictional highway system plan, as authorized by Section 66.945(12) of the Wisconsin Statutes, as a guide to highway system development within their area of jurisdiction. A model resolution for adoption of the Ozaukee County jurisdictional highway system plan is set forth in Appendix C. It is also suggested that the respective local planning agencies, by resolution, adopt and integrate the recommended jurisdictional highway system plan, as this plan affects their area of jurisdiction, into the local master plans, pursuant to Section 62.23(3)(b) of the Wisconsin Statutes, and certify such adoption to their local governing body.

Subsequent Adjustment of the Plan

No long-range plan can be permanent in all of its aspects or precise in all of its elements. Amendments to the recommended jurisdictional highway system plan will be forthcoming, not only from the work of the Southeastern Wisconsin Regional Planning Commission under its continuing area-wide transportation planning responsibilities, but also from the state, county, and local agencies as these agencies adjust and refine the plan during implementation and as new highway improvement programs are created or existing programs are expanded or curtailed. Any such adjustment, however, will require, on a continuing basis, the same close cooperation between the local, area-wide, state, and federal agencies concerned, as has been evidenced in the preparation of the jurisdictional highway system plan itself. To achieve this necessary coordination between local, state, and federal programs and thereby assure the timely adjustment of the recommended plan, it is recommended that the Technical Coordinating and Advisory Committee on Jurisdictional Highway Planning for Ozaukee County, created for the jurisdictional highway planning study, be retained and that all agencies having highway planning and plan implementation powers advise and transmit any subsequent proposed changes in the plan to the Committee, from time to time, for review and possible integration into an amended jurisdictional highway system plan. In order to achieve full intergovernmental coordination in highway system development within Ozaukee County, it is further recommended that the Committee annually review and comment on highway construction project priorities and other major plan implementation actions as proposed by the various implementing agencies.

## PLAN IMPLEMENTATION

Implementation of the recommended jurisdictional highway system plan may be considered under four distinct, but interrelated, areas of action by the three major implementing agencies concerned: 1) realignment of state and county jurisdictional responsibilities, 2) realignment of the federal aid systems, 3) realignment of state and county operational responsibilities, and 4) right-of-way reservation and acquisition and facility construction. Major implementation efforts of a system-wide nature will be necessary in the first three areas to bring the existing jurisdictional systems, federal aid routes, and operational responsibilities into alignment with the 1975 staging of the recommended plan. Subsequent actions in these three areas can be on an individual route basis, as developing events dictate, to reach the 1990 staging of the recommended plan. All implementation efforts in the fourth area can be part of the normal construction programming efforts of two of the major implementing agencies

Realignment of Jurisdictional Responsibilities

In Wisconsin, realignment of the state trunk highway system is made a joint state-county function, pursuant to Sections 84.02(3) and 84.025(3) of the Wisconsin Statutes. It is accordingly recommended that, upon adoption of the recommended jurisdictional highway system plan by the Ozaukee County Board and the State Highway Commission, the State Highway Commission act, in cooperation with the Ozaukee County Board, to effect the realignment of the state trunk highway system within Ozaukee County.

It is recommended that the initial action include all of the specific additions to, and deletions from, the state trunk highway system set forth in Table 35, in order to achieve the first (1975) stage of plan implementation. Subsequent actions

Table 35

ADDITIONS TO AND DELETIONS FROM RECOMMENDED TYPE I (STATE TRUNK) ARTERIAL HIGHWAY SYSTEM IN OZAUKEE COUNTY: 1975

| Additions to State Trunk Highway System | | | |
|---|---|---|---|
| Route | Limits | Municipality | Number of Miles |
| CTH Q | STH 57 to USH 141 | Village and Town of Grafton | 1.6 |
| North-South Freeway | Sheboygan County line to STH 57 | Towns of Belgium, Port Washington, Saukville, and Grafton | 18.4 |

| Deletions from State Trunk Highway System | | | |
|---|---|---|---|
| Route | Limits | Municipality | Number of Miles |
| STH 57 | Proposed connection to the proposed North-South Freeway to USH 141 | Town and Village of Saukville and Town of Grafton | 5.3 |
| USH 141 | Sheboygan County line to STH 32 | Towns of Belgium and Port Washington | 14.2 |

*Source: SEWRPC.*

Table 36

ADDITIONS TO AND DELETIONS FROM RECOMMENDED TYPE I (STATE TRUNK) ARTERIAL SYSTEM IN OZAUKEE COUNTY: 1975-1990

| Additions to the State Trunk Highway System | | | |
|---|---|---|---|
| Route | Limits | Municipality | Number of Miles |
| Stadium Freeway | North-South Freeway to Milwaukee County line | Towns of Saukville and Cedarburg and City of Mequon | 16.6 |

| Deletions from the State Trunk Highway System | | | |
|---|---|---|---|
| Route | Limits | Municipality | Number of Miles |
| STH 84 | Washington County line to STH 32 | Town and Village of Fredonia and Towns of Belgium and Port Washington | 11.4 |
| STH 143 | Washington County line to STH 57 | Town and City of Cedarburg | 5.9 |
| STH 181 | STH 167 to Milwaukee County line | City of Mequon | 2.0 |

*Source: SEWRPC.*

should effect the specific additions to, and deletions from, the state trunk highway system set forth in Table 36 by the design year (1990) of the recommended plan. It is recommended that all of the initial changes in the state trunk highway system be effected by one inclusive action of the State Highway Commission of Wisconsin supported by the Ozaukee County Board. Such action may require public hearing prior to action, as specified by Sections 84.02(3) and 84.025(3) of the Wisconsin Statutes. Subsequent realignments can be effected on a route-by-route basis, as dictated by developing circumstances.

In Wisconsin, realignment of the county trunk highway system is, like realignment of the state trunk highway system, made a joint state-county function, pursuant to Section 83.025 of the Wisconsin Statutes. It is accordingly recommended that, upon adoption of the recommended jurisdic-

tional highway system plan by the Ozaukee County Board and endorsement by the State Highway Commission, the Ozaukee County Board act in cooperation with the Highway Commission to effect the realignment of the county trunk highway system within Ozaukee County.

It is recommended that the initial action include all of the specific additions to, and deletions from, the county trunk highway system set forth in Table 37, in order to achieve the first (1975) stage of plan implementation. Subsequent actions should effect the specific additions to, and dele-

Table 37

ADDITIONS TO AND DELETIONS FROM RECOMMENDED TYPE II (COUNTY TRUNK) ARTERIAL HIGHWAY SYSTEM IN OZAUKEE COUNTY: 1975

| Additions to County Trunk Highway System | | | |
|---|---|---|---|
| Route | Limits | Municipality | Number of Miles |
| STH 57 | Proposed connection to the proposed North-South Freeway to USH 141 | Town and Village of Saukville and Town of Grafton | 5.3 |
| USH 141 | Sheboygan County line to STH 32 | Towns of Belgium and Port Washington | 14.2 |
| Belgium Road | CTH E to CTH I and Cedar Valley Road to STH 57 | Town of Fredonia | 3.1 |
| Bridge Street | STH 143 to STH 57 | City of Cedarburg | 0.6 |
| Cedar Valley Road | Belgium Road to Kohler Road | Town of Fredonia | 0.5 |
| W. Chestnut Street | S. Division Street to S. Wisconsin Street | City of Port Washington | 0.2 |
| S. County Line Road | Washington County line to STH 57 | City of Mequon | 2.5 |
| S. Division Street | W. Chestnut Street to City of Port Washington South Corporate Limits | City of Port Washington | 0.5 |
| Freistadt Road | Western intersection with Granville Road to eastern intersection with Granville Road | City of Mequon | 0.3 |
| Granville Road | CTH C to Milwaukee County line | City of Mequon | 6.0 |
| Highland Road | Western intersection with Granville Road to CTH W | City of Mequon | 6.3 |
| S. Hilbert Street | E. Spring Street to E. Portland Road | City of Cedarburg | 0.1 |
| Kohler Road | CTH I to Cedar Valley Road | Town of Fredonia | 1.0 |
| Old Port Washington Road | CTH W to Milwaukee County line | City of Mequon | 0.2 |
| Pioneer Road[a] | CTH Y to Lake Shore Road | Cities of Mequon and Cedarburg | 3.7 |
| E. Portland Road | S. Hilbert Street to Struck Avenue | City of Cedarburg | 0.3 |
| N. Sheboygan Street | STH 143 to CTH I | City of Cedarburg | 0.6 |
| E. Spring Street | STH 57 to S. Hilbert Street | City of Cedarburg | 0.2 |
| N. Spring Street | CTH KK to STH 33 | City of Port Washington | 0.8 |
| Wauwatosa Road | CTH C to STH 167 | City of Mequon | 4.0 |
| W. Western Avenue | 4th Avenue to STH 57 | City of Cedarburg | 0.3 |
| S. Wisconsin Avenue | E. Grand Avenue to W. Chestnut Street | City of Port Washington | 0.1 |

| Deletions from County Trunk Highway System | | | |
|---|---|---|---|
| Route | Limits | Municipality | Number of Miles |
| CTH AA | CTH I to STH 84 | Town and Village of Fredonia | 1.5 |
| CTH B | STH 84 to USH 141 | Town of Port Washington | 2.1 |
| CTH C[b] | Washington County line to CTH Y | Town of Cedarburg | 0.5 |
| CTH CC | USH 141 to CTH C | Town and City of Port Washington | 0.8 |
| CTH KK | N. Spring Street to City of Port Washington North Corporate Limits | Town of Port Washington | 0.3 |
| CTH O | CTH I to STH 33 and Ulao Street to Mill Street | Town and Village of Saukville | 4.9 |
| CTH Q | STH 57 to USH 141 | Village and Town of Grafton | 1.6 |

[a] *Those segments of Pioneer Road within the jurisdiction of the Towns of Cedarburg and Grafton are presently on the county trunk highway system.*

[b] *The segment of Pioneer Road under the jurisdiction of the City of Mequon is not on the county trunk highway system.*

*Source: SEWRPC.*

tions from, the county trunk highway system set forth in Table 38 by the design year (1990) of the recommended plan. It is recommended that all of the initial changes in the county trunk highway system be effected by one inclusive action of the Ozaukee County Board supported by the State Highway Commission. Subsequent realignments can be effected on a route-by-route basis, as dictated by developing circumstances.

In order to achieve the desired continuity of the state and county trunk highway systems through incorporated municipalities, it is recommended that the Ozaukee County Board and the State Highway Commission jointly sponsor amendments to Section 84.02(11) of the Wisconsin Statutes to abolish the connecting street concept and to Section 83.025(1) to prohibit the governing body of any city or village from unilaterally removing a street or highway from the county trunk system.

It is further recommended that the State Highway Commission sponsor amendments to Section 349.13 of the Wisconsin Statutes to explicitly empower the State Highway Commission to limit or prohibit the stopping, standing, or parking of vehicles on any part of the state trunk highway system.

Aid System Adjustment

Upon realignment of the state and county trunk highway systems, pursuant to the foregoing recommendations, it will be necessary to adjust the federal aid system, as established under Title 23, U. S. Code, Section 103, to the resulting state and county trunk highway systems. In Wisconsin the State Highway Commission is, pursuant to Section 84.01(17) of the Wisconsin Statutes, charged with the responsibility for laying out and revising the national system of interstate and defense highways and the federal aid primary system, subject

Table 38

ADDITIONS TO AND DELETIONS FROM RECOMMENDED TYPE II (COUNTY TRUNK) ARTERIAL HIGHWAY SYSTEM IN OZAUKEE COUNTY: 1975-1990

| Additions to County Trunk Highway System | | | |
|---|---|---|---|
| Route | Limits | Municipality | Number of Miles |
| STH 84 | Washington County line to USH 141 | Town and Village of Fredonia and Towns of Belgium and Port Washington | 11.4 |
| STH 143 | Washington County line to STH 57 | Town and Village of Cedarburg | 5.9 |
| STH 181 | STH 167 to Milwaukee County line | City of Mequon | 2.0 |
| Extension of Belgium Road | CTH I to Cedar Valley Road | Town of Belgium | 1.0 |
| Bridge Street | CTH Y to STH 143 | Town and City of Cedarburg | 2.7 |
| S. County Line Road | STH 57 to CTH W | City of Mequon | 1.2 |
| Extension of Granville Road | Highland Road to Freistadt Road | City of Mequon | 1.0 |
| Lovers Lane Road | CTH A to STH 84 | Towns of Belgium and Port Washington | 1.4 |

| Deletions from County Trunk Highway System | | | |
|---|---|---|---|
| Route | Limits | Municipality | Number of Miles |
| CTH B | CTH A to STH 84 | Towns of Belgium and Port Washington | 2.2 |
| CTH T | CTH Y to STH 57 | Town and City of Cedarburg | 2.8 |
| Cedar Valley Road | Belgium Road to Kohler Road | Town of Fredonia | 0.5 |
| Freistadt Road | Western intersection with Granville Road to eastern intersection with Granville Road | City of Mequon | 0.3 |
| Granville Road | Highland Road to Freistadt Road | City of Mequon | 1.0 |
| Highland Road | Western intersection with Granville Road to eastern intersection with Granville Road | City of Mequon | 0.3 |
| Kohler Road | CTH I to Cedar Valley Road | Town of Fredonia | 1.0 |

*Source: SEWRPC.*

to federal review and approval. The State Highway Commission and the County Board, acting through its Highway Committee, are charged with the joint responsibility of laying out and revising the federal aid secondary system, also subject to federal review and approval, pursuant to Section 83.026 of the Wisconsin Statutes.

It is accordingly recommended that, upon realignment of the state and county trunk highway systems, the State Highway Commission act to effect the realignment of the federal aid primary system within Ozaukee County. It is recommended that the initial action include all of the specific additions to, and deletions from, the federal aid primary system set forth in Table 39 in order to achieve the first stage (1975) of plan implementation. Subsequent actions should effect the specific addition to the federal aid primary system set forth in Table 40 by the design year (1990) of the recommended plan. It is recommended that all of the initial changes in the federal aid primary system be effected by one inclusive action of the State Highway Commission supported by the Ozaukee County Board. Subsequent realignments can be effected on a route-by-route basis as dictated by developing circumstances. It is also recommended that the State Highway Commission and the U. S. Federal Highway Administration give due consideration to the jurisdictional highway system plan in the allocation of any additional interstate highway mileage within Ozaukee County.

It is further recommended that, upon realignment of the state and county highway systems, the State Highway Commission act, in cooperation with the Ozaukee County Board, to effect the realignment of the federal aid secondary system within Ozaukee County. It is recommended that the initial action include all of the specific additions to, and deletions from, the federal aid secondary system set forth in Table 41 in order to achieve the first stage (1975) of plan implementation. Subsequent actions should effect the specific additions to, and deletions from, the federal aid secondary system set forth in Table 42 by the design year (1990) of the recommended plan. It is recommended that all of the initial changes in the federal aid secondary system be effected by one inclusive action of the State Highway Commission supported by the Ozaukee County Board. Subsequent realignments can be effected on a route-by-route basis, as dictated by developing circumstances.

Finally, it is recommended that the federal aid urban system, as established under the Federal Aid Highway Act of 1970, be designated to coincide with the Type III (local trunk) highway system

Table 39

ADDITIONS TO AND DELETIONS FROM RECOMMENDED FEDERAL AID PRIMARY SYSTEM IN OZAUKEE COUNTY: 1975

| Additions to Federal Aid Primary System | | | |
|---|---|---|---|
| Route | Limits | Municipality | Number of Miles |
| CTH Q | STH 57 to USH 141 | Village and Town of Grafton | 1.6 |
| STH 32 | North-South Freeway to present USH 141 | Town and City of Port Washington | 4.3 |
| STH 60 | Washington County line to STH 57 | Town of Cedarburg and Village of Grafton | 5.6 |
| STH 167 | Washington County line to USH 141 | City of Mequon | 7.1 |
| North-South Freeway | Sheboygan County line to proposed Stadium Freeway | Towns of Belgium, Port Washington, Saukville, and Grafton | 13.1 |

| Deletions from Federal Aid Primary System | | | |
|---|---|---|---|
| Route | Limits | Municipality | Number of Miles |
| STH 57 | Proposed connection to the proposed North-South Freeway to USH 141 | Town and Village of Saukville and Town of Grafton | 5.3 |
| USH 141 | Sheboygan County line to STH 32 | Towns of Belgium and Port Washington | 14.2 |

*Source: SEWRPC.*

Table 40

ADDITION TO THE RECOMMENDED FEDERAL AID PRIMARY SYSTEM IN OZAUKEE COUNTY: 1975-1990

| Route | Limits | Municipality | Number of Miles |
|---|---|---|---|
| Stadium Freeway | North-South Freeway to Milwaukee County line | Towns of Saukville and Cedarburg and City of Mequon | 16.6 |

*Source: SEWRPC.*

within that portion of Ozaukee County which lies within the Milwaukee urbanized area as defined by the U. S. Bureau of the Census.

It is recommended that the U. S. Department of Transportation, Federal Highway Administration, cooperate in, and approve, the above recommended revisions in the federal aid systems.

The realignment of the federal aid systems will be one of the major benefits of the jurisdictional highway planning program in Ozaukee County. The present designation of federal aid routes does not, in all cases, coincide with major arterial routes. Yet, the selective transfer of federal aid designations for given routes has been discouraged in recent years without the benefit of comprehensive study. By correlating jurisdictional responsibility with federal aid importance, implementation of the recommended jurisdictional highway system plan will achieve the alignment of the federal aid interstate and federal aid primary systems with the Type I (state trunk) highway system; the alignment of the federal aid secondary system with the Type II (county trunk) highway system; and the alignment of the federal aid urban system with the Type III (local trunk) highway system in the urbanized area.

It is recommended that the Ozaukee County Board act to abolish the existing county aid highway system and establish a town road improvement fund which could be used for the reconstruction of any existing town road on a seventy-thirty (county-town) matching basis, pursuant to Section 83.14 of the Wisconsin Statutes. County funds could be appropriated annually on a varying but uniform per mile basis, as determined by the County Highway Committee, and placed in accounts earmarked for each town as the county portion of the matching funds. Finally, maintenance of all town roads would be the financial responsibility of the respective towns pursuant to Section 83.06 of the Wisconsin Statutes.

Realignment of Operational Responsibilities

Following the realignment of the state and county trunk highway systems, as recommended in this report, the State Highway Commission shall assume full operational and maintenance responsibilities, as hereinafter defined, over the recommended state trunk highway system and shall mark and maintain all state trunk highways within Ozaukee County, including those facilities within incorporated cities and villages. The Ozaukee County Board shall similarly assume full operational and maintenance responsibilities, as hereinafter defined, over the recommended county trunk highway system, and shall mark and maintain all county trunk highways within Ozaukee County, including those facilities within incorporated cities and villages.

It is recommended that the Ozaukee County Board, in cooperation with the cities, villages, and towns within Ozaukee County, mark and sign as scenic drives all streets and highways over which such scenic drives have been designated for routing within Ozaukee County.

It is recommended that the State Highway Commission continue to contract with the Ozaukee County Board, pursuant to Section 84.07 of the Wisconsin Statutes, for maintenance of the state trunk highway facilities, with the added option of contracting on an annual basis directly with the cities and villages concerned for maintenance of these facilities. It is similarly recommended that the Ozaukee County Board, at its option, contract with the cities and villages concerned for maintenance of the county trunk highway way Commission and the Ozaukee County Highway Committee establish, respectively, standards for such contractual maintenance, relating these standards to the recommended eligible maintenance items set forth in Chapter VII of this report, namely: physical maintenance of roadway surface pavements and structures and physical maintenance of storm sewers, snow and ice control

Table 41

ADDITIONS TO AND DELETIONS FROM RECOMMENDED FEDERAL AID SECONDARY SYSTEM IN OZAUKEE COUNTY: 1975

| Additions to Federal Aid Secondary System[a] | | | |
|---|---|---|---|
| Route | Limits | Municipality | Number of Miles |
| STH 57 | Proposed connection to the proposed North-South Freeway to USH 141 | Town and Village of Saukville and Town of Grafton | 5.3 |
| USH 141 | Sheboygan County line to STH 32 | Towns of Belgium and Port Washington | 14.2 |
| CTH A | STH 84 to USH 141 | Towns of Fredonia and Belgium | 5.0 |
| CTH B | Sheboygan County line to CTH A | Town of Belgium | 5.1 |
| CTH C (Pioneer Road) | CTH Y to CTH W | Towns of Cedarburg and Grafton and Cities of Mequon and Cedarburg | 6.0 |
| CTH D | Sauk Trail Road to eastern terminus | Town of Belgium | 0.4 |
| CTH E | Sheboygan County line to STH 84 | Town of Fredonia | 3.2 |
| CTH K | STH 57 to USH 141 | Towns of Fredonia and Belgium | 3.0 |
| CTH KK | STH 84 to N. Spring Street | Towns of Fredonia, Belgium, Saukville, and Port Washington | 5.1 |
| CTH KW | Sheboygan County line to STH 84 | Towns of Belgium and Port Washington | 9.1 |
| CTH P | USH 141 to Forest Beach Lane | Towns of Belgium and Port Washington | 1.3 |
| CTH W | STH 57 to CTH T, and Highland Road to Milwaukee County line | Town of Grafton and City of Mequon | 7.1 |
| CTH Y | CTH A to STH 33 | Towns of Fredonia and Saukville | 3.5 |
| Belgium Road and its extension | CTH E to STH 57 | Town of Fredonia | 4.1 |
| E. Bridge Street | STH 143 to STH 57 | City of Cedarburg | 0.6 |
| S. County Line Road | Washington County line to STH 57 | City of Mequon | 2.5 |
| Highland Road | Granville Road to Freistadt Road | City of Mequon | 4.9 |
| S. Hilbert Street | E. Spring Street to E. Portland Road | City of Cedarburg | 0.1 |
| Old Port Washington Road | CTH W to S. County line Road | City of Mequon | 0.2 |
| E. Spring Street | STH 57 to S. Hilbert Street | City of Cedarburg | 0.2 |
| N. Spring Street | CTH KK to STH 33 | Town and City of Port Washington | 0.8 |

| Deletions from Federal Aid Secondary System | | | |
|---|---|---|---|
| Route | Limits | Municipality | Number of Miles |
| STH 32 | North-South Freeway to USH 141 | Town and City of Port Washington | 4.3 |
| STH 60 | Washington County line to STH 57 | Town of Cedarburg and Village of Grafton | 5.6 |
| STH 167 | Washington County line to USH 141 | City of Mequon | 7.1 |
| CTH AA | CTH I to STH 84 | Town of Fredonia | 0.7 |
| CTH Q | STH 57 to USH 141 | Village and Town of Grafton | 1.6 |
| Cedar Sauk Road | CTH Y to CTH O | Towns of Saukville and Cedarburg and Village of Saukville | 3.5 |
| Covered Bridge Road | Cedar Sauk Road to STH 143 | Town of Cedarburg | 3.2 |
| Freistadt Road | Washington County line to its western intersection with Granville Road and eastern intersection with Granville Road to Highland Road | City of Mequon and Village of Thiensville | 6.8 |
| E. Portland Road | STH 57 to S. Hilbert Street | City of Cedarburg | 0.3 |

[a] *With enactment of the Federal Aid Highway Act of 1973, it is anticipated that those segments of the Type II (county trunk) arterial highway system within urban and urbanized areas, as those terms are defined by the U. S. Bureau of the Census, recommended above for addition to the federal aid secondary system, will instead be placed on the federal aid urban system along with the recommended Type III (local trunk) arterial highway system.*

*Source: SEWRPC.*

Table 42

ADDITIONS TO AND DELETIONS FROM RECOMMENDED FEDERAL AID SECONDARY SYSTEM IN OZAUKEE COUNTY: 1975-1990

| Additions to Federal Aid Secondary System[a] | | | |
|---|---|---|---|
| Route | Limits | Municipality | Number of Miles |
| Bridge Street | CTH Y to STH 143 | Town and City of Cedarburg | 2.7 |
| S. County Line Road | STH 57 to CTH W | City of Mequon | 1.2 |
| Extension of Granville Road | Highland Road to Granville Road | City of Mequon | 1.0 |
| Lovers Lane Road | CTH A to STH 84 | Towns of Belgium and Port Washington | 1.4 |

| Deletions from Federal Aid Secondary System | | | |
|---|---|---|---|
| Route | Limits | Municipality | Number of Miles |
| Freistadt Road | Western intersection with Granville Road to eastern intersection with Granville Road | City of Mequon | 0.3 |
| Granville Road | Highland Road to Granville Road | City of Mequon | 1.0 |
| Highland Road | Western intersection with Granville Road to eastern intersection with Granville Road | City of Mequon | 0.3 |
| CTH T | CTH Y to STH 57 | Town and City of Cedarburg | 2.6 |

[a]*With enactment of the Federal Aid Highway Act of 1973, it is anticipated that those segments of the Type II (county trunk) arterial highway system within urban and urbanized areas, as those terms are defined by the U. S. Bureau of the Census, recommended above for addition to the federal aid secondary system, will instead be placed on the federal aid urban system along with the recommended Type III (local trunk) arterial highway system.*

*Source: SEWRPC.*

between curbs, traffic control devices, and pavement marking. It is similarly recommended that the state and county assume direct administration of the operational control devices on the state and county trunk highway systems, respectively, as recommended in Chapter VII of this report, namely: issuance of driveway permits, control of advertising signs, maintenance of signals and route signing, establishment of speed zoning, issuance of special permits, and prohibition of parking.

It is further recommended that the State Highway Commission, pursuant to Section 84.25 of the Wisconsin Statutes, review the status of controlled access highways within Ozaukee County and declare all such state trunk highway facilities within the County as are found to meet the statutory requirements and provisions as controlled-access highways. It is similarly recommended that the Ozaukee County Board, pursuant to Section 83.027 of the Wisconsin Statutes, review the status of controlled-access highways within Ozaukee County and declare all such county trunk highway facilities within Ozaukee County as are found to meet the statutory requirements and provisions as controlled-access highways.

Facility Construction and Right-of-Way Acquisition

It has already been noted that the planning and programming procedure developed by the State Highway Commission 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, this planning and programming procedure constitutes an effective current planning and plan implementation program. It is accordingly recommended that the recommended jurisdictional highway system

plan be integrated into the state and county highway construction planning and programming procedures as necessary to meet the staged completion dates recommended in the jurisdictional highway system plan. In order to assist in such integration, the priority list of Type I and Type II highway facility improvement projects set forth in Tables 43 and 44 have been prepared. The list of recommended highway improvements is arranged in order of priority of need, based upon a systems analysis of the existing and probable future traffic demand and on consideration of necessary system continuity, of existing structural condition, and of feasible project limits.

Facility Construction: In connection with facility construction, it is recommended that the State Highway Commission and the Ozaukee County Board adopt common, uniform construction aid formulae and policies providing for a fixed local contribution of 15 percent of the cost of all state and county trunk highway construction projects involving urban cross sections, except interstate highway and other freeway projects, with the cost of the construction project being determined on the basis of the participating work items set forth in Chapter VII of this report, namely: right-of-way acquisition; grading; construction of pavement base and surface and curb and gutter; construction of inlets for surface water drainage, together with connections to storm sewer mains; construction of storm sewer mains necessary for pavement and right-of-way drainage; and engineering services. Interstate highway projects are financed by 90 percent federal and 10 percent state funds. In accordance with the Federal Aid Highway Act of 1970, beginning in fiscal year 1974, federal participation will be increased to 70 percent and local participation decreased to 30 percent of eligible costs on federal aid projects.

Table 43

RECOMMENDED STAGING OF TYPE I (STATE TRUNK) ARTERIAL HIGHWAY SYSTEM IMPROVEMENTS IN OZAUKEE COUNTY: 1971-1990

| Time Period | Highway Facility | Limits | Number of Miles |
|---|---|---|---|
| 1971-1975 | STH 32 | Proposed North-South Freeway to City of Port Washington W. Walters Street to E. Grand Avenue | 1.1 |
| | STH 33 | STH 57 to proposed North-South Freeway | 0.6 |
| | Proposed North-South Freeway | Sheboygan County line to STH 57 | 18.4 |
| | Subtotal | | 19.8 |
| 1976-1980 | STH 33 | Bach Road to STH 57 and USH 141 to STH 32 | 1.5 |
| | STH 57 | E. Spring Street to CTH C and Bridge Street to USH 141 | 5.1 |
| | STH 167 | Washington County line to USH 141 | 7.1 |
| | Proposed Stadium Freeway | Proposed North-South Freeway to Milwaukee County line | 16.6 |
| | Subtotal | | 30.3 |
| 1981-1985 | STH 32 | STH 33 to N. Franklin Street | 0.9 |
| | STH 33 | Proposed North-South Freeway to USH 141 | 1.2 |
| | STH 57 | Bridge Street to E. Spring Street, Freistadt Road to Milwaukee County line, and Sheboygan County line to proposed North-South Freeway | 12.9 |
| | CTH Q | STH 57 to USH 141 | 1.6 |
| | Subtotal | | 16.6 |
| 1986-1990 | STH 33 | Washington County line to Bach Road | 5.7 |
| | STH 57 | CTH C to Freistadt Road | 2.8 |
| | STH 60 | Proposed Stadium Freeway to STH 57 | 3.1 |
| | Subtotal | | 11.6 |

*Source: SEWRPC.*

Table 44

RECOMMENDED STAGING OF TYPE II (COUNTY TRUNK) ARTERIAL HIGHWAY SYSTEM IMPROVEMENTS IN OZAUKEE COUNTY: 1971-1990

| Time Period | Highway Facility | Limits | Number of Miles |
|---|---|---|---|
| 1971-1975 | STH 57 | Village of Saukville | 1.1 |
| | CTH D | Village of Belgium to proposed North-South Freeway | 0.7 |
| | CTH I | Sheboygan County line to STH 84 | 5.5 |
| | CTH O | Cedar Sauk Road to STH 60 | 3.3 |
| | CTH Y | CTH A to STH 143 and STH 60 to CTH C | 9.8 |
| | CTH C | City of Port Washington to USH 141 | 6.0 |
| | Subtotal | | 26.4 |
| 1976-1980 | STH 84 | Washington County line to CTH A | 3.7 |
| | STH 143 | CTH Y to Bridge Street | 4.5 |
| | STH 181 | STH 167 to Milwaukee County line | 2.0 |
| | CTH C | CTH N to Green Bay Road | 1.6 |
| | CTH E | Sheboygan County line to STH 84 | 3.2 |
| | CTH I | STH 33 to Cedar Sauk Road | 2.0 |
| | CTH K | Sheboygan County line to STH 57 | 0.4 |
| | CTH Y | STH 143 to STH 60 | 2.0 |
| | Bridge Street | Proposed Stadium Freeway to STH 143 | 1.0 |
| | Granville Road | CTH C to Highland Road and Freistadt Road to Milwaukee County line | 5.0 |
| | Subtotal | | 25.4 |
| 1981-1985 | CTH B | CTH D to CTH A | 2.0 |
| | CTH C | Green Bay Road to USH 141 | 2.5 |
| | CTH D | STH 57 to CTH KW and proposed North-South Freeway to eastern terminus | 5.3 |
| | CTH I | STH 84 to STH 33 | 5.2 |
| | CTH K | STH 57 to CTH KW | 2.0 |
| | CTH Q | USH 141 to CTH C | 0.7 |
| | Bridge Street | CTH Y to proposed Stadium Freeway | 1.7 |
| | S. County Line Road | Baehr Road to CTH W | 1.7 |
| | Extension of Granville Road | Highland Road to Freistadt Road | 1.0 |
| | Lovers Lane Road | CTH A to STH 84 | 1.4 |
| | Subtotal | | 23.5 |
| 1986-1990 | CTH A | Washington County line to STH 84 | 2.5 |
| | CTH C | CTH Y to CTH N | 2.0 |
| | CTH I | STH 60 to STH 143 | 1.4 |
| | CTH K | CTH KW to USH 141 | 1.0 |
| | CTH KK | USH 141 to N. Spring Street | 0.8 |
| | CTH KW | Village of Belgium | 0.5 |
| | CTH N | STH 143 to CTH C | 2.9 |
| | CTH T | Washington County line to CTH Y | 1.0 |
| | Belgium Road | CTH E to STH 57 | 4.1 |
| | S. County line Road | Washington County line to Baehr Road | 2.0 |
| | N. Spring Street | CTH KK to Woodlawn Street | 0.3 |
| | Wauwatosa Road | Freistadt Road to STH 167 | 1.0 |
| | Subtotal | | 19.5 |
| | Total | | 94.8 |

*Source: SEWRPC.*

Right-of-Way Reservation: A considerable interval necessarily exists between the time a long-range plan for a given highway facility is formally adopted and the time when actual construction of the facility can begin. If maximum economies are to be effected and future disruption to urban development minimized, the conversion of open land to urban use and the redevelopment of land for urban use within required future right-of-way lines must be avoided. This is particularly true in a rapidly urbanizing area such as Ozaukee County, where urban development and redevelopment, if allowed to proceed in the path of needed highway facilities, will not only make the eventual construction of the proposed facilities extremely costly and difficult but will also require expensive and agonizing readjustment of the urban development itself to the ultimate highway development.

It is therefore recommended that prior reservation of right-of-way for the required highway facilities be accomplished in accordance with the recommended jurisdictional highway system plan, utilizing statutory devices made available for this purpose, including official mapping, building setback line ordinances, and land subdivision control ordinances. Such prior reservation of right-of-way serves as an expression of governmental intent to acquire land for highway purposes in advance of actual facility construction and thereby can not only achieve 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 can serve to greatly reduce public misunderstanding of proposed highway improvements and should thereby assist in avoiding and overcoming opposition to the actual construction of the recommended facilities. Such prior reservation of right-of-way also serves to assure that lands needed for future highways will be available when needed at the price of unimproved land. This serves not only to effect great economies, but also to avoid in the future the disruption, dislocation, discontent, and great expense involved in the acquisition and clearance of developed areas for street and highway purposes.

The most effective and efficient means of prior reservation of right-of-way for highway purposes 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, February 1964. It is recommended that, upon adoption of the jurisdictional highway system plan by the Ozaukee County Board and endorsement by the State Highway Commission, the Ozaukee County Board, in cooperation with the three cities, five villages, and six towns within Ozaukee County, adopt a modified "official" map pursuant to Section 80.64 of the Wisconsin Statutes, encompassing all of the recommended Type I (state trunk), Type II (county trunk), and prospective arterial highway facilities shown on the recommended jurisdictional highway system plan and providing for the reservation of at least the right-of-way widths indicated on that plan. Such a County Official Map will serve to establish street and highway widths in excess of the widths in use and likewise to establish the location and width of proposed future arterial streets or highways. It is important to note, however, that to become effective such a County Map must be approved by the governing body of the municipality in which a mapped street or highway or any part thereof is located and, therefore, actually becomes a joint county and city, village, or town map. It is, therefore, recommended that the governing bodies of the three cities, five villages, and six towns within the county approve the County Map once prepared, in accordance with the adopted jurisdictional highway system plan.

It is further recommended, because of the limited powers of such a County Map, that the County Official Map be augmented by the preparation and adoption of local official maps and ordinances,[1] which would include, in addition to the recommended state and county mapped routes, all of the Type III (local trunk) highway facilities and prospective arterials shown on the recommended jurisdictional highway system plan. In accordance with Section 62.23(6) of the Wisconsin Statutes, such official mapping may be supplemented in certain intensely developed areas by the establishment of building setback lines, pursuant to Section 62.23(11) of the Wisconsin Statutes, in order to protect portions of the recommended street and highway rights-of-way.

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[1] *The Towns of Grafton and Port Washington have not assumed village powers pursuant to Section 60.18(12) of the Wisconsin Statutes and, therefore, may not exercise all planning powers relating to villages, in this instance the adoption of an official map.*

It is recommended that the planning agencies of all of the three cities, four villages, and five towns within the county recommend to their respective governing bodies, pursuant to Section 236.45(4) of the Wisconsin Statutes, the adoption of the subdivision regulations similar to those contained in the SEWRPC Model Land Division Ordinance set forth in SEWRPC Planning Guide No. 1, Land Development Guide, November 1963, so as to assure dedication of required rights-of-way for the arterial streets and highways included on the recommended jurisdictional highway system plan. It is further recommended that the respective governing bodies adopt such ordinances or amendments thereto, pursuant to Section 236.45 of the Wisconsin Statutes.

Finally, it is recommended that the plan commissions of the three cities, four villages, and five towns within the county formulate and recommend to their respective governing bodies new zoning ordinances or amendments to their existing ordinances, pursuant to Section 62.23(7) of the Wisconsin Statutes, to provide for traffic, parking, and access restrictions, exclusive highway service districts, sign controls, and conditional use regulations similar to those provided in the SEWRPC Model Zoning Ordinance, as set forth in SEWRPC Planning Guide No. 3, Zoning Guide, April 1964, and apply these provisions properly to the lands abutting the proposed Type I, II, and III arterial subsystems. It is further recommended that their respective governing bodies adopt such ordinances or amendments, pursuant to Section 62.23(7) of the Wisconsin Statutes.

## SUMMARY

This chapter has set forth specific procedures for implementation of the recommended jurisdictional highway system plan. The most important of the recommended plan implementation actions are summarized in the following paragraphs by level of government concerned.

### Federal Level

U. S. Department of Transportation, Federal Highway Administration: It is recommended that the U. S. Department of Transportation, Federal Highway Administration:

1. Acknowledge the recommended jurisdictional highway system plan for Ozaukee County and utilize the plan as a guide in the realignment of the various federal aid systems and in the administration and granting of federal aids for highway improvement within the county.

2. Cooperate in, and approve the adjustment of, the federal aid systems to the recommended jurisdictional highway system plan.

### State Level

Highway Commission of the Wisconsin Department of Transportation, Division of Highways: It is recommended that the State Highway Commission:

1. Endorse and integrate the recommended jurisdictional highway system plan into the state long-range highway system plan.

2. Seek, in cooperation with the Ozaukee County Board, realignment of the state trunk, county trunk, and federal aid systems to the recommended jurisdictional highway system plan.

3. Assume full operational and maintenance responsibilities for all state trunk highways within Ozaukee County.

4. Review the status of controlled-access highways within Ozaukee County and declare all such state trunk highways within Ozaukee County as are found to meet the statutory requirements and provisions as controlled-access highways.

5. Proceed with right-of-way acquisition and facility construction to meet the staged facility completion dates included in the recommended jurisdictional highway system plan.

6. Adopt uniform construction aid formulae and policies for all state trunk highways consistent with similar formulae and policies for all county trunk highways in Ozaukee County.

### Regional Level

Southeastern Wisconsin Regional Planning Commission: It is recommended that the Southeastern Wisconsin Regional Planning Commission act to formally adopt the recommended jurisdictional highway system plan as an integral part of the master plan for the Region, constituting an amendment to the regional transportation plan adopted by the Commission on December 1, 1966.

County Level

Ozaukee County Board: It is recommended that the Ozaukee County Board, having adopted the recommended jurisdictional highway system plan on December 5, 1973, as a guide to future highway facility development within the county:

1. Seek, in cooperation with the State Highway Commission, realignment of the state trunk, county trunk, and federal aid systems to the recommended jurisdictional highway system plan.

2. Assume full operational and maintenance responsibilities for all county trunk highways within Ozaukee County.

3. Abolish the existing county aid highway system and establish a town road improvement fund to provide matching funds for the reconstruction of town roads within Ozaukee County.

4. With the consent of affected cities, villages, and towns proceed to mark and sign the scenic drive system within Ozaukee County.

5. Review the status of controlled-access highways and declare all such county trunk facilities as are found to meet the statutory requirements and provisions as controlled-access highways.

6. Proceed with right-of-way acquisition and facility construction as necessary to meet the staged facility completion dates included in the recommended jurisdictional highway system plan.

7. Adopt uniform construction aid formulae and policies for all county trunk highways consistent with similar formulae and policies for state trunk highways in Ozaukee County.

8. Establish, with the approval of the municipalities as they are affected, a modified "official" map including the proposed Type I (state trunk), Type II (county trunk), and prospective arterial highway facilities.

Local Level

1. It is suggested that, to supplement recommended federal, state, regional, and county plan adoption actions, the three city common councils, five village boards, and six town boards within Ozaukee County act to adopt the recommended jurisdictional highway system plan as a guide to highway system development within their area of jurisdiction. It is further suggested that the respective local planning agencies adopt and integrate the recommended jurisdictional highway system plan into the local master plans and certify such adoption to their local governing body.

2. It is recommended that the three city common councils, five village boards, and six town boards within Ozaukee County act to approve a County Official Map prepared in conformance with the recommended jurisdictional highway system plan and establish local official maps including the proposed local trunk highway facilities.

3. It is recommended that the three city common councils, five village boards, and six town boards within Ozaukee County adopt, pursuant to the recommendation of their local planning agencies, subdivision control ordinances and zoning regulations necessary to assure the integrity of the recommended jurisdictional highway system plan.

In addition, it is recommended that the State Highway Commission and the Ozaukee County Board cooperatively support state legislation to abolish the connecting street concept and assure the full continuity of state and county trunk highway systems through incorporated municipalities.

Chapter IX

# SUMMARY AND CONCLUSIONS

## INTRODUCTION

On December 1, 1966, the Southeastern Wisconsin Regional Planning Commission, pursuant to its statutory responsibilities and after four years of intensive study, adopted a comprehensive regional transportation plan for the seven-county Southeastern Wisconsin Region. On March 17, 1967, in accordance with its advisory role, the Commission certified this plan to the constituent counties, cities, villages, and towns, as well as to certain state and federal agencies, for adoption and implementation. Subsequently, all of the county boards concerned, as well as the State Highway Commission, adopted or endorsed the recommended transportation plan as a guide to the development of transportation facilities within the Region. The Ozaukee County Board of Supervisors adopted the plan on July 31, 1967, after careful consideration and upon the recommendation of the Ozaukee County Highway Committee. Southeastern Wisconsin thus became the first large urbanizing region in the United States to have completed and adopted an official transportation plan in accordance with the spirit and intent of the 1962 Federal Aid Highway Act.

The adopted regional transportation plan contains, as an integral element, a functional arterial street and highway system plan. This functional plan consists of recommendations concerning the general location, type, capacity, and service levels of the arterial street and highway facilities required to serve the rapidly developing Region to the year 1990. Except for freeways, however, the functional plan does not contain recommendations as to which levels and agencies of government should assume responsibility for the construction, operation, and maintenance of each of the various facilities included in the functional plan.

As a logical sequel to the adoption of the regional transportation plan, and as recommended in that plan, the Ozaukee County Board of Supervisors directed that the County Highway Committee, in cooperation with the U. S. Department of Transportation, Federal Highway Administration; the Wisconsin Department of Transportation, Division of Highways; the Southeastern Wisconsin Regional Planning Commission; and the local units of government concerned, proceed with the conversion of the functional highway system plan contained within the adopted regional transportation plan to a jurisdictional plan. This plan would contain specific recommendations as to the level and agency of government which should assume responsibility for the construction, maintenance, and operation of each segment of the total arterial street and highway system within Ozaukee County. Such a plan would also contain concomitant recommendations for the realignment of the federal aid highway systems, as well as of the state and county trunk highway systems, and, if warranted, proposed necessary or desirable changes in the various federal, state, and county highway aid formulae, policies, or programs.

Although implementation of the adopted regional transportation plan was an important reason for proceeding with the jurisdictional highway planning program, other equally important reasons existed. The jurisdictional highway planning effort was also required in order to: cope with the growing traffic demands within Ozaukee County; adjust the existing jurisdictional highway systems to changes in land use development along their alignment; reestablish an integrated county trunk highway system; and adjust the jurisdictional highway systems to better serve the major changes in traffic patterns within the County that have resulted from freeway construction and use.

Accordingly, an interagency study staff, consisting of planning and engineering personnel drawn from the staffs of the Wisconsin Department of Transportation, Division of Highways; and the Southeastern Wisconsin Regional Planning Commission, was organized to carry out the necessary jurisdictional highway planning effort. Because any realignment of the existing jurisdictional highway systems would affect the local units of government within the County in many ways, it was considered essential to involve actively these local units of government in the planning process. This was done by the formation of a Technical Coordinating and Advisory Committee on Jurisdictional Highway Planning, with representation from the U. S. Department of Transportation,

Federal Highway Administration; the Wisconsin Department of Transportation, Divisions of Highways and Planning; the Southeastern Wisconsin Regional Planning Commission; the Ozaukee County Highway Department; the Cities of Cedarburg, Mequon, and Port Washington; and the Town of Cedarburg.

## STUDY PURPOSE AND PLAN OBJECTIVES

The primary purpose of the jurisdictional highway planning study was to identify and subsequently group into subsystems classes of arterial streets and highways serving similar functions and providing similar levels of service and, further, to assign jurisdictional responsibility over the subsystems so established to the appropriate level of government having the greatest basic interest. This was intended to achieve the following objectives:

1. Promote implementation of the adopted regional transportation plan.

2. Provide a sound basis for the efficient multijurisdictional management of the total arterial street and highway system and for the attainment of the necessary intergovernmental coordination in that management.

3. Provide a sound basis for the efficient design and improvement of the total arterial system by combining into subsystems those facilities which, because of the type and level of service provided, should have similar standards for design, construction, operation, and maintenance.

4. Provide a basis for the establishment of a sound, long-range fiscal policy and for the systematic programming of arterial street and highway improvements and thereby to assure the most effective use of the public resources in the provision of highway transportation, focusing the appropriate resources and capabilities in corresponding areas of need.

5. Provide a basis for the more equitable distribution of highway system development costs and revenues among the levels and agencies of government concerned.

## THE JURISDICTIONAL HIGHWAY PLANNING PROCESS

The singularly most important basic concept underlying the jurisdictional highway planning process applied in Ozaukee County was that the jurisdictional highway planning process must be preceded by, and grow out of, a functional highway planning process; that is, that a jurisdictional highway system plan must be based upon, and derived from, a prior functional highway system plan. The development of a sound and viable jurisdictional highway system plan, therefore, can properly proceed only within the context of a comprehensive, areawide transportation planning process which has identified the transportation needs of the entire urbanizing region to a selected design year and which has provided definitive recommendations for meeting those needs through the improvement of both arterial highway and mass transit facilities in the form of a functional transportation plan.

Based upon this basic concept, a seven-step planning process was employed in the development of a jurisdictional highway system plan for Ozaukee County: 1) study design; 2) formulation of objectives and standards; 3) inventory of existing systems, aid formulae, and financial resources; 4) jurisdictional systems analyses; 5) plan design; 6) plan test and evaluation; and 7) plan adoption. One of the most important steps in this process was the formulation of a set of criteria which could be used as a basis for the objective and rational assignment of jurisdictional responsibility to the various facilities comprising the total arterial street and highway system. Functional variations within the total system provided the basis for the establishment of the criteria.

Since three levels of government—state, county, and local—have direct responsibilities for the planning, design, construction, operation, and maintenance of highway facilities within southeastern Wisconsin, criteria were prepared to classify all segments of the total arterial street and highway systems into three subsystems: Type I (state trunk) highway facilities; Type II (county trunk) highway facilities; and Type III (local trunk) highway facilities. The Type I, state trunk, highway facilities include all those routes which are intended to provide the highest level of traffic mobility, that is, the highest speeds and lowest degree of traffic congestion; the minimum degree

of land access service; and which must have regional or interregional system continuity. The Type II, county trunk, highway facilities include all those routes which are intended to provide an intermediate level of traffic mobility, an intermediate level of land access service, and which must have intercommunity system continuity. The Type III, local trunk, highway facilities include all those routes which are intended to provide the lowest level of arterial traffic mobility, the highest degree of arterial land access service, and which must possess intracommunity system continuity. The Type III arterial subsystem was provided only in the urban areas of Ozaukee County, with all arterial facilities in the rural areas being included in either the Type I or Type II arterial subsystems.

The criteria deemed most significant to a functional subclassification of the total arterial system were related to three basic characteristics of the facilities: 1) the trips served, 2) the land uses served, and 3) the operational characteristics of the facilities themselves. Detailed criteria related to each of these basic characteristics were prepared as a part of the jurisdictional highway planning study and have been fully described in Chapter IV of this report.

The criteria were applied to the total arterial street and highway system for Ozaukee County, as proposed in the adopted regional transportation plan, and subsequently refined through a careful review of the arterial network by experienced public works engineers responsible for the design, construction, operation, and maintenance of arterial highway facilities within the County. The application of the criteria required a careful analysis of the trip lengths and traffic volumes to be served by each link in the total arterial system, an inventory of the land uses to be served by each of the jurisdictional subsystems, and an investigation of the operational characteristics of the arterial facilities themselves. This application has been fully described in Chapter V of this report.

## PRESENT STATE OF THE JURISDICTIONAL HIGHWAY SYSTEMS

The study found that, as of January 1, 1969, there were a total of nearly 684 miles of streets and highways open to traffic within Ozaukee County. Of this total, 244 miles, or approximately 36 percent, comprised the functional arterial street and highway network. Responsibility for the design, construction, operation, and maintenance of this arterial street and highway network rested with three levels and 16 units of government—the state, the county, and 14 local municipalities. Approximately 99 miles, or 40 percent, of the arterial network were under state jurisdiction, being comprised of state trunk highways and connecting streets. About 97 miles, or 40 percent, were under county jurisdiction, being comprised of county trunk highways; and about 48 miles, or 20 percent, were under city, village, and town jurisdiction, being comprised of local arterial streets and highways.

Superimposed on the state, county, and local trunk highways were 194 miles of federal aid routes, of which about 68 miles, or 35 percent, were federal aid primary routes and 126 miles, or 65 percent, were federal aid secondary routes.

The location and configuration of these jurisdictional highway systems and supporting aid routes were the result of a long process of historic evolution influenced by many complex political, administrative, financial, and engineering considerations and constraints. The state trunk and county trunk networks were originally conceived by the State Legislature as integrated highway systems and were originally so delineated and mapped. The state trunk highway network, however, was last studied and revised as an integrated system by the State Legislature in 1923; and the county trunk systems, by the State Highway Commission and the Ozaukee County Board in 1931. Many piecemeal additions and deletions have been made to these two jurisdictional highway networks since 1931. Consequently, these two important networks no longer represent fully integrated, continuous, arterial highway systems capable of serving in the most efficient manner possible the areawide land use and traffic service functions originally intended. Moreover, since the federal aid highway networks are intended to assist in implementing the state and county trunk highway systems and, therefore, reflect the pattern of these systems, these federal aid networks were also found to be in need of revision.

It was, therefore, considered most appropriate at this time to study and analyze the jurisdictional highway systems within Ozaukee County and, guided by the functional transportation system plan prepared by the Southeastern Wisconsin Regional Planning Commission, endorsed by the State

Highway Commission, and adopted by the Ozaukee County Board, to recommend changes necessary to reclassify and regroup these networks into complete, fully coordinated, and continuous systems able to meet the present and expected future arterial highway traffic demands within Ozaukee County at an adequate level of service.

## THE RECOMMENDED PLAN

The jurisdictional highway system plan prepared for Ozaukee County provides for three jurisdictional highway systems—Type I, state trunk; Type II, county trunk; and Type III, local trunk—which together comprise the total arterial street and highway system required to serve the growing travel demands within Ozaukee County and its constituent cities, villages, and towns to the plan design year of 1990. Thus, the jurisdictional highway system plan recommends an alignment of governmental responsibility for each of the various facilities comprising the total arterial street and highway system in the design year. The recommended plan also constitutes a refinement of the functional arterial street and highway system plan prepared by the Southeastern Wisconsin Regional Planning Commission and, as such, is intended upon its adoption to constitute a functional, as well as a jurisdictional, highway system plan for Ozaukee County to the plan design year of 1990. As a functional plan, the plan recommends minimum cross sections having right-of-way and pavement widths adequate to serve the forecast traffic demand at a desirable level of service while meeting state and regional transportation system development objectives.

In addition to the recommended jurisdictional highway systems, the plan recommends a system of prospective arterial highways for the purpose of preserving rights-of-way for arterial street and highway facilities which may be needed to meet the future traffic demand beyond the design year of the plan. Finally, the plan recommends the marking and signing of a continuous system of scenic drives located throughout the County connecting and serving state and county parks and sites of scenic, scientific, cultural, and historic interest.

### Type I State Trunk, Highway System

The arterial street and highway system recommended to serve the growing traffic demand within Ozaukee County through the plan design year 1990 totals approximately 319 route-miles of facilities, or about 35 percent of the estimated 912 route-miles of facilities expected to comprise the total street and highway system within the County in 1990. Of this total arterial system, 96.5 route-miles, or about 30 percent, are proposed to comprise the Type I, or state trunk, system, a reduction of 2.2 route-miles over the present system. This Type I system may be expected to carry approximately 67 percent of the arterial travel demand and approximately 61 percent of the total travel demand expected to be generated within Ozaukee County by the year 1990. The Type I system, as recommended, includes all of the committed and proposed freeway facilities within the County, as well as certain important surface arterials, and, as such, comprises the basic framework of the total highway transportation system in the County.

### Type II County Trunk, Highway System

The recommended plan further proposes a Type II, county trunk, highway system consisting of 176.4 route-miles, or an additional 55 percent, of the total arterial mileage required to serve the County in the plan design year of 1990. This Type II system represents an increase of 55.8 route-miles over the present system and is intended to complement the recommended Type I, state trunk, highway system and, together with that system, to include all major arterial facilities having areawide significance. The county trunk highway system may be expected to carry 25 percent of the arterial travel demand and 22 percent of the total travel demand expected to be generated within Ozaukee County by the year 1990.

### Type III Local Trunk, Highway System

Finally, the plan recommends a Type III, or local trunk, highway system consisting of the remaining 46.0 route-miles of arterial facilities, or about 15 percent of the total arterial mileage proposed to serve Ozaukee County in the plan design year 1990. This Type III system, comprising an integral part of the total arterial street and highway system, represents an increase of 5.5 route-miles over the present system and is intended to serve primarily local arterial street and highway needs.

### Prospective Arterial Highways

In addition to the recommended Type I, Type II, and Type III arterial systems, the plan proposes the establishment of a system of prospective arterial highways consisting of 61.5 route-miles of facilities. These prospective arterials, of which about 51.2 miles are currently open to traffic, are intended to serve primarily collector and land access functions through the plan design year

1990. If urbanization continues within Ozaukee County beyond the design year of the plan, these facilities may be expected to have to perform arterial, rather than collector and land access, functions in order to meet the growing traffic demand which would accompany such urbanization. The purpose in designating these facilities is to provide for the control of access on, and the preservation of, adequate rights-of-way for these facilities so that they can, if necessary, in the future be converted to arterials without excessive costs or disruption to community development.

Scenic Drives

In order to meet the existing and anticipated increase in the demand for pleasure driving as a recreational activity, it is recommended that Ozaukee County mark and sign a system of pleasure drives throughout the County. This system of pleasure drives would consist of 100.4 miles of streets and highways, of which all but 0.3 mile are currently open to traffic. About 57.8 miles, or 58 percent of the pleasure drive system, would be routed over arterial highway facilities, and about 42.6 miles, or 42 percent, would be routed over collector and land-access streets and highways. Of the arterial facilities so utilized, 6.6 miles, or 14 percent, would consist of Type I, state trunk, facilities; 32.6 miles, or 69 percent, of Type II, county trunk, facilities; and the remaining 8.1 miles, or 17 percent, of Type III, local trunk, facilities.

## FINANCIAL FEASIBILITY

In order to determine the practicality and acceptability of the recommended jurisdictional highway system plan, a careful analysis was made of the financial feasibility of the plan. Total plan construction and maintenance costs were estimated and compared to anticipate revenues over a 20-year plan implementation period. As a necessary part of this analysis, the existing structure of highway revenues and expenditures was carefully examined and construction and maintenance formulae and policies analyzed. The analysis indicated that the recommended plan is financially feasible. Total plan implementation costs, including construction and maintenance of collector and minor land-access, as well as of arterial, facilities, were estimated at $121 million over the 20-year plan implementation period.

It is extremely difficult to forecast the revenues which may become available for highway purposes over the 20-year plan implementation period. This difficulty is due not only to the length of the forecast period involved and the unpredictable changes which may occur during this period in such important factors affecting highway revenues as the general level of economic activity but also to major changes in the structure of highway aid formulae which will come about upon expiration of the massive interstate highway construction program. Based upon current rates of expenditures for highway purposes within Ozaukee County, anticipated revenues for highway purposes over the plan implementation period were estimated. Comparing these forecast revenues to the estimated $121 million plan cost indicated that local tax effort for highway purposes by cities, villages, and towns would not have to be increased, and that actual reductions in such tax effort could be anticipated. Surplus monies thus raised could be made available for other street and highway purposes, such as mass transit system development, landscaping and beautification programs, safety improvement programs, automated and computerized traffic operation, communication and control systems, lighting, parking, and administrative costs, none of which could, as a practical matter, be included in the plan implementation cost estimates.

It should be noted in this connection that, if the anticipated revenues are to be actually received over the plan implementation period, the federal government will either have to continue to participate in the financing of freeway construction as it has in the past—that is, to the extent of 90 percent of the cost of some new freeways as under the interstate highway construction program—or additional federal aids equivalent to those expended on freeway construction within the County over the recent past will have to be made available and reallocated for the improvement of surface arterials on the federal aid primary and secondary systems.

Although the financial analysis indicates that the plan is feasible, considering the County as a whole, some disparities may exist with respect to the distribution of resources to the individual municipalities comprising the County. These disparities, however, relate primarily to the anticipated costs of, and revenues for, the system and to the nonarterial facilities located within the various municipalities within Ozaukee County.

The financial analysis also carefully explored the effect of the recommended changes in the jurisdictional highway systems on supplemental aids

and allotments, as well as on other construction and maintenance aids, and resulted in the formulation of three major recommended revisions to the aid structure. These three revisions—namely: 1) the abandonment of the connecting street concept; 2) the adoption of common, uniform construction aid formulae and policies for state and county trunk highways; and 3) the revision of the county aid highway system—were recommended in order to meet certain basic objectives of the jurisdictional highway planning effort.

## IMPLEMENTING RECOMMENDATIONS

Specific procedures for implementation of the recommended jurisdictional highway system plan have been set forth in Chapter VIII of this report. The most important of these include formal plan adoption by the Southeastern Wisconsin Regional Planning Commission and endorsement by the Highway Commission of the Wisconsin Division of Highways, the Ozaukee County Board having already adopted the plan at its December 5, 1973 meeting, prior to report publication; realignment of the state trunk, county trunk, and federal aid systems to conform with the recommended jurisdictional highway system plan through the cooperative actions of the Ozaukee County Board, the State Highway Commission, and the U. S. Department of Transportation, Federal Highway Administration; assumption of full operational and maintenance responsibilities by the state for all state trunk highways and by the county for all county trunk highways; integration of the recommended plan into the construction, planning, and programming procedures of both the Highway Commission and the Ozaukee County Highway Department; and adoption of common, uniform construction aid formulae and policies for all state and county trunk highways within Ozaukee County. Additional recommendations include the establishment of an Official Map for the protection of the rights-of-way of all Type I, state trunk, and Type II, county trunk, highway facilities through the cooperative action of the Ozaukee County Board and the governing bodies of the 14 municipalities comprising the County and the establishment of a town road improvement fund by the County Board.

## CONCLUSION

Adoption and implementation of the jurisdictional highway system plan recommended in this report would provide the County with an integrated highway transportation system which will effectively serve the existing, and promote a desirable future, land use pattern, meet the anticipated future travel demand at an adequate level of service, abate traffic congestion, reduce travel time and costs between component parts of the Region, and reduce accident exposure. It would serve to concentrate appropriate resources and capabilities on corresponding areas of need, assuring a more effective use of the total public resources in the provision of highway transportation, and provide a sound basis for the establishment of long-range fiscal policies and for the systematic programming of arterial street and highway improvements within Ozaukee County. It would also provide a basis for the more efficient planning and design of the total arterial street and highway system, for the efficient multijurisdictional management of that system, and for the attainment of intergovernmental coordination necessary to the cooperative development of the system. Finally, it should provide a more equitable distribution of highway improvement, maintenance, and operating costs among the various levels and agencies of government concerned.

# APPENDICES

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Appendix A

## TECHNICAL COORDINATING AND ADVISORY COMMITTEE ON JURISDICTIONAL HIGHWAY PLANNING FOR OZAUKEE COUNTY

| | |
|---|---|
| Sylvester N. Weyker<br>Chairman | County Highway Commissioner, Ozaukee County |
| Kurt W. Bauer<br>Secretary | Executive Director, SEWRPC |
| Russell A. Dimick | City Engineer, City of Cedarburg |
| Arne L. Gausmann | Director, Bureau of Systems Planning, Division of Planning, Wisconsin Department of Transportation |
| Thomas R. Kinsey | District Engineer, District 2, Division of Highways, Wisconsin Department of Transportation |
| Martin J. Monahan | Assistant Planning and Research Engineer, U. S. Department of Transportation, Federal Highway Administration, Madison |
| Herbert H. Peters | Consulting Engineer, Ozaukee County Highway Department |
| Kenneth A. Roell | Town Manager, Town of Cedarburg |
| Donald A. Roensch | Director of Public Works, City of Mequon |
| John H. Sigwart | Director of Public Works, City of Port Washington |

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Appendix B

## DETAILED DATA—OZAUKEE COUNTY JURISDICTIONAL HIGHWAY SYSTEM PLAN

Table B-1

CONSTRUCTION AND MAINTENANCE COST ESTIMATES FOR OZAUKEE COUNTY JURISDICTIONAL HIGHWAY SYSTEM PLAN BY MUNICIPALITY

| Civil Division[a] | Construction Cost Estimates | | | | | Maintenance Cost Estimates | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Arterial | | | Nonarterial | | Arterial | | | Nonarterial | | | |
| | Type I (Nonfreeway) | Type II | Type III | Existing Local, Collector | Subtotal | Type I (Nonfreeway) | Type II | Type III | New Local, Collector[b] | Existing Local, Collector | Subtotal | |
| CITIES | | | | | | | | | | | | |
| Cedarburg | $ 195,800 | $ 434,200 | $ 232,800 | $ 1,184,100 | $ 2,046,900 | $ -- | $ -- | $ 16,200 | $ 334,500 | $ 1,646,400 | $ 1,997,100 | $ 4,044,000 |
| Mequon | 877,400 | 677,400 | 2,024,700 | 2,686,900 | 6,266,400 | -- | -- | 1,986,700 | 5,376,800 | 4,789,800 | 12,153,300 | 18,419,700 |
| Port Washington | 170,100 | 110,900 | 790,200 | 912,500 | 1,983,700 | -- | -- | 57,500 | 48,000 | 1,691,500 | 1,797,000 | 3,780,700 |
| Subtotal | 1,243,300 | 1,222,500 | 3,047,700 | 4,783,500 | 10,297,000 | -- | -- | 2,060,400 | 5,759,300 | 8,127,700 | 15,947,400 | 26,244,400 |
| VILLAGES | | | | | | | | | | | | |
| Belgium | $ -- | $ 43,000 | $ -- | $ 85,200 | $ 128,200 | $ -- | $ -- | $ -- | $ 90,300 | $ 152,400 | $ 242,700 | $ 370,900 |
| Fredonia | -- | 6,100 | -- | 161,000 | 167,100 | -- | -- | -- | 86,100 | 266,700 | 352,800 | 519,900 |
| Grafton | 173,200 | 91,100 | 966,500 | 761,000 | 1,991,800 | -- | -- | 125,100 | 146,800 | 1,234,800 | 1,506,700 | 3,498,500 |
| Saukville | 83,500 | 87,400 | -- | 195,800 | 366,700 | -- | -- | -- | 39,500 | 278,000 | 317,500 | 684,200 |
| Thiensville | 170,200 | -- | 190,800 | 359,900 | 720,900 | -- | -- | 117,100 | -- | 643,500 | 760,600 | 1,481,500 |
| Subtotal | 426,900 | 227,600 | 1,157,300 | 1,562,900 | 3,374,700 | -- | -- | 242,200 | 362,700 | 2,575,400 | 3,180,300 | 6,555,000 |
| TOWNS | | | | | | | | | | | | |
| Belgium | $ -- | $ -- | $ -- | $ 880,400 | $ 880,400 | $ -- | $ -- | $ -- | $ 3,500 | $ 701,600 | $ 705,100 | $ 1,585,500 |
| Cedarburg | -- | -- | -- | 702,000 | 702,000 | -- | -- | -- | 37,400 | 652,800 | 690,200 | 1,392,200 |
| Fredonia | -- | -- | -- | 917,400 | 917,400 | -- | -- | -- | 20,700 | 719,600 | 740,300 | 1,657,700 |
| Grafton | -- | -- | -- | 498,700 | 498,700 | -- | -- | -- | 22,600 | 467,100 | 489,700 | 988,400 |
| Port Washington | -- | -- | -- | 432,200 | 432,200 | -- | -- | -- | 2,700 | 374,500 | 377,200 | 809,400 |
| Saukville | -- | -- | -- | 872,100 | 872,100 | -- | -- | -- | 2,700 | 722,300 | 725,000 | 1,597,100 |
| Subtotal | -- | -- | -- | 4,302,800 | 4,302,800 | -- | -- | -- | 89,600 | 3,637,900 | 3,727,500 | 8,030,300 |
| Ozaukee County | $ -- | $13,180,600 | $ -- | $ -- | $13,180,600 | $ -- | $6,280,500 | $ -- | $ -- | $ -- | $ 6,280,500 | $19,461,100 |
| Total | $1,670,200 | $14,630,700 | $4,205,000 | $10,649,200 | $31,155,100 | $ -- | $6,280,500 | $2,302,600 | $6,211,600 | $14,341,000 | $29,135,700 | $60,290,800 |

[a] *For analysis purposes, it was assumed that the corporate limits of cities and villages would change over the 20-year plan implementation period to include any adjacent planned urban development as recommended in the adopted regional land use plan.*

[b] *Plan implementation costs set forth in Chapter VII of this report assumed that the cost of all new collector streets and local streets would be borne by the developer.*

*Source: SEWRPC.*

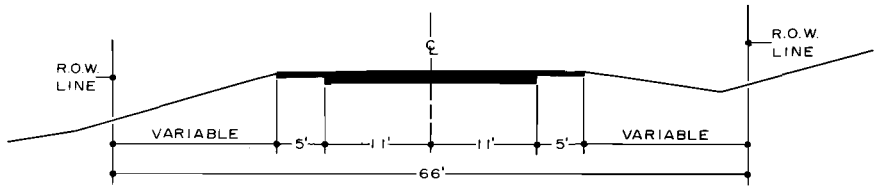
## INTRODUCTION TO FIGURE B-1

## TYPICAL RURAL AND URBAN STREET AND HIGHWAY CROSS SECTIONS

The typical rural and urban street and highway cross sections developed under the Ozaukee County jurisdictional highway system planning program and utilized in the preparation of the Ozaukee County jurisdictional highway system plan are shown in Figure B-1. The cross sections presented include, for two, four, and six moving lanes of traffic, both desirable and minimum configurations of pavement width; curb lawns, medians, shoulders, and sidewalks where appropriate; and the required right-of-way.

Included with each cross section are typical cost estimates, on a per mile basis, for the construction, resurfacing, and annual maintenance of the particular facility involved. In atypical circumstances such as unusual topography or intensive urban development, the typical cross sections presented may require modification during plan implementation to meet detailed design standards and to minimize disruption of the landscape or cityscape. It should be noted that the per mile costs for construction, resurfacing, and annual maintenance are expressed in 1970 dollars and reflect the most recent cost experiences of the Wisconsin Division of Highways in Ozaukee County and in areas of the state similar to Ozaukee County. While these cost estimates thus provide an average project cost for all proposed arterial highway improvements within Ozaukee County, the cost of an individual project during plan implementation should be expected to vary somewhat from the average costs.

RURAL AREA
TYPICAL CROSS SECTION NO. 1
MINIMUM TWO LANE ARTERIAL

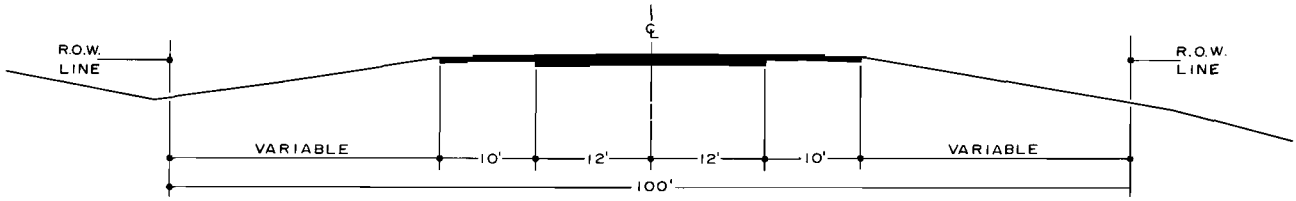



GRAVEL BASE VARIES
22' HIGH TYPE PAVEMENT, 66' R.O.W.
ESTIMATED COST PER MILE:
CONSTRUCTION = $180,000
RESURFACE = $ 20,000
MAINTENANCE = $ 1,300 (ANNUAL)

CAPACITY RANGE:

| LEVEL OF SERVICE | MAXIMUM SERVICE VOLUME |
|---|---|
| B | 4,400 VEH./DAY |
| C | 7,400 VEH./DAY |

RURAL AREA
TYPICAL CROSS SECTION NO. 2
DESIRABLE TWO LANE ARTERIAL

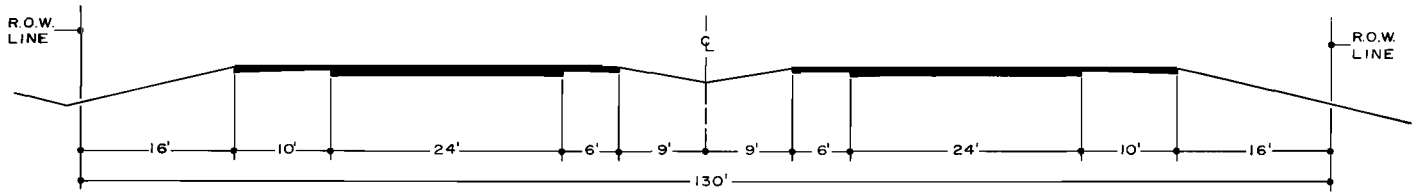



GRAVEL BASE VARIES
24' HIGH TYPE PAVEMENT, 100' R.O.W.
ESTIMATED COST PER MILE:
CONSTRUCTION = $215,000
RESURFACE = $ 24,000
MAINTENANCE = $ 1,500 (ANNUAL)

CAPACITY RANGE:

| LEVEL OF SERVICE | MAXIMUM SERVICE VOLUME |
|---|---|
| B | 5,200 VEH./DAY |
| C | 8,500 VEH./DAY |

RURAL AREA
TYPICAL CROSS SECTION NO. 3
MINIMUM FOUR LANE ARTERIAL

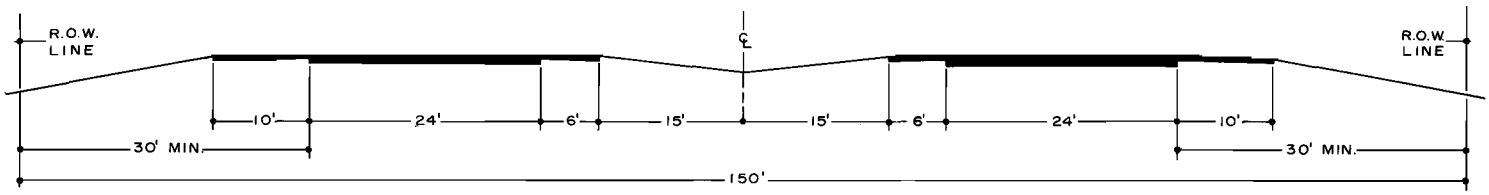



GRAVEL BASE VARIES
DUAL 24' HIGH TYPE PAVEMENT, 130' R.O.W.
ESTIMATED COST PER MILE:
CONSTRUCTION = $570,000
RESURFACE = $ 51,000
MAINTENANCE = $ 2,900 (ANNUAL)

CAPACITY RANGE:

| LEVEL OF SERVICE | MAXIMUM SERVICE VOLUME |
|---|---|
| B | 8,700 VEH./DAY |
| C | 13,400 VEH./DAY |

RURAL AREA
TYPICAL CROSS SECTION NO.4
DESIRABLE FOUR LANE ARTERIAL

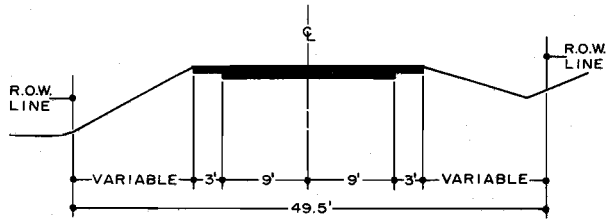



GRAVEL BASE VARIES
DUAL 24' HIGH TYPE PAVEMENT, 150' R.O.W.
ESTIMATED COST PER MILE:
CONSTRUCTION = $580,000
RESURFACE = $ 51,000
MAINTENANCE = $ 3,400 (ANNUAL)

CAPACITY RANGE:

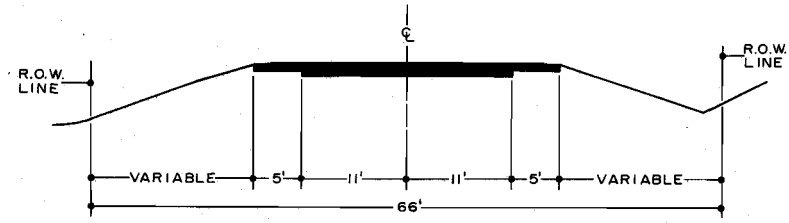
| LEVEL OF SERVICE | MAXIMUM SERVICE VOLUME |
|---|---|
| B | 8,700 VEH./DAY |
| C | 13,400 VEH./DAY |

RURAL AREA
TYPICAL CROSS SECTION NO. 5
MINIMUM TWO LANE
COLLECTOR OR MINOR STREET[a]



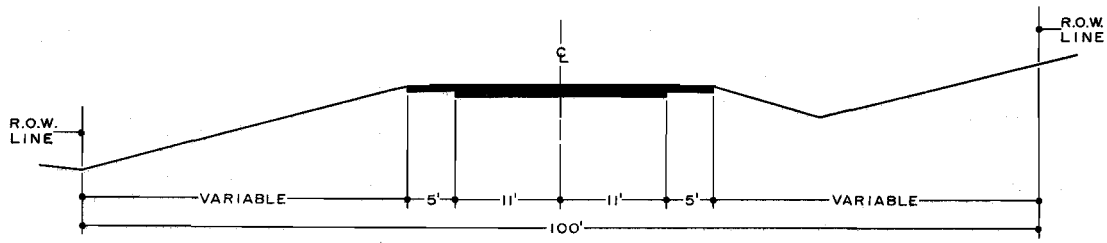

GRAVEL BASE VARIES — 18' BITUMINOUS PAVEMENT — 49.5' R.O.W.

RURAL AREA
TYPICAL CROSS SECTION NO. 6
DESIRABLE TWO LANE
COLLECTOR OR MINOR STREET[b]




GRAVEL BASE VARIES — 22' BITUMINOUS PAVEMENT — 66' R.O.W.

RURAL AREA
TYPICAL CROSS SECTION NO. 7
PROSPECTIVE ARTERIAL

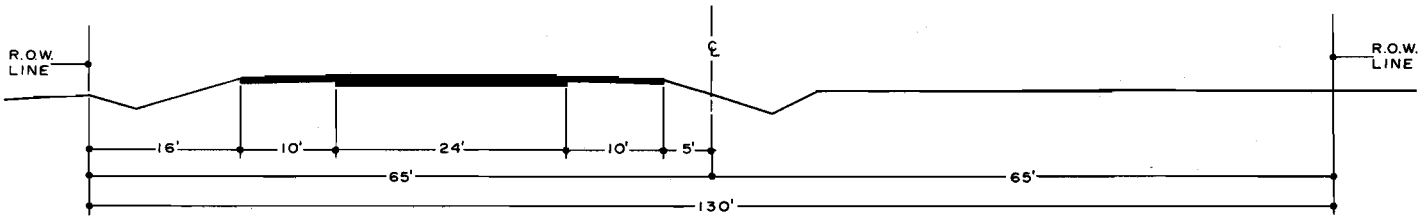



GRAVEL BASE VARIES — 22' BITUMINOUS PAVEMENT — 100' R.O.W.

ESTIMATED COST PER MILE FOR RURAL, NON-ARTERIAL STREETS:
CONSTRUCTION = $180,000 (AVERAGE)
RESURFACE = $ 12,000 (AVERAGE)
MAINTENANCE = $ 800 (ANNUAL AVERAGE)

[a] *Town road standards as established in section 86.26, Wisconsin statutes.*
[b] *Ibid.*

URBANIZING AREA
TYPICAL CROSS SECTION NO. 8
DESIRABLE TWO LANE ARTERIAL



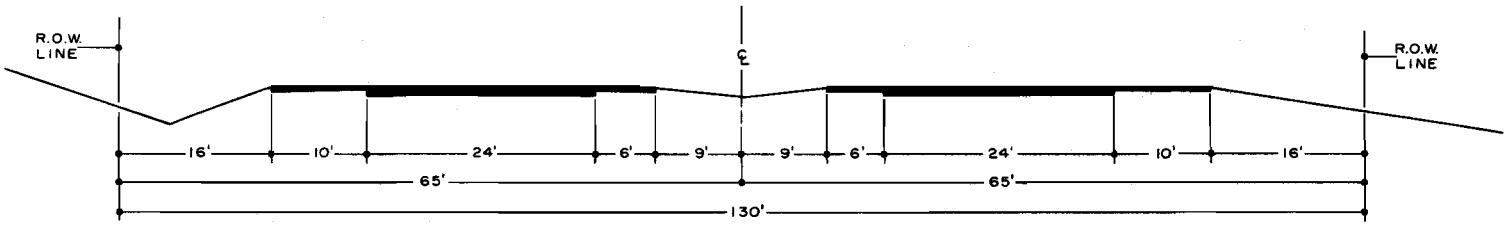

GRAVEL BASE VARIES
24' HIGH TYPE PAVEMENT, 130' R.O.W.

ESTIMATED COST PER MILE:
CONSTRUCTION = $410,000
RESURFACE = $ 26,000
MAINTENANCE = $ 2,000 (ANNUAL)

CAPACITY RANGE:

| LEVEL OF SERVICE | | MAXIMUM SERVICE VOLUME |
|---|---|---|
| RURAL | | |
| | B | 5,200 VEH./DAY |
| | C | 8,500 VEH./DAY |
| URBAN | | |
| | B | 6,100 VEH./DAY |
| | C | 6,800 VEH./DAY |
| | D | 7,400 VEH./DAY |

URBANIZING AREA
TYPICAL CROSS SECTION NO. 9
DESIRABLE FOUR LANE ARTERIAL



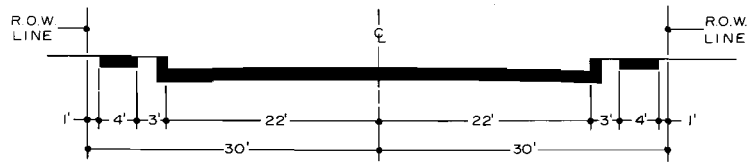

GRAVEL BASE VARIES
DUAL 24' HIGH TYPE PAVEMENT, 130' R.O.W.

ESTIMATED COST PER MILE:
CONSTRUCTION = $630,000
RESURFACE = $ 51,000
MAINTENANCE = $ 5,000 (ANNUAL)

CAPACITY RANGE:

| LEVEL OF SERVICE | | MAXIMUM SERVICE VOLUME |
|---|---|---|
| RURAL | | |
| | B | 8,700 VEH./DAY |
| | C | 13,400 VEH./DAY |
| URBAN | | |
| | B | 11,100 VEH./DAY |
| | C | 12,300 VEH./DAY |
| | D | 13,600 VEH./DAY |

URBAN AREA
TYPICAL CROSS SECTION NO. 10
*MINIMUM* TWO LANE ARTERIAL



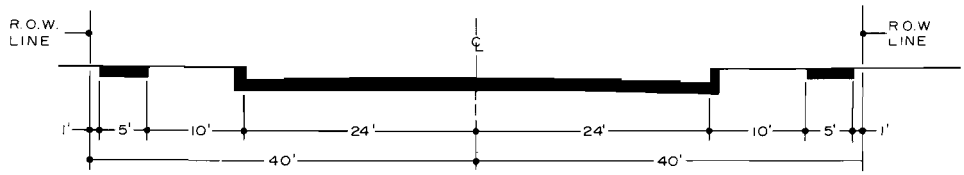

6" GRAVEL BASE
44' HIGH TYPE PAVEMENT, 60' R.O.W.
SIDEWALK, STREET LIGHTING

ESTIMATED COST PER MILE:
CONSTRUCTION = $360,000
RESURFACE = $ 21,700
MAINTENANCE = $ 4,500 (ANNUAL)

CAPACITY RANGE:

| LEVEL OF SERVICE | MAXIMUM SERVICE VOLUME |
|---|---|
| B | 11,300 VEH./DAY |
| C | 11,600 VEH./DAY |
| D | 12,400 VEH./DAY |

URBAN AREA
TYPICAL CROSS SECTION NO. 11
DESIRABLE TWO LANE ARTERIAL



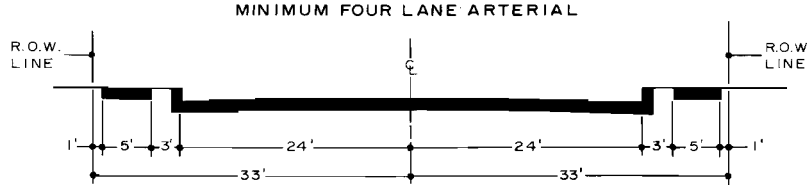

6" GRAVEL BASE
48' HIGH TYPE PAVEMENT, 80' R.O.W.
(ADDITIONAL R.O.W. MAY BE RESERVED IN UNDEVELOPED AREAS)
SIDEWALK, STREET LIGHTING

ESTIMATED COST PER MILE:
CONSTRUCTION = $430,000
RESURFACE = $ 23,800
MAINTENANCE = $ 5,000 (ANNUAL)

CAPACITY RANGE:

| LEVEL OF SERVICE | MAXIMUM SERVICE VOLUME |
|---|---|
| B | 12,300 VEH./DAY |
| C | 12,800 VEH./DAY |
| D | 13,900 VEH./DAY |

URBAN AREA
TYPICAL CROSS SECTION NO. 12
MINIMUM FOUR LANE ARTERIAL



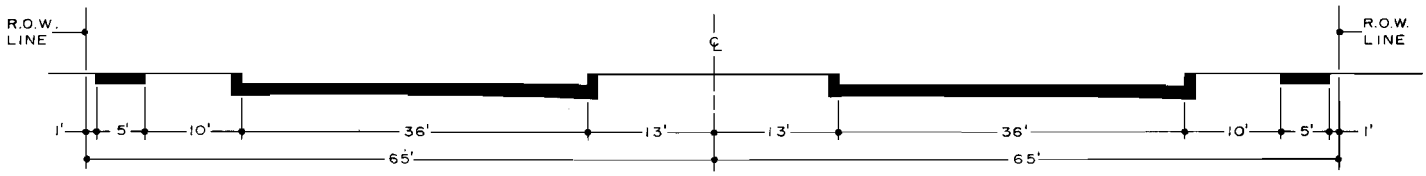

6" GRAVEL BASE
48' HIGH TYPE PAVEMENT, 66' R.O.W.
SIDEWALK, STREET LIGHTING

ESTIMATED COST PER MILE:
CONSTRUCTION = $380,000
RESURFACE = $ 23,800
MAINTENANCE = $ 5,000 (ANNUAL)

CAPACITY RANGE:

| LEVEL OF SERVICE | MAXIMUM SERVICE VOLUME |
|---|---|
| B | 15,700 VEH./DAY |
| C | 17,100 VEH./DAY |
| D | 19,500 VEH./DAY |

URBAN AREA
TYPICAL CROSS SECTION NO. 13
DESIRABLE FOUR LANE ARTERIAL



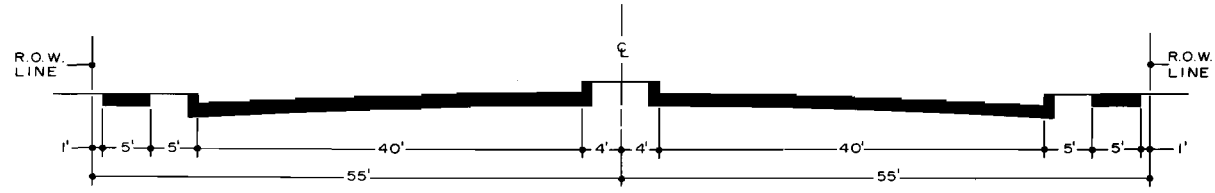

6" GRAVEL BASE
DUAL 36' HIGH TYPE PAVEMENT, 130' R.O.W.
SIDEWALK, STREET LIGHTING

ESTIMATED COST PER MILE:
CONSTRUCTION = $860,000
RESURFACE = $ 35,000
MAINTENANCE = $ 6,800 (ANNUAL)

CAPACITY RANGE:

| LEVEL OF SERVICE | MAXIMUM SERVICE VOLUME |
|---|---|
| B | 18,400 VEH./DAY |
| C | 19,600 VEH./DAY |
| D | 22,500 VEH./DAY |

URBAN AREA
TYPICAL CROSS SECTION NO.14
MINIMUM SIX LANE ARTERIAL



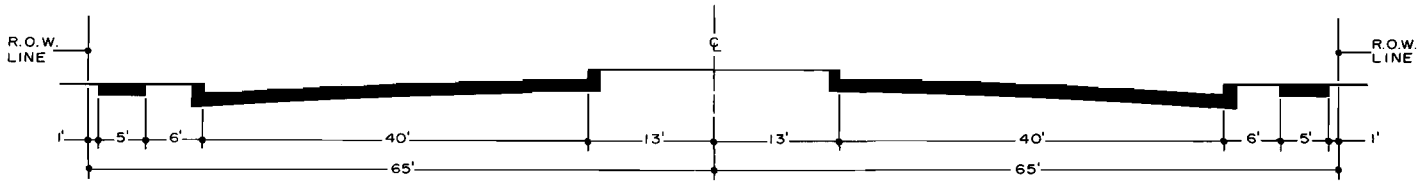

6" GRAVEL BASE
DUAL 40' HIGH TYPE PAVEMENT, 110' R.O.W.
SIDEWALK, STREET LIGHTING

ESTIMATED COST PER MILE:
CONSTRUCTION = $880,000
RESURFACE = $ 38,500
MAINTENANCE = $ 9,000 (ANNUAL)

CAPACITY RANGE:

| LEVEL OF SERVICE | MAXIMUM SERVICE VOLUME |
|---|---|
| B | 27,500 VEH./DAY |
| C | 29,600 VEH./DAY |
| D | 34,600 VEH./DAY |

URBAN AREA
TYPICAL CROSS SECTION NO. 15
DESIRABLE SIX LANE ARTERIAL



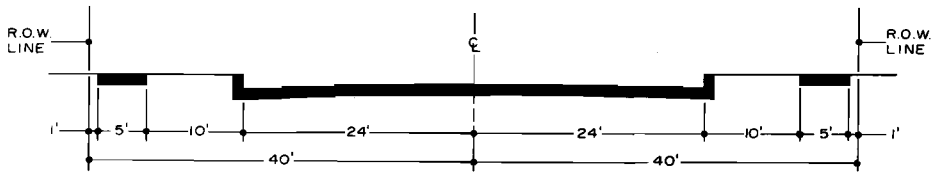

6" GRAVEL BASE
DUAL 40' HIGH TYPE PAVEMENT, 130' R.O.W.
SIDEWALK, STREET LIGHTING

ESTIMATED COST PER MILE:
CONSTRUCTION = $900,000
RESURFACE = $ 38,500
MAINTENANCE = $ 9,000 (ANNUAL)

CAPACITY RANGE:

| LEVEL OF SERVICE | MAXIMUM SERVICE VOLUME |
|---|---|
| B | 27,500 VEH./DAY |
| C | 29,600 VEH./DAY |
| D | 34,600 VEH./DAY |

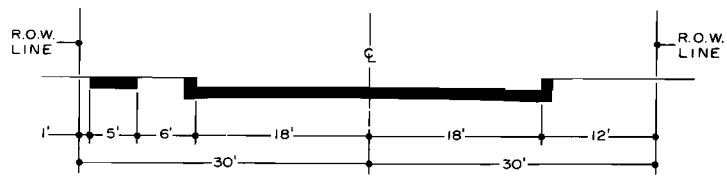
URBAN AREA
TYPICAL CROSS SECTION NO.16
COLLECTOR STREET




6" GRAVEL BASE
48' HIGH TYPE PAVEMENT
80' R.O.W.

ESTIMATED COST PER MILE:
CONSTRUCTION = $250,000
RESURFACE = $ 23,800
MAINTENANCE = $ 4,100 (ANNUAL)

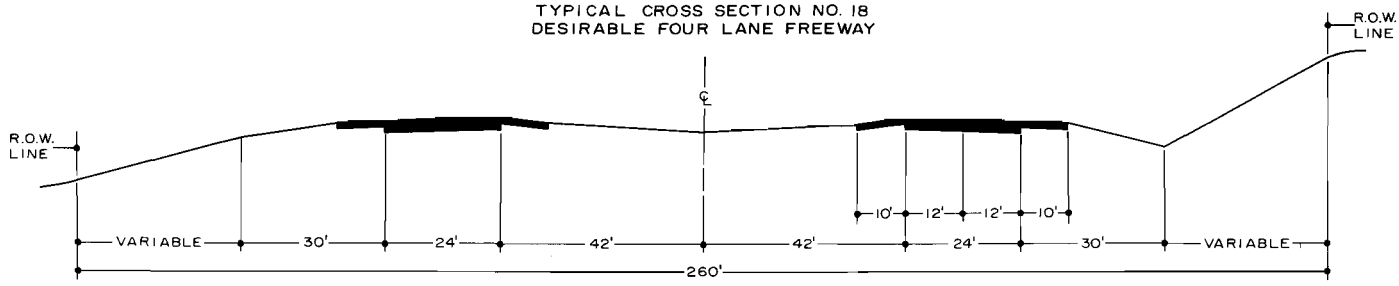
URBAN AREA
TYPICAL CROSS SECTION NO.17
MINOR STREET




6" GRAVEL BASE
36' HIGH TYPE PAVEMENT
60' R.O.W.

ESTIMATED COST PER MILE:
CONSTRUCTION = $ 195,000
RESURFACE = $ 17,900
MAINTENANCE = $ 2,700 (ANNUAL)

RURAL AREA
TYPICAL CROSS SECTION NO. 18
DESIRABLE FOUR LANE FREEWAY



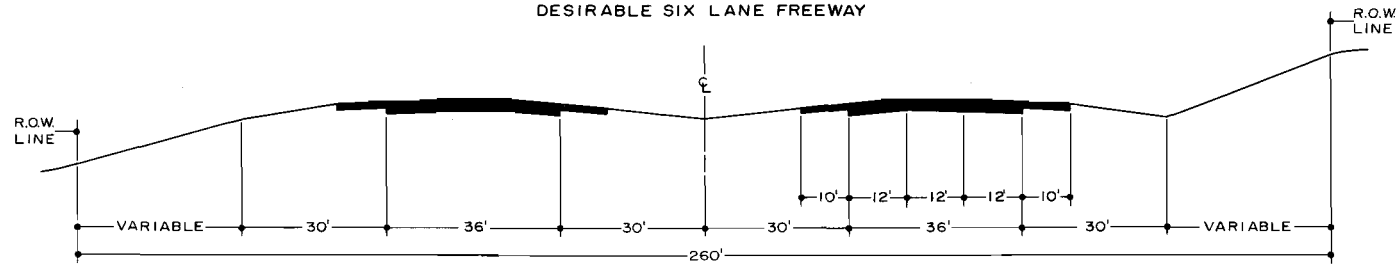

DUAL 24' HIGH TYPE PAVEMENT, 260' R.O.W.

ESTIMATED COST PER MILE:
- CONSTRUCTION = $865,000
- RESURFACE = $ 55,000
- MAINTENANCE = $ 4,100 (ANNUAL)

CAPACITY RANGE:

| LEVEL OF SERVICE | MAXIMUM SERVICE VOLUME |
|---|---|
| A | 19,200 VEH./DAY |
| B | 27,500 VEH./DAY |
| C | 37,500 VEH./DAY |

RURAL AREA
TYPICAL CROSS SECTION NO. 19
DESIRABLE SIX LANE FREEWAY



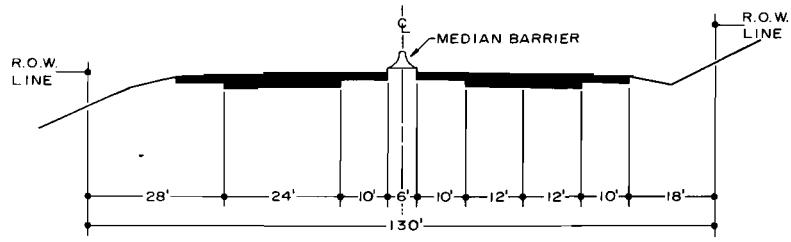

DUAL 36' HIGH TYPE PAVEMENT, 260' R.O.W.

ESTIMATED COST PER MILE:
- CONSTRUCTION = $1,040,000
- RESURFACE = $ 70,000
- MAINTENANCE = $ 5,300 (ANNUAL)

CAPACITY RANGE:

| LEVEL OF SERVICE | MAXIMUM SERVICE VOLUME |
|---|---|
| A | 33,000 VEH./DAY |
| B | 47,800 VEH./DAY |
| C | 60,000 VEH./DAY |

URBAN AREA
TYPICAL CROSS SECTION NO. 20
MINIMUM FOUR LANE FREEWAY



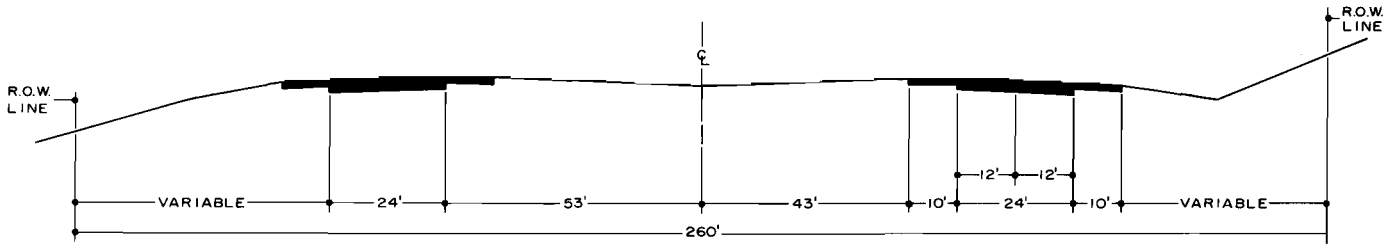

DUAL 24' HIGH TYPE PAVEMENT, 130' R.O.W.

ESTIMATED COST PER MILE:
- CONSTRUCTION = $980,000
- RESURFACE = $ 55,000
- MAINTENANCE = $ 6,600 (ANNUAL)

CAPACITY RANGE:

| LEVEL OF SERVICE | MAXIMUM SERVICE VOLUME |
|---|---|
| B | 37,800 VEH./DAY |
| C | 51,500 VEH./DAY |
| D | 61,900 VEH./DAY |

URBAN AREA
TYPICAL CROSS SECTION NO. 21
DESIRABLE FOUR LANE FREEWAY



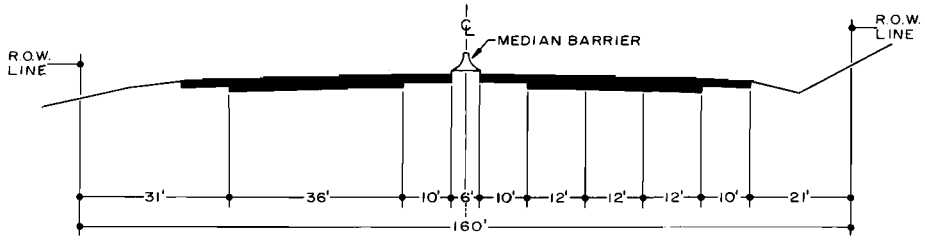

DUAL 24' HIGH TYPE PAVEMENT, 260' R.O.W.

ESTIMATED COST PER MILE:
- CONSTRUCTION = $1,170,000
- RESURFACE = $ 55,000
- MAINTENANCE = $ 12,000 (ANNUAL)

CAPACITY RANGE:

| LEVEL OF SERVICE | MAXIMUM SERVICE VOLUME |
|---|---|
| B | 37,800 VEH./DAY |
| C | 51,500 VEH./DAY |
| D | 61,900 VEH./DAY |

URBAN AREA
TYPICAL CROSS SECTION NO. 22
MINIMUM SIX LANE FREEWAY



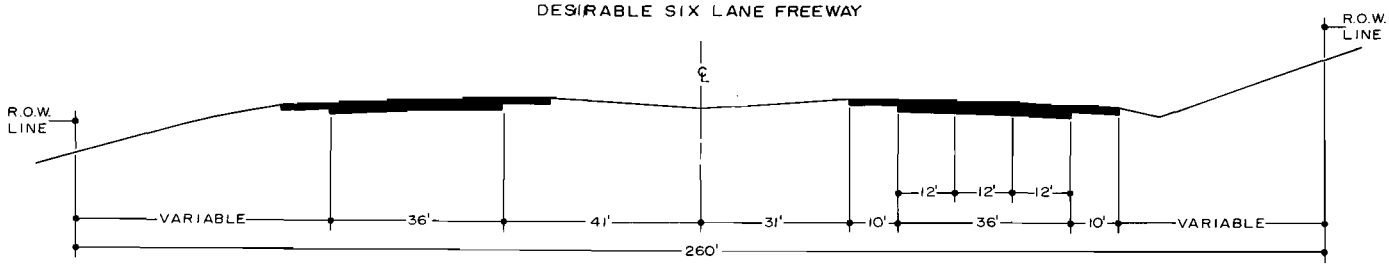

DUAL 36' HIGH TYPE PAVEMENT, 160' R.O.W.

ESTIMATED COST PER MILE:
- CONSTRUCTION = $1,185,000
- RESURFACE = $ 70,000
- MAINTENANCE = $ 7,700 (ANNUAL)

CAPACITY RANGE:

| LEVEL OF SERVICE | MAXIMUM SERVICE VOLUME |
|---|---|
| B | 65,700 VEH./DAY |
| C | 82,500 VEH./DAY |
| D | 92,800 VEH./DAY |

URBAN AREA
TYPICAL CROSS SECTION NO. 23
DESIRABLE SIX LANE FREEWAY




DUAL 36' HIGH TYPE PAVEMENT, 260' R.O.W.

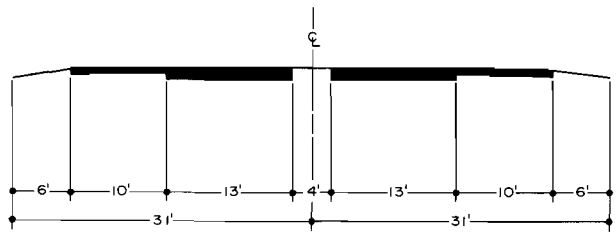
ESTIMATED COST PER MILE:

| | | |
|---|---|---|
| CONSTRUCTION | = $ | 1,365,000 |
| RESURFACE | = $ | 70,000 |
| MAINTENANCE | = $ | 14,000 (ANNUAL) |

CAPACITY RANGE:

| LEVEL OF SERVICE | MAXIMUM SERVICE VOLUME |
|---|---|
| B | 65,700 VEH./DAY |
| C | 82,500 VEH./DAY |
| D | 92,800 VEH./DAY |

TYPICAL CROSS SECTION NO. 24
TRANSITWAY




FOR FUTURE DEVELOPMENT WITHIN FREEWAY MEDIAN

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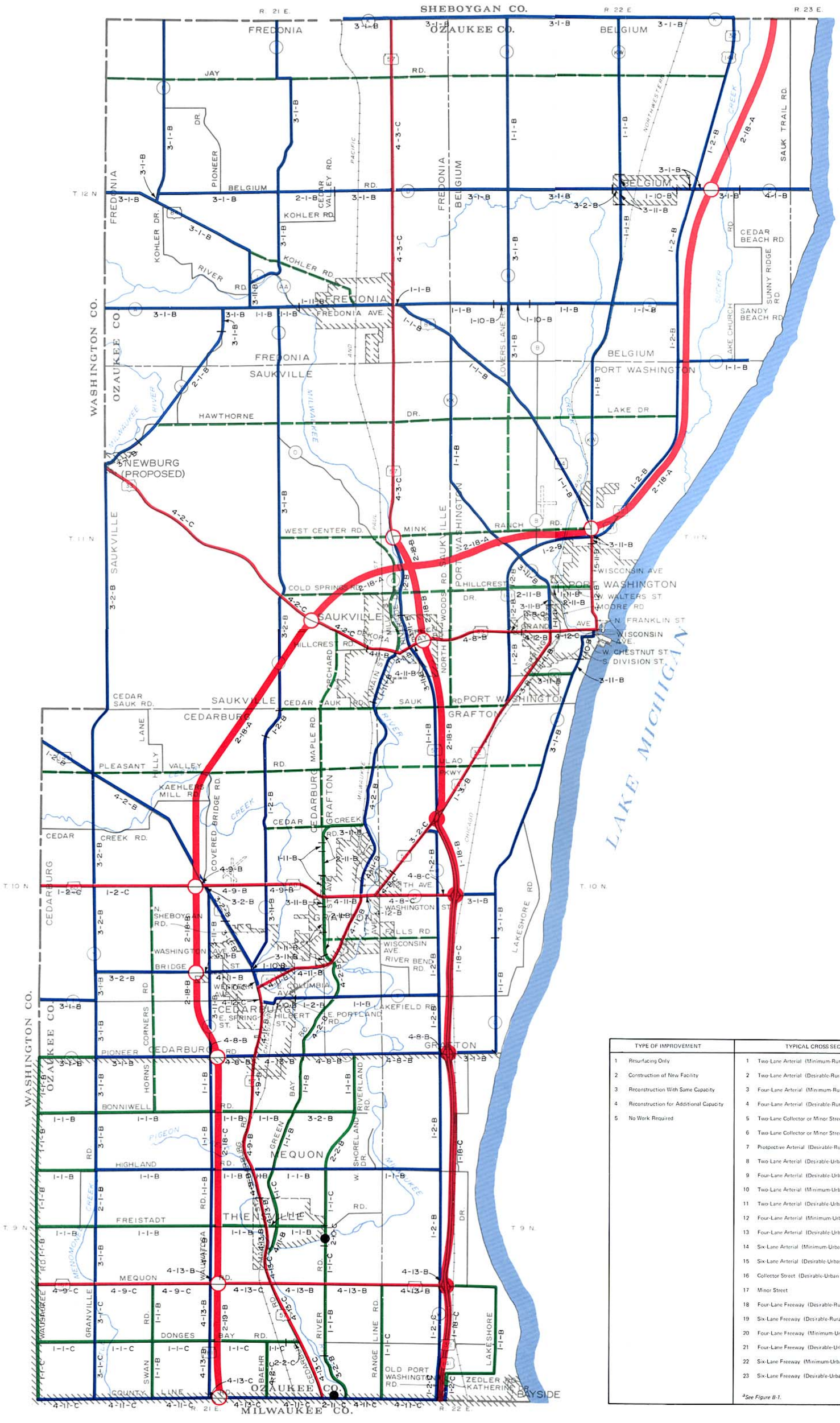
# MAP B-1
# RECOMMENDED JURISDICTIONAL HIGHWAY SYSTEM PLAN FOR OZAUKEE COUNTY — 1990




## LEGEND

JURISDICTIONAL CLASSIFICATION

- TYPE I ARTERIAL (FREEWAY – STATE TRUNK HIGHWAY)
- TYPE I ARTERIAL (STATE TRUNK HIGHWAY)
- TYPE II ARTERIAL (COUNTY TRUNK HIGHWAY)
- TYPE III ARTERIAL (LOCAL TRUNK HIGHWAY)
- PROSPECTIVE ARTERIAL
- EXISTING FREEWAY INTERCHANGE
- PROPOSED FREEWAY INTERCHANGE
- SPECIAL FACILITIES (BRIDGES)

DESIGN CLASSIFICATION

4 – 11 – C
- 4 — TYPE OF IMPROVEMENT
- 11 — TYPICAL CROSS SECTION
- C — LEVEL OF SERVICE

SEE ACCOMPANYING KEY TO NUMBER AND LETTER CODES

NOTE: RECOMMENDED TYPE OF IMPROVEMENT AND LEVEL OF SERVICE CLASSIFICATIONS WERE NOT DEVELOPED FOR PROSPECTIVE ARTERIALS. TYPICAL CROSS-SECTION NUMBER 7 SHOULD BE APPLIED TO ALL PROSPECTIVE ARTERIALS.

**DESIGN CLASSIFICATION CODE KEY**

| TYPE OF IMPROVEMENT | TYPICAL CROSS SECTION[a] | LEVEL OF SERVICE[b] |
|---|---|---|
| 1 Resurfacing Only | 1 Two-Lane Arterial (Minimum-Rural Area) | A Level of Service A describes a condition of free flow, with low volumes and high speeds. Traffic density is low, with speeds controlled by driver desires, speed limits, and physical roadway conditions. There is little or no restriction in maneuverability due to the presence of other vehicles, and drivers can maintain their desired speeds with little or no delay. |
| 2 Construction of New Facility | 2 Two-Lane Arterial (Desirable-Rural Area) | B Level of Service B is in the zone of stable flow, with operating speeds beginning to be restricted somewhat by traffic conditions. Drivers still have reasonable freedom to select their speed and lane of operation. Reductions in speed are not unreasonable, with a low probability of traffic flow being restricted. The lower limit (lowest speed, highest volume) of this level of service has been associated with service volumes used in the design of rural highways. |
| 3 Reconstruction With Same Capacity | 3 Four-Lane Arterial (Minimum-Rural Area) | C Level of Service C is still in the zone of stable flow, but speeds and maneuverability are more closely controlled by the higher volumes. Most of the drivers are restricted in their freedom to select their own speed, change lanes, or pass. A relatively satisfactory operating speed is still obtained, with service volumes perhaps suitable for urban design practice. |
| 4 Reconstruction for Additional Capacity | 4 Four-Lane Arterial (Desirable-Rural Area) | D Level of Service D approaches unstable flow, with tolerable operating speeds being maintained through considerably affected by changes in operating conditions. Fluctuations in volume and temporary restrictions to flow may cause substantial drops in operating speeds. Drivers have little freedom to maneuver, and comfort and convenience are low, but conditions can be tolerated for short periods of time. |
| 5 No Work Required | 5 Two-Lane Collector or Minor Street (Minimum-Rural Area) | E Level of Service E cannot be described by speed alone, but represents operations at even lower operating speeds than in level D, with volumes at or near the capacity of the highway. At capacity, speeds are typically, but not always, in the neighborhood of 30 mph. Flow is unstable, and there may be stoppages of momentary duration. |
| | 6 Two-Lane Collector or Minor Street (Desirable-Rural Area) | F Level of Service F describes forced flow operation at low speeds, where volumes are below capacity. These conditions usually result from queues of vehicles backing up from a restriction downstream. The section under study will be serving as a storage area during parts or all of the peak hour. Speeds are reduced substantially and stoppages may occur for short or long periods of time because of the downstream congestion. In the extreme, both speed and volume can drop to zero. |
| | 7 Prospective Arterial (Desirable-Rural Area) | |
| | 8 Two Lane Arterial (Desirable-Urbanizing Area) | |
| | 9 Four-Lane Arterial (Desirable-Urbanizing Area) | |
| | 10 Two-Lane Arterial (Minimum-Urban Area) | |
| | 11 Two-Lane Arterial (Desirable-Urban Area) | |
| | 12 Four-Lane Arterial (Minimum-Urban Area) | |
| | 13 Four-Lane Arterial (Desirable-Urban Area) | |
| | 14 Six-Lane Arterial (Minimum-Urban Area) | |
| | 15 Six-Lane Arterial (Desirable-Urban Area) | |
| | 16 Collector Street (Desirable-Urban Area) | |
| | 17 Minor Street | |
| | 18 Four-Lane Freeway (Desirable-Rural Area) | |
| | 19 Six-Lane Freeway (Desirable-Rural Area) | |
| | 20 Four-Lane Freeway (Minimum-Urban Area) | |
| | 21 Four-Lane Freeway (Desirable-Urban Area) | |
| | 22 Six-Lane Freeway (Minimum-Urban Area) | |
| | 23 Six-Lane Freeway (Desirable-Urban Area) | |

[a] *See Figure B-1.*

[b] *See Highway Research Board Special Report 87, Highway Capacity Manual 1965, pages 78-81.*

*Source: SEWRPC*

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## Appendix C

# SUGGESTED MODEL RESOLUTION FOR ADOPTION OF THE OZAUKEE COUNTY JURISDICTIONAL HIGHWAY SYSTEM PLAN

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(2) 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; and

WHEREAS, the Southeastern Wisconsin Regional Planning Commission has completed and adopted a regional transportation plan (highway and transit components) at its meeting held on the 1st day of December 1966; and

WHEREAS, the said adopted regional transportation plan recommends as an important plan implementation step that the State Highway Commission of Wisconsin, the Milwaukee County Expressway Commission (now the Milwaukee Expressway and Transportation Commission), and the seven county highway committees, in cooperation with the local units of government within the Region, convert the functional highway plan contained in the adopted regional transportation plan into a jurisdictional plan on a county-by-county basis; and

WHEREAS, the Ozaukee County Board, by resolution dated June 29, 1967, requested the guidance, cooperation, and assistance of the Commission in the preparation of a jurisdictional highway system plan for Ozaukee County; and

WHEREAS, a Technical Coordinating and Advisory Committee for Jurisdictional Highway Planning in Ozaukee County was created to assist in the preparation of such a study, which consisted of knowledgeable and experienced engineers and planners from the U. S. Department of Transportation, Wisconsin Department of Transportation, Ozaukee County, municipalities within Ozaukee County, and the Southeastern Wisconsin Regional Planning Commission; and

WHEREAS, under the guidance of the Technical Coordinating and Advisory Committee for Jurisdictional Highway Planning in Ozaukee County and of a competent interagency staff, all research studies undertaken for the accomplishment of a jurisdictional highway system plan for Ozaukee County have been concluded, including: 1) the preparation and printing of a map setting forth the proposed jurisdictional highway system in Ozaukee County, as projected to the calendar year 1990; and 2) the preparation and publication of SEWRPC Planning Report No. 17, entitled A Jurisdictional Highway System Plan for Ozaukee County, published in December of 1973, which contains specific recommendations as to the level and agency of government which should assume responsibility for the construction, maintenance, and operation of each segment of the total 1990 planned arterial street and highway system within Ozaukee County, and concomitant recommendations for the realignment of the federal aid highway systems and the state and county trunk highway systems, together with descriptive and explanatory matter and other matters intended to comprise a conversion of the functional highway plan for Ozaukee County into a jurisdictional highway plan, said functional plan being a component of the adopted regional transportation plan; and

WHEREAS, the process of converting the adopted functional highway plan for Ozaukee County into a jurisdictional highway system plan has necessarily resulted in refinements to the functional highway plan, such refinements consisting of additions, deletions, and changes to the functional highway system, thus constituting recommended amendments to the adopted functional plan; and

WHEREAS, the Commission has transmitted certified copies of its resolution adopting such jurisdictional highway system plan for Ozaukee County, together with the aforementioned SEWRPC Planning Report No. 17, to the local units of government; and

WHEREAS, the Ozaukee County Board of Supervisors, by resolution dated December 5, 1973, adopted the Ozaukee County jurisdictional highway system plan as set forth in SEWRPC Planning Report No. 17; and

WHEREAS, the (Name of Local Governing Body) did on the _____ day of _____, 19__, approve a resolution adopting the regional transportation plan; and

WHEREAS, the (Name of Local Governing Body) has supported, participated in the financing of, and generally concurred in the regional transportation and other planning programs undertaken by the Southeastern Wisconsin Regional Planning Commission and believes that the Ozaukee County jurisdictional highway system plan as prepared by the Commission in cooperation with other agencies is a valuable guide not only to the development of Ozaukee County but also of the community, and the adoption of such plan by the (Name of Local Governing Body) will assure a common understanding by the several governmental levels and agencies concerned and enable these levels and agencies of government to program the necessary 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 the _____ day of _____, 19__, hereby adopts the Ozaukee County jurisdictional highway system plan previously adopted by the Commission as set forth in SEWRPC Planning Report No. 17, as an amendment to the highway system component of the adopted regional transportation plan and as a guide for community development.

BE IT FURTHER RESOLVED, that the _____ Clerk transmit a certified copy of this resolution to the Southeastern Wisconsin Regional Planning Commission.

_____
(Chairman, President, or Mayor of Local Governing Body)

ATTESTATION:

_____
(Clerk of Local Governing Body)

**TECHNICAL COORDINATING AND ADVISORY COMMITTEE ON JURISDICTIONAL HIGHWAY PLANNING FOR OZAUKEE COUNTY**

Sylvester N. Weyker . . . . . County Highway Commissioner, Ozaukee County
Chairman

Kurt W. Bauer . . . . . .Executive Director, SEWRPC
Secretary

Russell A. Dimick. . . . . City Engineer, City of Cedarburg

Arne L. Gausmann . . . . . .Director, Bureau of Systems Planning, Division of Planning, Wisconsin Department of Transportation

Thomas R. Kinsey . . . . . .District Engineer, District 2, Division of Highways, Wisconsin Department of Transportation

Martin J. Monahan . . . . . Assistant Planning and Research Engineer, U. S. Department of Transportation, *Federal Highway Administration, Madison*

Herbert H. Peters . . . . . Consulting Engineer, Ozaukee County Highway Department

Kenneth A. Roell . . . . . .Town Manager, Town of Cedarburg

Donald A. Roensch . . . . . Director of Public Works, City of Mequon

John H. Sigwart . . . . . .Director of Public Works, City of Port Washington

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**OZAUKEE COUNTY JURISDICTIONAL HIGHWAY STUDY**

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