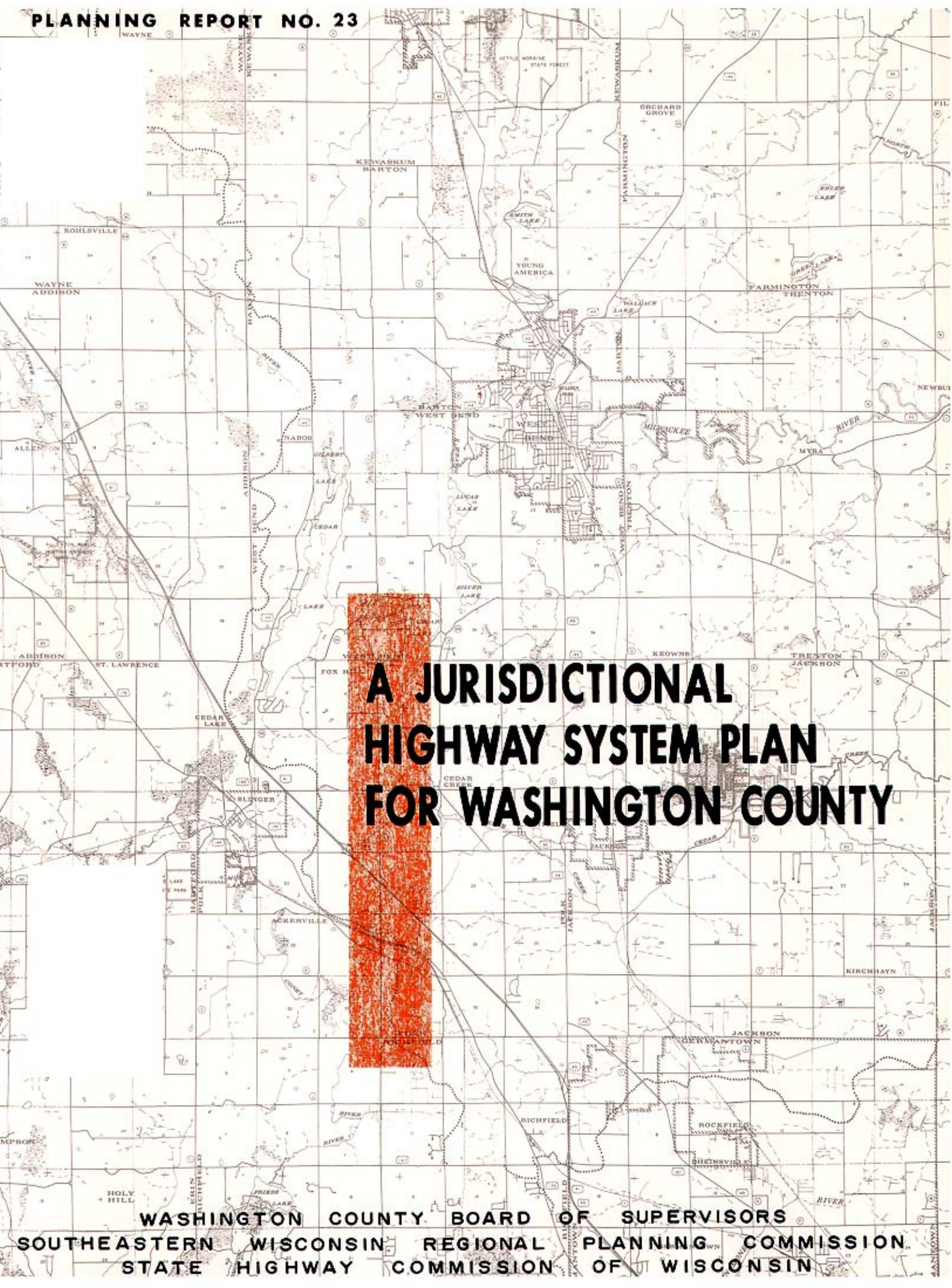
PLANNING REPORT NO. 23



A JURISDICTIONAL HIGHWAY SYSTEM PLAN FOR WASHINGTON COUNTY

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PLANNING REPORT
NUMBER 23

A JURISDICTIONAL HIGHWAY SYSTEM PLAN FOR WASHINGTON COUNTY

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

Southeastern Wisconsin Regional Planning Commission
Continuing Regional Land Use-Transportation Study
P. O. Box 769
Old Courthouse
916 N. East Avenue
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 Washington County.

October 1974

Inside Region $ 5.00
Outside Region $10.00

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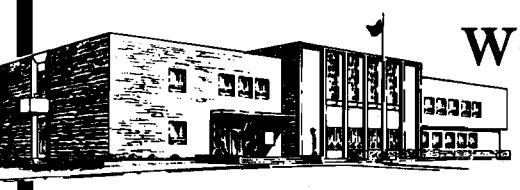

Washington County

432 E. WASHINGTON, WEST BEND, WISCONSIN 53095

October 14, 1974

To: Washington County Board of Supervisors
Southeastern Wisconsin Regional Planning Commission
State Highway Commission of Wisconsin

The Washington County Board of Supervisors on June 9, 1970, directed that a comprehensive study be made of the jurisdictional responsibility for the construction, maintenance, and operation of arterial streets and highways in Washington 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 and Intergovernmental Coordinating and Advisory Committee was formed to assist and advise the interagency staff, with membership from the U. S. Department of Transportation, the Wisconsin Department of Transportation, and the Regional Planning Commission, as well as representatives of local units of government and interested citizens from throughout the County.

This report contains the findings and recommendations of more than a year of intensive study by the interagency staff and the Technical and Intergovernmental 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 Washington 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 and Intergovernmental Coordinating and Advisory Committee. Adoption and implementation of the recommended plan 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 Washington County.

The report and plan are hereby respectfully submitted for your careful consideration and, hopefully, adoption. Favorable action on the report and plan is respectfully urged by the interagency staff and by the Technical and Intergovernmental Coordinating and Advisory Committee.

Respectfully submitted,

Lloyd Jacklin

Lloyd Jacklin, Chairman
Technical and Intergovernmental Coordinating and
Advisory Committee on Jurisdictional Highway Planning
for Washington 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 August 15, 1967, after careful consideration and upon the recommendation of the Washington County Highway Committee, the Washington 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 Washington County Board of Supervisors, on June 9, 1970, 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 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 these is the fact that the location and extent of the state and county trunk highway systems in Washington County, as well as the related federal aid highway systems, are becoming 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 Washington County and the Region, of which Washington 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, Washington

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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 Washington County.*

County can expect to continue to experience residential, commercial, and industrial growth in the next two decades, and this growth will be accompanied by greater increases in motor vehicle registrations and in the demand for improved highway transportation facilities. Moreover, the changing land use pattern has brought about, and will continue to bring about, important changes in the manner in which the highway system is affected by increased traffic demand so that the existing jurisdictional highway systems may 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 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 the developed areas of Washington County, those streets and highways which carried the heaviest volumes of traffic have tended to attract "strip" commercial land use development. Thus, in some cases 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, at least in certain areas of 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 of the Region, they do exist in Washington 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 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 deletions from the county trunk highway system which have resulted in a fragmentation of the system as land has been converted from rural to urban use and concomitantly incorporated. This fragmentation has complicated construction, operation, and maintenance of the system and has destroyed the necessary system continuity.

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 Washington 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 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 Washington County.

STUDY ORGANIZATION

Staff Requirements

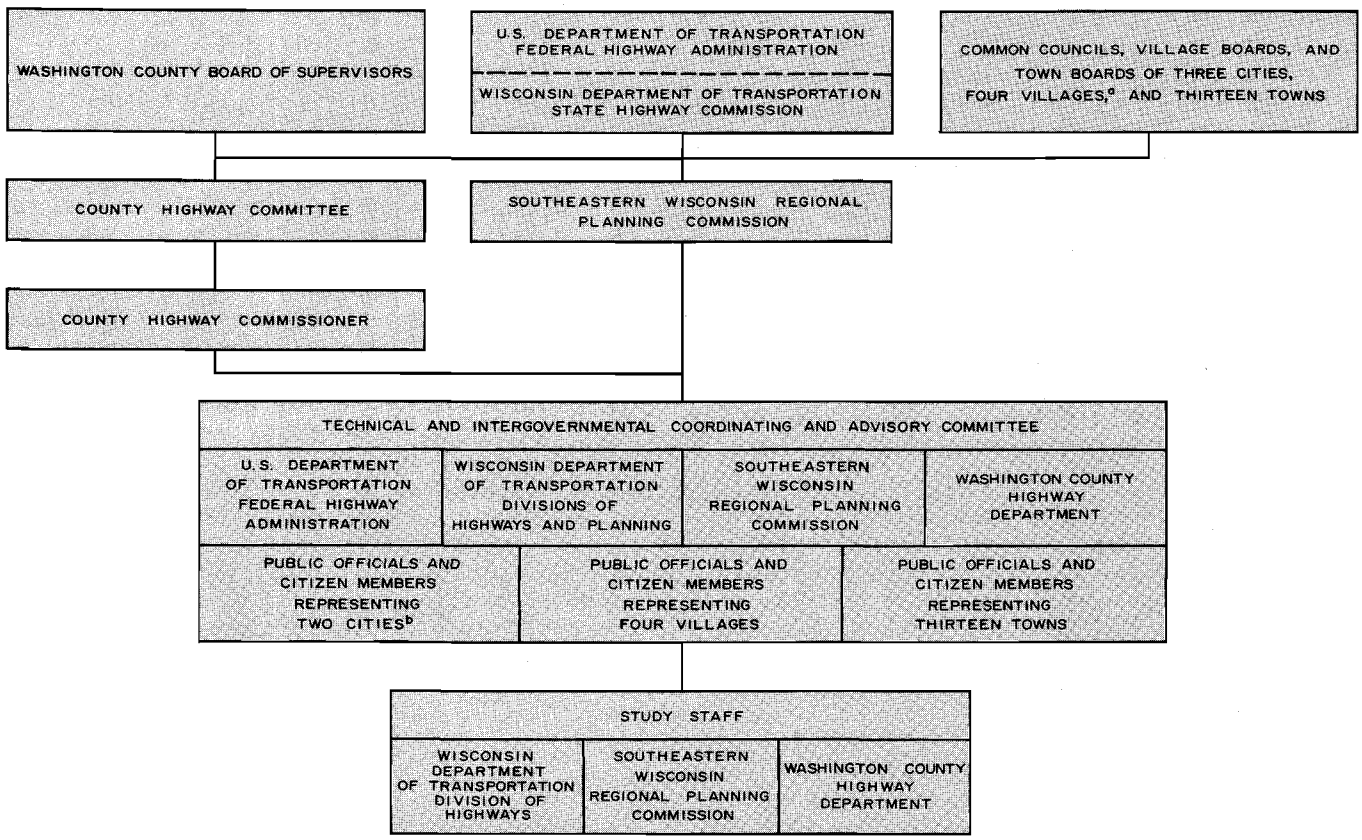
The organization created for the necessary jurisdictional highway planning study is shown in Figure 1. Since the necessary jurisdictional highway planning effort was preceded by an intensive, comprehensive, areawide functional highway planning study, a large staff was not required to carry out the effort. 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 county as well as from the federal and state levels. The

Figure 1

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



[a] AS OF JANUARY 1, 1973, THE BASE DATE OF THE STUDY, THE VILLAGE OF NEWBURG WAS NOT YET INCORPORATED.

[b] THE CITY OF MILWAUKEE IS NOT REPRESENTED ON THE COMMITTEE BECAUSE OF THE VERY SMALL AREA OF THE CITY WITHIN WASHINGTON COUNTY.

Source: SEWRPC.

Washington County Board of Supervisors determined that a similar arrangement for the jurisdictional highway planning effort would be considered desirable and that the technical and, in addition, policy-making local officials should be represented on the advisory committee. A Technical and Intergovernmental 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 preparations 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 Wisconsin Department of Transportation, Division of Highways; the Southeastern Wisconsin Regional Planning Commission; the Washington County Highway Department; and two of the three cities, all of the four villages, and all of the 13 townships comprising Washington County.

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 multijurisdictional 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 maintenanee.

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; thereby assuring 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 and Intergovernmental Coordinating and Advisory Committee on Jurisdictional Highway Planning for Washington County established for the study. The report briefly traces the historic development of the present state trunk, county trunk, 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 are advanced for the revision of these formulae, and the financial feasibility of the recommended plan is determined and documented. Finally, means for implementation of the study findings are provided, together with recommended staging of major improvements.

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 Washington County, which is an integral 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 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.

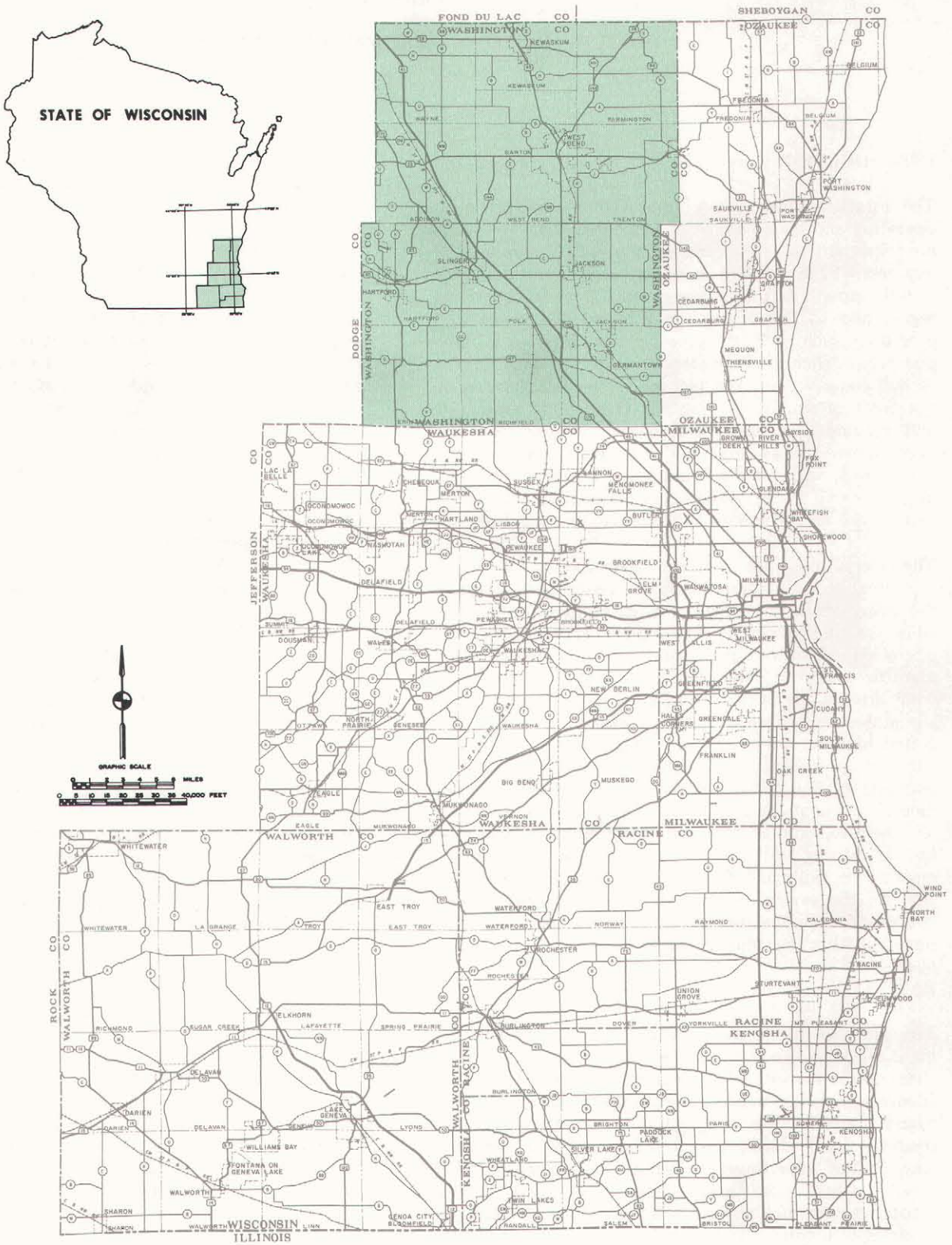
The functional arterial street and highway system established in the initial regional land use-transportation study effort for the Southeastern Wisconsin Region accordingly became the point of departure for the preparation of the jurisdictional highway system plan within Washington County. The jurisdictional 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

Map 1

LOCATION OF WASHINGTON COUNTY WITHIN THE SOUTHEASTERN WISCONSIN REGION



Washington County comprises about 16 percent of the total area of the seven-county Southeastern Wisconsin Region, contains about 4 percent of the Region's population, employs about 3 percent of its labor force, and contains about 5 percent of its tangible wealth. The county, which has been a rich agricultural and recreational resource within the Region, is beginning to experience the pressures of urban development, and with the completion of USH 41 and USH 45 in the future linking the county to the Milwaukee urbanized area. This pressure may be expected to increase.

Source: SEWRPC.

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.[1] 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.

Functional Classification Criteria

In the delineations 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 county are still rural in nature, with such urban development as exists occurring primarily in and around the relatively small urban communities located throughout the county.

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 urban communities containing commercial, industrial, institutional, recreational, and residential development, and between farmsteads and such communities. In rural areas, however, the arterial facilities must also be located to promote the economic viability 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 spaced no closer than two miles apart.

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[1] *A freeway may be defined as a divided arterial highway with full control of access and grade separations at all intersections. An expressway may be defined as a divided arterial highway with full or partial control of access and grade separations at some, but not necessarily all, intersections. A parkway may be defined as an arterial highway provided for noncommercial traffic with full or partial control of access and usually located within a ribbon of park-like development. Standard arterial streets and highways may be defined as arterials with intersections at grade with no control of access, i.e., with direct access to abutting property.*

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[2] urban development—one-half mile spacing.

2. Medium-density[3] urban development—one-mile spacing.

3. Low-density[4] 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 become 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 and Rustic Roads

A third highway system facility category is the system of scenic drives, normally not considered in the jurisdictional highway planning process, but considered as both a special functional and jurisdictional classification under the Washington County jurisdictional highway planning program, made up of scenic drives and rustic roads. 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 geological interests and areas containing sites of scientific, cultural, or historic interest. Rustic roads are segments of the overall system of scenic drives and for the purposes of this report, a rustic road is defined as a low speed, low volume local access road with outstanding natural features along its borders, including native trees, shrubs, wild flowers, grass, and ferns, as well as open areas with rustic or natural vistas. 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, and though the rustic roads function only as low speed, low volume local access roads, the areawide nature of the recreational travel demand served by the scenic drive and rustic road facilities during seasonal weekend and holiday periods dictates that these facilities 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 and rustic road segments through proper marking and signing, and the need to relate such roads properly to the natural resource base all indicate the need for a special functional and jurisdictional classification relating to such roads. Consequently, an existing and proposed scenic drives and rustic road segments within Washington County were identified as a special functional category and assigned a jurisdictional classification as a part of the Washington 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 Washington 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 Washington 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 originally 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

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[2]*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).*

[3]*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).*

[4]*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).*

much emphasis upon the functions actually being performed 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 Washington County were made. The net result was the addition of about 14 miles of facilities to 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 Washington 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 Washington 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 and Intergovernmental Coordinating and Advisory Committee necessary to assist in the conduct of the study and in the provision of technical policy guidance; and provided for the documentation of the study results in detailed staff memoranda, the minutes of the Technical and Intergovernmental 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[5] 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

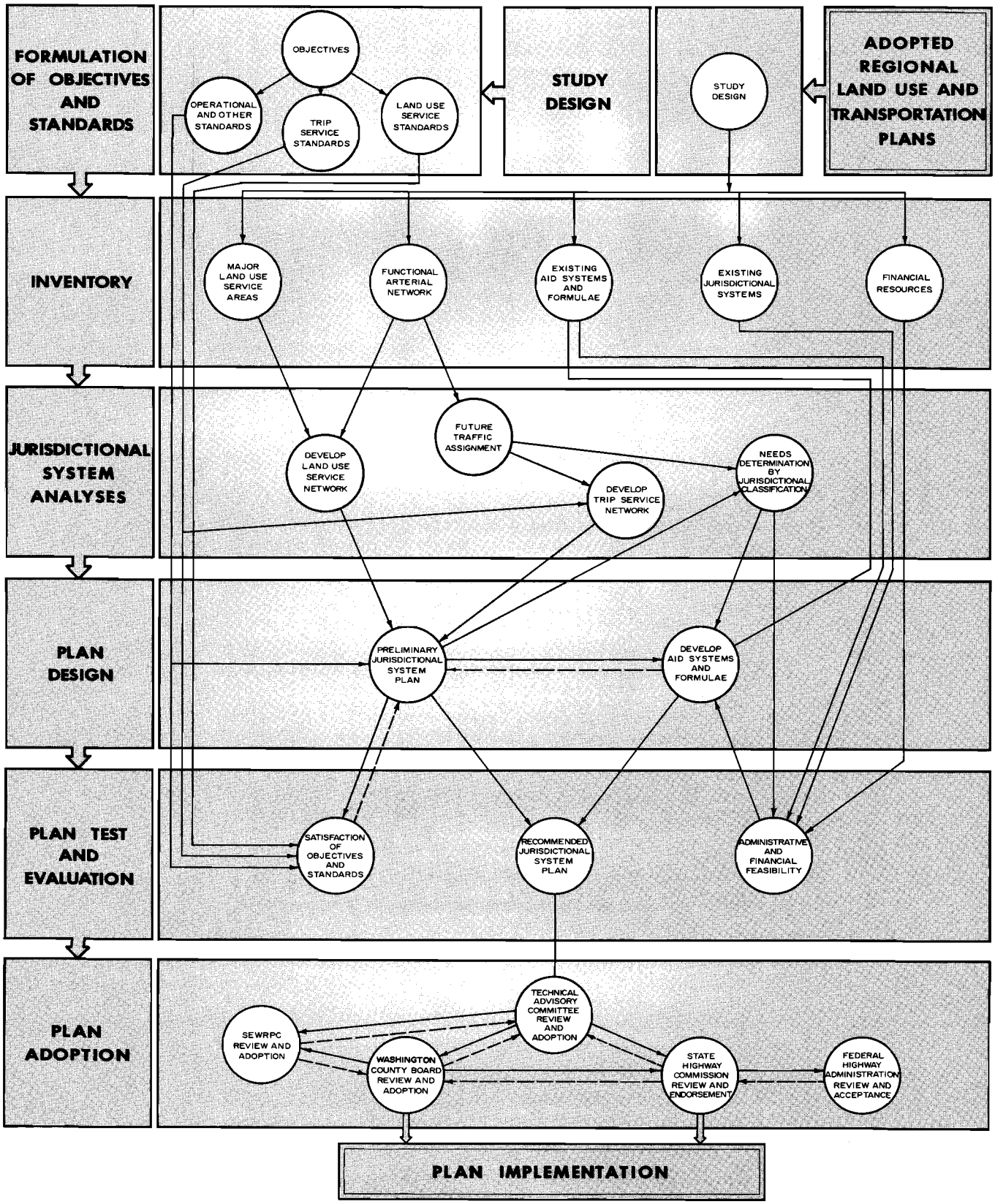
Reliable data collected on a uniform, areawide basis are absolutely essential to the formulation of workable development plans. Consequently, inventory becomes the first operational step in any planning process, growing out of the study design. The crucial nature of factual information in the planning 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 Washington 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

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

Figure 2

THE JURISDICTIONAL HIGHWAY PLANNING PROCESS FOR WASHINGTON COUNTY



Source: SEWRPC.

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 Washington County was 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.

Jurisdictional Systems Analysis

Inventories provide factual information about the existing state of the system being planned, but analysis 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 Washington 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.

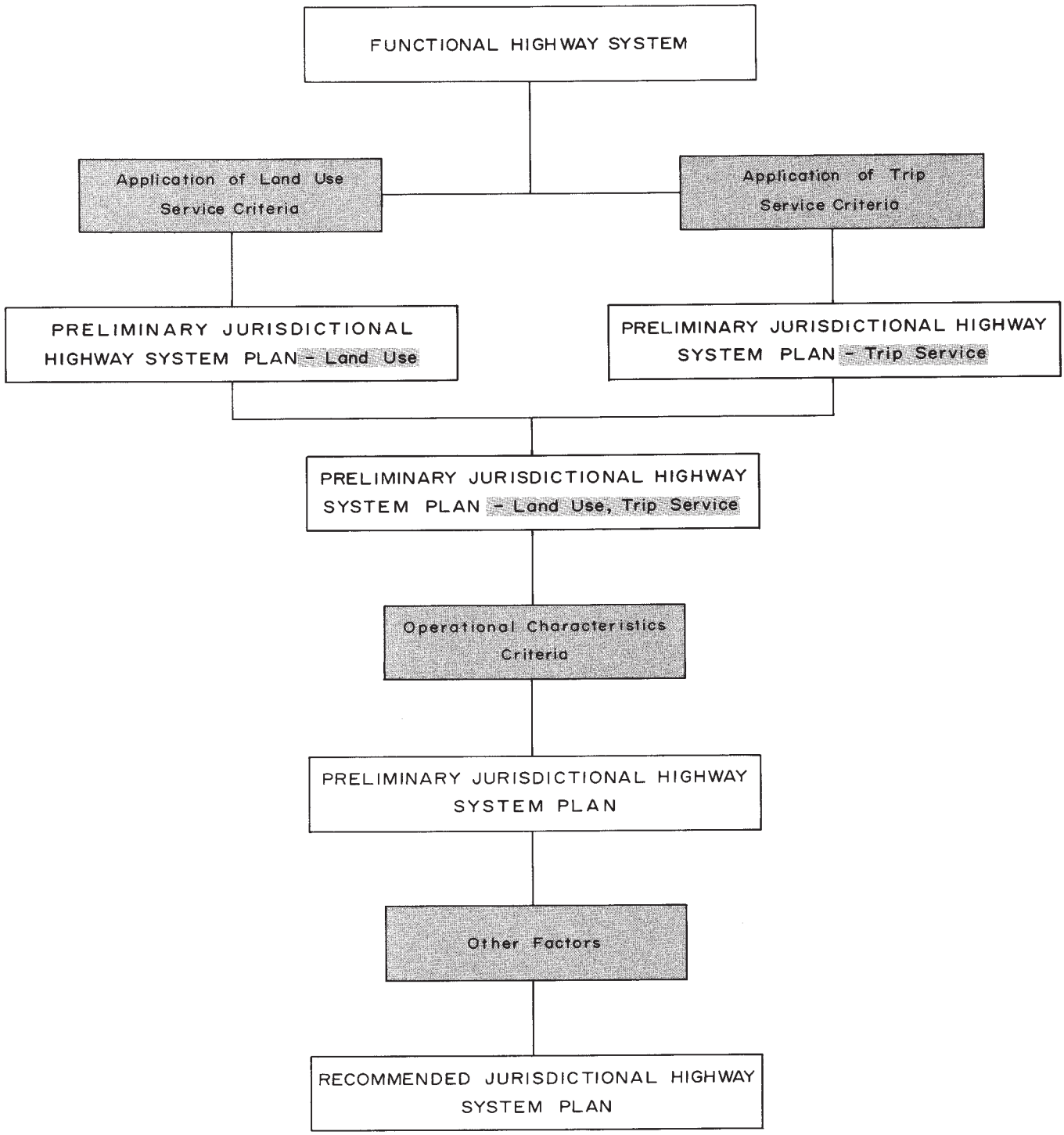
In order to overcome the limitations of individual intuitive grasp of the design problem, maximum resort was made to team effort in the actual plan synthesis; and the knowledge and experience of federal, state, and local highway engineers familiar with the geographic and functional areas concerned were applied to the plan synthesis process through careful Technical and Intergovernmental Coordinating and 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 and Intergovernmental 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 these 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 comprehensible 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 maintenance 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.

Figure 3

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



Source: SEWRPC.

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 Washington County Board of Supervisors, the Highway Commission of the Wisconsin Department of Transportation, and the U. S. Department of Transportation, 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.

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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 military road that traversed Washington County. This road connected Dekorra, located on the Wisconsin River, with Sauk Harbor, which is now Port Washington, by way of West Bend. Its route consisted of portions of the present alignments of CTH MY, Wallace Lake Road, STH 144, STH 33, STH 175, and Ohio Road.

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 territorial, and later state, roads that traversed Washington County linking West Bend to Cedarburg, Merton to Mayville, Milwaukee to Fond du Lac, and Hustisford to Milwaukee. As shown on Map 3, the West Bend-Cedarburg road, the single state road in Washington County, was located along portions of the present alignments of STH 143, CTH M, Paradise Drive, CTH I, and Decorah Road. The Merton-Mayville road was routed along portions of the present alignments of CTH K, Dublin Drive, STH 83, and STH 175; the Milwaukee-Fond du Lac road followed portions of the present alignments of STH 145, STH 167, and USH 45; and the Hustisford-Milwaukee road followed portions of what are presently CTH Q, Clare Road, and Roosevelt Drive.

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.

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 steam railroad in the late 1800s 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 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:

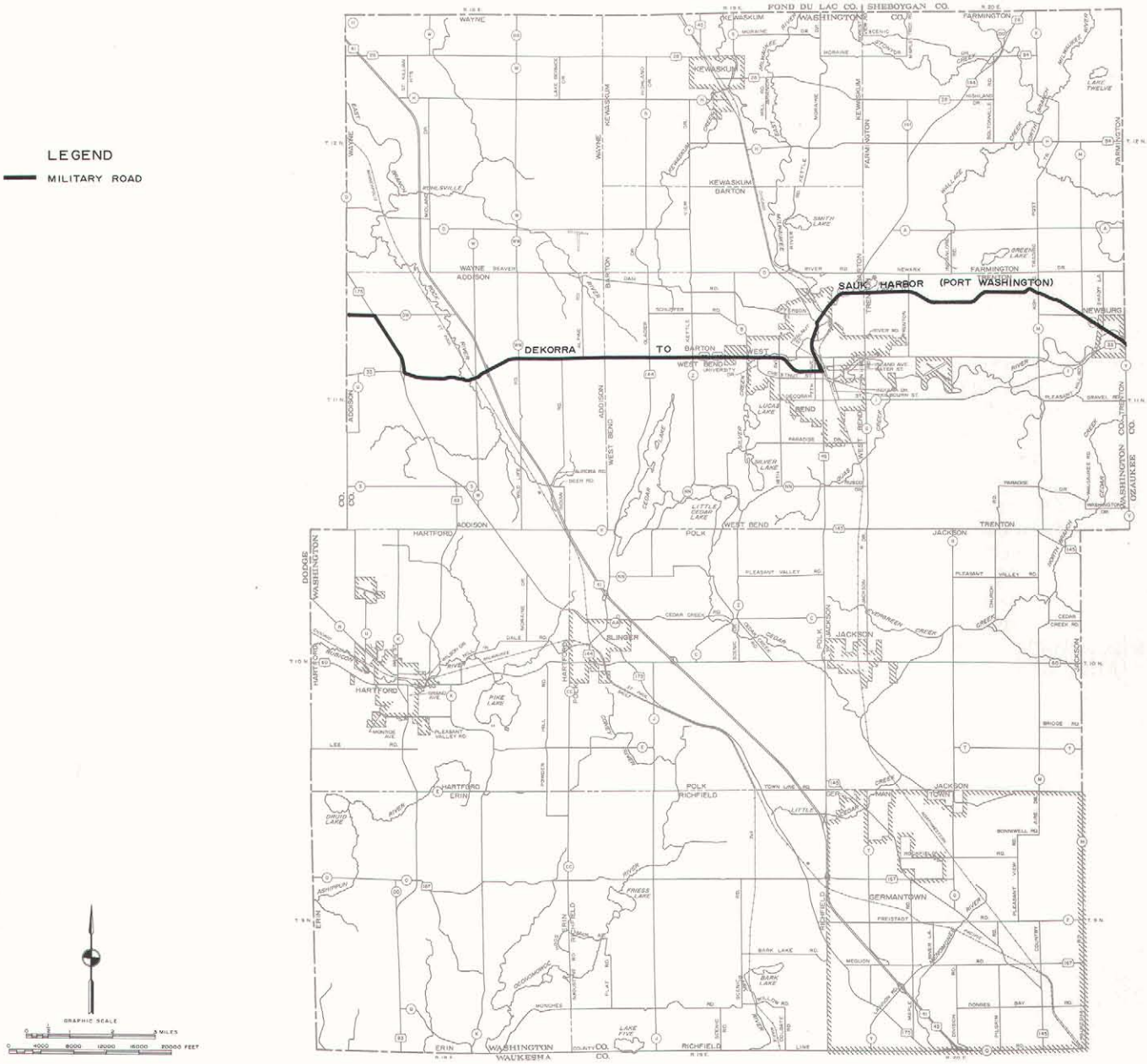
> ...that the state may appropriate money in the treasury or to be thereafter raised by taxation for the construction or improvement of public highways.

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 became 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 of not only 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 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

Map 2

MILITARY ROAD IN WASHINGTON COUNTY: 1835-1870

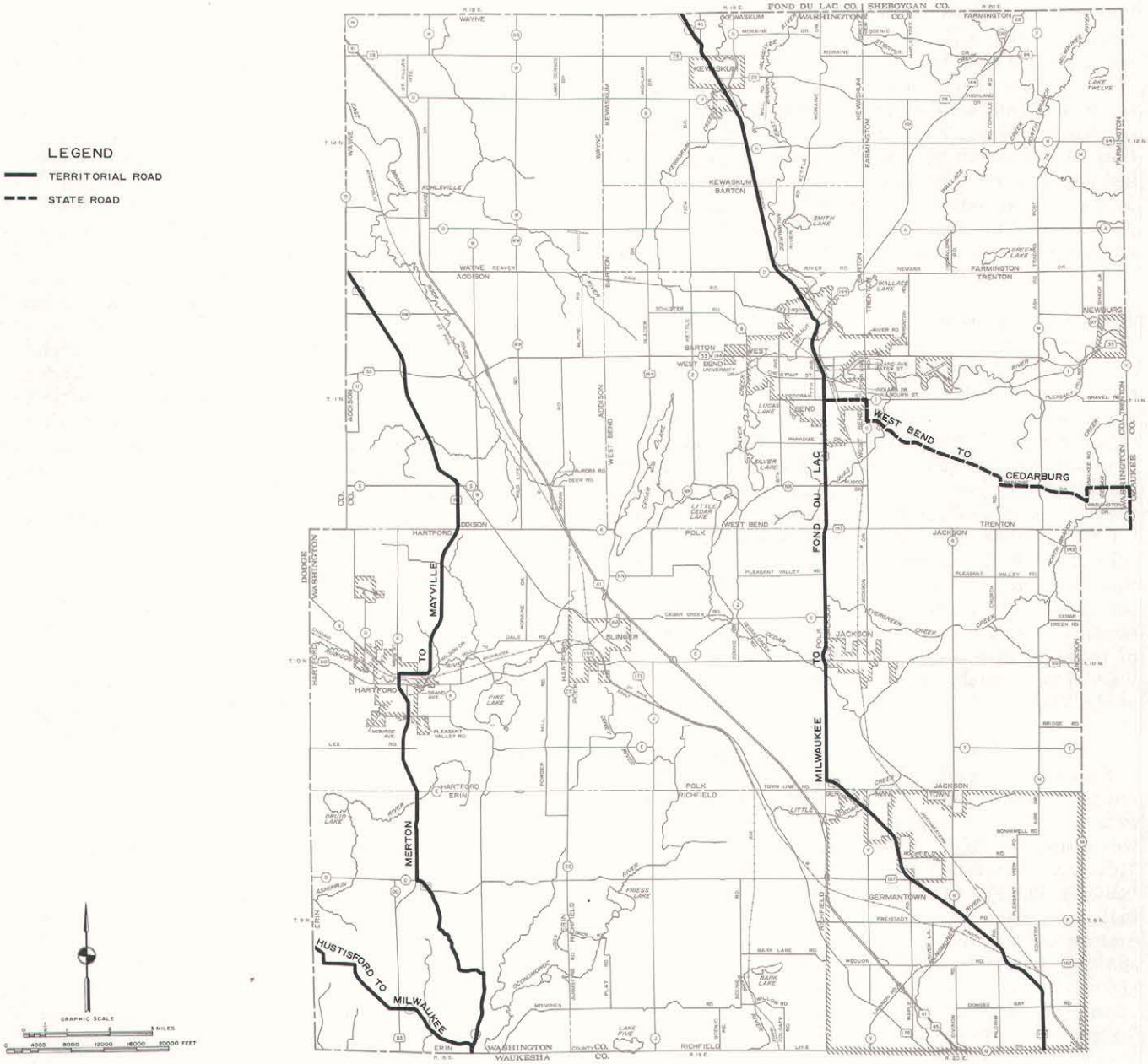


A system of military roads was built by the federal government in territorial Wisconsin to make the transportation of troops and supplies easier between forts established to guard the developing frontier. One of these military roads traversed Washington County and connected Dekorra, on the Wisconsin River, with Sauk Harbor (Port Washington) via West Bend. Portions of the present routings of Ohio Road, STH 175, STH 33, STH 144, Wallace Lake Road, and CTH MY follow the location of this old military road.

Source: Washington County Historical Museum and SEWRPC.

Map 3

STATE AND TERRITORIAL ROADS IN WASHINGTON COUNTY: 1846-1849



In 1836 the Territorial Legislature established a system of territorial roads to connect important settlements within the territory. Four territorial roads traversed Washington County. The Hustiford-Milwaukee road followed present CTH Q, Clare Road, and Roosevelt Drive. The Merton-Mayville road was located generally along present CTH K, Dublin Drive, STH 83, and STH 175. The Milwaukee-Fond du Lac road generally followed present STH 145, STH 167, and USH 45. The West Bend-Cedarburg road, the single state road in Washington County, was located along the present alignments of STH 143, CTH M, Paradise Drive, CTH I, and Decorah Road.

Source: Washington County Historical Museum and SEWRPC.

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 4 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 5 depicts this system as established in Washington County in 1918, totaling about 63 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 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. It consisted of 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.

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 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 6 depicts the system of county trunk highways in Washington County which was validated by the Legislature in 1925, totaling about 150 miles of facilities.

With the establishment of the county trunk highway system in 1925, the original jurisdictional classification of highways in Washington County was completed. The state trunk highway system, which by 1923 had been increased to 10,000 miles statewide and to approximately 127 miles within the county, became the primary system of highways; the county trunk highway system, which then totaled approximately 150 miles within the county, the secondary system; and other roads more local in nature, the tertiary 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.

Map 4

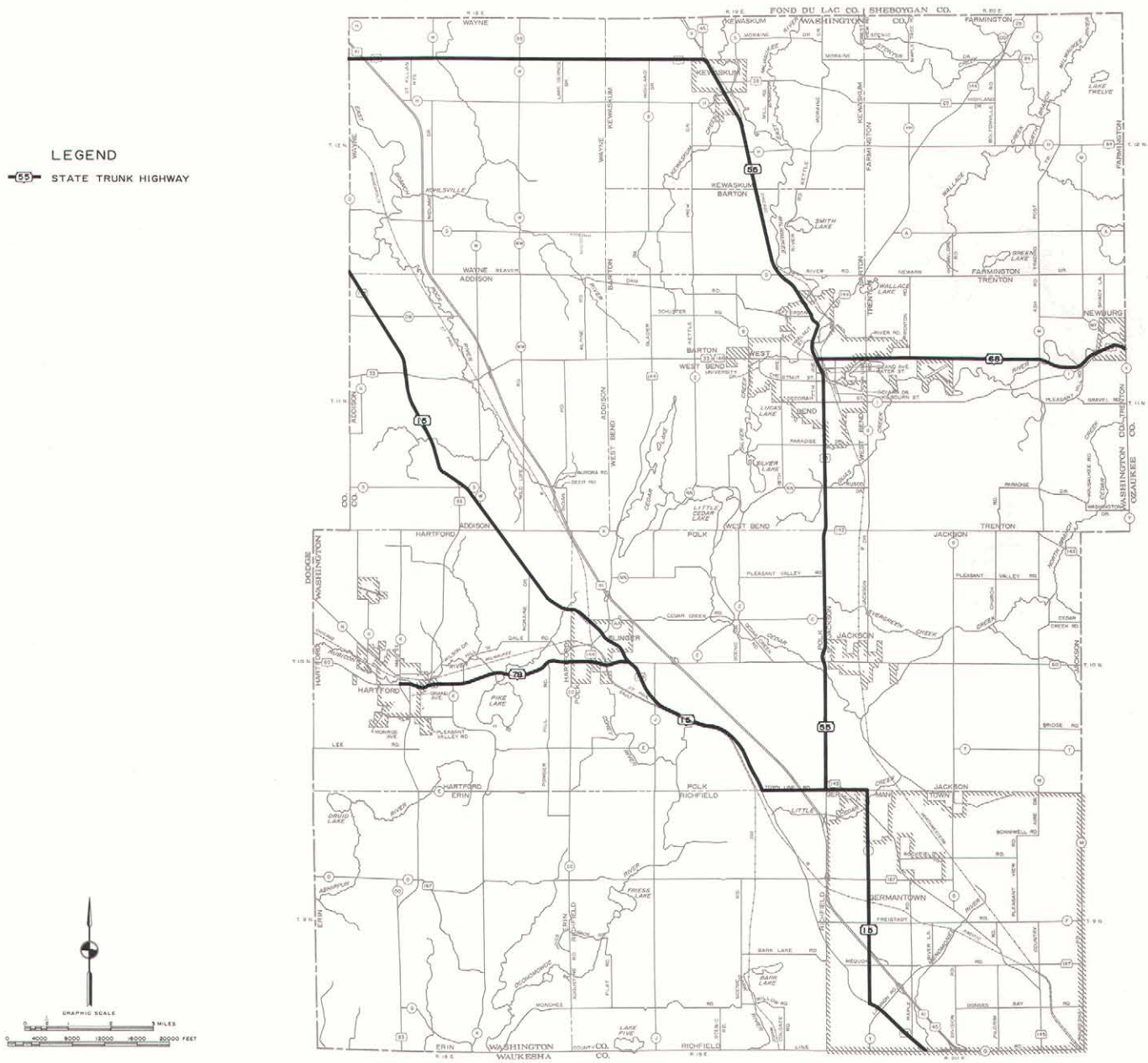
ORIGINAL STATE TRUNK HIGHWAY SYSTEM IN WISCONSIN: 1918

The original state trunk highway system in Wisconsin, as established 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. Initially, this was the only system of streets and highways for which federal aid in partial support of improvements was available. The system of designating state trunk highways by number and of marking the numbers on signs along the route and on maps developed in Wisconsin. The installation of thousands of signs providing information on distance and direction to motorists was completed in 1918.

Source: SEWRPC.

Map 5

ORIGINAL STATE TRUNK HIGHWAY SYSTEM IN WASHINGTON COUNTY: 1918

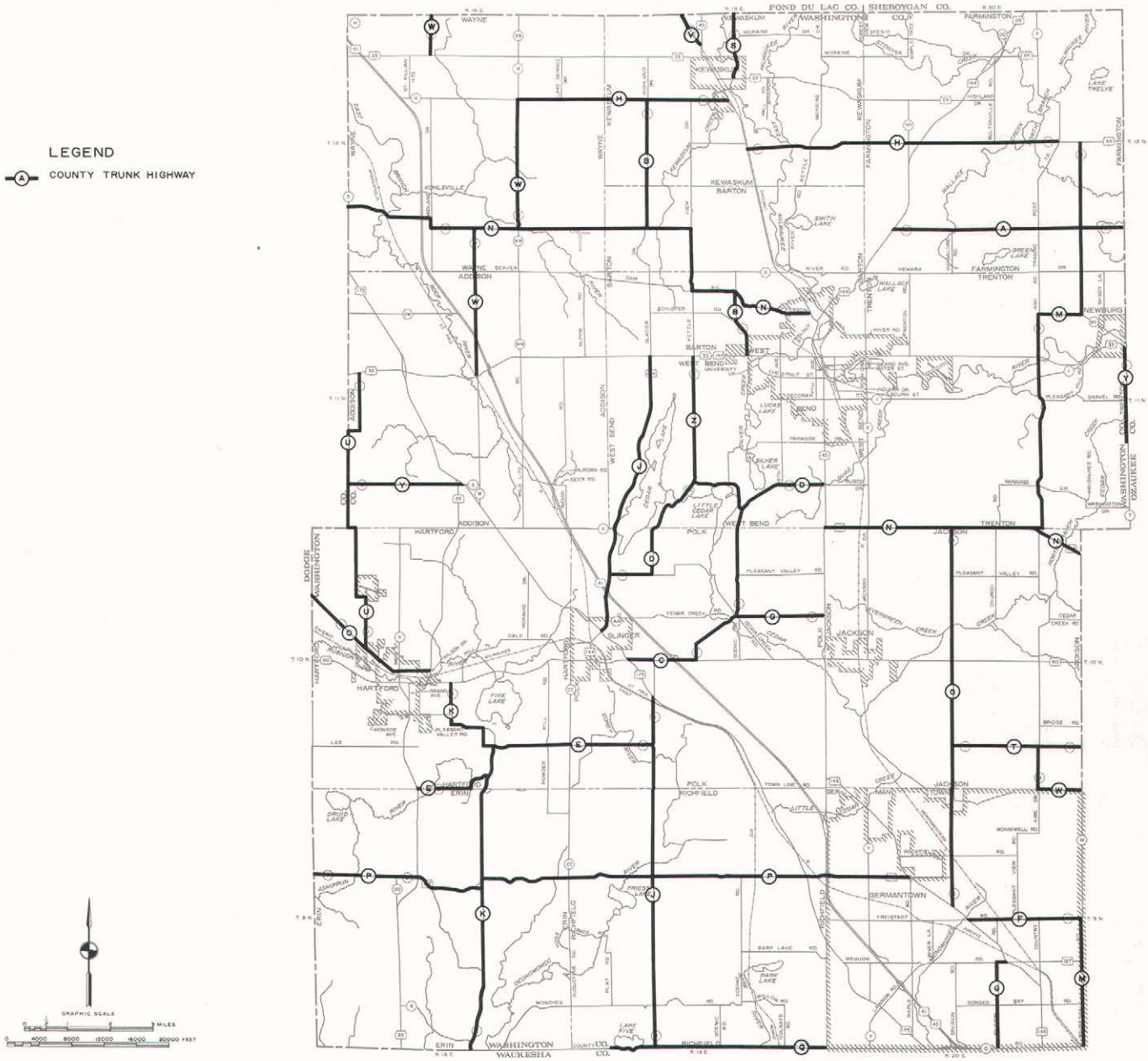


The original system of state trunk highways in Washington County consisted of about 63 route miles of facilities. The location of these early state trunk highways illustrates the permanence of highways as a feature of the landscape, with portions of the original state trunk highways being located along present USH 45, STH 28, STH 33, STH 60, and STH 175.

Source: SEWRPC.

Map 6

COUNTY TRUNK HIGHWAY SYSTEM IN WASHINGTON COUNTY: 1925



The original county trunk highway system in Washington County, established by the County Board and the Wisconsin Legislature in 1925, totaled about 150 route miles of facilities to be marked, maintained, and signed by the county. With the establishment of this system, the original jurisdictional classification of highways in Washington County was completed. Portions of the original county trunk highway system remain on the present county trunk highway system, including segments along present alignments of CTH A, CTH B, CTH C, CTH D, CTH E, CTH F, CTH G, CTH H, CTH J, CTH K, CTH M, CTH N, CTH O, CTH Q, CTH S, CTH T, CTH U, CTH V, CTH W, CTH Y, CTH Z, CTH NN, and CTH WW.

Source: Washington County Historical Museum and SEWRPC.

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 "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 existing 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 urban areas of the United States. This system is intended to supplement the existing federal aid highway systems within urban areas, which formerly consisted only of the extensions of the federal aid primary and secondary systems into such urban areas. As such the new system is intended to include the most heavily traveled elements of the urban street and highway system.

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 Washington County developed over the years, with minor additions and revisions, to the present state and county trunk systems. Table 1 sets forth street and highway mileages in Washington County for selected years from 1918 to 1973. The state trunk highway mileage shown in the table includes connecting streets. Figure 4 indicates that the number of miles of each of these three jurisdictional systems has 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 1940s, when about 19 miles of county trunk highways were removed from this system and either placed on the state trunk highway system or reverted to local streets; increases in the county trunk system during the early 1950s with the addition of 41 miles of local roads; and rapid increases in the local street system during the past 15 years as a result of new urban development within the county.

Table 1

STREET AND HIGHWAY MILEAGE IN WASHINGTON COUNTY SELECTED YEARS 1918-1973

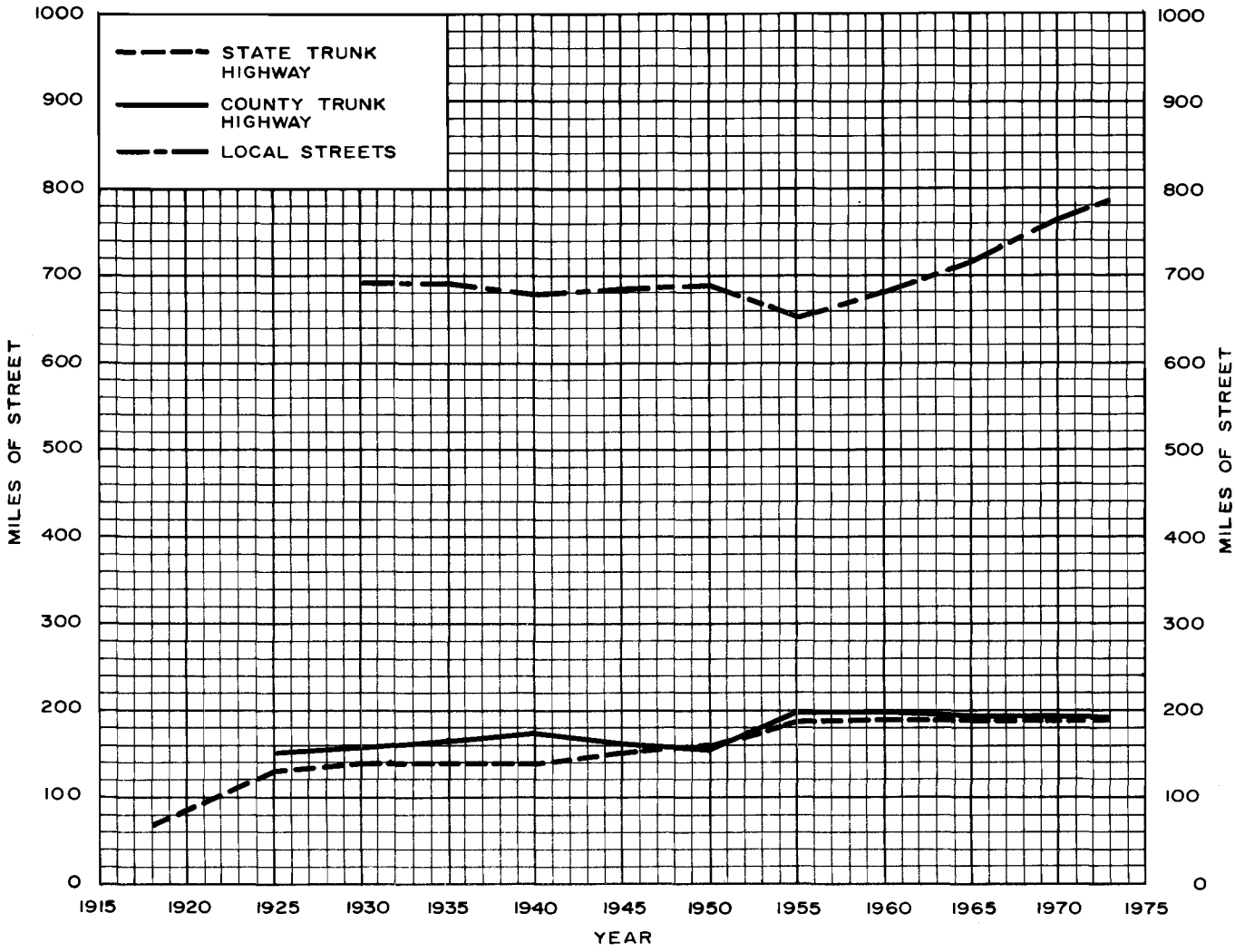
Year	State Trunk Highways (Includes Connecting Streets)		County Trunk Highways		Local Streets		Total Miles
	Number of Miles	Percent of Total	Number of Miles	Percent of Total	Number of Miles	Percent of Total	
1918	63[a]	--	--	--	--	--	--
1925	127	--	150	--	--	--	--
1930	138	14.0	158	16.0	692	70.0	988
1935	137	13.9	162	16.4	690	69.7	989
1940	136	13.8	174	17.6	679	68.6	989
1945	151	15.2	160	16.0	685	68.8	996
1950	161	16.0	155	15.4	689	68.6	1,005
1955	186	17.9	196	18.9	655	63.2	1,037
1960	188	17.6	196	18.3	685	64.1	1,069
1965	187	17.1	190	17.4	717	65.5	1,094
1970	187	16.4	191	16.7	764	66.9	1,142
1973	187	16.1	191	16.4	786	67.5	1,164

[a] *Historical documents conflict with respect to the termini of STH 78 in 1918. This figure is based upon records which show STH 78 in Washington County extending from the Dodge-Washington County line easterly to STH 55.*

Source: Wisconsin Department of Transportation and SEWRPC.

Figure 4

TOTAL STREET AND HIGHWAY MILEAGE IN WASHINGTON COUNTY: 1918-1973



[a] *Includes connecting streets.*

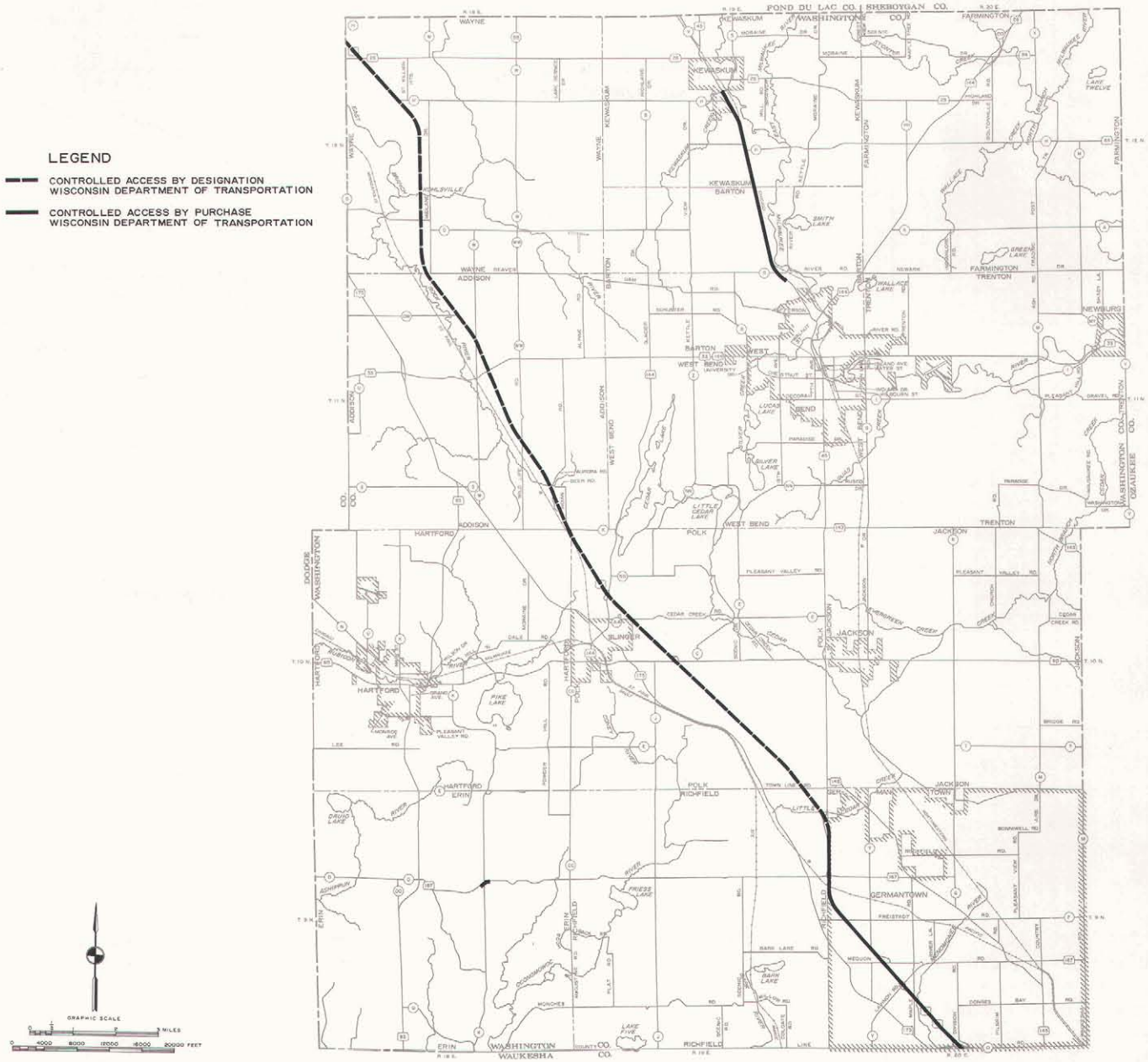
Source: Wisconsin Department of Transportation and SEWRPC.

After World War II, the large increase in motor vehicle utilization brought about a public demand for further improvements in highway system 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, 1973), 371 miles have been designated within the state. Twenty-nine miles of rural state trunk highways in Washington County have been designated as controlled-access highways (see Map 7). In addition, the state has acquired access control rights by purchase, totaling about eight miles, as also shown on Map 7.

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 Washington County is USH 41-45, which is about 29 miles in length (see Map 8). Aside from the requirement of public hearings for changes, no differences significant to jurisdictional highway system planning or plan implementation exist

Map 7

CONTROLLED-ACCESS HIGHWAYS IN WASHINGTON COUNTY: 1973



In order to improve safety and to provide a higher level of service on heavily traveled arterial highways, the Wisconsin Department of Transportation, Division of Highways, has purchased access control along eight route miles of state trunk highways in Washington County. In addition, the State Highway Commission has formally designated 29 route miles of controlled-access highways in the county.

Source: Wisconsin Department of Transportation.

between ordinary state trunk highways and state arterial highways. 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.[1] Those highway segments carrying sufficient traffic to warrant ultimate construction of four or more moving lanes could be so designated. To date (January 1, 1973), 588 miles have been designated as freeways or expressways, of which about 29 miles, comprised of USH 41-45, have been designated as freeways within Washington County (see Map 8). In addition, the federal system of interstate and national defense highways, established in 1956, now provides for 574 miles of interstate highways within Wisconsin which are constructed to freeway standards. Washington County does not presently have, nor is it foreseen to have, any of its arterial facilities so designated.

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 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.

[1] *In 1972, the State Legislature removed the mileage limitation on the designation of freeways and expressways originally contained in Section 84.295(3) of the Wisconsin Statutes.*

The County board is authorized, under Section 83.027 of the Wisconsin Statutes,[2] to designate as controlled-access highways those rural portions of the county trunk highway system having an average traffic potential of 1,000 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 35 percent of the county trunk mileage. The Washington County Board has not chosen to designate any portions of the county trunk highway system as controlled-access facilities, nor has Washington County acquired access control rights by purchase along its county trunk highways.

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 systems are under the jurisdiction of the towns, which either contract with the county or a consultant for planning, design, construction, maintenance, and operation.

[2] *Prior to the 1971 session of the State Legislature, Section 83.027 of the Wisconsin Statutes limited the percent of the county trunk highway system which could be designated as controlled-access highways to 10 percent of the total county trunk system, and set the minimum average daily traffic potential of such designated highways at 2,000 vehicles per day.*

Table 2

LEGAL CONSTRAINTS GOVERNING CHANGES TO THE STATE TRUNK HIGHWAY (STH) AND STATE ARTERIAL HIGHWAY SYSTEMS

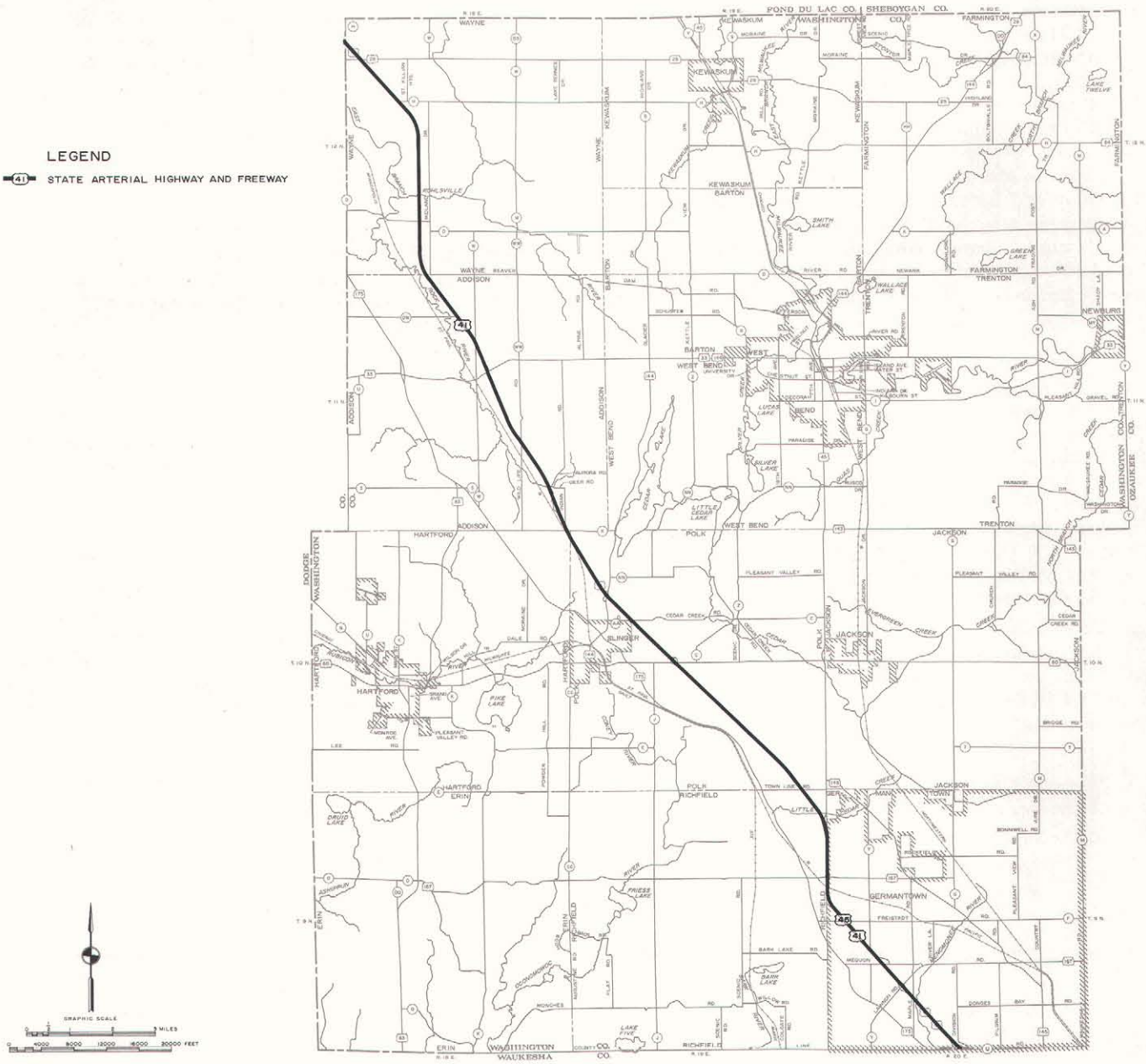
Highway System	Statutory Reference[a]	Length Constraint	Public Hearing Required	County Board Approval Required
STH	84.02(3)(a)	Less than 2 1/2 miles	No	No
STH	84.02(3)(a)	2 1/2 miles or more	Yes	Yes
STH and State Arterial	84.02(3)(a)	More than 5 miles	Yes	Yes
State Arterial	84.025(3)	Less than 5 miles	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 1971 Wisconsin Statutes.*

Source: Wisconsin Department of Transportation and SEWRPC.

Map 8

DESIGNATED STATE ARTERIAL AND FREEWAY HIGHWAY SYSTEMS IN WASHINGTON COUNTY: 1973

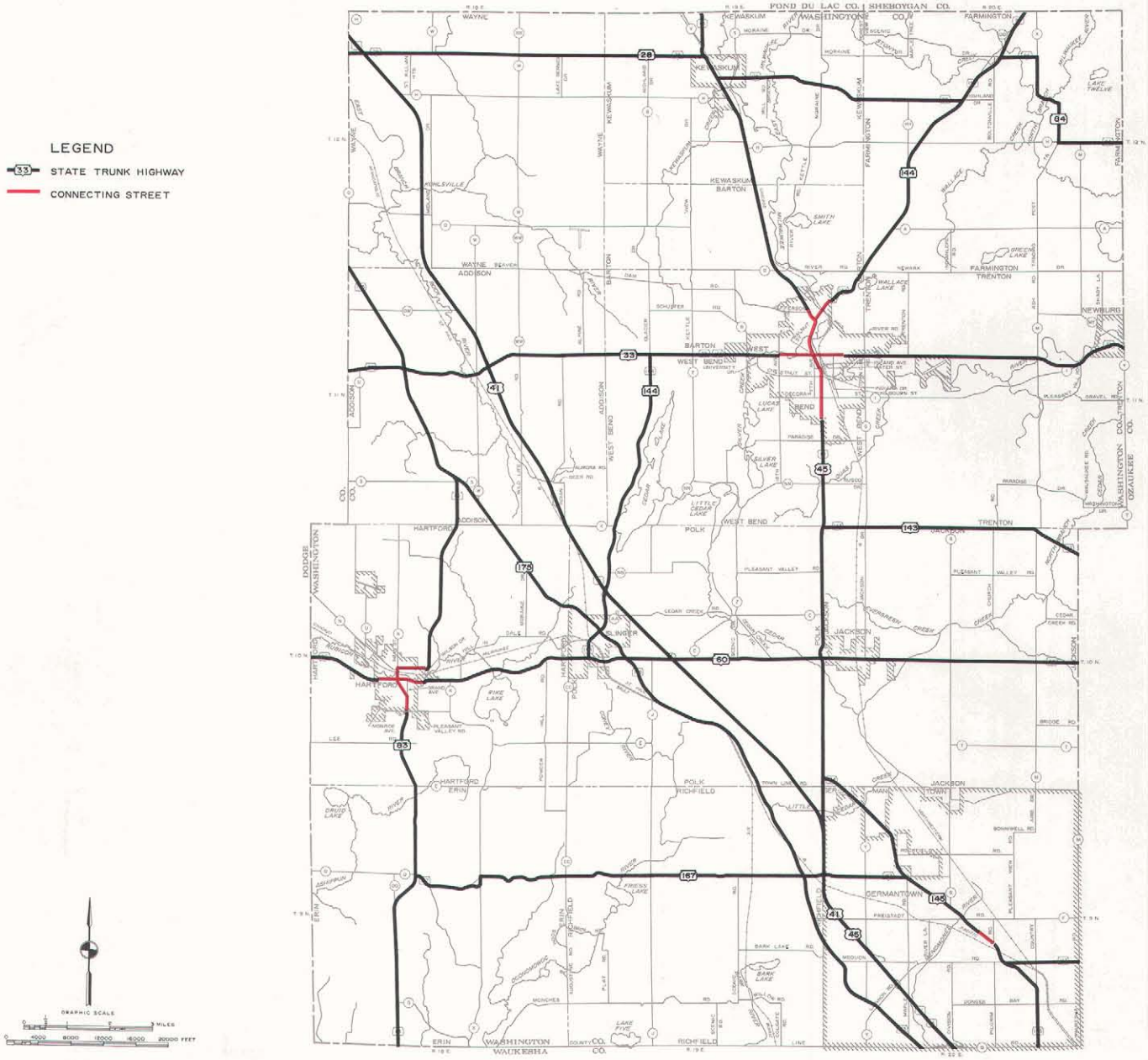


In 1955 the Wisconsin Legislature provided for the creation of the state arterial highway system to facilitate improvement of the most important portions of the total state trunk system. The State Highway Commission has also designated 292 route miles of state trunk highways as officially designated freeways or expressways in Wisconsin, of which approximately 29 route miles have been designated within Washington County. Within Washington County, the state arterial highway system as well as the officially designated freeways or expressways are located exclusively along USH 41-45.

Source: Wisconsin Department of Transportation.

Map 9

STATE TRUNK HIGHWAY AND CONNECTING STREET SYSTEM IN WASHINGTON COUNTY: 1973

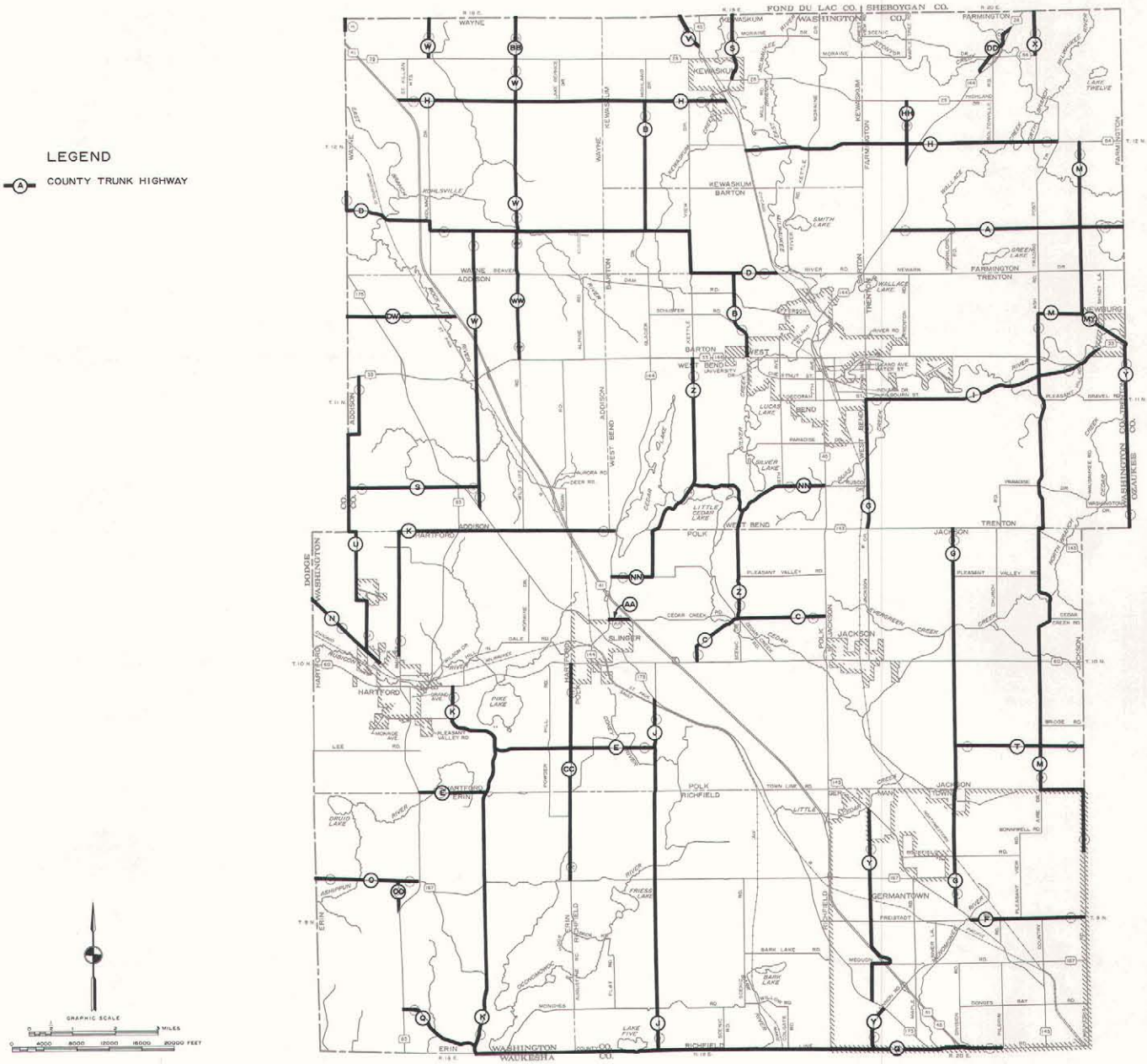


In Washington County, the existing system of state trunk highways and connecting streets over which state trunk highways are routed consists of about 187 miles, of which eight miles are connecting streets. Such connecting streets exist in the Cities of Hartford and West Bend and the Village of Germantown, and provide for system continuity. The connecting streets are maintained at the expense of the municipality in which they are located, with nominal reimbursement for such expense from the state at the rate of $500 per mile per year.

Source: Wisconsin Department of Transportation.

Map 10

COUNTY TRUNK HIGHWAY SYSTEM IN WASHINGTON COUNTY: 1973



Within Washington County there are presently a total of about 191 miles of county trunk highways, 128 miles of which are on the existing arterial street and highway system. The county trunk highways are discontinuous through urban areas within the county, and therefore do not form an integrated system.

Source: Wisconsin Department of Transportation.

Table 3

PERCENTAGE DISTRIBUTION OF EXISTING ARTERIAL STREET AND HIGHWAY MILEAGE IN WASHINGTON COUNTY BY JURISDICTIONAL CATEGORY JANUARY 1973

Jurisdictional Category	Number of Miles	Percent of Total
State Trunk Highways	179.18	51.9
Connecting Streets	8.14	2.4
County Trunk Highways	127.74	37.0
Local Arterial Streets and Highways	29.90	8.7
Total	344.96	100.0

Source: SEWRPC.

CURRENT STATUS

Current Jurisdictional Highway Mileage

As of January 1, 1973, there were 11,914 miles of state trunk highways in Wisconsin, of which 456 miles, or 4 percent, consisted of interstate highways; 231 miles, or 2 percent, consisted of other freeways currently open to traffic; 10,703 miles, or 90 percent, consisted of standard arterials; and 524 miles, or 4 percent, consisted of connecting streets. In Washington County there were 187 miles of state trunk highways, of which 6 miles, or 3 percent, were freeways currently open to travel; 173 miles, or 93 percent, were standard arterials; and 8 miles, or 4 percent, were connecting streets over which state trunk highways were routed (see Map 9). There were also 191 miles of county trunk highways

Table 4

EXISTING JURISDICTIONAL HIGHWAY SYSTEM MILEAGE IN WASHINGTON COUNTY BY CIVIL DIVISION: JANUARY 1, 1973

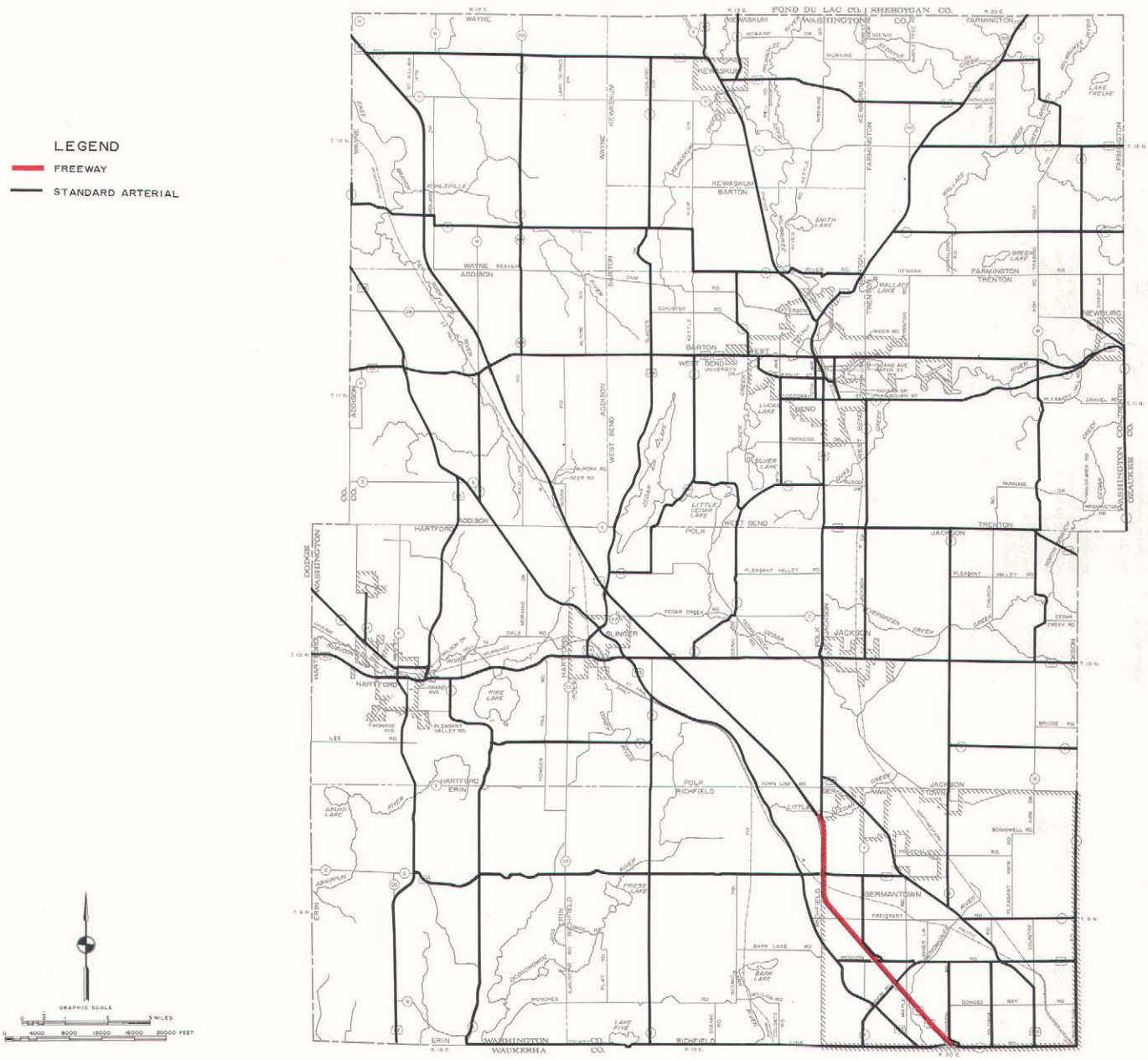
Civil Division	Existing Arterials (Miles)						Existing Nonarterials (Miles)			Total[a]
	State Trunk Highway		Connecting Street	County Trunk Highway	Local Trunk Highway	Subtotal	County Trunk Highway	Local-Collector	Subtotal	
	Freeway	Nonfreeway								
CITIES										
Hartford	--	0.37	2.73	0.57	0.59	4.26	0.49	22.63	23.12	27.38
Milwaukee	--	--	--	--	0.12	0.12	--	--	--	0.12
West Bend	--	2.13	4.83	0.50	6.21	13.67	--	60.22	60.22	73.89
Subtotal	--	2.50	7.56	1.07	6.92	18.05	0.49	82.85	83.34	101.39
VILLAGES										
Germantown	6.31	14.11	0.58	12.37	11.47	44.84	2.79	60.43	63.22	108.06
Jackson	--	1.24	--	--	0.38	1.62	--	3.71	3.71	5.33
Kewaskum	--	1.95	--	0.52	--	2.47	0.33	6.86	7.19	9.66
Slinger	--	2.97	--	--	--	2.97	0.55	6.22	6.77	9.74
Subtotal	6.31	20.27	0.58	12.89	11.85	51.90	3.67	77.22	80.89	132.79
TOWNS										
Addison	--	21.32	--	5.02	--	26.34	13.36	55.30	68.66	95.00
Barton	--	5.46	--	7.68	5.27	18.41	--	33.29	33.29	51.70
Erin	--	10.10	--	7.53	--	17.63	7.17	47.28	54.45	72.08
Farmington	--	14.36	--	11.71	--	26.07	5.20	55.27	60.47	86.54
Germantown	--	1.49	--	0.79	--	2.28	0.37	3.81	4.18	6.46
Hartford	--	13.19	--	8.17	--	21.36	8.90	44.41	53.31	74.67
Jackson	--	11.78	--	12.68	2.74	27.20	3.53	44.54	48.07	75.27
Kewaskum	--	8.31	--	3.92	1.01	13.24	5.30	36.48	41.78	55.02
Polk	--	24.02	--	9.92	--	33.94	4.05	53.13	57.18	91.12
Richfield	--	11.52	--	8.86	--	20.38	1.03	81.70	82.73	103.11
Trenton	--	8.18	--	15.84	--	24.02	2.00	57.37	59.37	83.39
Wayne	--	11.74	--	11.56	--	23.30	7.89	45.99	53.88	77.18
West Bend	--	8.63	--	10.10	2.11	20.84	0.07	31.79	31.86	52.70
Subtotal	--	150.10	--	113.78	11.13	275.01	58.87	590.36	649.23	924.24
Total	6.31	172.87	8.14	127.74	29.90	344.96	63.03	750.43	813.73	1,158.42

[a] *Does not include national forest, state park and forest, or county forest roads.*

Source: Wisconsin Department of Transportation and SEWRPC.

Map 11

ARTERIAL STREET AND HIGHWAY SYSTEM IN WASHINGTON COUNTY: 1973



The 345 miles of streets and highways shown on this map comprise the existing arterial street and highway system in Washington County. Of this total, 187 miles are state trunk highways or connecting streets, 128 miles are county trunk highways, and 30 miles are local streets and highways. Because of the nature of the local streets and highways, and the piecemeal additions and deletions which have been made in the county trunk highway system over time, only the state trunk highway system represents a truly integrated arterial street and highway system.

Source: SEWRPC.

(see Map 10) and 780 miles of local streets and highways. Thus, as of January 1, 1973, there were a total of 1,158 miles of streets and highways open to traffic in Washington County. Of this total, 345 miles, or 30 percent, were determined to comprise the functional arterial street and highway network. These 345 miles were jurisdictionally categorized as shown in Table 3. The configuration of the arterial system within Washington County is shown on Map 11. Table 4 summarizes existing mileages by municipality.

Current Federal Aid Mileage

As of January 1, 1973, there were a total of 323 miles of federal aid routes designated within Washington County. Of this total, 89 miles were located on the federal aid primary system, 234 miles were located on the federal aid secondary system, and one-half mile was located on federal aid urban system. The total federal aid system mileage open to traffic as of January 1, 1973, was 310. Of this total, 76 miles consisted of federal aid primary system mileage and 233 miles consisted of federal aid secondary system mileage, and one-half mile was located on the federal aid urban system. 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 Washington County are shown on Map 12, with the sections on the federal aid systems which are not open to traffic indicated by long broken lines. Table 5 sets forth the designated federal aid system mileages by municipality.

Table 5

FEDERAL AID ROUTE MILEAGE IN WASHINGTON COUNTY BY CIVIL DIVISION
JANUARY 1973

Civil Division	Federal Aid Primary Route Mileage						
	State Trunk Highway						
	Freeway						
	Officially Designated	Open to Traffic	Nonfreeway	Connecting Street	County Trunk Highway	Local Street	Subtotal
CITIES							
Hartford	--	--	0.37	0.99	--	--	1.36
Milwaukee	--	--	--	--	--	--	--
West Bend	0.98	--	2.04	4.25	--	--	7.27
Subtotal	0.98	--	2.41	5.24	--	--	8.63
VILLAGES							
Germantown	--	6.31	0.38	--	--	--	6.69
Jackson	--	--	0.09	--	--	--	0.09
Kewaskum	--	--	1.15	--	--	--	1.15
Slinger	--	--	0.50	--	--	--	0.50
Subtotal	--	6.31	2.12	--	--	--	8.43
TOWNS							
Addison	--	--	13.06	--	--	--	13.06
Barton	1.70	--	4.39	--	--	--	6.09
Erin	--	--	--	--	--	--	--
Farmington	--	--	--	--	--	--	--
Germantown	--	--	0.25	--	--	--	0.25
Hartford	--	--	5.13	--	--	--	5.13
Jackson	--	--	2.80	--	--	--	2.80
Kewaskum	--	--	3.18	--	--	--	3.18
Polk	6.08	--	13.26	--	--	--	19.34
Richfield	0.57	--	1.53	--	--	--	2.10
Trenton	--	--	6.28	--	--	--	6.28
Wayne	--	--	6.04	--	--	--	6.04
West Bend	3.67	--	3.92	--	--	--	7.59
Subtotal	12.02	--	59.84	--	--	--	71.86
Total	13.00	6.31	64.37	5.24	--	--	88.92

Table 5 (continued)

Civil Division	Federal Aid Secondary Route Mileage						Federal Aid Urban Route Mileage		Total
	State Trunk Highway								
	Officially Designated	Open to Traffic	Connecting Street	County Trunk Highway	Local Street	Subtotal	County Trunk Highway	Subtotal	
CITIES									
Hartford	--	--	1.74	0.76	0.56	3.06	--	--	4.42
Milwaukee	--	--	--	--	--	--	--	--	--
West Bend	--	0.09	0.58	0.13	1.00	1.80	--	--	9.07
Subtotal	--	0.09	2.32	0.89	1.56	4.86	--	--	13.49
VILLAGES									
Germantown	--	11.33	0.58	9.89	5.77	27.57	0.53	0.53	34.79
Jackson	--	1.15	--	--	--	1.15	--	--	1.24
Kewaskum	--	0.80	--	0.52	--	1.32	--	--	2.47
Slinger	--	2.47	--	--	--	2.47	--	--	2.97
Subtotal	--	15.75	0.58	10.41	5.77	32.51	0.53	0.53	41.47
TOWNS									
Addison	--	8.26	--	10.41	--	18.67	--	--	31.73
Barton	--	1.07	--	--	--	1.07	--	--	7.16
Erin	--	10.10	--	10.02	--	20.12	--	--	20.12
Farmington	--	14.36	--	12.99	--	27.35	--	--	27.35
Germantown	--	1.24	--	1.16	--	2.40	--	--	2.65
Hartford	--	8.06	--	4.12	--	12.18	--	--	17.31
Jackson	--	5.13	--	4.64	--	9.77	--	--	12.57
Kewaskum	--	10.76	--	8.38	--	19.14	--	--	22.32
Polk	0.63	9.99	--	8.86	--	19.48	--	--	38.82
Richfield	--	1.90	--	15.84	--	17.74	--	--	19.84
Trenton	--	5.70	--	6.00	--	11.70	--	--	17.98
Wayne	--	4.71	--	9.73	--	14.44	--	--	20.48
West Bend	--	8.98	--	12.64	0.67	22.29	--	--	29.88
Subtotal	0.63	90.26	--	104.79	0.67	196.35	--	--	268.21
Total	0.63	106.10	2.90	116.09	8.00	233.72	0.53	0.53	323.17

Source: U. S. Department of Transportation, Federal Highway Administration; Wisconsin Department of Transportation; and SEWRPC.

SUMMARY

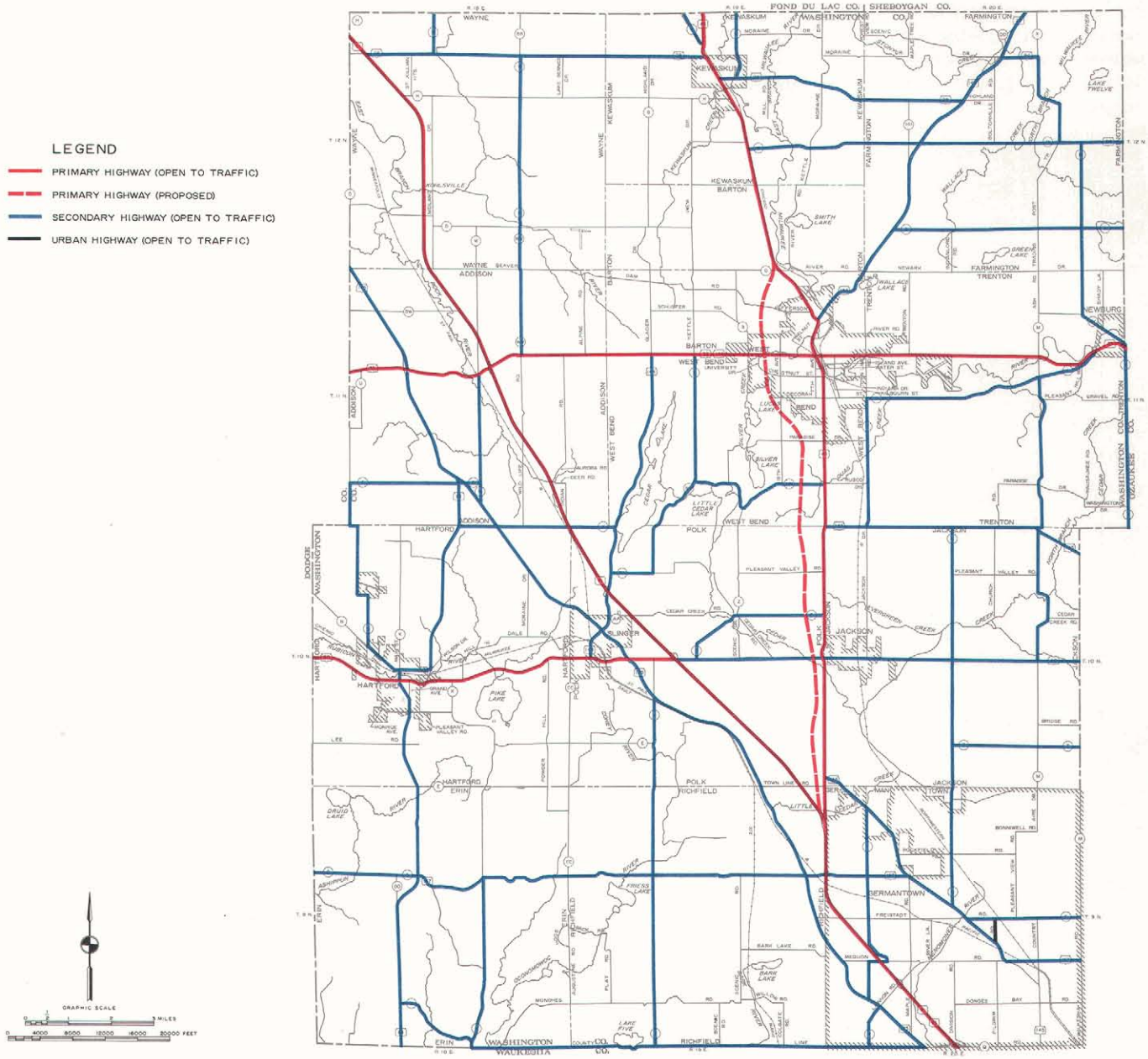
As of January 1, 1973, there were a total of 1,158 miles of streets and highways open to traffic within Washington County. Of this total, 345 miles, or 30 percent, comprised the functional arterial street and highway network. The responsibility for the design, construction, operation, and maintenance of this arterial street and highway network rested with three levels of government: the state, the county, and local municipalities. Approximately 187 miles, or 54 percent of the arterial street and highway network, were under state jurisdiction, being comprised of state trunk highways and connecting streets. About 128 miles, or an additional 37 percent, were under county jurisdiction, being comprised of county trunk highways; and about 30 miles, or 9 percent, were under city, village, or town jurisdiction, being comprised of local arterial streets and highways.

Superimposed on the state, county, and local trunk highways and arterial streets were 310 miles of federal aid routes, of which about 76 miles, or 25 percent, consisted of federal aid primary routes, 233 miles, or 75 percent, consisted of federal aid secondary routes, and one-half mile, or less than 1 percent consisted of a federal aid urban route.

The location and configuration of these jurisdictional highway systems and supporting aid routes were the result of a long process of 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

Map 12

FEDERAL AID HIGHWAY SYSTEMS IN WASHINGTON COUNTY: JANUARY 1973



Highways designated as part of the federal aid highway systems are eligible for federal aid in partial support of improvements. There are presently 323 miles of federal aid routes open to traffic or officially designated within Washington County, including 89 miles on the federal aid primary system, 234 miles on the federal aid secondary system, and one-half mile on the federal aid urban system. The primary system includes USH 41, USH 45, STH 33, and STH 60. The secondary system includes STH 28, STH 60, STH 83, STH 84, STH 144, STH 145, STH 167, and STH 175, and several significant county trunk highways.

Source: Wisconsin Department of Transportation.

studied and revised by the State Highway Commission of Wisconsin and the Washington County Board in 1925. Many piecemeal additions and deletions have been made to these two jurisdictional highway networks since 1923 and 1925. Consequently, these two important networks no longer represent fully integrated and continuous arterial highway systems capable to 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 Washington 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 Washington 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 Washington County.

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 must be 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 the traffic analyses required 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. 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 existing and proposed facilities 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 transportation objectives 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. After such a functional transportation plan has been prepared, it 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 thus 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 continuous within themselves or 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 Washington 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 Washington 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). 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 statewide and regionwide 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 Washington 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 about 8 miles (see Figure 6) and would have an average trip length range of from 1 to 8 miles. This fact, together with the fact that an analysis of origin-destination data for Washington County indicated that 76 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 Washington County is primarily of an intercommunity nature. The findings reflect the socioeconomic relationships that exist between farms, which are economic enterprises, residences, and small urban communities, which act as farm market and service centers.

The Technical and Intergovernmental 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 in Washington County should be assigned to either the Type I (state trunk) or 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 various kinds of urban land use are not only more intensely developed, but areas devoted to different kinds of land use are located much closer together in urban areas. Moreover, economically productive rural land uses, such as extractive and agricultural operations, 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, but nevertheless require good arterial highway facilities to remain economically productive and competitive.

In Washington County, therefore, it was deemed necessary to develop two sets of area service, trip service, and operational criteria, one for urban and one for rural arterials. For the purposes of this distinction, urban arterials were defined as those arterials within the corporate limits of either a city or village, while rural arterials are those within the boundaries of a town. Only in this way could a jurisdictional classification be achieved which would meet the often diverse needs of both the urban and rural areas of Washington County.

Trip Service Criteria

Trip service criteria for a jurisdictional classification of arterials could include specific criteria concerning trip length, trip purpose, and trip peaking. Trip length was selected as 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 classification are presented in Table 6.

The following procedure was used to develop the recommended values for the trip service criteria. An interzonal trip table[1] of trip distance volumes[2] (TDV) was produced by multiplying the number of trips expected to be made between pairs of traffic analysis zones,[3] 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[4] was then divided by previously assigned link volumes to obtain average trip lengths. Curves were plotted to provide a graphical representation of the relationship 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 marked the points beyond which a relatively high increase in facility type mileage would accommodate only a relatively small increase in trip length range.

Table 6

AVERAGE TRIP LENGTH CRITERIA FOR ARTERIAL SUBCLASSIFICATION

Arterial Type	Average Trip Length (Miles)	
	Urban	Rural
I (State Trunk) . . .	11.00 or More	41.00 or More
II (County Trunk) . .	8.00 to 10.99	Less than 41.00
III (Local Trunk) . . .	Less than 8.00	--

Source: SEWRPC.

Area Service Criteria

Area service criteria for a jurisdictional classification 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—Urban and Rural

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—Urban and Rural

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.

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

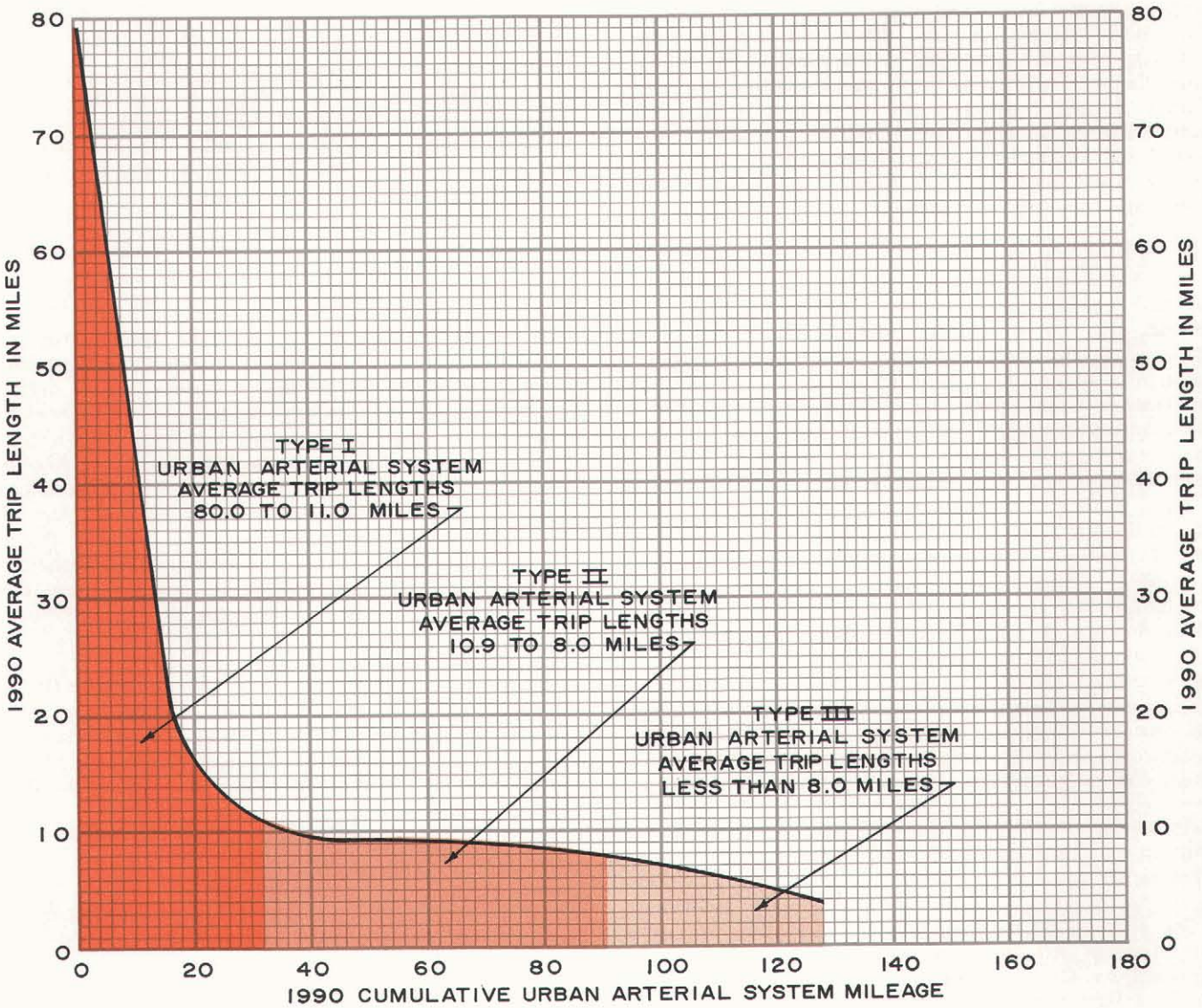
[2] *The term "trip distance volume" as used herein is synonymous with the term "volume trip length index" as used by the U. S. Department of Transportation, Federal Highway Administration, in its manual entitled, 1968 National Highway Functional Classification Study Manual.*

[3] *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.*

[4] *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.*

Figure 5

RELATIONSHIP BETWEEN AVERAGE TRIP LENGTH AND CUMULATIVE URBAN ARTERIAL MILEAGE
WASHINGTON COUNTY ARTERIAL STREET AND HIGHWAY SYSTEM: 1990



Source: SEWRPC.

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

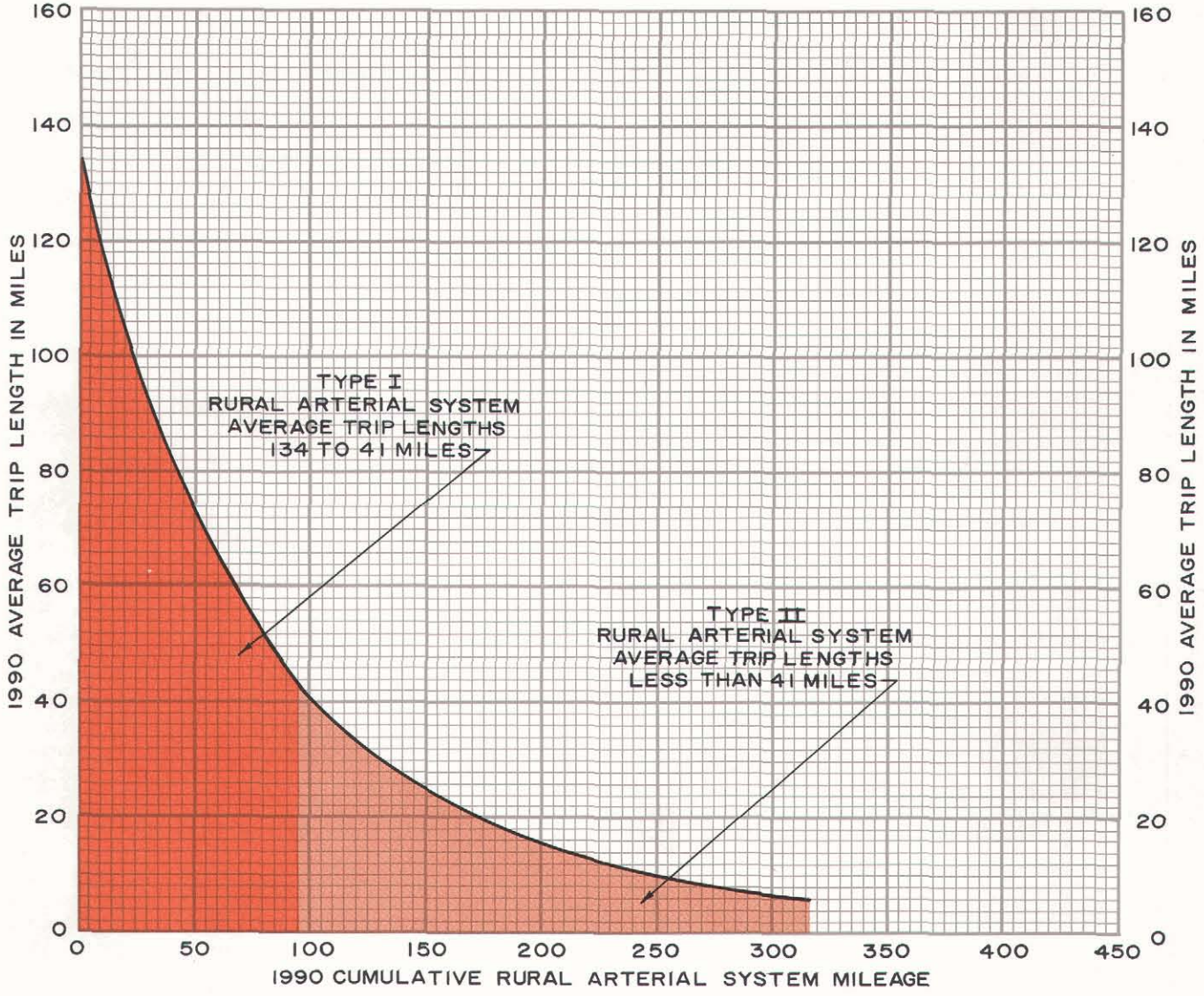
Type III Arterials—Urban

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 of 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 Washington County jurisdictional highway planning study.

Figure 6

RELATIONSHIP BETWEEN AVERAGE TRIP LENGTH AND CUMULATIVE RURAL ARTERIAL MILEAGE
WASHINGTON COUNTY ARTERIAL STREET AND HIGHWAY SYSTEM: 1990



Source: SEWRPC.

1. Transportation Terminals[5]

Type I Arterials—Urban and Rural
Type I arterial facilities shall connect and serve interregional rail, bus, and major truck terminals;[6] and air-carrier airports.[7]

[5] *A transportation terminal is herein 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.*

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

[7] *An air-carrier airport is herein defined as a public airport intended to serve primarily commercial local service and trunkline air-carrier aircraft providing service to the general public on a regularly scheduled basis between major cities of the country.*

Type II Arterials—Urban and Rural
Type II arterial facilities shall connect and serve freeway interchanges, general-aviation airports,[8] pipeline terminals, and major intraregional truck terminals[9] 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 a minimum of 150 parking spaces not served by Type I and Type II arterials.

2. Recreational Facilities

Type I Arterials—Urban and Rural
Type I arterial facilities shall connect and serve all state parks and those public and private recreational facilities of interregional and statewide importance with a gross site area of 500 acres or more.

Type II Arterials—Urban and Rural
Type II arterial facilities shall connect and serve those public and private recreational facilities of regional and countywide importance not served by Type I arterials.

Type III Arterials—Urban
Type III arterial facilities shall connect and serve community parks[10] 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.[11]

Type II Arterials—Urban and Rural
Type II arterial facilities shall connect and serve community retail and service centers[12] not served by Type I arterials.

Type III Arterials—Urban
Type III arterial facilities shall connect and serve neighborhood retail and service commercial centers[13] 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 industrial centers.[14]

Type II Arterials—Urban and Rural
Type II arterial facilities shall connect and serve major community industrial centers[15] not served by Type I arterials.

Type III Arterials—Urban
Type III arterial facilities shall connect and serve minor community industrial centers[16] not served by Type I and Type II arterials.

5. Institutional

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

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[8] *A general-aviation airport is herein 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.*

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

[10] *A community park is herein 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.*

[11] *A major retail and service center is herein 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 multicommunity 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, is herein defined as an area shown on adopted regional or local land use plans or recognized in local zoning district maps.*

[12] *A community retail and service center is herein defined as an existing or officially designated concentration of retail and service uses having a gross site area ranging from 20 to 60 acres, intended to serve the retail and service use needs of a tributary area with a population of from two to five residential neighborhoods.*

[13] *A neighborhood retail and service commercial center is herein defined as an existing or officially designated concentration of retail and service uses having a gross site area ranging from five to 20 acres intended to serve the retail and service needs of the population of one residential neighborhood.*

[14] *A regional industrial center is herein 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.*

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

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

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 Concentrations

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

Type II Arterials—Rural
Type II rural arterial facilities shall connect and serve urban concentrations 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 Washington 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 Washington 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 faclity.

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 criterion. It is important, when considering volume as a criterion 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 Washington County jurisdictional highway planning study.

Table 7

TRAFFIC VOLUME CRITERIA FOR ARTERIAL SUBCLASSIFICATION

Arterial Type	Average Weekday Traffic Volume (Vehicles)	
	Urban	Rural
I (State Trunk) . . .	4,000 or More	2,000 or More
II (County Trunk) . .	1,500 to 3,999	Less than 2,000
III (Local Trunk) . . .	Less than 1,500	--

Source: SEWRPC.

Future potential traffic volumes were derived from a system traffic assignment based on an areawide land use plan or projection. Such a traffic assignment exists for Washington County as part of the 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 criterion. 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. From these data, curves were plotted to provide a graphical representation of the relationship between traffic volume and cumulative arterial system mileage for both urban and rural areas (see Figures 7 and 8). Break points were identified on the 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 criterion previously established.

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 criteria with respect to traffic mobility shown in Table 8 were adopted for the Washington County jurisdictional highway planning study.

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 Washington County jurisdictional highway planning study:

Type I Arterials—Urban and Rural
All Type I arterials shall have full or partial control of access.[17,18]

Type II Arterials—Urban and Rural
All Type II arterials shall have at least partial control of access.[19]

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	--

[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*

Source: SEWRPC.

Type III Arterials—Urban
All Type III arterials shall have at least minimum control of access.[20]

[17] *Full control of access is herein 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.*

[18] *Partial control of access is herein defined as 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 the parcels existed at the time of an official declaration that partial control of access shall be exercised.*

[19] *See definition of partial control of access as stated in footnote 18.*

[20] *Minimum control of access is herein 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.*

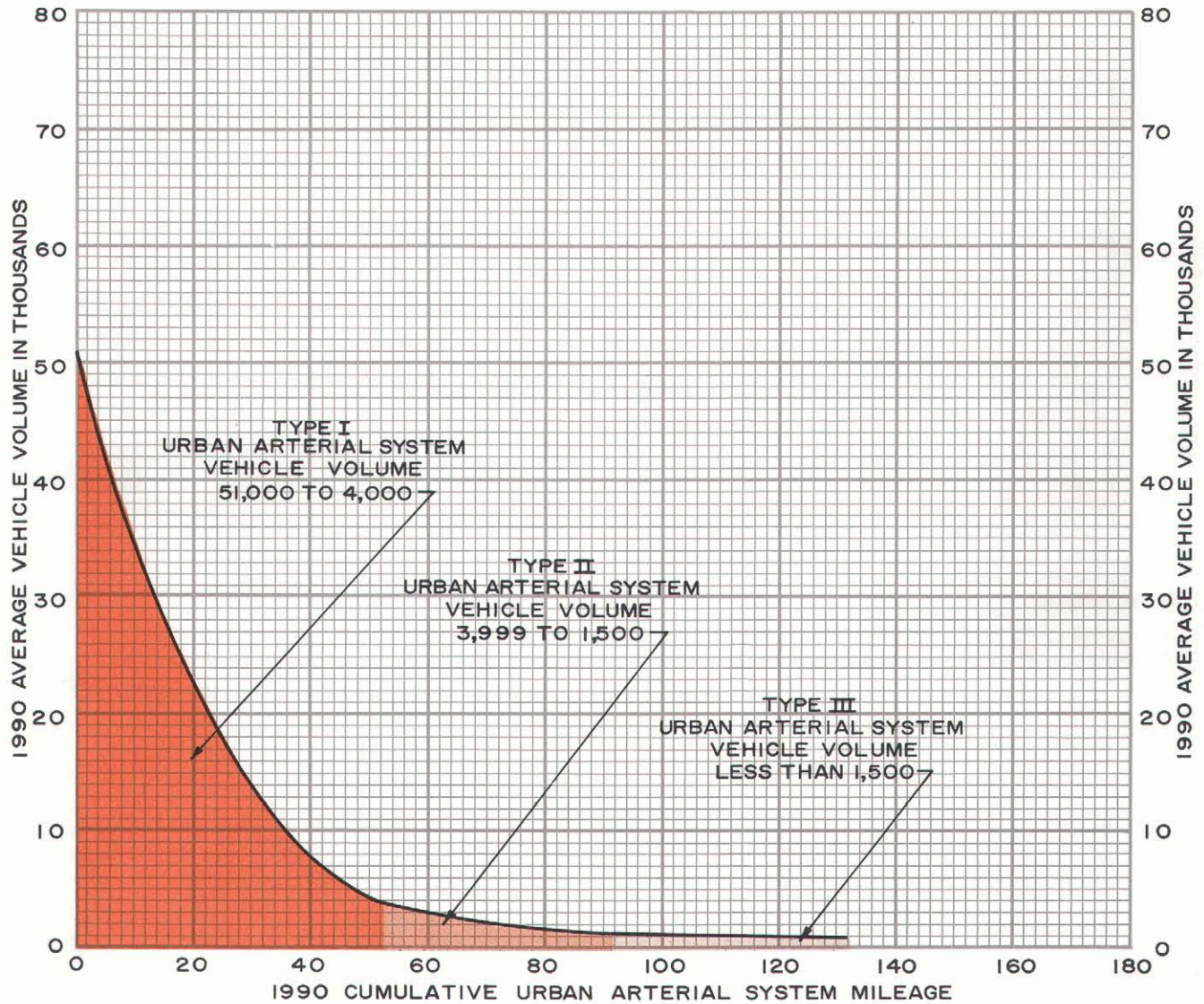
Table 9 summarizes the functional criteria used for the jurisdictional classification of arterial highways in Washington County.

OTHERS 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.

Figure 7

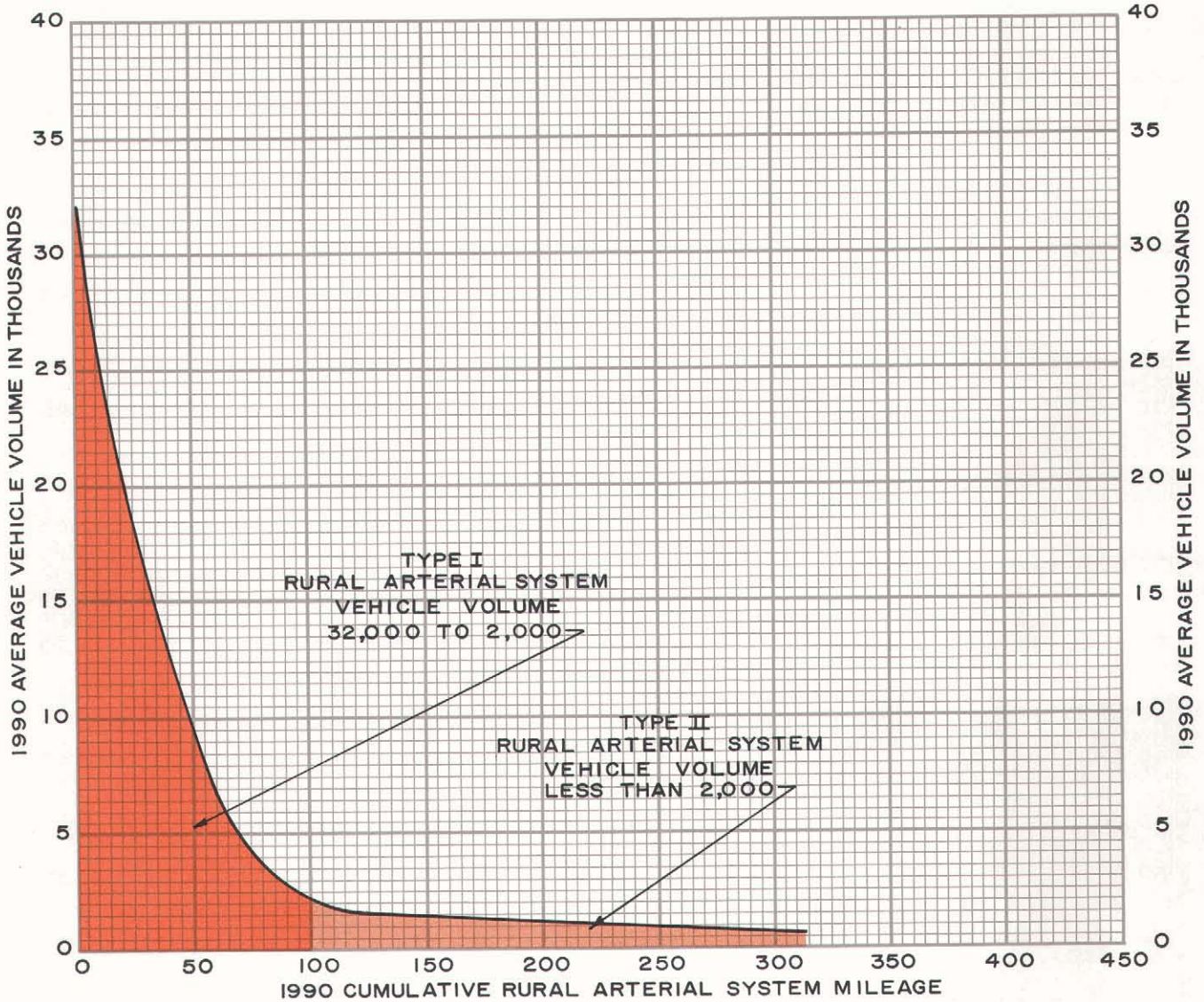
RELATIONSHIP BETWEEN AVERAGE WEEKDAY VEHICLE VOLUME AND CUMULATIVE URBAN ARTERIAL MILEAGE WASHINGTON COUNTY ARTERIAL STREET AND HIGHWAY SYSTEM: 1990



Source: SEWRPC.

Figure 8

RELATIONSHIP BETWEEN AVERAGE WEEKDAY VEHICLE VOLUME AND CUMULATIVE RURAL ARTERIAL MILEAGE
WASHINGTON COUNTY ARTERIAL STREET AND HIGHWAY SYSTEM: 1990



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 the assignment of 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 Washington County.

It is proposed that all segments of the total (existing and proposed) arterial street and highway system in Washington 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

Table 9

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

	Criteria	Arterial Type		
		I (State Trunk)	II (County Trunk)	III (Local Trunk)[a]
TRIP SERVICE	Average Trip Length (Miles)	Urban 11.0 or More Rural 41.0 or more	Urban 8 to 10.9 Rural Less than 41.0	Urban Less than 8.0 --
LAND USE SERVICE	Transportation Terminals	Urban[b] and Rural[c] Connect and serve interregional rail, bus, and major truck terminals and air-carrier airports.	Urban[b] and Rural[c] Connect and serve freeway interchanges, general-aviation airports, pipeline terminals, major intraregional truck terminals, and rapid transit and modified rapid transit system loading and uploading points not served by Type I arterials.	Urban[b] 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 Connect and serve all state parks having a gross area of 500 acres or more.	Urban and Rural Connect and serve regional parks and special recreational use areas of countywide significance.	Urban Connect and serve community parks not served by Type I and II arterials.
	Commercial Centers	Urban and Rural Connect and serve major retail and service centers.	Urban and Rural Connect and serve community retail and service centers not served by Type I arterials.	Urban Connect and serve neighborhood retail and service commercial centers not served by Type I and II arterials.
	Industrial Centers	Urban and Rural Connect and serve major regional industrial centers.	Urban and Rural Connect and serve major community industrial centers not served by Type I arterials.	Urban Connect and serve minor community industrial centers not served by Type I and II arterials.
	Institutional	Urban and Rural Connect and serve universities, county seats, and state institutions.	Urban and Rural Connect and serve county institutions; accredited, degree-granting colleges; public vocational schools; and community hospitals not served by Type I arterials.	Urban Connect and serve city and village halls and high schools not served by Type I and II arterials.
	Urban Areas	Rural Connect and serve urban areas of 2,500 or more population.	Rural Connect and serve developed areas of 500 or more population.	--

urban and rural subcategories; the Type III category was given only an urban subcategory. Based on data which indicated that rural travel within Washington County is primarily of an intercommunity nature, the Technical Intergovernmental Coordinating and Advisory Committee was of the opinion that town governments in Washington County were not staffed and equipped to carry out the planning, design, construction, operation, and maintenance of arterial highways to serve such travel, nor should they be required to be so staffed and equipped.

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 rural land use areas. The economically productive rural land uses such as extractive and agricultural operations also, by their nature, require large land areas and a relatively small labor force, therefore generating less concentrated traffic.

Table 9 (continued)

	Criteria	Arterial Type		
		I (State Trunk)	II (County Trunk)	III (Local Trunk)[a]
OPERATIONAL CHARACTERISTICS	System Continuity	Urban and Rural Interregional or regional continuity comprising total systems at the regional and state level.	Urban and Rural Intermunicipality and intercounty continuity comprising integrated systems at the county level.	Urban Intracommunity continuity comprising an integrated system at the city or village level.
	Spacing	Urban and Rural Minimum 2 miles.	Urban and Rural Minimum 1 mile.	Urban Minimum 0.5 mile.
	Volume	Urban Minimum 4,000 vehicles per average weekday (1990 forecast). Rural Minimum 2,000 vehicles per average weekday (1990 forecast).	Urban 1,500 to 3,999 vehicles per average weekday (1990 forecast). Rural Less than 2,000 vehicles per average weekday (1990 forecast).	Urban Less than 1,500 vehicles per average weekday (1990 forecast). --
	Traffic Mobility	Urban Average overall travel speed[d] 30 to 70 miles per hour. Rural Average overall travel speed 40 to 70 miles per hour.	Urban Average overall travel speed[d] 25 to 50 miles per hour. Rural Average overall travel speed 30 to 60 miles per hour.	Urban Average overall travel speed[d] 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.

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, regional commercial centers, major 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 Washington 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 Washington County, as proposed in the adopted regional transportation plan, and refined through a careful review of the arterial system conducted as 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 13.

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 Washington 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 to incorporate the effects of any changes in land use and highway system development in Washington County since the adoption of the functional plan, and to incorporate indicated desirable changes in the functional plan 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 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 inside and outside Washington County with all traffic analysis zone centroids affected by the network modification. Once this network editing was completed and the computer description of the system deemed satisfactory, the effect of the forecast 1990 travel demand on the network was simulated by a computer traffic assignment of the 1990 interzonal trip table, 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.

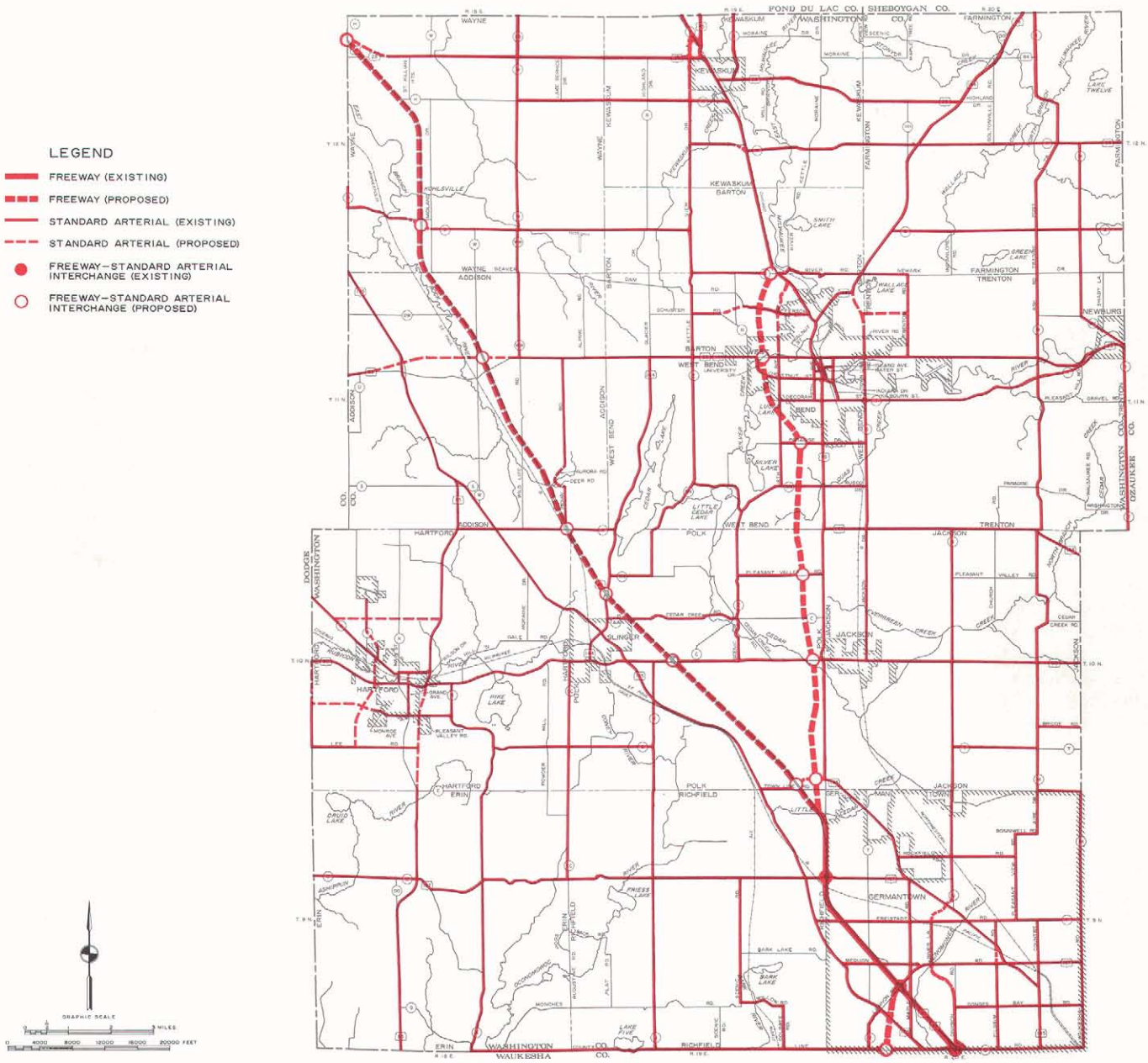
In the development of the trip service subsystems, the average trip length which could be expected to occur on each link was calculated in the manner described in Chapter IV of this report. Using the calculated trip length data, each link was classified as a Type I, Type II, or Type III arterial facility, in accordance with the previously established trip service criteria. The resulting subsystems are shown on Map 14, the jurisdictional classification for each link being indicated by color code. Continuous segments of lengths of the same color tended to focus attention on routes of similar function which could be combined to form jurisdictional subsystems.

It should be noted that the average trip length for those arterial facilities which cross the northern and western boundaries of Washington County were increased subsequent to a review of the 1963 travel survey data. These adjustments were deemed necessary to reflect that portion of the trips on these arterials which involve out-of-region travel, this providing a more accurate representation of the trip service provided by those arterial facilities carrying travel into and out of the Region.

The subsystems delineated by application of the trip service criteria were generally found 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—

Map 13

ARTERIAL STREET AND HIGHWAY SYSTEM IN WASHINGTON COUNTY: 1990

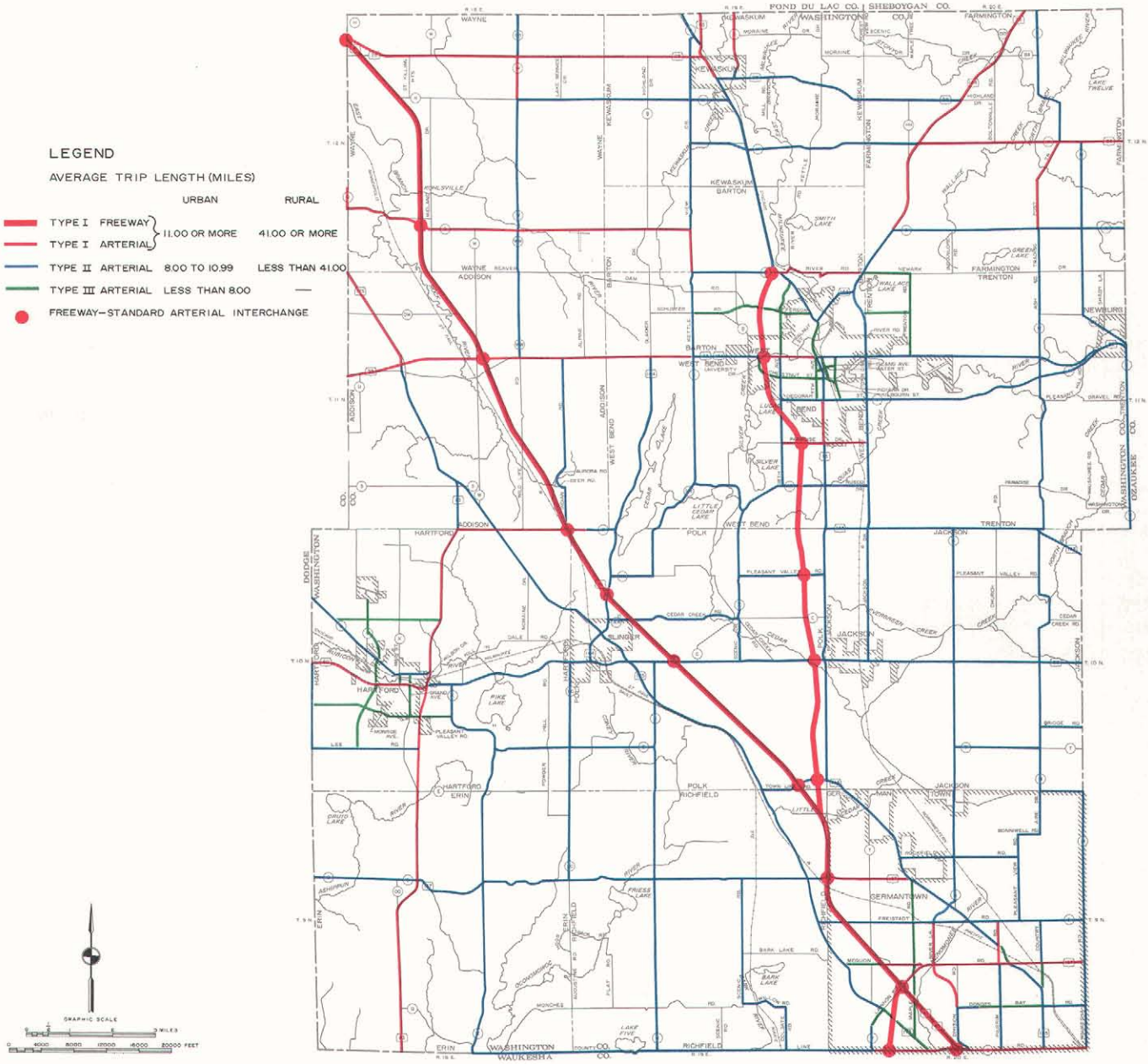


A 446-mile arterial street and highway system is proposed to serve existing and probable future travel demand in Washington County to the year 1990. This total arterial system forms the basic network to which criteria were applied for the assignment of jurisdictional responsibilities for each link in the system. The total represents a refinement of the arterial street and highway system for Washington County as included in the adopted regional transportation plan, and will provide the county with a high level of highway transportation service through 1990, meeting the anticipated increases in travel demand efficiently and effectively.

Source: SEWRPC.

Map 14

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



Application of the trip length criteria alone resulted in the classification of the total arterial street and highway system into the three jurisdictional subsystems shown on this map. The average trip length for the Type I arterial facility is 11 miles or more in urban areas, and 41 miles or more in rural areas; for the Type II arterial facility, 8 to 10.99 miles in urban areas and less than 41 miles in rural areas; and for the Type III arterial facility, less than 8 miles in urban areas.

Source: SEWRPC.

exhibited the longest average trip lengths, ranging from 41 to 132 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 8 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 reviewed by knowledgeable local planners and engineers. Future land uses were identified from the adopted regional land use plan, 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 15.

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 15.

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 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 16, was identified by application of the traffic volume criteria previously established. This third group, 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 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.

As shown on Map 17, the total arterial street and highway system was thus objectively and rationally classified into 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 within 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.

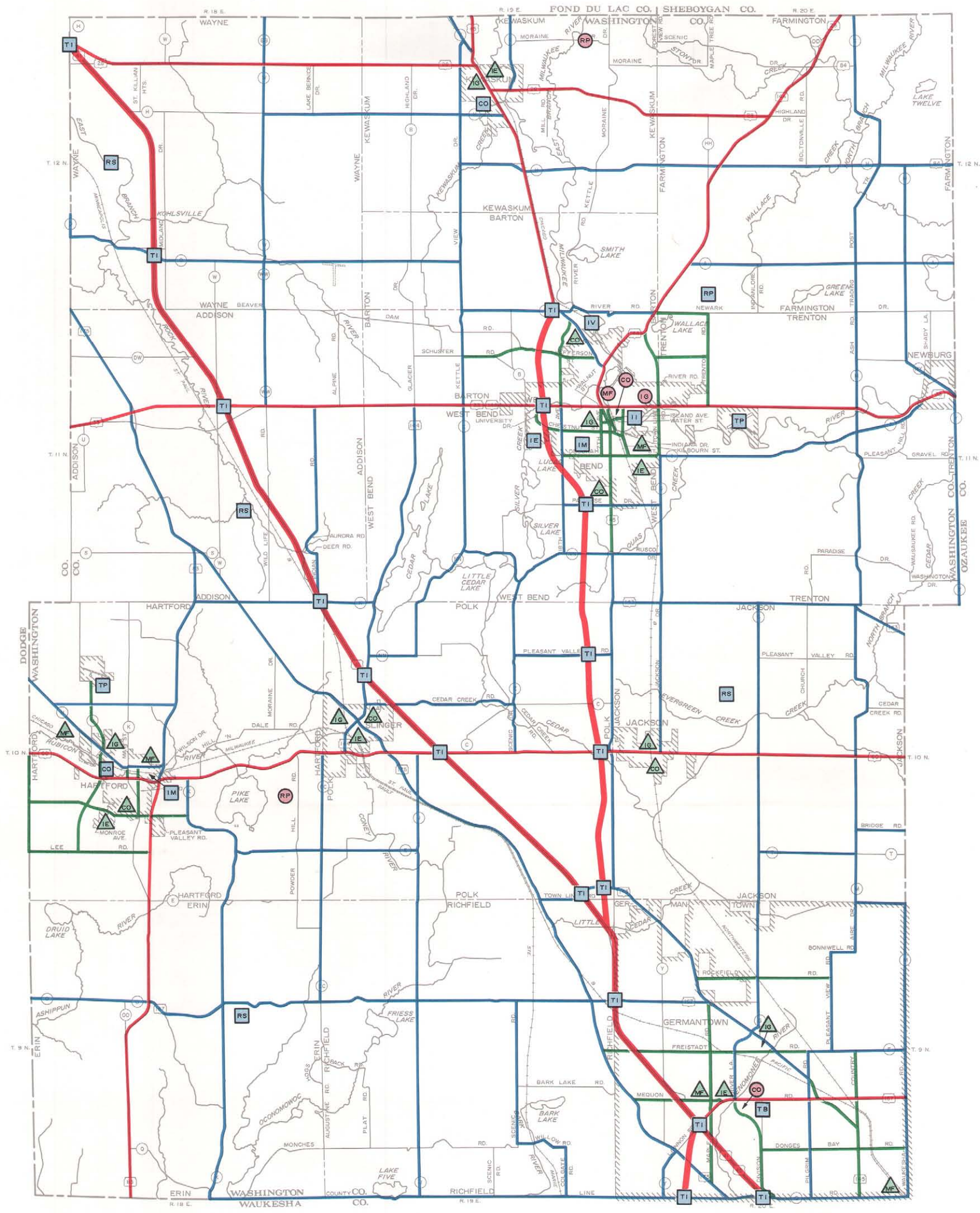
SUMMARY

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.

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 categories: Type I (state trunk), Type II (county trunk), or Type III (local trunk). Some judgment was exercised in the case of a limited number of marginal facilities which did not clearly fall into one category or another, because not all of the criteria were met for the majority of the route length.

Map 15

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



LEGEND

- FREEWAY FACILITY CONNECTING AND SERVING TYPE I LAND USES
- ARTERIAL FACILITY CONNECTING AND SERVING TYPE I LAND USES
- ARTERIAL FACILITY CONNECTING AND SERVING TYPE II LAND USES
- ARTERIAL FACILITY CONNECTING AND SERVING TYPE III LAND USES

GRAPHIC SCALE
0 1 2 MILES
0 4000 8000 12000 FEET

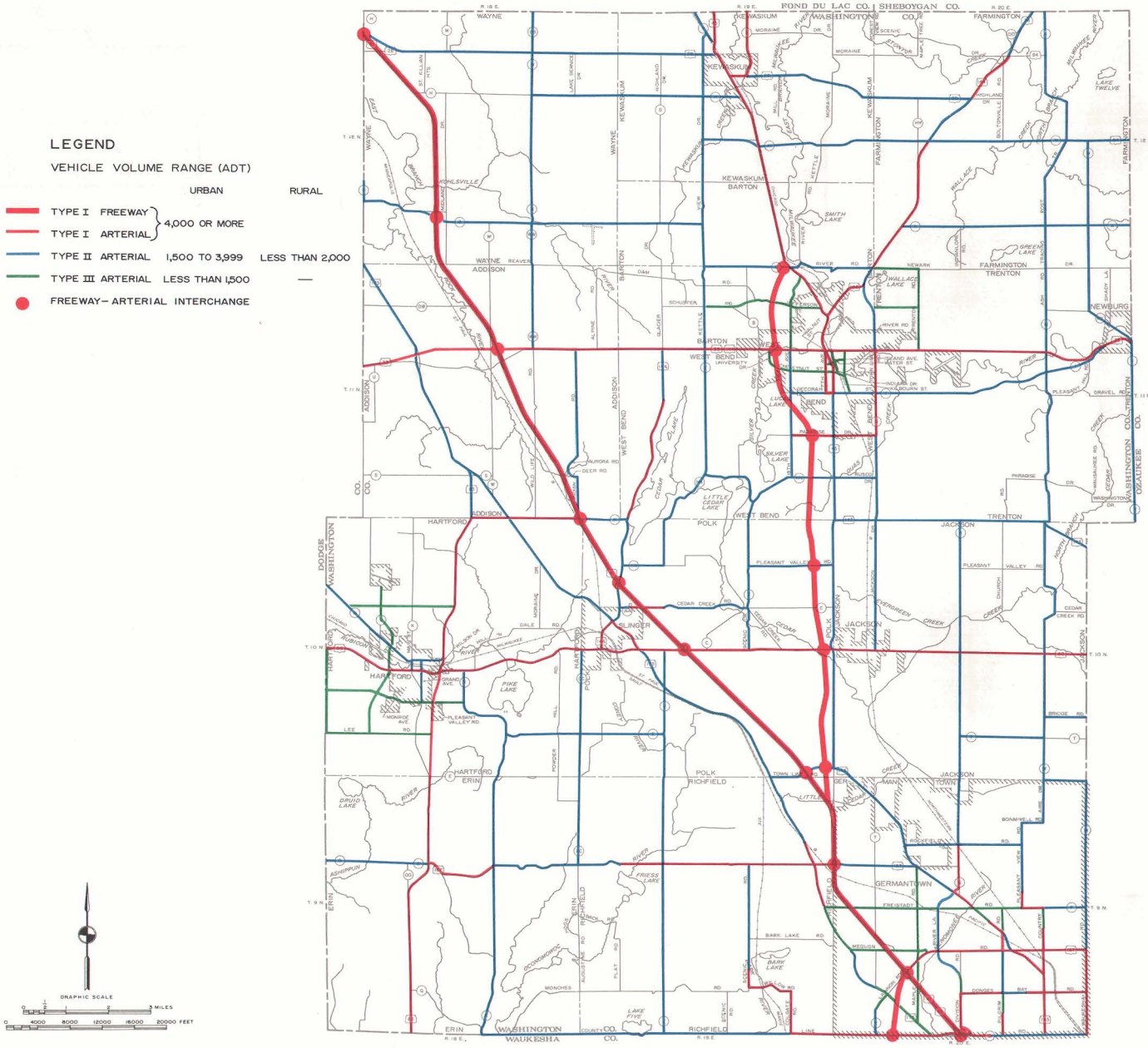
LAND USE TYPE	TRANSPORTATION TERMINALS	RECREATIONAL AREAS	COMMERCIAL CENTERS	INDUSTRIAL CENTERS	INSTITUTIONAL CENTERS
I	TR RAIL TERMINAL TB BUS TERMINAL TT TRUCK TERMINAL TP PORT (AIR & SEA)	RP REGIONAL OR INTER-REGIONAL PARK	CO REGIONAL RETAIL & SERVICE COMMERCIAL CENTER	MF REGIONAL INDUSTRIAL CENTER	IG COUNTY SEAT II STATE INSTITUTION
II	TI INTERCHANGE TP NON-COMMERCIAL AIRPORT TL PIPELINE TT TRUCK TERMINAL TB RAPID TRANSIT LOADING	RP COUNTY OR INTER-COUNTY PARK RS SPECIAL USE AREA	CO COMMUNITY RETAIL & SERVICE COMMERCIAL CENTER	MF COMMUNITY MAJOR INDUSTRIAL CENTER	II COUNTY INSTITUTION IE COLLEGE IV VOCATIONAL SCHOOL IM HOSPITAL
III	TT TRUCK TERMINAL TS OFF-STREET PARKING	RP COMMUNITY PARK	CO NEIGHBORHOOD RETAIL & SERVICE COMMERCIAL CENTER	MF COMMUNITY MINOR INDUSTRIAL CENTER	IE HIGH SCHOOL IG CITY OR VILLAGE HALL

Application of the land use service criteria alone resulted in the classification of the total arterial street and highway system into the three jurisdictional subsystems shown on this map. The pattern shown emphasizes the close relationship which exists between land use development and arterial highway needs. The land uses which are shown include transportation terminals; recreational areas; and commercial, industrial, and institutional centers.

Source: SEWRPC.

Map 16

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

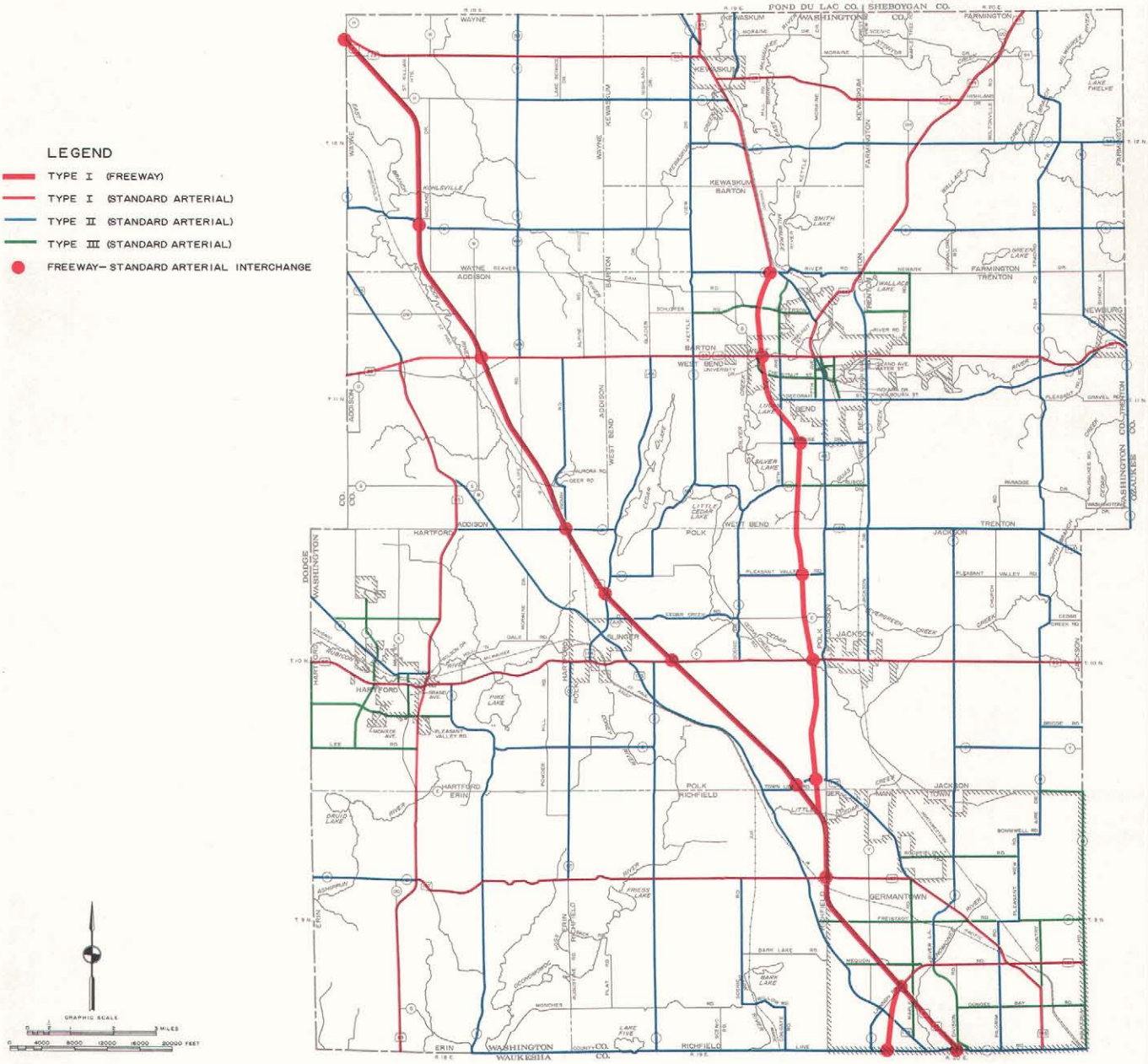


Application of the vehicle volume criteria alone resulted in the classification of the total arterial street and highway system into the three jurisdictional subsystems shown on this map. The configuration of the system again indicates the importance of freeways in serving the highest traffic volume. This third group of subsystems, based only on 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 trip service and land use service criteria necessary to develop the final classification of the entire arterial system into recommended jurisdictional subsystems.

Source: SEWRPC.

Map 17

PROPOSED JURISDICTIONAL CLASSIFICATION OF THE ARTERIAL STREET AND HIGHWAY SYSTEM IN WASHINGTON 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 subsystems shown on Maps 14, 15, and 16 into three individual but integrated, continuous jurisdictional highway systems. These systems consist of the Type I (state trunk), the Type II (county trunk), and the Type III (local trunk) highway subsystems. The Type I highway system carries the greatest traffic volumes, serves the longest trips, and connects the most significant land uses both within Washington County and within adjacent counties. The Type II highway system serves primarily intracounty trips, while the Type III highway system serves primarily intracommunity trips.

Source: SEWRPC.

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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 Washington 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 Washington County and its constituent cities, villages, and towns through the plan design year 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 Washington 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.

Two of these routes, USH 45 and STH 175, generally parallel proposed freeways. To avoid duplication of facilities and service, it is proposed that portions of these state trunk facilities revert to the Type II system at such time as the recommended paralleling freeways have been completed and opened to traffic. Two other existing state trunk highways, STH 33 and STH 83, are to be retained on the proposed Type I arterial system, which will include new alignments on portions of both state trunk facilities, with the old alignment of STH 33 reverting to the collector and local road system, and the old alignment of STH 83 reverting to the Type II, Type III, and collector and local road systems.

The staging of the Type II arterial system anticipates such facilities as Aurora and Indian Drives (Town of Addison), Badger Road (Town of Kewaskum), Kettle View Drive (Towns of Barton and Kewaskum), Pilgrim Road (Village of Germantown), and Town Line Road (Towns of Polk and Richfield) being retained on the local road system as nonarterial facilities, until such time as the construction of links integrating these facilities into the remainder of the arterial highway system is imminent. At that time, the jurisdiction of these facilities would be changed from the nonarterial town road classification to the Type II arterial classification, and the improvements and extensions effected. This staging is intended to provide the best possible trip service, land use service, and system continuity during the interim period required to fully implement the highway system plan, as well as to assign the responsibility for the arterial improvements required to the appropriate level of government.

The jurisdictional highway systems within Washington County as these systems are anticipated to exist by 1975, 1980, and 1990 are shown on Maps 19, 20, and 17, respectively. The configurations of the three jurisdictional highway systems as recommended for the years 1975, 1980, and 1990 are such that, in each case, the proposed Type I (state trunk) arterial system forms a complete and continuous arterial subsystem in and of itself; the proposed Type II (county trunk) arterial system complements the proposed Type I arterial system and with that system forms a continuous arterial subsystem; while the proposed Type III (local trunk) arterial system comprises the remainder of the total arterial street and highway system. Map 17 indicates this hierarchy of system and subsystem continuity.

THE RECOMMENDED TYPE I (STATE TRUNK) ARTERIAL HIGHWAY SYSTEM

The arterial street and highway system recommended to serve the arterial traffic demand in Washington County through the plan design year 1990 totals 446 route-miles of facilities, or about 36 percent of the estimated 1,248 route-miles of facilities expected to comprise the total street and highway system within the county in 1990. Of this total arterial system, 149 route-miles, or about 33 percent, are proposed to comprise the Type I (state trunk) arterial highway system. This represents a reduction of 38 miles in the existing state trunk highway and connecting street mileage within Washington County. The recommended Type I system includes about 105 miles of standard arterial facilities, as well as all of the 44 miles of existing and proposed freeways serving Washington County through the plan design year 1990 (see Table 10).

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 USH 41, USH 45, and Belt Freeways:

Table 10

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

Functional Facility Type	Number of Miles	Percent of Total
Freeways		
Existing	6.31	4.2
Proposed	37.31	25.0
Subtotal	43.62	29.2
Standard Surface Arterials		
Existing	99.95	67.1
Proposed	5.47	3.7
Subtotal	105.42	70.8
Total	149.04	100.0

Source: Wisconsin Department of Transportation and SEWRPC.

1. USH 45 from the northern terminus of the proposed USH 45 Freeway over its present alignment and over Fond du Lac Road (Village of Kewaskum) to the Fond du Lac County line, and over Main Street (City of West Bend) from Washington Street (STH 33, City of West Bend) to Barton Avenue (STH 144, City of West Bend).

2. STH 28 over its present alignment from USH 41 and over Main Street (Village of Kewaskum) to STH 144.

3. STH 33 over its present alignment from the Dodge County line to a point near CTH U, then over a new alignment north of the unincorporated places of Addison and Allenton, intersecting the present alignment near CTH WW, continuing over its present alignment and over Washington Street (City of West Bend) to the Ozaukee County line.

4. STH 60 over its present alignment from the Dodge County line over Sumner Street (City of Hartford), through the Village of Slinger, and over Main Street (Village of Jackson) to the Ozaukee County line.

5. STH 83 over its present alignment from the Waukesha County line to CTH E, then over a new alignment east of the City of Hartford, connecting with the present alignment north of the intersection of Union Street and Wilson Drive (City of Hartford), proceeding over its present alignment to STH 175.

6. STH 144 over its present alignment from Main Street (USH 45, City of West Bend) over Barton Avenue (City of West Bend) to the Sheboygan County line.

7. STH 145 over its present alignment from the Waukesha County line to its intersection with Maple Road (Village of Germantown).

8. STH 167 over its present alignment from STH 83 and over Holy Hill Road (Village of Germantown) to its intersection with STH 145 and Maple Road (Village of Germantown), and from STH 145 over Mequon Road (Village of Germantown) to the Ozaukee County line.

9. STH 175 over its present alignment from STH 83 to STH 33.

10. A new state trunk facility incorporating those portions of present Lannon Road (Village of Germantown) and Mequon Road (Village of Germantown) from USH 41 to STH 145.

All 21 municipalities within Washington 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 11.

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 Washington County to the plan design year of 1990. 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 of this report. The cross sections related to each code number are set forth in Figure B-1 of Appendix B and contain, in addition to the recommended typical dimensions, estimated representative unit construction and maintenance 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 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

Table 11

RECOMMENDED DISTRIBUTION OF TYPE I (STATE TRUNK) ARTERIAL SYSTEM MILEAGE IN WASHINGTON 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									
Hartford	--	3.10	3.10	--	4.14	4.14	--	3.00	3.00
Milwaukee	--	--	--	--	--	--	--	--	--
West Bend	--	6.96	6.96	2.38	7.92	10.30	2.38	7.92	10.30
Subtotal	--	10.06	10.06	2.38	12.06	14.44	2.38	10.92	13.30
VILLAGES									
Germantown	6.31	13.21	19.52	6.44	9.25	15.69	8.00	11.93	19.93
Jackson	--	1.24	1.24	--	1.43	1.43	--	1.43	1.43
Kewaskum	--	1.95	1.95	--	2.46	2.46	--	2.46	2.46
Newburg	--	0.78	0.78	--	0.78	0.78	--	0.78	0.78
Slinger	--	2.97	2.97	--	0.93	0.93	--	0.93	0.93
Subtotal	6.31	20.15	26.46	6.44	14.85	21.29	8.00	17.53	25.53
TOWNS									
Addison	--	21.32	21.32	6.85	10.24	17.09	6.85	10.24	17.09
Barton	--	5.46	5.46	1.27	3.12	4.39	1.27	3.12	4.39
Erin	--	10.10	10.10	--	10.10	10.10	--	10.10	10.10
Farmington	--	14.36	14.36	--	14.36	14.36	--	9.63	9.63
Germantown	--	0.25	0.25	--	--	--	--	--	--
Hartford	--	13.19	13.19	0.15	9.36	9.51	0.15	9.72	9.87
Jackson	--	11.31	11.31	--	4.58	4.58	--	4.58	4.58
Kewaskum	--	8.31	8.31	--	7.80	7.80	--	7.80	7.80
Polk	--	24.02	24.02	14.26	5.01	19.27	14.26	5.01	19.27
Richfield	--	11.52	11.52	1.78	6.06	7.84	1.78	6.06	7.84
Trenton	--	7.40	7.40	--	3.73	3.73	--	3.73	3.73
Wayne	--	11.74	11.74	6.04	5.70	11.74	6.04	5.70	11.74
West Bend	--	8.63	8.63	2.89	1.28	4.17	2.89	1.28	4.17
Subtotal	--	147.61	147.61	33.24	81.34	114.58	33.24	76.97	110.21
Total	6.31	177.82	184.13	42.06	108.25	150.31	43.62	105.42	149.04

Source: Wisconsin Department of Transportation and SEWRPC.

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 243 route-miles of facilities, or about 55 percent of the total arterial mileage proposed to serve Washington 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 243 route-miles of county trunk highways proposed represents an

increase of 52 miles over the existing county trunk mileage. The proposed system is shown on Map B-1 in Appendix B, and the distribution of the system mileage by municipality for the years 1975, 1980, and 1990 is indicated in Table 12.

As shown on Map B-1, all of the 17 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 28, STH 33, STH 60, and STH 167, and Lannon Road; and the following existing and proposed Type II arterial facilities: present STH 144 and a proposed extension of STH 145, which are to revert to the Type II arterial system, CTH D, CTH K, Paradise Road, and Pleasant Valley Road, the latter two being existing town roads.

In addition, certain roads of countywide significance, including both roads formerly designated as state trunk highways and existing local roads, are recommended for inclusion in the proposed Type II system. Facilities in the former category include USH 45 over its present alignment from STH 145 over Main Street (City of West Bend) to Washington Avenue (STH 33, City of West Bend); then over Main Street (City of West Bend) from Barton Avenue (STH 144, City of West Bend) to the terminus of the proposed USH 45 Freeway; existing STH 84 from CTH X to the Ozaukee County line; existing STH 143 from present USH 45 to the Ozaukee County line; STH 144 from STH 33 over its present alignment and over Franklin and Rector Streets (Village of Slinger) to STH 60; existing STH 145 from Maple Road (Village of Germantown) to present USH 45; and STH 175 from the Waukesha County line over its present alignment and over Washington Street (Village of Slinger) to STH 83, then from STH 33 to the Dodge County line.

Facilities in the latter category include Ash Road (Town of Trenton), Aurora Road (Town of Addison), Badger Road (Town of Kewaskum), Bonniwell Road (Village of Germantown), Bridge Street (Town of Jackson), Cedar Creek Road (Town of Polk), Colgate Road (Town of Richfield), County Line Road (City of Milwaukee and Village of Germantown), Decorah Road (City of West Bend), Division Road (Village of Germantown), Freistadt Road (Village of Germantown), Jackson Drive (Village and Town of Jackson), Kettle View Drive (Towns of Barton and Kewaskum), Lovers Lane Road (Town of Polk), N. Country Aire Drive (Village of Germantown), Paradise Drive (City and Town of West Bend), Pilgrim Road (Village of Germantown), Pleasant Valley Road (Town of Polk), Pleasant View Road (Village of Germantown), N. River Road (Town of Barton), River Lane (Village of Germantown), Scenic Drive (Towns of Polk and Richfield), Scenic Road (Town of Richfield), S. River Road (City of West Bend and Towns of Trenton and West Bend), State Street (City of Hartford), Summit Drive (Town of Barton), Town Line Road (Towns of Polk and Richfield), Trading Post Trail (Town of Farmington), Willow Road (Town of Richfield), and 18th Avenue (City and Town of West Bend).

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 Washington 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.

Table 12

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

Civil Division	Standard Surface Arterial (Miles)		
	1975	1980	1990
CITIES			
Hartford	1.03	1.16	1.89
Milwaukee	0.03	0.03	0.03
West Bend	0.13	11.24	12.82
Subtotal	1.19	12.43	14.74
VILLAGES			
Germantown	14.49	18.99	20.46
Jackson	0.38	0.47	0.60
Kewaskum	0.85	1.65	1.65
Newburg	1.15	1.15	1.15
Slinger	0.55	3.02	3.02
Subtotal	17.42	25.28	26.88
TOWNS			
Addison	3.76	12.04	12.04
Barton	4.99	8.73	10.07
Erin	10.97	10.97	10.97
Farmington	17.20	17.20	21.05
Germantown	2.03	1.53	1.53
Hartford	10.74	13.25	12.23
Jackson	18.91	25.25	25.12
Kewaskum	7.20	11.38	11.38
Polk	11.36	28.38	28.38
Richfield	14.87	19.10	19.10
Trenton	16.70	18.72	18.47
Wayne	14.57	14.57	14.57
West Bend	10.17	17.36	16.75
Subtotal	143.47	198.48	201.66
Total	162.08	236.19	243.28

Source: Wisconsin Department of Transportation and SEWRPC.

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 from 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 53 route-miles of facilities, or about 12 percent of the total arterial mileage proposed to serve Washington County in the plan design year 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 13. The proposed Type III arterial system is intended to serve the lowest level of arterial traffic demand within the urban areas of Washington County, and as such, to complement the proposed Type I and Type II subsystems. Although 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, 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 the 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

Table 13

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

Civil Division	Standard Surface Arterial (Miles)		
	1975	1980	1990
CITIES			
Hartford	0.76	1.20	3.78
Milwaukee	0.09	0.09	0.09
West Bend	7.38	7.26	10.93
Subtotal	8.23	8.55	14.80
VILLAGES			
Germantown	27.52	28.38	23.96
Jackson	--	--	--
Kewaskum	--	--	--
Newburg	--	--	--
Slinger	--	--	--
Subtotal	27.52	28.38	23.96
TOWNS			
Addison	--	--	--
Barton	2.06	1.34	2.22
Erin	--	--	--
Farmington	0.51	0.51	0.51
Germantown	0.86	--	--
Hartford	0.69	0.25	9.55
Jackson	0.51	0.51	0.51
Kewaskum	--	--	--
Polk	--	--	--
Richfield	0.21	0.21	0.21
Trenton	2.41	0.20	0.20
Wayne	--	--	--
West Bend	4.48	1.51	1.51
Subtotal	11.73	4.53	14.71
Total	47.48	41.46	53.47

Source: Wisconsin Department of Transportation and SEWRPC.

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.

RELATIONSHIP OF RECOMMENDED PLAN TO OTHER COUNTY JURISDICTIONAL HIGHWAY SYSTEM PLANS

An important consideration in the preparation of the Washington County jurisdictional highway system plan was the inter-county continuity of the arterial street and highway system and the jurisdictional subsystems. In the plan preparation every attempt was made to ensure consistency between the Washington County jurisdictional plan and the plans of adjoining counties. One relatively short segment of county trunk highway in adjoining Ozaukee County does not match the proposed Washington County jurisdictional system, as described in this chapter. Consequently, a future adjustment will have to be effected in either the Ozaukee or Washington County plan to provide the required inter-county continuity of the jurisdictional subsystems. The facility affected is CTH "T" which, under the recommended Washington County plan, would be routed over Bridge Street in the Town of Cedarburg between the Washington/Ozaukee border and CTH "Y" instead of over the present alignment of CTH "T." This segment of CTH "T" would thus revert to the local road system as Bridge Street is added to the Type II system in the 1990 Ozaukee County plan. Although this misalignment is of a relatively minor nature it is recommended that the Advisory Committee for Ozaukee County consider modification of the Ozaukee County jurisdictional highway system plan in order to provide consistency with the recommended Washington County plan.

SCENIC DRIVES AND RUSTIC ROADS

One of the most popular outdoor recreational activities within Washington County and the Region, of which Washington County is a part, is pleasure driving, as evidenced by the estimated 21,000 average seasonal Sunday participants in such pleasure driving within Washington County in 1970. 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 36,000 participants by 1990. To provide facilities for this activity, the marking and signing of a system of scenic drives and rustic roads routed over existing roadways within the county are herein recommended. The terms "scenic drive" and "rustic road" as used herein were defined in Chapter II of this report.

The scenic drives and rustic roads recommended to be marked and signed in Washington County are shown on Map 18. These roads are routed over 176 and 14 miles, respectively, of streets and highways which are comprised of existing arterial, collector, and land access facilities. Of the 176 miles of proposed scenic drives, 97 miles, or about 55 percent, would normally perform arterial street and highway functions, while the remaining 79 miles, or about 45 percent, would normally perform collector and land access functions during weekdays through the plan design year 1990. All 14 miles of proposed rustic roads would perform collector and land access functions through the plan design year.

The recommended scenic drive system within Washington County consists of four basic drives—the Kettle Moraine Scenic Drive, the proposed Milwaukee River Scenic Drive, the proposed Maskikon Scenic Drive,[1] and the proposed Southern Lakes Scenic Drive—with interconnecting links that provide access to geomorphological, historical, recreational, and scientific points of interest, and that make possible a continuous route for pleasure driving throughout Washington County.

The Kettle Moraine Scenic Drive is an established scenic drive that has been marked by the Wisconsin Department of Natural Resources. The Kettle Moraine Scenic Drive traverses Washington County from the Fond du Lac County line to the Waukesha County line, serving as a connecting link between the northern and southern units of the Kettle Moraine State Forest. It is routed over streets and highways from which interesting land forms created by glaciation may be seen, and serves the Sunday pleasure driving participant as a scenic route between cities and villages located in the western areas of the Region. The proposed Milwaukee River Scenic Drive generally traverses the wetlands of the Milwaukee River in northeastern Washington County, and in parts parallels the course of the main stem of the Milwaukee River, thus providing views of, and access to, these scenic riverine areas. The proposed Maskikon Scenic Drive, located primarily in western Washington County, would provide a marked and signed route between numerous wetlands, including the Allenton Public Hunting Grounds, whose natural vegetation and wildlife provide areas of scientific and recreational interest. The proposed Southern Lakes Scenic Drive connects the Kettle Moraine Scenic Drive to the proposed Milwaukee River Scenic Drive, thus providing continuity in the scenic drive system as well as providing access to the southern lakes of Washington County.

The proposed system of scenic drives is located within one mile of all municipalities in Washington County, thus providing good accessibility for the populous areas of the county. The location and configuration of the proposed system within the county were based upon analyses of

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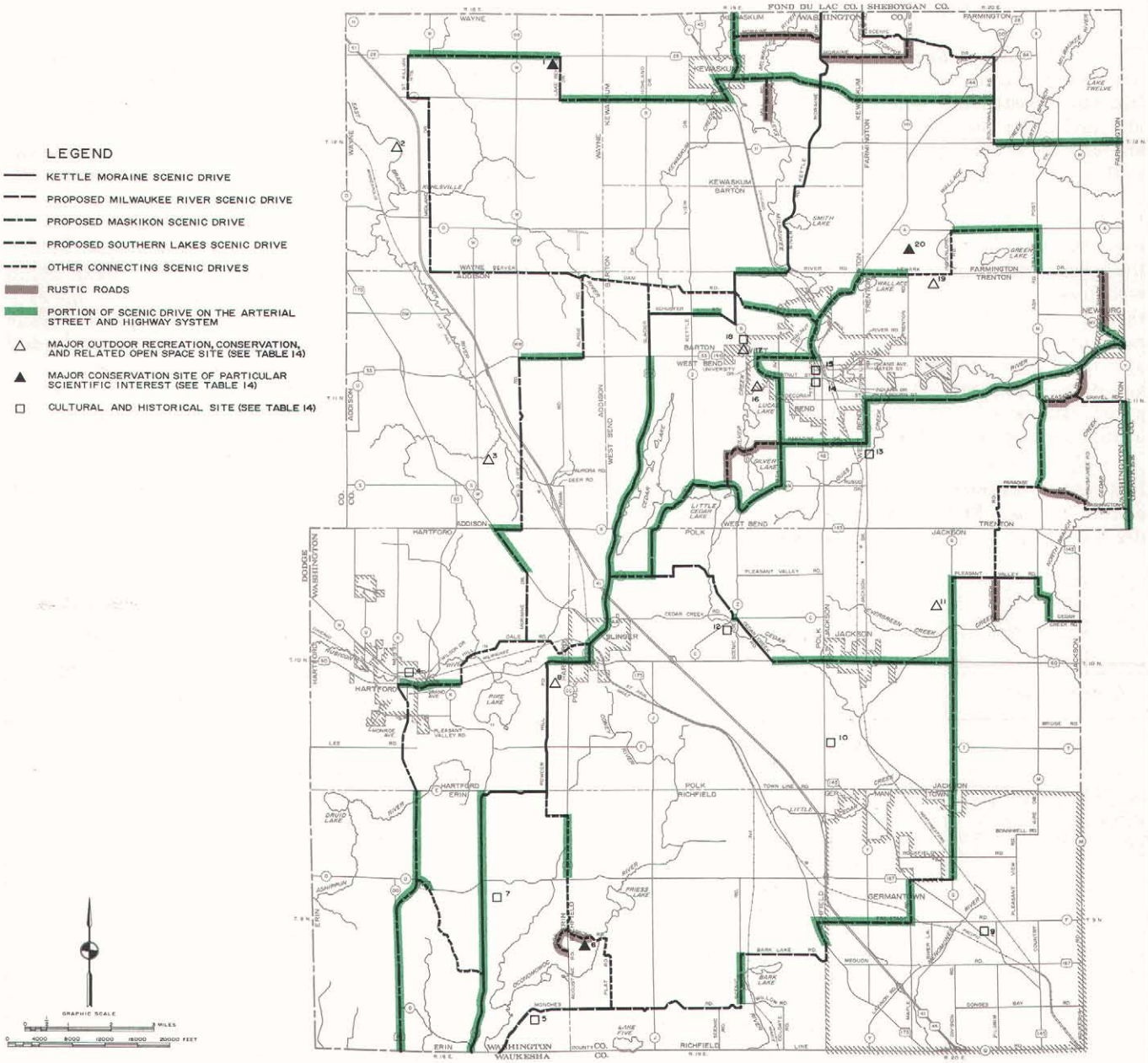
[1] *Maskikon is the Menomonee Indian word meaning "swamps or marshland." The Menomonees were the tribe that inhabited what is now Washington County at the time of its settlement by Europeans.*

Map 18

RECOMMENDED SCENIC DRIVE AND RUSTIC ROAD SYSTEM IN WASHINGTON COUNTY: 1990



The scenic drive system recommended for marking and signing within Washington County consists of 176 miles of existing arterial, collector, and land access streets. This system consists of the existing Kettle Moraine Scenic Drive, and the proposed Milwaukee River, Maskikon, and Southern Lakes Scenic Drives, with interconnecting links to provide for access to the scenic, historical, and recreational sites in the county. The rustic roads recommended to be marked and signed within the county consist of 14 miles of existing nonarterial streets and highways which are particularly scenic in their present state.

Source: SEWRPC.

the recreational and natural resource base of the Region and the county. As shown on Map 18, the scenic drive system would connect all existing county and state parks within Washington County, as well as 19 of the 20 sites identified in inventories conducted by the Regional Planning Commission as having cultural, historical, recreational, or scientific interest within the county (see Table 14).

The rustic road elements of the proposed system are comprised of segments of existing nonarterial streets and highways located throughout Washington County which are particularly scenic in their present state. These roads are also shown on Map 18, and are proposed to remain in their present rustic state.

In order to attain the necessary intercommunity and intercounty continuity in the scenic drives, to assure the proper relationship of the rustic roads to the natural resource base, to assure uniformity in the marking and signing of the scenic drive and rustic road system, and, most importantly, to assure the attainment of an equitable fiscal policy for the maintenance of the scenic drive and rustic road system, the functional classification categories established under the study were expanded to include scenic drives and rustic roads as a special category.

It is further recommended that, pursuant to Section 83.42 of the Wisconsin Statutes of 1973, those portions of the designated scenic drive system, as shown in Table 15, which meet the established rules and standards for identification, use, and preservation as rustic roads should be so designated by the local unit of government and the Washington County Highway Committee.

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 1.52 million of the 1.90 million arterial miles of travel anticipated to occur daily within Washington County by the year 1990. Thus, approximately 33 percent of the total arterial street and highway mileage within the county may be expected to carry approximately 80 percent of the total arterial travel demand. The proposed Type II arterial may be expected to carry an additional 300,000 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 16 percent of the total arterial travel demand. The remaining 80,000 arterial vehicle miles of travel, or 4 percent of the total demand, would be carried on the

Table 14

CULTURAL, HISTORICAL, SCIENTIFIC, AND MAJOR OUTDOOR RECREATIONAL SITES IN WASHINGTON COUNTY: 1973

Code Number[a]	Cultural, Historical, Scientific, or Major Outdoor Recreational Site	
1	Drumlins (Glaciated Feature)	--
2	Theresa Marsh	State of Wisconsin
3	Allenton Public Hunting Grounds	State of Wisconsin
4	Kissel Car Factory	Wisconsin Registered Marker
5	St. Paul's United Church of Christ	Congregation Synod
6	Crevasse Fill (Glaciated Feature)	--
7	Carmelite Fathers Monastery (Holy Hill)	Carmelite Brothers
8	Pine Lake State Park	Wisconsin Department of Natural Resources
9	Germantown Mutual Insurance Co.	Washington County Historical Society
10	Schowalter Pioneer Cemetery	Unknown
11	Jackson Marsh	State of Wisconsin
12	Maxon-Wright House	Washington County Historical Society
13	Carl A. Schroeder 1856-1944 Marker	Washington County Historical Society
14	Court House Square	Washington County Historical Society
15	Old Settlers Triangle	Washington County Historical Society
16	Ridge Run County Park	Washington County Park and Planning Commission
17	Albecker County Park	Washington County Park and Planning Commission
18	First Rural Power Line Marker	Washington County Historical Society
19	Leinberger County Park (Proposed)	Washington County Historical Society
20	Lizard Mound State Park	Wisconsin Department of Natural Resources

[a] *See Map 18.*

Source: Washington County Historical Society; Washington County Park and Planning Commission; and SEWRPC.

proposed Type III arterial system. Thus, the proposed Type I and Type II systems combined may be expected to carry approximately 96 percent of the total arterial vehicle miles of travel expected to take place within the county by the year 1990, leaving only 4 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 Washington County by the year 1990 are similarly estimated as 2.09 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 16 and 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 15

RECOMMENDED RUSTIC ROADS IN WASHINGTON COUNTY

Route	Limits	Municipality
Church Road	Pleasant Valley Road to its southern terminus	Town of Jackson
E. Moraine Drive	CTH S to E. Kettle Moraine Drive, and E. Kettle Moraine Drive to Maple Tree Road	Towns of Kewaskum and Farmington
Hogs Back Road	St. Augustine Road to Friess Lake Road	Town of Richmond
Maple Tree Road	E. Kettle Moraine Drive to Scenic Drive	Town of Farmington
Paradise Drive	Woodland Drive to 18th Avenue, and CTH M to Elm Road	Towns of West Bend and Trenton
Pleasant Hill	CTH M to CTH I	Town of Trenton
Shady Lane	Town Line Road to CTH MY	Town of Trenton
S. Mill Road	STH 28 to its southern terminus	Town of Kewaskum

Source: SEWRPC.

Table 16

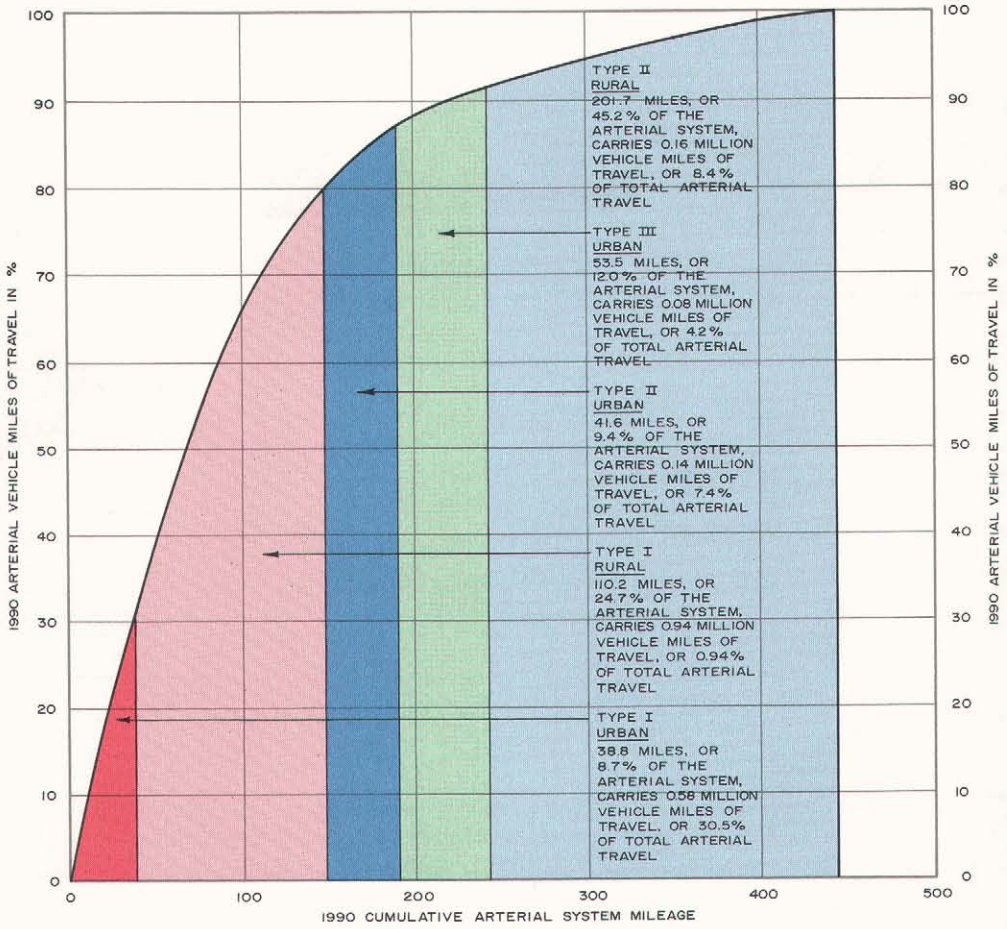
ANTICIPATED DISTRIBUTION OF TRAVEL ON THE TOTAL STREET AND HIGHWAY SYSTEM IN WASHINGTON COUNTY: 1990

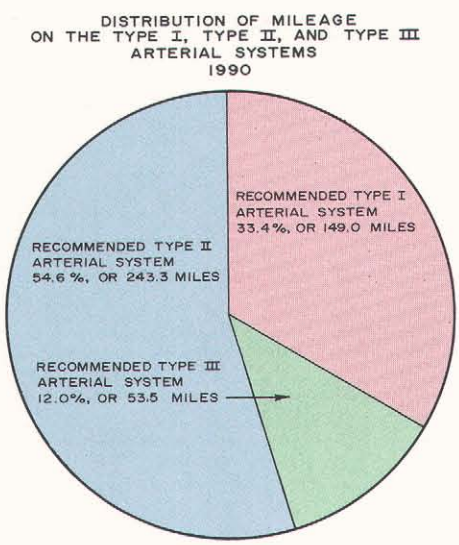
Type of Street or Highway	Miles		Travel Demand Served	
	Number	Percent of Total	Millions of Vehicle Miles Per Day	Percent of Total
Arterial				
Rural				
Type I (State Trunk)	110.2	8.8	0.94	45.0
Type II (County Trunk)	201.7	16.2	0.16	7.6
Subtotal	311.9	25.0	1.10	52.6
Urban				
Type I (State Trunk)	38.8	3.1	0.58	27.8
Type II (County Trunk)	41.6	3.3	0.14	6.7
Type III (Local Trunk)	53.5	4.3	0.08	3.8
Subtotal	133.9	10.7	0.80	38.3
Arterial Total	445.8	35.7	1.90	90.9
Nonarterial				
Existing and Proposed Collector and Minor Streets	802.1	64.3	0.19	9.1
Total	1,247.9	100.0	2.09	100.0

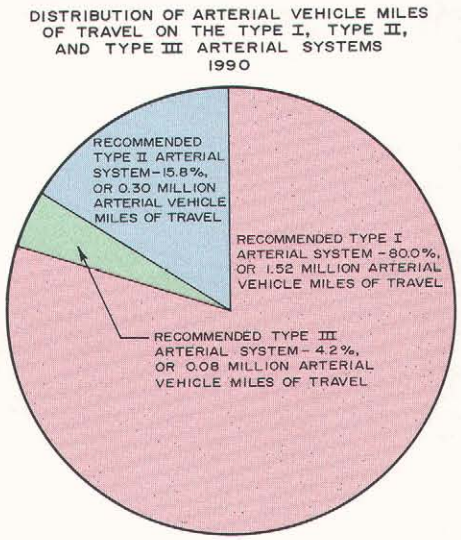
Source: SEWRPC.

Figure 9

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



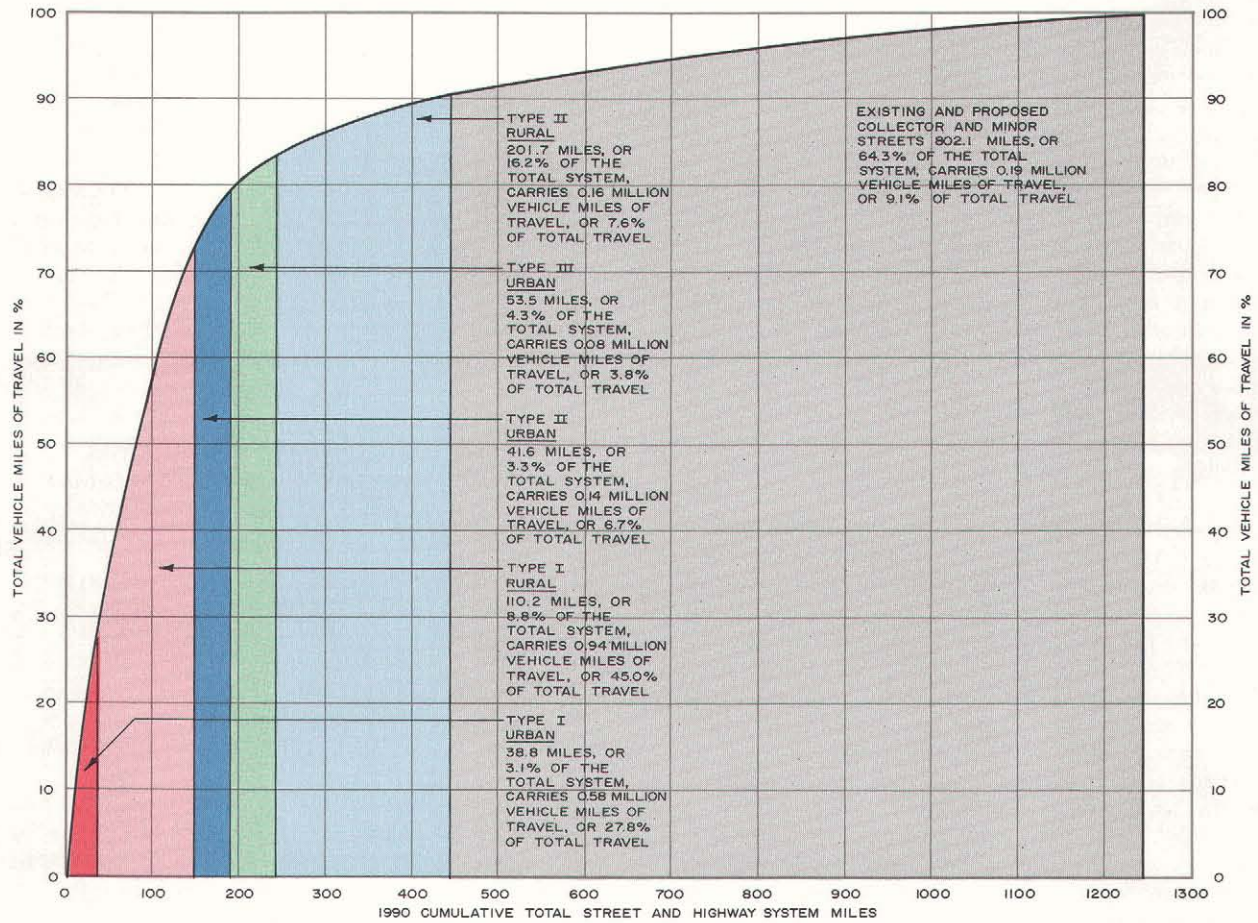




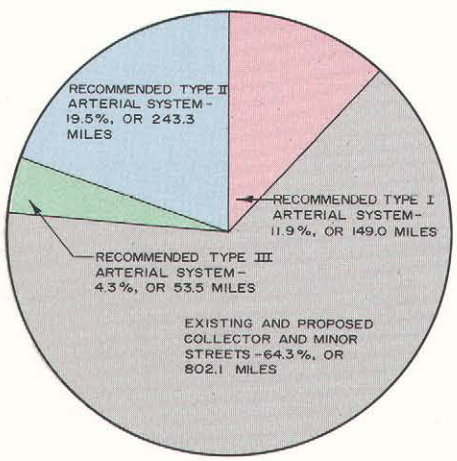
Source: SEWRPC.

Figure 10

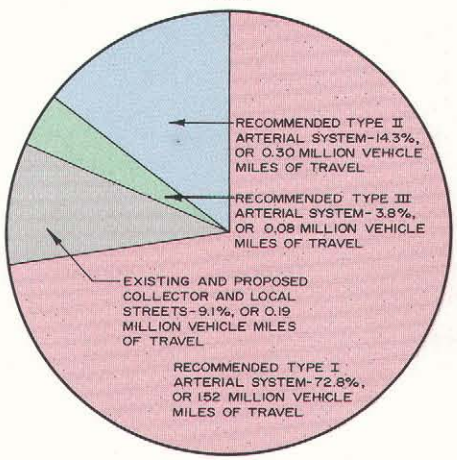
RELATIONSHIP BETWEEN PERCENT OF TOTAL VEHICLE MILES OF TRAVEL AND CUMULATIVE TOTAL MILEAGE RECOMMENDED WASHINGTON COUNTY JURISDICTIONAL HIGHWAY SYSTEM: 1990



DISTRIBUTION OF MILEAGE ON THE TOTAL STREET AND HIGHWAY SYSTEM 1990



DISTRIBUTION OF VEHICLE MILES OF TRAVEL ON THE TOTAL STREET AND HIGHWAY SYSTEM 1990



Source: SEWRPC.

STAGING OF THE PROPOSED JURISDICTIONAL HIGHWAY SYSTEMS

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 for construction after 1975, it is recommended that certain arterial facilities which should ultimately be designated as Type II routes be maintained as Type I routes until such time as the paralleling freeways intended to serve the corridors are constructed. Upon completion of these freeways, these interim Type I facilities would revert to Type II facilities. This staged development, in addition to providing improved traffic service, would facilitate system continuity and arterial route marking during the interim plan implementation period. A summary of the proposed freeway construction as set forth in the adopted regional transportation plan is presented in Table 17, together with a listing of the corresponding surface arterials required to fulfill the Type I needs in the corridor on an interim basis.

The jurisdictional highway system within Washington County as this system is anticipated to exist in 1975 is shown on Map 19. The 1975 stage reflects the reversion to the county trunk highway system of STH 145 from USH 45 to STH 167 (Village of Germantown and Towns of Germantown and Jackson). Additional changes in the 1975 stage, including the reversion of arterial county trunk highways to the local road system, nonarterial county trunk highways to the local road system, and local roads to the county trunk system, are shown in Tables 18, 19, and 20, respectively.

The proposed configuration of the jurisdictional highway system within Washington County as anticipated to exist by 1980 is shown on Map 20. The 1980 stage reflects the completion of the proposed USH 45 freeway; the relocation of STH 33 over new alignment north of the unincorporated community of Allenton; the reversion to the Type II (county trunk) highway system of USH 45 from STH 145 to STH 33 and from Barton Avenue to the proposed USH 45 freeway (City of West Bend, Villages of Germantown and Jackson, and Towns of Barton, Jackson, Polk, Richfield, and West Bend), STH 175 from the Waukesha County line to STH 83 (Villages of Germantown and Slinger and Towns of Richfield, Polk, Hartford, and Addison) and from STH 33 to the Dodge County line (Town of Addison), STH 144 from STH 60 to STH 33 (Village of Slinger and Towns of Polk and West Bend), and STH 143 from USH 45 to the Ozaukee County line (Towns of Jackson and Trenton); the addition to the Type II highway system of Bridge Street from CTH T to the Ozaukee County line (Town of Jackson), Cedar Creek Road from USH 41 to present CTH C (Town of Polk), Decorah Road from CTH G to 18th Avenue (City of West Bend), Lover's Lane Road from STH 175 to

Table 17

PROPOSED FREEWAYS AND TEMPORARY ALTERNATE ROUTING OVER STATE TRUNK HIGHWAYS IN WASHINGTON COUNTY: 1973-1990

Proposed Freeway	Temporary Alternate Routing
Proposed USH 41 Freeway from Milwaukee County line to Dodge County line	Over present STH 175 from Milwaukee County line to STH 83, and from STH 33 to the Dodge County line
Proposed USH 45 Freeway from USH 41 to present USH 45 and CTH D	Over present USH 45 from USH 41 to its intersections with the proposed USH 45 Freeway and CTH D

Source: SEWRPC.

Table 18

ARTERIAL COUNTY TRUNK HIGHWAYS PROPOSED TO REVERT TO THE LOCAL ROAD SYSTEM BY 1975

Route	Limits	Municipality
CTH B	STH 33 to CTH D, and CTH D to CTH H	City of West Bend and Towns of Barton and Kewaskum
CTH C	STH 60 to CTH Z	Town of Polk
CTH F	STH 145 to Pilgrim Road, and Pleasant View Road to Wausaukee Road	Village of Germantown
CTH K	STH 83 to a point approximately 0.04 mile north of STH 60	City and Town of Hartford
CTH M	CTH C (Ozaukee County) to a point approximately 0.51 mile north of Highland Road	Village of Germantown
CTH W	STH 33 to STH 175	Town of Addison
CTH Y	STH 167 to Mequon Road	Village of Germantown
CTH Y (Mequon Road)	Goldendale Road North to Goldendale Road South	Village of Germantown

Source: SEWRPC.

STH 60 (Town of Polk), Paradise Drive from CTH G to 18th Avenue (City and Town of West Bend), Pleasant Valley Road from CTH Z to present USH 45 (Town of Polk), and 18th Avenue from STH 33 to CTH NN (City and Town of West Bend); and the reversion of CTH NN from 18th Avenue to present USH 45 (Town of West Bend) to the Type III (local trunk) highway system, as well as approximately 10.28 miles of local roads which were to be added to the Type II highway system at such time as segments of new arterial facilities have been constructed providing continuity in the existing roadway systems. These local roads and the new construction required prior to their addition to the Type II system consist of the following:

Table 19

NONARTERIAL COUNTY TRUNK HIGHWAYS PROPOSED TO REVERT TO THE LOCAL ROAD SYSTEM BY 1975

Route	Limits	Municipality
CTH C	USH 45 to CTH Z	Town of Polk
CTH E	STH 83 to CTH K	Towns of Erin and Hartford
CTH F	Mequon Road to STH 175	Village of Germantown
CTH H	USH 41 to CTH W, and Badger Lane to Fond du Lac County line	Town of Wayne
CTH K	The intersection of Prospect and N. Main Streets to STH 83	City of Hartford and Towns of Addison and Hartford
CTH M	Ash Road to CTH MY, and N. Country Aire Drive to Ozaukee County line	Towns of Trenton and Jackson and Village of Germantown
CTH Q	STH 83 to CTH K	Town of Erin
CTH S	Dodge County line to CTH W	Town of Addison
CTH U	STH 33 to Hartford Airport	Towns of Addison and Hartford and City of Hartford
CTH W	CTH D to STH 33, and STH 28 to the Fond du Lac County line	Towns of Addison and Wayne
CTH Y	STH 167 to STH 145, and STH 175 to Mequon Road	Town and Village of Germantown
CTH DD	STH 144 to STH 144	Town of Farmington
CTH DW	Dodge County line to USH 41	Town of Addison
CTH HH	STH 28 to STH 144	Town of Farmington
CTH OO	CTH O to STH 83	Town of Erin

Source: SEWRPC.

Table 20

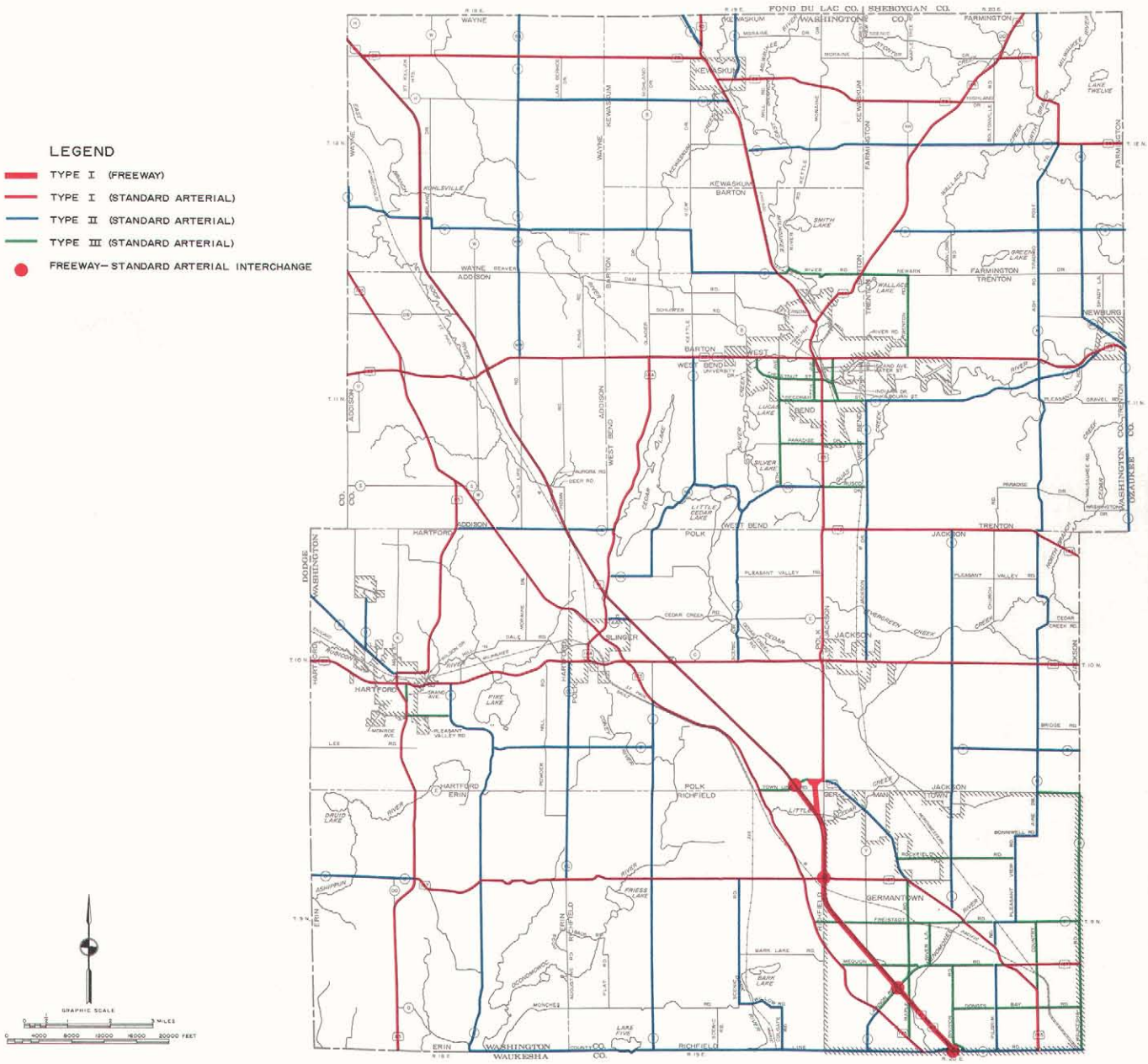
LOCAL ROADS PROPOSED TO BECOME ARTERIAL COUNTY TRUNK HIGHWAYS BY 1975

Route	Limits	Municipality
Ash Road	CTH M to E. Town Line Road	Town of Trenton
Bonniwell Road	Pleasant View Road to N. Country Aire Drive	Village of Germantown
Colgate Road	CTH Q to Willow Road	Town of Richfield
County Line Road	Pilgrim Road to Wausaukee Road	City of Milwaukee and Village of Germantown
Jackson Drive	STH 60 to STH 143	Village and Town of Jackson
N. Country Aire Drive	Bonniwell Road to CTH M	Village of Germantown
Pilgrim Road	Waukesha County line to Mequon Road, and STH 145 to Freistadt Road	Village of Germantown
Pleasant View Road	Freistadt Road to Bonniwell Road	Village of Germantown
Scenic Drive	STH 60 to CTH Z	Town of Polk
Scenic Road	Willow Road to STH 167	Town of Richfield
State Street	Victor Drive to N. Main Street	City of Hartford
Trading Post Trail	E. Town Line Road to STH 84	Town of Farmington
Willow Road	Colgate Road to Scenic Road	Town of Richfield

Source: SEWRPC.

Map 19

RECOMMENDED JURISDICTIONAL HIGHWAY SYSTEM PLAN FOR WASHINGTON COUNTY: 1975 STAGE

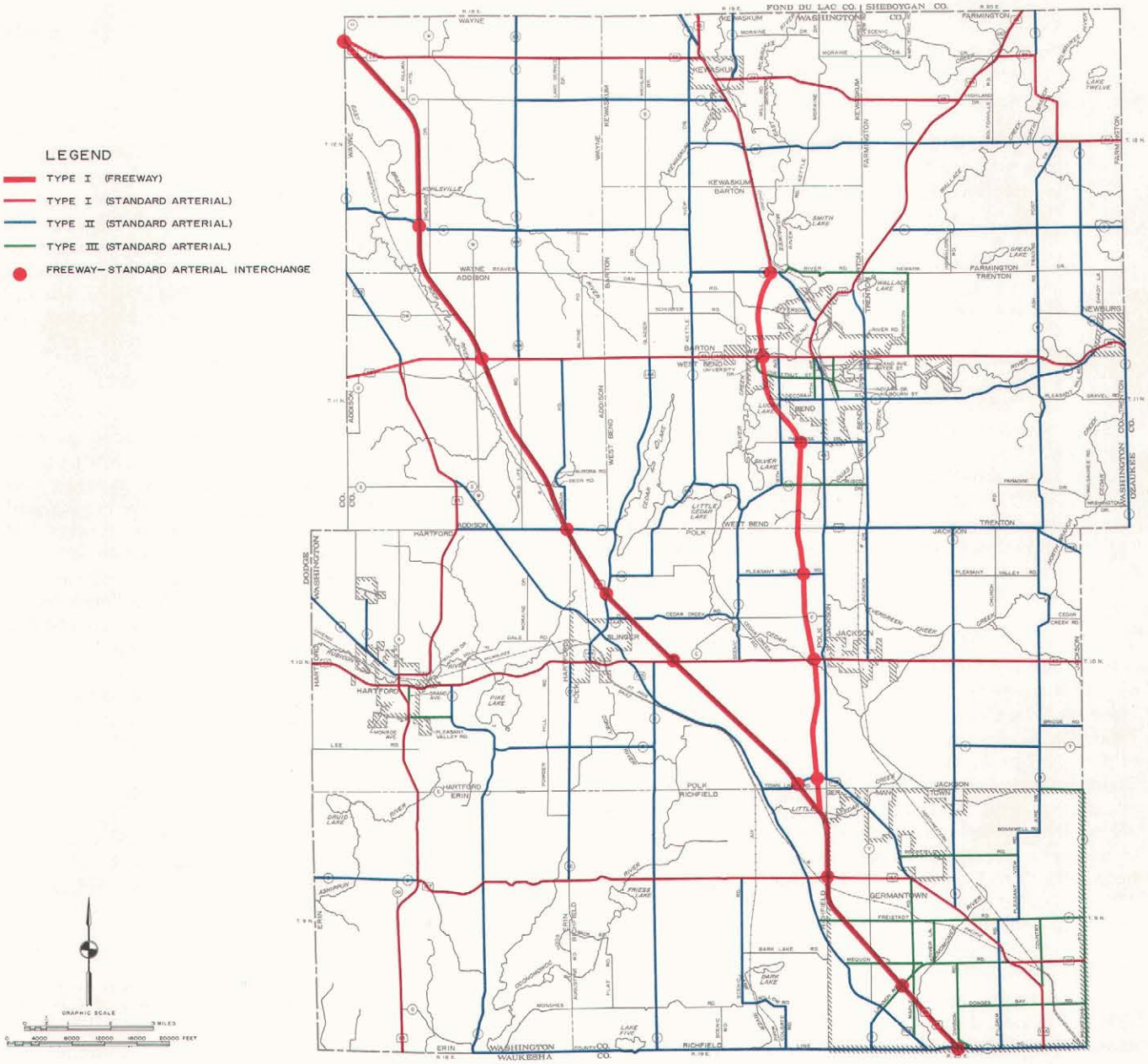


The 1975 stage of the recommended jurisdictional highway system plan for Washington County, representing the first stage in the implementation of the 1990 plan, includes a freeway system comprised of USH 41 from the Washington-Waukesha County line to USH 45. Recommended changes in jurisdiction by 1975 include the reversion from the state trunk highway system to the county trunk highway system of STH 145 from USH 45 to STH 167, together with the appropriate realignment of the county trunk and local trunk highway systems.

Source: SEWRPC.

Map 20

RECOMMENDED JURISDICTIONAL HIGHWAY SYSTEM PLAN FOR WASHINGTON COUNTY: 1980 STAGE



The 1980 stage of the recommended jurisdictional highway system plan for Washington County anticipates the completion of the proposed USH 45 freeway, in addition to the upgrading of USH 41 to freeway status over its entire length. With these additions to the freeway system, portions of existing USH 45, STH 175, STH 144, and STH 143 will revert to the county trunk system. The 1980 stage of the plan recommends a Type I (state trunk) arterial system consisting of 150 route-miles of facilities, a Type II (county trunk) arterial system of 236 route-miles of facilities, and a Type III (local trunk) arterial system consisting of nearly 42 route-miles of facilities.

Source: SEWRPC.

1. Aurora Road from STH 33 to a point approximately 0.43 mile north of Deer Road, and Indian Road from Deer Road to USH 41, with a new facility from 0.43 mile north of Deer Road to the intersection of Deer and Indian Roads (Town of Addison).

2. Badger Road from Kettle View Drive to Prospect Drive (Town of Kewaskum), with the construction of a new facility from approximately the intersection of Badger Road and Prospect Drive to the present intersection of USH 45 and CTH H.

3. Kettle View Drive from Schuster Drive to CTH H, with the construction of a new facility from the intersection of Kettle View Drive and Schuster Drive to the intersection of STH 33 and CTH Z, and a new facility from the intersection of Kettle View Drive and CTH H to approximately the intersection of CTH V and W. Moraine Drive (Towns of Barton and Kewaskum).

4. Pilgrim Road from Mequon Road to STH 145, with the construction of a railroad crossing for the Chicago, Milwaukee, St. Paul and Pacific Railroad Company (Village of Germantown).

5. Town Line Road and N. River Road from CTH I to STH 144, with the construction of a river crossing on the Milwaukee River and a new facility from Creek Drive to Wallace Lake Drive (City of West Bend and Towns of Barton, Trenton, and West Bend).

The proposed configuration of the jurisdictional highway system within Washington County as anticipated to exist by 1990 is shown on Map 17. The 1990 stage reflects the completion of the proposed Belt Freeway from the Waukesha County line to the USH 41 freeway (Village of Germantown), the relocation of STH 83 over new alignment east of the City of Hartford from the present intersection with CTH E to the present intersection with Wilson Drive (City and Town of Hartford); the reversion to the Type II (county trunk) highway system of STH 83 from State Street to Wilson Drive (City of Hartford) and STH 84 from CTH X to the Ozaukee County line (Town of Farmington); the reversion to the Type III (local trunk) highway system of STH 83 from State Street to STH 60 and from Lincoln Street to Monroe Avenue (City of Hartford); the reversion to the local road system of STH 83 from STH 60 to Lincoln Street and from Monroe Avenue to CTH E (City and Town of Hartford), and STH 84 from CTH X to STH 144; the addition to the Type I (state trunk) system of Lannon Road from USH 41 to Mequon Road, and Mequon Road from Lannon Road to STH 145 (Village of Germantown); the addition to the Type II highway system of River Road and Summit Drive from present USH 45 to STH 144 (Town of Barton), as well as the addition of River Lane from Mequon Road to Freistadt Road, with the construction of new arterial facilities providing continuity in the existing roadway systems from the intersection of Division Road and Lilac Lane to the intersection of River Lane and Mequon Road, and from the intersection of River Lane and Freistadt Road to the intersection of STH 145 and CTH G (Village of Germantown). Deletions from the Type II system include Division Road from STH 145 to CTH G (Village of Germantown), and CTH U from the Hartford Airport to CTH N (City and Town of Hartford).

The proposed Type I system is recommended to include 184 route-miles of facilities in 1975, and the proposed Type II system, 162 route-miles. Thus, the total mileage for the combined Type I and Type II systems in 1975 is 346 miles, somewhat less than the proposed 1980 and 1990 equivalent mileages, as shown in Tables 11 and 12. In 1980, the proposed Type I system is recommended to include 150 route-miles of facilities, complemented by a proposed Type II system comprised of 236 route-miles of standard arterials. With the completion of the proposed freeway system by 1990, the proposed Type I system is recommended to include 149 route-miles of facilities, and the proposed Type II system is recommended to include 243 route-miles of facilities.

SUMMARY

This chapter has described the recommended jurisdictional highway plan developed for Washington 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 Washington 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 well as a jurisdictional, arterial street and highway system plan for Washington County to the plan design year 1990.

The arterial street and highway system recommended to serve the traffic demand in Washington County through the plan design year 1990 totals 446 route-miles of facilities, or about 36 percent of the estimated 1,248 route-miles of facilities expected to comprise the total street and highway system within the county in 1990. Of this total arterial system, 149 route-miles, or about 33 percent, are proposed to comprise the Type I (state trunk) highway system, a reduction of 38 miles. This Type I system is anticipated to carry approximately 80 percent of the arterial travel demand and approximately 73 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 and proposed freeway facilities within Washington 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 (county trunk) highway system, consisting of 243 route-

miles of arterial facilities, or about 55 percent of the total arterial mileage required to serve Washington County in the plan design year 1990. This Type II system, representing an increase of 52 route-miles over the present system, would serve to complement the recommended Type I (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 16 percent of the arterial travel demand and an additional 14 percent of the total travel demand expected to be generated within Washington County by the year 1990.

The Type III (local trunk) highway system recommended in the plan consists of the remaining 53 route-miles of arterial facilities, or about 12 percent of the total arterial mileage proposed to serve Washington 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 Washington County, while comprising an integral part of the total arterial street and highway system.

Finally, the plan recommends the marking and signing of a system of scenic drives and rustic roads within the county. The scenic drive system, consisting of 176 route-miles of streets and highways, would be comprised of 97 miles of local, county, and state trunk highways and 79 miles of local collector and land access streets. All 14 miles of proposed rustic roads would perform collector and land access functions through the plan design year. The scenic drive and rustic road system would accommodate the anticipated 36,000 average seasonal Sunday participants in pleasure driving forecast for 1990 in Washington County. The recommended scenic drive system would consist of four basic drives—the Kettle Moraine Scenic Drive, the proposed Milwaukee River Scenic Drive, the proposed Maskikon Scenic Drive, and the proposed Southern Lakes Scenic Drive—with additional interconnecting links to provide for access to the scenic, cultural, historical, natural, scientific, and recreational sites located throughout Washington County. The plan recommends that certain facilities comprising the scenic drive system be designated as rustic roads and be maintained in their natural state.

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 Washington 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 more sound basis for the efficient multijurisdictional management of the total arterial street and highway system, and for the attainment of 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.

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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 attainment of the objectives expressed through one or more of the criteria used to prepare the plan is beyond the financial reach of implementing 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 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 application of the planning criteria set forth in this report. Total plan construction and maintenance costs were estimated and compared to anticipated revenues over an approximately 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 Aids for Highways

Federal aids for highway construction are derived from federal highway user excise taxes and the federal motor fuel tax, presently established at four 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, highway-related, and, effective in 1974, for mass transit 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.

Federal aid interstate funds are apportioned to the states on the basis of the following formula:

> For the fiscal years 1960 through 1966, funds were apportioned in the ratio which the estimated cost of completing the Interstate System in such State . . . bears to the sum of the estimated cost of completing the Interstate System in all of the States. For the fiscal years 1967 to the present, funds were apportioned in the ratio which the Federal share of the estimated cost of completing the Interstate System in such State . . . bears to the sum of the estimated cost of the Federal share completing the Interstate System in all of the States.[1]

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 rural areas of each State bears to the total population of rural areas of all the States as shown by the latest available Federal census; and one-third in the ratio which the mileage of rural delivery routes and intercity mail routes where service is performed by motor vehicles in each State bears to the total mileage of such 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.[2]

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 population of rural areas of each State bears to the total population of rural areas 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,[3] 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.[4]

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

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

[2] *Ibid.*

[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] *Ibid.*

> in municipalities and other urban places of five thousand or more in all the States, as shown by the latest available Federal census.[5]

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.[6] TOPICS is an acronym for "Traffic Operations Program to Increase Capacity and Safety." Federal aid funds authorized by Congress for TOPICS were apportioned to the states on the same basis as federal aid funds for improvements on extensions of the federal aid primary and secondary systems into urban areas, or "C" funds. The Federal Aid Highway Act of 1973 abolished the separate appropriation for TOPICS improvements. Such improvements, however, were made eligible for federal funds if located on the federal aid urban system.

As a counterpart of the newly established, urban-oriented TOPICS program, the Congress 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' extensions into urban areas.

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.[7]

The Federal Aid Highway Act of 1973 provides for the realignment of the federal aid highway systems into 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.

Revenues from Federal Aids for Highways: Federal aid funds are received from the Federal Highway Administration by the Wisconsin Department of Transportation, Division of Highways, as reimbursements for the 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 21 indicates federal aid apportionments to Wisconsin during the 10 years from fiscal year 1963 through fiscal year 1972.

Disbursements of Federal Aids for Highways: The federal aids received into the State Highway Fund are administered by the State 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 with state funds. No federal aid interstate funds were expended in Washington County during fiscal years 1963 through 1972.

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. Since construction is scheduled on a statewide basis and varies annually on a county basis, Washington County has received varying annual amounts of such aids. Table 22 sets forth the annual amounts of federal aid primary funds expended in Washington County during the fiscal years 1963 through 1972.

The distribution of federal aid secondary funds, including rural secondary funds, received by Wisconsin has been 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 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 compared with the total number of motor vehicles registered within the state. Based on this formula, Washington County has received about $77,400 annually, or more than 1 percent of the total federal aid secondary funds received annually by the

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[5] *Ibid.*

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

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

state. If a county did not utilize its federal aid secondary apportionment, the funds would revert to the State Highway Commission to be reapportioned to other counties which applied for such funds, or would be used by the State Highway Commission at its discretion anywhere in the state on the federal aid secondary system. Washington County, along with other populous counties in the state, has received such reverted funds. The annual amounts of

Table 21

FEDERAL HIGHWAY AID APPORTIONMENTS TO WISCONSIN BY AID CATEGORY
FISCAL YEARS 1963-1972

Fiscal Year	Aid Category					
	Interstate		Primary		Secondary	
	Apportionment	Percent of Total	Apportionment	Percent of Total	Apportionment	Percent of Total
1963	$ 21,164,100	51.4	$ 9,109,799	22.1	$ 6,431,738	15.6
1964	22,927,775	52.5	9,484,657	21.7	6,690,955	15.3
1965	23,689,058	53.0	9,592,323	21.4	6,770,585	15.1
1966	24,691,450	52.6	10,230,422	21.8	7,207,143	15.3
1967	24,733,350	52.3	10,390,974	22.0	7,313,176	15.5
1968	28,144,962	55.3	10,491,840	20.6	7,381,920	14.5
1969	31,408,425	58.1	10,436,973	19.3	7,344,879	13.6
1970	34,435,600	52.1	13,176,715	19.9	9,273,485	14.0
1971	34,260,800	52.1	13,135,078	19.9	9,243,153	14.0
1972	35,828,800	53.5	13,080,267	19.6	9,441,046	14.0
Total	$281,284,320	--	$109,129,048	--	$77,098,080	--
10-Year Average	$ 28,128,432	--	$ 10,912,905	--	$ 7,709,808	--

Fiscal Year	Aid Category						Total Apportionments
	Urban		TOPICS[a]		Urban (M System)		
	Apportionment	Percent of Total	Apportionment	Percent of Total	Apportionment	Percent of Total	
1963	$ 4,471,619	10.9	$ --	--	$ --	--	$ 41,177,256
1964	4,588,651	10.5	--	--	--	--	43,692,038
1965	4,685,560	10.5	--	--	--	--	44,737,526
1966	4,849,228	10.3	--	--	--	--	46,978,243
1967	4,836,951	10.2	--	--	--	--	47,274,451
1968	4,856,594	9.6	--	--	--	--	50,875,316
1969	4,849,228	9.0	--	--	--	--	54,039,505
1970	5,320,646	8.1	3,869,561	5.9	--	--	66,076,007
1971	5,295,638	8.1	3,849,918	5.9	--	--	65,784,587
1972	5,133,355	7.7	1,866,674	2.7	1,694,387	2.5	67,044,529
Total	$48,887,470	--	$9,586,153	--	$1,694,387	--	$527,679,458
10-Year Average	$ 4,888,747	--	$3,195,384[b]	--	$1,694,387	--	$ 52,767,946

[a] *TOPICS, an acronym for "Traffic Operations Program to Increase Capacity and Safety," was first funded under the Federal Aid Highway Act of 1968.*

[b] *Denotes three year average.*

Source: Wisconsin Department of Transportation.

federal aid secondary funds expended in Washington County during fiscal years 1963 through 1972 are also shown in Table 22.

Beginning with fiscal year 1973, federal aid secondary funds are to be apportioned by the State of Wisconsin to the counties by means of a new formula. This apportionment is to be based on a ranked priority list of numerical ratings developed from previous annual apportionments, and the requested amounts submitted by each county for the present year. The funds are then apportioned to counties by means of their ratings until the total cost of the selected counties' projects approximately equals the amount of federal aid secondary funds available.

Federal aid funds to be used on the extensions of federal aid primary and secondary routes within urban areas ("C" funds) are distributed throughout the state on the basis of need, as determined by the State Highway Commission. During fiscal years 1963 through 1972, Washington County received no such federal aid funds.

Federal aid funds for TOPICS received by Wisconsin were apportioned by the State Highway Commission to cities and villages with a population of 5,000 or more on the basis of population. For eligibility in the program, a city or village must have had a population of 5,000 persons or more and must have prepared a plan documenting the operational improvements required to improve the safety and capacity of the existing arterial street and highway system. The Cities of Hartford and West Bend and the Village of Germantown within Washington County were eligible for TOPICS aid, but have not yet availed themselves of such aid. Table 23 indicates the amount of such aid which was available annually had these cities and village chosen to participate in the program.

Table 23

FEDERAL HIGHWAY AID APPORTIONED TO URBAN AREAS IN WASHINGTON COUNTY FOR TOPICS PROGRAM FISCAL YEARS 1970-1973[a]

Fiscal Year	Municipality			Total
	Village of Germantown	City of Hartford	City of West Bend	
1970	$ --	$ 8,400	$17,200	$25,600
1971	--	8,400	17,200	25,600
1972	4,900	4,600	11,600	21,100
1973	4,900	4,600	11,600	21,100
Total	$9,800	$26,000	$57,600	$93,400

[a] *Under provisions of the Federal Aid Highway Act of 1973, separate appropriation of TOPICS improvements has been abolished. Such improvements, however, were made eligible for federal funds if located on the federal aid urban system.*

Source: Wisconsin Department of Transportation.

Table 22

FEDERAL HIGHWAY AID ALLOTTED TO WASHINGTON COUNTY BY AID CATEGORY FISCAL YEARS 1963-1972

Fiscal Year	Aid Category				Total Allotment	Federal Highway Aid Apportioned to Wisconsin	
	Primary		Secondary				
	Allotment	Percent of Total	Allotment	Percent of Total		Total	Percent Received by Washington County
1963	$ 51,000	33.3	$102,000	66.7	$ 153,000	$ 41,177,256	0.4
1964	274,000	74.7	93,000	25.3	367,000	43,692,038	0.8
1965	--	--	22,000	100.0	22,000	44,737,526	0.1
1966	--	--	--	--	--	46,978,243	0.0
1967	--	--	--	--	--	47,274,451	0.0
1968	--	--	156,000	100.0	156,000	50,875,316	0.3
1969	2,157,000	100.0	--	--	2,157,000	54,039,505	4.0
1970	490,000	72.4	187,000	27.6	677,000	66,076,007	1.0
1971	--	--	--	--	--	65,784,587	0.0
1972	--	--	214,000	100.0	214,000	67,044,529	0.3
Total	$2,972,000	--	$774,000	--	$3,746,000	$527,679,458	--
10-Year Average	$ 297,200	79.3	$ 77,400	20.7	$ 374,600	$ 52,767,946	0.7

Source: SEWRPC.

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 called 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. The establishment of the federal aid urban system within Washington County was not completed until May of 1972, and no apportionments were made in the county during fiscal years 1963 through 1972.

The Federal Aid Highway Act of 1973 provided for the realignment of the federal aid urban system. This redefinition of the urban system is undertaken by the appropriate local officials with the concurrence of the State Highway Commission, subject to the approval of the Federal Highway Administration.

The federal aid urban system to be established by June 30, 1976, is to supplant the existing federal aid secondary system, TOPICS system, and present urban system, while complementing the federal aid primary and interstate systems.

State Aids for Highways

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.

Revenues from State Aids for Highways: The state motor fuel tax, accounting for almost two-thirds of total motor vehicle tax revenues, was initiated in 1925 at two cents per gallon. It increased to four cents in 1931, 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 24 indicates the state motor vehicle revenues collected in Wisconsin during fiscal years 1963 through 1972.

Table 24

WISCONSIN MOTOR VEHICLE REVENUES
FISCAL YEARS 1963-1972

Fiscal Year	Revenue Source			Adjustments[a]	Total Gross Revenues	Collection Expenses and First Charges of Other Agencies[b]	Total Net Revenues to be Distributed
	License Fees	Fuel Taxes	Carrier Fees				
1963	$ 47,955,404	$ 78,527,005	$ 594,285	$ 11,886	$ 127,088,580	$ 9,771,451	$ 117,317,129
1964	48,714,763	81,009,598	571,404	79,118	130,374,883	10,651,603	119,723,280
1965	51,697,661	84,934,763	600,815	20,490	137,253,729	11,421,211	125,832,518
1966	54,762,427	90,054,602	580,363	288	145,397,680	11,139,515	134,258,165
1967	60,304,239	108,385,059	622,716	--	169,312,014	15,992,722	153,319,292
1968	64,111,550	115,395,320	641,279	428	180,148,577	16,443,408	163,705,169
1969	67,062,072	122,142,203	635,072	642	189,839,989	18,948,360	170,891,629
1970	71,083,902	130,512,312	661,238	39,685	202,297,137	26,281,057	176,016,080
1971	72,723,706	137,062,521	653,717	1,360	210,441,304	25,162,359	185,278,945
1972	75,860,075	145,928,763	660,117	1,459	222,450,414	28,829,987	193,620,427
Total	$614,275,799	$1,093,952,146	$6,221,006	$155,356	$1,714,604,307	$174,641,673	$1,539,962,634
10-Year Average	$ 61,427,580	$ 109,395,215	$ 622,100	$ 15,535	$ 171,460,430	$ 17,464,167	$ 153,996,263

[a] *Adjustments include surplus funds and aids withheld pursuant to Section 84.01(25)(d) of the Wisconsin Statutes.*

[b] *Collection expenses and first charges of other agencies include charges for the following: the administration and collection costs of the Motor Vehicle Department, the Department of Taxation motor fuel tax, and the Public Service Commission; Legislative Council highway studies; Department of Public Instruction, driver education; Conservation Fund advertising of Wisconsin recreational facilities; the Aeronautics Commission; legislative awards for claims; and the Executive Department.*

Source: Wisconsin Department of Transportation.

Disbursement of State Aids for Highways: 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 25 indicates the statewide distribution of net motor vehicle revenues for fiscal years 1963 through 1972. It may be noted from this table that for fiscal year 1972, about 48 percent of the net motor vehicle revenues were allocated to state trunk highways; about 43 percent were returned to local units of government, including counties, cities, villages, and towns; and about 9 percent were utilized for miscellaneous purposes.

Of the approximately 43 percent returned to local units of government, about 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,[8] and 40 percent on the basis of the proportion which the motor vehicles registered within the county comprise of the total motor vehicles registered with the state. In addition, each county receives 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 allotment.

[8] *Counties having a population of 500,000 or more may 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 25

PERCENTAGE DISTRIBUTION OF NET MOTOR VEHICLE REVENUES BY THE STATE OF WISCONSIN FISCAL YEARS 1963-1972

Net Motor Vehicle Revenue Distribution	Annual Percent Distributed									1972 Distribution	
	1963	1964	1965	1966	1967	1968	1969	1970	1971	Amount	Percent
Allotted and Apportioned to Local Units of Government											
Counties	14.2	14.1	14.1	14.1	12.5	12.4	12.4	12.3	12.2	$ 22,838,365	11.8
Cities	16.8	17.0	17.1	17.2	15.6	15.5	15.6	15.4	15.3	29,033,233	15.0
Villages	3.2	3.2	3.2	3.2	3.0	3.0	3.0	3.1	3.0	5,842,609	3.0
Towns	15.1	15.1	15.1	15.1	13.6	13.5	13.7	13.4	13.3	25,086,805	13.0
Flood Damage Aid	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	0.0
Subtotal	49.4	49.4	49.5	49.6	44.7	44.4	44.7	44.2	43.8	$ 82,817,537[b]	42.8
Allotted and Apportioned for State Trunk Highways											
Construction	19.3	20.4	19.5	20.1	25.3	31.1	28.1	25.4	24.7	$ 45,546,260	23.5
Urban Street Improvement	3.2	3.2	3.0	2.8	2.5	2.3	2.2	2.1	2.0	3,800,000	2.0
Bond Retirement and Improvement	6.9	6.7	6.4	6.0	5.2	4.9	4.7	4.6	4.4	8,052,915	4.1
Maintenance, Traffic Service	11.6	11.3	11.2	11.1	10.7	10.1	10.6	11.7	10.9	24,742,392	12.8
Snow Removal	4.5	3.5	4.6	3.7	4.7	--	2.6	4.4	5.5	8,297,808	4.3
Safety Improvement	0.0	0.0	0.0	0.9	1.4	1.4	1.4	1.4	1.4	2,655,215	1.4
Subtotal	45.5	45.1	44.7	44.6	49.8	49.8	49.6	49.6	48.9	$ 93,094,590	48.1
Miscellaneous Allotments[a]	5.1	5.5	5.8	5.8	5.5	5.8	5.7	6.2	7.3	$ 17,708,300	9.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	$193,620,427	100.0

[a] *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.*

[b] *Subtotal of monies allotted and apportioned to local units of government includes an additional $16,525 of supplemental privilege tax allotment to be distributed to cities, villages, and towns at a later date.*

Source: Wisconsin Department of Transportation and SEWRPC.

Of the 43 percent of the motor fuel revenues returned to local units of government, approximately 31 percent of the total state highway aids were returned to local municipalities on the following basis: 13 percent to towns, 3 percent to villages, and 15 percent to cities. This return comprises 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 26 shows the rate per mile at which the towns, villages, and cities are paid their respective local road and street allotments. The supplemental aids consist of 35 percent of the revenues raised by the two-cent-a-gallon gas tax increase effected in 1955, and 42 percent of the net motor carrier fees and original four-cent-a-gallon motor fuel tax which remain after the payment of all previously committed allotments. Both the former and latter amounts are distributed as follows: 43 percent to towns, 21 percent to villages and cities with a population of 10,000 or less, and 36 percent to cities with a population over 10,000. The supplemental aids, which are also shown in Table 26, 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 of each year, 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 towns, villages, or cities. This allotment, known as the highway privilege tax allotment, is supplemented by an additional 40 cents 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. 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. The last allotments in accordance with Sections 86.35(1) and 20.395(2)(wd) were made on December 15, 1972, with the shared tax distribution to begin subsequent to that date.

Table 26

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

Level of Government	Rate Per Mile	
	Basic Allotment	1973 Supplemental Aids
Towns	$ 65	$ 339
Villages	65	1,891
Cities with Population of:		
0 - 10,000	130	1,891
10,001 - 35,000	260	1,746
35,001 - 150,000	390	2,619
150,001 or More	520	3,492

[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 1971 Wisconsin Statutes.*

Source: Wisconsin Statutes and Wisconsin Department of Transportation.

State Trunk Highway Improvement and Maintenance Funding

Revenues: Revenues for the construction and maintenance of state trunk highways and the construction of connecting streets are derived from two principal sources: federal aids and state sources. State sources can be further divided into two categories: apportionments made directly from net motor vehicle revenues, and bonds issued for construction. Table 27 indicates the combined state and federal aid funds allocated to Washington County for calendar years 1963 through 1972 for the construction and maintenance 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 on federal aid systems are funded on a 70-30 percent matching revenue basis on federal aid primary and secondary routes.

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 "participating" construction costs, which costs are, in turn, 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, Divi-

sion 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 less than 15 percent to more than 50 percent of the total project cost, depending on the relative costs of the various items on the project and the agreement arrived at between the state and local units 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 the 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, an amount substantially less than the actual cost of maintenance.

Table 27 summarizes state expenditures in Washington County for the construction and operation and maintenance of the state trunk highway and connecting street systems for calendar years 1963 through 1972.

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 of the Wisconsin Statutes to issue general obligation bonds for highway construction purposes. Washington County, however, has not to date utilized bonding for highway purposes. Local property taxes for highway purposes may not exceed two mills (0.002 cent) 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 received 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 28 indicates the revenues received by Washington County for highway purposes for fiscal years 1963 through 1972.

Expenditures: Construction expenditures on the county trunk highway system consist of direct expenditures of county funds by the respective counties, administered through the county highway committees of the county boards; and federal aid funds matched by county funds, administered by the State Highway Commission on those

Table 27

STATE OF WISCONSIN EXPENDITURES AND REVENUES FOR HIGHWAY AND HIGHWAY-RELATED PURPOSES IN WASHINGTON COUNTY: CALENDAR YEARS 1963-1972

Calendar Year	Expenditures[a]			Revenues[a]		
	Maintenance	Construction	Total	State Funds[b]	Federal Aids	Total
1963	$ 248,843	$ 102,000	$ 350,843	$ 299,843	$ 51,000	$ 350,843
1964	245,853	549,000	794,853	520,853	274,000	794,853
1965	272,969	--	272,969	272,969	--	272,969
1966	275,712	35,000	310,712	310,712	--	310,712
1967	328,292	--	328,292	328,292	--	328,292
1968	305,260	207,000	512,260	356,260	156,000	512,260
1969	413,958	5,061,000	5,474,958	3,317,958	2,157,000	5,474,958
1970	428,970	982,000	1,410,970	920,970	490,000	1,410,970
1971	502,644	242,000	744,644	744,644	--	744,644
1972	560,742	80,000	640,742	640,742	--	640,742
Total	$3,583,243	$7,258,000	$10,841,243	$7,713,243	$3,128,000	$10,841,243
10-Year Average	$ 358,324	$ 725,800	$ 1,084,124	$ 771,324	$ 312,800	$ 1,084,124

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

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

Source: Wisconsin Department of Transportation and SEWRPC.

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 70 percent federal funds and 30 percent county funds. The amount of the county contribution is determined as 30 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 right-of-way; replacement of walks and private driveways; repair of 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 minimum cost to the county for construction of county trunk highways through cities and villages is determined on the basis of the width of the proposed construction. The county is responsible for the full cost of 18 feet of the width plus a portion of the cost of the balance of the width, to be determined by dividing the cost of the width exceeding 18 feet by the total width of the improvement and multiplying by 18, as provided for in Section 83.05(2) of the Wisconsin Statutes. In practice, Washington County has historically participated in the cost of improving the total roadway width required.

Maintenance and operation costs for the county trunk highway system are paid by the county, and maintenance is performed by county forces. Table 28 indicates the county highway funds expended by Washington County for highway construction and maintenance and operation during fiscal years 1963 through 1972.

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 local tax receipts, which

Table 28

WASHINGTON COUNTY EXPENDITURES AND REVENUES FOR HIGHWAY AND HIGHWAY-RELATED PURPOSES FISCAL YEARS 1963-1972

Fiscal Year	Expenditures[a]			Revenues[a]			
	Maintenance	Construction	Total	Local Funds[c]	State Aids	Federal Aids	Total
1963[b]	$ 346,543	$ 344,365	$ 690,908	$ 392,681	$ 196,227	$102,000	$ 690,908
1964	329,215	341,864	671,079	379,512	198,567	93,000	671,079
1965	339,120	195,174	534,294	282,876	229,418	22,000	534,294
1966	364,463	28,591	393,054	177,296	215,758	--	393,054
1967	410,808	85,807	496,615	277,647	218,968	--	496,615
1968	344,580	238,815	583,395	350,848	232,547	--	583,395
1969	493,798	86,413	580,211	332,895	247,316	--	580,211
1970	482,154	560,015	1,042,169	601,313	253,856	187,000	1,042,169
1971	676,695	185,941	862,636	598,269	264,367	--	862,636
1972	637,386	621,366	1,258,752	772,566	272,186	214,000	1,258,752
Total	$4,424,762	$2,688,351	$7,113,113	$4,165,903	$2,329,210	$618,000	$7,113,113
10-Year Average	$ 442,476	$ 268,835	$ 711,311	$ 416,590	$ 232,921	$ 61,800	$ 711,311

[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 1963 extends from January 1, 1963 through December 31, 1963.*

[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: Washington County Highway Department and SEWRPC.

account for approximately 77 percent and include special assessments, property taxes from the general fund, and miscellaneous sources; and bonding, which accounts for about 23 percent. Tables 29, 30, and 31 indicate the highway and highway-related revenues for cities, villages, and towns, respectively, in Washington County for fiscal years 1963 through 1972.

Expenditures: Construction costs for streets and highways under the jurisdiction of a city, village, or town are paid for entirely by the respective unit of government unless the local street is on a federal aid route. Maintenance and operation costs for all city and village streets and town roads, regardless of federal aid designation, are also paid for by the respective unit of government, with the unit of government involved generally performing its own maintenance work. Tables 29, 30, and 31 summarize the expenditures for construction, operation, and maintenance by all cities, villages, and towns, respectively, in Washington County for fiscal years 1963 through 1972.

Concluding Remark-Highway Improvement and Maintenance Funding

Table 32 provides a summary of all expenditures for highway construction, operation, and maintenance in Washington County for calendar years 1963 through 1972. The present participation of the various levels of government in highway construction and maintenance costs is summarized in Table 33. It should be noted that, as explained above, 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 participating or eligible work items. Local participation in past construction projects within Washington County has varied from zero to 50 percent of the total cost.

PLAN RECOMMENDATIONS AFFECTING HIGHWAY FINANCING

Analysis of the existing highway aid policies and formulae indicates that two major revisions in these policies and formulae would be desirable in order to meet certain basic objectives of the jurisdictional highway planning effort, namely, abolition of the connecting street concept and establishment of uniform construction aid formulae and policies. These revisions would affect any financial analysis of a jurisdictional highway system plan, 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 indi-

Table 29

CITY EXPENDITURES AND REVENUES FOR HIGHWAY AND HIGHWAY-RELATED PURPOSES IN WASHINGTON COUNTY FISCAL YEARS 1963-1972

Fiscal Year	Expenditures[a]			Revenues[a]		
	Maintenance	Construction	Total	Local Funds[c]	State Aids	Total
1963[b]	$ 177,547	$ 311,545	$ 489,092	$ 355,948	$ 133,144	$ 489,092
1964	157,891	189,853	347,744	209,689	138,055	347,744
1965	182,632	133,809	316,441	173,487	142,954	316,441
1966	195,934	263,094	459,028	300,408	158,620	459,028
1967	229,597	201,774	431,371	262,677	168,694	431,371
1968	212,064	315,131	527,195	349,931	177,264	527,195
1969	317,192	314,060	631,252	429,842	201,410	631,252
1970	370,590	244,245	614,835	410,527	204,308	614,835
1971	405,857	459,440	865,297	648,252	217,045	865,297
1972	488,397	766,319	1,254,716	1,085,988	168,728	1,254,716
Total	$2,737,701	$3,199,270	$5,936,971	$4,226,749	$1,710,222	$5,936,971
10-Year Average	$ 273,770	$ 319,927	$ 593,697	$ 422,675	$ 171,022	$ 593,697

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

[b] The city fiscal year 1963 extends from January 1, 1963 through December 31, 1963.

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

Source: Wisconsin Department of Administration and SEWRPC.

Table 30

VILLAGE EXPENDITURES AND REVENUES FOR HIGHWAY AND HIGHWAY-RELATED PURPOSES IN WASHINGTON COUNTY
FISCAL YEARS 1963-1972

Fiscal Year	Expenditures[a]			Revenues[a]		
	Maintenance	Construction	Total	Local Funds[c]	State Aids	Total
1963[b]	$ 33,690	$ 4,933	$ 38,623	$ 6,743	$ 31,880	$ 38,623
1964	47,158	30,730	77,888	45,467	32,421	77,888
1965	80,081	17,787	97,868	--	113,374[d]	97,868
1966	104,838	50,610	155,448	31,073	124,375	155,448
1967	115,835	77,220	193,055	52,529	140,526	193,055
1968	124,647	36,489	161,136	12,647	148,489	161,136
1969	148,562	82,360	230,922	64,689	166,233	230,922
1970	142,696	85,470	228,166	51,599	176,567	228,166
1971	166,846	166,626	333,472	150,233	183,239	333,472
1972	144,020	40,984	185,004	26,048	158,956	185,004
Total	$1,108,373	$593,209	$1,701,582	$441,028	$1,276,060	$1,701,582
10-Year Average	$ 110,837	$ 59,321	$ 170,158	$ 44,103	$ 127,606	$ 170,158

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

[b] *The village fiscal year 1963 extends from January 1, 1963 through December 31, 1963.*

[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] *Due to incorporations by the Village of Germantown, state aids exceeded budgeted expenditures for 1965.*

Source: Wisconsin Department of Administration and SEWRPC.

Table 31

TOWN EXPENDITURES AND REVENUES FOR HIGHWAY AND HIGHWAY-RELATED PURPOSES IN WASHINGTON COUNTY
FISCAL YEARS 1963-1972

Fiscal Year	Expenditures[a]			Revenues[a]			
	Maintenance	Construction	Total	Local Funds[c]	County Aids	State Aids	Total
1963[b]	$ 402,241	$ 155,909	$ 558,150	$ 363,936	$ 2,839	$ 191,375	$ 558,150
1964	438,946	144,743	583,689	338,236	3,562	241,891	583,689
1965	426,884	135,617	562,501	340,997	7,574	213,930	562,501
1966	463,030	182,208	645,238	393,236	34,243	217,759	645,238
1967	465,524	334,284	799,808	515,074	36,860	247,874	799,808
1968	552,647	119,704	672,351	435,351	2,422	234,578	672,351
1969	612,186	256,991	869,177	608,093	19,506	241,578	869,177
1970	560,854	127,312	688,166	402,871	13,938	271,357	688,166
1971	798,322	124,311	922,633	625,459	13,901	283,273	922,633
1972	712,243	157,957	870,200	529,291	17,072	323,837	870,200
Total	$5,432,877	$1,739,036	$7,171,913	$4,552,544	$151,917	$2,467,452	$7,171,913
10-Year Average	$ 543,288	$ 173,903	$ 717,191	$ 455,254	$ 15,192	$ 246,745	$ 717,191

[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 1963 extends from April 1, 1962 through March 31, 1963.*

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

Source: Wisconsin Department of Administration and SEWRPC.

Table 32

EXPENDITURES BY FEDERAL, STATE, COUNTY, AND LOCAL GOVERNMENTS FOR HIGHWAY CONSTRUCTION, OPERATION, AND MAINTENANCE IN WASHINGTON COUNTY CALENDAR YEARS 1963-1972

Calendar Year	Level of Government					
	Federal			State		
	Construction[a]	Operation and Maintenance[b]	Total	Construction[a]	Operation and Maintenance[b]	Total
1963	$ 153,000	$ --	$ 153,000	$ 51,000	$ 248,843	$ 299,843
1964	367,000	--	367,000	275,000	245,853	520,853
1965	22,000	--	22,000	--	272,969	272,969
1966	--	--	--	35,000	275,712	310,712
1967	--	--	--	--	328,292	328,292
1968	156,000	--	156,000	51,000	305,260	356,260
1969	2,157,000	--	2,157,000	2,904,000	413,958	3,317,958
1970	677,000	--	677,000	492,000	428,970	920,970
1971	--	--	--	242,000	502,644	744,644
1972	214,000	--	214,000	80,000	560,742	640,742
Total	$3,746,000	$ --	$3,746,000	$4,130,000	$3,583,243	$ 7,713,243
10-Year Average	$ 374,600	$ --	$ 374,600	$ 413,000	$ 358,324	$ 771,324

Calendar Year	Level of Government					
	County			Local		
	Construction[a]	Operation and Maintenance[b]	Total	Construction[a]	Operation and Maintenance[b]	Total
1963	$ 245,747	$ 346,543	$ 592,290	$ 460,630	$ 641,007	$ 1,101,637
1964	255,436	329,215	584,651	351,910	634,949	986,859
1965	200,750	339,120	539,870	294,580	716,707	1,011,287
1966	64,797	364,463	429,260	573,763	765,673	1,339,436
1967	96,839	410,808	507,647	441,311	876,298	1,317,609
1968	254,051	344,580	598,631	559,053	934,013	1,493,066
1969	101,744	493,798	595,542	540,821	1,039,442	1,580,263
1970	386,926	482,154	869,080	440,865	1,252,242	1,693,107
1971	202,220	676,695	878,915	759,333	1,306,466	2,065,799
1972	423,028	637,386	1,060,414	959,645	1,625,410	2,585,055
Total	$2,231,538	$4,424,762	$6,656,300	$5,381,911	$9,792,207	$15,174,118
10-Year Average	$ 223,154	$ 424,476	$ 665,630	$ 538,191	$ 979,221	$ 1,517,412

[a] *Construction includes such items as expenditures for engineering costs, right-of-way acquisition, curb and gutter, sidewalks, storm sewers, interest on bond proceeds used for construction purposes, and outlays for roads and streets and bridges and culverts.*

[b] *The operation and maintenance category includes such items as expenditures for road and street expense; bridge and culvert expense; street cleaning, oiling, and sprinkling; snow and ice removal; street machinery; general administration; signs and guide boards; and traffic control and regulation devices.*

Source: Wisconsin Department of Administration, Wisconsin Department of Transportation, and SEWRPC.

Table 33

RELATIONSHIP BETWEEN JURISDICTIONAL HIGHWAY CLASSIFICATION AND AID FORMULAE FOR CONSTRUCTION AND MAINTENANCE IN WASHINGTON COUNTY: 1973

Jurisdictional Classification	Number of Miles (1973)	Percent of Total Miles	Participation in Construction Costs	Participation in Maintenance Costs
State Trunk Highways (Excludes connecting streets)	179.18	15.47	Freeways and rural highways - 100 percent state 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)	8.14	0.70	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	190.77	16.47	Rural highways - 100 percent county 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 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	780.33	67.36	100 percent municipal funds	State aid provided at variable rate based on size and class of municipality
Total	1,158.42	100.00	--	--

vidual 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

Table 33 (continued)

Federal Aid Classification	Number of Miles (1973)	Percent of Total Miles	Participation in Construction Costs	Participation in Maintenance Costs[a]
Interstate (Presently no routes existing or planned within Washington County)	--	--	90 percent federal, 10 percent state	100 percent nonfederal
Primary System (Includes 41 percent of the state trunk highway mileage in Washington County)	75.92	24.53	70 percent federal, 30 percent nonfederal[b]	100 percent nonfederal
Secondary System (Includes 58 percent of the state trunk highway mileage, 61 percent of the county trunk highway mileage, and 1 percent of the local street and road mileage)	233.09	75.30	70 percent federal, 30 percent nonfederal[b]	100 percent nonfederal
Urban System (Includes less than 1 percent of the local street and road mileage)	0.53	0.17	70 percent federal, 30 percent nonfederal[b]	100 percent nonfederal
TOPICS[c]	--	--	50 percent federal, 50 percent city or village	100 percent nonfederal
Total	309.54	100.00	--	--

[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] *At the present time, no city or village within Washington County is participating in the TOPICS program.*

Source: Wisconsin Department of Transportation and SEWRPC.

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 in Washington County as Hartford and West Bend and such a village as Germantown.

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 classification. While the cost of maintaining connecting

streets within Washington County has increased on an average to more than 10 times the $500 allotment over the past 30 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.

Two of the cities—Hartford and West Bend, and one of the villages—Germantown,[9] within Washington County have connecting street mileage. Of the eight cities and villages, six have state trunk highway mileage, with the City of Milwaukee having no state trunk highway or connecting street mileage. Table 4 indicates the present distribution of state trunk highway and connecting street mileage within Washington County by municipality. State trunk highways within Washington 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 Washington 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 Washington County of a Type I arterial highway system totaling 149 route-miles is recommended. Of this total, approximately 44 route-miles would consist of freeways and the remaining 105 miles of standard arterials. It is proposed that all Type I arterials which are also freeways be classified as state trunk highways, and therefore be maintained by Washington 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 on a regionwide or statewide basis. Toward this end, and in order to ensure a continuous, uniformly desirable cross section and operating conditions along 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 with 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 recommended that the state in all cases contract for maintenance with those cities and villages which have a demonstrated capability and desire to perform the maintenance function, and which continue to meet the state established standards for such 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 highway facilities:

1. Physical maintenance of the roadway pavement surfaces and structures, including crack sealing, patching, resurfacing, sweeping, 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 and 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 and shoulders.

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, or 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 signs.

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 these operational controls to the local municipalities concerned. Such delegation shall parallel contracting for maintenance service.

[9] *As of January 1, 1974, the Village of Germantown no longer had connecting street mileage.*

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 and 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. It is recommended that the county in all cases contract for maintenance with those cities and villages which have a demonstrated capability and desire to perform the maintenance function, and which continue to meet the county established standards for such maintenance. 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 and 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 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 Washington 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 would 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.
7. Pedestrian walkways and bikeways.

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.

FINANCIAL ANALYSIS AND FEASIBILITY

Financial Analysis

Having determined that two 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 Washington 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 Washington County will affect the mileage of state trunk and county trunk facilities within each municipality in Washington 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 system within Washington County on highway aids and allotments is summarized in Table 34.

Table 34

HIGHWAY AND HIGHWAY-RELATED AIDS AND ALLOTMENTS RETURNED TO MUNICIPALITIES IN WASHINGTON COUNTY 1973, 1975, and 1990

Current Jurisdictional Highway System - 1973

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									
Hartford	--	0.37	2.73	1.06	23.22	$ 46,938	$ 593	$1,365	$ --
Milwaukee	--	--	--	--	0.12	481	9	--	--
West Bend	--	2.13	4.83	0.50	66.43	133,267	1,609	2,415	--
Subtotal	--	2.50	7.56	1.56	89.77	$ 180,686	$2,211	$3,780	$ --
VILLAGES									
Germantown	6.31	14.11	0.58	15.16	71.90	$ 140,667	$ 660	$ 290	$ --
Jackson	--	1.24	--	--	4.09	8,002	101	--	--
Kewaskum	--	1.95	--	0.85	6.86	13,421	203	--	--
Newburg	--	--	--	--	--	--	--	--	--
Slinger	--	2.97	--	0.55	6.22	12,169	154	--	--
Subtotal	6.31	20.27	0.58	16.56	89.07	$ 174,259	$1,118	$ 290	$ --
TOWNS									
Addison	--	21.32	--	18.38	55.30	$ 22,337	$ 230	$ --	$ --
Barton	--	5.46	--	7.68	38.56	15,575	155	--	--
Erin	--	10.10	--	14.70	47.28	19,098	144	--	--
Farmington	--	14.36	--	16.91	55.27	22,325	177	--	--
Germantown	--	1.49	--	1.16	3.81	1,539	71	--	--
Hartford	--	13.19	--	17.07	44.41	17,939	248	--	--
Jackson	--	11.78	--	16.21	47.28	19,097	254	--	--
Kewaskum	--	8.31	--	9.22	37.49	15,143	122	--	--
Polk	--	24.02	--	13.97	53.13	21,460	258	--	--
Richfield	--	11.52	--	9.89	81.70	33,002	614	--	--
Trenton	--	8.18	--	17.84	57.37	23,173	347	--	--
Wayne	--	11.74	--	19.45	45.99	18,576	130	--	--
West Bend	--	8.63	--	10.17	33.90	13,693	253	--	--
Subtotal	--	150.10	--	172.65	601.49	$ 242,957	$3,003	$ --	$ --
Washington County	--	--	--	--	--	$ 290,108	$ --	$ --	$479,954
Total	6.31	172.87	8.14	190.77	780.33	$ 888,010	$6,332	$4,070	$479,954

Table 34 (continued)

Initial Jurisdictional Highway System - 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									
Hartford	--	3.10	--	1.03	23.25	$ 46,860	$ --	$ --	$ 13,650
Milwaukee	--	--	--	0.03	0.09	359	--	--	--
West Bend	--	6.96	--	0.13	66.80	133,199	--	--	24,150
Subtotal	--	10.06	--	1.19	90.14	$ 180,418	$ --	$ --	$ 37,800
VILLAGES									
Germantown	6.31	13.21	--	14.49	74.05	$ 143,879	$ --	$ --	$ 2,900
Jackson	--	1.24	--	0.38	3.71	7,209	--	--	--
Kewaskum	--	1.95	--	0.85	6.86	13,329	--	--	--
Newburg	--	0.78	--	1.15	2.47	4,799	--	--	--
Slinger	--	2.97	--	0.55	6.22	12,085	--	--	--
Subtotal	6.31	20.15	--	17.42	93.31	$ 181,301	$ --	$ --	$ 2,900
TOWNS									
Addison	--	21.32	--	3.76	69.92	$ 28,038	$ --	$ --	$ --
Barton	--	5.46	--	4.99	41.25	16,541	--	--	--
Erin	--	10.10	--	10.97	51.01	20,455	--	--	--
Farmington	--	14.36	--	17.20	54.98	22,047	--	--	--
Germantown	--	0.25	--	2.03	4.18	1,676	--	--	--
Hartford	--	13.19	--	10.74	51.45	20,631	--	--	--
Jackson	--	11.31	--	18.91	45.05	18,065	--	--	--
Kewaskum	--	8.31	--	7.20	39.51	15,844	--	--	--
Polk	--	24.02	--	11.36	55.74	22,352	--	--	--
Richfield	--	11.52	--	14.87	76.72	30,765	--	--	--
Trenton	--	7.40	--	16.70	54.89	22,011	--	--	--
Wayne	--	11.74	--	14.57	50.87	20,399	--	--	--
West Bend	--	8.63	--	10.17	33.90	13,594	--	--	--
Subtotal	--	147.61	--	143.47	629.47	$ 252,418	$ --	$ --	$ --
Washington County	--	--	--	--	--	$ 280,326	$ --	$ --	$479,954
Total	6.31	177.82	--	162.08	812.92	$ 894,463	$ --	$ --	$520,654

This table indicates the recommended change in jurisdictional highway mileage within each municipality within the county, the 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 1973 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 1973. 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 34 indicates that, as a result of the recommended jurisdictional realignment as the initial step toward the 1975 stage of the plan, an increase in the local street aids and allotments paid to units of government in Washington County of approximately $6,450 per year could be expected. This increase is due to two offsetting 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 increase 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 reduction in allot-

Table 34 (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							
CITIES									
Hartford	--	3.00	--	1.89	31.15	$ 99,369	$ --	$ --	$ 14,995
Milwaukee	--	--	--	0.03	0.09	540	--	--	--
West Bend	2.38	7.92	--	12.82	98.04	309,806	--	--	42,861
Subtotal	2.38	10.92	--	14.74	129.28	$ 409,715	$ --	$ --	$ 57,856
VILLAGES									
Germantown	8.00	11.93	--	20.46	91.67	$ 281,427	$ --	$ --	$ 71,242
Jackson	--	1.43	--	0.60	4.41	13,539	--	--	--
Kewaskum	--	2.46	--	1.65	9.50	29,165	--	--	--
Newburg	--	0.78	--	1.15	3.65	11,206	--	--	--
Slinger	--	0.93	--	3.02	8.62	26,463	--	--	--
Subtotal	8.00	17.53	--	26.88	117.85	$ 361,800	$ --	$ --	$ 71,242
TOWNS									
Addison	6.85	10.24	--	12.04	69.83	$ 44,691	$ --	$ --	$ --
Barton	1.27	3.12	--	10.07	34.94	22,362	--	--	--
Erin	--	10.10	--	10.97	51.01	32,646	--	--	--
Farmington	--	9.63	--	21.05	55.86	35,750	--	--	--
Germantown	--	--	--	1.53	2.14	1,370	--	--	--
Hartford	0.15	9.72	--	12.23	57.69	36,922	--	--	--
Jackson	--	4.58	--	25.12	44.91	28,742	--	--	--
Kewaskum	--	7.80	--	11.38	36.21	23,174	--	--	--
Polk	14.26	5.01	--	28.38	50.10	32,064	--	--	--
Richfield	1.78	6.06	--	19.10	76.92	49,229	--	--	--
Trenton	--	3.73	--	18.47	47.62	30,477	--	--	--
Wayne	6.04	5.70	--	14.57	50.87	32,557	--	--	--
West Bend	2.89	1.28	--	16.75	30.39	19,450	--	--	--
Subtotal	33.24	76.97	--	201.66	608.49	$ 389,434	$ --	$ --	$ --
Washington County	--	--	--	--	--	$ 535,760	$ --	$ --	$583,013
Total	43.62	105.42	--	243.28	855.62	$1,696,709	$ --	$ --	$712,110

[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 was 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 that in 1973 the net effect of this change in the method of distributing the privilege highway tax resulted in a slight reduction--about 7 percent--in the amount of aid from this source received by Washington 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 15 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 should not substantially affect the financial analyses relating to the Washington County jurisdictional highway system plan presented in this chapter. The amounts shown for the privilege highway tax in this table are based upon the old method of distributing this tax, and can be expected to vary slightly as the new method is implemented.*

Source: Wisconsin Department of Transportation and SEWRPC.

ments received by Washington County of $4,070 per year. Thus, the net increase in aids and allotments would be $2,380 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 Washington 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 34, it is anticipated that about $40,700 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 $43,100 per year with implementation of the initial stage of the recommended jurisdictional highway system plan.

It was recognized that a policy change affecting the status of the connecting streets would have to be administratively feasible on a statewide basis. In 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 this diagram that, with the exception of a portion of the supplemental motor fuel tax,[10] 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, is 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 Washington County may be expected to result in an increase of $3,270 per year in local street aids and allotments. Because this process of redistribution provides for the withholding of sufficient funds to reimburse actual maintenance costs accrued on all state trunk highways, however, the net effect of the plan recommendations on Washington County would be to increase aids by $43,100 per year, as previously stated.

[10] *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.*

It should be noted that the forecast of aids and allotments returned to municipalities as shown in Table 34 for 1990 is based upon forecast 1990 city and village corporate limits and a conservative estimate of expected increases in 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 three assumptions: that the preceding recommendations concerning the abandonment of the connecting street concept will be adopted and implemented, that the preceding recommendations concerning the adoption of uniform construction aid formulae and policies will be adopted and implemented, and that the recommendations concerning the realignment of the federal aid systems set forth in Chapter VI of this report will be adopted and implemented.

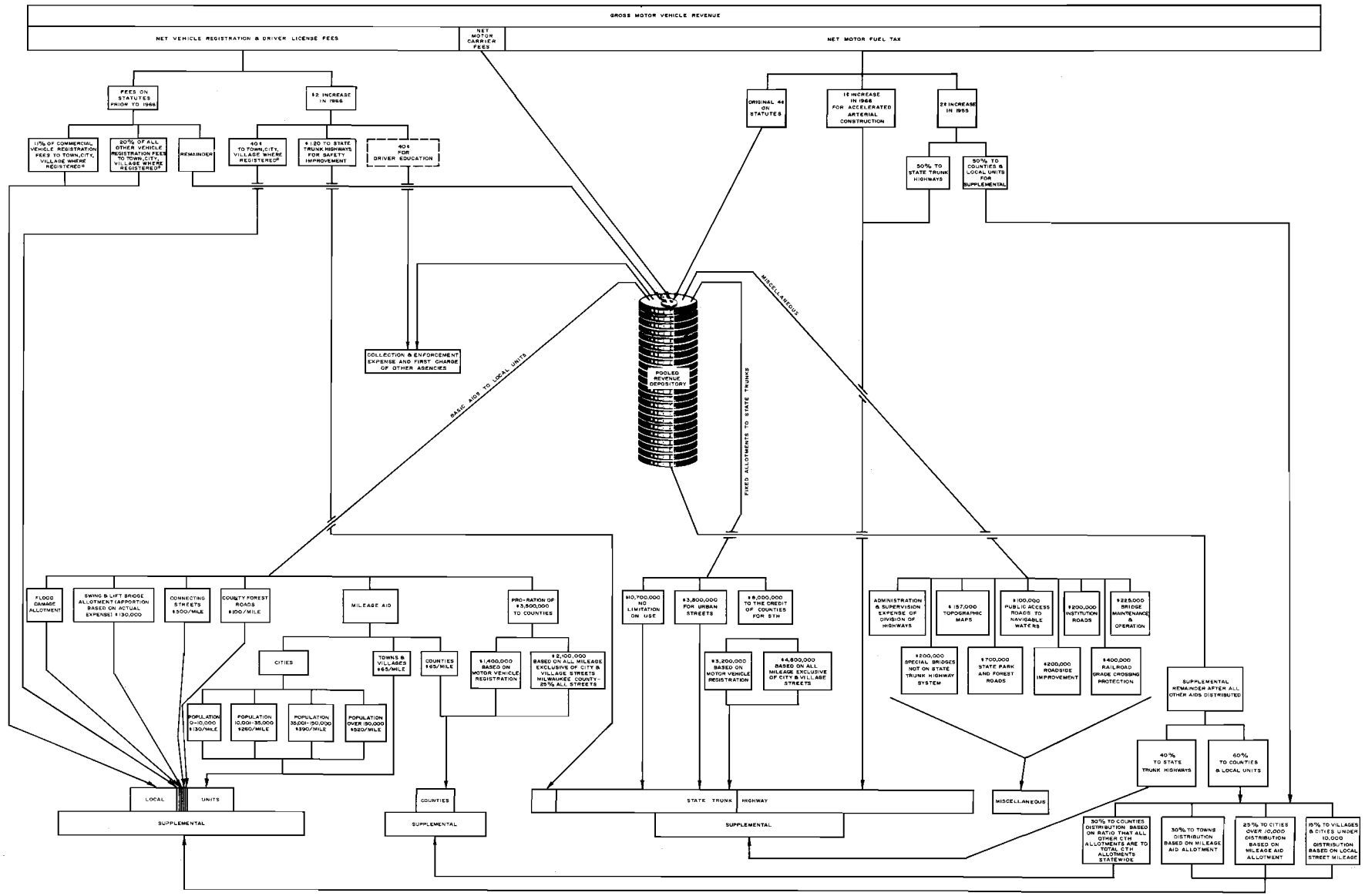
Estimates of the cost of constructing and maintaining the total street and highway system within Washington County through the plan design year of 1990 were prepared by applying unit improvement and maintenance costs to the existing and proposed arterial, collector, and local (land access) street mileage. 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 Washington 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 set forth in this report 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

Figure 11

DISTRIBUTION OF TOTAL MOTOR VEHICLE REVENUE IN WISCONSIN: 1971



[a] *Beginning in 1972, those portions of the motor vehicle registration fees historically returned to local units of government known as "privilege highway taxes" were 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.

the District Office of the Division of Highways, and reflect recent experience in areas of development similar to Washington County. It should be noted that these unit costs, in 1973 dollars, range from 14 percent to 20 percent less than comparable unit costs for construction and maintenance of comparable cross sections in Milwaukee County, as shown in Appendix B of SEWRPC Planning Report No. 11, A Jurisdictional Highway System Plan for Milwaukee County. The principal reasons for these lower unit costs in Washington County are lower traffic volumes, resulting in lower maintenance costs, and lower right-of-way acquisition, utility relocation, and material costs encountered in the construction of new facilities or in the improvement of existing facilities. It should be further noted that the cost of resurfacing the minimum two-lane rural cross section (see Appendix B) has been adjusted to include minor reconstruction for spot improvement of horizontal and vertical alignment and of intersections.

The resulting total arterial plan implementation costs are summarized by jurisdictional subsystem in Table 35. The plan implementation costs are expressed in terms of 1973 unit prices, and total approximately $119 million for the entire arterial system, including approximately $94 million for construction and $25 million for maintenance costs. The breakdown of these costs by level of government is set forth in Table 36.

Estimated Cost of Nonarterial System: Construction and maintenance needs for nonarterial streets and highways and 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 Appendix B. The mileage of new facilities was calculated by applying the appropriate factors representing the portion of land normally devoted to collector[11] and local[12] streets under good land subdivision practice to the total land area to be converted from rural to urban use within each municipality in Washington County over the plan design period. Since there is relatively no difference between collector and local 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 street cross sections are used within the various cities and villages in Washington County, these differences were not considered significant, and the same unit costs were utilized for the aggregate of all urban nonarterial mileage.

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[11] *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.*

[12] *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 anticipate new high-, medium-, and low-density development, respectively, to obtain corresponding local (land access) street mileage.*

Table 35

IMPLEMENTATION COSTS FOR THE WASHINGTON COUNTY JURISDICTIONAL HIGHWAY SYSTEM PLAN BY JURISDICTIONAL SUBSYSTEM 1973-1990

Jurisdictional Subsystem	Plan Implementation Costs		
	Construction	Maintenance	Total
Arterial			
Type I (State Trunk)	$ 52,557,000	$10,412,040	$ 62,969,040
Type II (County Trunk)	29,475,400	11,550,380	41,025,780
Type III (Local Trunk)	11,766,600	3,497,160	15,263,760
Subtotal	$ 93,799,000	$25,459,580	$119,258,580
Nonarterial	$ 11,720,300	$22,918,160	$ 34,638,460
Total Street and Highway System	$105,519,300	$48,377,740	$153,897,040

Source: SEWRPC.

Table 36

IMPLEMENTATION COSTS FOR THE WASHINGTON COUNTY JURISDICTIONAL HIGHWAY SYSTEM PLAN BY LEVEL OF GOVERNMENT 1973-1990

Level of Government	Plan Implementation Costs		
	Construction	Maintenance	Total
Arterial System			
State			
Type I (State Trunk)	$ 50,736,200	$10,412,040	$ 61,148,240
Type II (County Trunk)	3,743,700	--	3,743,700
Type III (Local Trunk)	10,500	--	10,500
Subtotal	$ 54,490,400	$10,412,040	$ 64,902,440
County			
Type II (County Trunk)	$ 23,806,800	$11,550,380	$ 35,357,180
City			
Type I (State Trunk)	$ 513,600	$ --	$ 513,600
Type II (County Trunk)	638,000	--	638,000
Type III (Local Trunk)	2,927,300	953,670	3,880,970
Subtotal	$ 4,078,900	$ 953,670	$ 5,032,570
Village			
Type I (State Trunk)	$ 1,129,700	$ --	$ 1,129,700
Type II (County Trunk)	1,048,500	--	1,048,500
Type III (Local Trunk)	5,842,700	2,052,310	7,895,010
Subtotal	$ 8,020,900	$ 2,052,310	$ 10,073,210
Town			
Type I (State Trunk)	$ 177,500	$ --	$ 177,500
Type II (County Trunk)	238,400	--	238,400
Type III (Local Trunk)	2,986,100	491,180	3,477,280
Subtotal	$ 3,402,000	$ 491,180	$ 3,893,180
Total	$ 93,799,000	$25,459,580	$119,258,580
Nonarterial System			
City	$ 1,728,200	$ 6,905,120	$ 8,633,320
Village	1,371,700	5,257,950	6,629,650
Town	8,620,400	10,755,090	19,375,490
Total	$ 11,720,300	$22,918,160	$ 34,638,460
Total Street and Highway System	$105,519,300	$48,377,740	$153,897,040

Source: SEWRPC.

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, approximately 40 percent of the existing nonarterial mileage would require resurfacing, and the remaining 50 percent would require maintenance only during the planning period.

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 10 percent of all existing nonarterial facilities would require reconstruction, approximately 40 percent of all existing nonarterial facilities would require resurfacing, and 50 percent would require only maintenance during the planning period.

The estimated construction and maintenance costs for new and existing nonarterial facilities through the plan design year of 1990 are summarized in Table 35. Expressed in terms of 1973 prices, costs total approximately $35 million, of which $12 million is for construction and $23 million is for maintenance. The breakdown of these costs by level of government is shown in Table 36.

Thus, the total cost of full plan implementation over the 20-year plan implementation period was estimated at $154 million based on 1973 prices, of which $106 million was for construction and $48 million for maintenance.

Estimated Revenues: Anticipated revenues available for highway purposes within Washington County over the plan implementation period were estimated from an analysis of the rate of expenditure for highway and highway-related purposes within Washington County from 1963 through 1972. A summary of the 10-year expenditures for highway construction and maintenance within Washington County was presented in Table 32 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, it was estimated that $154 million could be expected to become available for highway purposes over the plan implementation period, or an amount equal to the total costs of implementing the street and highway plan, estimated to be $154 million. It was concluded, therefore, that the plan was financially feasible.

It should be noted, however, that with the recommended transfer of local trunk arterial street and highway system mileage to the county and state trunk highway systems, thereby reducing the local responsibility for highway facility design, construction, operation, and maintenance, a concomitant adjustment of highway revenue distribution will be required.

It should also 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 because of increasing motor vehicle registrations and motor vehicle utilization.

SUMMARY

This chapter has explored the financial feasibility of the recommended jurisdictional highway plan for Washington County. This exploration has required a description of the existing highway aid structure and the two 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 and the adoption of uniform construction aid formulae and policies for state and county trunk highways. 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 arterial facilities, was estimated at $154 million over the 20-year plan implementation period. Anticipated revenues for highway purposes over this same period based upon current rates of expenditure were estimated at $154 million, or approximately equal the amount required to fully implement the plan.

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 to 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 historical trend of expenditures for highway purposes within Washington County had to be used to forecast future revenues. On this basis, the historical participation at the federal level in construction aids for secondary and primary federal aid routes was incorporated in the forecasts.

It should be noted that while the financial analysis of the plan is feasible for the county as a whole, some disparity in the distribution of resources may exist initially between the county and local levels of government relating to the transfer of local trunk facilities to the county trunk system, and relating 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 Washington County with integrated state, county, and local trunk highway systems able to effectively meet existing and anticipated future travel demands 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 for the efficient and effective provision of highway transportation facilities and services within Washington County.

In a practical sense, the recommended plan is not complete until the steps required for its implementation are specified. This chapter, therefore, is 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 Washington 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) 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 Washington County, not only satisfying almost 87 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, however, to mean 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 24 agencies of government: the U. S. Department of Transportation, Federal Highway Administration; the Wisconsin Department of Transportation; the Washington County Board; and the governing bodies of the 21 cities, villages, and towns in Washington 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 Washington 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 Washington 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 aids 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 formerly independently funded 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 to function in some instances 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; Chapters 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, including necessary mapping and 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, and 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.

Washington 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 Washington 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 following specific plan adoption actions are hereby recommended:

1. That the Washington County Board, upon recommendation of the Washington County Highway Committee, formally adopt the recommended jurisdictional highway system plan as a guide to future highway facility development within Washington County, as authorized by Section 66.945(12) of the Wisconsin Statutes.

2. That upon approval of the recommended jurisdictional highway system plan by the Washington County Board, 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 Washington County.

3. 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 review of requests for realignment of the various federal aid systems and to the administration and granting of federal aids for highway improvement within Washington County.

4. 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.

To supplement the aforementioned recommended federal, state, regional, and county actions, it is suggested that the three city common councils, five village boards, and 13 towns within Washington 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 Washington 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 areawide 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 expanded or curtailed. As such adjustment, however, will require, on a continuing basis, the same close cooperation between the local, areawide, 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 and Intergovernmental Coordinating and Advisory Committee on Jurisdictional Highway Planning for Washington County, created for the jurisdictional highway planning study, be retained, and that all agencies having highway planning and plan implementation powers advise and transmit from time to time any subsequent proposed changes in the plan to the Committee for review and possible integration into an amended jurisdictional highway system plan. In order to achieve full intergovernmental coordination in highway system development within Washington 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 Washington County Board and endorsement by the State Highway Commission, the State Highway Commission act in cooperation with the Washington County Board to effect the realignment of the state trunk highway system within Washington County.

It is recommended that the initial action include the specific deletion from the state 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 deletions from, the state trunk highway system set forth in Tables 38 and 39 for 1980 and the design year (1990) of the recommended plan. It is recommended that the first stage change in the state trunk highway system be effected by the mutual action of the State Highway Commission of Wisconsin and the Washington 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, like realignment of the state trunk highway system, is 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 jurisdictional highway system plan by the Washington County Board and endorsement by the State Highway Commission, the Washington County Board act in cooperation with the Highway Commission to effect the realignment of the county trunk highway system within Washington 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 40, in order to achieve the first (1975) stage of plan implementation. Subsequent actions should effect the specific additions to, and deletions from, the county trunk highway system set forth in Tables 41 and 42 for 1980 and 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 Washington 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 Washington County Board support the enactment of legislation presently before the State Legislature which would amend Section 84.02(11) of the Wisconsin Statutes to abolish the connecting street concept, and 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.[1] 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, and pursuant to the foregoing recommendations, it will be necessary to adjust the federal aid system as established under Title 23, United States Code, Sec-

[1] *Effective January 31, 1974, Section 83.025(1) of the Wisconsin Statutes was amended as follows: "provide that where a county has completed a functional and jurisdictional classification of highways approved by the county, by the municipalities and by the state highway commission, additions or deletions from the approved county trunk system may be made only by the county board, with the consent of the highway commission."*

Table 37

DELETION FROM THE RECOMMENDED TYPE I (STATE TRUNK) ARTERIAL HIGHWAY SYSTEM IN WASHINGTON COUNTY: 1975

Deletion From State Trunk Highway System			
Route	Limits	Municipality	Number of Miles
STH 145.	STH 167 to USH 45	Towns of Germantown and Jackson, and Village of Germantown	3.19

Source: SEWRPC.

Table 38

ADDITIONS TO AND DELETIONS FROM THE RECOMMENDED TYPE I (STATE TRUNK) ARTERIAL HIGHWAY SYSTEM IN WASHINGTON COUNTY: 1975-1980

Additions To State Trunk Highway System			
Route	Limits	Municipality	Number of Miles
New Facility (USH 45 Freeway)	Northern terminus of proposed USH 45 Freeway at north corporate limits of City of West Bend to intersection of USH 41 and USH 45	Towns of West Bend, Barton, Polk, and Richfield, and City of West Bend	13.49
New Facility (STH 33)	From a point 0.33 mile east of intersection of CTH U and STH 33 to a point 0.15 mile west of intersection of CTH WW and STH 33	Town of Addison	3.24

Deletions From State Trunk Highway System			
Route	Limits	Municipality	Number of Miles
USH 45	Northern terminus of proposed USH 45 Freeway to north corporate limits of City of West Bend, and south corporate limits of City of West Bend to intersection of USH 45 and USH 41	Villages of Germantown and Jackson, and Towns of Barton, Germantown, Jackson, Polk, Richfield, and West Bend	10.16
USH 45 (Main Street)	North corporate limits of the City of West Bend to Barton Avenue, and Washington Avenue to the south corporate limits of the City of West Bend	City of West Bend	2.78
STH 33	0.15 mile west of intersection of STH 33 and CTH WW to a point 0.33 mile east of intersection of STH 33 and CTH U	Town of Addison	3.46
STH 143	STH 45 to Ozaukee County line	Towns of West Bend, Jackson, and Trenton	6.06
STH 144	STH 60 to STH 33	Village of Slinger and Towns of Polk and West Bend	7.50
STH 175	Waukesha County line to east corporate limits of Village of Slinger and west corporate limits of Village of Slinger to STH 83, and from the new alignment of STH 33 to Dodge County line	Village of Germantown and Towns of Richfield, Polk, Hartford, and Addison	19.28
STH 175 (Washington Avenue)	West corporate limits of the Village of Slinger to east corporate limits of the Village of Slinger	Village of Slinger	1.31

Source: SEWRPC.

tion 103, to the resulting state and county trunk highway systems. In Wisconsin, the State Highway Commission is charged, pursuant to Section 84.01(17) of the Wisconsin Statutes, with the responsibility for laying out and revising the national system of interstate and defense highways and the federal aid primary system subject 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.

Routes on the federal aid urban system shall be selected by the appropriate local officials so as to serve the goals and objectives of the community, with the concurrence of the State Highway Department, and in urbanizing areas, also in accordance with the planning process established under Title 23, United States Code, Section 134, pursuant to Section 84.03(1) of the Wisconsin Statutes.

It is accordingly recommended that, upon realignment of the state, county, and local trunk highway systems, the State Highway Commission act to effect the realignment of the federal aid primary system within Washington County. It is recommended that the initial action include all of the specific additions to the federal aid primary system set forth in Table 43 in order to achieve the first (1975) stage of plan implementation. Subsequent actions should effect the specific additions to, and deletions from, the federal aid primary system set forth in Table 44 by the design year (1990) of the recommended plan. Prior to the enactment of the Federal Aid Highway Act of 1973, the federal aid primary system was divided into two subsystems under the TOPICS program: Type I, which consisted primarily of state and county trunk highways, as shown in Tables 43 and 44; and Type II, which consisted of local arterials in the urban areas. The 1973 Act, however, eliminated the FAP Type II classification in favor of the more comprehensive federal aid urban system. It must be noted, therefore, that between 1973 and 1975 all of the FAP Type II roads in Washington County have been either reclassified as federal aid urban or completely deleted from the federal aid system. 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 Washington County Board. Subsequent realignments can be effected on a route-by-route basis as dictated by developing circumstances.

It is further recommended that, upon realignment of the state, county, and local trunk highway systems, the State Highway Commission act in cooperation with the Washington County Board to effect the realignment of the federal aid secondary system within that portion of Washington County that has not been designated by the State Highway Commission as an urban area. 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 45 in order to achieve the first (1975) stage of plan implementation. Subsequent actions should effect the specific additions to, and deletions from, the federal aid secondary system set forth in Table 46 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 Washington County Board. Subsequent realignments can be effected on a route-by-route basis, as dictated by developing circumstances.

It is recommended that, upon realignment of the state, county, and local trunk highway systems, the State Highway Commission act, in cooperation with the Washington County Board and appropriate local officials, to effect the realignment of the federal aid urban system within the urban area as established under Title 23, United States Code, Section 101. It is recommended that the initial action include all of the specific additions to, and

Table 39

ADDITIONS TO AND DELETIONS FROM THE RECOMMENDED TYPE I (STATE TRUNK) ARTERIAL HIGHWAY SYSTEM IN WASHINGTON COUNTY: 1980-1990

Additions To State Trunk Highway System			
Route	Limits	Municipality	Number of Miles
Lannon Road	USH 41 to Mequon Road	Village of Germantown	0.69
Mequon Road	STH 145 to Lannon Road	Village of Germantown	1.99
Wilson Drive	STH 83 to STH 60, and from Monroe Avenue to the south corporate limits of the City of Hartford	City and Town of Hartford	0.76
New Facility (Belt Freeway)	USH 41 to Waukesha County line	Village of Germantown	1.56
New Facility (STH 83)	STH 60 to Monroe Avenue, and from the south corporate limits of the City of Hartford to STH 83	City and Town of Hartford	2.14

Deletions From State Trunk Highway System			
Route	Limits	Municipality	Number of Miles
STH 83	CTH E to Monroe Avenue	City and Town of Hartford	1.84
STH 83 (Branch Street)	N. Main Street to Grand Avenue	City of Hartford	0.44
STH 83 (Grand Avenue)	Branch Street to Monroe Street	City of Hartford	0.30
STH 83 (Main Street)	Union Street to Branch Street	City of Hartford	0.34
STH 83 (Union Street)	Wilson Drive to N. Main Street	City and Town of Hartford	0.76
STH 84	STH 144 to Ozaukee County line	Town of Farmington	4.73

Source: SEWRPC.

Table 40

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

Additions To County Trunk Highway System

Route	Limits	Municipality	Number of Miles
STH 145	STH 167 to USH 45	Towns of Germantown and Jackson and Village of Germantown	3.19
Ash Road	East Town Line Road to CTH M	Town of Trenton	1.01
Bonniwell Road	Pleasant View Road to N. Country Aire Drive	Village of Germantown	0.50
Colgate Road	Willow Road to Waukesha County line (CTH Q)	Town of Richfield	1.00
County Line Road East	Pilgrim Road to Wausaukee Road	City of Milwaukee and Village of Germantown	0.99
Jackson Drive	STH 60 to STH 143	Village and Town of Jackson	3.12
N. Country Aire Drive	Bonniwell Road to CTH M	Village of Germantown	0.99
Pilgrim Road	Mequon Road to Waukesha County line, and STH 145 to CTH F (Freistadt Road)	Village of Germantown	2.53
Pleasant View Road	Bonniwell Road to Freistadt Road	Village of Germantown	2.01
Scenic Drive	CTH Z to STH 60	Town of Polk	0.98
Scenic Road	STH 167 to Willow Road	Town of Richfield	2.91
State Street	W. Rossman Street to N. Main Street	City of Hartford	0.55
Trading Post Trail	STH 84 to E. Town Line Road	Town of Farmington	3.17
Willow Road	Scenic Road to Colgate Road	Town of Richfield	1.07

Deletions From County Trunk Highway System

Route	Limits	Municipality	Number of Miles
CTH B	STH 33 to CTH D, and CTH D to CTH H	City of West Bend and Towns of Barton and Kewaskum	5.08
CTH C	STH 60 to USH 45	Town of Polk	3.59
CTH E	STH 83 to CTH K	Towns of Hartford and Erin	1.59
CTH F	Mequon Road to STH 175	Village of Germantown	0.14
CTH F (Freistadt Road)	STH 145 to Pilgrim Road, and Pleasant View Road to the Ozaukee County line	Village of Germantown	2.17
CTH H	USH 41 to CTH W, and Fond du Lac County line to Badger Lane	Town of Wayne	2.91
CTH K	Prospect Avenue to STH 83	City of Hartford and Towns of Hartford and Addison	4.35
CTH K (Wilson Drive)	STH 83 to end of CTH K	City and Town of Hartford	0.29
CTH M	Ash Road to CTH MY	Town of Trenton	1.00
CTH M (Pioneer Road)	Ozaukee County line to N. Country Aire Drive	Village of Germantown and Town of Jackson	1.01
CTH M (Wausaukee Road)	CTH C to a point approximately 0.51 mile north of Highland Road	Village of Germantown	1.49
CTH Q	STH 83 to CTH K	Town of Erin	2.22
CTH S	CTH W to Dodge County line	Town of Addison	3.05
CTH U	STH 33 to City of Hartford Airport	Towns of Addison and Hartford and City of Hartford	4.93
CTH W	STH 175 to CTH D, and STH 28 to Fond du Lac County line	Towns of Wayne and Addison	7.44
CTH Y (Goldendale Road)	STH 145 to Mequon Road, and Mequon Road to STH 175	Village and Town of Germantown	4.41
CTH Y (Mequon Road)	Goldendale Road South to Goldendale Road North	Village of Germantown	0.43
CTH DD	Northern intersection of CTH DD and STH 144 to southern intersection of CTH DD and STH 144	Town of Farmington	1.43
CTH DW	USH 41 to Dodge County line	Town of Addison	2.56
CTH HH	STH 28 to STH 144	Town of Farmington	1.45
CTH OO	CTH O to STH 83	Town of Erin	0.73

Source: SEWRPC.

Table 41

ADDITIONS TO AND DELETIONS FROM THE RECOMMENDED TYPE II (COUNTY TRUNK) ARTERIAL HIGHWAY SYSTEM IN WASHINGTON COUNTY: 1975-1980

Additions To County Trunk Highway System			
Route	Limits	Municipality	Number of Miles
USH 45	Northern terminus of proposed 45 Freeway to Barton Avenue, and from Washington Street to the intersection of STH 45 and STH 145	Towns of Barton, West Bend, Jackson, and Polk, City of West Bend, and Village of Jackson	11.72
STH 143	STH 45 to Ozaukee County line	Towns of West Bend, Jackson, and Trenton	6.06
STH 144	STH 60 to STH 33	Village of Slinger and Towns of Polk and West Bend	7.50
STH 175	Waukesha County line to STH 83, and from the new alignment of STH 33 to Dodge County line	Villages of Germantown and Slinger and Towns of Richfield, Polk, Hartford, and Addison	20.59
CTH G (Townline Road)	CTH I to a point approximately 0.08 mile south of intersection of STH 33 and North River Road	City of West Bend and Towns of West Bend and Trenton	0.92
Aurora Road	STH 33 to Deer Road	Town of Addison	2.55
Badger Road	Prospect Drive to Kettle View Drive	Town of Kewaskum	1.00
Bridge Street	CTH M to Ozaukee County line	Town of Jackson	1.00
Cedar Creek Road	USH 41 to CTH C	Town of Polk	2.48
Decorah Road	18th Avenue to CTH G	City and Town of West Bend	2.03
18th Avenue	STH 33 to CTH NN	City and Town of West Bend	3.00
Indian Drive	Deer Road to USH 41	Town of Addison	1.00
Kettle View Drive	Schuster Drive to CTH D, and CTH D to CTH H	Towns of Barton and Kewaskum	4.02
Lover's Lane Road	STH 175 to STH 60	Town of Polk	0.88
Paradise Road	CTH G to 18th Avenue	City and Town of West Bend	1.99
Pilgrim Road	Mequon Road to a point approximately 0.14 mile south of STH 145	Village of Germantown	0.28
Pleasant Valley Road	CTH Z to USH 45	Town of Polk	2.00
N. River Road	North corporate limits of City of West Bend to STH 33	City of West Bend and Town of Trenton	0.50
Townline Road	Intersection of Townline Road and Mayfield Road to STH 175	Towns of Polk and Richfield	0.60
New Facility (River Road Extension)	STH 144 to N. River Road	City of West Bend and Town of Barton	1.14
New Facility	STH 33 to a point 0.08 mile south of intersection of STH 33 and North River Road	City of West Bend	0.08
New Facility	Aurora Road to Indian Drive	Town of Addison	0.72
New Facility	STH 33 to Schuster Drive	Town of Barton	1.00
New Facility	CTH 11 to CTH V	Village and Town of Kewaskum	1.61
New Facility	Intersection of Townline Road and Mayfield Road to intersection of STH 145 and present USH 45	Town of Polk	0.95
New Facility	USH 45 to intersection of Badger Road and Prospect Drive	Town of Kewaskum	0.35
New Facility	STH 145 to Pilgrim Road	Village of Germantown	0.14

Deletions From County Trunk Highway System			
Route	Limits	Municipality	Number of Miles
CTH T	CTH M to Ozaukee County line	Town of Jackson	1.00
CTH NN	18th Avenue to USH 45	City and Town of West Bend	1.00

Source: SEWRPC.

Table 42

ADDITIONS TO AND DELETIONS FROM THE RECOMMENDED TYPE II (COUNTY TRUNK) ARTERIAL HIGHWAY SYSTEM IN WASHINGTON COUNTY: 1980-1990

Additions To County Trunk Highway System			
Route	Limits	Municipality	Number of Miles
STH 83 (Union Street)	Wilson Drive to N. Main Street	City and Town of Hartford	0.76
STH 83 (N. Main Street)	Union Street to State Street	City of Hartford	0.04
STH 84	CTH X to Ozaukee County line	Town of Farmington	3.85
River Lane	Mequon Road to Freistadt Road	Village of Germantown	1.00
River Road	USH 45 to Salisbury Road	City of West Bend and Town of Barton	1.06
Summit Drive	Salisbury Road to STH 144	City of West Bend and Town of Barton	1.00
New Facility	Freistadt Road to Division Street	Village of Germantown	0.79

Deletions From County Trunk Highway System			
Route	Limits	Municipality	Number of Miles
CTH G (Division Street)	STH 145 to a point approximately 0.32 mile north of the intersection of Division Street and STH 145	Village of Germantown	0.32
CTH U	City of Hartford Airport to CTH N	City and Town of Hartford	1.09

Source: SEWRPC.

deletion from, the federal aid urban system set forth in Table 47 in order to achieve the first (1975) stage of plan implementation. Subsequent actions should effect the specific additions to, and deletions from, the federal aid urban system set forth in Table 48 by the design year (1990) of the recommended plan. It is recommended that all of the initial changes in the federal aid urban system be effected by one inclusive action of the State Highway Commission supported by the Washington County Board and appropriate local officials. Subsequent realignments can be effected on a route-by-route basis, as dictated by developing circumstances.

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 Washington 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 primary system with the Type I (state trunk) highway system, the alignment of the federal aid secondary system with the Type II (county trunk) highway system in that portion of Washington County that is not designated an urban area, and the alignment of the federal aid urban system with the Type III (local trunk) highway system in an urban area.

Realignment of Operational Responsibilities

The State Highway Commission, following the realignment of the state and county trunk highway systems as recommended in this report, 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 Washington County, including those facilities within incorporated cities and villages. The Washington 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 Washington County, including those facilities within incorporated cities and villages.

It is recommended that the Rustic Roads Board upon the application of the Washington County Board and pursuant to Section 83.42 of the Wisconsin Statutes designate as Rustic Roads the facilities identified in Table 15. It is further recommended that the Washington County Board, in cooperation with appropriate governmental agencies and organizations such as the State Department of Natural Resources, the County Park and Planning Commission, the County Historical Society, garden and women's clubs, and recreation-oriented business associations, mark and sign the recommended system

Table 43

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

Additions To Federal Aid Primary System			
Route	Limits	Municipality	Number of Miles
USH 45	STH 144 to STH 33	City of West Bend	0.89
STH 28	USH 41 to USH 45, and USH 45 to STH 144	Village of Kewaskum and Towns of Wayne, Kewaskum, and Farmington	13.68
STH 60	USH 41 to Ozaukee County line	Towns of Polk and Jackson and Village of Jackson	9.48
STH 83	STH 175 to the Waukesha County line	City of Hartford and Towns of Addison, Erin, and Hartford	14.54
STH 144	Sheboygan County line to existing USH 45	City of West Bend and Towns of Farmington and Barton	9.07
STH 145	STH 167 (Holy Hill Road) to the Waukesha County line	Village of Germantown	5.47
STH 167	STH 83 to STH 145	Village of Germantown and Towns of Erin and Richfield	11.90
STH 167 (Mequon Road)	STH 145 to the Ozaukee County line	Village of Germantown	1.78

Deletions From Federal Aid Primary System			
Route	Limits	Municipality	Number of Miles
USH 45	STH 144 to the proposed USH 45 freeway	City of West Bend and Town of Barton	1.73
USH 45	STH 33 to USH 41	Towns of Germantown, Jackson, Polk, Richfield, and West Bend and Villages of Jackson and Germantown	8.34
STH 175	STH 83 to STH 33	Town of Addison	3.07

Source: SEWRPC.

of scenic drives and designated Rustic Roads within Washington County for such recreational activities as pleasure driving, and to provide access to the sites of cultural, historic, recreational, scenic, and scientific interest within the county.

It is recommended that the State Highway Commission continue to contract with the Washington County Board, pursuant to Section 84.07 of the Wisconsin Statutes, for maintenance of the Type I (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 Washington County Board, at its option, contract with the cities and villages concerned for maintenance of the Type II (county trunk) highway facilities. It is recommended that the State Highway Commission and the Washington County Highway Committee, respectively, establish 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 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 Washington County, and declare all such Type I (state trunk) highway facilities within the county which meet the statutory requirements and provisions as controlled-access highways. It is similarly recommended that the Washington County Board, pursuant to Section 83.027 of the Wisconsin Statutes, declare all such county trunk highway facilities within Washington County as are found to meet the statutory requirements and provisions as controlled-access highways.

Table 44

ADDITIONS TO AND DELETIONS FROM THE RECOMMENDED FEDERAL AID PRIMARY SYSTEM IN WASHINGTON COUNTY: 1975-1990

Additions To Federal Aid Primary System			
Route	Limits	Municipality	Number of Miles
Lannon Road	Mequon Road to USH 41	Village of Germantown	0.69
Mequon Road	Lannon Road to STH 145	Village of Germantown	1.99
Wilson Drive	STH 83 to STH 60, and Monroe Avenue to the south corporate limits of the City of Hartford	City of Hartford	0.67
New Facility (New Alignment of STH 33)	Approximately 0.15 mile west of intersection of STH 33 and CTH WW to approximately 0.33 mile east of intersection of STH 33 and CTH U	Town of Addison	3.24
New Facility (Belt Freeway)	USH 41 to the Waukesha County line	Village of Germantown	1.56
New Facility (STH 83)	Intersection of STH 60 and Wilson Drive to Monroe Avenue, and CTH E to south corporate limits of City of Hartford	City and Town of Hartford	2.14

Deletions From Federal Aid Primary System			
Route	Limits	Municipality	Number of Miles
STH 33	Approximately 0.15 mile west of the intersection of STH 33 and CTH WW to approximately 0.33 mile east of the intersection of STH 33 and CTH U	Town of Addison	3.46
STH 83	Monroe Avenue to CTH E	Town of Hartford	1.84
STH 83 (Branch Street)	Grand Avenue to S. Main Street	City of Hartford	0.44
STH 83 (Grand Avenue)	Branch Street to Monroe Avenue	City of Hartford	0.30
STH 83 (Main Street)	Branch Street to Union Street	City of Hartford	0.34
STH 83 (Union Street)	N. Main Street to Wilson Drive	City of Hartford	0.76

Source: SEWRPC.

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 49 and 50 has 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 demands, 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 Washington 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

Table 45
ADDITIONS TO AND DELETIONS FROM THE RECOMMENDED FEDERAL AID SECONDARY SYSTEM IN WASHINGTON COUNTY: 1975

Additions To Federal Aid Secondary System			
Route	Limits	Municipality	Number of Miles
USH 45	STH 145 to Paradise Road	Towns of Jackson, Polk, Richfield, and West Bend and Village of Jackson	5.05
CTH D	Dodge County line to USH 45	Towns of Wayne and Barton	11.51
CTH E	CTH K to CTH J	Towns of Polk and Hartford	3.74
CTH H	USH 45 to CTH W	Village of Kewaskum and Towns of Kewaskum and Wayne	4.92
CTH K	STH 167 to STH 60	Towns of Hartford and Erin	5.50
CTH M	STH 60 to Pioneer Road	Town of Jackson	3.02
CTH M	Ash Road to STH 33	Town of Trenton	1.00
CTH N	Dodge County line to the City of Hartford urban boundary	Town of Hartford	1.61
CTH X	Sheboygan County line to STH 84	Town of Farmington	1.04
CTH Z	CTH NN to CTH C	Towns of West Bend and Polk	2.55
CTH BB	STH 28 to the Fond du Lac County line	Town of Wayne	0.98
CTH CC	STH 167 to STH 60	Towns of Erin, Richfield, Hartford, and Polk, and Village of Slinger	5.06
Ash Road	Trading Post Trail to CTH M	Town of Trenton	1.01
Colgate Road	CTH Q to Willow Road	Town of Richfield	1.00
Jackson Drive	STH 143 to STH 60	Town of Jackson	3.12
Scenic Drive	CTH C to STH 60	Town of Polk	0.98
Scenic Road	Willow Road to STH 167	Town of Richfield	2.91
Trading Post Trail	STH 84 to Ash Road	Town of Farmington	3.17
Willow Road	Colgate Road to Scenic Road	Town of Richfield	1.07

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 connection to storm sewer mains; construction of storm sewer mains necessary for pavement and right-of-way drainage; and engineering services. Freeway projects on federal aid routes in Washington County are financed with 70 percent federal funds and 30 percent state funds.

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 the rural areas in and surrounding developing cities and villages such as exist in Washington County, where urban development, 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 greatly to 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.

Table 45 (continued)

Deletions From Federal Aid Secondary System			
Route	Limits	Municipality	Number of Miles
USH 45	STH 144 to STH 33	City of West Bend	0.89
STH 28	USH 41 to USH 45, and USH 45 to STH 144	Towns of Wayne, Farmington, and Kewaskum, and Village of Kewaskum	13.68
STH 60	USH 41 to Ozaukee County line	Towns of Polk and Jackson and Village of Jackson	9.48
STH 83	STH 175 to Waukesha County line	City of Hartford and Towns of Addison, Erin, and Hartford	14.54
STH 144	Sheboygan County line to existing USH 45	City of West Bend and Towns of Farmington and Barton	9.07
STH 145	Waukesha County line to the northern urban boundary	Village of Germantown	7.10
STH 167	STH 83 to STH 145	Towns of Erin and Richfield	11.90
STH 167 (Mequon Road)	STH 145 to Ozaukee County line	Village of Germantown	1.78
STH 175	CTH Q to the western urban boundary	Village of Germantown	3.58
STH 175	STH 83 to STH 33	Town of Addison	3.07
CTH C	USH 45 to STH 60	Town of Polk	3.59
CTH F	STH 145 to Ozaukee County line	Village of Germantown	2.67
CTH G (Division Road)	STH 145 to the northern urban boundary	Village of Germantown	2.34
CTH G	CTH I to Paradise Road	City of West Bend and Town of West Bend	1.00
CTH Q	STH 83 to CTH K	Town of Erin	2.21
CTH Q	Amy Belle Road to STH 175	Village of Germantown	1.14
CTH S	Dodge County line to CTH W	Town of Addison	3.05
CTH U	CTH S to CTH N	City of Hartford, Towns of Addison and Hartford	3.74
CTH W	Fond du Lac County line to STH 28	Town of Wayne	0.96
CTH W	STH 33 to STH 175	Town of Addison and Wayne	3.02
CTH Y	STH 145 to STH 175	Village of Germantown	5.21
Decorah Road	CTH G to Main Street	City of West Bend	1.00
Mequon Road	STH 175 to USH 145	Village of Germantown	2.59
State Street	CTH U to N. Main Street	City of Hartford	0.93
Townline Road	CTH I to STH 33	City of West Bend	1.00

Source: SEWRPC.

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 and to 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 Washington County Board and endorsement by the State Highway Commission, the Washington County Board, in cooperation with the three cities, five villages, and 13 towns within Washington County, adopt a modified "official" map pursuant to Section 80.64 of the Wisconsin Statutes. This map initially should encompass all of the Type I and Type II highway facilities which are to remain on existing location and which, therefore, should require no route location studies as a basis for the mapping. Proposed Type I and Type II highway facilities which are to be placed on new location should be added to the map as the necessary route location studies are completed. 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 13 towns within the county approve the county map prepared in accordance with the adopted jurisdictional highway system plan.

It is further recommended that the county Official Map be augmented by the preparation and adoption of local official maps and ordinances, which would include, in

Table 46

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

Additions To Federal Aid Secondary System			
Route	Limits	Municipality	Number of Miles
CTH AA	USH 41 to STH 144	Village of Slinger and Town of Polk	0.55
Aurora Drive	STH 33 to approximately 0.43 mile north of intersection of Indian Drive and Deer Road	Town of Addison	2.55
Badger Road	Kettle View Drive to Prospect Drive	Town of Kewaskum	1.00
Bridge Street	CTH M to Ozaukee County line	Town of Jackson	1.00
Cedar Creek Road	USH 41 to CTH Z	Town of Polk	2.48
18th Avenue	CTH NN to Paradise Road	Town of West Bend	1.00
Indian Drive	Deer Road to CTH K	Town of Addison	1.00
Kettle View Drive	CTH H to CTH D, and CTH D to Schuster Drive	Towns of Kewaskum and Barton	4.02
Lover's Lane	STH 175 to STH 60	Town of Polk	0.88
New Facility	CTH V to CTH H	Town and Village of Kewaskum	1.62
New Facility	Prospect Drive to USH 45	Town of Kewaskum	0.35
New Facility	USH 41 to Town Line Road	Town of Polk	0.89
New Facility	Aurora Drive to Indian Drive	Town of Addison	0.72
New Facility	Schuster Drive to STH 33	Town of Barton	1.00

Deletions From Federal Aid Secondary System			
Route	Limits	Municipality	Number of Miles
STH 84	STH 144 to CTH X	Town of Farmington	0.88
CTH NN	18th Avenue to existing USH 45	City and Town of West Bend	1.00
CTH T	CTH M to Ozaukee County line	Town of Jackson	1.00

Source: SEWRPC.

addition to the recommended state and county mapped routes, all of the Type III highway facilities 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, established pursuant to Section 62.23(11) of the Wisconsin Statutes, in order to protect portions of recommended street and highway rights-of-way.

It is recommended that the planning agencies of the three cities, five villages, and 13 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, 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, five villages, and 13 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. Implementation procedures by the U. S. Department of Transportation, Federal Highway Administration; the Wisconsin Department of Transportation; the Southeastern Wisconsin Regional Planning Commis-

Table 47

ADDITIONS TO THE RECOMMENDED FEDERAL AID URBAN SYSTEM IN WASHINGTON COUNTY: 1975

Additions To Federal Aid Urban System			
Route	Limits	Municipality	Number of Miles
STH 145	Holy Hill Road to the northern urban boundary	Village of Germantown	1.63
STH 175	CTH Q to the western urban boundary	Village of Germantown	3.58
CTH G (Townline Road)	Paradise Road to the northern terminus of Townline Road	City of West Bend	1.92
CTH G (Division Road)	Lovers Lane Road to Pioneer Road	Village of Germantown	2.02
CTH M (Pioneer Road)	N. Country Aire Road to Wausaukee Road	Village of Germantown	1.00
CTH Q	Amy Belle Road to Pilgrim Road	Village of Germantown	2.46
CTH Y (Lannon Road)	STH 175 to CTH Q	Village of Germantown	1.07
Bonniwell Road	Pleasant View Road to N. Country Aire Road	Village of Germantown	0.50
Chestnut Street	Kilbourn Street to University Drive	City of West Bend	1.23
County Line Road	Pilgrim Road to Wausaukee Road	City of Milwaukee and Village of Germantown	0.99
Decorah Road	CTH G to 18th Avenue	City of West Bend	2.03
Donges Bay Road	S. Division Road to Wausaukee Road	Village of Germantown	2.97
Freistadt Road	USH 41 to Wausaukee Road	Village of Germantown	5.56
Grand Avenue	Branch Street to E. Sumner Street	City of Hartford	0.45
Indiana Avenue	Decorah Road to STH 33	City of West Bend	1.02
Island Avenue (extended)	STH 33 to Kilbourn Street	City of West Bend	0.52
Jefferson Street	18th Avenue extended to Main Street	City of West Bend	0.72
Kilbourn Street	Indiana Avenue to Chestnut Street	City of West Bend	0.25
Main Street	CTH D to Barton Avenue and STH 33 to Paradise Road	City of West Bend	3.56
Maple Road	STH 175 to STH 167	Village of Germantown	3.67
Mequon Road	STH 175 to Maple Road	Village of Germantown	1.57
Monroe Avenue (extended)	Grand Avenue to Wacker Drive extended	City of Hartford	1.41
N. Country Aire Drive	Bonniwell Road to Pioneer Road	Village of Germantown	0.99
N. River Road	STH 33 to Creek Road	City of West Bend	0.50
Paradise Road	CTH G to 18th Avenue	City of West Bend	1.49
Pilgrim Road	County Line Road to a point approximately 0.14 mile south of STH 145	Village of Germantown	2.28
Pleasant View Road	Freistadt Road to Bonniwell Road	Village of Germantown	2.01
River Lane	Mequon Road to Freistadt Road	Village of Germantown	1.00
Rockfield Road	STH 145 to Pleasant View Road	Village of Germantown	2.76
S. Country Aire Drive	Freistadt Road to STH 145	Village of Germantown	1.58
S. Division Road	CTH Q to a point approximately 0.73 mile south of Mequon Road	Village of Germantown	1.41
State Street	N. Main Street to the western urban boundary	City of Hartford	1.09
University Drive	Chestnut Street to STH 33	City of West Bend	0.29
Wacker Drive (extended)	State Street to Monroe Avenue extended	City of Hartford	1.71
Walnut Street	Main Street to 7th Avenue	City of West Bend	0.14
Water Street	Indiana Avenue to Main Street	City of West Bend	0.38
Wausaukee Road	Pioneer Road to County Line Road	City of Milwaukee and Village of Germantown	2.98
4th Street (extended)	Union Street to E. Sumner Street	City of Hartford	0.26
7th Avenue	STH 33 to Decorah Road	City of West Bend	1.00
18th Avenue	Paradise Road to Park Avenue	City of West Bend	2.50
New Facility (Pilgrim Road)	Pilgrim Road to STH 145	Village of Germantown	0.14
New Facility	S. Division Road to Mequon Road	Village of Germantown	0.94
New Facility (River Lane)	Freistadt Road to the intersection of N. Division Road and Lovers Lane	Village of Germantown	0.79
New Facility	N. River Road at Creek Road to STH 144	City of West Bend	1.14
New Facility	Town Line Road to STH 33	City of West Bend	0.08
New Facility (18th Avenue)	Park Avenue to Main Street	City of West Bend	1.24

Source: SEWRPC.

Table 48

ADDITIONS TO THE RECOMMENDED FEDERAL AID URBAN SYSTEM IN WASHINGTON COUNTY: 1975-1990

Additions To Federal Aid Urban System			
Route	Limits	Municipality	Number of Miles
Grand Avenue	Branch Street to Monroe Avenue	City of Hartford	0.30
Hubertus Road	USH 41 to STH 175	Village of Germantown	0.62
Mequon Road	Maple Road to Lannon Road	Village of Germantown	0.27
Monroe Avenue	Grand Avenue to CTH K	City of Hartford	1.02
N. Main Street	E. Sumner Street to Union Street	City of Hartford	0.26
River Road	USH 45 to Salisbury Road	City of West Bend	1.06
Summit Drive	Salisbury Road to STH 144	City of West Bend	1.00
Trenton Road	STH 33 to Summit Drive	City of West Bend	1.93
Union Street	N. Main Street to Wilson Drive	City of Hartford	0.76
W. Townline Road	STH 144 to Trenton Road	City of West Bend	2.06

Source: SEWRPC.

sion; the Washington County Board; and the governing bodies of the three cities, five villages, and 13 towns are intended to be consistent with all existing and proposed legislation, administrative codes, and ordinances of the implementing agencies. 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 Washington County, and utilize the plan as a guide in the review of requests for 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 Washington County Board and appropriate local officials, realignment of the state trunk, county trunk, local 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 Washington County.

4. Review the status of controlled-access highways within Washington County, and declare all such state trunk highways within Washington County 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 Washington County.

Rustic Roads Board: It is recommended that the Rustic Roads Board:

1. Act to endorse the recommended jurisdictional highway system plan for Washington County and utilize the plan as a guide in the review of requests for designation of Rustic Roads within the county.

2. Cooperate in, and approve the designation of the Rustic Roads recommended in the jurisdictional highway system plan.

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, con-

Table 49

RECOMMENDED STAGING OF THE TYPE I (STATE TRUNK) ARTERIAL HIGHWAY SYSTEM IMPROVEMENTS IN WASHINGTON COUNTY: 1973-1990

Time Period	Highway Facility	Limits	Municipality	Number of Miles
1973-1975	STH 33	Trenton Road to east corporate limits of City of West Bend	Towns of West Bend and Trenton	1.80
	STH 33 (Washington Street)	East corporate limits of City of West Bend to 18th Avenue	City of West Bend	1.68
1976-1980	USH 41	Richfield Interchange to the Dodge County line	Towns of Wayne, Addison, Hartford, Polk, and Richfield	22.13
	STH 33	18th Avenue to Riesel Drive	City of West Bend and Town of Barton	2.58
	New Facility (Proposed 45 Freeway)	North terminus of the proposed 45 Freeway to the intersection of present USH 45 and USH 41	Towns of West Bend, Polk, and Richfield and City of West Bend	13.49
	New Facility (New alignment of STH 33)	From a point approximately 0.33 mile east of the intersection of CTH U and STH 33 to a point approximately 0.15 mile west of the intersection of CTH WW and STH 33	Town of Addison	3.24
1981-1985	USH 45 (Main Street)	STH 144 (Barton Avenue) to STH 33 (Washington Street)	City of West Bend	0.89
	USH 45 (Fond du Lac Road)	STH 28 to CTH H	Village of Kewaskum	1.16
	STH 28	USH 45 to new facility (extension of Kettle View Drive)	Village and Town of Kewaskum	0.30
	STH 28 (Main Street)	CTH S (Riverview Drive) to S. Mill Road	Village and Town of Kewaskum	0.74
	STH 60 (Main Street)	USH 45 to east corporate limits of the Village of Jackson	Town and Village of Jackson	1.73
	STH 144	W. Town Line Road to east corporate limits of the City of West Bend	Town of Barton	1.07
	STH 144 (Barton Avenue)	USH 45 (Main Street) to east corporate limits of the City of West Bend	City of West Bend	0.67
	STH 145	Waukesha County line to STH 167	Village of Germantown	5.47
	STH 175	STH 83 to the new alignment of STH 33	Town of Addison	3.07
	Wilson Drive	STH 83 to STH 60, and from Monroe Avenue to south corporate limits of the City of Hartford	City and Town of Hartford	0.76
	New Facility (STH 83)	CTH E to south corporate limits of the City of Hartford, and from the intersection of STH 60 and Wilson Drive to Monroe Avenue	City and Town of Hartford	2.14
1986-1990	STH 60	Wilson Drive to CTH C	City of Hartford, Village of Slinger, and Towns of Hartford and Polk	6.43
	Lannon Road	USH 41 to Mequon Road	Village of Germantown	0.69
	Mequon Road	Lannon Road to Ozaukee County line	Village of Germantown	3.77
	New Facility (Belt Freeway)	USH 41 to Waukesha County line	Village of Germantown	1.56

Source: SEWRPC.

Table 50

RECOMMENDED STAGING OF THE TYPE II (COUNTY TRUNK) ARTERIAL HIGHWAY SYSTEM IMPROVEMENTS IN WASHINGTON COUNTY: 1973-1990

Time Period	Highway Facility	Limits	Municipality	Number of Miles
1973-1975	STH 145	STH 167 to Rockfield Road	Village of Germantown	0.60
	CTH D	Dodge County line to USH 45	Towns of Wayne and Barton	11.51
	CTH NN	CTH Z to STH 144	Towns of West Bend and Polk	3.66
1976-1980	USH 45	North terminus of proposed 45 Freeway to north corporate limits of the City of West Bend	Town of Barton	1.02
	USH 45 (Main Street)	North corporate limits of the City of West Bend to STH 144	City of West Bend	0.99
	STH 143	USH 45 to Ozaukee County line	Towns of Jackson, Trenton, and West Bend	6.06
	STH 175 (Washington)	STH 60 to STH 144 (Franklin)	Village of Slinger	0.96
	CTH G	Paradise Road to CTH I (Decorah Road)	City of West Bend and Town of Trenton	1.02
	CTH Q (County Line Road)	Ozaukee County line to a point approximately 0.20 mile west of Colgate Road	Village of Germantown and Town of Richfield	4.62
	CTH Y	STH 33 to Knoll Wood Drive	Town of Trenton and Village of Newburg	2.12
	Aurora Drive	STH 33 to a point approximately 0.43 mile north of the intersection of Indian Drive and Deer Road	Town of Addison	2.55
	Bridge Street	CTH M to Ozaukee County line	Town of Jackson	1.00
	Decorah Road	18th Avenue to Townline Road	City of West Bend	1.93
	18th Avenue	Paradise Road to STH 33 (Washington Street)	City and Town of West Bend	2.00
	Freistadt Road	S. Country Aire Drive to western corporate limits of the Village of Germantown	Village of Germantown	4.97
	Freistadt Road	Pilgrim Road to Pleasant View Road	Village of Germantown	0.50
	Indian Drive	CTH K to Deer Road	Town of Addison	1.00
	Lovers Lane Road	STH 175 to STH 60	Town of Polk	0.88
	Paradise Road	18th Avenue to CTH G (S. River Road)	Town and City of West Bend	1.99
	Pilgrim Road	STH 145 to Freistadt Road	Village of Germantown	0.53
	Pilgrim Road	Waukesha County line to a point approximately 0.14 mile south of STH 145	Village of Germantown	2.28
	N. River Road	STH 33 to Creek Road	City of West Bend	0.50
	Townline Road	STH 33 to CTH I (Decorah Road)	Towns of West Bend and Trenton	1.00
	New Facility (Pilgrim Road)	STH 145 to a point approximately 0.14 mile south of STH 145	Village of Germantown	0.14
	New Facility	Intersection of CTH Z and STH 33 to the intersection of Schuster Drive and Kettle View Drive	Town of Barton	1.00
	New Facility	CTH V to CTH H	Town and Village of Kewaskum	1.62

Table 50 (continued)

Time Period	Highway Facility	Limits	Municipality	Number of Miles
1981-1985	CTH I	STH 33 to CTH G	Village of Newburg and Town of Trenton	5.73
	CTH H	USH 45 (Fond du Lac Avenue) to Kettle View Drive	Village and Town of Kewaskum	0.88
	CTH M	STH 143 to CTH I	Towns of Trenton and Jackson	3.87
	CTH M (Country Aire Road)	Bridge Street to STH 60	Town of Jackson	1.51
	CTH S	Fond du Lac County line to STH 28 (Main Street)	Town and Village of Kewaskum	1.56
	CTH W	CTH D to CTH H	Town of Wayne	3.02
	CTH MY	Ozaukee County line to CTH M	Village of Newburg and Town of Trenton	1.24
	Scenic Drive	STH 60 to CTH C (Cedar Creek Road)	Town of Polk	0.98
	CTH N (State Street)	North corporate limits of the City of Hartford to N. Main Street	City and Town of Hartford	1.26
	New Facility	Intersection of USH 45 and CTH H to the intersection of Badger Road and Prospect Drive	Town of Kewaskum	0.35
1986-1990	STH 175	Waukesha County line to the proposed Belt Freeway	Village of Germantown	1.12
	CTH G (Division Road)	CTH T to a point approximately 0.32 mile north of intersection of STH 145 and CTH G (Division Road)	Village of Germantown and Towns of Germantown and Jackson	3.46
	Cedar Creek Road	CTH Z to Lovers Lane Road	Town of Polk	2.03
	Colgate Road	CTH Q (County Line Road) to Willow Road	Town of Richfield	1.00
	Lannon Road	Waukesha County line to STH 175	Village of Germantown	1.07
	River Lane	Freistadt Road to Mequon Road	Village of Germantown	1.00
	River Lane	USH 45 to Salisbury Road	Town of Barton	1.06
	Scenic Road	Willow Road to STH 167 (Holy Hill Road)	Town of Richfield	2.91
	Summit Drive	Salisbury Road to STH 144	Town of Barton	1.00
	Willow Road	Colgate Road to Scenic Road	Town of Richfield	1.07
	New Facility	N. Division Road to Freistadt Road	Village of Germantown	0.79

Source: SEWRPC.

stituting an amendment to the regional transportation plan adopted by the Commission on December 1, 1966.

County Level

Washington County Board: It is recommended that the Washington County Board, upon recommendation of the Washington County Highway Committee:

1. Adopt the recommended jurisdictional highway system plan as a guide to future highway facility development within the county.

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

3. Assume full operational and maintenance responsibilities for all county trunk highways within Washington County.

4. Proceed, in cooperation with the appropriate agencies and organizations, to establish and designate a system of scenic drives and rustic roads to be marked and signed for routing within Washington County.

5. Declare all county trunk facilities that 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 Washington County.

8. Establish, with the approval of the municipalities as they are affected, a modified "official" map including the proposed Type I and Type II highways.

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 13 town boards within Washington 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 13 town boards within Washington 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 13 town boards within Washington 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.

4. Proceed with right-of-way acquisition and facility construction included in the recommended jurisdictional highway system plan.

In addition, it is recommended that the State Highway Commission and the Washington 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 Washington County Board of Supervisors adopted the plan on August 15, 1967, after careful consideration and upon the recommendation of the Washington 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 Washington 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 Washington County. Such a plan would also contain concomitant recommendations for the realignment of the federal aid highway systems as well as the state and county trunk highway systems, and if warranted, propose 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 Washington 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 actively involve these local units of government in the planning process. This was done by the formation of the Technical and Intergovernmental Coordinating and Advisory Committee on Jurisdictional Highway Planning for Washington County, with representation from the U. S. Department of Transportation, Federal Highway Administration; the Wisconsin Department of Transportation, Division of Highways; the Southeastern Wisconsin Regional Planning Commission; the Washington County Highway Department; and 27 local public officials and citizen members who collectively represent the interests of the two cities, five villages, and 13 towns within Washington County.

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 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 assure the most effective use of public resources in the provision of highway transportation, focusing the appropriate resources and capabilities on 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 Washington 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 Washington 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 highway facilities included 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 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 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 Washington County, with all arterial facilities in the rural areas being included in either 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: the trips served, the land uses served, and 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 Washington 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, 1973, there were a total of 1,158 miles of streets and highways open to traffic within Washington County. Of this total, 345 miles, or 30 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 23 units of government—the state, the county, and 21 local municipalities. Approximately 187 miles, or 54 percent, of the arterial network were under state jurisdiction, being comprised of state trunk highways and connecting streets. About 128 miles, or 37 percent, were under county jurisdiction, being comprised of county trunk highways; and about 30 miles, or 9 percent, were under city, village, or town jurisdiction, being comprised of local arterial streets and highways.

Superimposed on the state, county, and local trunk highways were 310 miles of federal aid routes, of which about 76 miles, or about 25 percent, were federal aid primary routes, 234 miles, or 75 percent, were federal aid secondary routes, and one-half mile, or less than 1 percent, was a federal aid urban route.

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 Washington County Board in 1925. Many piecemeal additions and deletions have been made to these two jurisdictional highway networks since 1923 and 1925. 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 Washington 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 Washington 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 Washington County at an adequate level of service.

THE RECOMMENDED PLAN

The jurisdictional highway system plan prepared for Washington 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 Washington 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 Washington County to the plan design year of 1990. As a functional plan, the plan recommends 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.

Type I (State Trunk) Highway System

The arterial street and highway system recommended to serve the growing traffic demand within Washington County through the plan design year 1990 totals approximately 446 route-miles of facilities, or about 36 percent of the estimated 1,248 route-miles of facilities expected to comprise the total street and highway system within the county in 1990. Of this total arterial system, 149 route-miles, or about 33 percent, are proposed to comprise the Type I system, a decrease of 38 route-miles over the present system. This Type I system may be expected to carry approximately 80 percent of the arterial travel demand and approximately 73 percent of the total travel demand expected to be generated with Washington County by the year 1990. The Type I system as recommended includes all of the existing 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 243 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 52 route-miles over the present system. It is intended to complement the recommended Type I 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 16 percent of the arterial travel demand and 14 percent of the total travel demand expected to be generated within Washington County by the year 1990.

Type III (Local Trunk) Highway System

The plan further recommends a Type III (local trunk) highway system consisting of the remaining 53 route-miles of arterial facilities, or about 12 percent of the total arterial mileage proposed to serve Washington County in the plan design year of 1990. This Type III system, comprising an integral part of the total arterial street and highway system, represents an increase of 16 route-miles over the present system, and is intended to serve primarily local arterial street and highway needs.

Scenic Drives and Rustic Roads

Finally, the plan recommends the marking and signing, by the county, of a system of scenic drives and rustic roads within the county. The recommended scenic drive system would consist of four basic drives—the Kettle Moraine Scenic Drive, the proposed Milwaukee River Scenic Drive, the proposed Maskikon Scenic Drive, and the proposed Southern Lakes Scenic Drive—with additional interconnecting links to provide access to the scenic, cultural, historical, natural, scientific, and recreational sites located throughout Washington County. The plan recommends that certain facilities comprising the scenic drive system be designated as rustic roads and be maintained in their natural state.

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 anticipated 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 arterial facilities, were estimated at $154 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 expenditure for highway purposes within Washington County, anticipated revenues for highway purposes over the plan implementation period were estimated at $154 million, or approximately the amount required to fully implement the plan.

Although the financial analysis indicates that the plan is feasible considering the county as a whole, some disparities may exist with respect to the initial distribution of resources between the county and local levels of government relating to the transfer of local trunk facilities to the county trunk system, and within the individual municipalities comprising the county relating primarily to the anticipated costs of, and revenues for, the Type III system and to the nonarterial facilities located within the various municipalities within Washington 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 two major recommended revisions to the aid structure: the abandonment of the connecting street concept, and the adoption of common, uniform construction aid formulae and policies for state and county trunk highways.

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 Washington County Board and the Southeastern Wisconsin Regional Planning Commission, and endorsement by the Highway Commission of the Wisconsin Division of Highways; 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 Washington 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 Washington County Highway Department; and adoption of common, uniform construction aid formulae and policies for all state and county trunk highways within Washington County. Additional recommendations include the establishment of an Official Map for the protection of the rights-of-way of all Type I and Type II highway facilities through the cooperative action of the Washington County Board and the governing bodies of the 20 municipalities comprising the county.

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 county and the Region, of which the county is a part; 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 Washington 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 AND INTERGOVERNMENTAL COORDINATING AND ADVISORY COMMITTEE ON JURISDICTIONAL HIGHWAY PLANNING FOR WASHINGTON COUNTY

Lloyd Jacklin Chairman	Trustee, Village of Jackson
Albert E. McClurg Secretary	Engineering Aide, City of West Bend
Majed Abu-Lughod	Director of Public Works, City of Hartford
Kurt W. Bauer	Executive Director, SEWRPC
Frederick H. Chlupp	Land Use and Park Administrator, Washington County
Jerome P. Faust	County Supervisor, Washington County
Peter Gonnering	Chairman, Town of Barton
Cornelius Gundrum	County Supervisor, Washington County; Member, County Board Highway Committee
Carl Hauch	Supervisor, Town of Farmington
Alfred Hemauer	City Clerk, City of West Bend
John O. Hibbs	Division Engineer, U. S. Department of Transportation, Federal Highway Administration, Madison
Thomas R. Kinsey	District Engineer, District 2, Division of Highways, Wisconsin Department of Transportation
Walter L. Kletti	Member, City of Hartford Planning Commission
Reuben Koch	Supervisor, Town of West Bend
Howard J. Kruepke	Chairman, Town of Polk
Arnold J. Lepien	Supervisor, Town of Hartford
John W. Lietzau	Trustee, Village of Germantown
Adolph Lofy	Chairman, Town of Richfield; County Supervisor, Washington County; Member, County Board Highway Committee
Charles F. Miller	President, Village of Kewaskum; County Supervisor, Washington County
Thomas J. Muth	Director of Public Works, Village of Germantown
John A. Oelhafen	Chairman, Town of Wayne; County Supervisor, Washington County
Alois Okruhlica	Supervisor, Town of Jackson
John M. Pick	Alderman, City of West Bend
Helmuth F. Prahl	County Supervisor, Washington County; Member, County Board Highway Committee
Albert P. Rettler	County Highway Commissioner, Washington County
Ralph P. Schnorenberg	Alderman, City of Hartford
Hugo Schwulst	Chairman, Town of Erin; County Supervisor, Washington County
Roland S. Senner	Chairman, Town of Trenton
Mervin C. Thompson	Chairman, Town of Kewaskum
Carl Vogt	Town Clerk, Town of Addison
Harley Wachs	Town Clerk, Town of Germantown

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Appendix B

DETAILED DATA—WASHINGTON COUNTY JURISDICTIONAL HIGHWAY SYSTEM PLAN

Table B-1

CONSTRUCTION AND MAINTENANCE COST ESTIMATES FOR WASHINGTON COUNTY JURISDICTIONAL HIGHWAY SYSTEM PLAN BY MUNICIPALITY[a]

Civil Division	Construction Cost Estimates					Maintenance Cost Estimates					
	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											
Hartford	$ 79,600	$ 34,400	$ 860,200	$ 440,400	$ 1,414,600	$ --	$ --	$ 219,780	$ 188,800	$ 1,451,390	$ 1,859,970
Milwaukee	--	1,900	2,200	--	4,100	--	--	4,120	--	--	4,120
West Bend	434,000	601,700	2,064,900	1,287,800	4,388,400	--	--	729,770	1,096,800	4,168,130	5,994,700
Subtotal	$ 513,600	$ 638,000	$ 2,927,300	$ 1,728,200	$ 5,807,100	$ --	$ --	$ 953,670	$1,285,600	$ 5,619,520	$ 7,858,790
VILLAGES											
Germantown	$ 876,000	$ 851,200	$ 5,842,700	$ 975,700	$ 8,545,600	$ --	$ --	$2,052,310	$ 640,480	$ 3,085,440	$ 5,778,230
Jackson	91,200	32,500	--	78,900	202,600	--	--	--	28,800	243,840	272,640
Kewaskum	100,800	67,800	--	142,200	310,800	--	--	--	135,200	455,170	590,370
Newburg	2,400	49,700	--	49,200	101,300	--	--	--	18,880	158,080	176,960
Slinger	59,300	47,300	--	125,700	232,300	--	--	--	88,800	403,260	492,060
Subtotal	$1,129,700	$ 1,048,500	$ 5,842,700	$ 1,371,700	$ 9,392,600	$ --	$ --	$2,052,310	$ 912,160	$ 4,345,790	$ 7,310,260
TOWNS											
Addison	$ --	$ --	$ --	$ 1,013,900	$ 1,013,900	$ --	$ --	$ --	$ --	$ 1,257,100	$ 1,257,100
Barton	32,500	58,000	494,400	475,100	1,060,000	--	--	106,370	--	613,390	719,760
Erin	--	--	--	740,700	740,700	--	--	--	--	918,180	918,180
Farmington	--	--	205,500	803,700	1,009,200	--	--	28,240	--	1,015,040	986,800
Germantown	--	--	--	31,100	31,100	--	--	--	--	40,640	40,640
Hartford	64,100	10,800	1,912,000	697,700	2,684,600	--	--	204,420	--	1,092,470	888,050
Jackson	19,100	--	77,500	644,700	741,300	--	--	23,040	--	824,740	801,700
Kewaskum	--	15,900	--	525,800	541,700	--	--	--	--	657,720	657,720
Polk	29,300	19,800	--	727,500	776,600	--	--	--	--	911,950	911,950
Richfield	--	--	84,600	1,113,800	1,198,400	--	--	11,720	--	1,392,140	1,380,420
Trenton	--	53,600	40,400	688,500	782,500	--	--	25,660	--	888,330	862,670
Wayne	--	--	--	738,600	738,600	--	--	--	--	915,660	915,660
West Bend	32,500	80,300	171,700	419,300	703,800	--	--	91,730	--	612,540	520,810
Subtotal	$ 177,500	$ 238,400	$ 2,986,100	$ 8,620,400	$12,022,400	$ --	$ --	$ 491,180	$ --	$11,246,270	$10,246,270
Washington County	$ --	$23,806,800	$ --	$ --	$23,806,800	$ --	$11,550,380	$ --	$ --	$ --	$11,550,380
Total	$1,820,800	$25,731,700	$11,756,100	$11,720,300	$51,028,900	$ --	$11,550,380	$3,497,160	$2,197,760	$20,720,400	$37,965,700

Civil Division	Total
CITIES	
Hartford	$ 3,274,570
Milwaukee	8,220
West Bend	10,383,100
Subtotal	$13,665,890
VILLAGES	
Germantown	$14,323,830
Jackson	475,240
Kewaskum	901,170
Newburg	278,260
Slinger	724,360
Subtotal	$16,702,860
TOWNS	
Addison	$ 2,271,000
Barton	1,779,760
Erin	1,658,880
Farmington	2,024,240
Germantown	71,740
Hartford	3,777,070
Jackson	1,566,040
Kewaskum	1,199,420
Polk	1,688,550
Richfield	2,590,540
Trenton	1,670,830
Wayne	1,654,260
West Bend	1,316,340
Subtotal	$23,268,670
Washington County	$35,357,180
Total	$88,994,600

[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

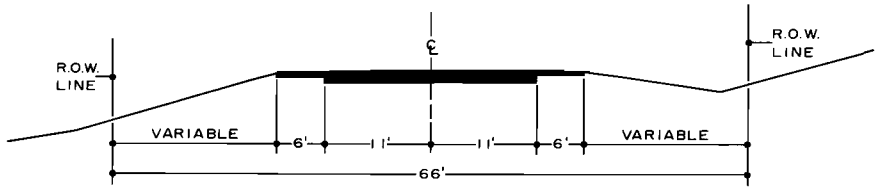
The typical rural and urban street and highway cross sections developed under the Washington County jurisdictional highway system planning program and utilized in the preparation of the Washington County jurisdictional highway system plan are shown in Figure B-1. The cross sections presented include, 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 1973 dollars, and reflect the most recent cost experiences of the Wisconsin Division of Highways in Washington County and in areas of the state similar to Washington County. While these cost estimates thus provide an average project cost for all proposed arterial highway improvements within Washington County, the cost of an individual project during plan implementation should be expected to vary somewhat from the average costs.

Figure B-1

TYPICAL RURAL AND URBAN STREET AND HIGHWAY CROSS SECTIONS

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

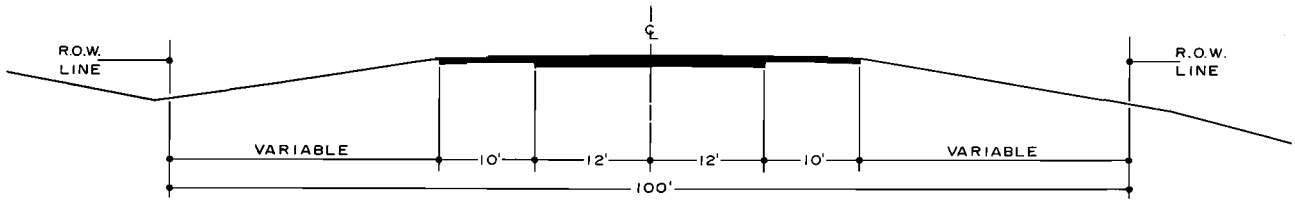


GRAVEL BASE VARIES
22' HIGH TYPE PAVEMENT, 66' R.O.W.
ESTIMATED COST PER MILE:
CONSTRUCTION = $ 169,000
RESURFACE = $ 24,000
MAINTENANCE = $ 1,500 (ANNUAL)

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

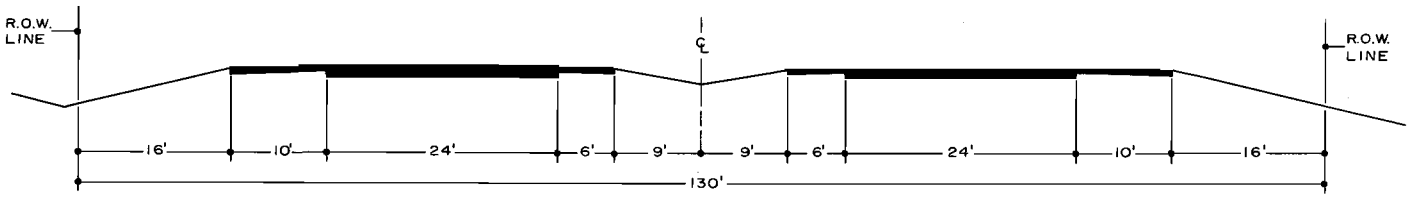


GRAVEL BASE VARIES
24' HIGH TYPE PAVEMENT, 100' R.O.W.
ESTIMATED COST PER MILE:
CONSTRUCTION = $224,000
RESURFACE = $ 26,400
MAINTENANCE = $ 1,700 (ANNUAL)

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

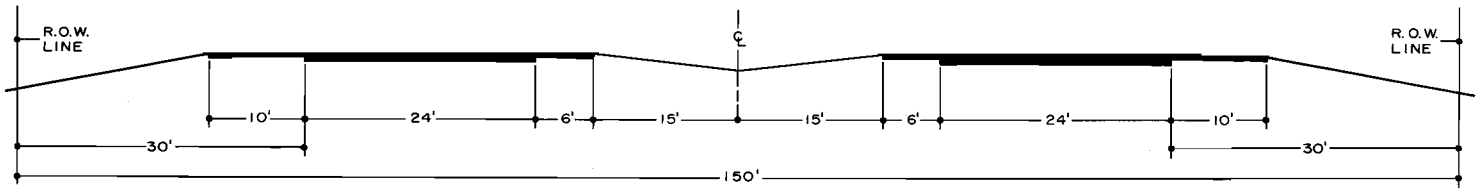


GRAVEL BASE VARIES
DUAL 24' HIGH TYPE PAVEMENT, 130' R.O.W.
ESTIMATED COST PER MILE:
CONSTRUCTION = $623,000
RESURFACE = $ 56,100
MAINTENANCE = $ 3,400 (ANNUAL)

CAPACITY RANGE:

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

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

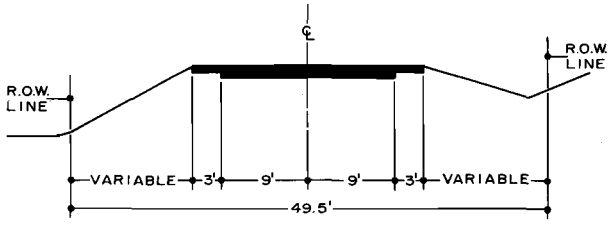


GRAVEL BASE VARIES
DUAL 24' HIGH TYPE PAVEMENT, 150' R.O.W.
ESTIMATED COST PER MILE:
CONSTRUCTION = $629,000
RESURFACE = $ 56,100
MAINTENANCE = $ 3,900 (ANNUAL)

CAPACITY RANGE:

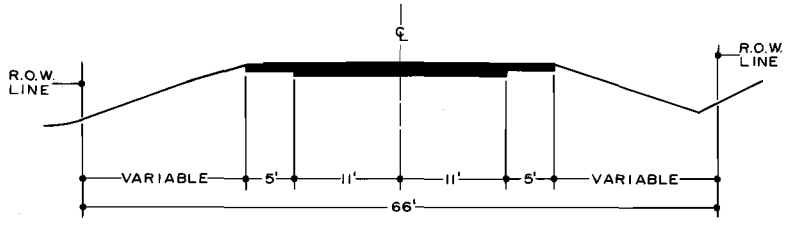
LEVEL OF SERVICE	MAXIMUM SERVICE VOLUME
B	8,700 VEH./DAY
C	13,400 VEH./DAY

RURAL AREA
TYPICAL CROSS SECTION
MINIMUM TWO LANE[a]
COLLECTOR OR MINOR STREET[a]



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

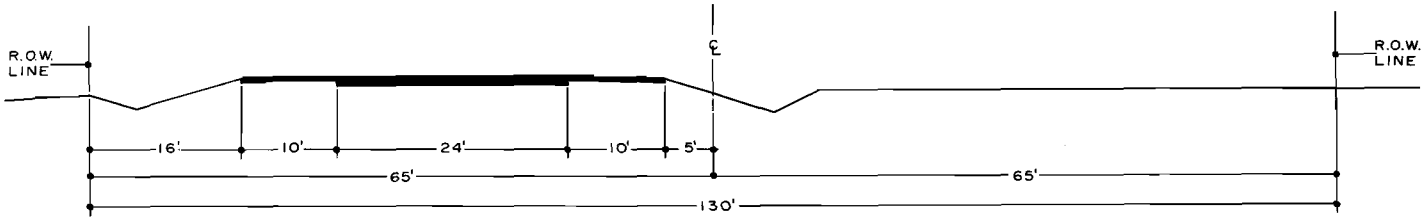
RURAL AREA
TYPICAL CROSS SECTION
DESIRABLE TWO LANE
COLLECTOR OR MINOR STREET



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

ESTIMATED COST PER MILE FOR RURAL, NON-ARTERIAL STREETS:
CONSTRUCTION = $194,000 (AVERAGE)
RESURFACE = $ 13,200 (AVERAGE)
MAINTENANCE = $ 1,000 (ANNUAL AVERAGE)

URBANIZING AREA
TYPICAL CROSS SECTION NO. 5
DESIRABLE TWO LANE ARTERIAL
(INITIAL STAGE OF FUTURE FOUR LANE ARTERIAL)



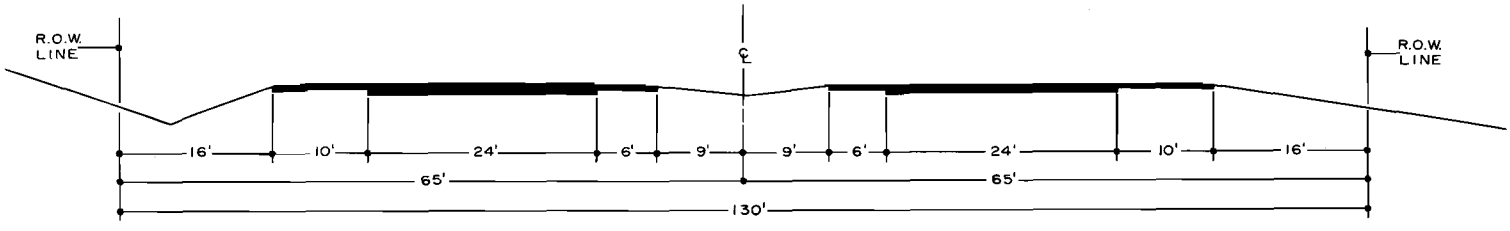
GRAVEL BASE VARIES
24' HIGH TYPE PAVEMENT, 130' R.O.W.

ESTIMATED COST PER MILE:
CONSTRUCTION = $448,000
RESURFACE = $ 28,700
MAINTENANCE = $ 2,300 (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. 6
DESIRABLE FOUR LANE ARTERIAL



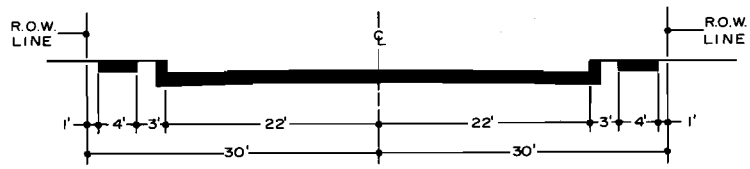
GRAVEL BASE VARIES
DUAL 24' HIGH TYPE PAVEMENT, 130' R.O.W.

ESTIMATED COST PER MILE:
CONSTRUCTION = $ 684,000
RESURFACE = $ 56,100
MAINTENANCE = $ 5,800 (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. 7
MINIMUM TWO LANE ARTERIAL



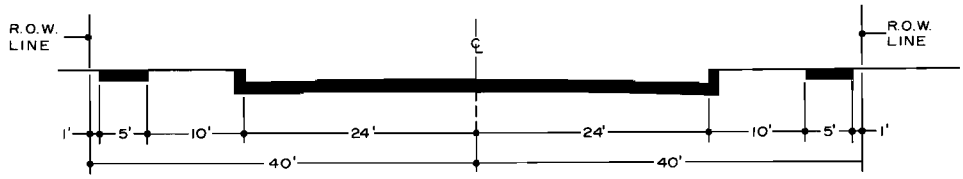
6" GRAVEL BASE
44' HIGH TYPE PAVEMENT, 60' R.O.W.
SIDEWALK, STREET LIGHTING

ESTIMATED COST PER MILE:
CONSTRUCTION = $393,000
RESURFACE = $ 23,800
MAINTENANCE = $ 5,200 (ANNUAL)

CAPACITY RANGE:

LEVEL OF SERVICE	MAXIMUM SERVICE VOLUME
B	8,200 VEH./DAY
C	8,500 VEH./DAY
D	9,100 VEH./DAY

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



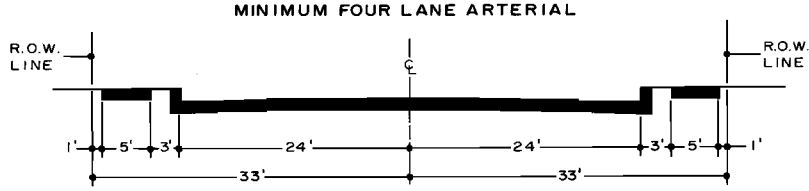
6" GRAVEL BASE
48' HIGH TYPE PAVEMENT, 80' R.O.W.
(ADDITIONAL R.O.W. MAY BE RESERVED IN UNDEVELOPED AREAS)
SIDEWALK, STREET LIGHTING

ESTIMATED COST PER MILE:
CONSTRUCTION = $472,000
RESURFACE = $ 26,300
MAINTENANCE = $ 5,800 (ANNUAL)

CAPACITY RANGE:

LEVEL OF SERVICE	MAXIMUM SERVICE VOLUME
B	9,100 VEH./DAY
C	9,500 VEH./DAY
D	10,300 VEH./DAY

URBAN AREA
TYPICAL CROSS SECTION NO. 9
MINIMUM FOUR LANE ARTERIAL



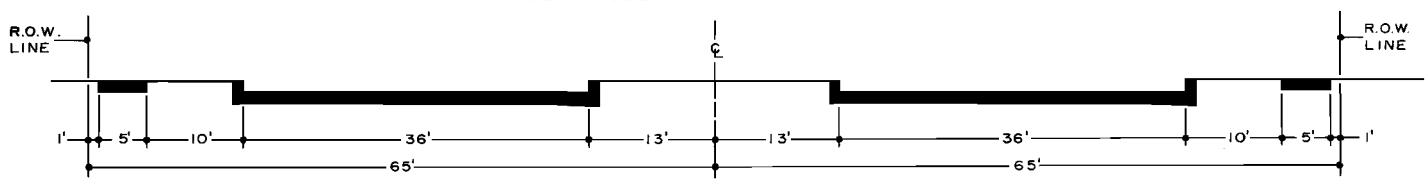
6" GRAVEL BASE
48' HIGH TYPE PAVEMENT, 66' R.O.W.
SIDEWALK, STREET LIGHTING

ESTIMATED COST PER MILE:
CONSTRUCTION = $411,000
RESURFACE = $ 26,300
MAINTENANCE = $ 5,800 (ANNUAL)

CAPACITY RANGE:

LEVEL OF SERVICE	MAXIMUM SERVICE VOLUME
B	11,800 VEH./DAY
C	12,800 VEH./DAY
D	14,600 VEH./DAY

URBAN AREA
TYPICAL CROSS SECTION NO. 10
DESIRABLE FOUR LANE ARTERIAL



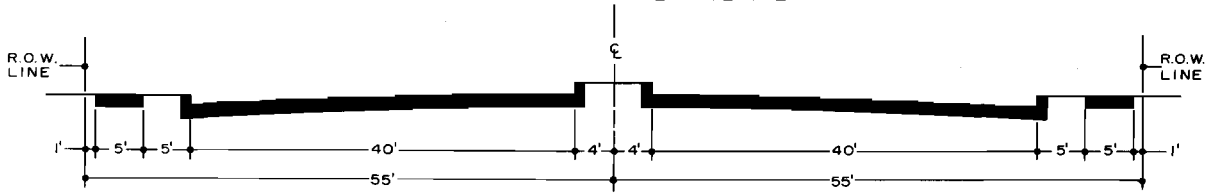
6" GRAVEL BASE
DUAL 36' HIGH TYPE PAVEMENT, 130' R.O.W.
SIDEWALK, STREET LIGHTING

ESTIMATED COST PER MILE:
CONSTRUCTION = $937,800
RESURFACE = $ 38,500
MAINTENANCE = $ 7,900 (ANNUAL)

CAPACITY RANGE:

LEVEL OF SERVICE	MAXIMUM SERVICE VOLUME
B	14,000 VEH./DAY
C	12,800 VEH./DAY
D	17,900 VEH./DAY

URBAN AREA
TYPICAL CROSS SECTION NO. 11
MINIMUM SIX LANE ARTERIAL



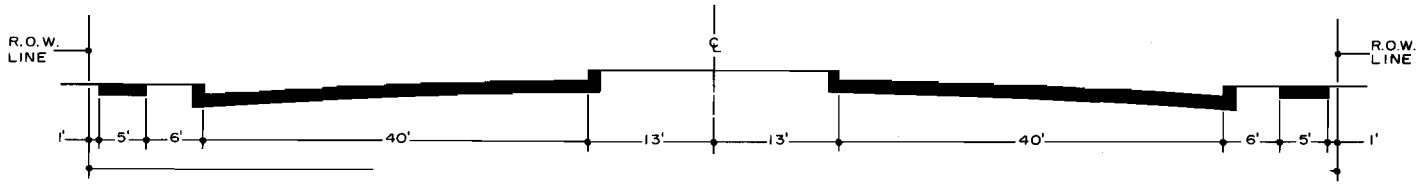
6" GRAVEL BASE
DUAL 40' HIGH TYPE PAVEMENT, 110' R.O.W.
SIDEWALK, STREET LIGHTING

ESTIMATED COST PER MILE:
CONSTRUCTION =$ 956,000
RESURFACE =$ 42,400
MAINTENANCE =$ 10,400 (ANNUAL)

CAPACITY RANGE:

LEVEL OF SERVICE	MAXIMUM SERVICE VOLUME
B	21,200 VEH./DAY
C	22,700 VEH./DAY
D	26,600 VEH./DAY

URBAN AREA
TYPICAL CROSS SECTION NO. 12
DESIRABLE SIX LANE ARTERIAL



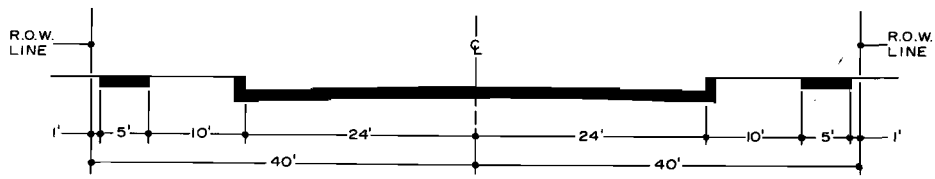
6" GRAVEL BASE
DUAL 40' HIGH TYPE PAVEMENT, 130' R.O.W.
SIDEWALK, STREET LIGHTING

ESTIMATED COST PER MILE:
CONSTRUCTION = $980,000
RESURFACE = $ 42,400
MAINTENANCE = $ 10,400 (ANNUAL)

CAPACITY RANGE:

LEVEL OF SERVICE	MAXIMUM SERVICE VOLUME
B	21,200 VEH./DAY
C	22,700 VEH./DAY
D	26,600 VEH./DAY

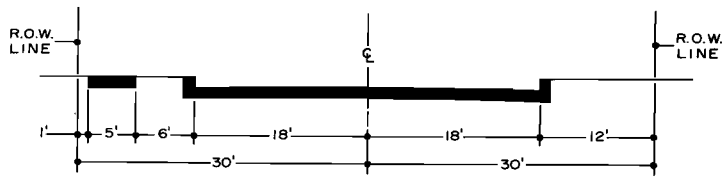
URBAN AREA
TYPICAL CROSS SECTION
COLLECTOR STREET



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

ESTIMATED COST PER MILE:
CONSTRUCTION = $272,300
RESURFACE = $ 26,300
MAINTENANCE = $ 4,700 (ANNUAL)

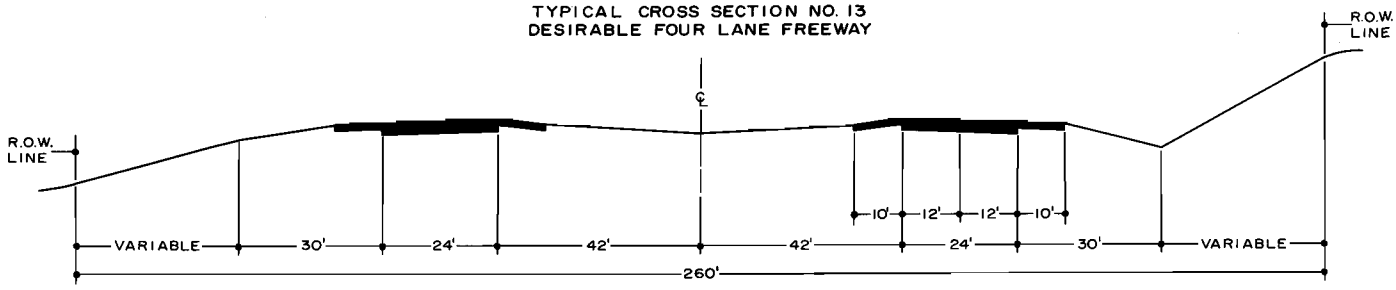
URBAN AREA
TYPICAL CROSS SECTION
MINOR STREET



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

ESTIMATED COST PER MILE:
CONSTRUCTION = $211,800
RESURFACE = $ 19,700
MAINTENANCE = $ 3,100 (ANNUAL)

RURAL AREA
TYPICAL CROSS SECTION NO. 13
DESIRABLE FOUR LANE FREEWAY



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

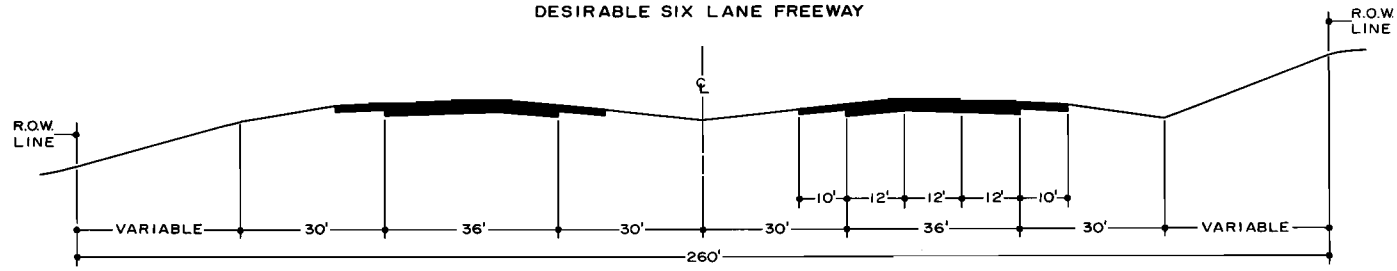
ESTIMATED COST PER MILE:

CONSTRUCTION	=	$ 944,000
RESURFACE	=	$ 60,600
MAINTENANCE	=	$ 4,700 (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. 14
DESIRABLE SIX LANE FREEWAY



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

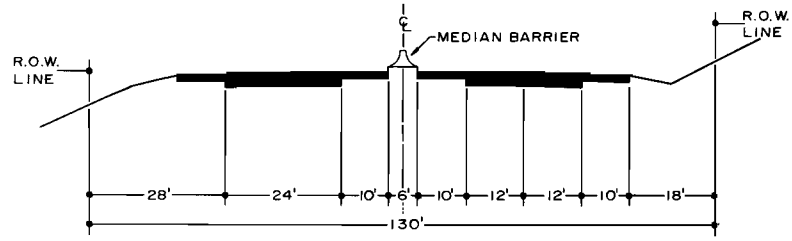
ESTIMATED COST PER MILE:

CONSTRUCTION	=	$1,131,000
RESURFACE	=	$ 77,100
MAINTENANCE	=	$ 6,100 (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. 15
MINIMUM FOUR LANE FREEWAY



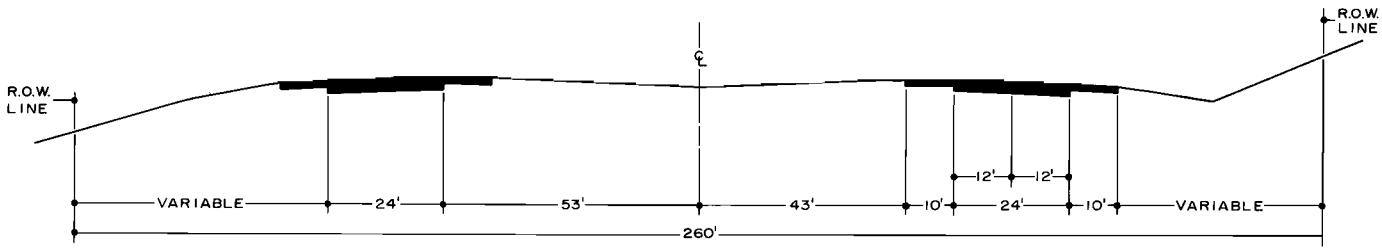
DUAL 24' HIGH TYPE PAVEMENT, 130' R.O.W.

ESTIMATED COST PER MILE:
- CONSTRUCTION = $1,065,000
- RESURFACE = $ 60,600
- MAINTENANCE = $ 7,600 (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. 16
DESIRABLE FOUR LANE FREEWAY



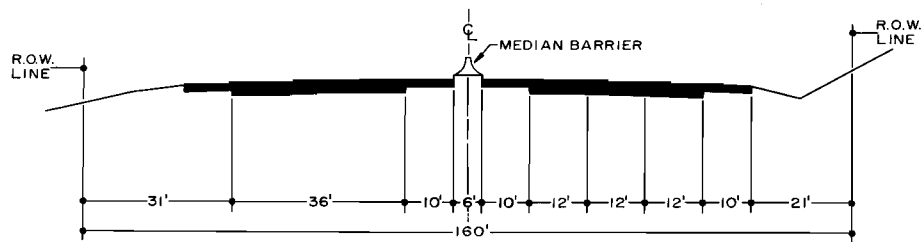
DUAL 24' HIGH TYPE PAVEMENT, 260' R.O.W.

ESTIMATED COST PER MILE:
- CONSTRUCTION = $1,277,000
- RESURFACE = $ 60,600
- MAINTENANCE = $ 13,800 (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. 17
MINIMUM SIX LANE FREEWAY



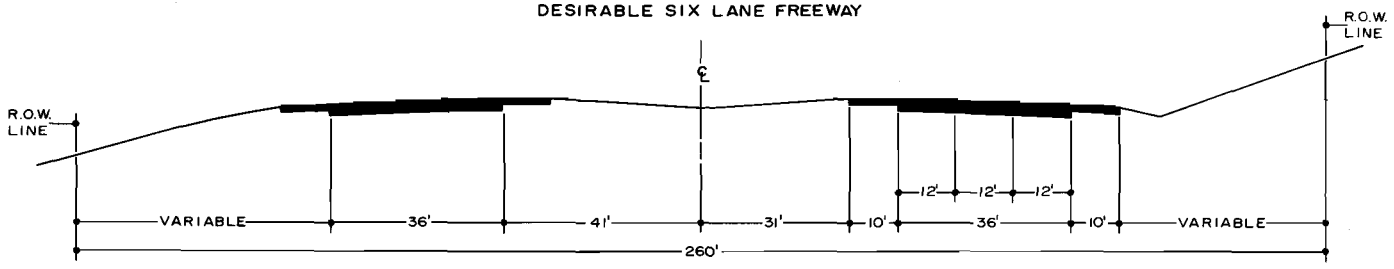
DUAL 36' HIGH TYPE PAVEMENT, 160' R.O.W.

ESTIMATED COST PER MILE:
- CONSTRUCTION = $1,289,000
- RESURFACE = $ 77,100
- MAINTENANCE = $ 8,800 (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. 18
DESIRABLE SIX LANE FREEWAY



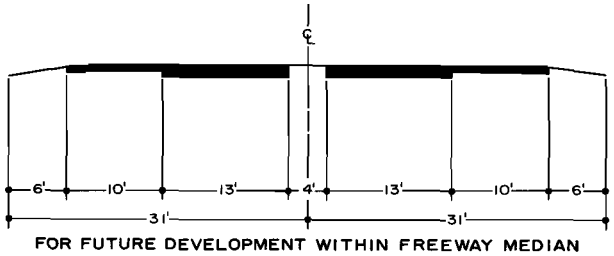
DUAL 36' HIGH TYPE PAVEMENT, 260' R.O.W.

ESTIMATED COST PER MILE:
CONSTRUCTION = $1,488,000
RESURFACE = $ 77,100
MAINTENANCE = $ 16,100 (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 TRANSITWAY CROSS SECTION



FOR FUTURE DEVELOPMENT WITHIN FREEWAY MEDIAN

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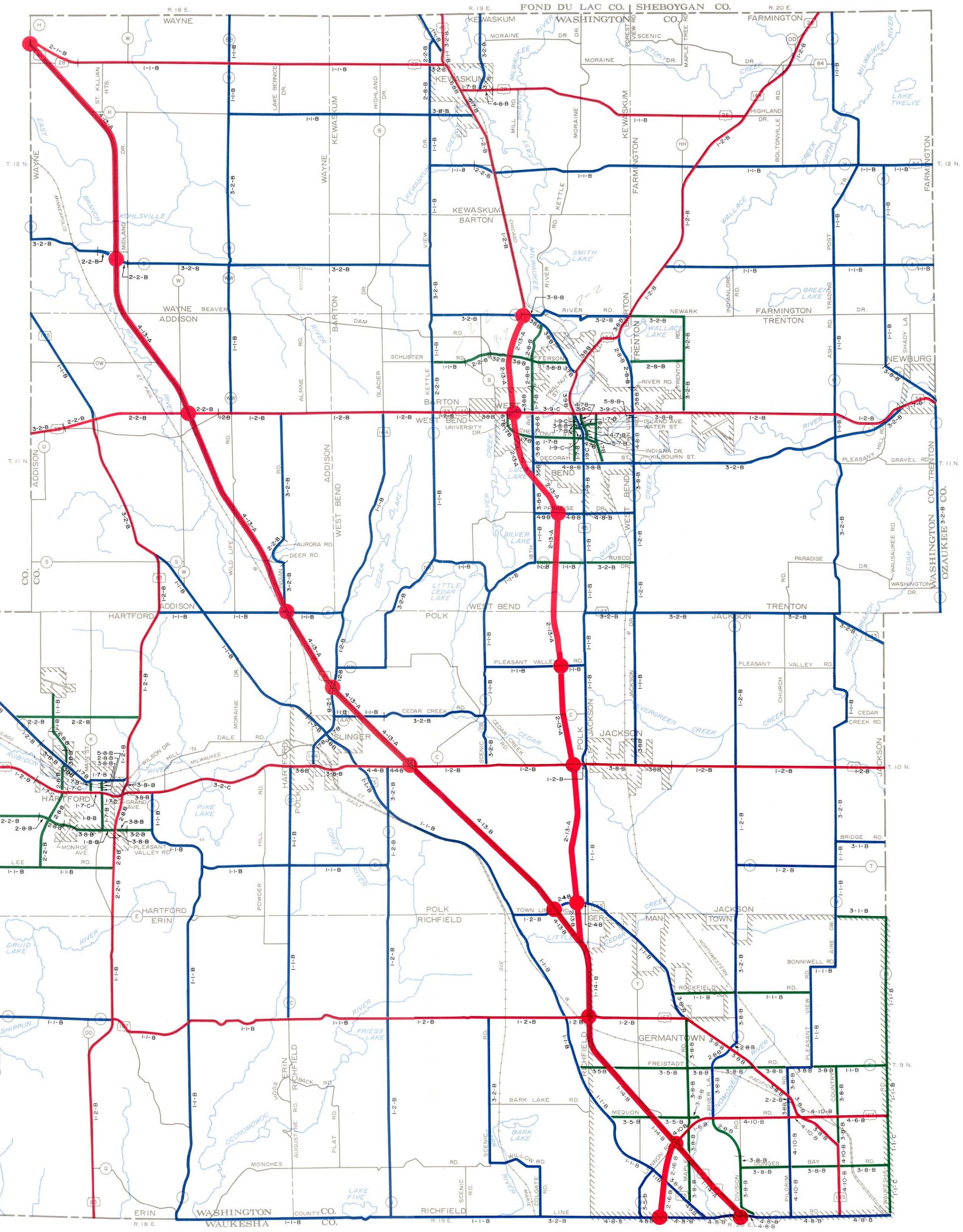
MAP B-1

RECOMMENDED JURISDICTIONAL HIGHWAY SYSTEM PLAN FOR WASHINGTON 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)
- FREEWAY–STANDARD ARTERIAL INTERCHANGE

DESIGN CLASSIFICATION

4-13-B
- 4 — TYPE OF IMPROVEMENT
- 13 — TYPICAL CROSS SECTION
- B — LEVEL OF SERVICE

SEE ACCOMPANYING KEY TO NUMBER AND LETTER CODES

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)	
3 Reconstruction With Same Capacity	3 Four-Lane Arterial (Minimum-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.
4 Reconstruction for Additional Capacity	4 Four-Lane Arterial (Desirable-Rural Area)	
5 Special Project	5 Two-Lane Arterial (Desirable-Urbanizing 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.
6 No Work Required	6 Four-Lane Arterial (Desirable-Urbanizing Area)	
	7 Two-Lane Arterial (Minimum-Urban Area)	D Level of Service D approaches unstable flow, with tolerable operating speeds being maintained though 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.
	8 Two-Lane Arterial (Desirable-Urban Area)	
	9 Four-Lane Arterial (Minimum-Urban Area)	
	10 Four-Lane Arterial (Desirable-Urban 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.
	11 Six-Lane Arterial (Minimum-Urban Area)	
	12 Six-Lane Arterial (Desirable-Urban Area)	
	13 Four-Lane Freeway (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.
	14 Six-Lane Freeway (Desirable-Rural Area)	
	15 Four-Lane Freeway (Minimum-Urban Area)	
	16 Four-Lane Freeway (Desirable-Urban Area)	
	17 Six-Lane Freeway (Minimum-Urban Area)	
	18 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.

GRAPHIC SCALE

0 1/2 1 2 MILES

0 4000 8000 12000 FEET

Source: SEWRPC.

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Appendix C

SUGGESTED MODEL RESOLUTION FOR ADOPTION OF THE WASHINGTON 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 Washington County Highway Commissioner, acting pursuant to a directive of the Washington County Board of Supervisors, dated June 9, 1970, requested on June 9, 1970, the guidance, cooperation, and assistance of the Commission in the preparation of a jurisdictional highway system plan for Washington County; and

WHEREAS, a Technical and Intergovernmental Coordinating and Advisory Committee on Jurisdictional Highway Planning for Washington 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, Washington County, municipalities within Washington County, and the Southeastern Wisconsin Regional Planning Commission, as well as citizen representatives; and

WHEREAS, under the guidance of the Technical and Intergovernmental Coordinating and Advisory Committee on Jurisdictional Highway Planning for Washington County and of a competent interagency staff, all research studies undertaken for the accomplishment of a jurisdictional highway system plan for Washington County have been concluded, including: 1) the preparation and printing of a map setting forth the proposed jurisdictional highway system in Washington County, as projected to the calendar year 1990; and 2) the preparation and publication of SEWRPC Planning Report No. 23, entitled A Jurisdictional Highway System Plan for Washington County, published in October of 1974, 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 Washington 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 Washington 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 Washington 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 Washington County, together with the aforementioned SEWRPC Planning Report No. 23, to the local units of government; 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 Washington 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 Washington 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 Washington County jurisdictional highway system plan previously adopted by the Commission as set forth in SEWRPC Planning Report No. 23, 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)