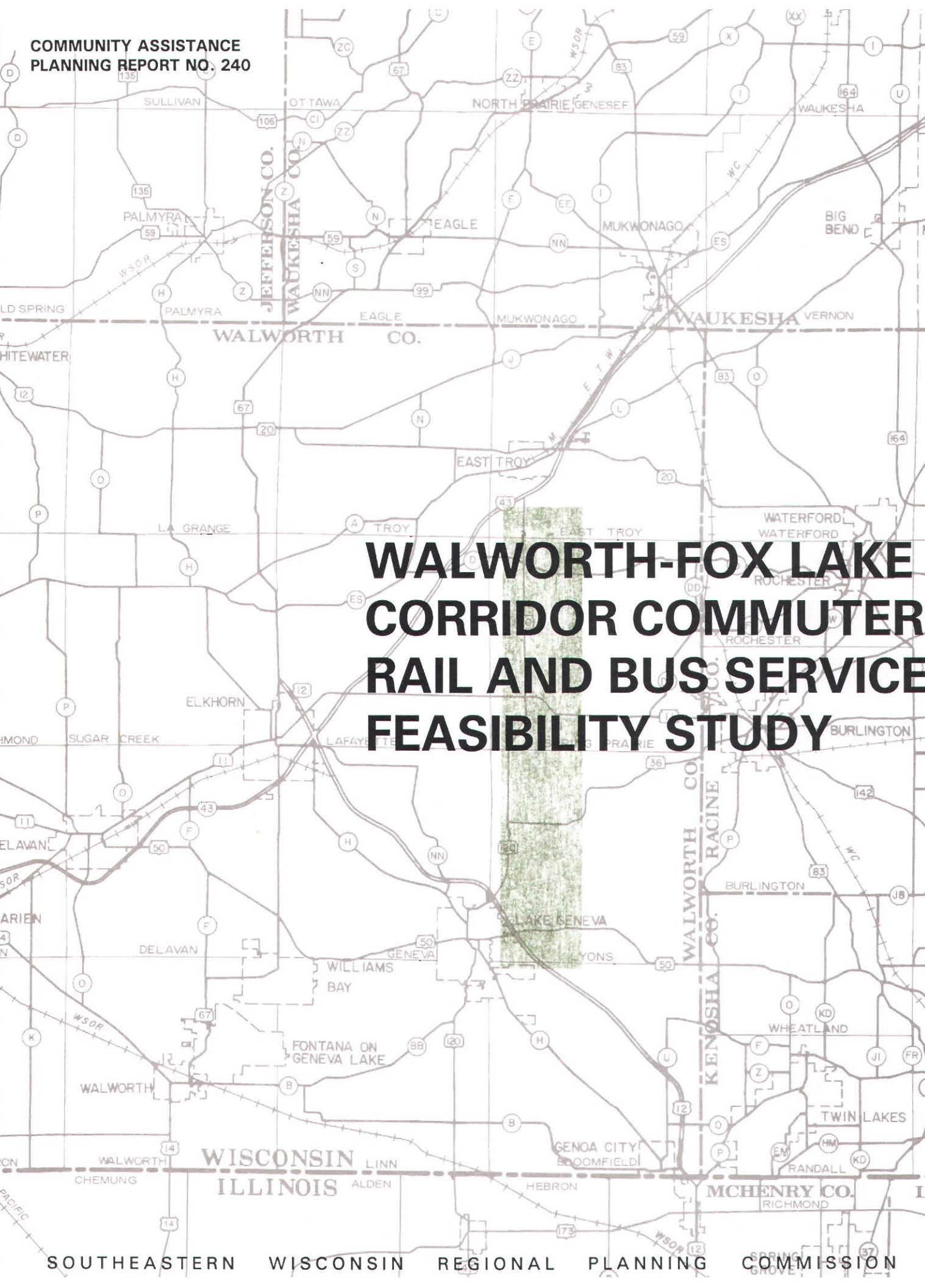
COMMUNITY ASSISTANCE
PLANNING REPORT NO. 240



WALWORTH-FOX LAKE CORRIDOR COMMUTER RAIL AND BUS SERVICE FEASIBILITY STUDY

SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION

Special acknowledgment is due Mr. Otto P. Dobnick, SEWRPC Principal Planner, for his contribution to the conduct of this study and the preparation of this report. Special appreciation is also extended to Mr Lyle G. Gomm, Section Manager in the Metra Office of Planning & Analysis, and Mr. Douglas M. Jakalski, Senior Civil Engineer in the firm of T.Y. Lin International Bascor, for their assistance in the conduct of this study.

Special acknowledgment is due the following individuals who served as members or alternates during the preparation of this plan: Mr. Brian Bliesner, Project Engineer, Systems Planning Group, Wisconsin Department of Transportation; Mr. Kenneth Clemmons, Manager of Sales, Wisconsin & Southern Railroad Company; Mr. Benjamin J. Coopman, Jr., Commissioner, Highway Department, Walworth County; Mr. Dale A. Curley, Superintendent of Passenger Operations, Wisconsin & Southern Railroad Company; Mr. Douglas F. Dalton, Chief, Urban Planning, Wisconsin Department of Transportation; Mr. Joel P. Ettinger, Area Director, Region V, Federal Transit Administration, U.S. Department of Transportation; Mr. Thomas L. Frank, Systems Planning and Programs Engineer, Federal Highway Administration, U.S. Department of Trans-portation; Mr. John M. Glass, Trustee, Village of Walworth; Mr. Lyle G. Gomm, Section Manager, Office of Planning and Analysis, Metra; Mr. Vernon J. Haan, Member, Historic Preservation Committee, City of Lake Geneva; Mr. Chris L. Jones, Supervisor, Town of Linn; Mr. Gerald C. Kerns, Chief of Police, Town of Linn; Ms. Marianne P. Klemke, President, Village of Williams Bay; Ms. Irene M. LaBonne, President, Village of Fontana; Mr. H. M. McConville, Superintendent of Transportation, Wisconsin & Southern Railroad Company; Mr. Wayne R. Miczek, Chief Transportation Planner, Chicago Area Transportation Study; Ms. June M. Notbusch, Public Works Assistant, City of Delavan; Mr. James M. Parker, President, Village of Genoa City; Mr. Floyd F. Pierce, Supervisor, Town of Walworth; Mr. Lyle A. Smith, Director of Public Works, City of Delavan; and Mr. David M. Trowbridge, Transportation Planner, Bureau of Planning, Wisconsin Department of Transportation.

COMMUNITY ASSISTANCE PLANNING REPORT
NUMBER 240

WALWORTH-FOX LAKE CORRIDOR COMMUTER RAIL AND BUS SERVICE FEASIBILITY STUDY

Southeastern Wisconsin Regional Planning Commission
P.O. Box 1607
Old Courthouse
916 N. East Avenue
Waukesha, Wisconsin 53187-1607

August 2001

Inside Region $10.00
Outside Region $20.00

(This page intentionally left blank)

TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF TABLES

LIST OF MAPS

Map Page

Chapter II

Chapter III

Chapter IV

Chapter I

INTRODUCTION

This report documents the findings and recommendations of a study of the feasibility of instituting commuter rail or commuter bus service in the Walworth-Fox Lake Corridor. The corridor extends from the Village of Walworth in the southern portion of Walworth County in the Southeastern Wisconsin Region to the Village of Fox Lake in the northwestern portion of Lake County in Northeastern Illinois. The service would be provided as an extension to the existing commuter rail service between Fox Lake and the City of Chicago central business district which is operated by Metra—the Commuter Rail Division of the Regional Transportation Authority of Northeastern Illinois—as its Milwaukee District North Line. Extension of the commuter service was envisioned as either operation of commuter rail trains beyond Fox Lake to Walworth, or operation of buses in feeder service between Walworth and Fox Lake.

Such a feasibility study would help implement the year 2020 regional transportation system plan for Southeastern Wisconsin adopted by the Regional Planning Commission on December 3, 1997. The plan recommends significant improvement and expansion of public transit service within the Region, including the development of rapid and express transit service and the improvement and expansion of existing local transit services. The rapid transit component of the regional public transit system is envisioned as connecting the urban centers of the Region not only to each other and to the Milwaukee central business district, but also to Northeastern Illinois and the City of Chicago. Buses operating over freeways in mixed traffic, buses operating over special busways, and commuter rail trains are identified in the adopted plan as potential modes for providing the recommended rapid transit service.

As shown on Maps 1 and 2, one of the several corridors identified in the adopted regional transportation system plan for development of rapid transit service extends from the Village of Walworth southeast through the unincorporated community of Zenda in the Town of Linn — located south of the City of Lake Geneva — to the Village of Fox Lake in northeastern Illinois. In April 1993, the Walworth County Board of Supervisors expressed interest in the conduct of a feasibility study of the potential extension of Chicago-oriented commuter rail service from Fox Lake, Illinois, to the Village of Walworth. This interest was expressed through the County submittal of an application to the U. S. Department of Transportation, Federal Highway Administration, for Congestion Mitigation and Air Quality Improvement Program funding in support of the study. The grant application was not approved, the Federal Highway Administration having determined such a study to be ineligible for the use of such funding. However, at an intergovernmental meeting held at the request of Walworth County and the Geneva Lake Area Joint Transit Commission on November 17, 1995, representatives of Walworth County, the Village of Walworth, the Town of Linn, the Geneva Lake Area Joint Transit Commission, and the Wisconsin Department of Transportation jointly requested the Regional Planning Commission to conduct a feasibility study of the extension of commuter rail service in the Walworth-Fox Lake Corridor, approved a scope of work for the desired feasibility study, and agreed to fund the study.

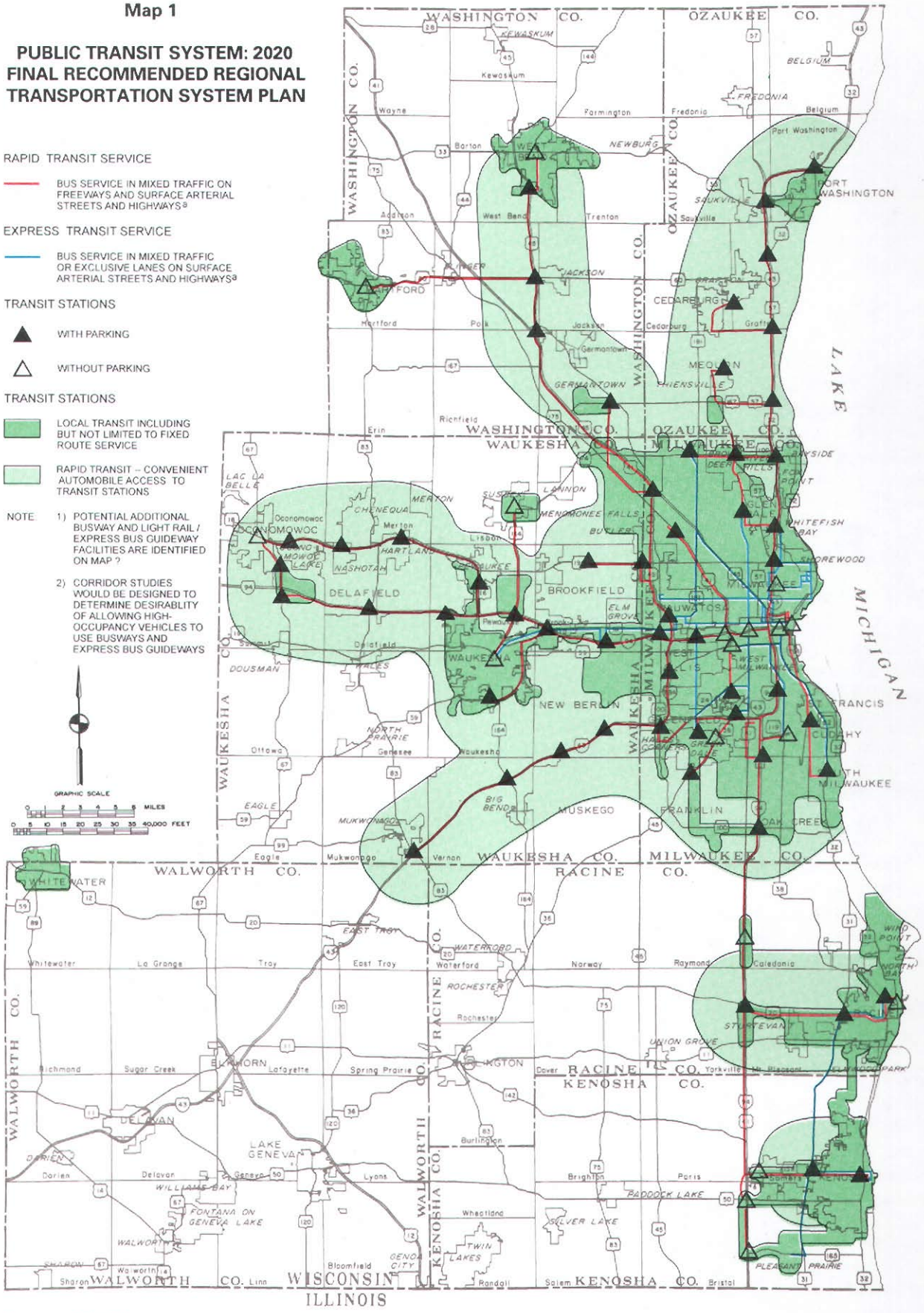
STUDY PURPOSE

The requested study is intended to constitute a feasibility study conducted prior to the initiation of a Federally-prescribed major investment study and preparation of an attendant environmental impact statement. As such, the feasibility study is intended to provide the information needed by the public officials concerned to make a decision as to whether or not to proceed with such a costly major investment study. Under Federal regulations, a major investment study is a prerequisite for any consideration of Federal funding in support of the implementation of a major transit service improvement project such as the extension of commuter rail service. A major investment study is likely to be necessary for the implementation of a commuter rail extension using Federal funding from Fox Lake to Walworth. A major investment study would not be necessary for the implementation of feeder bus service in the same corridor. A major investment study must provide a detailed evaluation of bus and fixed guideway transit alternatives in a travel corridor before final decisions on implementation and specific mode and alignment are made. The necessary environmental impact assessment may be conducted as part of, or subsequent to, the major investment study.

Accordingly, the feasibility study is to provide an estimate of the total capital and operating costs of commuter rail and feeder bus service alternatives in the corridor, together with an estimate of the potential commuter service ridership. In addition to providing a sound basis for a

Map 1

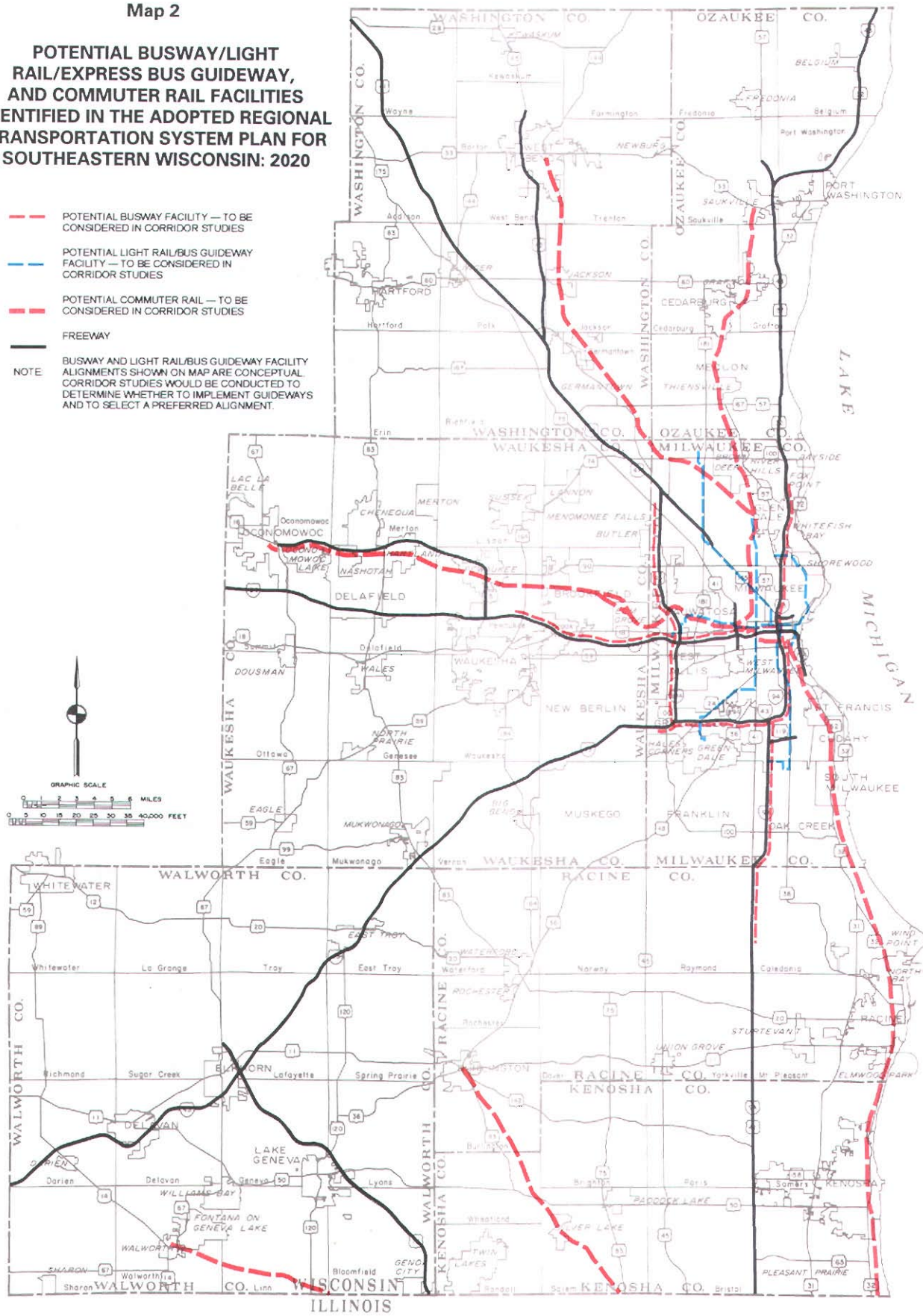
PUBLIC TRANSIT SYSTEM: 2020 FINAL RECOMMENDED REGIONAL TRANSPORTATION SYSTEM PLAN



Source: SEWRPC.

Map 2

POTENTIAL BUSWAY/LIGHT RAIL/EXPRESS BUS GUIDEWAY, AND COMMUTER RAIL FACILITIES IDENTIFIED IN THE ADOPTED REGIONAL TRANSPORTATION SYSTEM PLAN FOR SOUTHEASTERN WISCONSIN: 2020



Under the adopted regional transportation system plan, rapid transit busway facilities, and rapid transit commuter rail facilities could be considered as alternatives to motor-bus transit service in mixed traffic over arterial street and highway lanes. Consideration of such fixed-guideway transit service facilities would be initiated as part of federally required detailed planning transit alternatives analysis studies for each of the identified corridors. The addition of these potential fixed guideway transit facilities to the regional plan, and the ultimate implementation of these fixed-guideway transit facilities, depends upon the outcome of the corridor studies. Upon completion of a corridor study, the local units of government concerned—specifically, the transit operator concerned—the Wisconsin Department of Transportation and the Regional Planning Commission would have to affirm the study findings, determine to pursue guideway implementation, and, as necessary, amend the regional transportation system plan.

Source: SEWRPC.

decision as to whether or not to proceed with a major investment study, the feasibility study may also be expected to assist in the ultimate conduct of a major investment study should it be decided to proceed with such a study, as well as the preparation of an environmental impact statement, by identifying key issues and options which need to be considered in a more detailed design and evaluation of transit service alternatives in the corridor.

More specifically, the feasibility study of commuter rail and commuter bus service in the Walworth-Fox Lake Corridor is intended to serve the following purposes:

1. To identify the physical and operational characteristics of commuter rail and bus feeder service alternatives in the corridor;

2. To identify the capital costs of the commuter rail and bus feeder service alternatives;

3. To identify the anticipated operating costs of, and necessary operating cost subsidies for, the commuter rail and bus feeder service alternatives;

4. To identify impacts of the commuter rail service alternatives on freight train operations over the railway line concerned;

5. To identify the potential ridership of the commuter rail and bus feeder service alternatives; the attendant farebox revenues; and the impact on highway traffic in the corridor;

6. To provide the basis for a determination by the public officials concerned as to whether or not to proceed with a major investment study in the corridor.

DEFINITION OF COMMUTER RAIL SERVICE

Commuter rail service is a type of urban public transit that has been the subject of increasing interest within the United States in recent years chiefly because it offers the potential for providing attractive, high quality, rapid transit service at reasonable costs—as compared to heavy and light rail rapid transit service—using existing railway trackage. This type of urban passenger transportation is normally referred to simply as "commuter rail." In other countries this mode is often referred to as "regional rail" to emphasize the length of the lines involved and to emphasize the high level of service provided throughout the entire day as opposed to the only peak travel period, peak-direction service typically provided by existing commuter rail systems in the United States.

In spite of the current widespread interest in commuter rail—especially in areas of the United States where commuter rail service does not now exist—there is frequently confusion as to what commuter rail is, what passenger markets it is intended to serve, and the important characteristics that distinguish commuter rail from other railway passenger transit modes such as light rail, heavy rail, and high speed rail. Each of these railway transit modes has different technological, design, operational, performance, capacity, cost and economic characteristics. While different types of bus service are commonplace and familiar to most people throughout the United States, it is important and useful to define the term "commuter rail" and to describe how commuter rail service differs from other types of railway passenger transportation services. A comparison of some of the basic characteristics attendant to each of these types of railway passenger services is provided in Table 1.

Commuter Rail

Commuter rail may be defined as a type of passenger train transit service that utilizes diesel-electric or electrically propelled trains, operating over the same rights-of-way and trackage used by intercity railway freight and passenger train traffic. Common practice in the United States and Canada is to use trains of coaches drawn by diesel-electric locomotives, as opposed to electrified multiple-unit equipment. Some commuter rail service is provided by self-propelled diesel-powered coaches. Fare collection is typically on board the train by cash or ticket, and boarding is normally from low platforms.

Commuter rail normally accommodates only the longest distance trips made within metropolitan regions during weekday peak travel periods at high overall average operating speeds of typically between 30 and 50 miles per hour with relatively few station stops. Typical commuter rail routes range from 20 to 50 miles in length. Because the railway track is shared with intercity freight and passenger trains, commuter rail does not normally require the acquisition of new right-of-way nor the construction of new mainline trackage. However, for safety and operational reasons, locomotives and cars must be manufactured to mainline railway standards with respect to size and strength. These characteristics, together with the relatively long station spacings of two to five miles, characterize commuter rail as having the ability to provide a very high level of riding comfort for passengers.

Commuter rail is the oldest of all railway passenger transit modes, but presently exists only in corridors with substantial concentrations of passenger-trip origins in the outlying suburban areas of the corridors with destinations in the central business district of the corridor. The closest operating commuter rail system to Southeastern Wisconsin is the system centered on the central business district of

Table 1

COMPARISON OF SELECTED CHARACTERISTICS AMONG DIFFERENT TYPES OF RAIL PASSENGER SERVICES BASED UPON TYPICAL NORTH AMERICAN PRACTICE

Characteristics	Light Rail	Heavy Rail	Commuter Rail	Conventional Intercity Rail	High Speed Rail
Vehicles (usual type)	Modern articulated streetcars	Modern subway or elevated cars	Locomotive-hauled or self-propelled coaches	Locomotive-hauled coaches	Locomotive-hauled coaches
Train Length	1 to 3 cars	4 to 10 cars	2 to 8 coaches	2 to 14 coaches	8 to 12 coaches
Propulsion system	Electric using overhead wire	Electric using third rail	Diesel-electric[a]	Diesel-electric	Electric using overhead wire
Right-of-Way Requirements	New surface alignment	New grade separated alignment	Existing mainline railway trackage	Existing mainline railway trackage	Upgraded existing or new railway mainline trackage
Route Length (typical in miles)	5 to 15	5 to 15	20 to 50	50 to 2,000	100 to 500
Station Spacing (average in miles)	1/4 to 1	1/2 to 2	2 to 5	5 to 50	10 to 50
Boarding Level of Platforms at Stations	Low or high	High	Low	Low	High
Fare Collection (typical)	Self-service	At stations	On board	On-board	At stations or on-board
Speed					
Maximum Operating (mph)	50	70	79	79 to 90	125 to 250
Average Along Route (mph)	10 to 20[b] 20 to 30[c]	25 to 40	30 to 50	40 to 70	100 to 150
Primary Passenger Market (typical)	Trips within densely developed urbanized areas	Trips within densely developed urbanized areas	Trips within metropolitan areas between suburbs, and major urban centers including central business district	Long-distance trips between cities	Long-distance trips between major metropolitan areas
Frequency of Service					
Peak Period	5 to 10 minutes	5 to 10 minutes	30 to 60 minutes	1 to 2 hours	30 to 60 minutes
Nonpeak Period	10 to 20 minutes	10 to 20 minutes	1 to 3 hours	Daily	1 to 2 hours

[a] *Self-propelled coaches may be either diesel-electric, diesel-hydraulic, or diesel-mechanical.*

[b] *Extensive use of street rights-of-way.*

[c] *Extensive use of exclusive grade-separated rights-of-way.*

Source: SEWRPC.

the City of Chicago and operated by Metra. As already noted, Metra is the Commuter Rail Division of the Regional Transportation Authority of Northeastern Illinois. Metra operates one of the largest commuter rail systems in North America, and the Metra system is generally regarded as among the best managed and most cost-effective. Metra, as well as some other existing commuter rail systems in the United States and Canada, has made efforts to attract off-peak as well as peak travel period ridership and the services are marketed to attract passengers using the private automobile to the railway service. Extensive park-ride facilities are usually associated with commuter rail services. Some of the existing systems—again, including Metra—have begun to give consideration to finding ways of serving noncentral business district oriented trips in metropolitan areas. Typical commuter rail frequency of service on individual routes may be every 30 minutes in the peak travel direction during weekday peak travel periods with midday, evening, and weekend service varying from one to three hours where such nonpeak service is operated at all.

Commuter rail systems are found only in a relatively few of the largest metropolitan areas within the United States and Canada. Large-scale commuter rail operations, which include frequent peak period service and a base service

during nonpeak periods and weekends are found in the Boston, Chicago, Montreal, New York, Philadelphia, San Francisco, and Toronto areas. Other commuter rail operations with service provided principally during weekday peak periods operate in the Baltimore and Washington D.C. areas. New commuter rail operations which include peak period service and some limited nonpeak weekday service have commenced operations within the last ten years in the Dallas, Los Angeles, Miami, New Haven, San Diego, San Jose, and Seattle areas. Specialized commuter rail services that function more as local area shuttles have commenced operations in the southern New Jersey and Syracuse areas. A small number of long established commuter rail operations have ceased operation in recent years, including those in the Detroit and Pittsburgh areas. The potential for commuter rail services continues to be considered in a number of other metropolitan areas. New services being considered for initiation within the near future include those serving the Burlington (Vermont), Oakland, and Portland (Maine) areas. Additional services are undergoing either planning or preliminary engineering in the Atlanta, Cleveland, Hartford (Connecticut), New Orleans, St. Louis, and Tampa areas.

Light Rail

The commuter rail mode should not be confused with the light rail mode. Light rail may be defined as a type of urban passenger transportation service that utilizes electrically propelled cars, or trains of cars, operating primarily on the surface over either exclusive rights-of-way or over public streets. Light rail is essentially an improved and modernized version of the old streetcar and electric interurban railway modes that were common in the United States from the 1890s through the World War II years. Light rail can best be envisioned as trains of one to three articulated rail vehicles operating largely on the surface and receiving electric power from overhead trolley wires. Fare collection is typically self-service whereby tickets are purchased from vending machines. Boarding may be from either high or low level platforms.

The trackage used for light rail operations is not normally shared with freight and other railway passenger trains. Light rail systems are intended to accommodate all types and lengths of passenger trips within the most densely developed portions of metropolitan areas during weekday peak travel periods as well as during midday and evening off-peak travel periods, and on weekends. Typically, light rail routes range from five to 15 miles in length. Normal station spacing for such systems ranges from one-quarter mile to one mile thus providing good access while maintaining reasonable overall operating speeds. Typical average overall speeds for express transit light rail routes operating primarily over public streets may range from 10 to 20 miles per hour. Such speeds for rapid light rail routes operating extensively over exclusive grade separated rights-of-way may range from 20 to 30 miles per hour. Frequency of service on light rail systems typically ranges from five to ten minute headways during peak travel periods, and from 10- to 20-minute headways during other times of the day. Extensive park-ride facilities may be provided at outlying stations, but substantial ridership accesses light rail facilities by walking to stations or using feeder bus service. Unlike commuter rail, which utilizes existing railway trackage, the development of a new light rail system typically requires the acquisition or dedication of new rights-of-way and the construction of new trackage. Thus, the capital cost of implementing a light rail route will normally be significantly greater than the capital cost of a commuter rail route.

Within the United States and Canada, examples of light rail systems include the San Diego Trolley, MetroLink in St. Louis, C-Train in Calgary, Metropolitan Area Express in Portland (Oregon), and the Sacramento Regional Transit District.

Heavy Rail

The commuter rail mode also should not be confused with the heavy rail mode. Heavy rail may be defined as a type of urban passenger transportation service that utilizes electrically propelled trains of cars operating over fully grade separated rights-of-way. Heavy rail may best be envisioned as high capacity, semiautomated trains of four to 10 cars receiving electric power through a third rail. Because heavy rail systems require an exclusive, completely grade-separated alignment, extensive subways and elevated structures are needed, both of which are costly and disruptive to construct. Fare collection is typically at stations, and boarding is from high level platforms.

The trackage used for heavy rail operations is not shared with freight and other railway passenger trains. Like light rail, heavy rail systems are intended to accommodate all types and lengths of passenger trips within the most densely developed portions of metropolitan areas during weekday peak travel periods as well as during midday and evening off-peak travel periods, and on weekends. Typically, heavy rail routes range from five to 15 miles in length. Normal station spacing for such systems ranges from one-half mile to two miles. Typical average overall speeds may range from 25 to 30 miles per hour. Frequency of service on heavy rail systems typically ranges from five- to 10-minute headways during peak travel periods, and from 10- to 20-minute headways during other times of the day. Extensive park-ride facilities may be provided at outlying stations, but substantial ridership accesses heavy rail facilities by walking to stations or using feeder bus service. Unlike commuter rail, which utilizes existing

railway trackage already in place, the development of a heavy rail system typically requires the acquisition or dedication of new rights-of-way and the construction of new trackage. Unlike light rail, which is intended to operate primarily on the surface, heavy rail requires fully grade separated elevated or subway locations. Thus, the capital cost of implementing a heavy rail route will normally be much greater than the capital cost of either a commuter rail or light rail route.

Within the United States and Canada, examples of heavy rail systems include the Chicago Transit Authority—or "L", the New York City subway system, Metro in Washington, D.C., MARTA in Atlanta, the Red Line in Los Angeles, and BART in San Francisco and Oakland.

High Speed Rail

The commuter rail mode also should not be confused with the high speed rail mode. High speed rail is a technical term which defines a type of long distance, intercity railway passenger train service. While this type of service has also been a subject of increasing interest within the United States, it is intended to serve the same passenger market as Amtrak, that is, passengers traveling between metropolitan areas, and not to serve passengers traveling within metropolitan areas as do the commuter rail, light rail, and heavy rail modes.

High speed rail would require the use of either an improved existing railway alignment or a new alignment that includes very gentle horizontal and vertical curvatures as well as few, if any, grade crossings. Whereas commuter rail, light rail, and heavy rail trains may be expected to have maximum operating speeds of between 50 and 79 miles per hour, high speed intercity trains maybe envisioned as operating at maximum speeds of anywhere from 125 to 250 miles per hour. Conventional Amtrak trains typically operate at top speeds of 79 to 90 miles per hour. For example, the present maximum operating speed for the Milwaukee to Chicago Amtrak trains is 79 miles per hour. The only true high speed intercity rail service currently operating in North America is in the corridor between New York and Washington, D.C., although high speed rail systems are common in other parts of the world especially France, Germany, Great Britain, and Japan.

SCOPE OF WORK

The feasibility study was comprised of four major elements: 1) conduct of inventories and analyses; 2) definition of alternatives; 3) evaluation of alternatives; and 4) identification of the most feasible alternative.

The conduct of the study required the collection or collation of data on existing and probable future resident population, household, and employment levels in the travel corridor; on land use; on travel habits and patterns; and on the characteristics of existing railway, public transit, and highway facilities in the corridor and on their utilization. The required data were collected primarily from existing Commission data files. An inventory of the existing condition and use of the potential commuter rail line was also conducted. Analyses were facilitated by the availability of the Commission travel survey data and travel simulation models which were used to identify existing and potential travel within the corridor by mode.

The study identified a number of alternative service configurations that were to be considered, and described the physical and operational characteristics of each of those alternatives. The definition of alternatives included the identification of possible routes and alignments; the identification of potential station locations and attendant automobile parking facilities; the development of operational plans; and for the commuter rail alternatives, identification of needed signal systems, additional tracks, passing sidings, and equipment storage and servicing facilities. Consideration was given to the improvements necessary to accommodate commuter rail train traffic along with current and potential future freight train traffic.

The feasibility of instituting commuter service in the travel corridor was evaluated on the basis of necessary capital improvements and attendant costs, anticipated ridership, potential operating costs and revenues, and necessary public operating cost subsidies. Based upon the evaluations of the alternatives that were considered, the study identified whether or not each of the alternatives was feasible.

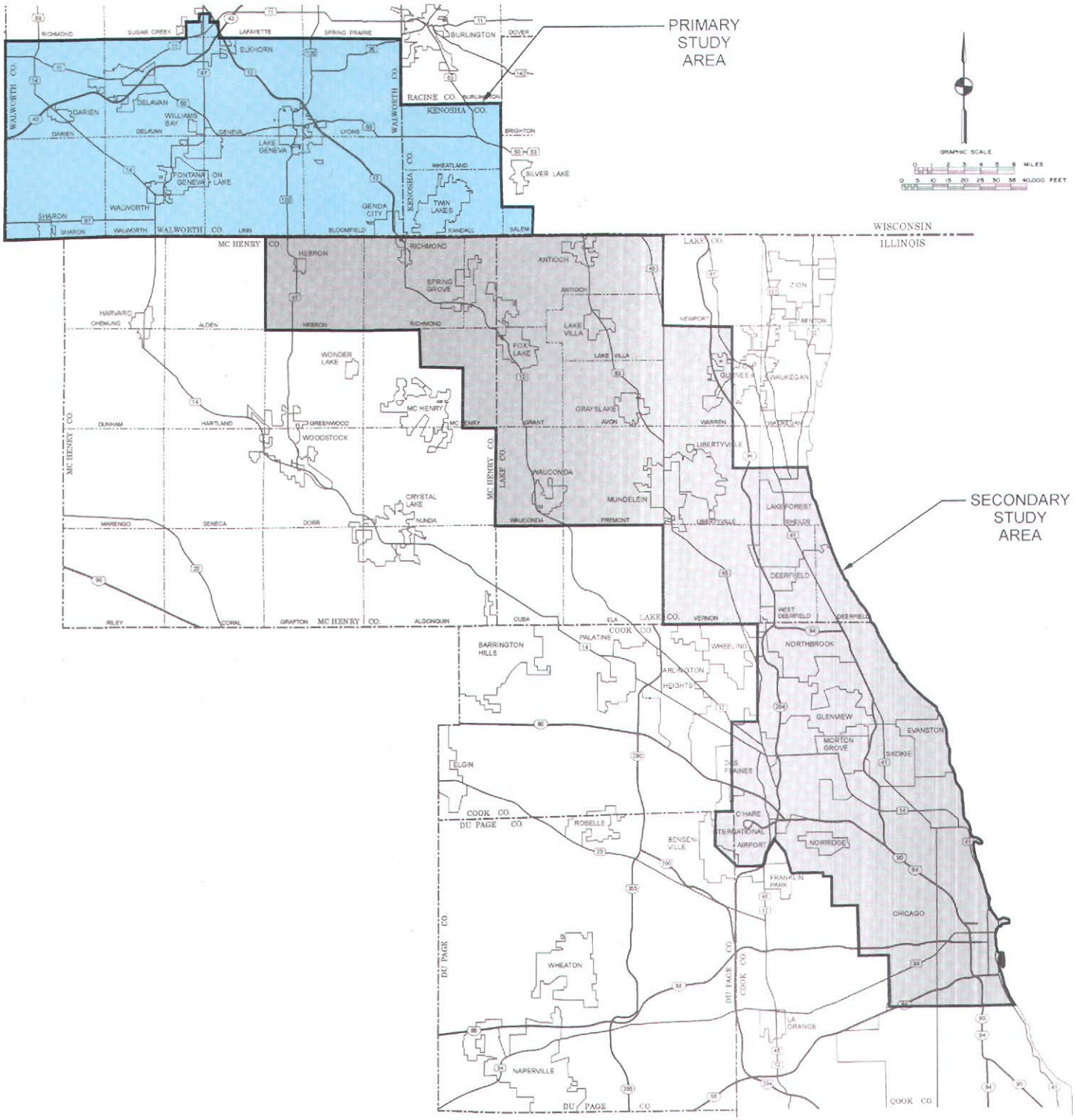
This report documents the findings and recommendations of the feasibility study, including the recommendation of the study Advisory Committee with respect to whether or not a full scale major investment study should be undertaken.

STUDY AREA

The study area consisted of a "primary" study area, and a "secondary" study area, as shown on Map 3. The primary study area consisted of the Walworth-Fox Lake Corridor within the Southeastern Wisconsin Region comprised of the southern half of Walworth County and a portion of western Kenosha County. The boundaries of the primary study area were delineated so as to be consistent with the conduct of comprehensive travel surveys by the Regional Planning Commission. The primary study area lies entirely within the Southeastern Wisconsin counties of Walworth and Kenosha.

Map 3

STUDY AREA FOR THE FEASIBILITY STUDY OF COMMUTER SERVICE IN THE WALWORTH-FOX LAKE CORRIDOR



Source: SEWRPC.

The secondary study area consisted of an extension of the corridor into northeastern Illinois and to the central business district of the City of Chicago. The boundaries of the secondary study area were delineated so as to be consistent with areas used in the conduct of comprehensive travel surveys by the Regional Planning Commission and by the Chicago Area Transportation Study. The secondary study area lies entirely within the northeastern Illinois counties of McHenry, Lake, and Cook.

STUDY ORGANIZATION

The lead agency for the conduct of the feasibility study was the Southeastern Wisconsin Regional Planning Commission. The study was conducted by the Commission staff with the assistance of a consulting transportation engineering firm and the staffs of the counties and communities within the study area, together with the staffs of the Wisconsin Department of Transportation, the Chicago Area Transportation Study, the various railways concerned, and Metra.

To provide guidance to the staff in the conduct of the study and to more directly and actively involve concerned and affected public officials in the development of the feasibility study, an Advisory Committee was created. The membership of this Committee is listed on the inside front cover of this report. The Committee reviewed staff-prepared materials and approved this report.

SCHEME OF PRESENTATION

The findings and recommendations of the feasibility study are set forth in this report which consists of six chapters including this introductory chapter.

Chapter II describes the land use, demographic, economic, and travel information considered in the study. The information presented includes a description of the resident population levels and distributions in the primary study area, along with an identification of the principal trip generators in that area. The travel habits and patterns within the primary study area and between Southeastern Wisconsin and Northeastern Illinois were identified using data collected in the comprehensive travel survey conducted by the Regional Planning Commission in 1991, supplemented with data collected in a similar study by the Chicago Area Transportation Study, and simulation modeling.

Chapter III presents a description of the existing transportation services and facilities within the study area. The existing bus services within the primary study area are identified and described as well as the existing commuter rail service presently operated by Metra between Fox Lake and Chicago. The existing arterial street and highway facilities are also described. This chapter also presents a description of the existing railway line and attendant facilities that would be necessary for the operation of commuter rail service in the corridor. The railway line is described in terms of its existing condition and current use.

Chapter IV identifies the bus and commuter rail equipment and facility requirements as needed for the definition and evaluation of each of the alternative commuter services considered. This information is described in terms of the commuter service alternative alignments and routes, station locations, operational plans, service providers—for the commuter rail alternatives—track and signal improvements and locomotive and coach requirements.

Chapter V presents a comparison and evaluation of the alternatives considered. The principal evaluation measures include anticipated ridership, capital costs, operating costs and deficits, fare box revenues and deficits, reduction in highway traffic and attendant impacts, travel time improvements within the corridor, and impact on railway freight operations. This chapter also sets forth a description of the most promising alternative based upon the comparative evaluation of the alternatives considered. It also sets forth the recommendation of the Advisory Committee as to whether or not to proceed with a major investment study.

Chapter VI presents a summary of the findings and recommendations of the feasibility study.

(This page intentionally left blank)

Chapter II

EXISTING LAND USE AND TRAVEL PATTERNS

INTRODUCTION

This chapter describes the factors which may be expected to influence the potential demand for commuter railway or bus passenger service within the Walworth-Fox Lake Travel Corridor. These factors include the extent of existing urban development in the corridor, including resident population, household, and employment levels; and existing travel patterns. Also presented are planned year 2020 population, household, and employment levels within the corridor. For the presentation of these data, the primary and secondary study areas within the corridor were divided into the subareas shown on Map 4.

POPULATION, HOUSEHOLDS AND EMPLOYMENT

The 1990 and planned 2020 resident population levels in the study area are set forth by subarea in Table 2. The resident populations within the primary study area in Walworth and Kenosha Counties are anticipated to increase by about 14,600 and 3,600 persons, respectively, between 1990 and 2020. Thus, the resident population within the primary study area is anticipated to increase from about 45,500 persons in the Walworth County portion of the study area, and 10,100 persons in the Kenosha County portion in 1990 to about 60,100 persons and 13,700 persons, respectively, by 2020, or by 18,200 persons, or 33 percent, in the primary study area as a whole.

The 1990 and planned 2020 household levels in the study area are set forth by subarea in Table 3. The number of households within the primary study area is anticipated to increase in each of the two county areas concerned between 1990 and 2020, from about 17,800 households in the Walworth County portion of the primary study area and 3,500 households in the Kenosha County portion, to about 25,800 and 4,900 households, respectively, by 2020, or by 9,400 households, or 44 percent in the primary study area as a whole. These totals represent households that occupy the areas concerned on a year-round basis. It is important to note that there are also significant concentrations of seasonal housing units in southern Walworth and western Kenosha Counties. These are utilized primarily during the summer months generally from Memorial Day to Labor Day and are maintained as vacation and recreational homes largely by residents of Northeastern Illinois. The number and distribution of these seasonal homes is important in estimating summertime travel to and from the study area. Estimates of the number of seasonal housing units in the primary study area are provided on Map 5 by delineated subarea, based upon data collected in the 1990 Federal Census of Population and Housing. These levels are assumed to remain essentially constant through the year 2020.

The 1990 and 2020 employment levels in the study area are set forth in Table 4. Employment within the primary study area is anticipated to increase in each of the two county areas concerned between 1990 and 2020, from about 27,000 jobs in the Walworth County portion of the primary study area and from about 2,300 jobs in the Kenosha County portion to 41,200 and 2,700 jobs, respectively, by 2020, or by 14,600 jobs, or 50 percent, in the primary study area as a whole.

With respect to the secondary study area in the Illinois counties of Cook, Lake, and McHenry, the resident population is anticipated to increase by 17 percent from about 2,470,600 persons in 1990 to about 2,888,000 persons in 2020. The number of households within the secondary study area is anticipated to increase from about 933,100 households in 1990 to about 1,171,100 households in 2020, or by 26 percent. Employment within the secondary study area is anticipated to increase from about 1,705,300 jobs in 1990 to about 2,141,300 jobs in 2020, or by about 26 percent.

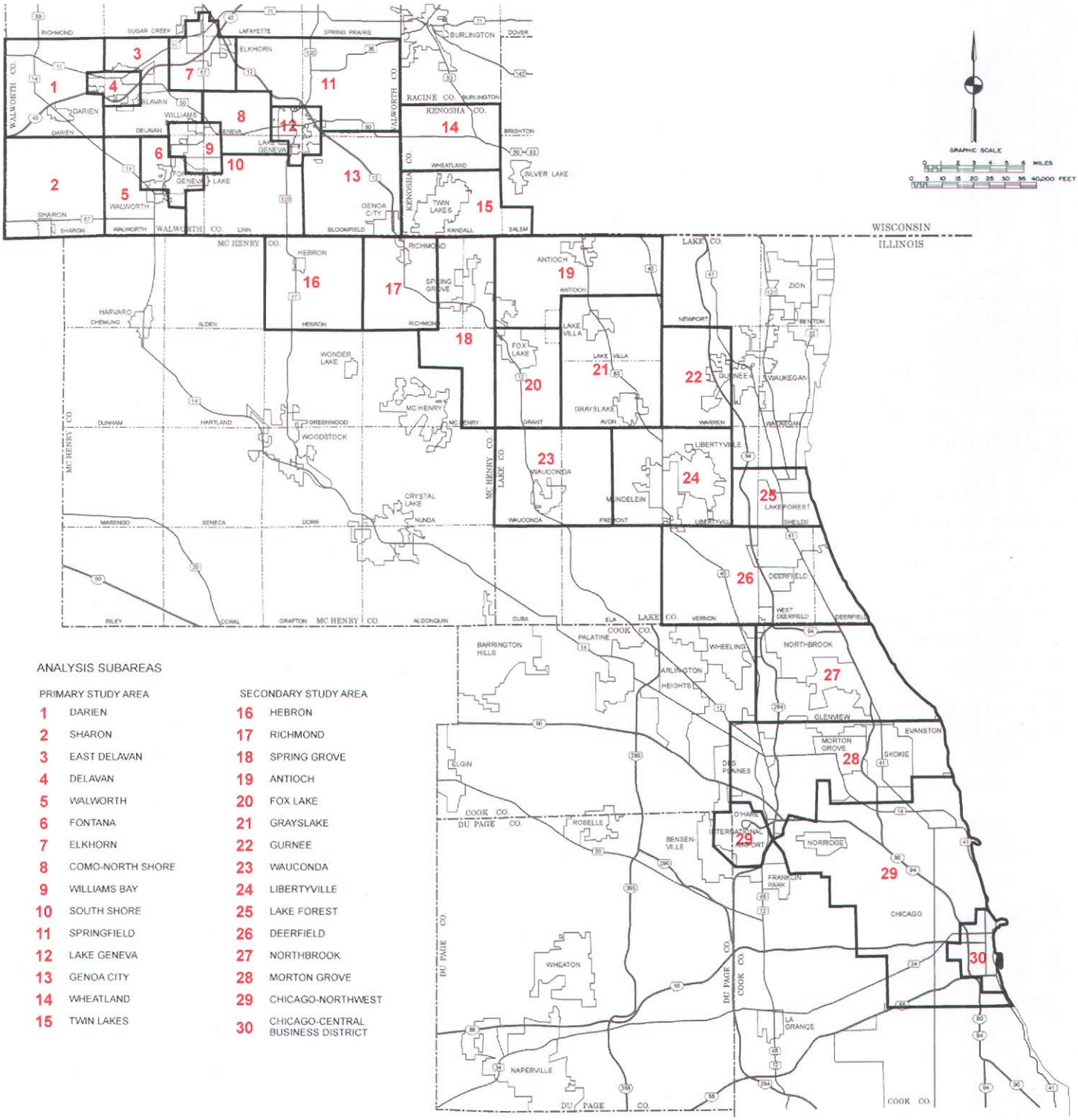
EXISTING LAND USE

Historic Urban Growth

The historic pattern of urban development in the primary study area is shown on Map 6. Prior to 1880, urban development within the primary study area was largely confined to areas within the communities of Darien, Delavan, Elkhorn, Genoa City, Lake Geneva, Sharon, and Walworth. The proliferation of scattered low-density urban development around the shorelines of the inland lakes in the area began sometime after 1880, and has continued to date. This diffusion of urban development around the lake shorelines has been accompanied in more recent decades by more widely scattered urban sprawl. Consequently, a significant portion of new urban development continues to occur away from existing urban centers in the primary study area.

Map 4

ANALYSIS SUBAREAS WITHIN THE PRIMARY AND SECONDARY STUDY AREAS



ANALYSIS SUBAREAS

PRIMARY STUDY AREA		SECONDARY STUDY AREA	
1	DARIEN	16	HEBRON
2	SHARON	17	RICHMOND
3	EAST DELAVAN	18	SPRING GROVE
4	DELAVAN	19	ANTIOCH
5	WALWORTH	20	FOX LAKE
6	FONTANA	21	GRAYSLAKE
7	ELKHORN	22	GURNEE
8	COMO-NORTH SHORE	23	WAUCONDA
9	WILLIAMS BAY	24	LIBERTYVILLE
10	SOUTH SHORE	25	LAKE FOREST
11	SPRINGFIELD	26	DEERFIELD
12	LAKE GENEVA	27	NORTHBROOK
13	GENOA CITY	28	MORTON GROVE
14	WHEATLAND	29	CHICAGO-NORTHWEST
15	TWIN LAKES	30	CHICAGO-CENTRAL BUSINESS DISTRICT

NOTE: DUE TO MAP SCALE LIMITATIONS, ONLY SELECTED CIVIL DIVISIONS ARE SHOWN FOR LAKE, MC HENRY AND COOK COUNTY, ILLINOIS.

Source: SEWRPC.

Table 2

STUDY AREA RESIDENT POPULATION: EXISTING 1990 AND PLANNED 2020

Study Area		Population		Change in Population 1990-2020	
Map Key Number[a]	Name	1990	Forecast Year 2020[b]	Number	Percent
	Primary Study Area				
	Walworth County				
1	Darien	2,500	3,600	1,100	44.0
2	Sharon	2,300	2,500	200	8.7
3	East Delavan	3,600	5,300	1,700	47.2
4	Delavan	6,100	7,900	1,800	29.5
5	Walworth	2,400	3,700	1,300	54.2
6	Fontana	2,000	2,700	700	35.0
7	Elkhorn	5,700	7,700	2,000	35.1
8	Como-North Shore	2,500	3,000	500	20.0
9	Williams Bay	2,300	2,600	300	13.0
10	South Shore	1,800	2,700	900	50.0
11	Springfield	2,700	3,400	700	25.9
12	Lake Geneva	6,800	9,000	2,200	32.4
13	Genoa City	4,800	6,000	1,200	25.0
	Subtotal	45,500	60,100	14,600	32.1
	Kenosha County				
14	Wheatland	3,300	3,400	100	3.0
15	Twin Lakes	6,800	10,300	3,500	51.5
	Subtotal	10,100	13,700	3,600	35.6
	Primary Study Area Total	55,600	73,800	18,200	32.7
	Secondary Study Area				
	McHenry County				
16	Hebron	1,800	2,300	500	27.8
17	Richmond	2,200	3,800	1,600	72.7
18	Spring Grove	15,100	21,900	6,800	45.0
	Subtotal	19,100	28,000	8,900	46.6
	Lake County				
19	Antioch	16,900	29,400	12,500	74.0
20	Fox Lake	16,600	27,300	10,700	64.5
21	Grayslake	55,700	106,400	50,700	91.0
22	Gurnee	15,300	32,500	17,200	112.4
23	Wauconda	11,900	34,800	22,900	192.4
24	Libertyville	35,300	75,500	40,200	113.9
25	Lake Forest	16,700	20,800	4,100	24.6
26	Deerfield	115,500	143,000	27,500	23.8
	Subtotal	283,900	469,700	185,800	65.4
	Cook County				
27	Northbrook	139,000	157,400	18,400	13.2
28	Morton Grove	308,100	323,000	14,900	4.8
29	Chicago –Northwest	1,646,200	1,807,500	161,300	9.8
30	Chicago CBD	74,300	102,400	28,100	37.8
	Subtotal	2,167,600	2,390,300	222,700	10.3
	Secondary Study Area Total	2,470,600	2,888,000	417,400	16.9
	Corridor Total	2,526,200	2,961,800	435,600	17.2

[a] *The map key number refers to Map 4, "Analysis Subareas Within the Primary and Secondary Study Areas."*

[b] *Within the primary study area, the forecast year 2020 resident population data set forth in this table are based upon forecast design year 2020 data prepared by the Southeastern Wisconsin Regional Planning Commission. Within the secondary study area, the forecast year 2020 resident population data set forth in this table are based upon existing 1990 and forecast design year 2020 data for Cook and Lake Counties prepared by the Northeastern Illinois Planning Commission.*

Source: SEWRPC.

Table 3

STUDY AREA HOUSEHOLDS: EXISTING 1990 AND PLANNED 2020

Study Area		Households		Change in Households 1990-2020	
Map Key Number[a]	Name	1990	Forecast Year 2020[b]	Number	Percent
	Primary Study Area				
	Walworth County				
1	Darien	900	1,400	500	55.6
2	Sharon	800	900	100	12.5
3	East Delavan	1,400	2,000	600	42.9
4	Delavan	2,400	3,300	900	37.5
5	Walworth	900	1,600	700	77.8
6	Fontana	800	1,200	400	50.0
7	Elkhorn	2,300	3,300	1,000	43.5
8	Como-North Shore	1,100	1,300	200	18.2
9	Williams Bay	1,000	1,200	200	20.0
10	South Shore	600	1,100	500	83.3
11	Springfield	1,100	1,300	200	18.2
12	Lake Geneva	2,900	4,800	1,900	65.5
13	Genoa City	1,600	2,400	800	50.0
	Subtotal	17,800	25,800	8,000	44.9
	Kenosha County				
14	Wheatland	1,100	1,200	100	9.1
15	Twin Lakes	2,400	3,700	1,300	54.2
	Subtotal	3,500	4,900	1,400	40.0
	Primary Study Area Total	21,300	30,700	9,400	44.1
	Secondary Study Area				
	McHenry County				
16	Hebron	700	900	200	28.6
17	Richmond	800	1,400	600	75.0
18	Spring Grove	5,000	7,700	2,700	54.0
	Subtotal	6,500	10,000	3,500	53.8
	Lake County				
19	Antioch	6,400	11,700	5,300	82.8
20	Fox Lake	6,200	9,100	2,900	46.8
21	Grayslake	18,400	38,700	20,300	110.3
22	Gurnee	5,800	13,300	7,500	129.3
23	Wauconda	4,000	13,300	9,300	232.5
24	Libertyville	12,500	28,300	15,800	126.4
25	Lake Forest	5,800	7,500	1,700	29.3
26	Deerfield	39,900	53,700	13,800	34.6
	Subtotal	99,000	175,600	76,600	77.4
	Cook County				
27	Northbrook	50,800	59,200	8,400	16.5
28	Morton Grove	117,400	168,000	50,600	43.1
29	Chicago-Northwest	619,800	702,900	83,100	13.4
30	Chicago-CBD	39,600	55,400	15,800	39.9
	Subtotal	827,600	985,500	157,900	19.1
	Secondary Study Area Total	933,100	1,171,100	238,000	25.5
	Corridor Total	954,400	1,201,800	247,400	25.9

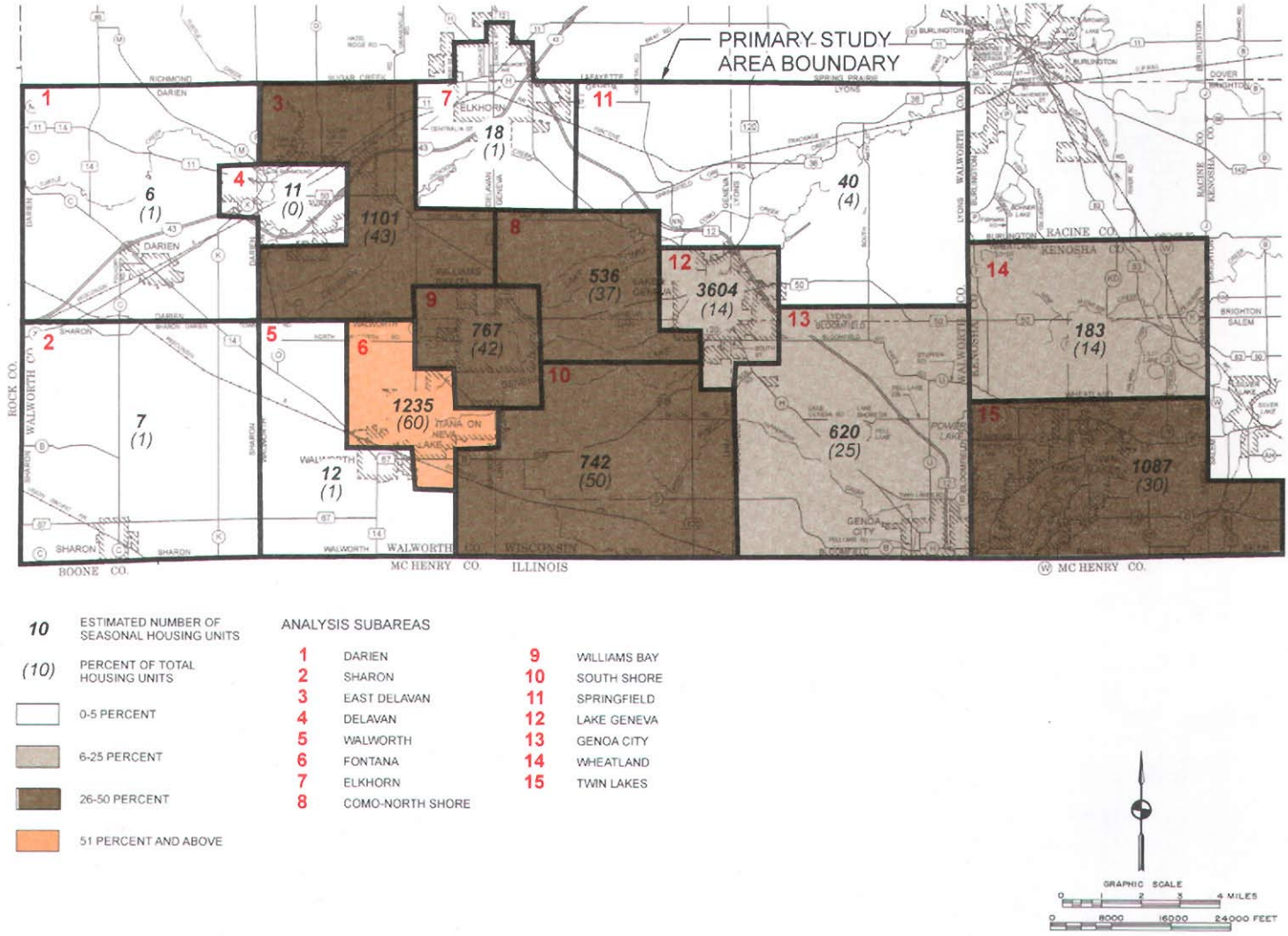
[a] *The map key number refers to Map 4, "Analysis Subareas Within the Primary and Secondary Study Areas."*

[b] *Within the primary study area, the forecast year 2020 resident household data set forth in this table are based upon forecast design year 2020 data prepared by the Southeastern Wisconsin Regional Planning Commission. Within the secondary study area, the forecast year 2020 resident household data set forth in this table are based upon existing 1990 and forecast design year 2020 data for Cook and Lake Counties prepared by the Northeastern Illinois Planning Commission.*

Source: SEWRPC.

Map 5

DISTRIBUTION OF SEASONAL HOUSING UNITS WITHIN THE PRIMARY STUDY AREA: 1990



10 ESTIMATED NUMBER OF SEASONAL HOUSING UNITS

(10) PERCENT OF TOTAL HOUSING UNITS

0-5 PERCENT

6-25 PERCENT

26-50 PERCENT

51 PERCENT AND ABOVE

ANALYSIS SUBAREAS

1 DARIEN
2 SHARON
3 EAST DELAVAN
4 DELAVAN
5 WALWORTH
6 FONTANA
7 ELKHORN
8 COMO-NORTH SHORE
9 WILLIAMS BAY
10 SOUTH SHORE
11 SPRINGFIELD
12 LAKE GENEVA
13 GENOA CITY
14 WHEATLAND
15 TWIN LAKES

Source: SEWRPC.

Planned Urban Development

The adopted year 2020 regional land use plan for the seven-county Southeastern Wisconsin Region recommends a relatively compact, centralized regional settlement pattern, with urban development occurring at medium urban densities in concentric rings along the full periphery of, and outward from, existing urban centers. The regional land use plan defines the boundaries within which sanitary sewer service should be provided and thus within which urban development should be encouraged to locate.[1] The extent of planned urban development upon buildout of the planned sanitary sewer service areas within the primary study area is graphically compared to the extent of existing 1990 urban development in Map 7. The sanitary sewer service areas are not expected to be fully developed by the year 2020 since they incorporate some reserve lands to provide flexibility to local communities in determining the spatial distribution of new urban development and to facilitate operation of the urban land market.

Major Potential Trip Generators

For the purposes of this planning effort, the following types of land uses were identified as major potential trip generators within the primary study area: 1) major educational institutions; 2) major resorts; 3) major marinas; and 4) other major recreational centers. Given the large

[1] *See SEWRPC Planning Report No. 40,* A Regional Land Use Plan for Southeastern Wisconsin—2010, *January 1992.*

Table 4

STUDY AREA EMPLOYMENT: EXISTING 1990 AND PLANNED 2020

Study Area		Employment		Change in Employment 1990-2020	
Map Key Number[a]	Name	1990	Forecast Year 2020[b]	Number	Percent
	Primary Study Area				
	Walworth County				
1	Darien	1,100	1,400	300	27.3
2	Sharon	500	1,000	500	100.0
3	East Delavan	1,000	3,100	2,100	210.0
4	Delavan	4,900	7,400	2,500	51.0
5	Walworth	1,900	2,300	400	21.1
6	Fontana	1,200	1,900	700	58.3
7	Elkhorn	5,100	7,600	2,500	49.0
8	Como-North Shore	500	700	200	40.0
9	Williams Bay	800	1,400	600	75.0
10	South Shore	600	700	100	16.7
11	Springfield	2,000	2,300	300	15.0
12	Lake Geneva	6,500	8,400	1,900	29.2
13	Genoa City	900	3,000	2,100	233.3
	Subtotal	27,000	41,200	14,200	52.6
	Kenosha County				
14	Wheatland	600	600	0	0.0
15	Twin Lakes	1,700	2,100	400	23.5
	Subtotal	2,300	2,700	400	17.4
	Primary Study Area Total	29,300	43,900	14,600	49.8
	Secondary Study Area				
	McHenry County				
16	Hebron	900	1,200	300	33.3
17	Richmond	2,000	2,500	500	25.0
18	Spring Grove	5,100	6,400	1,300	25.5
	Subtotal	8,000	10,100	2,100	26.3
	Lake County				
19	Antioch	4,400	7,800	3,400	77.3
20	Fox Lake	3,800	7,000	3,200	84.2
21	Grayslake	11,700	27,500	15,800	135.0
22	Gurnee	1,700	15,300	13,600	800.0
23	Wauconda	1,700	11,200	9,500	558.8
24	Libertyville	21,300	62,300	41,000	192.5
25	Lake Forest	15,400	24,800	9,400	61.0
26	Deerfield	62,700	111,400	48,700	77.7
	Subtotal	122,700	267,300	144,600	117.8
	Cook County				
27	Northbrook	102,100	122,300	20,200	19.8
28	Morton Grove	247,100	289,600	42,500	17.2
29	Chicago-Northwest	655,600	781,700	126,100	19.2
30	Chicago-CBD	569,800	670,300	100,500	17.6
	Subtotal	1,574,600	1,863,900	289,300	18.4
	Secondary Study Area Total	1,705,300	2,141,300	436,000	25.6
	Corridor Total	1,734,600	2,185,200	450,600	26.0

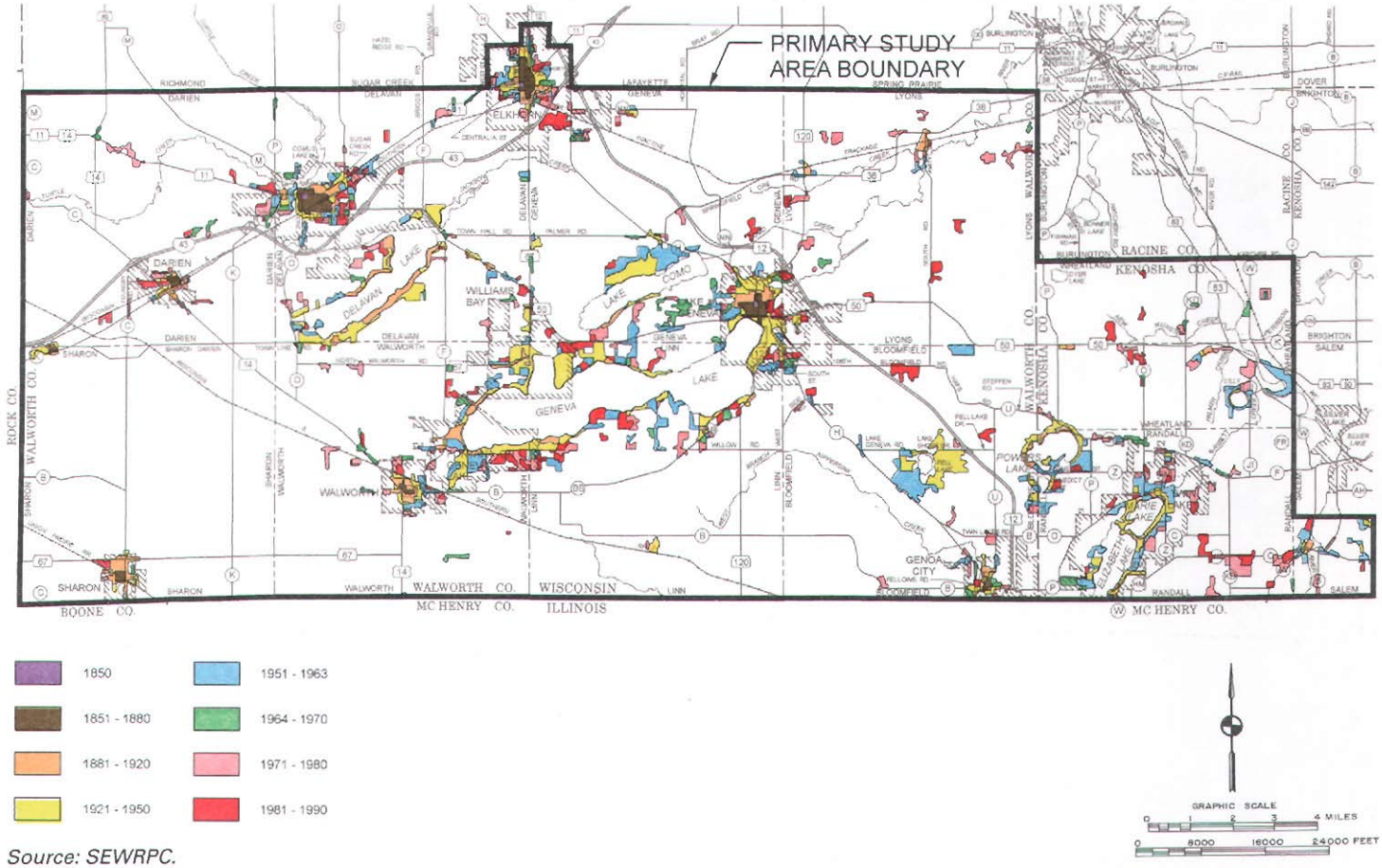
[a] *The map key number refers to Map 4, "Analysis Subareas Within the Primary and Secondary Study Areas."*

[b] *Within the primary study area, the forecast year 2020 employment data set forth in this table are based upon forecast design year 2020 data prepared by the Southeastern Wisconsin Regional Planning Commission. Within the secondary study area, the forecast year 2020 employment data set forth in this table are based upon existing 1990 and forecast design year 2020 data for Cook and Lake Counties prepared by the Northeastern Illinois Planning Commission.*

Source: SEWRPC.

Map 6

HISTORIC URBAN GROWTH IN THE PRIMARY STUDY AREA: 1850-1990



Source: SEWRPC.

scale resort and recreational nature of trips in southern Walworth County, these categories of trip generators were concluded to be the most important in terms of trip generation. While significant amounts of retail, office, commercial, and industrial land uses certainly exist in and around the communities of southern Walworth County—in large part to support the resort and recreational activities—no such concentrations sufficiently large to be considered major trip generation centers were identified.

Educational Institutions

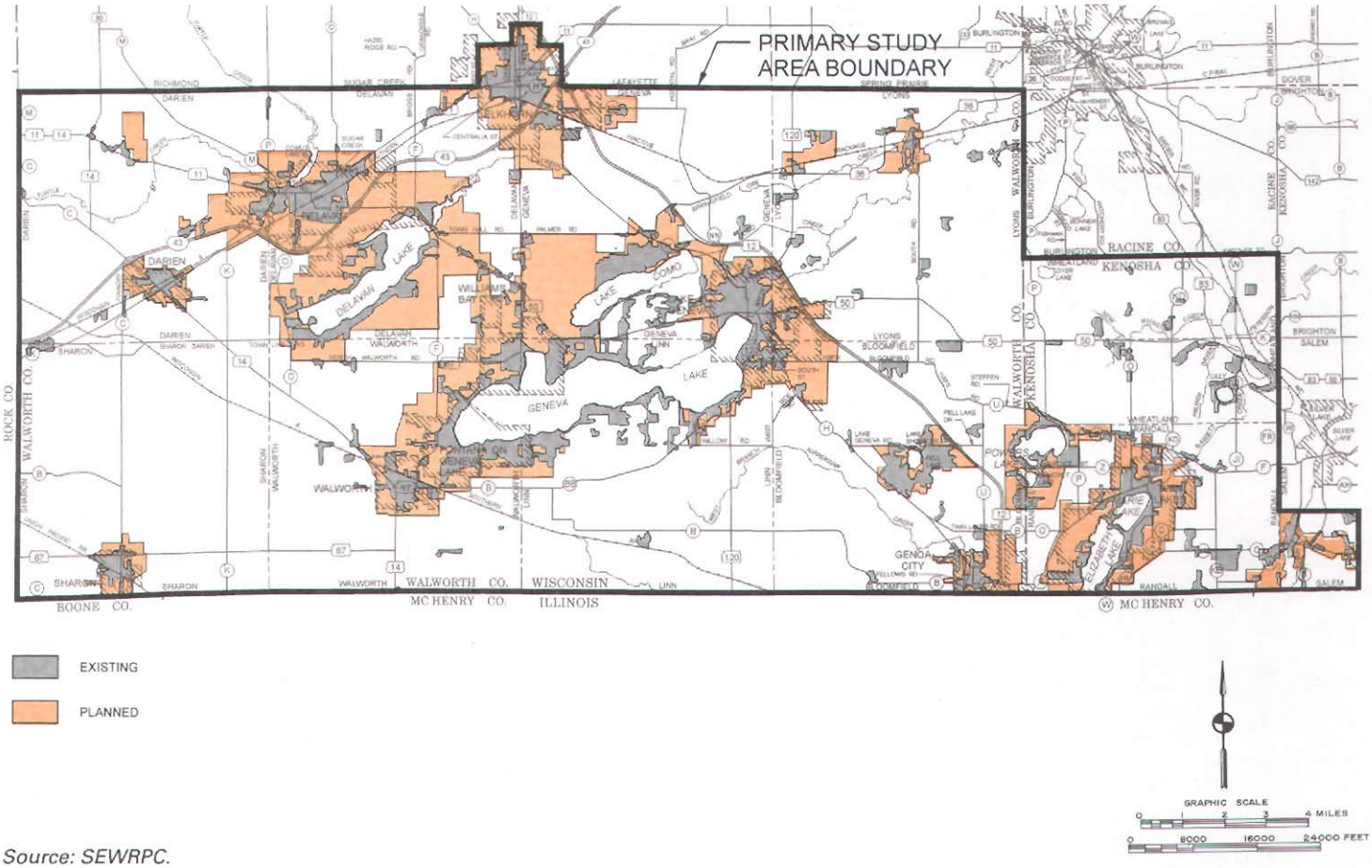
Major educational facilities by definition consist of colleges and universities. Colleges and universities constitute major trip generation centers not only because they have large student enrollments, but because they provide significant employment as well. One such major educational facility exists within the primary study area—the Gateway Technical College-Walworth County Campus—as shown on Map 8.

Major Resorts

Major resort complexes within the primary study area were identified not only because such resorts may represent significant trip generation centers, but also because such resorts may also represent major employment centers. It is recognized, in this respect, that the level of trip activity to and from resorts and the attendant employment may be highly skewed towards the summer

Map 7

EXTENT OF EXISTING 1990 AND PLANNED YEAR 2010 URBAN DEVELOPMENT WITHIN THE PRIMARY STUDY AREA



Source: SEWRPC.

season. The major resorts identified within the primary study area are shown on Map 9.

Major Recreational Boating Facilities

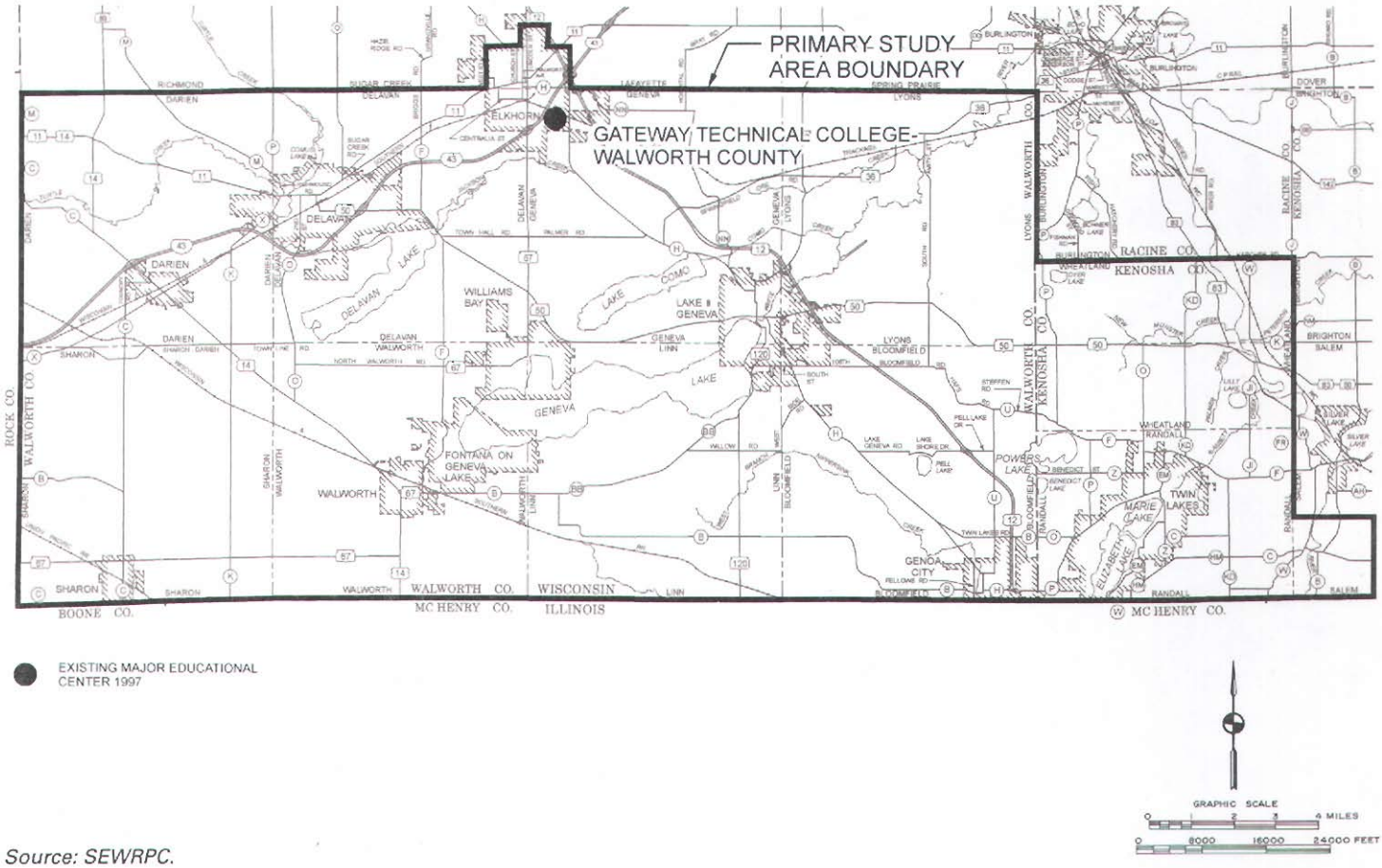
Recreational boating facilities within the primary study area such as major marinas and concentrations of docks were identified as potential major trip generator centers. Much of the popularity of southern Walworth County as a recreation and resort destination is a result of boating opportunities on Geneva Lake and other lakes. It is recognized that the level of trip activity to and from these marinas may be highly skewed towards the summer season. The major concentrations of recreational boating facilities identified within the primary study area are shown on Map 10.

Other Major Recreational Centers

Other major recreational centers within the primary study area include golf courses not otherwise associated with a major resort, and entertainment centers such as dog racing tracks. These land uses were also identified as potential major trip generation and employment centers. It is recognized that the level of trip activity to and from these centers and the attendant employment may be highly skewed towards the summer season. The other major

Map 8

MAJOR EDUCATIONAL CENTER WITHIN THE PRIMARY STUDY AREA



Source: SEWRPC.

recreational centers identified within the primary study area are shown on Map 11.

EXISTING TRAVEL PATTERNS

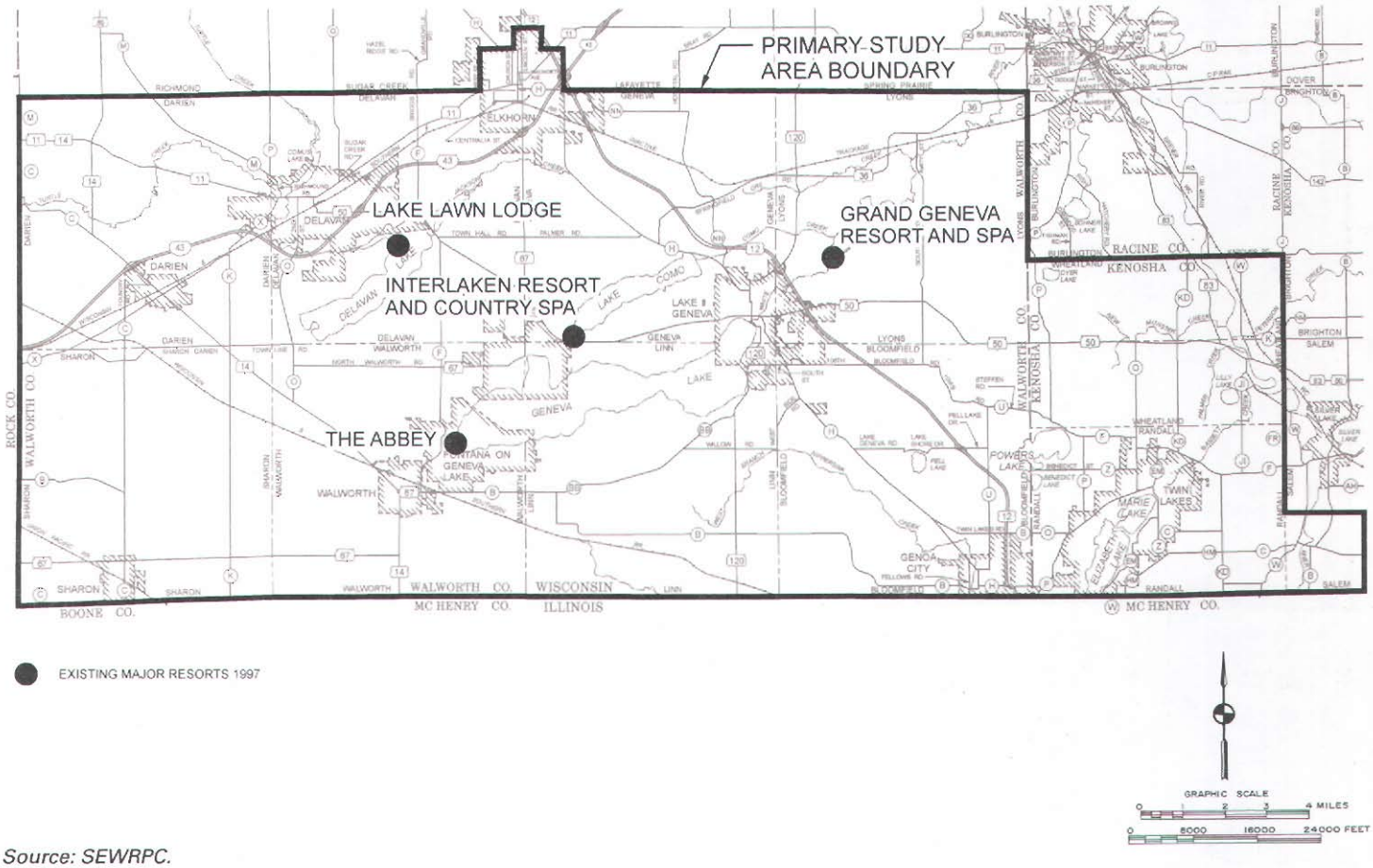
This section presents data on the amount of travel that occurs on an average weekday within the primary study area of the corridor, as well as data on travel between the primary and secondary study areas of the corridor. The travel data are based on the findings of a regional resident household travel survey and an external cordon survey conducted by the Regional Planning Commission in the fall of 1991. These surveys were a part of a comprehensive regional inventory of travel which included, in addition to the household travel and the external cordon surveys, a public transit user survey, and a truck and taxi survey. The 1991 household travel is the basis for data on person trips[2] made on an average weekday in 1991 within the primary study area. The 1991 external cordon survey is the basis for data on person trips made between the primary and secondary study areas. Based on the travel surveys

---

[2] *A person trip was defined as a one-way journey between a point of origin and a point of destination by a person five years of age or older traveling as an auto driver or as a passenger in an auto, taxi, truck, motorcycle, school bus, or other mass transit carrier. To be considered, the trip must have been at least the equivalent of one full city block—that is, approximately one-eighth mile in length.*

Map 9

MAJOR RESORTS WITHIN THE PRIMARY STUDY AREA



Source: SEWRPC.

approximately 141,700 person trips are made on an average weekday within the primary study area, and between the primary and secondary study areas.

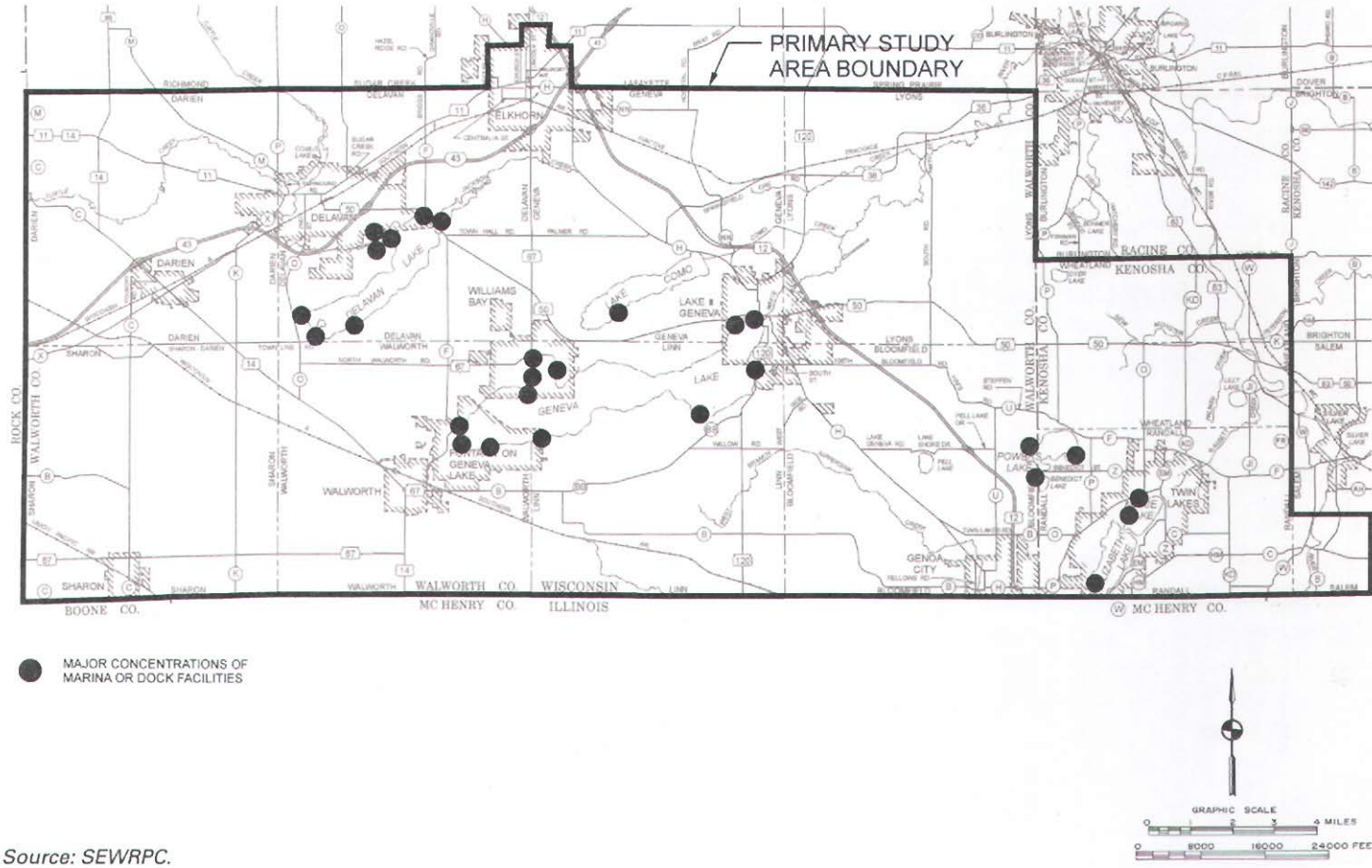
A trip is herein defined and presented as travel by a person from a place of trip production to a place of trip attraction. For trips with one end of the trip at home, the place of trip production is always defined as the home and the place of trip attraction is always defined as the other end of the trip, which may be a place of work, shopping, personal business, social activity, recreation, or other activity. For a trip which neither begins or ends at home, the place of trip production is defined as the place of origin of the trip, and the place of trip attraction is defined as the place of destination of the trip.

Travel Within the Primary Study Area

On an average weekday in 1991, about 128,800 trips were made between origins and destinations entirely within the primary study area. Of these trips, about 51,700 or about 40 percent, were made between analysis areas within the primary study area, and about 77,100 trips, or 60 percent, were made totally within such analysis areas. Of the 51,700 person trips made between analysis areas, about 48,800 person trips, or about 94 percent, were intracounty trips, or trips made entirely within one of the portions of the two counties concerned located within the primary

Map 10

RECREATIONAL BOATING FACILITIES WITHIN THE PRIMARY STUDY AREA



Source: SEWRPC.

study area. The remaining 2,900 person trips, or about 6 percent, were trips which crossed the county boundary. The pattern of person trips within the primary study area is presented in Table 5, and graphically displayed in Map 12.

The largest proportion of the person trips made within the primary study area in 1991 were "home-based other" trips. These would include trips made for medical, personal business, or social or recreational purposes. About 34 percent of all person trips in the primary study area were made for this purpose on an average weekday. The remaining person trips within the primary study area were relatively evenly distributed among the other trip purposes, with about 23 percent made for work, about 13 percent made for shopping, about 20 percent were nonhome-based, and about 10 percent were school trips.

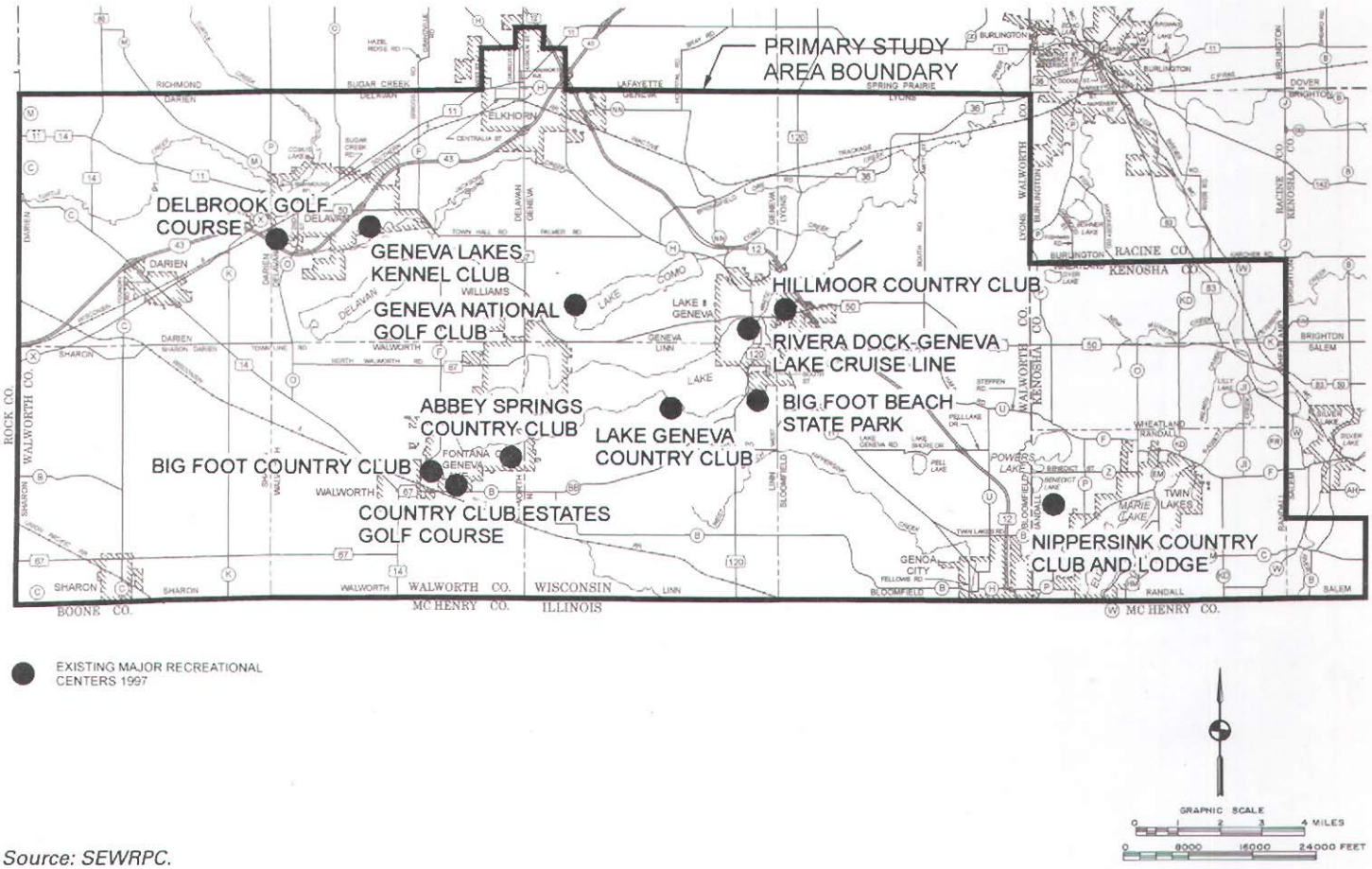
The pattern of person trips between the primary study area and the remainder of the Southeastern Wisconsin Region was also an important consideration in the study. Data on these trips is also presented in Table 5 and graphically displayed on Map 13. The overall pattern of person trips among the seven counties of Southeastern Wisconsin is graphically displayed on Map 14.

Interregional Travel

About 12,900 interregional person trips, or trips crossing the Wisconsin-Illinois State line between the primary and

Map 11

OTHER MAJOR RECREATIONAL CENTERS WITHIN THE PRIMARY STUDY AREA



Source: SEWRPC.

secondary study areas, were made on an average weekday in 1991. This represents approximately 9 percent of the total 150,200 person trips found to be crossing the Wisconsin-Illinois State line anywhere between the western boundary of Walworth County and the eastern boundary of Kenosha County on an average weekday in 1991.

The largest proportion of the 12,900 person trips made on an average weekday between the primary study area and the secondary study area—about 41 percent—were home-based work trips. Of the remaining person trips, about 11 percent were home-based shopping trips, about 35 percent were home-based other trips, about 11 percent were nonhome-based trips, and about 2 percent were school trips.

The generalized pattern of person trips made on an average weekday between the primary and secondary study areas is shown in Table 6, and illustrated graphically on Map 15.

In addition, some of the travel occurring in Walworth County is travel between Rock County and Northeastern Illinois. It was estimated that on an average weekday in 1991, approximately 700 person trips were made between Rock County and the Illinois Counties of Cook, Lake, and McHenry that passed through Walworth County. The majority of these trips—almost 60 percent—were made

Table 5

DISTRIBUTION OF AVERAGE WEEKDAY PERSON TRIPS WITHIN THE PRIMARY STUDY AREA AND BETWEEN THE PRIMARY STUDY AREA AND COUNTIES IN THE REGION: 1991

	Area of Trip Attraction															
Area of Trip Production	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Primary Study Area Total
Primary Study Area																
1 Darien	2,720	120	320	1,850	190	240	190	0	0	0	0	0	0	0	0	5,630
2 Sharon	120	5,470	0	250	2,000	470	430	0	0	230	120	60	0	0	0	9,150
3 East Delavan	190	0	980	4,550	140	140	140	0	0	60	0	240	0	0	0	6,440
4 Delavan	1,850	280	2,000	22,430	390	140	3,250	170	270	0	740	1,370	0	0	0	32,890
5 Walworth	160	0	0	80	860	190	120	0	40	80	0	340	0	0	0	1,870
6 Fontana	80	0	150	50	280	160	150	0	80	190	0	170	0	0	0	1,310
7 Elkhorn	130	0	380	2,010	180	180	13,250	290	620	90	670	1,130	0	170	0	19,100
8 Como-North Shore	0	0	0	0	0	0	330	170	0	0	0	360	0	0	0	860
9 Williams Bay	0	0	0	210	120	0	80	0	40	0	0	140	0	0	120	710
10 South Shore	0	0	0	0	480	150	90	0	0	210	0	220	0	0	0	1,150
11 Springfield	0	0	0	460	0	0	1,250	300	0	0	1,270	1,690	320	70	120	5,480
12 Lake Geneva	130	80	300	650	0	540	2,220	1,120	470	690	3,450	22,960	630	150	160	33,550
13 Genoa City	0	0	0	0	170	0	330	0	60	150	70	500	2,810	210	1,450	5,750
14 Wheatland	0	0	0	0	0	0	50	0	0	0	0	170	0	1,500	510	2,230
15 Twin Lakes	0	0	0	0	0	0	0	0	0	80	30	120	0	180	2,300	2,710
Primary Study Area Total	5,380	5,950	4,130	32,540	4,810	2,210	21,880	2,050	1,580	1,780	6,350	29,470	3,760	2,280	4,660	128,830
Remainder of Region																
101 Remainder of Walworth County	310	0	180	1,280	160	380	3,790	250	0	0	310	490	0	60	0	--
102 Remainder of Kenosha County	0	0	0	0	0	0	190	80	0	0	80	590	60	1,040	3,910	--
103 Milwaukee County	0	0	490	530	0	0	190	0	0	30	0	160	60	0	0	--
104 Ozaukee County	0	0	0	0	0	0	30	0	0	0	0	30	0	0	0	--
105 Racine County	40	0	300	380	0	80	610	80	100	0	490	1,610	0	1,310	380	--
106 Washington County	5	0	20	20	0	0	0	0	0	0	0	0	20	0	0	--
107 Waukesha County	0	0	40	160	90	0	400	70	0	130	50	200	0	90	240	--
Total	350	0	1,030	2,370	250	460	5,210	480	100	160	930	3,080	140	2,500	4,530	--
Region Total	5,730	5,950	5,160	34,910	5,060	2,670	27,090	2,530	1,680	1,940	7,280	32,550	3,900	4,780	9,190	--

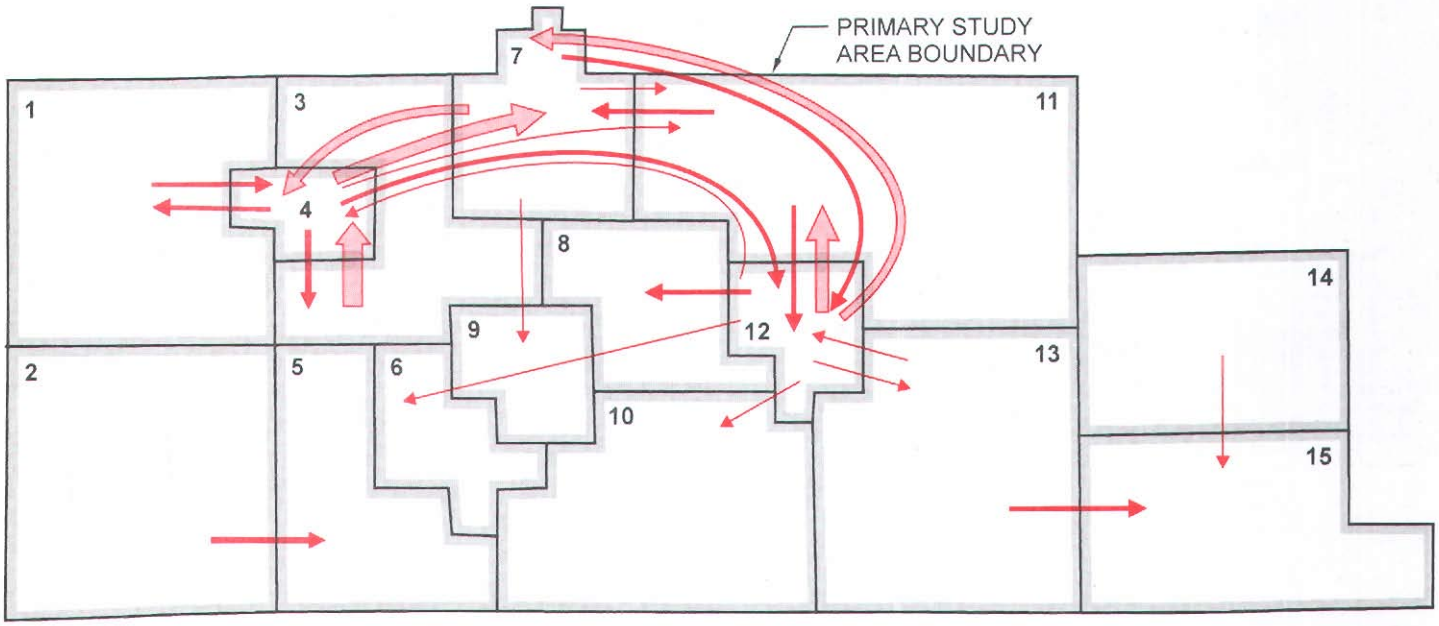
	Area of Trip Attraction								
Area of Trip Production	101	102	103	104	105	106	107	Remainder of Region Total	Region Total
Primary Study Area									
1 Darien	1,060	0	120	0	0	0	0	1,180	6,810
2 Sharon	140	0	0	0	120	0	0	260	9,410
3 East Delavan	270	0	240	0	150	0	80	740	7,180
4 Delavan	1,940	0	350	0	190	20	250	2,750	35,640
5 Walworth	0	0	0	0	0	0	0	0	1,870
6 Fontana	0	0	0	0	0	0	0	0	1,310
7 Elkhorn	1,770	0	440	0	250	0	540	3,000	22,100
8 Como-North Shore	60	120	0	0	0	0	0	180	1,040
9 Williams Bay	0	0	0	0	0	0	0	0	710
10 South Shore	0	0	50	0	0	0	0	50	1,200
11 Springfield	390	140	0	0	3,080	0	366	3,970	9,450
12 Lake Geneva	150	490	520	0	1,350	0	250	2,760	36,310
13 Genoa City	0	360	0	0	540	0	0	900	6,650
14 Wheatland	40	1,590	160	0	2,080	0	110	3,980	6,210
15 Twin Lakes	0	1,790	30	0	320	0	80	2,220	4,930
Total	--	--	--	--	--	--	--	--	--
Remainder of Region									
101 Reminder of Walworth County								7,210	7,210
102 Remainder of Kenosha County								5,950	5,950
103 Milwaukee County								1,460	1,460
104 Ozaukee County								60	60
105 Racine County								5,380	5,380
106 Washington County								60	60
107 Waukesha County								1,470	1,470
Total	5,820	4,490	1,910	0	8,080	20	1,670	43,580	--
Region Total	5,820	4,490	1,910	0	8,080	20	1,670	--	172,410

NOTE: Trips are shown in produced-attracted format; that is, from the area of production to the area of attraction. Shaded cells indicate trips made entirely within an individual subarea analysis area.

Source: SEWRPC.

Map 12

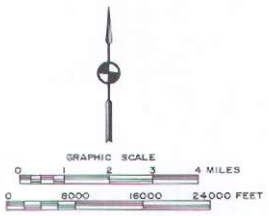
INTRACOUNTY AVERAGE WEEKDAY PERSON TRIPS BETWEEN SUBAREA ANALYSIS AREAS WITHIN THE PRIMARY STUDY AREA: 1991



TRIPS INTERNAL TO ANALYSIS SUBAREAS

AREA	NAME	TRIPS
1	DARIEN	2,720
2	SHARON	5,470
3	EAST DELAVAN	980
4	DELAVAN	22,430
5	WALWORTH	860
6	FONTANA	160
7	ELKHORN	13,250
8	COMO-NORTH SHORE	170
9	WILLIAMS BAY	40
10	SOUTH SHORE	210
11	SPRINGFIELD	1,270
12	LAKE GENEVA	22,960
13	GENOA CITY	2,810
14	WHEATLAND	1,500
15	TWIN LAKES	2,300

NOTE: TRIPS ARE SHOWN IN PRODUCED-ATTRACTED FORMAT; THAT IS, FROM AREA OF PRODUCTION TO AREA OF ATTRACTION. TRAVEL BETWEEN SUBAREA ANALYSIS AREAS IS NOT DEPICTED UNLESS THERE WERE A MINIMUM OF 500 TRIPS FROM ONE ANALYSIS AREA TO ANOTHER.



Source: SEWRPC.

to and from McHenry County origins and destinations. It was noted that these trips represent only a portion of the total weekday travel between Rock County and Northeastern Illinois since much of this travel may be expected to use IH 90 and the Northwest Tollway, thus completely bypassing Walworth County.

Seasonal Increases in Travel

Consideration was given in the study to the affects of seasonal variations in existing travel patterns that may impact the potential demand for commuter service in the Walworth-Fox Lake corridor. Southern Walworth County has historically been, and continues to be, a popular recreational destination for visitors, many of whom are residents of Northeastern Illinois. Much of this recreational activity is focused on sailing and other boating activities as well as on traditional resort and country club activities such as golf and horseback riding. These activities are heavily concentrated in the months of June, July, and August, with Memorial Day and Labor Day distinctly signifying the beginning and end, respectively, of the summer season and attendant peak recreational travel to and from southern Walworth County.

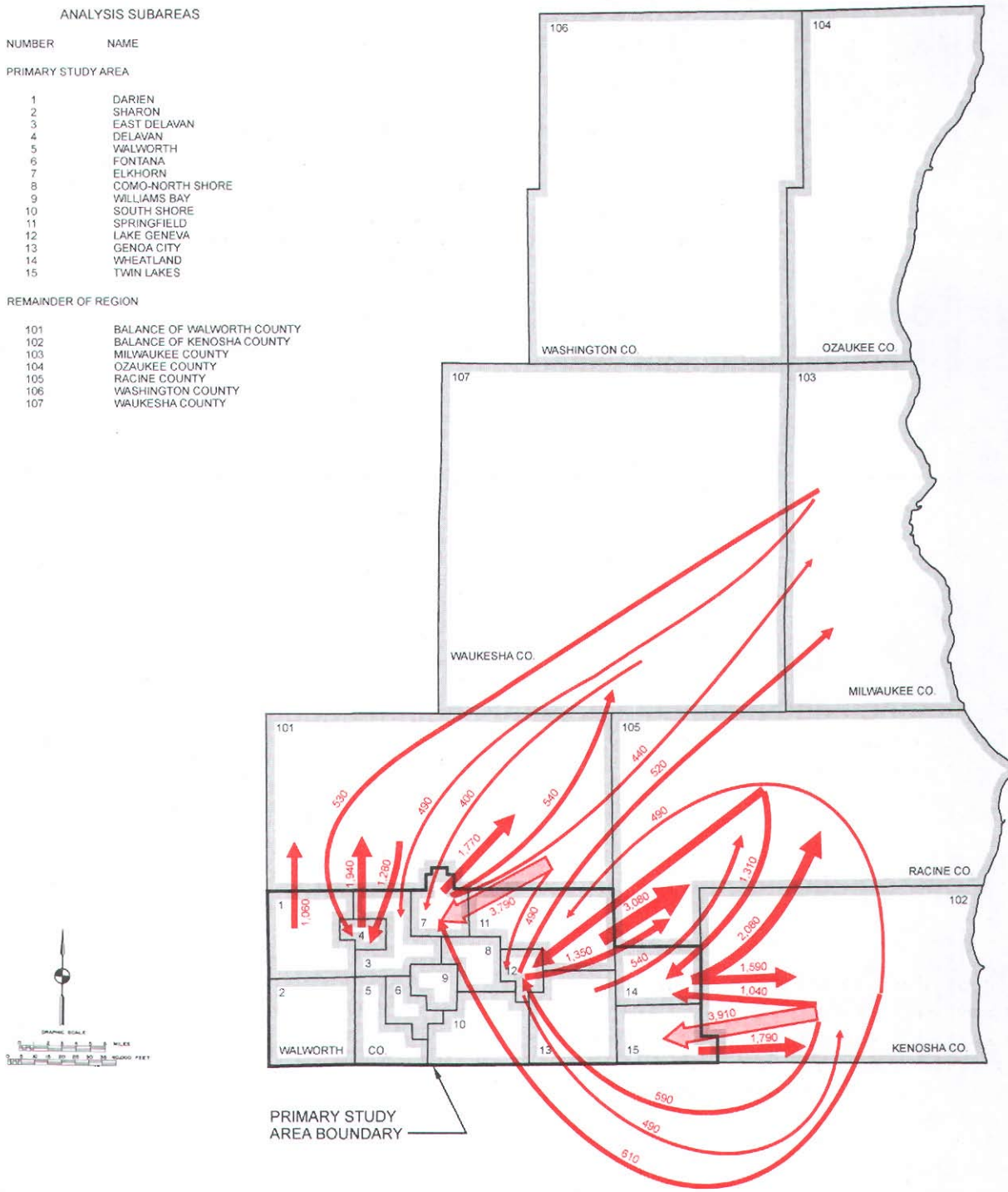
Detailed data concerning the nature of these summer season visitors has never been collected on a consistent and

Map 13

INTERCOUNTY AVERAGE WEEKDAY PERSON TRIPS BETWEEN SUBAREA ANALYSIS AREAS WITHIN THE PRIMARY STUDY AREA AND THE REMAINDER OF THE REGION: 1991

ANALYSIS SUBAREAS

NUMBER	NAME
PRIMARY STUDY AREA	
1	DARIEN
2	SHARON
3	EAST DELAVAN
4	DELAVAN
5	WALWORTH
6	FONTANA
7	ELKHORN
8	COMO-NORTH SHORE
9	WILLIAMS BAY
10	SOUTH SHORE
11	SPRINGFIELD
12	LAKE GENEVA
13	GENOA CITY
14	WHEATLAND
15	TWIN LAKES
REMAINDER OF REGION	
101	BALANCE OF WALWORTH COUNTY
102	BALANCE OF KENOSHA COUNTY
103	MILWAUKEE COUNTY
104	OZAUKEE COUNTY
105	RACINE COUNTY
106	WASHINGTON COUNTY
107	WAUKESHA COUNTY

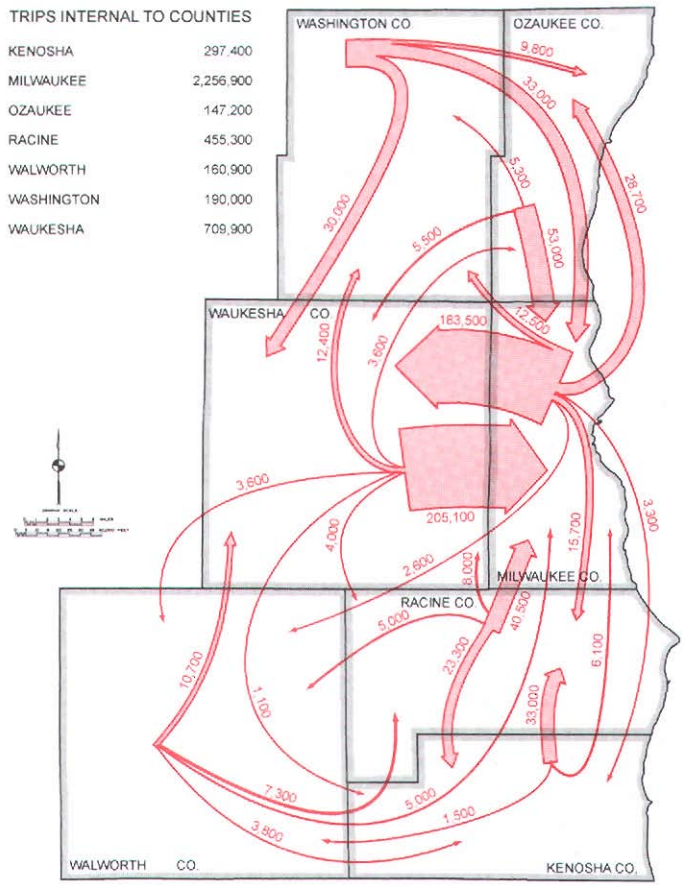


NOTE: TRIPS ARE SHOWN IN PRODUCED - ATTRACTED FORMAT. THAT IS, FROM AREA OF PRODUCTION TO AREA OF ATTRACTION. TRAVEL BETWEEN SUBAREA ANALYSIS AREAS IS NOT DEPICTED UNLESS THERE WERE A MINIMUM OF 400 TRIPS FROM ONE ANALYSIS AREA TO ANOTHER. APPROXIMATELY 32,800 OF THE NEARLY 43,600 INTERCOUNTY TOTAL PERSON TRIPS, OR ABOUT 75 PERCENT, ARE SHOWN HERE.

Source: SEWRPC.

Map 14

AVERAGE WEEKDAY PERSON TRIPS BETWEEN COUNTIES IN THE REGION: 1991



NOTE: TOTAL TRAVEL BETWEEN COUNTIES LESS THAN 1,000 TRIPS PER DAY NOT SHOWN.

TRIPS ARE BASED ON THE RESIDENT HOUSEHOLD SURVEYS AND INCLUDE TRIPS FOR ALL PURPOSES EXCEPT SCHOOL.

Source: SEWRPC.

reliable basis. The character of these visitors as a group may be expected to be transient and widely varied. Most of these visitors are destined for areas surrounding Geneva Lake and a lesser number are destined for areas surrounding other inland lakes in southern Walworth County including Lake Como, Delavan Lake, and Pell Lake. Many will visit these lake areas in southern Walworth County occasionally throughout the summer months, often for one or two days on a weekend. Those visitors traveling to the area for more than one day will usually arrive on Friday afternoon or evening, or on Saturday morning, and leave on Sunday afternoon or evening. Some may stay in the area from several days to a week or two, but this proportion of visitors may be expected to be a relatively small portion of the total. Some of these visitors own second homes or "summer homes" where they stay while visiting. These second homes may be used only on selected weekends, largely during the summer months. The proportion of these summer visitors who own or maintain second homes in southern Walworth County may be expected to comprise a small proportion of the total number of recreational visitors during the summer season.

It was concluded that the best estimate of the peak summer travel impact resulting from residents of Northeastern Illinois traveling to southern Walworth County could be estimated by examining traffic counts collected by the Wisconsin Department of Transportation, including monthly traffic counts conducted by the Department on USH 12 southeast of the STH 50 interchange and on STH 50 between Walworth County and IH 94. These traffic counters are located on primary routes for recreational traffic traveling from Northeastern Illinois to southern Walworth County. The traffic trends may be used as guidelines for estimating increases or decreases in potential commuter service ridership due to recreational travel between southern Walworth County and Northeastern Illinois.

Review of the traffic count data for 1996 indicated that traffic volumes definitely peak in the summer months and on weekends. For example, during June, the average weekday and average weekend traffic volumes exceeded the annual average daily traffic volume by 9 percent and 23 percent, respectively. During July, the average weekday and average weekend traffic volumes exceeded the annual average daily traffic volume by 24 percent and 44 percent, respectively. During August, the average weekday and average weekend traffic volumes exceeded the annual average daily traffic volume by 21 percent and 44 percent, respectively. During September, the average weekday and average weekend traffic volumes exceeded the annual average daily traffic volume by 9 percent and 14 percent, respectively. Data for the remaining months indicate that the average weekday and average weekend traffic volumes are near or below the average annual daily traffic volume. Traffic data for the months of May and October are less than 5 percent greater than average annual daily traffic volume.

SUMMARY

This chapter has presented information on pertinent existing and probable future characteristics of the primary study area which may affect, or may be affected by, the provision and use of commuter railway service, including population, employment, land use, and travel habits and patterns. The most important findings concerning these characteristics may be summarized as follows:

Table 6

DISTRIBUTION OF AVERAGE WEEKDAY PERSON TRIPS WITHIN THE PRIMARY STUDY AREA AND BETWEEN THE PRIMARY AND SECONDARY STUDY AREAS: 1991

	Area of Trip Attraction															
Area of Trip Production	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Primary Study Area Total
Primary Study Area																
1 Darien	2,720	120	320	1,850	190	240	190	0	0	0	0	0	0	0	0	5,630
2 Sharon	120	5,470	0	250	2,000	470	430	0	0	230	120	60	0	0	0	9,150
3 East Delavan	190	0	980	4,550	140	140	140	0	0	60	0	240	0	0	0	6,440
4 Delavan	1,850	280	2,000	22,430	390	140	3,250	170	270	0	740	1,370	0	0	0	32,890
5 Walworth	160	0	0	80	860	190	120	0	40	80	0	340	0	0	0	1,870
6 Fontana	80	0	150	50	280	160	150	0	80	190	0	170	0	0	0	1,310
7 Elkhorn	130	0	380	2,010	180	180	13,250	290	620	90	670	1,130	0	170	0	19,100
8 Como-North Shore	0	0	0	0	0	0	330	170	0	0	0	360	0	0	0	860
9 Williams Bay	0	0	0	210	120	0	80	0	40	0	0	140	0	0	120	710
10 South Shore	0	0	0	0	480	150	90	0	0	210	0	220	0	0	0	1,150
11 Springfield	0	0	0	460	0	0	1,250	300	0	0	1,270	1,690	320	70	120	5,480
12 Lake Geneva	130	80	300	650	0	540	2,220	1,120	470	690	3,450	22,960	630	150	160	33,550
13 Genoa City	0	0	0	0	170	0	330	0	60	150	70	500	2,810	210	1,450	5,750
14 Wheatland	0	0	0	0	0	0	50	0	0	0	0	170	0	1,500	510	2,230
15 Twin Lakes	0	0	0	0	0	0	0	0	0	80	30	120	0	180	2,300	2,710
Total	5,380	5,950	4,130	32,540	4,810	2,210	21,880	2,050	1,580	1,780	6,350	29,470	3,760	2,280	4,660	128,830
Secondary Study Area																
16 Hebron	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	--
17 Richmond	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	--
18 Spring Grove	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	--
19 Antioch	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	--
20 Fox Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	--
21 Grayslake	0	0	20	10	10	0	10	10	0	0	0	100	10	80	290	--
22 Gurnee	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	--
23 Wauconda	0	0	0	0	0	0	10	10	0	0	0	10	0	0	10	--
24 Libertyville	0	0	0	10	0	10	10	40	10	0	0	10	10	0	50	--
25 Lake Forest	0	0	10	0	0	0	0	0	0	0	0	0	10	0	40	--
26 Deerfield	0	10	20	0	0	20	10	0	20	0	0	50	0	0	50	--
27 Northbrook	0	0	20	0	0	10	10	0	10	0	10	60	10	30	80	--
28 Morton Grove	0	0	10	0	0	0	20	0	10	10	0	80	30	10	70	--
29 Chicago – Northwest	10	0	30	40	10	50	60	60	30	20	30	140	50	50	220	--
30 Chicago – CBD	10	0	30	30	20	40	30	30	40	30	10	160	60	20	240	--
Total	20	10	140	90	40	130	160	150	120	60	50	610	180	190	1,140	--
Corridor Total	5,400	5,960	4,270	32,630	4,850	2,340	22,040	2,200	1,700	1,840	6,400	30,080	3,940	2,470	5,800	--

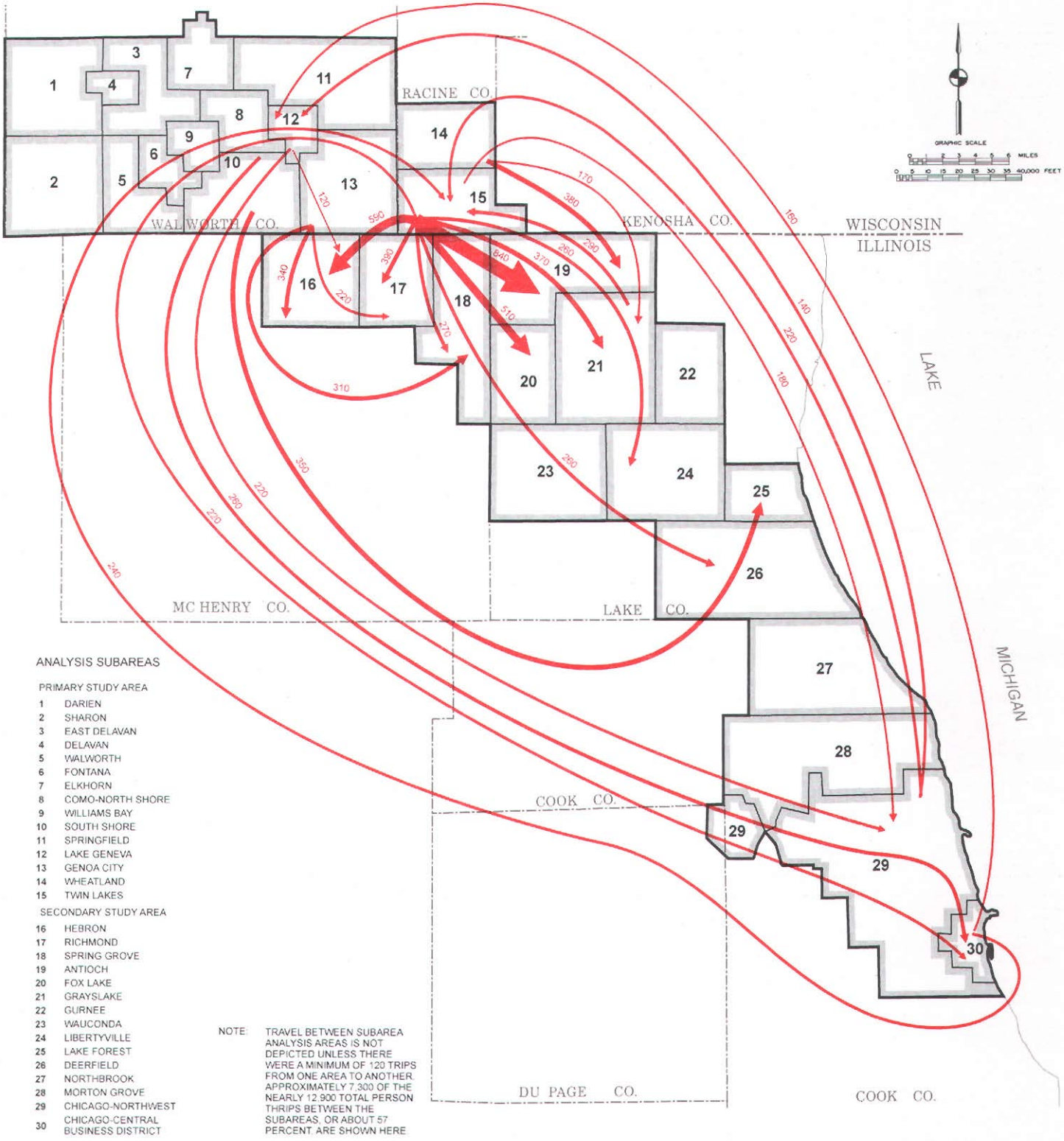
	Area of Trip Attraction																
Area of Trip Production	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Secondary Study Area Total	Corridor Total
Primary Study Area																	
1 Darien	10	10	0	0	0	10	0	0	0	0	0	0	0	0	0	30	5,660
2 Sharon	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	20	9,170
3 East Delavan	10	10	10	10	0	0	0	0	0	0	0	10	10	50	60	170	6,610
4 Delavan	20	10	40	30	10	40	10	10	0	0	0	10	30	30	40	280	33,170
5 Walworth	20	10	20	10	10	0	0	0	0	0	10	0	10	0	10	100	1,970
6 Fontana	30	20	0	0	0	10	0	0	0	0	20	10	10	70	80	250	1,560
7 Elkhorn	30	20	30	10	0	10	20	20	0	0	10	20	0	50	30	250	19,350
8 Como-North Shore	20	10	10	20	10	10	10	0	0	0	10	10	20	60	80	270	1,130
9 Williams Bay	10	10	0	0	10	10	0	20	0	0	20	30	10	60	70	250	960
10 South Shore	50	30	10	0	0	0	0	20	10	350	10	10	10	30	40	570	1,720
11 Springfield	40	30	60	20	0	20	30	0	10	10	10	0	10	0	0	240	5,720
12 Lake Geneva	120	80	100	40	20	40	20	30	0	0	10	40	60	220	260	1,040	34,590
13 Genoa City	340	220	310	60	30	40	0	70	40	0	40	30	20	50	50	1,300	7,050
14 Wheatland	50	30	50	380	50	170	20	0	70	0	10	30	10	10	10	890	3,120
15 Twin Lakes	590	390	270	840	510	370	0	40	260	10	260	100	70	190	220	4,120	6,830
Total	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Secondary Study Area																	
16 Hebron																0	0
17 Richmond																0	0
18 Spring Grove																40	40
19 Antioch																50	50
20 Fox Lake																0	0
21 Grayslake																540	540
22 Gurnee																0	0
23 Wauconda																40	40
24 Libertyville																150	150
25 Lake Forest																60	60
26 Deerfield																180	180
27 Northbrook																240	240
28 Morton Grove																240	240
29 Chicago – Northwest																800	800
30 Chicago – CBD																750	750
Total	1,350	890	910	1,420	650	730	110	210	390	370	410	300	270	820	950	12,900	--
Corridor Total	1,350	890	910	1,420	650	730	110	210	390	370	410	300	270	820	950	--	141,700

NOTE: Trips are shown in produced-attracted format; that is, from the area of production to the areas of attraction. Shaded cells indicate trips made entirely within an individual subarea analysis area.

Source: SEWRPC.

Map 15

AVERAGE WEEKDAY PERSON TRIPS PRODUCED WITHIN THE STUDY AREA ANALYSIS AREAS AND ATTRACTED TO STUDY AREA ANALYSIS AREAS: 1991



Source: SEWRPC.

1. In 1990, the resident population of the primary study area totaled about 55,600 persons. The resident population within the primary study area is anticipated to increase to about 73,800 persons by 2020, or by about 33 percent;

2. In 1990, the number of households in the primary study area totaled about 21,300. The number of households in the primary study area is anticipated to increase to about 30,700 households by 2020, or by about 44 percent;

3. In 1990, employment in the primary study area stood at about 29,300 jobs. The number of jobs in the primary study area is anticipated to increase to about 43,900 jobs by 2020, or by about 50 percent;

4. Based upon travel surveys undertaken by the Commission, about 128,800 person trips were made on an average weekday in 1991 within the primary study area. Of those trips, about 77,100 trips were made entirely within the individual subarea analysis areas, and about 51,700 trips were made between subarea analysis areas. About 12,900 person trips crossed the Wisconsin-Illinois State line between the primary study area and the secondary study area on an average weekday in 1991;

5. A significant seasonal increase in travel between Northeastern Illinois and southern Walworth County occurs during the summer months of June, July, and August. Highway traffic count data indicate that average weekday traffic volumes during these months may exceed annual average daily volumes by up to 24 percent on weekdays and 44 percent on weekends.

(This page intentionally left blank)

Chapter III

EXISTING TRANSPORTATION SERVICES AND FACILITIES

INTRODUCTION

This chapter describes the existing transportation services and facilities within the Walworth-Fox Lake Corridor. The first section of this chapter provides a description of existing commuter rail and bus transportation services in the corridor. Commuter rail services include the existing Metra commuter rail service between Fox Lake and Chicago, and other nearby Metra commuter rail routes. A description of existing public bus transportation services within the corridor is also provided, although these services are limited and primarily consist of local bus routes that serve as feeders to commuter rail routes.

The second section of this chapter provides a description of the existing railway facilities in the corridor with emphasis on the facilities of the Wisconsin & Southern Fox Lake Subdivision between Walworth and Fox Lake. The description includes information on trackage, bridges, stations, and signals. The existing condition and current utilization of the facilities is also described. The third section of this chapter describes the existing arterial street and highway system within the corridor.

For purposes of this inventory of existing transportation facilities and services, it is important to distinguish the Walworth-Fox Lake Corridor from the primary and secondary study areas that were identified in Chapter I of this report. In order to analyze the necessary socio-economic and travel data for use in preparing ridership projections, the primary and secondary study areas for this study were delineated based on city, village, town, and county limits, the Wisconsin-Illinois State line, and planning analysis area boundaries already established by planning agencies both in Wisconsin and Illinois. Since any potential commuter service between Walworth and Fox Lake would most likely be an extension of existing commuter service into Chicago, it was necessary for the secondary study area to extend as far as the Chicago central business district. The actual Walworth-Fox Lake Corridor, however, may be thought of as including the area served by the extension of commuter service and including all of the primary study area between the Village of Walworth and the State line, and that part of the secondary study area between the State line and the City of Fox Lake, Illinois, as shown on Map 16. This map also shows the existing Metra commuter rail routes in or near the corridor.

EXISTING RAILWAY AND BUS PASSENGER TRANSPORTATION SERVICES IN THE CORRIDOR

Existing Commuter Rail Service

As of January 2001, there was one existing commuter rail route operating within the Walworth-Fox Lake Corridor. This was the Milwaukee District North Line of Metra, operated between the City of Fox Lake and Chicago Union Station. The Milwaukee District name refers to the Chicago, Milwaukee, St. Paul & Pacific Railroad Company—or the "Milwaukee Road"—which operated this commuter rail service prior to Metra. Commuter service in the Walworth-Fox Lake Corridor would likely constitute either an extension of, or a connection to, this existing Metra service. A description of this service is provided following a brief history of passenger train service in the Corridor.

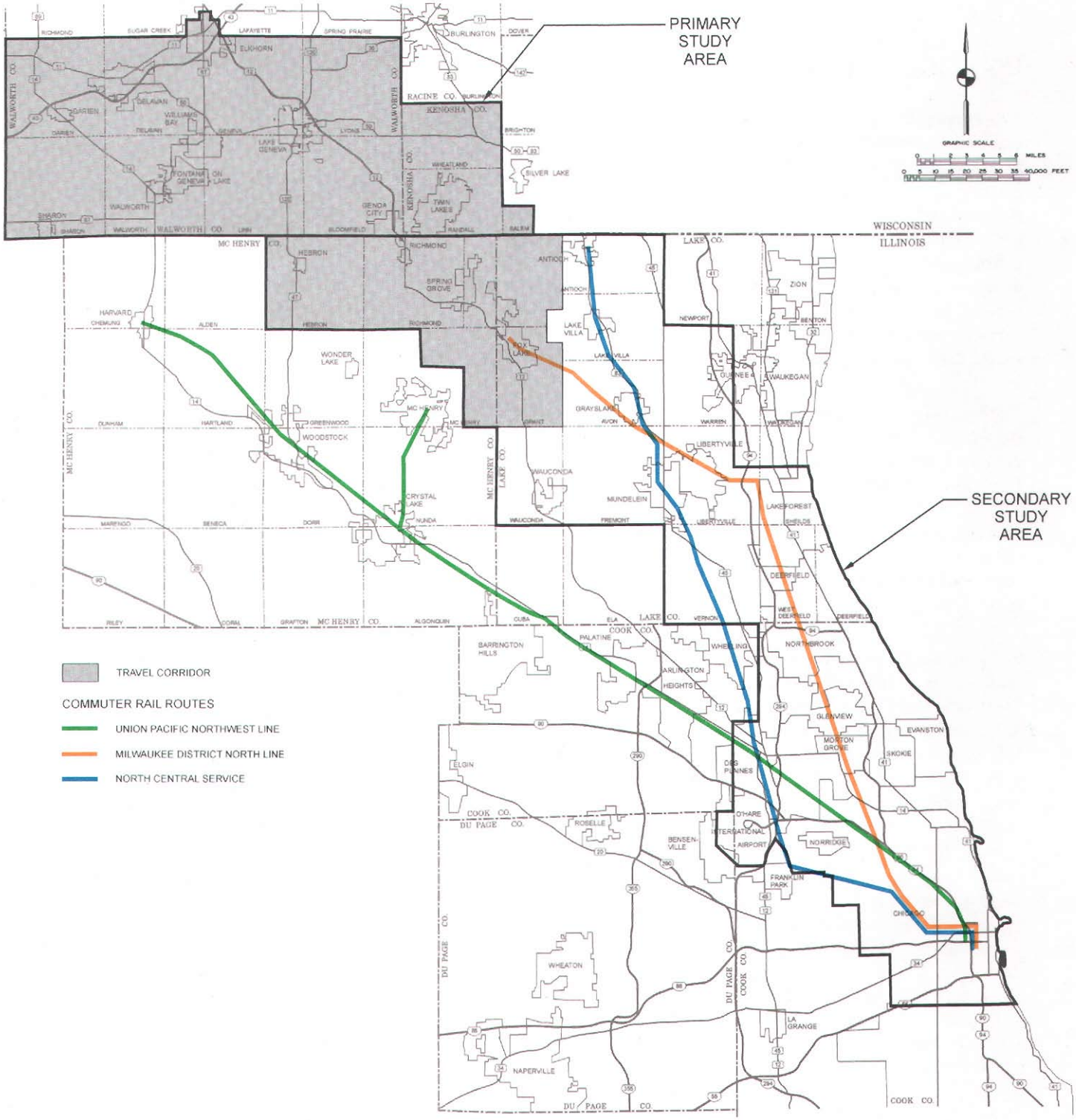
Historic Perspective

Historically, most passenger train service in the Walworth-Fox Lake Corridor has been oriented toward serving residential and recreational travel to and from the recreational areas centered on Geneva Lake in Walworth County. Until May 1971, when Amtrak assumed the operation of most remaining intercity passenger train service in the United States, private railway companies—including electric interurban railway companies—were responsible for operating virtually all commuter and long-distance passenger trains. Through most of the twentieth century, passenger train service in the Walworth-Fox Lake Corridor was provided by two private railway companies. The first of these was the Chicago & North Western Railway Company (CNW), now part of the Union Pacific Railroad. The second was the Chicago, Milwaukee, St. Paul & Pacific Railroad Company (better known as the Milwaukee Road), now part of the Canadian Pacific Railway. Both of these carriers operated commuter train services between Chicago and the Geneva Lake area. In addition, there was a short electric interurban railway that operated in the western portion of the corridor.

The CNW operated commuter train service from Chicago directly to the Geneva Lake area and historically was the more popular of the two major rail passenger routes serving the area. This service operated as part of the CNW Northwest Line from Chicago to Harvard, Illinois, now

Map 16

WALWORTH-FOX LAKE TRAVEL CORRIDOR AND METRA COMMUTER RAIL ROUTES IN OR NEAR THE CORRIDOR: 1997



NOTE: DUE TO MAP SCALE LIMITATIONS, ONLY SELECTED CIVIL DIVISIONS ARE SHOWN FOR LAKE, MC HENRY, AND COOK COUNTY, ILLINOIS.

Source: SEWRPC.

known as Metra's Union Pacific Northwest Line. The Lake Geneva service operated over the CNW Chicago-Janesville-Madison mainline from its downtown Chicago passenger terminal as far as suburban Crystal Lake, a distance of 42.5 miles. At Crystal Lake, where most commuter trains continued on the mainline to Harvard, Lake Geneva trains turned north and followed a branch line through the Illinois communities of McHenry, Ringwood, and Richmond; and through the Wisconsin communities of Genoa City, Pell Lake, Lake Geneva, and Lake Como to Williams Bay, another 34.6 miles.

Chicago-based commuter train service was operated on this line virtually since construction was completed to Lake Geneva in 1871 and to Williams Bay in 1888.[1] Daily year-round passenger service on the CNW Lake Geneva and Williams Bay route, however, was always limited to no more than a few trains in each direction, far fewer than were operated on most other Chicago area commuter rail routes. At least since the 1930s, regular year-round service between Chicago and Williams Bay consisted of two trains in each direction on weekdays and Saturdays, and one train in each direction on Sundays and holidays. This frequency essentially remained unchanged until service was discontinued north of the Wisconsin-Illinois State line in 1975. Until the 1950s, the basic service was supplemented by additional trains during the summer season. For example, during the 1930s, one extra train on Saturdays and two extra trains on Sundays would be operated in each direction. Because this was a stub-end branch, no other through intercity passenger trains provided service over the line.

Like the CNW, the Milwaukee Road also operated limited commuter rail service to the Geneva Lake area through the Village of Walworth. This service was operated as part of Milwaukee Road North Line from Chicago to Fox Lake, Illinois, now known as Metra's Milwaukee District North Line. The North Line operated over the Milwaukee Road Chicago-Janesville-Madison mainline, originating at Chicago Union Station, and extending 49.5 miles to Fox Lake. At Fox Lake, where most commuter trains originated or terminated, some trains continued another 24 miles through the Illinois communities of Spring Grove and Solon Mills; to the Wisconsin communities of Zenda and Walworth.

Chicago-based commuter train service was operated on this line almost since the line was completed in 1900. Commuter train service beyond Fox Lake, however, was always limited to no more than a few trains a day, far fewer than were operated on most other Chicago area commuter rail routes. At least since the 1950s, service beyond Fox Lake to Walworth consisted of one train a day in each direction. This frequency essentially remained unchanged until the service was discontinued west of Fox Lake in 1982. In 1974, Saturday, Sunday, and holiday service was eliminated. Until 1971, passengers using the Walworth station could also utilize several intercity passenger trains operated by the Milwaukee Road between Chicago and Madison, Wisconsin. While these trains were not intended for commuters, some of their schedules could be used to conduct daytime business in downtown Chicago since all of these trains stopped at Walworth. During the 1960s, the Milwaukee Road gradually reduced its intercity passenger train service. On May 1, 1971, the National Railroad Passenger Corporation, a quasi-public corporation known as Amtrak, assumed operation of most remaining passenger train services in the United States. At that time the remaining passenger trains operated between Chicago and Madison through Fox Lake and Walworth were discontinued.

During the 1950s and 1960s, several railways that operated commuter trains in the Chicago area—including both the CNW and Milwaukee Road—challenged the then commonly prevailing opinions that railway passenger train service, and especially commuter rail service, was unprofitable. Unlike commuter rail operations elsewhere in the United States, these Chicago based carriers re-equipped and marketed the commuter train services and even managed to earn a small profit on the commuter services for several years. By the late 1970s, however, virtually all commuter rail operations in the Chicago area and in the rest of the United States were operating at a loss and had been transferred from private operation to public operation requiring subsidy. In spite of the investment of the railroad companies in modernizing these services, passengers continued to steadily convert to use of the private automobile, with an attendant decline in railway use. Factors that contributed to this decline included: the decreased cost of operating the private automobile, the convenience of the private automobile; general postwar economic prosperity; and public investment in improved highways, including the development of freeway facilities. This shift away from a historic emphasis on passenger train operation in the planning area was, at the time, shared by most other private railway companies in the United States. Commuter operations at less patronized stations at the far ends of routes—such as Williams Bay, Lake Geneva, and Walworth—were particularly affected since, being located at the end of the route, their boardings were relatively few to begin with.

Eventually, all commuter rail services in the United States were provided either directly by a public operator or under contract between a public authority and a private operator. For those services for which no willing public

[1] *From Richmond to Lake Geneva, the line was constructed on the alignment of a very early railway reported to be opened in 1856, but abandoned by 1860.*

operator providing the necessary financial support could be found, discontinuance was the end result. As the Regional Transportation Authority of Northeastern Illinois undertook the responsibility of coordinating and financially assisting the continuation and improvement of commuter rail services throughout the Chicago metropolitan area during the 1970s, it was required to directly support only those services within its six-county service area. During this time financial assistance did not appear to be forthcoming from any State or local sources for the Geneva Lake and Walworth trains operating in Wisconsin. As a result, commuter train service was discontinued from Lake Geneva to Richmond, Illinois, in 1975. Commuter train service beyond Lake Geneva to Williams Bay had already been discontinued by the CNW in 1965 through the normal abandonment process. Commuter train service beyond Fox Lake to Walworth was discontinued by the Trustee for the Milwaukee Road in 1982 while the railroad was in reorganization.

Discontinuance of passenger train service into Lake Geneva was controversial at the time. Various local officials, groups, and individuals—especially the Lake Geneva Area Joint Transit Commission—made significant efforts to preserve the passenger train service concerned, and later to restore the service. These efforts included consideration of maintaining and upgrading the existing service, restoring commuter train service after it had been discontinued, and consideration of a tourist train operation over the route. None of these attempts were successful. In January 1979, the Wisconsin Department of Transportation completed a special study, the purpose of which was to analyze various alternatives for commuter service in the corridor.[2]

The electric interurban railway that operated in the Geneva Lake area was the Chicago, Harvard, & Geneva Lake Railway Company. Unlike many of the well-engineered, high-speed, electric interurban railways that once operated in the Midwest, this operation consisted of a basic 11-mile-long side-of-the-road "country trolley" that connected the communities of Harvard with Big Foot on the Wisconsin-Illinois State line and with Walworth and Fontana in Wisconsin. The line functioned primarily as a means for resort-bound passengers to travel to the western end of Geneva Lake from steam passenger train service connections at Harvard and Walworth. The line opened in 1899. Passenger service was discontinued in 1930 and the line abandoned in 1932.

These historic commuter rail passenger train services in the Geneva Lake area are shown on Map 17. Recognition that a significant level of railway passenger train service was once provided in the Walworth-Fox Lake Corridor is important. This history has provided one basis on which individuals, public officials, and organized groups have proposed the re-institution of railway passenger train service in the area.

Existing Metra Commuter Rail Service

In 2001, one existing commuter rail route extended into the Walworth-Fox Lake corridor. This service was provided by Metra over its Milwaukee District North Line, extending from Chicago Union Station to Fox Lake, a distance of 49.5 miles. The line is one of 12 commuter rail lines in the Metra system. Metra is the marketing name utilized by the commuter rail division of the Regional Transportation Authority of Northeastern Illinois. The 540 mile Metra commuter rail system serves about 230 stations within the Northeastern Illinois region, which includes the six Illinois counties of Cook, DuPage, Kane, Lake, McHenry, and Will. The Milwaukee District North Line is owned by Metra, having been purchased from the Chicago Milwaukee Corporation—formerly the parent company of the Milwaukee Road —in 1987. Significant portions of the Metra Milwaukee District North Line are shared with Canadian Pacific Railway mainline freight trains and Amtrak Hiawatha and Empire Builder intercity passenger trains operating between Chicago, Milwaukee, and St. Paul. Responsibility for dispatching train movements and maintenance along the Chicago-Fox Lake route remains with the Canadian Pacific Railway.

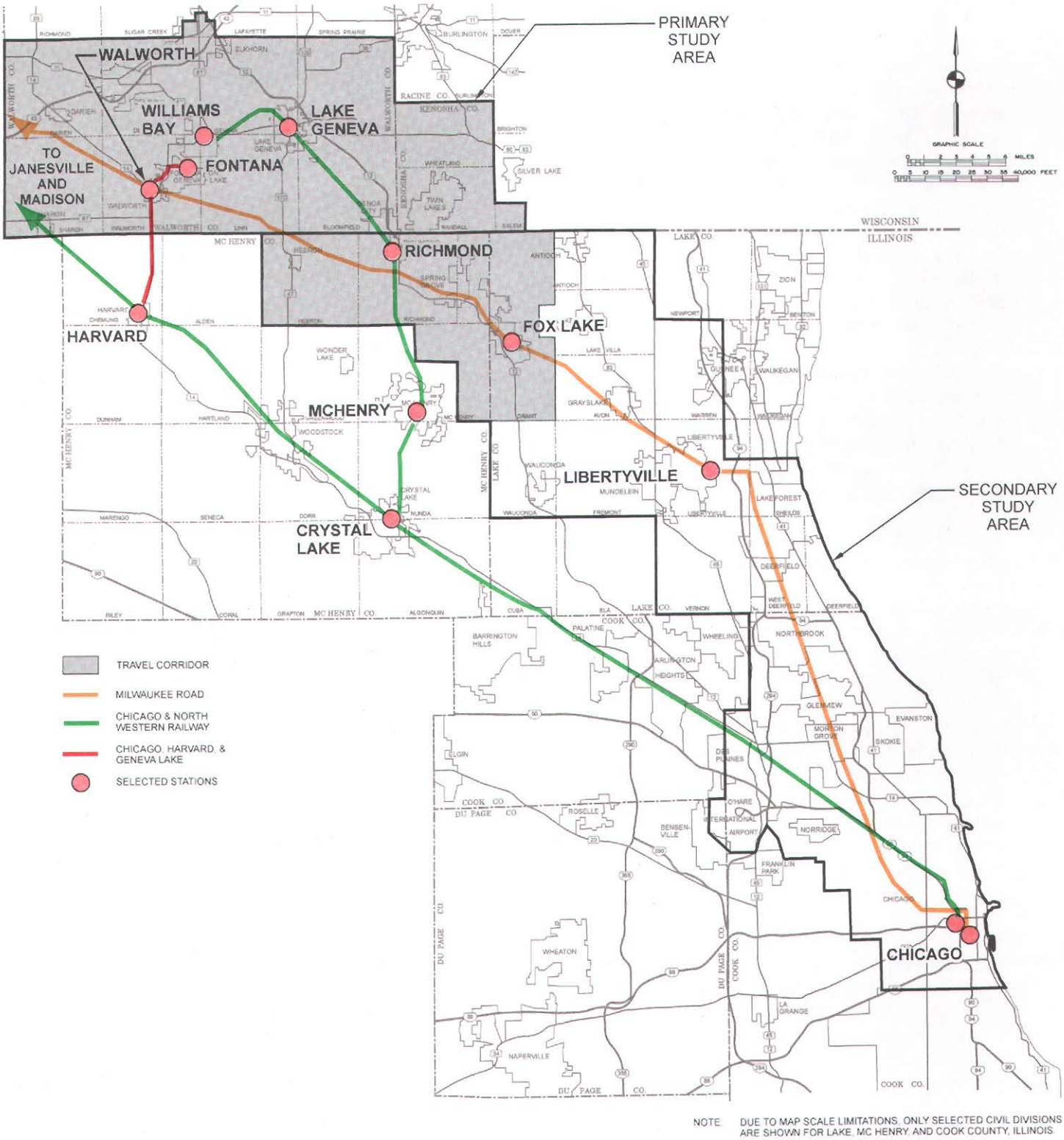
Commuter rail service on the Milwaukee District North Line is oriented toward serving passengers who reside along the route and work in the central business district of the City of Chicago. Much of the train service on this line originates and terminates at Fox Lake, which is the primary outlying terminal and overnight storage yard for equipment used on this route. As of January 2001, weekday service on this route consisted of 29 trains in each direction. There were 13 southbound trains during the weekday morning peak period. Two of these originated at Deerfield while the remaining 11 originated at Fox Lake. Nine of the 13 morning inbound trains—including one originating at Deerfield—were express trains which "skipped" some station stops on the way into Chicago. Of the 16 remaining southbound weekday trains, eight were operated during the midday period, four during the afternoon peak period, and four during the evening period. Four of the midday trains and one of the evening trains originated at Grayslake, and three of the afternoon peak trains and one evening train originated at Deerfield. All southbound midday, afternoon peak, and evening trains stopped at all stations.

---

[2] *See Southeastern Wisconsin Commuter Study:* A Summary of the Alternatives for Walworth County, *January 1979, Wisconsin Department of Transportation Division of Planning.*

Map 17

FORMER PASSENGER TRAIN ROUTES SERVING THE WALWORTH-FOX LAKE-CHICAGO CORRIDOR



NOTE: DUE TO MAP SCALE LIMITATIONS, ONLY SELECTED CIVIL DIVISIONS ARE SHOWN FOR LAKE, MC HENRY, AND COOK COUNTY, ILLINOIS.

Source: SEWRPC.

Northbound trains reflected a pattern similar to that of the southbound trains, but in the opposite direction. There were 12 northbound trains during the weekday afternoon peak period. Four of these terminated at Deerfield, one at Grayslake, and the remaining seven terminated at Fox Lake. Seven of the 12 afternoon outbound trains—including one of the Deerfield trains and the Grayslake train—were express trains which "skipped" some station stops. Of the 17 remaining northbound weekday trains, four were operated during the morning peak period, eight during the midday period, and five during the evening period. Three of these midday trains terminated at Grayslake, and three of the morning peak period trains terminated short of Fox Lake, one each at Deerfield, Lake Forest, and Grayslake. All southbound midday and evening trains, and three of the morning peak period trains, stopped at all stations. The remaining one morning peak period train skipped some stops.

On Saturdays, there were 10 trains in each direction between Fox Lake and Chicago. One train in each direction operated only between Lake Forest and Chicago. On Sundays and major holidays, there were nine trains in each direction which operated the entire length of the route. All Saturday, Sunday and holiday trains stopped at all stations.

The length of trains on the Milwaukee District North Line varied, but peak-period peak-direction trains typically consisted of one locomotive and five to eight bi-level gallery coaches. Trains operating during other times and on weekends and holidays typically consisted of one locomotive and four to five bi-level gallery coaches, although all coaches may not be open for use.

In 2001, there were 21 passenger stations located along the 49.5 mile commuter rail route. Fox Lake and Ingleside—the first stop east of Fox Lake—were the only stations located within the Walworth-Fox Lake Corridor. The southbound travel times from Fox Lake to Chicago varied during weekday peak periods from 76 minutes for the fastest express trains at an average overall speed of 39 miles per hour, to 91 minutes for local trains at an average overall speed of 33 miles per hour. The travel time was typically 84 minutes during nonpeak travel periods. On weekends average operating speeds were 35 miles per hour. The northbound travel times from Chicago to Fox Lake also varied during weekday peak periods from 79 minutes for the fastest express trains, to 92 minutes for local trains, and was typically 84 minutes during nonpeak periods and on weekends.

Ridership on the Metra service provided over the Milwaukee District North Line has been substantial and compares favorably with other heavily used Metra routes. Between 1979 and 1983, average weekday ridership on the line decreased from about 19,310 to about 12,670, but from 1983 to 1999, average weekday ridership had increased to about 22,000 weekday passengers as shown in Table 7. In 1999, ridership was about 3,690 on an average Saturday and about 2,180 on an average Sunday. On an average weekday, about 16,400—or 75 percent—of all passengers were carried on peak-period peak-direction trains; about 1,550—or 7 percent—of all passengers were carried on peak-period reverse direction trains; about 2,050—or 10 percent—of all passengers were carried on midday trains; and about 1,490—or 7 percent—were carried on evening trains. During 1999, about 6,452,000 annual passenger trips were carried on this Metra line, or about 113,300 during an average week. The average passenger trip length for all trips was 24.4 miles on the 49.5 mile route.

Table 7

TOTAL WEEKDAY PASSENGER BOARDINGS ON METRA'S MILWAUKEE DISTRICT NORTH LINE: 1979-1999

Year	Weekday Boardings
1979	19,311
1983	12,670
1985	14,389
1987	15,337
1989	16,287
1991	17,452
1993	19,306
1995	19,914
1997	20,031
1999	22,034

Source: Metra.

Ridership information specific to the Fox Lake station is also available for selected years from surveys conducted about every two years by Metra. While passenger boardings and alightings at any Metra station will vary from day to day, the counts resulting from the surveys are considered to be representative of weekday passenger activity at individual stations. As shown in Table 8, between 1979 and 1999, weekday boardings and alightings at Fox Lake have varied from a low of 405 to a high of 678. In 1999, there were 547 southbound passengers boarding at Fox Lake. These consisted of 469 boardings on the morning peak period trains; 54 boardings on the midday trains; 11 boardings on the evening peak period trains; and 13 boardings on the evening trains. In 1999, there were 564 northbound passengers alighting at Fox Lake: These consisted of 13 on morning peak period trains; 92 on midday trains; 400 on the evening peak period trains; and 59 on evening trains. For comparison purposes, the 1999

Table 8

WEEKDAY PASSENGER BOARDINGS AND ALIGHTINGS AT THE FOX LAKE STATION ON METRA'S MILWAUKEE DISTRICT NORTH LINE: 1979-1999

Year	Weekday Boardings	Weekday Alighting
1979	675	678
1983	405	428
1985	457	450
1987	445	455
1989	495	479
1991	433	429
1993	443	435
1995	500	487
1997	558	551
1999	547	564

Source: Metra.

Table 9

WEEKDAY PASSENGER BOARDINGS AND ALIGHTINGS AT STATIONS ALONG METRA'S MILWAUKEE DISTRICT NORTH LINE: 1999

Station	Weekday Boardings	Weekday Alightings
Fox Lake	547	564
Ingleside	75	71
Long Lake	83	83
Round Lake	534	517
Grayslake	827	844
Libertyville	1,118	1,130
Lake Forest	717	753
Deerfield	1,279	1,211
Lake Cook Road	1,128	1,149
Northbrook	1,505	1,477
Glenview	1,046	1,571
Golf	326	291
Morton Grove	989	991
Edgebrook	578	585
Forest Glen	320	288
Mayfair	239	227
Grayland	263	262
Healy	272	262
Western Avenue	288	515
Chicago Union Station	9,300	9,243
Total	22,034	22,034

Source: Metra.

weekday boardings and alightings for all stations on the Metra Milwaukee District North Line including Fox Lake are shown in Table 9.

Over the years, changes to the commuter rail service between Fox Lake and Chicago have been relatively minor, consisting largely of adjustments to schedules to better serve passengers and better integrate commuter train operations with those of Amtrak passenger trains and Canadian Pacific freight trains. As already noted, the single pair of weekday trains that once operated beyond Fox Lake to Walworth was discontinued in 1982. In 1984, two stops between Fox Lake and Chicago were discontinued because of low utilization. These were Wilson Road—located between the stations at Ingleside and Long Lake—and Rondout —located between Libertyville and Lake Forest. In 1996, a new station and park-ride lot was opened at Lake Cook Road. In 2001, a new station and park-ride lot was opened at The Glen of North Glenview.

Existing Bus Transportation Services

In 2000, existing public bus transportation services within the Walworth-Fox Lake Corridor were limited to serving individuals with special needs, and individuals traveling to and from major airports. Specialized services within the southern Walworth County portion of the corridor were provided by the Walworth County Department of Human Services and by Vocational Industries, Inc. Both of these services were of a specialized nature primarily intended to provide transportation for the elderly and disabled. There were no specific routes for these services, advance reservations were necessary, and priority was given to trips made for nutritional, medical, and work purposes.

A variety of airport shuttle services were available. American Sightseeing Service, based in the Chicago area, operates scheduled bus service between the Cities of Delavan and Lake Geneva, major resorts in southern Walworth County, and O'Hare International Airport. Known as the Owl Service, two daily round trips were normally operated during the summer season and three round trips per week were normally operated during the nonsummer season. Van Galder Bus Company, based in Janesville, operated scheduled bus service between the Cities of Madison, Janesville, South Beloit, Rockford, and O'Hare International Airport. A limousine service, based in the Milwaukee area, operates an on-demand service between Walworth County and Milwaukee County's General Mitchell International Airport. This service uses vans, is known as the Airport Shuttle, and is available 24 hours a day. The Abbey resort also offers its own van service to and from Mitchell International and O'Hare International Airports which is available 24 hours a day.

At one time long-distance intercity motor coach carriers, such as Greyhound Lines and Wisconsin Coach Lines, and limousine services operated daily routes through southern Walworth County and between southern Walworth County, Chicago, and Chicago-O'Hare International Airport. The last of these was discontinued during the 1980s. Following the discontinuance of commuter train services in southern Walworth County, the operation of limited bus feeder service from Lake Geneva, Williams Bay, and Delavan to commuter rail stations at Richmond, McHenry, and Crystal Lake was attempted during the 1970s by the Geneva Lake Area Joint Transit Commission and others. These efforts, however, were short-lived. At its maximum extent, the basic level of service provided by these feeder routes consisted of one daily round trip between Delavan, Lake Geneva, and Richmond, and a second daily round trip between Lake Geneva and Crystal Lake. Daily ridership on these two feeder routes reportedly averaged a total of 15 passengers.

Pace is the marketing name utilized by the bus operating division of the Regional Transportation Authority of Northeastern Illinois. Pace provides municipal bus service within individual satellite cities in the six-county Northeastern Illinois Region as well as service between Chicago area suburbs. Pace bus routes and schedules are coordinated with Metra commuter rail routes and schedules and with rapid transit and bus routes and schedules operated by the Chicago Transit Authority. As of October 2000, local bus routes were operated by Pace within or near the Illinois portion of the corridor as shown on Map 18. These routes functioned largely as feeders to, and supplemental service for, Metra commuter rail routes. Pace supplemental bus operations also provided service along Metra routes that had limited or no train service during nonpeak periods. These supplemental services provided connecting buses between the Metra stations with limited service and stations on other Metra routes with more frequent service during nonpeak times.

EXISTING WALWORTH-FOX LAKE RAILWAY LINE

A potential new commuter rail route serving the Walworth-Fox Lake Corridor of the Southeastern Wisconsin Region would extend from the existing Metra passenger station in Fox Lake to the Village of Walworth at the west end of Geneva Lake. The 24.0-mile long route would utilize trackage owned and operated by Metra for a distance of 0.3 mile between the Fox Lake passenger depot and the change of ownership near Milepost 49.8 west of Oak Street in the City of Fox Lake; and trackage owned by the Wisconsin River Rail Transit Commission (WRRTC) and operated by the Wisconsin & Southern Railroad Company (WSOR) for a distance of 23.7 miles between the change of ownership in Fox Lake and the Village of Walworth. The trackage owned by the WRRTC is located on right-of-way owned by the Transit Commission within Illinois, and on right-of-way owned by the Wisconsin Department of Transportation within Wisconsin.

Within Lake County, Illinois, the route passes through the City of Fox Lake and Grant Township. Within McHenry County, Illinois, the route passes through the Villages of Spring Grove and Richmond; and the Townships of Burton, Richmond, and Hebron. The route also passes through the unincorporated community of Solon Mills located in the Township of Richmond. Within Walworth County, the route passes through the Village of Walworth and the Towns of Linn and Walworth. The route also passes through the unincorporated community of Zenda located in the Town of Linn. As of October 2000, there were a total of six stations identified along this route as shown in Table 10. It should be noted that these *stations* are specific locations designated in the operating timetables of railway companies and are used in the dispatching and operation of trains. Such stations do not necessarily denote the existence of depot buildings or other facilities; and, in fact, are frequently marked only by signs. The Walworth-Fox Lake line is part of Wisconsin & Southern Railroad's freight mainline from Janesville to Chicago. For reference purposes, Table 10 also lists other selected station and railway junctions from Janesville to Chicago Union Station.

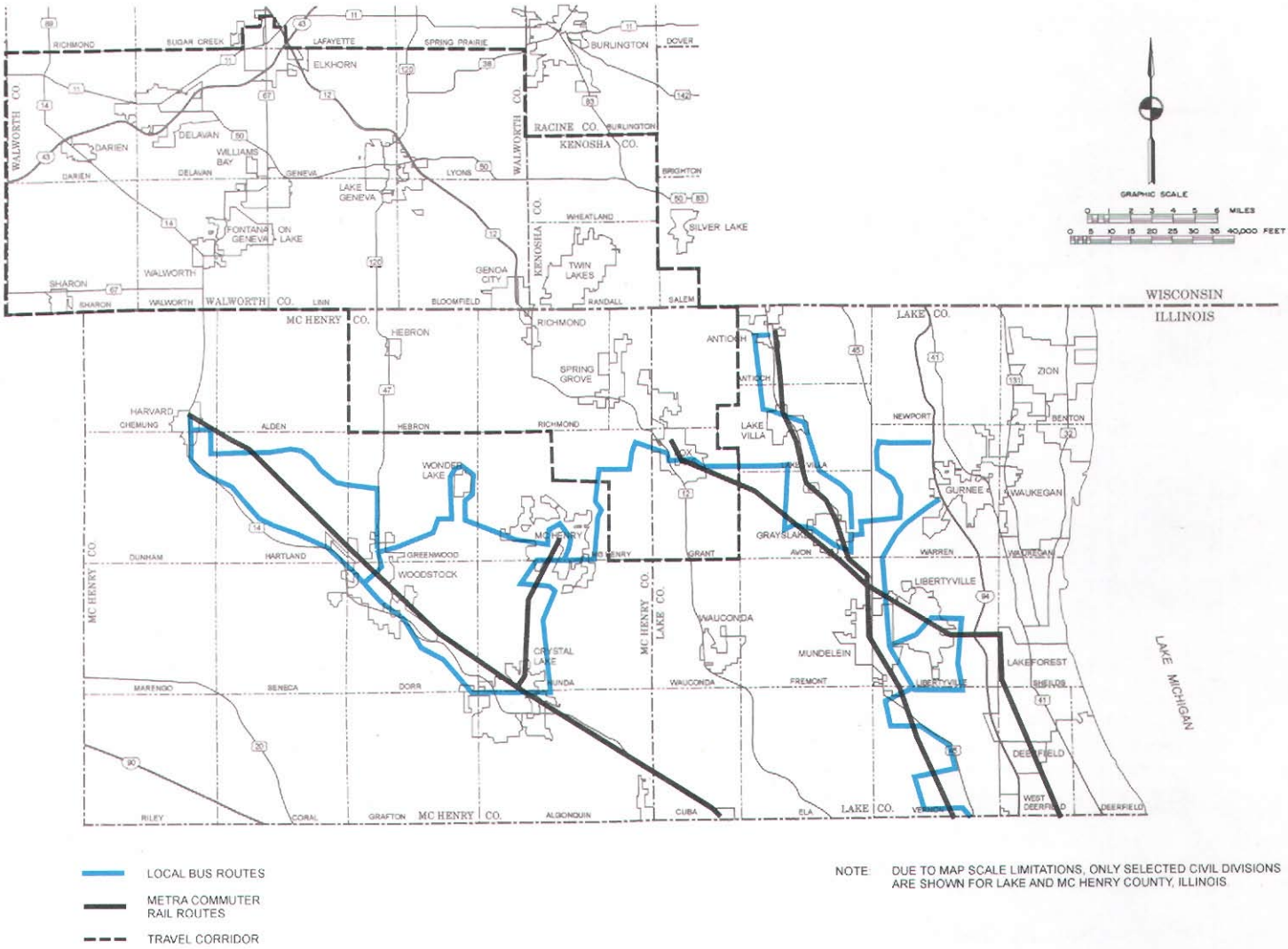
The potential Walworth-Fox Lake commuter rail route would be located along the Wisconsin & Southern Railroad Fox Lake Subdivision, a 107.5 mile long route extending from Janesville, Wisconsin to the Belt Railway of Chicago Clearing Yard on the southwest side of the City of Chicago. The segment considered under this study extends from Milepost 49.5 in Fox Lake to Milepost 73.5 in Walworth. On this line, mileposts are measured from Chicago Union Station. This, and other railway lines in the Walworth-Fox Lake-Chicago corridor, are shown on Map 19 by ownership and on Map 20 by operating subdivision.

Historic Perspective

For most of its historic existence, the Fox Lake Subdivision was operated by the Milwaukee Road as part of a passenger and freight mainline between Chicago and Madison. Constructed relatively late compared with other railway lines in the area, the line was extended northwest from Libertyville—originally the end of a three-mile branch from Rondout on the Milwaukee-Chicago mainline—as far as Walworth in 1900, and then to Janesville in 1901. Referred to as the "Janesville" or "J" Line, this line was intended as a faster, shorter, and less congested routing for trains operating between Chicago,

Map 18

LOCAL PACE BUS ROUTES IN OR NEAR THE WALWORTH-FOX LAKE TRAVEL CORRIDOR: 1997



Source: SEWRPC.

Janesville, and Madison which previously had to travel via Rockford or Milwaukee. The line handled significant train traffic and was maintained for high speed passenger train operation through the 1960s. The line was equipped with an Automatic Block Signal (ABS) system and crossings with other railway lines were also protected by signals.

On May 1, 1971, Amtrak assumed responsibility for all intercity passenger train operations previously operated by the Milwaukee Road and the remaining long-distance passenger trains operating between Chicago, Walworth, Janesville, and Madison were discontinued. During the 1970s, traffic and financial conditions began to change rapidly for the Milwaukee Road. As a result, the role of the "J" Line also began to change. Its physical condition mirrored the overall declining financial situation of the Milwaukee Road, resulting in regular maintenance on much of the Chicago-Janesville route being deferred. This was reflected in the reduction of maximum operating speeds on the Walworth-Fox Lake segment. For example, in 1967, the maximum operating speed for freight trains on this segment of line was 45 miles per hour; while the maximum operating speed for passenger and commuter trains was 75 miles per hour between Fox Lake and Solon Mills, and 65 miles per hour between Solon Mills and Walworth. By 1974, maximum operating speeds were 40 miles per hour for freight trains and 60 miles per hour for commuter trains. By 1977, the maximum operating speed for commuter trains remained at 60 miles per hour, but the maximum operating speed for freight trains was reduced to

Table 10

EXISTING RAILWAY STATIONS ON THE POTENTIAL FOX LAKE-WALWORTH COMMUTER RAIL ROUTE

Milepost	Station Name [a]	Distance (miles) From Chicago	Distance (miles) From Walworth
	Canadian Pacific C & M Subdivision		
0.0	Chicago Union Station	--	73.5
2.9	Tower A 2 -- Western Ave.	2.9	70.6
5.4	Tower A 5	5.4	68.1
8.2	Grayland	8.2	65.3
9.0	Mayfair	9.0	64.5
19.5	Shermer	19.5	54.0
32.3	Rondout	32.3	41.2
	Canadian Pacific Fox Lake Subdivision		
32.3	Rondout	32.3	41.2
39.9	Prairie Crossing	39.9	33.6
41.0	Grayslake	41.0	32.5
49.5	Fox Lake	49.5	24.0
	Wisconsin & Southern Fox Lake Subdivision		
49.5	Fox Lake	49.5	24.0
53.7	Spring Grove	53.7	19.8
55.8	Solon Mills	55.8	17.7
59.9	Belden	59.9	13.6
67.4	Zenda	67.4	6.1
73.5	Walworth	73.5	--
82.1	Bardwell	82.1	8.6
98.3	Janesville	98.3	24.8

[a] Stations are specific locations designated by operating timetables or engineering records and do not necessarily denote the existence of depot buildings or other facilities. Not all stations between Chicago Union Station and Fox Lake are shown.

Source: Wisconsin & Southern Railroad and Canadian Pacific Railway.

30 miles per hour. By 1981, the maximum operating speed for freight trains remained at 30 miles per hour, but the maximum operating speed for commuter trains was reduced to 50 miles per hour. Also by this time, operating speeds between Fox Lake and Janesville were further reduced along specific segments, with frequent use of "slow orders" restricting operating speeds to as low as 10 miles per hour.

In December 1977, the Milwaukee Road petitioned for reorganization under the Federal Bankruptcy Act. By November 1979, the Trustee for the Milwaukee Road had developed a reorganization plan, had begun to embargo many lines, and began undertaking an aggressive program of railway line abandonments and sale of excess property. Among the lines deemed surplus was the former mainline from Fox Lake to Janesville. Service on a portion of the line west of Walworth ceased during 1979, ending operation of the "J" Line as a through route by the Milwaukee Road. During the period from 1979 to 1983, any remaining freight service between Fox Lake and Janesville was discontinued and the entire line abandoned in segments by the Trustee. Abandonment of the Walworth-Fox Lake railway line segment was approved in November 1982, with freight service by the Milwaukee Road ending in January 1983.

During this period, efforts to preserve and restore freight service on many former Milwaukee Road lines were cooperatively undertaken by local communities and shippers, county-based transit commissions such as the Wisconsin River Rail Transit Commission, regional planning commissions, and the Wisconsin Department of Transportation. This was generally accomplished through public acquisition of selected former Milwaukee Road lines with resumption of service by a shortline railroad under contract to a transit commission. The Janesville-Walworth-Fox Lake line was considered important for such a railroad operator, providing service over the former Milwaukee Road lines in southern Wisconsin and a link to

connections with many major railroads in the Chicago area. Through freight service between Janesville and Chicago over the Walworth-Fox Lake segment was restored in early 1989 by the Wisconsin & Calumet Railroad Company, a shortline railroad acquired by the Wisconsin & Southern Railroad Company in 1992. The Wisconsin & Southern Railroad has aggressively sought to build freight traffic on its network of railway lines in southern Wisconsin and the Fox Lake Subdivision between Janesville, Walworth, Fox Lake, and Chicago is an important link to connecting railroads at Chicago.

Current and Anticipated Future Utilization

As of October 2000, regular freight service on the Walworth-Fox Lake segment was normally provided by one through freight operating in each direction between Janesville and Chicago. The two trains were operated over the Wisconsin & Southern trackage between Janesville and Fox Lake. East of Fox Lake, Metra trackage was used as far as Cragin, a station in the City of Chicago. Between Cragin and Clearing Yard in the City of Bedford Park on the southwest side of the Chicago area, Belt Railway of Chicago trackage was used. The trains are designated JC and CJ and are scheduled to operate seven days per week. They also provided service to any customers located along the line between Janesville and Fox Lake.

Operating times for Trains JC and CJ are based on two main considerations. First, they are intended to connect at Janesville with other Wisconsin & Southern freight trains. Janesville functions as a hub for the short line railroad operations on its Southern Division which consists of the former Wisconsin & Calumet Railroad lines. Other Wisconsin & Southern freight trains for Madison, Waukesha, Monroe, and Elkhorn originate and terminate there. Second, under an agreement between the Wisconsin & Southern and Metra for use of the Metra line between Fox Lake and Chicago, freight operations cannot conflict with commuter train operations east of Fox Lake. Accordingly, the freight trains are scheduled to operate on Metra lines at times other than during weekday peak periods. As of October 2000, Train JC was scheduled to depart Janesville after 6:00 p.m., while Train CJ was scheduled to depart the Belt Railway of Chicago Clearing Yard after 3:00 p.m. Upon departure, both trains use non-Metra freight-only trackage for some distance. As a result, the trains do not use Metra trackage until after 9:00 p.m., following the evening peak commuter train traffic; and before 4:00 a.m., prior to the morning peak commuter train traffic. Thus, these freight trains normally operate over the Walworth-Fox Lake segment during the early to mid-evening hours and early morning hours. Typically, the two freight trains meet at Spring Grove or Grayslake. While freight traffic varies based on seasonal and market conditions, on many occasions, the size of these two trains is at the maximum practical tonnage or length.

As noted above, Wisconsin & Southern is aggressively seeking new business. This may result in the need to operate additional freight trains over the Fox Lake Subdivision in the future. Railroad officials have indicated that traffic on this line may increase from the current level of one through freight in each direction seven days per week to two through freights in each direction seven days per week. In addition, it may be necessary to add a local freight train that would likely be based in Janesville and work east to Spring Grove and return on weekdays. In 2000, customers were located on the route at Walworth, Zenda, Belden, and Spring Grove. These increases in service may be expected to occur within the next three to seven years.

As already noted, commuter trains were operated from Chicago as far as Fox Lake as part of the Metra Milwaukee District North Line operations. At Fox Lake commuter trains were stored overnight in the nine-track yard located adjacent to the mainline and east of the passenger depot.

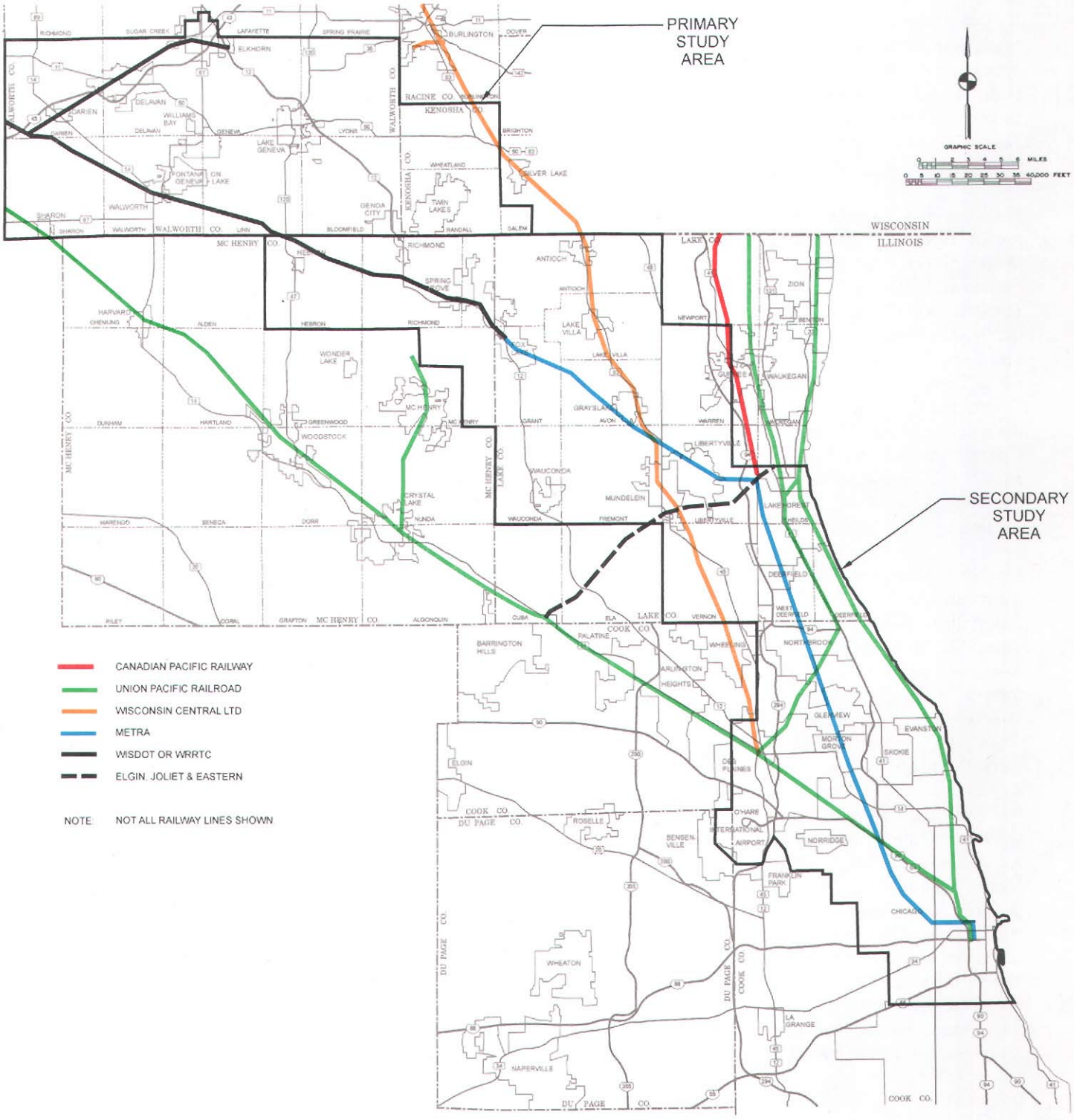
Traffic Control

Train operation authority along Wisconsin & Southern Fox Lake Subdivision is governed by Track Warrant Control (TWC). This is an essentially manual dispatching system whereby train crews obtain permission for train movements over specific segments of track from a dispatcher by radio. Dispatchers who govern train movements along this segment work out of the Wisconsin & Southern operations center located in Milwaukee. Track Warrant Control is typical for train operation over unsignaled segments of track and replaces the traditional written train order authority used by railways in the past. As the Trustee for the Milwaukee Road ceased freight service over the Janesville-Fox Lake route during the 1979 to 1983 period, the signal systems that were in place on the line were taken out of service and equipment and materials salvaged or scrapped. Wisconsin & Southern track warrant control authority extends to Milepost 50.0, just west of the Fox Lake station.

Train operations on Metra trackage along the entire Milwaukee District North Line are controlled by the Canadian Pacific Railway, formerly the Soo Line Railroad Company, and before that, the Milwaukee Road. The Fox Lake to Rondout segment of the Metra Milwaukee District North Line is operated as the Canadian Pacific Fox Lake Subdivision. Dispatchers governing train movements along this segment work out of the Canadian Pacific dispatching center located in Minneapolis, Minnesota. Commuter passenger trains are operated by timetable authority and train spacing is protected by an Automatic Block Signal system (ABS) extending from Rondout to Milepost 49.4, just east of the Fox Lake depot. Yard limits along the Fox Lake Subdivision in the City of Fox Lake area extend from Milepost 48.0 to 50.0. Eastward Wisconsin & Southern

Map 19

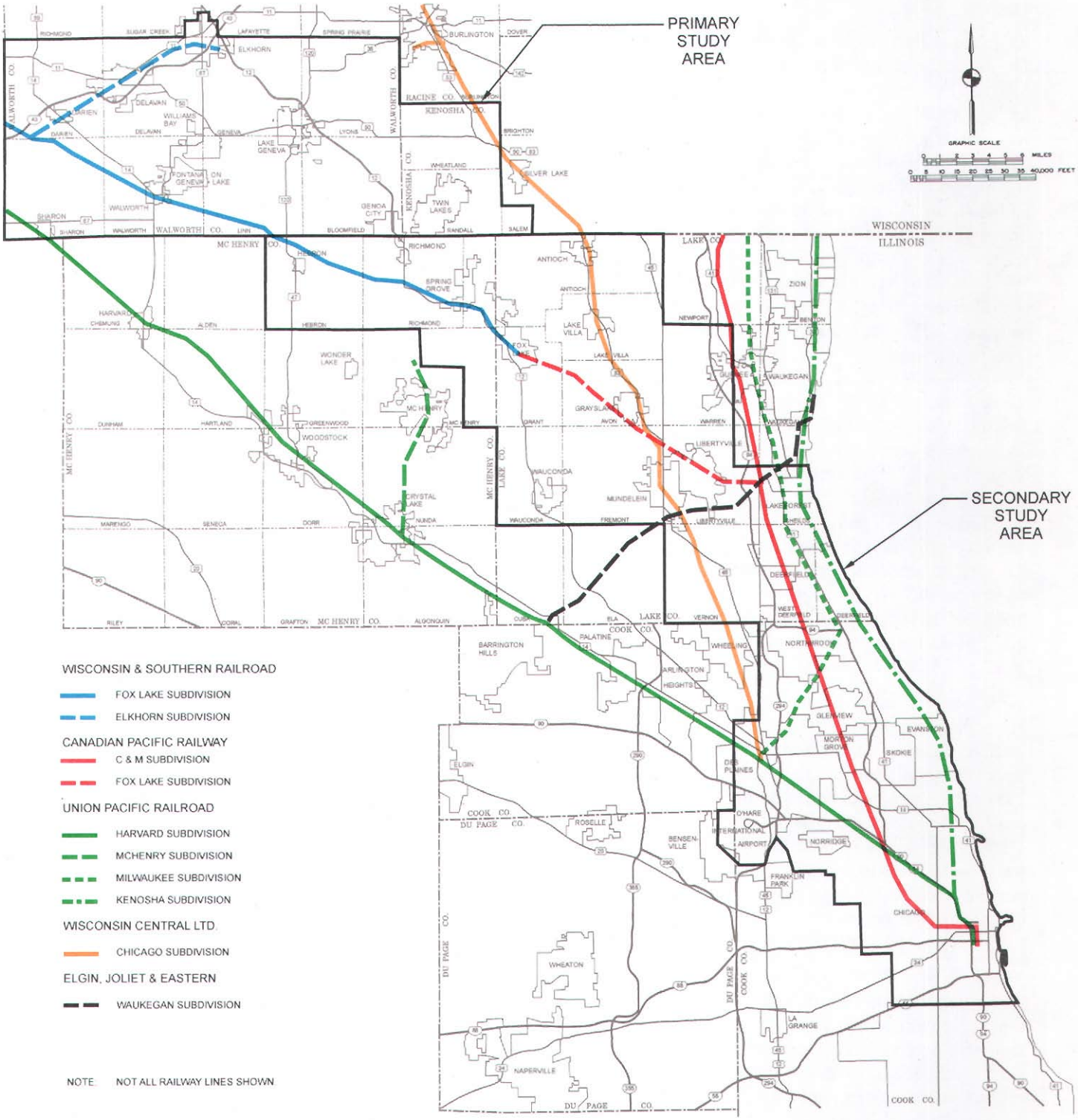
RAILWAY LINES IN THE WALWORTH-FOX LAKE-CHICAGO CORRIDOR BY OWNERSHIP: 1997



Source: SEWRPC.

Map 20

RAILROAD SUBDIVISIONS AND OTHER LINE SEGMENTS IN THE WALWORTH-FOX LAKE-CHICAGO CORRIDOR: 1997



Source: SEWRPC.

trains using the Canadian Pacific Railway Fox Lake Subdivision must obtain verbal authority from the Canadian Pacific dispatcher prior to passing Milepost 50.0.

Alignment and Right-of-Way

The vertical and horizontal alignment of the railway line between Fox Lake and Walworth is generally well suited for high speed passenger train operation. Because the route was constructed as a supplementary high-speed line between Chicago and Janesville, its alignment was well engineered. Accordingly, most of the route is well located on the surrounding topography with minimal grades. The line rises from an elevation of about 750 feet above mean sea level in Fox Lake to an elevation of about 1,000 feet in Walworth. The vertical alignment is marked by a gentle, but relatively steady, westward ascending grade to about Milepost 69.0, west of Zenda. The grade is then relatively level to Walworth. The alignment is located on several fills through wetland areas, the most significant of which is located south of the Village of Richmond where the line crosses over USH 12 and the former CNW railway line. Most grades between Fox Lake and Walworth are minor and do not exceed 0.5 percent. The most significant grades are: between Milepost 56.7 and Milepost 60.1, south of the Village of Richmond, where the line ascends in a westerly direction on an average grade of about 0.6 percent; and between Milepost 63.7 and Milepost 66.9, near the Wisconsin-Illinois State line, where the line ascends in a westerly direction also on an average grade of about 0.6 percent.

With respect to horizontal alignment, there are 12 horizontal curves along the entire route. Most of these are relatively gentle. Only five of these curves are greater than 1°00', with four of the five being no greater than 2°00'. The sharpest curve is on the Metra section of the route, just west of the Fox Lake depot. This curve is a 4°15' curve, but is located in an area where commuter trains would be either slowing for, or accelerating from, a station stop, and where freight trains are required to operate at reduced speeds.

The basic right-of-way width is 100 feet between Fox Lake and Walworth with the main track located on the center line of the right-of-way along the entire segment. There are a number of locations at which additional right-of-way was acquired to accommodate additional tracks, facilities, or related uses. Such segments of right-of-way were typically located near stations, and were generally 150, 200, 300, or 350 feet in width. As of 2000, much of the additional right-of-way area beyond the basic 100-foot width was deemed excess and sold to adjacent property owners either by the Milwaukee Road, its Trustee, or the Wisconsin Department of Transportation following public acquisition of the line.

There are no vertical or horizontal clearance restrictions along the route that would prohibit the use of conventional commuter train rolling stock over this route. In fact, bi-level gallery coaches of the type extensively used by Metra have been operated over this entire route on a regular basis in the past.

Track Structure and Condition

The Wisconsin & Southern Fox Lake Subdivision between Walworth and Fox Lake consists of a single track main line with passing sidings. The sidings are relatively short and include a 2,075 foot long siding at Walworth; an 800 foot long siding at Zenda; an 825 foot long siding at Belden; and a 1,400 foot long siding at Spring Grove. Other trackage exists along the line for local switching or storage purposes, or for providing service to local freight customers. Such additional trackage is primarily located at Walworth, Zenda, Solon Mills, and Spring Grove.

In Fox Lake, the Metra mainline track has 115-pound continuous welded rail rolled in 1981 as far west as Milepost 49.6, and the lead tracks into the Metra coach yard have 115-pound continuous welded rail rolled in 1994. Between Milepost 49.6, past the end of Metra ownership in Fox Lake at about Milepost 49.8 and to Milepost 50.3, the mainline track has 112-pound jointed rail rolled in 1942; between Milepost 50.3 and 67.3, 130-pound jointed rail rolled mostly in 1929 with some rolled in 1954; and between Milepost 67.3 and 73.5, 100-pound jointed rail rolled mostly in 1934 with some rolled in 1930 and 1966. In Walworth, just west of the former passenger depot, there is a segment of mainline track from Milepost 73.5 to Milepost 74.1 that has 90-pound jointed rail which was rolled in 1926. From Milepost 74.1, the mainline heading west from Walworth again has 100-pound jointed rail rolled in 1938. The sidings in Walworth utilize 90-pound jointed rail rolled in 1925. Other miscellaneous trackage also has 75 pound to 90 pound jointed rail rolled between 1913 and 1926.

The condition of the railway track along the Walworth-Fox Lake route may be characterized in terms of maximum permissible train operating speeds. The maximum practical operating speed along any specific section of railway track is dependent upon four principal factors: alignment, special track work, operational considerations, and physical condition. Maximum operational speed limits are determined primarily by the horizontal curvature of the alignment and to a lesser extent by the severity of grades. Maximum operating speed limits over special track work such as turnouts and crossings are determined by the curvature of the turnouts and by the angle of the crossings. Other factors affecting speeds at special track work may include the extent of such work in a single area and the need for train movements to have adequate time to

respond to signal indications. Operational speed limits are determined by factors such as station-to-station distances, performance characteristics of locomotives and rolling stock, surrounding development, and safety considerations. In general it is desirable to operate trains at the highest safe speeds, considering these factors. The operational requirements of passenger trains are generally more demanding of track and signal systems than are the operational requirements of freight trains. In most cases, the slower operating speeds of freight trains compared with passenger trains permits use of less sophisticated track and signal systems as well as comparatively lower levels of maintenance.

With respect to the physical condition of railway tracks, the Federal Railroad Administration (FRA) has prescribed minimum requirements for the safe operation of freight and passenger trains over railway lines that are a part of the general railway system of the United States. These minimum requirements are set forth in a detailed set of engineering standards that relate to the condition of the track work structure including the age and condition of rails, the age and condition of crossties, the condition of ballast, the quality of drainage, and the level of vegetation. As shown in Table 11, there are a total of six classes that apply to specific track conditions. Based upon the detailed technical requirements of each class, the FRA allows train movements over railway trackage in the United States up to specified operating speed limits for each class. These six FRA classes provide a good basis for an initial evaluation of the condition of railway trackage and for estimation of the costs of improvements needed in an existing track structure to meet desired operating speeds.

The trackage and roadbed along the Wisconsin & Southern Fox Lake Subdivision between Fox Lake and Walworth is generally in good condition and meets FRA Class 2 track safety standards. As of October 2000, the maximum authorized speed limit on the Fox Lake Subdivision was 30 miles per hour for passenger trains; and 25 miles per hour for freight trains between Fox Lake and Milepost 63.9 at the state line and 30 miles per hour from Milepost 63.9 to Walworth. Major rehabilitation of the line between Janesville and Fox Lake was undertaken during 1990 and 1991 using grants and loans provided by the Wisconsin and Illinois Departments of Transportation. This work improved the condition of the line from FRA Class 1 to Class 2 track safety standards. There were speed restrictions of 10 miles per hour between Milepost 49.8 and Milepost 50.1 on the bridges where the line passes over the Fox River and Nippersink Channel, and at the crossings with N. Main Street and Madison Street (USH 14) in the Village of Walworth. The maximum speed limit on all tracks other than main tracks as well as in the diverging direction through all turnouts was 10 miles per hour.

Table 11

MAXIMUM ALLOWED TRAIN OPERATING SPEEDS BY FEDERAL RAILROAD ADMINISTRATION TRACK CLASSIFICATION: 1997

Class	Maximum Allowable Operating Speed (in miles per hour)	
	Freight Trains	Passenger Trains
1	10	15
2	25	30
3	40	60
4	60	80
5	80	90
6	110	110

NOTE: Actual operating speeds on a specific section of railway trackage are not only dependent upon the physical condition of the track structure and roadbed, but also on the track alignment, existence of special trackwork, and operational considerations.

Source: Federal Railroad Administration.

The trackage and roadbed along the Canadian Pacific Railway Fox Lake Subdivision in the Fox Lake area is in very good condition and meets FRA Class 3 track safety standards. As of October 2000, the maximum authorized speed limit in the Fox Lake area was 30 miles per hour for freight trains and for passenger trains was 40 miles per hour from Fox Lake to Milepost 49.0 at Sayton Road, and 60 miles per hour east of Milepost 49.0. There were speed restrictions of 10 miles per hour in the City of Fox Lake for eastbound trains approaching the Grand Avenue grade crossing and westbound trains approaching the Oak Street grade crossing. The maximum speed limit on all tracks other than main tracks in Fox Lake was five miles per hour.

Street and Highway Crossings

There are a total of 27 public street, highway, and pedestrian crossings along the potential commuter rail route of which 21 are at-grade, and six are grade separated. Of the 21 at-grade crossings, all are protected by crossbucks and 12 are also equipped with automatic flashing lights and bells. None are equipped with crossing gates. Of the 10 at-grade crossings that only have crossbucks, and do not have flashing lights and bells, only one—a pedestrian crossing—has stop signs. Of the six grade separated public crossings, only one crosses over the railway line and the remaining five cross below it. There

are also a total of 35 private crossings along this route, of which 33 are at-grade and two are underpasses. None of the private crossings are equipped with crossbucks or automatic warning devices and only one of the private crossings has any type of warning signs. In general, the electrical circuits for activating the automatic grade crossing signals at public crossings are timed for freight train operations with a maximum speed of 30 mph. A list of all crossings is provided in Appendix A.

Passenger Depot Buildings

There are two passenger depot buildings remaining along the Walworth to Fox Lake route. These are located at Fox Lake and Walworth. For purposes of this study the term "depot" refers to a building and attendant facilities used for passenger boarding and alighting. This differs from the meaning of the term "station". In railway terminology, stations are specific locations designated for operating and engineering purposes and do not necessarily denote the existence of a depot building or other facilities.

The Fox Lake passenger depot building is located on the east side of the railway line at 32 Nippersink Boulevard north of Grand Avenue in downtown Fox Lake. This depot is a single-story brick building owned by Metra and constructed in 1982. In addition to the depot building, this station facility consists of an 825-foot long black-top platform with lighting, benches, and other passenger amenities. The depot building includes a waiting room and ticket agent area which is staffed from 5:00 a.m. to 12:30 p.m. on weekdays. The depot waiting room is open from 4:15 a.m. to 7:30 p.m. on weekdays, and to 12:45 p.m. on Saturdays, Sundays, and holidays. Outside the depot, there are three park-ride lots which have a total capacity of 391 automobiles and an automobile passenger dropoff and pickup area.

The Walworth depot building is located on the south side of the main track east of the Main Street grade crossing in the Village of Walworth. This depot is a single-story wood frame building. The building is now privately owned and used for storage by a neighboring manufacturing firm. The early 1900s vintage building appears to be in fair condition. The 350-foot long concrete platform at this depot still exists and also appears to be in fair condition. However, a metal fence separates the depot building from the railway track.

Existing Fox Lake-Chicago Railway Line

The Metra Milwaukee District North Line between Fox Lake and Chicago Union Station is 49.5 miles in length and consists of two distinct segments. The first segment is a single-track branch that extends 17.2 miles from Fox Lake to a junction at Rondout, an unincorporated community in the Township of Libertyville. The branch has one 4,400-foot long passing siding located at Grayslake, a station midway on the line. The second segment is a mainline that extends 32.3 miles from Rondout to Chicago Union Station, consisting of two main tracks from Rondout to Tower A 5 and three main tracks from Tower A 5 into Chicago Union Station. Between Rondout and Chicago, all main tracks are signaled for bi-directional operation at maximum allowable speeds. Crossovers between the main tracks are available at nine locations. The crossovers are power-operated, but are designed for operation at no more than 25 miles per hour. The entire route between Fox Lake and Chicago Union Station is protected by an Automatic Block Signal (ABS) system, and train movements on the section between Rondout and Mayfair are governed by Centralized Traffic Control (CTC), controlled by the Canadian Pacific dispatcher in Minneapolis.

While Metra owns almost the entire railway route between Fox Lake, Rondout, and Chicago, train operations on the route are under the authority of Canadian Pacific Railway and its dispatchers. The segment from Fox Lake to Rondout is referred to as the Canadian Pacific Fox Lake Subdivision and the segment from Rondout to Chicago is referred to as Canadian Pacific C&M Subdivision. Chicago Union Station and its approaches are owned by, and are under the operating authority of, Amtrak.

The mainline segment between Rondout and Chicago handles a high volume of trains. These include all of the Metra Milwaukee District North Line commuter trains, all Amtrak intercity passenger trains operating between Milwaukee and Chicago, all Canadian Pacific Railway freight trains operating between Milwaukee and Chicago, and the Wisconsin & Southern freight trains operating between Janesville and Chicago. Most Canadian Pacific freight trains use the mainline only as far south as Shermer and the Wisconsin & Southern freight trains use the line between Fox Lake, Rondout, and Tower A 5. These locations are listed in Table 10.

Metra has proposed a number of physical improvements to the Milwaukee District North Line as funding becomes available. Such improvements would permit increased operating speeds, enable the C&M Subdivision to better handle additional commuter trains mixed with Amtrak and freight trains, improve operational flexibility, permit additional reverse-commuter trains, permit additional trains on the Rondout-Fox Lake branch, and maximize the potential to recycle peak-period trains. Major track and operation-related improvements that have been proposed include: upgrading of the existing signals and CTC on the C&M Subdivision and installation of CTC on the Fox Lake Subdivision; upgrading of existing crossovers at seven locations to permit higher speeds; and construction of two new passing sidings on the Fox Lake

Subdivision, one at Libertyville and one at Round Lake. Other proposed improvements include a variety of grade separation, station and park-ride lot improvements.

EXISTING ARTERIAL STREETS AND HIGHWAYS

The total street and highway system within the primary study area is comprised of three types of facilities: land access, collector, and arterial. Land access facilities function primarily to provide access to abutting property. Collector facilities function primarily to collect and distribute traffic between land access and arterial facilities. Collector facilities may also provide access to abutting property. Arterial facilities are intended to serve the through movement of traffic. Arterial facilities provide transportation service between major subareas of the primary study area as well as between the primary and secondary study areas. Arterial facilities may also provide access to abutting property. The existing arterial street and highway system within the primary study area, totaling about 288 miles, is shown on Map 21.

Freeways are arterial highway facilities that provide the highest level of service, that carry the heaviest volumes of traffic at the highest speeds, and that are fully grade separated with no access provided to abutting properties. Freeways currently accommodate significant amounts of travel between the primary and secondary study areas. Of the 26,000 vehicular crossings of the Wisconsin-Illinois State line between the primary and secondary study areas observed on an average weekday in 1999, approximately 12,000 vehicle crossings, or about 45 percent, were made on USH 12. The freeway component of the arterial street and highway system within the primary study area is also shown on Map 21.

SUMMARY

This chapter has presented information on the existing transportation services and facilities within the Walworth-Fox Lake Corridor, as well as between the primary and secondary study areas of the corridor, pertinent to any consideration of the provision of commuter rail or bus service within the corridor. The information presented included a description of the existing railway and bus passenger transportation services provided in the corridor; a description of existing railway facilities within the study area that could be used to provide commuter rail services between Walworth, Fox Lake, and Chicago; and a description of the existing arterial street and highway system within the corridor. The most important findings concerning these services and facilities may be summarized as follows:

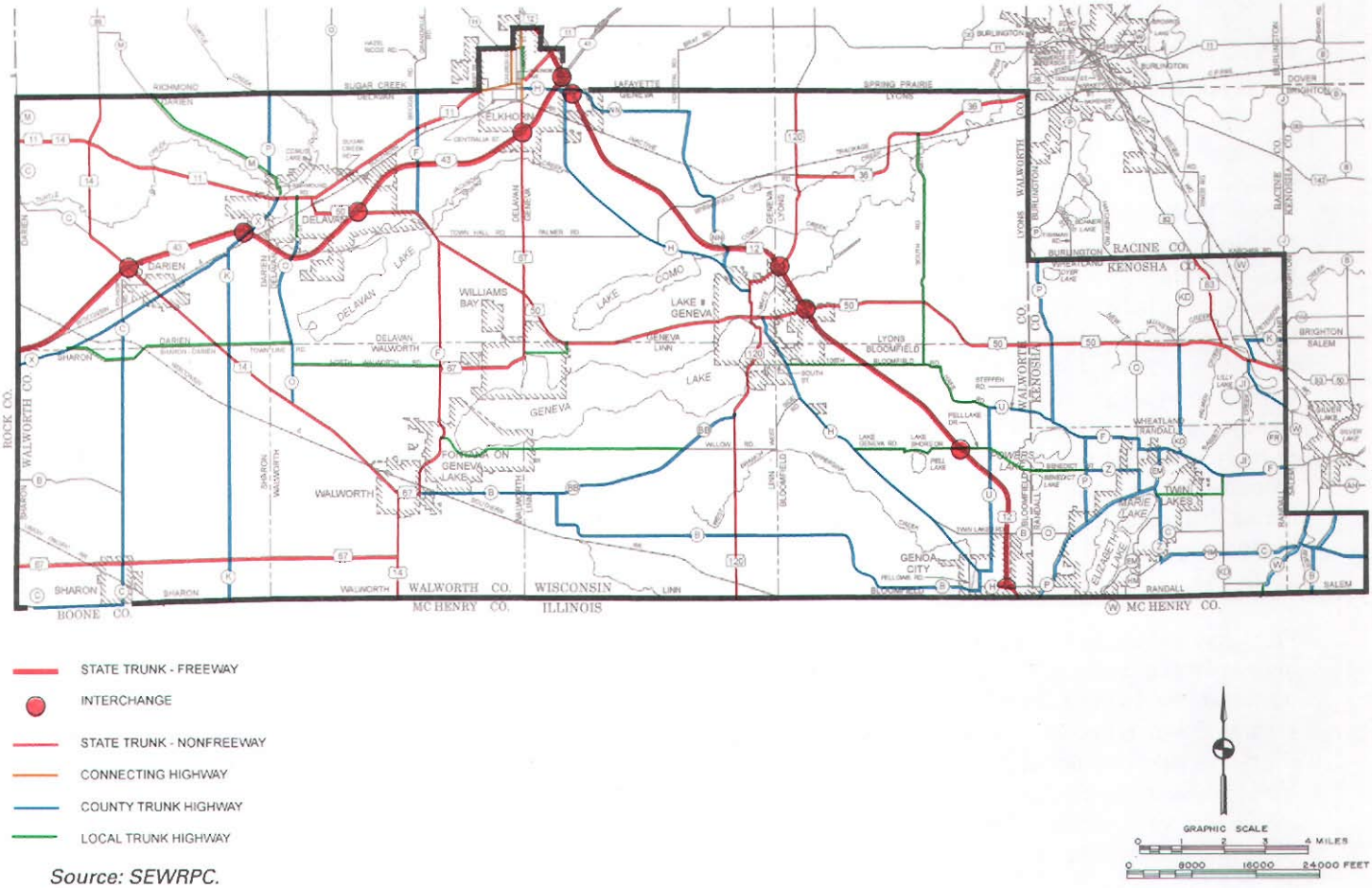
- Commuter rail service is provided by Metra—the commuter rail service division of the Regional Transportation Authority—over a 49.5-mile long route extending from Fox Lake through the northern suburbs of Chicago to Chicago Union Station in the Chicago central business district. The commuter rail route is referred to as the Metra Milwaukee District North Line and is owned by Metra. This long established commuter rail service is strongly oriented to serve passengers residing in the corridor who are employed in the City of Chicago, especially in and around the Chicago central business district. Most of the passenger trains on this route originate or terminate at Fox Lake, Illinois, but a small number of trains in each direction operate only between Chicago and Deerfield or Grayslake.

- Ridership on the Metra service provided over the Milwaukee District North Line has been substantial and compares favorably with other heavily used Metra routes. During 1999, about 6,452,000 annual passenger trips were carried on this Metra line; or about 113,300 during an average week. In 1999, average weekday ridership on the Metra Milwaukee District North Line totaled about 22,000, with about 550 passengers boarding and alighting at the Fox Lake stop on an average weekday. On an average weekday, about 16,400—or 75 percent—of all passengers were carried on peak-period peak direction trains.

- Existing public bus transportation services within the Walworth-Fox Lake Corridor were limited. These services included the specialized services provided by the Walworth County Department of Human Services and Vocational Industries, Inc. and intended for elderly and disabled users; and four local bus routes operated by Pace within or near the Illinois portion of the corridor. Pace is the name for the bus operating division of the Regional Transportation Authority of Northeastern Illinois. The Pace routes functioned primarily as feeders to, and supplemental service for, Metra commuter rail routes. Limited bus feeder services from Lake Geneva, Williams Bay, and Delavan to commuter rail stations in Northeastern Illinois were operated during the 1970s, but were short-lived. Also, some long-distance motor coach carriers such as Greyhound Lines and Wisconsin Wisconsin Coach Lines provided regular service through southern Walworth County, as did some limousine services. The last of this type of service was operated during the 1980s.

Map 21

ARTERIAL STREET AND HIGHWAY SYSTEM SERVINGTHE WALWORTH-FOX LAKE TRAVEL CORRIDOR: 1997



STATE TRUNK - FREEWAY

INTERCHANGE

STATE TRUNK - NONFREEWAY

CONNECTING HIGHWAY

COUNTY TRUNK HIGHWAY

LOCAL TRUNK HIGHWAY

Source: SEWRPC.

- A potential new commuter rail route within the Walworth-Fox Lake Corridor would extend from the existing Metra passenger station in Fox Lake, Illinois to the Village of Walworth in Walworth County, Wisconsin. Except for a 0.3-mile-long segment in Fox Lake which is owned and operated by Metra, the 24.0-mile-long route would utilize trackage operated by Wisconsin & Southern Railroad Company. Trackage along this route is owned by the Wisconsin River Rail Transit Commission and the right-of-way is owned by the Transit Commission within Illinois, and the Wisconsin Department of Transportation within Wisconsin.

- The Walworth-Fox Lake railway line is operated as part of the Wisconsin & Southern Railroad Janesville-Chicago mainline and is called its Fox Lake Subdivision. It provides an important link between other railway lines in southern Wisconsin and many major railways in the Chicago area. The line consists of a single-track mainline with relatively short passing sidings. The trackage and roadbed along the Fox Lake Subdivision

between Fox Lake and Walworth generally is in good condition and meets FRA Class 2 track safety standards. Maximum operating speeds are 30 miles per hour for passenger trains and 25 miles per hour for freight trains. Major rehabilitation of the line between Janesville and Fox Lake was undertaken during 1990 and 1991 using grants and loans provided by the Wisconsin and Illinois Departments of Transportation.

- For most of its historic existence, the Fox Lake Subdivision was operated by the Chicago, Milwaukee, St. Paul & Pacific Railroad Company—or the "Milwaukee Road"—as part of a passenger and freight mainline between Chicago and Madison. During the 1970s, the traffic and financial conditions of the Milwaukee Road began to change rapidly. As a result, the physical condition of the Fox Lake Subdivision declined as regular maintenance was deferred; maximum operating speeds were steadily reduced; trains once using the route were rerouted; and the line was abandoned in 1983 by the Trustee for the then-bankrupt Milwaukee Road. During the 1980s, successful efforts were made to preserve and restore freight service on this line. Through freight service between Janesville and Chicago over the Walworth-Fox Lake segment was restored in 1989. Since that time, the Wisconsin & Southern Railroad has aggressively sought to build freight traffic on its network of railway lines in southern Wisconsin including the Fox Lake Subdivision. During the next three to seven years, freight traffic on this line may be expected to increase from the current level of one through freight train in each direction seven days per week to two through freight trains in each direction seven days per week plus a local freight train based in Janesville and working east to Spring Grove and return on weekdays.

- The street and highway system within the primary study area is comprised of land access, collector, and arterial facilities. Freeways are those components of the arterial street and highway system which provide the highest level of service and which carry the heaviest and fastest volumes of traffic, including between the primary and secondary study areas. Of the nearly 26,000 vehicular crossings at the Wisconsin-Illinois border between the primary and secondary study areas on an average day in 1999, approximately 12,000 vehicle crossings, or about 45 percent, were made on USH 12. The existing arterial street and highway system within the primary study area totaled about 288 miles.

(This page intentionally left blank)

Chapter IV

POTENTIAL COMMUTER ROUTE FACILITIES AND SERVICES

INTRODUCTION

The purpose of this chapter is to identify potential alternative commuter rail and bus facility and service options in the Walworth-Fox Lake Corridor; to screen those alternatives; and, based upon that screening, to recommend the most practical and reasonable commuter rail and bus alternative for further evaluation with respect to benefits and costs. The commuter rail and bus alternatives proposed for such evaluation were those with the greatest potential to provide cost-effective commuter rail or bus service within the Walworth-Fox Lake Corridor extending from Walworth to Fox Lake and on to Chicago.

The principal physical, operational, and service characteristics of any potential commuter rail or bus service in the corridor concerned included route alignment, passenger station locations and facilities, operating plan, service provider, rolling stock and vehicle requirements, railway line improvements, and storage and servicing facility needs. Alternatives for each of these characteristics were identified, and the alternatives were then screened with respect to attendant advantages and disadvantages. The most promising alternative consisting of the best of these characteristics was then identified for more detailed evaluation.

COMMUTER RAIL ROUTE ALIGNMENT

The purpose of this section is to identify the most promising commuter rail route alignment option within the Walworth-Fox Lake corridor and to eliminate from further consideration alternative route alignments which are less promising. A prerequisite for the initiation of commuter rail service in the corridor concerned was the availability of already existing railway lines used for intercity freight or passenger train service. Ideally, such railway lines would be constructed to mainline railway standards, and connect major trip generators and residential areas. The major aspect concerning route alignment alternatives within the corridor that was considered in the screening of alternatives was, in fact, consideration of available mainline route alternatives.

Consideration was given as to whether or not there were other promising basic mainline route alignments within the Walworth-Fox Lake corridor in addition to the Wisconsin & Southern Railroad (WSOR) Fox Lake Subdivision alignment. The WSOR alignment is the only existing railway route that directly connects southern Walworth County with Northeastern Illinois as shown in the previous chapter on Map 19. The route alignment was found to be well-suited to accommodate commuter rail train operations, and in fact, has done so in the past. Also, the route currently carries a limited number of freight train operations. Importantly, service over the WSOR Fox Lake Subdivision could be operated as an extension of the existing Metra commuter train service between Fox Lake and Chicago.

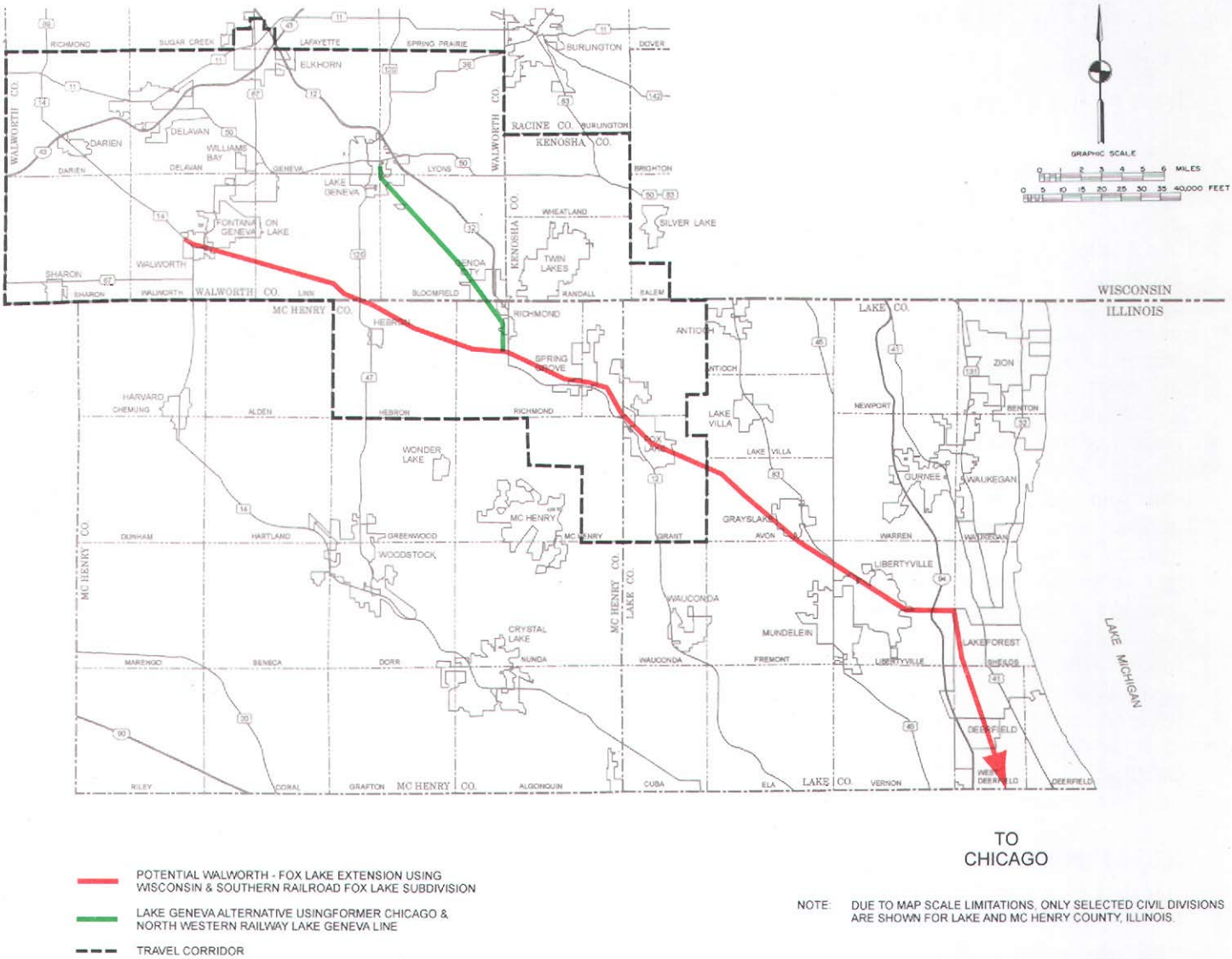
During the first meeting of the advisory committee for this feasibility study, a representative of the City of Lake Geneva requested that the study include consideration of whether or not reinstituting commuter rail service directly to the City of Lake Geneva was feasible. It was suggested that providing such service directly to Lake Geneva may attract more users than providing such service to the Village of Walworth.

Following discussion among the committee members, it was agreed that the feasibility study was to include a screening level comparison of a Lake Geneva alignment to the Walworth-Fox Lake alignment. This alternative alignment between Fox Lake and Lake Geneva would extend along the WSOR from Fox Lake to the location where the former Chicago & North Western (CNW) Railway line to Lake Geneva passes under the Wisconsin & Southern Railroad line on the south side of Richmond, Illinois. At Richmond, a new connecting track would branch off the WSOR line and connect with the former CNW right-of-way from Richmond into Lake Geneva. Instead of going directly into the center of Lake Geneva as did the former CNW line, the route would enter the east side of the City and terminate in the industrial park. The findings of the screening process for this alternative were to be presented to the Advisory Committee for consideration and action.

Accordingly, the Commission staff undertook such a screening of the Fox Lake-Lake Geneva alternative alignment by investigating this option and providing a comparative evaluation with the Walworth-Fox Lake alignment. The Fox Lake-Lake Geneva alternative alignment as proposed by the City of Lake Geneva representative is shown on Map 22. The comparative evaluation considered: service area population, service area employ-

Map 22

FOX LAKE-LAKE GENEVA ALTERNATIVE COMMUTER RAIL ALIGNMENT



Source: SEWRPC.

ment, adjoining land uses, right-of-way ownership and availability, and capital and operating costs. Because both alternative alignments would be identical between Fox Lake and Richmond, Illinois, the comparative evaluation focused on those segments of each alignment which were located north and west of Richmond. These segments are referred to in the following text simply as the "Walworth" and "Lake Geneva" alignments and were located almost entirely within the primary study area.

Population

A comparison was made of the resident population along the Lake Geneva alignment with that along the Walworth alignment. Residents were considered to be close enough to an alignment to be served if they were located within three miles of the alignment. For urban transportation planning analyses within the Southeastern Wisconsin Region, a distance of three miles has generally been considered to be the distance that passengers are willing to travel to access a rapid transit facility. This provides a basis for the delineation of a service area corridor along the alternative commuter rail alignments. Using this three-mile service area standard and based on 1996 population estimates, about 14,500 residents would be served by the Walworth alignment. About 16,800 residents would be served by the Lake Geneva alignment, this being

about 2,300 residents, or 16 percent greater than along the Walworth alignment.

Users of established commuter rail systems in the United States are willing to regularly travel distances greater than three miles from their home to a commuter rail station if the travel time spent on the commuter train is sufficiently long. This is especially true at stations located at or near the outlying ends of commuter rail routes. Examples of such Metra stations include Antioch, Fox Lake, McHenry, Harvard, and Elgin. Metra surveys indicate that many passengers boarding at these and other stations reside in northern Illinois communities beyond Metra territory such as Belvidere, Rockford, Sycamore, and De Kalb as well as in Southeastern Wisconsin. These passengers are willing to drive from 10 to 30 miles to the nearest Metra station. On this basis, if the potential service area were assumed to be as little as 10 miles along either side of the Lake Geneva and Walworth alignments, then the entire primary study area would essentially be within the service area of both alignments. Based on this standard, about 59,100 residents—or all of the residents within the primary study area—would be served by either the Lake Geneva alignment or the Walworth alignment.

Employment

A comparison was made of the employment opportunities located along the Lake Geneva alignment with those along the Walworth alignment. Like resident population, jobs were considered to be close enough to an alignment to be served if they were within three miles of the alignment. Using the three-mile service area standard and based on 1996 employment estimates, about 5,400 jobs would be served by the Walworth alignment. About 8,100 jobs would be served by the Lake Geneva alignment, this being about 2,700 jobs, or 50 percent greater than along the Walworth alignment. If the service area was assumed to be 10 miles along either side of the Lake Geneva and Walworth alignments, then the entire primary study area would essentially be within the service area of both alignments. Based on this standard, about 30,300 jobs—or all of the jobs within the primary study area—would be served by either the Lake Geneva alignment or the Walworth alignments.

Adjacent Land Uses

A comparison was made of the land uses immediately adjacent to both alternative alignments west and north of the Village of Richmond, Illinois. A comparison was not made east of Richmond since both alignments would use the same WSOR line between Richmond and Fox Lake. The predominant land uses located along the alignments are presented in Table 12. As shown in this table, almost three-quarters of the Walworth alignment is adjacent to agricultural land use. About 30 percent and 40 percent of the Lake Geneva alignment is located adjacent to residential land uses or wetlands and natural resource protection areas, respectively.

Table 12

PREDOMINANT LAND USES ADJACENT TO ALTERNATIVE COMMUTER RAILWAY ALIGNMENTS IN SOUTHERN WALWORTH COUNTY: 1997

Predominant Adjacent Land Use	Estimated Percentage of Alignment	
	Walworth-Richmond	Lake Geneva-Richmond
Residential	1	30
Commercial and Industrial	9	11
Agricultural	72	19
Wetlands and Natural Resource Protection Areas	18	40
Total	100	100

Source: SEWRPC.

Right-of-Way Ownership and Availability

A critical evaluation measure was whether or not the former right-of-way between Richmond and Lake Geneva was indeed still intact, and therefore usable once again as a railway alignment. A perception among some individuals is that the right-of-way for this former railway line remains intact and potentially available for reuse as a railway corridor. The right-of-way and railway line between Richmond and the Village of Walworth is, of course, still intact and regularly used by freight traffic. As noted above, consideration of the Lake Geneva alignment would also require a connection between the existing WSOR and former CNW alignments at Richmond. With regard to the Lake Geneva alignment, the following findings are significant:

- The right-of-way from the present end-of-track in Ringwood through the Village of Richmond to the Illinois-Wisconsin state line was acquired by Metra upon abandonment by the CNW in 1982. At this time, all remaining trackage, signals, and buildings were removed from the right-of-way which has since been used as a recreational trail. No trains have operated on this segment since August 1982.

- Village of Richmond officials have indicated that the former CNW railway right-of-way extending through the Village should not be considered for possible reinstitution of commuter rail service because of changes in the adjoining land uses and development along the right-of-way. Since railway

service along this line was discontinued, development of a new high school complex has begun along the right-of-way on the south side of the Village. Additional development has occurred along the right-of-way in the older, central portion of the Village. Village officials have indicated that reinstitution of train operations in these areas would lead to safety concerns for students and pedestrians and would no longer be compatible with surrounding land uses.

- An inspection was made by the Regional Planning Commission and Metra staffs of the area where a connection between the WSOR and the former CNW Lake Geneva line right-of-way would be required. In this area, the WSOR line is situated on a high fill and passes over the former CNW line and USH 12 on bridges. A connection in this area would require the construction of a substantial fill to bring the former CNW line up to the elevation of the WSOR alignment. It is shown as "Connection A" on Map 23. In order to construct the required fill, some private property would need to be acquired. It is also likely that some wetlands would need to be acquired and filled.

- Because of the cost and disruption attendant to the construction of a connection between the two railway alignments on the south side of Richmond, other potential connection alternatives were considered. One other possible connection was identified. This would utilize right-of-way already acquired by the Illinois Department of Transportation for use as a transportation corridor and located to the west of the Village of Richmond. While this corridor is intended to be used for a proposed freeway, it could also serve as an alignment for a connection between the two railway alignments. This connection, shown as "Connection B" on Map 23, may be preferable to the connection described above since it avoids a line location through established portions of the Village of Richmond and avoids the need to acquire new right-of-way.

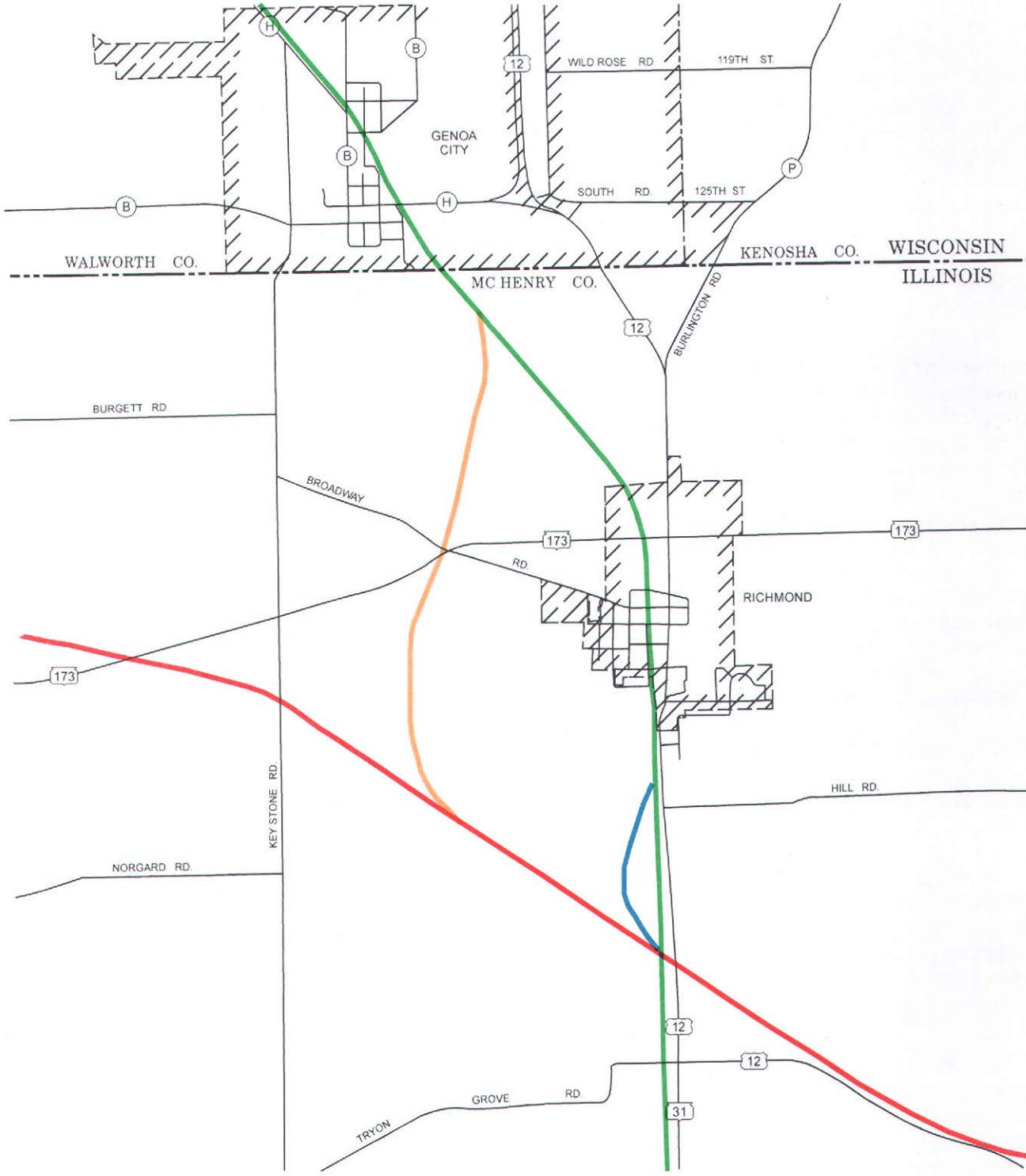
- Following final abandonment of the CNW line concerned in December 1982, the right-of-way from the Illinois-Wisconsin state line to the then end of track in the City of Lake Geneva either reverted back to adjacent owners as a condition of the original easement agreed upon when the line was constructed or was sold to adjacent or other interested property owners. At this time, all remaining trackage, signals, buildings, and other structures were sold or otherwise removed from the right-of-way. Much of the previous right-of-way has since been developed for other land uses. For example, in the Genoa City and Pell Lake areas, the former right-of-way has been developed with single- and multi-family residences. In the Lake Geneva area, the former right-of-way has been developed with commercial uses. In some cases, new buildings have been constructed directly on the former mainline alignment. In other cases, residential front yards and back yards, as well as automobile parking areas now occupy the right-of-way and are directly on the former railway track alignment. In addition, the original grade has been largely obliterated over much of the route with fills having been leveled and cuts having been filled.

- The Richmond to Lake Geneva corridor was examined for other possible commuter rail route alignments. None were apparent. The only other continuous transportation alignments in the corridor were the USH 12 freeway facility and the CTH H—or "old USH 12"—two-lane arterial highway facility. Neither of these public highways possessed the cross-sectional width, bridge structures, or vertical curvature required for a railway line without considerable right-of-way acquisition, modifications to horizontal and vertical curvature, and disruption to the surrounding lands.

- The challenges associated with establishing a new railway right-of-way in this corridor were concluded to be so great as to make the establishment impractical. A major issue in this regard would be finding a suitable route through the local topography other than the route chosen by the railway location engineers in the 19th century. Another major issue would be attempting to assemble a continuous strip of land in an area that has been divided into individual parcels, populated, and developed for a variety of uses over the past 125 years. Another major issue would be gaining acceptance of a new railway line from adjacent residential and commercial property owners. Recent experience with new highway and railway transit proposals throughout the United States suggests that such facilities are often viewed as very objectionable by neighboring landowners. Without a strong local consensus in support of a project, the only recourse for right-of-way acquisition may be condemnation. As a practical matter, however, this approach would likely be politically unacceptable and would probably be legally challenged on the basis of need and public interest.

Map 23

ALTERNATIVE CONNECTIONS BETWEEN WISCONSIN & SOUTHERN RAILROAD AND FORMER CHICAGO & NORTH WESTERN RAILWAY ALIGNMENT IN THE RICHMOND, ILLINOIS AREA



Source: SEWRPC.

Relative Capital Costs

A comparative evaluation was made of the capital costs for the Lake Geneva alignment and for the Walworth alignment. For purposes of this comparative evaluation, the Lake Geneva alignment was assumed to be 10.4 miles in length from its junction with the existing WSOR mainline on the west side of Richmond to the proposed end of track in the Lake Geneva industrial park. The Walworth alignment was assumed to be 15.1 miles in length from the same junction point for the Lake Geneva alignment, extending along the WSOR mainline to Walworth. The cost estimates included the costs of track and signal improvements; equipment requirements; passenger station facilities; and equipment storage and servicing facilities.

With respect to track and signal improvements, the Lake Geneva alignment would require the construction of a completely new railway mainline along the entire 10-mile distance. This would include: reacquisition of right-of-way along the entire distance; acquisition and demolition or relocation of residences and businesses now located on the right-of-way; grading and reconstruction of cuts and fills, particularly for the new connection at Richmond and the new alignment into the Lake Geneva industrial park; construction of the mainline track; construction of at least six bridges over watercourses and one bridge over a public highway; installation of 15 at-grade crossings with public streets and highways; and installation of appropriate grade crossing signals at selected crossings and signals to control train movements at the new junction at Richmond. The Walworth alignment already exists and is in regular use by freight trains, but would require improvement for commuter rail passenger train operation over its 15-mile distance. The improvements required would include: selected cross tie and rail replacement; placement of ballast together with attendant undercutting, surfacing, alignment, and ditch clearing; and installation of appropriate grade crossing signals at selected crossings. Construction of a new siding or extension of an existing siding may also be required to allow coordinated operation of freight and commuter trains.

With respect to equipment requirements, it was assumed that service on either alignment would be operated as a through extension of the Metra Milwaukee District North Line from Chicago to Fox Lake. The operation of some Chicago-Fox Lake trains would be extended to either Walworth or Lake Geneva. The additional utilization attributable to either alignment, even under the most optimistic conditions, may be expected to be similar, as would the running and turnaround time for trains. Therefore, for purposes of the comparative evaluation, it was concluded that the two alignments would require the same rolling stock in the form of locomotives and coaches.

For the purposes of the comparative evaluation, it was assumed that there would be three passenger stations located along the Lake Geneva alignment: at Genoa City, Pell Lake, and Lake Geneva. There would also be three passenger stations located along the Walworth alignment: at STH 120, Zenda, and Walworth. A passenger station for Richmond would be on the segment of WSOR mainline common to both alignments.

With respect to equipment storage and servicing facilities, some trains would need to be stored overnight at either Walworth or Lake Geneva. Because the level of service and equipment requirements for either alignment may be expected to be similar, it was concluded that storage and servicing facility requirements would also be similar.

Relative Operating Costs

A comparative evaluation was made of the probable operating costs for the Lake Geneva and Walworth alignments. Operating costs include train crew expenses, fuel, trackage use and maintenance charges, maintenance of equipment, administrative expenses, and insurance. Assuming the level of service in terms of the number, frequency, and days of operation of the trains would be the same on the two alignments, it may be expected that the train crew hours, train-hours, and train-miles would be approximately the same between the two alignments.

Evaluation of Commuter Rail Route Alignments

Based upon these considerations with respect to the Lake Geneva and Walworth alignments, the following findings were recognized:

- The potential passenger market for each alignment option was considered based on existing residential population and employment levels. Based on a three-mile service area along either side of a potential commuter rail route, the Lake Geneva alignment was found to have about 16 percent greater population and about 50 percent greater employment. However, if a 10-mile service area along either side of a potential commuter rail route is assumed, all of the residents and jobs within the primary study area would be served by either alignment. Regardless of the assumed size of the service area, total population and employment levels within the entire primary study area are relatively small, when compared to surrounding population and employment levels at most Metra commuter stations in Northeastern Illinois.

- The predominant land use along the Walworth alignment is agricultural and along the Lake Geneva alignment is either wetlands and resource protection areas or residential. The amount of

adjacent residential land use may represent both sources of potential ridership and sources of objection to the operation of trains.

- The Lake Geneva alignment north of the Wisconsin-Illinois state line no longer exists as an intact continuous right-of-way. Significant portions of it have been converted to other nontransportation uses with the original railway grade having been obliterated. The remaining portions have largely been absorbed into the adjacent land uses. Retrieving this right-of-way may be expected to require a major effort and to engender objections from neighboring landowners. This factor may be expected to overshadow all other considerations concerning this alignment. Village of Richmond officials have indicated that reinstitution of train operation on the alignment south of the State line through the Village would not be appropriate, requiring construction of a bypass route. The Walworth alignment already exists and is in regular use by freight trains.

- The anticipated capital cost requirements with respect to equipment, passenger stations, and storage facilities would be similar for the two alignments considered. With respect to necessary track and signal improvements, however, the amount of capital investment necessary to reconstruct the Lake Geneva alignment may be expected to be two to three times the amount of capital investment necessary to upgrade the Walworth alignment. In addition, the Lake Geneva alignment would entail a high capital cost for right-of-way acquisition, relocation of development which has been built on the former right-of-way, and major civil engineering works.

- The anticipated operating costs for the two alignments may be expected to be similar.

Based upon the above findings, the Advisory Committee concluded that the potential cost, effort, and disruption necessary to acquire right-of-way for the Lake Geneva alignment would be prohibitive and impractical. Therefore, the Committee determined that the feasibility study should continue to focus on the potential provision of commuter rail service over the existing railway line between Walworth and Fox Lake. The most important advantage of the Walworth alignment is that it utilizes an existing railway line and does not entail the significantly higher costs, disruption, and impacts associated with assembling a new right-of-way and constructing a new track where one does not already exist.

COMMUTER BUS ROUTE ALIGNMENT

The purpose of this section of the chapter is to identify the most promising commuter bus route alignment option within the Walworth-Fox Lake Corridor and to eliminate from further consideration alternative route options that are less promising. Development of a promising commuter bus route alignment is based on the following general guidelines:

- The commuter bus route alignment should be designed to be comparable to the potential commuter rail route alignment with respect to the area within the Walworth-Fox Lake Corridor to be served.

- The commuter bus route alignment should be designed to optimize its ability to provide an attractive and efficient service within the Walworth-Fox Lake Corridor.

- The commuter bus route alignment should be designed to take advantage of the express bus mode's inherent advantages, such as its ability to provide some degree of local collection and distribution of passengers along its route.

A prerequisite for the initiation of commuter bus service in the corridor concerned is the availability of already-existing arterial streets and highways that connect the areas of existing and planned development with already-existing Metra commuter rail routes serving the northern Lake and McHenry County areas of the Chicago metropolitan area. Arterial streets and highways are necessary to provide a roadway facility with the strength that can handle the relatively heavy motor bus vehicles on a regular basis during all seasons, as well as provide a smooth, comfortable, and rapid ride for passengers.

With respect to designing a basic commuter bus route alignment within the Walworth-Fox Lake travel corridor intended to function as a feeder to already-established commuter rail services in Northeastern Illinois, the following fundamental findings were evident. These included:

- A major highway facility—USH 12—parallels the proposed Walworth-Fox Lake commuter rail route only between Fox Lake and Richmond, Illinois.

- In that portion of the Walworth-Fox Lake travel corridor west of the Village of Richmond, Illinois, there is no highway facility that parallels, or generally follows, the proposed commuter rail route.

While the proposed commuter rail route is located on a northwest-southeast alignment in this area, the major arterial highways in this same area—USH 14 and STH 120—are located on a north-south alignment.

- Several already-established commuter rail passenger stations could be utilized as transfer locations between commuter bus feeder routes and existing Metra commuter rail services. These stations include Harvard, Woodstock, and McHenry located in McHenry County, Illinois; and Fox Lake and Antioch, located in Lake County, Illinois.

Based upon these considerations, it was recommended that only one basic commuter bus route option be considered further in this feasibility study consisting of two feeder routes extending from southern Walworth County to existing Metra commuter rail stations in northeastern Illinois. The first route would extend from Elkhorn and Lake Geneva to Fox Lake primarily along USH 12, passing through the communities of Genoa City, Richmond, Solon Mills, and Spring Grove, a distance of 29.8 miles. The purpose of this route would be to provide a comparable level of service under the commuter bus alternative to that provided under the commuter rail alternative for passengers traveling to and from the Lake Geneva, Genoa City, Richmond, Solon Mills, and Spring Grove areas. The second route would extend from Delavan and Williams Bay to Harvard primarily along STH 50, STH 67, and USH 14 passing through the communities of Fontana, Walworth, and Big Foot, a distance of 21.0 miles. This route would be intended to provide a comparable level of service to that offered by the commuter rail alternative for passengers traveling to and from the area surrounding the western areas of Geneva Lake. These basic commuter bus route alignments are shown on Map 24.

The highway routings proposed for use were found to represent the most direct, reasonable, and practical choice for such a feeder bus service. For purposes of this feasibility study, another option would be provide only one feeder bus route from Harvard to Williams Bay with an extension to Lake Geneva. This option was considered but rejected since it was found that any passengers boarding at Lake Geneva would have to backtrack through Williams Bay to go to Harvard and then Chicago. It was found that the extra travel time involved for such a trip would inhibit passengers from using this portion of the service. However, it was noted that the bus routes were extended to Elkhorn and Delavan, respectively, in an effort to increase potential ridership and to take advantage of the flexibility of bus feeder services. If and when such feeder bus services were actually implemented, route details may require further consideration. For example, the Fox Lake-Lake Geneva route could be extended to Delavan instead of Elkhorn. Likewise, the Harvard-Williams Bay route could be extended to Elkhorn instead of Delavan.

PASSENGER STATION FACILITIES

The purpose of this section of the chapter is to identify and screen preliminary commuter rail and bus passenger station locations and needs within the Walworth-Fox Lake corridor. In the context of this section, passenger stations are defined as the site, structures, and other equipment necessary to allow passengers to access commuter rail or bus services including platforms, depot buildings, shelters, parking lots, entrance drives, and other passenger amenities. The exact location, specifications, and design of such passenger facilities are more properly considered under subsequent detailed planning, environmental assessment, and engineering phases that must follow completion of a feasibility study, and will be dependent upon the input and decisions of residents and public officials from the local units of government in which such facilities or stops may ultimately be located. Nevertheless, preliminary assumptions concerning the basic general characteristics of station facilities are necessary to adequately define commuter service alternatives for feasibility assessment. The purpose of this section is to establish the likely number and spacing of passenger stations, the generalized location of such facilities for purposes of feasibility assessment, and basic facility characteristics that can be used in evaluating the alternatives developed under this study.

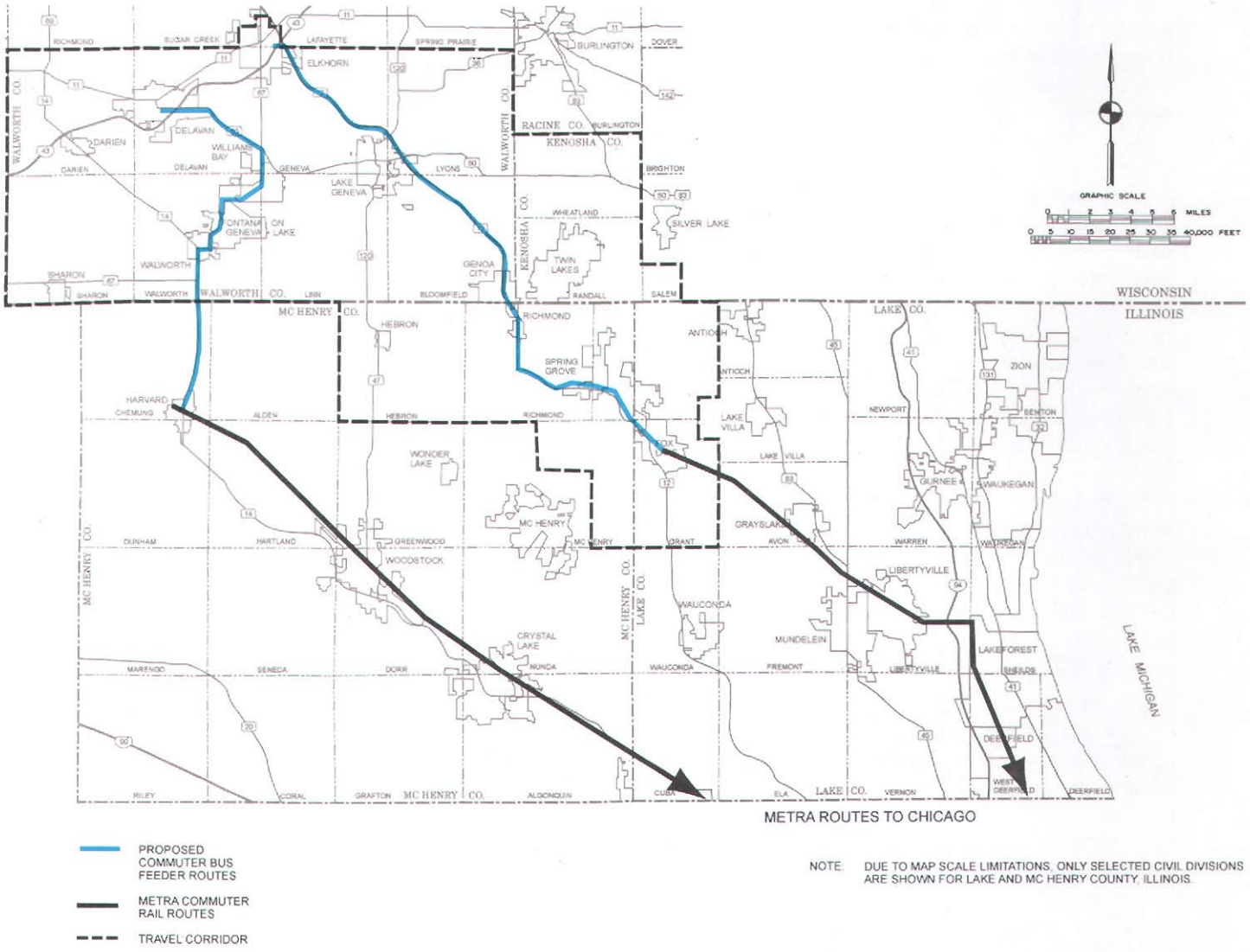
Number and Spacing of Passenger Stations

Passenger stations should be located close enough to each other to properly serve as much of the surrounding existing and planned future urban development as possible, but far enough apart to allow trains or buses to maintain adequate average speeds. The preliminary number of passenger stations and their spacing was determined on the basis of two principal criteria. These were the proximity of the proposed commuter rail or bus routes to concentrations of existing and planned urban development, and sufficient distance between stations to permit acceptable vehicle performance.

The proximity of potential stations to existing and planned concentrations of urban development is crucial since most of the potential ridership will be generated by nearby residential and employment concentrations. The extent of existing and planned year 2020 urban development within the primary study area of the corridor was shown on Map 7. It is important to note that a significant amount of the primary study area consists of existing and planned urban development, most of which includes and surrounds the long established and larger southern Walworth County communities of Fontana, Genoa City, Lake Geneva, Walworth, and Williams Bay.

Map 24

PROPOSED COMMUTER BUS ROUTE ALIGNMENTS



Source: SEWRPC.

For feasibility planning purposes, it was therefore concluded to be appropriate to consider, at a minimum, potential commuter stations located either in these communities, or as near as possible to provide convenient access to and from these communities.

Stations should be spaced far enough apart so that commuter trains and buses can accelerate away from stations, decelerate for the next station, and still be able to sustain reasonable average speeds. Passenger stations located too close together defeat the purpose of providing a relatively fast and attractive new-start transit service.

With respect to potential commuter rail stations, such stations serving older, established commuter rail routes have average spacings ranging from two to five miles, with three miles being typical. For example, the average station spacings on several of Metra's commuter rail lines serving the Lake and McHenry County areas of northeastern Illinois range from 2.8 miles to 3.2 miles. The average station spacing on Metra's new North Central Service between Chicago and Antioch is 2.9 miles. However, station spacings on some recent new-start commuter rail routes in other areas of the United States and Canada are greater than the above-referenced and such stations have

been centrally located only within the most densely developed urban areas since these areas may be expected to generate the largest volumes of potential passengers. The advantages of longer station spacings include: 1) higher possible average operating speeds because of fewer stops, resulting in a higher level of service, which in turn may attract more riders; and 2) lower initial capital cost requirements for passenger station facilities. The primary disadvantage of longer station spacings is the lower level of accessibility provided along the route, resulting in possibly a smaller potential passenger market. In most cases, it is the intent of the newer services to add additional stations in the future, but only as demand increases in areas between the initial stations, or as the initial station facilities become too crowded. For example, the average station spacings on the Los Angeles Metrolink Riverside and Santa Clarita lines are 11.8 miles and 9.5 miles, respectively; on the New Haven Shore Line East service, 8.8 miles; on the San Diego Coast Express Rail service, six miles; on the Miami Tri-Rail service, 4.8 miles; and on the Vancouver West Coast Express, six miles. It was concluded that commuter rail station spacings in the Walworth-Fox Lake Corridor ranging from three to eight miles and located so as to provide access to and from existing and planned concentrations of development could provide a desirable level of commuter train service and performance.

Based on these considerations, a basic set of commuter rail stations within the corridor was identified. It was determined that, at a minimum, the long established community areas within the corridor and located along the Walworth-Fox Lake railway line should be served by appropriately located stations. These areas would include Walworth, Zenda, Richmond, Solon Mills, Spring Grove, and Fox Lake. In addition, the proposed stations should be appropriately located to serve the nearby communities of Fontana, Genoa City, Lake Geneva, Pell Lake, and Williams Bay. It is possible that potential stations for some of these communities could be located in close proximity to each other and therefore be too closely spaced for maintaining a relatively high average speed operation. For example, a single centrally located station serving Lake Geneva and Zenda may be preferable to two separate stations in close proximity to each other. Similarly, a small number of centrally located stations serving Genoa City, Richmond, Spring Grove, and Solon Mills may be preferable to separate stations for each of these communities.

Accordingly, for purposes of this feasibility study, a basic set of commuter rail stations in the Walworth-Fox Lake Corridor would consist of a total of five stations along the route, as set forth in Table 13, and as shown on Map 25. The average station spacing would be about six miles.

Table 13

POTENTIAL PASSENGER STATIONS TO BE USED FOR FEASIBILITY ASSESSMENT ON THE WALWORTH-FOX LAKE COMMUTER RAIL ROUTE

Milepost Location	Passenger Station Name	Distance (miles)	
		From Fox Lake	From Walworth
49.5	Fox Lake	--	24.5
54.7	Spring Grove-Solon Mills	5.2	19.3
59.1	Richmond	9.6	14.9
65.3	Highway 120 (Lake Geneva and Zenda)	15.8	8.7
74.0	Walworth	24.5	--

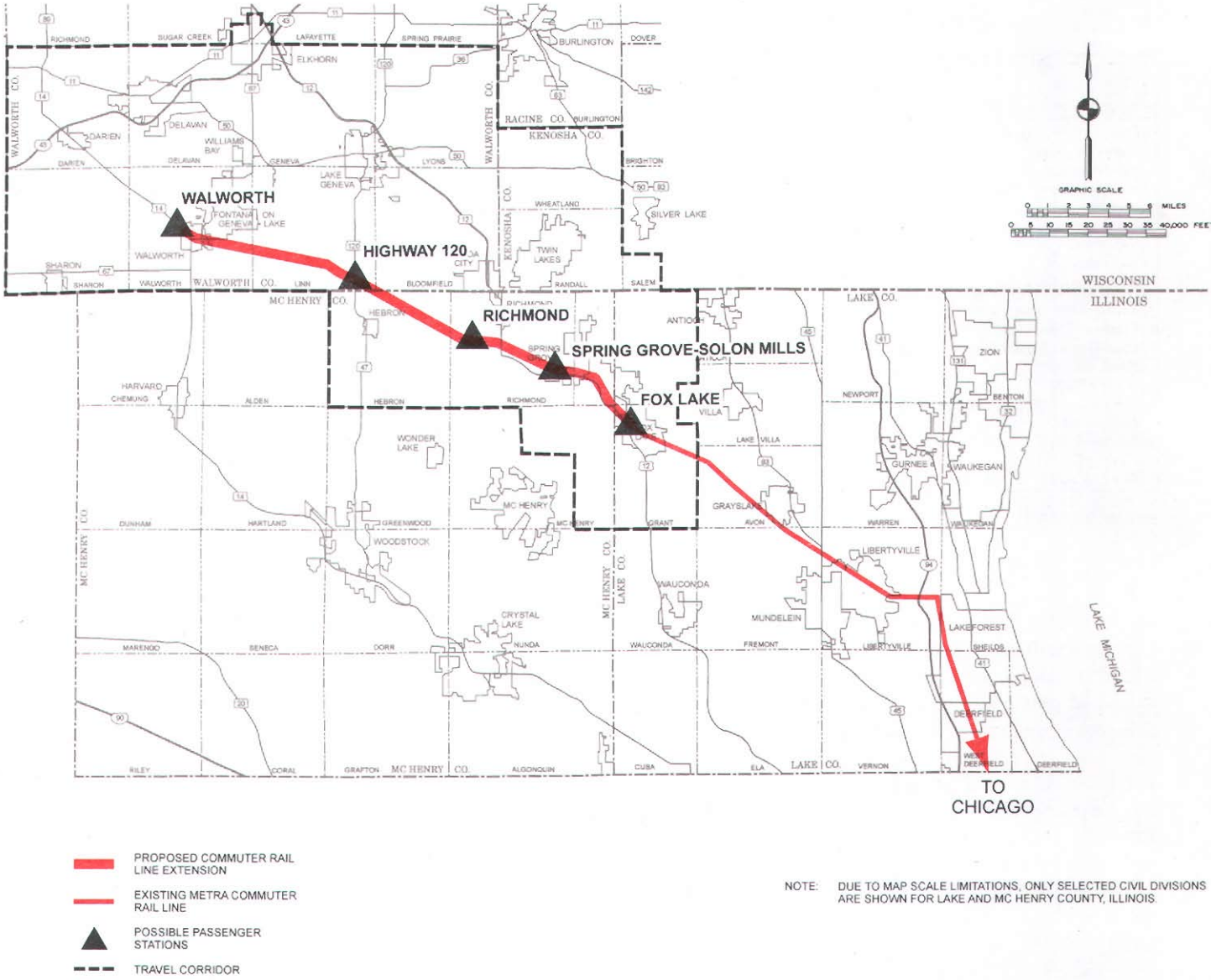
Source: SEWRPC.

The spacing of potential commuter bus stations varies considerably depending upon the characteristics of each individual route. For example, there are many existing rapid transit and express bus routes in Southeastern Wisconsin that provide what is essentially a commuter service. Many of the freeway flyer routes operated by Milwaukee County Transit System stop only at designated park-ride lots in outlying areas, resulting in a typical station spacing of two to five miles; but make stops every one-quarter mile in the Milwaukee central business district. The suburban bus routes operated by Wisconsin Coach Lines, Inc., in the Milwaukee-Waukesha-Oconomowoc and Milwaukee-Racine-Kenosha corridors also have stops in the outlying areas varying anywhere from one to five miles, but make more frequent stops varying from one-quarter to one-half mile in the more densely developed urbanized areas. Some of these commuter bus services will also make special stops at other locations at the request of passengers.

Some of the bus routes operated by Pace, the suburban bus operating division of the Regional Transportation Authority for Northeastern Illinois, are specifically coordinated with Metra commuter rail service and function largely as feeders to Metra commuter rail routes. Other Pace services that are referred to as supplemental routes provide service to commuter rail stations during periods when train service is not operated. Since these supplemental bus services typically stop only at the commuter rail stations, the station spacing of the bus routes is very similar to the commuter rail station spacing, which varies from two to three miles. In actuality, the supplemental bus service station spacing is somewhat longer than the commuter rail station spacing along the same route since the bus routes must follow a more circuitous route over local streets and highways between the stations. The Pace supplemental bus service operated for Metra's South West Service commuter rail route

Map 25

GENERALIZED LOCATIONS FOR POSSIBLE COMMUTER RAIL PASSENGER STATIONS IN THE WALWORTH-FOX LAKE CORRIDOR



Source: SEWRPC.

between Orland Park and Chicago provides an example of the type of potential feeder bus service in the Walworth-Fox Lake corridor.

Based on these considerations, a basic set of commuter bus stations and stops within the corridor was identified. It was determined that at a minimum, the long-established community areas served by the feeder bus routes should be served by appropriately located stations or stops. As noted above, the feeder bus service envisioned would consist of two feeder bus routes. These areas would include Delavan, Williams Bay, Fontana, Walworth, Big Foot, and Harvard along the first feeder bus route, and Elkhorn, Lake Geneva, Pell Lake, Genoa City, Richmond, Solon Mills, Spring Grove, and Fox Lake along the second commuter bus feeder route. Because the acceleration, deceleration, and operating speed characteristics for buses differ from those of commuter rail equipment, stations or stops for commuter bus services can be located closer together. Also, since the commuter buses are not confined to a

Table 14

POTENTIAL PASSENGER STATIONS TO BE USED FOR FEASIBILITY ASSESSMENT OF THE WALWORTH-FOX LAKE CORRIDOR COMMUTER BUS SERVICE

Station or Stop Name	Distance (miles)	
	Southbound	Northbound
Delavan–Williams Bay–Harvard Route		
Delavan (Park-Ride)	--	21.0
Williams Bay (Downtown)	6.9	14.1
Williams Bay (West Side)	7.5	13.5
Fontana	10.9	10.1
Walworth (Park-Ride)	12.5	8.5
Walworth (Village Square)	13.1	7.9
Big Foot	15.6	5.4
Harvard (Metra Depot)	21.0	--
Elkhorn–Lake Geneva–Fox Lake Route		
Elkhorn (Park-Ride)	--	29.8
Lake Geneva (Park-Ride)	8.9	20.9
Pell Lake	14.3	15.5
Genoa City	18.2	11.6
Richmond (Downtown)	19.7	10.1
Richmond (Park-Ride)	20.5	9.3
Solon Mills	23.2	6.6
Spring Grove	25.0	4.8
Fox Lake (Metra Depot)	29.8	--

Source: SEWRPC.

single railway line routing, they have the ability to connect a larger number of communities or developed areas. It was also recognized that if commuter bus service were indeed implemented, additional stations or stops could easily be added along the route as necessary.

The basic set of commuter bus stations in the Walworth-Fox Lake corridor would consist of eight stations or stops along the Delavan-Williams Bay-Harvard bus route and nine stations or stops along the Elkhorn-Lake Geneva-Fox Lake bus route. The stations are set forth in Table 14 and shown on Map 26. The average station spacing would be about three miles along the Williams Bay-Harvard bus route and about 3.7 miles along the Lake Geneva-Fox Lake bus route.

Specific Locations of Passenger Stations

Once the number and spacing of passenger stations along the commuter rail route was determined, further consideration was given to the location of each facility. The primary criteria used to identify specific passenger station locations included:

- The location, extent and intensity of existing and planned urban and suburban development in the vicinity of the stations. It is desirable that commuter rail and bus stations be centrally located in concentrations of existing and planned residential development as well as in central business districts and as close as possible to other major traffic generators. Concentrations of residential development located up to a distance of three miles from a station can be adequately served since commuter rail and bus services will generally be dependent upon park-ride lot and feeder bus access as well as upon direct walk access.

- Availability of adequate land for initial station facility development and future expansion. The initial station facilities may include only platforms and minor passenger amenities with an adequately sized park-ride and possibly feeder bus access facilities. Commuter rail stations can be the least elaborate of all types of rail transit stations and bus stations or stops are typically the least elaborate of all types of public transit stations. However, significant area may be required for park-ride lot facilities.

- Appropriate access to the station. Passengers need to have safe, efficient, and direct access to platforms from sidewalks, bus and taxi stops, automobile parking lots, and nearby land uses. To facilitate proper access by private automobile, taxi, and feeder buses, commuter stations should be well located with respect to the arterial street and highway system of the corridor. The arterial street and highway system in the corridor is shown on Map 21. Passengers should also be able to readily interconnect with other urban and intercity transportation modes.

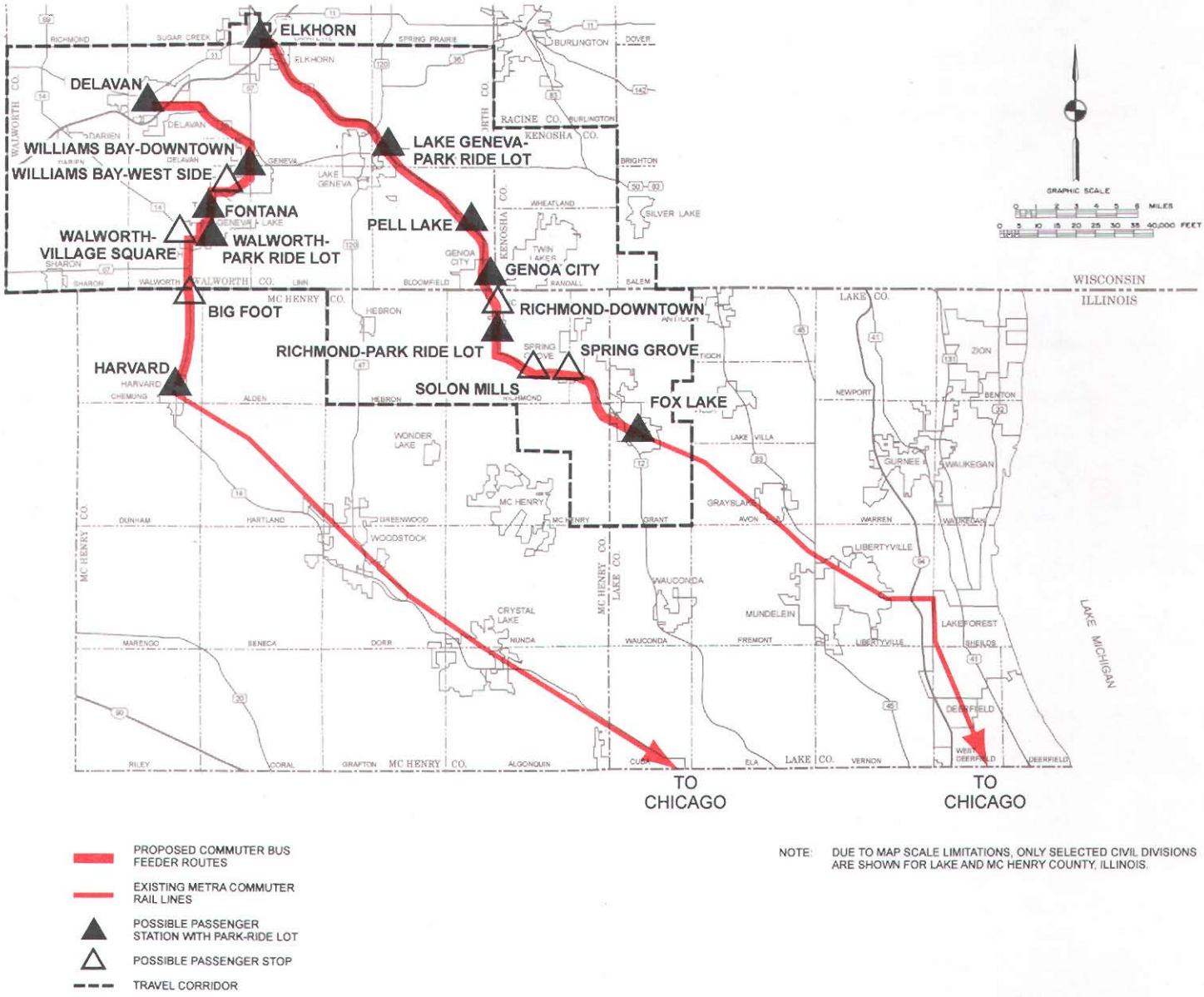
- Historic locations of rail and bus stations in the corridor and the present condition and use of such locations. Such historic station locations may provide convenient and readily developable locations for new commuter stations.

Based upon application of these criteria, comments and suggestions made by individuals, and review of past commuter rail planning efforts by the Regional Planning Commission, specific locations were identified for the set of five potential commuter rail stations recommended in the Walworth-Fox Lake Corridor as follows:

- WALWORTH—This station would be located where the Wisconsin & Southern mainline crosses Madison Street (USH 14). This site is about 0.8 mile northwest of the center of the Village of Walworth and would be located along a major highway. This site would be well located to serve trips arriving

Map 26

GENERALIZED LOCATIONS FOR POSSIBLE COMMUTER BUS PASSENGER STATIONS AND STOPS IN THE WALWORTH-FOX LAKE CORRIDOR



Source: SEWRPC.

by automobile from not only the Village and Town of Walworth, but also the City of Delavan, the Villages of Fontana, Williams Bay, and Darien, and the area surrounding Delavan Lake. Alternative depot sites would be where the railway line crosses Main Street, and where the railway line crosses Kenosha Avenue (CTH B), both in the Village of Walworth. The Main Street site would be about 0.4 mile north of the center of the Village and could facilitate direct walk access by many Village of Walworth residents. The Kenosha Avenue site would be about one mile east of the center of the Village but could result in a slightly shorter operating time between Walworth and Fox Lake for commuter trains and may offer more convenient automobile drive access for passengers going to and from the Fontana and Williams Bay areas. Either of these two alternative sites may be worthwhile to consider during any subsequent planning or engineering phase.

- HIGHWAY 120—This station would be located where the Wisconsin & Southern mainline crosses Wisconsin STH 120, about one-half mile north of the Wisconsin-Illinois state line. This location is about two miles east of the unincorporated community of Zenda and about 6.5 miles south of the City of Lake Geneva central business district. This site is the most convenient for passengers going to and from the City of Lake Geneva and would also serve trips arriving by automobile from throughout the Town of Linn, which includes residential areas situated on the south shore of Geneva Lake. This site also offers good access to the arterial street and highway system. A single station serving the Town of Linn, Town of Zenda, and the City of Lake Geneva may be more appropriate than two or more separate stations closely spaced together in this area.

- RICHMOND—This station would be located where the Wisconsin & Southern mainline crosses Keystone Road. This location is about 1.4 miles west of the Village of Richmond central business district and about 0.3 mile south of Illinois STH 173. This location is well positioned to serve trips arriving by automobile from the Village of Richmond in Illinois, as well as the Village of Genoa City and the Pell Lake area of the Town of Bloomfield in Wisconsin. Two other alternative sites were considered in the Richmond area. The first would be where the Wisconsin & Southern mainline crosses over USH 12 about 1.3 miles south of the Richmond central business district. This site was considered to be impractical because of the difference in elevation between the railway line and the surrounding land, as well as the presence of some wetland areas and residential and commercial development immediately adjacent to the railway right-of-way. The second alternative site would be where the Wisconsin & Southern mainline crosses Kuhn Road near its intersection with USH 12, located about two miles southeast of the Village of Richmond central business district. This site was also considered impractical because of its proximity to a heavily trafficked major highway and its relative proximity to a potential station for the Solon Mills-Spring Grove area. According, for purposes of this feasibility study, the Keystone Road site was concluded to be the most practical.

- SPRING GROVE–SOLON MILLS—This station would be located along the Wisconsin & Southern mainline at about Milepost 54.7 adjacent to the industrial park on the Village of Spring Grove's west side. This location is about 0.8 mile west of the former Spring Grove passenger depot site and would be situated midway between the centers of the Villages of Spring Grove and Solon Mills. In addition, this location has been proposed as a depot site by local development interests. This location could facilitate direct walk access to future residential, commercial, and industrial development in the area and serve trips from throughout the Spring Grove and Solon Mills area arriving by automobile. It was concluded that a single station in this area would be preferable to separate stations for Solon Mills and Spring Grove located in close proximity to each other.

- FOX LAKE—This station would utilize the existing Metra passenger depot located at 32 Nippersink Boulevard on the west side of the Fox Lake central business district. Because Metra already uses this facility, it is already established as a commuter rail passenger station and as a transportation center for the Fox Lake area. This site is well-located to provide direct walk access to the older developed portion of the Village of Fox Lake and to serve trips from throughout the area arriving by automobile, taxi, and local bus routes. The depot area already has automobile parking facilities and good access from the arterial street and highway system.

Based upon application of the criteria, comments and suggestions made by individuals, and review of past transit planning efforts by the Regional Planning Commission, specific locations were identified for the set of 13 potential commuter bus stations and stops recommended in the Walworth-Fox Lake Corridor as follows:

Delavan-Williams Bay-Harvard Feeder Bus Route

- DELAVAN—This station would be located near the intersection of Geneva Street—STH 50—and Borg Road, about 1.2 miles southeast of downtown Delavan. This station would include a parking lot and would be primarily intended to serve trips from throughout the Delavan area arriving by automobile, taxicab, and shuttle vans.

- WILLIAMS BAY-DOWNTOWN—This station would be located near the intersection of Geneva Street and Walworth Avenue along STH 67 in downtown Williams Bay. This station would include a parking lot and could provide direct walk access to much of the older portion of Williams Bay, including Edgewater Park, and

serve trips arriving by automobile, taxicab, and shuttle vans from nearby areas.

- WILLIAMS BAY-WEST SIDE—This stop would be located on Geneva Street—STH 67—near its intersection with Orchard Street. This stop would consist only of curbside boarding areas and would be primarily intended to provide direct walk access to and from the residential areas on the west side of the Village of Williams Bay.

- FONTANA—This station would be located near the intersection of Alpine Street—STH 67—and West Main Street, about 0.3 mile west of downtown Fontana. This station would include a parking lot and could provide direct walk access to and from residences, commercial establishments, and the lakefront in the Village of Fontana and serve trips from throughout the Fontana area arriving by automobile, taxicab, or shuttle vans.

- WALWORTH PARK-RIDE—This station would be located near the intersection of Kenosha Avenue—CTH B—and Alpine Street—STH 67—about 0.6 mile east of downtown Walworth. This station would include a parking lot and would be primarily intended to serve trips from throughout the Walworth and Fontana area arriving by automobile, taxicab, and shuttle vans.

- WALWORTH-VILLAGE SQUARE—This stop would be located near the intersection of Kenosha Avenue—STH 67—and South Main Street—USH 14—near the Village Square. This stop would consist only of curbside boarding areas and would be primarily intended to provide direct walk access to and from commercial and residential areas in the older developed portion of the Village of Walworth.

- BIG FOOT—This stop would be located near the intersection of USH 14 and State Line Road. This stop would consist only of roadside boarding areas and would be primarily intended to serve residents in and around the unincorporated Illinois community of Big Foot.

- HARVARD—This station would utilize the existing Metra passenger depot located at 1 N. Ayers Street near the central business district of the City of Harvard. Because Metra already uses this facility, it is already established as a commuter rail passenger station and would be an appropriate location for passengers transferring between the feeder bus route and already established Metra commuter trains to and from Chicago.

Elkhorn-Lake Geneva-Fox Lake Feeder Bus Route

- ELKHORN—This station would be located near the intersection of Geneva Street—CTH NN—and CTH H, about 0.9 mile east of downtown Elkhorn. This station would include a parking lot and would be primarily intended to serve trips from throughout the Elkhorn area arriving by automobile and taxicab.

- LAKE GENEVA—This station would be located near the interchange of STH 50 and USH 12, about 1.2 miles east of downtown Lake Geneva. This station would include a parking lot and would be primarily intended to serve trips from throughout the Lake Geneva area arriving by automobile, taxicab, and shuttle vans.

- PELL LAKE—This station would be located near the interchange of Pell Lake Drive and USH 12 on the east side of the community of Pell Lake. This station would include a parking lot and would be primarily intended to serve trips from throughout the Pell Lake area and Town of Bloomfield arriving by automobile.

- GENOA CITY—This station would be located near the interchange of Main Street—CTH B—and USH 12 on the east side of the Village of Genoa City. This station would include a parking lot and would be primarily intended to serve trips from throughout the Genoa City and Bloomfield area arriving by automobile.

- RICHMOND-DOWNTOWN—This stop would be located near the intersection of S. Main Street—USH 12 and STH 31—and Broadway Street in downtown Richmond. This stop would consist only of curbside boarding areas and would be primarily intended to provide direct walk access to the older developed portion of the Village of Richmond.

- RICHMOND PARK-RIDE—This station would be located near the intersection of S. Main Street—USH 12 and STH 31—and Hill Road about one mile south of the center of the Village of Richmond. This station would include a parking lot and would be primarily intended to serve trips from throughout the Richmond area arriving by automobile.

- SOLON MILLS—This stop would be located near the intersection of USH 12 and White Street in the center of Solon Mills. This stop would consist only of curbside boarding areas and would be primarily intended to provide walk access to the older developed portion of the Village of Solon Mills.

- SPRING GROVE—This stop would be located near the intersection of USH 12 and Finch Street. This stop would consist only of curbside boarding areas

and would be primarily intended to provide walk access to the older developed portion of the Village of Spring Grove.

- FOX LAKE—This station would utilize the existing Metra passenger depot located at 32 Nippersink Boulevard on the west side of the Fox Lake central business district. Because Metra already uses this facility, it is already established as a commuter rail passenger station and would be an appropriate location for passengers transferring between the feeder bus route and already-established Metra commuter trains to and from Chicago.

Basic Commuter Rail and Commuter Bus Passenger Station Facility Requirements

As already noted, determination of the precise configurations and details for individual bus or rail passenger stations is beyond the scope of this feasibility study. Design guidelines were, however, formulated under the study and in the preparation of estimates of spatial needs and development costs. The following guidelines used are generally consistent with railway station and bus station design guidelines and standards utilized in Southeastern Wisconsin and Northeastern Illinois, and which seek to minimize capital cost requirements while providing adequate station facilities.

The size and complexity of railway and bus stations varies widely. Such stations may simply consist of a boarding and deboarding platform, a waiting shelter, and pedestrian access and small automobile parking facilities. Stations at locations generating large volumes of passengers may have very elaborate facilities and especially for commuter rail systems, may include pedestrian overpasses or tunnels to the platforms and elaborate depot buildings complete with ticketing facilities. In some cases, the depot buildings and related passenger facilities for present-day commuter rail systems were originally constructed by private railway companies when those companies operated extensive intercity and commuter train services. This is especially true of the commuter rail depot buildings located in the central business districts of the larger cities of the United States. In any case, the facility needs for commuter rail stations are usually greater and more complex than the facility needs for commuter bus stations. Thus, certain portions of this discussion of station facilities will pertain only to commuter rail stations.

The design of commuter stations must facilitate access by passengers to station facilities and to buses and trains in compliance with guidelines set forth by the Americans with Disabilities Act (ADA). Provisions for passenger accessibility should be consistent with such provisions on connecting public transit services such as Metra which provides the existing commuter rail service between Fox Lake and Chicago and bus services in Wisconsin or Illinois.

For purposes of this feasibility study, the basic elements of passenger stations were assumed to include: boarding and deboarding platforms, passenger access facilities to the platforms, depot buildings, parking for automobiles, drop-off and pick-up areas for passengers using connecting taxis, shuttle vans, and bus services, and certain passenger amenities. Basic guidelines for these elements follow.

Platforms

To facilitate movement of passengers in commuter rail and commuter bus station areas, the design of platforms should consider the existing and future location of depot buildings, shelters, automobile parking, and points of public access. Usually platforms for commuter rail stations are longer than those for commuter bus stations since passengers on commuter trains will board or disembark from several coaches at once during a station stop. Where commuter rail platforms are located near existing streets and highways with at-grade crossings, interruption of vehicular traffic at the crossings should be minimized to the extent possible. Boarding trains across active tracks should be avoided. On single-track lines, (such as the Walworth-Fox Lake route) one platform should be provided on the same side of the track as the public access and parking facilities. Consideration should be given to the possible need to add a second track at the station in the future.

In general, platforms should be located along tangent segments of track or roadways. For commuter rail stations, this is important since it will provide the train crew with a clear view of boarding and deboarding passengers. Platforms should be of low level design. Such design will, however, require the provisions of the Federal Americans with Disabilities Act to be met. For commuter rail stations, the platform width should be a minimum of 10 feet.

Platform length should be based upon projected peak passenger boarding volumes and train operational requirements as shown in Table 15.

For commuter bus stations, the paved platform waiting areas should be a minimum of 12 feet in width by 25 feet in length for each bus loading position. If the bus station is anticipated to have heavy peak passenger volumes, multiple bus loading bays may be necessary.

Platform Access

For both commuter rail and commuter bus stations, sidewalks, stairways, and ramps should be located to provide a clear and direct path for passengers going to and from the platforms. Where public access and platforms are at different elevations, ramps or stairs, or both, should be provided. Whereas the parking areas and platforms for commuter bus stations are normally at the same elevation, parking areas and platforms for commuter rail

Table 15

MINIMUM COMMUTER RAIL PASSENGER STATION PLATFORM LENGTHS

Projected Peak Train Passenger Boardings	Platform Length
1-105	210 linear feet (3 cars)
106-140	295 linear feet (4 cars)
141-175	380 linear feet (5 cars)
176-210	465 linear feet (6 cars)
211-245	550 linear feet (7 cars)

Source: Metra and SEWRPC.

stations are sometimes at different elevations. Where there is a significant change in elevation, elevators or ramps shall be provided. Ramps are more desirable than stairways because of safety and ease of use by elderly and individuals with disabilities. Where elevators need to be provided, they should be located adjacent to the main access point of the platform, and should conform to the applicable requirements for accessibility for individuals with disabilities.

At commuter rail stations, special consideration should be given to minimize the need for passengers to cross active railway tracks at grade. Crossings that are necessary shall be planned to provide direct, but safe, access between platforms, depot buildings, parking areas, pickup points, and connecting taxi and bus service. Locations where pedestrians must cross tracks should be provided with warning devices such as flashing lights and bells.

At commuter rail stations, site conditions and design may indicate whether grade-separated pedestrian crossings are needed or desirable. Overpasses are preferred to underpasses. Grade-separated crossings should be located central to the depot building and platforms, parking areas, streets, and other access points. New grade-separated pedestrian crossings should be accessible to individuals with disabilities and may require the provision of ramps or elevators. Wherever possible, existing street overpasses and underpasses should be utilized.

Passenger Station Buildings

Waiting areas at passenger stations can be provided by various types of structures including depot buildings, warming houses, shelters, and canopies. The required waiting area for each station should be based upon the peak boardings in the plan design year. Specific passenger station design will depend upon forecast ridership and local community desires. Typically, the only structures used at bus stations—such as park-ride lots—are one or more modular shelters. Depot buildings are usually used at bus stations only where several bus routes converge and the location is used as a major transit center or transfer point between bus routes. However, the type of structures at commuter rail stations will vary. At commuter rail stations, forecast passenger demand will help to identify the type of waiting area structure to be used at a given station based on the general guidelines provided in Table 16.

With respect to commuter rail station structures, a passenger depot is an enclosed, heated structure that includes a passenger waiting area and possibly other areas for ticket agent operations, vendor space, public rest rooms, storage, crew facilities, janitor and maintenance operations, and miscellaneous passenger furnishings and amenities. A small depot may have a daily ridership of 500 to 1,000 boardings. A large depot may have a daily ridership of over 1,000 boardings. The complexity of an individual depot will be dependent upon whether it is designed to accommodate a ticket office, which in turn is based on the forecast ridership, guidelines for which are provided in Table 17. A warming house is defined as a fully enclosed and heated structure providing accommodations for waiting passengers only. A shelter is an open structure having three or four sides and a roof providing a protected waiting area for passengers. A shelter may contain a demand-activated heater. A canopy is a column-supported roof structure that provides a covered connection between station buildings and boarding trains.

Parking and Drop-Off Areas

Both commuter rail and commuter bus station sites should be designed to accommodate a variety of access modes including pedestrian, bicycle, bus, taxi, automobile drop-off and pick-up, shuttle vans, and park-ride. Circulation patterns on the station site should be designed to provide good transition and eliminate conflicts between different modes of transportation.

Adequate public parking is important in the design of commuter rail and commuter bus stations. Stations should provide the number of parking stalls required based on projected peak usage during the plan design period.

Other Passenger Amenities

Attention should be given to the provision of other passenger amenities necessary to provide an attractive, safe, cost-effective, and otherwise useable passenger environment. Such amenities consist of those fixtures, furnishings, and equipment providing conveniences to passengers. These may include, but may not be limited to:

Table 16

GUIDELINES FOR TYPES OF STRUCTURES AT COMMUTER RAIL AND BUS PASSENGER STATIONS

Projected Peak Train or Peak Bus Passenger Boardings	Type and Number of Structures
1-24	1 Shelter
25-49	2 Shelters
50-74	1 or 2 Warming Houses
75-99	1 Depot Waiting Room
100-99	1 Depot Waiting Room with Small Canopy
400 and above	1 Depot Waiting Room with Large Canopy

Source: Metra and SEWRPC.

Table 17

GUIDELINES FOR TICKET OFFICES IN COMMUTER RAIL PASSENGER DEPOTS

Projected Daily Passenger Boardings	Number of Ticket Windows and Office Space
1-499	None
500-999	Need for ticket windows to be determined on an individual basis
1,000 and above	1 ticket window and 200 square foot minimum office area

Source: Metra and SEWRPC.

lighting; service information displays; appropriate passenger and vehicle signing; telephones; seating and windbreaks; fencing and guardrails; communication, security, and emergency equipment; landscaping; trash disposal containers; newspaper and other vending machines; and advertising displays. The locations of these items in the passenger area should provide utility and convenience without interfering with normal passenger and pedestrian flow. The specific types and number of amenities will vary with the particular needs of each station site.

ALTERNATIVE SERVICE PROVIDER ARRANGEMENTS

The purpose of this section of the chapter is to provide an evaluation of alternative service provider arrangements for commuter rail and commuter bus service within the Walworth-Fox Lake corridor. It was recognized that there were two important considerations with regard to this issue, regardless of what service provider arrangement or operational configuration would ultimately be selected should the service be implemented. First, the potential service will be interstate in nature. It could therefore be expected that funding for implementation and operation of such a new service could be shared by responsible public entities from both Wisconsin and Illinois. The degree to which such responsibility is shared would have to be negotiated and agreed upon. Second, an appropriate public entity within Wisconsin would need to be designated as responsible for implementation, funding, and operation of the service and to serve as the administrative organization and sponsoring agency for this service. This could be an office or department of an existing unit of government or agency at the municipal, county, or state level, or a new public agency specifically created for this purpose. Such an entity already exists within Illinois in the form of Metra.

The range of possible service-provider arrangements was found to be represented by three basic alternatives. These were: 1) provision of service by a public entity contracting with an existing operator; 2) provision of service by a public entity contracting with a new private operator through a competitively awarded contract; and 3) provision of service by a new local public provider as the direct operator. These alternative service provider arrangements are described below.

Provision of Service by a Public Entity Contracting with an Existing Operator

Under this type of arrangement, service would be provided by an existing transit operator. With respect to commuter rail, the only existing operator in the area is Metra. Metra is an established operating agency with a reliable service, safety, and dependability record and has the experience to operate a successful commuter rail service. In providing service in the Walworth-Fox Lake Corridor, it may be most cost-effective to expand as necessary Metra's existing staff of operators, mechanics, and ticket agents, as well as rolling stock fleet and facilities than to have a new agency procure equipment, assemble staff, and create the necessary infrastructure for commuter service. Metra is also experienced in negotiating trackage use and purchase-of-service agreements with freight railroads for commuter service. Under this alternative, the day-to-day control over service, costs, and other factors would be the responsibility of Metra. Because Metra already operates the Fox Lake-Chicago commuter rail service, it could easily provide a through service between the Walworth-Fox Lake extension

and Chicago, which would not require passengers to transfer between trains at Fox Lake. Through service to and from Chicago is considered to be essential in attracting any ridership to the Walworth-Fox Lake service.

It is important to note that about one-half of the potential Walworth-Fox Lake extension would be in Wisconsin, and about one-half would be in Illinois. It is anticipated that within Illinois, the extension would serve residents in and around the communities of Spring Grove, Solon Mills, and Richmond. Thus, it may be assumed that the costs for such a service extension could be shared between Metra and an appropriate Wisconsin public entity since both the Wisconsin and Illinois portions of the corridor may be expected to benefit. It is important to point out that Metra's responsibility lies entirely with addressing transportation needs and providing service within the six-county Northeastern Illinois Region. Metra's territory includes all of Lake and McHenry Counties. Metra officials have indicated that providing regularly scheduled weekday commuter rail service outside Metra's six-county territory could be considered. However, such service could only be operated if another responsible party provides funding for all necessary capital costs and all net operating costs for that portion of the service outside Metra's territory, and if Metra has the equipment and staff to undertake such an extension. It should be noted that while Metra may be able to provide service outside its territory, as of the end of 1999, no such service was being provided on a regular basis with one exception, that being the Metra Union Pacific North Line which provides service to Kenosha, Wisconsin. This route is unique in that it is the only Metra route that currently extends outside the six-county Northeastern Illinois region without receiving any public funding other than by Metra. The primary reason for this is the existence of overnight train storage facilities at Kenosha that are currently used by Metra and are, therefore, an operational convenience to Metra and Union Pacific Railroad. Any provision of commuter rail service in the Walworth-Fox Lake corridor will require sponsorship and funding for all capital and operating cost needs by a Wisconsin entity at least for that share of the service actually in Wisconsin. It was therefore concluded that provision of potential commuter rail service in the Walworth-Fox Lake corridor by Metra was a reasonable and practical service provider arrangement.

With respect to commuter bus, the only existing operator of fixed-route service in the corridor is Pace. Pace is an established operator with a reliable service, safety, and dependability record and has the experience to operate commuter bus service. As noted previously, Pace provides the suburban bus service in the Chicago Metro area and, in fact, has provided the supplemental and feeder bus services that have been coordinated with some Metra commuter rail routes. Pace operates a wide variety of local and express fixed-route services as well as dial-a-ride, paratransit, and vanpool services throughout Northeastern Illinois. Fixed route services include bus routes operated as feeders and supplements to Metra commuter rail service, and many of the outlying routes serving low-density areas such as those in McHenry and Lake Counties. For many of these routes, and especially where such a route would require a lengthy deadhead mileage from Pace garage facilities, Pace contracts with private transit providers. In 1998, Pace contracted directly with eight such private providers for fixed-route service throughout its territory.

Like Metra, Pace's responsibility for providing services lies entirely within the six-county Northeastern Illinois Region. Also, like Metra, Pace does not normally provide fixed-route bus services outside its six-county territory, and to date, the only Pace routes that do operate outside the six counties do so to reach the Hammond, Indiana transit center, a major transfer point located only about one mile east of the Illinois-Indiana state line. If Pace were requested to provide a fixed-route type of bus service—such as the commuter feeder routes envisioned in this study—between an outlying area of Northeastern Illinois and an area beyond the boundary of Northeastern Illinois, Pace officials have indicated that it would probably do so only through contracting with a private operator. This would provide no advantage over a Wisconsin public entity directly contracting with a private operator. In fact, the extra step of providing such service through Pace would serve to complicate the service procurement process and even increase the total cost because of the need to reimburse Pace for its overhead costs. For this reason, it was concluded that provision of potential commuter bus service in the Walworth-Fox Lake corridor by an existing public operator was not a practical service-provider arrangement and would not be considered further.

Provision of Service by a Public Entity Contracting with a New Private Operator through a Competitively Awarded Contract

Under this type of arrangement, service would be provided by a private operator through a competitively awarded contract. This service-provider arrangement would be expected to be more practical for a commuter bus alternative than for a commuter rail alternative. Within the Southeastern Wisconsin Region, Waukesha County utilizes this kind of arrangement to provide suburban and commuter bus transit services.

With respect to commuter rail, the private operator could conceivably be any other private firm—including another railroad company—which was qualified to operate passenger train service. However, it was considered unlikely that any operators would be permitted to operate passenger trains east of Fox Lake on Metra-owned

trackage other than Amtrak—which already has an agreement to operate its trains over Metra-owned trackage between Fox Lake, Rondout, and Chicago—and, of course, Metra. Thus, passengers would be required to change trains at Fox Lake. The inconvenience of changing trains at Fox Lake, and the attendant effect on potential ridership levels; together with the operational complexity of operating non-Metra commuter trains into Fox Lake, provided sufficient reason to conclude that provision of potential commuter rail service in the Walworth-Fox Lake corridor by a new private operator may not be a practical service-provider arrangement and should not be considered further in this feasibility study.

With respect to commuter bus, the service contract between the responsible public entity and the successful private transit operator would cover all of the costs of day-to-day operations, including the provision of necessary capital facilities such as a storage and maintenance garage. Under this kind of arrangement, the private transit operator would supply the necessary operating equipment, staff and facilities as part of its service contract. The private operator would require a garage facility for bus overnight storage, cleaning, and servicing somewhere in the Lake Geneva-Williams Bay area. If the successful operator did not already have such a facility, one would have to be developed. This, however, would be the responsibility of the operator under terms of the contract. An advantage of this arrangement is that the responsible public entity would not have the responsibility to make potentially large capital outlays for equipment and facilities. It was concluded that provision of potential commuter bus service in the Walworth-Fox Lake corridor by a public entity contracting with a new private operator was a reasonable and practical service-provider arrangement.

A variation of this service provider arrangement would be for the responsible public entity to purchase the operating equipment and facilities that would be necessary and provide them to a private transit operator who would be selected through a competitively awarded contract. This variation would also recognize that potential transit operators might not have the financial resources or capability to fund the needed level of capital expenditures. Under this variation, the responsible entity could draw on Federal transit programs to offset the major portion of the major expenditures required for capital equipment and facilities. This variation would assure the responsible public entity of having the desired equipment and facilities. This arrangement, however, would be more complicated and could require greater lead time than simply contracting with an operator for the service as well as the necessary equipment and support facilities.

New Local Public Provider as Direct Operator

Under this type of arrangement, a potential new commuter rail or bus service would be owned and operated directly by a public entity such as a local unit of government or agency. The responsible public entity would purchase and own the operating equipment and facilities needed for the commuter service. The public entity would also operate the system, using public employees, and would be responsible for overseeing all activities related to the administration, as well as day-to-day management and operation, of the service. This service-provider arrangement would permit the public entity to have the greatest amount of control over the operating equipment and facilities to be used and over all aspects of service administration, management, and operation. Within the Southeastern Wisconsin Region, the City of Kenosha utilizes this kind of arrangement to provide transit services.

This arrangement, however, would require a significant increase in public staff with the appropriate expertise and require the responsible public entity to assume direct responsibility for resolving any potential labor relations problems and negotiation of potential union contracts with such personnel as vehicle operators and mechanics. Also, public ownership of the operating equipment and facilities would require a significant capital outlay to initiate service. Thus, this service-provider arrangement was concluded to be relatively complicated and not have any real advantage over the other arrangements described above. With respect to commuter rail, an additional disadvantage of this arrangement lies in that Metra would probably not allow any other provider to operate its passenger trains east of Fox Lake on Metra-owned trackage. Thus, passengers would be required to change trains at Fox Lake, significantly affecting potential ridership levels.

It was therefore concluded that the provision of either commuter rail or commuter bus service in the Walworth-Fox Lake corridor by a new local public provider as the direct operator was not a practical service provider arrangement and would not be considered further.

Evaluation of Service Provider Alternatives

Based on the review of the alternative service provider arrangements, the arrangement most practical for further consideration in this feasibility study of commuter rail service in the Walworth-Fox Lake corridor is operation by Metra. For further consideration of commuter bus service in the Walworth-Fox Lake corridor, it was concluded that provision of such service in the Walworth-Fox Lake corridor by a public entity contracting with a private operator through a competitively awarded contract was the most reasonable and practical service provider arrangement.

OPERATING PLANS

The purpose of this section of the chapter was to provide a description and screening of alternative commuter rail and bus operating plans. Two basic categories of operating plans were considered, one consisting of rail operating plans, the other consisting of bus operating plans. In each of these two categories, different operating schedules were considered to provide alternative levels of service.

The general methodology utilized to develop operating plans was to first identify each alternative in terms of the basic service characteristics. Then, other operating alternatives were considered as variations of each basic alternative. Differences in ridership, capital costs, and operating costs would result from each of the alternative levels of service. The level of service characteristics that are critical to forecasting potential ridership included average operating speeds, days and hours of service, frequency of service, and headways. Developing detailed schedules, or exact timetables, was not essential to the feasibility planning effort. Operating plan scenarios were designed to be representative of other new-start commuter rail and feeder bus services intended to be coordinated with commuter rail routes.

Operating Plan Assumptions

It was necessary to make certain assumptions as a basis for the design of various operating plan alternatives. The intent of these assumptions was to enable the alternatives to be designed in a realistic and implementable manner in a corridor where no such service exists. For the commuter rail operating alternatives, the following assumptions were based upon a review of the characteristics and recent experience of other new-start commuter rail services in North America, such as those operating in the metropolitan areas of Los Angeles, Miami, Vancouver, and Washington D.C., as well as the new commuter rail services being developed by Metra in the Chicago area.

- The overall experience of contemporary new-start commuter rail routes in the United States and Canada indicates that initially, only a very basic service is operated, consisting of a small number of trains operating only in the peak direction and only during weekday peak periods.

- On new-start commuter rail routes, initial peak-period service has normally consisted of two or three trains in the peak direction during the peak period. A smaller number of reverse direction peak period trains have been instituted on some routes where sufficient demand in the nonpeak direction has been forecast.

- A small number of weekday, midday, and early evening trains have been operated on new-start commuter rail routes to provide more schedule choices for passengers. Such service has been initiated in some cases as part of the start up of service, and in other cases only when the initial peak-period service has been in operation for some time.

- Service in late evenings on weekdays and on Saturdays, Sundays, and holidays is rare on contemporary new-start commuter rail lines. Institution of service during these periods has been viewed as a potential improvement over the long-term future. In the interim, some new-start services provide shuttle buses to the commuter rail stations during periods that trains do not operate. The shuttle buses may operate along the entire length of the route, or may provide service from another rail transit terminal that does operate during those periods.

- Improvements and enhancements to contemporary new-start commuter rail routes have normally been undertaken on an incremental basis only after the initial service offering, or last service improvement, has been successfully tested in terms of ridership, market acceptance, and cost-effectiveness. In some cases, several years separate such incremental improvements.

- Incremental improvements and enhancements have been dependent upon sufficient resources being available and the ability to integrate the added services with existing passenger and freight train traffic.

To facilitate the design of preliminary operating schedules under this feasibility assessment, existing and desirable future operating speeds were identified by zones along the potential Walworth-Fox Lake commuter rail route. Existing speeds were identified from the current operating timetables of the railway companies involved. Desirable future operating speeds were based upon possible operational considerations, possible signal system improvements, operating speeds of other existing commuter rail systems, and historical operating speeds of passenger train operations along the same route. Following this review, it was concluded that for purposes of this feasibility study, a maximum mainline operating speed of 59 miles per hour would be desirable. This would be consistent with the prevailing maximum operating speed of 60 miles per hour between Fox Lake and Rondout where the single-track route then becomes double track. In some zones, the maximum operating speeds would be proportionally lower

Table 18

MAXIMUM OPERATING SPEEDS FOR POSSIBLE COMMUTER RAILWAY PASSENGER TRAIN SERVICE IN THE WALWORTH-FOX LAKE CORRIDOR

Zone	Description	Mileposts	Distance	Maximum Operating Speed	
				Existing	Proposed
A	Fox Lake Depot to Oak Street	49.5-49.7	0.2	10	10
B	Across Bridges	49.7-50.1	0.4	10	30
C	Fox Lake to Walworth	50.1-72.4	22.3	30	59
D	East Side of Walworth to Walworth Depot	72.4-74.0	1.6	30	35
--	Total	--	24.5	--	--

Source: SEWRPC.

because of alignment, operational, or safety constraints. The operating speeds for each zone is set forth in Table 18.

Once the permissible operating speeds for each segment were identified, commuter train travel times over the entire proposed route were developed. A one-way trip in either direction between Walworth and Fox Lake would take a total of 38 minutes at all times of the day including stops at the Highway 120, Richmond, and Spring Grove stations. A one-way trip in either direction along the entire Walworth-Fox Lake-Chicago route may typically take 118 minutes for express travel making 12 to 16 intermediate stops during weekday peak periods and 123 minutes for local trains making all 22 intermediate stops during weekday nonpeak periods and on weekends and holidays. The travel times to be used under this feasibility assessment between stations, as well as station dwell times, and total travel time along the route for trains are presented in Table 19. Meets between commuter rail trains and freight trains operations may also have to be accommodated. The times presented in Table 19 do not include any time increments for such meets between trains.

With respect to average speeds for the potential commuter rail service, an average speed of 39 miles per hour would be attained over the 24-mile long Walworth-Fox Lake extension. An average speed of 36 to 38 miles per hour would be attained over the entire 74-mile long Walworth-Fox Lake-Chicago route depending upon the time of day. As noted earlier, commuter rail service, in general, operates at relatively high overall average speeds ranging from 30 to 50 miles per hour. By comparison, typical average speeds on Metra's Milwaukee District North Line between Fox Lake and Chicago range from 35 to 38 miles per hour, and average speeds on Metra's new North Central Service between Chicago and Antioch are 37 miles per hour.

For the commuter bus operating alternatives, the following assumptions were used as a basis for design based on a review of the characteristics and recent experience of express and commuter bus services in North America. Of particular interest were such bus services operating in Southeastern Wisconsin and Northeastern Illinois, especially the feeder and supplemental bus services operated by Pace that provide connecting services to Metra commuter rail routes in the Chicago area.

- The overall experience of commuter bus routes in the United States and Canada indicates that a majority of these routes provides service only in the peak direction and only during weekday peak periods.

- In some cases, such commuter bus services operate primarily as feeders terminating at outlying commuter rail stations. In other cases, such commuter bus services operate as supplemental services providing service along the entire commuter rail corridor; sometimes only during periods of the day when commuter trains do not operate, and in other cases, as additional service during weekday peak periods when commuter trains are operated.

- In situations where commuter buses are intended to provide supplemental service during periods when commuter trains do not operate, they may be designed to connect with other commuter rail routes that do operate during the entire day.

Table 19

ASSUMMED OPERATING TIMES TO BE USED FOR FEASIBILITY ASSESSMENT OF COMMUTER RAIL PASSENGER TRAIN SERVICE IN THE WALWORTH-FOX LAKE-CHICAGO CORRIDOR

Measured Distance	Passenger Stations and Route Segments	Travel and Dwell Times (in minutes)[a]	
		Weekday Peak	Weekday Nonpeak
--	*Walworth*	--	--
8.7	**Walworth-Highway 120**	**12**	**12**
--	*Highway 120*	*1*	*1*
6.2	**Highway 120-Richmond**	**8**	**8**
--	*Richmond*	*1*	*1*
4.4	**Richmond-Spring Grove**	**6**	**6**
--	*Spring Grove*	*1*	*1*
5.2	**Spring Grove-Fox Lake**	**9**	**9**
--	*Fox Lake*	*1*	*1*
8.5	**Fox Lake-Grayslake**	**13**	**13**
--	*Grayslake*	*1*	*1*
5.5	**Grayslake-Libertyville**	**6**	**6**
--	*Libertyville*	*1*	*1*
7.5	**Libertyville-Lake Forest**	**9**	**9**
--	*Lake Forest*	*1*	*1*
3.8	**Lake Forest-Deerfield**	**5**	**5**
--	*Deerfield*	*1*	*1*
6.8	**Deerfield-Glenview**	**9**	**10**
--	*Glenview*	*1*	*1*
3.1	**Glenview-Morton Grove**	**5**	**5**
--	*Morton Grove*	*1*	*1*
6.1	**Morton Grove-Grayland**	**9**	**11**
--	*Grayland*	*1*	*1*
8.2	**Grayland-Chicago CBD**	**16**	**18**
--	*Chicago CBD*	--	--
24.5	Walworth-Fox Lake	0:38	0:38
49.5	Fox Lake-Chicago	1:19	1:24
74.0	Walworth-Chicago	1:58	2:03

[a]*Times shown for stations are in italics and indicate dwell times. Times shown for route segments are in bold and indicate running times.*

Source: SEWRPC.

- For commuter bus services intended to act as feeders for commuter rail lines, some service was found to be provided during middays and early evening hours on weekdays and also on Saturdays, but rarely on Sundays and major holidays.
- The number and spacing of stations and stops along commuter bus routes was found to vary considerably. On commuter bus routes providing feeder or supplemental service to commuter rail routes, however, these services were found to

have station spacings very similar to the attendant commuter rail route. On some of these bus services, the only stops in fact were at the actual commuter rail stations in the particular corridor.

Commuter bus travel times were developed upon maximum permissible speed limits on streets and highways, location of traffic signals, anticipated traffic congestion, design of stations and stops, and the average speeds of other express and feeder bus services in Southeastern Wisconsin and Northeastern Illinois. A one-way trip in either direction between Delavan and Harvard would take a total of 49 minutes including all intermediate stops during weekday peak periods, and 42 minutes including all intermediate stops during weekday nonpeak periods and on weekends and holidays. Therefore, a one-way trip in either direction along the entire Delavan-Walworth-Harvard-Chicago route, including changing between the bus and train at Harvard and using Metra's Union Pacific Northwest Line between Harvard and Chicago, may typically take 149 minutes during weekday peak periods and 153 minutes during weekday nonpeak periods and on weekends and holidays. The travel times to be used under this feasibility assessment between stations, station dwell times, and total travel time along the Williams Bay-Harvard route are presented in Table 20.

With respect to average speeds for the potential commuter bus service, an average speed of 26 to 30 miles per hour would be attained over the 21-mile long Delavan-Harvard route. An average speed of 33 to 34 miles per hour would be attained over the combined 84-mile long Delavan-Harvard-Chicago route depending upon the time of day. This includes an assumed transfer time of five minutes for passengers changing between buses and trains at Harvard. By comparison, average speeds on Pace's now-discontinued supplemental bus service which was coordinated with Metra's North Central Service range from 16 to 24 miles per hour depending upon the time of day. Average speeds on Wisconsin Coach Lines' express bus service between Milwaukee, Racine, and Kenosha range from 29 to 33 miles per hour depending upon the time of day.

A one-way trip in either direction between Elkhorn and Fox Lake would take a total of 55 minutes including all intermediate stops during weekday peak periods and 48 minutes including all intermediate stops during weekday nonpeak periods and on weekends and holidays. Therefore, a one-way trip in either direction along the entire Elkhorn-Fox Lake-Chicago route including changing between the bus and train at Fox Lake and using Metra's Milwaukee District North Line between Fox Lake and Chicago may typically take 139 minutes during weekday peak periods and 137 minutes during weekday nonpeak periods and on weekends and holidays. The travel times to be used under this feasibility assessment between stations, station dwell times, and total travel time along the Elkhorn-Fox Lake route are presented in Table 21.

With respect to average speeds for the potential commuter bus service, an average speed of 32 to 37 miles per hour would be attained over the 30-mile-long Elkhorn-Fox Lake route. An average speed of 34 to 35 miles per hour would be attained over the combined 79-mile-long Elkhorn-Fox Lake-Chicago route depending upon the time of day. This includes an assumed transfer time of five minutes for passengers changing between buses and trains at Fox Lake.

Operating Plan Alternatives

For purposes of this feasibility study, three commuter rail operating plan alternatives and three commuter bus operating plan alternatives were initially considered. These are described as follows:

Alternative No. 1—Operation of Commuter Rail Passenger Trains Between Walworth, Fox Lake, and Chicago as an Extension of Metra's Existing Milwaukee District North Line with a Basic Level of Service: Under this alternative, selected existing Metra trains operating between Fox Lake and Chicago would essentially remain on their existing schedules but would be operated along the entire length of the corridor west of Fox Lake to Walworth. Trains would continue to make all existing stops between Fox Lake and Chicago, and would make all intermediate stops between Walworth and Fox Lake.

The initial frequency of service would be two inbound trains from Walworth to Chicago during the morning peak period and two outbound trains from Chicago to Walworth during the afternoon peak period. Service headway would be about 80 minutes. The trains would be operated as through trains along the entire corridor. All trains would initially operate only on weekdays with no operation assumed for Saturdays, Sundays and major holidays.

Alternative No. 2—Operation of Commuter Rail Passenger Trains Between Walworth, Fox Lake, and Chicago as an Extension of Metra's Existing Milwaukee District North Line with a Moderate Level of Service: Under this alternative, selected Metra trains operating between Fox Lake and Chicago would essentially remain on their existing schedules but would be operated along the

Table 20

ASSUMED OPERATING TIMES TO BE USED FOR FEASIBILITY ASSESSMENT OF COMMUTER BUS SERVICE IN THE DELAVAN-WILLIAMS BAY-WALWORTH-HARVARD-CHICAGO CORRIDOR

Measured Distance	Passenger Stations and Route Segments	Travel and Dwell Times (in minutes)[a]	
		Weekday Peak	Weekday Nonpeak
--	*Delavan (Park-Ride)*	--	--
6.9	**Delavan–Williams Bay**	**12**	**10**
--	*Williams Bay (Downtown)*	*1/2*	*1/2*
0.6	**Downtown–West Side**	**2**	**2**
--	*Williams Bay (West Side)*	*1/2*	*1/2*
3.4	**Williams Bay–Fontana**	**7**	**6**
--	*Fontana*	*1/2*	*1/2*
1.6	**Fontana–Walworth**	**4**	**4**
--	*Walworth (Park-Ride)*	*1/2*	*1/2*
0.6	**Park-Ride–Village Square**	**3**	**2**
--	*Walworth (Village Square)*	*1/2*	*1/2*
3.5	**Walworth–Big Foot**	**5**	**5**
--	*Big Foot*	*1/2*	*1/2*
5.4	**Big Foot–Harvard**	**13**	**10**
--	*Harvard*	*5*	*5*
11.5	**Harvard–Woodstock**	**13**	**13**
--	*Woodstock*	*1*	*1*
8.4	**Woodstock–Crystal Lake**	**10**	**10**
--	*Crystal Lake*	*1*	*1*
11.4	**Crystal Lake–Barrington**	**19**	**17**
--	*Barrington*	*1*	*1*
9.1	**Barrington–Arlington Heights**	↓	**16**
--	*Arlington Heights*	↓	*1*
5.7	**Arlington Heights–Des Plaines**	**41**	**10**
--	*Des Plaines*	↓	*1*
13.9	**Des Plaines–Clybourn**	↓	**26**
--	*Clybourn*	*1*	*1*
2.8	**Clybourn–Chicago CBD**	**8**	**8**
--	*Chicago CBD*	--	--
21.0	Delavan–Harvard	0:49	0:42
62.8	Harvard–Chicago	1:35	1:46
83.8	Delavan–Chicago	2:29	2:33

[a]*Times shown for stations are in italics and indicate dwell times. Times shown for route segments are in bold and indicate running times.*

Source: SEWRPC.

Table 21

ASSUMED OPERATING TIMES TO BE USED FOR FEASIBILITY ASSESSMENT OF COMMUTER BUS SERVICE IN THE ELKHORN–LAKE GENEVA–FOX LAKE–CHICAGO CORRIDOR

Measured Distance	Passenger Stations and Route Segments	Travel and Dwell Times (in minutes)[a]	
		Weekday Peak	Weekday Nonpeak
- -	*Elkhorn (Park-Ride)*	- -	- -
8.9	**Elkhorn–Lake Geneva**	**10**	10
- -	*Lake Geneva (Park-Ride)*	*1*	*1*
5.4	**Lake Geneva–Pell Lake**	**7**	**7**
- -	*Pell Lake*	*1/2*	*1/2*
3.9	**Pell Lake–Genoa City**	**5**	**5**
- -	*Genoa City*	*1/2*	*1/2*
1.5	**Genoa City–Richmond**	**4**	**3**
- -	*Richmond (Downtown)*	*1/2*	*1/2*
0.8	**Downtown–Park-Ride**	**2**	**2**
- -	*Richmond (Park-Ride)*	*1/2*	*1/2*
2.7	**Richmond–Solon Mills**	**7**	**5**
- -	*Solon Mills*	*1/2*	*1/2*
1.8	**Solon Mills–Spring Grove**	**4**	**3**
- -	*Spring Grove*	*1/2*	*1/2*
4.8	**Spring Grove–Fox Lake**	**12**	**9**
- -	*Fox Lake*	*5*	*5*
8.5	**Fox Lake–Grayslake**	**13**	**13**
- -	*Grayslake*	*1*	*1*
5.5	**Grayslake–Libertyville**	**6**	**6**
- -	*Libertyville*	*1*	*1*
7.5	**Libertyville–Lake Forest**	**9**	**9**
- -	*Lake Forest*	*1*	*1*
3.8	**Lake Forest–Deerfield**	**5**	**5**
- -	*Deerfield*	*1*	*1*
6.8	**Deerfield–Glenview**	**9**	**10**
- -	*Glenview*	*1*	*1*
3.1	**Glenview–Morton Grove**	**5**	**5**
- -	*Morton Grove*	*1*	*1*
6.1	**Morton Grove–Grayland**	**9**	**11**
- -	*Grayland*	*1*	*1*
8.2	**Grayland–Chicago CBD**	**16**	**18**
- -	*Chicago CBD*	- -	- -
29.8	Elkhorn–Fox Lake	0:55	0:48
49.5	Fox Lake–Chicago	1:19	1:24
79.3	Elkhorn–Chicago	2:19	2:17

[a]*Times shown for stations are in italics and indicate dwell times. Times shown for route segments are in bold and indicate running times.*

Source: SEWRPC.

entire length of the corridor west of Fox Lake to Walworth. Trains would continue to make all existing stops between Fox Lake and Chicago, and would make all intermediate stops between Walworth and Fox Lake.

The initial frequency of service would be three inbound trains from Walworth to Chicago during the morning peak period, and three outbound trains from Chicago to Walworth during the afternoon peak period. The service headway during peak periods would be about 40 minutes. In addition, one train would operate in each direction during the midday period and one train would operate outbound from Chicago to Walworth during the evening period. The trains would be operated as through trains along the entire corridor. All trains would initially operate only on weekdays with no operation assumed for Saturdays, Sundays, and major holidays.

Alternative No. 3—Operation of Commuter Rail Passenger Trains Between Walworth, Fox Lake, and Chicago as an Extension of Metra's Existing Milwaukee District North Line with a High Level of Service: Under this alternative, selected Metra trains operating between Fox Lake and Chicago would essentially remain on their existing schedules but would be operated along the entire length of the corridor west of Fox Lake to Walworth. Trains would continue to make all existing stops between Fox Lake and Chicago, and would make all intermediate stops between Walworth and Fox Lake.

The initial frequency of service would be three inbound trains from Walworth to Chicago during the morning peak period, and three outbound trains from Chicago to Walworth during the afternoon peak period. The service headway during peak periods would be about 40 minutes. In addition, one train would operate in each direction during the midday period and one train would operate outbound from Chicago to Walworth during the evening period. The trains would be operated as through trains along the entire corridor. Weekend service would also be provided. On Saturdays, two trains—and on Sundays, one train—would operate inbound from Walworth to Chicago during the morning period and outbound from Chicago to Walworth during the late afternoon period. The service headway for these trains would be about 90 minutes. These trains would operate all year. In addition, from May through September, one train would operate outbound from Chicago to Walworth during the morning period and inbound from Walworth to Chicago during the early evening period on Saturdays, Sundays, and major holidays.

Alternative No. 4—Operation of Commuter Bus Service in the Walworth-Fox Lake Corridor as Feeder Service to Metra's Existing Commuter Rail Routes with a Basic Level of Service: Under this alternative, new commuter bus service would be operated over two separate routes from Southern Walworth County communities to existing Metra commuter rail routes. One bus route would operate between Delavan and the Metra station at Harvard, stopping at Williams Bay, Fontana, Walworth, and Big Foot. The other bus route would operate between Elkhorn and the Metra station at Fox Lake, stopping at Lake Geneva, Pell Lake, Genoa City, Richmond, Solon Mills, and Spring Grove.

Service on these bus routes would be coordinated with Metra Milwaukee District North Line and Union Pacific Northwest Line train schedules. The initial frequency of service would be two inbound bus runs from Delavan to Harvard and from Elkhorn to Fox Lake during the morning peak period and two outbound bus runs from Harvard to Delavan and from Fox Lake to Elkhorn during the afternoon peak period. Service headway would be about 80 minutes. The commuter buses would initially operate only on weekdays with no operation of Saturdays, Sundays, and major holidays.

Alternative No. 5—Operation of Commuter Bus Service in the Walworth-Fox Lake Corridor as Feeder Service to Metra's Existing Commuter Rail Routes with a Moderate Level of Service: Under this alternative, new commuter bus service would be operated over two separate routes from Southern Walworth County communities to existing Metra commuter rail routes. One bus route would operate between Delavan and the Metra station at Harvard, stopping at Williams Bay, Fontana, Walworth, and Big Foot. The other bus route would operate between Elkhorn and the Metra station at Fox Lake, stopping at Lake Geneva, Pell Lake, Genoa City, Richmond, Solon Mills, and Spring Grove.

Service on these bus routes would be coordinated with Metra Milwaukee District North Line and Union Pacific Northwest Line train schedules. The initial frequency of service would be three inbound bus runs from Delavan to Harvard and from Elkhorn to Fox Lake during the morning peak period and three outbound bus runs from Harvard to Delavan and from Fox Lake to Elkhorn during the afternoon peak period. Service headway would be about 40 minutes. In addition, on each route, one bus run

would operate in each direction during the midday period and one bus run would operate outbound from Harvard or Fox Lake during the evening period. The commuter buses would initially operate only on weekdays with no operation on Saturdays, Sundays, and major holidays.

Alternative No. 6—Operation of Commuter Bus Service in the Walworth-Fox Lake Corridor as Feeder Service to Metra's Existing Commuter Rail Routes with a High Level of Service: Under this alternative, new commuter bus service would be operated over two separate routes from Southern Walworth County communities to existing Metra commuter rail routes. One bus route would operate between Delavan and the Metra station at Harvard, stopping at Williams Bay, Fontana, Walworth, and Big Foot. The other bus route would operate between Elkhorn and the Metra station at Fox Lake, stopping at Lake Geneva, Pell Lake, Genoa City, Richmond, Solon Mills, and Spring Grove.

Service on these bus routes would be coordinated with Metra Milwaukee District North Line and Union Pacific Northwest Line train schedules. The initial frequency of service would be three inbound bus runs from Delavan to Harvard and from Elkhorn to Fox Lake during the morning peak period and three outbound bus runs from Harvard to Delavan and from Fox Lake to Elkhorn during the afternoon peak period. Service headway would be about 40 minutes. In addition, on each route, one bus run would operate in each direction during the midday period and one bus run would operate outbound from Harvard or Fox Lake during the evening period. Weekend service would also be provided. On Saturdays, two bus runs—and on Sundays, one bus run—would operate inbound from Delavan to Harvard and from Elkhorn to Fox Lake during the morning period and outbound from Harvard to Delavan and from Fox Lake to Elkhorn during the late afternoon period. The service headway for these bus runs would be about 90 minutes. These bus runs would operate all year. In addition, from May through September, one bus run would operate outbound from Fox Lake to Elkhorn and from Harvard to Delavan during the morning period and inbound from Elkhorn to Fox Lake and from Delavan to Harvard during the early evening period on Saturdays, Sundays, and major holidays.

Operating Plans for Feasibility Assessment

Commuter rail and bus operating plans that provided an inherent ability to generate the highest ridership over the plan design period were identified for initial consideration under this feasibility study. Therefore, Alternative No. 3, Operation of Commuter Rail Passenger Trains Between Walworth, Fox Lake and Chicago as an Extension of Metra's Existing Milwaukee District North Line with a High Level of Service; and Alternative No. 6, Operation of Commuter Bus Service in the Walworth-Fox Lake Corridor as Feeder Service to Metra's Existing Commuter Rail Routes with a High Level of Service were identified for initial consideration under this feasibility study, recognizing that the characteristics of this operating plan would likely undergo refinement as the ridership projections are developed, as equipment, track, signal, and institutional requirements are identified, and as necessary and appropriate capital and operating cost estimates are prepared.

ROLLING STOCK AND VEHICLE REQUIREMENTS

The purpose of this section of the chapter is to describe the commuter rail rolling stock and commuter bus vehicles required to provide possible service within the Walworth-Fox Lake corridor.

For the commuter rail alternatives, it was recommended that conventional locomotive-hauled commuter train equipment be assumed for use instead of other types such as self-propelled equipment. Conventional commuter train equipment consists of bi-directional trains of diesel locomotives with bi-level passenger coaches operating in a "push-pull" mode. A locomotive is at one end of the train set, and a coach equipped with a control cab is at the opposite end. The locomotive supplies all of the power necessary for operation of the train set. Thus, there is no need to turn the train around at the end of a route to change the direction of travel, eliminating the need for attendant facilities and crews to handle this task. This reduces operating costs as well as turnaround and layover times.

This type of equipment has proved to have a long and established record with respect to availability, dependability, performance and safety in use by Metra and Metra's predecessors on most of the commuter rail routes in the Chicago area for many years. It would be compatible with existing Metra equipment that currently operates between Fox Lake and Chicago, and meets current Federal Railroad Administration and Federal Transit Administration requirements with respect to safety, structural strength, and accessibility. In fact, since some of the trains that now operate between Fox Lake and Chicago would be extended to Walworth, the entire Walworth-Fox Lake-Chicago service would likely be operated with one common pool of equipment. Use of other types of equipment could require

passengers to change trains at Fox Lake, which was concluded to be undesirable for attracting ridership.

Use of bi-level coaches significantly increases passenger capacity without a corresponding increase in train length and station platform length. Bi-level coaches can each typically accommodate from 120 to 150 seated passengers compared to single-level coaches that can each typically accommodate from 100 to 120 seated passengers. The exact seating configuration as well as interior appointments and passenger amenities may vary these capacities. All new passenger coaches are designed to meet the requirements of the Federal Americans with Disabilities Act, and can generally be configured to utilize either high or low level platforms.

Several domestic and foreign manufacturers of locomotives and passenger cars provide reliable equipment of this type. In 2000 dollars, the cost of a new diesel locomotive equipped for commuter rail service approximated $2.4 million. The cost of a new passenger coach approximated $2.0 million. Actual equipment costs will vary based on the options selected, the quantities ordered, and other factors. In the normal rolling stock procurement process used in the railway industry, the equipment is built to order. The typical manufacturing lead time for new locomotives and passenger cars is about two years once funding arrangements are in place.

For the commuter bus alternatives, it was recommended that conventional transit buses be assumed for use. Most conventional transit buses range from 30 to 40 feet in length, and seat from 28 to 48 passengers depending upon the vehicle size and interior configuration. The interior configuration of seats and aisles will be dependent upon the style and size of seats that are used, the relative comfort level desired for passengers, and the arrangement of space for wheelchair passengers. Compared to buses used in regular urban transit service, interior appointments and amenities are particularly important for buses utilized in commuter service because of the longer trip duration and higher passenger expectations. In some cases, larger, higher-quality, or more-plush seats similar to those used on intercity and long-distance charter buses are used for buses intended for longer commuter trips. Also, other passenger amenities such as reading lights, improved interior ventilation, and luggage racks are common on buses used in commuter or suburban service. Some commuter bus services in the United States have utilized intercity motor coaches for commuter service because of the higher levels of performance and comfort of these vehicles.

Vehicles smaller than conventional transit buses represent another option that has been gaining in popularity for low-ridership and special applications. A wide variety of such models are available ranging from vehicles resembling van conversions to bus bodies mounted on truck chassis to shortened versions of regular buses. Most buses operated in commuter service by transit operators in Southeastern Wisconsin and by Pace are the standard urban transit buses. While most buses are full-size models, which are 40 feet in length, smaller vehicles with a length of 30 to 35 feet are sometimes used where passenger demand is lighter or where maneuverability in tight areas is required. All new passenger coaches are designed to meet the requirements of the Federal Americans with Disabilities Act.

Several domestic and foreign manufacturers of transit buses provide reliable equipment of this type. In 2000 dollars, the cost of a new 40-foot urban transit bus, approximated $290,000 and the cost of a new 35-foot transit bus approximated $260,000. Actual equipment costs will vary based on the options selected, the quantities ordered, and other factors. In the normal vehicle procurement process, equipment is built to order. The typical manufacturing lead time for urban transit buses is about one year once funding arrangements are in place.

RAILWAY LINE IMPROVEMENTS

The potential initiation of passenger train service under the commuter rail alternatives would require improvements to the railway line. The purpose of this section of the chapter is to describe the existing condition of the railway line, and then to identify, evaluate as necessary, and describe necessary improvements. The railway line improvements are described with respect to: track structure; ballast, roadbed, and roadway; passing sidings; turnouts; grade crossings; bridges and other structures; and signals. The necessary improvements were identified based on the most promising route alignment, the preliminary passenger station locations, and the most practical operating plan.

Railway Line Planning Assumptions

In order to operate commuter rail service in an efficient, safe, and cost-effective manner that will attract an adequate level of patronage, the railway trackage and attendant facilities such as bridges and signals must be maintained in an appropriate condition. This may require that existing facilities be rehabilitated, upgraded, or replaced. To attract sufficient patronage, the proposed commuter rail service must be able to offer high-speed, comfortable, and dependable train operation at all times. In general it is desirable to operate trains at the highest practical speeds, consistent with safety. Because of the higher operating speeds and the need for strict adherence to schedules, the operational requirements of passenger trains are generally

more demanding of the track and signal systems than are the operational requirements of freight trains.

The following factors were considered in identifying needed railway line improvements;

- Commuter rail trains were to be operated at the highest practical speeds between stations consistent with safety and with minimal delays. Accordingly, en route speed restrictions were to be minimized, routine stops other than at passenger stations eliminated, and interference among the various types of train traffic avoided.

- The maximum practical operating speed along any specific section of railway track would be dependent upon four principal factors: horizontal and vertical alignment, physical condition, special track work, and operational considerations. Any one of these may be the limiting factor along a specific segment of track.

- With respect to the physical alignment of the potential route, maximum train speeds were assumed to be determined primarily by horizontal curvature and to a lesser extent by the severity of grades. Since the potential commuter rail service was to be operated over an existing railway mainline, and since it is unlikely that the existing horizontal and vertical alignment of the right-of-way concerned could be easily modified in a practical, nondisruptive, and cost-effective manner, the existing route alignment was assumed to remain unchanged.

- The track safety standards promulgated by the Federal Railroad Administration (FRA) prescribe minimum requirements for the physical condition of railway tracks to provide for the safe operation of freight and passenger trains. The standards specify maximum allowable speeds based on the condition of the track structure including the age and condition of rails, ties, and ballast, the degree of curvature and superelevation, as well as the quality of drainage and vegetation. These standards were used in the evaluation of the condition of the railway trackage concerned. It is important to note, however, that the standards represent minimums for safe operation, and may represent a lower condition than desirable for providing passengers with a smooth and comfortable ride.

- Various operational considerations unique to a specific segment of railway line may also govern train operating speeds. Such considerations may include, but not be limited to, station-to-station distances, performance characteristics of locomotives and rolling stock, density of train traffic, the proximity of surrounding development, and safety considerations such as frequency of at-grade street and highway crossings.

- The extent of some necessary track and signal improvements will be dependent upon the intended level of service to be offered. That is, a greater number of commuter trains on a daily basis, or higher operating speeds, may require a more sophisticated level of improvement, particularly with respect to necessary signal systems. However, a certain minimum level of track and signal improvements may be expected to be necessary for the initiation of any commuter rail service, regardless of the number of intended trains, or the level of service intended to be offered.

The relationship between track condition and signal requirements is important since both track and signals have a significant cost associated with their installation and maintenance, and the facilities with the most restrictive conditions will govern maximum allowable train speeds and operation. Train operations are governed by an extensive set of rules and regulations prescribed by railway companies and regulatory bodies. The rules and regulations have been developed over the years using a "fail-safe" philosophy and are designed to permit only the most restrictive and cautious operations unless superseded by procedures and signal systems that safely permit faster and more heavily trafficked train operations. Thus, railway signal systems perform two basic functions: 1) allowing faster, and more efficient operation of trains along mainlines through control of train spacing and the meeting or passing of trains; and 2) protecting trains from, and providing priority over, conflicting movements at junctions, crossings, and moveable bridges.

Federal regulations require certain types of signals to be in operation if certain speeds are to be attained in mainline operation. For example, an automatic block signal system (ABS) must be used where passenger trains are operated at speeds of 60 miles per hour or more, or freight trains are operated at speeds of 50 miles per hour or more. Either an automatic cab signal (ACS), automatic train stop (ATS), or automatic train control (ATC) system must be used where any train is operated at speeds of 80 miles per hour or more. Accordingly, passenger and freight trains are limited to maximum speeds of 59 and 49 miles per hour, respectively, over nonsignaled trackage.

Assessment of Railway Line Condition and Improvement Needs

An assessment of the existing condition of the railway line in the Walworth-Fox Lake corridor was made to determine the improvements that may be expected to be necessary to permit operation of commuter rail service. The assessment was conducted by a transportation engineering consulting firm working with the Commission staff. The assessment was made for that segment of the railway line between Milepost 49.6, near the Oak Street grade crossing in Fox Lake, to about Milepost 74.6, west of the former depot in Walworth and immediately east of the Six Corners Road crossing, a distance of 25 miles. The assessment of track as well as bridge and structure conditions was completed through review of Wisconsin & Southern Railroad and Wisconsin Department of Transportation engineering data and records, field inspection of the entire Walworth-Fox Lake railway line, and discussions with railway company operating and engineering staffs. This work was undertaken with the cooperation of the Wisconsin & Southern Railroad, the Wisconsin Department of Transportation, and the Wisconsin River Rail Transit Commission.

In general, the Wisconsin & Southern Fox Lake Subdivision between Walworth and Fox Lake was concluded to be in acceptable condition for existing freight operations, but would require significant improvement to accommodate commuter rail operations in a safe, efficient, and reliable manner. The railway line condition and recommended improvements are described below by major components.

Track Structure

Track structure refers to the various components that comprise railway track including the rails, ties, and other track material. Other track material includes tie plates, spikes, joint bars, joint bolts, and rail anchors. Ballast is part of the roadbed, and considered in the next section of this chapter.

The existing rail condition along the Walworth-Fox Lake route ranges from good to poor. A significant portion of the rail along the Walworth-Fox Lake mainline is relatively old. A total of 17.0 miles, or about 68 percent of the mainline, is predominantly laid with 130-pound rail rolled in 1927, 1928, and 1929. Small segments of the 130-pound rail as originally installed were replaced with 115-pound rail rolled in 1954, mostly at grade crossings. New 130-pound rail is no longer rolled and, in fact, this rail section has not been manufactured since the early 1930s. A total of 6.7 miles, or about 27 percent, of the mainline is predominantly laid with 100-pound rail rolled in 1934. Over the years, small segments of the 100-pound rail as originally installed were replaced with rail rolled mostly in 1930 with a small amount rolled in 1966. A total of 0.7 mile, or about 3 percent, of the mainline is laid with 112-pound rail rolled in 1942, and 0.6 mile, or 2 percent, of the mainline is laid with 90-pound rail rolled in 1926. The entire mainline consists of jointed rail.

Most of the mainline rail consists of noncontrolled cooled rail. Controlled-cooling is a process developed during the 1930s whereby during the manufacturing of the rails, hydrogen gas is removed from the steel by controlling the cooling rate of the hot steel immediately following the rolling process. Use of this process was begun on a large scale in 1936 and quickly became universal. Prior to this cooling process being used, hydrogen gas inclusions could remain within the rail, which in turn could eventually cause some rails to develop fatigue cracks or internal fractures—referred to as transverse fissures. This type of rail defect could lead to failure of the rail. Furthermore, this type of defect does not provide any visible evidence until such time that the rail breaks or fails under load. Almost all of the rail between Walworth and Fox Lake is potentially subject to this type of failure.

It is important to note that there continues to be some disagreement within the railway engineering community regarding the issue of older noncontrolled cooled rail. For example, some railway engineers maintain that because such rail still in place is at least 60 years old, any hydrogen gas inclusions should have already dissipated, therefore making the chance of any associated failures very remote. Furthermore, noncontrolled cooled rail still exists in daily use in many places in the United States, including on some railway lines that see significant freight tonnage. It is generally thought that these kinds of rail defects occur while under load and are more likely to occur as a result of heavy freight train operations as compared to lighter passenger train loads. Other railway engineers maintain that since there still is some chance that hydrogen inclusions may exist in such rail, appropriate precautions should be employed, especially on railway lines over which passenger service is operated.

The mainline rail was also found to generally consist of relatively old jointed rail that has experienced extensive use and shows signs of wear. There are sections along the existing rail that show defects and damage such as soft spots or engine wheel burns, that is, places where slippage of driving wheels has deformed or flattened the rail surface. Many of the defects are too deep to grind out, or are in sections of rail with reduced railhead thickness. Because the rail is jointed, much of the wear and many of the defects are located at or near the rail ends. In these areas, there are frequent indications of rail end wear, sunken joints, and possibly permanently deformed or bent rails. While these conditions allow the safe operation of freight trains at moderate speeds, they should not be expected to provide a smooth, comfortable ride for passengers and passenger train equipment at high speeds.

Because of the reduction in the level of track maintenance by the Chicago, Milwaukee, St. Paul and Pacific Railroad, the original owner of the line, following the discontinuance of regular intercity passenger train service in 1971, much of the rail has probably been in this condition for 20 to 30 years.

Based upon the type and condition of the rail installed on the line, it was concluded that a significant improvement of the track would be required. Accordingly, consideration was given to identifying appropriate options.

One option would be to leave the existing jointed rail in place and have a rail defect detection service perform an inspection of the mainline rail every two months. Under this option, the maximum operating speed of commuter trains along the entire line between Walworth and Fox Lake would be limited to a maximum of 40 miles per hour to minimize the risk of a high-speed derailment due to failure of a rail. This option was concluded to be unacceptable since rail failures could occur between inspections and since the relatively low maximum speed would discourage potential ridership on the route.

A variation of this option would be to leave the existing jointed rail in place, have a rail defect detection service perform an inspection of the rail every two months, and install an automatic block signal system. Under this option, the maximum operating speed for commuter trains along the line would be set at 59 miles per hour. The intent of the signal system would be to help detect any defects by displaying a stop indication when a broken rail disrupts the circuit continuity. However, depending on exactly how such a break would occur, the signal circuit may not be positively disrupted. For example, a break could occur through the entire cross-section of a rail, posing a hazard; yet the two pieces of rail would still be touching, still completing a signal circuit. Thus, this option may not offer complete and absolute assurance that a broken rail would be detected by a signal system. This option was, therefore, also concluded to be unacceptable.

Under this variation, as well as under the first option, about two miles of the 130-pound jointed rail would be removed and replaced with 115-pound continuous welded rail. The two miles of 130-pound rail removed would be used to replace existing worn, battered, or defective rails in other areas of 130-pound rail. Rail rolled to 130-pound specifications is no longer manufactured and may be difficult to obtain by any other means.

A second option would be to have all existing jointed rail replaced with 115-pound continuous welded rail. Replacement of the old jointed rail would eliminate the need to hire a rail defect detection service at frequent intervals, would allow a maximum operating speed of 59 miles per hour without any restrictions, and would address the need to replace segments of rail that show extensive use and wear, or other defects. Such replacement would also provide a smoother ride for the commuter rail trains. The principal disadvantage of this option is its higher cost. Replacement of the rail, however, would alleviate any concern stemming from the age of the rail, its wear and condition, and the possible development of rail defects or failure under high speed passenger train use. Therefore, to enable commuter train operation with a maximum mainline operating speed of 59 miles per hour, it is recommended that all of the existing 130-pound, 112-pound, 100-pound, and 90-pound jointed rail on the main track from Milepost 49.7 to Milepost 74.55 be replaced with new 115-pound continuous welded rail. This includes the existing 112-pound jointed rail between Mileposts 49.7 and 50.2 rolled in 1942 which is recommended to be replaced due to wear. Also, existing 100-pound jointed rail from Milepost 74.0 to Milepost 74.55 is recommended because of the location of the proposed storage and servicing facility on the west side of the Village of Walworth.

The existing tie condition along the Walworth-Fox Lake commuter rail route ranges from fair to good. Major tie replacement along the rail line was performed as part of a 1991-1992 track rehabilitation project. During this rehabilitation project, industrial grade ties were installed. Industrial grade ties have a cross section that measures six inches by eight inches, and are generally smaller than mainline grade ties, which measure seven inches by nine inches. Industrial grade ties may also be shorter than mainline grade ties since they are allowed to have a length as short as eight feet compared to mainline grade ties, which must be a minimum of 8.5 feet. In addition, industrial grade ties are normally allowed to have a larger amount of splits, knots, cracks, and other imperfections than mainline grade ties. Industrial grade ties are acceptable for the existing freight tonnage and speeds, but will present surface and alignment problems with higher speeds as would be required with commuter train operation. The Wisconsin Department of Transportation has allowed the installation of industrial grade ties as part of its track rehabilitation program on railway lines where maximum speeds were envisioned to be only moderate or low. Many of the ties on the Walworth-Fox Lake line were found to be as short as eight feet in length. With respect to the existing ties that were not replaced as part of the recent rehabilitation effort, tie failure along the rail line was most likely due to aging of the ties, rather than mechanical failure which tends to be found on heavier tonnage lines. Ties, together with the roadbed, form the foundation of a railway track. The ties support the load of the trains and distribute that load through the ballast and subgrade. If the foundation is not sound, unequal or poor distribution of trainloads may be expected to lead to failure of the roadbed, ties, and rail. It is therefore

recommended that all remaining defective ties along the entire line be replaced, regardless of the intended maximum mainline operating speed for commuter trains. Also, it is recommended that all ties with a length of less than 8.5 feet be replaced. All new ties to be installed should be of mainline grade and measure seven inches by nine inches by 8.5 feet in length. The percentage of ties that should be replaced ranged from 20 percent to 50 percent depending upon the section of railway line concerned. Along the mainline between Walworth and Fox Lake as a whole, it was estimated that 40 percent of all ties should be replaced.

Other track material consists primarily of tie plates, spikes, joint bars, joint bolts, and rail anchors. Tie plates exist along the entire length of the track, but inspection indicates that some have cracked and others are no longer properly seated on the ties. All of the tie plates are rail spiked only. The rail line is anchored with drive-on and spring-type anchors. Inspection of the track did not indicate any set pattern for anchoring of the line, however the rail is fully anchored through curves and turnouts, and appears to be adequately anchored along the length of the line for existing traffic volumes. A significant quantity of each of these items may be expected to require replacement during track rehabilitation efforts.

Ballast, Roadbed, and Roadway: Ballast is the material placed under and around a track to hold its position, distribute weight, dissipate loads and provide drainage. The roadway is that part of the right-of-way which includes the roadbed—or subgrade—which in turn supports the track and, in addition, includes the slopes of cuts, ditches, and other drainage structures, and access roads.

The original ballast used along the Walworth-Fox Lake railway line was pit run gravel. This material was placed by the original owner, the Chicago, Milwaukee, St. Paul and Pacific Railroad. Crushed limestone was later added as part of a 1990-1991 track rehabilitation effort. This has resulted in the formation of a cementatious mixture of material in wet areas. Also, pumping of subgrade material up through the ballast was found to be occurring in some localized sections of track. In these areas, the track moves vertically under load and causes subgrade particles and mud to travel up—or "pump"—into the ballast. More recently, quartzite ballast has been added at some locations. This added to the ballast mix problem, as the harder quartzite will break down the limestone. In general, the ballast is fouled with fines and growing vegetation. Also, at locations where track pumping is occurring, mud is also contaminating the ballast. This was predominantly found at grade crossings, turnouts, and areas with certain types of rail defects such as engine wheel burns. At various locations the ditch line is nonexistent, or has partially or completely filled in with sediment, impeding proper drainage of the area. For purposes of recommended rehabilitation efforts under this feasibility study, the entire ditch line on both sides of the mainline for its entire length needs to be recut or cleaned out.

The majority of the problems with the existing ballast and roadway could be alleviated by completely undercutting the railway line, removing all of the existing ballast, and adding new ballast. Undercutting is the process of removing the old, fouled ballast and other foreign material from the track, replacing it with new or cleaned ballast, and then bringing the track to the intended surface and line. It was concluded that complete ballast replacement would be necessary due to the existing poor condition of large sections of the ballast as well as the resulting mixture of pit run gravel, limestone, and quartzite. Complete ballast replacement is recommended for two principal reasons. First the existing mixture of ballast material will not safely withstand lateral forces placed on railway track constructed with continuous welded rail during periods of hot weather. Second, any remaining areas of jointed rail—if some jointed rail were to remain in place—will continue to cause the limestone ballast to break down into a cementatious mixture under rail joints. This would create a rough ride for trains and, therefore, require more frequent surface work and increased operating costs. While in most areas the old ballast to be removed can be placed beyond the ditch line, old ballast in areas near grade crossings and sidings will require the old ballast to be hauled away.

Passing Sidings

The assessment of track condition also considered the need for new passing sidings between Walworth and Fox Lake. The need for additional passing sidings was based on an analysis of future commuter train and freight train operations along the line. Sidings would be required to allow trains traveling in opposite directions to meet or pass each other. The existing sidings along the Walworth-Fox Lake line were found to be few in number, of relatively short length, and, for the most part, already used for customers or car storage.

It was noted that even under the potential operating plan that envisions a high level of service between Walworth and Fox Lake, the number of commuter rail trains would be relatively low. Based upon this proposed operating scenario, there would be no need for passing sidings between Walworth and Fox Lake for regularly scheduled commuter trains traveling in opposite directions and when operating on time.

As noted earlier, future freight operations along this line are expected to remain relatively low in number, ultimately increasing to two through freight trains in each direction between Janesville and Chicago, and one local freight train

operating on weekdays between Janesville and Spring Grove. It is anticipated that through freight trains will continue to be scheduled to operate into and out of Chicago at times other than during weekday commuter peak periods. It is anticipated that the local freight train to be added between Janesville and Spring Grove would be scheduled to perform most of its work in a flexible manner outside of periods when commuter trains are operating. However, its exact work and therefore location at any one time will vary from day to day as a result of customer needs and work demands. It is anticipated that its work along the Walworth-Fox Lake segment would probably coincide with times when the weekday midday commuter trains are operating and may even extend into the evening peak period on occasion.

Thus, the operation of freight services while expected to present some conflicts with commuter train operations, should not represent a significant constraint. Due to the relatively long length of the single-track mainline between Walworth and Fox Lake, the unavailability of other clear sidings for occasional, unplanned, or other "emergency" meets, and the need to provide flexibility to accommodate some possible local freight operations with the commuter rail service, it was recommended that a passing siding be located approximately midway between Walworth and Fox Lake.

The area that appears to present the best opportunity for such a siding is the former location of the Hebron siding between Milepost 61.0 and Milepost 62.0. Some of the roadbed for an old siding once located in this area remains. The new siding would, however, require construction from the subballast on up. While this siding length is longer than necessary for commuter trains and local freight trains, a length of about one mile is recommended to provide flexibility for all freight trains to use the siding, if necessary. Other potential locations for a passing siding midway between Walworth and Fox Lake were considered but rejected largely due to the presence of wetlands and other soft or unstable ground adjacent to the existing roadbed.

The new siding at Hebron would require the following work:

- Installation of one mile of new track including rail, ties, other track material, ballast, and subballast. Because of the intended use of this siding and the low speed of trains while using it, the 130-pound rail and other track material removed from the mainline could be reused for this siding. However, if commuter train service were implemented and future service levels increase, the 130-pound jointed rail on the siding may ultimately need to be replaced with new 115-pound continuous welded rail.

- Installation of a No. 15 turnout at each end of the new siding. Reconstruction of the at-grade crossing with Lange Road to accommodate both the existing main track and the new siding.

Consideration was given to installing power-operated turnout machinery and signals at both ends of the new siding wherein a dispatcher would control the siding switches. Without a power-operated turnout, the switches will have to be manually operated. Because this new siding is not intended to be regularly used by scheduled commuter trains, it was assumed that hand operated switches would be sufficient, thus saving the capital cost of installing power turnout machinery, controls, and signals. If the turnouts were to be remote-controlled, then the capital cost of providing this siding would be increased to about $3.3 million.

For purposes of this feasibility study, it was concluded that no other new sidings would be required nor would any other segments of existing track need to be relocated or reconfigured for the provision of commuter rail service.

Turnouts

The existing turnouts along the Walworth-Fox Lake railway mainline are no longer standard sizes, making the replacement of parts difficult. In addition, all of the turnouts were found to show wear on many of the rails and other parts and included outdated components such as rigid switch braces which are not desirable for commuter train operations. Replacement of the turnouts would also be necessary to match the new 115-pound continuous welded rail proposed to be installed. It is recommended that the following turnout-related work be undertaken:

- Replacement of the existing No. 11 turnout at Milepost 53.7 for the Hines Lumber Spur with a new No. 10 115-pound turnout.

- Replacement of the existing No. 11 turnouts at Milepost 53.8 and Milepost 54.1 for both ends of Spring Grove Siding with new No. 10 115-pound turnouts.

- Replacement of the switch points and stock rails on the existing turnout for the Scot Forge Spur at Milepost 54.5. These parts should be replaced because of wear.

- Removal of the existing No. 11 turnout at Milepost 56.3 for the Solon Mills Siding. This siding is no

longer used on account of continuing soft ground conditions. Removal of this turnout would be subject to railroad approval.

- Replacement of the No. 11 turnouts at Milepost 59.8 and Milepost 60.1 for both ends of Belden Siding with new No. 10 115-pound turnouts.

- Replacement of the existing No. 9 turnouts at Milepost 67.2 and Milepost 67.4 for both ends of Zenda Siding with new No. 10 115-pound turnouts.

- Replacement of the existing No. 9 turnout at Milepost 67.5 for the FS Spur with a new No. 10 115-pound turnout.

- Replacement of the existing No. 9 turnouts at Milepost 73.6 and Milepost 74.0 for both ends of Walworth Siding with new No. 10 115-pound turnouts.

- Replacement of the existing No. 9 turnout at Milepost 73.6 for the east end of the Walworth storage track with a new No. 10 115-pound turnout.

Grade Crossings

There are 57 at-grade street, highway, and pedestrian crossings along the Walworth-Fox Lake railway line. Of these, 22 are public and 35 are private. The condition of these crossings ranges from poor to good. A number of factors contribute to the poor condition of some crossings, including failure of the railway track structure or roadway subgrade and failure of the grade crossing material. It is recommended that all crossings in poor condition be rebuilt. All of the crossings will require some physical improvement that would be performed as the track through each crossing is rehabilitated.

Thirteen public grade crossings along the route are protected by automatic crossing signals consisting of flashing lights and bells which are activated by electrical track circuits and 10 public grade crossings are protected only by crossbucks. A complete listing of all at-grade crossings is provided in Appendix A. It is recommended that crossing signals already equipped with lights and bells be upgraded to include gates. At public street and highway crossings that are protected only by crossbucks, automatic signals should be installed that include lights, bells, and gates. It is recommended that all automatic grade crossing signals be activated by constant warning time devices. Use of these devices will provide a consistent length of time for crossing gates to be lowered, regardless of the approach speed for trains.

It is recommended that all private at-grade road and driveway crossings have crossbucks and stop signs installed on both sides of each crossing. Prior to any track rehabilitation being initiated, it is recommended that efforts be made to close those private crossings that are little or no longer used and combine other private crossings that are close to each other. This, however, will take agreement and possibly negotiation with each adjacent landowner who has the rights to a particular private crossing.

Assessment of Bridges and Other Structures

Bridges and other structures along the proposed Walworth-Fox Lake commuter rail route were also examined. Bridges allow the rail line to cross over or under streets, highways, other railway lines, and major rivers. There are a total of 14 bridges along the route, seven of which are over rivers or other watercourses, four of which are over public highways or roads, one over a private road, one over a former railway line which is now a recreational trail, and one which carries a local public road over the rail line. The bridges are listed in Appendix A.

The bridges range in size from one to eight spans in length and vary in their design although most spans are of relatively simple steel or timber construction. Inspection of the bridges indicated that the existing condition of the various superstructure and substructure elements ranges from good to poor. Superstructure refers to the bridge spans, and substructure refers to supporting piers, bents, piles, and abutments. The assessment was based only on visual surface inspections of each bridge. If consideration of commuter rail service over this line continues, it is recommended that a specialized testing firm obtain borings of the timber elements on all bridges to more precisely determine their condition. This represents normal inspection practice for timber railway bridge elements. Following is a summary assessment on the condition of each bridge. Unless otherwise indicated, all bridges allow the Walworth-Fox Lake railway line to pass over another feature.

Milepost 49.80—Nippersink Channel

This three-span ballasted-deck bridge consists of a steel through-girder plate-deck middle span with two timber-deck outer spans supported on timber-pile piers with timber abutments supported on timber piles. The spans are in good condition with some minor corrosion on the steel span. The abutments are also in good condition. The pier piles are in fair condition with some splitting on some outside piles. The bracing members are in fair to poor condition. It is recommended that all timber bracing members on the substructure be replaced.

Milepost 50.02—Fox River

This bridge consists of eight spans. The two middle spans include a multiple-steel-beam open-deck span and

a steel-girder open-deck swing span. The swing span was originally constructed as a moveable bridge span, but has been made stationery and, in fact, has not been opened for several decades. All of the spans are supported on timber-pile piers with timber abutments. The three outer spans at the east end of the bridge are timber open-deck spans. Two of the three outer spans at the west end of the bridge are also timber open-deck spans, the third span being of multiple-steel-beam design. All of the spans are in fair condition. The abutments are in fair condition. The pile piers are in fair to poor condition with moderate to heavy section loss at the water level. It is recommended that all bridge timbers be replaced. Because of the condition of the timber piles, it is recommended that all pier piles be replaced with steel H-piles with concrete caps.

Milepost 51.58—Nippersink Creek
This four-span open-deck bridge consists of two steel through-girder middle spans and two multiple-steel-beam outer spans supported on concrete piers with concrete abutments. The spans are in fair condition with some minor to moderate corrosion on the spans, some initial section loss, and some pitting in the webs of the cross girders. The piers and abutments are in good condition with some minor horizontal cracks observed in the piers below the bearings. It is recommended that all bridge timbers be replaced.

Milepost 55.02—Nippersink Creek
This three-span bridge consists of open-deck steel-girder spans supported on concrete piers with concrete abutments. The spans are in good condition with only some surface rusting. The abutments and piers are in fair condition with only some spalling observed on the abutments. The top of the east abutment appears to have rotated, its bearing pad is deteriorated, and the expansion gap between the girder and back wall appears insufficient. It is recommended that all of the bridge timbers on each of the three spans be replaced. It is also recommended that the backwall and bearings on the east abutment be replaced.

Milepost 57.10—North Branch of Nippersink Creek
This bridge consists of a single steel-girder span with a ballasted deck supported on concrete abutments. The span is in good condition with only some surface rusting. The abutments are in fair condition with moderate spalling and minor horizontal and vertical leaching cracks observed. No improvements to this bridge are recommended at this time.

Milepost 57.35—Main Street (USH 12 and STH 31)
This bridge consists of a single steel-girder span with a ballasted-timber deck supported on concrete abutments. The span is in good condition with only some surface rusting. The abutments are in fair to poor condition and are heavily spalled and deteriorated with extensive map cracking and leaching observed. It is recommended that both abutments be rehabilitated. For this work, the loose and deteriorated concrete would be removed from the abutments and wing walls to a depth ranging from four to six inches. A concrete encasement of at least eight-inch thickness would then be placed over the entire surface of the existing abutments and wing walls and attached with reinforcing dowels.

Milepost 57.37—Metra Right-of-Way/Recreational Trail
This bridge consists of a single steel through-girder span with an open deck supported on concrete abutments. The span is generally in good condition with only some surface rusting although the top flange of the south girder and is cracked at its west end due to impact damage. The abutments are in poor condition with heavy spalling, map cracking, and leaching. Also, the bearing seats are spalled and are undermining the bearings. It is recommended that both abutments be rehabilitated. For this work, the backwalls and bearing seats at both ends of the bridge should be reconstructed, bearings at both ends replaced, and repairs made to all areas where spalling has occurred. Also, it is recommended that all bridge timbers be replaced and the cracked end of the south girder be reconstructed.

Milepost 58.35—Private Road and Wetlands
This six-span bridge consists of a ballasted-timber deck supported on timber-pile piers with timber abutments supported on timber piles. The spans are in fair condition. The piles are in fair condition, although some piles were observed to have section loss at the roadway level due to vehicular impact. It is recommended that the lower portion of the timber piles along both sidings of the private road be encased in a three-foot-high concrete barrier. This will help prevent further damage and provide reinforcement for the existing damaged piles.

Milepost 58.96—Unnamed Stream
This bridge consists of a single timber span with an open deck and timber abutments supported on timber piles. The span is in good condition with some horizontal shear cracks on the outside beams. The abutments are also in good condition. The replacement of all bridge timbers is recommended.

Milepost 63.81—North Branch of Nippersink Creek
This six-span bridge consists of an open-deck timber-trestle structure supported on timber-pile piers with timber abutments supported on timber piles. The spans are in fair condition and were observed to have heavy discoloration of the timbers possibly indicating potential areas of decay.

The piles are also in fair condition and also were observed to have heavy discoloration, again indicating potential areas of decay. The replacement of all bridge timbers is recommended.

Milepost 63.91—State Line Road
This bridge consists of a single steel-girder span with an open deck supported on concrete abutments. The span is in good condition but was observed to have some bent intermediate stiffeners along with peeling paint. The abutments are in poor condition with heavy spalling, cracking and deterioration observed. The bearing seat for the west end of the south girder is completely crushed, leaving the beam resting directly on the concrete abutment. It is recommended that both abutments be rehabilitated. For this work, the loose and deteriorated concrete would be removed from the abutments and wing walls to a depth ranging from four to six inches. A concrete encasement of at least eight-inch thickness would then be placed over the entire surface of the existing abutments and wing walls and attached with reinforcing dowels. Also, it is recommended that the backwalls and bearing seats at both ends of the bridge be reconstructed, bearings at both ends replaced, and all bridge timbers replaced.

Milepost 65.05—STH 120
This five-span bridge consists of an open-deck through-girder middle span with four timber open-deck outer spans. The middle steel span is supported by concrete piers. The outer timber spans are supported by timber-pile piers and timber abutments supported on timber piles. The spans are in good condition with only some surface rusting observed on the steel span. The concrete piers are in fair condition with some horizontal leaching cracks observed. The timber piles are in fair condition with heavy discoloration observed indicating potential areas of decay. The replacement of all bridge timbers is recommended.

Milepost 66.12—Hillside Road
This bridge carries Hillside Road over the Wisconsin & Southern Railroad mainline. This timber bridge consists of eight spans supported on timber-pile piers and timber abutments supported by timber piles. The spans are in good to fair condition. The substructure is generally in fair condition with the bracing observed to be in poor condition. It was estimated that approximately 50 percent of the bracing had 90 percent section loss at the member ends. It is recommended that all timber bracing members be replaced on this bridge.

Milepost 72.92—
Alpine Street (STH 67)
This ballasted-deck bridge consists of three steel through-girder spans supported on concrete piers with concrete abutments. The spans are in good condition with only some surface rusting. The abutments are in good condition with only some spalling observed on the concrete piers. No improvements to this bridge are recommended at this time.

Other structures consist mainly of culverts that allow the railway line to cross minor watercourses and drainage features. These structures consist of a variety of culvert types. The majority of the culverts consist of cast iron pipe, with concrete pipe or masonry construction. One large concrete box culvert is used as a cattle underpass. Inspection indicated that the condition of these culverts is generally good to fair, with some showing evidence of collapse or separation of pipe sections.

The existing culverts along the recommended new passing siding at Hebron are already of sufficient length to accommodate the new track since the grade still remains from the former siding at this location.

There are no other structures located along the Walworth-Fox Lake railway line. The wayside buildings and structures that once existed along the route such as freight houses and crossing shanties have been dismantled, removed, or sold as railway needs have changed over the years.

Assessment of Signal Needs
As already noted, there were no longer any signals along the Walworth-Fox Lake railway route. Based upon the preferred operating plan proposed under this feasibility study, it is envisioned that the Walworth-Fox Lake commuter rail extension could be operated without the addition of new signals. Dispatching of all trains on the Walworth-Fox Lake segment would continue to be performed by use of track warrants issued by the Wisconsin & Southern dispatchers. As noted above, the turnouts for the new siding at Hebron would be manually operated. Manual operation of these turnouts was concluded to be practical based on their low level of use.

A basic level of signalization may be required for such commuter train operation by the railway operators involved regardless of the maximum operating speeds or the expected number of trains. In this case, the installation of an automatic block signal system (ABS) together with signals for the turnouts at the proposed new siding and the equipment storage yard may be required.

A basic automatic block signal system between Walworth and Fox Lake would require the installation of block signals approximately every two miles, with the signals to be installed for the new passing siding at Hebron and the storage yard lead track becoming part of the automatic block signal system. Installation of an automatic block signal system would permit closer spacing of trains which could ultimately permit more frequent service and more

efficient operation; would allow commuter trains to eventually be operated up to 79 miles per hour, if desired; and would provide an extra level of safety. If an automatic block signal system were installed, the total capital cost of extending commuter rail service from Fox Lake to Walworth would be increased by about $4.0 million, excluding power turnout machinery and control apparatus for the Hebron passing siding and the Walworth storage yard lead track.

EQUIPMENT STORAGE AND SERVICING FACILITY NEEDS

The purpose of this section of the chapter was to describe the rolling stock and vehicle storage and maintenance facility requirements. Since the commuter rail alternatives would be operated as an extension of the already-existing Fox Lake-Chicago Metra service, any additional equipment would need to be compatible with, and operated as part of, the existing fleet of locomotives and coaches used on the route. Thus, it was assumed that train inspections and heavy maintenance could be done at an existing Metra facility as is now done for equipment used for the Fox Lake-Chicago service. This would likely be accomplished as part of the contractual agreement for the Walworth-Fox Lake extension and would avoid the need to construct a major new maintenance facility. However, provisions for overnight storage, cleaning, and light maintenance of train sets at Walworth will be necessary.

A review of possible sites for such a facility indicated that the most appropriate location would be along the north side of the railway line between USH 14 grade crossing and the Six Corners Road grade crossing just west of the Village of Walworth. This location would extend from about Milepost 74.1 to about Milepost 74.6 and is shown on Map 27. This area is currently undeveloped and would provide sufficient width and length for the installation of the needed facilities. The north side of the railway line is preferred since there is an electrical power transmission line paralleling the track to the south side. In order to store trains overnight at this location, appropriate electrical connections would need to be installed so that the internal functions of the trains can be maintained without operating the locomotive's diesel engine. Also, a rest and locker-room facility for train crews and cleaning personnel operating out of Walworth would need to be provided. This function will require the construction of a new building. Use of the existing sidetracks in Walworth for such a facility was considered but dismissed because these tracks are frequently used for freight car storage and cleaning and because of the pedestrian crossing located in the middle of the area connecting a major industrial employer with its employee parking lot.

Construction of an overnight train storage area will require the following improvements:

- Construction of two storage tracks, each one approximately 2,170 feet in length. Track construction would include subballast, ballast, ties, rail, and other track material. The 130-pound rail and other track material to be removed from the mainline could be used for construction of this trackage.

- Installation of two No. 10 turnouts to connect the storage tracks with the existing mainline.

- Construction of a new building for use by the train crews and maintenance and cleaning personnel.

- Installation of wayside electrical boxes to provide power to the trains.

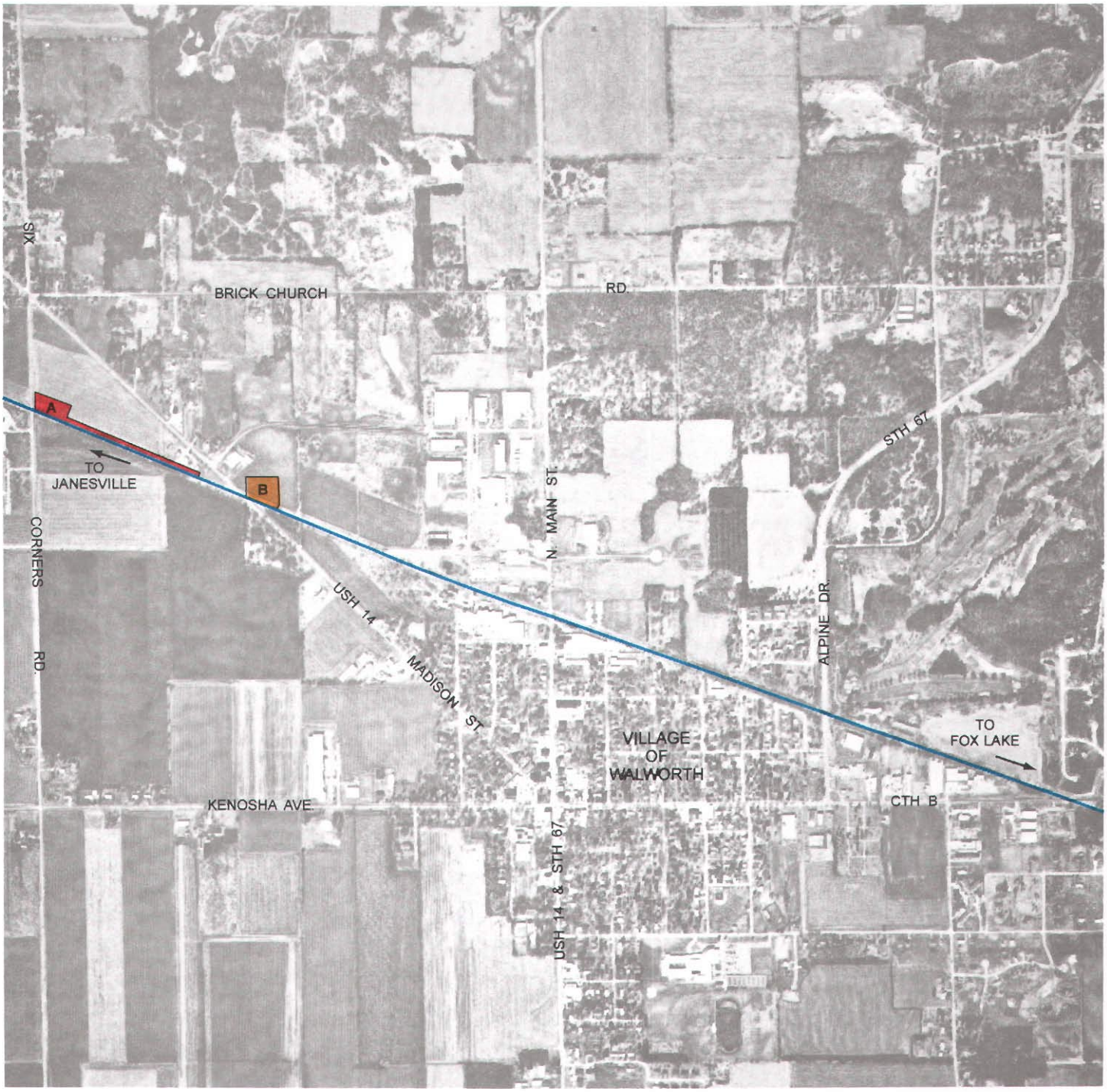
For purposes of this feasibility study, it was assumed that a single-ended storage yard would be sufficient and that the turnouts would be manually operated. It was recognized that because of possible rules and regulations in existing labor agreements or because of operational requirements, it may be necessary or more cost-effective for the storage yard to be double-ended and for all turnouts to be remotely operated by dispatchers. If the yard were constructed as a double-ended facility, then turnouts would also be required at the west end of the proposed storage yard. If it were required that the turnouts be remotely operated, then the appropriate power turnout machinery and signals would have to be installed. The total capital cost of extending commuter rail service from Fox Lake to Walworth would be increased by about $300,000 if the storage yard were constructed as a double-ended facility, and an additional $5.3 million if the associated turnouts were required to be power controlled.

Based upon a review of right-of-way maps for this railway line, the right-of-way in this area was concluded to be 100 feet wide. Approximately one additional acre would need to be acquired to construct the overnight storage yard facility and provide for an appropriate service road.

An equipment storage and servicing facility for the commuter bus alternative would be the responsibility of the service provider. As noted above, the most appropriate service provider arrangement for commuter bus service

Map 27

POTENTIAL SITE FOR COMMUTER RAIL OVERNIGHT STORAGE FACILITY



WISCONSIN & SOUTHERN RAILROAD MAIN LINE

A POTENTIAL STORAGE FACILITY SITE

B POTENTIAL PASSENGER STATION SITE

NOTE: THE POTENTIAL FACILITIES SHOWN ON THIS MAP ARE INTENDED TO REPRESENT POSSIBLE CONCEPTUAL DESIGNS SOLELY FOR THE PURPOSE OF FEASIBILITY ASSESSMENT. THE PRECISE LOCATION, SIZE, AND DESIGN OF SUCH FACILITIES WILL ULTIMATELY BE DEPENDENT UPON THE INPUT AND DECISIONS OF RESIDENTS AND PUBLIC OFFICIALS FROM THE APPROPRIATE LOCAL UNITS OF GOVERNMENT, AGREEMENT WITH THE RAILROADS INVOLVED, AND MEETING APPROPRIATE LOCAL, STATE, AND FEDERAL REQUIREMENTS.

GRAPHIC SCALE
0 400 800 1200 FEET
DATE OF PHOTOGRAPHY: APRIL 1995

Source: SEWRPC.

would be a public agency or unit of government contracting with a private operator through a competitively awarded contract. In this situation, it is envisioned that the successful private operator would provide not only the equipment and staff, but also all other day-to-day functions necessary for the commuter bus service to operate. Therefore, any costs attendant to the provision of such a facility are assumed to be included under the operating costs for that service.

SUMMARY

The purpose of this chapter was to identify the various options and recommend the most promising option with respect to physical, operational and service characteristics for potential commuter rail or commuter bus service in the Walworth-Fox Lake corridor. The principal characteristics that were considered included commuter rail and bus route alignments, passenger station facilities, service providers, operating plans, rolling stock and vehicles, and track improvements.

Commuter Rail Route Alignment

A single commuter rail route alignment was determined to be sufficiently promising to warrant further consideration under this feasibility study. This route was along the Wisconsin & Southern Railway's Fox Lake Subdivision, a distance of about 24 miles between Walworth and Fox Lake. This route alignment was found to be well-suited for accommodating potential commuter rail operations, and in fact has done so in the past. This is the only existing railway route that directly connects southern Walworth County with Northeastern Illinois. No other alignment alternatives were found to be acceptable including the former Chicago & North Western Railway line between Richmond and Lake Geneva. This line has long been dismantled, and the right-of-way in Wisconsin either reverted back to or was sold to adjacent property owners.

Commuter Bus Route Alignment

A single basic commuter bus route option was determined to be sufficiently promising to warrant further consideration under this feasibility study. The commuter bus route option consists of two feeder routes extending from Southern Walworth County to existing Metra commuter rail stations in Northeastern Illinois. The first route would extend a distance of about 30 miles from Elkhorn to Fox Lake, Illinois, primarily along USH 12 and STH 120. This bus route would connect with the existing Metra Milwaukee District North Line service operating between Fox Lake and Chicago. The second route would extend a distance of about 21 miles from Delavan to Harvard, Illinois, primarily along STH 50, STH 67, and USH 14. This bus route would connect with the existing Metra Union Pacific Northwest Line service operating between Harvard and Chicago. The purpose of these routes would be to provide bus services that directly connect with established Metra commuter train routes providing a comparable level of service under the commuter bus alternative to that provided under the commuter rail alternative for passengers traveling between Southern Walworth County and the Chicago area.

Passenger Station Facilities

A basic set of five stations was proposed for the commuter rail alternative along the Walworth-Fox Lake railway line. The stations would include: Walworth; Highway 120, which would serve Lake Geneva and Zenda; Richmond; Spring Grove, which would also serve Solon Mills; and Fox Lake. The average station spacing would be about six miles. In Fox Lake the existing Metra passenger station would be utilized. At the remaining stations, new facilities would need to be constructed.

With respect to the commuter bus alternative, a total of eight stations or stops would be located along the Delavan-Harvard bus route and a total of nine stations or stops would be located along the Elkhorn-Fox Lake bus route. For the Delavan-Harvard route, stations or stops would include: Delavan Park-Ride Lot, Williams Bay-Downtown, Williams Bay-West Side, Fontana, Walworth Park-Ride Lot, Walworth-Village Square, Big Foot, and Harvard. For the Elkhorn-Fox Lake route, stations or stops would include: Elkhorn Park-Ride Lot, Lake Geneva Park-Ride Lot, Pell Lake, Genoa City, Richmond-Downtown, Richmond Park-Ride Lot, Solon Mills, Spring Grove, and Fox Lake. The average station spacing would be about three miles along the Williams Bay-Harvard bus route and about 3.7 miles along the Lake Geneva-Fox Lake bus route.

Determination of the precise location and design of each passenger station or stop is properly a function of preliminary and final engineering studies that must follow the feasibility and detailed planning phases of any commuter service development effort. In any such succeeding phases, it will be important that local residents and public officials be involved in station location and design work. Thus, the station characteristics and locations described herein should be regarded as preliminary for purposes of this feasibility study.

Service Provider

Several alternative service provider arrangements were considered for commuter rail and commuter bus service within the Walworth-Fox Lake corridor. For commuter rail service, it was concluded that operation by Metra as an extension of its already-existing Fox Lake-Chicago service would be the most reasonable and practical arrangement. This recommendation was based on Metra's familiarity and experience with large commuter rail operations and its

ability to easily provide a through service between the Walworth-Fox Lake extension and Chicago which would not require passengers to transfer between trains at Fox Lake. Operation of such service by Metra would require negotiation and agreement between Metra and a public entity responsible for implementing commuter rail service in Wisconsin.

For commuter bus service in the Walworth-Fox Lake corridor, a public entity contracting with a new private operator through a competitively awarded contract process would be the most reasonable and practical arrangement. This recommendation was based on the absence of any similar bus service in the corridor and the successful and efficient operation of bus services under this kind of arrangement elsewhere in South-eastern Wisconsin.

Operating Plans

For purposes of this feasibility study, it was concluded that operating plans for the commuter rail and commuter bus alternatives should provide the inherent flexibility to attract the highest ridership over the entire plan design period.

The recommended commuter rail operating plan provides for service between Walworth and Fox Lake as an extension of the existing Metra's Milwaukee District North Line service. Selected existing Metra trains operating between Fox Lake and Chicago would remain on their existing schedules, but be extended west of Fox Lake to Walworth. To the extent possible, the Chicago-Fox Lake trains utilized for the extended service would be those that already provide some express service during peak travel periods. Trains would stop between Walworth and Fox Lake at all intermediate stations. On weekdays, there would be three inbound trains from Walworth to Chicago during the morning peak period, and three outbound trains from Chicago to Walworth during the afternoon peak period, together with a limited amount of nonpeak period service during the early afternoon and evening periods and on weekends.

The recommended commuter bus operating plan provides for service over two separate routes from southern Walworth County communities to existing Metra commuter rail stations in Illinois at Harvard and Fox Lake. Service on these bus routes would be coordinated with Metra's Milwaukee District North Line and Union Pacific Northwest Line train schedules. The initial frequency of service would be three inbound bus runs from Delavan to Harvard and from Elkhorn to Fox Lake during the morning peak period, and three outbound bus runs from Harvard to Delavan and from Fox Lake to Elkhorn during the afternoon peak period. There would also be a limited amount of service along these routes during the early afternoon and evening periods and on weekends.

Rolling Stock and Vehicle Requirements

It was recommended that conventional locomotive-hauled commuter train equipment be assumed for use instead of other types of equipment such as self-propelled equipment. Conventional commuter train equipment consists of bi-directional trains of diesel locomotives with bi-level passenger coaches operating in a "push-pull" mode. This type of equipment has proved to have along and established record with respect to availability, dependability, performance, and safety in use by Metra and Metra's predecessors on most of the commuter rail routes in the Chicago area for many years, and would be compatible with existing Metra equipment that currently operates between Fox Lake and Chicago. With respect to commuter bus service, it was recommended that conventional transit buses be assumed for use. Such vehicles would range from 30 to 40 feet in length, the exact size and configuration to be determined by passenger demand and the service provider. These vehicles would be similar to most buses operated in commuter service by transit operators in Southeastern Wisconsin and by Pace in Northeastern Illinois and would include passen-ger amenities appropriate for the service. The buses would need to meet the accessibility requirements of the Federal Americans with Disabilities Act.

Railway Line Improvements

An assessment of the railway line condition was conducted and an identification of improvements that will be necessary to permit the possible initiation of commuter rail service along the existing Walworth-Fox Lake railway line was made. This work was conducted by a consulting transportation engineering firm working with the Commission staff and with the cooperation of the railroad companies involved. The purpose of the assessment was to identify the existing railway line facilities that would have to be rehabilitated, upgraded, or replaced in order to operate commuter rail service in an efficient, safe, and cost-effective manner, to permit attracting an adequate level of patronage with a smooth and comfortable ride at acceptable operating speeds.

In general, the Wisconsin & Southern Fox Lake Subdivision between Walworth and Fox Lake was concluded to be in acceptable condition for existing freight operations, but would require overall upgrading to accommodate commuter rail operations in a safe, efficient, and reliable manner. A maximum mainline operating speed of 59 miles per hour between Walworth and Fox Lake was assumed for purposes of this feasibility study. Much of the required track upgrading and many of the improvements, however, would be necessary regardless of the maximum mainline operating speed or the assumed frequency of operation.

To enable commuter train operation, improvements which would have to be undertaken along the railway line include the following: replacement of all of the existing jointed rail on the main track with 115-pound continuous welded rail; replacement of all failing cross ties with new mainline-grade ties along the entire route; repair, adjustment and replacement, as necessary, of other track material including tie plates, spikes, joint bars, joint bolts, and rail anchors; undercutting the ballast, replacement of all ballast, and bringing the track to the intended line and surface; cleaning and recutting of drainage ditches along the roadbed; replacement and rehabilitation of turnouts along the entire line; rebuilding of street, highway, and private grade crossings; improvement of automatic grade crossing signals at all public crossings to include automatic gates; and installation of crossbucks and stop signs at all private grade crossings.

The assessment concluded that one new passing siding would be required to allow flexibility in the dispatching and the combined operation of commuter trains and freight trains along the Walworth-Fox Lake railroad segment. It was proposed that the new siding be about one mile in length and be located on the former grade of the old Hebron siding between Milepost 61.0 and Milepost 62.0. Turnouts for the new siding would be manually operated.

The assessment further concluded that repairs would be required to a number of bridges. It was recommended that repairs be made to 12 of the 14 bridges along the route. The recommended work ranged from relatively small repairs to replacement of major structural components and varies with each individual bridge. It was recommended that bridge timbers be replaced on eight bridges. Reconstruction, replacement, and repair work to the abutment areas are recommended for four bridges. This work includes encasing and reinforcing existing abutments and wing walls and repairing and replacing backwall sections, bearings, and bearing seats. Replacement, reinforcement, or repair work to piles, piers, and bracing on four bridges was also recommended. One bridge also requires the repair of a main steel girder. It was also recommended that should consideration of reinstituting commuter rail service along this line continue, a specialized testing firm be retained to obtain borings of the timber elements on all bridges to more precisely determine their condition.

No signal improvements were recommended at this time. Dispatching of all trains on the Walworth-Fox Lake segment would continue to be performed by use of track warrants issued by Wisconsin & Southern Railroad dispatchers. Turnouts for the new siding at Hebron and for the storage facility at Walworth would be manually operated. It was recognized, however, that remote control of these turnouts, as well as installation of an automatic block signal system, may be required by the participating railways or Metra prior to initialization of commuter service or at some time in the future.

Equipment Storage and Servicing Facility Needs

A facility for the overnight storage, cleaning, and light maintenance of train sets at Walworth would be necessary. This would be a basic facility and require the construction of two storage tracks, installation of two turnouts to connect the storage tracks with the mainline, construction of a small building for use by train crews and cleaning personnel, and installation of wayside electrical boxes to provide power to the trains. For purposes of this feasibility study, it was assumed that the yard would be single-ended with manually operated turnouts. About one additional acre would need to be acquired for this facility. Major train inspections and heavy maintenance work could be done at an existing Metra facility.

An equipment storage and servicing facility for the commuter bus alternative would be the responsibility of the service provider under a contractual agreement with a private operator. It is envisioned that the operator would provide not only the equipment and staff, but also equipment and facilities such as for the storage and maintenance of buses for all other day-to-day functions necessary for the commuter bus service to operate.

Chapter V

EVALUATION OF POTENTIAL COMMUTER RAIL AND BUS TRANSIT ALTERNATIVES

INTRODUCTION

The purpose of this chapter is to provide an estimate of capital costs, operating costs, and potential ridership attendant to the provision of commuter rail or commuter bus service in the Walworth-Fox Lake Corridor. Previous chapters of this report have identified a conceptual design including physical, operational, and service characteristics for the potential extension of commuter rail service and the alternative provision of commuter bus service in this corridor.

The first section of this chapter provides a description and evaluation of the potential extension of commuter rail service from Fox Lake to Walworth. This section includes a physical and operational description of the potential service extension, including an operating plan; an estimate of its attendant capital costs; a forecast of potential ridership; an estimate of attendant total operating costs and of net operating costs (total costs less farebox revenues attendant to ridership); and estimates of the principal impacts of the service extension, including travel time reductions, compared to existing automobile travel, reductions in highway traffic, and reductions in air pollutant emissions and motor fuel consumption.

The next section of this chapter provides a description and evaluation of the potential provision of commuter bus service from Walworth to Fox Lake. This section includes a physical and operational description of the potential service, including an operating plan; an estimate of its attendant capital costs; a forecast of potential ridership; an estimate of the attendant total operating costs and of net operating costs (total costs less farebox revenues attendant to ridership); and estimates of the principal impacts of the service extension, including travel time reductions compared to existing automobile travel, reductions in highway traffic, and reductions in air pollutant emissions and motor fuel consumption.

The next section of this chapter provides a comparison of potential commuter rail service with potential commuter bus service in the corridor, and then compares both of these types of services with other existing commuter rail services in the United States and with other bus transit systems in Southeastern Wisconsin. Following this section, the recommendations and conclusions of the Advisory Committee are documented.

DEFINITION AND EVALUATION OF THE POTENTIAL COMMUTER RAIL EXTENSION

Based upon the findings of the inventories, and of the identification of principal physical, operational, and service characteristics presented in previous chapters of this report, a conceptual commuter rail extension proposal was identified and described for feasibility assessment. The commuter rail extension proposal would entail operation of commuter railway passenger trains between Walworth and Fox Lake as an extension of Metra's existing Milwaukee District North Line. Selected existing Metra trains operating between Chicago and Fox Lake would be extended along the entire length of the corridor west of Fox Lake to Walworth. The service would be provided over the existing railway route which consists of the Canadian Pacific Railway C&M Subdivision from Chicago Union Station to a junction at Rondout; the Canadian Pacific Railway Fox Lake Subdivision from Rondout to Fox Lake;[1] and the Wisconsin & Southern Railroad Fox Lake Subdivision from Fox Lake to Walworth.

The foregoing service provider recommendation is a preference that is entirely and solely a result of this feasibility study. It does not constitute or represent a commitment or endorsement by Metra with respect to any of the proposals or recommendations contained in this study. While Metra has participated in this study in a technical advisory role, its responsibility lies in addressing needs within the six-county Northeastern Illinois Region. Any provision of service in the Wisconsin portion of the Walworth-Fox Lake Corridor

[1] *As noted in Chapter III of this report, although train operations on the Chicago-Rondout-Fox Lake route are controlled by Canadian Pacific Railway dispatchers, most of this railway route is owned by Metra.*

will require sponsorship and funding for capital and operating cost needs by Wisconsin governments or agencies.

To provide for the Walworth-Fox Lake commuter rail extension, the single-track railway line of 24 miles would be upgraded to allow for a maximum mainline operating speed for commuter passenger trains of 59 miles per hour. One passing siding of one mile in length would need to be added to allow trains traveling in opposite directions to meet and pass each other. Train operations would be governed by track warrant control and commuter train schedule authority under the direction of Wisconsin & Southern Railroad dispatchers. A more detailed description of the improvements attendant to the extension of commuter rail service was provided in Chapter IV, "Potential Commuter Route Facilities and Services."

Freight train movements were assumed to remain relatively low in number. Thus, freight train traffic was not considered to be a significant constraint with respect to locating and sizing passing sidings, and the operation of both commuter railway passenger and freight trains was assumed to be accomplished through an operating agreement that included the coordinated scheduling of all operations. Based upon the best information available to this study, existing and likely future freight train operations on the Fox Lake Subdivision may be expected to be accom-modated using the overall mainline track and siding configuration that now exists. The addition of the single passing siding identified in this feasibility study is intended primarily to provide flexibility for the operation of both freight and commuter railway passenger trains on the same line.

The basic conceptual commuter rail extension described herein would serve all five passenger stations described in Chapter IV, including Walworth, Highway 120 (Lake Geneva and Zenda), Richmond, Spring Grove-Solon Mills, and Fox Lake. At Fox Lake, the existing Metra station facilities would be utilized. At Walworth, Highway 120, Richmond, and Spring Grove-Solon Mills, new station facilities would be necessary. The average station spacing would be about six miles.

As already noted, for purposes of this feasibility assessment it was assumed that the Walworth-Fox Lake service would be operated as an extension of Metra's existing service on its Milwaukee District North Line between Fox Lake and Chicago. Such operation would provide a practical approach to both extending service west of Fox Lake and providing through service in the corridor without requiring passengers to change trains at Fox Lake, thus encouraging ridership. Commuter rail service on the Milwaukee District North Line is operated directly by Metra. The extension of commuter rail service between Walworth and Fox Lake would be ultimately subject to negotiation and cooperative agreements between the Wisconsin & Southern Railroad, Metra, railway labor unions, implementing agencies in Wisconsin, and local counties and communities concerning such matters as operating responsibilities, train crew agreements, railroad access and use agreements, and the division of revenues, expenses, and subsidies.

Operating Plan

On weekdays, the commuter rail service between Walworth, Fox Lake, and Chicago under the potential service extension would consist of three inbound trains from Walworth to Chicago during the morning peak period, and three outbound trains from Chicago to Walworth during the afternoon peak period. In addition, one train would operate in each direction during the midday period and one train would operate outbound from Chicago to Walworth during the evening period and then return to Fox Lake as a non-revenue or "deadhead" train. The trains would be operated as through trains along the entire corridor. Weekend service would also be provided. On Saturdays, two trains—and on Sundays, one train—would operate inbound from Walworth to Chicago during the morning period and outbound from Chicago to Walworth during the late afternoon period. The service headway for these trains would be about 90 minutes. These trains would operate all year. In addition, from May through September, one train would operate outbound from Chicago to Walworth during the morning period and inbound from Walworth to Chicago during the early evening period on Saturdays, Sundays, and major holidays.

Other operating plan assumptions for this feasibility assessment pertained to the fare structure. For determining the one-way adult fares assumed to be charged, a zone system was defined for the Walworth-Fox Lake-Chicago service based on an extension of the distance-based fare zone system used by Metra on its commuter rail lines radiating out of the Chicago central business district. The assumed fare structure would therefore be integrated with the fare structure in place on the Metra system. This is important since the service under this alternative was assumed to be operated as an extension of the Metra Milwaukee District North Line. The fare zone designations and the passenger stations within each zone between Chicago, Fox Lake, and Walworth are shown on Table 22. The one-way fares used for feasibility assessment of the Walworth-Fox Lake service as an extension of the Metra Milwaukee District North Line are shown on Table 23 and were based on the 2000 Metra fare structure, with some minor adjustments. It was also assumed that multi-ride reduced fares in

the form of ten-ride tickets and monthly passes similar to those available from Metra would be available for the Walworth-Fox Lake service extension.

Capital Costs

The capital costs attendant to the potential commuter rail extension were estimated based on a cost build-up approach with respect to track and signal improvements, locomotive and passenger coach equipment requirements, passenger station facilities, and equipment storage and servicing facilities. All capital costs are presented in 2000 dollars. The capital costs include all items necessary for full implementation of the alternative by the design year. It is possible that the identified improvements—frequency of service and attendant equipment and storage needs and track and signal improvements—may be implemented in an incremental manner, thereby spreading the total required capital investment over a period of years. The estimated capital cost attendant to each of the categories is described below.

Track Improvements

To provide commuter rail service within this corridor, the existing rail infrastructure requires rehabilitation and upgrading to provide a comfortable ride and acceptable operating speeds. Under this alternative, a maximum mainline operating speed of 59 miles per hour was designed to be achieved; however, maximum operating speeds would be lower along specific segments due to track alignment and other operating factors.

The necessary track improvements were described in Chapter IV of this report and include: overall rehabilitation and improvement of the mainline, track, roadbed, and right-of-way; rehabilitation of street and highway grade crossings; and installation and upgrading of grade-crossing signals. The capital cost of the recommended track improvements was estimated to total about $51.5 million as shown in Table 24. Development of these costs was based on the most current unit cost prices contained in Metra cost estimating handbooks, unit costs used for other Metra feasibility studies, and actual costs for implementing Metra's new North Central Service route. Thus, the costs in this estimate should be representative of the cost of extending a Metra route by assuming a cost structure based on Metra's actual capital cost experience and upgrading and improvements to meet Metra requirements. In general, Metra requires the long-term condition of mainline track it operates over to meet Federal Railroad Administration Class 4 track safety standards. An important element of the track rehabilitation is the replacement of the old jointed rail with continuous welded rail either immediately or within the first few years following start-up of the commuter train service. The capital cost of replacing the rail was estimated to total about $23.4 million including contingencies and preliminary engineering, or about 45 percent of the total track improvement capital cost.

Table 22

FARE ZONE AND STATION ARRANGEMENT ASSUMED FOR PROPOSED CHICAGO-FOX LAKE-WALWORTH COMMUTER RAIL SERVICE

Fare Zone Designation	Passenger Stations within Zone
A	Chicago Union Station Western Ave.
B	Healy Grayland Mayfair
C	Forest Glen Edgebrook Morton Grove
D	Golf Glenview Glen of North Glenview
E	Northbrook Lake Cook Rd. Deerfield
F	Lake Forest
G	(no stations)
H	Libertyville
I	Grayslake Round Lake
J	Long Lake Ingleside Fox Lake
K	Spring Grove-Solon Mills
L	Richmond
M	(no stations)
N	Highway 120 (Lake Geneva and Zenda)
O	Walworth

Source: Metra and SEWRPC.

The capital cost of constructing a new passing siding at Hebron was estimated to total about $1.8 million as shown in Table 25. The siding would be about one mile in length and would have hand-operated turnouts at each end of the siding. The capital cost of the recommended

Table 23

ONE-WAY ADULT FARES FOR TRAVEL BETWEEN ZONES USED FOR FEASIBILITY ASSESSMENT OF WALWORTH COUNTY-CHICAGO COMMUTER RAIL AND BUS SERVICE IN 2000 DOLLARS

Fare Zone	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
A	$1.80																
B	2.20	$1.80															
C	2.60	2.20	$1.80														
D	3.00	2.60	2.20	$1.80													
E	3.40	3.00	2.60	2.20	$1.80												
F	3.80	3.40	3.00	2.60	2.20	$1.80											
G	4.20	3.80	3.40	3.00	2.60	2.20	$1.80										
H	4.60	4.20	3.80	3.40	3.00	2.60	2.20	$1.80									
I	5.00	4.60	4.20	3.80	3.40	3.00	2.60	2.20	$1.80								
J	5.40	5.00	4.60	4.20	3.80	3.40	3.00	2.60	2.20	$1.80							
K	5.80	5.40	5.00	4.60	4.20	3.80	3.40	3.00	2.60	2.20	$1.80						
L	6.20	5.80	5.40	5.00	4.60	4.20	3.80	3.40	3.00	2.60	2.20	$1.80					
M	6.60	6.20	5.80	5.40	5.00	4.60	4.20	3.80	3.40	3.00	2.60	2.20	$1.80				
N	7.00	6.60	6.20	5.80	5.40	5.00	4.60	4.20	3.80	3.40	3.00	2.60	2.20	$1.80			
O	7.40	7.00	6.60	6.20	5.80	5.40	5.00	4.60	4.20	3.80	3.40	3.00	2.60	2.20	$1.80		
P	7.80	7.40	7.00	6.60	6.20	5.80	5.40	5.00	4.60	4.20	3.80	3.40	3.00	2.60	2.20	$1.80	
Q	8.20	7.80	7.40	7.00	6.60	6.20	5.80	5.40	5.00	4.60	4.20	3.80	3.40	3.00	2.60	2.20	$1.80

Source: SEWRPC.

track improvements including this passing siding would be about $ 53.3 million. As this feasibility study was being completed, the Wisconsin & Southern Railroad was considering the extension of existing sidings at Bardwell and Zenda. If these sidings were extended to a sufficient length, they could be used for the purpose of meeting and passing trains, and possibly reduce or eliminate the need to construct a new siding at Hebron.

The capital cost of bridge rehabilitation work was estimated to total about $833,000 as shown in Table 26. The necessary bridge rehabilitation work was also described in greater detail in Chapter IV of this report. This work includes bridge tie replacement on most bridges along the route extension and timber boring and testing on many of the bridges. Much of the repair and rehabilitation work is specific to individual bridges and includes a variety of items such as replacement of piers, reconstruction or replacement of backwalls, reconstruction of bearing seats, replacement of bearings, encasement of abutments, piers, or wingwalls, and miscellaneous concrete and steel repairs.

As work on this feasibility study was being completed, three issues concerning track improvement needs and costs were identified, all of which suggest that the estimated total track improvement costs of $54.1 million may be conservatively high. Should it be concluded that the commuter rail extension is feasible, the subsequent corridor study could explore the potential for lower track improvement costs based upon these considerations. First, it was suggested that the potential extension of commuter rail service from Fox Lake to Walworth over a regional shortline railroad, rather than a major railroad such as the Union Pacific or Canadian Pacific, might allow a reduction in the estimated costs of performing the necessary track improvements. These potential lower costs of track improvements may be attributed to lower labor and overhead costs of a shortline railroad, higher costs of performing work on the busy mainlines of major railroads that must be kept open to traffic during the work, and more demanding engineering and material standards used by major railroads. Almost all new North American commuter rail routes and commuter rail route extensions that have been implemented in recent years and that are intended to provide traditional weekday peak-period service have been over mainlines of major railroads in metropolitan areas.

Table 24

CAPITAL COST OF RECOMMENDED TRACK IMPROVEMENTS FOR WALWORTH-FOX LAKE COMMUTER RAIL SERVICE IN 2000 DOLLARS BASED ON UNIT COST EXPERIENCE OF MAJOR RAILROADS

Category	Quantity	Cost of Material and Installation
Upgrade Existing Mainline Track		
Install new continuous welded rail	131,200 Track Feet	$17,188,000
Cross tie replacement	30,000	2,515,000
Undercutting, surfacing, and alignment work	131,200 Track Feet	7,689,000
Install new turnouts	11	1,268,000
Remove existing turnouts	12	252,000
Miscellaneous turnout rehabilitation and upgrading	Lump Sum	41,000
Rail inspection and testing	5 Days	21,000
Drainage ditch and culvert repair and cleaning	241,296 Linear Feet	395,000
Upgrade At-Grade Street and Highway Crossings		
Rebuild existing crossings and upgrade signals	20	4,192,000
Install constant warning time device equipment for grade crossing signals	22 Crossings	3,458,000
Install crossbucks and stop signs at private crossings	33 Crossings	27,000
Subtotal	--	$37,046,000
Contingencies	30 percent	$11,114,000
Preliminary engineering, design, and construction management	12 percent	4,446,000
Less salvage and scrap	Lump Sum	1,099,000
Total	--	$51,507,000

NOTE: The total recommended cost of all track improvements has the potential to be reduced by several factors including: other track improvement projects that may be undertaken on the railway line between Walworth and Fox Lake; the potential for the entire mainline track not to require complete ballast replacement and/or under-cutting; and the potential for the necessary work to be accomplished at somewhat lower costs due to lower labor, management and engineering, and overhead unit costs inherent to shortline and regional railroads as compared to major railroad companies.

Source: SEWRPC.

Table 25

CAPITAL COST OF CONSTRUCTING NEW PASSING SIDING AT HEBRON FOR WALWORTH-FOX LAKE COMMUTER RAIL SERVICE IN 2000 DOLLARS

Item	Quantity	Cost of Material and Installation
Construct New Track	5,280 Track Feet	$ 636,000
Install New Turnouts	2	272,000
Install At-Grade Roadway Crossing for Second New Track	1	162,000
Upgrade Crossing Signals and Install Constant Warning Time Equipment	Item	210,000
Subtotal	--	$1,280,000
Contingencies	30 percent	$ 385,000
Preliminary Engineering, Design, and Construction Management	12 percent	154,000
Total	--	$1,819,000

NOTE: The total recommended cost of all track improvements has the potential to be reduced by several factors including: other track improvement projects that may be undertaken on the railway line between Walworth and Fox Lake; the potential for the entire mainline track not to require complete ballast replacement and/or under-cutting; and the potential for the necessary work to be accomplished at somewhat lower costs due to lower labor, management and engineering, and overhead unit costs inherent to shortline and regional railroads as compared to major railroad companies.

Source: SEWRPC.

Second, the potential for the necessary track improvements to require less than the recommended complete replacement of the ballast along the entire commuter rail route extension was identified. Representatives of the Wisconsin Department of Transportation and the Wisconsin & Southern Railroad suggested further inspection and preliminary engineering may establish that the mainline between Walworth and Fox Lake may not need to be completely undercut and the ballast completely replaced. Rather, some extent of the mainline may only require the placement of additional ballast together with surfacing and alignment of the track. However, following additional inspection, it remained the recommendation of T. Y. Lin Bascor staff—the consultant for this feasibility study—that the entire length of the line be undercut and the ballast replaced. The Department and Railroad staffs concurred that complete ballast replacement would be required at all at-grade street and highway crossings and along several track segments that have experienced ongoing stability, drainage, or alignment problems.

Third, the cost of estimated track improvements required due to potential extension of commuter rail service from Fox Lake to Walworth could be reduced as a result of improvements made under other projects.

Table 26

CAPITAL COST OF BRIDGE REHABILITATION WORK FOR WALWORTH-FOX LAKE COMMUTER RAIL SERVICE IN 2000 DOLLARS

Category	Number of Bridges	Cost of Material and Installation
Bridge tie replacement	13	$134,000
Replace timber bracing	2	13,000
Replace timber-pile piers with steel piles and concrete caps	1	145,000
Replace abutment backwall	1	18,000
Replace bearings	3	46,000
Reconstruct bearing seats and backwalls	2	96,000
Abutment, pier, and wingwall encasement	3	65,000
Timber borings and testing	7	44,000
Miscellaneous concrete abutment repair work	1	21,000
Miscellaneous steel repair work	1	5,000
Subtotal	--	$587,000
Contingencies	30 percent	$176,000
Preliminary engineering, design, and construction management	12 percent	70,000
Total	--	$833,000

NOTE: The total recommended cost of all track improvements has the potential to be reduced by several factors including: other track improvement projects that may be undertaken on the railway line between Walworth and Fox Lake; the potential for the entire mainline track not to require complete ballast replacement and/or undercutting; and the potential for the necessary work to be accomplished at somewhat lower costs due to lower labor, management and engineering, and overhead unit costs inherent to shortline and regional railroads as compared to major railroad companies.

Source: SEWRPC.

During 1999, Wisconsin & Southern Rail-road officials were advancing a proposal to operate an intercity, or "long-distance," passenger train service for Amtrak between Chicago and Janesville under the name "Wisconsin Express." As envisioned, this service would begin operation on a trial basis, probably with one round trip per day. En route stops would likely be limited, possibly including only Walworth. Initial maximum operating speeds and average speeds may be expected to be much lower between Janesville and Fox Lake than between Fox Lake and Chicago. Although schedules had not been finalized, the southbound train would arrive in Chicago during the mid-morning and the northbound train would depart Chicago during the late afternoon. While commuters may be able to use the northbound train, the southbound train would not be conducive for providing travel to work in downtown Chicago. Actual schedules would be determined only after negotiation with Metra, as the service would operate over Metra tracks between Fox Lake and Chicago. Because of the limited level of service, it is expected that these trains would be used primarily by leisure travelers and persons making occasional trips to downtown Chicago. These trains would also handle cars of Amtrak express freight shipments. Thus, this represented a significantly different type of service, serving a different passenger market than would commuter rail service. Nevertheless, the Wisconsin Express proposal could be viewed as a first step or stage of service, which could eventually become commuter train service. If this initial level of service were determined to be a success, it was noted that improvements could then be considered including: extension of the trains to Madison; addition of a second daily round trip; schedule changes; and increased operating speeds.

The Wisconsin Express proposal was expected to have different operational, track improvement, and capital-cost requirements compared to traditional commuter rail service. The level of initial service for the Wisconsin Express would not require the same level of capital investment as would the potential commuter rail service described in the feasibility study. In fact, the trial nature of the Wisconsin Express service would have encouraged an effort to keep the initial capital investment as low as possible. For example, continued use of the existing jointed rail may be appropriate. In addition, a lower level of ballast, roadbed, and other associated work may also be appropriate. An estimate of track improvement needs and the attendant cost for this service is presented in Table 27 and was prepared

Table 27

CAPITAL COST OF INITIAL TRACK IMPROVEMENTS FOR WALWORTH-FOX LAKE SEGMENT OF "WISCONSIN EXPRESS" JANESVILLE-CHICAGO INTERCITY PASSENGER TRAIN SERVICE IN 2000 DOLLARS

Category	Quantity	Cost of Material and Installation
Upgrade Existing Mainline Track		
Install new continuous welded rail	49,100 Track Feet	$ 2,610,000
Cross tie replacement	12,000	750,000
Undercutting, surfacing, and alignment work	25.5 Miles	910,000
Miscellaneous rail replacement and testing	Lump Sum	100,000
Renew grade crossings	16	512,000
Drainage ditch cleaning	12,000 Linear Feet	48,000
Bridge Rehabilitation Work		
Bridge A-929 renewal	166 Feet	166,000
Other bridge upgrades	1,195 Feet	3,585,000
Other Track Work		
Install passing track	5,280 Track Feet	1,044,000
Rehabilitate Walworth tracks	4,500 Track Feet	630,000
Subtotal	--	$10,355,000
Preliminary Engineering, Design, and Construction Management	13 percent	1,346,000
Total	--	$11,701,000

NOTE: Cost estimate does not include grade crossing signal upgrade and installation work, miscellaneous turnout rehabilitation and upgrade work, and contingencies. These categories are included in Tables 24 and 25.

Source: Wisconsin & Southern Railroad Co.

by the Wisconsin & Southern Railroad. While this service, at least initially, would not serve commuters, it could be identified as an initial stage of passenger train service that could eventually be improved to the level envisioned under the proposed extension of existing Metra service. Accordingly, the track improvement cost attendant to the potential extension of commuter rail service as described in this feasibility study could ultimately be reduced up to the amount invested in the Wisconsin Express or other passenger train service proposals.

Although the Wisconsin Express service as operated by the Wisconsin & Southern Railroad was not implemented, a passenger train service similar in concept began service between Janesville and Chicago on April 15, 2000. Named the "Lake Country Limited," the train is operated by Amtrak as part of its national system. The new service is part of an Amtrak service expansion program largely based on adding trains to its national network that will handle profitable express and freight shipments in addition to carrying passengers. The goal of the expansion program is to assist Amtrak operations in reaching financial self-sufficiency by handling profitable express freight ship-ments on passenger trains.

The Lake Country Limited operates from a new passenger station on the southeast side of the City of Janesville to Chicago Union Station. There are two stops: Glenview, Illinois and Lake Geneva, Wisconsin. The Lake Geneva station is located along the railroad line at the unincorporated community of Zenda. The service operates over the Wisconsin & Southern Railroad between Janesville and Fox Lake and over the Metra mainline between Fox Lake and Chicago. There is one round trip per day over the 98-mile long route. On Mondays through Fridays the southbound train departs Janesville at 6:00 a.m. and arrives at Chicago at 9:20 a.m. On Saturdays, Sundays, and holidays the train leaves Janesville at 6:15 a.m. and arrives in Chicago at 9:05 a.m. The northbound train departs Chicago at 8:15 p.m. and arrives in Janesville at 11:05 p.m. seven days a week. When operating over Metra trackage between Chicago and Fox Lake, the train is able to operate at maximum speeds of up to 79 miles per hour. Track conditions on Wisconsin & Southern trackage between Fox Lake and Janesville currently restrict maximum operating speeds to 30 miles per hour. Consequently, the average operating speed for the southbound train is about 29 miles per hour on weekdays and about 35 miles per hour on weekends and holidays. The average operating speed for the northbound train is about 35 miles per hour. On weekdays the southbound train currently requires a longer running time because of the need to operate the new train in between schedules of existing Metra commuter trains south of Fox Lake. The train normally consists of one locomotive, one baggage car for small freight and express shipments, one coach, and three or more cars for contract freight and express shipments.

Capital improvements for the Lake Country Limited have been relatively modest to date since initiation of the service. Station facilities for the Janesville and Lake Geneva stops have included the installation of paved parking lots, landscaping, boarding platforms, signing, permanent lighting, and telephones. The Janesville station also includes a small shelter. Prior to and following start up of the service, Wisconsin & Southern maintenance forces performed track work to eliminate a number of slow orders so that the entire distance from Janesville to Fox Lake would have a normal operating speed of 30 miles per hour. This work has

included replacement of cross ties, spreading of new ballast, and track surface and alignment work. Railroad officials have indicated that the track could be upgraded to provide for a higher operating speed over the next few years if some type of public funding were made available.

According to information provided by Amtrak, during the first two weeks of operation in April there was an average of about 11 passengers per day using the service. During May, an average of about 21 passen-gers per day used the service. Since this time a small number of groups have also used the trains. The one-way fare between Janesville and Chicago is $15.00. The one-way fare between the Lake Geneva stop and Chicago is $11.00. Reservations are not required on the train.

The Amtrak Lake Country Limited train is similar to the Wisconsin Express proposal set forth by the Wisconsin & Southern Railroad. The Lake Country Limited service was instituted with a minimum amount of investment and is intended to serve a very different transportation market than would a conventional commuter train service. The market for the Amtrak service includes leisure and occasional passengers traveling to and from Chicago, passengers connecting with other Amtrak trains at Chicago, and the movement of express freight shipments. The present schedule of the Lake Country Limited, although relatively slow especially between Janes-ville, the Lake Geneva stop, and Fox Lake, does enable users to conduct business in Chicago for an entire day. However, its slow average speed and late northbound arrival time back at the Lake Geneva stop would not encourage users on a daily basis. Eventual upgrading of this service to a level compatible with other Metra commuter train services and operations would still ultimately require much of the investment described elsewhere in this report with respect to rail, cross ties, ballast, roadbed, and other track and right-of-way work. However, as was discussed above under the Wisconsin Express proposal, the track improvement costs attendant to the potential extension of commuter rail service could ultimately be reduced up to the amount already invested in other passenger train services that utilize the Fox Lake to Walworth railroad line.

Equipment Requirements

To provide commuter rail service on the Walworth-Fox Lake extension, it was assumed that selected Metra trains that now operate between Fox Lake and Chicago would simply be extended to Walworth. Therefore, the type of equipment and mode of operation would be that of Metra in the Chicago area and on the Milwaukee District North Line. With respect to equipment, this would be conventional locomotive-hauled commuter trains consisting of diesel locomotives with bi-level gallery coaches operated in a push-pull mode.

Equipment needs were based on the anticipated volume of passengers on each train, analysis of the proposed frequency of service between Walworth and Chicago, integration with existing commuter train schedules on the Metra Milwaukee District North Line, and attempting to maintain the most efficient equipment utilization possible. To meet the ridership demands of the potential Walworth-Fox Lake extension, one coach would need to be added to each of the trains extended beyond Fox Lake. The minimum train size on this line is one locomotive and four coaches. In actual practice, nonpeak period trains may require less than four coaches but experience on Metra and other commuter rail systems has shown that, except on the longest trains, changing train lengths for midday and evening periods becomes inefficient because of additional operating costs and is time-consuming and may cause delays. Because the Walworth-Fox Lake service would be operated as part of the Metra Fox Lake-Chicago service, it was assumed that the equipment to be acquired would actually be used in the overall Milwaukee District North Line equipment pool. The spare equipment required would be integrated with the Metra general spare equipment pool already in place and would be available as needed.

Additional weekday peak-period equipment needs to operate the Walworth-Fox Lake extension would require that three coaches be procured in addition to the equipment already required by Metra for its Fox Lake-Chicago service. It was also concluded that an appropriate ratio of spare equipment would need to be contributed. This would total one coach. Accordingly, a total of four coaches would need to be acquired for the Walworth-Fox Lake extension. The capital cost of the required equipment under this alternative was estimated to total about $8.0 million. This estimate of coach requirements was based on Metra equipment utilization practices for the Milwaukee District North Line. Subsequent changes to operational patterns for this route—such as the extension of existing midday trains beyond Grayslake to Fox Lake—could affect the amount of equipment necessary to implement service between Walworth and Fox Lake. This estimate also assumes that an additional spare complete train set including a locomotive and coaches will not need to be based at Walworth.

Passenger Station Facilities

With respect to stations, new facilities would need to be constructed at Walworth, Highway 120 (Lake Geneva and Zenda), Richmond, and Spring Grove-Solon Mills.

The size and extent of the necessary improvements were based upon the overall design guidelines set forth in Chapter IV of this report and the anticipated passenger demand at each station. As noted earlier, this feasibility study will not determine the exact details or specifications for individual stations, including location. However, station needs and cost requirements must be determined. The basic elements for each station include: boarding platforms, access facilities meeting the requirements of the Federal Americans with Disabilities Act, waiting shelters, parking for automobiles, drop-off and pick-up areas for passengers, and certain station amenities.

The capital cost of passenger station facility improvements was estimated to total about $3.6 million as shown in Table 28. Based upon the year 2020 ridership forecasts that were prepared for this alternative, Table 28 sets forth the basic facility needs and capital cost requirements for each of the four new stations along the extension route. The Fox Lake station would require only some minor signage additions.

Ticket sales for service on the Walworth-Fox Lake extension would be handled in much the same manner as is presently done by Metra. For purposes of this feasibility study, tickets would be available in one-way, multi-ride, and monthly pass denominations and could be purchased from ticket agents, by mail, or on board trains from conductors at stations where no agent is on duty. It was assumed that, at least initially, ticket sales would only be available at depots on the Fox Lake-Chicago route that are already staffed with ticket agents. Ticket sales at any of the proposed new stations west of Fox Lake could be added at a later date based on sufficient passenger volume, available funding and facility resources, or other local needs. In 1998, eight of the 20 stations along the Milwaukee District North Line had ticket agents on duty during at least part of each weekday.

Equipment Storage and Servicing Facilities

Appropriate facilities for overnight and midday storage, cleaning, and light servicing of equipment would need to be provided at terminals where trains begin and end their runs. These locations would include Chicago and Walworth. The existing facilities already in place and used for this purpose at Chicago would continue to be so used with no significant improvements being necessary. Under this alternative, three trains would originate and terminate at Walworth, where construction of an equipment storage and servicing facility would be necessary.

The capital cost of the equipment storage and servicing facility at Walworth under this alternative was estimated to total about $3.5 million as shown in Table 29. Equipment servicing improvements that would be necessary include: installation of electrical power boxes and associated equipment to provide connections for the provision of power and heat to the train sets while they are serviced, cleaned, and stored overnight; a crew facility for use by train crews, cleaning staff, and any other inspection and maintenance personnel; two storage tracks along with the attendant turnouts; and adequate access to the facility. For purposes of this feasibility study, it was assumed that major inspection, maintenance, and repair work will be performed on the additional coaches required for the Walworth-Fox Lake extension under agreement with Metra at its existing facilities.

Summary of Capital Costs

A summary of the capital costs attendant to the extension of commuter rail service in the Walworth-Fox Lake corridor is presented in Table 30. The total cost of the necessary capital improvements under this alternative was estimated to be $69.3 million in 2000 constant dollars. The track improvement element of the cost which totals $54.1 million has the potential to be reduced by other projects which may be undertaken on the railway line, the potential to not require complete ballast replacement, and the potential for the necessary work to be accomplished at lower than estimated unit costs due to it being on a short-line railroad.

The two line items identified as "Contingencies" and "Preliminary Engineering, Design, and Construction Management" have been added to all capital cost estimates—except for equipment procurement—as a percentage of the total material and installation costs. These factors have been long accepted as appropriate for use in long-range capital-cost estimation. The rates used for these two items are 30 percent and 12 percent, respectively. These rates are based on similar rates used by Metra in its feasibility and long-range planning work. Should detailed planning and engineering work continue and the estimation of capital costs becomes more precise, it may be appropriate to revise the factors for these items.

Ridership Forecasts

A forecast of probable ridership on the proposed commuter rail extension was prepared. The forecast is based upon the application of the Regional Planning Commission battery of travel simulation models. The travel forecasts were prepared for the future design year 2020 based upon the Commission year 2020 adopted regional population and employment fore-casts and regional land use and transportation system plans for Southeastern Wisconsin, and the Northeastern Illinois

Table 28

CAPITAL COST OF PASSENGER STATIONS FOR WALWORTH-FOX LAKE COMMUTER RAIL SERVICE IN 2000 DOLLARS

Item	Assumed Size	Cost of Material and Installation
Walworth		
Platform and access	210 feet	$110,000
Shelters	2	42,000
Park-Ride lot	65 spaces	223,000[a]
Land acquisition	3 acres	79,000[b]
Contingencies	30 percent	136,000
Preliminary engineering, design, and construction management	12 percent	55,000
Subtotal	--	$ 645,000
Highway 120 (Lake Geneva and Zenda)		
Platform and access	210 feet	$110,000
Shelters	2	42,000
Park-ride lot and driveway	120 spaces	472,000[a]
Land acquisition	5.0 acres	131,000[b]
Contingencies	30 percent	226,000
Preliminary engineering, design, and construction management	12 percent	90,000
Subtotal	--	$1,071,000
Richmond		
Platforms and access	210 feet	$110,000
Shelters	2	42,000
Park-Ride lot	40 spaces	157,000[a]
Land acquisition	2.0 acres	52,000[b]
Contingencies	30 percent	109,000
Preliminary engineering, design, and construction management	12 percent	43,000
Subtotal	--	$ 513,000
Spring Grove-Solon Mills		
Platforms and access	210 feet	$110,000
Shelters	2	42,000
Park-Ride lot	240 spaces	681,000[a]
Land acquisition	6.0 acres	157,000[b]
Contingencies	30 percent	298,000
Preliminary engineering, design, and construction management	12 percent	119,000
Subtotal	--	$1,407,000
Fox Lake		
Signing improvements	Lump Sum	$ 1,000[c]
Total	--	$3,637,000

NOTE: Costs include design features to make all stations accessible.

[a]*Cost includes area to be used for passenger drop-off and pick-up.*

[b]*Actual land-acquisition costs will be dependent upon specific parcels to be acquired and attendant negotiation efforts. For purposes of this feasibility study, such lands in developed areas assumed to be $25,000/acre.*

[c]*Includes contingencies and preliminary engineering, design, and construction management.*

Source: SEWRPC.

Table 29

CAPITAL COST OF STORAGE AND SERVICING FACILITY FOR WALWORTH-FOX LAKE COMMUTER RAIL SERVICE IN 2000 DOLLARS

Item	Quantity	Cost of Material and Installation
Construct New Track	3,970 Track Feet	$ 479,000
Install New Turnout	2	$ 231,000
Land Acquistion	1 Acre	26,000
Crew Facility and Access	Item	1,050,000
Wayside Power Boxes and Associated Electrical Equipment	Item	660,000
Subtotal	--	$2,446,000
Contingencies	30 percent	$ 734,000
Preliminary Engineering, Design, and Construction Management	12 percent	293,000
Total	--	$3,473,000

NOTE: The total recommended cost of all track improvements has the potential to be reduced by several factors including: other track improvement projects that may be undertaken on the railway line between Walworth and Fox Lake; the potential for the entire mainline track not to require complete ballast replacement and/or undercutting; and the potential for the necessary work to be accomplished at somewhat lower costs due to lower labor, management and engineering, and overhead unit costs inherent to shortline and regional railroads as compared to major railroad companies.

Source: SEWRPC.

Table 30

SUMMARY OF CAPITAL COSTS FOR COMMUTER RAIL SERVICE IN THE WALWORTH-FOX LAKE CORRIDOR IN 2000 DOLLARS

Item	Cost of Material and Installation
Mainline Track Improvements	$51,507,000
Bridge Rehabilitation Work	833,000
New Passing Siding	1,819,000
Train Equipment	8,000,000
Passenger Station Facilities	3,637,000
Storage and Servicing Facilities	3,473,000
Total	$69,269,000

NOTE: The total recommended cost of all track improvements has the potential to be reduced by several factors including: other track improvement projects that may be undertaken on the railway line between Walworth and Fox Lake; the potential for the entire mainline track not to require complete ballast replacement and/or undercutting; and the potential for the necessary work to be accomplished at somewhat lower costs due to lower labor, management and engineering, and overhead unit costs inherent to shortline and regional railroads as compared to major railroad companies.

Source: SEWRPC.

year 2020 population and employment forecasts and regional land use and transportation system plans prepared by the Northeastern Illinois Planning Commission and the Chicago Area Transportation Study. Also considered was data from the 1990 U.S. Census, which estimates the workplace locations of residents of Southeastern Wisconsin and Northeastern Illinois. The travel simulation models predict the relative proportion of trips made by auto and commuter rail between subareas within Southeastern Wisconsin, and between those subareas and subareas of Northeastern Illinois based upon the rail extension was estimated to be 930 trips, as shown in Table 31. Approximately 85 percent of the projected 930 trips may be expected to be made between stations on the potential new extension and the Union Station terminal in the Chicago central business district. About 370, or 40 percent of the trips on the extension may be expected to be generated at the potential new Wisconsin stations of Walworth and Highway 120. About 560, or 60 percent, of the trips on the extension may be expected to be generated at the potential new Illinois stations of Richmond and Spring Grove-Solon Mills. Forecast annual total year 2020 ridership is shown in Table 32. A relative travel time and costs of commuter rail and auto travel, and characteristics of the tripmaker including auto ownership, income, household size, and residential density. Before the travel models were applied to predict future trips on the potential commuter rail extension, the models were validated by comparing current year model application results to actual current year commuter rail ridership on the existing Metra service at the existing Fox Lake Station. This validation indicated that the models predicted the total ridership and the ridership by Wisconsin residents, within a tolerance of 5 percent to 10 percent.[2]

The forecast number of trips made on an average weekday in the year 2020 on the potential commuter significant proportion of the estimated ridership attributable to the potential Walworth-Fox Lake extension would likely consist of Wisconsin and Illinois

[2]*Appendix B to this report provides the results of a license plate survey conducted at the passenger stations along the Metra Milwaukee District North Line and Union Pacific Northwest Line commuter rail routes.*

Table 31

FORECAST AVERAGE WEEKDAY RIDERSHIP ON POTENTIAL WALWORTH-FOX LAKE COMMUTER RAIL SERVICE BY STATION: 2020

Station	Average Weekday Ridership: 2020	
	Ons	Offs
Walworth	65	65
Highway 120 (Lake Geneva and Zenda)	120	120
Richmond	40	40
Spring Grove-Solon Mills	240	240
Total	465	465

Source: SEWRPC.

Table 32

FORECAST ANNUAL RIDERSHIP ON POTENTIAL WALWORTH-FOX LAKE COMMUTER RAIL SERVICE EXTENSION

Day of Week	Projected Number of Annual Trips: 2020
Weekdays	237,100
Saturdays[a]	7,700
Sunday and Holidays[b]	5,400
Total	250,200

[a]Saturday ridership is estimated at 16 percent of weekday ridership based on existing Metra Milwaukee District North Line commuter rail ridership

[b]Sunday and holiday ridership is estimated at 10 percent of weekday ridership based on existing Metra Milwaukee District North Line commuter rail ridership.

Source: SEWRPC.

residents who would otherwise drive to existing Metra stations.

The ridership forecast was prepared for the design year 2020, which is consistent with ridership and travel forecast levels prepared for Southeastern Wisconsin and Northeastern Illinois. Potential current year ridership may be expected to be about 30 percent to 40 percent less than the projected year 2020 ridership, based upon forecast total travel growth to and travel conditions in, the year 2020. Potential "start-up" ridership immediately upon service initiation would be less than this potential current year ridership during the first one to three years following service initiation, as is typical of new-start commuter rail systems.

The forecast ridership may be considered conservative, as it assumes that the cost of motor fuel per mile of automobile operation will remain at current levels adjusted for inflation; that parking costs will remain at current levels adjusted for inflation; that land-use development and total travel within the corridor of the commuter rail extension will not significantly increase as a result of commuter rail service initiation; and that Metra service on other nearby commuter rail routes will continue to operate at current levels of service. In addition, long-term future improvements which could be considered for Metra's existing Fox Lake-Chicago service—such as improved express service—could also foster increased ridership. The forecast ridership also does not assume the initiation of any planned express bus service that could serve potential commuter travel between the Walworth-Fox Lake corridor and downtown Chicago.

Total and Net Operating Costs

The total annual operating cost of the potential commuter rail extension was estimated to total about $3.1 million expressed in 2000 dollars, as shown in Table 33. The total annual operating cost was determined by estimating the operating costs of major functional elements of the service, utilizing unit operating costs from actual Metra operations, Metra service cost-estimation and planning procedures, and Commission transit-service-planning unit costs based on actual transit operations in Southeastern Wisconsin. The total annual operating costs for the extension

Table 33

ESTIMATED ANNUAL TOTAL AND NET OPERATING COSTS OF WALWORTH-FOX LAKE COMMUTER RAIL SERVICE EXTENSION

Category and Items	Projected Annual Amount (in 2000 dollars)		
	Weekday Service	Weekend and Holiday Service	Total
Operating Cost[a]			
Train Crew Personnel	$ 262,000	$ 43,000	$ 305,000
Fuel and Power	785,000	110,000	895,000
Railroad Access and Use	491,000	79,000	570,000
Maintenance of Equipment	1,034,000	144,000	1,178,000
Administrative	63,000	- -	63,000
Insurance	96,000	- -	96,000
Total Cost	$2,731,000	$376,000	$3,107,000
Operating Revenue[b]			
Number of Annual Commuter Rail Passengers	$ 237,100	$ 13,100	$ 250,200
Total Operating Revenue	1,078,000	60,000	1,138,000
Net Operating Cost	$1,653,000	$316,000	$1,969,000
Percent of Total Operating Cost Recovered through Operating Revenue	39	16	37

[a] *Total operating cost is the incremental cost of extending service north of the Fox Lake station.*

[b] *Total operating revenue is the total projected fare generated by ridership at all new stations. Nominal one-way fares have been reduced by 27 percent to reflect Metra fare revenue experience with monthly pass and multi-ticket purchase discounts.*

Source: SEWRPC.

of commuter rail service represent the incremental resources required to operate the entire extension beyond the current Fox Lake terminal.

Cost estimates of the train crew personnel element of operating costs were based on current Metra basic wage rates plus benefits and estimated overtime for three-person crews. The three-person crew includes an engineer, conductor, and assistant conductor. Determination of whether train crews are employees of Metra, the Wisconsin & Southern Railroad, or a new or other operating entity would be the result of negotiation and cooperative agreements pursuant to prevailing labor contracts. Train crew expenses were based on the incremental time required to operate trains beyond Fox Lake to Walworth according to the operating plan described herein.

The railroad access and use element of the total operating cost includes the charges and fees for use of the trackage, facilities, property, and attendant support personnel and services. This category includes access to, use of, and shared maintenance costs for trackage, right-of-way, bridges and other structures, signals, train dispatching, communication, grade crossings, and other operational functions and reflects labor, material, equipment, overhead, and other appropriate charges. Incentive compensation for on-time train performance may also be a component of this cost. Future agreements for access and use will be subject to negotiation and agreement between the implementing agency

responsible for implementing Walworth-Fox Lake commuter rail service, the Wisconsin River Rail Transit Commission, the Wisconsin & Southern Railroad, and Metra.

There are many components to the development, negotiation, and agreement of compensation to a freight railroad from a commuter operating entity in exchange for operation over the freight railroad's tracks and right-of-way. These costs have varied significantly over the years, and are highly dependent upon the corporate philosophy of the freight railroads at a given point in time. In the late 1970s and early 1980s, due to a reduction in the usage of railways for the movement of freight, commuter rail was viewed by some freight railroads as a profitable market for generating additional revenue. By the late 1990s, however, the overall volume of freight traffic had begun increasing dramatically, and is expected to continue to do so. As a result, the freight railroad industry generally appears to be much more closely scrutinizing existing and future capacity along their rail lines to ensure preservation of adequate capacity for future freight traffic. In turn, this appears to be increasing the costs that the freight railroads are charging commuter rail entities for operating over their right-of-way.

To compensate for the costs associated with the operation of commuter rail, freight railroads charge usage—or "access"—fees in exchange for commuter rail services having the right to operate over their lines. Typically, access fees provide for the commuter operating entity to share in the costs associated with dispatching, maintenance of the railroad's physical plant, labor for maintenance of the physical plant, supervisory personnel, and other ancillary items inherent to operation of the rail line. Such fees will ultimately be based on: the value of the line in question to the freight railroad; the need for the freight railroad to be confident that its ability to serve customers now and in the future is not compromised; the need for the commuter rail operation to be confident that its trains will operate on schedule; and an agreeable allocation of liability arising out of joint commuter rail and frequent operations in the event of damage or injury to persons and property of the railroad, commuter rail operating entity, passengers, customers, employees, or third parties. The issue of liability may be expected to be a complicated and possibly a pivotal concern. In any case, these and other issues will need to be negotiated in an acceptable agreement between the railroads involved and the commuter rail operating entity.

A review of data from recent new-start commuter rail systems throughout the United States indicated that railroad access-and-use costs vary quite widely, rang-ing from approximately $4.00 to $23.00 per train mile. While there are many factors that will affect a final negotiated agreement, in general such access-and-use costs appeared to be directly proportional to the relative volume of freight traffic handled on the line in question. Most unit-cost estimates are clustered in the $6.00 to $11.00 per train mile range. For purposes of this feasibility study, an estimated cost of $7.50 per train mile was used. An exact determination of access-and-use charges cannot be determined until negotiations are entered into with the freight railroad.

While the estimated access-and-use fee is reflective of such fees around the country, it should be noted that there are generally three different options regarding what form an operating agreement between the freight railroad and the commuter operating entity may take. As noted above, operation over the rail line will be subject to negotiation and agreement between the freight railroad and the commuter operating entity. The three operating options are:

- Use of Trackage Rights—Under this option, the commuter operating entity would enter into a "trackage rights" agreement with the freight railroad(s) to use its facilities. In essence, under this type of agreement, the freight railroad would provide rail-line capacity and attendant support services to the commuter operating entity. The commuter service would operate over the freight railroad's right-of-way, in turn compensating the freight railroad for its share of the operation and maintenance of the rail line. All rolling stock and train crews would be provided by the commuter operating entity, but the rail line would be operated and controlled by the owning railroad.

- Purchase of Service Agreement—Under this option, the freight railroad would operate the commuter rail service under contract with the commuter rail operating entity. This contract would entail complete operation of the commuter rail service by the freight railroad, in exchange for compensation for all costs to operate the commuter service including the operation and maintenance of the rail line. All train crews, ticket agents, and staff and services would be provided by the freight railroad. Rolling stock including locomotives and cars could be provided by either the freight railroad or the entity sponsoring the commuter rail service.

- Purchase of the Rail Line—Under this option, the freight railroad would sell ownership of the rail

line to the commuter operating entity. This option may be appropriate where the commuter rail service may be expected to be the principal user, where there is a low volume of existing freight traffic, or where no or minimal freight growth is expected. Thus, it may be more bene-ficial to the freight railroad to sell the rail line to the commuter operating entity. If freight service were to continue on the line, the freight railroad may then enter into a trackage-rights agreement with the commuter rail operating entity for freight movements. A variation of this option would have ownership of the rail line transferred from the freight railroad to the commuter operating entity for a specified period under a long-term lease arrangement. For example, that period could be 25 or 50 years. Ownership of the track and right-of-way by the commuter rail operating entity may be the most positive means of maintaining a specific service quality, providing for possible service increases, and controlling costs over the long-term future. It should be noted that in the case of the Walworth-Fox Lake railway line, ownership of the line rests with a combination of the Wisconsin River Rail Transit Commission—a multi-county public agency in Wisconsin—and the Wisconsin Department of Transportation.

The maintenance-of-equipment operating-cost element includes the labor, materials and supplies, overhead, and other appropriate charges for normal daily servicing, cleaning, and inspection, light running repairs, and heavy "backshop" repairs. Heavier inspection, maintenance, and repair work would be contracted out to either Metra or another independent shop. This category also includes the operation and maintenance of the necessary facilities and the cost of overnight heating and power for trains at Walworth. Equipment maintenance expenses were based on the incremental use of the additional coaches necessary to operate the commuter rail service according to the operating plan described herein.

The administrative operating-cost element includes management and other related staff functions that would be the responsibility of the service sponsor in Wisconsin as well as marketing expense. Another support cost included in this category is maintenance at stations. This would primarily involve cleaning, trash pickup, snow removal, and minor repairs.

Other major operating-cost elements include fuel and insurance. The fuel category includes the cost of the fuel itself and its delivery. The insurance item reflects the share of the overall liability charges that could be expected to be attributable to the Walworth-Fox Lake extension of commuter rail service.

The annual operating revenue of the potential commuter rail extension was estimated to total about $1.1 million as shown in Table 33. The projected operating revenue includes all projected fares paid by trips between Southeastern Wisconsin and Northeastern Illinois. The revenue projections account for the effects of monthly pass and multi-ticket purchase discounts.

It is important to note that the operating revenues, operating costs, and ridership projections, while representing the best possible estimates for feasibility assessment must be considered preliminary in nature. Furthermore, they represent an assumed operating and coordination plan with the freight railroads involved and with Metra. If and when commuter rail service is implemented in the Walworth-Fox Lake corridor; actual ridership, revenues, and operating costs may vary from those presented herein and will ultimately be dependent upon the actual operating plan and railroad access charges negotiated between the freight railroad companies involved and the commuter rail operating entity.

The estimated reduction in motor fuel consumption attributable to the forecast 930 commuter rail trips on an average weekday is approximately 2,100 gallons of motor fuel per average weekday (assuming 25 miles per gallon and automobile occupancy of 1.15). On an average weekday in Southeastern Wisconsin in 2020, automobiles and trucks are projected to consume an estimated 1.6 million gallons of motor fuel.

The estimated reduction in ozone-related air pollutant emissions attendant to the forecast 930 commuter rail weekday trips is 125 pounds of volatile organic compounds and 120 pounds of nitrogen oxide (based upon year 2020 emission factors). Automobiles and trucks within Southeastern Wisconsin are projected to generate on a hot summer weekday in the year 2020 an estimated 24 tons of volatile organic compound emissions and 49 tons of nitrogen oxide emissions.

The estimated reduction in highway traffic attendant to the 930 commuter rail trips is an estimated 52,000 vehicle-miles of travel on an average weekday. On an average weekday within Southeastern Wisconsin in 2020, approximately 47 million vehicle-miles of travel are projected to be made by automobiles and trucks.

DEFINITION AND EVALUATION OF POTENTIAL COMMUTER BUS ROUTES

Based upon the findings of the inventories, and of the screening of principal physical, operational, and service characteristic options presented in previous chapters of this report, a conceptual commuter bus option was identified and described for feasibility assessment. The commuter bus option would consist of two feeder routes extending from southern Walworth County to existing Metra commuter rail stations in Northeastern Illinois. The first route would extend a distance of about 30 miles from Elkhorn to Fox Lake, Illinois, primarily along USH 12. This bus route would connect with the existing Metra Milwaukee District North Line service operating between Fox Lake and Chicago. The second route would extend a distance of about 21 miles, primarily along STH 50, STH 67, and USH 14. This bus route would connect with the existing Metra Union Pacific Northwest Line service operating between Harvard and Chicago. The purpose of these routes would be to provide bus services that directly connect with established Metra commuter train routes and to provide a comparable level of service to that provided under the commuter rail alternative for passengers traveling between southern Walworth County and the Chicago area.

Along the Elkhorn-Fox Lake route, the conceptual commuter bus service described herein would serve nine passenger stations and stops as described in Chapter IV. These include Elkhorn, Lake Geneva, Pell Lake, Genoa City, Downtown Richmond, Richmond Park-Ride, Solon Mills, Spring Grove, and Fox Lake. At Fox Lake, the existing Metra station facilities would be utilized. At Elkhorn, Lake Geneva, Pell Lake, Genoa City, and Richmond Park-Ride, new station facilities including park-ride lots for automobiles would be necessary. The stops at Downtown Richmond, Solon Mills, and Spring Grove would consist only of curbside boarding areas. The average station spacing would be about four miles. Along the Delavan-Harvard route, the conceptual commuter bus service described herein would serve eight passenger stations and stops as described in Chapter IV. These include Delavan, Williams Bay-Downtown, Williams Bay-West Side, Fontana, Walworth-Park-Ride, Wal-worth-Village Square, Big Foot, and Harvard. At Harvard, the existing Metra station facilities would be utilized. At Delavan, Williams Bay-Downtown, Fontana, and Walworth Park-Ride, new station facilities, including park-ride lots for automobiles, would be necessary. The average station spacing would be about three miles. The stops at Williams Bay-West Side, Walworth-Village Square, and Big Foot would consist only of curbside boarding areas.

For purposes of this feasibility assessment, it was assumed that commuter bus service in the Walworth-Fox Lake Corridor would be provided by a public entity contracting with a private operator through a competitively awarded contract process. This kind of arrangement has been used to provide successful and efficient bus services elsewhere in Southeastern Wisconsin.

Operating Plan

On weekdays, commuter bus service would consist of three inbound runs from Delavan to Harvard and from Elkhorn to Fox Lake during the morning peak period and three outbound runs from Fox Lake to Elkhorn and from Harvard to Delavan during the afternoon peak period. Service headway would be about 40 minutes. In addition, on both routes, one bus would operate in each direction during the midday period and one bus would operate outbound from both Fox Lake and Harvard during the evening period. A limited amount of weekend service would also be provided. On Saturdays, two bus runs—and on Sundays, one bus run—would operate inbound from Delavan to Harvard and from Elkhorn to Fox Lake during the morning period and outbound from Harvard to Williams Bay and from Fox Lake to Lake Geneva during the late afternoon period. The service headway for these bus runs would be about 90 minutes. These bus runs would operate all year. In addition, from May through September, one bus run would operate outbound from Fox Lake to Elkhorn and from Harvard to Delavan during the morning period and inbound from Elkhorn to Fox Lake and from Delavan to Harvard during the early evening period on Saturdays, Sundays, and major holidays.

Other operating plan assumptions for this feasibility assessment pertained to the fare structure. For determining the one-way adult fares assumed to be charged, a zone system was defined for the Walworth County-Chicago coordinated bus-rail service based on an extension of the distance-based fare-zone system used by Metra on its commuter rail lines radiating out of the Chicago central business district. The assumed fare structure would therefore be integrated with the fare structure in place on the Metra system. This is important since the bus service under this alternative was assumed to be operated in a coordinated manner with Metra's Milwaukee District North Line and Union Pacific Northwest Line. The fare zone desig-nations and the passenger stations within each zone between Chicago and Walworth County are shown on Tables 34 and 35. The one-way fares used for feasibility assessment of the Walworth-Fox Lake Corridor bus service are shown on Table 23 and were based on the 2000 Metra

Table 34

FARE ZONE AND STATION ARRANGEMENT ASSUMED FOR POTENTIAL COORDINATED COMMUTER RAIL AND BUS SERVICE BETWEEN ELKHORN AND CHICAGO

Fare Zone Designation	Passenger Stations within Zone
Chicago-Fox Lake Commuter Rail Service	
A	Chicago Union Station Western Ave.
B	Healy Grayland Mayfair
C	Forest Glen Edgebrook Morton Grove
D	Golf Glenview Glen of North Glenview
E	Northbrook Lake Cook Rd. Deerfield
F	Lake Forest
G	(no stations)
H	Libertyville
I	Grayslake Round Lake
J	Long Lake Ingleside Fox Lake
Fox Lake-Elkhorn Commuter Bus Service	
K	Spring Grove
L	Solon Mills Richmond - Park-Ride Richmond - Downtown
M	Genoa City
N	Pell Lake
O	Lake Geneva
P	Elkhorn

Source: Metra and SEWRPC.

Table 35

FARE ZONE AND STATION ARRANGEMENT ASSUMED FOR POTENTIAL COORDINATED COMMUTER RAIL AND BUS SERVICE BETWEEN DELAVAN AND CHICAGO

Fare Zone Designation	Passenger Stations within Zone
Chicago-Harvard Commuter Rail Service	
A	Chicago Passenger Terminal Clybourn
B	Irving Park Jefferson Park Gladstone Park
C	Norwood Park Edison Park Park Ridge Dee Road
D	Des Plaines Cumberland Mount Prospect
E	Arlington Heights Arlington Park
F	Palatine
G	Barrington
H	Fox River Grove Cary
I	Crystal Lake
J	(no stations)
K	Woodstock
L	(no stations)
M	Harvard
Harvard-Delavan Commuter Bus Service	
N	Big Foot
O	Walworth - Village Square Walworth - Park-Ride Fontana
P	Williams Bay - West Side Williams Bay - Downtown
Q	Delavan

Source: Metra and SEWRPC.

fare structure, with some minor adjustments. It was also assumed that multi-ride reduced fares in the form of ten-ride tickets and monthly passes similar to those available from Metra would be available for the Walworth-Chicago coordinated bus-rail service.

Capital Costs

The capital costs attendant to the potential commuter bus alternative were estimated based on a cost build-up approach with respect to the necessary facilities and equipment requirements. The capital cost requirements for the commuter bus alternative will be less than that for the commuter rail alternative because bus transit services are normally far less capital-intensive than are rail transit services. As discussed earlier, the commuter bus service may be expected to be provided by a private operator who would be responsible for furnishing vehicles, maintenance services and facilities, and an

overnight storage facility under contract with the responsible public entity. Accordingly, many potential capital-cost items under this type of service-provider arrangement would be accounted for as an addition to operating-cost items. The focus of these estimates was on identifying all capital-cost items necessary for full implementation of the alternative by the design year. It is possible that the identified improvements—frequency of service and attendant equipment and storage needs—may be implemented in an incremental manner, thereby spreading the total required capital investment over a period of years. All capital costs are presented in constant 2000 dollars. The estimated capital costs are described below.

The principal capital cost associated with the commuter bus alternative is for station facilities. Because the commuter bus operations would use the public street and highway system, there would be no improvements required that would be attendant to right-of-way, roadway, or signals. With respect to equipment, overnight storage, and maintenance facilities, these items would be the responsibility of the operator to whom the service is contracted. It is anticipated that the vehicles to be used would be required to be full-sized transit buses similar to most buses operated in commuter service by transit operators in Southeastern Wisconsin and Northeastern Illinois and would include passenger amenities appropriate for the service. In general, the operator would be responsible for all day-to-day functions necessary to the operation of the bus service.

With respect to stations, new facilities with park-ride lots would need to be constructed at Elkhorn, Lake Geneva, Pell Lake, Richmond, Delavan, Williams Bay, Fontana, and Walworth. The existing carpool lot at Genoa City would need to be improved to function as a bus station. New bus stops would need to be located at Richmond-Downtown, Solon Mills, Spring Grove, Williams Bay-West Side, Walworth-Village Square, and Big Foot. Existing Metra stations would be used at Fox Lake and Harvard. The size and extent of the necessary improvements were based upon the overall design guidelines set forth in Chapter IV of this report which, in turn, are based upon the anticipated passenger demand at each station. As noted earlier, it is not the purpose of this feasibility study to determine the exact details or specifications for individual stations, including with respect to location. Much of this work should include the input and consideration of the appropriate local officials for the area in which the station will be located. However, overall basic design assumptions were made to enable generalized station spatial needs and cost requirements to be determined. The basic elements for each station were assumed to include: boarding platforms, access facilities meeting the requirements of the Federal Americans with Disabilities Act, buildings and shelter areas, parking for automobiles, drop-off and pick-up areas for passengers using connecting taxis and bus services, and certain station amenities.

The capital cost of passenger station facility improvements for the Elkhorn-Fox Lake bus route was estimated to total about $1.9 million as shown in Table 36. The capital cost of passenger station facility improvements for the Delavan-Harvard bus route was estimated to total about $1.5 million as shown in Table 37. Based upon the year 2020 ridership forecasts that were prepared for the commuter bus alternative, these two tables set forth the basic facility needs and capital-cost requirements for each of the 17 stations and stops along the two routes. The total cost of stations and stops along both bus routes was estimated to be about $3.4 million and is summarized in Table 38. This amount represents the total capital cost for the commuter bus service in the Walworth-Fox Lake Corridor.

Ticket sales for this coordinated bus-rail service would be handled in much the same manner as does Metra. For purposes of this feasibility study, tickets would be available in one-way, multi-ride and monthly pass denominations and could be purchased from ticket agents, by mail, or on board trains and buses from conductors and drivers at stations and stops where no agent is on duty. It was assumed that, at least initially, ticket sales at depots would only be available at Metra commuter rail stations that are already staffed with ticket agents because of large passenger volumes. Ticket sales at other stations could be added at a later date based on sufficient passenger volume, available funding and facility resources, or other local needs. In 2000, eight of the 20 stations along the Milwaukee District North Line had ticket agents on duty during at least part of each weekday.

The two line items identified as "Contingencies" and "Preliminary Engineering, Design, and Construction Management" have been added to all capital cost estimates as a percentage of the total material and installation costs. These factors have been long accepted as appropriate for use in long-range capital cost estimation. The rates used for these two items are 30 percent and 12 percent, respectively. These rates are based on similar rates used by Metra in its feasibility and long-range planning work. Should detailed planning and engineering work continue and the estimation of capital costs becomes more precise, it may be appropriate to revise the factors for these items.

Table 36

CAPITAL COST OF PASSENGER STATIONS FOR ELKHORN-FOX LAKE COMMUTER BUS SERVICE IN 2000 DOLLARS

Item	Assumed Size	Cost of Material and Installation	
Elkhorn			
Platform and access	100 feet	$ 52,000	
Shelter	1	26,000	
Park-Ride lot	20 spaces	105,000[a]	
Land acquisition	2.0 acres	52,000[b]	
Contingencies	30 percent	71,000	
Preliminary engineering, design, and construction management	12 percent	28,000	
Subtotal			$ 334,000
Lake Geneva			
Platform and access	100 feet	$ 52,000	
Shelter	1	26,000	
Park-Ride lot	50 spaces	183,000[a]	
Land acquisition	2.0 acres	52,000[b]	
Contingencies	30 percent	94,000	
Preliminary engineering, design, and construction management	12 percent	38,000	
Subtotal			$ 445,000
Pell Lake			
Platform and access	100 feet	$ 52,000	
Shelter	1	26,000	
Park-ride lot	25 spaces	118,000[a]	
Land acquisition	2.0 acres	52,000[b]	
Contingencies	30 percent	74,000	
Preliminary engineering, design, and construction management	12 percent	30,000	
Subtotal			$ 352,000
Genoa City			
Platforms and access	100 feet	$ 52,000	
Shelter	1	26,000	
Park-Ride lot	25 spaces	118,000[a]	
Land acquisition	2.0 acres	52,000[b]	
Contingencies	30 percent	74,000	
Preliminary engineering, design, and construction management	12 percent	30,000	
Subtotal			$ 352,000
Richmond - Downtown			
Shelter and signing	Lump Sum		$ 39,000[c]
Richmond - Park Ride Lot			
Platforms and access	100 feet	$ 52,000	
Shelter	1	26,000	
Park-Ride lot	25 spaces	118,000[a]	
Land acquisition	2.0 acres	52,000[b]	
Contingencies	30 percent	74,000	
Preliminary engineering, design, and construction management	12 percent	30,000	
Subtotal			$ 352,000
Solon Mills			
Shelter and signing	Lump Sum		$ 39,000[c]
Spring Grove			
Shelter and signing	Lump Sum		$ 39,000[c]
Fox Lake			
Signing improvements	Lump Sum		1,000[c]
Total	--		$1,953,000

NOTE: Costs include design features to make all stations accessible.

[a] *Cost includes area to be used for passenger drop-off and pick-up.*

[b] *Actual land-acquisition costs will be dependent upon specific parcels to be acquired and attendant negotiation efforts. For purposes of this feasibility study, such lands in developed areas assumed to be $25,000 per acre.*

[c] *Includes contingencies and preliminary engineering, design, and construction management.*

Source: SEWRPC.

Table 37

CAPITAL COST OF PASSENGER STATIONS FOR DELAVAN-HARVARD COMMUTER BUS SERVICE IN 2000 DOLLARS

Item	Assumed Size	Cost of Material and Installation	
Delavan			
Platform and access	100 feet	$ 52,000	
Shelter	1	26,000	
Park-Ride lot	20 spaces	105,000[a]	
Land acquisition	2.0 acres	52,000[b]	
Contingencies	30 percent	71,000	
Preliminary engineering, design, and construction management	12 percent	28,000	
Subtotal			$ 335,000
Williams Bay-Downtown			
Platform and access	100 feet	$ 52,000	
Shelter	1	26,000	
Park-Ride lot	20 spaces	105,000[a]	
Land acquisition	2.0 acres	52,000[b]	
Contingencies	30 percent	71,000	
Preliminary engineering, design, and construction management	12 percent	28,000	
Subtotal			$ 335,000
Williams Bay-West Side			
Shelter and signing	Lump Sum		$ 39,000[c]
Fontana			
Platform and access	100 feet	$ 52,000	
Shelter	1	26,000	
Park-ride lot	20 spaces	105,000[a]	
Land acquisition	2.0 acres	52,000[b]	
Contingencies	30 percent	71,000	
Preliminary engineering, design, and construction management	12 percent	28,000	
Subtotal			$ 335,000
Walworth - Park-Ride Lot			
Platforms and access	100 feet	$ 52,000	
Shelter	1	26,000	
Park-Ride lot	20 spaces	105,000[a]	
Land acquisition	2.0 acres	52,000[b]	
Contingencies	30 percent	71,000	
Preliminary engineering, design, and construction management	12 percent	28,000	
Subtotal			$ 335,000
Walworth-Village Square			
Shelter and signing	Lump Sum		$ 39,000[c]
Big Foot			
Shelter and signing	Lump Sum		$ 39,000[c]
Harvard			
Signing improvements	Lump Sum		$ 1,000[c]
Total			$1,459,000

NOTE: Costs include design features to make all stations accessible.

[a] *Cost includes area to be used for passenger drop-off and pick-up.*

[b] *Actual land-acquisition costs will be dependent upon specific parcels to be acquired and attendant negotiation efforts. For purposes of this feasibility study, such lands in developed areas assumed to be $25,000 per acre.*

[c] *Includes contingencies and preliminary engineering, design, and construction management.*

Source: SEWRPC.

Table 38

SUMMARY OF CAPITAL COSTS FOR COMMUTER BUS SERVICE IN THE WALWORTH-FOX LAKE CORRIDOR IN 2000 DOLLARS

Item	Cost of Materials and Installation
Station Improvements for Elkhorn-Fox Lake Bus Route	$1,953,000
Station Improvements for Delavan-Harvard Bus Route	1,459,000
Total	$3,412,000

NOTE: Estimates presented in this table include appropriate costs for contingencies and preliminary engineering, design, and construction management.

Source: SEWRPC.

Table 39

FORECAST AVERAGE WEEKDAY RIDERSHIP ON POTENTIAL COORDINATED COMMUTER RAIL AND BUS SERVICE: 2020

Route	Average Weekday Ridership: 2020	
	Ons	Offs
Elkhorn/Lake Geneva/ Richmond/Spring Grove/Fox Lake	80	80
Delavan/Williams Bay/ Fontana/Walworth/Harvard	30	30
Total	110	110

Source: SEWRPC.

Ridership Forecasts

A forecast of probable ridership on the proposed coordinated commuter bus and rail services was prepared. The forecast is based upon the application of the Regional Planning Commission battery of travel simulation models. The travel forecasts were prepared for the future design year 2020 based upon the Commission year 2020 adopted regional popu-lation and employment forecasts and regional land-use and transportation system plans for Southeastern Wisconsin, and the Northeastern Illinois year 2020 population and employment forecasts and regional land-use and transportation system plans prepared by the Northeastern Illinois Planning Commission and the Chicago Area Transportation Study. Also considered was data from the 1990 U.S. Census, which estimates the workplace location of residents of Southeastern Wisconsin and Northeastern Illinois. The travel-simulation models predict the relative proportion of trips made by auto and commuter rail/commuter bus between subareas within Southeastern Wisconsin, and between those subareas and subareas of Northeastern Illinois based upon the relative travel time and costs of commuter rail/commuter bus and auto travel, and characteristics of the tripmaker, including auto ownership, income, household size, and residential density. Before the travel models were applied to predict future trips on the potential bus routes, the models were validated by comparing current year model application results to actual current year commuter rail ridership on existing Metra service at the existing Fox Lake Station and to actual ridership on existing bus services in Southeastern Wisconsin. This validation indicated that the models predicted the ridership within a tolerance of 5 percent to 10 percent.

The forecast number of trips made on an average weekday in the year 2020 on both of the potential commuter bus routes was estimated to be 220 trips as shown in Table 39. Almost 90 percent of the projected 220 trips may be expected to be made between stops on the two bus routes and the Union Station terminal in the Chicago central business district. About 160, or 71 percent, of the total trips could be expected to use the Elkhorn-Lake Geneva-Fox Lake route and about 60, or 29 percent, of the total trips, could be expected to use the Delavan-Walworth-Harvard route. With respect to where the trips using the two bus routes are generated; on the Elkhorn-Lake Geneva-Fox Lake route, about 120, or 75 percent of the trips on this route, may be expected to be generated at the potential new Wisconsin stations and stops. The remaining 40 trips, or 25 percent of the trips on this route, may be expected to be generated at the potential new Illinois stations and stops. On the Delavan-Walworth-Harvard route, virtually all of the trips may be expected to be generated at the potential new Wisconsin stations and stops. Forecast annual total year 2020 ridership is shown on Table 40.

The ridership forecast was prepared for the design year 2020, which is consistent with ridership and travel forecast levels prepared for Southeastern Wisconsin and Northeastern Illinois. Potential current year ridership may be expected to be about 30 percent to 40 percent less than the projected year 2020 ridership, based upon forecast total travel growth to the year 2020. Potential "start-up" ridership immediately upon service initiation would be less than this potential current year ridership during the first one to three years following service

Table 40

FORECAST ANNUAL RIDERSHIP ON POTENTIAL COORDINATED COMMUTER RAIL AND BUS SERVICE IN THE WALWORTH-FOX LAKE CORRIDOR

Day of Week	Projected Number of Annual Trips: 2020	
	Elkhorn-Lake Geneva-Fox Lake Route	Delavan-Walworth-Harvard Route
Weekdays	40,800	15,300
Saturdays[a]	1,300	500
Sunday and Holidays[b]	900	300
Total	43,000	16,100

[a]Saturday ridership is estimated at 16 percent of weekday ridership based on existing Metra Milwaukee District North Line commuter rail ridership.

[b]Sunday and holiday ridership is estimated at 10 percent of weekday ridership based on existing Metra Milwaukee District North Line commuter rail ridership.

Source: SEWRPC.

initiation, as is typical of newly implemented commuter bus services.

The forecast ridership may be considered conservative, as it assumes that the cost of motor fuel per mile of automobile operation will remain at current levels adjusted for inflation; that parking costs will remain at current levels adjusted for inflation; that land development and total travel within the corridor will not significantly increase as a result of the coordinated bus-rail service initiation; and that Metra service on other nearby commuter rail routes will continue to operate at current levels of service. In addition, long-term future improvements which could be considered for Metra's existing Fox Lake-Chicago service—such as improved express service—could also foster increased ridership. The forecast ridership also does not assume the initiation of any other express bus service that could serve potential commuter travel between the Walworth-Fox Lake corridor and downtown Chicago.

Total and Net Operating Costs

The combined total annual operating cost of the potential commuter bus routes was estimated to total about $0.5 million expressed in 2000 dollars, as shown in Table 41. The annual operating cost for the potential Elkhorn-Lake Geneva-Fox Lake route was estimated to be about $324,000, or about 59 percent of the total. The annual operating cost for the potential Delavan-Walworth-Harvard route was estimated to be about $228,000, or about 41 percent of the total. The annual operating cost in Table 41 is also presented by weekday and weekend periods for the service on each route.

As described in Chapter IV of this report, it was assumed that the coordinated bus-rail service over these two routes would be provided by a public entity which would contract with a private bus operator through a competitively awarded contract. The service contract between the responsible public entity and the private bus operator would cover all of the costs of day-to-day operations. This would include providing capital facilities such as the storage and maintenance garage as well as vehicles. This type of arrangement is typical for many local and suburban transit systems in Southeastern Wisconsin. Examples include the suburban bus services operating between Kenosha, Racine, and Milwaukee sponsored by the City of Racine and between Oconomowoc, Waukesha, and Milwaukee sponsored by Waukesha County. Only the station, park-ride lots, and curb-side stop facilities would be provided through a public source such as a county or State Department of Transportation since these facilities would most likely be located on publicly owned lands. Maintenance of the bus stations and stops, however, could be the responsibility of the private operator under terms of the agreement.

The total annual operating cost for the bus routes in this feasibility study was determined by utilizing comparable operating unit costs from actual transit operations in Southeastern Wisconsin. A review of operating cost data based on the experience of transit systems in Southeastern Wisconsin indicates that such unit costs vary widely, ranging from approximately $2.40 to $5.60 per revenue vehicle-mile based on systemwide averages. Operating unit costs within a specific system may also vary by route and were found to range up to $8.00 per revenue vehicle-mile. For purposes of this feasibility study, an estimated cost of $3.50 per revenue vehicle-mile was used. An exact determination of bus route operating costs cannot be determined until bids are solicited and negotiations are entered into with an operator. The total annual operating costs for the coordinated bus services represent the incremental resources required to operate the entire routes beyond the current Fox Lake and Harvard Metra terminals.

The annual operating revenue of the potential commuter bus services was estimated to total about $57,000 as shown in Table 41. The annual operating revenue for the potential Elkhorn-Lake Geneva-Fox Lake route was estimated to be about $44,000, or about 77 percent of the total. The annual operating revenue for the potential

Table 41

ESTIMATED ANNUAL TOTAL AND NET OPERATING COSTS OF WALWORTH-FOX LAKE CORRIDOR COMMUTER BUS SERVICE: 2020

Routes	Projected Annual Amount (in 2000 dollars)		
	Weekday Service	Weekend and Holiday Service	Total
Elkhorn-Lake Geneva-Fox Lake Route			
Total Operating Cost[a]	$278,000	$46,000	$324,000
Total Operating Revenue[b]	42,000	2,000	44,000
Net Operating Cost	236,000	42,000	280,000
Percent of Total Operating Cost Recovered through Operating Revenue	15	4	14
Delavan-Walworth-Harvard Route			
Total Operating Cost[a]	$196,000	$32,000	$228,000
Total Operating Revenue[b]	12,000	1,000	13,000
Net Operating Cost	184,000	31,000	215,000
Percent of Total Operating Cost Recovered through Operating Revenue	6	3	6
Both Routes			
Total Operating Cost[a]	$474,000	$78,000	$552,000
Total Operating Revenue[b]	54,000	3,000	57,000
Net Operating Cost	420,000	75,000	495,000
Percent of Total Operating Cost Recovered through Operating Revenue	11	4	10

[a]Total operating cost is the incremental cost of extending service north of the Fox Lake station.

[b]Total operating revenue is the total projected fare generated by ridership at all new stations. Nominal one-way fares have been reduced by 27 percent to reflect Metra fare revenue experience with monthly pass and multi-ticket purchase discounts.

Source: SEWRPC.

Delavan-Walworth-Harvard route was estimated to be about $13,000, or about 23 percent of the total. The annual operating revenue in Table 41 is also presented by weekday and weekend portions of the service on each route. The projected operating revenue includes all projected fares paid by trips between Southeastern Wisconsin and Northeastern Illinois, but only on the two new bus routes. The projected operating revenue does not include any revenue attributable to the rail portion of trips south of Fox Lake or Harvard. The revenue projections account for the effects of monthly pass and multi-ticket purchase discounts.

It is important to note that the operating revenues, operating costs, and ridership projections, while representing the best possible estimates for feasibility assessment, must be considered preliminary in nature. Furthermore, they represent an assumed operating and coordination plan. If and when commuter bus service is implemented in the Walworth-Fox Lake corridor, actual ridership, revenues, and operating costs may vary from those presented herein and will ultimately be dependent upon the actual operating plan and negotiated agreements between the service providers involved and the public sponsoring entity. The estimated reduction in motor fuel consumption attributable to the forecast 220 weekday commuter trips on an average weekday is approximately 500 gallons of motor fuel per average weekday (assuming 25 miles per gallon and automobile occupancy of 1.15 and including both bus and commuter rail segments of the trips). On an average weekday in Southeastern Wisconsin in 2020, automobiles and trucks are projected to consume 1.6 million gallons of motor fuel.

The estimated reduction in ozone-related air pollutant emissions attendant to the forecast 220 weekday commuter bus trips is 30 pounds of volatile organic compounds and 30 pounds of nitrogen oxide (based upon year 2020 emission factors, including both bus and commuter rail segments of the trips). Automobiles and trucks are projected to generate on a hot summer weekday an estimated 24 tons of volatile organic compound emissions and 49 tons of nitrogen oxide emissions in Southeastern Wisconsin in the year 2020.

The estimated reduction in highway traffic attendant to the 220 weekday commuter bus trips is an estimated 13,000 vehicle-miles of travel on an average weekday (including both bus and commuter rail segments of the trips). On an average weekday within Southeastern Wisconsin in 2020, approximately 47 million vehicle-miles of travel are projected to be made by automobiles and trucks.

COMPARISON OF PROPOSED COMMUTER RAIL OR BUS SERVICE WITH OTHER EXISTING COMMUTER RAIL AND BUS TRANSIT SERVICES

To assist in the assessment of the feasibility of the proposed Walworth-Fox Lake Corridor commuter rail and bus service, these proposed services were compared with each other and with other existing new-start commuter rail systems in the United States, long-established commuter rail systems in the United States, and existing public transit systems in South-eastern Wisconsin. These comparisons are provided in the accompanying tables.

While any number of physical, ridership, operating, and cost characteristics may be compared among the various systems, of particular interest are two of these characteristics: ridership and the operating-cost recovery rate. The operating-cost recovery rate represents the percentage of total annual operating costs recovered through annual revenues generated by passengers. This particular measure provides a very good indication of the financial feasibility of such a service as well as a criterion for comparison among various systems.

A basic comparison of selected characteristics for the Walworth-Fox Lake commuter rail alternative and the Walworth-Fox Lake Corridor commuter bus alternative is presented in Table 42. This comparison includes both the Elkhorn-Lake Geneva-Fox Lake and Delavan-Walworth-Harvard routes under the commuter bus alternative. It is apparent from this comparison that the commuter rail alternative may be expected to attract about four times the ridership than would a commuter bus alternative in the corridor. The commuter rail alternative would generate about 930 trips on an average weekday, or about 250,200 trips annually; and the commuter bus alternative would generate about 220 trips on an average weekday, or about 59,100 trips annually. Also, the estimated operating-cost recovery rate for the commuter rail alternative would be about 37 percent, or almost four times the estimated operating-cost recovery rate for the commuter bus alternative of about 10 percent. The higher ridership level for commuter rail can be attributed to faster travel times and passengers not having to transfer between vehicles during the trip. This translates to a more convenient and thus more attractive trip for many passengers. However, for the commuter rail alternative to attract the estimated higher level of ridership, the annual operating cost could be expected to be about six times that for the bus alternative and the total capital cost could be expected to be up to 20 times that of the bus alternative.

Under the commuter rail alternative, the additional ridership resulting from extending the Metra Milwaukee District North Line from Fox Lake to Walworth would increase the line's total weekday boardings by about four percent. As shown previously in Table 31, average weekday boardings at most of the potential new stations—Walworth (65 boardings), Highway 120 (120 boardings), and Richmond (40 boardings)—would be modest compared to weekday boardings at most Chicago-area Metra stations. Very few Metra stations experience weekday boardings of less than 200 passengers. The average weekday boardings for the Spring Grove-Solon Mills station (240 boardings) would be comparable to weekday boardings at many of the smaller, outlying stations on the current Metra system.

A comparison of selected characteristics for the Walworth-Fox Lake commuter rail alternative and the Walworth-Fox Lake Corridor commuter bus alternative with other existing new-start commuter rail services in the United States is presented in Table 43. The other commuter rail services in this table have all begun operations during the past 10 years. The comparison presented in this table indicated that the estimated operating-cost recovery rate of about 37 percent for the commuter rail alternative compares favorably on an overall basis with these new-start systems, having a smaller recovery rate than that of Metra's Chicago-Antioch route and the Virginia Railway Express system in Washington, D.C., but a larger recovery rate than the four new-start commuter rail systems serving Los Angeles, New Haven, Miami, and San Diego. The operating-cost recovery rate of about 10 percent for the commuter bus alternative is significantly less than that for all of the other systems shown in the table.

Table 42

COMPARISON OF POTENTIAL COMMUTER RAIL AND BUS ALTERNATIVESIN THE WALWORTH—FOX LAKE CORRIDOR

Category	Alternative	
	Commuter Rail	Commuter Bus
Route Characteristics		
Number	1	2
Total Length (miles)	24.5	21.0/29.8
Number of Stations and Stops	4	7/8
Level of Service Characteristics		
Number of Scheduled Round Trips		
Weekdays	5	5
Saturdays	2[a]	2[a]
Sundays and Holidays	1[a]	1[a]
Sample One-Way Travel Times[b]		
Lake Geneva to Chicago	2 Hours 1 Minute	2 Hours 18 Minutes
Walworth to Chicago	1 Hour 57 Minutes	2 Hours 2 Minutes
Richmond to Chicago	1 Hour 36 Minutes	1 Hour 51 Minutes
Ridership Characteristics		
Weekday Passengers	930	220
Annual Passengers	250,200	59,100
Cost Characteristics		
Total Capital Cost	$69.3 million	$3.4 million
Annual Operating Cost	$3.1 million	$0.55 million
Annual Operating Revenue	$1.1 million	$0.05 million
Net Annual Operating Cost	$2.0 million	$0.50 million
Operating-Cost Recovery Rate	37 percent	10 percent

[a] *One additional round-trip operated during summer season.*

[b] *Weekday peak period.*

Source: SEWRPC.

A comparison of selected characteristics for the Walworth-Fox Lake commuter rail alternative and the Walworth-Fox Lake Corridor commuter bus alternative with other long-established commuter rail services in the United States is presented in Table 44. This comparison includes all of the long-established commuter rail systems operating in the United States and is organized by metropolitan area. The operating characteristics for these commuter rail services are further subdivided based on the operator involved.

The comparison presented in this table indicates that the estimated operating-cost recovery rate of about 37 percent for the commuter rail alternative would be: greater than the recovery rate for the commuter rail system in San Francisco; somewhat less than the recovery rates for commuter rail systems in the Boston, Philadelphia, Baltimore, and Washington, D.C. areas and certain Metra routes in the Chicago area; and significantly less than the recovery rates for commuter rail systems operated in the New York and New Jersey area and certain Metra routes in the Chicago area. The operating-cost recovery rate of about 10 percent for the commuter bus alternative is significantly less than that for all of the other systems shown in the table.

A comparison of selected characteristics for the Walworth-Fox Lake commuter rail alternative and the Walworth-Fox Lake Corridor commuter bus alternative with existing bus transit systems in Southeastern Wisconsin is presented in Table 45. This comparison includes the bus transit systems operated by Milwaukee,

Table 43

COMPARISON OF SELECTED CHARACTERISTICS FOR COMMUTER SERVICE ALTERNATIVES IN THE WALWORTH-FOX LAKE CORRIDOR AND OTHER EXISTING NEW-START COMMUTER RAIL SERVICES

Item	Potential Commuter Service Extension				Other Existing New-Start Systems				
	Commuter Rail	Commuter Bus[a]	Metra North Central Service (Chicago-Antioch)						
	Forecast 2020	Forecast 2020	Existing 1997	Forecast 2010	Metro Link (Los Angeles)	Shoreline East (New Haven)	Tri-Rail (Miami)	Virginia Railway Express (Washington)	Coaster (San Diego)
Route Characteristics									
Number (of routes)	1	2	1	1	7	1	1	2	1
Length (in miles)	24.6	21.0/29.8	53	53	416	51	70	96	41
Year Opened	--	--	1996	1996	1992	1990	1994	1992	1995
Ridership Characteristics									
Weekday Passengers	930	220	3,600	5,900	18,000	1,200	9,000	8,000	3,500
Annual Passengers	250,200	59,100	670,000	1.5 million	4.4 million	291,500	2.7 million	1.8 million	910,000
Annual Passenger-Miles	14.6 Million	0.9 Million	20.2 million	45.3 million	155.1 million	5.9 million	87.0 million	62.3 million	24.8 million
Operating Characteristics									
Annual Train-Miles/Bus Miles	72,900	150,600	134,600	188,500	840,600	129,900	625,300	199,000	198,400
Passengers Per Train-Mile	3.4	0.4	5.0	8.0	5.2	2.2	4.3	9.0	4.6
Operating Cost Characteristics									
Annual Total Operating Cost	$3.1 million	$0.55 million	N/A	$6.1 million	$52.0 million	$5.8 million	$21.7 million	$13.7 million	$9.2 million
Annual Revenues	$1.1 million	$0.05 million	N/A	$3.7 million	$16.4 million	$1.1 million	$5.3 million	$7.9 million	$1.8 million
Recovery Rate (percent)	37	10	N/A	61	31	19	24	58	19
Annual Net Operating Cost	$2.0 million	$0.50 million	N/A	$2.4 million	$35.6 million	$4.7 million	$16.4 million	$5.8 million	$7.4 million
Net Operating Cost per Passenger	$7.99	$8.46	N/A	$1.60	$8.09	$16.12	$6.07	$3.22	$8.13
Net Operating Cost per Passenger-Mile	$0.13	$0.55	N/A	$0.05	$0.23	$0.80	$0.19	$0.09	$0.30
Total Operating Cost per Train-Mile/Bus Mile	$42.52	$3.65	N/A	$32.36	$61.92	$44.83	$34.63	$68.63	$46.56

[a]*Only includes the bus portion of trips.*

Source: SEWRPC.

Ozaukee, Waukesha, and Washington Counties, systems operated by the Cities of Kenosha, Racine, and Waukesha, and the existing Kenosha-Racine-Milwaukee bus service that is sponsored by the City of Racine. The comparison presented in this table indicated that the estimated operating-cost recovery rate of about 37 percent for the commuter rail alternative would be comparable to the recovery rate for the existing Kenosha-Racine-Milwaukee bus service, would be less than the recovery rate of the Milwaukee County Transit System, and would be greater than the recovery rates of the remaining transit systems in Southeastern Wisconsin. The operating-cost recovery rate of about 10 percent for the commuter bus alternative is significantly less than that for all of the other systems shown in the table.

FUNDING CONSIDERATIONS

Overall Implementation Issues

As noted previously, both the commuter rail and bus alternatives extend into Wisconsin and Illinois. For example, on the basis of mileage, about 40 percent of the commuter rail route is in Wisconsin, and about 60 percent of the commuter rail route is in Illinois. Furthermore, some of the potential stations and stops would be located in each of the two states. An appropriate agency or unit of government, or perhaps a department of a unit of government, would be required to operate, manage, and fund such a service. Local units of government in the area are not set up to accommodate this, and the State of Wisconsin presently plays no role in the implementation, operation, or funding of existing or potential commuter rail services. The State role could change in the future. As this feasibility study was being completed, a special blue ribbon passenger rail task force appointed by the Governor was studying what role the State of Wisconsin should have in possible commuter rail as well as other types of passenger rail services. This task force, however, could not agree whether commuter rail should be State operated and funded with Federal and State funds, or locally operated and funded by a combination of Federal, State, and local funds. The State's role will ultimately be established by the State legislature and Governor. There is a need to consider that local units of government may be responsible for some share of operating subsidy and the capital cost of any commuter rail service, as well as may have responsibility for operation and management.

Table 44

COMPARISON OF SELECTED CHARACTERISTICS FOR COMMUTER SERVICE ALTERNATIVES IN THE WALWORTH-FOX LAKE CORRIDOR AND OTHER LONG ESTABLISHED COMMUTER RAIL SERVICES

Item	Potential Commuter Service Extension		Chicago				New York City Area			Other Northeast United States Cities			San Francisco
	Commuter Rail	Commuter Bus[a]	Metra			South Shore Line	Long Island Railroad	Metro-North	New Jersey Transit	MBTA (Boston)	SEPTA (Philadelphia)	MARC (Baltimore-Washington)	Cal Train
	Forecast 2020	Forecast 2020	Union Pacific Lines	BNSF Line	Metra Operated								
Route Characteristics													
Number (of routes)	1	2	3	1	8	1	10	5	10	9	7	3	1
Length (in miles)	24.6	21.0/29.8	155	38	463	90	319	268	348	287	292	187	77
Ridership Characteristics													
Weekday Passengers	930	220	72,600	37,800	96,600	8,700	325,800	208,000	158,500	85,000	77,700	20,000	18,500
Annual Passengers (millions)	0.25	0.06	23.1	12.0	30.7	2.6	97.7	62.4	47.5	25.5	23.3	4.8	5.5
Annual Passenger-Miles (millions)	14.6	0 .9	504.8	253.6	641.7	72.8	2,224.4	2,001.7	1,169.2	476.5	328.5	144.5	126.6
Operating Characteristics													
Annual Train-Miles/Bus-Miles	72,900	150,600	2.16	839,800	3.93	340,000	16.90	12.24	8.05	2.29	2.22	914,400	920,600
Passengers Per Train-Mile/ Bus-Mile	3.4	0.4	10.7	14.3	7.8	7.6	5.8	5.1	5.9	11.1	10.5	5.2	6.0
Operating Cost Characteristics													
Annual Total Operating Cost (millions)	$3.1	$0.55	$92.2	$33.1	$184.3	$21.0	$634.1	$469.2	$332.1	$108.7	$142.8	$37.3	$41.4
Annual Revenues (millions)	$1.1	$0.05	$58.1	$29.1	$72.1	$10.7	$298.4	$262.2	$182.1	$45.0	$62.0	$15.7	$12.8
Recovery Rate (percent)	37	10	63	88	39	51	47	56	55	41	43	42	31
Annual Net Operating Cost (millions)	$2.0	$0.50	$34.1	$4.0	$112.2	$10.3	$335.7	$207.0	$150.0	$63.7	$80.8	$21.6	$28.6
Net Operating Cost per Passenger	$7.99	$8.46	$1.48	$0.33	$3.65	$3.96	$3.44	$3.32	$3.16	$2.50	$3.47	$4.50	$5.20
Net Operating Cost per Passenger-Mile	$0.13	$0.55	$0.07	$0.02	$0.17	$0.14	$0.15	$0.10	$0.13	$0.13	$0.25	$0.15	$0.23
Total Operating Cost per Train-Mile/Bus-Mile	$42.52	$3.65	$42.70	$39.45	$46.89	$61.88	$37.52	$38.33	$41.27	$47.46	$64.31	$40.78	$45.03

[a] *Only includes the bus portion of trips.*

Source: SEWRPC.

Institutional questions that relate to implementing a commuter rail alternative are further complicated by some other considerations. First, the service would extend into a different state. It should be noted that Metra may only initiate additional services within the six-county area of Northeastern Illinois. Any service expansion outside of Metra's normal territory—such as to and from Walworth County—could only occur at the initiation of an appropriate Wisconsin-based agency, unit of government, or other entity working in agreement with Metra and possibly other Northeastern Illinois agencies or units of government. Obtaining the necessary and appropriate agreements between the suitable Wisconsin and Illinois agencies would require careful negotiation and agreement, but could be accomplished. It is important to note that such interstate agreements do exist in other parts of the United States, including the South Shore Line service that extends into Indiana from Illinois. Second, there is the question of who would bear the responsibility for track and station improvements and train operations beyond the existing commuter rail terminal at Fox Lake. For example, even though the Illinois communi-ties of Spring Grove and Richmond have expressed interest in having Metra commuter rail service, to date Metra itself has no plans for extending such service beyond Fox Lake to these communities. In addition, Metra does not own the railroad line beyond Fox Lake. West of Fox Lake to the state line, both the trackage and right-of-way are owned by the Wisconsin River Rail Transit Commission (WRRTC), a

Table 45

COMPARISON OF SELECTED CHARACTERISTICS FOR COMMUTER SERVICE ALTERNATIVES IN THE WALWORTH-FOX LAKE CORRIDOR AND EXISTING BUS TRANSIT SYSTEMS IN SOUTHEASTERN WISCONSIN

Item	Potential Commuter Service Extension		Existing Bus System[a]							
	Commuter Rail	Commuter Bus[d]	Kenosha-Racine-Milwaukee Bus Service	Kenosha Transit System	Milwaukee County Transit System	Ozaukee County Transit System	Racine Transit System	Washington County Transit System	City of Waukesha Transit System	Waukesha County Transit System
	Forecast Year 2020	Forecast Year 2020	Actual 1999	Actual 1999	Actual 1999	Actual 1999	Actual 1999	Actual 1999	Actual 1999	Actual 1999
Route Characteristics										
Route-Miles	24.6	21.0/29.8	42.7	76.5	804.2	93.1	88.5	136.5	70.4	294.5
Operating Characteristics										
Annual Vehicle-Miles	72,900	150,600	265,600	1,108,400	19,320,000	473,400	1,339,700	188,600	801,200	845,900
Ridership Characteristics										
Annual Passengers[b]	250,200	59,100	69,700	1,672,000	47,887,900	83,100	1,491,300	24,100	558,900	674,900
Annual Passenger-Miles	14.6 Million	0.9 Million	1,742,500	5,640,800	190,469,100	1,495,800	6,673,100	590,000	2,179,800	9,347,500
Cost Characteristics										
Annual Total										
Operating Cost	$3,107,000	$552,000	$796,400	$3,782,900	$102,202,300	$851,300	$4,519,300	412,600	$2,326,300	$4,262,700
Annual Revenues	$1,138,000	$57,000	$207,900	$583,400	$37,385,500	$151,200	$1,167,600	53,600	$408,800	$949,900
Recovery Rate (percent)	37	10	26	15	37	18	26	13	18	22
Annual Net Operating Cost	$1,969,000	$495,000	$588,500	$3,199,500	$64,816,800	$700,100	$3,351,700	359,000	$1,917,500	$3,312,800
Net Operating Cost Per Passenger	$7.99	$8.46	$8.44	$1.91	$1.35	$8.42	$2.25	$14.90	$3.43	$4.91
Net Operating Cost Per Passenger-Mile	$0.13	$0.55	$0.34	$0.57	$0.34	$0.47	$0.50	$0.61	$0.88	$0.35
Capital Cost (2000 dollars)	$69.3 Million	$3.4 Million	--	N/A	N/A	--	N/A		N/A	--
Annualized Capital Cost per Passenger	$24.14[c]	$5.03[c]	--	N/A	N/A	--	N/A		N/A	--
Annualized Capital Cost per Passenger-Mile	$0.41[c]	$0.33[c]	--	N/A	N/A	--	N/A		N/A	--

[a] *Does not include costs, service, and ridership attendant to ADA required paratransit service. Ozaukee County, Washington County, and Kenosha-Racine-Milwaukee are not required to provide such service.*

[b] *Annual passengers shown in this table approximate the number of one-way trips made on the system between specific origins and destinations. Passengers are counted only once and transfers between routes are not counted as the transfer is a continuation of a single trip.*

[c] *Capital cost has been annualized on the basis of the present value of a 20-year amortization period and a 6 percent rate inflation rate.*

[d] *Only includes the bus portion of trips.*

Source: SEWRPC.

Wisconsin multi-county agency. From the state line to the Village of Walworth, the trackage and other improvements are owned by the WRRTC, but the Wisconsin Department of Transportation owns the right-of-way. These questions of who would be responsible for operating and maintaining the railroad line and service as well as ownership issues are important institutional considerations that will need to be addressed. In any event, the cooperation and agreement between the suitable Illinois and Wisconsin agencies would be critical.

The various ridership, ownership, and operational responsibility considerations that may be inherent in these alternatives provide some indication as to who may bear the responsibility of providing certain costs. For the commuter rail alternative, the levels of anticipated ridership expected to be generated at both Wisconsin

and Illinois stations are relatively similar. Therefore, it would be reasonable to assume that entities from both states might be interested in agreeing to jointly pursue the project. Thus, it could be suggested that Illinois sources would be responsible for funding that portion of the commuter rail extension that would serve the Illinois stations of Spring Grove and Richmond. Wisconsin sources would then be responsible for funding that portion of the commuter rail extension beyond the last station in Illinois, which would be Richmond. For the bus alternative, all of the anticipated ridership on the Delavan-Harvard route and the majority of the anticipated ridership on the Elkhorn-Fox Lake route is expected to be generated at Wisconsin stations. Thus, it could be expected that Illinois sources may have little, if any interest in agreeing to jointly pursue the project. For the bus alternative, Wisconsin sources would likely be responsible for funding the entire project. As noted at the beginning of this chapter, these possible implementation responsibilities do not constitute or represent a commitment or endorsement by Metra, but are entirely and solely a suggestion provided in this feasibility study.

Capital Costs

Capital costs required to construct and begin operation of a new service normally represent a one-time commitment, but may be substantial. The capital costs presented for each of the alternatives above reflect the attendant cost of the entire service extension. If it were decided that such service were to be imple-mented, it is possible that the capital costs might be shared between certain Wisconsin and Illinois entities. With respect to capital costs, it is likely that station and parking development costs for both the commuter rail and bus alternatives would be the responsibility of the community in which the station would be located. This represents the typical funding practices for sta-tions on Metra as well as new commuter rail stations in the United States. With respect to the commuter rail alternative, there are also significant capital costs associated with vehicles and improvements to the railway line.

With respect to these costs for the commuter rail alternative, until discussions and negotiations have occurred, it is unknown how they would be shared. On one hand, and based on the discussion above, it is possible that Illinois would participate in the capital costs up to and including the Richmond station, a distance of 9.6 miles. Wisconsin would then participate in the capital costs necessary to extend the service from Richmond to Walworth, a distance of 14.9 miles. An estimated possible division of capital costs is shown in Table 46. Under this alternative, the track improvement, bridge rehabilitation, and passing siding costs were allocated on the basis of how much of the route mileage was either side of the proposed Richmond station; the train equipment costs were evenly divided; and the passenger station facility costs were allocated on the basis of the capital costs developed for each specific station. This would result in Illinois sources being responsible for about 42 percent of the capital costs ($29.0 million) and Wisconsin sources being responsible for about 58 percent of the capital costs ($40.3 million). On the other hand, since Metra currently has no plans to extend current service beyond Fox Lake, and since the rail line beyond Fox Lake to Walworth is already owned by a Wisconsin commission, it is possible that Wisconsin may be required to provide funding for the entire capital cost of the commuter rail extension beyond Fox Lake.

With respect to the capital costs for the bus alternative, as discussed above, Wisconsin sources would likely be responsible for funding the entire project. Thus, the possible Wisconsin share of the total capital cost could be expected to be the entire amount of about $3.4 million.

Operating Costs

Operating costs are an important consideration since they represent a recurring and normally annual commitment. The operating costs presented for each of the alternatives reflect the incremental costs of the entire service extension. As discussed above, it is reasonable to assume that if such service were to be implemented, it is possible that the operating costs might be shared between certain Wisconsin and Illinois entities for commuter rail service. For commuter bus service, it is likely that Wisconsin would be solely responsible.

With respect to the operating costs and revenues for the commuter rail alternative, until discussions and negotiations have occurred, it is unknown how they would be shared, and there are many ways that the operating costs and revenues could be shared. Sharing of operating revenues could be based on the anticipated ridership at the various Wisconsin and Illinois stations. While the commuter rail alternative envisions two new stations in Illinois and two new stations in Wisconsin, the ridership estimates envision that about 40 percent of the boarding passengers would be generated at Wisconsin stations and about 60 percent of boarding passengers would be generated at Illinois stations. Thus, revenues could be shared based on ridership on a 40 percent-60 percent basis between Wisconsin and Illinois. This revenue-sharing scenario is summarized in Table 47. As shown in this table, the annual Wisconsin share of the operating revenue could be $512,000.

Sharing of operating expenses for the commuter rail alternative could be based on mileage since most

Table 46

SUMMARY OF CAPITAL COSTS FOR COMMUTER RAIL SERVICE IN THE WALWORTH-FOX LAKE CORRIDOR IN 2000 DOLLARS: SHARED FUNDING ALTERNATIVE

Item	Shares		Total
	Wisconsin Share	Illinois Share	
Mainline Track Improvements	30,904,200	20,602,800	$51,507,000
Bridge Rehabilitation Work	499,800	333,200	833,000
New Passing Siding	1,091,400	727,600	1,819,000
Train Equipment	4,000,000	4,000,000	8,000,000
Passenger Station Facilities	1,716,000	1,921,000	3,637,000
Storage and Servicing Facilities	2,083,800	1,389,200	3,473,000
Total	40,295,200	28,973,800	$69,269,000

Source: SEWRPC.

expense categories are distance or mileage-related. As discussed above, it is possible that Illinois would participate in costs up to and including the Richmond station. Wisconsin would then need to provide for the costs necessary to extend the service beyond Richmond to Walworth. Thus, the operating costs could be shared on a 60 percent-40 percent basis between Wisconsin and Illinois. This operating expense sharing scenario is also summarized in Table 47. As shown in this table, the annual Wisconsin share of the total operating costs could be about $1.9 million. Thus, the annual Wisconsin share of the total net operating costs could be about $1.4 million.

With respect to the operating costs for the bus alternatives, as discussed above, Wisconsin sources would likely be responsible for funding the entire share of the annual operating cost. Thus, the possible Wisconsin share of the net annual operating cost could be expected to be about $495,000.

Moreover, beyond the uncertainty of possible sharing of capital and operating costs is the uncertainty of pursuing implementation by the State of Wisconsin of commuter rail service in the State of Illinois. It may be that the extension of service in Wisconsin may be pursued only after Metra determines to first extend service to Richmond.

ADVISORY COMMITTEE CONCLUSIONS AND RECOMMENDATION

Based upon review and consideration of the material and findings presented in this and previous chapters of the study report, the following conclusions concerning commuter rail and commuter bus in the Fox Lake-Walworth Corridor can be made based upon the feasibility study. A summary of the principal characteristics of the alternatives is shown in Table 48.

With respect to the commuter bus alternative, the following conclusions may be reached:

- The anticipated ridership on both commuter bus routes would be very small, even during weekday peak periods. The combined average weekday ridership for both routes would total only 110 trips in each direction, or 220 trips on an entire weekday. The travel times for the commuter buses are longer than that of driving to the commuter rail station, and may include circuitous routing, and a need for passengers to change from the bus to existing commuter train routes at either Fox Lake or Harvard.

- Of the two bus routes that were considered, the Elkhorn-Lake Geneva-Fox Lake route would be expected to have twice the ridership that the

Table 47

ESTIMATED ANNUAL TOTAL AND NET OPERATING COSTS OF WALWORTH-FOX LAKE COMMUTER RAIL SERVICE EXTENSION SHARED FUNDING ALTERNATIVE

Category and Items	Shares		Total
	Wisconsin Share	Illinois Share	
Operating Cost[a]			
Train Crew Personnel	$ 183,000	$ 122,000	$ 305,000
Fuel and Power	537,000	358,000	895,000
Railroad Access and Use	342,000	228,000	570,000
Maintenance of Equipment	707,000	471,000	1,178,000
Administrative	38,000	25,000	63,000
Insurance	58,000	38,000	96,000
Total Cost	$1,864,000	$1,243,000	$3,107,000
Operating Revenue[b]			
Number of Annual Commuter Rail Passengers	99,600	150,600	250,200
Total Operating Revenue	$ 509,000	$ 629,000	$1,138,000
Net Operating Cost	$1,355,000	$ 614,000	$1,969,000
Percent of Total Operating Cost Recovered through Operating Revenue	27	51	37

[a]*Total operating cost is the incremental cost of extending service north of the Fox Lake station.*

[b]*Total operating revenue is the total projected fare generated by ridership at all new stations. Nominal one-way fares have been reduced by 27 percent to reflect Metra fare revenue experience with monthly pass and multi-ticket purchase discounts.*

Source: SEWRPC.

Delavan-Walworth-Harvard route would. However, either each route singly or both routes together would still be expected to attract very few riders on a weekday and annual basis.

- The commuter bus service operating-cost recovery rate—that is the percent of total operating cost recovered through operating revenue—could be expected to be very low even under the most optimistic conditions. The highest operating-cost recovery rate for the commuter bus service alternative was estimated to be 15 percent for the weekday service along the Elkhorn-Fox Lake route. Both routes together could be expected to have an overall operating-cost recovery rate of only 10 percent and 11 percent if only weekday service was considered. This is lower than the operating-cost recovery rate of existing and new-start commuter rail systems which range from 19 percent to 88 percent and of existing bus transit systems in Southeastern Wisconsin which range from 13 percent to 37 percent.

- The net operating cost per passenger and per passenger-mile could be expected to be high when compared with other transit systems. The net operating cost per passenger for the commuter bus alternative was estimated to be $8.46. This is higher than all of the existing established commuter rail systems, which range from $0.33 to $5.20; higher than most of the new-start commuter rail systems, which range from $3.22 to $16.12; and higher than five of the eight bus transit systems in Southeastern Wisconsin, which range from $1.35 to $14.90. The net operating cost per passenger-mile for the com-

Table 48

COMPARISON OF POTENTIAL COMMUTER RAIL AND BUS ALTERNATIVES IN THE WALWORTH-FOX LAKE CORRIDOR

Category	Alternative			
	Commuter Rail			
	Possible Wisconsin Share	Possible Illinois Share	Total	Commuter Bus
Route Characteristics				
Number	1	1	1	2
Total Length (miles)	14.9	9.6	24.5	21.0/29.8
Number of Stations and Stops	2	2	4	7/8
Level of Service Characteristics				
Number of Scheduled Round Trips				
Weekdays	5			5
Saturdays	2[a]			2[a]
Sundays and Holidays	1[a]			1[a]
Sample One-Way Travel Times[b]				
Lake Geneva to Chicago	2 Hours 1 Minute			2 Hours 18 Minutes
Walworth to Chicago	1 Hour 57 Minutes			2 Hours 2 Minutes
Richmond to Chicago	1 Hour 36 Minutes			1 Hour 51 Minutes
Ridership Characteristics				
Weekday Passengers	370	560	930	220
Annual Passengers	99,600	150,600	250,200	59,100
Cost Characteristics				
Total Capital Cost	$40.3 Million	$29.0 Million	$69.3 Million	$3.4 Million
Annual Operating Cost	$1.9 Million	$1.2 Million	$3.1 Million	$0.55 Million
Annual Operating Revenue	$0.5 Million	$0.6 Million	$1.1 Million	$0.05 Million
Net Annual Operating Cost	$1.4 Million	$0.6 Million	$2.0 Million	$0.50 Million
Operating-Cost Recovery Rate	27 Percent	50 Percent	37 Percent	10 Percent

[a]*One additional round-trip operated during summer season.*

[b]*Weekday peak period.*

Source: SEWRPC.

muter bus alternative was estimated to be $0.55. This is higher than all of the existing established commuter rail systems, which range from $0.02 to $0.25; higher than most of the new-start commuter rail systems, which range from $0.09 to $0.80; and higher than five of the eight bus transit systems in Southeastern Wisconsin, which range from $0.34 to $0.88.

Thus, the analysis indicated that the potential operation of feeder bus service as an extension of the existing Metra commuter rail service between Fox Lake or Harvard and Walworth County could be expected to have a very low level of ridership, a very low operating-cost recovery rate, and compared to other bus and commuter rail transit systems, a high net operating cost per passenger, and a high net operating cost per passenger-mile.

With respect to the commuter rail alternative, the following conclusions may be reached:

- The anticipated ridership on the commuter rail alternative would be modest, especially com-pared to the level of passenger boardings at Metra stations in Northeastern Illinois, most of which board at least 200 passengers per week-day. The population and number of households are much lower in Walworth County than Lake and McHenry Counties in Northeastern Illinois. The anticipated ridership on Saturdays, Sundays, and holidays would also be very low when compared to weekday ridership. It was noted that the potential extension of commuter rail service between Walworth and Fox Lake would be more cost-effective if the service were operated only on weekdays.

- The operating-cost recovery rate—that is the percent of total operating cost recovered through operating revenue—could be expected to be about 37 percent and therefore lower than all except one of the existing long-established commuter rail systems, but higher than all except one of the new-start commuter rail systems, and equal or higher than all of the bus transit systems in Southeastern Wisconsin. Long-established commuter rail systems had an operating-cost recovery rate ranging from 31 percent to 88 percent. New-start commuter rail systems had an operating-cost recovery rate ranging from 19 percent to 58 percent. Existing bus transit systems in Southeastern Wisconsin had an operating-cost recovery rate ranging from 13 percent to 37 percent. The Metra com-muter rail system that serves the Chicago metropolitan area is required by law to recover at least 55 percent of its operating costs through operating revenue. The Wisconsin portion of the extended commuter rail line would have an operating-cost recovery rate of 27 percent. Metra may not be willing to participate in a service extension with a recovery rate that would decrease the systemwide average.

- The net operating cost per passenger and per passenger-mile could be expected to be high when compared with other transit systems. The net operating cost per passenger for the commuter rail alternative was estimated to be $7.99. This is higher than all of the existing established commuter rail systems, which range from $0.33 to $5.20; comparable to or higher than most of the new-start commuter rail systems, which range from $3.22 to $16.12; and higher than five of the eight bus transit systems in Southeastern Wisconsin, which range from $1.35 to $14.90. The net operating cost per passenger-mile for the commuter rail alternative was estimated to be $0.13. This is comparable to or lower than most of the existing established commuter rail systems, which range from $0.02 to $0.25; lower than most of the new-start commuter rail systems, which range from $0.09 to $0.80; and lower than all of the bus transit systems in Southeastern Wisconsin, which range from $0.34 to $0.88.

- A significant portion of the commuter rail alternative extends beyond Wisconsin into Illinois. Some of the potential stations would be located in each of the two states. Unlike the commuter bus alternative, it is reasonable to assume that the capital and annual operating costs of a potential commuter rail extension between Fox Lake and Walworth could be shared between the two states. Under such a sharing agreement, it could be expected that Wisconsin sources would be responsible for about 58 percent of the capital costs and Illinois sources would be responsible for about 42 percent of the capital costs. With respect to annual operating expenses and revenues, it could be expected that Wisconsin sources would be responsible for about 60 percent of the expenses; however, Wisconsin stations would generate only about 40 percent of the revenues. Accordingly, Illinois sources would be responsible for about 40 percent of the expenses; however, Illinois stations would generate about 60 percent of the revenues. On this basis, the annual operating-cost recovery rate for the Wisconsin portion of the commuter rail extension would be about 27 percent. The annual operating cost recovery rate for the Illinois portion of the commuter rail extension would be about 50 percent. The annual operating-cost recovery rate for the entire extension would be about 37 percent.

- An appropriate Wisconsin agency or unit of government would be required to operate, manage, and fund such a service. However, local units of government in the area are not presently set up to accommodate this, and the State of Wisconsin presently plays no role in the implementation, operation, or funding of existing or potential commuter rail services. Regardless of the future availability of Federal or State funding assistance, a local operating subsidy and local share of capital improvement costs may need to be shared by the local units of government.

Thus, the analysis indicated that the potential operation of commuter rail as an extension of the existing Metra commuter rail service between Fox Lake or Harvard and Walworth County could be expected to have a modest level of ridership and would be somewhat more cost-effective than the commuter bus alternative. The potential operation of commuter rail service in this corridor could be expected to generate an operating-cost recovery rate comparable to other commuter rail and bus systems, a net operating cost per passenger generally comparable or higher than other systems, and a net operating cost per passenger-mile generally comparable or lower than other systems. With regard to the operating-cost recovery rate, it was noted that the operating expenses and revenues could be shared between Wisconsin and Illinois. If this were done, the Illinois portion of the service extension could be expected to be more cost effective while the Wisconsin portion could be expected to be less cost effective. However, as noted previously, the possible extension of commuter rail service beyond Fox Lake is being considered entirely and solely within the context of this feasibility study and does not in any way constitute or represent a commitment or endorsement by Metra.

Following careful consideration of the study findings concerning the potential ridership, capital costs, and operating costs of operating commuter bus service in the Walworth-Fox Lake corridor as an extension of the existing Metra commuter rail service to Fox Lake, the Advisory Committee concluded that:

- Feeder bus service in the corridor would attract minimal ridership and would have a very low operating-cost recovery rate, particularly when compared to existing bus systems within Southeastern Wisconsin and new-start and established commuter rail services.

- Feeder bus service in the corridor would have a very low level of cost effectiveness.

- Therefore, the potential operation of feeder bus service in the corridor cannot be justified.

Based upon these conclusions, the Advisory Com-mittee recommended that no further consideration of commuter bus service in the Walworth-Fox Lake corridor was warranted at this time.

Following careful consideration of the study findings concerning the potential ridership, capital costs, and operating costs of extending commuter rail service from Fox Lake to Walworth County, the Advisory Committee concluded that:

- Extension of commuter rail service into the Walworth-Fox Lake corridor is physically feasible.

- Commuter rail service in the corridor would attract more ridership than would the bus alternative and could be expected to have an operating-cost recovery rate similar to other new-start and established commuter rail services in the United States.

- Ridership and the operating-cost recovery rate on the potential extension could be expected to be significantly greater along the Illinois portion of the corridor than along the Wisconsin portion of the corridor. Ridership along the Wisconsin portion of the corridor would be modest, and the operating-cost recovery rate would be somewhat low.

- Therefore, the full extension may be considered only marginally feasible on a cost-effectiveness basis and within the Wisconsin portion of the service, such feasibility is questionable.

Based upon these conclusions, the Advisory Commit-tee recommended that implementation of commuter rail service should not be further pursued at this time. Rather, further planning and engineering work toward such service is recommended to be deferred until two conditions have been met. The first is for Metra to be actively planning for the extension of commuter rail service beyond Fox Lake to Richmond. The second is that State and local roles in Wisconsin with respect to implementing and sharing the costs of commuter rail have been clearly determined. Until these conditions are met, the Advisory Committee recommended that no further efforts be made in Wisconsin at this time. If and when it is decided that further steps toward implementation are appropriate, it was recommended that the work include consideration of staging an extension only to the Highway 120 station, and consideration of the prospects for reducing capital and operating costs that were identified in this feasibility study. In the meantime, it is recommended that concerned State and local officials continue to monitor any Metra and Amtrak activities that may impact upon the situation and consider the incremental enhancement of the existing Amtrak service in the corridor.

In drawing these conclusions and making the foregoing recommendations, the Advisory Committee recognized that other factors may also prompt revisiting the extension of commuter rail including, increasing traffic

congestion, increases in the price of motor fuel, and changes in development and travel patterns, particularly any substantial increase in the number of people living in Walworth County and working in the Chicago central business district.

The Advisory Committee requested that the Regional Planning Commission complete publication of the final report for this feasibility study phase, and subsequently transmit the completed feasibility study to the Wisconsin Department of Transportation and the local units of government involved.

SUMMARY

This chapter has provided an evaluation for feasibility assessment of a proposed commuter rail service or a commuter bus service in the Walworth-Fox Lake Corridor extending from the Village of Fox Lake to the Village of Walworth.

Previous chapters of this study report have identified a range of possible physical, operational, and service characteristics for potential rail or bus extension. Through an extensive screening process, the most promising physical, operational, and service characteristics for the potential commuter rail service or the potential commuter bus service in this corridor were identified. The findings and conclusions of this screening process were used to design the two principal alternatives presented in this chapter.

The commuter rail alternative would entail operation of commuter trains throughout the day over the entire 24-mile distance between Walworth and Fox Lake as an extension of Metra's existing Milwaukee District North Line service. The single-track railway line would be upgraded to allow for a maximum mainline operating speed for commuter passenger trains of 59 miles per hour. Track improvements would include general upgrading of the mainline track, bridges, and grade crossings, and adding a passing siding to allow trains traveling in opposite directions to meet each other and to be coordinated with the relatively low number of anticipated freight train movements.

On weekdays, the commuter rail service between Walworth, Fox Lake, and Chicago would consist of: three southbound trains during the morning peak period; three northbound trains during the afternoon peak period; one train in each direction during the midday period; and one train northbound during the evening period. Weekend service would consist of two trains on Saturday and one train on Sunday in each direction—southbound in the morning period and northbound in the late afternoon period. In addition, from May to September, one train would operate outbound from Chicago to Walworth during the morning period and inbound from Walworth to Chicago during the early evening period on Saturdays, Sundays, and major holidays. All trains would make all stops between Walworth and Fox Lake. The commuter rail service would serve five passenger stations including Walworth, Highway 120 (Lake Geneva and Zenda), Richmond, Spring Grove-Solon Mills, and Fox Lake, providing an average station spacing of about six miles.

The most important findings concerning the commuter rail alternative may be summarized as follows:

- The capital cost of track and signal improvements necessary to provide a comfortable ride and acceptable operating speeds for commuter rail service between Walworth and Fox Lake was estimated to total about $51.5 million. These improvements include: overall rehabilitation and improvement of the mainline, track, roadbed, and right-of-way; rehabilitation of street and highway grade crossings; and installation and upgrading of grade crossing signals. The capital cost of necessary bridge rehabilitation was estimated to total about $0.8 million and the cost to construct a new passing siding was estimated to be about $1.8 million.

- The total recommended cost of all track improvements has the potential to be reduced by several factors including: other track improvement projects that may be undertaken on the railway line between Walworth and Fox Lake; the potential for the entire mainline track not to require complete ballast replacement and/or undercutting; and the potential for the necessary work to be accomplished at somewhat lower costs due to lower labor, management and engineering, and overhead unit costs inherent to shortline and regional railroads as compared to major railroad companies.

- The capital cost of the required equipment was estimated to total about $8.0 million. To operate the Walworth-Fox Lake service, a total of four coaches would need to be procured in addition to the equipment already required by Metra for its Milwaukee District North Line service.

- The capital cost of passenger station facility improvements was estimated to total about $3.6 million. New facilities would need to be constructed at Walworth, Highway 120 (Lake

Geneva and Zenda), Richmond, and Spring Grove-Solon Mills.

- The capital cost of an equipment storage and servicing facility was estimated to total about $3.5 million. Appropriate facilities for overnight and midday storage, cleaning, and light servicing of equipment would need to be provided at terminals where trains begin and end their runs. These locations would include Chicago and Walworth. The existing facilities already in place and used for this purpose at Chicago would continue to be so used with no significant improvements being necessary. Under this alternative, three trains would originate and terminate at Walworth, where construction of an equipment storage and servicing facility would be necessary.

- The total cost of the necessary capital improvements under the basic Walworth-Fox Lake commuter rail alternative was estimated to be $69.3 million in year 2000 dollars.

- The number of trips that could be expected to be made on the potential commuter rail service during an average weekday in the year 2020 was forecast to be a total of 930 trips. Approximately 85 percent of the projected 930 trips may be expected to be made between stations on the potential new extension and the Union Station terminal in the Chicago central business district. About 370, or 40 percent, of the trips on the proposed rail service may be expected to be generated at the potential new Wisconsin stations of Walworth and Highway 120. About 560, or 60 percent, of the trips on the service may be expected to be generated at the potential new Illinois stations of Richmond and Spring Grove-Solon Mills.

- The annual total operating cost of the potential commuter rail extension beyond the existing Fox Lake station was estimated to be about $3.1 million. The annual operating revenue of the service was estimated to be about $1.1 million. This would result in a net annual operating cost of almost $2.0 million.

The commuter bus alternative would consist of two feeder routes extending from southern Walworth County to existing Metra commuter rail stations in Northeastern Illinois. The first route would extend a distance of about 30 miles from Elkhorn to Fox Lake, Illinois, primarily along USH 12. This bus route would connect with the existing Metra Milwaukee District North Line service operating between Fox Lake and Chicago. The second route would extend a distance of about 21 miles, primarily along STH 50, STH 67, and USH 14. This bus route would connect with the existing Metra Union Pacific Northwest Line Service operating between Harvard and Chicago. The purpose of these routes would be to provide bus service that directly connects with established Metra commuter train routes and provide a comparable level of service to that provided under the commuter rail alternative for passengers traveling between southern Walworth County and the Chicago area.

On weekdays, commuter bus service would consist of three inbound runs from Delavan to Harvard and from Elkhorn to Fox Lake during the morning peak period, three outbound runs from Fox Lake to Elkhorn and from Harvard to Delavan during the afternoon peak period. Service headway would be about 40 minutes. In addition, on both routes, one bus would operate in each direction during the midday period and one bus would operate outbound from both Fox Lake and Harvard during the evening period. A limited amount of weekend service would also be provided. On Saturdays, two bus runs—and on Sundays, one bus run—would operate inbound from Williams Bay to Harvard and from Lake Geneva to Fox Lake during the morning period and outbound from Harvard to Williams Bay and from Fox Lake to Lake Geneva during the late afternoon period. The service headway for these bus runs would be about 90 minutes. These bus runs would operate all year. In addition, from May through September, one bus run would operate outbound from Fox Lake to Lake Geneva and from Harvard to Williams Bay during the morning period and inbound from Lake Geneva to Fox Lake and from Williams Bay to Harvard during the early evening period on Saturdays, Sundays, and major holidays

The most important findings concerning the commuter bus alternative may be summarized as follows:

- The total capital cost for initiation of both commuter bus routes would be about $3.4 million. The principal capital cost is for passenger station facility improvements, as a private operator would be responsible for furnishing vehicles, maintenance services and facilities, and an overnight storage facility. In addition, no right-of-way, roadway, or signal improvements would be required, as the buses would operate over the public street and highway system. Improvement to the 17 stations and stops along the two routes include: boarding platforms, access facilities meeting the requirements of the Federal

Americans with Disabilities Act, buildings and shelter areas, parking for automobiles, drop-off and pick-up areas for passengers using connecting taxis and bus services, and certain station amenities.

- The number of trips that could be expected to be made on both of the proposed commuter bus routes during an average weekday in the year 2020 was forecast to be a total of 220 trips, with 90 percent of these expected to be made between stops on the bus routes and the Union Station terminal in the Chicago central business district. About 71 percent of the total trips could be expected to use the Elkhorn-Lake Geneva-Fox Lake route, and the remaining 29 percent, the Delavan-Walworth-Harvard route.

- The combined total annual operating cost of the proposed commuter bus routes was esti-mated to total about $552,000. The annual operating revenue of the service was estimated to total about $57,000. This would result in a net annual operating cost of about $495,000.

A comparison of selected characteristics for the proposed Walworth-Fox Lake commuter service alternatives was made between the alternatives and with other existing new-start and long-established commuter rail systems in the United States and with the existing bus transit systems in Southeastern Wisconsin. Of particular interest were the estimated ridership and the operating-cost recovery rates for these systems since these measures provides a very good indication of long-term financial feasibility.

The commuter rail alternative may be expected to attract about four times the ridership than would a commuter bus alternative in the corridor. The commuter rail alternative would generate about 930 trips on an average weekday, or about 250,200 trips annually; and the commuter bus alternative would generate about 220 trips on an average weekday, or about 59,100 trips annually. Average weekday boardings at the potential new stations in Wisconsin would range from 65 at Walworth to 120 at the Highway 120 station for Lake Geneva. These could be considered modest compared to weekday boardings at most Chicago-area Metra stations, very few of which experience weekday boardings of less than 200 passengers. The estimated operating-cost recovery rate for the commuter rail alternative would be about 37 percent, or almost four times the estimated operating-cost recovery rate for the commuter bus alternative of about 10 percent. For the commuter rail alternative to attract the estimated higher level of ridership, the annual operating cost could be expected to be about six times that for the bus alternative and the total capital cost could be expected to be up to 20 times that of the bus alternative.

The comparison with other systems indicated that the estimated operating-cost recovery rate of about 37 percent for the commuter rail alternative compares favorably on an overall basis with other new-start commuter rail systems and many of the long-estab-lished commuter rail systems in the United States. With respect to existing bus transit systems in Southeastern Wisconsin, the comparison indicated that the estimated operating-cost recovery rate of about 37 percent would be comparable to the recovery rate for the existing Kenosha-Racine-Milwaukee bus service, would be less than the recovery rate of the Milwaukee County Transit System, and would be greater than the recovery rates of the remaining transit systems. The operating-cost recovery rate of about 10 percent for the commuter bus alternative is significantly less than that for all of the other commuter rail and bus transit systems.

How a commuter rail or bus alternative would be paid for, where the funding would come from, and what unit of government would provide such funding are issues that would need to be addressed as part of a subsequent detailed corridor analysis following com-pletion of this feasibility study. Some of the overall implementation issues and funding considerations that would need to be assessed as part of preparing a practical and workable financial plan for sponsoring and financing such an improvement were identified:

- The question of funding or implementing an alternative will require cooperation among local governments since the potential services extend across local, county, and even state lines into a number of different jurisdictions. Since the implementation of these types of transit projects normally involve a sharing of the capital and operating costs among Federal, State, and local governments, the potential magnitude of such responsibility shares will be of particular impor-tance, especially at the local level.

- An appropriate agency or unit of government, or perhaps a department of a unit of government, would be required to operate, manage, and fund such a service. To date, local units of govern-ment in the area are not set up to accommodate this, and the State of Wisconsin presently plays no role in the implementation, operation, or funding of existing or potential commuter rail services. The State role could change in the future.

- There is presently no State transit or transportation program available that can be directly used for commuter rail projects. The financial aids already available for use as transit operating cost assistance are aggressively sought by existing urban and rural transit systems. This suggests that any required local operating subsidy and local share of capital improvement costs may need to be shared by the local units of government through which the potential service would operate. Some type of areawide transportation authority or multi-county transit district or agency may be appropriate, but these types of entities do not exist at this time for the Walworth County area.

- The service would extend into two different states. It should be noted that Metra may only initiate additional services within the six-county area of northeastern Illinois. Any service expan-sion outside of Metra's normal territory—such as to and from Walworth County—could only occur at the initiation of an appropriate Wisconsin-based agency, unit of government, or other entity working in agreement with Metra and possibly other Northeastern Illinois agencies or units of government.

- There is the question of who would bear the responsibility for track and station improvements and train operations beyond the existing commuter rail terminal at Fox Lake. Metra currently has no plans for extending such service beyond Fox Lake, nor does it own the railroad line beyond Fox Lake. Ownership issues will need to be addressed. Cooperation and agreement between suitable Illinois and Wisconsin agencies would be critical.

- Capital costs required to construct and begin operation of a new service normally represent a one-time commitment, but may be substantial. Operating costs are an important consideration since they represent a recurring and normally annual commitment. It is likely that station and parking development costs for both the commuter rail and bus alternatives would be the responsibility of the community in which the station would be located. With respect to the other costs for the commuter rail alternative, it is possible that Illinois would participate in the capital costs up to and including the Richmond station. Wisconsin would then participate in the capital costs necessary to extend the service from Richmond to Walworth. Until discussions and negotiations have occurred, it is unknown how the costs would be shared, but it is likely they would be shared based on some combination of distance, mileage, and ridership. It also possible that since Metra currently has no plans to extend current service beyond Fox Lake, and since the rail line beyond Fox Lake to Walworth is already owned by Wisconsin entities, Wisconsin sources may be required to provide funding for the entire cost of the commuter rail extension beyond Fox Lake. With respect to the other costs for the bus alternative, Wisconsin sources would likely be responsible for funding the entire project. In any case, a local share of the project cost could be expected.

Following careful consideration of the material and study findings presented in this and previous chapters of the study report concerning the potential ridership, capital costs, and operating costs of operating commuter rail or bus service in the Walworth-Fox Lake corridor as an extension of the existing Metra commuter rail service to Fox Lake, the Advisory Committee reached several conclusions. With respect to potential bus service:

- Feeder bus service in the corridor would attract minimal ridership and would have a very low operating-cost recovery rate, particularly when compared to existing bus systems within South-eastern Wisconsin and new-start and established commuter rail services.

- Feeder bus service in the corridor would have a very low level of cost effectiveness.

- Therefore, the potential operation of feeder bus service in the corridor cannot be justified.

Based upon these conclusions, the Advisory Commit-tee recommended that no further consideration of commuter bus service in the Walworth-Fox Lake corridor was warranted at this time.

With respect to the potential extension of commuter rail service:

- Extension of commuter rail service into the Walworth-Fox Lake corridor is physically feasible.

- Commuter rail service in the corridor would attract more ridership than would the bus alternative and could be expected to have an operating-cost recovery rate similar to other new-start and established commuter rail services in the United States.

- Ridership and the operating-cost recovery rate on the potential extension could be expected to be significantly greater along the Illinois portion of the corridor than along the Wisconsin portion of the corridor. Ridership along the Wisconsin portion of the corridor would be modest, and the operating-cost recovery rate would be somewhat law.

- Therefore, the full extension may be considered only marginally feasible on a cost-effectiveness basis and within the Wisconsin portion of the service, such feasibility is questionable.

Based upon these conclusions, the Advisory Committee recommended that implementation of commuter rail service should not be further pursued at this time. Rather, further planning and engineering work toward such service was recommended to be deferred until two conditions have been met. The first is for Metra to be actively planning for the extension of commuter rail service beyond Fox Lake to Richmond. The second is that State and local roles in Wisconsin with respect to implementing and sharing the costs of commuter rail have been clearly determined. Until these conditions are met, the Advisory Committee recommended that no further efforts be made in Wisconsin at this time. If and when it is decided that further steps toward implementation are appropriate, it was recommended that the work include consideration of staging an extension only to the Highway 120 station, and consideration of the prospects for reducing capital and operating costs that were identified in this feasibility study. In the meantime, it was recom-mended that concerned State and local officials continue to monitor any Metra and Amtrak activities that may impact upon the situation and consider the incremental enhancement of the existing Amtrak service in the corridor.

In drawing these conclusions and making the foregoing recommendations, the Advisory Committee recognized that other factors may also prompt revisiting the extension of commuter rail including: increasing traffic congestion; increases in the price of motor fuel; and changes in development and travel patterns, particularly any substantial increase in the number of people living in Walworth County and working in the Chicago central business district

The Advisory Committee requested that the Regional Planning Commission complete publication of the final report for this feasibility study phase, and subsequently transmit the completed feasibility study to the Wisconsin Department of Transportation and the local units of government involved.

(This page intentionally left blank)

Chapter VI

SUMMARY

INTRODUCTION

This report documents the findings and recommendations of a study of the feasibility of instituting commuter rail or bus service in the Walworth-Fox Lake Travel Corridor. The potential service would be operated as an extension of the Metra commuter rail service currently operating between the Village of Fox Lake in the northwestern portion of Lake County in Northeastern Illinois and the City of Chicago central business district. The study was undertaken at the request of the Walworth County Board of Supervisors on behalf of the Geneva Lake Area Joint Transit Commission.

The study was carried out within the context of the adopted design year 2020 regional transportation system plan for Southeastern Wisconsin. That plan recommends significant improvement and expansion of public transit service within the Region, including development of rapid and express transit service and the improvement and expansion of existing local transit services. The rapid transit component of the regional public transit system is envisioned as connecting the urban centers of the Region to each other and to the Milwaukee central business district. Some of the services would also connect urban centers in the southern portion of the Region to the Chicago metropolitan area. Buses operating over freeways in mixed traffic, buses operating over special busways, and commuter rail passenger trains are identified in the adopted plan as potential ways of providing the recommended rapid transit service.

The technical work for the feasibility study was performed by Commission staff with the assistance of: the transportation engineering consulting firm of T. Y. Lin, Bascor, Inc. of Chicago, Illinois; officials and staffs from the counties and communities within the study area; the Wisconsin Department of Transportation; the Chicago Area Transportation Study; the various freight railway companies concerned; and Metra, the Chicago-based commuter rail operator. However, the possible extension of commuter rail service beyond Fox Lake is being considered entirely and solely within the context of this feasibility study and does not in any way constitute or represent a commitment or endorsement by Metra. Conduct of the study was guided by a 19-member Advisory Committee consisting of representatives from concerned local, county, State, and Federal units of government, other public agencies and railway companies concerned. The membership of this Committee is listed on the inside front cover of this report.

STUDY PURPOSE

The purpose of this study was to determine the feasibility of operating Chicago-oriented commuter rail or bus service between Walworth and Fox Lake and to provide the information needed by public officials to make a decision as to whether or not to proceed further with consideration of commuter rail or bus service in the corridor. The feasibility study was also designed to assist in the ultimate conduct of a transit alternatives analysis study, should it be decided to proceed with such a study, as well as the preparation of an attendant environmental impact statement (EIS), by identifying key issues and options which must be considered in a more detailed design and evaluation of transit service alternatives in the Corridor.

More specifically, this feasibility study was intended to serve the following purposes:

1. To identify the physical and operational characteristics of commuter rail and bus feeder service alternatives in the corridor;

2. To identify the capital costs of the commuter rail and bus feeder service alternatives;

3. To identify the anticipated operating costs of, and necessary operating cost subsidies for, the commuter rail and bus feeder service alternatives;

4. To identify impacts of the commuter rail service alternatives on freight train operations over the railway line concerned;

5. To identify the potential ridership of the commuter rail and bus feeder service alternatives; the attendant farebox revenues; and the impact on highway traffic in the corridor; and

6. To provide the basis for a determination by the public officials concerned as to whether or not to proceed with a major investment study in the corridor.

In the conduct of the study, several other tasks were performed. These included an inventory and analysis of the existing land uses and of the current travel habits, patterns, and needs of the residents of the area; an identification of past and existing commuter transit services in the corridor; and an inventory of the existing condition and use of the potential commuter rail line. The study additionally provided designs for commuter rail and bus alternatives and identification of the most feasible alternatives.

EXISTING SOCIOECONOMIC CHARACTERISTICS AND TRAVEL PATTERNS

Study Area

The study area consisted of a "primary" study area, and a "secondary" study area, as shown on Map 2. The primary study area consisted of the Walworth-Fox Lake Travel Corridor within the Southeastern Wisconsin Region comprised of the southern half of Walworth County and a portion of western Kenosha County. The boundaries of the primary study area were delineated so as to be consistent with the conduct of comprehensive travel surveys by the Regional Planning Commission. The primary study area lies entirely within the Southeastern Wisconsin counties of Walworth and Kenosha.

The secondary study area consisted of an extension of the travel corridor to Northeastern Illinois and to the central business district of the City of Chicago. The boundaries of the secondary study area were delineated so as to be consistent with areas used in the conduct of comprehensive travel surveys by the Regional Planning Commission and by the Chicago Area Transportation Study. The secondary study area lies entirely within the Northeastern Illinois counties of McHenry, Lake, and Cook.

Population and Households

In 1990, the resident household population of the primary study area totaled about 55,600 persons. The resident population within the primary study area is anticipated to increase to about 73,800 persons by 2020, or about 33 percent. In 1990, the number of households in the primary study area totaled about 21,300. The number of households in the primary study area is anticipated to increase to about 30,700 households by 2020, or by about 36 percent.

Employment

In 1990, employment in the primary study area was an estimated 29,300 jobs. The number of jobs in the primary study area is anticipated to increase to about 43,900 jobs by 2020, or by about 50 percent.

Travel Habits and Patterns

Based upon travel surveys undertaken by the Commission, about 128,800 person trips were made on an average weekday in 1991 within the primary study area. Of those trips, about 77,100 trips were made entirely within the individual subarea analysis areas, and about 51,700 trips were made between subarea analysis areas. About 12,900 person trips crossed the Wisconsin-Illinois state line between the primary study area and the secondary study area on an average weekday in 1991.

A significant seasonal increase in travel between Northeastern Illinois and southern Walworth County occurs during the summer months of June, July, and August. Highway traffic count data indicate that average weekday traffic volumes during these months may exceed annual average daily volumes by up to 24 percent on weekdays and 44 percent on weekends.

EXISTING TRANSPORTATION SERVICES AND FACILITIES

The existing transportation services and facilities within the Walworth-Fox Lake Corridor, as well as between the primary and secondary study areas of the corridor, pertinent to any consideration of the provision of commuter rail or bus service within the corridor are described below.

- Commuter rail service was provided by Metra—the commuter rail service division of the Regional Transportation Authority—over a 49.5-mile long route extending from Fox Lake through the northern suburbs of Chicago to the Chicago Union Station in the Chicago central business district. The commuter rail route is referred to as the Metra Milwaukee District North Line and is owned by Metra. This long-established commuter rail service is strongly oriented to serve passengers residing in the corridor who are employed in the City of Chicago, especially in and around the Chicago central business district. Most of the passenger trains on this route originate or terminate at Fox Lake, Illinois, but a small number of trains in each direction operated only between Chicago and Deerfield or Grayslake.

- Ridership on the Metra service provided over the Milwaukee District North Line has been substantial and compares favorably with other heavily used Metra routes. During 1999, about 6.4 million annual passenger trips were carried on this Metra line; or about 113,000 during an average week. In 1999, average weekday ridership on the Metra Milwaukee District North Line totaled about 21,500, with about 550 passengers boarding and alighting at the Fox Lake stop on a typical weekday. On an average weekday, about 16,400—or 76 percent—of all passengers were carried on peak-period peak-direction trains.

- Existing public bus transportation services within the Walworth-Fox Lake Corridor are limited. These services included the specialized services provided by the Walworth County Department of Human Services and Vocational Industries, Inc. intended for elderly and disabled users; and four local bus routes operated by Pace within or near the Illinois portion of the corridor. Pace is the name for the bus operating division of the Regional Transportation Authority of Northeastern Illinois. The Pace routes functioned primarily as feeders to, and supplemental service for, Metra commuter rail routes. Limited bus feeder services from Lake Geneva, Williams Bay, and Delavan to commuter rail stations in Northeastern Illinois were operated during the 1970s, but were short-lived. Also, some long-distance motor coach carriers such as Greyhound Lines and Wis-consin Coach Lines provided regular service through southern Walworth County, as did some limousine services. The last of these types of services was operated during the 1980s.

- A potential new commuter rail route within the Walworth-Fox Lake Corridor would extend from the existing Metra passenger station in Fox Lake, Illinois to the Village of Walworth in Walworth County, Wisconsin. Except for a 0.3-mile long segment in Fox Lake that is owned and operated by Metra, the 24.0-mile long route would utilize trackage operated by Wisconsin & Southern Railroad Company. The Wisconsin River Rail Transit Commission owns trackage along this route and the right-of-way is owned by the Transit Commission within Illinois, and by Wisconsin Department of Trans-portation within Wisconsin.

- The Walworth-Fox Lake railway line is operated as part of the Wisconsin & Southern Railroad Janesville-Chicago main line and is called its Fox Lake Subdivision. It provides an important link between other railway lines in southern Wisconsin and many major railways in the Chicago area. The line consists of a single-track main line with relatively short passing sidings. The trackage and roadbed along the Wisconsin & Southern Fox Lake Subdivision between Fox Lake and Walworth are generally in good condition for current freight train operations and meet FRA Class 2 track safety standards. Maximum operating speeds are 30 miles per hour for passenger trains and 25 miles per hour for freight trains. Major rehabilitation of the line between Janesville and Fox Lake was undertaken during 1990 and 1991 using grants and loans provided by the Wisconsin and Illinois Departments of Transportation.

- For most of its historic existence, the Fox Lake Subdivision was operated by the Chicago, Milwaukee, St. Paul & Pacific Railroad Company—or the "Milwaukee Road"—as part of a passenger and freight main line between Chicago and Madison. During the 1970s, the traffic and financial conditions of the Milwaukee Road began to change rapidly. As a result, the physical condition of the Fox Lake Subdivision declined as regular maintenance was deferred; maximum operating speeds were steadily reduced; trains once using the route were rerouted; and the line was abandoned in 1983 by the Trustee for the then-bankrupt Milwaukee Road. During the 1980s, successful efforts were made to preserve and restore freight service on this line. Through-freight service between Janesville and Chicago over the Walworth-Fox Lake segment was restored in 1989. Since that time, the Wisconsin & Southern Railroad has aggressively sought to build freight traffic on its network of railway lines in southern Wisconsin including the Fox Lake Subdivision. During the next three to seven years, freight traffic on this line may be expected to increase from the current level of one through freight train in each direction seven days per week to two through-freight trains in each direction seven days per week plus a local freight train based in Janesville and working east to Spring Grove on weekdays.

- The street and highway system within the primary study area is comprised of land access, collector, and arterial facilities. Freeways are those components of the arterial street and highway system which provide the highest level of service and which carry the heaviest and fastest volumes of traffic, including between the

primary and secondary study areas. Of the nearly 26,700 vehicular crossings at the Wisconsin-Illinois border between the primary and secondary study areas on an average day in 1996, approximately 13,500 vehicle crossings, or about 51 percent, were made on USH 12. The existing arterial street and highway system within the primary study area totaled about 288 miles.

POTENTIAL COMMUTER RAIL AND BUS SERVICES AND FACILITIES

Various options with respect to physical, operational and service characteristics for potential commuter rail or commuter bus service in the Walworth-Fox Lake corridor were evaluated. The most practical and reasonable facility and service options were then used to develop basic commuter rail and bus alternatives with the greatest potential for providing cost-effective service in the Walworth-Fox Lake corridor.

Commuter Rail Route Alignment

A single commuter rail route alignment was determined to be sufficiently promising to warrant further consideration under this feasibility study. This route was along the Wisconsin & Southern Railroad's Fox Lake Subdivision, a distance of about 24 miles between Walworth and Fox Lake. This route alignment was found to be well suited for accommodating potential commuter rail operations, and in fact has done so in the past. This is the only existing railway route that directly connects southern Walworth County with Northeastern Illinois. No other alignment alternatives were found to be acceptable, including the former Chicago & North Western Railway line between Richmond and Lake Geneva. The line to Lake Geneva has long been dismantled, and the right-of-way in Wisconsin either reverted back to or sold to adjacent property owners.

Commuter Bus Route Alignment

A single basic commuter bus option was deter-mined to be sufficiently promising to warrant further consideration under this feasibility study. The commuter bus option consists of two feeder routes extending from southern Walworth County to existing Metra commuter rail stations in Northeastern Illinois. The first route would extend a distance of about 30 miles from Elkhorn to Fox Lake, Illinois, primarily along USH 12 and STH 130. This bus route would connect with the existing Metra Milwaukee District North Line service operating between Fox Lake and Chicago. The second route would extend a distance of about 21 miles from Delavan to Harvard, Illinois, primarily along STH 50, STH 67, and USH 14. This bus route would connect with the existing Metra Union Pacific Northwest Line service operating between Harvard and Chicago. The purpose of these routes would be to provide bus services that directly connect with established Metra commuter train routes providing a comparable level of service under the commuter bus alternative to that provided under the commuter rail alternative for passengers traveling between Southern Walworth County and the Chicago area.

Passenger Station Facilities

A basic set of five stations was proposed for the commuter rail alternative along the Walworth-Fox Lake railway line. The stations would include: Walworth; Highway 120, which would serve Lake Geneva and Zenda; Richmond; Spring Grove, which would also serve Solon Mills; and Fox Lake. The average station spacing would be about six miles. In Fox Lake the existing Metra passenger station would be utilized. At the remaining stations, new facilities would need to be constructed.

With respect to the commuter bus alternative, a total of eight stations or stops would be located along the Delavan-Harvard bus route; and a total of nine stations or stops would be located along the Elkhorn-Fox Lake bus route. For the Delavan-Harvard route, stations or stops would include: Delavan Park-Ride Lot; Williams Bay-Downtown; Williams Bay-West Side; Fontana; Walworth Park-Ride Lot; Walworth-Village Square; Big Foot, and Harvard. For the Elkhorn-Fox Lake route, stations or stops would include: Elkhorn Park-Ride Lot; Lake Geneva Park Ride Lot; Pell Lake; Genoa City; Richmond-Down-town; Richmond Park Ride Lot; Solon Mills; Spring Grove; and Fox Lake. The average station spacing would be about three miles along the Williams Bay-Harvard bus route and about four miles along the Lake Geneva-Fox Lake bus route.

Determination of the precise location and design of each passenger station or stop is properly a function of preliminary and final engineering studies that must follow the feasibility and detailed planning phases of any commuter service development effort. In any such succeeding phases, it will be important that local residents and public officials be involved in station location and design work. Thus, the station characteristics and locations described herein should be regarded as preliminary for purposes of this feasibility study.

Rolling Stock and Vehicle Requirements

It was recommended that conventional locomotive-hauled commuter train equipment be assumed for use instead of other types of equipment such as self-propelled equipment. Conventional commuter train equipment consists of bi-directional trains of diesel

locomotives with bi-level passenger coaches operating in a "push-pull" mode. This type of equipment has proved to have a long and established record with respect to availability, dependability, performance, and safety in use by Metra and Metra's predecessors on most of the commuter rail routes in the Chicago area for many years, and would be compatible with existing Metra equipment that currently operate between Fox Lake and Chicago. With respect to commuter bus service, it was recommended that conventional transit buses be assumed for use. Such vehicles would range from 30 to 40 feet in length, the exact size and configuration to be determined by passenger demand and the service provider. These vehicles would be similar to most buses operated in commuter service by transit operators in Southeastern Wisconsin and by Pace in Northeastern Illinois and would include passenger amenities appropriate for the service. The buses and train equipment would need to meet the accessibility requirements of the Federal Americans with Disabilities Act.

Railway Line Improvements

An assessment of the railway line condition was conducted and an identification of improvements that will be necessary to permit the possible initiation of commuter rail service along the existing Walworth-Fox Lake railway line was made. This work was conducted by a consulting transportation engineering firm working with the Commission staff and with the cooperation of the railroad companies involved. The purpose of the assessment was to identify the existing railway line facilities that would have to be rehabilitated, upgraded, or replaced in order to operate commuter rail service in an efficient, safe, and cost-effective manner, to permit attracting an adequate level of patronage with a smooth and comfortable ride at acceptable operating speeds.

In general, the Wisconsin & Southern Fox Lake Subdivision between Walworth and Fox Lake was concluded to be in acceptable condition for existing freight operations, but would require over-all upgrading to accommodate commuter rail operations in a safe, efficient, and reliable manner. A maximum mainline operating speed of 59 miles per hour between Walworth and Fox Lake was assumed for purposes of this feasibility study. Much of the required track upgrading and many of the improvements, however, would be necessary regardless of the maximum mainline operating speed or the assumed frequency of operation.

To enable commuter train operation, improvements which would have to be undertaken along the railway line include the following: replacement of all of the existing jointed rail on the main track with 115-pound continuous welded rail; replacement of all failing cross ties with new mainline-grade ties along the entire route; repair, adjustment and replacement, as necessary, of other track material including tie plates, spikes, joint bars, joint bolts, and rail anchors; undercutting the ballast, replacement of all ballast, and bringing the track to the intended line and surface; cleaning and recutting of drainage ditches along the roadbed; replacement and rehabilitation of turnouts along the entire line; rebuilding of street, highway, and private grade crossings; improvement of automatic grade crossing signals at all public crossings to include automatic gates; and installation of crossbucks and stop signs at all private grade crossings.

The assessment concluded that one new passing siding would be required to allow flexibility in the dispatching and the combined operation of commuter trains and freight trains along the Walworth-Fox Lake railroad segment. It was proposed that the new siding be about one mile in length and be located on the former grade of the old Hebron siding midway along the route extension.

The assessment further concluded that repairs would be required to a number of bridges. It was recommended that repairs be made to 12 of the 14 bridges along the route. The recommended work ranged from relatively small repairs to replacement of major structural components and varies with each individual bridge. It was recommended that bridge timbers be replaced on eight bridges. Reconstruction, replacement, and repair work to the abutment areas are recommended for four bridges. This work includes encasing and reinforcing existing abutments and wing walls and repairing and replacing backwall sections, bearings, and bearing seats. Replacement, reinforcement, or repair work to piles, piers, and bracing on four bridges was also recommended. One bridge also requires the repair of a main steel girder. It was also recommended that should consideration of reinstituting commuter rail service along this line continue, a specialized testing firm be retained to obtain borings of the timber elements on all bridges to more precisely determine their condition.

No signal improvements were recommended at this time. Dispatching of all trains on the Walworth-Fox Lake segment would continue to be performed by use of track warrants issued by Wisconsin & Southern Railroad dispatchers. Turnouts for the new siding at Hebron and for the storage facility at Walworth would be manually operated. It was recognized, however, that remote control of these turnouts, as well as installation of an automatic block signal system, may be required by the participating railways or Metra prior to initiation of commuter service or at some time in the future.

Equipment Storage and Servicing Facility Needs

A facility for the overnight storage, cleaning, and light maintenance of train sets at Walworth would be

necessary. This would be a basic facility and require the construction of two storage tracks, installation of two turnouts to connect the storage tracks with the main line, construction of a small building for use by train crews and cleaning personnel, and installation of wayside electrical boxes to provide power to the trains. For purposes of this feasibility study, it was assumed that the yard would be single ended with manually operated turnouts. About one additional acre would need to be acquired for this facility. Major train inspections and heavy maintenance work could be done at an existing Metra facility.

An equipment storage and servicing facility for the commuter bus alternative would be the responsibility of the service provider under a contractual agreement with a private operator. It is envisioned that the operator would provide not only the equipment and staff, but also equipment and facilities such as for the storage and maintenance of buses and for all other day-to-day functions necessary for the commuter bus service to operate.

Service Provider

Several alternative service provider arrangements were considered for commuter rail and commuter bus service within the Walworth-Fox Lake corridor. For commuter rail service, it was concluded that operation by Metra as an extension of its already-existing Fox Lake-Chicago service would be the most reasonable and practical arrangement. This recommendation was based on Metra's familiarity and experience with large commuter rail operations and its ability to easily provide a through service between the Walworth-Fox Lake extension and Chicago which would not require passengers to transfer between trains at Fox Lake. Operation of such service by Metra would require negotiation and agreement between Metra and a public entity responsible for implementing commuter rail service in Wisconsin.

This service provider recommendation is solely a result of this feasibility study. It does not constitute or represent a commitment or endorsement by Metra with respect to any of the proposals or recommendations contained in this study. While Metra has participated in this study in a technical advisory role, its responsibility lies in addressing needs within the six-county Northeastern Illinois Region. Any provision of service in the Wisconsin portion of the Walworth-Fox Lake Corridor will require sponsorship and funding for those capital cost and operating cost needs by Wisconsin governments and agencies.

For commuter bus service in the Walworth-Fox Lake corridor, it was concluded that provision of such service be a public entity contracting with a new private operator through a competitively awarded contract process would be the most reasonable and practical arrangement. This recommendation was based on the absence of any similar bus service in the corridor and the successful and efficient operation of bus services under this kind of arrangement elsewhere in Southeastern Wisconsin.

Operating Plans

For purposes of this feasibility study, it was concluded that operating plans for the commuter rail and commuter bus alternatives should provide the inherent flexibility to attract the highest ridership over the entire plan design period.

The recommended commuter rail operating plan provides for service between Walworth and Fox Lake as an extension of the existing Metra's Milwaukee District North Line service. Selected existing Metra trains operating between Fox Lake and Chicago would remain on their existing schedules, but be extended west of Fox Lake to Walworth. To the extent possible, the Chicago-Fox Lake trains utilized for the extended service would be those that already provide some express service during peak travel periods. Trains would stop between Walworth and Fox Lake at all intermediate stations. On weekdays, there would be three inbound trains from Walworth to Chicago during the morning peak period, and three outbound trains from Chicago to Walworth during the afternoon peak period, together with a limited amount of nonpeak period service during the early afternoon and evening periods and on weekends.

The recommended commuter bus operating plan provides for service over two separate routes from southern Walworth County communities to existing Metra commuter rail stations in Illinois at Harvard and Fox Lake. Service on these bus routes would be coordinated with Metra's Milwaukee District North Line and Union Pacific Northwest Line train schedules. The initial frequency of service would be three inbound bus runs from Delavan to Harvard and from Elkhorn to Fox Lake during the morning peak period, and three outbound bus runs from Harvard to Delavan and from Fox Lake to Elkhorn during the afternoon peak period. There would also be a limited amount of service along these routes during the early afternoon and evening periods and on weekends.

EVALUATION OF ALTERNATIVES

Following consideration and screening of various physical, operational, and service options, a basic commuter rail and commuter bus alternative were evaluated with respect to cost and ridership. The commuter bus alternative included two routes. The first route would

extend a distance of about 30 miles from Elkhorn to Fox Lake, Illinois, primarily along USH 12. The second route would extend a distance of about 21 miles, primarily along STH 50, STH 67, and USH 14. This chapter has provided an evaluation for feasibility assessment of a proposed commuter rail service and commuter bus service in the Walworth-Fox Lake Corridor extending from the Village of Fox Lake to the Village of Walworth.

The principal findings concerning the commuter rail alternative are as follows:

- The capital cost of track and signal improvements necessary to provide a comfortable ride and acceptable operating speeds for commuter rail service between Walworth and Fox Lake was estimated to total about $51.5 million. These improvements include: overall rehabilitation and improvement of the main line, track, roadbed, and right-of-way; rehabilitation of street and highway grade crossings; and installation and upgrading of grade crossing signals. The capital cost of necessary bridge rehabilitation was estimated to total about $0.8 million and the cost to construct a new passing siding was estimated to be about $1.8 million.

- The total recommended cost of all track improvements has the potential to be reduced by several factors including: other track improvement projects that may be undertaken on the railway line between Walworth and Fox Lake; the potential for the entire mainline track not to require complete ballast replacement and/or undercutting; and the potential for the necessary work to be accomplished at somewhat lower costs due to lower labor, management and engineering, and overhead unit costs inherent to shortline and regional railroads as compared to major railroad companies.

- The capital cost of the required equipment was estimated to total about $8.0 million. To operate the Walworth-Fox Lake service, a total of four coaches would need to be procured in addition to the equipment already required by Metra for its Milwaukee District North Line service.

- The capital cost of passenger station facility improvements was estimated to total about $3.6 million. New facilities would need to be constructed at Walworth, Highway 120 (Lake Geneva and Zenda), Richmond, and Spring Grove-Solon.

- Appropriate facilities for overnight and mid-day storage, cleaning, and light servicing of equipment would need to be provided at terminals where trains begin and end their runs. These locations would include Chicago and Walworth. The capital cost of an equipment storage and servicing facility at Walworth was estimated to total about $3.5 million. The existing facilities already in place and used for this purpose at Chicago would continue to be so used with no significant improvements being necessary.

- The total cost of the necessary capital improvements under the basic Walworth-Fox Lake commuter rail alternative was estimated to be $69.3 million in year 2000 dollars.

- The number of trips that could be expected to be made on the potential commuter rail service during an average weekday in the year 2020 was forecast to be a total of 930 trips. Approximately 85 percent of the projected 930 trips may be expected to be made between stations on the potential new extension and the Union Station terminal in the Chicago central business district. About 370, or 40 per-ent of the trips on the proposed rail service may be expected to be generated at the potential new Wisconsin stations of Walworth and Highway 120. About 560, or 60 percent, of the trips on the service may be expected to be generated at the potential new Illinois stations of Richmond and Spring Grove-Solon Mills.

- The annual total operating cost of the potential commuter rail extension beyond the existing Fox Lake station was estimated to be about $3.1 million. The annual operating revenue of the service was estimated to be about $1.1 million. This would result in a net annual operating cost of almost $2.0 million.

The principal findings concerning the commuter bus alternative are as follows:

- The total capital cost for initiation of both commuter bus routes would be about $3.4 million. The principal capital cost is for passenger station facility improvements, as a private operator would be responsible for furnishing vehicles, maintenance services and facilities, and an over-night storage facility. In addition, no right-of-way, roadway, or signal improvements would be required, as the buses would operate over the public street and highway system. Improvement to

the 17 stations and stops along the two routes include: boarding platforms, access facilities meeting the requirements of the Federal Americans with Disabilities Act, buildings and shelter areas, parking for automobiles, drop-off and pick-up areas for passengers using connecting taxis and bus services, and certain station amenities. The number of trips that could be expected to be made on both of the proposed commuter bus routes during an average weekday in the year 2020 was forecast to be a total of 220 trips, with 90 percent of these expected to be made between stops on the bus routes and the Union Station terminal in the Chicago central business district. About 71 percent of the total trips could be expected to use the Elkhorn-Lake Geneva-Fox Lake route, and the remaining 29 percent, the Delavan-Walworth-Harvard route.

- The combined total annual operating cost of the proposed commuter bus routes was estimated to total about $552,000. The annual operating revenue of the service was estimated to total about $57,000. This would result in a net annual operating cost of about $495,000.

A comparison of selected characteristics for the proposed Walworth-Fox Lake commuter service alternatives was made between the alternatives and with other existing new-start and long-established commuter rail systems in the United States and with the existing bus transit systems in Southeastern Wisconsin. Of particular interest were the estimated ridership and the operating cost recovery rates for these systems since these measures provide an indication of long-term financial feasibility.

The commuter rail alternative may be expected to attract about four times the ridership than would a commuter bus alternative in the corridor. The commuter rail alternative would generate about 930 trips on an average weekday, or about 250,200 trips annually; and the commuter bus alternative would generate about 220 trips on an average weekday, or about 59,100 trips annually. For the commuter rail alternative average weekday boardings at the potential new stations in Wisconsin would range from 65 at Walworth to 120 at the Highway 120 station for Lake Geneva. These could be considered modest compared to weekday boardings at most Chicago-area Metra stations, very few of which experience weekday boardings of less than 200 passengers. The estimated operating cost recovery rate for the commuter rail alternative would be about 37 percent, or almost four times the estimated operating cost recovery rate for the commuter bus alternative of about 10 percent. For the commuter rail alternative to attract the estimated higher level of ridership, the annual operating cost could be expected to be about six times that for the bus alternative and the total capital cost could be expected to be up to 20 times that of the bus alternative.

The comparison with other systems indicated that the estimated operating cost recovery rate of about 37 percent for the commuter rail alternative compares favorably on an overall basis with other new-start commuter rail systems and many of the long-established commuter rail systems in the United States. With respect to existing bus transit systems in Southeastern Wisconsin, the comparison indicated that the estimated operating cost recovery rate of about 37 percent would be comparable to the recovery rate for the existing Kenosha-Racine-Milwaukee bus service, would be less than the recovery rate of the Milwaukee County Transit System, and would be greater than the recovery rates of the remaining transit systems. The operating cost recovery rate of about 10 percent for the commuter bus alternative is significantly less than that for all of the other commuter rail and bus transit systems.

How a commuter rail or bus alternative would be paid for, where the funding would come from, and what unit of government would provide such funding are issues that would need to be addressed as part of a subsequent detailed corridor analysis following completion of this feasibility study. Some of the overall implementation issues and funding considerations that would need to be assessed as part of preparing a practical and workable financial plan for sponsoring and financing such an improvement were identified:

- The question of funding or implementing an alternative will require cooperation among local governments since the potential services extend across local, county, and even state lines into a number of different jurisdictions. Since the implementation of these types of transit projects normally involve a sharing of the capital and operating costs among Federal, State, and local governments, the potential magnitude of such shares will be of particular importance, especially at the local level.

- An appropriate agency or unit of government, or perhaps a department of a unit of government, would be required to operate, manage, and fund such a service. To date, local units of government in the area are not set up to accommodate this, and the State of Wisconsin presently plays no role in the implementation, operation, or funding of

existing or potential commuter rail services. The State role could change in the future.

- There is presently no State transit or transportation program available that can be directly used for commuter rail projects. The financial aids already available for use as transit operating cost assistance are aggressively sought by existing urban and rural transit systems. This suggests that any required local operating subsidy and local share of capital improvement costs may need to be shared by the local units of government through which the potential service would operate. Some type of areawide transportation authority or multi-county transit district or agency may be appropriate, but these types of entities do not exist at this time for the Walworth County area.

- The service would extend into two different states. It should be noted that Metra may only initiate additional services within the six-county area of Northeastern Illinois. Any service expansion outside of Metra's normal territory—such as to and from Walworth County—could only occur at the initiation of an appropriate Wisconsin-based agency, unit of government, or other entity working in agreement with Metra and possibly other Northeastern Illinois agencies or units of government.

- There is the question of who would bear the responsibility for track and station improvements and train operations beyond the existing commuter rail terminal at Fox Lake. Metra currently has no plans for extending such service beyond Fox Lake, nor does it own the railroad line beyond Fox Lake. Ownership issues will need to be addressed. Cooperation and agreement between suitable Illinois and Wisconsin agencies would be critical.

- Capital costs required to construct and begin operation of a new service normally represent a one-time commitment, but may be substantial. Operating costs are an important consideration since they represent a recurring and annual commitment. It is likely that station and parking development costs for both the commuter rail and bus alternatives would be the responsibility of the community in which the station would be located. With respect to the other costs for the commuter rail alternative, it is possible that Illinois would participate in the capital costs up to and including the Richmond station. Wisconsin would then participate in the capital costs necessary to extend the service from Richmond to Walworth. Until discussions and negotiations have occurred, it is unknown how the costs would be shared, but it is likely they would be shared based on some combination of distance, mileage, and ridership. It also possible that since Metra currently has no plans to extend current service beyond Fox Lake, and since the rail line beyond Fox Lake to Walworth is already owned by Wisconsin entities, Wisconsin sources may be required to provide funding for the entire cost of the commuter rail extension beyond Fox Lake. With respect to the other costs for the bus alternative, Wisconsin sources would likely be responsible for funding the entire project. In any case, a local share of the project cost could be expected.

Following careful consideration of the material and study findings presented in this and previous chapters of the study report concerning the potential ridership, capital costs, and operating costs of operating commuter rail or bus service in the Walworth-Fox Lake corridor as an extension of the existing Metra commuter rail service to Fox Lake, the Advisory Committee reached several conclusions. With respect to potential bus service:

- Feeder bus service in the corridor would attract minimal ridership and would have a very low operating cost recovery rate, particularly when compared to existing bus systems within Southeastern Wisconsin and new-start and established commuter rail services.

- Feeder bus service in the corridor would have a very low level of cost-effectiveness.

- Therefore, the potential operation of feeder bus service in the corridor cannot be justified.

Based upon these conclusions, the Advisory Committee recommended that no further consideration of commuter bus service in the Walworth-Fox Lake corridor was warranted at this time.

With respect to the potential extension of commuter rail service:

- Extension of commuter rail service into the Walworth-Fox Lake corridor is physically feasible.

- Commuter rail service in the corridor would attract more ridership than would the bus alternative and could be expected to have an

operating cost recovery rate similar to other new-start and established commuter rail ser-vices in the United States.

- Ridership and the operating cost recovery rate on the potential extension could be expected to be significantly greater along the Illinois portion of the corridor than along the Wisconsin portion of the corridor. Ridership along the Wisconsin portion of the corridor would be modest, and the operating cost recovery rate would be somewhat low.

- Therefore, the full extension may be considered only marginally feasible on a cost-effectiveness basis and within the Wisconsin portion of the service, such feasibility is questionable.

Based upon these conclusions, the Advisory Committee recommended that implementation of commuter rail service should not be further pursued at this time. Rather, further planning and engineering work toward such service was recommended to be deferred until two conditions have been met. The first is for Metra to be actively planning for the extension of commuter rail service beyond Fox Lake to Richmond. The second is that State and local roles in Wisconsin with respect to implementing and sharing the costs of commuter rail have been clearly determined. Until these conditions are met, the Advisory Committee recommended that no further efforts be made in Wisconsin at this time. If and when it is decided that further steps toward implementation are appropriate, it was recommended that the work include consideration of staging an extension only to the Highway 120 station, and consideration of the prospects for reducing capital and operating costs that were identified in this feasibility study. In the meantime, it was recommended that concerned State and local officials continue to monitor any Metra and Amtrak activities that may impact upon the situation and consider the incremental enhancement of the existing Amtrak service in the corridor.

In drawing these conclusions and making the foregoing recommendations, the Advisory Committee recognized that other factors may also prompt revisiting the extension of commuter rail including: increasing traffic congestion; increases in the price of motor fuel; and changes in development and travel patterns, particularly any substantial increase in the number of people living in Walworth County and working in the Chicago central business district

The Advisory Committee requested that the Regional Planning Commission complete publication of the final report for this feasibility study phase, and subsequently transmit the completed feasibility study to the Wisconsin Department of Transportation and the local units of government involved.

APPENDICES

(This page intentionally left blank)

Appendix A

INVENTORY OF CROSSINGS ALONG POTENTIAL WALWORTH-FOX LAKE COMMUTER RAIL ROUTE: DECEMBER 1997

Milepost Location	Type of Crossing or Other Location	Station or Feature Name	Crossing Protection[a]	Number of Tracks
49.41	At-Grade	Grand Avenue	CB,FL,B,G	3
49.50	***Station***	***FOX LAKE***	--	--
49.70	At-Grade	Oak Street	CB,FL,B	1
49.80	Bridge	Nippersink Channel	--	1
50.02	Bridge	Fox River	--	1
50.19	At-Grade	Riverside Island Drive (Private)	CB,S	1
50.47	At-Grade	Lake Vista Terrace	CB,FL,B	1
50.97	At-Grade	State Park Road	CB,FL	1
51.40	At-Grade	Private Road	--	1
51.58	Bridge	Nippersink Creek	--	1
52.56	At-Grade	Wilmot Road	CB,FL,B	1
53.22	At-Grade	Private Farm Road	--	1
53.38	At-Grade	Private Road	--	1
53.59	At-Grade	Blivin Street	CB,FL,B	1
53.70	***Station***	***SPRING GROVE***	--	--
54.14	At-Grade	Winn Road	CB,FL	1
55.02	Bridge	Nippersink Creek	--	1
55.29	At-Grade	E. Solon Road	CB,FL,B	1
55.65	At-Grade	N. Solon Road	CB,FL,B	1
55.80	***Station***	***SOLON MILLS***	--	--
55.92	At-Grade	Private Farm Road	--	1
56.50	At-Grade	Private Farm Road	--	1
56.71	At-Grade	Kuhn Road	CB	1
57.10	Bridge	N. Branch of Nippersink Creek	--	1
57.35	Overpass	Main Street (USH 12 and STH 31)	--	1
57.37	Overpass	Metra R.O.W./Trail	--	1
58.35	Overpass	Private Road	--	1
58.72	At-Grade	Private Farm Road	--	1
58.96	Bridge	Unnamed Stream	--	1
59.17	At-Grade	Keystone Road	CB,FL	1
59.58	At-Grade	Private Farm Road	--	1
59.76	At-Grade	STH 173	CB,FL,B	1
59.90	***Station***	***BELDEN***	--	--
60.10	At-Grade	Private Farm Road	--	1
60.50	At-Grade	Private Farm Road	--	1
60.93	At-Grade	Private Farm Road	--	1

Appendix A (continued)

Milepost Location	Type of Crossing or Other Location	Station or Feature Name	Crossing Protection[a]	Number of Tracks
61.16	At-Grade	Private Farm Road	--	1
61.50	At-Grade	Lange Road	CB	1
61.75	***Former Station***	***Hebron Tower***	--	--
62.03	At-Grade	Private Farm Road	--	1
62.30	At-Grade	Private Farm Road	--	1
62.32	At-Grade	Seaman Road	CB	1
62.59	At-Grade	Private Farm Road	--	1
63.10	At-Grade	Private Farm Road	--	1
63.44	At-Grade	Private Farm Road	--	1
63.81	Bridge	North Branch of Nippersink Creek	--	1
63.91	Overpass	State Line Road	--	1
64.22	At-Grade	Private Farm Road	--	1
64.35	At-Grade	Private Farm Road	--	1
64.49	At-Grade	Armsby Road	CB	1
64.87	Subway	Private Farm Road	--	1
65.05	Overpass	STH 120	--	1
65.18	At-Grade	Private Farm Road	--	1
65.40	At-Grade	Private Farm Road	--	1
66.12	Underpass	Hillside Road	--	1
66.50	At-Grade	Private Farm Road	--	1
67.07	At-Grade	Private Farm Road	--	1
67.19	At-Grade	Zenda Road	CB	1
67.40	***Station***	***ZENDA***	--	--
67.41	At-Grade	Private Commercial Driveway	--	2
67.58	At-Grade	Private Commercial Driveway	--	1
67.83	At-Grade	Private Farm Road	--	1
68.26	At-Grade	Private Farm Road	--	1
68.71	At-Grade	Private Farm Road	--	1
69.05	At-Grade	Private Farm Road	--	1
69.50	At-Grade	Swamp Angel Road	CB	1
69.76	At-Grade	Private Farm Road	--	1
70.13	At-Grade	Private Farm Road	--	1
70.28	At-Grade	Linn-Walworth Townline Road	CB	1
70.81	At-Grade	Private Residential Driveway	S	1
71.34	At-Grade	Cobblestone Road	CB	1
71.73	At-Grade	School Road	CB	1

Appendix A (continued)

Milepost Location	Type of Crossing or Other Location	Station or Feature Name	Crossing Protection[a]	Number of Tracks
72.43	At-Grade	Kenosha Avenue (CTH B)	CB,FL,B	1
72.92	Overpass	Alpine Street (STH 67)	--	1
73.45	At-Grade	Private Pedestrian Crossing	None	1
73.46	***Former Station***	***Old Walworth Passenger Depot***	--	--
73.47	At-Grade	N. Main Street	CB,FL,B	1
73.50	***Station***	***WALWORTH***	--	--
73.62	At-Grade	USG Pedestrian Crossing	CB,FL,B	3
74.04	At-Grade	Private Crossing	--	2
74.13	At-Grade	Madison Street (USH 14)	CB,FL,B	1

[a]*Abbreviations Used:* FL – Flashing Lights G – Gates CB – Crossbucks B - Bell S– Stop or other Warning Sign

Source: SEWRPC.

(This page intentionally left blank)

Appendix B

LICENSE PLATE SURVEY OF WISCONSIN RESIDENTS USING THE MILWAUKEE DISTRICT NORTH AND UNION PACIFIC NORTHWEST COMMUTER RAIL LINES

To estimate the existing number of Wisconsin residents who use a nearby Metra commuter rail line, a one-day weekday survey of automobiles with Wisconsin license plates was conducted at Metra commuter rail park-ride lots. The survey included all park-ride lots at Lake and McHenry County stations along Metra's Milwaukee District North (Fox Lake-Chicago) and Union Pacific Northwest (Harvard-Chicago) commuter rail lines.

The results of this survey are summarized in Table B-1. An estimated 148 Wisconsin residents use these two Metra commuter rail routes on a typical weekday. Almost three-quarters of these used the Fox Lake-Chicago route and the remaining one-quarter used the Harvard-Chicago route. Most of these passengers used a commuter rail station closest to Wisconsin, which in most cases is also the station furthest from downtown Chicago. About 57 percent of the Wisconsin residents used the Fox Lake station; about 11 percent used the Harvard station; and about 8 percent used the Woodstock station. Less than 5 percent of the passengers used any of the remaining stations. Analysis of the home county for these passengers based on vehicle-garaging locations found that most of the Wisconsin passengers resided in either Walworth or Kenosha County. About 41 percent of these passengers resided in Walworth County; about 24 percent in Kenosha County; about 11 percent were from Racine County; about 11 percent from other Southeastern Wisconsin counties, those predominately being Milwaukee and Waukesha Counties; and the remaining 13 percent from various Wisconsin counties outside Southeastern Wisconsin. The home locations within Kenosha, Racine and Walworth Counties of Wisconsin residents who use Metra's Fox Lake-Chicago and Harvard-Chicago commuter rail lines, and the stations used by those passengers, are shown on Maps B-1 and B-2, respectively. Map B-3 shows the home location of all Wisconsin residents who use either one of these two commuter rail routes.

A review of this data suggests that Wisconsin residents who commute to Chicago do not necessarily drive to the nearest Metra commuter rail station.

- Passengers may be expected to board the stations with more frequent peak period as well as nonpeak period service. For example, the Fox Lake-Chicago line has frequent peak period service as well as hourly midday and evening service. This has resulted in the Fox Lake station being a popular station for Wisconsin passengers because of the wide variety of train schedules available. On the other hand, the Harvard, McHenry, and Woodstock stations have fewer peak period and nonpeak period trains and are, therefore, used by fewer Wisconsin passengers.

- Passengers may also be expected to use stations where parking is more readily available. Because the Fox Lake station is popular, its park-ride lots fill up quickly during peak periods. This causes some passengers to drive to other commuter rail stations—such as Ingleside or Grayslake—where parking spaces are more readily available. In some cases, passengers driving from Wisconsin may choose a station—such as Lake Forest or Lake Cook Rd.—because of those stations' proximity to a convenient freeway or tollway exit. It should be noted that Wisconsin residents' choice of stations might also be guided by local parking restrictions. Some commuter rail station park-ride lots are restricted to use only by residents of the community in which the station is located.

- Passengers may also be expected to choose a commuter rail station based on the specific downtown Chicago terminal used by a specific commuter rail route. For example, trains on the Fox Lake-Chicago route arrive at Chicago Union Station, while trains on the Harvard-Chicago route arrive at the

Table B-1

ESTIMATED NUMBER OF WISCONSIN RESIDENTS BOARDING WEEKDAY METRA COMMUTER TRAINS BY EXISTING SELECTED ROUTES AND STATIONS: 1998

Routes and Stations Used	County of Residence					Total
	Within Southeastern Wisconsin				Outside Southeastern Wisconsin	
	Walworth	Kenosha	Racine	Other		
Milwaukee District North Line (Fox Lake-Chicago)						
Fox Lake	38	29	9	5	4	85
Ingleside	-	2	--	1	1	4
Long Lake	-	--	1	--	1	2
Round Lake	--	--	--	--	--	--
Grayslake	1	2	1	--	1	5
Libertyville	--	--	--	2	--	2
Lake Forest	1	1	1	4	--	7
Deerfield	--	--	--	--	--	--
Lake Cook Rd.	--	--	1	--	3	4
Union Pacific Northwest Line (Harvard-Chicago)						
Harvard	12	--	--	1	4	17
Woodstock	7	--	--	2	3	12
McHenry	1	1	1	1	1	5
Crystal Lake	--	--	--	1	1	2
Cary	--	1	1	--	--	2
Fox River Grove	--	--	--	--	--	--
Barrington	--	--	1	--	--	1
Total	60	36	16	17	19	148

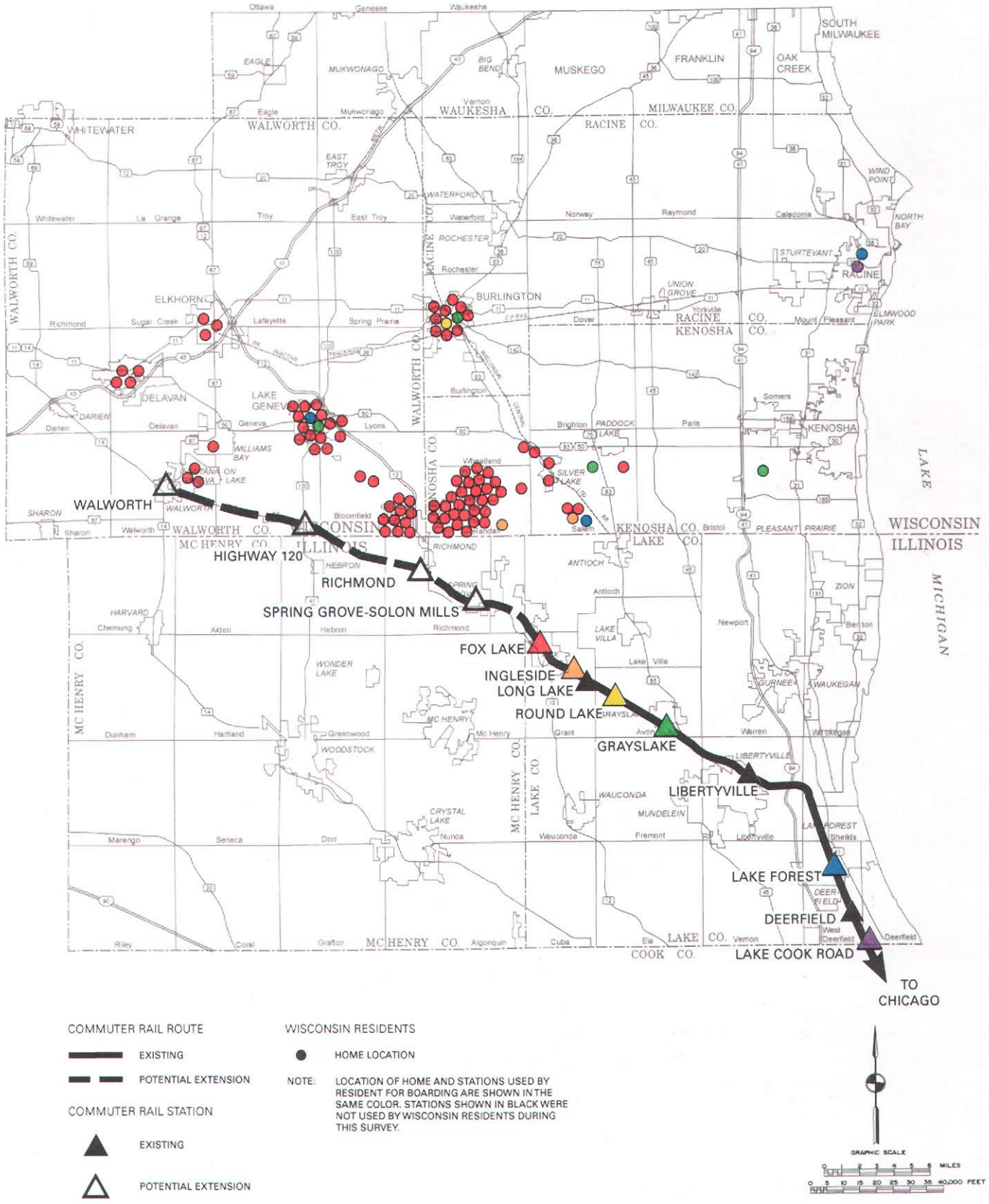
Source: SEWRPC.

Chicago Passenger Terminal (former North Western Station). In many instances, Chicago area commuters will choose a commuter rail route based on the proximity of the downtown terminal for that route to their place of work or other destination.

- Passengers may also choose a station based on other travel requirements for a particular day. In some cases, a passenger may choose what appears to be an out-of-the-way station because of business that needs to be conducted later in the day. For example, a passenger from Kenosha may board a commuter train at a station such as Cary to travel to downtown Chicago. When that person returns by train to Cary, he or she may have business in some community west or north of Cary and will be conveniently positioned to drive there as quick as possible.

Map B-1

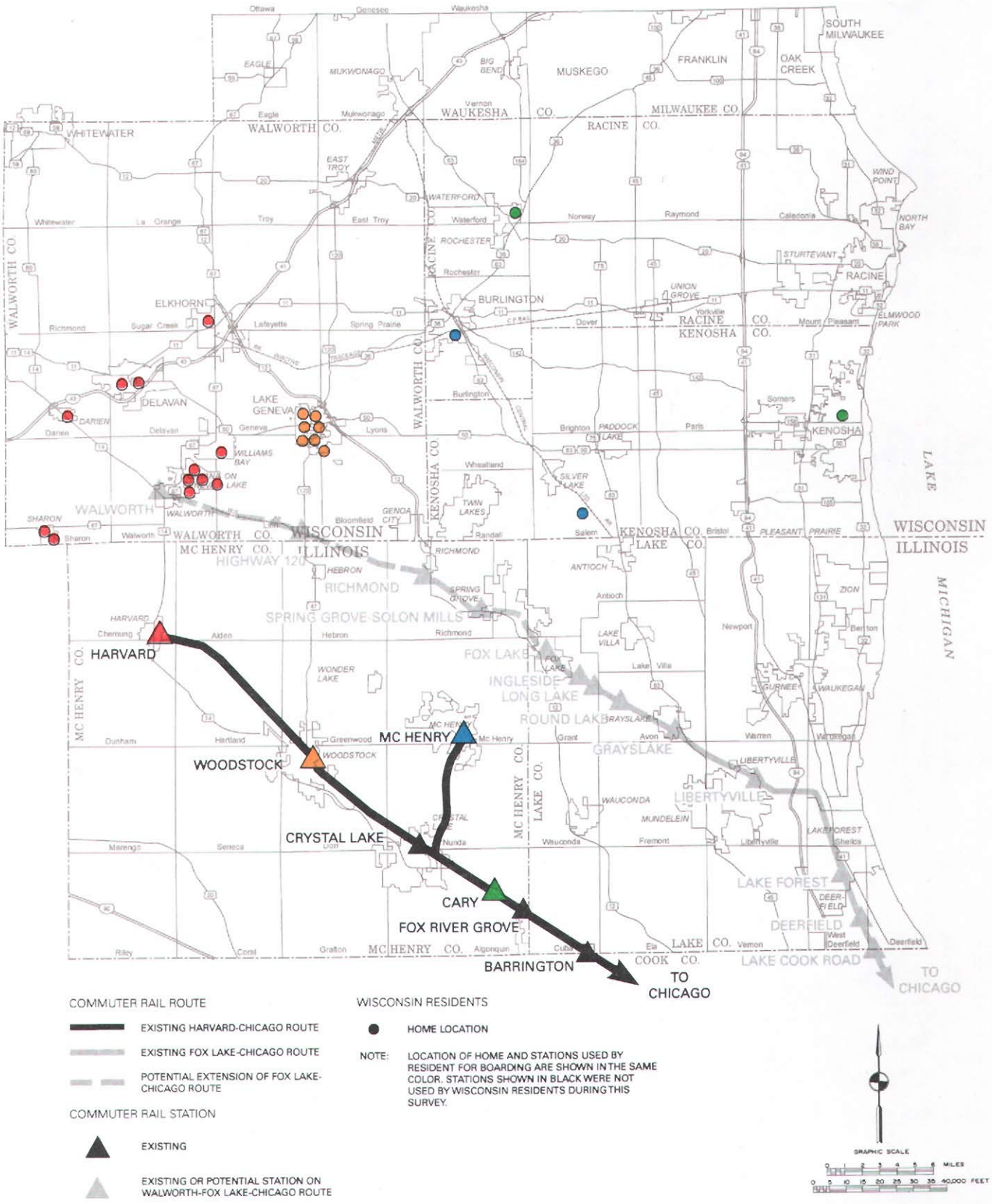
HOME LOCATION OF WISCONSIN RESIDENTS USING METRA'S FOX LAKE-CHICAGO COMMUTER RAIL LINE BY BOARDING STATION IN ILLINOIS ON A TYPICAL WEEKDAY: 1998



Source: SEWRPC.

Map B-2

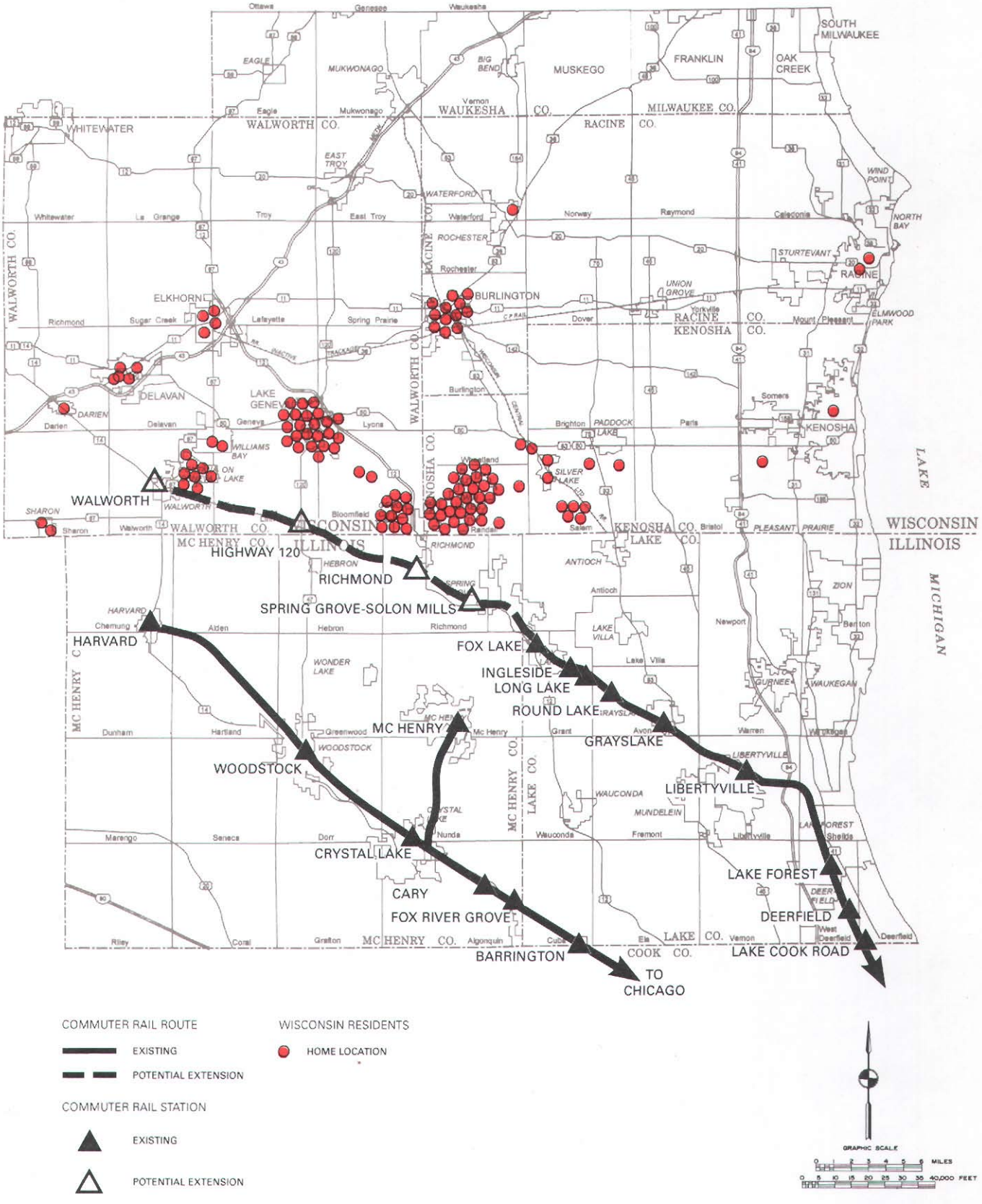
HOME LOCATION OF WISCONSIN RESIDENTS USING METRA'S HARVARD-CHICAGO COMMUTER RAIL LINE BY BOARDING STATION IN ILLINOIS ON A TYPICAL WEEKDAY: 1998



Source: SEWRPC.

Map B-3

HOME LOCATION OF WISCONSIN RESIDENTS USING METRA'S FOX LAKE-CHICAGO OR HARVARD-CHICAGO COMMUTER RAIL LINES ON A TYPICAL WEEKDAY: 1998



Source: SEWRPC.