

A CENTRAL TRANSFER SITE LOCATION AND DESIGN ANALYSIS FOR THE CITY OF WAUKESHA TRANSIT SYSTEM

CITY OF WAUKESHA OFFICIALS

Mayor

Paul J. Keenan

Members of the Common Council

Jan Bacskai
Charles K. Betker
George C. Dahms
Robert J. Foley, Sr.
Richard J. Hernandez
Lyal R. Lauersdorf
Ralph M. North, III
Thomas F. Owens

George K. Pantelis
Robert T. Price
Paul J. Pronold
Francis I. Vaughan
Simon Vitale
Ann W. Weiss
Geraldine H. Wuerslin

Waukesha Transit System Utility Board

Rodney W. VandenNoven
Chairman
William D. Dick

George W. Lawler
John I. Levenhagen
Thomas F. Owens

**SOUTHEASTERN WISCONSIN
REGIONAL PLANNING COMMISSION**

KENOSHA COUNTY

Leon T. Dreger
Donald E. Mayew
Francis J. Pitts

RACINE COUNTY

Raymond J. Moyer
Earl G. Skagen
Michael W. Wells

MILWAUKEE COUNTY

Irene M. Brown
Richard W. Cutler,
Secretary
Harout O. Sanasarian,
Vice-Chairman

WALWORTH COUNTY

John D. Ames
Anthony F. Balestrieri
Allen L. Morrison

OZAUKEE COUNTY

Allen F. Bruederle
Thomas H. Buestrin
Alfred G. Raetz,
Chairman

WASHINGTON COUNTY

Harold F. Ryan
Thomas J. Sackett
Frank F. Uttech

WAUKESHA COUNTY

Robert F. Hamilton
William D. Rogan,
Treasurer
Paul G. Vrakas

Kurt W. Bauer
Executive Director

**WAUKESHA MASS TRANSIT CITIZENS AND
TECHNICAL COORDINATING AND ADVISORY COMMITTEE**

Edward J. Stoltz Citizen Member
Chairman
David R. Markiewicz Citizen Member
Vice-Chairman
Paul Dybvad Administrator, Waukesha
Unified School District
Robert J. Foley, Sr. Alderman, City of Waukesha
Armand C. Garcia Citizen Member
John A. Inzeo Member, Waukesha Unified
School District Board
Paul J. Keenan Mayor, City of Waukesha
Mildred Kipp Citizen Member
Richard S. Nettum Executive Vice-President,
Waukesha Chamber of Commerce
Michael L. Thaller Citizen Member
Karen White President, Little Swiss
Clock Shop, Inc.
Geraldine H. Wuerslin Alderman, City of Waukesha

**COMMUNITY ASSISTANCE PLANNING REPORT
NUMBER 82**

**A CENTRAL TRANSFER SITE LOCATION AND DESIGN ANALYSIS
FOR THE CITY OF WAUKESHA TRANSIT SYSTEM**

City of Waukesha, Wisconsin

Prepared by the

**Southeastern Wisconsin Regional Planning Commission
P. O. Box 769
Old Courthouse
916 N. East Avenue
Waukesha, Wisconsin 53187**

The preparation of this report was financed in part through a planning grant from the U. S. Department of Transportation, Urban Mass Transportation Administration.

December 1982

**Inside Region \$2.50
Outside Region \$5.00**

(This page intentionally left blank)

SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION

916 NO. EAST AVENUE

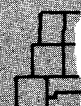
• P.O. BOX 769

• WAUKESHA, WISCONSIN 53187

• TELEPHONE (414) 547-6721

Serving the Counties of:

KENOSHA
MILWAUKEE
OZAUKEE
RACINE
WALWORTH
WASHINGTON
WAUKESHA



December 24, 1982

Mr. Rodney W. VandenNoven, Chairman
Waukesha Transit System Utility Board
Waukesha City Hall
201 Delafield Street
Waukesha, Wisconsin 53186

Dear Mr. VandenNoven:

In January 1982, the City of Waukesha requested the assistance of the Southeastern Wisconsin Regional Planning Commission in the selection of a suitable site for a central transit passenger transfer facility in downtown Waukesha. The site selection and related site development analysis was to be conducted under the guidance of the Waukesha Mass Transit Citizens and Technical Coordinating and Advisory Committee, a committee composed of elected and appointed public officials, businessmen, and concerned citizens, created to assist the City in transit system planning and development.

The necessary study was carried out in calendar year 1982, and this report presents the findings and recommendations of that study. More specifically, the report presents a set of central transit passenger transfer site location and design criteria formulated under the study; the findings of an inventory of alternative sites, including for each alternative site considered, data on site size and ability to accommodate the intended use, site configuration and expansion capabilities, land use and zoning of the site and environs, site ingress and egress, visual exposure and linkage to downtown, site microclimate and lighting, parking considerations, air and noise pollution considerations, and relation to downtown redevelopment proposals; the results of an evaluation of the alternative sites, including a ranking of the sites considered on the basis of suitability for the proposed use; and alternative and recommended site development plans for the recommended site, together with an estimate of site acquisition and development costs.

Twelve alternative sites, including the present transfer center site were considered under the study. The inventory, analysis, and evaluation of these sites indicated that two of the 12 sites were of insufficient size to accommodate the transfer facility, and that each of the remaining 10 sites had certain disadvantages as well as advantages. Based upon careful consideration of these advantages and disadvantages the Advisory Committee determined that the best of the 10 sites of sufficient size was the Fox River parking lot site. The advantages of this site included its location in the downtown area; compatibility with neighboring land uses; visual exposure; site size, shape orientation and expansion potential; and the limited conflicts presented with pedestrian and vehicular traffic flow. The sole disadvantage of the site was that its use as a transit passenger transfer facility would require the taking of about 50 automobile parking spaces. Of these 50 spaces, however, 16 would be replaced by the abandonment of the existing transfer facility site. The recommended site and its improvement as envisioned herein would provide the City of Waukesha with a well-located, attractive central transit passenger transfer facility—a facility which could be developed at a reasonable cost, and which would not only provide for the convenient transfer of passengers between local transit lines, but between the local transit lines and commuter and intercity lines.

The Regional Planning Commission is appreciative of the assistance and support given to the study by the Waukesha Transit System Utility Board, the Waukesha Department of Public Works, and the City Transit Coordinator. The Commission staff stands ready to assist the City of Waukesha in presenting the information and recommendations contained in this report to the public for its review and evaluation.

Sincerely,

Kurt W. Bauer
Executive Director

(This page intentionally left blank)

TABLE OF CONTENTS

	Page
CHAPTER I - INTRODUCTION.....	1
Background.....	1
Study Purpose.....	2
Study Organization.....	3
Format of Report Presentation.....	3
CHAPTER II - CENTRAL TRANSFER SITE SPATIAL AND LOCATIONAL REQUIREMENTS AND SITE PLANNING DESIGN CRITERIA.....	5
Introduction.....	5
Bus Geometrics and Specifications.....	5
Bus Turning Radius Site Planning Design Criteria.....	5
Transfer Site Locational Criteria.....	6
Proximity to Passenger Destinations.....	6
Traffic Conflicts.....	6
Site Size and Configuration.....	8
Compatibility with Neighboring Uses.....	8
Elimination of Vehicular Parking Spaces.....	8
Visual Exposure, Identity, and Linkage of the Transfer Site with Downtown Development.....	8
Bus Transfer Site Response to Downtown Area Microclimate.....	8
Summer Winds.....	8
Winter Winds.....	8
Sun Control and Sun Protection.....	8
Precipitation.....	8
Noise and Air Pollution Effects on Neighboring Uses.....	9
Zoning	9
Current Downtown Revitalization Plans.....	9
Current Regional Public Transit Plans.....	10
Bus Berthing Lanes.....	10
Type	10
Marking.....	10
Width	10
Access from Private Drives.....	10
Deliveries and Bus Berthing Lanes.....	10
Bus Berthing and Recessed Bus Bay Design Criteria.....	10
Size of Bus Berthing Area.....	10
Recessed Bus Bays.....	10
Types.....	10
Pavement Design.....	11
Shallow Saw-Tooth Bus Bay.....	11
Design.....	11
Loading Platforms.....	11
In-Line Platform Bus Bay.....	11
Design.....	11
Passenger and Pedestrian Requirements.....	11
Convenience.....	11
Safety	13
Curbs	13
Passenger Spatial Requirements.....	13

	Page
Pedestrian Spatial Requirements.....	13
Provision of Landscaping and Street Furniture.....	13
Bus Shelter Design Criteria.....	14
Visibility.....	14
Accessibility.....	14
Appearance.....	14
Capacity.....	14
Amenities.....	15
Security.....	15
Maintenance.....	15
Site Lighting Criteria.....	15
Accessibility to the Handicapped.....	15
Summary and Conclusions.....	16
 CHAPTER III - INVENTORY AND ANALYSIS OF ALTERNATIVE TRANSIT SYSTEM CENTRAL TRANSFER SITES.....	 17
Introduction.....	17
Alternative Site Identification.....	17
Site Inventory Procedure.....	19
Site Evaluative Measures.....	19
The Alternative Bus Transfer Sites.....	33
Site A: The "Five Points".....	33
Site B: Main Street Central.....	34
Site C: Main Street West.....	35
Site D: Main Street East.....	35
Site E: Broadway Parking Lot.....	36
Site F: Barstow Street Parking Lot.....	37
Site G: Madison Street Parking Lot.....	38
Site H: E. St. Paul Avenue.....	38
Site I: Corrina Boulevard.....	39
Site J: Wisconsin Avenue.....	40
Site K: Martin Street.....	41
Site L: River Parking Lot.....	41
Existing Local and Regional Plans.....	42
Local Downtown Plans.....	42
Regional Plans.....	44
Existing Zoning in Downtown Waukesha.....	44
 CHAPTER IV - ALTERNATIVE CENTRAL TRANSFER SITE EVALUATIONS.....	 47
Introduction.....	47
Advisory Committee Recommendation.....	48
 CHAPTER V - THE RECOMMENDED TRANSIT SYSTEM CENTRAL TRANSFER SITE DEVELOPMENT PLAN AND BUDGET ESTIMATE.....	 53
Introduction.....	53
Site Development Design Concepts for the Preliminary Recommended Site.....	53
The Alternative Staged Site and Landscape Development Plans.....	55
Site Circulation.....	61
Spatial Considerations.....	62

	Page
Floodplain Considerations.....	63
Landscaping.....	63
Site Furnishings.....	64
Site Access.....	64
Existing Site Ingress.....	65
Existing Egress.....	65
Downtown Plans and Impact on Site Ingress and Egress.....	66
Ingress/Egress Conclusions.....	66
Recent Costs of Similar Transfer and Ticket Facility Building Types.....	67
Site Development Budget Estimate Analysis.....	67
Committee Recommendation of a Site and Landscape Development Plan.....	70
 CHAPTER VI - SUMMARY AND CONCLUSIONS.....	 73
Introduction.....	73
Study Purpose.....	74
Conduct of Study.....	74
Central Transfer Site Spatial and Locational Requirements and Site Planning Design Criteria.....	 75
Inventory and Analysis of Alternative Transit System Central Transfer Sites.....	 75
The Alternative Sites.....	75
Alternative Site Analysis.....	76
Site Evaluation.....	77
Evaluation Measures.....	77
Evaluation Process.....	77
Advisory Committee Recommendations for Site Location.....	78
Description of Site L--The River Parking Lot.....	78
Site Development Design Concepts for the River Parking Lot (Site L).....	79
The Alternative Staged Site and Landscape Development Plans.....	80
Site Circulation.....	80
Spatial Considerations.....	81
Landscaping.....	81
Site Furnishings.....	81
Site Access.....	82
Site Development Budget Estimate.....	82
Committee Recommendation of a Site and Landscape Development Plan.....	83

LIST OF APPENDICES

Appendix	Page
A Waukesha Mass Transit Citizens and Technical Coordinating and Advisory Committee.....	 87
B Existing Lighting Levels of the Alternative Central Bus Transfer Sites: July 1982.....	 89
C Detailed Budget Estimate Analysis.....	91
Table C-1 Alternative Site Plan A: Total Budget Estimate Analysis Breakdown for the Central Bus Transfer Site Proposed Demolition and Improvements at Site L (The River Parking Lot).....	 91

Table C-2	Alternative Site Plan B: Total Budget Estimate Analysis Breakdown for the Central Bus Transfer Site Proposed Demolition and Improvements at Site L (The River Parking Lot).....	92
Table C-3	Alternative Site Plan C and the Recommended Site Plan: Total Budget Estimate Analysis Breakdown for the Central Bus Transfer Site Proposed Demolition and Improvements at Site L (The River Parking Lot).....	93

LIST OF TABLES

Table		Page
	Chapter II	
1	Specifications for Transfer Site Design Buses.....	6
	Chapter IV	
2	Comparative Central Bus Transfer Site Evaluation Measures.....	48
3	Comparative Central Bus Transfer Site Evaluation for Alternative Sites.....	49
4	Rank Order Listing of the Alternative Central Bus Transfer Sites Based Upon Site Evaluation.....	52
	Chapter V	
5	Recent Costs of Similar Building Types in the Midwest and Region: May 1981 to October 1981.....	68
6	Budget Estimate Analysis for the Recommended Transit System Central Transfer Site.....	68

LIST OF FIGURES

Figure		Page
	Chapter II	
1	Bus Turning Radius Site Planning Criteria.....	7
2	The Effects of Landscape Plantings on Air Temperature and Passenger and Pedestrian Comfort at the Bus Transfer Site.....	9
3	Recessed Bus Bay Design Criteria for Bays Parallel and Contiguous to Street Rights-of-Way.....	11
4	Recommended Roadway Widths and Bus Bay Lengths at Selected Pull-Out and Tail-Out Distances for 35-Foot and 40-Foot Buses.....	12
5	Shallow Saw-Tooth Platform Bus Bay Design Criteria.....	12
6	In-Line Platform Bus Bay Design Criteria.....	13

7	Minimum Design Criteria for Passenger Waiting Area at Bus Transfer Site.....	14
---	---	----

Chapter III

8	Site A: The Existing Central Bus Transfer Site Located on the North Side of W. Main Street Between Broadway and Gaspar Street and on the North Side of Broadway Between Clinton Street and W. Main Street.....	20
9	Site B: The North Side of W. Main Street from Broadway to N. Barstow Street.....	21
10	Site C: The North Side of W. Main Street from N. West Avenue to Clinton Street.....	22
11	Site D: The North Side of W. Main Street from N. Barstow Street to N. East Avenue.....	23
12	Site E: Municipal Parking Lot No. 3 Located at the Intersection of W. Broadway, Bank, and Clinton Streets.....	24
13	Site F: Municipal Parking Lot No. 5 Located Between N. Barstow Street and Martin Street South of W. Main Street.....	25
14	Site G: Municipal Parking Lot No. 12 Located on the Southwest Side of Madison Street South of Intersection of E. St. Paul Avenue and Madison Street.....	26
15	Site H: The Southeast Side of E. St. Paul Avenue Between Madison Street and Northwest Barstow Street.....	27
16	Site I: The Northwest Side of Corrina Boulevard Between N. Barstow Street and Buckley Street.....	28
17	Site J: The South Side of Wisconsin Avenue Between Maple Street and N. Grand Avenue.....	29
18	Site K: The West Side of Martin Street Between W. Main Street and South Street.....	30
19	Site L: Municipal Parking Lot Located Between W. Broadway and N. Barstow Street North of W. Main Street.....	31

Chapter V

20	Site Development Design Concepts for the Preliminary Recommended Central Bus Transfer Site.....	54
21	Alternative Site and Landscape Development Plan A for the Central Bus Transfer Site.....	56
22	Alternative Site and Landscape Development Plan B for the Central Bus Transfer Site.....	57
23	Alternative Site and Landscape Development Plan C for the Central Bus Transfer Site.....	58
24	Alternative Site and Landscape Development Plans A and B for the Central Bus Transfer Site: Section A-A.....	59
25	Alternative Site and Landscape Development Plan A for the Central Bus Transfer Site: Section B-B.....	59
26	Alternative Site Development Plans for the West and East Ends of the Preliminary Recommended Central Bus Transfer Site.....	60
27	Recommended Site and Landscape Development Plan for the Central Bus Transfer Site.....	71

LIST OF MAPS

Map

Page

Chapter III

1	Location of Alternative Central Bus Transfer Sites in the City of Waukesha Downtown.....	18
2	Downtown Design Framework Plan for Tax Incremental Financing District No. 2 in the City of Waukesha.....	43
3	Existing Zoning in the City of Waukesha Downtown: 1982.....	45

Chapter I

INTRODUCTION

BACKGROUND

In July 1979, at the request of the Common Council of the City of Waukesha, former Mayor Joseph C. LaPorte reactivated the Waukesha Mass Transit Citizens and Technical Coordinating and Advisory Committee and charged that Committee with the task of determining if increased motor fuel costs and the likelihood for future fuel shortages had had any impact on the need and support for the provision of public transportation in the Waukesha area. The Advisory Committee had originally been created in January 1975, and worked with the Southeastern Wisconsin Regional Planning Commission during 1975 and 1976 in the preparation of a report setting forth a transit development program for the Waukesha area, which report recommended the development of a demand-responsive transit service for the City of Waukesha and environs.¹ The recommendations set forth in that report were rejected by a two-to-one margin by the Waukesha electorate in a citywide referendum in April 1977, the vote being 2,236 in favor to 4,053 opposed.

Upon its reactivation by the Mayor in 1979, the Advisory Committee again requested the assistance of the Regional Planning Commission in the review and revision of the transit development program initially prepared by the Advisory Committee. Working with the Commission staff, the Committee completed work in February 1980 on a new report setting forth a revised transit development program for the City of Waukesha. The report, SEWRPC Community Assistance Planning Report No. 31, Waukesha Area Transit Development Program: 1981-1985, documented the Committee's revised recommendations for the reestablishment of public transit service in the City of Waukesha.

The revised plan recommended by the Committee was selected from among six alternative transit service options, including a "do nothing" alternative; three fixed route, cycle scheduled alternatives differing from one another only with respect to the number of routes to be provided; a fixed route, non-cycle scheduled alternative featuring loop routing; and a demand-responsive "dial-a-ride" alternative. This last alternative was similar in nature to the recommended transit development plan set forth in 1976 in the initial report noted above and rejected by the city residents. The transit system recommended by the Committee under the new plan consisted of nine radial fixed routes originating at the outer limits of the City of Waukesha and terminating at a common bus transfer point located in the Waukesha central business district. Put to a citywide referendum on April 1, 1980, the Committee's recommendations were approved by 69 percent of the City of Waukesha electorate--a 9,208 to 4,095 vote--and adopted on May 6, 1980, by the Waukesha Common Council.

An important recommendation of the revised transit development program was that the proposed fixed route bus service be operated using cycle or "pulse" type scheduling. Pulse scheduling requires that the vehicles used to provide transit

¹See SEWRPC Community Assistance Planning Report No. 12, Waukesha Area Transit Development Program: 1977-1981, January 1977.

service over each bus route meet at a common point at regular intervals during the hours of service, thus optimizing the potential for, and ease of, transfer between routes. As an outgrowth of the use of this scheduling technique, a transfer site within the Waukesha central business district adequate to accommodate the vehicles from all routes at the same time was required.

The revised transit development program recognized that long-range recommendations should be prepared for the development of such a bus transfer site which further considered the need to effect convenient transfers between the various forms of transit service currently provided within or planned for the greater Waukesha area. However, in order to facilitate the initiation of transit service by 1981, as recommended, a location for a transfer site was identified which would serve this purpose on an interim basis until a permanent transfer site could be located and designed. Following the analysis of several potential sites within the Waukesha central business district for suitability as the central transfer area, the transit development program recommended that Gaspar Street between W. Main Street and Park Street be used as the interim central transfer area.

In the process of carrying out the plan for initiation of transit service, the Gaspar Street location was rejected by the Waukesha Transit System Utility Board for several reasons, including insufficient size to accommodate the buses leased for initial system operation, complaints voiced by residents of a retirement home located at the corner of Gaspar Street and Park Street concerning the harmful effects of the exhaust emissions which would be generated in the transfer area, and the planned reconstruction of Gaspar Street during the fall of 1981. Accordingly, transit service was initiated by the City on August 31, 1981, using the north sides of W. Main Street and W. Broadway between Gaspar Street and Clinton Street as the central transfer area.

Objections by some members of the downtown business community over use of this location were voiced subsequent to the initiation of transit service. The objections were based upon the loss of on-street parking spaces on both streets and the exhaust emissions of the diesel buses idling at the location. It was also noted that use of this location for the central transfer area did not conform to the city's preliminary plans for redevelopment of the downtown area. Local officials concerned with these issues suggested several alternative locations for the central transfer area. The City of Waukesha subsequently requested assistance from the Wisconsin Department of Transportation and the Southeastern Wisconsin Regional Planning Commission for the conduct of a technical study which would address this problem. Accordingly, this technical report sets forth the findings and recommendations of analyses of 12 alternative locations for a central transfer site for the City of Waukesha transit system.

STUDY PURPOSE

This central transfer site analysis has four interrelated purposes:

1. To establish spatial and locational requirements and site planning design criteria through which the alternative central transfer site locations can be evaluated;

2. To comparatively evaluate the alternative locations for a transit system central transfer site;
3. To recommend, from the 12 alternative sites evaluated, a transit system central transfer site; and
4. To develop alternative detailed site plan design sketches for the recommended transit system central transfer site.

STUDY ORGANIZATION

The conduct of the central transit site location and design analysis was a joint effort by the staffs of the City of Waukesha and the Southeastern Wisconsin Regional Planning Commission. Additional staff assistance was obtained, as needed, from certain other agencies concerned with transit development in the Waukesha area, including the Wisconsin Department of Transportation.

To provide guidance to the technical staff in the conduct of the transit system central transfer site location analysis and design development, and to actively involve concerned and affected public officials and agency leaders in the selection of a central transfer site location, Mayor Paul J. Keenan of the City of Waukesha reactivated, in July 1982, the Waukesha Mass Transit Citizens and Technical Coordinating and Advisory Committee. The purpose of the Committee, which had not met since completing its work on the revised transit development program in 1980, was to assist in the conduct of the study by providing a critical review of all staff work. A complete list of the Committee membership is set forth in Appendix A of this report.

FORMAT OF REPORT PRESENTATION

This planning report consists of six chapters. Chapter I, "Introduction," briefly discusses the actions that led to the conduct of the central transfer site location analysis and design development, the intended purpose of the study, and the organization of the study. Chapter II, "Central Transfer Site Spatial and Locational Requirements and Site Planning Design Criteria," sets forth a set of noneconomic criteria proposed to be used in evaluating alternative central transfer site locations, selecting a recommended site, and in developing detailed site plan development sketches for the recommended site(s). Chapter III, "Inventory and Analysis of Alternative Transit System Central Transfer Sites," identifies each alternative site and includes descriptions of each site, identifying the salient site characteristics to be examined and analyzed. Chapter IV, "Alternative Central Transfer Site Evaluations," documents the results of the alternative evaluations of each alternative site, and presents a ranking of the alternative sites based, in part, upon the criteria presented in Chapter II, as well as the projected costs for acquisition, demolition, and development of each site. Chapter V, "The Recommended Transit System Central Transfer Site Development Plan and Budget Estimate," presents recommendations for the location, site plan design development, and budget estimates of a central transfer site for the Waukesha transit system, based upon the evaluation of alternative sites and the reactions of the Advisory Committee guiding the technical study. Finally, Chapter VI, "Summary and Conclusions," provides a summary of the significant findings and recommendations of the central transfer site location and site plan design study.

(This page intentionally left blank)

Chapter II

CENTRAL TRANSFER SITE SPATIAL AND LOCATIONAL REQUIREMENTS AND SITE PLANNING DESIGN CRITERIA

INTRODUCTION

In order to rationally locate and configure a site for the City of Waukesha transit system central transfer terminal, certain spatial, locational, and site planning design criteria of a high level of specificity must first be established. Taken together these criteria should define all of the characteristics which the transfer terminal site should possess in order for the site to properly perform its intended function. These criteria can then be applied to develop and evaluate alternative sites and site plans for the transfer terminal. In this chapter the necessary criteria are presented including criteria related to site location; bus performance specifications, including turning radii; bus lane, berthing, and recessed bus bay dimensions and capacities; pedestrian and user requirements; bus shelter design criteria; and site lighting criteria.

BUS GEOMETRICS AND SPECIFICATIONS

The transfer site should be designed to accommodate buses of the size and type expected to be operated by the local transit system. Consideration should also be made in the planning and design process for accommodation of the buses of the intercity and commuter bus operators serving the Waukesha area. Buses currently operated by the City of Waukesha consist of 35-foot urban transit motor coaches which are older surplus equipment leased from other transit properties. The City plans to replace these vehicles with new 35-foot urban transit motor coaches in the near future. Inasmuch as such vehicles are currently available from several manufacturers and no specific manufacturer or model has been selected at this time, the bus performance criteria or specifications related to the transfer terminal design represent controlling specifications for all 35-foot vehicle models from which the City may select vehicles for a future bus fleet, and 40-foot vehicle models currently operated by intercity bus companies. The bus specifications used are set forth in Table 1.

BUS TURNING RADIUS SITE PLANNING DESIGN CRITERIA

In areas where buses make right turns, it is desirable to increase the street curb radii to permit buses to turn without swinging out into adjacent traffic lanes or impacting against the curb. Consequently, a simple curve should be provided as shown in Figure 1. Such curb radii significantly reduce street corner sidewalk space and, therefore, may not be feasible where pedestrian volumes are heavy or where existing sidewalk space is limited.

Table 1

SPECIFICATIONS FOR TRANSFER SITE DESIGN BUSES

Specification	Measurement	
	Urban Coach	Intercity Coach
Bus Dimensions		
Length.....	35 feet	39' - 11 1/2"
Width.....	7' - 11 3/4"	8 feet
Height.....	9' - 11"	10' - 10"
Bus Turning Radius		
To Front Body Corner.....	37.08 feet	50.58 feet
To Front Wheel.....	32.17 feet	47.50 feet
Wheelbase.....	19' - 7"	23' - 9"
Seating Capacity.....	45 persons	47 persons
Step Height		
Front Door (ground to first step).....	13.5 inches	N/A
Back Door (ground to first step).....	15.7 inches	N/A
Bus Weight (empty)		
Front Axle.....	5,330 pounds	N/A
Rear Axle.....	14,095 pounds	N/A
Total	19,425 pounds	26,900 pounds
Bus Weight (with passengers)		
Seated.....	26,325 pounds ^a	33,950 pounds ^a
Standing.....	29,775 pounds ^b	--

NOTE: N/A indicates data not available.

^a Assumes full seated load plus driver at 150 pounds per person.

^b Assumes 150 percent of seated load.

Source: Waukesha Metro Transit, Wisconsin Coach Lines, Inc., and SEWRPC.

TRANSFER SITE LOCATIONAL CRITERIA

Proximity to Passenger Destinations

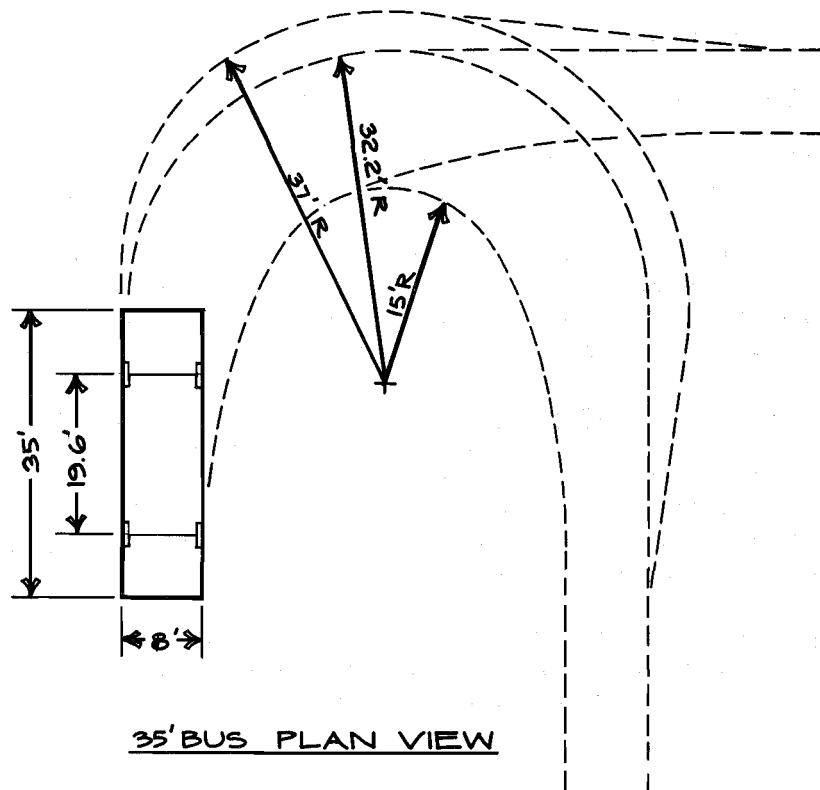
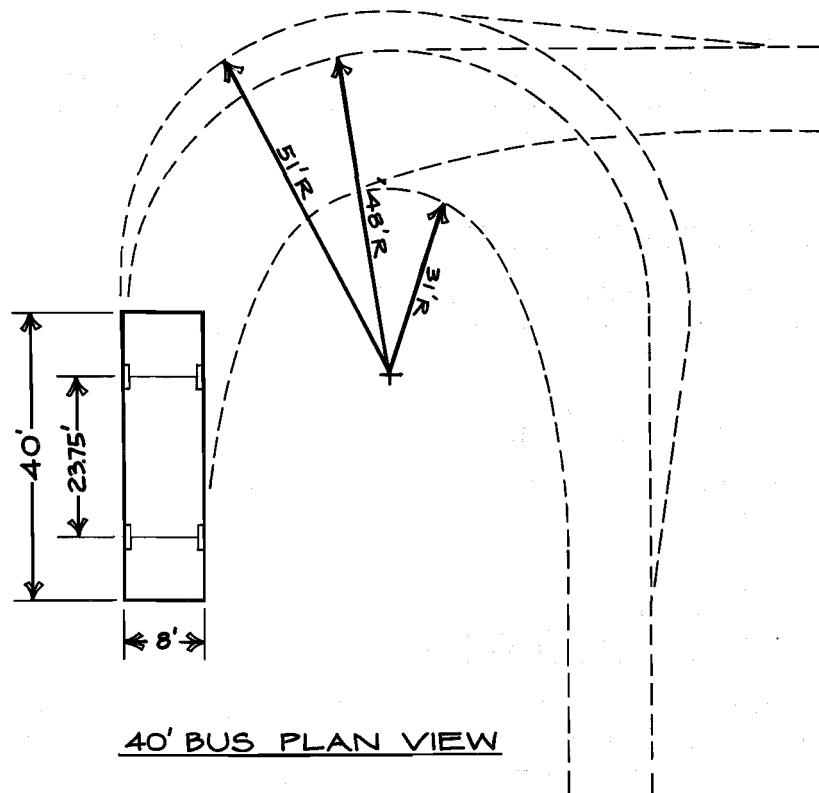
The transfer site should be located within proximity to downtown passenger destinations and should not be further away from these destinations than a reasonable walking distance of 1,320 feet (one-fourth mile). An average nonbaggage-carrying pedestrian may be expected to walk about 260 feet per minute. Consequently, the transfer site should not be further away from passenger destinations than about a five-minute walk.

Traffic Conflicts

The bus transfer site should not be located where traffic conflicts can seriously impede bus, other vehicular, or pedestrian flows. Buses entering, leaving, or stopped at the transfer site should not interfere with moving traffic on adjacent public streets. Stopped buses should not block more traffic lanes than the assigned bus lane. Departing buses should not have to swing beyond the lane adjacent to the transfer site.

Figure 1

BUS TURNING RADIUS SITE PLANNING CRITERIA



Site Size and Configuration

Sufficient site area should be available to accommodate both the present and long-term future needs of the bus transfer facility. The site shape or configuration should be adequate for the use of the site as a bus transfer facility.

Compatibility with Neighboring Uses

The bus transfer site should be compatible with adjoining land uses and structures and should not adversely affect neighboring areas.

Elimination of Vehicular Parking Spaces

The bus transfer site should be located in an area which minimizes the loss of existing downtown vehicular parking spaces.

Visual Exposure, Identity, and Linkage of the Transfer Site with Downtown Development

The bus transfer site should be located in an area which has good visual exposure to and from the downtown area. The site should offer potential for public identity as the Waukesha Bus Transfer Site and should provide both a visual and functional linkage to the Waukesha downtown area.

Bus Transfer Site Response to Downtown Area Microclimate

Summer Winds: Since the prevailing summer winds in the Waukesha area are from the southwest and south-southwest, these breezes should be taken advantage of during the hot summer months for their potential cooling effect on passengers and pedestrians at the bus transfer site.

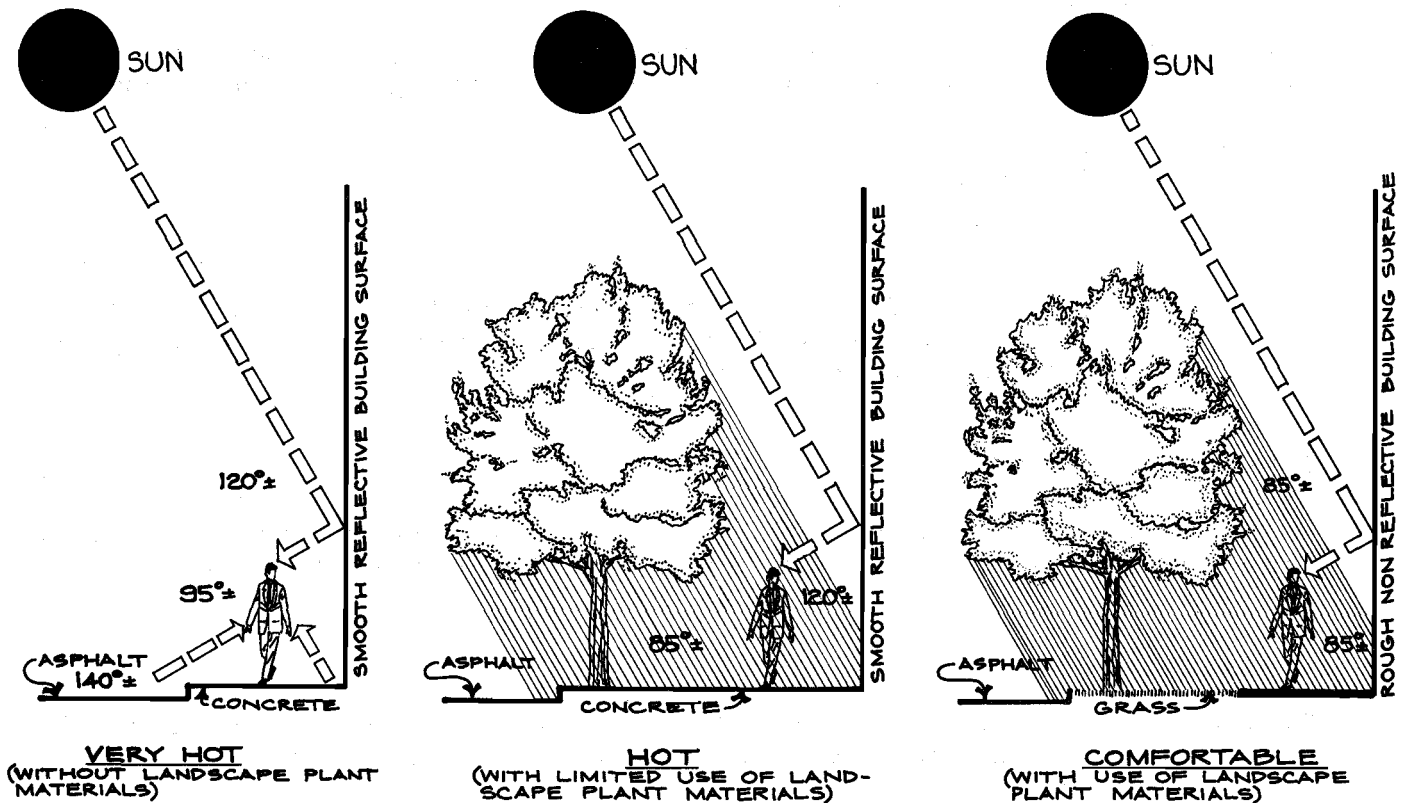
Winter Winds: Since the prevailing winter winds in the Waukesha area are from the west, passenger and pedestrian protection from these winter winds can best be afforded by the use of bus shelters and coniferous landscape planting materials placed in lines perpendicular to these westerly winter winds.

Sun Control and Sun Protection: Bus shelters and landscape planting materials should be provided at the bus transfer site for both sun control and sun protection for passengers and pedestrians. Landscape plantings will decrease incoming solar radiation (insolation) before it reaches either concrete and asphalt surfaces or the sides of buildings, thus preventing not only direct heat gain, but also surface re-radiation of heat as shown in Figure 2.

Precipitation: Bus shelters which meet the design criteria outlined later in this chapter should be provided at the bus transfer site to provide protection from rain and snow to the passengers waiting at the site.

Figure 2

THE EFFECTS OF LANDSCAPE PLANTINGS ON AIR TEMPERATURE AND PASSENGER AND PEDESTRIAN COMFORT AT THE BUS TRANSFER SITE



Source: SEWRPC.

Noise and Air Pollution Effects on Neighboring Uses

The bus transfer site should be located or designed so as to minimize both the perceived and actual impacts of bus noise and air pollution on pedestrians and occupants of neighboring properties.

Zoning

The bus transfer site should be in a zoning district which provides uses compatible with, and specifically permits, the location and development of a bus transfer facility.

Current Downtown Revitalization Plans

The location and design of the bus transfer facility should be in conformance with, and should help to implement, currently adopted downtown Waukesha revitalization plans.

Current Regional Public Transit Plans

The location and design of the bus transfer facility should be in conformance with, and should help to implement, the current adopted regional transit plan.

BUS BERTHING LANES

Type

Bus berthing lanes provided in the downtown area using traffic or parking lanes on arterial streets should be of the normal flow type with bus movements in the same direction as the general street traffic.

Marking

Bus berthing lanes in the terminal area should be properly marked by horizontal marking consisting of a continuous white line applied to the road surface.

Width

To avoid encroachment into adjacent traffic and parking lanes on arterial streets, bus berthing lanes should have a minimum width of 12 feet.

Access from Private Drives

Access to a bus berthing lane from private drives should be discouraged.

Deliveries and Bus Berthing Lanes

Parking, standing, or stopping in bus berthing lanes for delivery purposes should not be allowed during those hours when bus service is being provided.

BUS BERTHING AND RECESSED BUS BAY DESIGN CRITERIA

Size of Bus Berthing Area

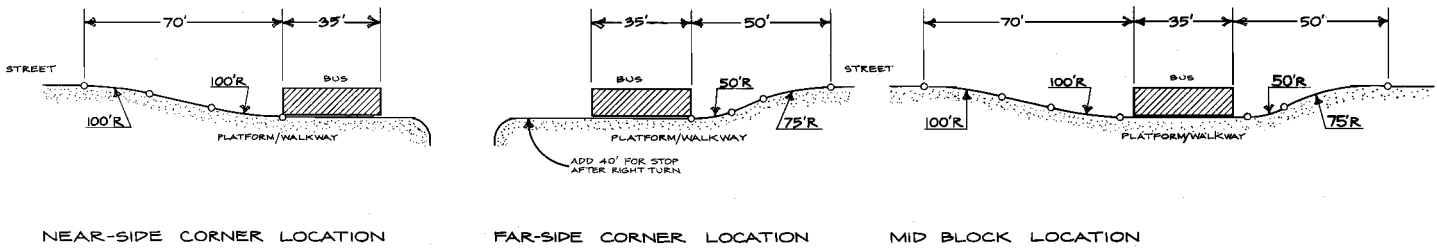
Bus berthing area size should reflect the number of buses expected to be accommodated at the site during the peak period of operation. The downtown Waukesha bus transfer site is designed to accommodate 10 buses. This accommodates the maximum of eight buses required for the present route and scheduling structure, as well as two additional buses, should the service be expanded in the near future.

Recessed Bus Bays

Types: Typical recessed bus bay design criteria for bus bays parallel and contiguous to street rights-of-way are shown in Figure 3. The figure includes specific design treatments for near-side corner locations, far-side corner

Figure 3

RECESSED BUS BAY DESIGN CRITERIA FOR BAYS PARALLEL AND CONTIGUOUS TO STREET RIGHTS-OF-WAY



NOTE: ALL THREE DESIGNS ARE BASED UPON THE WAUKESHA STANDARD 35 FOOT LONG BUS. ADD 45 FEET FOR EACH ADDITIONAL BUS BERTH. ADD 50 FEET FOR EACH INTERCITY BUS.

Source: SEWRPC.

locations, and midblock locations. For each additional Waukesha standard 35-foot bus at the site 45 feet should be added to the length of the entire bay. For each intercity coach the length added should be 50 feet.

Pavement Design: Recessed bus bays should be constructed with contrasting pavement color and/or texture and should be clearly delineated with a six- to eight-inch-wide solid white lane delineator line. Recommended roadway widths and bus bay lengths at selected pull-out and tail-out distances are shown in Figure 4. The pavement should be of a construction type which will support the weight of fully loaded buses.

Shallow Saw-Tooth Bus Bay

Design: A shallow saw-tooth platform bus bay should be designed in accordance with Figure 5 when warranted and desirable.

Loading Platforms: For saw-tooth type berthing positions, the loading platforms to the buses parallel to the bus door should be a minimum width of five feet.

In-Line Platform Bus Bay

Design: In-line platform bus bays should be designed in accordance with Figure 6.

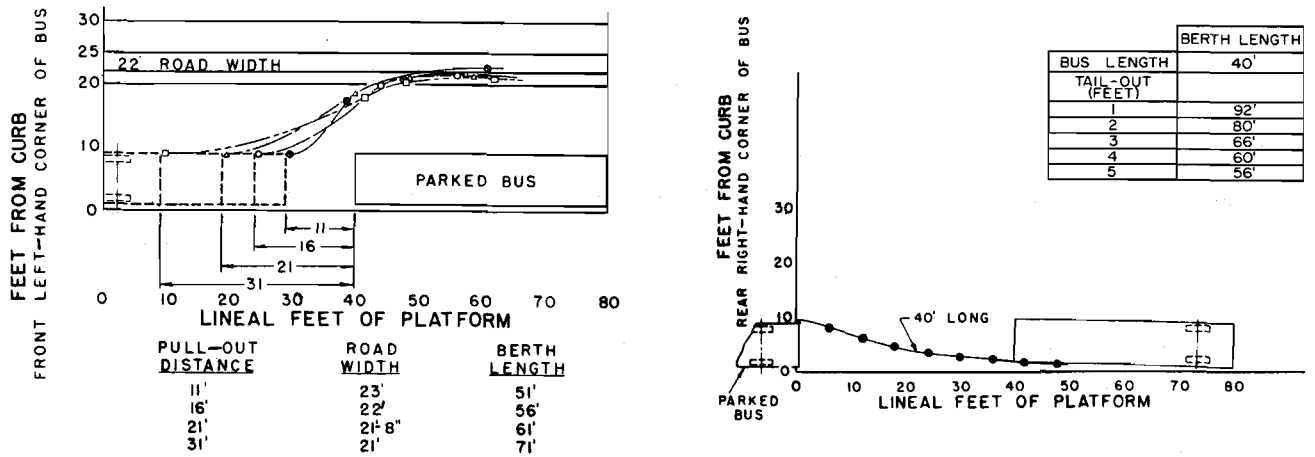
PASSENGER AND PEDESTRIAN REQUIREMENTS

Convenience

The transfer site should maximize passenger-pedestrian convenience and encourage direct conflict-free pedestrian flow between buses as well as between the buses and the alternate trip origins and destinations in the downtown area.

Figure 4

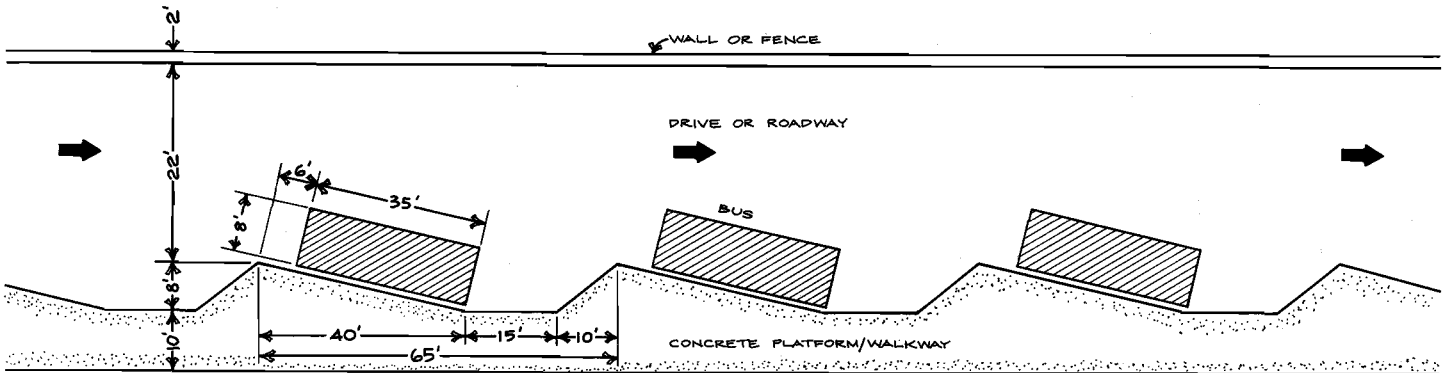
RECOMMENDED ROADWAY WIDTHS AND BUS BAY LENGTHS
AT SELECTED PULL-OUT AND TAIL-OUT DISTANCES
FOR 35-FOOT AND 40-FOOT BUSES



Source: SEWRPC.

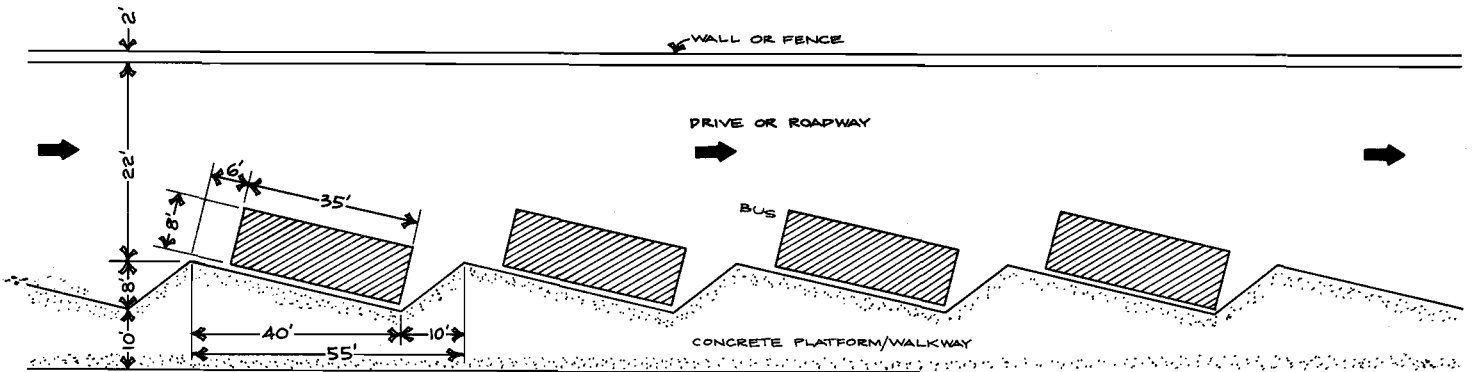
Figure 5

SHALLOW SAW-TOOTH PLATFORM BUS BAY DESIGN CRITERIA



NOTE: FOR 40' LONG INTERCITY BUSES ADD 5' TO THE LENGTH OF THE BUS SHOWN ABOVE AND 6' TO EACH BUS BERTH LENGTH.

DESIRABLE DESIGN--PLAN VIEW



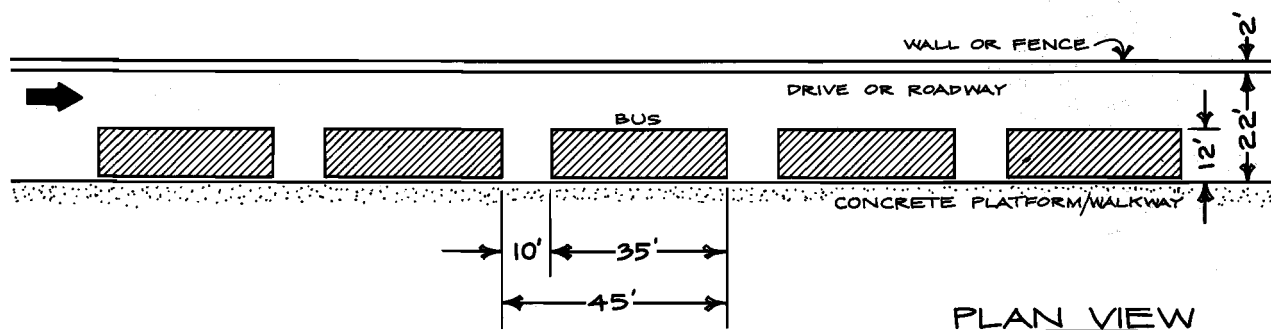
NOTE: NOT TO BE USED FOR BERTHING OF INTERCITY BUSES. THE MINIMUM CRITERIA ARE BASED UPON FIELD MEASUREMENTS OF THE EXISTING 1982 WAUKESHA METRO BUS FLEET AND MAY NOT BE APPLICABLE TO OTHER BUS SPECIFICATIONS.

MINIMUM DESIGN--PLAN VIEW

Source: SEWRPC.

Figure 6

IN-LINE PLATFORM BUS BAY DESIGN CRITERIA



NOTE: BUS POSITIONS ARE DEPENDENT UPON BUS ARRIVAL SEQUENCE. IF INDEPENDENT BUS PULLOUTS ARE DESIRED, ADD 11 FEET TO THE LENGTH OF EACH BERTH. FOR 40' BUSES ADD 5' TO EACH BERTH LENGTH MAKING THE TOTAL BERTH LENGTH 50'.

Source: SEWRPC.

Safety

The transfer site should maximize passenger-pedestrian safety. Passengers should be able to board and alight from buses in safety. Stopped or parked buses should not adversely affect pedestrian and vehicular sight distances.

Curbs

Roadway curbs at the transfer site should be of a constant height in order to minimize passenger missteps while alighting from a bus. Curb height should be from five to eight inches.

Passenger Spatial Requirements

A minimum of four square feet per passenger should be provided at the transfer site as shown in Figure 7 based upon the maximum daily passenger accumulation per bus cycle at the transfer site.

Pedestrian Spatial Requirements

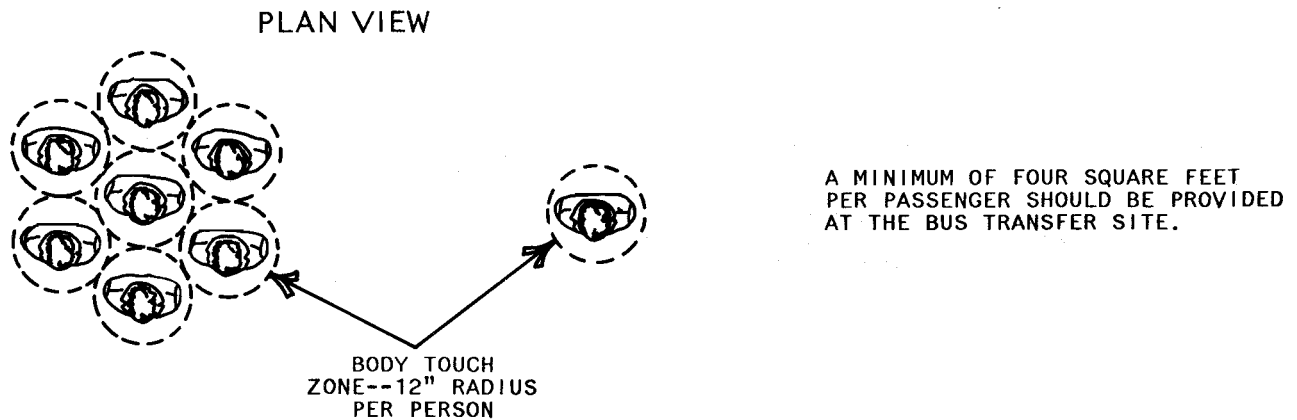
Pedestrian sidewalk widths at the transfer site should be a minimum of five feet and if located along or contiguous to commercial uses the pedestrian sidewalk should be 10 feet in width.

Provision of Landscaping and Street Furniture

Landscape planting materials should be provided at the transfer site for both functional and aesthetic reasons since landscape plantings assist in visually defining the transfer area, add color and texture to the transfer area,

Figure 7

MINIMUM DESIGN CRITERIA FOR PASSENGER WAITING AREA AT BUS TRANSFER SITE



Source: John J. Fruin, Pedestrian Planning and Design, New York: Metropolitan Association of Urban Designers and Urban Planners, 1971, and SEWRPC.

vide visual screening from adjoining land uses, and protect passengers from the weather elements. Placement of landscape planting materials should not jeopardize passenger security and should promote crime prevention.

BUS SHELTER DESIGN CRITERIA

Sheltered areas for passengers should be provided at the transfer site. The shelter areas should meet the following criteria:

Visibility

Bus shelters should have a high degree of visibility. Shelters should not be hidden from view by placement behind other structures.

Accessibility

Bus shelters should provide two points of pedestrian access. Shelters should provide access from both the sidewalk and the street. Each opening to the bus shelter should be a minimum of three feet in width.

Appearance

Bus shelters should be of pleasing appearance and should complement their surroundings. Shelters should provide the maximum possible transparency of wall design.

Capacity

Shelter capacity should be based upon the maximum daily passenger accumulation per bus cycle at the transfer site and a minimum of four square feet per person should be allowed in development of the shelter size based upon Figure 7.

Amenities

Bus shelters should provide ample weather protection to the user.

Benches should be provided for seated passenger waiting.

Lighting, where possible, should be provided through existing street and commercial illumination. Supplemental lighting should be provided, when necessary, to allow nighttime reading of information within the bus shelter.

Bus schedules, maps, and travel information should be displayed at the shelter.

Security

The bus shelter should be designed in a manner which provides the user with a sense of security. The shelter area should be well lighted pursuant to the site lighting criteria outlined in this chapter. A telephone and a police and fire call box should be available at the transfer site location.

Maintenance

The shelter should allow for both winter and summer maintenance at low cost. The bus shelter should be constructed of durable materials and be designed so as to not encourage vandalism to the shelter.

SITE LIGHTING CRITERIA

Site lighting of the facility should be provided and serve four purposes. First, site lighting should provide for the safe movement of pedestrian and vehicular traffic. Second, it should aid in the provision of an environment which promotes security and crime prevention. Third, it should aid in creating an aesthetically pleasing environment both at nighttime and during the daylight hours. And, fourth, site lighting should assist in promoting the use of the transfer site facilities. The recommended site lighting illumination levels for the transfer site facilities should be a minimum of two footcandles.¹

ACCESSIBILITY TO THE HANDICAPPED

Bus shelter facilities shall be designed and constructed to be accessible to handicapped individuals. Wheelchair curb ramps shall be installed, where necessary, at or near the transfer site to provide access to the handicapped pursuant to Section 66.616 of the Wisconsin Statutes.

¹A footcandle is a unit of measurement which represents the intensity of illumination that will be produced on a surface that is one foot distance from a source of one candle power, and at right angles to the light rays from the source.

SUMMARY AND CONCLUSIONS

The site planning design criteria set forth in this chapter provide an important basis for the design and evaluation of alternative transit transfer site locations and configurations.

The criteria presented have dealt with site location; bus performance specifications, including turning radii; bus lane, berthing, and recessed bus bay dimensions and capacities; pedestrian and user requirements; bus shelter design criteria; and site lighting criteria.

Chapter III

INVENTORY AND ANALYSIS OF ALTERNATIVE TRANSIT SYSTEM CENTRAL TRANSFER SITES

INTRODUCTION

Certain basic data for each alternative transit system central transfer site are essential to the sound evaluation of the alternative sites and the selection of the most suitable site. These data include definitive information on, among other site characteristics, the size and configuration of the site, vehicular and bus user ingress and egress, coordination with downtown plans, coordination with the local and intercity transit system, and existing land uses. The most suitable site cannot be selected from among the alternatives considered without these data, which provide essential information on the existing conditions of site-specific development problems. The analysis of the sites represents the collective judgment of the Advisory Committee.

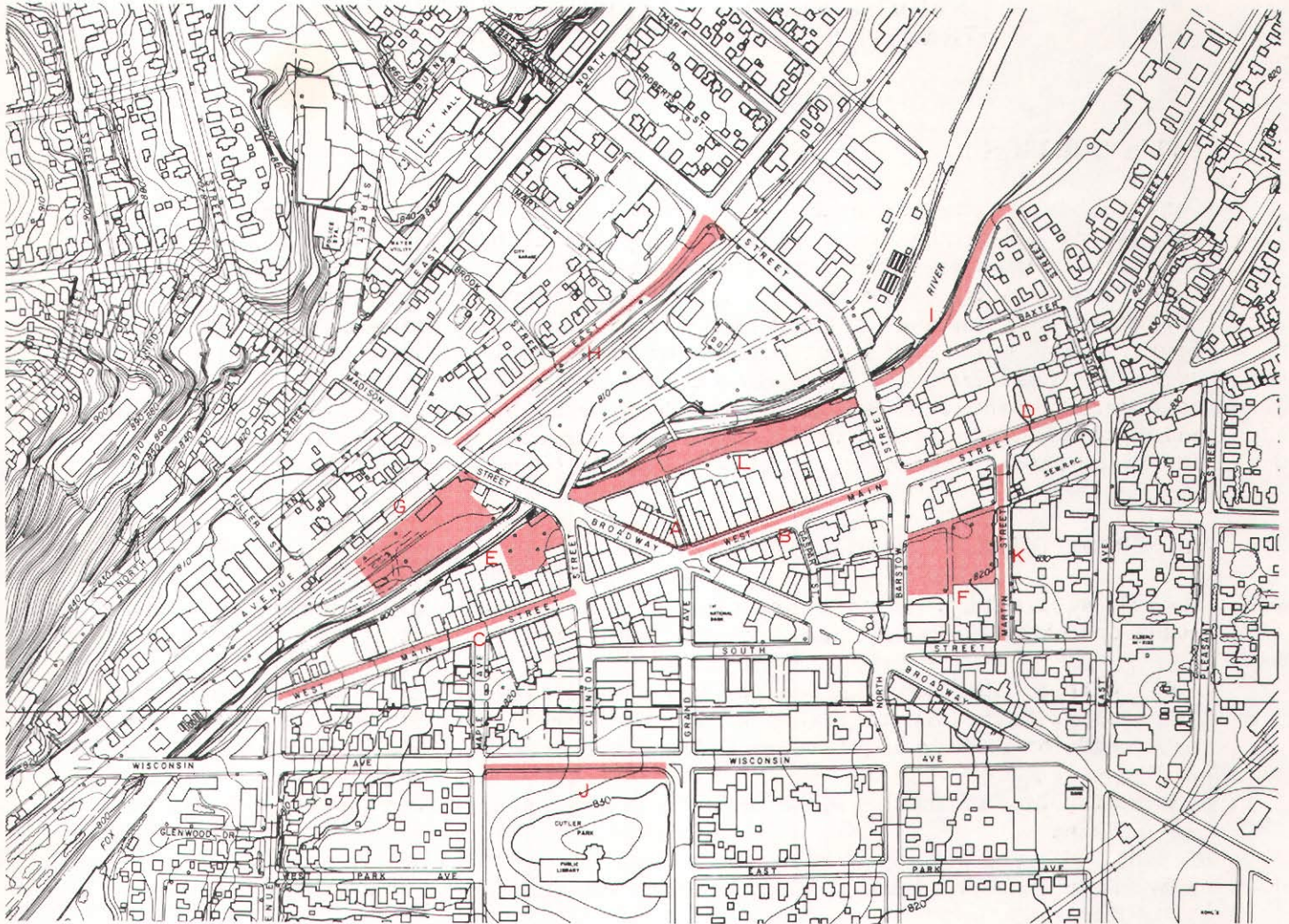
ALTERNATIVE SITE IDENTIFICATION

The 12 alternative transit system central transfer sites considered in this study are shown on Map 1. The sites are as follows:

- Site A: The existing central bus transfer site located on the north side of W. Main Street between W. Broadway and Gaspar Street and on the north side of W. Broadway between Clinton Street and W. Main Street.
- Site B: The north side of W. Main Street from W. Broadway to N. Barstow Street.
- Site C: The north side of W. Main Street from N. West Avenue to Clinton Street.
- Site D: The north side of W. Main Street from N. Barstow Street to N. East Avenue.
- Site E: Municipal parking lot No. 3 located at the intersection of W. Broadway, Bank Street, and Clinton Street.
- Site F: Municipal parking lot No. 5 located between N. Barstow Street and Martin Street south of W. Main Street.
- Site G: Municipal parking lot No. 12 located on the southwest side of Madison Street south of the intersection of E. St. Paul Avenue and Madison Street (privately owned).
- Site H: The southeast side of E. St. Paul Avenue between Madison Street and Northwest Barstow Street.
- Site I: Corrina Boulevard between N. Barstow Street and Buckley Street.

Map 1

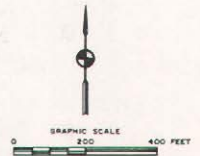
LOCATION OF ALTERNATIVE CENTRAL BUS TRANSFER SITES IN THE CITY OF WAUKESHA DOWNTOWN



LEGEND

-  ALTERNATIVE CENTRAL BUS TRANSFER SITE
-  IDENTIFICATION LETTER

Source: SEWRPC.



- Site J: The south side of Wisconsin Avenue between Maple Avenue and N. Grand Avenue.
- Site K: The west side of Martin Street between W. Main Street and South Street.
- Site L: The municipal parking lot between W. Broadway and N. Barstow Street.

All of the sites are located in an area considered by local officials as comprising the "downtown" of the City of Waukesha, being that area defined by Wisconsin Avenue on the south, E. St. Paul Avenue on the north, East Avenue on the east and West Avenue on the west. Eleven of the 12 sites are publicly owned. Site G, municipal parking lot No. 12, located at the southeast side of Madison Street south of the intersection of E. St. Paul Avenue and Madison Street, is leased by the City of Waukesha from the Waukesha State Bank.

SITE INVENTORY PROCEDURE

For each of the alternative sites considered, a sketch plan was prepared showing the location of street pavements and rights-of-way, sidewalks, buildings and other land uses, the location of on- and off-street parking spaces, the direction of current vehicular traffic flow (indicated by black arrows in Figures 8 through 19), and traffic flow changes proposed under current downtown redevelopment plans (indicated by dashed arrows in Figures 8 through 19), significant existing vegetation such as trees, significant natural features such as rivers, and certain climatic data such as the prevailing summer and winter wind direction and sun orientation. Also, for each of the 12 alternative sites considered, two photographs were taken which were deemed representative of the physical appearance of each site. Each of the sites was measured to determine the area of each site. The existing land use inventory field survey for each site was conducted by Commission staff during the summer of 1982. Illumination readings, in footcandles, using a footcandle meter, were taken at each of the 12 sites on a summer evening in 1982 between the hours of 10:00 p.m. and 1:00 a.m. A total of 337 footcandle readings at ground level were taken at all 12 sites and the high, low, and average footcandle level for each site is shown in Appendix B.

SITE EVALUATIVE MEASURES

The inventory and analysis undertaken for each of the 12 alternative transfer sites focused on 17 site characteristics considered to be pertinent to the evaluation of the suitability of each site for use as the central bus transfer location. The 17 evaluative measures were developed based upon the central transfer site spatial and locational and site planning design criteria set forth in Chapter II. These 17 evaluative measures are as follows:

1. Sufficient Site Size to Accommodate Use
Sufficient area should be available at the site to accommodate 10 buses--including eight local buses and two intercity buses--and the various movements associated with bus circulation within the site, approximately

SITE A
THE EXISTING CENTRAL BUS TRANSFER SITE LOCATED ON
THE NORTH SIDE OF W. MAIN STREET BETWEEN BROADWAY
AND GASPAR STREET AND ON THE NORTH SIDE OF BROADWAY
BETWEEN CLINTON STREET AND W. MAIN STREET



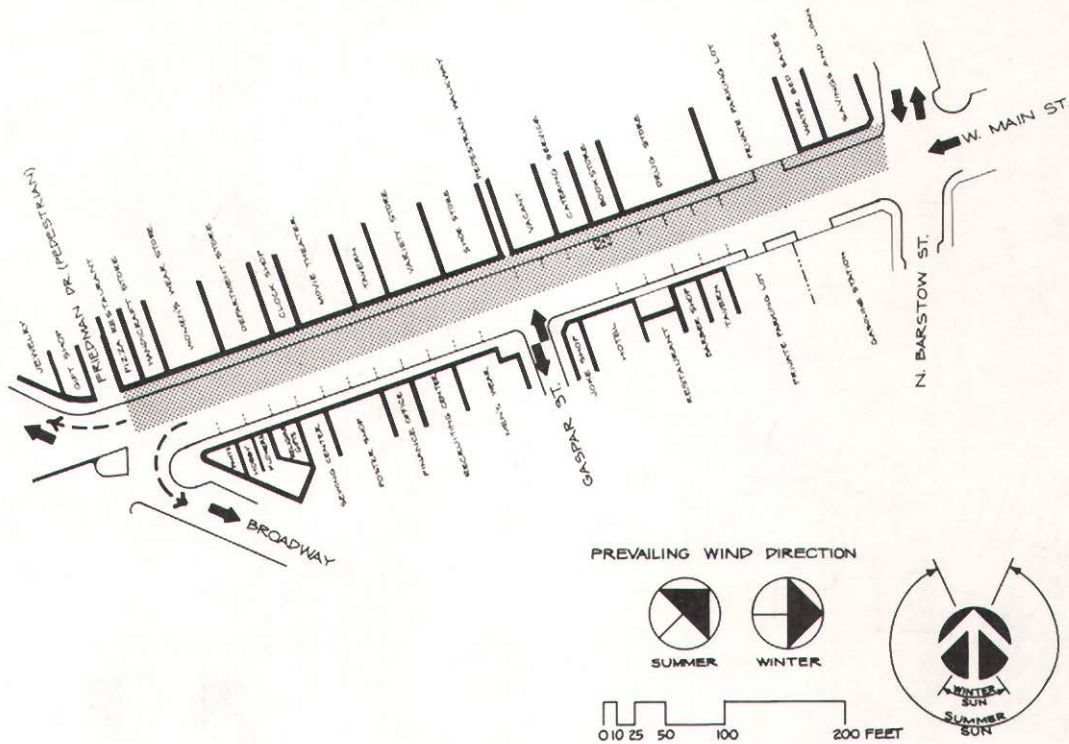
Source: SEWRPC.



20

Figure 9

SITE B
THE NORTH SIDE OF W. MAIN STREET
FROM BROADWAY TO N. BARSTOW STREET



View looking southwest along W. Main Street showing the north side of W. Main Street to Broadway from Gaspar Street.



View looking southwest along W. Main Street from the intersection of N. Barstow Street and W. Main Street

Source: SEWRPC.

SITE C
THE NORTH SIDE OF W. MAIN STREET FROM
N. WEST AVENUE TO CLINTON STREET



Source: SEWRPC.



View looking southwest along W. Main Street from Clinton Street.

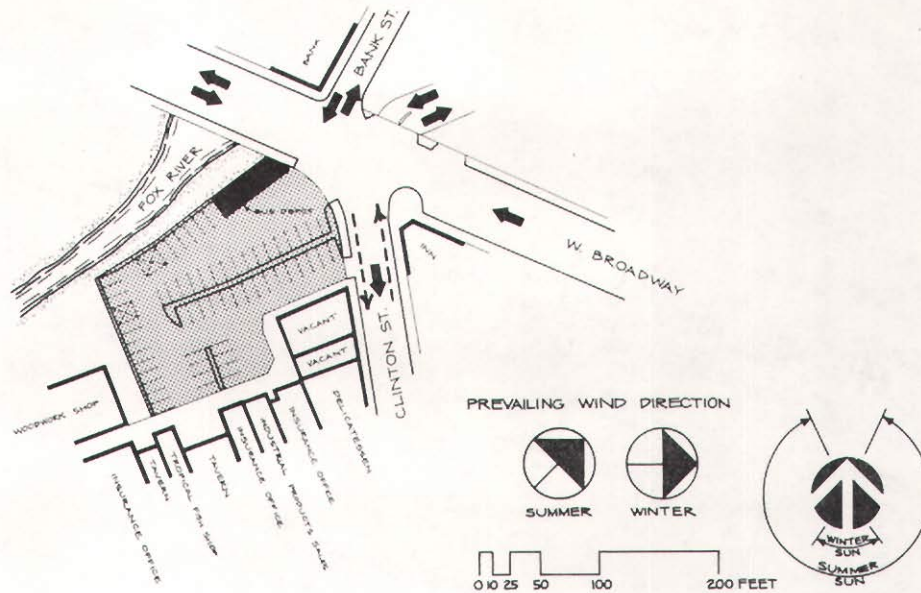
SITE D
THE NORTH SIDE OF W. MAIN STREET FROM
N. BARSTOW STREET TO N. EAST AVENUE



23

Figure 12

SITE E
MUNICIPAL PARKING LOT NO. 3 LOCATED AT THE
INTERSECTION OF W. BROADWAY, BANK, AND CLINTON STREETS



View looking east from the western-most corner of the parking lot.

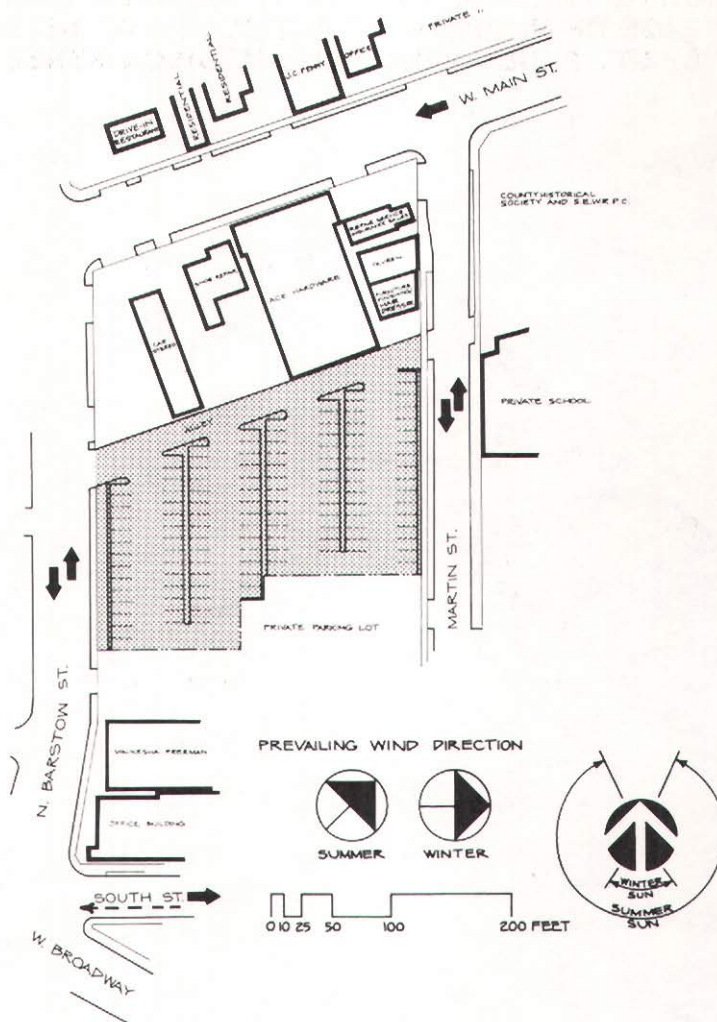
Source: SEWRPC.



View looking west at the parking lot entrance, from the intersection of W. Broadway and Clinton Street.

Figure 13

SITE F
MUNICIPAL PARKING LOT NO. 5 LOCATED BETWEEN N. BARSTOW
STREET AND MARTIN STREET SOUTH OF W. MAIN STREET



View looking northeast at the parking lot from the N. Barstow Street side of the lot.

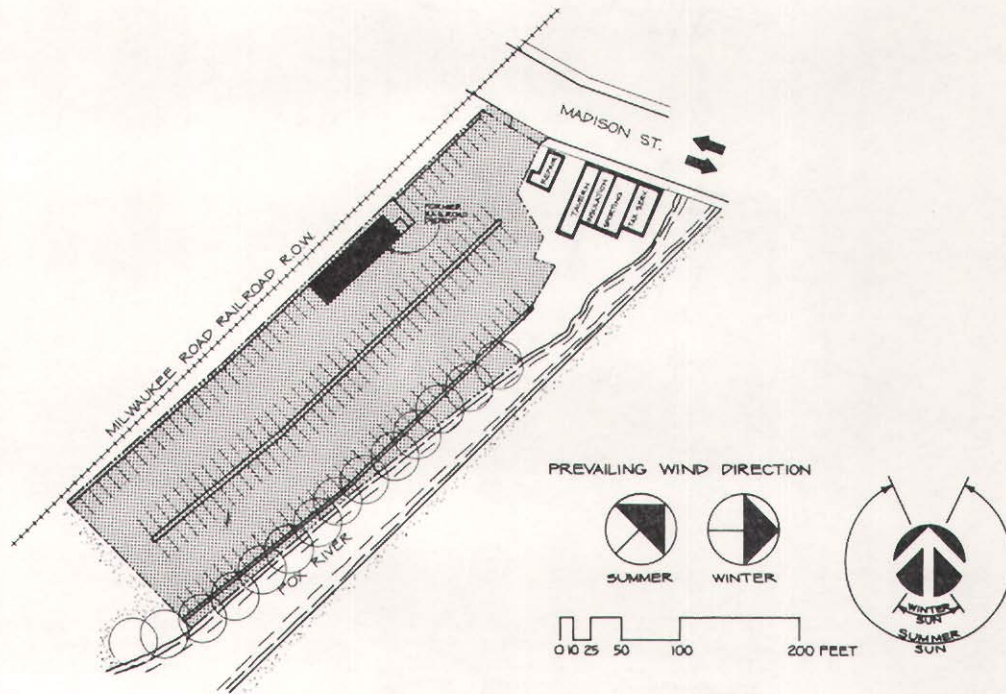
Source: SEWRPC.



View looking southwest at the parking lot from the Martin Street parking lot entrance/exit.

Figure 14

SITE G
MUNICIPAL PARKING LOT NO. 12 LOCATED ON THE
SOUTHWEST SIDE OF MADISON STREET SOUTH OF INTERSECTION
OF E. ST. PAUL AVENUE AND MADISON STREET



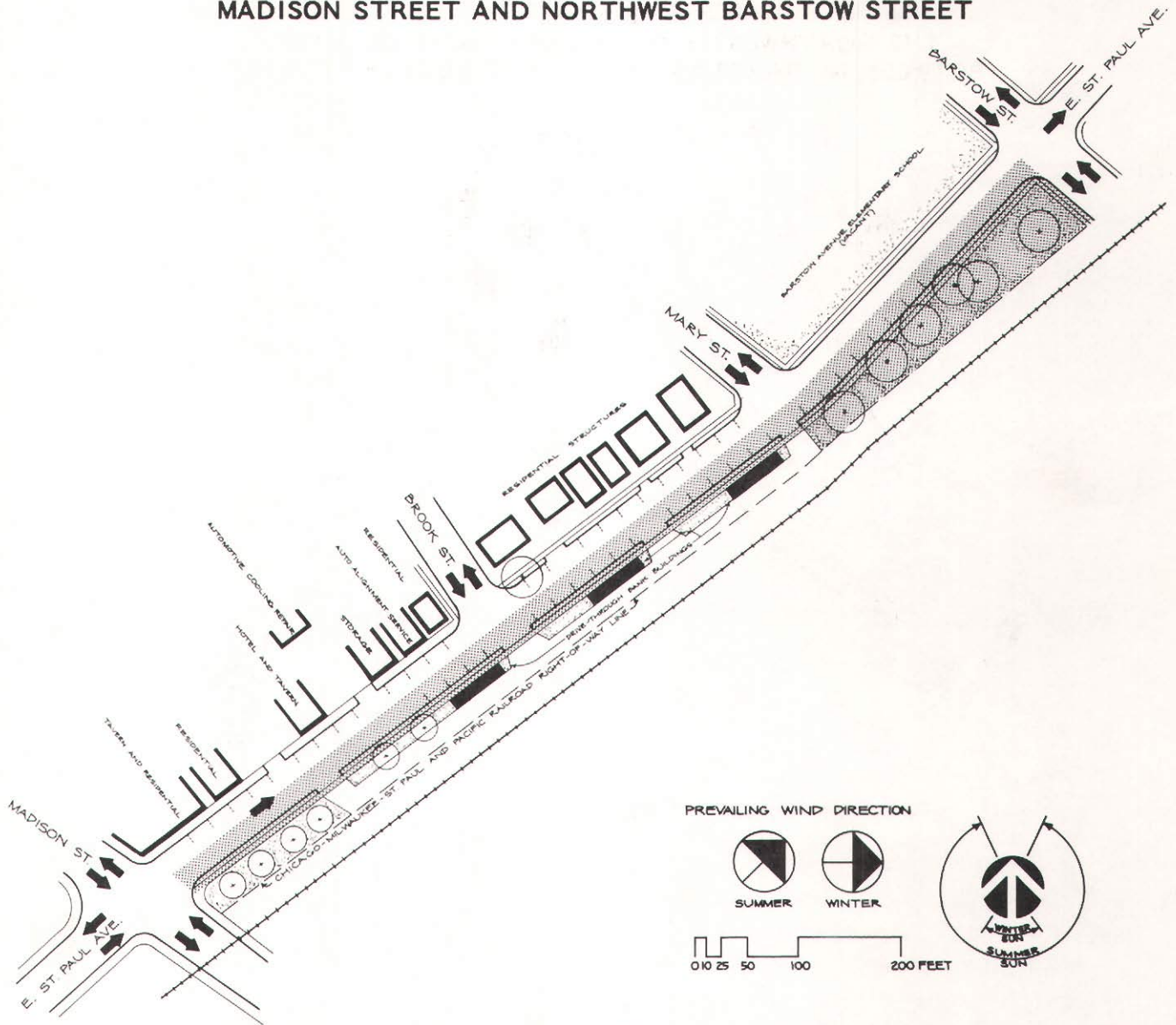
View looking northeast at parking lot.
Source: SEWRPC.



View looking southwest at exit from Madison Street.

Figure 15

SITE H
THE SOUTHEAST SIDE OF E. ST. PAUL AVENUE BETWEEN
MADISON STREET AND NORTHWEST BARSTOW STREET



View looking northeast at E. St. Paul Avenue
from Madison Street.

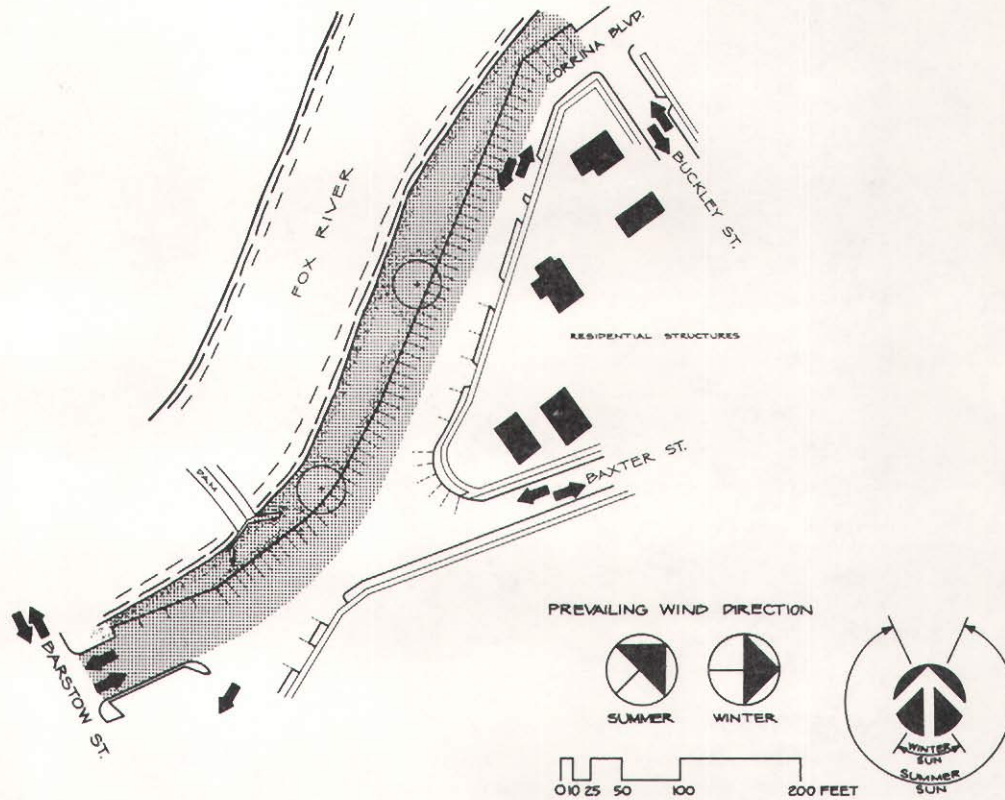
Source: SEWRPC.



View looking southwest at E. St. Paul Avenue
from northwest Barstow Street.

Figure 16

**SITE I
THE NORTHWEST SIDE OF CORRINA BOULEVARD
BETWEEN N. BARSTOW STREET AND BUCKLEY STREET**



View of Corrina Boulevard looking northeast from N. Barstow Street.

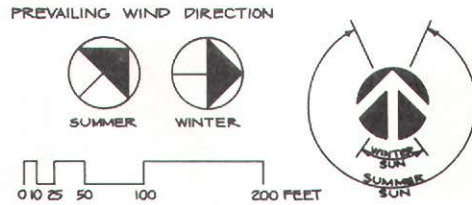
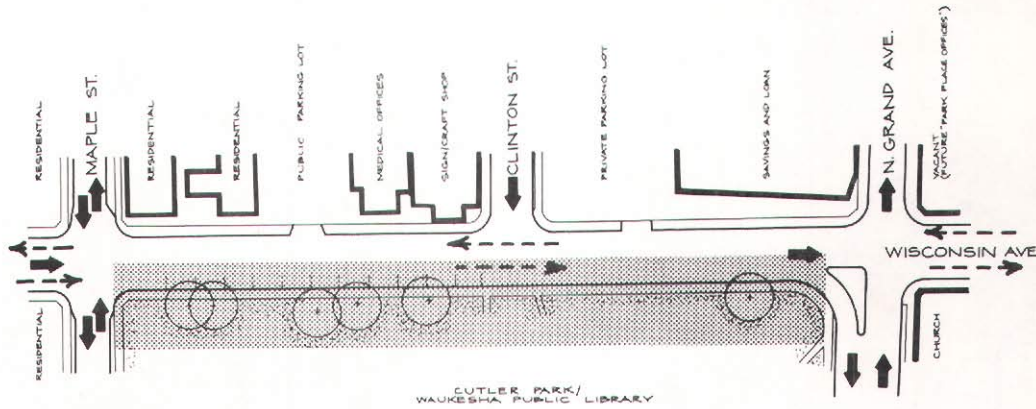
Source: SEWRPC.



View of Corrina Boulevard looking southwest from Buckley Street.

Figure 17

SITE J
THE SOUTH SIDE OF WISCONSIN AVENUE
BETWEEN MAPLE STREET AND N. GRAND AVENUE



View of Wisconsin Avenue looking east from Maple Street.

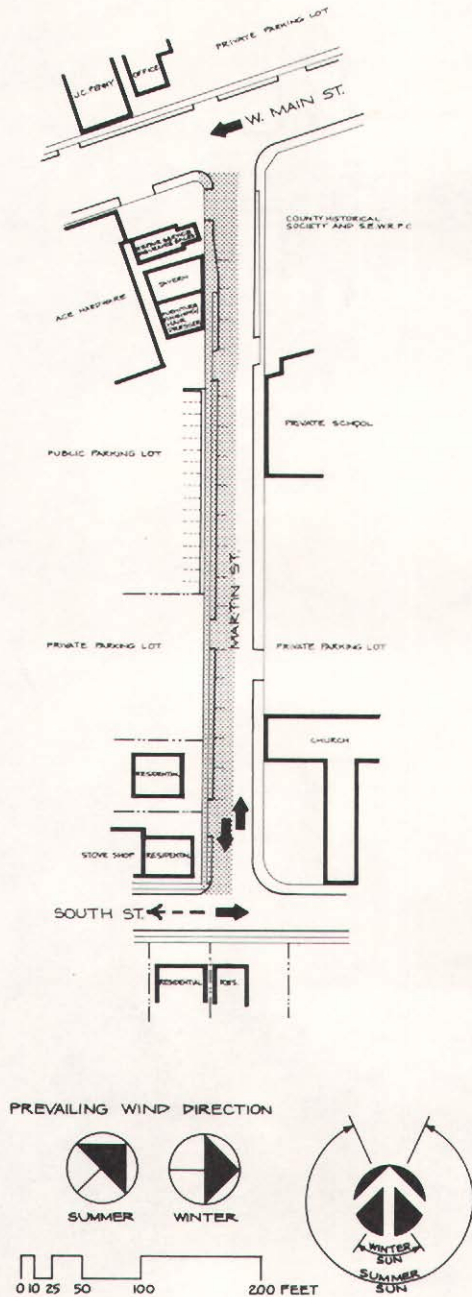
Source: SEWRPC.



View of the south side of Wisconsin Avenue from N. Grand Avenue.

Figure 18

SITE K
THE WEST SIDE OF MARTIN STREET
BETWEEN W. MAIN STREET AND SOUTH STREET



View of Martin Street looking south from W. Main Street.

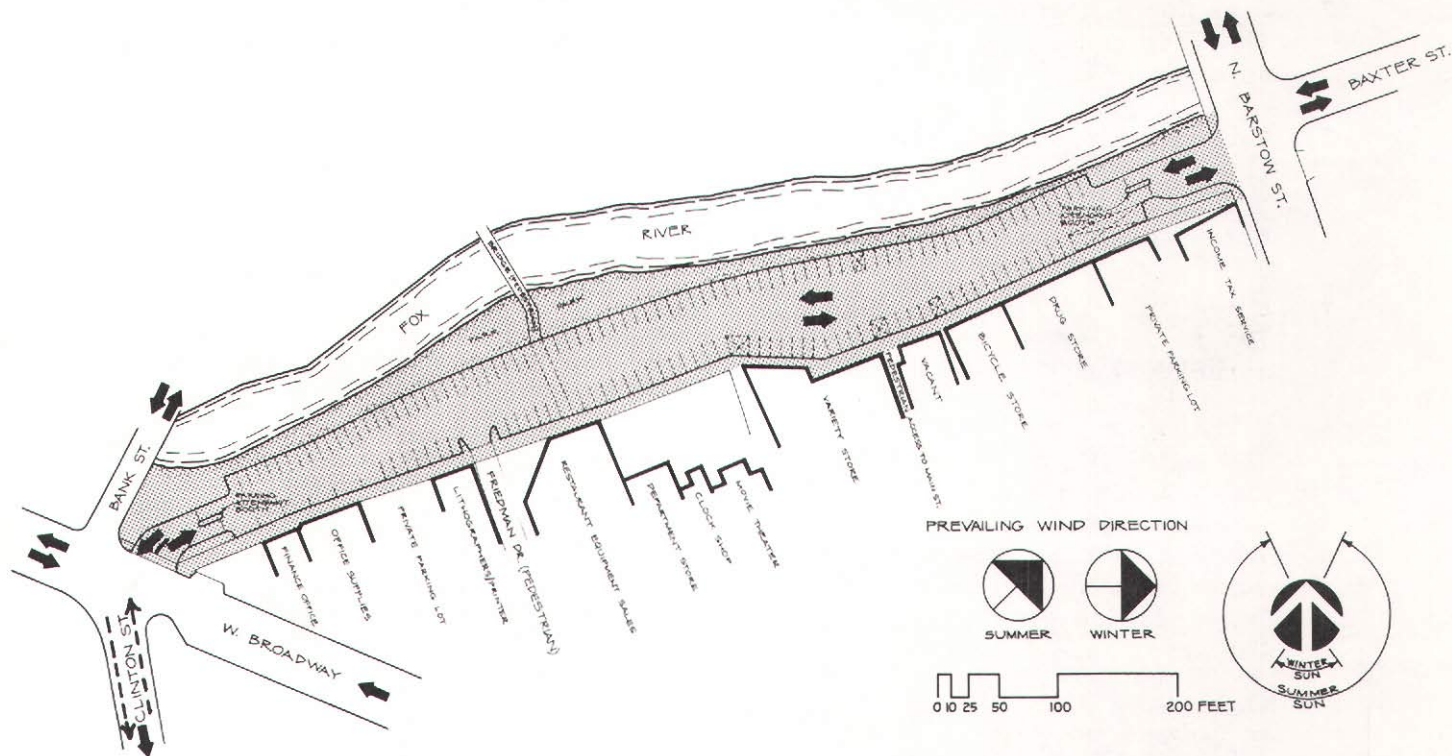


View of Martin Street looking north from South Street.

Source: SEWRPC.

Figure 19

SITE L
MUNICIPAL PARKING LOT LOCATED BETWEEN W. BROADWAY
AND N. BARSTOW STREET NORTH OF W. MAIN STREET



View of the parking lot looking northeast from near the W. Broadway Street entrance/exit.

Source: SEWRPC.



View of the parking lot looking southwest from near the N. Barstow Street entrance/exit.

100 waiting passengers, a transfer station with a small ticket sales and restroom facility; adequate space for pedestrian and passenger flow, and landscaping and street furniture.

2. Site Configuration Conducive to Use
The site configuration, or shape should accommodate the use of the site as a bus transfer facility.
3. Facility Expansion Capabilities of the Site
The site should allow for some expansion of the transfer facility in order to accommodate future needs such as space for additional buses and off-street parking for intercity and commuter bus users.
4. Compatibility with Neighboring Land Uses
The bus transfer site should be compatible with adjoining land uses and structures and should not adversely affect its neighboring land uses.
5. Elimination of Vehicular Parking Spaces
The elimination of vehicular parking spaces should be minimized at the bus transfer site.
6. Transit Vehicle Ingress/Egress
Buses should have easy access to and from the central transfer site. Other vehicular traffic should not present conflicts for bus traffic. The safety and flow of bus traffic should not be impaired.
7. Shortest Functional Distance to "Five Points"
Since the "Five Points" is the currently perceived, if not the geographic, center of downtown, the distance from this area and the bus transfer site should be minimized.
8. Visual Exposure, Identity, and Linkage to Downtown
The bus transfer site should be located in an area which has good visual exposure within the downtown area. The site should offer potential for public identity as the Waukesha Metro bus transfer site and should provide both a visual and functional linkage to the Waukesha downtown area.
9. Bus User Ingress and Egress
Bus users should have easy access to and from the transfer site. The safety of bus users should not be impaired by bus or automobile traffic.
10. Impacts on Nonbus Users Minimized
The impacts of bus users and bus traffic on pedestrian traffic and on automobile traffic at the bus transfer site should be minimized.
11. Potential Noise Impact on Neighboring Uses
The bus transfer site should be located or designed so as to minimize both the perceived and actual impacts of noise on pedestrians and occupants of neighboring properties.
12. Potential Air Pollution Impact on Neighboring Sites
The bus transfer site should be located or designed so as to minimize both the perceived and actual impacts of air pollution on pedestrians and occupants of neighboring properties.

13. Site Microclimate Effects/Orientation
The impact of the climate on passenger use of the transfer facility should be taken into consideration so that optimum comfort is provided to the bus user during all seasons.
14. Adequacy of Existing Artificial Light
Transfer site illumination levels should be a minimum of two footcandles on the pavement surface.
15. Coordination with Local and Intercity Transit Systems
The location of the bus transfer site should permit convenient coordination of bus stops of the local and intercity bus transit systems.
16. Coordination with Current Downtown Plans
The location and design of the bus transfer facility should be in conformance with, and should help to implement, current downtown Waukesha revitalization plans.
17. Existing Zoning
The bus transfer site should be in a zoning district which provides for uses compatible with, and specifically permits the location and development of, a bus transfer facility.

THE ALTERNATIVE BUS TRANSFER SITES

Site A: The "Five Points"

Site A, the existing central bus transfer site located on the north side of W. Main Street between Broadway and Gaspar Street and on the north side of Broadway between Clinton Street and W. Main Street is shown in Figure 8. The site is elongated in shape occupying 0.47 acre of land in two public rights-of-way, including street and sidewalk, and is of a sufficient size and appropriate shape to accommodate the central transfer site, as is evidenced by its current use. However, the site is not of sufficient size to accommodate a transfer station and ticket sales facility or passenger seating. The facility expansion capabilities of the site are poor since additional on-street parking space would be required to accommodate more than 10 buses. The site is surrounded by commercial land uses and structures which may be considered as compatible land uses. The site would not require the acquisition of parking spaces for automobiles although it has sufficient area for parking 16 automobiles. Transit vehicle ingress and egress is rated as excellent because buses enter and exit the site by merging into traffic flow on one-way streets. Traffic flow on W. Main Street--which in 1982 carried about 14,000 vehicles per average weekday--and on W. Broadway--which carries about 6,000 vehicles per average weekday--is interrupted by the cycling of traffic signals at N. Barstow Street and W. Main Street and at the "Five Points" to facilitate the entry of buses. The site is located at the "Five Points" and therefore has excellent visual exposure, identity, and linkage with the downtown area. The site is excellent for bus user/pedestrian ingress and egress since users board and depart from a sidewalk. However, the site is only fair with respect to the nonbus user conflicts created at the site because the loading and unloading of transit passengers may interfere with pedestrian traffic on W. Main Street and on W. Broadway. In addition, the weaving of buses into and out of the through

traffic lanes may have an adverse effect on the flow of nonbus traffic. Noise and air pollution impacts upon neighboring land uses are poor because abutting buildings are located only 10 feet away. The effects of the microclimate on the site are excellent since the site will be somewhat shielded from harsh winter winds by existing buildings and summer winds are channelled down W. Main Street to afford a cooling effect for pedestrians despite its southern exposure to the summer sun. The adequacy of existing nighttime lighting at the site is excellent with an average illumination level of 2.27 footcandles at ground level. The potential of the site to aid coordination of local and intercity transit systems is good because no local system rerouting would be required and because the site serves all existing intercity buses traveling in one direction through the City because W. Main Street and Broadway are one-way streets.

Site B: Main Street Central

Site B, located on the north side of W. Main Street from W. Broadway to N. Barstow Street, is graphically shown in Figure 9. Site B is linear and elongated in shape and occupies 0.51 acre of the W. Main Street right-of-way and is of adequate size and appropriate shape to accommodate the transfer site. However, the site is not of sufficient size to accommodate a transfer station and ticket sales facility or passenger seating. The facility expansion capabilities of the site are poor, since additional on-street parking space would be required to serve additional buses. The site is surrounded by commercial land uses and structures and is compatible with these uses. The site currently provides space for the on-street parking of seven automobiles which would be eliminated if the site were developed for the facility. Transit vehicle ingress and egress is excellent because buses enter and exit the site by merging into traffic flowing along one-way streets. Traffic flow interruption to permit buses to enter the through traffic lanes, which in 1982 carried about 14,000 vehicles on an average weekday on W. Main Street, is facilitated by the cycling of traffic signals located at N. Barstow Street and W. Main Street. The site is located at the "Five Points" and therefore has excellent visual exposure, identity, and linkage with the downtown area. Like Site A, Site B is also excellent for bus user/pedestrian ingress and egress since users would board and depart from a sidewalk. However, the site is only fair with respect to the nonbus user conflicts, because the loading and unloading of transit passengers may interfere with pedestrian traffic on W. Main Street. In addition, the weaving of buses into and out of the through traffic lanes may have an adverse effect on the flow of nonbus traffic. Potential noise and air pollution impacts upon neighboring land uses are poor since the abutting buildings are located only 10 feet away. The effects of the microclimate on the site are excellent. The site is somewhat shielded from harsh winter winds by existing buildings and summer winds are channeled down W. Main Street to afford a cooling effect for pedestrians despite its southern exposure to the summer sun. The adequacy of existing nighttime lighting at the site is good with an average illumination level of 1.71 footcandles at ground level. With respect to the coordination of the site with the local and intercity transit systems, the site is rated as good because no local system rerouting would be required and because the site serves all intercity buses traveling in one direction through the City because W. Main Street is a one-way street.

Site C: Main Street West

Site C, located on the north side of W. Main Street from N. West Avenue to Clinton Street is graphically shown in Figure 10. Site C is linear and elongated in shape and occupies 0.78 acre of the W. Main Street right-of-way and is of sufficient size and adequate shape to accommodate present needs. However, the site is not of sufficient size to accommodate a transfer station and ticket sales facility or passenger seating. The facility expansion capabilities of the site, as defined in Figure 10, are poor since additional on-street parking space would be required to accommodate more than 10 buses. The commercial land uses and structures border the southern and northern areas of the site. Four residential structures border the northwest portion of the site. These land uses and structures are considered only somewhat compatible with the central transfer site except the residential uses which are not. The site provides space for the on-street parking of 29 automobiles of which 15 to 20 spaces would be lost if this site were developed for the facility. Transit vehicle ingress and egress is excellent because buses enter and exit the site by merging into traffic flowing on a one-way street. Traffic flow interruption, to permit buses to enter the through traffic lanes of W. Main Street, which carry about 8,200 vehicles per average weekday, is facilitated by the cycling of traffic signals at W. Main Street and N. Clinton Street. The site is located about 400 feet from the "Five Points" and therefore has good visual exposure, identity, and linkage with downtown. Site C is excellent for bus user/pedestrian ingress and egress since users would board and depart from a sidewalk. The site is good with respect to the nonbus user conflicts because the loading and unloading of transit passengers should not interfere significantly with the relatively low volume of pedestrian traffic on W. Main Street. The weaving of buses into and out of the traffic lanes may have a moderately adverse effect on the flow of nonbus traffic. Potential noise and air pollution impacts upon neighboring land uses are poor due to the abutting buildings being located only 10 feet away. The effects of the microclimate on the site are excellent since the site is somewhat shielded from harsh winter winds by existing buildings and summer winds are channeled down W. Main Street to afford a cooling effect for pedestrians despite its southern exposure to the summer sun. The adequacy of existing nighttime lighting at the site is fair with an average illumination level of 1.54 footcandles at ground level. With respect to the coordination of the site with the local and intercity transit systems, the site is rated as poor because eight of the 10 existing city bus routes would be required to be rerouted and because of the four intercity bus routes, only one Wisconsin Coach Lines, Inc. route would be served by the site.

Site D: Main Street East

Site D, located on the north side of W. Main Street from N. Barstow Street to N. East Avenue, is graphically shown in Figure 11. Site D is a linear and elongated site and occupies 0.45 acre of the W. Main Street right-of-way. The site is inadequate in size to accommodate the existing transfer site needs and is therefore unsatisfactory. Neighboring land uses include residential, commercial, and medical uses located to the north of the site and commercial and governmental uses to the south of the site. These uses are compatible with the transfer station except for the residential uses. The site provides for the on-street parking of 13 automobiles which would be eliminated if this site

were developed as the facility. Transit vehicle ingress and egress is good because buses enter and exit the site by merging into traffic flowing on a one-way street, which in 1982 carried a traffic volume of over 16,000 vehicles per average weekday. Currently, no traffic signals are located on E. Main Street which could serve to interrupt the flow of traffic, thereby facilitating bus entry into and merger with the through traffic lanes. The site is about 750 feet from the "Five Points" and therefore provides fair visual exposure, identity, and linkage to downtown. The site is excellent for bus user/pedestrian ingress and egress since users would board and depart from a sidewalk. The site is good with respect to the nonbus user conflicts because the loading and unloading of transit passengers should not interfere significantly with the relatively low volume of pedestrian traffic on W. Main Street.

The weaving of buses into and out of the through traffic lanes may have a moderately adverse effect on the flow of nonbus traffic on W. Main Street. The queue of buses will also adversely affect vehicular traffic using driveways to abutting properties. Potential noise and air pollution impacts upon neighboring land uses are poor due to the abutting buildings being only 10 feet away. The effects of the microclimate on the site are good since the site will be somewhat shielded from harsh winter winds by buildings at its western and eastern extremities and summer winds will be channeled down W. Main Street to afford a cooling effect for pedestrians despite its southern exposure to the summer sun. The adequacy of existing nighttime lighting at the site is fair with an average illumination level of 1.62 footcandles at ground level. With respect to the coordination of the site with the local and intercity bus systems, the site is rated as good because only two of the 10 existing city bus routes would be required to be rerouted and because the site serves all intercity buses traveling in one direction through the City.

Site E: Broadway Parking Lot

Site E, the municipal parking lot No. 3 located at the intersection of W. Broadway, Bank Street, and Clinton Street, is graphically shown in Figure 12. The site is about 0.61 acre in size and is of an L-shaped configuration. The site is adequate in size to accommodate the present needs of the transit system, but unsatisfactory to accommodate the future needs of the transit system unless contiguous buildings would be demolished to provide additional space. The site is currently occupied by the existing interurban bus depot situated at its northernmost corner. Neighboring land uses with which the site is compatible include commercial uses and buildings to the south, east, and west of the site and the Fox River to the northwest. The site provides for the off-street parking of 57 automobiles. All existing parking spaces would be eliminated if this site were developed for the facility. Transit vehicle ingress and egress is difficult because buses enter and leave the site at an intersection which serves over 16,000 vehicle trips per average weekday, has five approach legs and five exit legs, is not traffic signal controlled, and provides very short sight distances at selected right- and left-turn traffic maneuvers. The site is located 400 feet from the "Five Points" and has good visual exposure, identity, and linkage with the downtown area. The site is good for bus user/pedestrian ingress and egress since users would board and depart from a parking lot area. The site is rated as fair for nonbus user impacts because while the loading and unloading of transit passengers would

not affect street pedestrian traffic in the area, the movement of buses into and out of the site would affect pedestrian traffic on W. Broadway, N. Clinton Street, N. Bank Street, and the western entrance/exit to the river parking lot. Potential noise impacts upon neighboring land uses are poor due to abutting buildings which are located only five to 20 feet away. Potential air pollution impacts upon neighboring land uses are fair due to the summer and winter wind direction. The effects of the microclimate on the site are fair. Winter winds are not adequately shielded at the site and cooling summer winds are shielded by the existing commercial structures abutting the south side of the site. The northern portion of the site has exposure to the hot summer sun. The adequacy of existing nighttime lighting at the site is poor with an average illumination level of 0.99 footcandle at ground level. With respect to the coordination of the site with the local and intercity transit systems, the site is rated as excellent because all local and intercity bus routes serve the site.

Site F: Barstow Street Parking Lot

Site F, municipal parking lot No. 5 located between N. Barstow Street and Martin Street south of W. Main Street, is shown graphically in Figure 13. The site is about 1.15 acres in size and is of sufficient size and adequate shape to accommodate the facility. The facility expansion capabilities of the site are excellent due to its large site area. The site is bounded on the north and west by existing commercial land uses and structures, on the south by a parking lot, and on the east by a church and private elementary school and is compatible with these uses. The site provides for the off-street parking of 114 automobiles. Approximately 50 parking spaces would be lost if this site were developed for the facility. Transit vehicle ingress and egress is good because buses enter and leave the site at a midblock location on N. Barstow Street which in 1982 carried about 10,000 vehicles per average weekday. Traffic flow interruption, to facilitate bus entry onto N. Barstow Street, is provided by the cycling of traffic signals at N. Barstow Street and W. Main Street and at N. Barstow Street and W. Broadway. However, potential traffic conflicts would exist with buses turning left to access the site from the north and to the south. The site is located about 750 feet from the "Five Points" and therefore has fair visual exposure, identity, and linkage with the downtown area. The site is good for bus user/pedestrian ingress and egress because users would board and depart from a parking lot area. The site is rated as good for nonbus user impacts because the loading and unloading of transit passengers would not interfere with pedestrian traffic. Potential noise impacts upon the neighboring land uses are fair due to the orientation and location of abutting buildings with their service areas facing the site. Potential air pollution impacts upon neighboring land uses are fair due to the summer and winter wind directions. The effects of the microclimate on the site are fair. Winter winds are not shielded at the site. Cooling summer winds, however, can penetrate the site. Since there are no shade trees at the site, the site has severe exposure to the hot summer sun. The adequacy of existing nighttime lighting at the site is poor with an average illumination level of 0.78 footcandle at ground level. With respect to the coordination of the site with the local and intercity transit systems, the site is rated as poor because all 10 local transit routes would require rerouting to serve the site and because the site is not directly served by any of the intercity transit routes.

Site G: Madison Street Parking Lot

Site G is the municipal parking lot No. 12 located on the southwest side of Madison Street south of the intersection of E. St. Paul Avenue and Madison Street and is graphically shown in Figure 14. The site is of a rectilinear configuration, occupies about 1.65 acres, and is of sufficient size and adequate shape to accommodate the facility. The facility expansion capabilities of the site are excellent due to its large size and shape. The site is bounded on the southeast by the Fox River, on the northwest by the Milwaukee Road railroad right-of-way, on the northeast by Madison Street and commerce-related uses and structures, and on the southwest by open lands and is extremely compatible with these land uses. The site is occupied by an old railroad depot which has some historic significance. The site provides for the off-street parking of 153 automobiles. Approximately 35 to 45 parking spaces would be lost if this site were developed for the facility. Transit vehicle ingress and egress is poor because buses enter and leave the site on W. Madison Street which in 1982 carried almost 16,000 vehicles per average weekday and is located within 80 feet of the intersection of W. Madison Street and W. St. Paul Avenue. The short distance between the site and the intersection and the queue of vehicles which may be stopped at the intersection may result in delays for buses which are exiting the site to proceed west on W. Madison Street. The site is located about 800 feet from the "Five Points" and therefore has fair visual exposure, identity, and linkage with the downtown area. The site is good for bus user/pedestrian ingress and egress because users would board and depart from a parking lot area. The site is rated good for nonbus user impacts because the loading and unloading of transit passengers will not interfere with pedestrian traffic and because only those transit vehicles making left turns to access the site will cause delays for automobiles. Potential noise and air pollution impacts upon neighboring land uses are excellent since the site is open in character and not surrounded by closely abutting buildings. The effects of the microclimate on the site are fair. Cold winter winds are not shielded at the site. Summer winds, however, can penetrate the site, thus assisting in cooling. Since vegetation is located only at the south end of the site, the northern portions of the site are not shielded from hot summer sun exposure. The adequacy of existing nighttime lighting at the site is unsatisfactory with an average illumination level of 0.54 footcandle at ground level. With respect to the coordination of the site with the local and intercity transit systems, the site is rated as fair because six of the 10 local transit routes would be required to be rerouted and because the site is not served by the existing Wisconsin Coach Lines, Inc., commuter routes.

Site H: E. St. Paul Avenue

Site H is located on the southeast side of E. St. Paul Avenue between Madison Street and Northwest Barstow Street and is graphically shown in Figure 15. The site is linear and elongated in shape, occupies about 1.10 acres of the E. St. Paul Avenue right-of-way, and is of sufficient size and adequate shape to accommodate the facility. The facility expansion capabilities of the site are excellent due to its length. Neighboring land uses include a drive-through bank and railroad right-of-way to the southeast of the site and mixed commercial and residential land uses and structures to the northwest of the site. Compatibility with neighboring land uses is fair due to the conflicts which would

be created relative to the drive-in banking use of the contiguous area to the southeast of the site. The site provides for the on-street parking of 20 automobiles and all would be eliminated if this site were developed as the facility. Transit vehicle ingress and egress is excellent because buses enter and exit the site by merging into traffic flowing on a one-way street. Traffic flow interruption, to permit the buses to enter the through traffic lanes which carry about 7,000 vehicles per average weekday, is provided by the traffic signal located at W. St. Paul Avenue and W. Madison Street. The site is located about 850 feet from the "Five Points" and therefore has poor visual exposure, identity, and linkage with the downtown area. The site is excellent for bus user/pedestrian ingress and egress since users would board and depart from a sidewalk area. The site is rated as poor for nonbus user impacts because the queue of buses will adversely affect the operation of vehicles accessing the drive-through banking facilities located on property abutting the site. Potential noise impacts upon neighboring land uses are good since the site is of sufficient distance from abutting residential structures between Brook Street and Martin Street. Potential air pollution impacts upon surrounding land uses are good due to the sufficient distance from abutting land uses. The effects of the microclimate on the site are good since the southwest portion of the site will be somewhat shielded from harsh winter winds. Cool summer winds are channeled down E. St. Paul Avenue to afford a cooling effect for pedestrians, thus minimizing the effects of the summer sun. The adequacy of existing nighttime lighting at the site is unsatisfactory with an average illumination level of 0.35 footcandle. With respect to the coordination of the site with the local and intercity transit systems, the site is rated as poor because eight of the 10 local transit routes would require rerouting to serve the site and because the intercity transit service does not serve the site.

Site I: Corrina Boulevard

Site I is located on the northwest side of Corrina Boulevard between N. Barstow Street and Buckley Street and is graphically shown in Figure 16. The site is of an elongated, curved configuration occupying about 0.81 acre of the Corrina Boulevard right-of-way and the site is of sufficient size and adequate shape to accommodate the facility. The facility expansion capabilities of the site are excellent since a more than adequate amount of space is available. Neighboring land uses and structures include the Fox River contiguous to the northwest side of the site and residential structures and uses to the southeast of the site. The compatibility with these neighboring land uses is only fair due to the proximity of residential buildings. The site provides for the on-street parking of 62 automobiles to serve existing needs and approximately 35 to 50 parking spaces would be lost if this site would be developed for the facility. Transit vehicle ingress and egress is poor because buses entering and leaving the site from the west must use N. Barstow Street which currently carries about 14,000 vehicles per average weekday. The intersection of N. Barstow Street and Corrina Boulevard is not signalized at present. The site is located about 1,100 feet from the "Five Points" (a distance further from the "Five Points" than any other alternative site being considered) and therefore has poor visual exposure, identity, and linkage with the downtown area. Site I is good for bus user/pedestrian ingress and egress since users will board and depart from a parking lot area. The site is rated as good for nonbus user impacts because the volumes of nontransit pedestrians and vehicles are rela-

tively low on E. Corrina Boulevard. Potential noise impacts upon neighboring land uses are poor due to the proximity of abutting residential structures. The potential air pollution impacts upon neighboring land uses are poor since the summer and winter winds would blow such pollutants at the neighboring residential structures located to the east of the site. The effects of the microclimate on the site are poor. Harsh winter winds from the west pass unobstructed over the Fox River to the shoreline parallel to Corrina Boulevard. There is no protection or shade offered from the hot summer sun. The adequacy of existing nighttime lighting at the site is unsatisfactory with an average illumination level of 0.11 footcandle at ground level, representing the lowest lighting level of any of the 12 sites being considered. With respect to the coordination of the site with the local and intercity transit systems, the site is rated as poor because nine of the 10 local transit routes would be required to be rerouted and because no intercity transit service is provided at the site.

Site J: Wisconsin Avenue

Site J is located on the south side of Wisconsin Avenue between Maple Street and N. Grand Avenue and is graphically shown in Figure 17. The site is linear and elongated in shape and occupies about 1.35 acres of land, including portions of both the Wisconsin Avenue right-of-way and Cutler Park and offers more than adequate space for the facility. The facility expansion capabilities of the site are good since additional lands could be taken from Cutler Park. The site is bounded on the south by Cutler Park and the City of Waukesha Public Library and on the north by mixed residential, commercial, medical service, and parking land uses. Consequently, the compatibility with those neighboring land uses is fair. The site provides for the on-street parking of 11 automobiles and all would be eliminated if this site would be developed as the facility. Transit vehicle ingress and egress is good because buses enter and leave the site by merging into a one-way traffic flow which ranges from 7,000 vehicles per average weekday between N. Maple and N. Clinton Streets, to 18,000 vehicles per average weekday between N. Clinton Street and N. Grand Avenue. It is anticipated that transit vehicle movement would be somewhat impaired by the heavy volumes of traffic on the eastern end of the site despite the interruption of flow resulting from the cycling of the traffic signal at N. Clinton Street and W. Wisconsin Avenue. The site is about 700 feet from the "Five Points" and, therefore, has fair visual exposure, identity, and linkage with downtown. The site is excellent for bus user/pedestrian ingress and egress because users would be boarding and departing from a sidewalk area. The site is rated fair for nonbus user impacts because buses entering and leaving the site would interfere with traffic flowing east on W. Wisconsin Avenue and particularly with those vehicles turning south from W. Wisconsin Avenue to W. Grand Avenue. Also, pedestrian conflicts with nonbus users would occur due, in part, to the heavy pedestrian usage and flow around Cutler Park and the public library. Potential noise impacts upon the neighboring land uses are poor due to the abutting Cutler Park and public library. Potential air pollution impacts upon abutting neighboring land uses to the north of the site are also poor due to the direction of the prevailing summer and winter winds. The effect of the microclimate on the site is good although harsh winter winds from the west are channeled down Wisconsin Avenue. The site allows for the passage of cool summer winds while retaining a natural tree canopy over the

site to afford the pedestrians with shade from the hot summer sun. The adequacy of existing nighttime lighting at the site is fair with an average illumination level of 1.49 footcandles at ground level. With respect to the coordination of the site with the local and intercity transit systems, the site is rated good because only three of the 10 local transit routes would be required to be rerouted to serve the site and the site serves all intercity buses traveling in one direction through the City.

Site K: Martin Street

Site K is located on the west side of Martin Street between W. Main Street and South Street and is graphically shown in Figure 18. The site is linear and elongated in shape and occupies an area of about 1.32 acres of the Martin Street right-of-way. The size and facility expansion capabilities of the site are unsatisfactory due to the lack of sufficient space along the Martin Street right-of-way to accommodate 10 buses, or the transfer station building. The site is bounded on the west by commercial, residential, and parking lot land uses and on the east by institutional (elementary school) land uses. Consequently, due to the elementary school land use, the site is rated poor for compatibility with neighboring land uses. The site provides for the on-street parking of 15 automobiles and all would be eliminated if this site would be developed for the facility. Transit vehicle ingress and egress is excellent because buses would enter and leave the site on a low-volume land access street. The site is located about 1,050 feet from the "Five Points" and therefore has poor visual exposure, identity, and linkage with the downtown area. The site is excellent for bus user/pedestrian ingress and egress since users would board and depart from a sidewalk area. The site is rated as poor for nonbus user impact because the use of N. Martin Street would preclude the closing of the street for elementary school playground purposes during the midday periods when the elementary school is in session. Potential noise and air pollution impacts upon neighboring land uses to the east of the site are fair due, in part, to the prevailing direction of summer and winter winds. The effects of the microclimate on the site are good. Although harsh winter winds from the west are allowed to pass through the contiguous parking lots on the western boundary of the site, summer winds from the southwest are also allowed to pass through the site providing a cooling effect. The north/south linear orientation of the site also tends to minimize the effects of the hot summer sun. The adequacy of existing nighttime lighting at the site is unsatisfactory with an average illumination level of 0.36 footcandle at ground level. With respect to the coordination of the site with the local and intercity transit systems, the site is rated poor because three of the 10 transit routes would require major rerouting and seven of the 10 routes would require minor rerouting to serve the site. The site is currently not served by any intercity bus route.

Site L: River Parking Lot

Site L is the municipal parking lot located between W. Broadway and N. Barstow Street north of W. Main Street and is graphically shown in Figure 19. The site is elongated extending the full length of the parking lot and occupies about 2.2 acres of land and is of sufficient size and adequate shape to accommodate

the facility. The facility expansion capabilities of the site are excellent due to the large area of land available. The site is bounded on the north by the Fox River and on the south by commercial land uses and structures and is extremely compatible with neighboring land uses. The entire parking lot provides for the off-street parking of 135 automobiles of which between 45 and 55 would be eliminated if this site would be developed for the facility. Transit vehicle ingress and egress is fair because buses enter and leave the site at intersections with two high-volume streets which currently are not signal-controlled. As previously noted, the intersection of W. Broadway and N. Clinton Street serves about 16,000 vehicles per average weekday and N. Barstow Street carries about 14,000 vehicles per average weekday. Ingress and egress is somewhat hampered by these high traffic volumes along W. Broadway and N. Barstow Street. Site L is good for bus user/pedestrian ingress and egress since bus users would board and depart from a parking lot area. The site is rated excellent for nonbus user impacts, including the conflict between transit vehicles and parking/unparking vehicles. The site is located about 300 feet from the "Five Points" and therefore has good visual exposure, identity, and linkage with the downtown area. Potential noise impacts upon neighboring land uses south of the site are fair due to the distance of the site from the existing buildings. Potential air pollution impacts upon neighboring land uses are good due to the prevailing summer and winter wind direction blowing these pollutants away from the abutting commercial buildings located south of the site. The effects of the microclimate on the site are good. Cool summer winds are channeled through the parking lot area from the southwest and the hot summer sun falling on portions of the site at certain times of the year shields the southern portions of the site. Although high illumination levels of over 4.00 footcandles were recorded in certain areas of the site, the overall adequacy of existing nighttime lighting at the site is only fair with an average illumination level of 1.37 footcandles at ground level. With respect to the coordination of the site with the local and intercity transit system, the site is rated good because all 10 of the local transit routes will require minor rerouting and all intercity bus routes are served at the western end of the site.

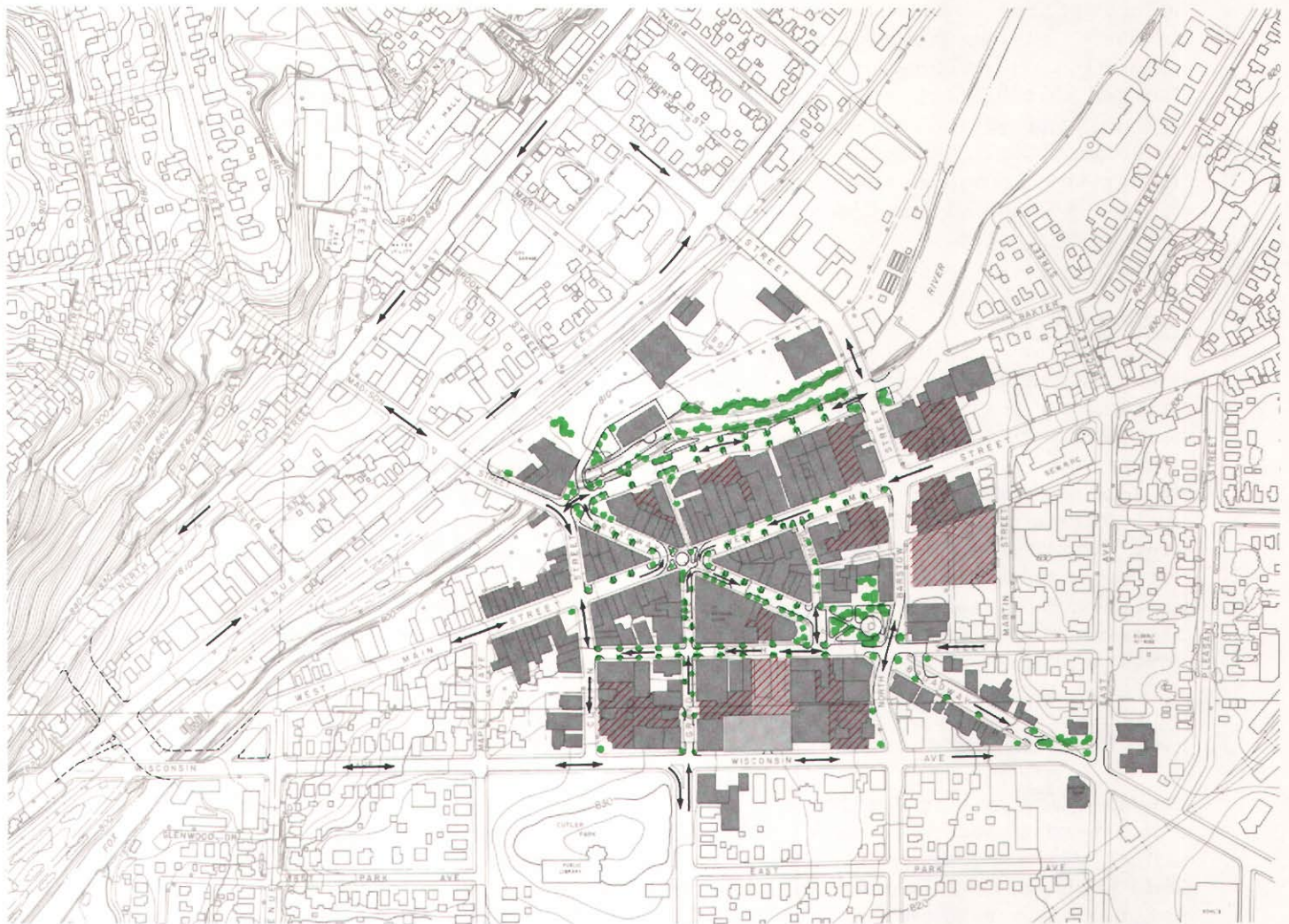
EXISTING LOCAL AND REGIONAL PLANS

Local Downtown Plans

The downtown design framework plan for tax incremental financing district No. 2 in the City of Waukesha is shown on Map 2. The conceptual plan map for the downtown area identifies existing and potential commercial areas, parking facilities, areas where additional development could occur, and vehicular traffic flow. In addition, the plan proposes detailed conceptual plans for the "Five Points" (the intersection of Main Street, Broadway, and Grand Avenue) and Grand Avenue between the "Five Points" and Wisconsin Avenue. Although the plan does not specifically address the issue of a need for a central bus transfer site in the downtown area, the placement of such a facility at any of the 12 locations described earlier would not appear to adversely affect the plan. Eight of the 12 alternative sites studied for the bus transfer site, however, are outside the plan area described on Map 2. These eight sites include Site C located on the north side of W. Main Street from N. West Avenue to Clinton Street; the eastern portion of Site D located on the north side of W. Main

Map 2

DOWNTOWN DESIGN FRAMEWORK PLAN FOR TAX INCREMENTAL FINANCING DISTRICT NO. 2 IN THE CITY OF WAUKESHA



LEGEND

- DOWNTOWN COMMERCIAL
- PARKING FACILITIES
- INFILL OPPORTUNITIES-
AREAS WHERE ADDITIONAL
DEVELOPMENT COULD OCCUR

- TREES
- TRAFFIC FLOW



Source: Donohue & Associates, Inc., Engineers and Architects and Johnson, Johnson, and Roy, Inc., Planning and Landscape Architecture.

Street from N. Barstow Street to N. East Avenue; Site E which is municipal parking lot No. 3 located at the intersection of W. Broadway, Bank, and Clinton Streets; Site G which is municipal parking lot No. 12 located on the southwest side of Madison Street south of the intersection of E. St. Paul Avenue and Madison Street; Site H located on the southeast side of E. St. Paul Avenue between Madison Street and Barstow Street; Site I located on the northwest side of Corrina Boulevard between Barstow Street and Buckley Street; Site J located on the south side of Wisconsin Avenue between Maple Street and N. Grand Avenue; and Site K located on the west side of Martin Street between W. Main Street and South Street. Site F, the Barstow Street parking lot located between N. Barstow Street and Martin Street south of W. Main Street, is unsatisfactory for a bus transfer site based upon current city plans to build a parking structure on that site.

Regional Plans

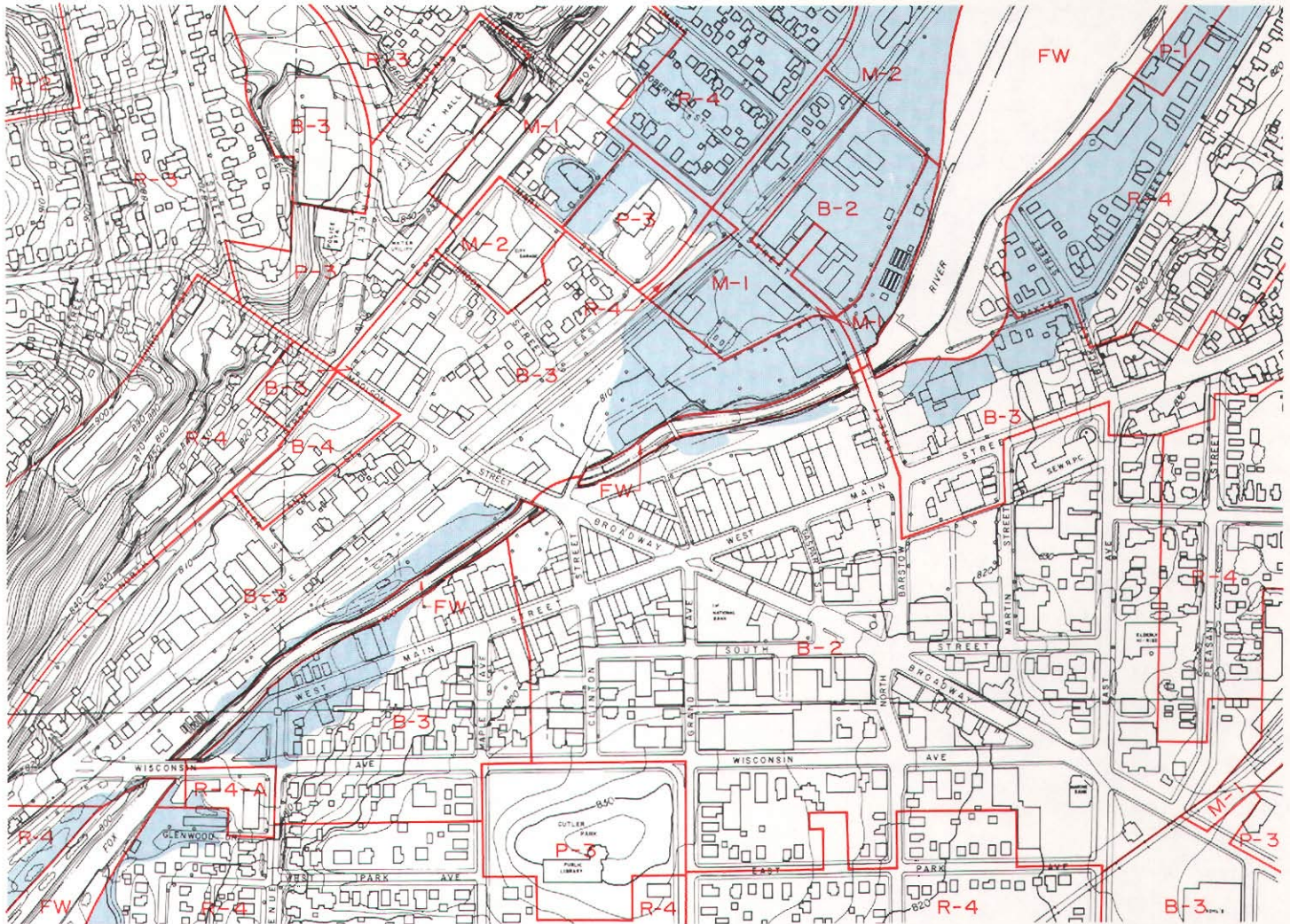
The recommended regional transit plan includes certain recommendations pertaining to the Waukesha area. These recommendations include the provision of modified rapid transit bus service to the Milwaukee central business district from public transit stations located in the Waukesha central business district, at the existing park-and-ride lot at USH 18 and IH 94 (Goerke's Corners), and at a new park-and-ride lot at CTH T and IH 94. At the present time, such service is provided to the Milwaukee central business district from the Goerke's Corners public transit station and the city-owned bus depot at W. Broadway and N. Clinton Street in the Waukesha central business district. The plan further recommends the coordination of the modified rapid transit service with the service provided by the local transit system.

EXISTING ZONING IN DOWNTOWN WAUKESHA

The existing zoning in the City of Waukesha downtown is shown on Map 3. Each of the alternative bus transfer sites fall within the B-2, B-3, P-1, P-3, or R-4 zoning district classifications as defined in the City of Waukesha Municipal Code Chapter 22--Zoning Code. The B-2, B-3, P-3, and R-4 zoning districts do not permit bus transfer facilities. The P-1 district, however, permits buildings and structures related to park and recreational or public utility functions. However, whether a bus transfer site and an associated building(s) could be considered as a "public utility" is not certain. Therefore, in order for any of the bus transfer sites to be legally designated, a variance from the existing zoning code would have to be sought or an amendment would have to be made to the existing zoning ordinance in order to add this type of use as either a permitted or conditional use.

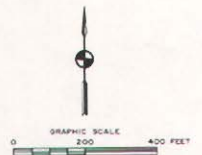
Map 3

EXISTING ZONING IN THE CITY OF WAUKESHA DOWNTOWN: 1982



LEGEND

- ZONING DISTRICT BOUNDARY
- R-2 ONE-FAMILY RESIDENCE DISTRICT
- R-3 ONE TO FOUR FAMILY RESIDENCE DISTRICT
- R-4 RESIDENTIAL PLANNED DEVELOPMENT DISTRICT
- R-4-A RESIDENTIAL PLANNED DEVELOPMENT DISTRICT
- B-2 CENTRAL BUSINESS DISTRICT
- B-3 GENERAL BUSINESS DISTRICT
- B-4 LIMITED BUSINESS DEVELOPMENT DISTRICT
- P-1 PARKS DISTRICT
- P-3 PUBLIC LANDS AND INSTITUTIONS DISTRICT
- M-1 LIGHT MANUFACTURING AND WAREHOUSE DISTRICT
- M-2 GENERAL MANUFACTURING DISTRICT
- F-W FLOODWAY DISTRICT
- Urban Flood District



Source: City of Waukesha Planning Department, City of Waukesha Federal Flood Insurance Study (March 2, 1982), and SEWRPC.

(This page intentionally left blank)

Chapter IV

ALTERNATIVE CENTRAL TRANSFER SITE EVALUATIONS

INTRODUCTION

Twelve potential sites for a central bus transfer facility in the Waukesha area were identified and inventoried to identify their characteristics and relative suitability. These sites are described in Chapter III of this report. To aid in the selection of the most suitable site from among those alternatives, a technique was used to facilitate an objective comparison of the suitability of the 12 alternative sites. This technique is based upon an identification of the relative importance of the various site evaluation measures in the proper planning and siting of a central transfer site. These measures are discussed in Chapter III of this report and are listed in Table 2. The measures are listed in Table 2 in rank order of importance, with the rank order being assigned a numeric value from four to one--four representing the highest level of importance and one representing the lowest. The Advisory Committee, deciding the site selection collectively, determined the rank order of the measures. This was done by asking each Committee member to rank order the measures and by then determining the combined average rank order of each measure. The relative values of the rank ordered measures were then normalized so that the total of the numeric values would equal 10. The 12 alternative central transfer sites were then comparatively evaluated on the basis of each of the site evaluation measures shown on Table 2 and scored accordingly, based upon the site inventory data presented in Chapter III of this report. The scoring was based upon the degree to which each site was deemed by the Advisory Committee to meet each site evaluation measure in relation to the other alternative sites considered. A score of four on a site evaluation measure indicates that the site is excellent for that particular evaluation element being considered; three, good; two, fair; one, poor and zero, unsatisfactory. The score of each site evaluation measure was then multiplied by its normalization factor (from Table 2) to attain its normalized score.

Based upon the summation of the normalized scores for all of the site evaluation measures, an overall score was assigned to each of the alternative central transfer sites. The site evaluation measure, its normalizing factor, and the score and normalized score for each alternative site considered are shown on Table 3. The site with the highest total normalized score was deemed the most suitable site for a central transfer terminal facility based upon the site evaluation measures presented. A rank order listing of all 12 alternative sites considered, based upon this evaluation, is shown in Table 4. The site which scored the highest is Site L located at the municipal parking lot between W. Broadway and N. Barstow Street north of W. Main Street along the Fox River. The site which scored the second highest is the existing central bus transfer site, Site A, located on the north side of W. Main Street between Broadway and Gaspar Street and on the north side of Broadway between Clinton Street and W. Main Street. The site which scored the third highest was Site B, which is located on the north side of W. Main Street from Broadway to N. Barstow Street. The site which scored the fourth highest was Site G, the municipal parking lot

No. 12 located on the southwest side of Madison Street south of the intersection of E. St. Paul Street and Madison Street.

ADVISORY COMMITTEE RECOMMENDATION

At the advisory committee meeting of September 14, 1982, the Advisory Committee toured each of the 12 alternative transfer sites considered. The Advisory Committee concurred that none of the 12 sites was "perfect" for use as the bus transfer site, and that each of the 12 sites had both positive and negative aspects. The four sites which scored the highest in the evaluation seemed reasonably well-suited for the intended use with the river parking lot (Site L) apparently being the best suited of the four. The Committee discussed some of their reservations concerning Site L, which included the loss of automobile parking spaces at the site; the preservation and enhancement of the view of the Fox River at the site; the integration of the site planning for this site with current downtown revitalization efforts; the potential staging of the site development into the phases consisting of the provision for the city bus routes first, and for the interurban bus routes at a later time; and the site development costs. The Committee acted unanimously to instruct the Commission staff to prepare a site development plan for Site L. By proceeding in this fashion, the Committee felt they would be better prepared to make a final recommendation to the Common Council.

Table 2

COMPARATIVE CENTRAL BUS TRANSFER SITE EVALUATION MEASURES

Evaluation Criteria	Rank Order and Value	Normalized Value
Sufficient Site Size to Accommodate Use.....	4.00	0.88
Vehicular Ingress/Egress.....	3.72	0.82
Bus User/Pedestrian Ingress/Egress.....	3.46	0.76
Coordination with Current Downtown Plans.....	3.23	0.71
Coordination with Local and Intercity Transit Systems.....	3.15	0.69
Compatibility with Neighboring Land Uses.....	2.95	0.65
Nonbus User Impacts Minimized.....	2.92	0.64
Visual Exposure, Identity, and Linkage to Downtown.....	2.89	0.64
Site Configuration (shape) Conducive to Use...	2.84	0.63
Potential Air Pollution Impact on Neighboring Uses.....	2.74	0.60
Shortest Functional Distance to "Five-Points".....	2.52	0.56
Potential Noise Impact on Neighboring Uses....	2.48	0.55
Facility Expansion Capabilities of Site.....	2.37	0.52
Elimination of Vehicular Parking Spaces.....	2.22	0.49
Adequacy of Existing Artificial Light.....	1.51	0.33
Site Microclimate Effects/Orientation.....	1.33	0.29
Existing Zoning.....	1.08	0.24
Total	45.41	10.00

Source: SEWRPC.

Table 3

**COMPARATIVE CENTRAL BUS TRANSFER SITE
EVALUATION FOR ALTERNATIVE SITES**

Evaluation Criteria	Normalizing Factor	Site A: "Five Points"		Site B: Main Street Central		Site C: Main Street West		Site D: Main Street East	
		Score	Normalized Score	Score	Normalized Score	Score	Normalized Score	Score	Normalized Score
Sufficient Site Size to Accommodate Use.....	0.88	2	1.76	2	1.76	2	1.76	--	--
Vehicular Ingress/Egress... Bus User Pedestrian Ingress/Egress.....	0.82	4	3.28	4	3.28	4	3.28	3	2.46
Coordination with Current Downtown Plans.....	0.76	4	3.04	4	3.04	4	3.04	4	3.04
Coordination with Local and Intercity Transit System.....	0.71	3	2.13	3	2.13	2	1.42	3	2.13
Compatibility with Neighboring Land Uses.....	0.69	3	2.07	3	2.07	1	0.69	3	2.07
Nonbus User Impacts Minimized.....	0.65	3	1.95	3	1.95	2	1.30	2	1.30
Visual Exposure, Identity, and Linkage to Downtown... Site Configuration (shape) Conducive to Use.....	0.64	2	1.28	2	1.28	3	1.92	3	1.92
Potential Air Pollution Impact on Neighboring Uses.....	0.64	4	2.56	4	2.56	3	1.92	2	1.28
Shortest Functional Distance to "Five Points".....	0.63	3	1.89	3	1.89	3	1.89	3	1.89
Potential Noise Impact on Neighboring Uses.....	0.60	1	0.60	1	0.60	1	0.60	1	0.60
Facility Expansion Capabilities of Site.....	0.56	4	2.24	4	2.24	3	1.68	2	1.12
Elimination of Vehicular Parking Spaces.....	0.55	1	0.55	1	0.55	1	0.55	1	0.55
Adequacy of Existing Artificial Light.....	0.52	1	0.52	1	0.52	1	0.52	--	--
Site Microclimate Effects/Orientation.....	0.49	3	1.47	3	1.47	3	1.47	3	1.47
Existing Zoning.....	0.33	4	1.32	3	0.99	2	0.66	2	0.66
	0.29	4	1.16	4	1.16	4	1.16	3	0.87
	0.24	1	0.24	1	0.24	1	0.24	1	0.24
Totals	10.00	47	28.06	46	27.73	40	24.10	37	21.60

Table 3 (continued)

Evaluation Criteria	Normalizing Factor	Site E: Broadway Parking Lot		Site F: Barstow Street Parking Lot		Site G: Madison Street Parking Lot		Site H: E. St. Paul Avenue	
		Score	Normalized Score	Score	Normalized Score	Score	Normalized Score	Score	Normalized Score
Sufficient Site Size to Accommodate Use.....	0.88	2	1.76	4	3.52	4	3.52	4	3.52
Vehicular Ingress/Egress... Bus User Pedestrian Ingress/Egress.....	0.82	--	--	3	2.46	1	0.82	4	3.28
Coordination with Current Downtown Plans.....	0.76	3	2.28	3	2.28	3	2.28	4	3.04
Coordination with Local and Intercity Transit System.....	0.71	2	1.42	--	--	2	1.42	2	1.42
Compatibility with Neighboring Land Uses.....	0.69	4	2.76	1	0.69	2	1.38	1	0.69
Nonbus User Impacts Minimized.....	0.65	3	1.95	4	2.60	4	2.60	2	1.30
Visual Exposure, Identity, and Linkage to Downtown... Site Configuration (shape) Conducive to Use.....	0.64	2	1.28	3	1.92	3	1.92	1	0.64
Potential Air Pollution Impact on Neighboring Uses.....	0.64	3	1.92	2	1.28	2	1.28	1	0.64
Shortest Functional Distance to "Five Points".....	0.63	2	1.26	4	2.52	4	2.52	3	1.89
Potential Noise Impact on Neighboring Uses.....	0.60	2	1.20	2	1.20	4	2.40	3	1.80
Facility Expansion Capabilities of Site.....	0.56	3	1.68	2	1.12	2	1.12	1	0.56
Elimination of Vehicular Parking Spaces.....	0.55	1	0.55	2	1.10	4	2.20	3	1.65
Adequacy of Existing Artificial Light.....	0.52	--	--	4	2.08	4	2.08	4	2.08
Site Microclimate Effects/Orientation.....	0.49	--	--	1	0.49	1	0.49	3	1.47
Existing Zoning.....	0.33	1	0.33	1	0.33	--	--	--	--
	0.29	2	0.58	2	0.58	2	0.58	3	0.87
	0.24	1	0.24	1	0.24	1	0.24	1	0.24
Totals	10.00	31	19.21	39	24.41	43	26.85	40	25.09

Table 3 (continued)

Evaluation Criteria	Normalizing Factor	Site I: Corrina Boulevard		Site J: Wisconsin Avenue		Site K: Martin Street		Site L: River Parking Lot	
		Score	Normalized Score	Score	Normalized Score	Score	Normalized Score	Score	Normalized Score
Sufficient Site Size to Accommodate Use.....	0.88	4	3.52	4	3.52	--	--	4	3.52
Vehicular Ingress/Egress...	0.82	1	0.82	3	2.46	4	3.28	2	1.64
Bus User Pedestrian Ingress/Egress.....	0.76	3	2.28	4	3.04	4	3.04	3	2.28
Coordination with Current Downtown Plans.....	0.71	2	1.42	2	1.42	3	2.13	3	2.13
Coordination with Local and Intercity Transit System.....	0.69	1	0.69	3	2.07	2	1.38	3	2.07
Compatibility with Neighboring Land Uses.....	0.65	2	1.30	2	1.30	1	0.65	4	2.60
Nonbus User Impacts Minimized.....	0.64	3	1.92	2	1.28	1	0.64	3	1.92
Visual Exposure, Identity, and Linkage to Downtown...	0.64	1	0.64	2	1.28	2	1.28	3	1.92
Site Configuration (shape) Conducive to Use.....	0.63	3	1.89	3	1.89	3	1.89	4	2.52
Potential Air Pollution Impact on Neighboring Uses.....	0.60	1	0.60	1	0.60	2	1.20	3	1.80
Shortest Functional Distance to "Five Points".....	0.56	1	0.56	2	1.12	1	0.56	3	1.68
Potential Noise Impact on Neighboring Uses.....	0.55	1	0.55	1	0.55	2	1.10	2	1.10
Facility Expansion Capabilities of Site.....	0.52	4	2.08	3	1.56	--	--	4	2.08
Elimination of Vehicular Parking Spaces.....	0.49	1	0.49	3	1.47	3	1.47	1	0.49
Adequacy of Existing Artificial Light.....	0.33	--	--	2	0.66	--	--	2	0.66
Site Microclimate Effects/Orientation.....	0.29	1	0.29	3	0.87	3	0.87	3	0.87
Existing Zoning.....	0.24	1	0.24	1	0.24	1	0.24	1	0.24
Totals	10.00	30	19.29	41	25.33	32	19.73	48	29.52

NOTE: The following scale was used for each score assigned:

- 4 = Excellent.
- 3 = Good.
- 2 = Fair.
- 1 = Poor.
- 0 = Unsatisfactory.

Source: SEWRPC.

Table 4

**RANK ORDER LISTING OF THE ALTERNATIVE CENTRAL BUS
TRANSFER SITES BASED UPON SITE EVALUATION**

Rank Order	Normalized Score	Site and Description
1	29.52	Site L: Municipal parking lot located between W. Broadway and N. Barstow Street north of W. Main Street
2	28.06	Site A: The existing central bus transfer site located on the north side of W. Main Street between Broadway and Gaspar Street and on the north side of Broadway between Clinton Street and W. Main Street
3	27.73	Site B: The north side of W. Main Street from Broadway to N. Barstow Street
4	26.85	Site G: Municipal parking lot No. 12 located on the southwest side of Madison Street south of the intersection of E. St. Paul Street and Madison Street
5	25.33	Site J: The south side of Wisconsin Avenue between Maple Street and N. Grand Avenue
6	25.09	Site H: The southeast side of E. St. Paul Street between Madison Street and N. Barstow Street
7	24.41	Site F: Municipal parking lot No. 5 located between N. Barstow Street and Martin Street south of W. Main Street
8	24.10	Site C: The north side of W. Main Street from N. West Avenue to Clinton Street
9	21.60	Site D: The north side of W. Main Street from N. Barstow Street and N. East Avenue
10	19.73	Site K: The west side of Martin Street between W. Main Street and South Street
11	19.29	Site I: The northwest side of Corrina Boulevard between N. Barstow Street and Buckley Street
12	19.21	Site E: Municipal parking lot No. 3 located at the intersection of W. Broadway and Bank and Clinton Streets

Source: SEWRPC.

Chapter V

THE RECOMMENDED TRANSIT SYSTEM CENTRAL TRANSFER SITE DEVELOPMENT PLAN AND BUDGET ESTIMATE

INTRODUCTION

Chapter IV of this report described the results of an evaluation of alternative central transfer sites utilizing Advisory Committee agreed-upon evaluation measures. Based upon that evaluation and the findings of the detailed site inventory and analyses presented in Chapter III for each of the 12 alternative sites considered, the Advisory Committee determined to tentatively recommend Site L, the municipal parking lot located between W. Broadway and N. Barstow Street north of W. Main Street, as the best site for the location of a central transfer facility, and to direct the Commission staff to prepare site development concepts, a site and landscape sketch plan, and a budget estimate.

This chapter presents site development design concepts for Site L, three alternative site and landscape development plans, and cost estimates for the development of the site under each alternative development plan. This chapter also presents the Advisory Committee's final recommendation for the location and development of a transit system central transfer site based upon Committee review of the data and design concepts presented in this report.

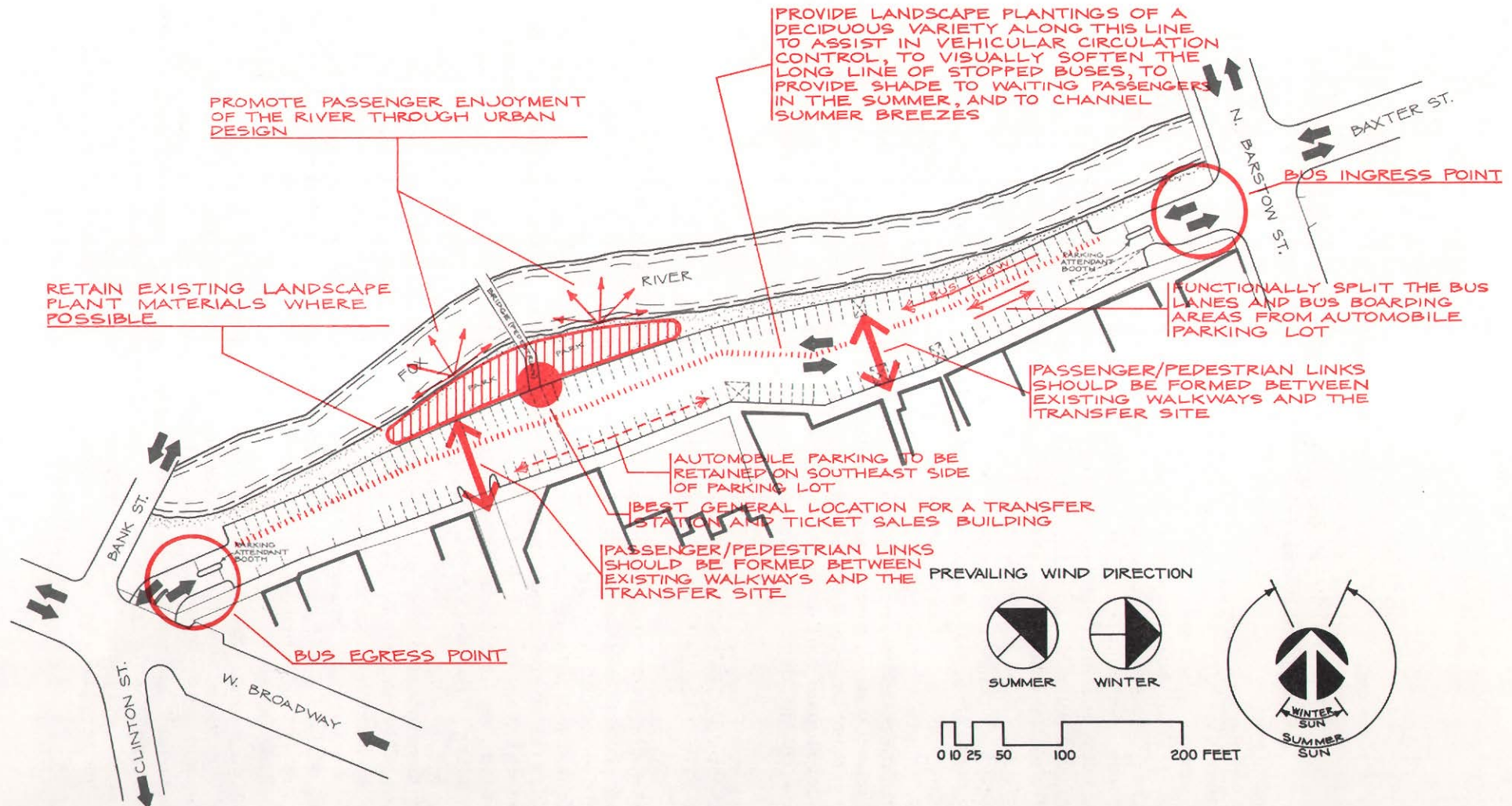
SITE DEVELOPMENT DESIGN CONCEPTS FOR THE PRELIMINARY RECOMMENDED SITE

A site development design concept identifies and interrelates the major plan design considerations. For the central bus transfer site, these considerations included both pedestrian and vehicular circulation, the separation of the various functions of the transfer site, the location of the various activities which are to be conducted at the site, the visual aspects of the site, the potential for the exploitation of site amenities, and the potential for the positive manipulation of the microclimate of the site in order to create a pleasing final design solution.

Site development design concepts for the preliminary recommended site are graphically shown in Figure 20. The bus flow direction through the site is from a northeast to a southwest direction with the buses entering the site from N. Barstow Street and exiting the site at W. Broadway. This flow of buses should be functionally separated from the balance of the automobile parking lot. Accordingly, automobile parking would be retained on the southeast side of the parking lot, while the bus lane or bus berths would be situated along the northwest side of the parking lot. This flow of buses and transfer site location within the parking lot will minimize the potential noise and air pollution impacts on neighboring land uses, and also minimize the impacts on nonbus-user pedestrian and automobile traffic. The boundary separating the bus lane or berths from the automobile parking lot area should be, if at all possible, clearly delineated by landscape plantings of a deciduous variety to not only assist in effecting the desired separation and control but to also visually soften the effect of the line of stopped buses,

Figure 20

SITE DEVELOPMENT DESIGN CONCEPTS FOR THE PRELIMINARY RECOMMENDED CENTRAL BUS TRANSFER SITE



Source: SEWRPC.

provide shade to waiting passengers in the summer, and to provide a channel for cooling summer breezes. Since the greatest amount of noncirculation-related space at the site is provided in the area along the south bank of the Fox River near the existing pedestrian bridge and because this area is centrally located on the site, this area is the best location for a transfer station and ticket sales building. This location also affords passenger and pedestrian viewing and enjoyment of the river. Pedestrian linkages should also be formed between the northwest and southeast side of the site in order to accommodate the passenger-pedestrian flow from the stopped buses to the commercial land uses on the opposite side of the parking lot and across the river.

THE ALTERNATIVE STAGED SITE AND LANDSCAPE DEVELOPMENT PLANS

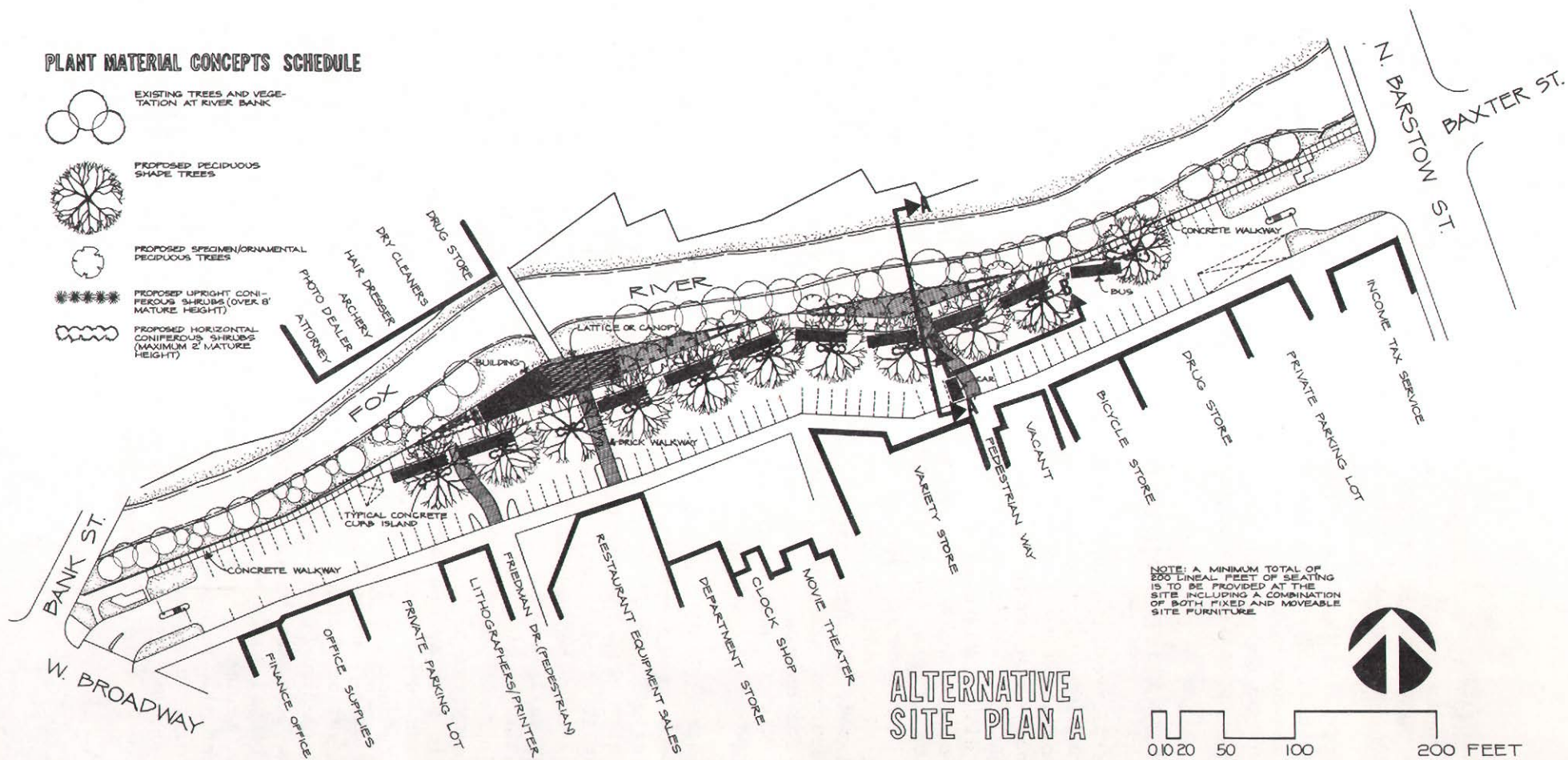
The alternative site and landscape development plans could be developed in two steps. The first stage would consist of the development of the easterly portion of the site plan in order to accommodate eight Waukesha Metro buses. The second phase would consist of the additional development of the site to accommodate two interurban buses, as well as the proposed intercity bus depot located either where shown in Figures 21 through 23, or at some other location along the south side of the parking lot. During the interim between the completion of the first stage and the second stage, the existing interurban bus facility located adjacent to the west end of the preliminary recommended transfer site could be utilized for interurban service until the second stage is completed. In this respect it should be noted, however, that the existing interurban transfer station and ticket sales building can continue to be used for only a limited period of time because of the dilapidated condition of the structure and its current inability to meet existing building code requirements.

Alternative Site and Landscape Plans A, B, and C for the second stage of the development are graphically described in Figure 21 (plan view), Figure 22 (plan view), Figure 23 (plan view), Figure 24 (sectional view), and Figure 25 (sectional view). The first stage of development would differ from the second only in that the intercity depot would not be developed and the length of the facility would be reduced by two buses, or by about 20 percent. In general, the plans call for the development of the transfer facility on the northwest side of the parking lot along the Fox River. Consequently, under Alternative Plan A, a total of 57 existing automobile parking spaces would be lost upon full development of the site; and under Alternative Plans B and C, 64 existing automobile parking spaces would be lost. Under Alternative Plan A, the initial development phase would require about 46 of these 57 spaces to accommodate eight city buses; under Alternative Plan B, about 48 spaces; and under Alternative Plan C, about 50 spaces. However, about 23 additional parking spaces could be gained through the redesign of the parking lot entrances and through the elimination of the parking toll booths at each end of the lot as shown in Figure 26 (plan view). If that were done, it would be desirable that the spaces created would be used for short-term parking. Another 16 parking spaces could be gained by replacing those lost at the existing bus transfer site located at the intersection of W. Broadway and W. Main Street. If 23 parking spaces would be gained through the redesign of the ends of the river parking lot and another 16 spaces gained by reuse of the present transfer site, only from 18 to 25 total parking spaces would be lost in the ultimate development

Figure 21

ALTERNATIVE SITE AND LANDSCAPE DEVELOPMENT PLAN A FOR THE CENTRAL BUS TRANSFER SITE

PLANT MATERIAL CONCEPTS SCHEDULE



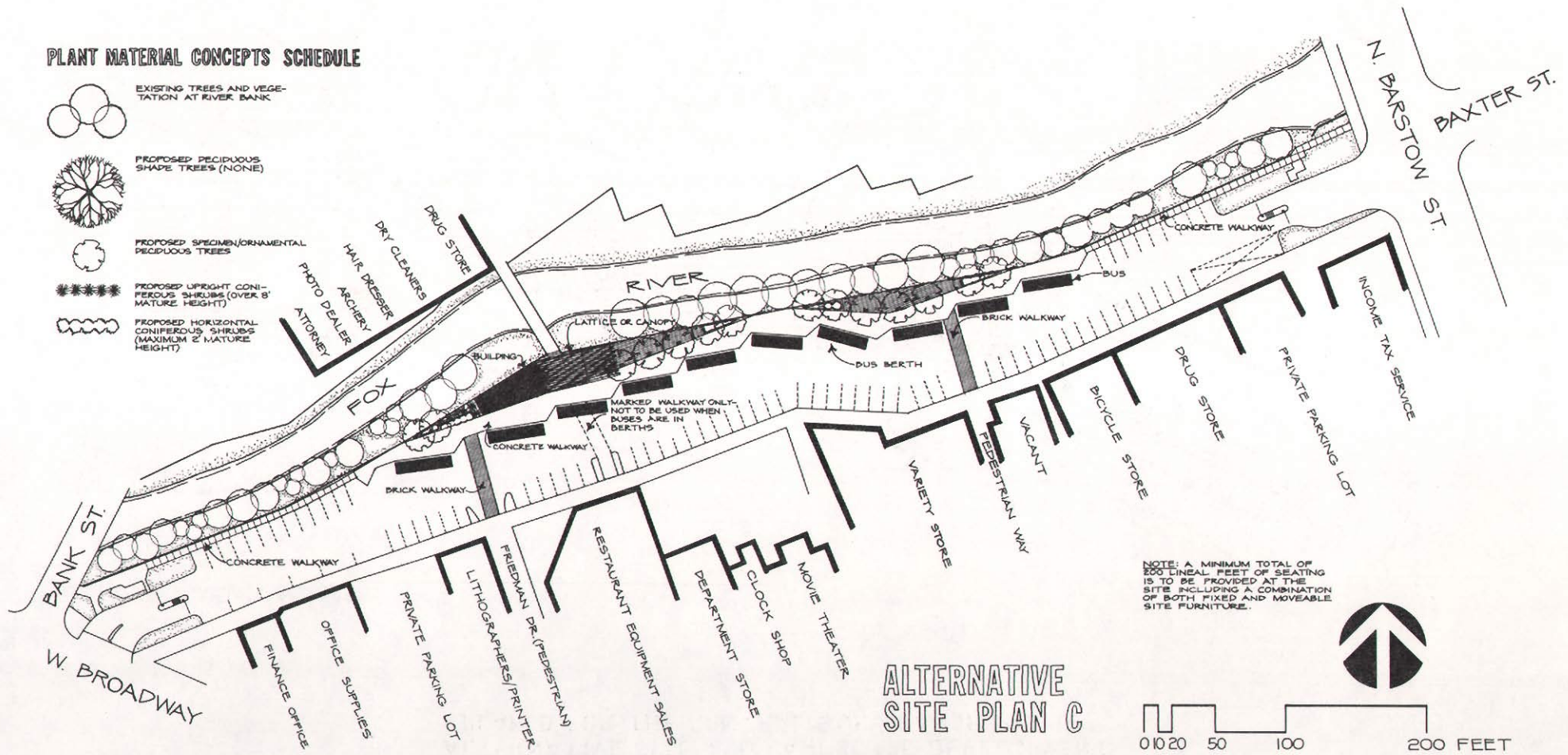
Source: SEWRPC.

ALTERNATIVE SITE AND LANDSCAPE DEVELOPMENT PLAN B FOR THE CENTRAL BUS TRANSFER SITE



Figure 23

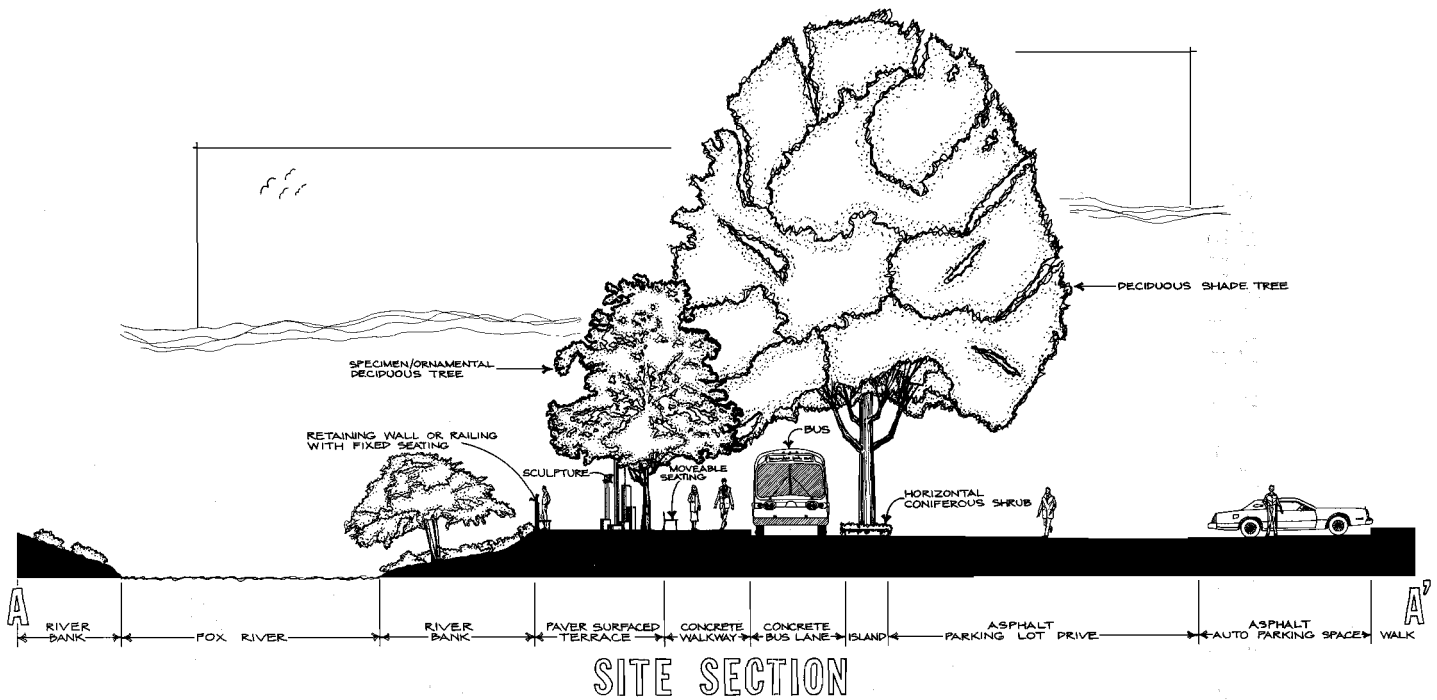
ALTERNATIVE SITE AND LANDSCAPE DEVELOPMENT PLAN C FOR THE CENTRAL BUS TRANSFER SITE



Source: SEWRPC.

Figure 24

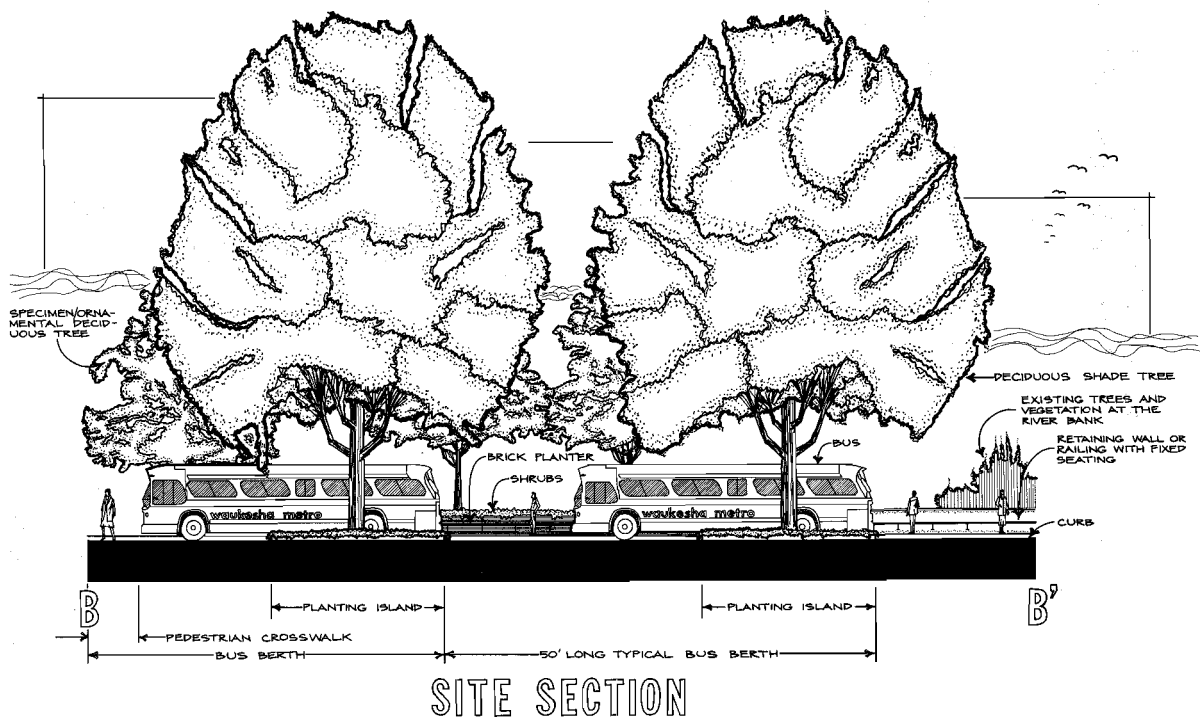
ALTERNATIVE SITE AND LANDSCAPE DEVELOPMENT PLANS A
AND B FOR THE CENTRAL BUS TRANSFER SITE: SECTION A-A



Source: SEWRPC.

Figure 25

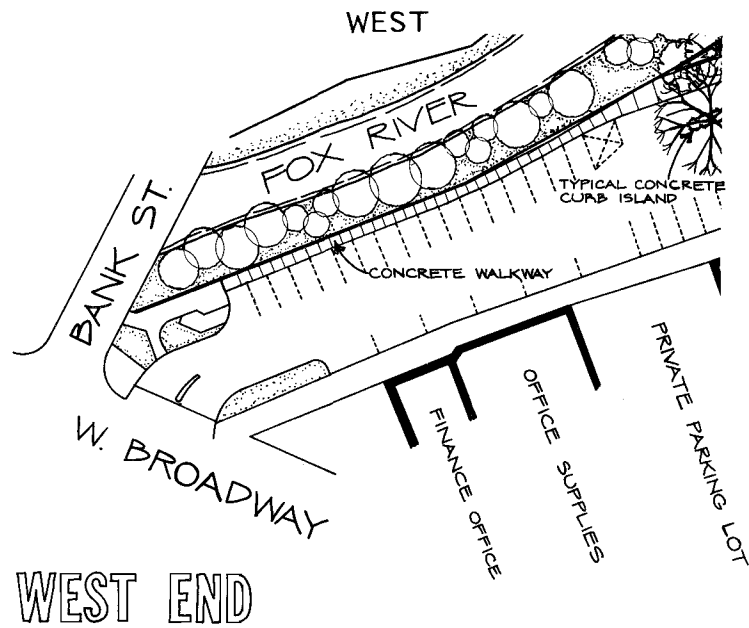
ALTERNATIVE SITE AND LANDSCAPE DEVELOPMENT PLAN A
FOR THE CENTRAL BUS TRANSFER SITE: SECTION B-B



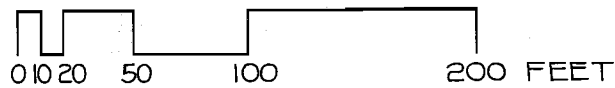
Source: SEWRPC.

Figure 26

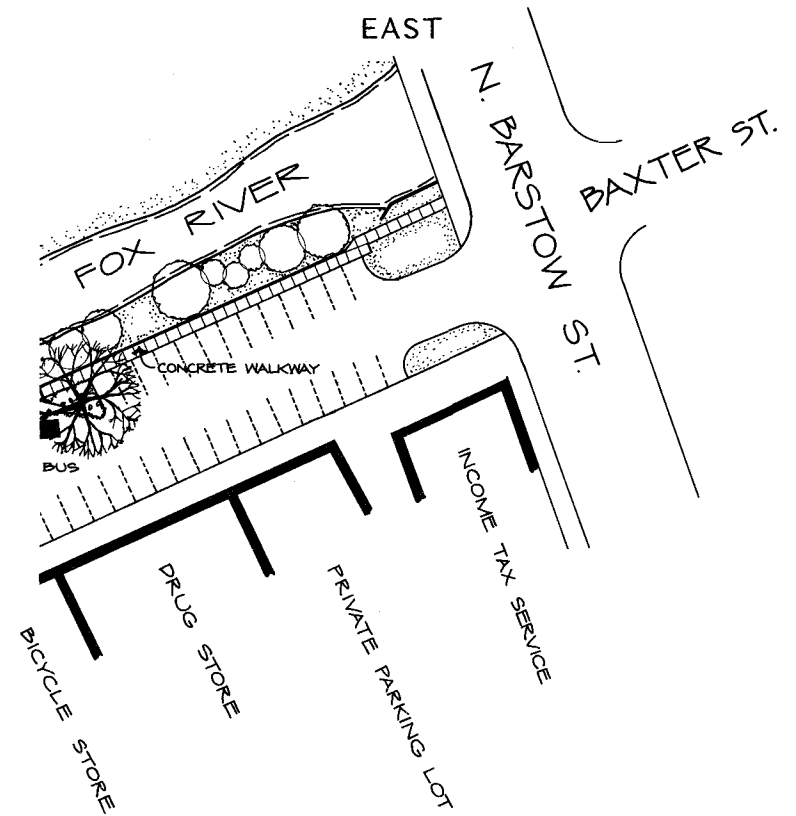
ALTERNATIVE SITE DEVELOPMENT PLANS FOR THE WEST AND EAST ENDS
OF THE PRELIMINARY RECOMMENDED CENTRAL BUS TRANSFER SITE



WEST END



Source: SEWRPC.



EAST END

of the site, depending upon the alternative plan selected. Approximately 12 additional parking spaces could also be gained at the site if the parking space width was reduced from its present 10 feet to nine feet.¹

The construction of the bus transfer facility at this site may result in continued and increased operating losses at the river parking lot. In the past, the operation of the parking lot with the toll booths has not generated sufficient revenues to cover the manpower expenses of the toll booths. The operation of the lot has been subsidized by other city parking revenues. The lot is operated with toll booths to minimize downtown employee parking in the lot, and to eliminate the possibility of its use as a shortcut for downtown traffic. Operation of the toll booths also enables downtown merchants, through a special program, to reimburse customers for part of the parking charge at the lot. Increases in the parking rates charged for using the lot have been adopted for 1983. Such rate increases were expected to generate enough additional revenue to reduce the operating deficit of the lot. The construction of the bus transfer facility at the site would be expected to reduce the number of revenue spaces at the lot with a corresponding reduction in parking revenues. An alternative to the continued operation of the parking lot with toll booths would be the use of short-term, metered or unmetered parking spaces with strict enforcement of parking limits. This may be expected to prevent use of the lot by employees of downtown businesses. Other measures would still be required to reduce the possibility of use of the lot as a shortcut and to provide for strict enforcement of parking limits. This alternative of short-term, metered or unmetered parking with strict enforcement would be consistent with the type of short-term parking which has been implemented in some areas of downtown Waukesha, and is proposed to be implemented in other areas of the downtown as part of Waukesha downtown redevelopment plans.

Site Circulation

The bus flow direction through the site would be one way entering the site from N. Barstow Street and exiting the site at W. Broadway in all alternative plans. Bus circulation would be segregated from automobile flow by 10 landscaped planting islands in Alternative Plan A which would measure approximately five feet in width and 20 feet in length and nine such islands in Alternative Plan B. These islands not only serve to segregate bus and automobile traffic through the site but also provide an area for landscape plantings which would assist in visually softening the long line of stopped buses as well as providing shade for waiting passengers. Sufficient space between each island would be allowed so that buses may depart from the designated bus lane independent of one another. Alternative Plan C, the saw-tooth bus berth design, provides no such site amenity and therefore stopped buses will be dominant visual features at the site under this plan.

¹Recent studies have indicated that automobile parking stall widths of nine feet are an optimum width for self-parkers of standard size autos. See Emanuel Berk's Downtown Improvement Manual, (Chicago: The ASPO Press, 1976, pp. 15-17); The Urban Land Institute's Shopping Center Development Handbook (Washington, D.C.: ULI, 1977, pp. 96-97); and Edward M. Whitlock's Parking (Westport, Connecticut: The ENO Foundation for Transportation, Inc., 1982, p. 49).

Automobile traffic would be permitted to enter the parking lot at either N. Barstow Street or W. Broadway and would also be permitted to leave the parking lot at either place. Two-direction automobile traffic flow would be maintained and existing automobile parking spaces on the southeast side of the site retained.

The bus berthing provided under Alternative Plan A would accommodate individual bus pull-out but not individual bus pull-in and, as a consequence of this, buses for the various routes would be randomly located at the transfer facility. Alternative Plan B provides for the grouping of buses into three separate, designated areas: two for the city buses and one for the intercity buses. This arrangement for Alternative Plan B would accommodate individual bus pull-out but not individual bus pull-in. Bus pull-in would be made in two groups of four buses each for the city routes, thus enabling specific route assignment to one of these two areas. Bus route identification could be provided under both Alternative Plans A and B through the use of portable sign plates carried on the buses and placed by the driver on a sign mount located at each berth. This grouping arrangement for buses would aid transferring passengers in locating buses by route by providing a general location for each route at the site. Alternative Plan C, the saw-tooth bus berth arrangement, allows for both individual bus pull-in and pull-out, thus facilitating the assignment of a specific bus berth to a specific bus route. This arrangement would provide a consistent location for each bus route at the site.

Pedestrian circulation at the transfer facility would be facilitated by a 10-foot-wide concrete walkway abutting and parallel to the designated bus lane. A five-foot-wide concrete walkway would link the transfer facility to both N. Barstow Street and W. Broadway providing unobstructed pedestrian flow from N. Barstow Street to W. Broadway along the Fox River. The pedestrian bridge which extends from the south side of the Fox River to the north side of the river would be retained. In addition, three concrete or fired brick paved or marked walkways traversing the drive of the parking lot would be provided, forming a link between the transfer facility and the commercial stores to the south. Two spaces, paved with either concrete or fired brick paving, would be provided at the site for waiting passengers and would be located outside the pedestrian pathways.

Spatial Considerations

In addition to the provision of a transfer site bus lane and accompanying islands and walkways, an intercity bus depot is also proposed to be located at the site. Because of the limited amount of land available at the site for any uses other than bus lanes, bus berths, and pedestrian walkways, the site does not provide many alternative possibilities for building placement nor for space allocation for such a building. Consequently, the building and accompanying enclosed lattice or canopy structure is proposed to be located centrally within the site. Other restricting factors pertaining to the location of the building include the location of the boundary of the Fox River floodway and potential encroachment into the river itself. A building of about 1,000 square feet of floor area could be adequately accommodated on the site. It is envisioned that this building could be multifunctional, providing limited rest room, transit system ticket sales, package handling, and

luggage distribution for the intercity routes, and possibly indoor passenger waiting facilities. The proposed enclosed lattice or canopy structure would be situated to the east of the proposed building and would provide shade and shelter from the weather for waiting passengers as well as providing a formal landscaped area under its span. An alternative to the use of an enclosed lattice or canopy would be the use of prefabricated bus shelters. Although less desirable for functional reasons, the intercity bus depot could be located on the southern portion of the site. As already noted, the provision of the intercity bus depot would be a part of the second stage of the site development. Bus shelters of some form should be provided, however, under the first stage of site development.

Also, as already noted, two areas paved with either concrete or fired brick would be provided at the site for waiting passengers. These two spaces would be located outside and north of the main pedestrian pathways. Each of these two spaces is proposed to be provided with site amenities such as planters, landscaping, and both fixed and movable seating.

Floodplain Considerations

SEWRPC Planning Report No. 12, A Comprehensive Plan for the Fox River Watershed, recommended that a concrete floodwall be constructed along the north side of the Fox River between Bank Street and N. Barstow Street. The plan did not, however, recommend such protective measures along the south side of the Fox River between these two streets. The 100-year recurrence interval flood stage of the Fox River at the upstream side of Bank Street is 809.3 feet National Geodetic Vertical Datum (NGVD); at the pedestrian bridge, 811.6 feet; at a point located about 250 feet west of the N. Barstow Street bridge, 812.3 feet; and at the downstream side of the N. Barstow Street bridge, 813.7 feet. Accordingly, the proposed intercity bus depot should be floodproofed to an elevation of 813.6 feet, or two feet above the 100-year flood stage elevation of 811.6. Such floodproofing, extending only to about two and one-half feet above the first floor of the building, would not significantly increase the building cost since the building foundation wall, properly designed, could also serve as a floodwall. A zoning variance would have to be granted by the Zoning Board of Appeals under Section 22.24 of the City of Waukesha Zoning Code, which requires that buildings shall be set back at least 50 feet from the ordinary high water mark of the Fox River.

Landscaping

Five types of landscape plant materials are proposed for the site including the retention of some existing natural vegetation located along the south bank of the Fox River, the introduction of deciduous shade trees in Alternative Plans A and B, the introduction of a variety of specimen-ornamental deciduous trees, and the introduction of both upright and horizontal spreading coniferous shrubs. Other types of plant materials could be introduced as the site development plan is further refined for construction document production. Existing natural vegetation located at the south bank of the Fox River should be cleared of dead, dying, or aesthetically undesirable plant material. By doing this and by planting new materials, the character of this urban waterway could be accented. This should also make the stream more visually accessible from the

parking lot area. As already noted, the deciduous shade trees located at each of the planting islands in Alternative Plans A and B would be placed so as to visually soften the long line of stopped buses, provide shade to waiting passengers in the summer, and to channel cooling summer breezes. The introduction of several specimen-ornamental deciduous trees would add color, texture and interest to the site, would assist in providing a more human scale, would provide shade at the site, and would assist in defining the various pedestrian spaces at the site. The upright coniferous shrubs would be placed so as to soften the backside of the proposed intercity bus depot, in addition to adding color and texture. Horizontal spreading coniferous shrubs would serve as a ground cover and add color and interest to the planting islands and planters located at the site. Selection of these horizontal spreading coniferous shrubs in island areas, however, should be based upon the ability of the species to withstand the effects of air pollutant emissions from the vehicles and salt from winter deicing of roads, drives, and walkways.

Site Furnishings

The site should provide a minimum of 200 linear feet of seating area for passengers. This seating area should be accommodated by a combination of both fixed and movable seating. Fixed seating is permanently located, such as a railing or wall which has a seat attached to it, whereas movable seating is fastened to the ground but could be relocated, such as a ground-fastened park bench. Seating should be located at the site so as to be out of the way of pedestrian traffic flow.

Four brick masonry planters are shown on the site development plans. These planters would assist in defining the two pedestrian-related spaces to which they would be contiguous as well as providing scale, color, and texture to the site. These planters could also be designed to serve for some of the needed seating or seating may be attached to them.

An adequate number of signs should be provided for informational purposes. In addition, other site furnishings such as waste disposal containers, railings, and lighting should be provided as needed.

Site Access

It is anticipated that all buses would enter the site from the east at the N. Barstow Street entrance/exit to the parking lot and leave the site from the west at the W. Broadway entrance/exit. N. Barstow Street is a two-way arterial street carrying about 14,000 vehicles per average weekday, with two moving traffic lanes in each direction. Traffic control along N. Barstow Street is provided by means of traffic signals located at the intersection of W. Main Street with N. Barstow Street about 230 feet to the south of the N. Barstow Street site entrance/exit and at the intersection of W. St. Paul Avenue with N. Barstow Street, about 720 feet north of the N. Barstow Street site entrance/exit. W. Broadway and N. Clinton Street are one-way arterial streets south of the W. Broadway site entrance/exit and W. Broadway is a two-way arterial north of the site entrance/exit. These two streets combine to form two moving traffic lanes in each direction, carrying about 16,000 vehicles per average weekday.

Existing Site Ingress: Under the current system of local and intercity bus routes and the operation of streets in the downtown area, buses serving two local routes--No. 7 and No. 9--and eastbound intercity bus routes operating through the City would access the site from the north by making a right turn into the station. This turning maneuver is not anticipated to create any significant operational problems for either buses or other vehicular traffic on N. Barstow Street. Buses serving seven of the existing local routes--Nos. 1 through 6 and No. 8--and the intercity bus routes terminating in the City or operating westbound through the City would approach the site from the south and would access the site by making a left turn from N. Barstow Street into the station. This turning maneuver will require crossing two traffic lanes carrying southbound vehicles on N. Barstow Street. This maneuver, however, is not expected to create any significant operational problems. The river parking lot site was used for the downtown transfer site on Thursday, May 27, 1982, because of a downtown sidewalk sale. No problems or delays were observed for buses or other traffic at the N. Barstow Street entrance/exit, and traffic at the intersection of N. Barstow Street and W. Main Street was not affected.

Bus route No. 10 would access the site by crossing N. Barstow Street at W. Baxter Street. This maneuver would be the most difficult of all required to access the station, but since the route is only operated during nonpeak hour travel periods, it should not create any significant operational problems.

The current operation of Route No. 10 requires a left turn across the northbound and into the southbound lanes of N. Barstow Street. The maneuver which would be required by the bus serving this route to access the preliminary recommended site is no more difficult than the current maneuver required.

Existing Egress: Under the current system of bus routes and the operation of the streets in the downtown area, buses serving four local routes--Nos. 7 through 10--and intercity bus routes operating westbound through the City would leave the site by turning right onto W. Broadway. This turning maneuver is not anticipated to create any operational problems for either buses or other vehicular traffic on W. Broadway since the cycling of the traffic signal at the "Five Points" would provide gaps for vehicles to complete the right turn entering the westbound traffic stream on W. Broadway. Buses serving the remaining six local routes--Nos. 1 through 6--and intercity bus routes originating at the site or operating eastbound through the City would cross the westbound traffic on W. Broadway and merge with traffic eastbound on W. Broadway to enter N. Clinton Street. This maneuver is not anticipated to be difficult during nonpeak periods. During peak traffic periods this maneuver would, however, be difficult and could be readily accomplished only when gaps between vehicles occurred as a result of the cycling of traffic signals located at the "Five Points" and at the intersection of W. Madison Street and N. St. Paul Avenue. Other vehicular traffic would not be delayed, but delays for transit vehicles could disrupt schedule adherence.

On Thursday, May 27, 1982, when the site was used as a result of a downtown sidewalk sale, traffic control was provided at the W. Broadway entrance/exit by off-duty City of Waukesha police officers. Throughout the day, during both the peak and off-peak travel periods, officers stopped all traffic at the

intersection of W. Broadway and N. Clinton Street to permit buses to exit the parking lot at scheduled departure times. It was the opinion of the city transit coordinator that the operation of the bus system would have been adversely affected had this traffic control not been provided.

Downtown Plans and Impact on Site Ingress and Egress: Implementation of the downtown redevelopment plans is not anticipated to change the need for traffic control at the site entrance and site exit. While the use of arterial facilities in the downtown area is anticipated to be reduced with the improvement of E. Moreland Boulevard, including the additional lanes provided by the new bridge over the Fox River, N. Barstow Street may be expected to continue to carry high volumes of traffic. Furthermore, the completion of the state office building on N. Barstow Street may be expected to result in higher traffic volumes as employees access parking facilities such as the Barstow Street parking lot and the Corrina Boulevard parking area. Consequently, it is anticipated that traffic volumes on N. Barstow Street will remain at current levels or somewhat increase. Traffic volumes on W. Main Street and W. Broadway may be expected to decrease between N. Barstow Street and N. Clinton Street. At the station exit location, it is anticipated that traffic volumes on W. Broadway immediately west of N. Clinton Street will be reduced and the traffic signal at the "Five Points" removed as traffic is diverted from the "Five Points." The traffic volume at this exit location, however, may be expected to remain the same, or slightly increased with the planned change in the operation of N. Clinton Street from one-way to two-way operation.

Given the anticipated changes in the downtown traffic patterns and changes in the operation of streets, the vehicular conflicts associated with buses entering the preliminary recommended site from N. Barstow Street may be expected to remain substantially the same under redeveloped, as opposed to existing, conditions. The vehicular conflicts associated with buses leaving the site at W. Broadway will probably increase. At this exit location under the redevelopment plan, buses traveling southbound will not only have to cross northbound W. Broadway traffic and turn into southbound W. Broadway traffic, but will have to cross northbound traffic from a two-way N. Clinton Street. Plans are currently being prepared for the redesign of the intersection of W. Broadway and N. Clinton Street.

The final design for the reconstruction of the intersection of W. Broadway and N. Clinton Street has not been completed at this time. It is anticipated that the final plan design will accommodate one-way entering traffic from W. Broadway east of the intersection and two-way traffic from N. Clinton Street, W. Bank Street, W. Broadway west of the intersection, and the river parking lot. The plan design may include stop signs or traffic control signals. The latter may be warranted at this intersection whether or not the river parking lot is used as the central transfer site.

Ingress/Egress Conclusions: It may be concluded that the N. Barstow Street entrance to the site could probably be operated as it currently exists, without traffic signals. Furthermore, since the downtown redevelopment plan does not indicate that traffic volumes on N. Barstow Street should change significantly, it is not anticipated that signals will be required in the future. If substantial increases in the traffic volume on N. Barstow Street would occur, the

installation of traffic signals at the site entrance would be feasible. These signals could be designed to be actuated by the buses approaching the site northbound on N. Barstow Street, and would operate in a flashing mode except when needed. The signals could be interconnected with the existing traffic signals located at W. St. Paul Avenue and W. Main Street and timed on a background cycle to maintain progressive traffic flow on N. Barstow Street to minimize vehicular delay and ensure that no queues of stopped vehicles would block the N. Barstow Street intersections with W. Main Street or W. St. Paul Avenue. It is estimated that the cost of the installation of these signals, including the necessary detection equipment and signal system interconnection would not exceed \$40,000.

It is recommended that a traffic signal be installed at the intersection of W. Broadway and N. Clinton Street for operation under both existing and future traffic flow plans to improve access to the river parking lot site. It is further recommended that this signal be interconnected and coordinated with the existing traffic signals located at the intersections of W. Main Street and N. Clinton Street, and W. Madison Street and W. St. Paul Avenue to provide for the progressive flow of traffic in both the eastbound and westbound directions. As previously noted, the traffic signals located at the "Five Points" will be removed with implementation of the downtown redevelopment plan. The cost of installing this signal is estimated to be about \$35,000, including the cost of the recommended interconnection with other traffic signals. This improvement would not only benefit the operation of the transit system, but the operation of those automobiles and trucks using the river parking lot and W. Bank Street as well.

RECENT COSTS OF SIMILAR TRANSFER AND TICKET FACILITY BUILDING TYPES

Table 5 outlines recent midwest costs for five buildings similar to the proposed transfer and ticket facility building. Although these buildings are not intercity bus depots, their use and complexity of design are somewhat similar to this type of use. Bids for these buildings were received by each respective municipality from May 1981 to September 1981. The cost data shown in Table 5 are based upon information obtained from F. W. Dodge, McGraw Hill Information Systems Company in their year-end 1981 report entitled Costs and Trends. Based upon the data contained in Table 5, a reasonable estimate of the cost of an intercity bus depot would be about \$90 per square foot, expressed in 1982 dollars.

SITE DEVELOPMENT BUDGET ESTIMATE ANALYSIS

Table 6 provides a budget estimate analysis for the development of the site under Alternative Plans A, B, and C. These costs are based, in part, upon information contained in the 1982 Dodge Guide to Public Works and Heavy Construction Costs--Annual Edition No. 14 (Princeton, New Jersey: McGraw-Hill Information Systems Company, 1981) and, in part, upon information provided by the City of Waukesha. The budget analysis was prepared using unit prices which include the cost of labor, materials, and equipment. The budget analysis does not include allowances for insurance, project peculiarities, or overhead and

Table 5

RECENT COSTS OF SIMILAR BUILDING TYPES IN THE MIDWEST AND REGION: MAY 1981 TO OCTOBER 1981

Type of Building	Location	Date Bids Received	Building Size (square feet)	Construction and Mechanical Systems	Building Cost Per Square Foot
Park Shelter Building	Centerville, Minnesota	May 1981	1,100	Concrete block construction with structural wood. No mechanical equipment	\$89.93
Park Shelter Building	Franklin, Wisconsin	September 1981	1,190	Limestone veneer with concrete block back-up and laminated wood structural system. Gas fired furnace	\$83.81
Playfield Comfort Station	Milwaukee, Wisconsin	September 1981	676	Concrete block and hollow core concrete panel structural system. No mechanical system	\$93.24
Restroom Facility	Atwater, Minnesota	October 1981	712	Concrete split face block with wood trusses. No mechanical systems	\$84.16
Visitation Center	Afton, Minnesota	1981	3,260	Wood frame with laminated wood roof structure with electric baseboard heat and natural cooling ventilation	\$97.38

Source: F. W. Dodge, McGraw-Hill Information System Company, Costs and Trends of Current Building Projects: Region A Edition/Mid-Year 1980, and Year-End 1981, and Mid-Year 1982, New York, Dodge Division, McGraw-Hill Information Systems Company, 1980, 1981, and 1982, and SEWRPC.

Table 6

BUDGET ESTIMATE ANALYSIS FOR THE RECOMMENDED TRANSIT SYSTEM CENTRAL TRANSFER SITE

Cost Factors	Estimated Cost ^a								
	Plan A			Plan B			Plan C		
	Phase I	Phase II	Total	Phase I	Phase II	Total	Phase I	Phase II	Total
A. Site Development.....	\$158,800	\$ 5,000	\$163,800	\$157,500	\$ 5,000	\$162,500	\$155,100	\$ 5,000	\$160,100
B. Intercity Bus Depot (Phase II).....	--	90,000	90,000	--	90,000	90,000	--	90,000	90,000
C. Total New Construction (A + B)	\$158,800	\$ 95,000	\$253,800	\$157,500	\$ 95,000	\$252,500	\$155,100	\$ 95,000	\$250,100
D. Site Acquisition.....	\$ --	\$ --	\$ --	\$ --	\$ --	\$ --	\$ --	\$ --	\$ --
E. Site Demolition Contingency....	2,000	--	2,000	2,000	--	2,000	2,000	--	2,000
F. Professional Fees (architects, engineers, etc., --8 percent to 10 percent of C) ^b	15,880	9,500	25,380	15,750	9,500	25,250	15,510	9,500	25,010
G. Construction Contingencies (10 percent of C).....	15,880	9,500	25,380	15,750	9,500	25,250	15,510	9,500	25,010
H. Administrative Costs for City (1 percent of C) ^b	1,590	950	2,540	1,575	950	2,525	1,550	950	2,500
I. Total Budget	\$194,150	\$114,950	\$309,100	\$192,575	\$114,950	\$307,525	\$189,670	\$114,950	\$304,620

^a All costs are shown in 1982 dollars. See Appendix C for detailed cost breakdown.

^b These costs may be lower or higher dependent upon the direct professional involvement of city staff.

Source: SEWRPC.

profit. It is important for the City to establish a realistic budget from the very beginning. Should the budget analysis result in a total budget amount which is larger than the extent of funds than can reasonably be expected to be made available, or that the City is willing to pay, then the quality of construction or project scope must be reduced. The following factors were addressed in the budget analysis:

- A. Site Development: These costs include all work required at the recommended central transfer site, including grading, stormwater drainage, the enclosed lattice/canopy structure or prefabricated bus shelters, paving and surfacing, landscaping, masonry, site furnishings, concrete, and lighting. These costs do not include the extension of electric power, sanitary sewer or water supply services to the site.
- B. Intercity Bus Depot: These costs include all costs of construction within five feet of the building, items required by codes, and items normally found in buildings regardless of building type. The unit price used to estimate the building cost was \$90 per square foot, expressed in 1982 dollars. These costs do not include the extension of electric power, sanitary sewer or water supply facilities to the building. It was assumed that a building of 1,000 square feet in area would be constructed at the site.
- C. Total New Construction: This figure represents the expected total budget for construction, including both site development costs and building costs.
- D. Site Acquisition: No allowance was made for site acquisition costs since the site is already under the ownership of the City of Waukesha.
- E. Site Demolition: This figure represents the cost of the demolition and removal of existing utilities and paving on the site.
- F. Professional Fees: This figure represents the cost of architectural, landscape architectural, and engineering fees required for the project. These costs may be greatly affected by the extent and amount of professional involvement of city staff.
- G. Contingencies: The contingency figure represents a percentage of the total new construction cost.
- H. Administrative Costs for City: This figure represents items for which the City is responsible during the planning and construction process which may include legal fees, insurance, materials testing, and city staff personnel time.
- I. Total Recommended Budget: This represents the expected total budget required to develop the site as described earlier. It should be noted, however, that this figure does not include any financing costs.

The total budget of about \$310,000 for each alternative site development plan--about \$195,000 for the initial development and \$115,000 for the ultimate development--is based upon the development of the site as described in Figures 21

through 25. The second stage budget assumes the construction of a new intercity bus depot. If any changes are made to the three designs shown, corresponding alterations to the recommended budget would also have to be made.

COMMITTEE RECOMMENDATION OF A SITE AND LANDSCAPE DEVELOPMENT PLAN







The Advisory Committee met on November 30, 1982, to consider the three alternative site and landscape plans presented herein for Site L--the Fox River parking lot. At that meeting, it was unanimously decided by the Committee that Site L be recommended to the City of Waukesha Common Council as the best site for the proposed central transit passenger transfer facility. After reviewing and considering, at length, alternative sites and landscape development Plans A, B, and C, the Advisory Committee concluded that Alternative Plan C, with some modifications, was the best of the three alternatives considered, since the saw-tooth design would allow for independent bus pull-out and pull-in and enable specific route assignments to each bus berth. The Advisory Committee, however, in considering the proposed riverside location of the intercity bus depot as shown on Alternative Plan C concluded that this location was somewhat limited in area for the accommodation of the facility and that the costs associated with constructing a new building at this location would be unwarranted if an existing building could be used at another site located close to the proposed transfer facility. Consequently, the Advisory Committee unanimously decided that alternative site and landscape development Plan C be recommended to the Common Council with a modification eliminating the proposed intercity bus depot building from the site plan. The Advisory Committee decided not to make a specific recommendation for the location of the intercity bus depot building, leaving this as an issue to be considered by the Committee at a later date, if so requested, or otherwise determined by city officials.

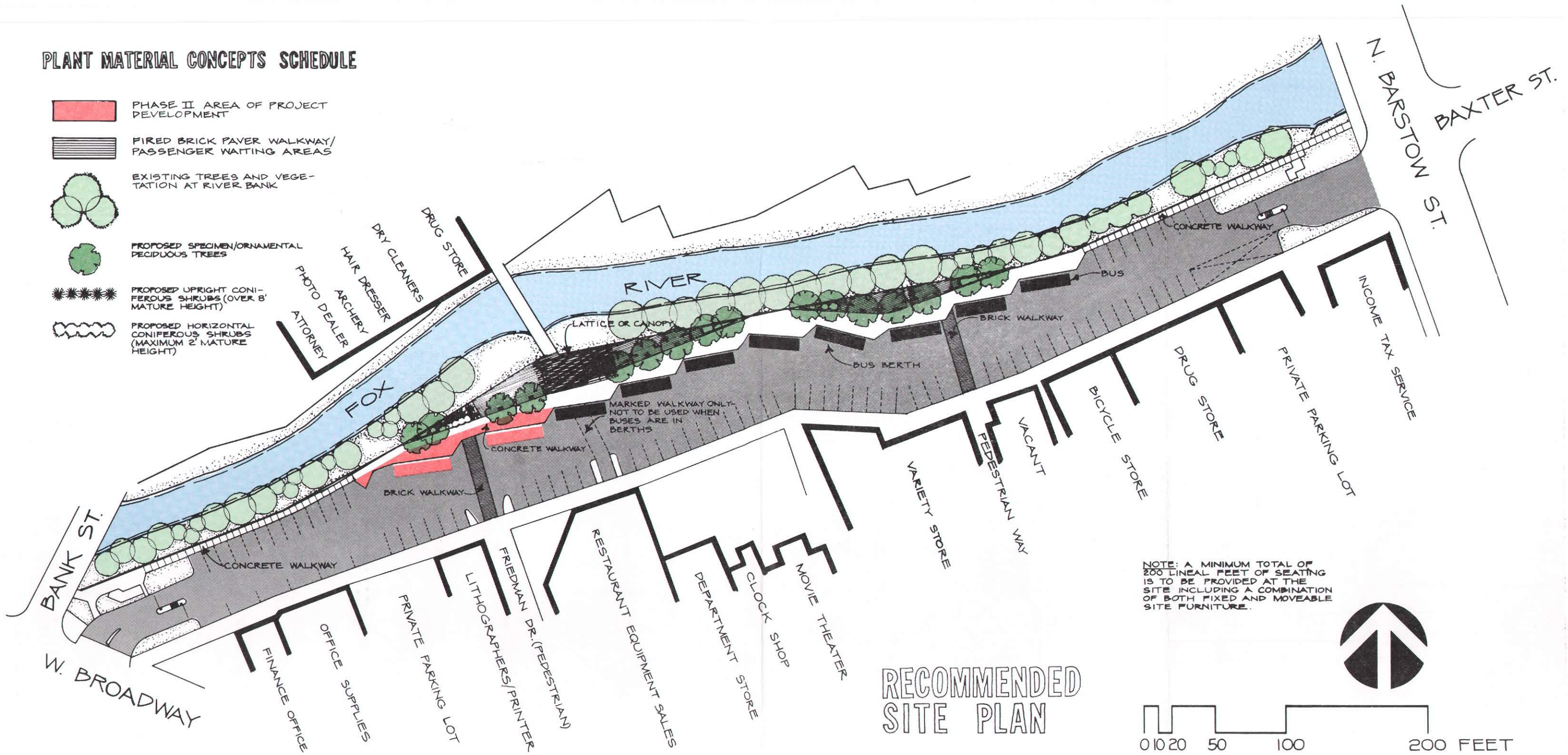
The Advisory Committee recommended plan is shown in Figure 27. The recommended site plan calls for the initial development of the site with eight bus berthing areas to accommodate the buses operated on the city bus routes. This initial development phase would require removal of approximately 50 automobile parking spaces from the parking lot. Under the second phase of the recommended site development plan, two additional bus berthing areas would be developed for use by the intercity bus operators. This second phase of site development would require removal of an additional 14 automobile parking spaces from the parking lot. The total of 64 off-street parking spaces that would be lost at the site, would be offset by a gain of 16 on-street parking spaces at the site of the existing transfer facility. A budget of about \$200,000 would be required for the recommended site development plan, since this recommended plan does not include a proposed new intercity bus depot.

Figure 27

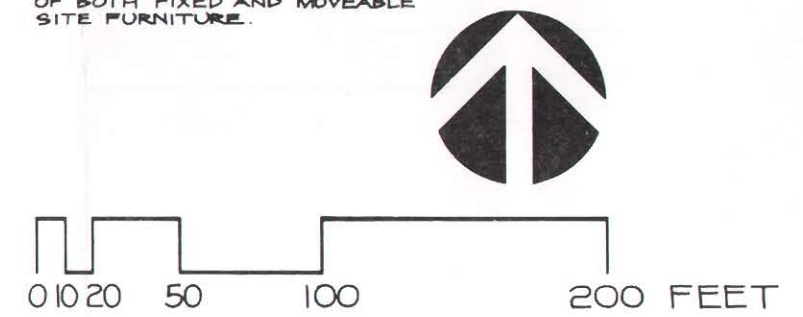
RECOMMENDED SITE AND LANDSCAPE DEVELOPMENT
PLAN FOR THE CENTRAL BUS TRANSFER SITE

PLANT MATERIAL CONCEPTS SCHEDULE

-  PHASE II AREA OF PROJECT DEVELOPMENT
-  FIRED BRICK PAVER WALKWAY/
PASSENGER WAITING AREAS
-  EXISTING TREES AND VEGETATION AT RIVER BANK
-  PROPOSED SPECIMEN/ORNAMENTAL
DECIDUOUS TREES
-  PROPOSED UPRIGHT CONIFEROUS
SHRUBS (OVER 8' MATURE HEIGHT)
-  PROPOSED HORIZONTAL CONIFEROUS
SHRUBS (MAXIMUM 2' MATURE HEIGHT)



NOTE: A MINIMUM TOTAL OF 200 LINEAL FEET OF SEATING IS TO BE PROVIDED AT THE SITE INCLUDING A COMBINATION OF BOTH FIXED AND MOVEABLE SITE FURNITURE.



(This page intentionally left blank)

Chapter VI

SUMMARY AND CONCLUSIONS

INTRODUCTION

In July 1979, at the request of the Common Council of the City of Waukesha, Mayor Joseph C. LaPorte reactivated the Waukesha Mass Transit Citizens and Technical Coordinating and Advisory Committee and charged that Committee with the task of determining if increased motor fuel costs and the likelihood for future fuel shortages had had an impact on the need and support for the provision of public transportation in the Waukesha area. Upon its reactivation, the Advisory Committee requested the assistance of the Southeastern Wisconsin Regional Planning Commission in the review and revision of the transit development program initially prepared by the Advisory Committee in 1976. With the assistance of the Commission staff, the Committee completed work in February 1980 on a report setting forth a revised transit development program for the City of Waukesha. The report, SEWRPC Community Assistance Planning Report No. 31, Waukesha Area Transit Development Program: 1981-1985, documented the Committee's revised recommendations for the reestablishment of public transit service in the City of Waukesha. The transit system recommended by the Committee under the new plan consisted of nine radial fixed routes originating at the outer limits of the City of Waukesha and terminating at a common bus transfer point located in the Waukesha central business district.

An important recommendation of the revised transit development program was that the proposed fixed route bus service be operated using cycle or "pulse" type scheduling. Pulse scheduling requires that the vehicles used to provide transit service over each bus route meet at a common point at regular intervals during the hours of service, thus optimizing the potential for, and ease of, transferring between between routes. As an outgrowth of the use of this scheduling technique, a transfer site within the Waukesha central business district adequate to accommodate the vehicles from all routes at the same time was required.

The revised transit development program recognized that long-range recommendations should be prepared for the development of such a central transfer site which further considered the need to effect convenient transfer of passengers between the various forms of transit service currently provided within or planned for the greater Waukesha area. However, in order to facilitate the initiation of transit service by 1981, as recommended, a location for a transfer site was identified which would serve this purpose on an interim basis until a permanent transfer site could be located and designed. Following the analysis of several potential sites within the Waukesha central business district for suitability as the central transfer area, the transit development program recommended that Gaspar Street between W. Main Street and Park Street be used as the interim central transfer area.

In the process of carrying out the plan for initiation of transit service, the Gaspar Street location was rejected by the Waukesha Transit System Utility Board for a number of reasons, including insufficient size to accommodate the buses leased for initial system operation, complaints voiced by residents of a retirement home located at the corner of Gaspar Street and Park Street

concerning the perceived harmful effects of the exhaust emissions which would be generated in the transfer area, and the planned reconstruction of Gaspar Street during the fall of 1981. Accordingly, transit service was initiated by the City on August 31, 1981, using the north sides of W. Main Street and W. Broadway between W. Gaspar Street and Clinton Street as the central passenger transfer area.

Objections by some members of the downtown business community over use of this location were voiced subsequent to the initiation of transit service. The objections were based upon the loss of on-street parking spaces on both streets and the exhaust emissions of the diesel buses idling at the location. It was also noted that use of this location for the central transfer area did not conform to the city's preliminary plans for redevelopment of the downtown area. Local officials concerned with these issues suggested several alternative locations for the central transfer area. The City of Waukesha subsequently requested assistance from the Wisconsin Department of Transportation and the Southeastern Wisconsin Regional Planning Commission for the conduct of a technical study which would address this problem. Accordingly, this technical report sets forth the findings and recommendations of analyses of alternative locations for a central transfer site for the City of Waukesha transit system.

Study Purpose

The central transfer site analysis had four interrelated purposes:

1. To establish spatial and locational requirements and site planning design criteria through which the alternative central passenger transfer site locations can be evaluated;
2. To comparatively evaluate the alternative locations for a transit system central transfer site;
3. To recommend, from the 12 alternative sites identified and evaluated, a transit system central transfer site; and
4. To develop alternative detailed site plan design sketches for the recommended transit system central transfer site.

Conduct of Study

The conduct of the central transfer site location and design analysis was a joint effort of the staffs of the City of Waukesha and the Southeastern Wisconsin Regional Planning Commission. Additional staff assistance was obtained, as needed, from certain other agencies concerned with transit development in the Waukesha area, including the Wisconsin Department of Transportation.

To provide guidance to the technical staff in the conduct of the transit system central transfer site location analysis and design development, and to actively involve concerned and affected public officials and agency leaders in the selection of a central transfer site location, Mayor Paul J. Keenan of the City of Waukesha reactivated, in July 1982, the Waukesha Mass Transit Citizens and Technical Coordinating and Advisory Committee. The purpose of the Committee,

which had not met since completing its work on the revised transit development program in 1980, was to assist in the conduct of the study by providing a critical review of all staff work. A complete list of the Committee membership is set forth in Appendix A of this report.

CENTRAL TRANSFER SITE SPATIAL AND LOCATIONAL REQUIREMENTS AND SITE PLANNING DESIGN CRITERIA

In order to rationally locate and configure a site for the City of Waukesha transit system central transfer terminal, certain spatial, locational, and site planning design criteria of a high level of specificity were established. Taken together, these criteria defined all of the characteristics which the transfer terminal site should possess in order for the site to properly perform its intended function. These criteria were then applied to develop and evaluate alternative sites and site plans for the transfer site.

Chapter II of the report presented detailed design criteria relating to: bus geometrics and specifications; bus turning radii; transfer site locational criteria, including guidelines for proximity to passenger destinations, impact on parking and on traffic movements and safety, site size and configuration, compatibility with neighboring land uses, visual exposure and linkage to the downtown, microclimate, and noise and air pollution effects; zoning; conformance with current downtown revitalization plans and regional transit system development plans; bus berthing lane design criteria, including type, marking, width, access from private drives, and impact upon delivery of goods to the downtown; bus berthing and recessed bus bay design criteria; passenger and pedestrian requirements for convenience, safety, spatial needs, and landscaping and street furniture needs; bus shelter design criteria relating to shelter visibility, accessibility, appearance, capacity, amenities within the shelters, security, and maintenance; site lighting criteria; and criteria relating to accessibility of the site to the handicapped.

INVENTORY AND ANALYSIS OF ALTERNATIVE TRANSIT SYSTEM CENTRAL TRANSFER SITES

Certain basic data for each alternative transfer site were considered essential to the sound evaluation of the alternative sites and to the selection of the most suitable site. These data included definitive information on, among other site characteristics, the size and configuration of the site, vehicular and bus user ingress and egress, coordination with downtown plans, coordination with the local and intercity transit system, and existing land uses. The most suitable site could not be selected from among the alternatives considered without these data, which provided essential information on the existing conditions of site-specific development problems. The analysis of the sites represented the collective judgement of the Advisory Committee.

The Alternative Sites

Twelve alternative transit system central transfer sites were identified and considered in this study and are shown on Map 1 in Chapter III. The sites were as follows:

- Site A: The existing central passenger transfer site located on the north side of W. Main Street between W. Broadway and Gaspar Street and on the north side of W. Broadway between Clinton Street and W. Main Street.
- Site B: The north side of W. Main Street from W. Broadway to N. Barstow Street.
- Site C: The north side of W. Main Street from N. West Avenue to Clinton Street.
- Site D: The north side of W. Main Street from N. Barstow Street to N. East Avenue.
- Site E: Municipal parking lot No. 3 located at the intersection of W. Broadway, Bank Street, and Clinton Street.
- Site F: Municipal parking lot No. 5 located between N. Barstow Street and Martin Street south of W. Main Street.
- Site G: Municipal parking lot No. 12 located on the southwest side of Madison Street south of the intersection of E. St. Paul Avenue and Madison Street (privately owned).
- Site H: The southeast side of E. St. Paul Avenue between Madison Street and N. Barstow Street.
- Site I: Corrina Boulevard between N. Barstow Street and Buckley Street.
- Site J: The south side of Wisconsin Avenue between Maple Avenue and N. Grand Avenue.
- Site K: The west side of Martin Street between W. Main Street and South Street.
- Site L: The municipal parking lot located between W. Broadway and N. Barstow Street.

All of the sites were located in an area considered by local officials as comprising the "downtown" of the City of Waukesha, being that area defined by Wisconsin Avenue on the south, E. St. Paul Avenue on the north, East Avenue on the east, and West Avenue on the west. Eleven of the 12 sites were publicly owned. Site G, municipal parking lot No. 12, located at the southwest side of Madison Street south of the intersection of E. St. Paul Avenue and Madison Street, is leased by the City of Waukesha from the Waukesha State Bank.

Alternative Site Analysis

For each of the alternative sites considered, a sketch plan was prepared as shown in Chapter III Figures 8 through 19 showing the approximate locations of street pavements and rights-of-way; sidewalks; buildings and other land uses; the location of on- and off-street parking spaces; the direction of current

vehicular traffic flow; traffic flow changes proposed under current downtown redevelopment plans; significant existing vegetation such as trees; significant natural features such as rivers; and certain climatic data such as the prevailing summer and winter wind direction and sun orientation. Also, for each of the 12 alternative sites considered, two photographs were taken which were deemed representative of the physical appearance of each site. The approximate area of each site was determined from the best available maps. An inventory of the existing land use on and immediately adjacent to each site was conducted by Commission staff during the summer of 1982. An inventory of the intensity of the existing nighttime illumination of each of the 12 sites was taken on a summer evening in 1982 between the hours of 10:00 p.m. and 1:00 a.m.

SITE EVALUATION

Evaluation Measures

The inventory and analyses undertaken for each of the 12 alternative transfer sites focused on 17 site characteristics considered to be particularly pertinent to the evaluation of the suitability of each site for use as a central passenger transfer location. The 17 evaluative measures were developed based on the central transfer site spatial, locational, and site planning design criteria set forth in Chapter II. These 17 evaluative measures are: sufficient site size to accommodate use; site configuration conducive to use; facility expansion capabilities of the site; compatibility with neighboring land uses; elimination of existing vehicular parking spaces; transit vehicle ingress and egress; shortest functional distance to the "Five Points" in downtown Waukesha; visual exposure and linkage to total downtown area; bus user ingress and egress; minimization of impacts on nonbus users; potential noise impact on neighboring land uses; potential air pollution impact on neighboring land uses; site microclimate; adequacy of existing artificial illumination at each site; the coordination of the site with existing and planned local and intercity transit service; compatibility of the site with existing downtown development plans; and the existing zoning of the site and immediate environs.

Evaluation Process

A technique was developed to facilitate an objective comparative evaluation of the suitability of the 12 alternative sites. This technique was based upon an identification of the relative importance of the various site evaluation measures in the proper planning and siting of a central transfer site. These measures were discussed in Chapter IV of this report and were listed in Table 2 in rank order of importance, with the rank order being assigned a numeric value from one to four--with four representing the highest level of importance. The Advisory Committee collectively determined the rank order of the measures to be used.

The relative values of the rank ordered measures were then normalized so that the total of the numeric values would equal 10. The 12 alternative central transfer sites were then comparatively evaluated on the basis of each of the site evaluation measures listed in Table 2 of Chapter IV and scored accordingly, based upon the site inventory data presented in Chapter III of this report. The scoring was based upon the degree to which each site was deemed

by the Advisory Committee to meet each site evaluation measure in relation to the other alternative sites considered. A score of four on a site evaluation measure indicates that the site is excellent for that particular evaluation element being considered; three, good; two, fair; one, poor; and zero, unsatisfactory. The score of each site evaluation measure was then multiplied by its normalization factor--from Table 2--in order to attain its normalized value.

Based upon the summation of the normalized scores for all of the site evaluation measures, an overall score was assigned to each of the alternative central transfer sites. The site evaluation measure, its normalizing factor, and the score and normalized score for each alternative site considered were set forth in Table 3 in Chapter IV. The site with the highest total normalized score was deemed the most suitable site for a central transfer terminal facility based upon the site evaluation measures presented. A rank order listing of all 12 alternative sites considered, based upon this evaluation, is shown in Table 4 of Chapter IV. The site which scored the highest was Site L located at the municipal parking lot between W. Broadway and N. Barstow Street north of W. Main Street along the Fox River. The site which scored the second highest was the existing central bus transfer site--Site A--located on the north side of W. Main Street between Broadway and Gaspar Street and on the north side of Broadway between Clinton Street and W. Main Street. The site which scored the third highest was Site B, which is located on the north side of W. Main Street from Broadway to N. Barstow Street.

Advisory Committee Recommendations for Site Location

At the Advisory Committee meeting held on September 14, 1982, the Committee concurred that none of the 12 sites was "perfect" for use as the bus transfer site; and that each of the 12 sites had both advantages and disadvantages. The three sites which scored the highest in the evaluation were judged reasonably well-suited for the intended use with the river parking lot (Site L) judged the best-suited of all the alternative sites considered. The Committee acted unanimously to instruct the Commission staff to prepare site development plans and budget estimates for Site L.

DESCRIPTION OF SITE L--THE RIVER PARKING LOT

Site L was the municipal parking lot located between W. Broadway and N. Barstow Street north of W. Main Street. The site was graphically shown in Figure 19 of Chapter III. The site is elongated, extending the full length of the parking lot, and occupies about 2.2 acres of land and is of sufficient size and adequate shape to accommodate the facility. The facility expansion capabilities of the site are excellent due to the large area of land available. The site is bounded on the north by the Fox River and on the south by commercial land uses and structures and is extremely compatible with neighboring land uses. The entire parking lot provides for the off-street parking of 135 automobiles. Transit vehicle ingress and egress is fair because buses enter and leave the site at intersections with two high-volume streets which currently are not signal-controlled. The intersection of W. Broadway and N. Clinton Street serves about 16,000 vehicles per average weekday and N. Barstow Street carries about 14,000 vehicles per average weekday. Ingress and egress to and from the site is somewhat hampered by these high traffic volumes along W. Broadway and

N. Barstow Street. Site L has good bus user pedestrian ingress and egress since bus users would board and depart from a parking lot area, and minimal conflicts between transit vehicles and parking and unparking vehicles. The site is located about 300 feet from the "Five Points" and, therefore, has good visual exposure, identity, and linkage with the downtown area. Potential noise impacts upon neighboring land uses south of the site are fair due to the distance of the site from existing buildings. Potential air pollution impacts upon neighboring land uses are not severe due to the prevailing summer and winter wind directions which tend to blow these pollutants away from the abutting commercial buildings located south of the site. The microclimate of the site is good. Cool summer winds are channeled through the parking lot area from the southwest, and the southerly portion of the site is shielded from the hot summer sun. Although high illumination levels of over 4.00 footcandles were recorded in certain areas of the site, the overall adequacy of existing nighttime lighting at the site is only fair with an average illumination level of 1.37 footcandles at ground level. With respect to the coordination of local and intercity transit service, the site is good because all 10 of the local transit routes would require only minor rerouting to use the site, while all intercity bus routes currently serve the western end of the site.

SITE DEVELOPMENT DESIGN CONCEPTS FOR THE RIVER PARKING LOT (SITE L)

A site development design concept identifies and interrelates the major plan design considerations. For the central bus transfer site, these considerations included: both pedestrian and vehicular circulation; the separation of the various functions of the transfer site; the location of the various activities which are to be conducted at the site; the visual aspects of the site; the potential for the exploitation of site amenities; and the potential for the positive adjustment to the microclimate of the site in order to create a pleasing final design solution.

Site development design concepts for the preliminary recommended site were graphically shown in Figure 20 of Chapter V. The bus flow direction through the site would be from a northeast to a southwest direction with the buses entering the site from N. Barstow and exiting the site at W. Broadway.

This flow of buses would be functionally separated from the balance of the automobile parking lot. Automobile parking would be retained on the southeast side of the parking lot, while the bus lane or bus berths would be situated along the northwest side of the parking lot. This flow of buses and attendant passenger transfer site locations within the parking lot would serve to minimize the potential noise and air pollution impacts on neighboring land uses, and also minimize the impacts on nonbus-user pedestrian and automobile traffic. Since the greatest amount of noncirculation-related space at the site is provided in the area along the south bank of the Fox River near the existing pedestrian bridge and because this area is centrally located on the site, this location was judged as the best location for a transfer station and ticket sales building. Pedestrian linkages should also be formed between the northwest and southeast side of the site in order to accommodate the passenger-pedestrian flow from the stopped buses to the commercial land uses on the opposite side of the parking lot and across the river.

THE ALTERNATIVE STAGED SITE AND LANDSCAPE DEVELOPMENT PLANS

The alternative site and landscape development plans were prepared to facilitate the staged development of the passenger transfer facility. The first stage would consist of the development of the easterly portion of the site plan in order to accommodate eight Waukesha Metro buses. The second phase would consist of the additional development of the site to accommodate two interurban buses, as well as the proposed intercity bus depot. Alternative site and landscape Plans A, B, and C for the second stage of the development were graphically described in Figure 21 (plan view), Figure 22 (plan view), Figure 23 (plan view), Figure 24 (sectional view), and Figure 25 (sectional view) of Chapter V. The first stage of development would differ from the second only in that the intercity bus depot would not be developed and the length of the facility would be reduced by two buses, or by about 20 percent.

Site Circulation

The bus flow direction through the site would be one way entering the site from N. Barstow Street and exiting the site at W. Broadway under all of the alternative site development plans considered. Automobile traffic would be permitted to enter the parking lot at either N. Barstow Street or W. Broadway and would also be permitted to leave the parking lot at either place. Two-direction automobile traffic flow would be maintained and existing automobile parking spaces on the southeast side of the site retained.

The bus berthing provided under Alternative Plan A would accommodate individual bus pull-out but not individual bus pull-in and, as a consequence of this, buses for the various routes would be randomly located at the transfer facility. Alternative Plan B provided for the grouping of buses into three separate, designated areas; two such areas for the city buses and one for the intercity buses. This arrangement for Alternative Plan B would accommodate individual bus pull-out but not individual bus pull-in. Bus pull-in would be made in two groups of four buses each for the city routes, thus enabling specific route assignment to one of these two areas.

Alternative Plan C, providing a "saw-tooth" bus berth arrangement, allowed for both individual bus pull-in and pull-out, thus facilitating the assignment of a specific bus berth to a specific bus route. This arrangement would provide a consistent location for each bus route at the site.

Pedestrian circulation at the transfer facility would be facilitated by a 10-foot-wide concrete walkway abutting and parallel to the designated bus lane. A five-foot-wide concrete walkway would link the transfer facility to both N. Barstow Street and W. Broadway, providing unobstructed pedestrian flow from N. Barstow Street to W. Broadway along the Fox River. The pedestrian bridge which extends from the south side of the Fox River to the north side of the river would be retained. In addition, three concrete or fired brick paved or marked walkways traversing the drive of the parking lot would be provided, forming a link between the transfer facility and the commercial stores to the south. Two areas, paved with either concrete or fired brick paving, would be provided at the site for waiting passengers and would be located outside the pedestrian pathways.

Spatial Considerations

In addition to the provision of a transfer site bus lane and accompanying islands and walkways, two areas paved with either concrete or fired brick pavers would be provided at the site for waiting passengers. These two areas would be located outside and north of the main pedestrian pathways. Each of these two areas was proposed to be provided with site amenities, such as planters, landscaping, and both fixed and movable seating. A proposed enclosed lattice or canopy structure would be centrally situated in these two areas and would provide shade and shelter from the weather for waiting passengers, as well as providing a formal landscaped area under its span. An alternative to the use of an enclosed lattice or canopy would be the use of prefabricated bus shelters. The intercity bus depot could be located either within the transfer facility, as shown in Figures 21 through 23 of Chapter V, or at some other location along the southern portion of the parking lot. As already noted, the provision of the intercity bus depot would be a part of the second stage of the site development. Bus shelters of some form would be provided, however, under the first stage of site development.

Landscaping

Five types of landscape plant materials were proposed for the site, including the retention of some existing natural vegetation located along the south bank of the Fox River, the introduction of deciduous shade trees in Alternative Plans A and B, the introduction of a variety of specimen-ornamental deciduous trees, and the introduction of both upright and horizontal spreading coniferous shrubs. Other types of plant materials could be introduced as the site development plan would be further refined for construction document production. Existing natural vegetation located at the south bank of the Fox River should be cleared of dead, dying, or aesthetically undesirable plant material. The introduction of several specimen-ornamental deciduous trees would add color, texture, and interest to the site; would assist in providing a more human scale; would provide shade at the site; and would assist in defining the various pedestrian spaces at the site. Horizontal spreading coniferous shrubs would serve as a ground cover and add color and interest to the planters located at the site. Selection of these horizontal spreading coniferous shrubs in island areas, however, should be based upon the ability of the species to withstand the effects of air pollutant emissions from the vehicles and salt from winter deicing of roads, drives, and walkways.

Site Furnishings

The site should provide a minimum of 200 linear feet of seating area for passengers. This seating area should be accommodated by a combination of both fixed and movable seating. Fixed seating is permanently located, such as a railing or wall which has a seat attached to it; whereas movable seating is fastened to the ground but could be relocated, such as a ground-fastened park bench. Seating should be located at the site so as to be out of the way of pedestrian traffic flow.

Four brick masonry planters were shown on the site development plans. These planters would assist in defining the two pedestrian-related spaces to which they would be contiguous, as well as providing scale, color, and texture to

the site. These planters could also be designed to serve for some of the needed seating or seating may be attached to them.

Adequate signs should be provided for informational purposes. In addition, other site furnishings, such as waste disposal containers, railings, and lighting, should be provided as needed.

Site Access

It was anticipated that all buses would enter the site from the east at the N. Barstow Street entrance and exit to the parking lot and leave the site from the west at the W. Broadway entrance and exit. The N. Barstow Street entrance to the site could probably be operated as it currently exists, without traffic signals. Furthermore, since under the existing downtown redevelopment plan traffic volumes on N. Barstow Street should not change significantly, it was not anticipated that signals will be required in the near future. If substantial increases in the traffic volume on N. Barstow Street were to occur, the installation of traffic signals at the site entrance would be feasible. These signals could be designed to be actuated by the buses approaching the site northbound on N. Barstow Street, and would operate in a flashing mode except when needed. The signals could be interconnected with the existing traffic signals located at W. St. Paul Avenue and W. Main Street, and timed on a background cycle to maintain progressive traffic flow on N. Barstow Street to minimize vehicular delay and ensure that no queues of stopped vehicles would block the N. Barstow Street intersections with Main Street or St. Paul Avenue. It is estimated that the cost of the installation of these signals, including the necessary detection equipment and signal system interconnection would not exceed \$40,000.

It was recommended that a traffic signal be installed at the intersection of W. Broadway and N. Clinton Street for operation under both existing and future traffic flow plans to improve access to the river parking lot site. It was further recommended that this signal be interconnected and coordinated with the existing traffic signals located at the intersections of W. Main Street and N. Clinton Street, and W. Madison Street and N. St. Paul Avenue to provide for the progressive flow of traffic in both the eastbound and westbound directions. The traffic signals located at the "Five Points" are proposed to be removed with implementation of the existing downtown redevelopment plan. The cost of installing the required signal was estimated to be about \$35,000, including the cost of the recommended interconnection with other traffic signals. This improvement would not only benefit the operation of the transit system, but the operation of those automobiles and trucks using the river parking lot and W. Bank Street as well.

Site Development Budget Estimate

Table 6 of Chapter V provided a budget estimate analysis for the development of the site under Alternative Plans A, B, and C. These costs were based, in part, upon information contained in the 1982 Dodge Guide to Public Works and Heavy Construction Costs--Annual Edition No. 14 (Princeton, New Jersey: McGraw-Hill Information Systems Company, 1981), and upon information provided by the City of Waukesha. The budget analysis was prepared using unit prices which

include the cost of labor, materials, and equipment. The budget analysis did not include allowances for insurance, project peculiarities, or overhead and profit. It was considered as important that a realistic budget be established. Should the budget analysis result in a total budget amount which is larger than the extent of funds than can reasonably be expected to be made available, or that the City is willing to pay, then the quality of construction or project scope must be reduced. Factors considered in the preparation of the budget estimate included costs related to site development, the proposed new intercity bus depot, total construction costs, site acquisition--in this case no cost--site demolition, professional fees, contingencies, and administrative costs.

The total budget of about \$310,000 for each of the alternative site development plans--about \$195,000 for the initial development and \$115,000 for the ultimate development--was based upon the development of the site as described in Figures 21 through 25 of Chapter V. The second stage budget assumed the construction of a new intercity bus depot. If any substantial changes were made to the three designs shown, corresponding changes in the recommended budget would also have to be made.

COMMITTEE RECOMMENDATION OF A SITE AND LANDSCAPE DEVELOPMENT PLAN

The Advisory Committee met on November 30, 1982, to consider the three alternative site and landscape plans presented herein for Site L (the river parking lot). At that meeting, it was unanimously decided by the Committee that Site L be recommended to the City of Waukesha Common Council as the site for the proposed central transit passenger transfer facility. After reviewing and considering at length alternative sites and landscape development Plans A, B, and C, the Advisory Committee concluded that Alternative Plan C, with some modifications, was the best of the three alternatives considered, since the saw-tooth design would allow for independent bus pull-out and pull-in and enable specific route assignments to each bus berth. The Advisory Committee, however, discussed the riverside location of the intercity bus depot as shown on Alternative Plan C and concluded that this location was somewhat limited in area for the accommodation of the facility and that the costs associated with constructing a new building at this location would be unwarranted if an existing building could be used at another site close to the transit facility. Consequently, the Advisory Committee unanimously recommended that alternative site and landscape development Plan C be recommended to the Common Council with a modification eliminating the proposed intercity bus depot building shown on the north side of the parking lot. The Advisory Committee recommended plan was shown on Figure 27 of Chapter V. A budget of about \$200,000 would be required for the recommended site development plan, since this recommended plan did not include a proposed new intercity bus depot.

(This page intentionally left blank)

APPENDICES

(This page intentionally left blank)

Appendix A

WAUKESHA MASS TRANSIT CITIZENS AND TECHNICAL COORDINATING AND ADVISORY COMMITTEE

Edward J. Stoltz.....Citizen Member
Chairman
David R. Markiewicz.....Citizen Member
Vice-Chairman
Paul Dybvad.....Administrator, Waukesha Unified
School District
Robert J. Foley, Sr.Alderman, City of Waukesha
Armand C. Garcia.....Citizen Member
John A. Inzeo.....Member, Waukesha Unified
School District Board
Paul J. Keenan.....Mayor, City of Waukesha
Mildred Kipp.....Citizen Member
Richard S. Nettum.....Executive Vice-President,
Waukesha Chamber of Commerce
Michael L. Thaller.....Citizen Member
Karen White.....President, Little Swiss Clock Shop, Inc.
Geraldine H. Wuerslin.....Alderman, City of Waukesha

Nonvoting Technical Staff Members

Kurt W. Bauer.....Executive Director, Southeastern
Wisconsin Regional Planning Commission
James A. Beckwith.....Chief, Public Transit Section,
Bureau of Transit, Wisconsin
Department of Transportation
Vencil F. Demshar.....Highway Commissioner, Waukesha County
Paul A. Feller, P.E.City Engineer, City of Waukesha
Robert C. Johnson.....Transit Coordinator, City of Waukesha
Paul J. Larrouse.....General Manager, Transit
Management of Waukesha, Inc.
Eugene T. Sheedy.....Executive Vice-President and General
Manager, Wisconsin Coach Lines, Inc.

Mr. Albert A. Beck, Senior Planner, SEWRPC, although not a member of the Committee, served as its Secretary.

(This page intentionally left blank)

Appendix B

EXISTING LIGHTING LEVELS OF THE ALTERNATIVE CENTRAL BUS TRANSFER SITES: JULY 1982

Illumination Level (footcandles)	Site											
	A	B	C	D	E	F	G	H	I	J	K	L
High.....	5.60	4.30	4.20	4.60 ^a	3.06	2.20	3.20	7.10 ^b	0.88 ^c	3.55	1.26	4.64
Low.....	0.83	0.35	0.41	0.22	0.19	0.15	0.009	0.16	0.007	0.49	0.05	0.39
Average.....	2.27	1.71	1.54	1.62	0.99	0.78	0.54	0.35	0.11	1.49	0.36	1.37
Total Number of Readings	21	23	34	22	27	38	48	36	19	20	21	28

NOTE: A footcandle is a unit of measurement which represents the intensity of illumination that will be produced on a surface that is one foot distance from a source of one candle power, and at right angles to the light rays from the source. Based upon the design criteria set forth in Chapter II of this report, the recommended site illumination levels for the transfer site should be a minimum of two footcandles.

^aThis relatively high reading was due, in part, to the placement of fluorescent lighting in the display window of the photography studio located along this site. The next highest reading for this site was 2.79 footcandles.

^bThis relatively high reading was due, in part, to the lighting provided at a bank teller booth located along the site. The next highest reading for this site was 0.97 footcandle.

^cThis relatively high reading was taken near Barstow Street and is somewhat influenced by lighting located along that street. The next highest reading was 0.18 footcandle.

Source: SEWRPC.

(This page intentionally left blank)

Appendix C

DETAILED BUDGET ESTIMATE ANALYSES

Table C-1

ALTERNATIVE SITE PLAN A TOTAL BUDGET ESTIMATE ANALYSIS BREAKDOWN FOR THE CENTRAL BUS TRANSFER SITE PROPOSED DEMOLITION AND IMPROVEMENTS AT SITE L (THE RIVER PARKING LOT)^a

SITE DEMOLITION AND PREPARATION		
<u>Demolition:</u> Bituminous paving, concrete curb/walk removal, guardrail removal, etc.	\$ 2,000	
<u>Preparation:</u> Site grading and preparation.....	\$ 2,500	
Subtotal		\$ 4,500
PAVING AND SURFACING^b		
<u>Bus Berthing Area/Platform:</u> ± 6,960 square feet 8-inch concrete paving with welded wire mesh reinforcing at \$20 per square yard.....	\$15,470	
± 567 tons gravel subbase at \$8 per ton.....	\$ 4,540	
6 storm sewer inlets at \$500 each.....	\$ 3,000	
250 linear feet 12-inch storm sewer at \$50 per linear foot.....	\$12,500	
<u>Concrete Curbing:</u> + 1,350 linear feet cast-in-place, nonreinforced at \$10 per linear foot.....	\$13,500	
<u>Concrete Sidewalks:</u> ± 4,800 square feet of 10 feet wide-by-6 inch concrete paving at \$2 per square foot.....	\$ 9,600	
± 2,100 square feet of 5 feet wide-by-6 inch concrete paving at \$2 per square foot.....	\$ 4,200	
<u>Concrete/Brick Paver Surfaces:</u> ± 5,375 square feet of concrete/brick paver surface at \$3.50 per square foot.....	\$18,820	
Subtotal		\$ 81,630
LANDSCAPING		
<u>Plantings</u> 11 deciduous shade trees (B + B) at \$250 each for 3-inch caliper.....	\$ 2,750	
14 specimen/ornamental deciduous trees (B + B) at \$175 each for 2-inch caliper.....	\$ 2,450	
6 upright coniferous shrubs at \$123 each.....	\$ 740	
70 horizontal coniferous shrubs at \$50 each.....	\$ 3,500	
Subtotal		\$ 9,440
SITE FURNISHINGS		
<u>Planters (4):</u> ± 40 cubic yards of steel reinforced concrete for continuous footings at \$95 per cubic yard	\$ 3,800	
± 2,190 square feet of 4-inch brick masonry veneer on 8-inch concrete block at \$5 per square foot	\$10,950	
<u>Enclosed Lattice Structure or Canopy or Prefabricated Bus Shelters.....</u>	\$20,000	
<u>Railing:</u> ± 225 linear feet of 3 rail aluminum railing at \$60 per linear foot.....	\$13,500	
<u>Seating:</u> ± 200 linear feet of both fixed and movable seating.....	\$ 7,500	
<u>Site Signage and Waste Disposal.....</u>	\$ 2,500	
<u>Site Lighting:</u> Relocate 7 existing decorative luminaries.....	\$ 2,500	
Install an additional 10 decorative luminaries...	\$ 7,500	
Subtotal		\$ 68,250
Total Cost	\$163,820	\$163,820

^a Costs shown herein are based upon unit costs, including labor and materials from McGraw-Hill's 1982 Dodge Guide to Public Works and Heavy Construction Costs--Annual Edition No. 14 (Princeton, New Jersey: McGraw-Hill Information Systems Company, 1981) and the City of Waukesha Metro Transit. All costs are in 1982 dollar amounts.

^b These costs do not include any bituminous paving costs which may, during the course of construction, prove to be necessary for that portion of the parking lot lying south of the proposed transit facility area.

Table C-2

**ALTERNATIVE SITE PLAN B
TOTAL BUDGET ESTIMATE ANALYSIS BREAKDOWN FOR THE
CENTRAL BUS TRANSFER SITE PROPOSED DEMOLITION AND
IMPROVEMENTS AT SITE L (THE RIVER PARKING LOT)^a**

SITE DEMOLITION AND PREPARATION		
<u>Demolition:</u> Bituminous paving, concrete curb/walk removal, guardrail removal, etc.	\$ 2,000	
<u>Preparation:</u> Site grading and preparation.....	\$ 2,500	
Subtotal		\$ 4,500
PAVING AND SURFACING^b		
<u>Bus Berthing Area/Platform:</u> ± 7,740 square feet 8-inch concrete paving with welded wire mesh reinforcing at \$20 per square yard.....	\$17,200	
+ 567 tons gravel subbase at \$8 per ton.....	\$ 4,540	
6 storm sewer inlets at \$500 each.....	\$ 3,000	
250 linear feet 12-inch storm sewer at \$50 per linear foot.....	\$12,500	
<u>Concrete Curbing:</u> + 1,300 linear feet cast-in-place, nonreinforced at \$10 per linear foot.....	\$13,000	
<u>Concrete Sidewalks:</u> ± 4,800 square feet of 10 feet wide-by-6 inch concrete paving at \$2 per square foot.....	\$ 9,600	
± 2,100 square feet of 5 feet wide-by-6 inch concrete paving at \$2 per square foot.....	\$ 4,200	
<u>Concrete/Brick Paver Surfaces:</u> ± 4,775 square feet of concrete/brick paver surface at \$3.50 per square foot.....	\$16,715	
Subtotal		\$ 80,755
LANDSCAPING		
<u>Plantings:</u> 10 deciduous shade trees (B + B) at \$250 each for 3-inch caliper.....	\$ 2,500	
14 specimen/ornamental deciduous trees (B + B) at \$175 each for 2-inch caliper.....	\$ 2,450	
6 upright coniferous shrubs at \$123 each.....	\$ 740	
66 horizontal coniferous shrubs at \$50 each.....	\$ 3,300	
Subtotal		\$ 8,990
SITE FURNISHINGS		
<u>Planters (4):</u> ± 40 cubic yards of steel reinforced concrete for continuous footings at \$95 per cubic yard	\$ 3,800	
± 2,190 square feet of 4-inch brick masonry veneer on 8-inch concrete block at \$5 per square foot	\$10,950	
<u>Enclosed Lattice Structure or Canopy or Prefabricated Bus Shelters.....</u>	\$20,000	
<u>Railing:</u> ± 225 linear feet of 3 rail aluminum railing at \$60 per linear foot.....	\$13,500	
<u>Seating:</u> ± 200 linear feet of both fixed and movable seating.....	\$ 7,500	
<u>Site Signage and Waste Disposal.....</u>	\$ 2,500	
<u>Site Lighting:</u> Relocate 7 existing decorative luminaries.....	\$ 2,500	
Install an additional 10 decorative luminaries.....	\$ 7,500	
Subtotal		\$ 68,250
Total	\$162,495	\$162,495

^a Costs shown herein are based upon unit costs, including labor and materials from McGraw-Hill's 1982 Dodge Guide to Public Works and Heavy Construction Costs--Annual Edition No. 14 (Princeton, New Jersey: McGraw-Hill Information Systems Company, 1981) and the City of Waukesha Metro Transit. All costs are in 1982 dollar amounts.

^b These costs do not include any bituminous paving costs which may, during the course of construction, prove to be necessary for that portion of the parking lot lying south of the proposed transit facility area.

Table C-3

**ALTERNATIVE SITE PLAN C AND
THE RECOMMENDED SITE PLAN
TOTAL BUDGET ESTIMATE ANALYSIS BREAKDOWN FOR THE
CENTRAL BUS TRANSFER SITE PROPOSED DEMOLITION AND
IMPROVEMENTS AT SITE L (THE RIVER PARKING LOT)^a**

SITE DEMOLITION AND PREPARATION		
<u>Demolition:</u> Bituminous paving, concrete curb/walk removal, guardrail removal, etc.	\$ 2,000	
<u>Preparation:</u> Site grading and preparation	\$ 2,500	
Subtotal		\$ 4,500
PAVING AND SURFACING^b		
<u>Bus Berthing Area/Platform:</u> + 8,700 square feet 8-inch concrete paving with welded wire mesh reinforcing at \$20 per square yard.....	\$19,330	
+ 709 tons gravel subbase at \$8 per ton.....	\$ 5,675	
6 storm sewer inlets at \$500 each.....	\$ 3,000	
250 linear feet 12-inch storm sewer at \$50 per linear foot.....	\$12,500	
<u>Concrete Curbing:</u> + 820 linear feet cast-in-place, nonreinforced at \$10 per linear foot.....	\$ 8,200	
<u>Concrete Sidewalks:</u> + 4,800 square feet of 10 feet wide-by-6 inch concrete paving at \$2 per square foot.....	\$ 9,600	
+ 2,100 square feet of 5 feet wide-by-6 inch concrete paving at \$2 per square foot.....	\$ 4,200	
+ 1,700 square feet of 6-inch concrete paving for bus platforms at \$2 per square foot.....	\$ 3,400	
<u>Concrete/Brick Paver Surfaces:</u> + 4,775 square feet of concrete/brick paver surface at \$3.50 per square foot.....	\$16,715 ^c	
Subtotal		\$ 82,620
LANDSCAPING		
<u>Plantings:</u> 14 specimen-ornamental deciduous trees (B + B) at \$175 each for 2-inch caliper.....	\$ 2,450 ^d	
6 upright coniferous shrubs at \$123 each.....	\$ 740	
30 horizontal coniferous shrubs at \$50 each.....	\$ 1,500	
Subtotal.....		\$ 4,690
SITE FURNISHINGS		
<u>Planters (4):</u> + 40 cubic yards of steel reinforced concrete for continuous footings at \$95 per cubic yard	\$ 3,800	
+ 2,190 square feet of 4-inch brick masonry veneer on 8-inch concrete block at \$5 per square foot	\$10,950	
<u>Enclosed Lattice Structure or Canopy or Prefabricated Bus Shelters.....</u>	\$20,000	
<u>Railing:</u> + 225 linear feet of 3 rail aluminum railing at \$60 per linear foot.....	\$13,500	
<u>Seating:</u> + 200 linear feet of both fixed and movable seating.....	\$ 7,500	
<u>Site Signage and Waste Disposal.....</u>	\$ 2,500	
<u>Site Lighting:</u> Relocate 7 existing decorative luminaries.....	\$ 2,500	
Install an additional 10 decorative luminaries.	\$ 7,500	
Subtotal		\$ 68,250
Total	\$160,060	\$160,060

^a Costs shown herein are based upon unit costs, including labor and materials from McGraw-Hill's 1982 Dodge Guide to Public Works and Heavy Construction Costs--Annual Edition No. 14 (Princeton, New Jersey: McGraw-Hill Information Systems Company, 1981) and the City of Waukesha Metro Transit. All costs are in 1982 dollar amounts.

^b These costs do not include any bituminous paving costs which may, during the course of construction, prove to be necessary for that portion of the parking lot lying south of the proposed transit facility area.

^c There are an additional 1,000 square feet of brick pavers for the recommended plan resulting in an additional cost of \$3,500.

^d There are two additional trees for the recommended plan which total an additional \$350.

Source: SEWRPC.