

# **TRANSPORTATION IMPACTS OF W. WISCONSIN AVENUE CLOSURE BETWEEN N. 11TH STREET AND N. 16TH STREET**

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**MEMORANDUM REPORT  
NUMBER 84**

**TRANSPORTATION IMPACTS OF W. WISCONSIN AVENUE  
CLOSURE BETWEEN N. 11TH STREET AND N. 16TH STREET  
CITY OF MILWAUKEE, MILWAUKEE COUNTY, WISCONSIN**

Prepared by the  
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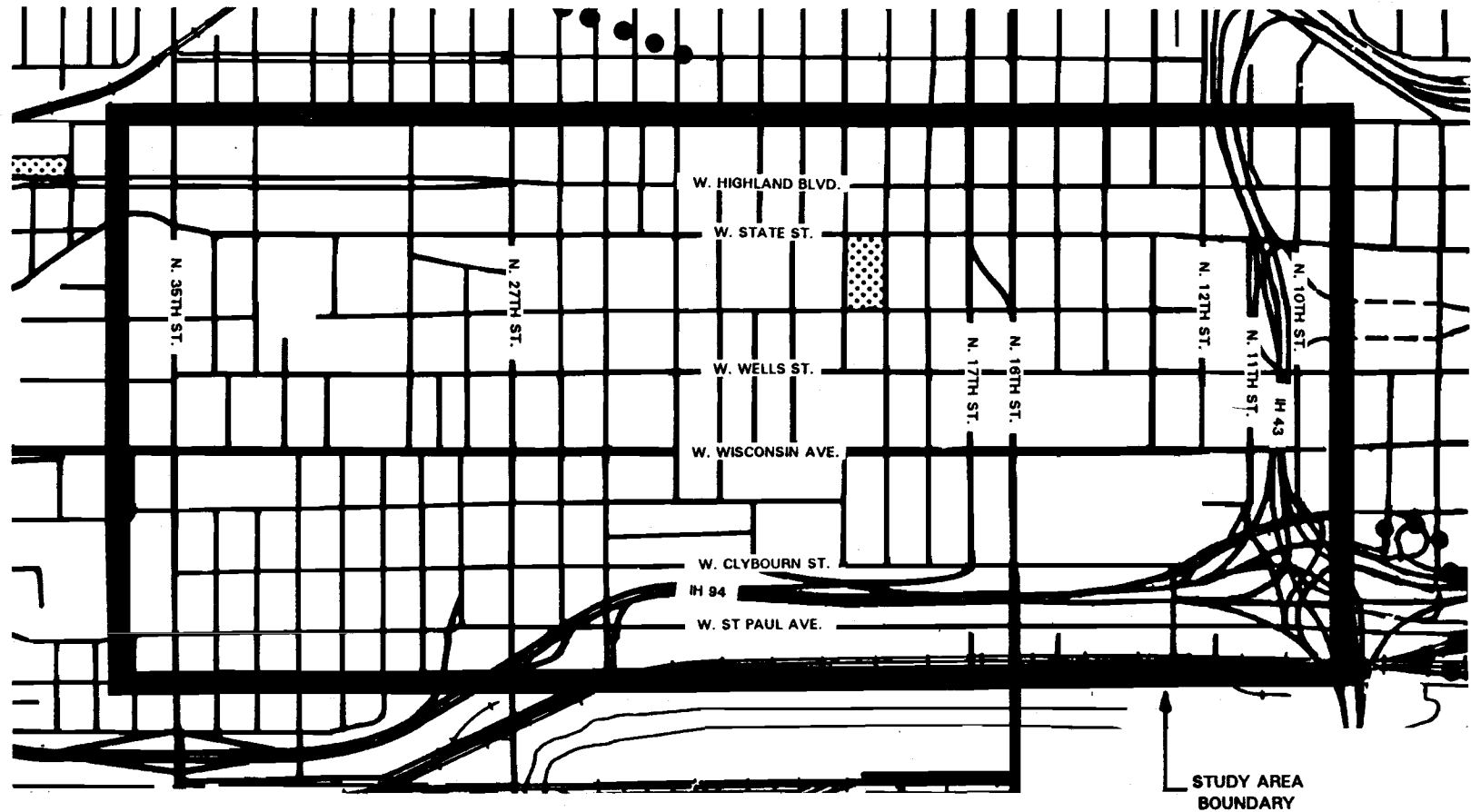
TRANSPORTATION IMPACTS  
OF W. WISCONSIN AVENUE CLOSURE  
BETWEEN N. 11TH STREET AND N. 16TH STREET

INTRODUCTION

This report documents the estimated existing, and the forecast probable future, transportation impacts of the proposed closure of W. Wisconsin Avenue between N. 11th Street and N. 16th Street including the related proposed closures of segments of N. 12th Street and N. 13th Street between W. Wells Street and W. Wisconsin Avenue. The transportation impact study was conducted by the Southeastern Wisconsin Regional Planning Commission staff at the specific request of the City of Milwaukee City Engineer as outlined in his letter request of June 11, 1992. The study area for this transportation impact study consists of that area which may be expected to experience transportation impacts as a result of the proposed closure of W. Wisconsin Avenue, and as shown on Map 1, is bounded by N. 10th Street on the east, IH 94 on the south, N. 35th Street on the west, and W. Highland Avenue on the north.

This report is divided into five sections, following this introductory section. The next, or second, section of the report describes existing transportation conditions within the study area. This section includes a description of the existing cross-section of the arterial streets within the study area and their current average weekday traffic volumes. Based upon a comparison of the current average weekday traffic volume to estimates of arterial roadway design capacities, those study area arterial facilities which currently experience traffic congestion are identified. For those arterial intersections along these congested arterial streets, analyses of intersection peak-hour congestion problems are also presented. With respect to the public transit element of the transportation system in the corridor, the description of existing conditions includes an identification of the existing Milwaukee County Transit System routes affected

Map 1  
STUDY AREA



-1a-



by the proposed closure, and the attendant affected bus transit and passenger movements.

The third section of the report presents potential future transportation conditions within the study area, including forecast probable future year 2010 average weekday traffic volumes and attendant forecasts of traffic congestion, and planned year 2010 public transit service levels. The future transportation conditions presented are those which may be anticipated if W. Wisconsin Avenue continues to remain open to traffic.

The fourth section of the report presents the potential estimated current and forecast future year 2010 traffic conditions and transportation problems within the corridor which may be expected if W. Wisconsin Avenue is closed to all traffic as proposed. Changes in average weekday traffic volumes are presented for both the current year and the forecast year 2010, along with attendant changes in traffic congestion. The potential impacts with respect to public transit are also presented.

The fifth section of the report presents and evaluates potential major improvements to mitigate the identified arterial street traffic and public transit problems which may be expected to result from the W. Wisconsin Avenue closure.

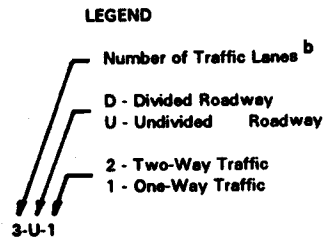
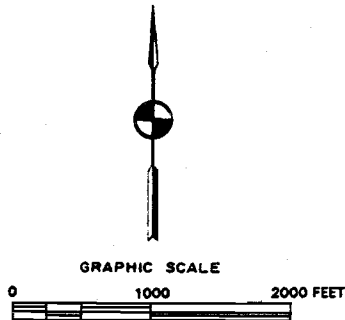
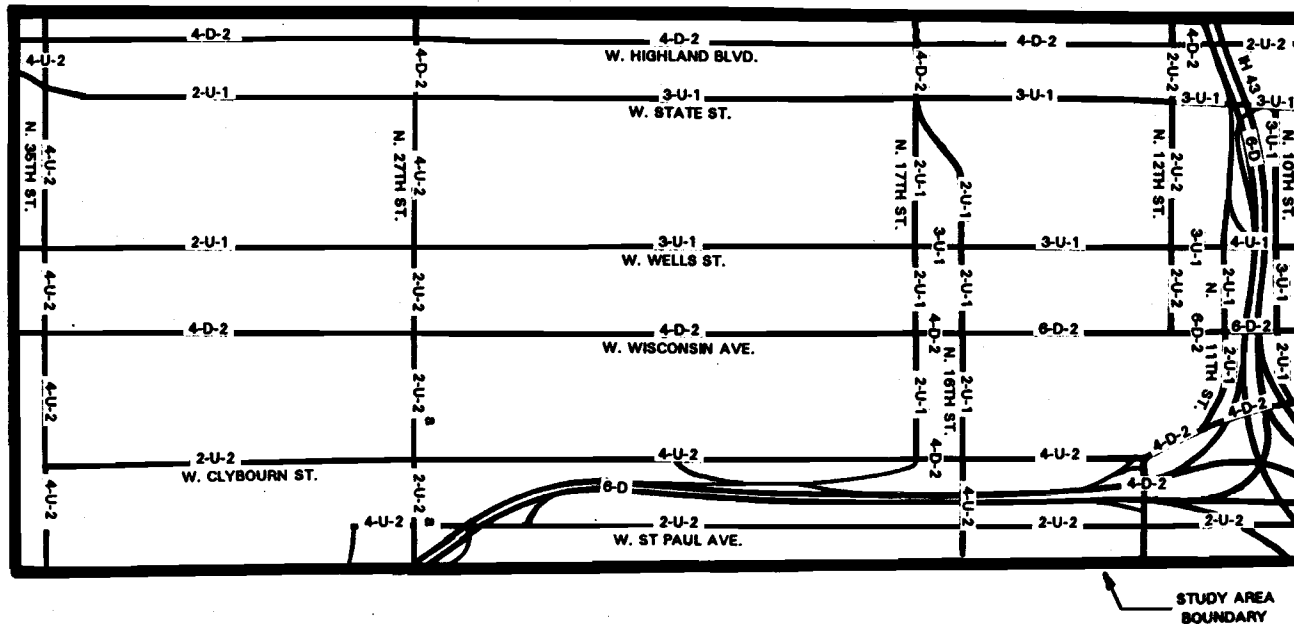
The last section of the report presents a summary of the major findings of this transportation impact study.

#### EXISTING TRANSPORTATION CONDITIONS

The existing arterial street system within the study area is shown on Map 2, along with existing roadway cross-sections and estimated existing design capacities. Estimated existing 24-hour average weekday traffic volumes for each segment of arterial street within the study area are presented on Map 3, based upon the most current traffic counts available. Those study area arterial facilities currently carrying average weekday traffic volumes which exceed their estimated average weekday design capacity, and, therefore, are currently experiencing traffic

Map 2

EXISTING ARTERIAL STREET SYSTEM WITHIN STUDY AREA: 1992



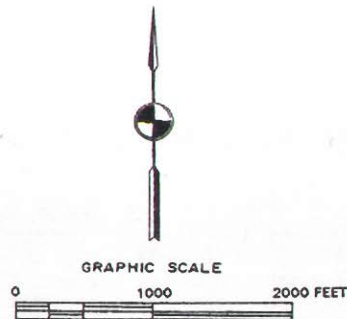
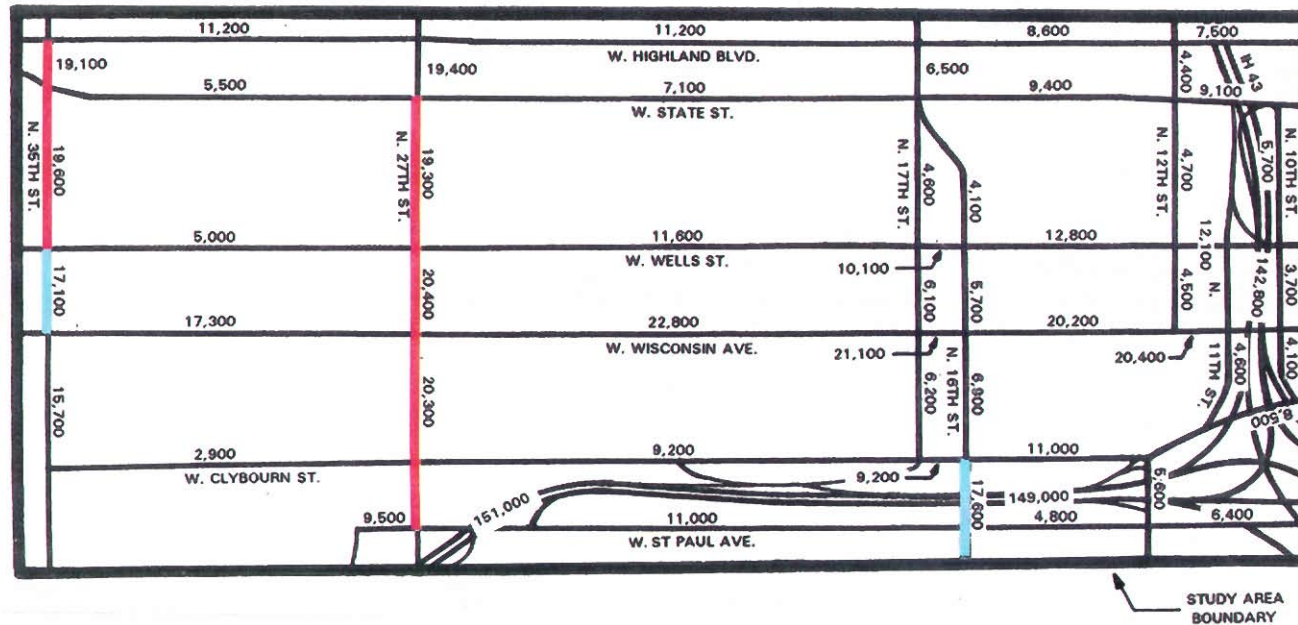
<sup>a</sup> Peak period parking is prohibited in the peak direction of travel.

<sup>b</sup> The design capacity of two and four traffic lane undivided two-way roadways is generally considered to be 13,000 and 17,000 vehicles per average weekday respectively. The design capacity of four and six lane divided two-way roadways is generally considered to be 25,000 and 35,000 vehicles per average weekday respectively. The design capacity of two, three, and four traffic lane one-way roadways is generally considered to be 16,500, 24,700, and 30,000 vehicles per average weekday.



Map 3

ESTIMATED EXISTING AVERAGE WEEKDAY TRAFFIC VOLUMES  
AND TRAFFIC CONGESTION ON THE STUDY AREA ARTERIAL STREET SYSTEM



- LEGEND**
- 11,200 Existing Average Weekday Traffic Volumes
  - ARTERIAL STREET AND HIGHWAY CONGESTION**
    - Volume Over Design Capacity (110 Percent or More of Design Capacity)
    - Volume At Design Capacity (100 to 110 Percent of Design Capacity)
    - Volume Under Design Capacity (Less Than Design Capacity)

<sup>a</sup>Urban arterials carrying average weekday traffic volumes exceeding design capacity may be expected to experience significant delays at controlled intersections, reduced speeds between intersections, and increased accident rates. The reduced speeds and intersection delays on urban arterials carrying average weekday traffic volumes equaling or exceeding their design capacity will generally occur only during the morning and peak traffic hours and periods, although, in some cases, also during the midday. During evening and early morning hours, there will generally be little, if any, traffic congestion and delay. Also, on most urban arterial streets, weekend traffic peaks will generally be less than weekday traffic peaks.

Map 3 (continued)

Typically, vehicles using arterials carrying traffic volumes substantially exceeding design capacity--that is, by 20 to 30 percent--will experience delays at signalized intersections of about 35 seconds during peak traffic periods, with delays to some vehicles of up to 120 seconds. Vehicles may have to wait through more than one traffic signal red phase to clear the intersection, particularly left-turning vehicles. Also, between controlled intersections, arterials carrying traffic volumes greater than design capacity may be expected to experience restrictions on operating speed and on the ability of vehicles to maneuver. Travel times on such arterials may typically increase by one-third over the average travel times on uncongested facilities.

Vehicles using arterials carrying traffic volumes at design capacity--that is, equal to, approaching, or modestly exceeding, design capacity (within 10 percent of design capacity)--typically experience vehicle delays at signalized intersections during peak traffic periods of from 20 to 30 seconds, with delays to some vehicles approaching 90 seconds. The average travel times on such arterials may typically increase by up to one-third over the average travel times on uncongested facilities.

Vehicles using arterials operating at or under design capacity will experience little vehicle backup at signalized intersections, and no vehicles will have to wait through more than one red traffic signal phase. The average delay to vehicles at signalized intersections will typically range from 5 to 15 seconds.

congestion, are also identified on Map 3.<sup>1</sup> Of the 13.2 miles of standard arterial facilities within the study area, it is estimated that 1.1 miles, or about 8 percent, currently carry average weekday traffic volumes which exceed their design capacity and experience traffic congestion problems during peak travel periods, including reduced traffic speeds, increased intersection delay, and reduced abilities to maneuver and change lanes.

For those arterial-to-arterial street intersections located along those segments of arterials determined to be carrying average weekday traffic volumes exceeding average weekday design capacity and experiencing congestion, analyses of intersection weekday peak hour traffic volumes were conducted, including comparisons to intersection peak hour design capacity. The results of this peak hour intersection capacity analysis, as shown on Map 4, confirm the identification of the location and extent of traffic congestion based upon the comparison of average weekday traffic volumes to average weekday facility design capacities by arterial street segment. Peak hour volume and capacity analyses of other selected arterial intersections within the study area were also conducted. These analyses further confirmed that the average weekday arterial segment capacity and congestion analyses are consistent with intersection peak hour capacity and congestion analyses. Intersection peak hour analyses conducted for the following intersections indicated that the intersections were operating within their design capacity, as the analyses of arterial segment average weekday capacity analyses had similarly concluded: W. Clybourn Street with N. 17th and N. 13th Streets; W. Wisconsin Avenue with N. 17th, N. 16th, N. 11th, and N. 10th Streets; and, W. Wells Street with N. 17th, N. 16th, N. 11th and N. 10th Streets.

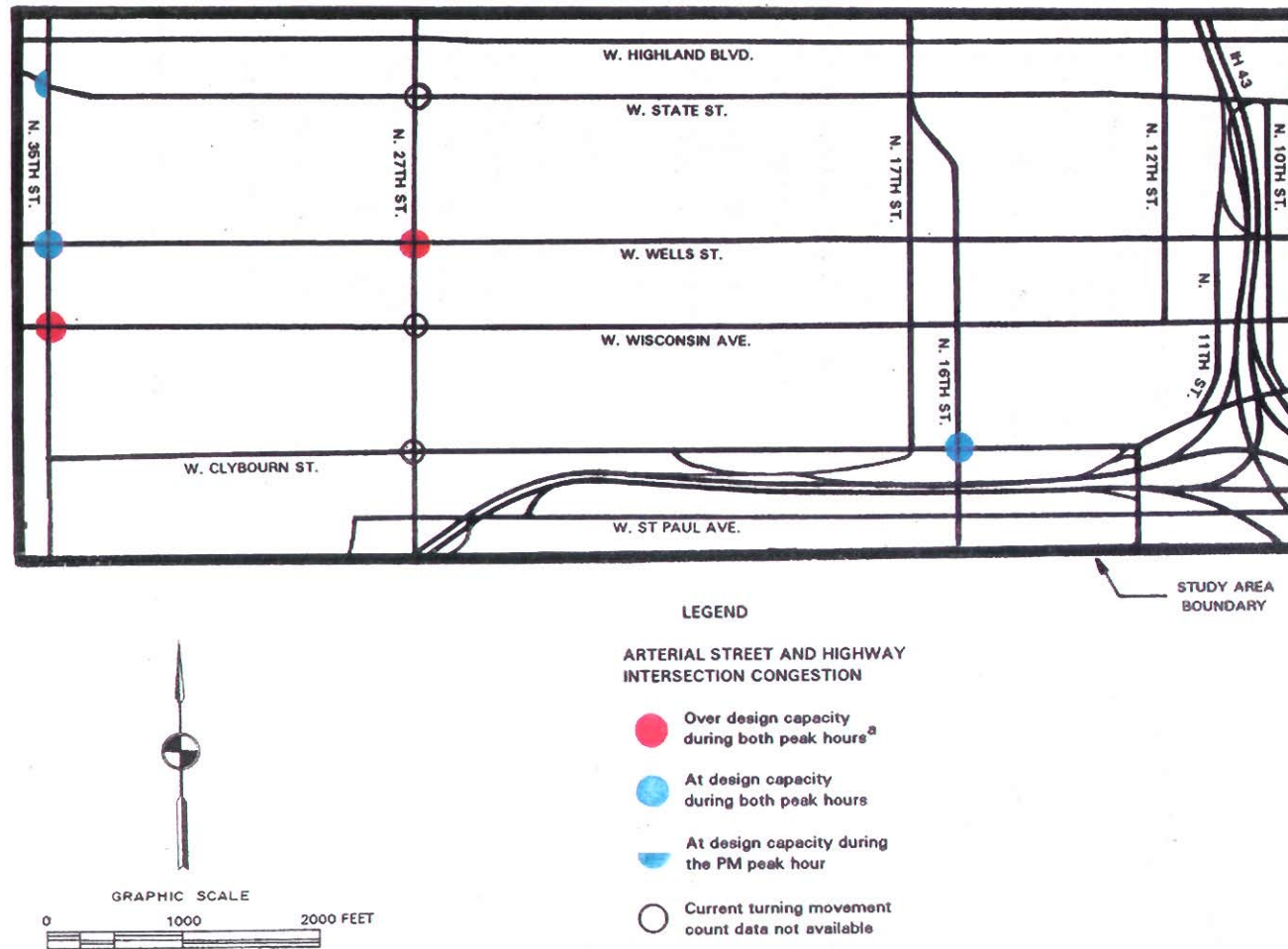
No historic traffic volume counts are available for W. Wisconsin Avenue in the study area. The City of Milwaukee, however, has conducted annual traffic counts on the W. Wisconsin Avenue viaduct since 1966. The traffic counts, as shown on Figure 1, indicate that estimated average weekday traffic volumes on the viaduct

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<sup>1</sup>The estimated current traffic volumes shown on Map 3 are based upon traffic counts taken during the years 1984 through 1992, with most of the counts being from the years 1986 through 1990. The traffic counts were generally not conducted during the recent closure of the W. Wisconsin Avenue viaduct for reconstruction.

Map 4

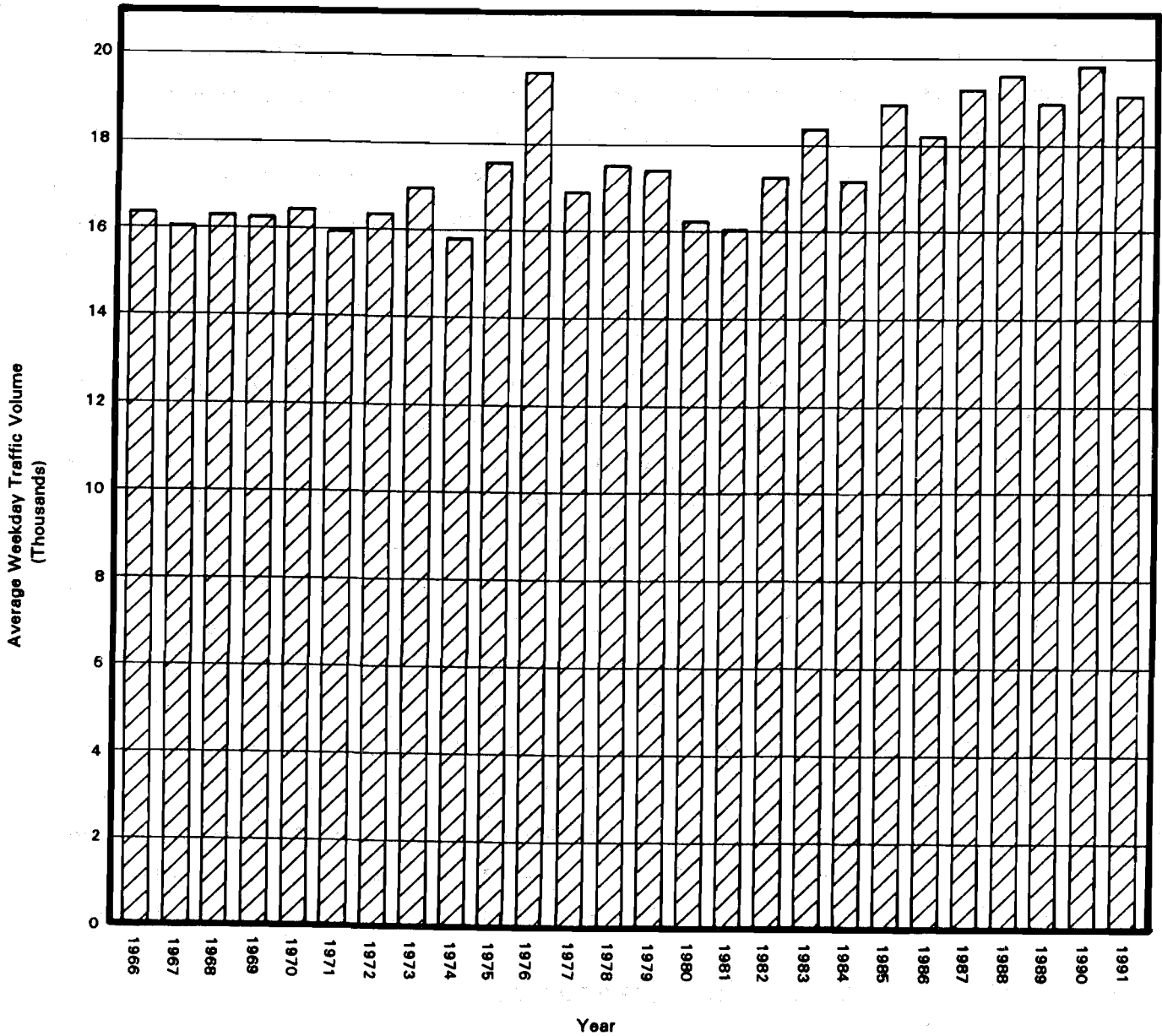
ARTERIAL INTERSECTION PEAK HOUR CAPACITY AND EXISTING CONGESTION ANALYSES FOR THOSE ARTERIAL INTERSECTIONS ALONG ARTERIAL STREET SEGMENTS DETERMINED TO BE CURRENTLY EXPERIENCING TRAFFIC CONGESTION



<sup>a</sup> An intersection is generally considered to be operating at its design capacity when providing a level of service "C" with average vehicular delays of less than 25 seconds per vehicle per signal cycle. An intersection is generally considered to be operating over its design capacity when it provides a level of service "D", "E", and "F" with average vehicular delays which exceed 25 seconds per vehicle per signal cycle.

Figure 1

HISTORIC AVERAGE WEEKDAY TRAFFIC COUNTS  
ON THE W. WISCONSIN AVENUE VIADUCT: 1966-1991



have been stable since 1987, and that the increase in traffic volume over the period 1966 to 1991 has been about 17 percent, or about 0.6 percent annually.

Seven Milwaukee County Transit System (MCTS) routes currently operate over the segment of W. Wisconsin Avenue proposed to be closed: Routes 1, 10, 12, 20, 23, 30, and 31. Four of the routes--20, 23, 30, and 31--operate in both directions over the entire stretch of W. Wisconsin Avenue proposed to be closed between N. 11th Street and N. 16th Street. One of the routes--Route 10--operates in a westbound direction only over the entire stretch of W. Wisconsin Avenue proposed to be closed, and operates in the eastbound direction over W. Wells Street. Two of the routes--Routes 1 and 12--operate only over the segment of W. Wisconsin Avenue proposed to be closed between N. 11th Street and N. 12th Street, and Route 1 operates over this stretch of W. Wisconsin Avenue only in the northbound direction, with its southbound movement occurring over N. 11th Street.

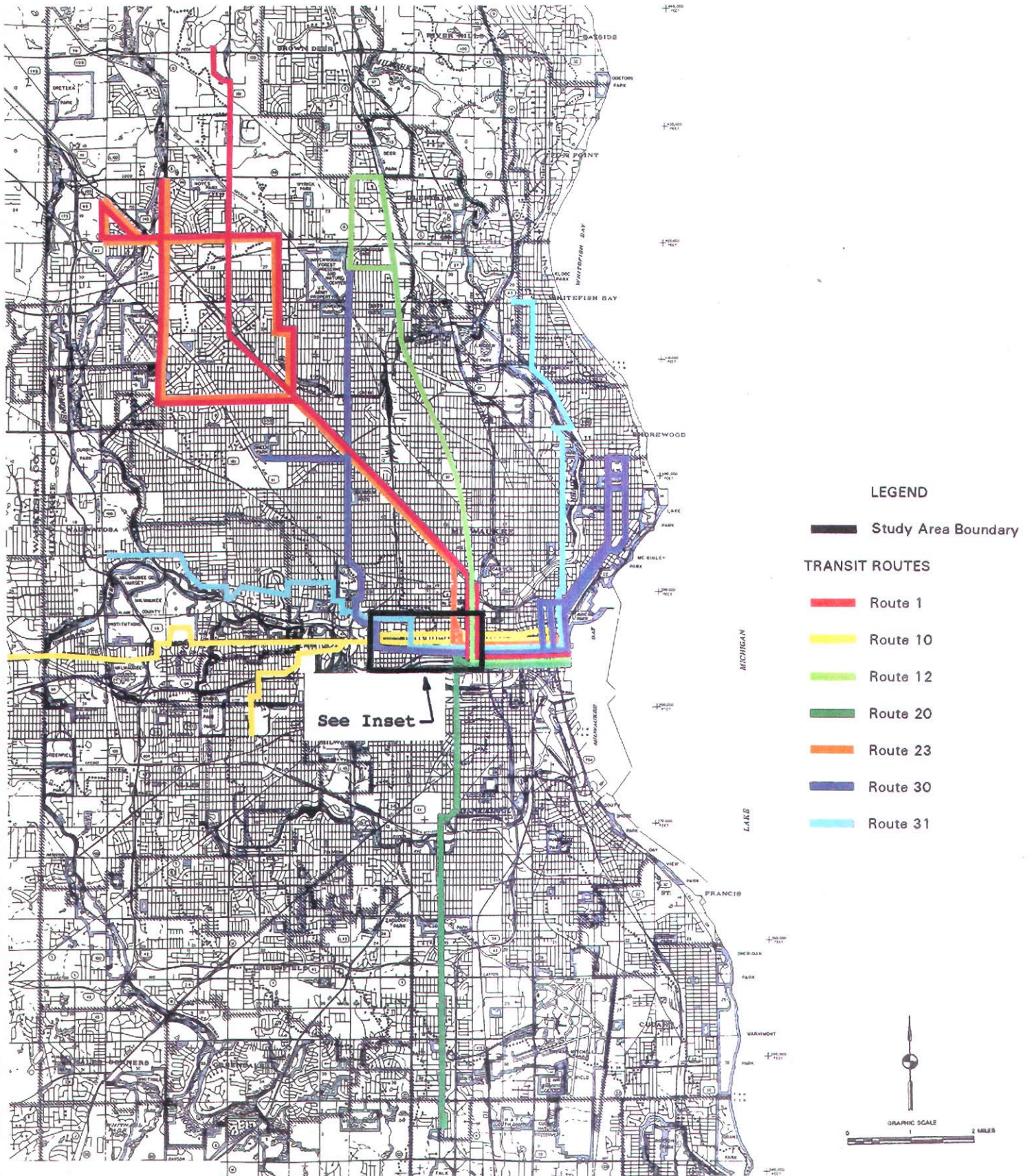
Map 5 displays the seven Milwaukee County Transit System routes which may be directly affected by the proposed closure of W. Wisconsin Avenue between N. 11th Street and N. 16th Street. Table 1 presents bus service and passenger characteristics of the seven routes affected by the proposed roadway closure. The proposed roadway closure may be expected to affect the operation of 1,139 buses on an average weekday, including the operation of approximately 75 buses during each morning and afternoon peak hour of an average weekday, representing approximately 17 percent of the total buses in operation by the Milwaukee County Transit System on an average weekday. The total passengers affected, including passengers boarding and deboarding on the segment of W. Wisconsin Avenue proposed to be closed, and the passengers traveling through this segment of W. Wisconsin Avenue proposed to be closed totals approximately 24,400 passengers on an average weekday, or approximately 16 percent of the total estimated 160,000 passengers currently carried by the Milwaukee County Transit System on an average weekday.

#### FORECAST YEAR 2010 STUDY AREA TRANSPORTATION CONDITIONS

This portion of the report presents forecast year 2010 arterial highway and public transit conditions in the study area assuming W. Wisconsin Avenue remains open to traffic. Two alternative scenarios were considered in the preparation of the



MILWAUKEE COUNTY TRANSIT SYSTEM ROUTES  
AFFECTED BY WISCONSIN AVENUE CLOSURE

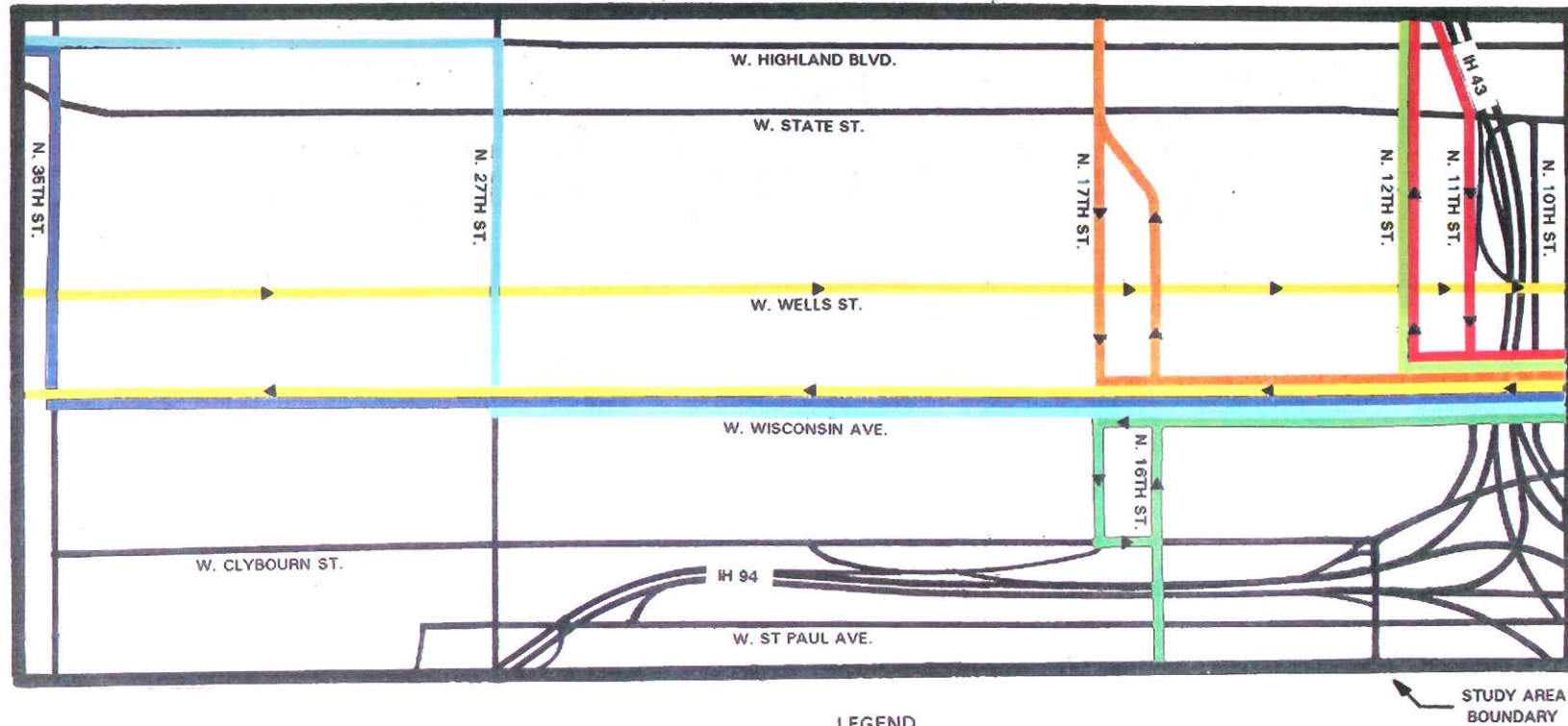




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# Map 5 (Continued)

## Study Area Inset

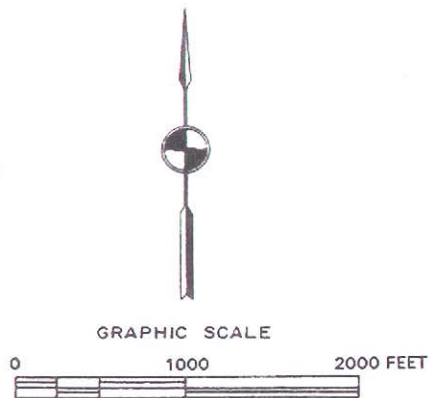


### LEGEND

#### TRANSIT ROUTES

- Route 1
- Route 10
- Route 12
- Route 20
- Route 23
- Route 30
- Route 31

Direction Of Travel On  
Route Segment Operated  
In One Direction Only



Source: SEWRPC

KRY/hh  
9/04/92  
c24:tab.1

Table 1  
CHARACTERISTICS OF EXISTING MILWAUKEE COUNTY TRANSIT SYSTEM  
ROUTES OPERATING OVER W. WISCONSIN AVENUE BETWEEN N. 11TH STREET AND N. 16TH STREET

Route Number	Segment of W. Wisconsin Avenue	Number of Average Weekday Passenger On and Off Movements on W. Wisconsin Avenue between N. 11th and N. 16th Streets	Number of Through Passenger Movements	Number of Buses on Average Weekday	Number of Buses Operated on Average Weekday Peak Hour
1	N. 11th to N. 12th (northbound only)	103	904	82	4 am/ 8 pm
10	N. 11th to N. 16th (westbound only)	537	1,362	98	6 am/ 6 pm
12	N. 11th to N. 12th	870	3,205	215	11 am/11 pm
20	N. 11th to N. 16th	1,038	1,244	114	8 am/ 8 pm
23	N. 11th to N. 16th	1,008	3,184	197	9 am/12 pm
30	N. 11th to N. 16th	1,995	6,093	301	25 am/21 pm
31	N. 11th to N. 16th	829	2,052	132	10 am/11 pm
Total		6,380	18,044 <sup>a</sup>	1,139	73 am/77 pm

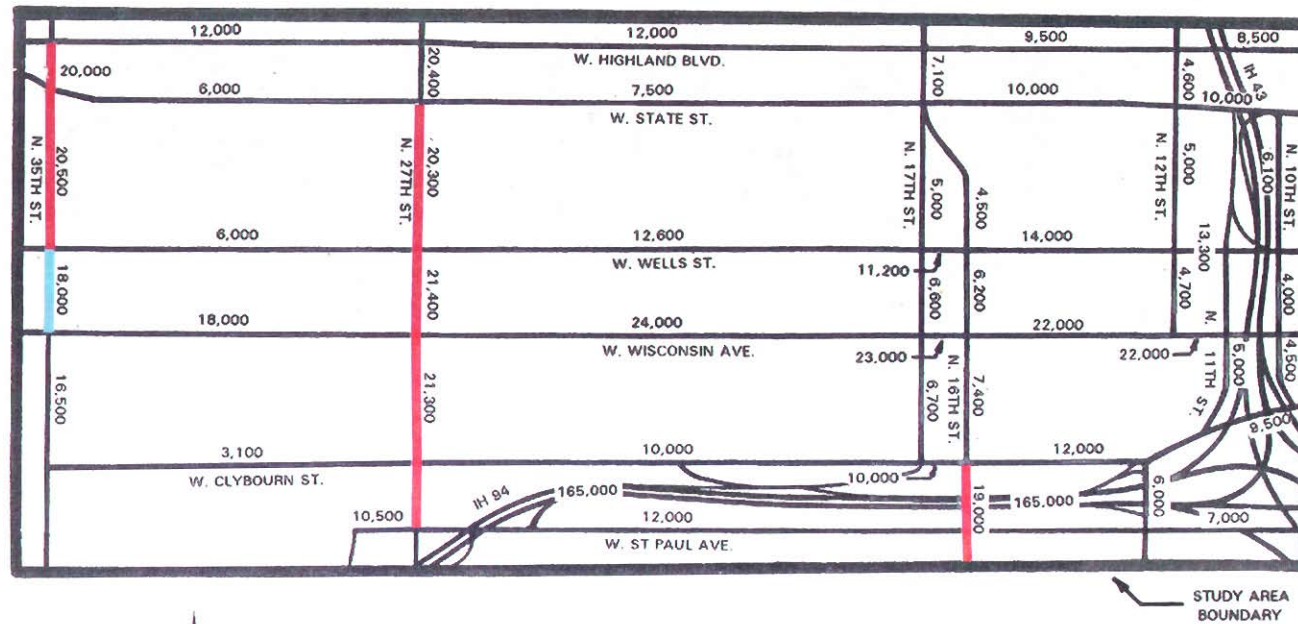
<sup>a</sup>Of the 18,044 through passenger movements on an average weekday on W. Wisconsin Avenue between N. 11th and N. 16th, 13,935 passengers travel W. Wisconsin Avenue between N. 11th Street and N. 16th Street, and 4,109 passengers travel W. Wisconsin Avenue only between N. 11th Street and N. 12th Street. Of the 1,139 buses, 842 buses operate over the entire stretch of W. Wisconsin Avenue proposed to be closed, and 297 buses operate only between N. 11th Street and N. 12th Street. Of the 73 morning peak hour buses and 77 afternoon peak hour buses operating over the segment of W. Wisconsin Avenue proposed to be closed, 58 operate during both morning and afternoon peak hours over the entire stretch of W. Wisconsin Avenue proposed to be closed, and 15 in the morning peak hour and 19 in the afternoon peak hour operate only over W. Wisconsin Avenue between N. 11th Street and N. 12th Street.

forecast traffic volumes. Under the first alternative scenario considered forecast traffic volumes are based upon the Regional Planning Commission's adopted population, household, and employment forecasts and the adopted regional land use plan, as documented in Southeastern Wisconsin Regional Planning Commission Report No. 40, A Regional Land Use Plan for Southeastern Wisconsin: 2010, and, as well, are based upon the adopted regional transportation system plan. The adopted regional transportation system plan proposes no arterial street improvements to increase capacity within the study area through the year 2010. The plan does propose substantial improvement and expansion of public transit facilities and services. Map 6 presents forecast year 2010 average weekday traffic volumes under alternative scenario one by segment of the arterial system for the study area, and attendant traffic congestion--that is, arterial segments expected to carry average weekday traffic volumes in the year 2010 which exceed design capacity. The forecast increase in average weekday traffic and vehicle-miles of travel on the standard arterial streets in the study area as a result of planned conditions is approximately 10 percent. The miles of congested arterial facilities, or facilities which may be expected to carry average weekday traffic volumes exceeding their design capacity, is expected to increase from 1.1 miles currently to 1.3 miles by the year 2010, or about 10 percent of the standard arterial street system in the study area. These forecast design year 2010 average weekday traffic volumes were utilized in the analyses of alternatives to the closure of W. Wisconsin Avenue.

The second alternative scenario considered differs from the first scenario in two important ways. First, forecast population, household, and employment levels were not based on the adopted regional land use plan, but rather on a high growth, centralized land use scenario postulated during the development of the adopted land use plan. Second, no improvements or expansion of existing public transit services--which are envisioned under the adopted regional transportation system plan--were assumed. Map 7 presents forecast year 2010 average weekday traffic volumes under the second alternative scenario by arterial system segment for the study, and attendant traffic congestion--that is, arterial segments expected to carry average weekday traffic volumes in the year 2010 which exceed design capacity. The forecast increase in average weekday traffic and vehicle miles of travel on the standard arterial streets in the study area under this scenario is

# Map 6

## STUDY AREA ARTERIAL SYSTEM YEAR 2010 FORECAST AVERAGE WEEKDAY TRAFFIC VOLUMES AND ATTENDANT TRAFFIC CONGESTION BASED ON THE ADOPTED REGIONAL LAND USE AND TRANSPORTATION SYSTEM PLANS



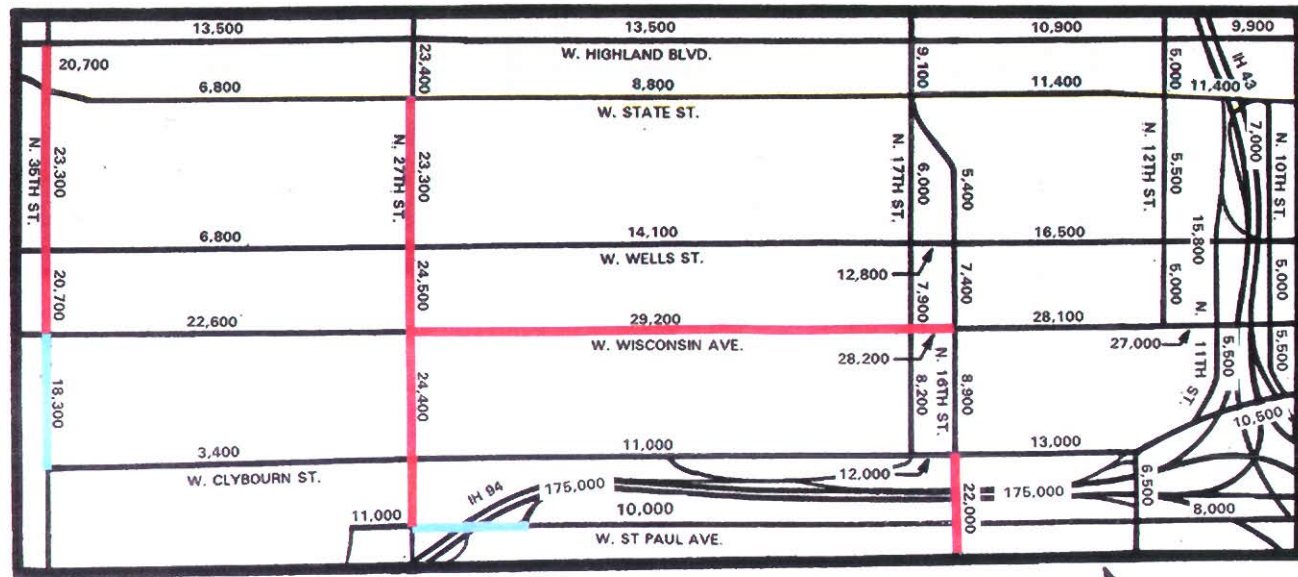
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- LEGEND
- 11,200 Forecast 2010 Average Weekday Traffic Volumes
- ARTERIAL STREET AND HIGHWAY CONGESTION<sup>a</sup>
- Volume Over Design Capacity (110 Percent or More of Design Capacity)
  - Volume At Design Capacity (100 to 110 Percent of Design Capacity)
  - Volume Under Design Capacity (Less Than Design Capacity)

<sup>a</sup> Compared to the arterial intersections determined to be operating at and over design capacity under existing traffic conditions with W. Wisconsin Avenue open to traffic, the following additional intersections would be expected to operate at design capacity: N. 17th Street at W. Wisconsin Avenue during both peak hours, and N. 17th Street at W. Clybourn Street during the p.m. peak hour.

Map 7

STUDY AREA ARTERIAL SYSTEM YEAR 2010 FORECAST  
 AVERAGE WEEKDAY TRAFFIC VOLUMES AND ATTENDANT TRAFFIC CONGESTION  
 BASED ON A HIGH-GROWTH CENTRALIZED LAND USE SCENARIO  
 AND NO IMPROVEMENTS IN OR EXPANSION OF THE EXISTING LEVEL OF PUBLIC TRANSIT SERVICE

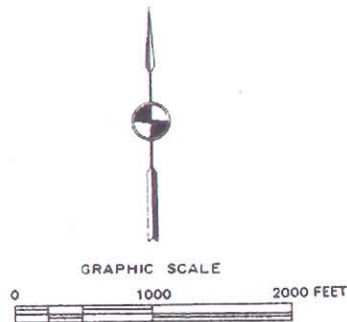


LEGEND

11,200 Forecast 2010 Average  
 Weekday Traffic Volumes

ARTERIAL STREET AND HIGHWAY  
 CONGESTION

- Volume Over Design Capacity (110 Percent or More of Design Capacity)
- Volume At Design Capacity (100 to 110 Percent of Design Capacity)
- Volume Under Design Capacity (Less Than Design Capacity)



approximately 26 percent, or about 16 percent higher than under the adopted regional land use plan. The miles of congested arterial facilities, or facilities which may be expected to carry average weekday traffic volumes exceeding their design capacity, may be expected to increase from 1.1 miles currently to 2.1 miles by the year 2010, or about 16.0 percent of the standard arterial street system in the study area.

Average weekday traffic volumes on both the freeways and the standard arterials within the study area have been increasing at about the same rate over the past decade. Additional increases in average weekday traffic volumes are anticipated on both the freeways and the standard arterials in the study area by the forecast design year 2010. The East-West Freeway (IH 94) through the study area currently carries average weekday traffic volumes substantially greater than its design capacity. However, it may be expected to accommodate the forecast 11 percent increase in average weekday traffic volume to the year 2010, but only through a further decline in the level of service provided by this facility. It should be noted, however, that the ability of the freeways within the study area to carry additional peak period traffic is limited as these freeway segments currently carry peak period traffic volumes approaching or equal to freeway capacity. Implementation of the Milwaukee area freeway traffic management system has some potential to limit additional peak period freeway travel within the study area. This potential, however, may be expected to be limited as freeway operational control is planned to be achieved by metering additional freeway system on-ramps and not by more substantial control at existing ramp meters including those located within the study area.

The public transit system element of the adopted regional transportation system plan envisions the substantial improvement and expansion of the existing public transit system of Southeastern Wisconsin, including within the study area. The components of the public transit system plan include the substantial improvement of the frequency of service of the existing transit system; the extension of local transit service to all of the greater Milwaukee area; the expansion and improvement of bus-on-freeway service; and the development of a true rapid transit system component of the regional transit system. The rapid, or express, transit system element would extend into each of the Milwaukee area's major travel



corridors, and would be provided initially with express bus on reserved street lanes, and potentially ultimately with light rail, on reserved street lanes or its own right-of-way.

Thus, the public transit element of the adopted regional transportation system plan envisions a substantially expanded and improved transit system. Planned transit service levels--as measured by the vehicle miles of transit service provided and the average speed of a transit trip--are proposed to be substantially improved. The plan envisions a more than doubling of the existing level of transit use in Southeastern Wisconsin. In particular, the study area is planned to receive substantially improved transit service. The east-west corridor of the proposed new rapid transit element is recommended to be located within the study area corridor, and specifically, on W. Wisconsin Avenue from N. 35th Street to N. Prospect Avenue. This segment of W. Wisconsin Avenue would serve as the rapid transit element for the east-west corridor, as well as for the northwest and southwest corridors. Approximately 24 feet of the W. Wisconsin Avenue roadway was recommended to be considered for conversion to exclusive transit use from existing median and parking/auxiliary lanes. The east-west corridor rapid transit study being conducted by the Wisconsin Department of Transportation serves to implement this adopted regional transit plan, and is further evaluating the potential use of W. Wisconsin Avenue for light rail and bus alternatives.

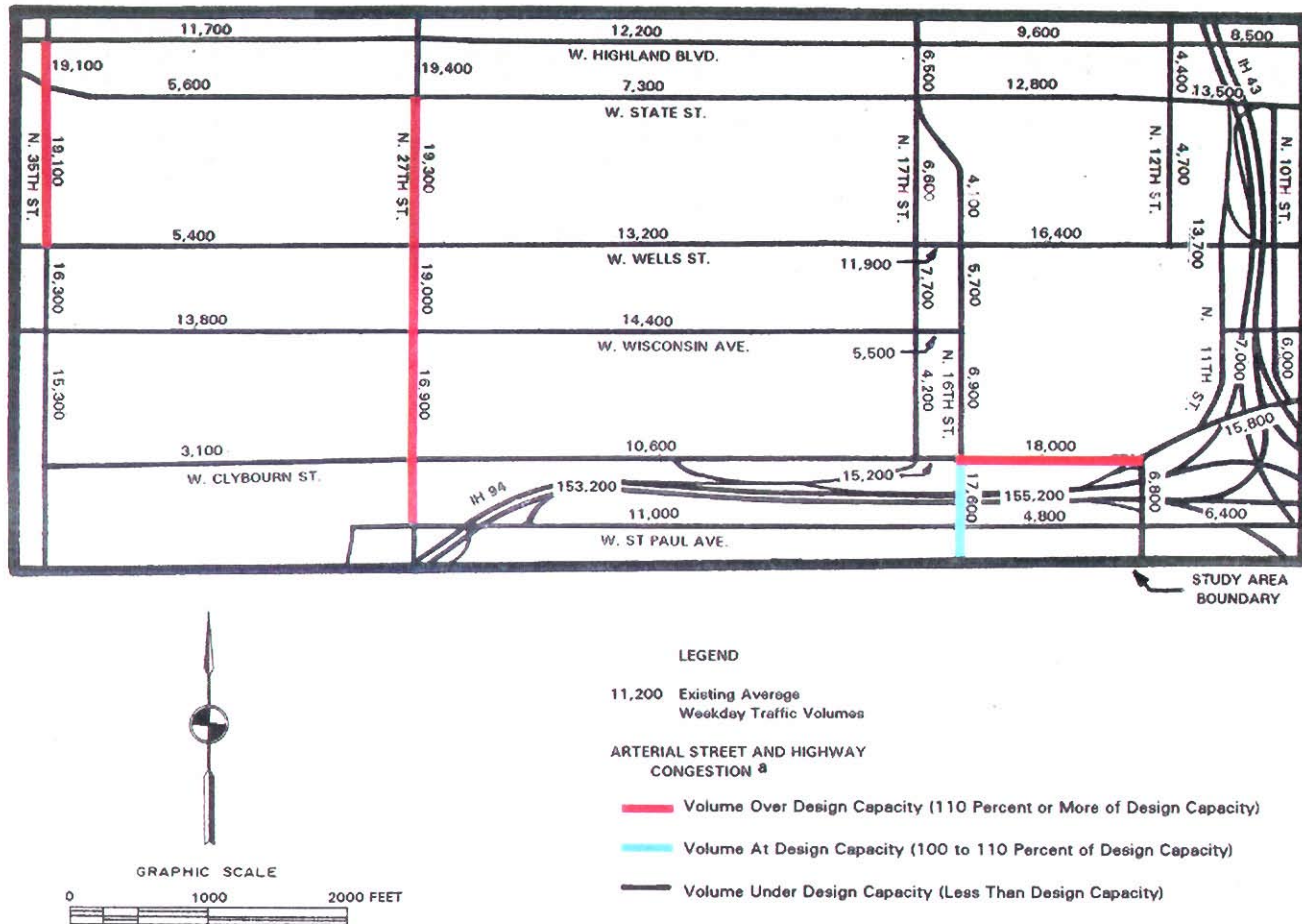
#### ESTIMATED EXISTING AND FORECAST YEAR 2010 TRANSPORTATION PROBLEMS AS A RESULT OF THE PROPOSED W. WISCONSIN AVENUE CLOSURE

##### Existing Conditions

Map 8 displays the estimated change in existing arterial highway average weekday traffic volumes on the arterial facilities within the study area which may be expected to result from the proposed closure of W. Wisconsin Avenue. This estimate of average weekday traffic volumes is based upon application of the Commission traffic simulation models and the findings of the comprehensive travel survey completed within the Region by the Commission in the fall of 1991 and spring of 1992.

Map 8

ESTIMATED 1992 AVERAGE WEEKDAY TRAFFIC VOLUMES ON THE STUDY AREA ARTERIAL SYSTEM  
UPON CLOSURE OF W. WISCONSIN AVENUE BETWEEN N. 11TH STREET AND N. 16TH STREET



<sup>a</sup> Compared to the arterial intersections determined to be operating at and over design capacity under existing traffic conditions with W. Wisconsin Avenue open to traffic, no additional intersections would be expected to operate at design capacity.

The analyses conducted by the Commission of the change in average weekday traffic volumes which may be expected as a result of the closure of W. Wisconsin Avenue between N. 11th Street and N. 16th Street indicate that no significant impact may be expected to the south of IH 94, which is the southern study area boundary; to the north of W. Highland Boulevard, which is the northern study area boundary; and, to the west of N. 35th Street, which is the western study area boundary. In addition, minimal impact may be expected to the east of N. 10th Street, which is the eastern study area boundary. No impact from the proposed closure of W. Wisconsin Avenue may be expected to the east of N. 6th Street in the Milwaukee central business district.

The closure of W. Wisconsin Avenue between N. 11th Street and N. 16th Street may be expected to have its most significant impact in that portion of the study area bounded by N. 10th Street on the east, and N. 17th Street on the west. This portion of the study area includes the stretch of W. Wisconsin Avenue between N. 11th Street and N. 16th Street proposed to be closed and which currently carries approximately 20,200 vehicles per average weekday. The arterial facility in this portion of the study area which may be expected to be affected the most from the proposed closure would be W. Clybourn Street on which traffic volumes may be expected to increase from 11,000 to 18,000 vehicles per average weekday. Other arterial facilities in this portion of the study area between N. 10th Street and N. 17th Street which may be expected to be affected include W. Wells Street, on which traffic volumes may be expected to increase from 12,800 to 16,400 vehicles per average weekday; W. State Street from 9,400 to 12,800 vehicles per average weekday; and W. Highland Boulevard from 8,600 to 9,600 vehicles per average weekday. In addition, traffic volumes on IH 94 in this portion of the study area may be expected to experience an increase from 149,000 to 155,200 vehicles per average weekday.

The analysis further indicates that while east-west arterial streets in the portion of the study area between N. 10th Street and N. 17th Street would be substantially affected by the closure of W. Wisconsin Avenue, average weekday traffic volumes should not substantially change on north-south arterial streets, including N. 16th and N. 17th Streets. This is because the increased traffic volumes on N. 16th and N. 17th Streets from turning movements between W. Wisconsin

Avenue and other east-west arterial streets which may be expected to occur as a result of the closure of W. Wisconsin Avenue between N. 11th Street and N. 16th Street, may be expected to be offset by the removal from N. 16th Street and N. 17th Street of current traffic which utilizes W. Wisconsin Avenue and N. 16th Street and N. 17th Street to access IH 94, as well as the N. 16th Street viaduct and N. 17th Street. Traffic volumes on N. 10th Street and N. 11th Street may be expected to increase from under 5,000 vehicles per average weekday to 7,000 vehicles per average weekday.

The analysis further indicates that the impact on traffic on the portion of W. Wisconsin Avenue west of the proposed closure of W. Wisconsin Avenue--that is, between N. 17th Street and N. 27th Street--may also be expected to be substantial. Specifically, a reduction from the current 22,800 vehicles per average weekday to 14,400 vehicles per average weekday may be expected on W. Wisconsin Avenue between N. 17th and N. 27th Streets upon the closure of W. Wisconsin Avenue between N. 11th and N. 16th Streets. The arterial facilities which may be expected to be affected by the proposed closure in the portion of the study area between N. 17th Street and N. 27th Street would include W. Clybourn Street on which traffic volumes may be expected to increase from 9,200 to 10,600 vehicles per average weekday; W. Wells Street from 11,600 to 13,200 vehicles per average weekday; W. State Street from 7,100 to 7,300 vehicles per average weekday; and W. Highland Boulevard from 11,200 to 12,200 vehicles per average weekday. In addition, IH 94 in this portion of the study area between N. 17th Street and N. 27th Street may be expected to experience an increase in traffic volume from 151,000 to 153,200 vehicles per average weekday.

Within that portion of the study area--between N. 27th Street and N. 35th Street--the impact of the proposed closure of W. Wisconsin Avenue may be expected to be further reduced. The current traffic volume on W. Wisconsin Avenue between N. 27th and N. 35th Streets of approximately 17,300 vehicles per average weekday may be expected to be only modestly reduced to approximately 13,800 vehicles per average weekday upon the closure of W. Wisconsin Avenue between N. 11th Street and N. 16th Street. The arterial facilities which may be expected to be affected by the proposed closure in this portion of the study area between N. 27th and N. 35th Streets would be W. Clybourn Street which may be expected to experience an

increase in traffic volume from 2,900 to 3,100 vehicles per average weekday; W. Wells Street from 5,000 to 5,400 vehicles per average weekday; and W. Highland Boulevard from 11,200 to 11,700 vehicles per average weekday. In addition, IH 94 in this portion of the study area may be expected to experience an increase in traffic volume from 156,000 to 158,200 vehicles per average weekday.

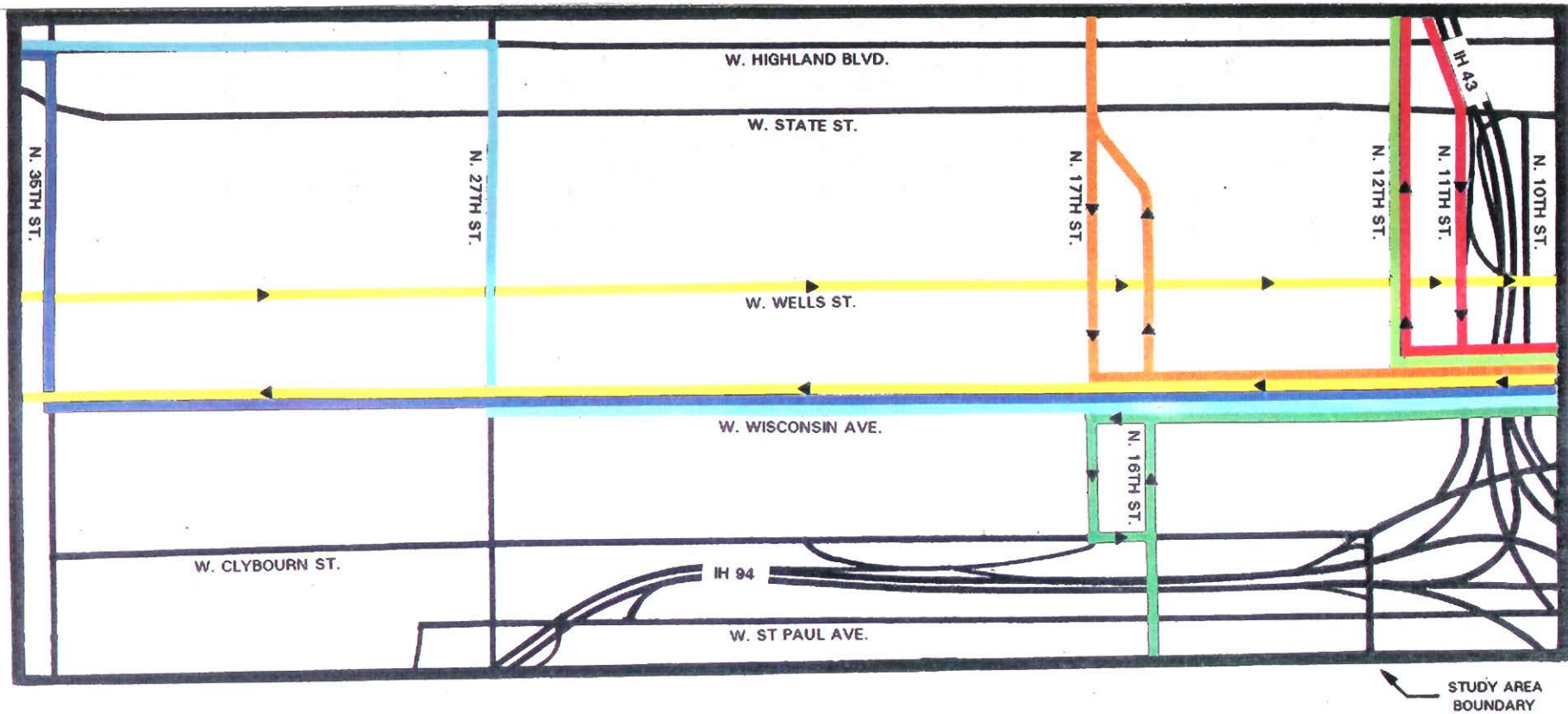
With respect to potential additional traffic congestion which may be expected under current traffic conditions upon the proposed closure of W. Wisconsin Avenue, only W. Clybourn Street between N. 16th Street and N. 13th Street may be expected to carry average weekday traffic volumes which would exceed design capacity and, as a result, experience traffic congestion.

The potential impacts of the proposed closure of W. Wisconsin Avenue between N. 11th Street and N. 16th Street on the existing public transit service are illustrated on Map 9 and described in Table 2. The necessary rerouting of four of the seven existing bus routes operating over the segment of W. Wisconsin Avenue proposed to be closed would entail two additional turning movements, while the necessary rerouting of the other three routes would entail four additional turning movements. In addition, the required rerouting of three of the routes would entail 0.3 miles of travel indirection. This necessary rerouting may be expected to result in an additional one minute to three minutes in route travel time, or approximately a 2 to 3 percent increase. In addition, the rerouting of all seven routes would make access to the Marquette University area by public transit less convenient, as it would require an additional one- to three-block walk from the stops on the relocated bus routes into Marquette University area. Two of the routes requiring rerouting would likely have to be changed from two-way operation over one street to one-way operation over a pair of one-way streets. One-way operation of transit routes on parallel one-way streets is generally less convenient and less understandable to the transit rider than operation on a single two-way street. The potential rerouting that may be required over one-way streets is particularly unattractive in that the rerouting of one of the routes--Route 23--would be over W. Wells and W. State Streets which are separated by two blocks, and the potential rerouting of Route 12 would be over N. 11th Street and N. 10th Street which are separated by IH 43.

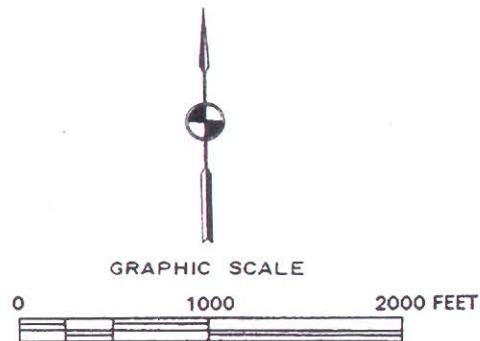
Map 9

EXISTING ROUTING OF PUBLIC TRANSIT ON W. WISCONSIN AVENUE WITHIN THE STUDY AREA AND  
POTENTIAL MODIFIED ROUTING UPON CLOSURE OF W. WISCONSIN AVENUE BETWEEN N. 11TH STREET AND N. 16TH STREET

Existing Routes



-10a-



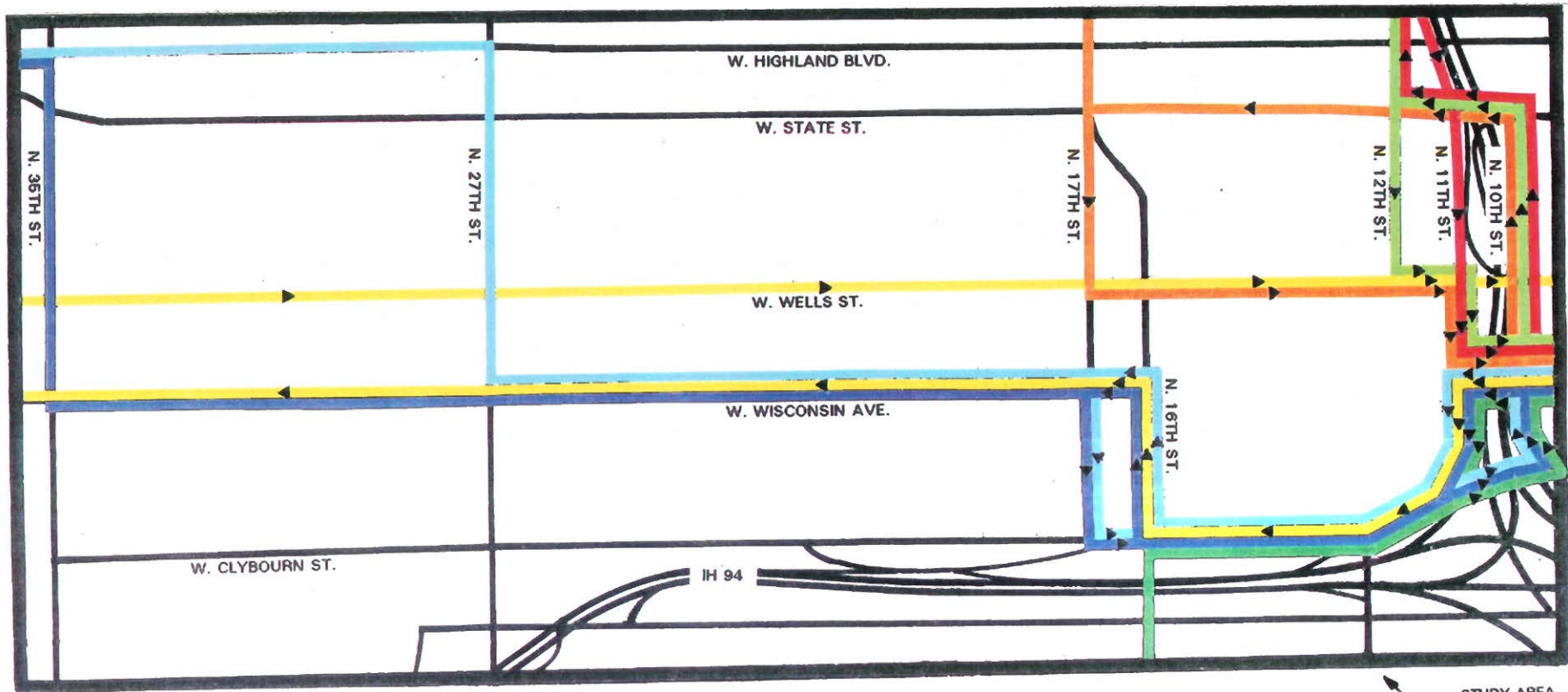
LEGEND

TRANSIT ROUTES	
<span style="color: red;">—</span> Route 1	<span style="color: orange;">—</span> Route 23
<span style="color: yellow;">—</span> Route 10	<span style="color: blue;">—</span> Route 30
<span style="color: lightgreen;">—</span> Route 12	<span style="color: cyan;">—</span> Route 31
<span style="color: darkgreen;">—</span> Route 20	

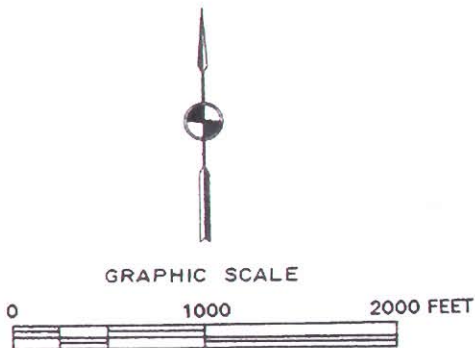
→ Direction Of Travel On Route Segment Operated In One Direction Only



Map 9 (Continued)  
Necessary Modified Routing



-10b-



Source: SEWRPC

LEGEND

TRANSIT ROUTES	
<span style="color: red;">—</span> Route 1	<span style="color: orange;">—</span> Route 23
<span style="color: yellow;">—</span> Route 10	<span style="color: blue;">—</span> Route 30
<span style="color: lightgreen;">—</span> Route 12	<span style="color: cyan;">—</span> Route 31
<span style="color: darkgreen;">—</span> Route 20	

➡ Direction Of Travel On Route Segment Operated In One Direction Only



Table 2

MODIFIED ROUTING OF EXISTING MILWAUKEE COUNTY TRANSIT SYSTEM  
ROUTES OPERATING OVER W. WISCONSIN AVENUE BETWEEN N. 11TH STREET AND N. 16TH STREET  
UPON CLOSURE OF W. WISCONSIN AVENUE

Route Number	Existing Operation Over Segment of W. Wisconsin Avenue to be Closed	Potential Modified Routing Upon Closure	Implications of Modified Routing <sup>a</sup>
1	N. 11th to N. 12th (northbound only)	Reroute northbound only from N. 10th Street and W. Wisconsin Avenue to N. 12th Street and W. State Street. New route over N. 10th Street and W. State Street, rather than current route over N. 12th Street and W. Wisconsin Avenue.	Introduces two additional turns (one right and one left). Access to northbound Route 12 is inconvenient (new one and two block walk) for development along N. 12th Street between W. State Street and W. Wisconsin Avenue.
10	N. 11th to N. 16th (westbound only)	Reroute westbound from N. 11th Street and W. Wisconsin Avenue to N. 16th Street and W. Wisconsin Avenue. New route over N. 11th Street, W. Clybourn Street, and N. 16th Street rather than current route over W. Wisconsin Avenue.	Introduces four additional turns (two right and 2 left), and approximately 0.3 miles of indirection. Access from Marquette is inconvenient with additional 1 block walk to transit.
12	N. 11th to N. 12th	Reroute northbound from N. 10th Street and W. Wisconsin Avenue to N. 12th Street and W. State Street. New route over N. 10th Street and W. State Street, rather than current route over N. 12th Street and W. Wisconsin Avenue. Reroute southbound from N. 12th Street and W. Wells Street to N. 11th Street and W. Wisconsin Avenue. New route over W. Wells Street and N. 11th Street rather than 12th Street and W. Wisconsin Avenue.	Introduces two additional turns in each direction (1 right and one left). Access from N. 12th Street and W. Wisconsin Avenue is inconvenient with additional one block walk to transit.
20	N. 11th to N. 16th	Reroute from N. 16th Street and W. Clybourn Street to N. 10th Street and W. Wisconsin Avenue with new route over W. Clybourn Street and N. 10th and N. 11th Streets rather than current route over N. 16th Street and W. Wisconsin Avenue.	Introduces two additional turns in eastbound direction (one right and one left). Access from Marquette is inconvenient with additional one block walk to transit.
23	N. 11th to N. 16th	Reroute southbound from N. 17th Street and W. Wells Street to N. 10th Street and W. Wisconsin Avenue with new route over W. Wells Street and N. 11th Street rather than current route over N. 17th Street and W. Wisconsin Avenue. Reroute northbound from N. 10th Street and W. Wisconsin Avenue to N. 17th Street and W. State Street. New route over N. 10th Street and W. State Street rather than Wisconsin Avenue and N. 16th Street.	Introduces two additional turns (one right and one left). Access from Marquette is inconvenient with additional one block walk to transit in southbound direction, and additional three-block walk in northbound direction.

Route Number	Existing Operation Over Segment of W. Wisconsin Avenue to be Closed	Potential Modified Routing Upon Closure	Implications of Modified Routing <sup>a</sup>
30	N. 11th to N. 16th	Reroute from N. 17th Street and W. Wisconsin Avenue to N. 10th Street and W. Wisconsin Avenue. New Route over N. 16th and N. 17th Streets, W. Clybourn Street, and N. 10th and N. 11th Streets rather than W. Wisconsin Avenue.	Introduces four additional turns in each direction (two right and two left) and 0.3 miles of indirection. Access from Marquette is inconvenient with additional one to two-block walk to transit.
31	N. 11th to N. 16th	Reroute from N. 17th Street and W. Wisconsin Avenue to N. 10th Street and W. Wisconsin Avenue. New route over N. 16th and N. 17th Streets, W. Clybourn Street, and N. 10th and N. 11th Streets rather than W. Wisconsin Avenue.	Introduces four additional turns in each direction (two right and two left) and 0.3 miles of indirection. Access from Marquette is inconvenient with additional one to two-block walk to transit.

<sup>a</sup>Rerouting may be expected to add up to three minutes to existing route travel times as a result of additional turning movements and increased route length which is estimated to be traversed at an average travel speed of about 15 miles per hour.

The potential rerouting of bus routes operating over the segment of W. Wisconsin Avenue proposed to be closed may be expected to reduce existing and potential future transit ridership on the seven directly affected routes with respect to transit passenger traffic to and from the Marquette University area, transit passenger traffic which currently travels through the Marquette University area, and transit passenger traffic from the affected routes which transfer to other routes in the Milwaukee County transit system.

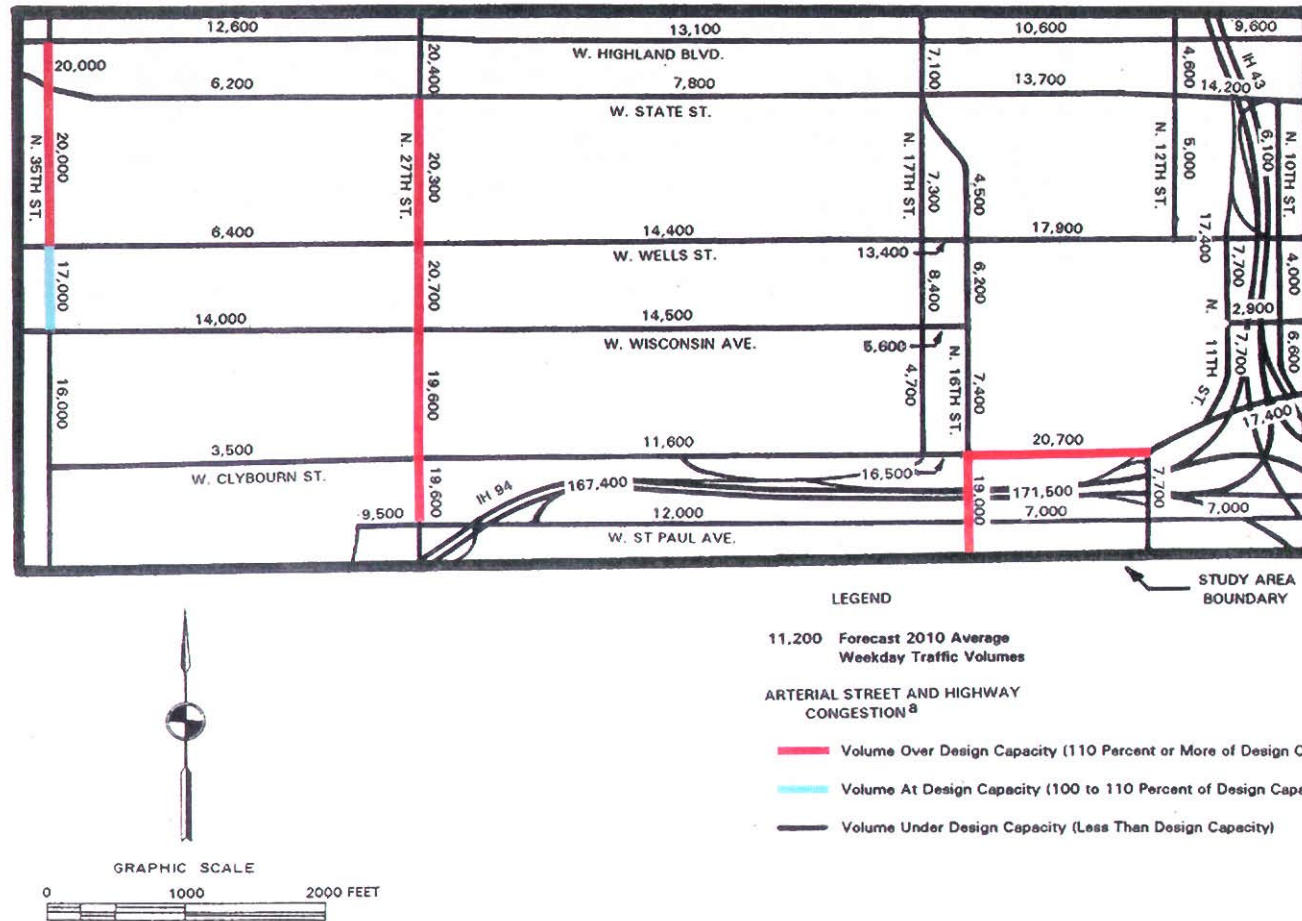
#### Future Year 2010 Planned Conditions

Map 10 displays the estimated changes in forecast year 2010 average weekday traffic volumes on arterial streets within the study area under planned conditions which may be expected to result from the proposed closure of W. Wisconsin Avenue. The estimated change is based upon application of the Commission traffic simulation models, and may be compared to Map 6 which displays the forecast year 2010 traffic volumes which may be expected within the study area if W. Wisconsin Avenue remains open to traffic. Analyses indicate that no significant impacts may be expected to the south of IH 94, which is the southern study area boundary; to the north of W. Highland Boulevard, which is the northern study area boundary; and to the west of N. 35th Street, which is the western study area boundary. In addition, minimal impacts may be expected to the east of N. 10th Street, which is the eastern study area boundary. No impact from the proposed closure of W. Wisconsin Avenue may be expected to the east of N. 6th Street in the Milwaukee central business district.

Analysis of the estimated changes indicate that the most significant impacts may be expected in that portion of the study area bounded by N. 10th Street on the east, and N. 17th Street on the west. This portion of the study area includes the segment of W. Wisconsin Avenue between N. 11th Street and N. 16th Street proposed to be closed and which if it remained open could be expected to carry by the year 2010 approximately 22,000 vehicles per average weekday. The arterial facility in this portion of the study area which may be expected to be affected most by the proposed closure would be W. Clybourn Street on which future traffic volumes may be expected to increase by from 12,000 to 20,700 vehicles per average weekday. Other arterial facilities in this portion of the study area which may

Map 10

FORECAST YEAR 2010 AVERAGE WEEKDAY TRAFFIC VOLUMES ON THE STUDY AREA ARTERIAL SYSTEM  
UPON CLOSURE OF W. WISCONSIN AVENUE BETWEEN N. 11TH STREET AND N. 16TH STREET



<sup>a</sup> Compared to the arterial intersections determined to be operating at and over design capacity under existing traffic conditions with W. Wisconsin Avenue open to traffic, the following additional intersections would be expected to operate at design capacity: N. 17th Street at W. Wisconsin Avenue, N. 17th Street at W. Clybourn Street, and N. 11th Street at W. Tory Hill during both peak hours, and N. 13th Street at W. Clybourn Street during the p.m. peak hour.

be expected to be affected include W. Wells Street, on which volumes may be expected to increase by from 14,000 to 17,900 vehicles per average weekday; W. State Street by from 10,000 to 13,700 vehicles per average weekday; and W. Highland Boulevard by from 9,500 to 10,600 vehicles per average weekday. In addition, future traffic volumes on IH 94 in this portion of the study area may be expected to increase from 165,000 to 171,500 vehicles per average weekday.

The analysis further indicates that, while traffic volumes on east-west arterial streets in the portion of the study area between N. 10th Street and N. 17th Street may be significantly affected by the closure of W. Wisconsin Avenue, average weekday traffic volumes should not change significantly on north-south arterial streets, including N. 16th and N. 17th Streets. Traffic volumes on N. 10th Street and N. 11th Street may be expected to increase as a result of the closure of W. Wisconsin Avenue from about 5,000 vehicles per average weekday in 1992 to about 8,000 vehicles per average weekday by the year 2010.

The analysis further indicates that the impact on traffic volumes on W. Wisconsin Avenue west of the proposed closure--that is, between N. 17th Street and N. 27th Street--may also be expected to be substantial. Specifically, the proposed closure of W. Wisconsin Avenue may be expected to entail a reduction by the year 2010 of traffic volume on W. Wisconsin Avenue between W. 17th Street and N. 27th Street from 24,000 vehicles per average weekday should W. Wisconsin Avenue remain open to 14,500 vehicles per average weekday. The arterial facilities which may be expected to be affected in the year 2010 by the proposed closure in the area between N. 17th Street and N. 27th Street include W. Clybourn Street on which traffic volumes may be expected to increase by the year 2010 from 10,000 to 11,600 vehicles per average weekday; W. Wells Street from 12,600 to 14,400 vehicles per average weekday; W. State Street from 7,800 to 8,500 vehicles per average weekday; and W. Highland Boulevard from 12,000 to 13,100 vehicles per average weekday. In addition, traffic volumes on IH 94 in this portion of the study area between N. 17th Street and N. 27th Street may be expected to experience an increase from 165,000 to 167,400 vehicles per average weekday.

Within that portion of the study area between N. 27th Street and N. 35th Street, the impact of the proposed closure of W. Wisconsin Avenue between N. 11th Street

and N. 16th Street may be expected to be even further reduced. The forecast year 2010 traffic volumes on W. Wisconsin Avenue between N. 27th and N. 35th Streets--assuming W. Wisconsin Avenue remains open to traffic--of approximately 18,000 vehicles per average weekday may be expected to be only modestly reduced to approximately 14,000 vehicles per average weekday upon the closure of W. Wisconsin Avenue between N. 11th Street and N. 16th Street. The arterial facilities which may be expected to be affected in the year 2010 by the proposed closure include W. Clybourn Street which may be expected to experience an increase in future traffic from 3,100 to 3,500 vehicles per average weekday; W. Wells Street from 6,000 to 6,400 vehicles per average weekday; and W. Highland Boulevard from 12,000 to 12,600 vehicles per average weekday. In addition, IH 94 in this portion of the study area may be expected to experience an increase in year 2010 traffic volume from 170,000 to 172,400 vehicles per average weekday.

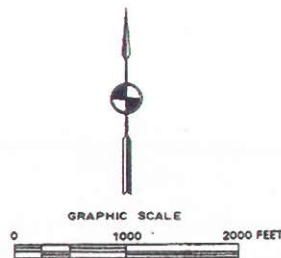
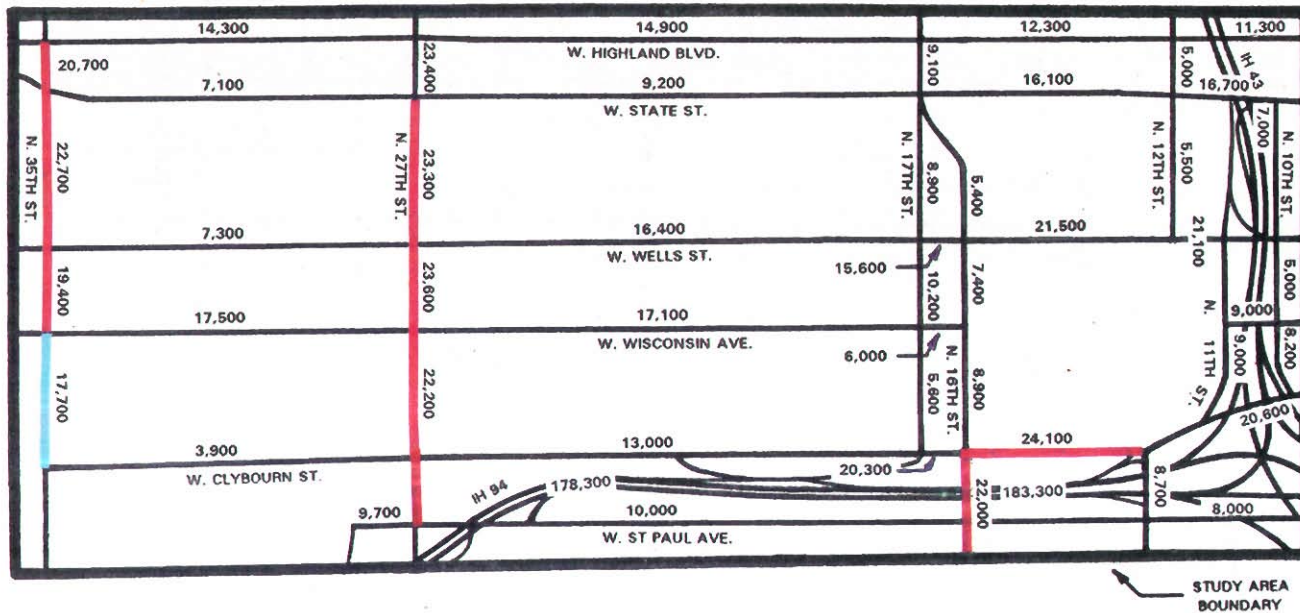
With respect to additional traffic congestion which may be expected upon the proposed closure of W. Wisconsin Avenue, only W. Clybourn Street between N. 16th Street and N. 13th Street may be expected as a result of the proposed closure to carry in the year 2010 average weekday traffic volumes which would exceed its design capacity and, as a result, experience traffic congestion.

Map 11 displays the potential future arterial traffic volumes within the study area with the closure of W. Wisconsin Avenue under an alternative future scenario described earlier in this report which would envision higher future traffic volumes within the study area. This alternative future envisions higher levels of Regional and City employment and household growth and little improvement in public transit service. Future traffic volumes on the principal streets affected by the closure of W. Wisconsin Avenue may be expected to be about 20 percent higher, and be more difficult to accommodate within existing street capacity at acceptable levels of service.

With respect to future impacts on public transit service the proposed closure would require the re-routing of local bus routes in a manner similar to that required for the seven routes currently operating over the segment of W. Wisconsin Avenue proposed to be closed. The re-routing would entail additional intersection turning movements, travel indirection, walks access distance to transit, and

# Map 11

FORECAST YEAR 2010 AVERAGE WEEKDAY TRAFFIC VOLUMES ON THE STUDY AREA ARTERIAL SYSTEM  
UPON CLOSURE OF W. WISCONSIN AVENUE BETWEEN N. 11TH STREET AND N. 16TH STREET  
BASED ON A HIGH-GROWTH CENTRALIZED LAND USE SCENARIO  
AND NO IMPROVEMENTS IN OR EXPANSION OF THE EXISTING LEVEL OF PUBLIC TRANSIT SERVICE



- LEGEND
- 11,200 Forecast 2010 Average Weekday Traffic Volumes
- ARTERIAL STREET AND HIGHWAY CONGESTION
- Volume Over Design Capacity (110 Percent or More of Design Capacity)
  - Volume At Design Capacity (100 to 110 Percent of Design Capacity)
  - Volume Under Design Capacity (Less Than Design Capacity)

- 13a -



transit travel time. This may be expected to reduce the attractiveness of transit service to potential transit users in the Marquette University area, transit passengers travelling through the Marquette University area, and transit passengers transferring between bus routes in the Marquette University area.

The proposed closure of W. Wisconsin Avenue could make the implementation of express bus or light rail operations over reserved lanes within the corridor more difficult. With W. Wisconsin Avenue open to traffic, the W. Wisconsin Avenue parking-auxiliary lanes or median could be converted to reserved transit lanes, and the design capacity of the remaining traffic-carrying lanes would be adequate to carry both current and anticipated future vehicle traffic volumes on W. Wisconsin Avenue without exceeding design capacity. However, with W. Wisconsin Avenue closed between N. 11th Street and N. 16th Street, sufficient traffic-carrying capacity would not be available under either existing or anticipated future conditions between N. 16th Street and N. 10th Street to readily permit conversion of street pavement to exclusive transit use. Specifically, W. Clybourn Street between N. 16th Street and N. 13th Street may require conversion of one traffic lane and its one parking lane to provide exclusive transit lanes. However, with the closure of W. Wisconsin Avenue, this segment of W. Clybourn Street may be expected to carry existing and future traffic volumes which exceed the design capacity of its existing four traffic lane cross-section. To provide exclusive transit lanes on W. Wells Street may entail the conversion of two parking lanes and one traffic lane to exclusive transit use. This may be expected to result in W. Wells Street carrying both existing and future traffic average weekday volumes which exceed its design capacity. Thus, the closure of W. Wisconsin Avenue between N. 10th Street and N. 16th Street may be expected to make the implementation of express bus-light rail on reserved lanes through the study area more difficult.

#### Other Impacts

Other potential transportation impacts of the proposed closure of W. Wisconsin Avenue, include impacts on access to, and egress from, other nearby land uses; impacts on pedestrian movements and potential conflicts with traffic; proposals to change existing one-way street operation in the study area to two-way operation; through traffic increases on nonarterial streets in the study area;

vehicle-miles of travel in the study area and related motor fuel consumption and air pollutant emissions; and impacts on the provision of emergency services.

Attendant to the proposed closure of W. Wisconsin Avenue between N. 16th Street and N. 11th Street is the closure of N. 12th Street and N. 13th Street between W. Wells Street and W. Wisconsin Avenue. Eastbound and westbound travel on W. Wisconsin Avenue to and from N. 12th Street and N. 13th Street would be diverted to W. Wells Street and W. State Street respectively. The nearest parallel southbound facilities are N. 17th Street on the west and N. 11th Street on the east. The nearest parallel northbound facilities are N. 16th Street on the west and N. 10th Street on the east. Because there are no facilities between W. Wisconsin Avenue and W. Clybourn Street from N. 16th Street to N. 11th Street, motorists accessing W. Wisconsin Avenue from N. 12th Street or N. 13th Street must travel at least to N. 11th Street or N. 16th Street before leaving W. Wisconsin Avenue unless the sole purpose of the trip is to circulate around the Marquette University campus. The diversion of N. 12th Street and N. 13th Street traffic to these facilities is not expected to result in any of these facilities carrying traffic volumes equal to or exceeding their design capacity.

Campus circulation would be impaired by the N. 12th Street and N. 13th Street closures. The provision of emergency services--medical, fire, and police--to campus buildings would also be impaired. The two public transit routes which currently utilize N. 12th Street between W. Wisconsin Avenue and W. Wells street would be rerouted thereby reducing transit service to the campus. Pedestrian safety would be improved for pedestrians currently crossing N. 12th Street and N. 13th Street.

The principal land use in the vicinity of the proposed closure of W. Wisconsin Avenue which may be expected to have its access and egress significantly affected by the proposed closure Sinai-Samaritan Medical Center. Vehicles destined for Sinai-Samaritan Medical Center from southbound IH 43 currently may use the N. 11th Street-W. Wells Street off-ramp, and then proceed south on N. 11th Street to W. Wisconsin Avenue, west on W. Wisconsin Avenue to N. 12th Street, and then north on N. 12th Street to the hospital. With the proposed closure of W. Wisconsin Avenue between N. 11th Street and N. 12th Street, and of N. 12th Street between

W. Wisconsin Avenue and W. Wells Street, vehicles destined for Sinai-Samaritan Medical Center from IH 43 southbound via the N. 11th Street-W. Wells Street off-ramp would use N. 11th Street southbound to W. Wells Street, W. Wells Street eastbound to N. 10th Street, N. 10th Street northbound to W. State Street, W. State Street westbound to N. 12th Street, and N. 12th Street southbound to Sinai-Samaritan Medical Center. This access routing is no more indirect than the existing access routing, although it may be less understandable.

Another transportation-related impact of the proposed closure of W. Wisconsin Avenue is its impact on pedestrian traffic, and particularly the conflict of pedestrian traffic with vehicular traffic. Pedestrian traffic may be expected to be highest along the segment of W. Wisconsin Avenue between N. 11th Street and N. 16th Street proposed to be closed. In addition, W. Wisconsin Avenue is the most heavily travelled east-west arterial street within the study area between N. 11th Street and N. 16th Street. The proposed closure of W. Wisconsin Avenue may be expected to eliminate the area of highest current pedestrian-traffic conflicts. While the closure of W. Wisconsin Avenue would entail the relocation of vehicular traffic to other streets within the study area, these arterial streets do not have nearly the same level of pedestrian traffic, and as a result potential pedestrian-traffic conflicts, as the segment of W. Wisconsin Avenue proposed to be closed.

Another transportation-related impact of the proposed closure of W. Wisconsin Avenue, is the potential effect on recent proposals to change the existing one-way street operation in the study area to two-way operation, specifically with respect to W. Wells Street between N. 35th Street and N. 10th Street, and W. State Street between N. 35th Street and N. 10th Street. Assuming W. Wisconsin Avenue remains open to traffic, the conversion of W. Wells Street and W. State Street in the study area from one-way to two-way streets may be expected to result in W. Wells Street between N. 10th Street and N. 27th Street carrying average weekday traffic volumes approaching design capacity under current conditions and carrying average weekday traffic volumes exceeding design capacity under year 2010 conditions. W. State Street may be expected to carry traffic volumes approaching design capacity between N. 17th Street and N. 10th Street only under forecast year 2010 traffic conditions. However, assuming in the alternative that W. Wisconsin Avenue

is closed as proposed, W. Wells Street under current traffic conditions may be expected to carry traffic volumes substantially exceeding design capacity between N. 10th Street and N. 17th Street. In addition, W. Wells Street between N. 17th Street and N. 27th Street and W. State Street between N. 10th Street and N. 17th Street may be expected to carry traffic volumes approaching design capacity under current traffic volumes. Under potential future year 2010 conditions with W. Wisconsin Avenue closed and W. Wells and W. State Streets converted to two-way streets, W. Wells Street between N. 10th Street and N. 17th Street may be expected to carry traffic volumes substantially exceeding design capacity, and W. Wells Street between N. 17th Street and N. 27th Street, and W. State Street between N. 10th Street and N. 17th Street, may be expected to carry traffic volumes modestly exceeding design capacity. Thus, the proposed closure of W. Wisconsin Avenue may be expected to make any proposed conversion of W. Wells Street and W. State Street in the study area from one-way to two-way streets more problematic. The conversion would likely only be feasible if all on-street parking on the segments of W. Wells Street and W. State Street so affected was eliminated.

Other potential impacts of the proposed closure of W. Wisconsin Avenue include its impacts on vehicle miles of travel, air pollutant emissions, and motor fuel consumption. Under current traffic conditions, the proposed closure of W. Wisconsin Avenue may be expected to result in an increase in vehicle miles of travel within the study area on an average weekday of 2,600 vehicle-miles, or 2 percent; of volatile organic compound emissions which lead to the formation of ozone of 10 pounds, or 2 percent; and of gallons of motor fuel consumed of 120 gallons, or 2 percent. Under potential year 2010 planned conditions, the proposed closure of W. Wisconsin Avenue may be expected to result on an average weekday in an increase in vehicle miles of travel within the study area on an average weekday of 2,800 vehicle-miles, or 2 percent; 8 pounds of volatile organic compound emissions, or 2 percent; and 110 gallons of motor fuel consumed, or 2 percent.

Because the proposed closure of W. Wisconsin Avenue may be anticipated to increase air pollutant emissions it may be considered to conflict with the requirements of the Clean Air Act Amendments of 1990. This Federal legislation mandates a reduction in such emissions for Southeastern Wisconsin. Not only would the

proposed closure make automobile travel less efficient within the study area, but it would impair the provision of improved public transit service and high occupancy vehicle (HOV) lanes to and through the Marquette campus. Improved public transit and HOV lanes are potentially important strategies for reducing single occupant vehicle travel and attendant air pollutant emissions in the greater Milwaukee area as required by the Clean Air Act Amendments.

The East-West Freeway (IH 94) through the study area is currently programmed for reconstruction in the years 1996 through 1998. While this reconstruction is underway, it may be expected that the capacity will be restricted, and some diversion to surface arterial streets within the study area will occur. Accordingly, consideration may need to be given to postponing any closure of W. Wisconsin Avenue and/or construction of any transition roadway to accommodate such closure until after the reconstruction of IH 94 has been completed.

A final potential impact of the proposed closure of W. Wisconsin Avenue is its impact upon the provision of emergency services both within and outside the Marquette campus. W. Wisconsin Avenue is currently designated a fire route and its closure would add travel indirection and time to areas immediately west of the campus. The provision of emergency services to campus buildings, particularly those abutting W. Wisconsin Avenue and N. 12th Street and N. 13th Street would be impaired as these buildings would become less accessible particularly for heavy fire fighting equipment.

#### POTENTIAL MAJOR IMPROVEMENTS

The final element of the requested study was the identification and evaluation of alternative major improvements which may be expected to alleviate the identified traffic problems which may be expected to result from the proposed closure of W. Wisconsin Avenue between N. 11th Street and N. 16th Street. The principal problems which may be expected to result from the closure of W. Wisconsin Avenue include the turning movements required for transit and other traffic; traffic congestion on W. Clybourn Street between N. 10th Street and N. 13th Street; the indirection for transit and vehicular traffic travelling through the Marquette University area; and the lack of roadway capacity to permit the

development of an exclusive express bus or light rail guideway within existing pavement widths. Three types of potential improvements to abate these problems were considered: 1) the placement of the segment of W. Wisconsin Avenue proposed to be closed in a tunnel through the Marquette University area; 2) the rerouting of automotive traffic, but the maintenance of transit traffic through the Marquette University area over an exclusive transitway along the alignment of W. Wisconsin Avenue, and 3) the development of a transition roadway or roadways which would carry W. Wisconsin Avenue around the Marquette University area without turning movements, although on an indirect alignment.

The alternative of carrying W. Wisconsin Avenue on its current path through the Marquette University area, but in a tunnel, would provide four lanes for automotive traffic and two lanes for exclusive transit use. The estimated cost of constructing such tunnel may be expected to range from approximately \$57.2 million to approximately \$61.4 million. Attendant major public utility relocation costs are estimated to add \$17.0 to \$21.2 million raising the project's estimated cost to \$74.2 to \$82.6 million.<sup>2</sup> This total does not, however, include costs attendant to private utility relocation; hollow walk abandonment; measures to protect buildings during construction; or unsuitable subsoil conditions. This alternative may permit avoidance of all of the identified transportation problems as a result of the closure of W. Wisconsin Avenue except the provision of emergency services within the Marquette campus.

An official detour route would have to be designated and maintained during tunnel construction. If construction began at N. 11th Street and proceeded westward, N. 10th and N. 17th Streets, and N. 11th and N. 16th Streets along with W. Clybourn Street and Tory Hill would function as the detours for east- and westbound W. Wisconsin Avenue traffic until reconstruction of the N. 16th Street intersection with W. Wisconsin Avenue began. At that time, N. 19th Street may

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<sup>2</sup>This cost estimate--which anticipates tunnel construction between N. 11th Street and No. 16th Street--is based on an estimate prepared by the City of Milwaukee for a tunnel between N. 11th Street and N. 17th Street. The City's cost was factored by 0.84, the ratio of the distance between N. 11th Street and N. 16th Street to the distance between N. 11th Street and N. 17th Street. Construction of the tunnel to N. 16th Street minimizes disruption to non University land used abutting W. Wisconsin Avenue between N. 16th and N. 17th Streets.

be utilized in lieu of N. 16th Street. Existing signal timings at intersections along these routes would require modification and temporary traffic signal installations would likely be necessary at the intersections of: 1) Tory Hill at N. 10th Street; 2) Tory Hill at N. 11th Street; 3) W. Clybourn Street at N. 19th Street; and, 4) W. Wells Street at N. 19th Street. It may be anticipated that existing on-street parking on detour route streets would be prohibited. During the tunnel construction period, W. Clybourn Street would be expected to carry average weekday traffic volumes in excess of its design capacity. The City of Milwaukee has estimated traffic control attendant to the tunnel construction to cost about \$800,000.

The alternative of closing W. Wisconsin Avenue to automobile and truck traffic, but maintaining W. Wisconsin Avenue open to transit traffic would permit W. Wisconsin Avenue to be reconstructed to a reduced cross-section. This would narrow the necessary width of roadway from approximately an existing 70 feet to about 32 feet, through the Marquette University area except at passenger loading areas where the width may be as much as 86 feet. Estimated to cost approximately \$1,000,000 by the City of Milwaukee, this alternative would reduce the amount of traffic carried from about 20,000 vehicles per average weekday currently to about 1,000 vehicles per average weekday. This alternative would permit avoidance of all identified transit service problems related to closure of W. Wisconsin Avenue, but would not avoid of any of the highway traffic-related problems, including congestion on W. Clybourn Street.

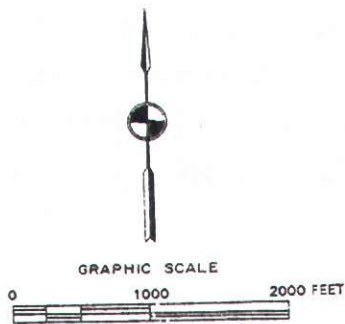
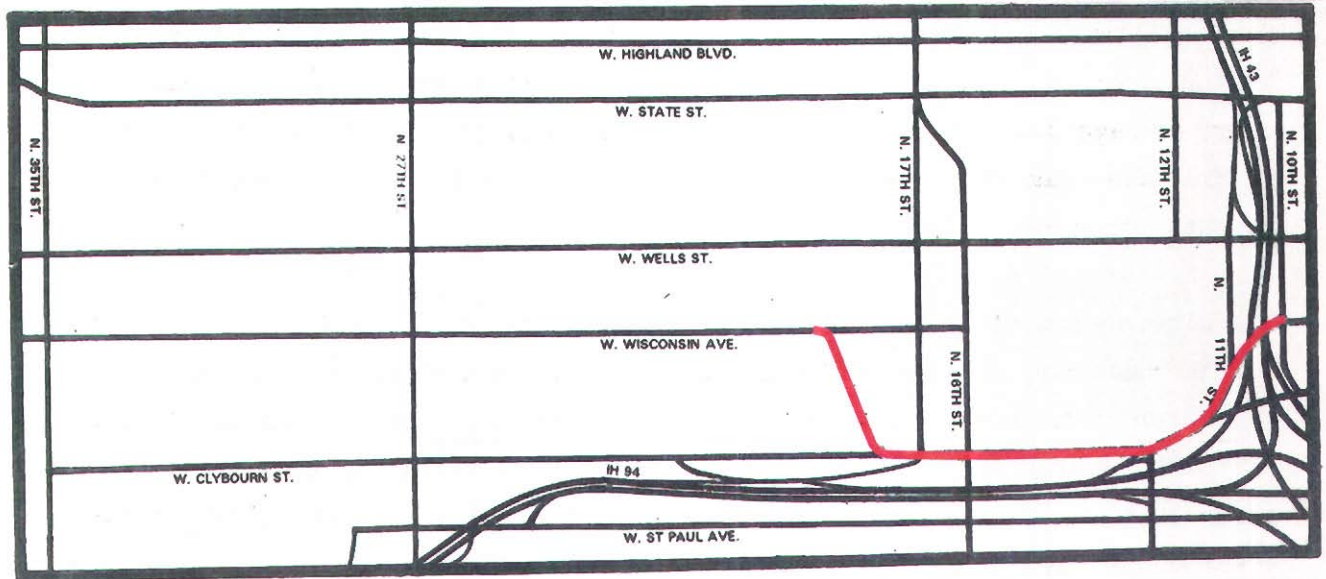
The alternative reviewed of developing a transition roadway which would carry W. Wisconsin Avenue around the Marquette University area without turning movements could be effected in a number of ways. The alternative considered best to alleviate the identified transportation problems is shown on Map 12. Other alternatives which were considered, but rejected, are shown on Map 13, along with the reasons for rejection. Shown on Map 14 are forecast design year 2010 average weekday traffic volumes and attendant congested facilities based upon planned conditions and implementation of the transitional roadway shown on Map 12.

The alternative transition roadway which may be expected to best resolve the identified transportation problems which may be expected upon the closure of W.



Map 12

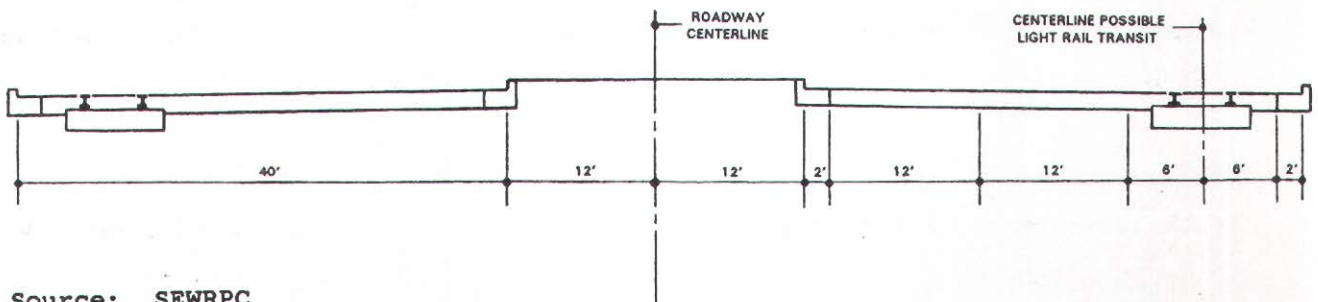
POTENTIAL TRANSITIONAL ROADWAY SYSTEM TO CARRY  
W. WISCONSIN AVENUE AROUND THE MARQUETTE UNIVERSITY AREA



LEGEND

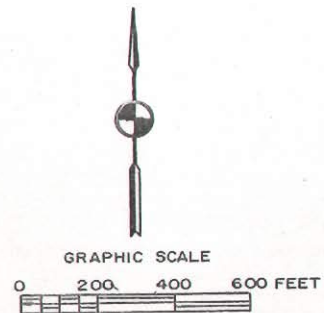
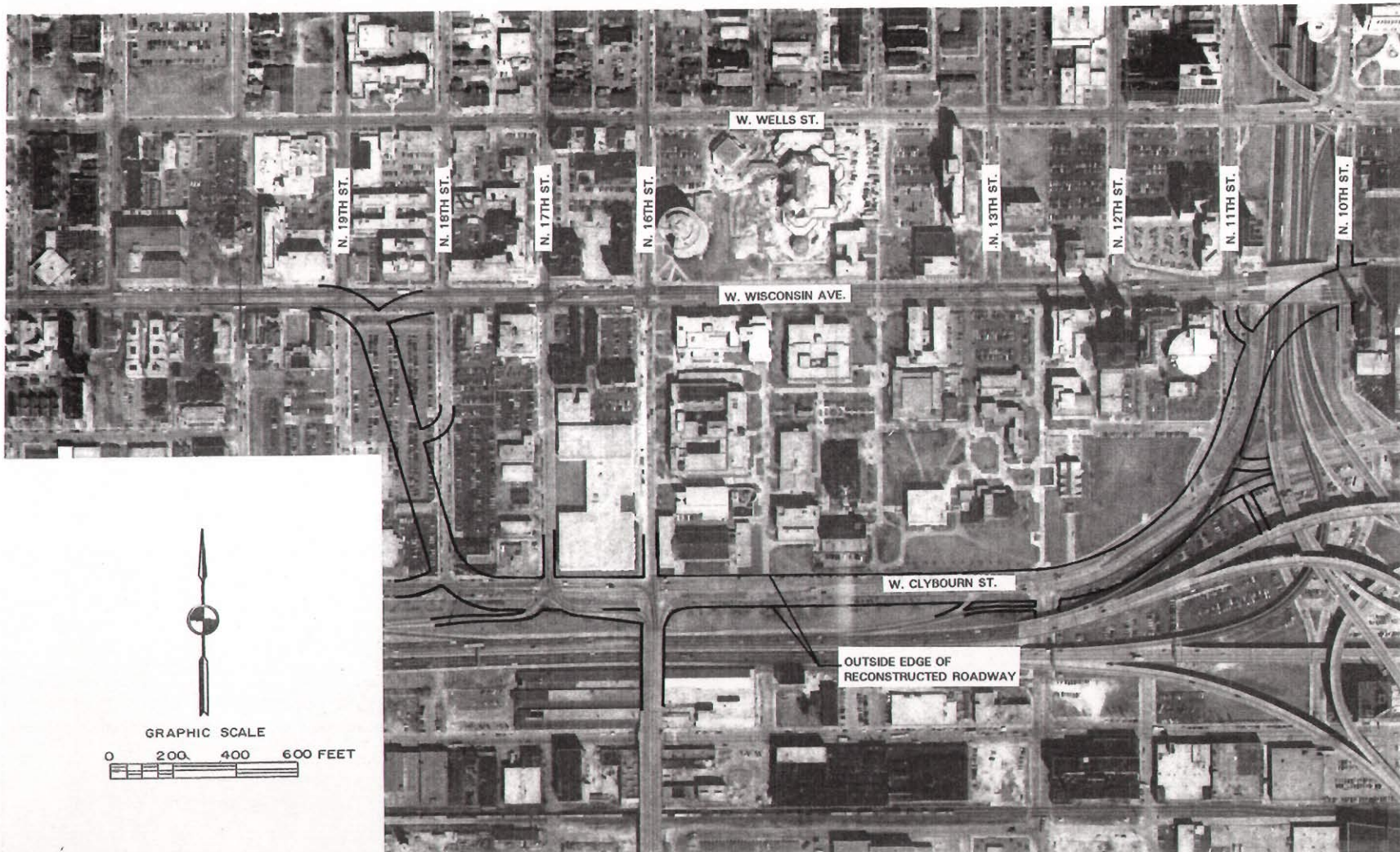
— ALTERNATIVE TRAVEL ROUTE

ALTERNATIVE TRANSITION ROADWAY CROSS-SECTION



Source: SEWRPC

Map 12 (Continued)



Source: SEWRPC

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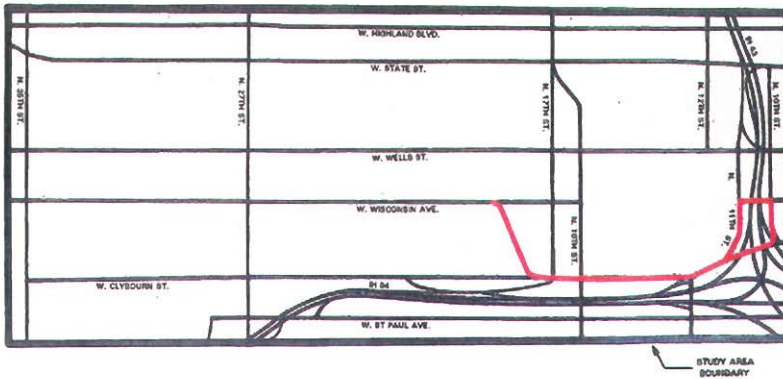




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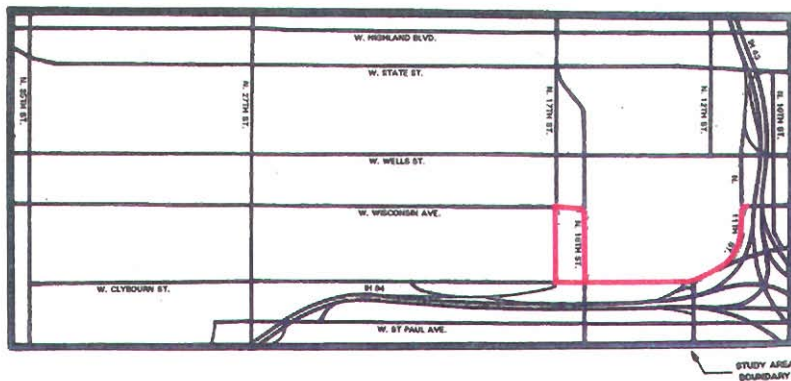
Map 13 (Continued)

Alternative 3



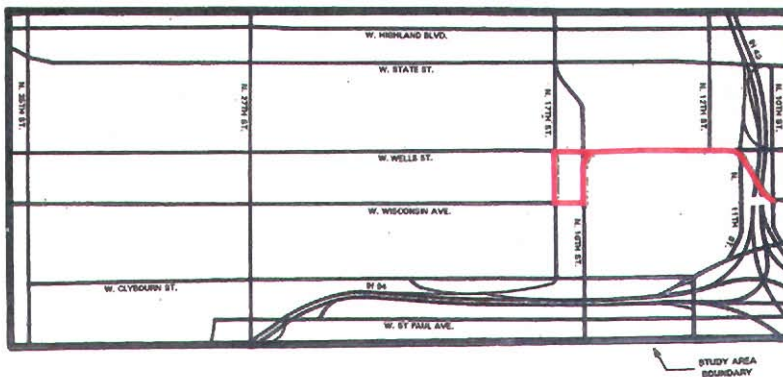
Rejected because turning movements remain on N. 10th street and N. 11th Street at both W. Wisconsin Avenue and W. Clybourn Street.

Alternative 4



Rejected because turning movements remain on N. 16th Street and N. 17th Street at both W. Wisconsin Avenue and W. Clybourn Street.

Alternative 5



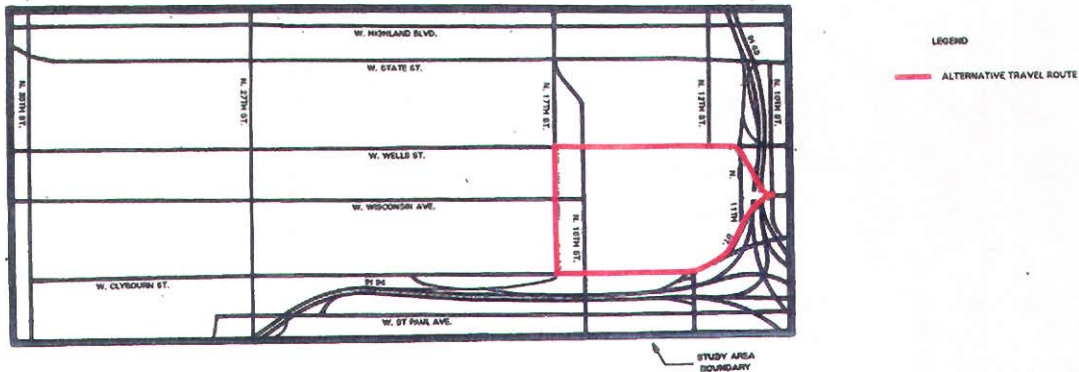
Rejected because inadequate existing and potential traffic carrying capacity exists on W. Wells Street to accommodate two-way traffic, and, particularly two-way traffic and reserved lanes for public transit. Also, turning movements remain on N. 16th Street and N. 17th Street at both W. Wells Street and W. Wisconsin Avenue.

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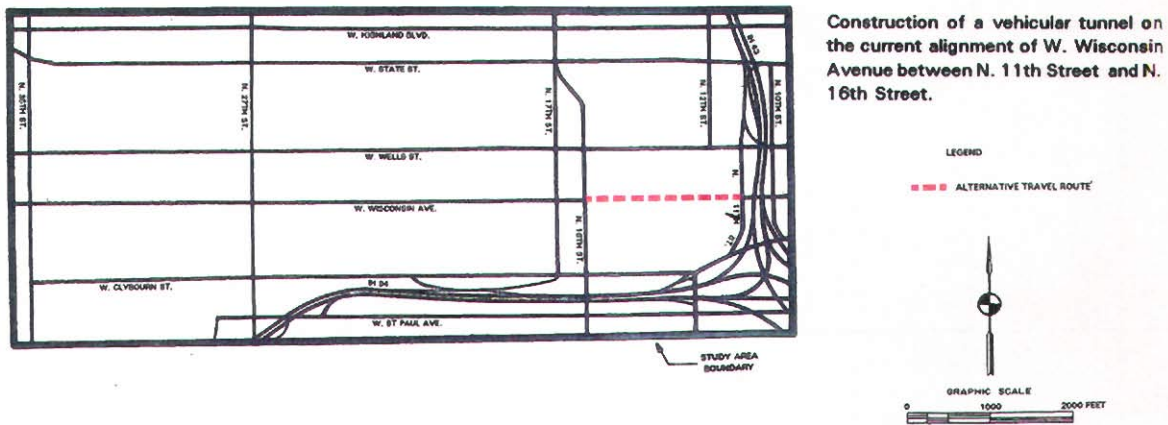
Map 13 (Continued)

Alternative 6



Rejected because W. Wells Street would require conversion from one-way eastbound to one-way westbound between N. 11th Street and N. 17th Street. Also, turning movements remain on N. 17th Street at W. Clybourn Street, W. Wells Street, W. Wisconsin Avenue.

Alternative 7

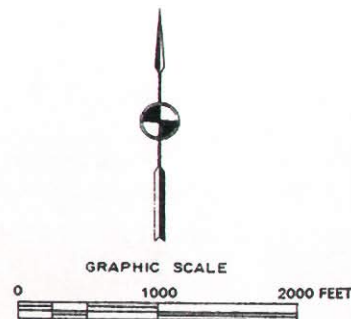
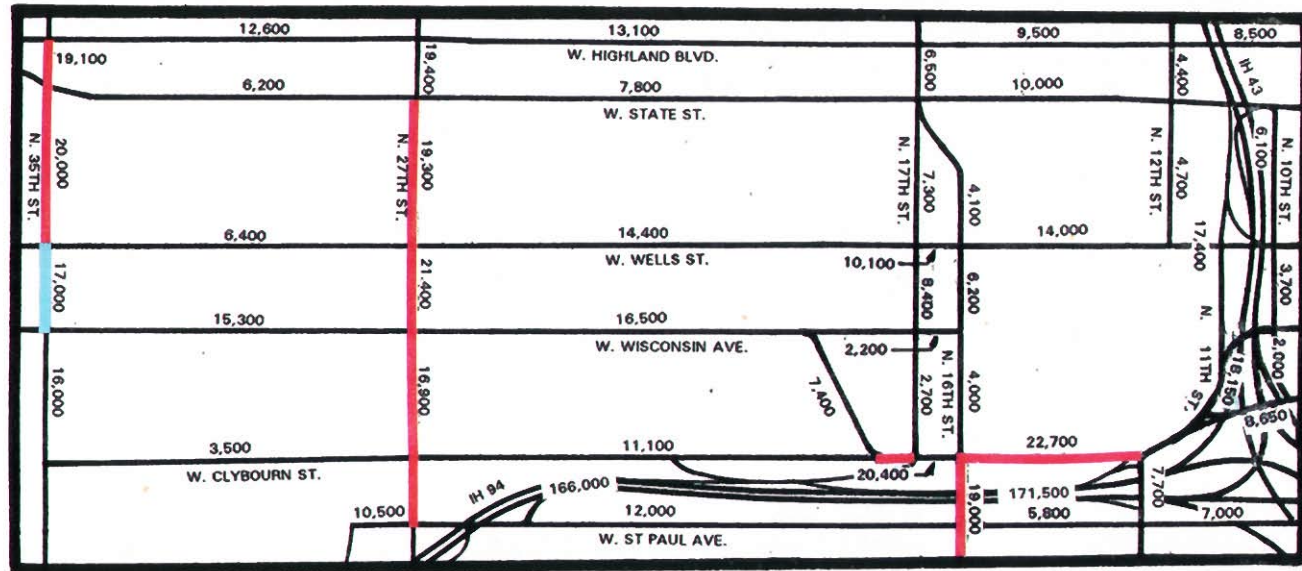


Rejected because the transitions between the existing roadway and the tunnel--at least one third of the total length between N. 11th Street and N. 16th Street--would be constructed as retained open cuts thereby providing a physical barrier between areas on each side of W. Wisconsin Avenue. Also, tunnel construction may be on the order of ten times or more costly as at-grade construction.

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Map 14

FORECAST YEAR 2010 AVERAGE WEEKDAY TRAFFIC VOLUMES ON THE STUDY AREA ARTERIAL SYSTEM  
UPON CLOSURE OF W. WISCONSIN AVENUE BETWEEN N. 11TH STREET AND N. 16TH STREET  
AND IMPLEMENTATION OF A TRANSITIONAL ROADWAY AS SHOWN ON MAP 12



- LEGEND
- 11,200 Forecast 2010 Average Weekday Traffic Volumes
- ARTERIAL STREET AND HIGHWAY CONGESTION
- Volume Over Design Capacity (110 Percent or More of Design Capacity)
  - Volume At Design Capacity (100 to 110 Percent of Design Capacity)
  - Volume Under Design Capacity (Less Than Design Capacity)

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Wisconsin Avenue between N. 11th Street and N. 16th Street would carry W. Wisconsin Avenue to the south of the Marquette University area along W. Clybourn Street. Specifically, a new roadway would be constructed to reroute W. Wisconsin Avenue east of N. 19th Street to connect to W. Clybourn Street west of N. 17th Street, and then along W. Clybourn Street to N. 11th Street, and then on new alignment over IH 43 to connect to W. Wisconsin Avenue west of N. 10th Street. The facility would be constructed as a four-lane divided roadway with median and exclusive lanes for public transit to provide adequate capacity for automobile and transit vehicles.

This alternative may be expected to resolve all identified turning movement and arterial street capacity problems with the exception of at-design capacity operation of the intersections of N. 17th Street and N. 16th Street and the relocated W. Wisconsin Avenue and the provision of emergency services to the Marquette campus. As shown on Map 12, the north curb line of the proposed transition roadway would largely coincide with the existing north curb line of W. Clybourn Street. Reconstruction of W. Clybourn Street to provide the desired roadway cross-section may be expected to entail the construction of a retaining wall parallel to the south side of the reconstructed roadway. The entrance to the westbound IH 94 on ramp from N. 17th Street and W. Clybourn Street would have to be relocated and may also entail construction of a retaining wall. The estimated cost of the recommended transition roadway, including intersection and on-ramp reconstruction, is approximately \$12 million, including \$2 million for right-of-way acquisition.

As shown on Map 12, the diagonal connection for the transition roadway between W. Wisconsin Avenue at N. 19th Street and W. Clybourn Street at N. 18th Street was assumed to have a design speed of 25 mile per hour. The provision of a more desirable horizontal curvature--corresponding to design speeds of 30 miles per hour or more--would entail substantial additional disruption. Dependent upon final design, such disruption may include the displacement of the just completed parking structure owned by the Blood Center of Southeastern Wisconsin, Incorporated on N. 18th Street between W. Wisconsin Avenue and W. Clybourn Street; the displacement of Redeemer Lutheran Church, Klose Flowers and ProBuColls

Christian Literature Center<sup>3</sup> on W. Wisconsin Avenue between N. 19th Street and N. 20th Street; the displacement of the Brett Funeral Home, Incorporated on W. Wisconsin Avenue west of N. 20th Street; and/or the displacement of the Occupational Medical Clinic on W. Clybourn Street between N. 17th Street and N. 18th Street.

With the exception of the demolition and replacement of the existing W. Wisconsin Avenue structure over IH-43, W. Wisconsin Avenue could remain open to traffic during the remainder of the transitional roadway's construction. Construction of the diagonal roadway segment from W. Wisconsin Avenue to W. Clybourn Street would require that N. 18th and N. 19th Streets be closed to through traffic. The official detour routes would include N. 16th, N. 17th, and N. 20th Streets and W. Wisconsin Avenue and W. Clybourn Street. Reconstruction of W. Clybourn Street could be done under traffic with the eastbound lanes built first and all traffic relegated to the existing westbound pavement. An official detour route would be required during reconstruction of the westbound IH 94 on-ramp at N. 17th Street using W. Clybourn Street and the N. 28th Street on-ramp.

Staged as the final phase, existing eastbound W. Wisconsin Avenue traffic would be directed to the transitional roadway and N. 10th Street. Existing westbound W. Wisconsin Avenue would be routed on N. 8th Street and W. Michigan Street to Tory Hill and the new transitional roadway. Existing traffic signal timings on all detour routes would likely require modification and temporary traffic signal installations would likely be necessary at the intersections of: 1) Tory Hill at N. 10th Street; and, 2) N. 20th Street at W. Clybourn Street and at W. Wisconsin Avenue. The cost of providing this traffic control is estimated to be about \$400,000.

Consideration is currently being given to: 1) reconstruction of the Marquette Interchange; and, 2) the provision of HOV lanes on the IH 94 East-West Freeway. Dependent upon final design, either of these projects may impact on the

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<sup>3</sup>Housed in the same building are The Presbytery of Milwaukee; the InterVarsity Christian Fellowship; the Christian Courier Newspaper; and the Christian Business Men's Committee.



feasibility of providing the cross-section recommended for the proposed transitional roadway on the W. Clybourn Street segment, although it may be noted that based on preliminary design work the HOV lanes would be located in the existing freeway median. Based on preliminary Marquette Interchange reconstruction sketches distributed in February, 1993, the westbound IH 94 East-West Freeway roadway between the interchange itself and N. 35th Street would be shifted modestly to the north. The southbound IH 43 to westbound IH 94 ramp is proposed to be reconstructed to: 1) modify the horizontal alignment providing a longer radius; 2) provide two lanes; and, 3) the merge point with the East-West Freeway would be shifted west. Each of these elements shifts the ramp closer to W. Clybourn Street than its current configuration. Shifting W. Clybourn Street modestly to the north would not be expected to substantially alter the feasibility to construct the transition roadway. However, Marquette University officials have indicated their intent to construct a building in the northwest quadrant of the N. 11th Street and W. Tory Hill intersection. The proposed location of this building may be expected to make it difficult to shift W. Clybourn Street to the north and continue to provide desirable horizontal alignment as the roadway transitions back to W. Wisconsin Avenue. This reconstruction may also eliminate the existing bus only westbound IH 94 on-ramp from W. Clybourn Street just west of N. 13th Street.

Finally, each of the alternatives currently under consideration for the IH 43 North-South Freeway leg north of the Marquette Interchange includes a proposed IH 43-94 on-ramp from W. Wisconsin Avenue at N. 11th Street. The provision of this ramp would likely preclude construction of the proposed transition roadway.

#### SUMMARY AND CONCLUSIONS

At the request of the City of Milwaukee City Engineer, the Southeastern Wisconsin Regional Planning Commission staff conducted a study of the probable transportation impacts of the proposed closure of W. Wisconsin Avenue between N. 11th Street and N. 16th Street, including the related proposed closures of the segments of N. 12th Street and N. 13th Street between W. Wells Street and W. Wisconsin Avenue. The study determined that the transportation impacts of the proposed roadway closures would be limited to a study area bounded by N. 10th Street on the east,

IH 94 on the south, N. 35th Street on the west, and W. Highland Avenue on the north.

Within the study area, it was determined that only about 1.1 miles, or about 8 percent, of the 13.2 miles of arterial streets within the study area currently carry average weekday traffic volumes which exceed design capacity and therefore experience traffic congestion during peak travel periods. Peak hour volume and capacity analyses of selected intersections within the study area confirmed this identification of the location and extent of current traffic congestion based upon comparison of average weekday traffic volumes to average weekday facility design capacities by arterial segment. Under the adopted regional transportation system plan, no major arterial improvements, including new arterial streets or widening of existing arterial streets to provide additional traffic lanes, are recommended within the study area. Under forecast future year 2010 traffic conditions, vehicle miles of travel within the study area may be expected to increase by approximately 10 percent and the number of miles of congested arterial facilities may be expected to increase only minimally from the current 1.1 miles to 1.3 miles by the year 2010.

The stretch of W. Wisconsin Avenue proposed to be closed is an important link in the current and proposed future public transit system for the Milwaukee area. Seven bus routes currently operate over the segment of W. Wisconsin Avenue proposed to be closed. Two of these routes only operate in one direction over this segment of W. Wisconsin Avenue, and another two routes only operate between N. 11th and N. 12th Streets. The number of buses currently operated over this segment of W. Wisconsin Avenue totals approximately 1,139 on an average weekday and approximately 75 buses during the morning and afternoon peak traffic hours. Total bus passengers currently carried over this segment of W. Wisconsin Avenue total approximately 24,400 on an average weekday.

The public transit system element of the adopted regional transportation system plan envisions substantial improvement and expansion of the existing public transit system in Southeastern Wisconsin. This recommended expansion includes the development of a true rapid transit system which would be provided initially by express buses operating over reserved street lanes and potentially ultimately

by light rail vehicles operating over reserved street lanes or over an exclusive right-of-way. The adopted regional transportation system plan envisions that the east-west corridor of the proposed new rapid transit system would be located within the study area corridor, and, more specifically, on W. Wisconsin Avenue from N. 35th Street to N. Prospect Avenue. Approximately 24 feet of the W. Wisconsin Avenue roadway is recommended to be considered for conversion to exclusive transit use from existing median and parking/auxiliary lanes. The east-west corridor rapid transit study being conducted by the Wisconsin Department of Transportation serves to implement this adopted regional transit plan and that study is further evaluating the potential use of W. Wisconsin Avenue for light rail and express bus alternatives.

The transportation problems under current traffic conditions which may be expected as a result of the proposed W. Wisconsin Avenue closure would be limited to the study area. The most significant impacts may be expected in that portion of the study area bounded by N. 10th Street on the east and N. 17th Street on the west. The stretch of W. Wisconsin Avenue in this portion of the study area currently carries approximately 20,200 vehicles on an average weekday. The arterial facility which may be expected to be affected the most by this proposed closure would be W. Clybourn Street, on which traffic volumes may be expected to increase from 11,000 to 18,000 vehicles per average weekday. Other facilities which may be expected to be affected include W. Wells Street on which traffic volumes may be expected to increase from 12,800 to 16,400 vehicles per average weekday; W. State Street from 9,400 to 12,800 vehicles per average weekday; and W. Highland Boulevard from 8,600 to 9,600 vehicles per average weekday. With respect to potential additional congestion which may be expected under current traffic conditions upon the proposed closure of W. Wisconsin Avenue, only W. Clybourn Street between N. 16th Street and N. 13th Street may be affected. This facility may be expected to carry average weekday traffic volumes which would exceed design capacity, and as a result, experience traffic congestion. Other arterial facilities, while carrying additional traffic as a result of the closure of W. Wisconsin Avenue, would not be expected to carry average weekday traffic volumes which would exceed their design capacity.

Under future year 2010 conditions, the principal impacts of the closure of W. Wisconsin Avenue were also determined to be located in the portion of the study area between N. 10th Street and N. 17th Street. The increase in traffic volume may be expected to be most substantial on W. Clybourn Street which may be expected to increase in average weekday traffic in the year 2010 from 12,000 to 20,700 vehicles per average weekday.

With respect to impacts of the proposed closure of W. Wisconsin Avenue on public transit, the implications would include adding two additional turning movements for four of the seven existing bus routes operating over W. Wisconsin Avenue and four additional turning movements for the other three routes. In addition, the required rerouting of three of the routes would entail 0.3 miles of travel indirection. Also, the rerouting of all seven routes would make access to the Marquette University area less convenient, as it would result in an additional one-to-three-block walk from the Marquette University area to the relocated routes. Another disadvantage to the potential rerouting is that two of the routes would likely be changed from a desirable two-way operation over one street to one-way operation over a pair of one-way streets. The one-way streets would be separated for one of the routes by two blocks and for another one of the routes by IH 43.

A potential future impact on public transit as a result of the proposed closure of W. Wisconsin Avenue is the attendant increased difficulty of implementation of express bus or light rail operating over reserved street lanes within the corridor. With W. Wisconsin Avenue open to traffic, the W. Wisconsin Avenue median and/or parking auxiliary lanes could have been converted to exclusive transit lanes and the remaining traffic carrying lanes would have had sufficient design capacity to carry both current and future vehicle traffic volumes without exceeding design capacity and attendant traffic congestion. However, with W. Wisconsin Avenue closed to traffic, sufficient traffic carrying capacity under both existing future conditions may not be expected between N. 16th Street and N. 10th Street to permit conversion of existing street right-of-way to exclusive transit use.

Other potential transportation impacts of the proposed closure of W. Wisconsin Avenue include its implications for access to and egress from nearby land uses, pedestrian movements, recent proposals to change one-way street operation to two-way operation, and vehicle miles of travel in the study area and related motor fuel consumption and air pollutant emissions. The principal land use in the vicinity of the proposed closure of W. Wisconsin Avenue which may be expected to be affected is Sinai Samaritan Medical Center. The access affected would be from the IH-43 southbound N. 11th Street west Wells Street off-ramp. The resultant access would not be more indirect, but may be less understandable.

Another transportation-related impact of the proposed closure of W. Wisconsin Avenue is its potential impact on pedestrian traffic. Within the study area, the conflict of pedestrian traffic with vehicular traffic is highest on the segment of W. Wisconsin Avenue proposed to be closed as it currently carries both the highest levels of pedestrian traffic, as well as the highest levels of vehicle traffic. The closure of W. Wisconsin Avenue may be expected to reduce pedestrian/vehicle conflicts in the study area.

With respect to implications on recent proposals to change the operation of W. Wells Street and W. State Street from one-way operation to two-way operation between N. 35th Street and N. 10th Street, such proposals may have been possible to achieve under current conditions without resultant traffic volumes exceeding design capacity. However, with the proposed closure of W. Wisconsin Avenue, the segments of W. Wells Street and W. State Street between N. 12th Street and N. 17th Street may be expected to operate over their design capacity upon conversion to two-way operation under both current and future conditions.

With respect to implications for vehicle miles of travel within the study area, the proposed closure of W. Wisconsin Avenue may be expected to increase vehicle-miles of travel by approximately 2 percent, with an attendant 2 percent increase in motor fuel consumption and air pollutant emissions. This conflicts with a Federal mandate to improve air quality; renders automobile travel more inefficient; and adversely impacts the ability to provide rapid transit and HOV lanes through the study area.

With respect to the potential for the closure of W. Wisconsin Avenue to increase through traffic on neighborhood streets, it is possible that such diversion could occur. However, as the principal arterial streets connecting W. Wisconsin Avenue and parallel east-west arterial streets may be expected to operate within their design capacity, it may be anticipated that minimal diversion to nonarterial streets will occur within the study area.

A final potential impact of the proposed closure of W. Wisconsin is its impact upon the provision of emergency services both within and outside the Marquette campus. W. Wisconsin Avenue was currently designated a fire route and its closure would add travel indirection and time to areas immediately west of the campus. Further, the provision of emergency services to campus buildings, particularly those abutting W. Wisconsin Avenue and N. 12th Street and N. 13th Street would be impaired as they would become less accessible particularly for heavy fire fighting equipment.