

AN ARTERIAL HIGHWAY SYSTEM PLAN FOR EASTERN RACINE COUNTY

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MEMORANDUM REPORT NUMBER 9

AN ARTERIAL HIGHWAY SYSTEM PLAN
FOR EASTERN RACINE COUNTY

Prepared by the
Southeastern Wisconsin Regional Planning Commission
P. O. Box 1607
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916 N. East Avenue
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STUDY OF EASTERN RACINE COUNTY ARTERIAL LOOP HIGHWAY IMPROVEMENTS

INTRODUCTION

On August 27, 1985, the Racine County Board requested the Southeastern Wisconsin Regional Planning Commission to conduct a study of the need for highway improvements in eastern Racine County. This area of the County was in 1966 proposed to be served by a freeway loop. This freeway loop was in 1978 removed from the regional transportation system plan and replaced with an arterial loop. That arterial loop was to have been composed of a new highway interchange with IH 94 at Four Mile Road; an improved segment of Four Mile Road from that interchange to STH 31; an improved segment of STH 31 from Four Mile Road to CTH KR; and an improved segment of CTH KR from STH 31 to its interchange with IH 94. The improvements proposed for the arterial loop included, in addition to the construction of a new interchange with Four Mile Road on IH 94; the widening of STH 31 to four lanes between CTH KR and STH 11 and between Four Mile Road and CTH MM, and widening to six lanes between STH 11 and CTH MM; and the designation of the entire arterial loop as a state trunk highway. Of these proposed improvements, only the widening of STH 31 to six lanes between STH 11 and CTH MM has been implemented, having been completed from STH 11 to STH 20 in 1975; and from STH 20 to CTH MM in 1982.² The Racine County Board requested the study because no action was currently being taken to implement the remainder of the arterial loop improvements and, yet, major land use developments which were to have been served by this arterial loop were already in place or underway, including an industrial park located along STH 31 near Braun Road; and the redevelopment of the Racine central business district, including major harbor improvements, with related high-rise residential, marina, and retail development.

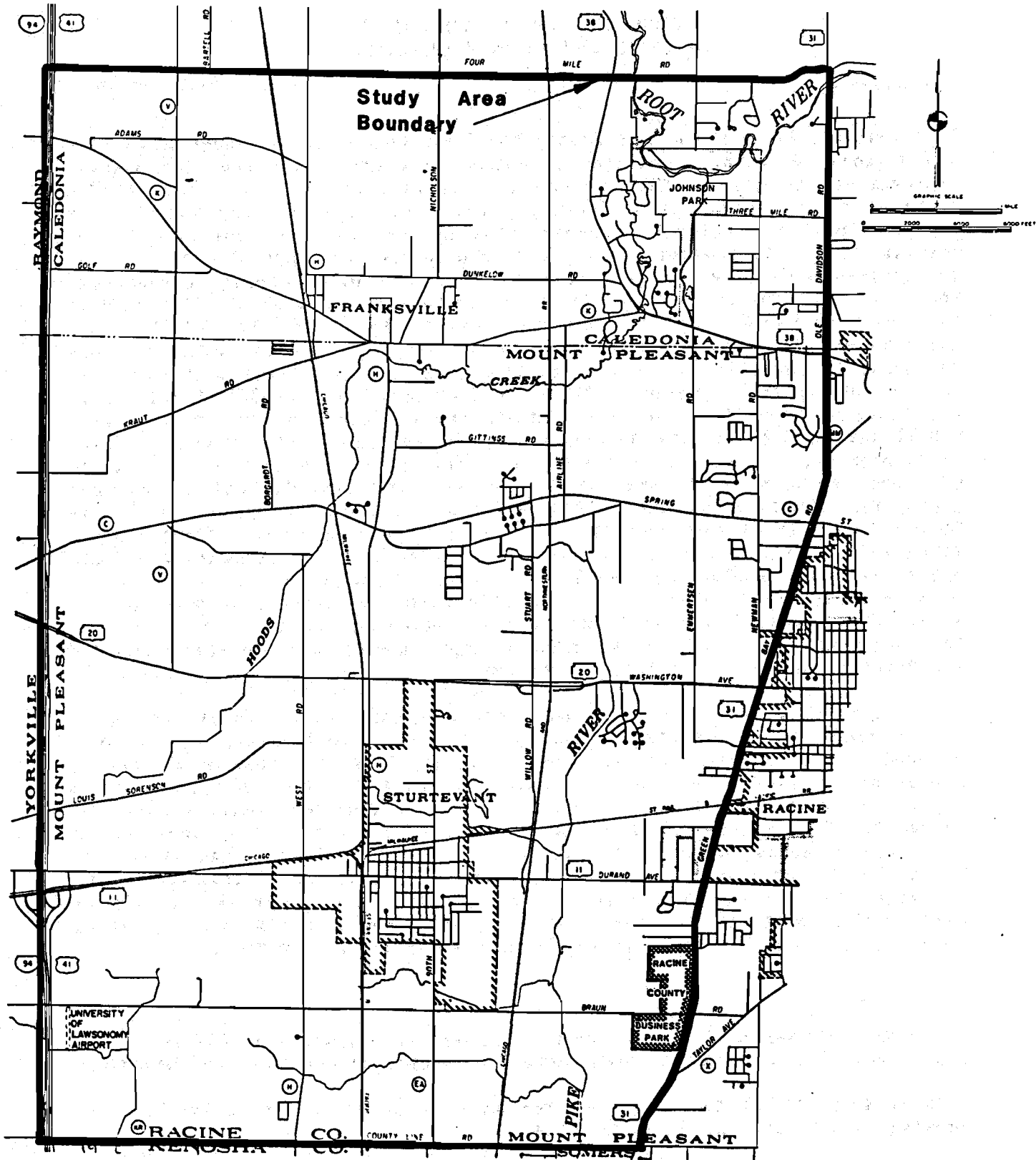
The requested study was to investigate existing and probable future transportation needs in eastern Racine County and, more specifically, in the area bounded by the proposed arterial loop, that is, Four Mile Road on the north, STH 31 on the east, CTH KR on the south, and IH 94 on the west, as shown on Map 1. In this study area, the need for major street improvements was to be examined. The impact of traffic which moves through the study area and is generated by areas outside the study area--such as the City of Racine--was to be explicitly considered in the study. Also, alternative configurations of the arterial loop were to be examined, including the development of a system of east-west and north-south arterial streets, which would provide a grid, rather than a loop system of arterials in the eastern Racine County area.

¹This interchange would also serve a relocated highway--now CTH K--to the west, providing a direct through route from Racine to Waterford and Waukesha.

²STH 31 from STH 11 to CTH M operates as a four-lane arterial facility, as parking is permitted in the curb lanes.

Map 1

RACINE COUNTY ARTERIAL LOOP STUDY AREA



SOURCE: SEWRPC

This report is divided into four sections. The first section presents information on the existing street and highway system in the study area, including the identification of the arterial street system within the study area and its characteristics, such as traffic control, jurisdictional responsibility, and cross-section. The second section of the report presents information on the existing and probable future traffic volumes on each segment of arterial street and highway system within the study area. The third section of the report identifies existing and probable future arterial street and highway deficiencies within the study area. The fourth and last section identifies and evaluates alternative arterial street and highway system improvements in the area; and identifies recommended major street and highway improvements.

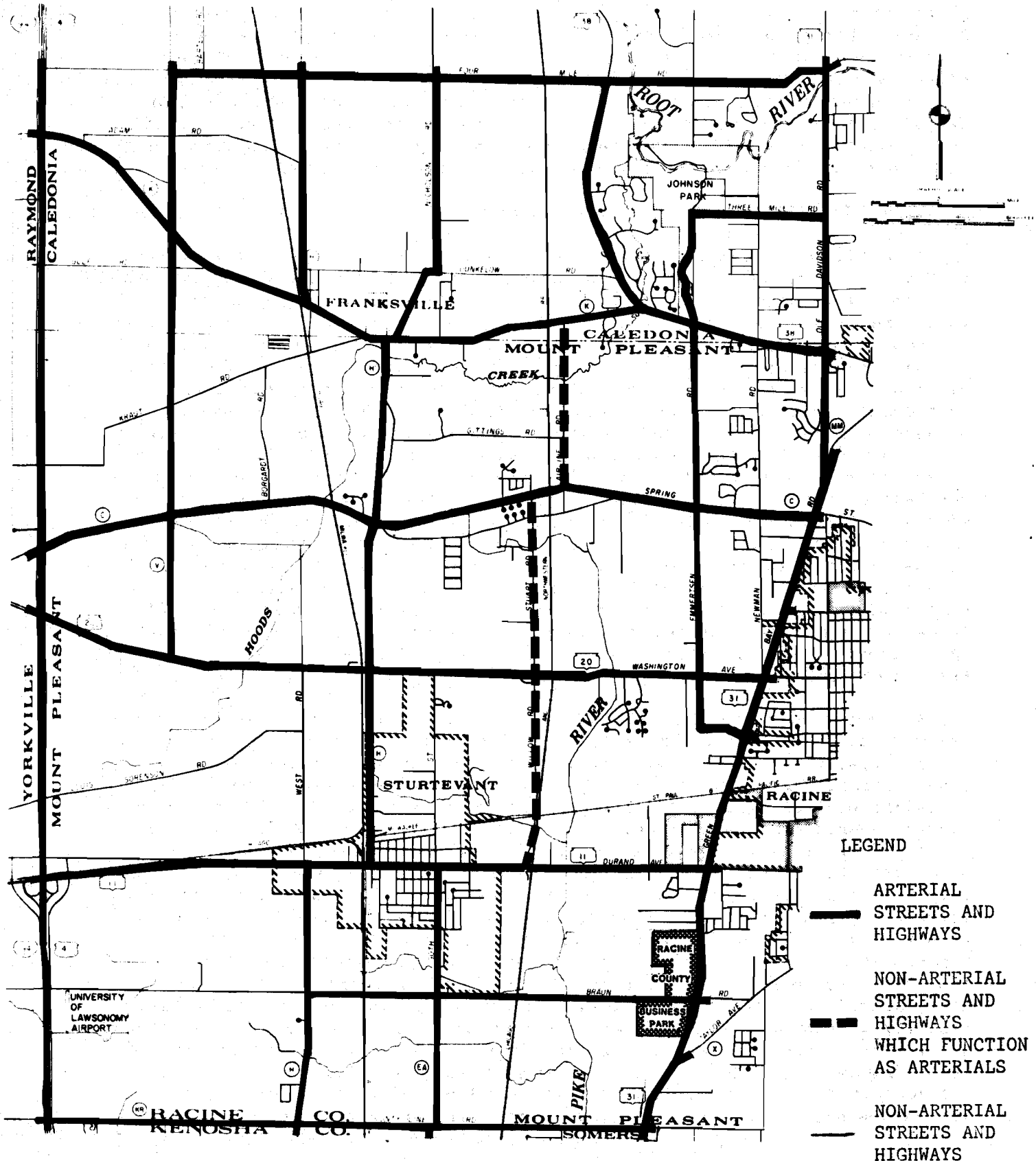
EXISTING STUDY AREA STREET AND HIGHWAY SYSTEM

The existing arterial street and highway system within the study area is shown on Map 2. Arterials are defined as those streets and highways whose principal function is to move heavy volumes of traffic within and through an area and, therefore, are those streets for which existing and probable future traffic volumes are critical elements in design and improvement. Also noted on Map 2 are those nonarterial streets in the study area which currently function as arterials, carrying substantial volumes of through traffic, but which were intended to only provide land access to adjacent residential land uses. Such streets include Airline Road between CTH K and CTH C; Stuart Road between CTH C and STH 20; and Willow Road between STH 20 and STH 11. These land access streets are forced to function as arterials because of the lack of a north-south arterial in this developing area. Map 3 identifies the pavement widths of each arterial street segment, and whether the arterial segment has an urban cross-section with curb and gutter and storm sewers, or a rural cross-section with shoulders and open ditches. Also noted is whether the arterial street cross-section is undivided, or divided by a median. The pavement width of an arterial street segment establishes the number of traffic lanes which can be provided on the street segment. The number of traffic lanes provided on an arterial facility is the principal factor determining traffic capacity.

Map 4 identifies the number of traffic lanes on each arterial segment in the study area. As shown in Table 1, a two-lane urban arterial generally has a design capacity of 13,000 vehicles per average weekday; a four-lane undivided urban arterial has a design capacity of 17,000 vehicles per average weekday; a four-lane divided urban arterial has a design capacity of 25,000 vehicles per average weekday; and a six-lane divided urban arterial has a design capacity of 35,000 vehicles per average weekday. The design capacities cited are for urban arterials typically having cross-sections with curb and gutter and auxiliary parking lanes which can also serve as distress lanes and, importantly, serve as bypass lanes at intersections. These design capacities assume that proper access control practices will be implemented as the Racine County Department of Planning and Zoning and the Wisconsin Department of Transportation have recommended for segments of STH 11, STH 20, and STH 31 through the study area. The traffic capacities of urban arterials are established by the capacity of the arterial's intersections with other arterial streets, which are typically controlled by a traffic signal. The comparable capacities for rural highways typically having cross-sections with shoulders and roadside ditches are also given in Table 1. The shoulders of rural highways generally are not paved, and may not accommodate the full width of a vehicle. Thus, no

Map 2

EXISTING ARTERIAL STREET SYSTEM: 1986



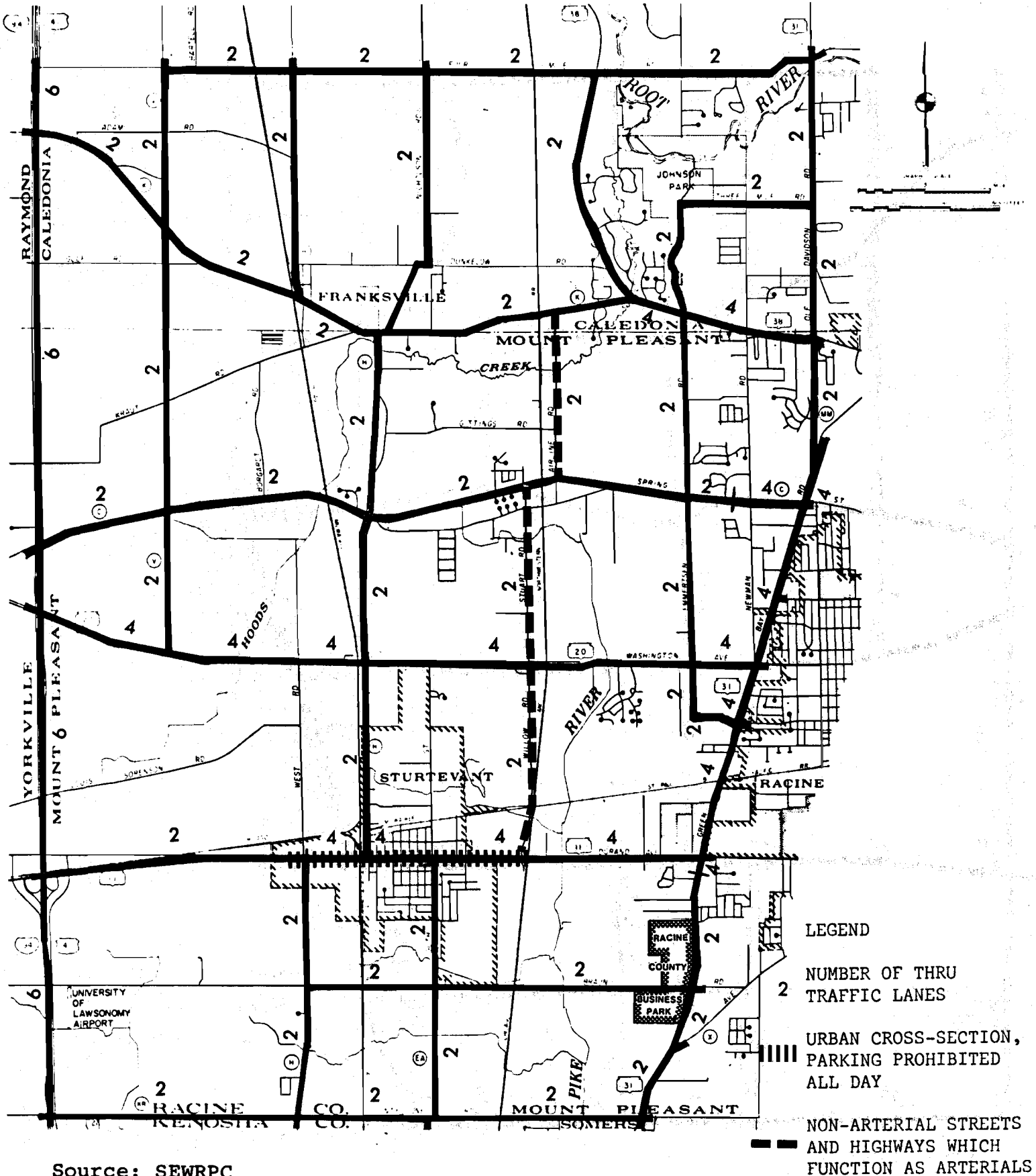
LEGEND

- RURAL CROSS-SECTION
- URBAN CROSS-SECTION
- RURAL CROSS-SECTION
NON-ARTERIAL STREETS
AND HIGHWAYS WHICH
FUNCTION AS ARTERIALS
- D 24' PAVEMENT WIDTH
- INDICATES DIVIDED ROADWAY

Source: SEWRPC

Map 4

TRAFFIC LANES PROVIDED
ON ARTERIAL STREETS: 1986



TR21K/w

Table 1

AVERAGE WEEKDAY DESIGN CAPACITIES
FOR URBAN AND RURAL ARTERIALS

| | | Urban Arterials | Rural Arterials |
|--|--------------------------------------|--------------------|--------------------|
| | | | |
| Average Weekday Design Capacities (vehicles per average weekday) | Two-Lane Arterials..... | 13,000 | 7,000 |
| | Four-Lane Undivided Arterials.... | 17,000 | -- |
| | Four-Lane Divided Arterials..... | 25,000 | 22,000 |
| | Six-Lane Divided Arterials..... | 35,000 | -- |
| | | | |

Source: SEWRPC.

full auxiliary lanes are provided. This reduces the volume of traffic which can safely and efficiently be accommodated, particularly on two-lane rural highways in areas where turning movements are frequent, and where multiple points of ingress and egress may be permitted along the highway. Rural highways also typically have higher speed limits than do urban highways, generally exceeding 35 miles per hour up to 55 miles per hour. Less traffic can generally be safely and efficiently accommodated on two-lane highways with higher speed limits. Also, the design capacity of stop sign-controlled arterial intersections is less than the capacity of traffic signal-controlled arterial intersections, and stop sign-controlled intersections are more typical of rural arterial highway intersections, while signalized intersections are more typical of urban arterial highway intersections.

Also identified on Map 4 is whether or not parking is prohibited during peak traffic periods, or all day to provide additional traffic lanes on selected urban arterial segments.

The existing traffic control at each intersection of arterial streets within the study area, and of those intersections of arterials with non-arterials where the arterial street traffic is controlled by a traffic signal or stop sign, is shown on Map 5. The design capacity of stop sign controlled arterial intersections is significantly less than that of traffic signal controlled arterial intersections. The traffic control provided on an arterial street also affects the travel speed along the arterial. A stop sign will require all traffic to stop and a traffic signal will entail the stopping of some portion of the traffic. As arterial traffic volumes approach and exceed design capacity, the duration of the necessary stop at a controlled intersection can substantially increase and significantly reduce travel speed.

An important--although by no means the only--determinant of the average travel time or speed along an arterial is its posted speed limit. The current posted speed limits on the study area arterial street system are displayed on Map 6.

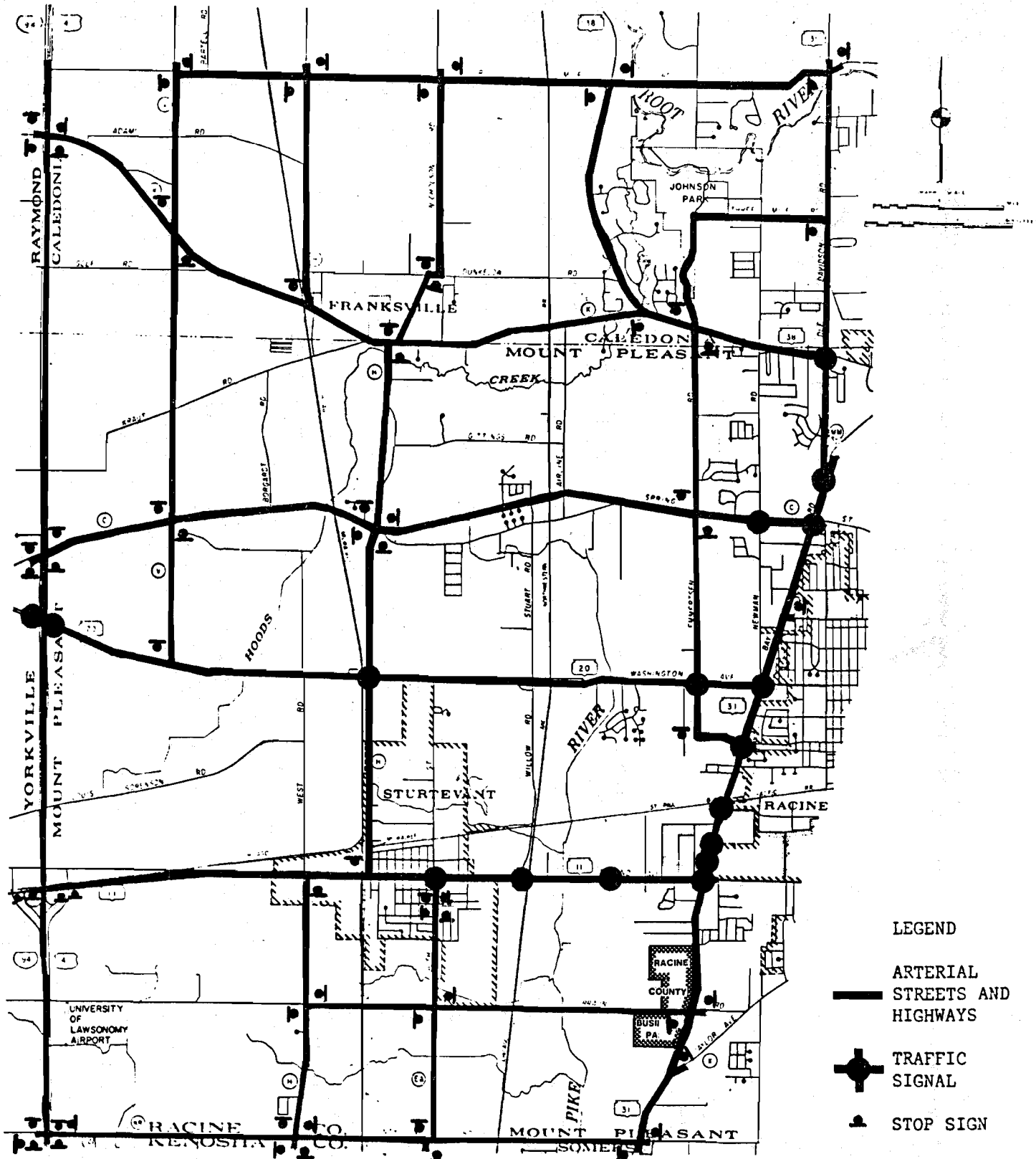
The current--as of July 1986--jurisdictional classification of each segment of arterial street facility in the study area is shown on Map 7. Jurisdictional classification indicates which level of government--state, county, or local--has primary responsibility for the arterial segment's planning, design, construction, operation, and maintenance. Jurisdictional classification of the street and highway system is an important factor in plan implementation.

EXISTING AND FORECAST TRAFFIC ON STUDY AREA ARTERIAL STREET AND HIGHWAY SYSTEM

The existing and probable future traffic volumes on the arterial street and highway system of the study area are largely determined by the existing and anticipated future population, household, and employment levels in the study area, and in those areas outside the study area which contribute traffic to the study area. Presented in Table 2 are existing 1980 and forecast year 2000 population, household, and employment levels for subareas of the study area, the remainder of Racine County, and the remainder of the seven-county Southeastern Wisconsin Region. The year 2000 forecasts of population, households, and employment are based on the adopted long-range year 2000 land use plan for the seven-county Southeastern Wisconsin Region. With respect to the study area, the adopted regional land use plan envisions, as shown on Map 8--as that

Map 5

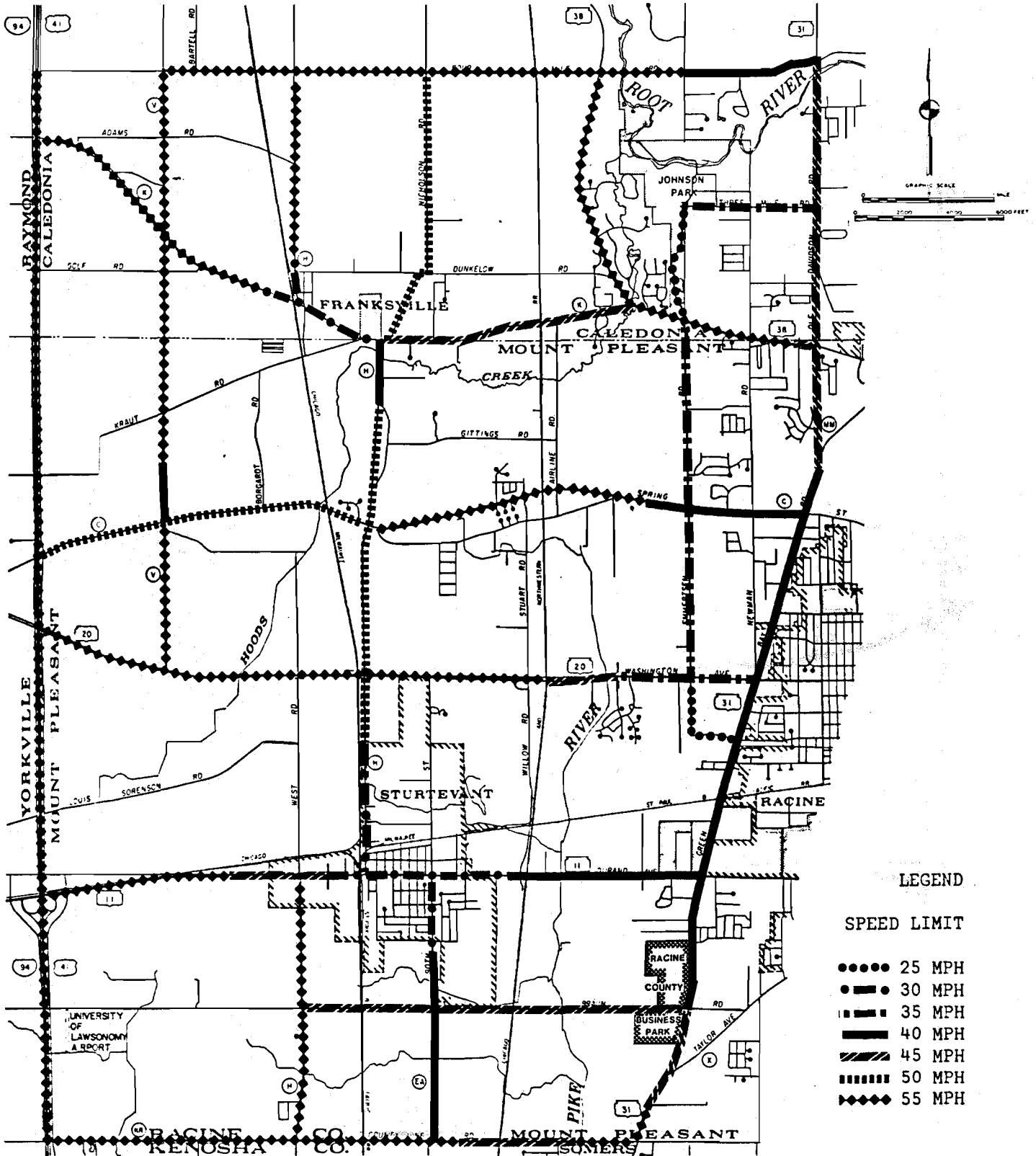
EXISTING TRAFFIC CONTROL
ON ARTERIAL STREET SYSTEM: 1986



SOURCE: SEWRPC.

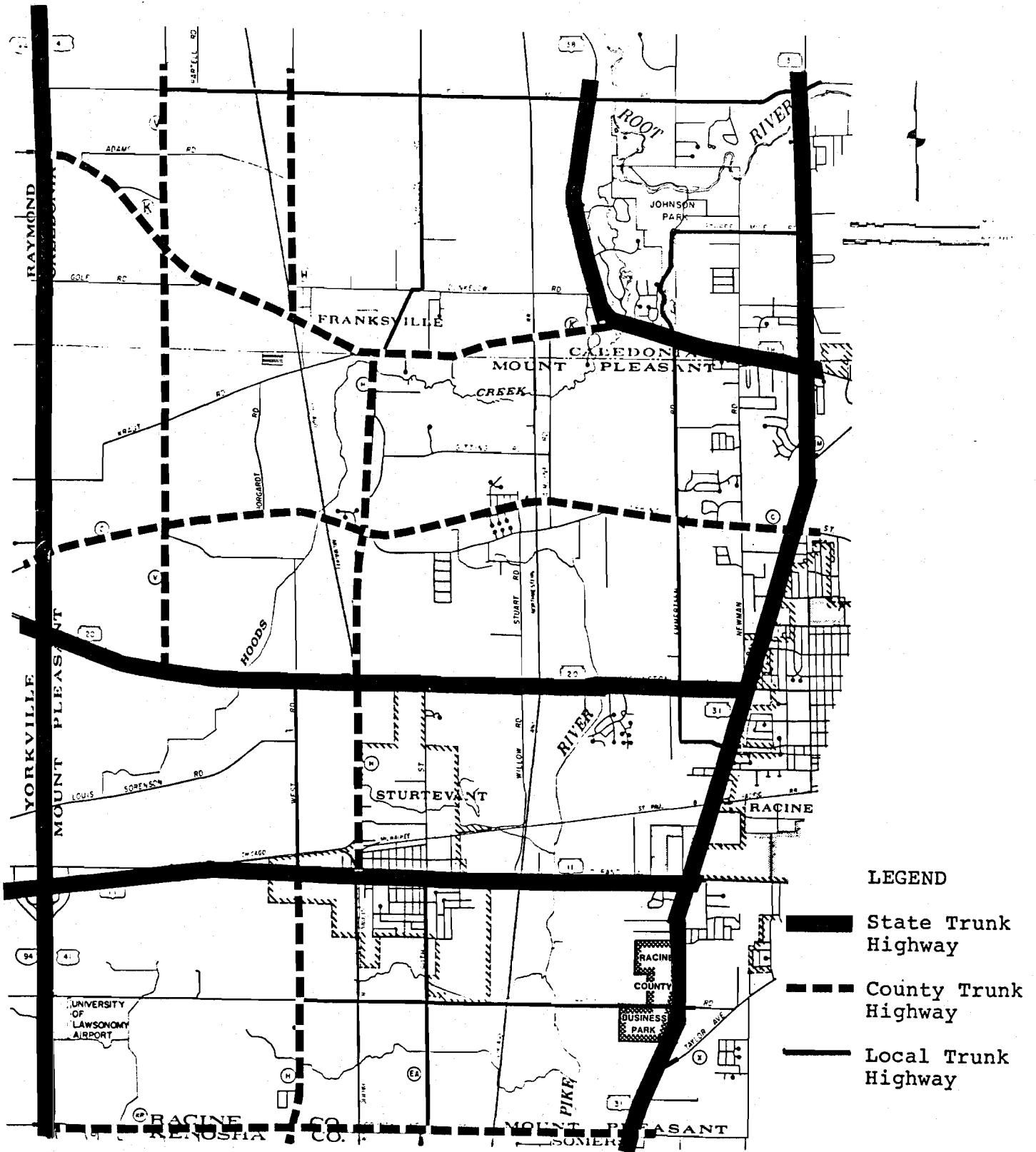
Map 6

EXISTING POSTED SPEED LIMITS
ON ARTERIAL STREET SYSTEM: 1986



Map 7

JURISDICTIONAL CLASSIFICATION
OF STREET SYSTEM: 1986



Source: Wisconsin Department of Transportation, and SEWRPC.

Table 2

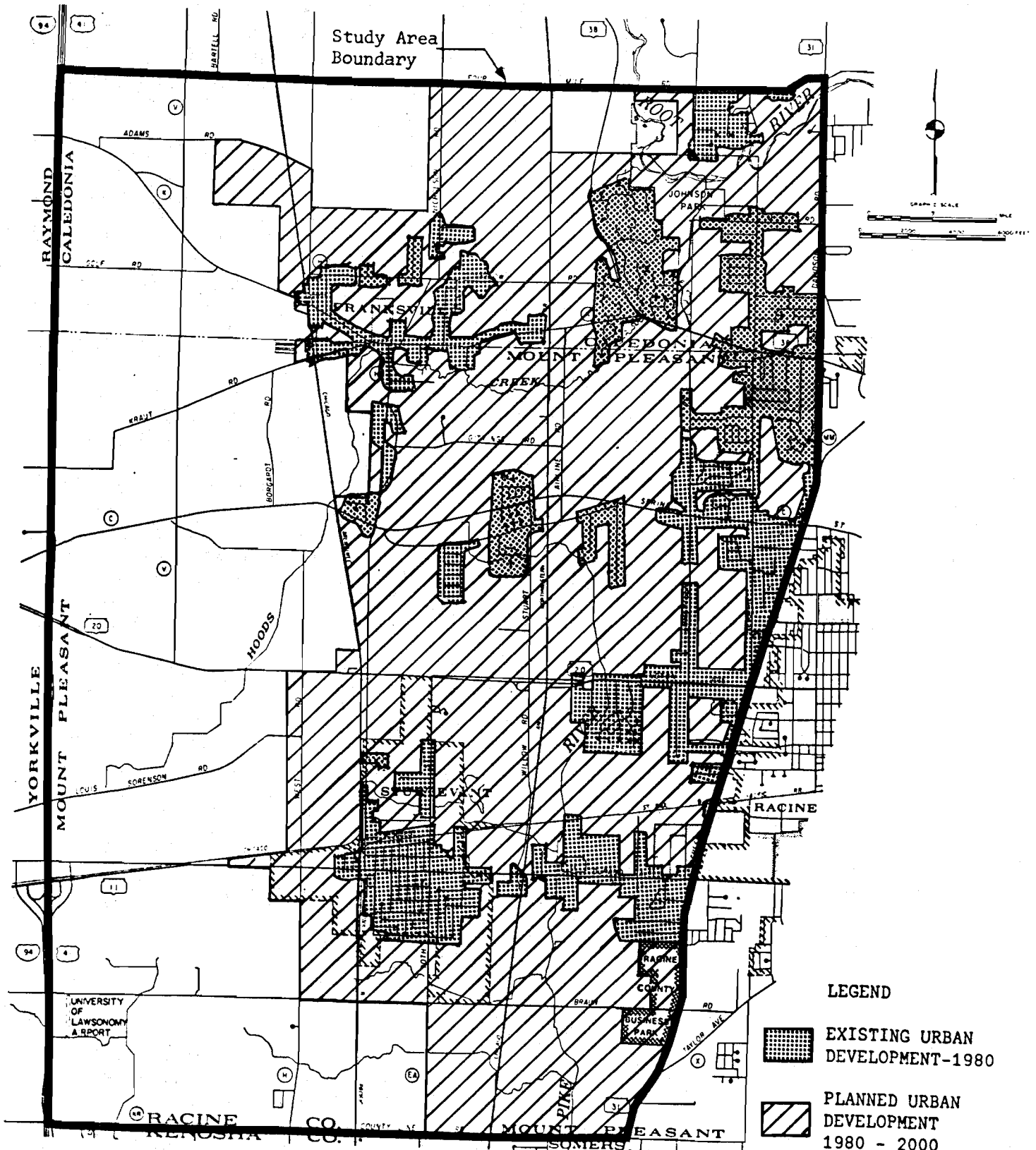
EXISTING 1980 AND FORECAST YEAR 2000 POPULATION, HOUSEHOLDS, AND
EMPLOYMENT IN THE RACINE ARTERIAL LOOP STUDY AREA, THE REMAINDER OF RACINE
COUNTY, AND THE REMAINDER OF THE SOUTHEASTERN WISCONSIN REGION

| | Employment | | | Households | | | Population | | |
|---|------------|-----------|--------------------------------|------------|---------|--------------------------------|------------|-----------|--------------------------------|
| | 1980 | 2000 | 1980-2000 Percent Change | 1980 | 2000 | 1980-2000 Percent Change | 1980 | 2000 | 1980-2000 Percent Change |
| <u>Racine Loop Study Area</u> | | | | | | | | | |
| Caledonia-Southeast..... | 200 | 200 | -- | 700 | 1,600 | 129 | 2,400 | 6,000 | 150 |
| Caledonia-Southwest..... | 700 | 800 | 14 | 400 | 400 | -- | 1,300 | 1,500 | 15 |
| Franksville..... | 400 | 500 | 25 | 400 | 600 | 50 | 1,100 | 2,200 | 100 |
| Mt. Pleasant-Central..... | 2,000 | 3,100 | 55 | 700 | 1,000 | 43 | 1,900 | 3,400 | 79 |
| Mt. Pleasant-- | | | | | | | | | |
| North Central..... | 200 | 200 | -- | 500 | 1,000 | 100 | 1,700 | 3,600 | 112 |
| Mt. Pleasant-Northeast.... | 1,800 | 1,600 | -11 | 1,900 | 3,000 | 58 | 5,300 | 10,100 | 91 |
| Mt. Pleasant-Southeast..... | 30 | 800 | 2,600 | 100 | 100 | -- | 300 | 300 | -- |
| Mt. Pleasant-West..... | 400 | 600 | 50 | 400 | 400 | -- | 1,100 | 1,400 | 27 |
| Sturtevant..... | 3,100 | 7,000 | 94 | 1,300 | 1,800 | 38 | 4,200 | 6,300 | 50 |
| Total Loop Study Area | 8,800 | 14,800 | 68 | 6,400 | 9,900 | 55 | 19,300 | 34,800 | 80 |
| <u>Racine County</u> | | | | | | | | | |
| Loop Study Area..... | 8,800 | 14,800 | 68 | 6,400 | 9,900 | 55 | 19,300 | 34,800 | 150 |
| Caledonia-North..... | 1,800 | 2,100 | 17 | 3,100 | 3,000 | -3 | 11,000 | 9,700 | -12 |
| Racine-North..... | 27,900 | 29,600 | 6 | 21,600 | 22,700 | 5 | 57,200 | 67,200 | 17 |
| Racine-South..... | 26,700 | 29,800 | 11 | 15,600 | 15,900 | 2 | 43,400 | 46,800 | 8 |
| Racine-West..... | 13,500 | 19,100 | 41 | 12,800 | 16,300 | 27 | 39,300 | 54,100 | 38 |
| Racine County Total | 78,700 | 95,400 | 21 | 59,500 | 67,800 | 14 | 170,200 | 212,600 | 25 |
| <u>Southeastern Wisconsin</u> | | | | | | | | | |
| Racine County..... | 78,700 | 95,400 | 21 | 59,500 | 67,800 | 14 | 170,200 | 212,600 | 25 |
| Remainder of South- eastern Wisconsin Region.. | 805,500 | 920,600 | 14 | 568,500 | 671,600 | 18 | 1,594,600 | 2,006,700 | 26 |
| Southeastern Wisconsin Region Total | 884,200 | 1,016,000 | 18 | 628,000 | 739,400 | 18 | 1,764,800 | 2,219,300 | 26 |

Source: SEWRPC.

Map 8

EXISTING 1980 AND PLANNED 2000
URBAN DEVELOPMENT WITHIN STUDY AREA



plan is currently being amended through a new Racine area sanitary sewer service area plan--continued urban development along and to the west of STH 31. The plan provides for an increase in employment--about 800 jobs--in the area proposed for a business and industrial park along STH 31 at Braun Road. However, the plan does not provide for the substantial growth in highway-oriented commercial land uses which has been proposed at the arterial street interchanges with IH 94 in the study area, and particularly between the STH 11 and CTH C interchanges with IH 94. The subareas of the study area are defined on Map 9. In 1980 there were about 19,300 residents, 6,400 households, and 8,800 jobs within the study area. There were about 170,200 residents, 59,500 households, and 78,700 jobs in all of Racine County in 1980; and 1,764,800 residents, 628,000 households, and 884,200 jobs in the seven-county Southeastern Wisconsin Region. The number of residents, households, and jobs in the study area is forecast to increase by the year 2000 to 34,800 residents, an 80 percent increase; to 9,900 households, a 55 percent increase; and to 14,800 jobs, a 68 percent increase. The number of residents, households, and jobs in the remainder of Racine County is anticipated to increase by the year 2000 from 150,900 to 177,800 residents, an 18 percent increase; from 53,100 to 57,900 households, a 9 percent increase; and from 69,900 to 80,600 jobs, a 15 percent increase. As a whole, the number of residents, households, and jobs in Racine County is anticipated to increase by the year 2000 to from 170,200 to 212,600 residents, a 25 percent increase; from 59,500 to 67,800 households, a 14 percent increase; and from 78,700 to 95,400 jobs, a 21 percent increase. The number of residents, households, and jobs in the seven-county Southeastern Wisconsin Region is anticipated to increase from 1,764,800 to 2,219,300 residents, a 26 percent increase; from 628,000 to 739,400 households, an 18 percent increase; and from 884,200 to 1,016,000 jobs, an 18 percent increase.

The existing 1980 and probable year 2000 travel generated within the study area is shown on Map 10. It is estimated that the population and employment within the study area generated about 86,000 person-trips on an average weekday in 1980. Based on the forecast population, households, and employment levels in this area, this level of weekday travel may be expected to increase by about 50 percent by the year 2000, to about 132,000 trips per average weekday. On a regionwide basis, it is estimated that about 5.1 million person trips were generated in the Region in 1980 on an average weekday, and it is projected that by the year 2000 this level of regional travel will increase about 15 percent to 5.8 million trips.

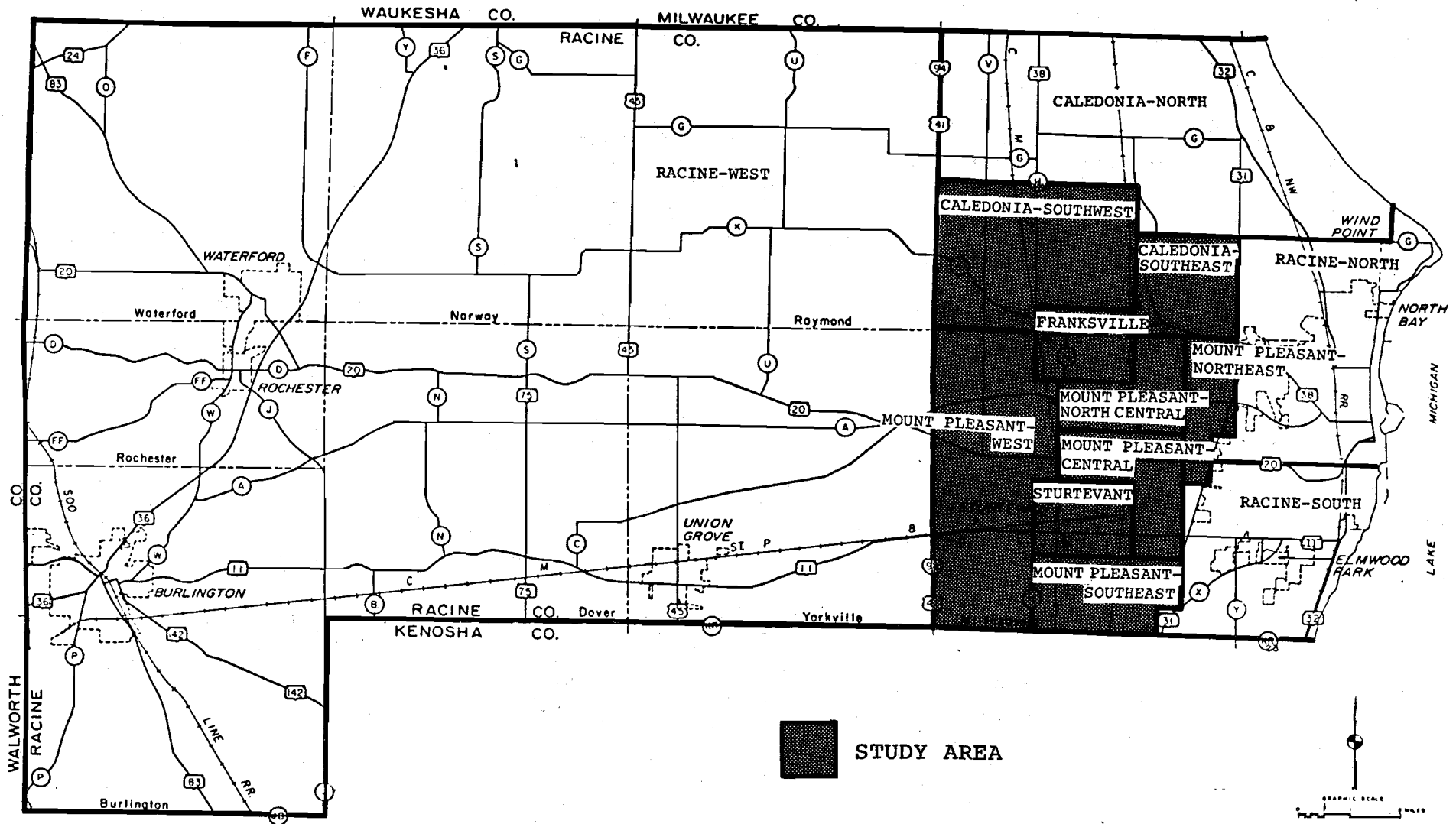
The most currently available existing average weekday traffic volumes on each arterial street within the study area are shown on Map 11. These traffic volume estimates are generally for the year 1984. Forecast year 2000 average weekday traffic volumes on the existing street system, based upon the forecast trip ends and population, households, and employment levels discussed earlier are also presented on Map 11.

EXISTING AND PROBABLE FUTURE TRANSPORTATION DEFICIENCIES

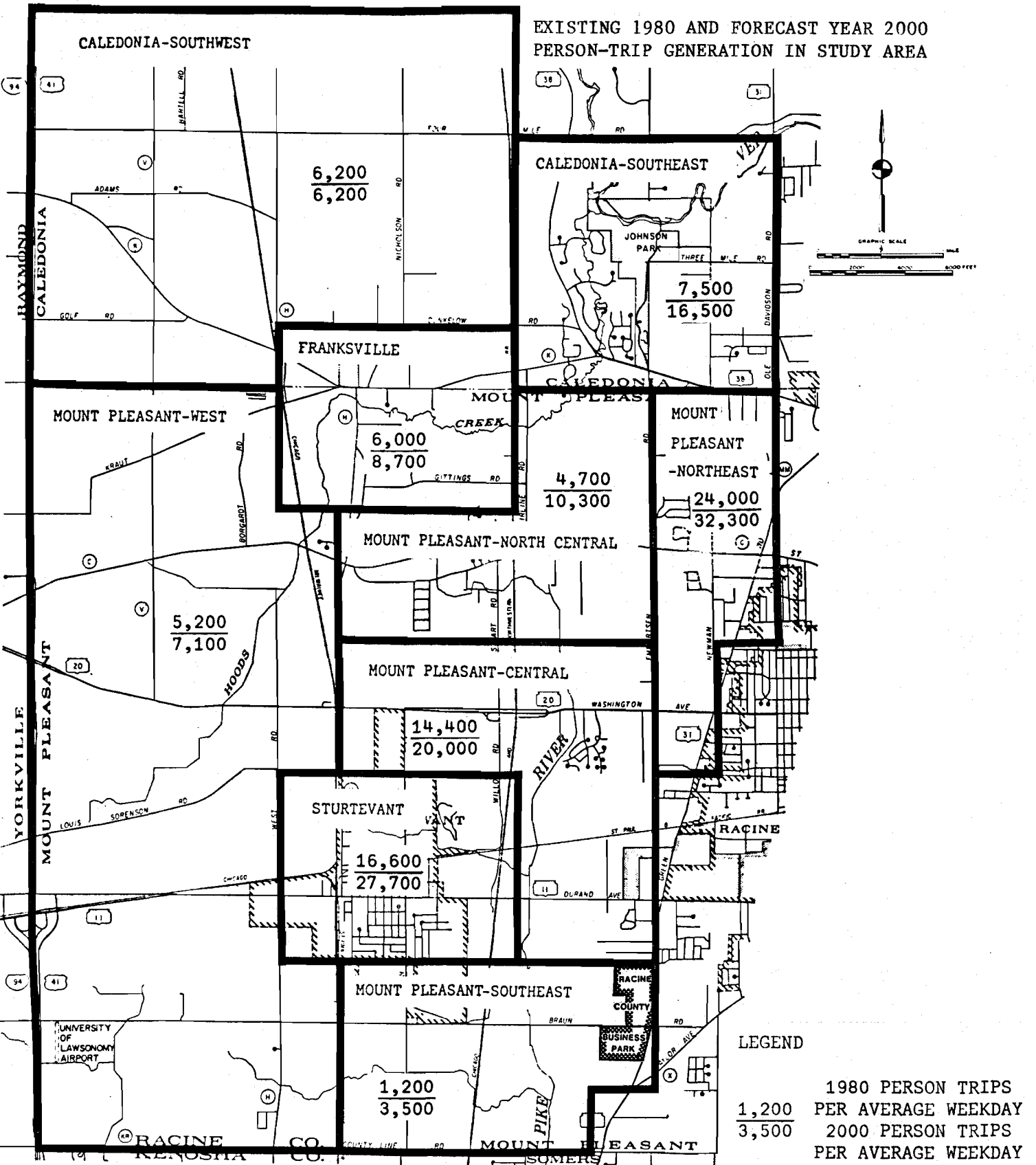
In their request for this study, the Racine County Board stated that an adequate level of transportation service within the study area was essential to promote and support sound land use and related economic development in the area. Specifically noted was the need to provide adequate access from IH 94 to the study area, and from IH 94 through the study area into the City of Racine and the Racine central business district and harbor area.

Map 9

SUBAREAS OF STUDY AREA AND
REMAINDER OF RACINE COUNTY

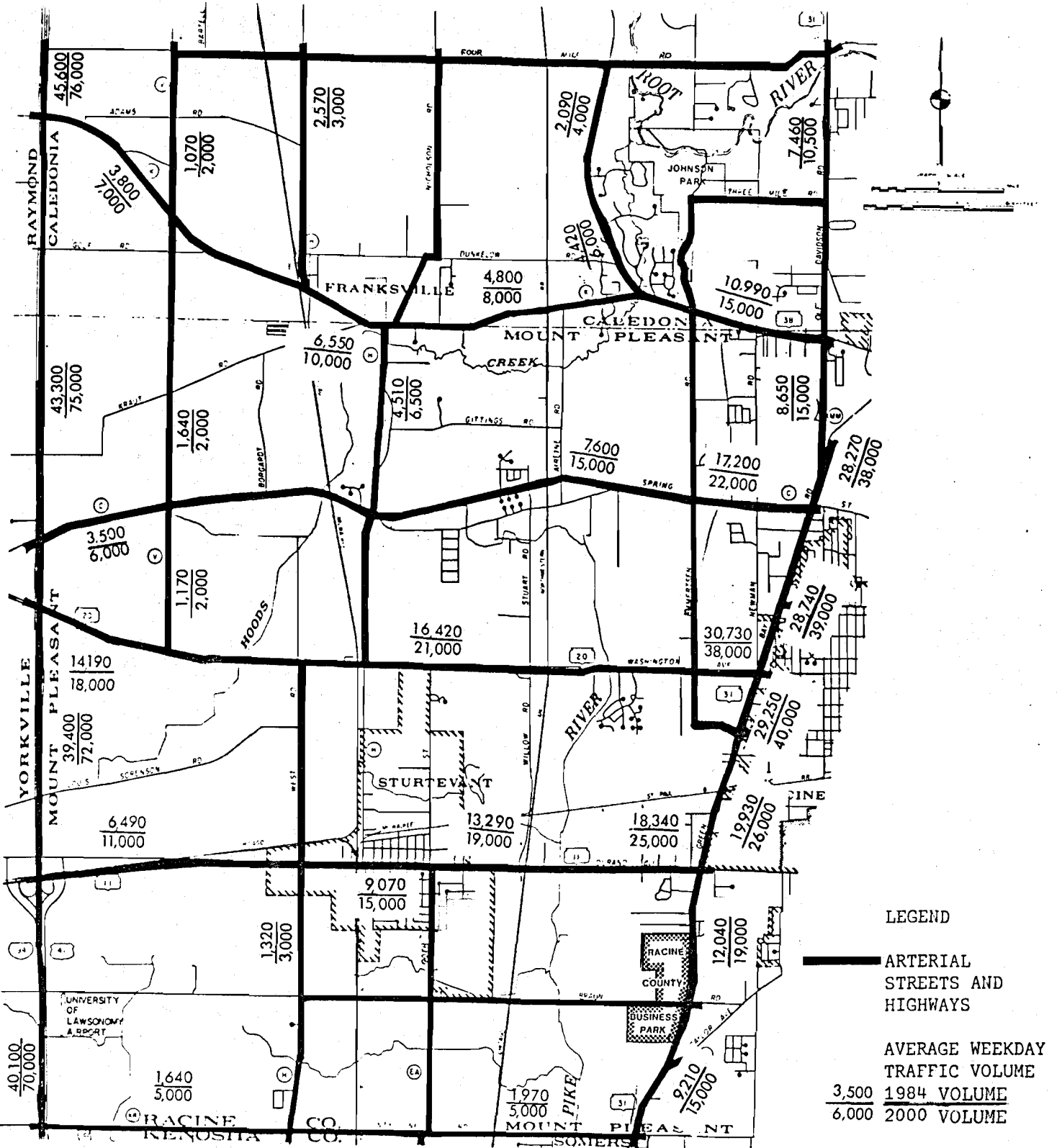


Map 10



Map 11

EXISTING AND FORECAST WEEKDAY TRAFFIC
VOLUME ON ARTERIAL STREET SYSTEM: 1984^a AND 2000



SOURCE: SEWRPC.

^a More current average weekday traffic counts for 1986 were available and are shown on this map for the following segments of STH 31: STH 31 north of CTH C, 32,700 vehicles per average weekday; STH 31 north of STH 20, 33,800 vehicles per average weekday; and STH 31 south of STH 20, 34,700 vehicles per average weekday.

The existing and potential future problems in providing an adequate level of transportation service in the area and the desired access to IH 94 were identified in the study in three ways. One way was through the identification of the indirection in the arterial street and highway system of the study area. Particular attention was given to indirection between the study area and IH 94, and through the study area between IH 94 and the City of Racine and its central business district and harbor area. Any indirection in the local arterial street system serving those parts of the study area which were in 1986 devoted to intensive urban development, or were proposed for such development were also identified.

A second way in which existing and potential future transportation problems of the study area were identified in the study was through consideration of the spacing of arterials. A desirable minimum arterial spacing was identified and applied in those parts of the study area which were devoted to intensive urban development, or were proposed for such development. In these areas, as shown on Map 8, an adequate spacing of arterials is essential to guide as well as support urban development. As the existing and planned urban development is generally medium-density, a minimum spacing of arterials of one mile in each direction is desirable.

The third way in which the existing and potential future transportation problems of the study area were identified in the study was through the identification of those arterial streets which currently carry, or may be anticipated to carry, traffic volumes exceeding their design capacity. Arterials carrying average weekday traffic volumes exceeding their 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 arterials carrying average weekday traffic volumes equaling or exceeding their design capacity will generally occur only during the morning and evening peak traffic hours, or, in some cases, during the three-hour morning and evening peak traffic periods. During midday, evening, and early morning hours of weekdays, there will generally be little, if any, traffic congestion and delay. Also, on most arterial highways, weekend traffic peaks will be less than weekday traffic. The exception would be in the summer and late spring and early fall on those routes such as IH 94 which serve heavy volumes of recreational traffic. Summer Sunday traffic volumes exceed typical weekday traffic volumes on IH 94 by 40 to 75 percent.

Generally, arterials carrying weekday traffic volumes exceeding their design capacity will have average vehicle delays at signalized intersections of at least 35 seconds during peak traffic periods, and delays to some vehicles may approach 120 seconds. Vehicles may nearly always have to wait through more than one traffic signal red phase to clear the intersection. Arterials carrying weekday traffic volumes equaling their design capacities will typically have average vehicle delays at signalized intersections during peak traffic periods of about 20 to 30 seconds, and delay to some vehicles may approach 60 to 90 seconds. Arterials operating under their design capacity will have little vehicle back-up at signalized intersections, and no vehicles will have to wait through more than one red traffic signal phase. The average delay to each vehicle at signalized intersections will be 5 to 15 seconds.

Also, between controlled intersections, arterials carrying traffic volumes greater than their design capacity may be expected to experience severe restrictions on operating speed and on the ability to maneuver. On two-lane highways, the ability to pass slower vehicles will be severely restricted. Overall, the average travel speeds on arterials operating over design capacity will be reduced by 25 to 50 percent, as compared to speeds on arterials operating at or under design capacity.

Existing Transportation Problems

Existing traffic congestion problems in the study area are shown on Map 12. The following arterial facility segments currently experience traffic congestion as they carry average weekday traffic volumes which exceed their design capacity:

- o STH 31 from CTH KR to STH 11 and from 16th Street to Four Mile Road;³
- o STH 20 from Emmertsen Road to STH 31;
- o STH 11 from Willow Road to STH 31; and
- o CTH C from Airline Road to the existing six-lane divided section west of Newman Road.

With respect to traffic indirection, the study area enjoys good access to IH 94, with four arterial facilities spaced about two to four miles apart, providing direct access to IH 94: CTH KR, STH 11, STH 20, and CTH K. The IH 94 on- and off-ramps and the frontage road system are, however, inadequate to serve existing and planned land use developments along IH 94. In the far northeastern corner of the study area in the Town of Caledonia, access to IH 94 is somewhat indirect via Four Mile Road or CTH K.

The four routes--CTH KR, STH 11, STH 20, and CTH K (and STH 38)--are also the major routes from and through the study area to the Racine central business district, and they connect with major existing and planned routes east of STH 31 through the central City of Racine to the Racine central business district and harbor.

One problem with respect to provision of adequate arterial spacing in the study area was identified: the need for a north-south arterial located about two miles west of STH 31 to remove through traffic from Airline Road, Stuart Road, and Willow Road. As shown on Map 8, the existing urban development in the area is scattered and does not yet warrant development of a grid system of arterial streets.

Forecast Transportation Problems

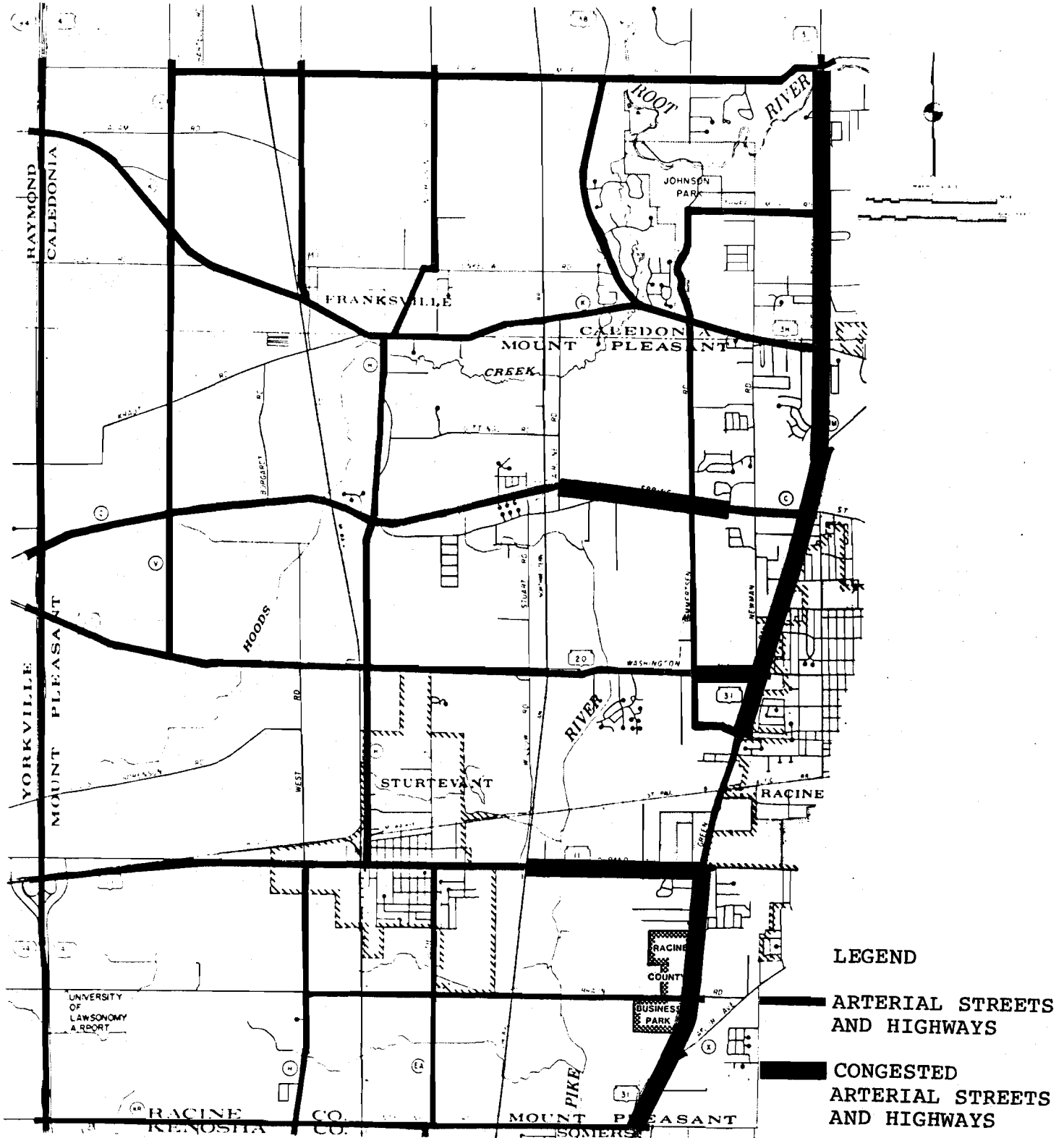
Forecast traffic congestion problems in the study area are shown on Map 13. The following arterial facility segments may be expected to experience traffic congestion by the year 2000, carrying average weekday traffic volumes exceeding their design capacity.

- o STH 31 from CTH KR to Four Mile Road;
- o STH 11 from IH 94 to the Village of Sturtevant western corporate limits, and from the Village of Sturtevant eastern corporate limits to STH 31;

³The segment of STH 31 from 16th Street to CTH MM currently carries traffic volumes which exceed its design capacity and experience traffic congestion, as parking is currently permitted in the curb lanes on this segment of STH 31.

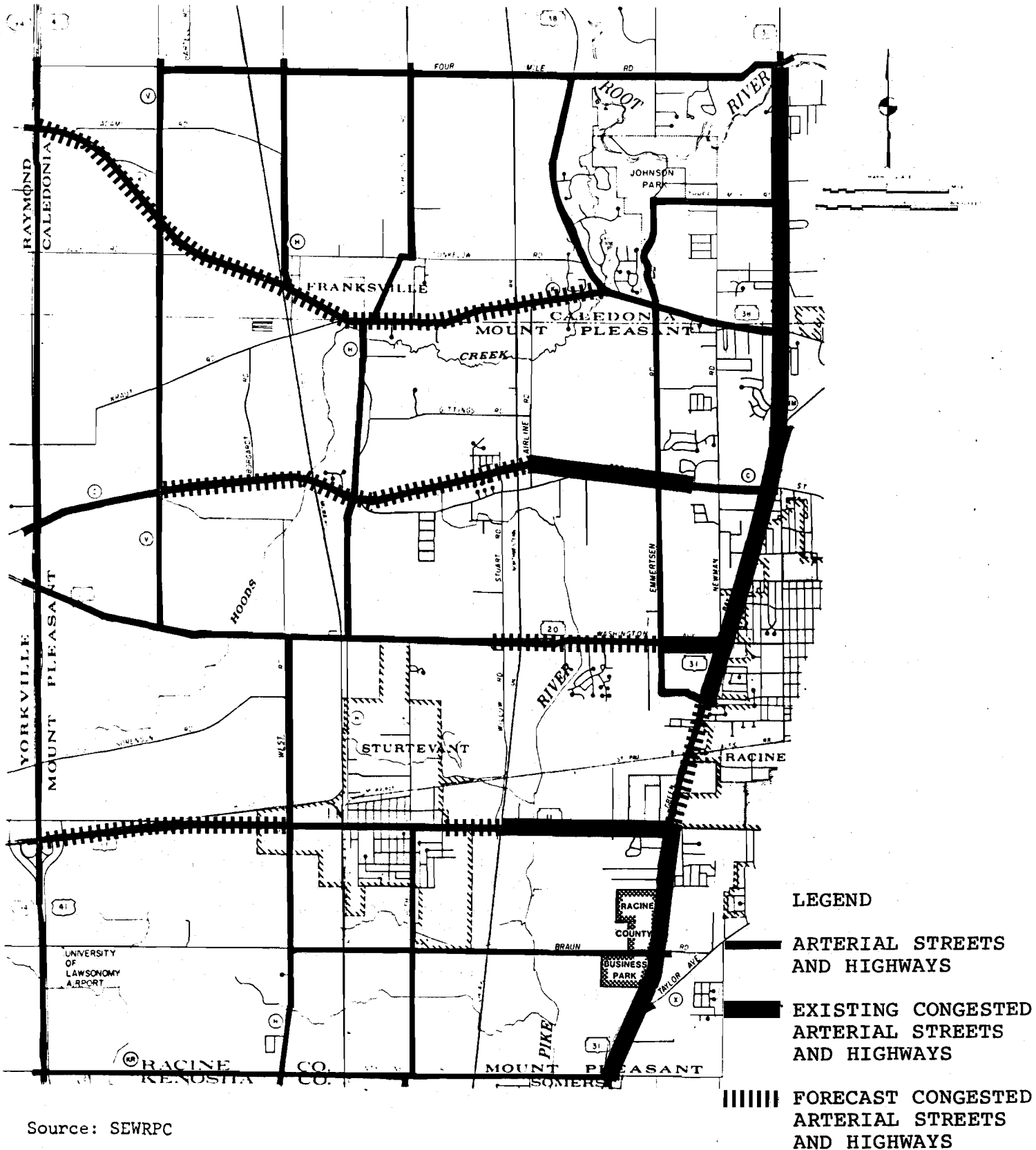
Map 12

EXISTING TRAFFIC
CONGESTION PROBLEMS: 1986



Map 13

EXISTING 1986 AND FORECAST YEAR
2000 TRAFFIC CONGESTION PROBLEMS



- o STH 20 from Willow Road to STH 31;
- o CTH C from CTH V to existing six-lane divided section west of Newman Road; and
- o CTH K from IH 94 to STH 38.

With respect to traffic indirection, the study area would continue to enjoy generally good access to IH 94, with the existing four arterial facilities spaced about two to four miles apart: CTH KR, STH 11, STH 20, and CTH K. However, the IH 94 on- and off-ramps, and the frontage road system would be inadequate to serve the planned development.

Also, under the planned future development pattern for the study area, as shown on Map 8, problems of inadequate arterial spacing may be expected to occur if a new arterial facility is not provided in a north-south corridor two to three miles west of STH 31. The planned development pattern proposes continuous urban development between STH 31 and the Chicago & North Western Transportation Company's New Line Subdivision between CTH KR and Four Mile Road, or an area about two miles wide and seven miles in length. The lack of a north-south arterial route west of STH 31 will not only add to the future traffic burden on STH 31, but would also cause significant indirection in traffic service to planned land uses west of STH 31, and may act as an impediment to this planned land use development. In addition, Airline Road, Stuart Road, and Willow Road may be expected to carry increasingly heavier volumes of through traffic and have an increasingly greater impact on adjacent residential land uses.

IDENTIFICATION AND EVALUATION OF IMPROVEMENTS NECESSARY TO RESOLVE IDENTIFIED TRANSPORTATION PROBLEMS

In this section of the report, the improvements necessary to resolve the identified existing and probable future transportation problems are proposed and evaluated. The improvements proposed include the widening of two-lane rural highways to four-lane divided urban and rural highways, and four-lane undivided urban highways. Desirable cross-sections for these improvements are shown in Figure 1, along with minimum cross-sections. The minimum right-of-way requirements are 14 to 20 feet less than those of the desirable improvements. The advantage of the desirable cross-sections is the increased safety and capacity provided, with wider traffic lanes and medians, as well as potential for better appearance with increased area for median and roadside landscaping.

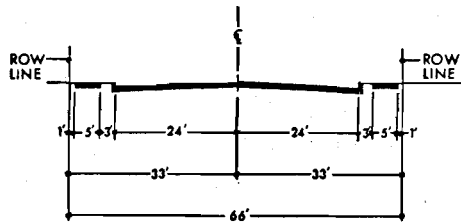
Each roadway improvement proposed to resolve an identified existing or future traffic problem is evaluated with respect to construction cost and potential disruption, including right-of-way acquisition and property takings. These measures of potential disruption are conservatively estimated based upon the desirable roadway right-of-way requirements. In addition, for those segments of roadway where right-of-way acquisition would be necessary and potentially substantial--that is, where the existing roadway right-of-way is less than the minimum required for a proposed improvement--a more detailed measure of disruption is provided, indicating the distance from buildings on abutting property to the proposed roadway edge.

Figure 1

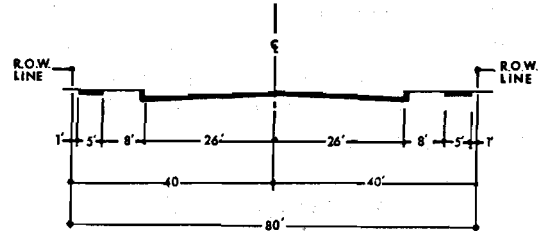
PROPOSED MINIMUM AND DESIRABLE
CROSS-SECTIONS FOR ROADWAY IMPROVEMENTS

Undivided Urban Roadway with Four Traffic Lanes

Minimum

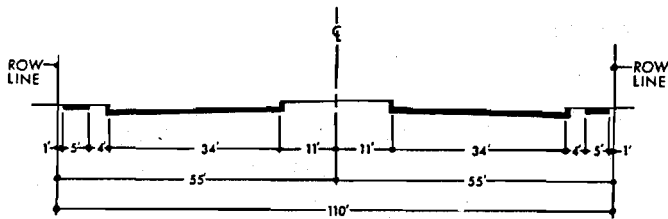


Desirable

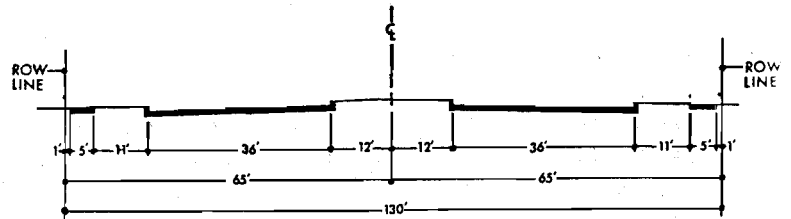


Divided Urban Roadway with Four
Traffic Lanes and Two Auxiliary Lanes

Minimum

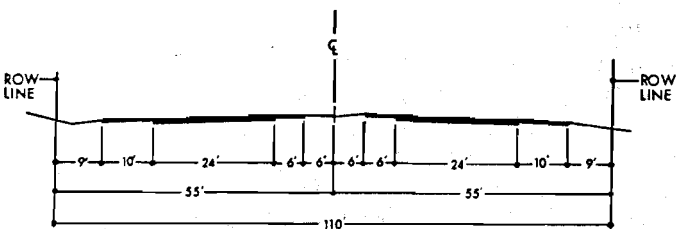


Desirable

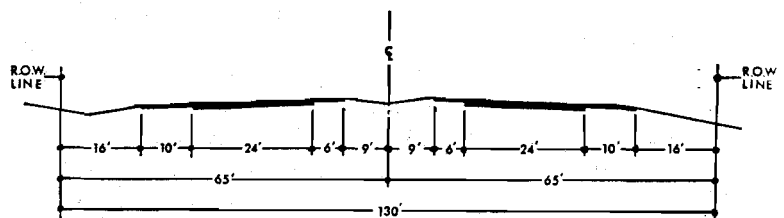


Divided Rural Roadway with Four Traffic Lanes

Minimum



Desirable



STH 31

The proposed improvement of STH 31, as shown on Table 3, would provide a divided multi-lane highway from CTH KR to Four Mile Road. This would entail the widening of two segments of STH 31 from two-lane rural highways to four-lane divided highways, including a segment from CTH KR to STH 11 in the southern portion of the study area and a segment from CTH MM to Four Mile Road in the northern portion of the study area. This improvement may need to be carried further north beyond the study area boundary to STH 32. The proposed improvement would have an estimated construction cost of \$9.0 million if the improved roadways were constructed to urban standards, or of \$5.6 million if constructed to rural standards. The segment of the improvement from CTH KR to STH 38 would have an estimated construction cost of \$5.4 million with an urban section, and \$3.4 million with a rural section. The disruption caused by this improvement would be limited, as sufficient right-of-way is available in most segments of the roadway to permit construction of a minimal four-lane divided roadway and, in some parts, a desirable four-lane divided roadway cross-section.

It is also proposed that parking be prohibited at least during peak periods and intersections be widened as needed--particularly the intersection of STH 31 and STH 20, which only has two through lanes in each direction--on the existing segments of STH 31 to permit full use of the existing six lanes on STH 31 from STH 11 to CTH MM.

All of these proposed improvements are necessary to resolve existing as well as future traffic problems, with the exception of the prohibition of parking on STH 31 between STH 11 and 16th Street, which would be necessary under future conditions.

The proposed improvements to STH 31 are all consistent with those recommended in the adopted regional long-range transportation system plan, with one exception--the proposed widening of STH 31 in the northern portion of the study area between Three Mile Road and Four Mile Road. The need for this additional improvement can be attributed to the dropping of the proposed Lake Freeway from the adopted regional plan, and its replacement with a surface arterial facility. The once-proposed higher standard freeway facility would have served trips which otherwise would be on STH 31.

STH 11

The proposed improvement of STH 11, as shown on Table 3, would provide a multi-lane highway from IH 94 to STH 31. A four-lane undivided roadway would be provided in the Village of Sturtevant; a connecting four-lane divided section would be provided to the west to IH 94; and a connecting six-lane divided section to the east to STH 31. This improvement would thus require the widening of STH 11 from IH 94 to West Road in the Village of Sturtevant from a two-lane to a four-lane roadway section. In addition, the existing four-traffic-lane undivided section of STH 11 from the eastern corporate limits of the Village of Sturtevant to STH 31 would be proposed to be improved to a divided six-lane highway section. This will require reconstruction of the Chicago & North Western railway overpass east of Willow Road. The proposed improvement would have an estimated total construction cost of \$7.4 million, of which about \$2.5 million would be required for the reconstruction of the railway overpass. The potential disruption caused by this improvement would be somewhat limited, as sufficient right-of-way is generally available except

Table 3

EVALUATION OF IMPROVEMENTS TO RESOLVE EXISTING AND FUTURE
TRANSPORTATION PROBLEMS IN THE RACINE LOOP STUDY AREA

| Location of Problem | Description of Problem | Proposed Improvement | | |
|------------------------------|---|--|--|--|
| | | Proposed Improvement | Construction Cost | Disruption |
| STH 31 o CTH KR to STH 11 | Existing and future traffic congestion. o Existing 9,200 to 12,000 awdt exceeds design capacity. o Forecast 15,000 to 19,000 awdt exceeds design capacity. | Widen existing two-lane rural highway to four-traffic-lane divided highway. | \$3,600,000 (urban) \$2,200,000 (rural) | o Acquire 20 feet additional right-of-way for some stretches between CTH KR and CTH X. o Acquire 64 feet additional right-of-way between CTH X and Braun Road. Will reduce distance from 8 residential properties to roadway edge from 100 to 60 feet. o Acquire 64 feet of additional right-of-way between Braun Road and Emstan Hills Road from Racine County property. o Acquire 64 feet of additional right-of-way between Emstan Hills Road and STH 11. Will require taking 9 residential properties or reducing distance from 23 residential properties to roadway edge from approximately 80 to 40 feet. |
| o STH 11 to 16th Street | Future traffic congestion problem. o Forecast 26,000 awdt exceeds design capacity. | Prohibit peak traffic period parking (6:00 to 9:00 a.m. and 3:00 to 6:00 p.m.) and intersection widening to provide six traffic lanes. | \$ 100,000 | -- |
| o 16th Street to CTH MM | Existing and future traffic congestion problem. o Existing 28,300 to 29,200 awdt exceeds design capacity. o Forecast 38,000 to 40,000 awdt exceeds design capacity. | Prohibit peak traffic period parking (6:00 to 9:00 a.m. and 3:00 to 6:00 p.m.) and intersection widening to provide six traffic lanes. | \$ 200,000 | -- |

-continued-

| Location of Problem | Description of Problem | Proposed Improvement | | |
|---|---|--|--|---|
| | | Proposed Improvement | Construction Cost | Disruption |
| STH 31 (continued) CTH MM to Four Mile Road | Existing and future traffic congestion problem. o Existing 7,500 to 8,700 awdt exceeds design capacity. o Forecast 10,500 to 15,000 awdt exceeds design capacity. | Widen existing two-lane highway to four-traffic-lane divided highway. | \$5,100,000 (urban) \$3,100,000 (rural) | o Acquire 10 feet additional right-of-way between CTH MM and STH 38. o Acquire 15 to 35 feet additional right-of-way for some stretches between STH 38 and Three Mile Road. o Acquire 10 to 15 feet additional right-of-way between Three Mile Road and Four Mile Road. |
| Total STH 31 | -- | -- | \$5,600,000 (rural) \$9,000,000 (urban) | -- |
| STH 11 o IH 94 to Village of Sturtevant western corporate limits | Future traffic congestion problem: o Forecast 11,000 awdt exceeds design capacity. | Widen existing two-lane rural highway to provide four-traffic-lane divided highway. | \$1,700,000 (rural) | o Acquire 36 feet additional right-of-way between IH 94 and old STH 11. o Acquire 61 feet additional right-of-way between old STH 11 and village western corporate limits. Will reduce distance from 2 residential properties to roadway edge from 70 to 50 feet. |
| o Village of Sturtevant western corporate limits to West Road | Future traffic congestion problem: o Forecast 11,000 awdt exceeds design capacity. | Widen existing two-lane rural highway to provide four-traffic-lane undivided highway. | \$ 300,000 (urban) | o Acquire 17 feet additional right-of-way. |
| o 86th Street in Village of Sturtevant to Willow Road | Future traffic congestion problem: o Forecast 19,000 awdt exceeds design capacity. | Widen existing four-traffic-lane undivided highway to provide four-traffic lane divided highway. | \$ 700,000 (urban) | o Acquire 10 to 50 feet additional right-of-way between 86th Street and eastern Village of Sturtevant corporate limits. |

-continued-

| Location of Problem | Description of Problem | Proposed Improvement | | |
|---|--|--|---------------------|---|
| | | Proposed Improvement | Construction Cost | Disruption |
| STH 11 (continued) o Willow Road to STH 31 | Existing and future traffic congestion: o Existing 18,300 awdt exceeds design capacity. o Forecast year 2000 25,000 awdt exceeds design capacity. | Widen existing four-traffic-lane undivided highway to provide six-traffic lane divided highway. | \$4,700,000 (urban) | o Acquire additional 10 feet of right-of-way. |
| Total STH 11 | -- | -- | \$7,400,000 | -- |
| STH 20 o Oaks Road to Sunnyslope Drive | Future traffic congestion problem: o Forecast year 2000 26,000 awdt exceeds design capacity. | Widen existing four-traffic-lane divided highway to provide six-lane divided highway. | \$1,300,000 (urban) | -- |
| o Sunnyslope Drive to Emmertsen Road | Future traffic congestion problem: o Forecast year 2000 33,000 awdt exceeds design capacity. | Prohibit peak traffic period parking (6:00 to 9:00 a.m. and 3:00 to 6:00 p.m.) and widen intersections to provide six traffic lanes. | \$ 100,000 | -- |
| Emmertsen Road to STH 31 | Existing and future traffic congestion problem: o Existing 30,700 awdt exceeds design capacity. o Forecast year 2000 38,000 awdt exceeds design capacity | Prohibit peak traffic period parking (6:00 to 9:00 a.m. and 3:00 to 6:00 p.m.) and widen intersection to provide six traffic lanes. | \$ 100,000 | -- |
| Total STH 20 | -- | -- | \$1,500,000 | -- |

-continued-

Table 3 (continued)

| Location of Problem | Description of Problem | Proposed Improvement | | |
|---|--|---|---|---|
| | | Proposed Improvement | Construction Cost | Disruption |
| CTH C o CTH V to Airline Road o Airline Road to Existing Six-Lane Divided Section West of Newman Road | Future traffic congestion problem: o Forecast 8,000 awdt exceeds design capacity. | Widen existing two-lane rural highway to four-traffic-lane divided highway. | \$1,600,000 (rural) from CTH V to CTH H. \$2,500,000 (urban) from CTH H to Airline Road. | o Acquire additional 20 to 30 feet of right-of-way. |
| | Existing and future traffic congestion problem: o Existing 7,600 awdt exceeds design capacity. o Forecast 15,000 awdt exceeds design capacity. | Widen existing two-rural highway to four-traffic-lane divided highway. | \$2,300,000 (urban) | -- |
| Total CTH C | -- | -- | \$6,400,000 | -- |

-continued-

Table 3 (continued)

| Location of Problem | Description of Problem | Proposed Improvement | | | |
|---------------------------------------|---|---|---|--|--|
| | | Proposed Improvement | Construction Cost | Disruption | |
| CTH K and STH 38 o IH 94 to STH 31 | Future traffic congestion problem between IH 94 and CTH H, and Kraut Road and STH 38. o Future 7,000 to 8,000 awdt exceeds design capacity. Also, need to provide continuous four traffic lanes between CTH H and Kraut Road in Franksville. Also, excessive delay at intersection of CTH K and STH 38, as principal movement of traffic will be between CTH K and STH 38 south of CTH K. | <u>Alternative 1--</u> <u>Improve Existing Alignment</u> | | | |
| | | o IH 94 to CTH H | Widen existing two-traffic-lane rural highway to provide a four-traffic-lane divided highway. | \$2,300,000 (rural) | -- |
| | | o CTH H to Kraut Road | Prohibit parking during peak periods to provide four traffic lanes. | \$ -- | -- |
| | | o Kraut Road to STH 38 | Widen existing two-lane rural highway to provide four-traffic-lane divided highway. | \$2,000,000 (rural) \$3,300,000 (urban) | o Acquire 10 feet additional right-of-way. |
| | | o Intersection of CTH K and STH 38 | Construct intersection to provide direct movement between CTH K and STH 38 south of CTH K as shown in Figure 2. | \$ 400,000 | -- |
| | | Total Alternative 1 | \$4,700,000 (rural) \$6,000,000 (urban) | | |

-continued-

Table 3 (continued)

| Location of Problem | Description of Problem | Proposed Improvement | | |
|--|---|---|--|---|
| | | Proposed Improvement | Construction Cost | Disruption |
| CTH K and STH 38 o IH 94 to STH 31 (continued) | Future traffic congestion and continuous four traffic lanes (continued) | <u>Alternative 2--New Alignment</u> o IH 94 to STH 38 Widen existing CTH K from two-lane rural highway to four-lane divided highway between IH 94 and south of Sunflower Drive, and provide four-lane divided highway on new alignment to STH 38, as shown in Map 15. Widen STH 38 from existing CTH K to new alignment. | \$5,400,000 | o Acquire 130 feet of new right-of-way for new alignment between CTH K south of Sunflower Drive and STH 38; and acquire additional 12 to 47 feet of right-of-way on STH 38 between Brook Road and CTH K. Will reduce distance from 10 residential properties on STH 38 to roadway edge from 130 to 90 feet. |
| North-south corridor between C&NW Transportation Company New Line Subdivision right-of-way and STH 31. | Inadequate north-south arterial spacing upon complete urban development in area between STH 31 and C&NW railway right-of-way. | <u>Alternative 1</u> <u>Option A</u> --New arterial within and along the eastern portion of C&NW railway right-of-way between CTH KR and Four Mile Road, as shown on Map 16. | \$15,000,000 | o Acquisition of 130 feet of right-of-way for length of arterial. Property takings include 3 residential and 3 commercial properties. |
| | | <u>Option B</u> --New arterial on alignment shown in Map 16 between CTH KR and CTH K. | \$11,000,000 (additional costs would be entailed to improve STH 38). | o Acquisition of 130 feet of right-of-way for length of arterial. |
| | | <u>Option C</u> --New arterial within and along the western portion of the C&NW railway right-of-way between CTH KR and Four Mile Road. | \$14,000,000 | o Acquisition of 130 feet of right-of-way for length of arterial. |

-continued-

Table 3 (continued)

Page 7

| Location of Problem | Description of Problem | Proposed Improvement | | |
|----------------------------------|---|--|-------------------|--|
| | | Proposed Improvement | Construction Cost | Disruption |
| North-South corridor (continued) | Inadequate north-south corridor (continued) | <u>Alternative 2</u> Grade separations at following intersections along STH 31: STH 11 and STH 31; STH 20 and STH 31; CTH C and STH 31. | \$ 3,000,000 | o Acquisition of access rights at each intersection. |

| Location of Problem | Description of Problem | Proposed Improvement | | |
|-----------------------------|--|---|-------------------|---|
| | | Proposed Improvement | Construction Cost | Disruption |
| CTH KR from IH 94 to STH 31 | Inadequate gateway to Racine business and industrial park. | Widen existing two-lane rural highway to four-traffic-lane divided highway. | \$ 4,700,000 | o Acquire 64 feet additional right-of-way between IH 94 and STH 31. |

Source: SEWRPC.

on the western end of the proposed improvement. No building takings would be required.

Only the proposed conversion of STH 11 from Willow Road to STH 31 from an undivided to a divided roadway is necessary to resolve existing as well as future traffic congestion problems. Other proposed improvements are necessary to avoid future traffic congestion problems.

The proposed improvements for STH 11 are entirely consistent with those included in the adopted regional transportation system plan.

STH 20

The proposed improvement to STH 20, as shown on Table 3, would provide a four-lane divided highway from IH 94 to Oaks Road, and a six-lane divided highway from Oaks Road to STH 31. This would entail the widening of STH 20 from Oaks Road to Sunnyslope Drive and the prohibition of peak period parking and intersection widening on STH 20 from Oaks Road to STH 31. The proposed improvement would have an estimated construction cost of \$1.5 million. In addition, it would be desirable to widen the existing six-lane divided section of STH 20 from Sunnyslope Drive to STH 31 from twin 34-foot-wide pavements to twin 36-foot-wide pavements. No disruption would be entailed as sufficient right-of-way is available to accommodate the proposed improvements.

Of the proposed improvements to STH 31, only the prohibition of parking and intersection widening from Emmertson Road to STH 31 are proposed to resolve existing traffic problems. The other improvements, including prohibition of parking from Oaks Road to Emmertson Road and the widening of STH 20 from a four-lane to a six-lane divided highway from Oaks Road to Sunnyslope Drive are proposed to avoid future traffic problems.

The proposed improvements to STH 20 are entirely consistent with those recommended in the adopted regional transportation system plan. Along with these improvements, it is recommended that the STH 20 access control plan prepared by the Racine County Department of Planning and Zoning in cooperation with the Town of Mt. Pleasant and the Wisconsin Department of Transportation be implemented.

CTH C

The proposed improvement of CTH C would provide a divided multi-lane highway from CTH V to STH 31, as shown in Table 3. This would entail the widening of CTH C from CTH V to the existing six-lane divided section at Newman Road from an existing two-lane rural highway to a four-traffic-lane divided highway. This improvement would have an estimated construction cost of \$6.4 million, of which the improvement from Newman Road to Airline Road would have an estimated cost of \$2.3 million; and from Airline Road to CTH V would have an estimated cost of \$4.1 million with an urban section from CTH H to Airline Road, and a rural section from CTH V to CTH H. The disruption caused by the proposed improvements would be minimal, as sufficient right-of-way is available in most segments to permit construction of the desirable roadway cross-section, and in nearly all sections to permit construction of a minimal roadway cross-section.

The proposed improvement of CTH C from Airline Road to the existing six-lane divided section near STH 31 is necessary to resolve existing as well as future traffic problems, and the remaining proposed widening from CTH V to Airline Road is only necessary under future traffic conditions.

The proposed improvements of CTH C between Airline Road and the existing six-lane divided section near STH 31 are consistent with the recommendations for CTH C in the adopted regional transportation system plan. The proposed improvement of CTH C between CTH V and Airline Road is an additional improvement recommendation not included in that adopted plan.

CTH K and STH 38

Two alternatives, as shown on Table 3, are proposed for consideration for the improvement of CTH K and STH 38 between IH 94 and STH 31. CTH K and STH 38 serve as the northern segment of a loop arterial in eastern Racine County, and the northern entrance to the City of Racine and eastern Racine County. The first alternative would be to improve the existing alignment to provide a four-traffic-lane highway between IH 94 and STH 31. The sections of this route between IH 94 and CTH H in Franksville, and Kraut Road in Franksville and STH 31 would be improved to four-traffic-lane divided highways, and the section within Franksville between CTH H and Kraut Road would be improved to provide four traffic lanes on an undivided roadway section. This would entail widening existing two-lane rural highways between IH 94 and CTH H, and between Kraut Road and STH 38 to a four-traffic-lane divided highway; and between CTH H and Kraut Road in Franksville, the prohibition of parking during peak traffic periods. It is also proposed that the intersection of CTH K and STH 38 be reconstructed, as shown in Figure 2, to provide a direct connection between CTH K and STH 38 south of CTH K, and thus a direct route from IH 94 to STH 31 via CTH K and STH 38. The estimated construction cost of this alternative, if built to urban standards, is \$6.0 million, or, if built to rural standards, is \$4.7 million, and the estimated potential disruption is minimal as, throughout the entire route, sufficient right-of-way is available to provide for the construction of a minimal roadway cross-section and, in most cases, construction of a desirable roadway cross-section.

The second alternative would be to construct a four-lane divided highway on new alignment just east of IH 94 and south of Sunflower Drive to STH 38, as shown on Map 14. This alternative would have an estimated construction cost of \$5.4 million, and would entail substantial right-of-way acquisition. The advantage of this alternative is that it would avoid the constriction of the roadway in Franksville, and attendant traffic problems.

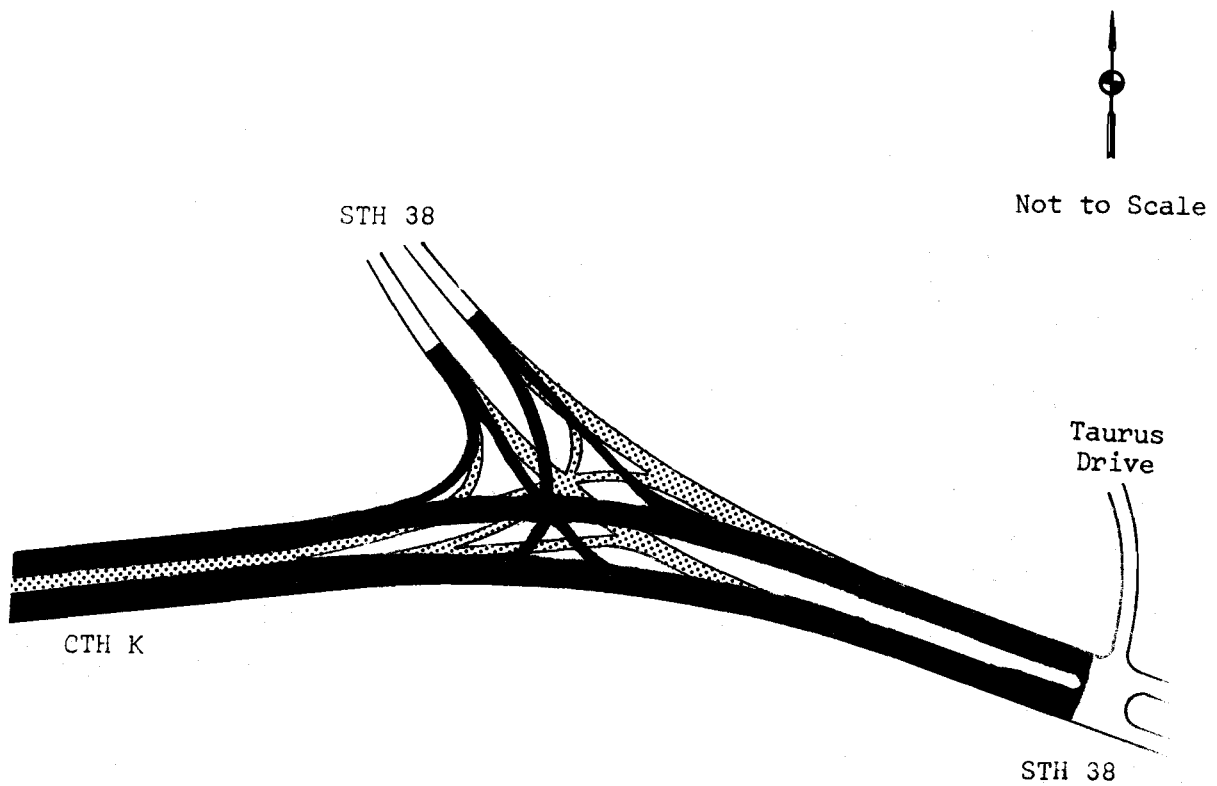
A third alternative would be to construct a new interchange with IH 94 at Four Mile Road and improve Four Mile Road so that it could serve as the northern segment of the eastern Racine County arterial loop. Under this option, the segment of CTH K between Franksville and STH 38 would also need to be improved to provide adequate traffic capacity. This alternative is currently a part of the adopted long-range transportation system plan.

It is recommended that Alternative 1--improvement of the existing alignment--be selected as the recommended plan of improvement. The proposed improvement of the existing alignment would entail little right-of-way acquisition, and would provide sufficient roadway capacity to carry existing and anticipated future traffic volumes. The only major restriction along this alignment is in Franksville, and it can be adequately addressed with pavement widening and prohibition of parking.



The recommended improvements for CTH K between Franksville and STH 38 are consistent with those in the adopted regional transportation system plan. The

Figure 2

PROPOSED RECONSTRUCTION OF INTERSECTION OF CTH K AND STH 38

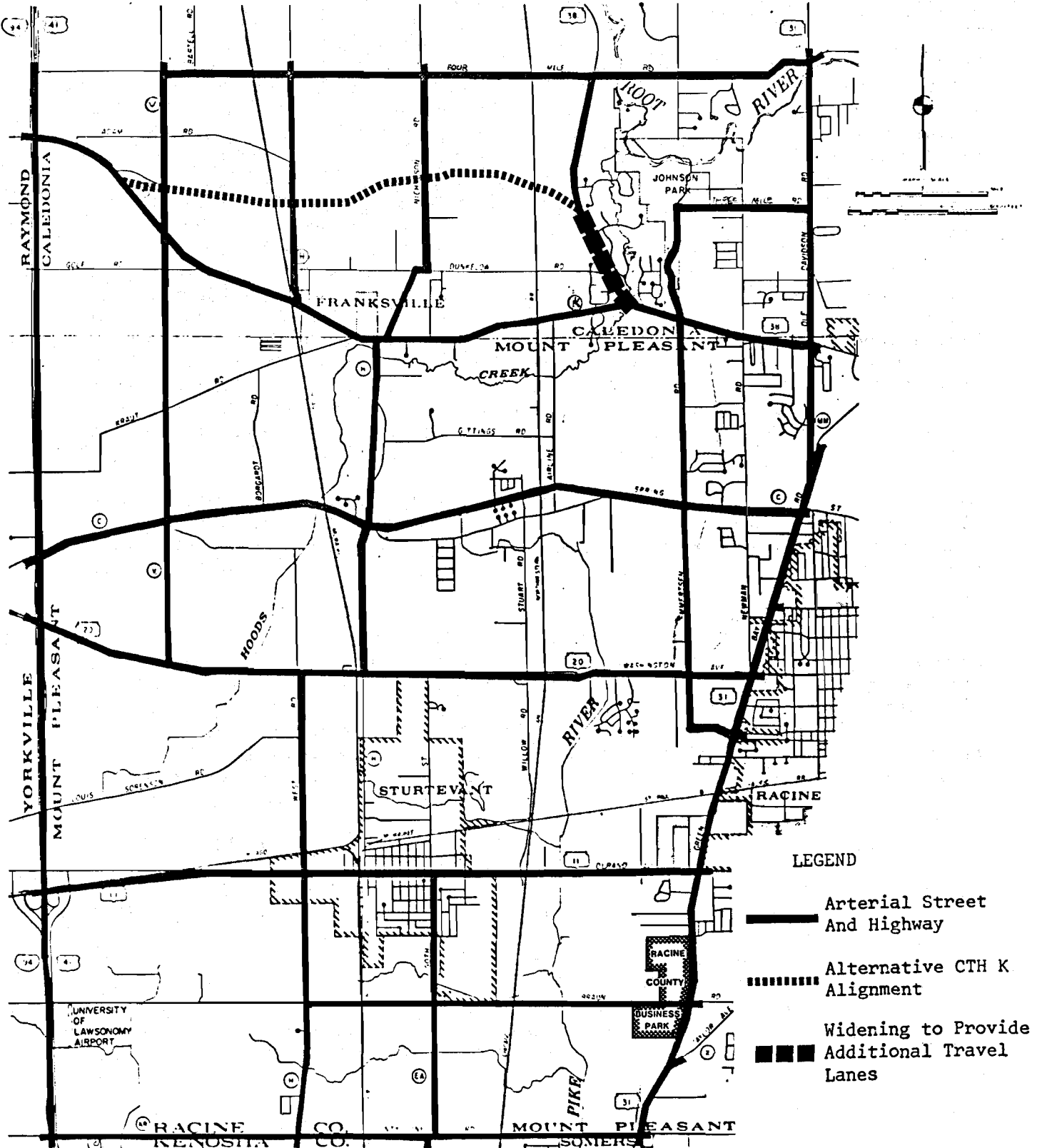


LEGEND

-  New Pavement
-  Existing Pavement to Be Removed

Map 14

PROPOSED ALIGNMENT OF CTH K UNDER
ALTERNATIVE 2--CONSTRUCT NEW ALIGNMENT--FOR
IMPROVEMENT OF CTH K AND STH 38 BETWEEN IH 94 AND STH 38



recommended improvements for CTH K within Franksville and between Franksville and IH 94 were not recommended in the adopted regional transportation system plan. The differences result from the proposed deletion of a new interchange of IH 94 with Four Mile Road. Rather, CTH K would serve as the northern access to the Racine arterial loop and to eastern Racine County and the City of Racine, and require additional improvement.

North-South Corridor Between Chicago & North Western Transportation (C&NW) Company New Line Subdivision Right-of-Way and STH 31

Two alternatives are proposed to address the problem of inadequate north-south arterial spacing which currently exist, and may be expected to increase with the development to urban densities of the area between STH 31 and the C&NW railway right-of-way, located two to three miles west of STH 31. Alternative 1 would provide a new arterial facility to serve the proposed development, and provide adequate arterial spacing. Without such a facility, future traffic volumes on STH 31 may be expected to exceed the design capacity of a six-lane divided arterial roadway. In addition, traffic flow to and from the planned development will be indirect and inefficient, as it will need to use STH 31 to travel north and south. Also, traffic may be expected increase on Airline Road, Stuart Road, and Willow Road. It is important to recognize that the principal need for this improvement is to serve proposed urban development in Racine County west of STH 31, and not to provide a new north-south arterial connection between Milwaukee, Racine, and Kenosha Counties. Three options, as shown on Map 15, have been identified for this new arterial. As shown on Table 3, the estimated cost of the new roadway would be approximately \$15 million. It would require substantial right-of-way acquisition; however, residential property and business takings and relocation would be limited.

The other alternative proposed would not resolve the problem of indirect traffic flow to and from the planned development, but would, rather, attempt to address the increased burden of traffic on STH 31 by providing grade separations at key intersections, including the intersections of STH 31 with STH 20, STH 11 and CTH C.

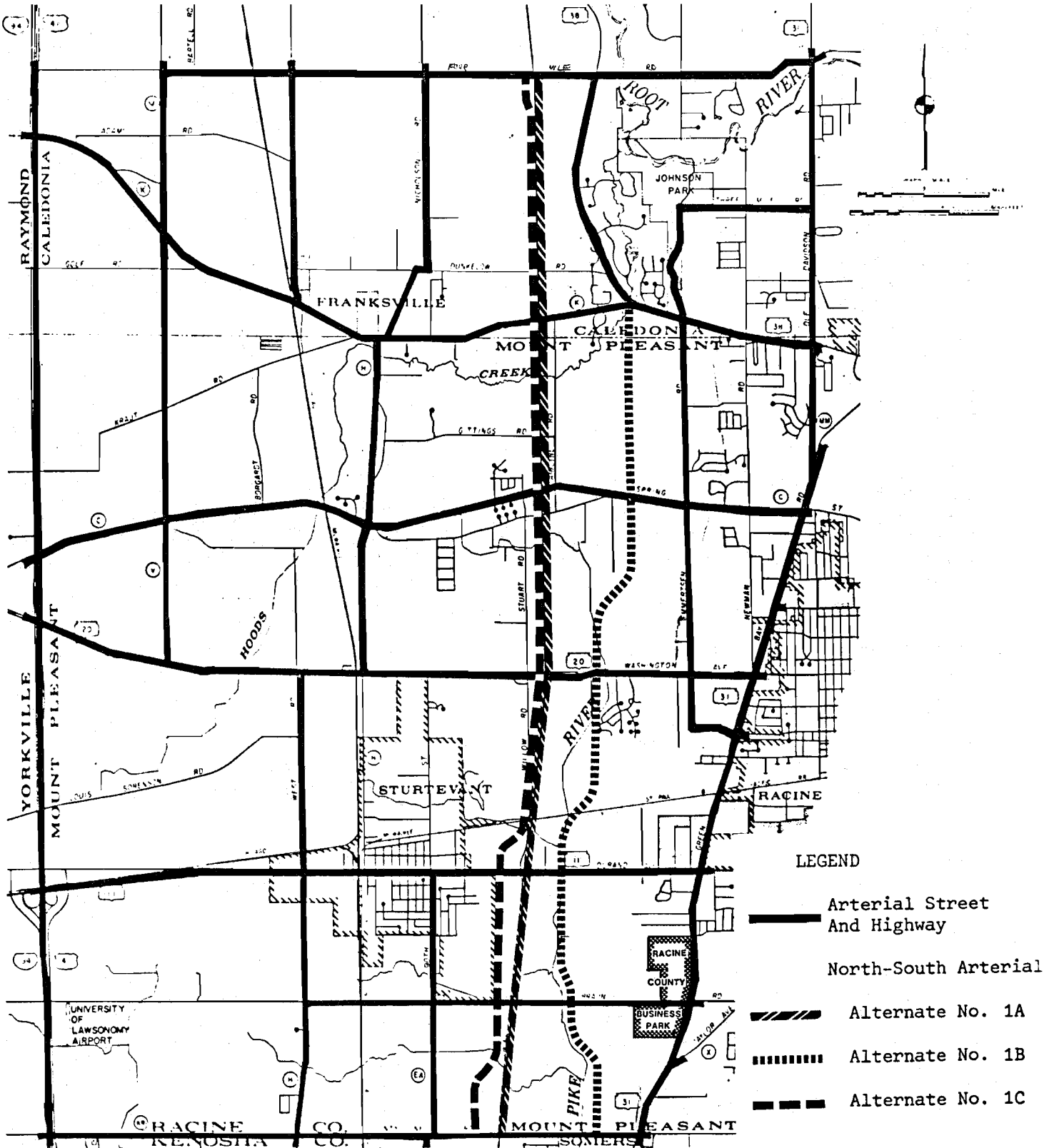
It is recommended that one of the three options under Alternative 1--which proposes the development of a new arterial west of STH 31--be implemented. A preliminary first step taken toward such implementation should be the conduct of a preliminary engineering study which would establish the best alignment for this alternative from the options identified. This proposed new arterial is consistent with amended recommendations of the adopted regional transportation system plan, which substituted an arterial facility for the Lake Freeway.

CTH KR

The proposed improvement of CTH KR, as shown on Table 3, would provide a divided four-lane facility from IH 94 to STH 31. This would entail the widening of CTH KR from a two-lane rural highway to a four-lane divided highway. The proposed improvement would have an estimated construction cost of \$4.7 million. Disruption would be entailed by this improvement as the existing right-of-way of CTH KR is limited to 66 feet. This improvement is considered essential to provide an appropriate gateway from the south to the Racine business and industrial park proposed in the vicinity of STH 31 and CTH KR and, as well, an appropriate gateway to northeastern Kenosha County. Implementation of this improvement should be short-range, to provide such an appropriate gateway.

Map 15

PROPOSED ALTERNATIVE ALIGNMENTS FOR
NEW NORTH-SOUTH ARTERIAL WEST OF STH 31



The proposed development of CTH KR as the southern connection of the arterial loop is consistent with recommendations of the adopted regional transportation system plan. The proposed improvement of CTH KR to a four-lane, divided facility was not included in the adopted regional transportation system plan, but is recommended to provide a proper gateway to the Racine business and industrial park proposed near STH 31 and Braun Road, and to northeastern Kenosha County; and to provide a better southern connection to the Racine arterial loop. This improvement of CTH KR could be carried beyond the study area to STH 32. It should be noted that the improvement of CTH KR could be developed in stages, with the first stage consisting of the construction of two of the proposed four lanes either on the existing 66-foot-wide right-of-way or the proposed 130-foot-wide right-of-way. This first stage of the improvement would have an estimated cost of \$3.0 million with a rural section.

Emmertsen Road

Another recommended arterial improvement in the study area is the extension of Emmertsen Road between STH 38 and Three Mile Road to replace the current connection between Emmertsen Road and Three Mile Road provided by the access road to Johnson Park. This improvement has been recommended for many years as the Johnson Park access road, with its adjacent recreational activity, should not serve as an arterial facility. The estimated cost of this improvement is \$900,000. Access to the park could be provided from the new arterial north of STH 38. Relocation of the park access road to the west would be required near Three Mile Road to provide for the connection of the new arterial to Emmertsen Road.

Summary of Recommended Improvements

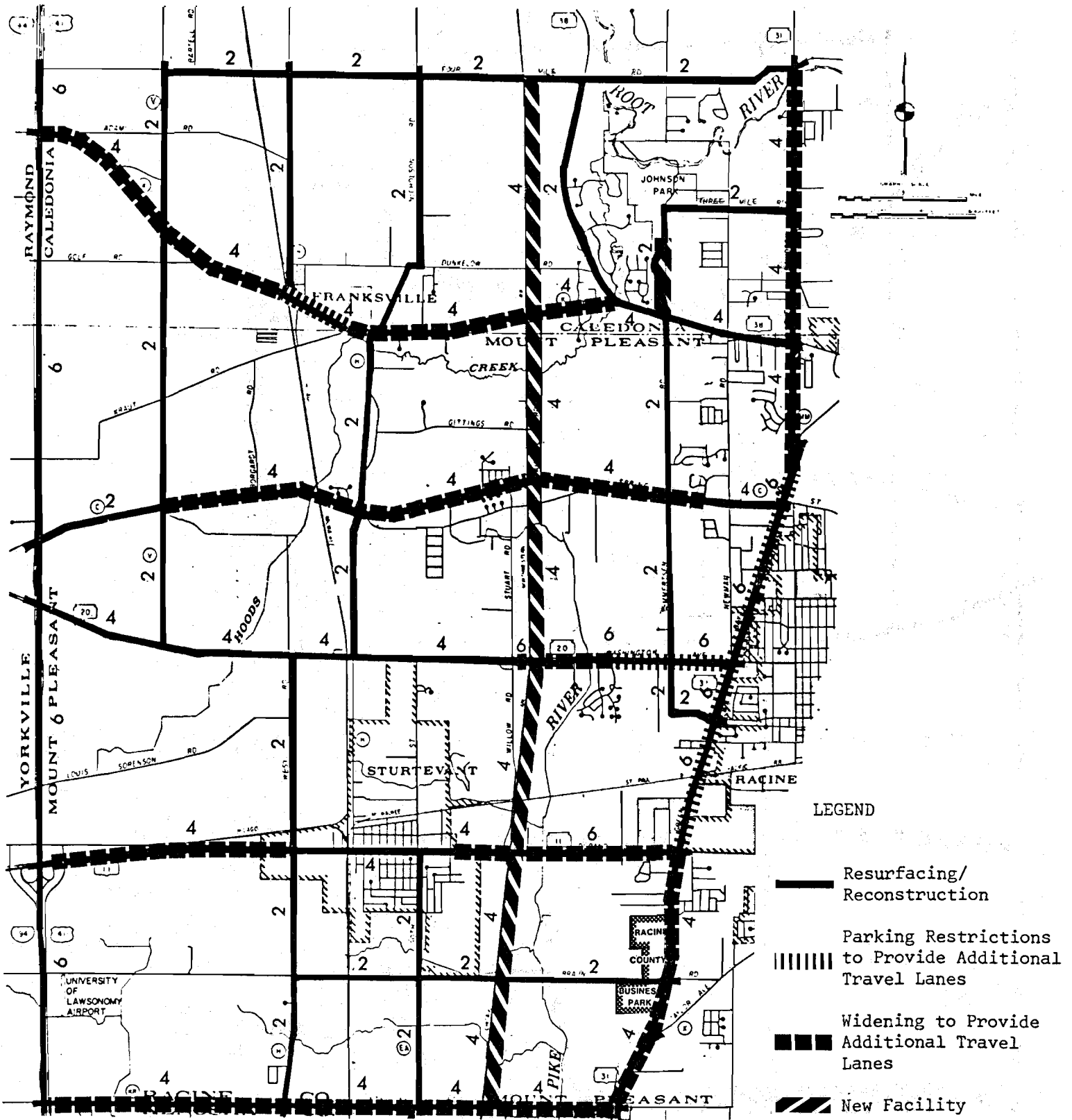
The recommended arterial street improvements in the eastern Racine County study area are shown on Map 16. The number of lanes which should be provided on each segment of arterial highway is indicated. In addition, those segments which will require widening to provide the recommended number of lanes and those segments which will require only parking prohibition to obtain the recommended number of lanes are indicated. The total estimated cost of the recommended improvements ranges from \$46.2 to \$50.9 million, with the range of cost depending upon whether the roadway improvements are constructed with rural or urban sections. The Wisconsin Department of Transportation would be responsible for the proposed state trunk highway improvements, representing \$31.5 to \$36.2 million of the total cost, or about 70 percent; Racine County would be responsible for the proposed county trunk highway improvements, representing \$13.8 million of the total costs, or about 28 percent; and local governments would be responsible for the local arterial improvements, representing \$0.9 million of the total costs, or about 2 percent.

Map 17 identifies those of the planned improvements which are recommended to resolve existing needs and those planned improvements which are recommended to resolve anticipated future needs.

The recommended plan of improvements differs somewhat from the existing adopted regional long-range plan. The differences, however, were necessary to resolve the problems in implementing the eastern Racine County arterial loop recommended as part of the adopted long-range transportation system plan. This difficulty of implementation was one of the reasons for undertaking this study. The principal difference between the recommended improvements and the adopted plan is that a new interchange on IH 94 with Four Mile Road is no longer recommended. Rather, the northern connection of the arterial loop and

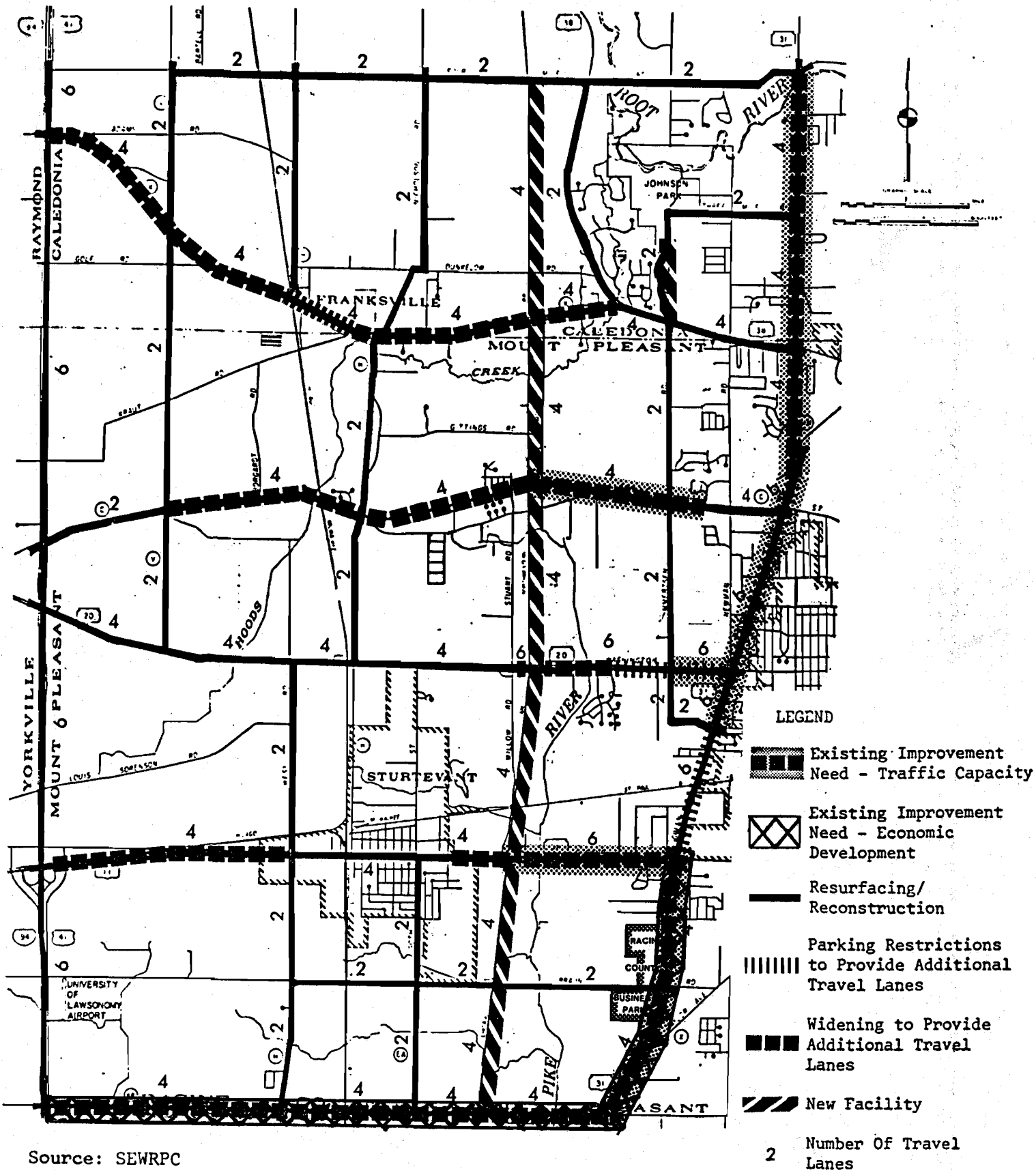
Map 16

RECOMMENDED PLAN OF
IMPROVEMENTS FOR RACINE COUNTY



Map 17

EXISTING AND FUTURE NEED FOR PLANNED
IMPROVEMENTS IN EASTERN RACINE COUNTY



the northern entrance to eastern Racine County and the City of Racine is proposed to be CTH K and STH 38, and additional improvements are recommended for CTH K and STH 38.

RECOMMENDED JURISDICTIONAL CLASSIFICATION OF ARTERIAL STREETS AND HIGHWAYS

Map 7 of this report showed the existing jurisdictional classification of the study area street system. The proposed jurisdictional classification of the street system in the eastern Racine County study area under the adopted regional transportation system plan is shown on Map 18. Based on the changes in the recommended long-range arterial street system for the study area, and with consideration of the criteria applied to establish jurisdictional classification--including trip length, traffic volume, travel speed, facility spacing, and land use served--the recommended jurisdictional classification of the arterial street system in eastern Racine County is shown on Map 19. Maps 20 and 21 document the changes in the existing jurisdictional classification which must be made to implement the proposed jurisdictional classification. The recommended jurisdictional responsibility changes include the transfer of STH 38 and STH 11 from state trunk to county and local trunk highway systems. The proposed change in jurisdictional classification of STH 38 to a county trunk highway assumes STH 38 would be transferred as well in Milwaukee County. Until such change is made, it is recommended that only the portion of STH 38 from CTH K to CTH G, a distance of 3.9 miles, be transferred to the County, and STH 38 be re-routed from that location to STH 31 over CTH G, a change in jurisdiction over a distance of 2.1 miles. The recommended jurisdictional responsibility changes also include the transfer of CTH K and CTH KR from the county trunk highway system to the state trunk highway system. The new north-south arterial along the Chicago & North Western railway is recommended to be developed as a state trunk highway.

PLAN IMPLEMENTATION

The following actions should be taken by the Wisconsin Department of Transportation, Racine County, and the Towns of Mount Pleasant and Caledonia to implement the recommended plan of improvements.

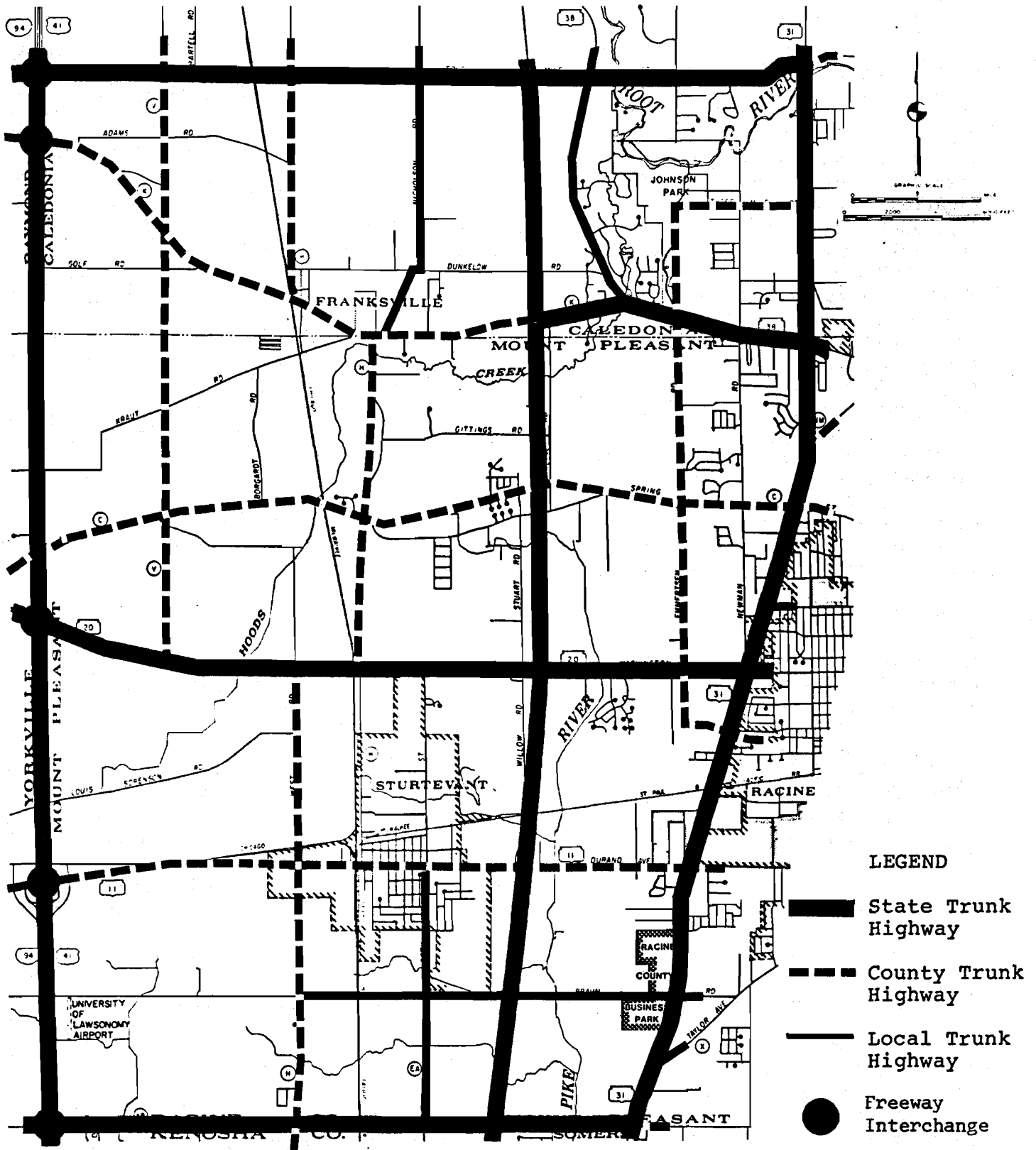
Wisconsin Department of Transportation

Short-Range Action:

1. Adopt the recommended plan of improvements as an amendment to the adopted regional transportation system plan and use the plan as a guide to state transportation system development actions within the area.
2. Widen the intersection of STH 20 and STH 31 to provide three through traffic lanes on each of the four approaches to the intersection, thereby permitting the provision of six traffic lanes on STH 20 between Emmertsen Road and STH 31, and on STH 31 between 16th Street and CTH MM.
3. Initiate recommended jurisdictional transfers between the State and local units of government in order to permit recommended improvements to be implemented. These transfers include the transfer of STH 11 and STH 38/STH 20 from state to county and municipal jurisdictions, specifically, STH 11 and STH 20 should be transferred to Racine County, and STH 38 to the Town of Caledonia. Also, CTH KR and CTH K should be transferred from Racine County to the State of Wisconsin.

Map 18

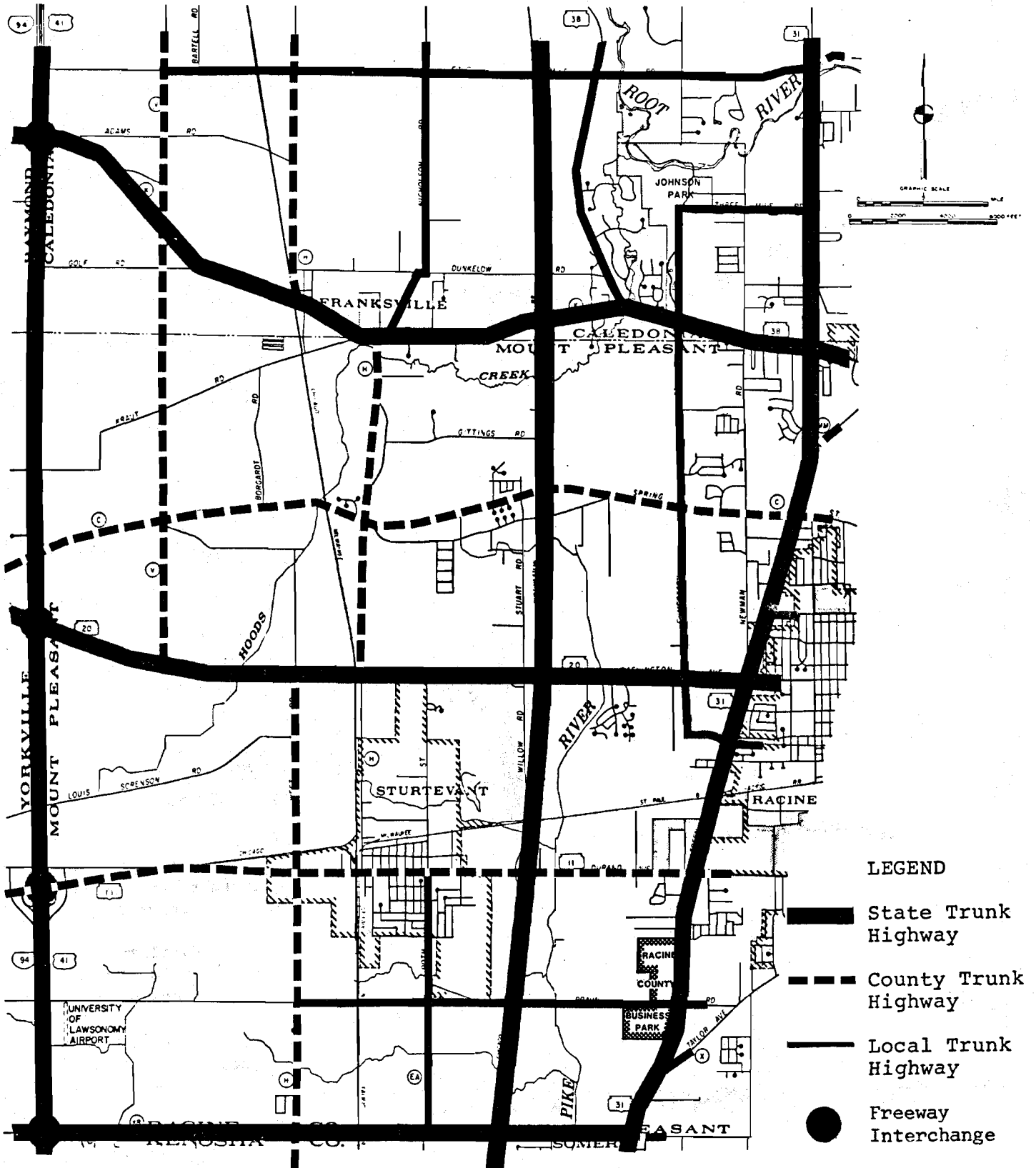
PROPOSED JURISDICTIONAL CLASSIFICATION OF
THE EASTERN RACINE COUNTY ARTERIAL STREET SYSTEM UNDER
THE ADOPTED REGIONAL TRANSPORTATION SYSTEM PLAN: 2000



Source: SEWRPC.

Map 19

RECOMMENDED JURISDICTIONAL CLASSIFICATION OF THE
EASTERN RACINE COUNTY ARTERIAL STREET SYSTEM: 2000



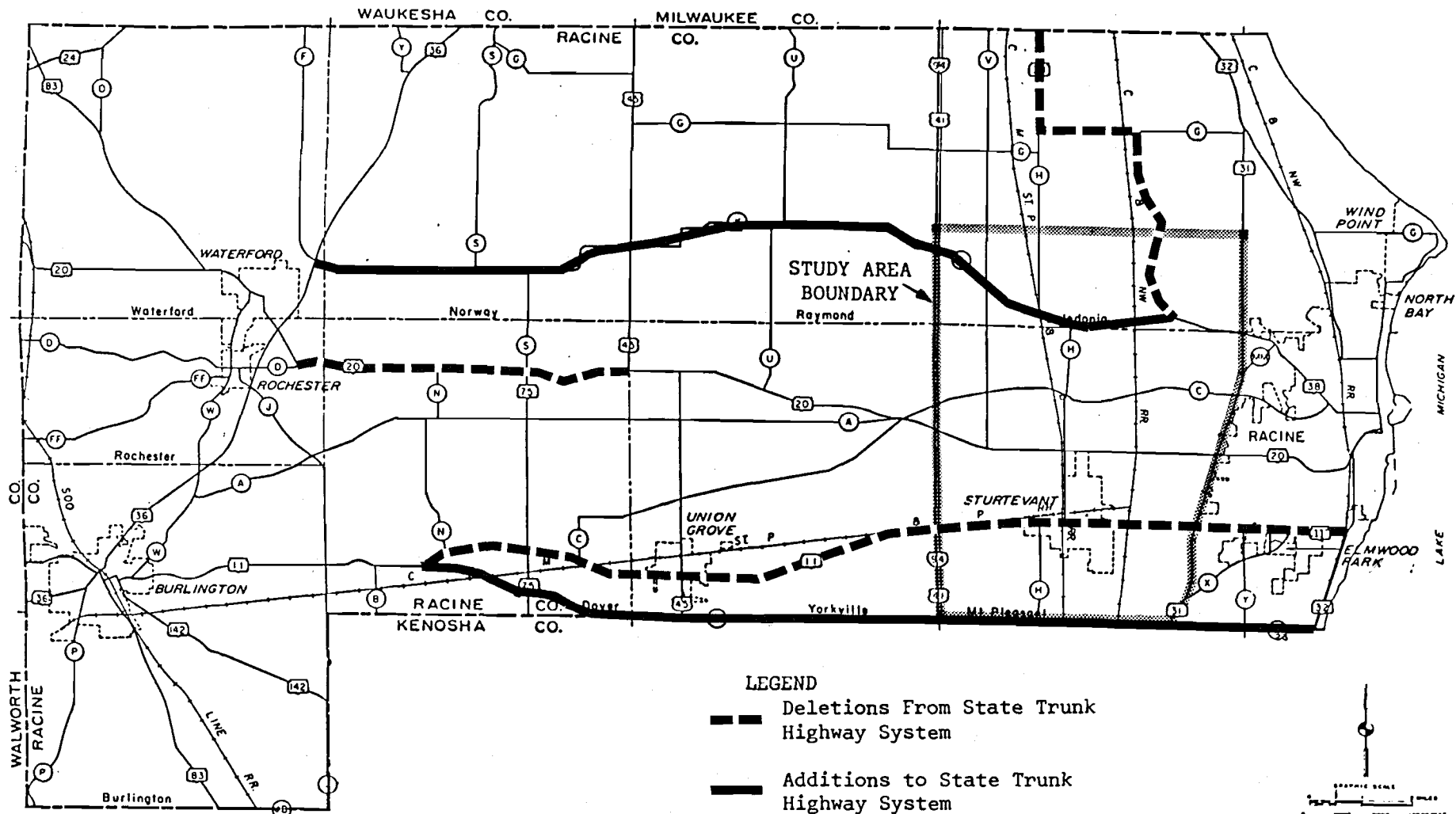
The map displays Racine County, Wisconsin, with various towns and roads. Key locations include Yorkville, Mount Pleasant, Sturtevant, Racine, and Caledonia. Major roads shown are Raymond, Yorkville, Mount Pleasant, Adams, Dunne, Gittins, Stuart, and Racine. The Root River and Racine River are also depicted. A legend in the bottom right corner defines the line styles used for proposed highway improvements:

- Facility Reverts to Local Unit of Government (solid line)
- Facility Added to County Trunk Highway System (dashed line)
- Facility Added to State Trunk Highway System (thick solid line)

Source: SEWRPC

Map 21

PROPOSED CHANGES IN THE STATE
TRUNK HIGHWAY SYSTEM IN RACINE COUNTY^a



^a Until STH 38 is transferred to county jurisdiction in Milwaukee County, it is proposed that only the portion of STH 38 from CTH K to CTH G be transferred to county jurisdiction, and STH 38 be re-routed along CTH G to STH 31.

Source: SEWRPC

4. Conduct the necessary preliminary engineering to identify a definitive alignment of the proposed new arterial facility along the Chicago & North Western railway right-of-way. This alignment should then be provided to the County and to the Towns of Mount Pleasant and Caledonia to be used in the guidance of land development decisions.
5. Implement the proposed widening of STH 31 from CTH KR to STH 11. This improvement is considered a "major" project and, as such, will have to compete for funding against other projects statewide.
6. Implement the proposed improvement of CTH KR from IH 94 to STH 31. This project is also considered a "major" project and, as such, will have to compete for funding against other such projects statewide.
7. Reconstruct the intersection of CTH K and STH 38.

Medium-Range Actions:

1. Implement the proposed improvement of STH 31 between CTH MM and STH 38.
2. Implement the proposed improvement of STH 20 between Willow Road and Emmertsen Road.

Long-Range Actions:

1. Implement the proposed improvement of STH 31 between STH 38 and Four Mile Road.
2. Implement the recommended improvement of CTH K between IH 94 and STH 38.

Racine County

Short-Range Actions:

1. Adopt the recommended plan of improvements as an amendment to the adopted regional transportation system plan, and use the plan as a guide to county land use and transportation system development actions within the area.
2. Participate in recommended jurisdictional transfers with the State of Wisconsin.

Medium-Range Action:

1. Implement the recommended improvement of CTH C from Airline Road to Newman Road.
2. Implement the proposed improvement of STH 11 between STH 31 and Village of Sturtevant eastern corporate limits.

Long-Range Actions:

1. Implement the recommended improvement of CTH C between Airline Road and CTH V.
2. Implement the recommended improvement of STH 11 between IH 94 and West Road.

Towns of Mount Pleasant and Caledonia

Short-Range Actions:

1. Adopt the recommended plan of improvements as an amendment to the adopted regional transportation system plan, and use the plan as a guide to local land use and transportation system development actions within the area.
2. Prohibit parking on the segment of STH 31 from CTH MM to 16th Street, and on STH 20 between STH 31 and Emmertsen Road (Town of Mount Pleasant).
3. Prepare an official map upon completion of Wisconsin Department of Transportation preliminary engineering study to preserve the right-of-way required along the alignment of the proposed new arterial along the Chicago & North Western railway right-of-way and to guide land development decisions.
4. Participate in recommended jurisdictional transfers with State of Wisconsin (Town of Caledonia).

Medium-Range Actions:

1. Prohibit parking on proposed improvement segment of STH 20 between Willow Road and Emmertsen Road (Town of Mount Pleasant).

SUMMARY AND CONCLUSIONS

This report presents the findings and recommendations of a study of the existing and long-range need for highway improvements in eastern Racine County. The study was conducted by the Southeastern Wisconsin Regional Planning Commission at the request of the Racine County Board. The eastern portion of Racine County was, in 1966, proposed to be served by a freeway loop. The freeway loop was in 1978 removed from the regional transportation system plan and replaced with an arterial loop. That arterial loop was to have been composed of a new highway interchange with IH 94 at Four Mile Road; an improved segment of Four Mile Road at an interchange with STH 31; an improved segment of STH 31 from Four Mile Road to CTH KR; and an improved segment of CTH KR from STH 31 to its interchange with IH 94. The Racine County Board requested this study because of all the improvements recommended as part of the arterial loop, only the widening of a portion of STH 31 had been completed to date, and no action was currently being undertaken to implement the remaining planned improvements. Yet, major land use developments which were to have been served by the arterial loop were already in place or underway.

The requested study investigated the existing and probable future transportation needs in eastern Racine County, that is, the area bounded by the proposed arterial loop: Four Mile Road on the north, STH 31 on the east, CTH KR on the south, and IH 94 on the west. In the study area, the need for major arterial improvements was examined in order to permit the proposal of an amendment to the regional transportation system plan which would result in local, state, and federal agreement on needed area improvements and the jurisdictional responsibility for those improvements.

The existing and anticipated future need for major street improvements in the study area was established in the study. Transportation problems with respect to traffic congestion, inadequate arterial street spacing, and indirect arterial routing were identified. The analysis determined that the following seg-

ments of arterial highway in the study area carried average weekday traffic volumes which exceeded their design capacity: STH 31 from CTH KR to STH 11 and from 16th Street to Four Mile Road; STH 20 from Emmertsen Road to STH 31; STH 11 from Willow Road to STH 31; and CTH C from Airline Road to the existing four-lane divided section at Newman Road, as shown on Map 12. Probable future traffic congestion problems were also identified based upon anticipated population and employment growth in the study area, and, as well, by changes in traffic which moves through the study area and is generated by areas outside the study area. The following segments of arterial highway were determined to be expected to experience traffic congestion by the year 2000, carrying expected future average weekday traffic volumes exceeding their design capacity: STH 31 from CTH KR to Four Mile Road; STH 11 from IH 94 to the Village of Sturtevant western corporate limits; from the village eastern corporate limits to STH 31; STH 20 from Willow Road to STH 31; CTH C from CTH V to STH 31; and CTH K from IH 94 to STH 38, as shown on Map 13.

Improvements necessary to resolve the identified existing and probable future transportation problems were defined and evaluated with respect to construction costs and potential disruption, including right-of-way acquisition and property takings. It was recommended that STH 31 be improved to a divided, multi-lane highway throughout the study area from CTH KR to Four Mile Road. This would entail the widening of two segments of STH 31 from two-lane rural highways to four-lane divided highways, including a segment from CTH KR to STH 11 and a segment from CTH MM to Four Mile Road, as shown on Map 16. It was also proposed that parking be prohibited at least during peak periods and intersections be widened on existing segments of STH 31 to permit full use of the existing six lanes on STH 31 from STH 11 to CTH MM, as shown on Map 16. The estimated cost of these improvements is \$5.6 to 9.0 million, the cost within this range depending upon whether the improved roadway would be built to urban or rural standards.

It was recommended that STH 11 also be improved to a multi-lane highway from IH 94 to STH 31. A four-lane undivided roadway would be provided in the Village of Sturtevant; a connecting four-lane divided section would be provided to the west to IH 94; and a connecting six-lane divided section to the east to STH 31. This improvement would require the widening of STH 11 from IH 94 to West Road in the Village of Sturtevant from a two-lane to a four-lane roadway section, and the widening to a six-lane divided section of the existing four-traffic-lane undivided section of STH 11 from the eastern corporate limits of the Village of Sturtevant to STH 31, all as shown on Map 16. The estimated cost of these improvements is \$7.4 million.

It was recommended that STH 20 be improved to provide six traffic lanes from Willow Road to STH 31. This would entail the widening of STH 20 from Willow Road to Sunnyslope Drive and the prohibition of peak period parking and intersection widening on STH 20 from Willow Road to STH 31 to permit full use of six traffic lanes, as shown on Map 16. The estimated cost of these improvements is \$1.5 million.

It was recommended that CTH C be improved to provide a divided multi-lane highway from CTH V to STH 31. This would entail the widening of CTH C from CTH V to about Newman Road from an existing two-lane rural highway to a four-traffic-lane divided highway, as shown on Map 16. The estimated cost of these improvements is \$6.4 million.

It was recommended that CTH K and STH 38 be improved to provide a multi-lane highway through the study area, as shown on Map 16. The section of this route between IH 94 and Franksville would be improved to a four-traffic-lane divided highway. The section within Franksville would require parking prohibition only. The widening of CTH K between Franksville and STH 38 to a four-lane divided highway was also recommended, as well as the reconstruction of the intersection of CTH K and STH 38, to provide a direct connection between CTH K and STH 38.

It was recommended that CTH KR be improved to provide a divided four-lane facility from IH 94 to STH 31, as shown on Map 17. This improvement was recommended to provide a proper gateway to the Racine business and industrial park proposed near STH 31 and Braun Road, and to provide a higher standard southern connection to the Racine arterial loop. The estimated cost of this improvement is \$4.7 million. It should be noted that the improvement of CTH KR could be developed in stages, with the first stage consisting of the construction of two of the proposed four lanes, either on the existing 66-foot-wide right-of-way or the proposed 130-foot-wide right-of-way. This first stage of the improvement would have an estimated cost of \$3.0 million.

The following recommended improvements were identified as necessary to resolve existing traffic problems: the widening of STH 31 from CTH KR to STH 11 and from CTH MM to Four Mile Road; the prohibition of parking and selected intersection widening along STH 31 from 16th Street to CTH MM; the prohibition of parking and intersection widening of STH 20 from Emmertsen Road to STH 31; the widening of STH 11 from Willow Road to STH 31; and the widening of CTH C from Airline Road to the existing four-lane divided roadway section west of Newman Road. The following additional improvements were recommended as necessary to resolve probable future traffic problems: the widening of STH 11 from IH 94 to the western Village of Sturtevant corporate limits and from the eastern Village limits to Willow Road; the widening of STH 20 from Willow Road to Sunnyslope Drive and the prohibition of parking from Willow Road to Emmertsen Road; the widening of CTH C from CTH V to Airline Road; the widening of CTH K from IH 94 to Franksville and from Franksville to STH 38 and the prohibition of parking in Franksville; the reconstruction of the intersection of CTH K and STH 38; and the construction of a new arterial facility paralleling the Chicago & North Western Transportation Company's New Line Subdivision railway. The timing of the improvement of CTH KR from IH 94 to STH 31 should be short-range to provide an appropriate gateway to the Racine business and industrial park and, as well, to the City of Racine central business district and harbor and northern Kenosha County.

Recommendations were also made with respect to the changes in the jurisdictional responsibility for each segment of arterial street within the eastern Racine County study area. These recommendations were based on the recommended long-range improvements for the arterial street system for the study area, and consideration of the criteria applied to establish jurisdictional classification, including trip length, traffic volume, traffic speed, facility spacing, and land use served. The recommended jurisdictional responsibility changes include the transfer of STH 38 and STH 11 from state trunk to county and local trunk highway systems. The recommended jurisdictional responsibility changes also include the transfer of CTH K and CTH KR from the county trunk highway system to the state trunk highway system.

The total estimated cost of the recommended improvements ranges from \$46.2 to \$50.9 million, with the range of cost depending upon whether the roadway improvements are constructed with rural or urban design standards. The Wisconsin Department of Transportation would be responsible for the proposed state trunk highways, representing \$31.5 to \$36.2 million of the total cost, or about 70 percent; Racine County would be responsible for the proposed county trunk highways, representing \$13.8 million of the total costs, or about 28 percent; and local governments would be responsible for \$0.9 million of the total costs, or about 2 percent.

**SOUTHEASTERN WISCONSIN REGIONAL
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