SOUTHEASTERN WISCONSIN REGIONAL FREEWAY SYSTEM RECONSTRUCTION STUDY

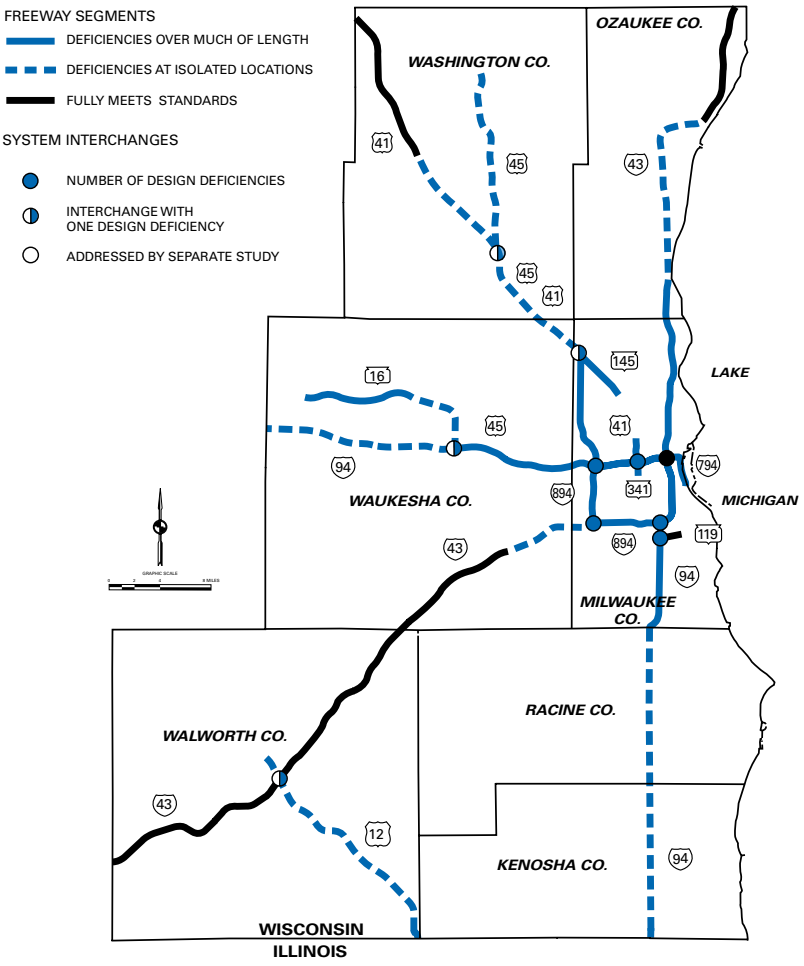
STUDY NEWSLETTER 3 JUNE 2001

Context for Freeway Problems and Deficiencies

In many respects the 272-mile freeway system in Southeastern Wisconsin has performed well. Freeways have become the mode of choice for much of the Region's trip-making. These 3 percent of our streets and highways carry 30 percent of all travel in Southeastern Wisconsin on an average weekday. Our freeways have also lasted a long time, generally meeting service life expectations of 40-50 years under heavy usage and harsh winters. Plus, the freeway system functions well in spite of the fact that many freeway segments were never completed as originally planned. Nevertheless, there are problems with the freeway system which are widely acknowledged.

This newsletter issue summarizes the identified problems and deficiencies of our freeways with respect to physical design, traffic safety, and traffic congestion.

EXISTING FREEWAY SYSTEM DESIGN DEFICIENCIES: 2000



Physical Design Deficiencies

The physical design characteristics of each freeway segment in the Region were compared to modern design standards. These design standards are described in the table inside this newsletter.

The map to the left summarizes the location of existing design deficiencies for the Region's freeways:

- Many of the oldest freeway segments, predominantly in Milwaukee County, do not meet a number of modern design standards for much of their length, including shoulder width, entrance/exit ramp spacing, lane balance, vertical curvature, and vertical clearance.
- Many older freeway segments in outlying counties generally meet the modern design standards with the exception of one or two standards at isolated locations, including vertical alignment, vertical curvature, vertical clearance, or shoulder width.
- A number of freeway segments at the far outlying portions of the Region fully meet all design standards.

Traffic Safety Problems

The traffic safety problems of the existing freeway system were assessed by analyzing the traffic crash, or accident, history over the recent three year period of 1996, 1997, and 1998. The traffic crash rate for each one-tenth mile segment of the 272 mile regional freeway system was determined, and expressed as the number of crashes per 100 million vehicle-miles. Each freeway segment was then compared to both the regional freeway system average crash rates and the average crash rate for freeways within the county where the freeway segment was located. Those freeway segments with crash rates exceeding the

DESIGN STANDARDS AND GUIDELINES FOR THE REGIONAL FREEWAY SYSTEM

STANDARD
Vertical Curvature Stopping Sight Distance – Provide adequate sight distance to observe an obstacle located on the freeway beyond a crest or in a sag, to react and stop a vehicle safely and comfortably prior to reaching the obstacle.
Horizontal Curvature – Avoid sharp curves so travel can be made safely at design speeds.
Vertical Alignment (Grade) – Avoid steep grades to maximize sight distance, permit design speeds to be achieved by all types of vehicles, and minimize variations in speeds. Provide some grade for drainage.
Lane Widths – Provide adequate (12-foot) travel lanes to allow for safe and comfortable driving.
Shoulder Width – Provide adequate width to shelter a stopped vehicle (10-12 feet).
Lane Balance – Maintain the number of lanes provided over a freeway, and particularly the number of lanes through interchanges to be consistent with the number of lanes approaching the interchanges.
Route Continuity – Provide a directional path through an interchange which delineates the major route and minimizes the need for lane changes to follow that route.
Entrance/Exit Ramp Spacing – Provide adequate distance between freeway ramps measured from ramp nose to ramp nose to allow traffic to merge and diverge without impeding adjacent freeway ramp traffic or freeway mainline traffic
Vertical Clearance – Minimum height of bridges over the freeway measured from the pavement to the bottom of freeway overpasses (16 feet), signs and pedestrian bridges (17 feet).
Weave Segments – No left hand ramps, or left hand lane drops at interchanges, so as to avoid stretches of freeway where two or more traffic streams must cross each other or change lanes between adjacent merge and diverge points.
GUIDELINE
Interchange Spacing – Provide adequate distance between adjacent interchanges to minimize the impact on freeway mainline merging, diverging, and weaving movements associated with freeway interchanges.

regional average, and/or their county freeway average crash rate, were considered to experience traffic safety problems.

The average freeway crash rates within the seven counties of Southeastern Wisconsin are shown to the right. Only the Milwaukee County freeway crash rate of 106 crashes per 100 million vehicle-miles is greater than the regional average rate of 77.

Statewide, the crash rate for Interstate freeways located in urban areas is an estimated 101 crashes per 100 million vehicle-miles, while rural Interstate freeways average 57 crashes.

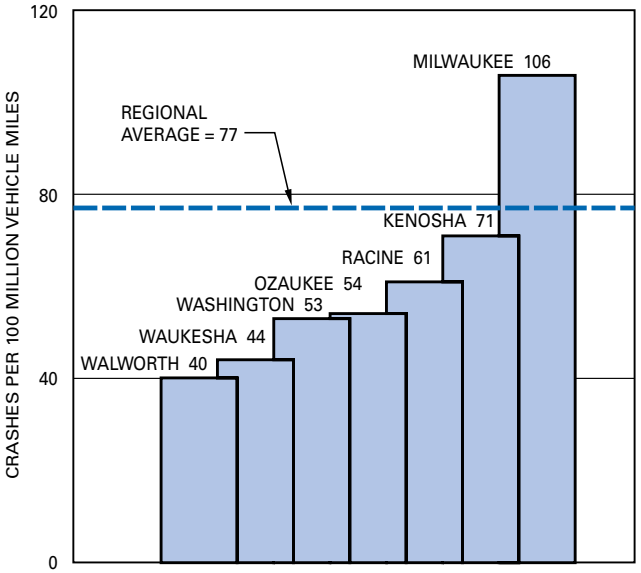
Traffic Congestion Problems

Existing traffic congestion on the freeway system was estimated by reviewing for each freeway segment average weekday hourly traffic speeds, traffic densities, and traffic volumes. Historic levels of traffic congestion were compared to the estimated existing traffic congestion. Also, a forecast of future congestion for the year 2020 was prepared. This forecast assumes full implementation of the Commission's year 2020 regional land use and transportation plans. It thus indicates the freeway traffic congestion that may be expected even if we achieve: 1) a more desirable pattern of regional and neighborhood land use development (that is, "smart growth"); 2) a significant 70 percent expansion of public transit; and 3) a substantial expansion of surface arterials (530 miles of widened and new arterial streets and highways). Freeway traffic congestion occurs in three levels:

- Moderate Traffic Congestion—Minor reduction in speeds of up to 5 mph. Freedom to maneuver or change lanes is substantially limited. Minor disruptions, such as multiple vehicles entering or vehicles parked on the side of the freeway, will result in a breakdown of flow with stop-and-go traffic. Volumes at 66 to 80 percent of maximum traffic carrying capacity. Defined as level of service "D."
- Severe Traffic Congestion—Freeway speeds reduced about 5 to 15 mph below typical free-flow speed. Extremely limited maneuverability. No gaps in traffic to accommodate lane changing or vehicles entering the freeway. Minor disruptions such as multiple vehicles entering the freeway or vehicles parked on the side will result in a breakdown of flow with stop-and-go traffic. Traffic volumes at 81 to 100 percent of maximum capacity. Defined as level of service "E."
- Extreme Traffic Congestion—Freeway speeds of 20 to 30 miles per hour or less. Breakdown of freeway traffic flow with stop-and-go, bumper-to-bumper traffic. No ability to maneuver or change lanes. Defined as level of service "F."

As shown in the series of maps on the following page, freeway traffic has increased significantly over the past 20 years, and may again be expected to increase significantly over the next 20 years. The latter would occur even with the land use, public transit, and surface arterial improvements recommended in regional land use and transportation plans described above.

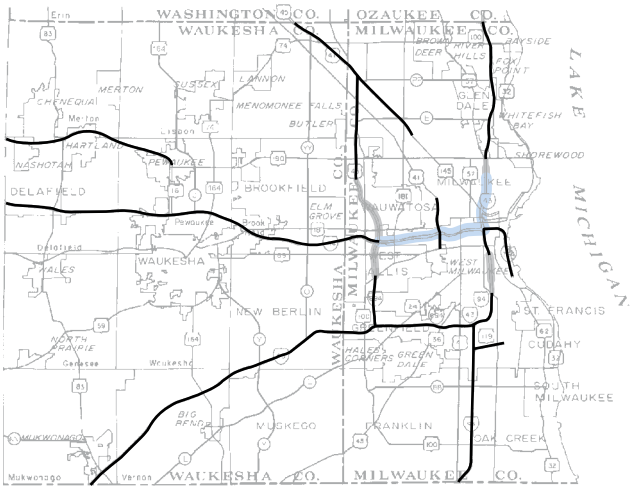
FREEWAY CRASH RATES IN THE REGION: 1996-1998



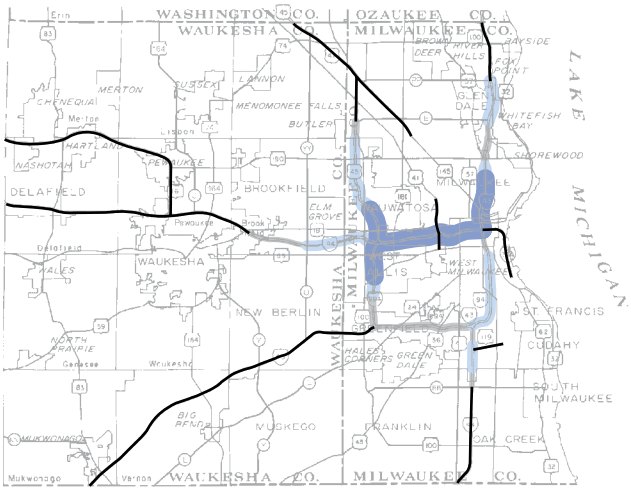
NOTE: The average freeway crash rate for the six counties of the Region, except Milwaukee County, is 51 crashes per 100 million vehicle-miles.

ESTIMATED GROWTH OF AVERAGE WEEKDAY CONGESTION FOR FREEWAY TRAFFIC IN THE REGION: 1980-2020

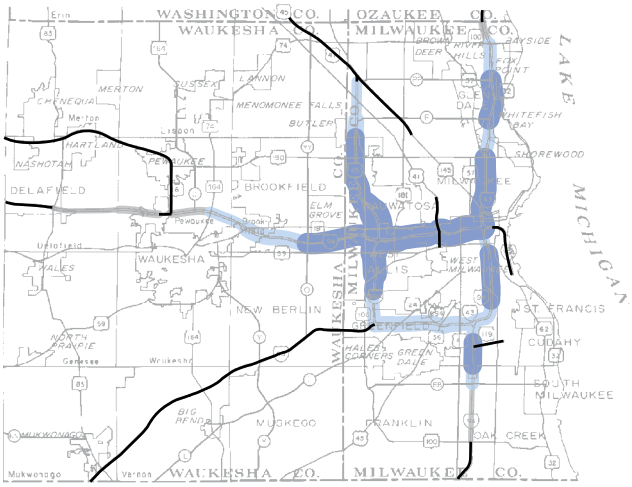
1980



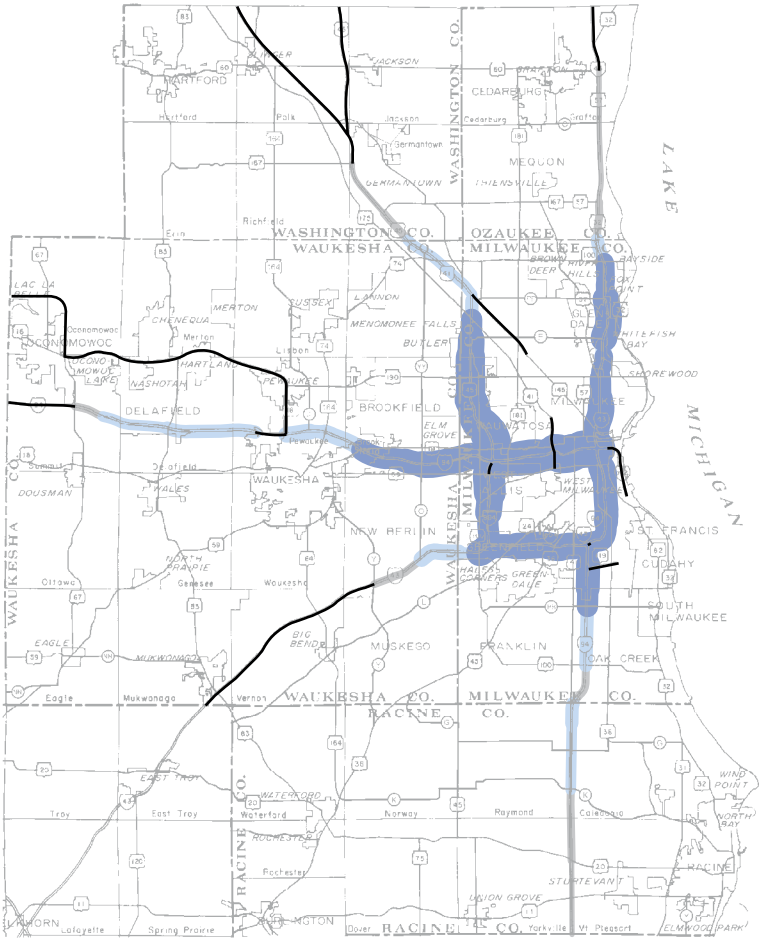
1991



1999



2020



ESTIMATED HOURS OF CONGESTION ON AN AVERAGE WEEKDAY	MOST SEVERE LEVEL OF HOURLY CONGESTION EXPERIENCED
NO CONGESTION	- -
1	MODERATE
3	MODERATE
3	SEVERE
4	SEVERE
4	SEVERE
6	EXTREME
8	EXTREME
11	EXTREME
13	EXTREME
14	EXTREME
15	EXTREME
16	EXTREME
17	EXTREME

GRAPHIC SCALE
0 2 4 8 MILES

NOTE: MODERATE WEEKDAY CONGESTION OF ONE TO THREE HOURS IS FORECAST TO CONTINUE SOUTH THROUGH KENOSHA COUNTY TO THE WISCONSIN - ILLINOIS STATE LINE.

Pulling It All Together

When we examine the three key factors of physical design deficiencies, traffic safety problems, and traffic congestion problems, it is not surprising that they correlate with our oldest and most heavily used freeway segments—primarily in Milwaukee County (see inside). However, as the traffic congestion data indicate, the radius of problem severity is moving outward to adjoining counties. Being the urban heart of Southeastern Wisconsin, this expanding area will continue to generate and receive vast freeway travel for employment, commerce, and recreation.

Almost all of the Region's freeways will require reconstruction over the next two decades. Even if some segments are eventually rebuilt "as is," now is the opportunity to verify that such a decision is prudent and acceptable. Alternatively, where freeway redesign and possible upgrading are warranted, the twilight of serviceable life is the economically sound time to make such changes. The next step in the study is to design and evaluate freeway system and segment reconstruction alternatives which would attempt to address the identified freeway design, safety, and congestion deficiencies.

At this juncture, the Freeway Reconstruction Study is about one-third completed. Public input via informational meetings will shortly be solicited. Look for an announcement of these meetings, visit or contact us via our website at www.sewrpc.org/freewaystudy, or call (262)547-6721.

Please also feel free to contact us with questions or comments at any time—or to schedule a presentation before your group. The organized, upcoming public meetings are but one way to become involved and further informed.

HISTORIC, CURRENT, AND FORECAST AVERAGE WEEKDAY FREEWAY CONGESTION IN THE REGION

Total Extent of Freeway System Congestion		
1972	9 miles	6% of system
1980	18 miles	8% of system
1991	45 miles	18% of system
1999	65 miles	24% of system
2020	122 miles	44% of system
Extent of Freeways Extremely Congested		
1972	0 miles	0% of system
1980	0 miles	0% of system
1991	11 miles	4% of system
1999	27 miles	10% of system
2020	48 miles	17% of system
Congestion Duration on Congested Freeway Segments		
1972	2.8 hours	
1980	3.5 hours	
1991	3.5 hours	
1999	5.5 hours	
2020	6.1 hours	

For more information:

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