

# REGIONAL TRANSPORTATION OPERATIONS PLAN FOR SOUTHEASTERN WISCONSIN: 2012-2016

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**MEMORANDUM REPORT  
NUMBER 202**

**REGIONAL TRANSPORTATION OPERATIONS PLAN  
FOR SOUTHEASTERN WISCONSIN: 2012-2016**

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## Chapter I

# INTRODUCTION

This regional transportation operations plan (RTOP) is a short-range plan listing the transportation systems management actions, or transportation systems operations measures, which are recommended for priority implementation over the next five years. The RTOP was prepared by the Southeastern Wisconsin Regional Planning Commission staff under the guidance of the Commission's Advisory Committee on Regional Transportation System Planning. The membership of this Advisory Committee is shown on the inside front cover of this report.

The Commission's long-range regional transportation plan (RTP) is documented in SEWRPC Planning Report No. 49, *A Regional Transportation System Plan for Southeastern Wisconsin: 2035*. The RTP has a horizon year of 2035 and recommends public transit, bicycle and pedestrian, arterial street and highway, travel demand management, and transportation systems management (TSM) measures proposed to be implemented over the next 25 years. This RTOP is intended to identify those TSM, or operations measures, in the RTP which are recommended for priority implementation over the next five years.

The preparation of the RTP for Southeastern Wisconsin, its reappraisal on a four year cycle, its major reevaluation and extension on a 10-year cycle, and its refinement through more detailed planning and programming efforts—including the RTOP—provide the planning and process addressing travel congestion in Southeastern Wisconsin. This planning and process addressing congestion includes: 1) definition of congestion management objectives and performance measures; 2) a program for data collection and system performance monitoring, including the evaluation of the efficiency and effectiveness of implemented actions; 3) testing and evaluation of alternative transportation plans and strategies including their effects on congestion; 4) identification of recommended actions and implementation schedules, responsibilities, and possible funding; and 5) the periodic assessment of the effectiveness of implemented strategies particularly with respect to the established performance measures.

The next chapter of this report, Chapter II, "Transportation Systems Management Element of the Year 2035 Regional Transportation Plan" describes the TSM or transportation systems operations recommendations of the RTP, and their current state of implementation of this transportation systems management element. The last chapter, Chapter III, "Alternative and Recommended Short-Range Transportation Systems Management Plan and Program" describes alternative and recommended RTOP measures proposed for implementation by State and local governments over the next five years. The responsibilities for implementing each recommended measure is outlined, along with potential funding sources, and the relationship of each measure to the regional intelligent transportation systems (ITS) architecture.

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## **Chapter II**

# **TRANSPORTATION SYSTEMS MANAGEMENT ELEMENT OF THE YEAR 2035 REGIONAL TRANSPORTATION PLAN**

### **INTRODUCTION**

The transportation systems management element of the year 2035 regional transportation plan includes measures intended to manage and operate existing transportation facilities to their maximum carrying capacity and travel efficiency, including: freeway traffic management, surface arterial street and highway traffic management, and major activity center parking management and guidance. In addition, improving the overall operation of the regional transportation system requires cooperation and coordination between the transportation agencies and operators in the Region, and coordination between the components of the regional transportation system. A regional intelligent transportation systems (ITS) architecture facilitates the institutional agreements and the technical integration required for such coordination of transportation operators in the Region including highway agencies, departments of public works, transit operators, and emergency service providers, and describes the operations of the transportation system and the necessary and desirable information exchanges that should take place between different agencies in order to accomplish current and improved regional transportation system operation. A key objective of the regional architecture is to ensure interoperability between the hardware and software components employed by the various transportation operators in the Region.

Southeastern Wisconsin is located along the heavily traveled, multi-state IH 94 corridor. Efforts to improve the operation of the multi-state corridor have been underway since the U.S. Department of Transportation designated the Gary-Chicago-Milwaukee (GCM) Corridor as one of four ITS priority corridors in 1993. With this designation came dedicated Federal funding for ITS beginning with the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. Since the GCM Corridor required an ITS architecture encompassing the interests of three states, the Wisconsin Department of Transportation (WisDOT) assumed the lead in the development of a regional ITS architecture which would serve both the Wisconsin portion of the GCM Corridor, and the Southeastern Wisconsin Region. The WisDOT, with support from other agencies including the Southeastern Wisconsin Regional Planning Commission, developed and continues to maintain, review, and update a regional ITS architecture for Southeastern Wisconsin.

### **FREEWAY TRAFFIC MANAGEMENT**

Recommended measures in the regional transportation plan (RTP) to improve the operation and management of the regional freeway system include operational control, advisory information, and incident management measures, as well as a traffic operations center supporting these measures. Essential to achieving freeway operational control, advisory information, and incident management is the WisDOT traffic operations center (TOC) in the City of Milwaukee. At the TOC all freeway segments in the Milwaukee area are monitored, freeway operational control and advisory information is determined, and incident management detection and confirmation is conducted. The TOC is important to the safe and efficient operation of the regional freeway system and is in operation 365 days a year, 24 hours a day.

## **Operational Control**

Measures to improve freeway operation during average weekday peak traffic periods and during minor and major incidents through monitoring of freeway operating conditions and control of entering freeway traffic include traffic detectors, freeway on-ramp-meters, and ramp-meter control strategy. Traffic detectors measure the speed, volume, and density of freeway traffic, and are used in operational control, as well as advisory information and incident management. Existing freeway system traffic detectors consist of detectors embedded in the pavement at one-half mile intervals on the freeways in Milwaukee County and on IH 94 in Waukesha County, and at about one to two mile intervals on IH 94 in Kenosha and Racine Counties. The data collected from these traffic detectors is monitored by the WisDOT at the TOC for the purposes of detecting freeway system travel speed and time, traffic congestion, traffic flow breakdowns, and incidents. Freeway ramp meter traffic entry rates can be modified based upon the traffic volume and congestion indicated by the traffic detectors. Travel information on traffic congestion and delays can be provided to freeway system users through the WisDOT website and on variable message signs. Traffic speeds and congestion indicated by traffic detectors can instantaneously identify the presence of a freeway incident. The RTP recommends that existing freeway system traffic detectors be maintained, and that traffic detectors be installed on the freeway system throughout the Region at one-half mile intervals. Possible exceptions for installing detectors on freeway segments were identified, including those freeway segments with current and expected future traffic volumes which would be substantially less than freeway traffic carrying design capacity, including IH 43 north of STH 57 in Ozaukee County, USH 45 north of the Richfield Interchange, USH 41 north of STH 60 in Washington County, and IH 43 and USH 12 in Walworth County.

Ramp-meters are traffic signals located on freeway entrance ramps or, in some cases, freeway-to-freeway entrance ramps, and are used to control the rate of entry of vehicles onto a freeway segment to achieve more efficient operation of the adjacent freeway segment and the downstream freeway system. To encourage ridesharing and transit use, preferential access for high-occupancy vehicles is provided at ramp-meter locations to allow the high-occupancy vehicles to bypass traffic waiting at a ramp-metering signal. There are 127 freeway on-ramps currently in the Milwaukee area equipped with ramp-meters. Buses and high-occupancy vehicles currently receive preferential access at 59 of the 127 on-ramp-meter locations. The RTP recommends that ramp-meters be installed on all freeway on-ramps within the Region, with high-occupancy vehicle preferential access provided at all metered ramps, particularly those which would be used by existing and planned public transit. The only exception for ramp-meter installation may be those freeway segments identified above which would be expected to carry current and future traffic volumes below their design capacity.

Another element of freeway operational control is the strategy used in the operational control of ramp-meters. The existing ramp-meters on the Southeastern Wisconsin freeway system are controlled in two ways. Some are controlled in a "pre-timed" mode, operating during specified peak traffic hours of the weekday at specified release rates of vehicles. Others are controlled as well during specified peak traffic hours of the weekday, but the vehicle release rates are based upon adjacent freeway system traffic volume and congestion. The RTP recommends that the strategy of controlling ramp-meters through consideration of adjacent congestion be expanded throughout the freeway system, and that an operational control strategy be developed which would consider downstream freeway traffic congestion and seek to minimize total travel delay on the freeway system while providing for equitable average and maximum delays at each ramp-meter, and avoiding the extension of vehicle queues onto surface streets. The RTP also proposes that the need for expanded vehicle storage on freeway on-ramps be considered, and addressed, during the reconstruction of the regional freeway system. It is also proposed that the WisDOT, in cooperation with the Wisconsin Department of Natural Resources (WDNR), the Regional Planning Commission, and the seven counties of Southeastern Wisconsin, conduct a study of managing speed on the freeway system, attempting to achieve more uniform speed at the posted speed limits. The study would be intended to quantify and consider the potential benefits including reduced crashes and attendant reduced congestion, and reduced air pollutant emissions both due to reduced speeds and reduced crash-related congestion, and the costs of implementation, specifically, law enforcement.

### **Advisory Information Measures**

Providing advisory information to motorists is an integral part of providing an efficient street and highway system. By providing information on current travel conditions, motorists can choose travel routes which are more efficient for their travel, and the result is a more efficient transportation system. Advisory information measures include permanent variable message signs (VMS), the WisDOT website, and provision of information to the media. The WisDOT uses the permanent VMS to provide real time information to travelers about downstream freeway traffic conditions, such as current travel times to selected areas, information about lane and ramp closures, and where travel delays begin and end. There are 25 permanent VMS located on the freeway system, primarily in the Milwaukee area, and 16 on surface arterials which connect with the freeway system primarily located in western Milwaukee County. The RTP recommends that VMS be provided on the entire freeway system, and on surface arterials leading to the most heavily used freeway system on-ramps.

The WisDOT also provides substantial information about current freeway system traffic conditions on a website using data collected from freeway system traffic detectors. The information includes maps depicting the current level of freeway traffic congestion and the locations of confirmed incidents, views of freeway system traffic available from the freeway system closed-circuit television (CCTV) camera network, and current travel times and delays on the major freeway segments in the Milwaukee area. The data on the website is also available to the media and used in daily radio and television broadcasts. The RTP proposes that WisDOT continue to enhance and expand the information provided on its website and to the media. The WisDOT also deploys a regional 511 traveler information system which allows the public to dial "511" and receive automated messages about current travel conditions along their desired route through a series of predetermined automated menus. Highway advisory radio (HAR) is a system of low-power radio transmitters licensed for state use which transmit pre-recorded messages. HAR systems are generally very localized and directed to motorists at a specific location along a specific route. The only existing HAR system in the Region is located at Miller Park along IH 94, and is used to relay messages concerning ongoing highway construction projects, special events—such as Milwaukee Brewer game day traffic conditions—and "Amber alerts" in the event of a child abduction. An emerging advisory information vehicle radio-based technology is radio data systems (RDS). Radio data systems are separate radio signals within a station's frequency allocation which transmit digital and audio information simultaneously with a standard FM stereo or radio broadcast. In Southeastern Wisconsin, RDS exists and is primarily used by radio stations to broadcast digital information, such as station call names and song titles and artists. In Europe, RDS has been used to also transmit audio information to motorists through their stereo or radio receiver, including local travel announcements regarding incidents and traffic conditions. The RDS will interrupt the playing of the radio or compact disc to alert the driver to the travel announcement. At the end of the announcement, the receiver returns to the previous radio station or compact disc. The RTP recommends that WisDOT monitor RDS technology for possible application in the future.

### **Incident Management Measures**

Incident management measures have as their objective the timely detection, confirmation, and removal of freeway incidents. As noted earlier, the WisDOT freeway system TOC and freeway system traffic volume detectors are essential to incident management, as well as freeway operational control and advisory information. Other incident management measures include CCTV, enhanced freeway location reference markers, freeway service patrols, crash investigation sites, the Traffic Incident Management Enhancement (TIME) program, ramp closure devices, and alternate route designations.

CCTV cameras provide live video images to the WisDOT and the Milwaukee County Sheriff's Department which allow for the rapid confirmation of congested areas and the presence of an incident, and immediate determination of the appropriate response to the incident and direction of the proper equipment to be deployed in response to the incident. There are currently 103 CCTV cameras on the Southeastern Wisconsin freeway system, covering Milwaukee County freeways, IH 94 and USH 41/45 in eastern Waukesha County, and IH 94 in Kenosha and Racine Counties. The RTP proposes that the CCTV camera network be provided on the entire regional freeway system with the possible exception of the freeway segments identified earlier which carry existing and future traffic volumes well below their design capacity.

Enhanced reference markers assist motorists in identifying specific locations along a freeway segment when reporting incidents. These markers are typically small signs provided at one-tenth mile intervals along the freeway system which typically display the highway shield and mile marker. Enhanced reference markers are currently provided in Milwaukee County in the freeway median at each one-tenth mile on USH 45 from the Zoo Interchange to the Milwaukee-Waukesha County line, and on IH 94 from the Mitchell Interchange to the Illinois-Wisconsin State line, including the freeway segments of IH 94 in Kenosha and Racine Counties. The RTP proposes that enhanced reference markers be provided on the entire regional freeway system.

Freeway service patrols provide for rapid removal of disabled vehicles and initial response to clearing incidents. Freeway service patrols consist of specially equipped vehicles designed to assist disabled motorists and assist in clearance of incidents. Freeway service patrol vehicles may be equipped to provide limited towing assistance, as well as minor services such as fuel, oil, water, and minor mechanical repairs. Freeway service patrols currently operate in a limited role on the Milwaukee County freeway system and on IH 94 in Kenosha and Racine Counties. In each of these three counties, service patrols operate during weekday peak traffic periods. In Milwaukee County service patrols also operate all day during weekdays, and in Kenosha and Racine Counties, service patrols also operate midday and early evenings during weekdays and all day during weekends. In Kenosha and Racine Counties, one service patrol vehicle serves 12 to 15 miles of freeways, and in Milwaukee County one service patrol vehicle serves 70 miles of freeways. Expansion of the freeway service patrol is recommended in the RTP to serve the entire regional freeway system, and to provide greater coverage including all day weekday and weekend service, evening service, and increased vehicle coverage of one vehicle per 12 to 15 miles of freeway.

Crash investigation sites are designated safe zones for distressed motorists to relocate to if they are involved in a crash or an incident on the freeway. There are 35 crash investigation sites on the Southeastern Wisconsin freeway system, with the largest concentration—24 of the 35, or about 69 percent—located on the system in Milwaukee County. The RTP proposes that the WisDOT evaluate the extent of use and attendant benefits of existing crash investigation sites, and consider expansion as needed to serve the entire regional freeway system.

The TIME program, sponsored by the WisDOT, has served to bring together, and coordinate, the transportation engineering, law enforcement, media, emergency responders, transit, tow and recovery, and other freeway system operational interests at monthly meetings. The goals of the TIME program are to improve and enhance freeway incident management, improve freeway safety, and enhance the quality and efficiency of freeway travel. The RTP proposes that the TIME program continue to be operated and sponsored by WisDOT.

Ramp closure devices have been deployed on IH 94 in Kenosha, Racine, and Waukesha Counties. The ramp closure devices are either Type III barricades or swing arm gates. These ramp closure devices allow for the closure of freeway on-ramps during planned and unplanned major incidents, such as special events and severe inclement weather. The RTP proposes that WisDOT evaluate the use and attendant benefits of existing ramp closure devices, and consider their application throughout the Region.

Alternate routes are designated, clearly marked and signed surface arterial street and highway routes which generally parallel freeway segments. These routes would be intended to be used by motorists during major freeway incidents and ramp closures and during particularly extreme congestion. Motorists would be directed through advisory information to these routes during major incidents and periods of particularly extreme congestion. The RTP proposes that WisDOT and the Regional Planning Commission, together with the concerned and affected local governments, examine the potential for the designation of alternative routes, and consider implementation of a pilot effort in a designated corridor.

In addition to these existing incident management measures in Southeastern Wisconsin, the RTP proposes that WisDOT should monitor the evolution of initiatives such as ITS America Vehicle Infrastructure Integration (VII). The VII Initiative is a cooperative effort between Federal and State departments of transportation and vehicle manufacturers to evaluate the feasibility of deploying a communications system which would support vehicle-to-vehicle and vehicle-to-infrastructure communication. The primary benefit of VII deployment would be roadway safety, including collision avoidance.

## **SURFACE ARTERIAL STREET AND HIGHWAY TRAFFIC MANAGEMENT**

This group of transportation system management measures recommended in the RTP would attempt to improve the operation and management of the regional surface arterial street and highway network, and include improved traffic signal coordination, intersection traffic engineering improvements, curb lane parking restrictions, access management, and advisory information.

Coordinated traffic signal systems provide for the efficient progression of traffic along arterial streets and highways, allowing motorists to travel through multiple signalized intersections along an arterial route at the posted speed limit minimizing or eliminating the number of stops at signalized intersections. These systems may be coordinated via time-based coordination, interconnected pre-timed coordination, traffic responsive, and/or central computer control. Time-based coordination relies on devices within each traffic signal controller to accurately keep time and the signal coordination is based upon a prescribed signal timing plan programmed into each individual traffic signal controller. Interconnected pre-timed coordination is based upon the hard wiring of each individual traffic signal controller into a master traffic signal controller. Traffic responsive systems are based upon an interconnected system of traffic signals which respond to information provided by traffic detectors to determine appropriate traffic signal cycle lengths and phasing. Central computer control systems are based upon a central computer facility which receives, analyzes, and develops appropriate signal cycle lengths, offsets, and phasing based upon information provided by traffic detectors and then communicates this information to the individual traffic signal controllers. In the Region, coordinated traffic signal systems currently range from systems comprising two traffic signals to systems comprising 100 traffic signals. Approximately 1,100 of the 1,700 traffic signals in the Region, or about 65 percent, are part of a coordinated signal system. The RTP recommends the preparation and implementation of coordinated traffic signal plans along all surface arterial street and highway routes in the Region with multiple traffic signals which are located at one-half mile or less spacing. This proposed measure also recommends that agencies coordinate their efforts so that motorists do not experience unnecessary stops or delays due to changes in individual traffic signal jurisdictional authority, with particular emphasis on those routes that may be designated as alternative routes to the freeway system. The RTP further recommends that the Regional Planning Commission work with State and local governments to document existing and planned arterial street and highway system traffic signals and traffic signal systems, and develop recommendations for improvement and expansion of signal systems, including identifying and addressing obstacles to traffic signal coordination and progression, such as changes in jurisdiction of traffic signal control.

The RTP also recommends that State and local governments aggressively consider and implement individual arterial street and highway intersection improvements. These intersection improvements may include geometric improvements, such as adding intersection right- and/or left-turn lanes; improvements in the type of traffic control deployed at the intersection, including two- or four-way stop control, roundabouts, or signalization; or improvements in signal timing at individual signalized intersections. This proposed measure also recommends the preparation, review, and updating by the State, county, and municipal governments of a prioritized short-range (two- to six-year) program of arterial street and highway intersection improvements under their jurisdiction. The RTP further recommends that the Regional Planning Commission work with State, county, and municipal governments, at their request, to prepare such programs for arterial street and highway intersections, identifying the need for improvement, and recommended improvements.

The RTP also recommends that arterial street and highway traffic flow and operation be improved through restricting curb-lane parking during peak traffic periods and operating these curb parking lanes as through traffic lanes. It is recommended that restriction of curb-lane parking, as needed, during peak periods be considered along the arterial street and highway system in order to reduce traffic congestion and help to provide good transit service. Local governments would consider the proposed curb-lane parking restrictions as traffic volumes and congestion increase, and implement these restrictions rather than consider expansion of highway capacity through widening and new construction beyond that envisioned in the plan.

Access management has been, and will continue to be, an important tool to improve transportation systems operations and provide for full use of roadway capacity. Access management involves identifying standards for the location, spacing, and operation of driveways—residential and commercial—median openings, and street connections, and recommending and implementing actions to achieve these standards. Failure to properly manage access to the arterial street and highway system may be associated with increased numbers of vehicle crashes, and increased travel times. Implementing sound access management may be expected to reduce both recurring and nonrecurring traffic congestion along the arterial route on which access management has been implemented. The objective of access management plans is to achieve a desirable spacing between adjacent access locations. This proposed measure recommends that State, county, and municipal governments with arterial streets and highways under their jurisdiction adopt access management standards, consider and implement these standards as development takes place along arterials under their jurisdiction, and prepare and implement access management plans along arterials which currently are developed and have access which violates these standards. A sample set of access management standards is provided in Appendix D of the RTP. Access management plans would be implemented over time and permit incremental improvements in access management as local units of government consider and approve development and redevelopment along an arterial street or highway. The RTP recommends that the Regional Planning Commission assist State, county, and municipal governments in the preparation of access management plans at their request.

Advisory information should also be provided to motorists concerning the surface arterial street and highway network in the Region. In addition to the VMS recommendation in the freeway traffic management section, the RTP recommends that the WisDOT improve and expand the data provided on its website (travel times, congestion maps, and camera images) concerning freeway travel to include surface arterial street and highway travel, beginning with the pilot route designated as an alternative route to the freeway system. This recommendation may require consideration be given to the installation of additional traffic detectors and/or other data collection devices along the alternative routes until other innovative techniques for data collection become feasible—such as collecting real-time global positioning data from the mobile phones or vehicles of system users.

Emergency vehicle preemption allows emergency vehicles to intervene in the normal operation of traffic signals through wireless technologies. The regular cycle of the traffic signal is interrupted to either change the traffic signal to the green phase or to hold the green phase for the approach from which the emergency vehicle is oriented. Some governmental units in the Region have implemented emergency vehicle preemption on some or all of the traffic signals under their jurisdictional authority. This proposed measure includes consideration by State, county, and local governments to provide emergency vehicle preemption at all traffic signals within their jurisdictional authority.

CCTV cameras provide live video images of traffic conditions. These cameras allow for the identification and confirmation of congested areas and incident locations. The WisDOT currently operates 16 CCTV cameras on the surface arterial street and highway system in Southeastern Wisconsin—primarily along the USH 18 corridor between CTH Y (Barker Road) and CTH O (Moorland Road) in Waukesha County, and on STH 100 between CTH E (W. Silver Spring Drive) and W. Lincoln Avenue in Milwaukee County. It is recommended that the surface arterial street and highway CCTV network be provided along all routes which have been designated as alternative routes to the freeway system as described in the freeway traffic management recommendations.

### **Major Activity Center Parking Management and Guidance**

Another proposed transportation system management measure would attempt to improve traffic operation conditions by reducing the traffic circulation of motorists seeking parking in major activity centers. The City of Milwaukee currently has an initiative to construct a SummerFest shuttle bus parking management and guidance system. This initiative would provide static and dynamic signing indicating the location of parking structures and the availability of parking in those structures for a number of parking structures in the central business district (CBD) which are near SummerFest shuttle bus routes. This proposed measure supports the City of Milwaukee initiative and proposes expansion of parking management and guidance systems to incorporate all of the Milwaukee CBD at all times of the year.

## Chapter III

# ALTERNATIVE AND RECOMMENDED SHORT-RANGE TRANSPORTATION SYSTEMS MANAGEMENT PLAN AND PROGRAM

This chapter presents candidate projects proposed by local governments and the State of Wisconsin over the next three to five years to implement the Transportation Systems Management (TSM) element of the long-range year 2035 Regional Transportation Plan for Southeastern Wisconsin (RTP). The Commission staff solicited these candidate projects during the last quarter of 2011 from the Counties, Cities, Villages, and Towns of Southeastern Wisconsin and from the Wisconsin Department of Transportation (WisDOT). (Appendix A includes a sample letter which was sent for the solicitation of candidate projects.)

The candidate projects and project sponsors are shown on Tables 1, 2, and 3. All candidate projects received were surface arterial traffic management projects. In the past three Federal Highway Administration (FHWA) Congestion Mitigation Air Quality Improvement Program funding cycles (2006-2008, 2008-2010, and 2010-2013), a total of 15 transportation systems management (TSM) projects were funded for a total of \$6.4 million. All but one (an activity center parking management and guidance project) of these projects were surface arterial traffic management projects. The candidate surface arterial traffic management projects received for the RTP have been divided into corridor projects, individual intersection projects, and study projects. Tables 1, 2, and 3 also show the recommended priority for candidate project implementation and funding, particularly with respect to Federal Highway Administration (FHWA) Congestion Mitigation and Air Quality Improvement Program (CMAQ) funding. Project priorities have been assigned based on the following considerations:

- Corridor projects are considered to have greater priority than individual intersection projects, as corridor projects include multiple intersections and have greater potential impact on transportation operations.
- Study projects have lower priority than both corridor and intersection projects, as study projects would not have an immediate impact on transportation operations.
- Corridor projects are grouped into three priority categories. Higher priorities have been assigned to projects with the greatest potential to improve transportation operations. Such projects would include those of the greatest length, number of traffic signals, signal spacing appropriate for interconnection, greatest traffic volume, and most severe traffic congestion. Appendix B provides more detail on this priority determination.

Table 1

## RECOMMENDED PRIORITY GROUPING FOR CANDIDATE CORRIDOR TRANSPORTATION SYSTEMS MANAGEMENT PROJECTS

Project Description	Location	Sponsor	Length	Number of Traffic Signals	Average Signal Spacing	Traffic Volume and Congestion <sup>a</sup>	Estimated Construction Cost	Project Priority Score	Project Priority Grouping
Design and Install Traffic Adaptive Signal Control System Including Remote Management Capability	W. Good Hope Road (CTH PP) Corridor from USH 41/USH 45 to IH 43	Milwaukee County	7.0 miles	13	0.58 miles	<u>23,900 – 35,700</u> 38,000	\$410,000	9	1
Design and Install Traffic Signal Interconnection	CTH L from CTH Y to Tess Corners Drive	Waukesha County	3.2 miles	6	0.64 miles	<u>11,200 – 21,100</u> 14,000	\$200,000	9	1
Design and Install Traffic Adaptive Signal Control System Including Remote Management Capability	W. Silver Spring Drive (CTH E) Corridor from N. 91st Street to N. 124th Street	Milwaukee County	2.0 miles	7	0.33 miles	<u>26,500 – 31,500</u> 27,000	\$210,000	9	1
Design and Install Traffic Adaptive Signal Control System Including Remote Management Capability	S. 76th Street (CTH U) from Oklahoma Avenue to Parkview Road	Milwaukee County	3.5 miles	11	0.35 miles	<u>18,300 - 22,300</u> 27,000	\$396,000	9	1
Design and Install Traffic Signal Interconnection	CTH K from CTH V to 124th Street	Waukesha County	6.1 miles	7	1.02 miles	<u>5,500 – 19,000</u> 14,000	\$200,000	8	2
Design and Install Traffic Signal Interconnection	CTH O from STH 59 to USH 18	Waukesha County	1.3 miles	8	0.19 miles	<u>33,200 – 39,200</u> 38,000	\$200,000	8	2
Design and Install Traffic Adaptive Signal Control System Including Remote Management Capability	W. Layton Avenue (CTH Y) Corridor from W. Loomis Road (STH 36) to S. 108th Street (STH 100)	Milwaukee County	4.0 miles	8	0.57 miles	<u>11,200 – 24,900</u> 27,000	\$216,000	7	2
Design and Install Traffic Signal Interconnection	CTH F from North of IH 94 to Duplainville Road	Waukesha County	1.2 miles	4	0.40 miles	<u>31,800 – 34,700</u> 38,000	\$200,000	7	2
Design and Install Traffic Adaptive Signal Control System Including Remote Management Capability	W. Oklahoma Avenue (CTH NN) Corridor from S. 76th Street to S. 92nd Street	Milwaukee County	1.0 miles	4	0.33 miles	<u>21,300 – 23,100</u> 27,000	\$144,000	6	3
Design and Install Traffic Signal Interconnection	CTH VV from Marcy Road to Lilly Road	Waukesha County	2.5 miles	4	0.83 miles	<u>19,900 – 23,500</u> 27,000	\$200,000	4	3

<sup>a</sup>Estimated average weekday traffic volume compared to typical average weekday design capacity.

Source: SEWRPC.

**Table 2**

**RECOMMENDED PRIORITY GROUPING FOR CANDIDATE INTERSECTION TRANSPORTATION SYSTEMS MANAGEMENT PROJECTS**

Project Description	Location	Sponsor	Traffic Volume and Congestion-Primary Street <sup>a</sup>	Traffic Volume and Congestion-Secondary Street <sup>a</sup>	Annual Number of Vehicle Crashes <sup>b</sup>	Vehicle Crash Rate <sup>b</sup>	Estimated Construction Cost	Project Priority Score	Project Priority Grouping
Install Traffic Signals	95th Street and 88th Avenue (CTH H) Intersection	Village of Pleasant Prairie	<u>5,600-7,300</u> 14,000	<u>6,500<sup>c</sup></u> 14,000	5.7	1.73	\$160,000	16	1
Install Traffic Signals	CTH KF and CTH JK Intersection	Waukesha County	<u>4,900-10,100</u> 14,000	<u>1,900-5,500</u> 14,000	3.7	0.97	\$900,000	13	1
Upgrade Traffic Signals	CTH YY and Burleigh Road Intersection	Waukesha County	<u>12,900-14,800</u> 14,000	<u>9,200<sup>c</sup></u> 14,000	1.7	0.27	\$650,000	12	2
Install Traffic Signals	CTH Y and Gebhardt Road Intersection	Waukesha County	<u>17,500-21,200</u> 14,000	<u>4,300<sup>d</sup></u> 14,000	1.7	0.23	\$500,000	11	2
Install Traffic Signals	CTH I and CTH ES (west) Intersection	Waukesha County	<u>8,100-9,000</u> 14,000	<u>900<sup>d</sup></u> 14,000	2.7	0.88	\$850,000	11	2
Install Traffic Signals	CTH Y and CTH K Intersection	Waukesha County	<u>8,900-9,500</u> 14,000	<u>4,300<sup>c</sup></u> 14,000	2.3	0.59	\$650,000	11	2
Construct Exclusive Turn Lanes	W. Beloit Road (CTH) and S. 112th Street Intersection	Milwaukee County	<u>10,000-15,100</u> 14,000	<u>1,800-4,400</u> 14,000	2.0	0.38	\$300,000	10	2
Construct Exclusive Turn Lanes	W. Rawson Avenue (CTH BB) and W. Forest Home Avenue (CTH OO) Intersection	Milwaukee County	<u>7,100-7,500</u> 14,000	<u>4,100<sup>c</sup></u> 14,000	2.0	0.63	\$350,000	10	2
Install Traffic Signals	CTH Y and CTH I Intersection	Waukesha County	<u>8,500-12,100</u> 14,000	<u>2,500-2,900</u> 14,000	2.0	0.45	\$550,000	9	3
Install Traffic Signals	CTH VV and Lake Five Road Intersection	Waukesha County	<u>5,900-6,300</u> 14,000	<u>1,700-3,400</u> 14,000	2.0	0.68	\$500,000	9	3
Install Traffic Signals	CTH I and CTH ES (east) Intersection	Waukesha County	<u>9,000-10,100</u> 14,000	<u>2,500<sup>d</sup></u> 14,000	1.0	0.27	\$850,000	7	3
Reconstruct as Roundabout	116th Avenue, 120th Avenue, and Corporate Drive Intersection	Village of Pleasant Prairie	<u>5,600-6,800</u> 14,000	<u>-<sup>c</sup></u> 14,000	1.3	0.61	\$1,500,000	7	3
Install Traffic Signals	CTH I and Calhoun Road Intersection	Waukesha County	<u>3,400-6,200</u> 14,000	<u>1,700-4,700</u> 14,000	1.0	0.37	\$600,000	6	3
Reconstruct as Roundabout	Bain Station Road and 88th Avenue (CTH H) Intersection	Village of Pleasant Prairie	<u>6,700-7,300</u> 14,000	<u>1,400-2,200</u> 14,000	1.3	0.43	\$1,700,000	6	3
Reconstruct as Roundabout	STH 32 (Sheridan Road) and 116th Street Intersection	Village of Pleasant Prairie	<u>9,000-10,100</u> 14,000	<u>1,100-1,900</u> 14,000	0.7	0.19	\$1,600,000	6	3

<sup>a</sup>Estimated average weekday traffic volume compared to estimated average weekday design capacity.

<sup>b</sup>Number of vehicle crashes and crash rate are based on a three year average. Vehicle crash rate is the annual number of crashes per 1,000,000 approaching vehicles at the intersection.

<sup>c</sup>Traffic volume data is not available in one or both legs of the secondary street. The available traffic volume data on the primary and secondary streets was used in the calculation of the vehicle crash rate.

<sup>d</sup>Secondary street is the minor leg of a T-intersection.

Source: SEWRPC.

Table 3

**RECOMMENDED PRIORITY GROUPING FOR CANDIDATE STUDY TRANSPORTATION SYSTEMS MANAGEMENT PROJECTS**

CORRIDOR PROJECTS

Project Description	Location	Sponsor	Length	Number of Traffic Signals	Average Signal Spacing	Traffic Volume and Congestion <sup>a</sup>	Estimated Construction Cost	Project Priority Grouping
Study to Improve Traffic Flow Including Signal Timing and Turn Lanes	14 Intersections in the City of Burlington on former STH 11, 36, 83, and 142	City of Burlington	--	14	--	--	\$43,000	--

Note: Intersection Projects: None

<sup>a</sup>Estimated average weekday traffic volume compared to typical average weekday design capacity.

Source: SEWRPC.

- Intersection projects are grouped into three priority categories. Projects with the greatest potential to improve transportation operations and also improve safety have been assigned the highest priority. Such projects include those with the highest traffic volume and most severe traffic congestion, and highest vehicle crash rate and number of vehicle crashes. Appendix B provides more detail on this priority determination.

The above recommended candidate project priorities are proposed to be used in the next two CMAQ funding cycles, the first to request projects in 2012, with projects to be implemented in 2013 through 2015, and the next to request projects in 2014, with projects to be implemented in 2015 through 2017. Candidate RTOP project solicitation would again be conducted by the Commission in the fall of 2015 on a four year cycle. In the past, three CMAQ funding cycles, approximately \$2 million each funding cycle, was awarded to TSM projects. Anticipating a similar allocation of such funding in the 2012 cycle, all of the highest priority, and three of the four next highest priority, corridor TSM projects could be expected to be funded and implemented. The selection of projects to be funded by CMAQ includes joint evaluation and recommendations by Regional Planning Commission, WisDOT, and Wisconsin Department of Natural Resources staffs, and review and approval by the Commission’s Advisory Committees on Transportation System Planning and Programming for the Kenosha, Milwaukee, Racine, and Round Lake Beach Urbanized Areas and the WisDOT Secretary. The Commission staff will be recommending that the priorities for TSM projects recommended in the RTOP be followed in CMAQ funding of TSM projects. The Commission staff will work with the local governments with proposed RTOP projects to monitor their implementation, and to conduct before-and-after studies to assess the effectiveness of the projects which are funded and implemented.

The intent would be that in future RTOP project solicitations and prioritizations to use the project scoring criteria developed and applied in this first project cycle. Should freeway traffic management and activity center parking management projects be submitted in future cycles, there will be a need to expand and refine the prioritization criteria.

WisDOT has appropriately been the lead agency in the development, update, and maintenance of the regional Intelligent Transportation Systems (ITS) architecture which was first prepared in 2000, updated in 2005, and further refined in 2008, as documented in the “WisDOT Traffic Operations Infrastructure Plan” (TOIP). The TOIP specifies the level of deployment—with respect to surveillance, detection, incident management, traffic flow management, traffic signals, and traveler information—to be implemented by corridor within the State. The

level of deployment by corridor is principally related to traffic volume, congestion, and safety, which are the same criteria as applied in the RTOP. The TOIP provides recommendations for each corridor for the level of deployment to be provided on state trunk highways. The corridor traffic signal coordination projects and intersection traffic signal/roundabout installation projects evaluated, prioritized, and proposed for CMAQ funding in the RTOP, support the recommendations in the TOIP. The RTOP projects provide for improved operations on County and municipal arterial streets and highways within the corridors identified in the TOIP, and consequently, serve to further improve operations on the State trunk highways identified in the TOIP.

It should be recognized that many other transportation operations projects will be implemented in the next few years in Southeastern Wisconsin as part of arterial roadway reconstruction and resurfacing projects and freeway traffic management projects. The operations element of these projects may be expected to include traffic signal upgrades, communication and interconnection installation and improvements, and remote management capability. Listed below are projects with such transportation operations improvements to be implemented in the next few years by WisDOT as part of surface arterial roadway reconstruction and resurfacing:

- STH 100 from IH 94 to Watertown Plank Road
- STH 59 from 124th Street to 106th Street
- STH 241 from Drexel Avenue to College Avenue
- STH 38 from Oakwood Road to Grange Avenue
- USH 18 from IH 94 to Moorland Road.

Also, as part of the reconstruction of the Zoo Interchange, WisDOT plans to pursue in cooperation with local governments implementation of integrated traffic management in the surface arterial corridors in the Zoo Interchange Area. These surface arterials include segments of USH 18 (Bluemound Road), STH 59 (Greenfield Avenue), STH 100, Watertown Plank Road, 84th Street, STH 190 (Capitol Drive), and Appleton Avenue. Together, these surface arterials encompass 156 traffic signals. The integrated corridor traffic management would include improved traffic signal timing, traffic signal coordination, enhanced real-time traveler information, and enhanced incident management.

WisDOT is also pursuing for the State Traffic Operations Center an upgrade of Advanced Traffic Management System (ATMS) software, including integration of computer aided dispatch, traffic signal management, and surface arterial trailblazer signing.

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## Chapter IV

# SUMMARY AND CONCLUSIONS

This regional transportation operations plan (RTOP) is a short-range plan listing the transportation systems management actions, or transportation systems operations measures, which are recommended for priority implementation over the next five years. The RTOP was prepared by the Southeastern Wisconsin Regional Planning Commission staff under the guidance of the Commission's Advisory Committee on Regional Transportation System Planning.

The Commission's long-range regional transportation plan (RTP) is documented in SEWRPC Planning Report No. 49, *A Regional Transportation System Plan for Southeastern Wisconsin: 2035*. The RTP has a horizon year of 2035 and recommends public transit, bicycle and pedestrian, arterial street and highway, travel demand management, and transportation systems management (TSM) measures proposed to be implemented over the next 25 years. This RTOP is intended to identify those TSM, or operations measures, in the RTP which are recommended for priority implementation over the next five years. Chapter II of this report, "Transportation Systems Management Element of the Year 2035 Regional Transportation Plan" describes the TSM or transportation systems operations recommendations of the RTP. These measures include freeway traffic management (operational control, advisory information, and incident management), surface arterial traffic management (traffic signal coordination, intersection improvements, parking restrictions, access management, and advisory information), and major activity center parking management and guidance.

In October, 2011, the Commission requested each County, City, Village, and Town in Southeastern Wisconsin and the Wisconsin Department of Transportation to identify candidate TSM projects for the years 2012 through 2016 to be evaluated, and prioritized for implementation, particularly with respect to FHWA CMAQ funding. Chapter III of this report lists the candidate projects, describes and presents the evaluation of these projects, and provides a priority listing of the projects. Candidate projects would continue to be solicited on a four year cycle, with the next solicitation of projects in the fall of 2015. The prioritization of TSM projects presented in this RTOP will be used in the next two CMAQ funding cycles, the first to request projects in 2012, with projects to be implemented in 2013 through 2015, and the next to request projects in 2014, with projects to be implemented in 2015 through 2017.

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## **APPENDICES**

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## Appendix A

### **SAMPLE LETTER SENT TO EACH COUNTY, CITY, VILLAGE, AND TOWN IN SOUTHEASTERN WISCONSIN AND THE WISCONSIN DEPARTMENT OF TRANSPORTATION REQUESTING CANDIDATE TRANSPORTATION SYSTEM MANAGEMENT PROJECTS POTENTIALLY PROPOSED OVER THE YEARS 2012 THROUGH 2016**

## SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION

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*Serving the Counties of:*

KENOSHA  
MILWAUKEE  
OZAUKEE  
RACINE  
WALWORTH  
WASHINGTON  
WAUKESHA



October 27, 2011

Mr. Richard Arrowood  
Town Chairman  
Town of Ottawa  
W360 S3337 STH 67  
Dousman, WI 53118

Dear Mr. Arrowood:

The Southeastern Wisconsin Regional Planning Commission is initiating the preparation of a regional transportation operations plan (RTOP). The RTOP is intended to be a short-range plan listing the transportation system management (TSM) actions, or transportation systems operations measures which are recommended for priority implementation in Southeastern Wisconsin over a five year period—2012-2016. TSM, or transportation systems operation measures, are implemented to manage and operate existing transportation facilities to their maximum carrying capacity and travel efficiency. They include improved traffic signal coordination, intersection traffic engineering improvements such as the provision of turn lanes, curb lane parking restrictions, access management improvements, and freeway operational control and incident management measures. The Commission's long range regional transportation plan (RTP) includes recommendations for such TSM measures. Enclosed with this letter is a newsletter which summarizes the recommendations contained in the RTP, including recommended TSM measures (see page 10 of the newsletter).

To assist in the preparation of the RTOP, Commission staff is soliciting a listing of candidate TSM projects from each County, City, Village, and Town in Southeastern Wisconsin and from the Wisconsin Department of Transportation that should be implemented over the years 2012 through 2016. Should your unit of government intend to implement a TSM project(s) over this five year period, we ask that you provide Commission staff a brief description of the project(s) and its benefits and estimated cost via letter, fax, or email ([rtop@sewrpc.org](mailto:rtop@sewrpc.org)) by November 30, 2011. A listing of the candidate TSM projects will be provided in the RTOP, along with a proposed prioritization based on project costs and benefits to be developed by Commission staff and the Commission's Advisory Committee on Regional Transportation Planning. The RTOP may be used to evaluate and recommend projects for Federal funding, such as Federal Congestion Mitigation and Air Quality Improvement Program (CMAQ) funds. CMAQ funding is intended to fund eligible congestion mitigation and air-quality improvement projects in non-attainment areas for ozone, carbon monoxide, and/or particulate matter standards under the Federal Clean Air Act. In Southeastern Wisconsin, CMAQ funding is available for eligible projects in all seven counties—Kenosha, Ozaukee, Milwaukee, Racine, Washington, and Waukesha Counties as being non-attainment for the 8-hour ozone standard; Milwaukee, Racine, and Waukesha Counties as being non-attainment for the fine particulates (PM<sub>2.5</sub>) standard, and Walworth County, having formerly been a non-attainment area. CMAQ funding has been used by WisDOT and local governments in Southeastern Wisconsin to fund TSM type projects such as the implementation of signal coordination and optimization projects. The next CMAQ funding cycle will begin with a candidate project solicitation in early 2012, likely for projects to be implemented in 2013 through 2015.

Mr. Richard Arrowood  
Page 2  
October 27, 2011

Please do not hesitate to contact me should you have any questions or comments related to our request for you to identify potential TSM projects, or should you have questions or comments related to the regional transportation operations planning effort.

Sincerely,

A handwritten signature in black ink, appearing to read "Kenneth R. Yunker". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Kenneth R. Yunker, P.E.  
Executive Director

KRY/RWH/dad  
Appendix A.pdf.doc

Enclosure

## Appendix B

### PRIORITY DETERMINATION FOR CANDIDATE PROJECTS

#### Corridor Projects

Projects were assigned points for four criteria:

- Corridor Length
  - 5 or more miles            3 points
  - 2.6 – 4.9 miles            2 points
  - 1.0 – 2.5 miles            1 point
  
- Number of Traffic Signals
  - 10 or more signals        3 points
  - 5 – 9 signals                2 points
  - Less than 5 signals        1 point
  
- Signal Spacing
  - 0.5 miles or less          3 points
  - 0.51 – 0.75 miles        2 points
  - 0.76 miles or more        1 point
  
- Traffic Volume and Congestion  
(average weekday traffic volume compared to average weekday design capacity—calculated as an average across length of facility)
  - 1.01 or more                3 points
  - 0.85 – 1.00                 2 points
  - 0.84 or less                 1 point

Projects were placed in three priority groupings:

- Priority Group 1:            9 to 12 total points
- Priority Group 2:            7 to 8 total points
- Priority Group 3:            4 to 6 total points

## Appendix B (continued)

### Intersection Projects

Projects were assigned points for four criteria:

- Traffic volume and congestion on primary street  
(average weekday traffic volume compared to average weekday—calculated as an average of both intersection approaches)
  - 1.01 or more 5 points
  - 0.85 – 1.00 4 points
  - 0.60 - 0.84 3 points
  - 0.40 - 0.59 2 points
  - 0.39 or less 1 point
  
- Traffic volume and congestion on secondary street  
(average weekday traffic volume compared to average weekday—calculated as an average of both intersection approaches)
  - 0.65 or more 5 points
  - 0.45 – 0.64 4 points
  - 0.25 - 0.44 3 points
  - 0.15 - 0.24 2 points
  - 0.14 or less 1 point
  
- Annual number of vehicle crashes
  - 5 or more 5 points
  - 3.0 – 4.9 4 points
  - 2.5 – 2.9 3 points
  - 1.6 – 2.4 2 points
  - 1.5 or less 1 point
  
- Vehicle crash rate
  - 1.0 or more 5 points
  - 0.81 - 0.99 4 points
  - 0.55 - 0.80 3 points
  - 0.35 - 0.54 2 points
  - 0.34 or less 1 point

Projects were placed in three priority groupings:

Priority Group 1:	13 to 16 points
Priority Group 2:	10 to 12 points
Priority Group 3:	6 to 9 points