Strategic Background

The Southeastern Wisconsin region, which encompasses the following eight counties: Fond du Lac, Kenosha, Milwaukee, Ozaukee, Racine, Walworth, Washington, and Waukesha, demands high quality transportation systems to provide for the safe, dependable, and efficient movement of people and products. Over twenty years ago, the Southeastern Wisconsin Regional Planning Commission (SEWRPC) and the Wisconsin Department of Transportation (WisDOT) identified a need to improve and expand the region’s freeway traffic management capabilities. Freeway traffic incident management was recommended as a critical activity to improve these capabilities. Throughout the 1990s and continuing today, the MONITOR Freeway Traffic Management System deployment provides a technical foundation for freeway incident management. In 1995, to address the equally important institutional component of incident management, the Traffic Incident Management Enhancement (TIME) Program was initiated. Today, TIME serves as a multi-agency, multi-disciplined Program with a mission to implement short and long-term strategies that enhance existing and evolving incident management organizational relationships, activities, and projects within Southeastern Wisconsin. The TIME Program has three primary goals and six objectives:

Program Goals

1. Improve and enhance traffic incident management in the Southeastern Wisconsin Region.
2. Improve freeway safety.
3. Enhance the quality and efficiency of freeway travel.
Program Objectives

1. Establish relationships and cultivate regional consensus on incident management issues and needs.
2. Review current incident management practices and procedures.
3. Determine incident management priorities and available resources.
4. Identify and implement incident management solutions.
5. Consistently evaluate incident management solutions and strategies.
6. Utilize a “Blueprint” or strategic plan for an on-going program of incident management in Southeastern Wisconsin.

To ensure Program goals and objectives are being met and to allow for a focused attention to project deployment, the TIME organizational structure was developed with a multi-agency Steering Committee and Freeway Incident Management (technical) Team (FIMT) (Figure ES.1). The Steering Committee meets approximately three times per year to provide direction and overall support for the on-going Program. The FIMT meets monthly to provide technical expertise in the continued planning, implementation, and evaluation of TIME projects. To facilitate project deployment, the FIMT is further broken down into four committees:

1. Emergency Services Committee;
2. Corridor Traffic Management Committee;
3. Special Events / Construction Committee; and,
4. Outreach Committee.
TIME Program Blueprint

The purpose of the TIME Program Blueprint is to serve as a responsive “living” guide or strategic plan for the on-going development and implementation of the Program. The initial Blueprint (dated June 1998) documents the results of the incident management study completed in 1997. It describes the process used to identify incident management problems and needs and also presents solutions and recommendations for an on-going program. The TIME Blueprint Version 2.0 focuses on updated problems/needs and solutions identified through a series of meetings and working sessions with a variety of stakeholders. Version 2.0 of the TIME Blueprint also addresses Program Administration requirements and provides brief summaries of the Regional Intelligent Transportation System (ITS) Architecture and TIME Evaluation.

Figure ES.1
TIME Organization

Traffic Incident Management Enhancement (TIME)  
Blueprint Version 2.0 Executive Summary

Draft 10/13/00
Problems/Needs

The TIME Blueprint update (version 2.0) process provided a structured approach to both verifying existing and identifying several new incident management problems/needs. For summary purposes, the core problems/needs have been synthesized into five fundamental problem areas that address both urban and rural characteristics.

Traffic Incident Management Fundamental Problems

1. The amount of time to Detect/Verify, Respond to, and Clear/Remove freeway incidents is excessive.
2. Incident management agencies have difficulties Communicating and Sharing Data with each other.
3. Congestion, accidents and other Traffic Management problems are occurring on the surface street system due to freeway incident diversion.
4. Comprehensive and timely Traveler Information is lacking for freeway incidents.
5. Strategies for effective, coordinated traffic incident management Planning and Evaluation are inconsistent.

It is important to note that the specifics of these fundamental incident management problems formed the basis for refining TIME solutions. A detailed listing of specific problems/needs can be found in the TIME Blueprint Version 2.0, Chapter 2.

Solutions

Identification of incident management problems and needs continues to be the foundation for developing TIME solutions. For the Blueprint Version 2.0, solutions were updated by:

- Synthesizing solutions identified in the initial study;
- Conducting meetings with representative Steering Committee members; and,
- Conducting various FIMT workshops and meetings.

The result of these activities is a need to deploy approximately fifty solutions or families of solutions (i.e. groups of related solutions) that make up the TIME Program. The following is a
listing of TIME solutions grouped according to the FIMT committee that would likely oversee their implementation as well as a listing of MONITOR solutions.

Emergency Services Solutions
- TIME Program Administration
- Emergency Respondent Resource Lists
- Emergency and Maintenance Vehicle Warning Systems
- Freeway Safety Patrols
- HAZMAT Program
- Inter-Jurisdictional Mutual Aid Agreements
- Traffic Incident Management Policies
- Operational Policies for CVOs
- Traffic Incident Management Demonstrations / Training Exercises
- Comprehensive Dispatcher Training
- Freeway Enforcement Patrol
- Incident Management Equipment
- Alternate Storage Sites
- Portable Changeable Message Signs
- TESCNET
- 911 Enhancements
- Measuring Devices for Crash Investigation
- Voice Communication Enhancements
- Freeway Fire Hydrants
- Highway Watch
- MONITOR Closed Circuit Television (CCTV) Video Sharing

Corridor Traffic Management Solutions
- Regional ITS Architecture Administration
- Alternate Route Planning and Traffic Control Plans
- Traveler Information Standards
- MONITOR Expansion/Enhancements
- Crash Investigation Sites
- Enhanced Reference Signs
- Signal Enhancements
- Measures to Reduce Freeway Speed
- Variable Messages Signs
- Regional Multi-Agency Traffic Management Center
- Probe Traffic Information
- In-Vehicle Traveler Information
- Incident Management Evaluation Program
- Freeway Access Enhancements for Emergency Response Vehicles
- Ramp Closure Gates and Detour Signing
- Weather Information Gathering and Dissemination System
- Locating Systems
- Integrated Corridors
- Policies for Installing Integrated Corridors Communication Conduit in Rehabilitation / Reconstruction Projects

Special Events / Construction Solutions
- Special Event Transportation Standard Operating and Emergency Management Procedures
- Special Events Parking Management System
• Integration of Road Weather Information
• Mobile Command Post and Special Event Management System
• Special Event Traveler Information

Outreach Solutions
• Market Research Study
• Statewide ITS Coordination
• Build ITS into the State Project Process (Design and Funding)
• Emergency Responder Education / Training Programs

MONITOR Solutions
• Stage 4 Construction
• Special Events Stage Construction (Miller Park)
• Stage 5 Construction
• Stage 6A Design
• Stage 6A Construction
• Communication Infrastructure Design
• Communication Infrastructure Construction
• Stage 6B Design
• Stage 6B Construction
• MONITOR 2010 Preliminary Engineering
• 2010 Stage 1 Design
• 2010 Stage 1 Construction
• 2010 Stage 2 Design
• MONITOR Web Page
• MONITOR Transit Integration Pilot Project

• Transit Initiatives
• Public Education / Outreach Programs
• Commercial Driver Education / Outreach Programs
• Tourist Education / Outreach Programs
• Enhanced Media Information / Dissemination

• TMC Design
• TMC Construction
• Computer System Update (Y2K Fix)
• Computer and Control System Upgrade – Phase 1
• Computer and Control System Upgrade – Phase 2
• System Software Update
• Freeway Corridor ATMS Maintenance and Integration
• Systems Engineering and Configuration Management
• System Evaluation and Technology Development
• Education, Training, and Awareness
• Control Room Technical Support and Training

Six-Year Work Plan and Estimated Project Funding Requirements

In preparation of developing the TIME Six-Year WisDOT District 2 ITS Work Plan, the Freeway Incident Management Team participated in solution prioritization exercises to determine the appropriate time frame for implementing solutions. Based on their understanding of the solutions as well as prior transportation planning and incident management experience, the FIMT recommended: Short (0-3 years); Medium (3-6 years); and, Long (6+ years) term time periods for implementing the TIME solutions. The results of this activity were further refined to propose a specific year of deployment. As a result, the Six-Year WisDOT District 2 ITS
Work Plan was developed to propose the state fiscal year of project deployment and the estimated funding required for each TIME solution. The Six-Year Work Plan is anticipated to be updated quarterly to accommodate the dynamic needs of the TIME Program.

In summary, as indicated in the Six-Year WisDOT District 2 ITS Work Plan (Chapter 3), an average of approximately $15 million will be required per year to deploy TIME solutions to meet incident management needs identified by stakeholders in Southeastern Wisconsin. Additionally, a minimum of $2 million will be required annually for operations and maintenance.

**Southeastern Wisconsin Regional ITS Architecture**

The TIME Program is a source of a wide variety of existing and proposed traffic incident management solutions, many of which are Intelligent Transportation System (ITS) technologies. The Southeastern Wisconsin Regional ITS Architecture was developed to address interagency coordination among transportation and public safety organizations. It was prepared in the language and grammar defined by the Federal Highway Administration (FHWA) National Architecture and satisfies the interim federal regional architecture requirements.

Information exchanged among transportation and public safety organizations must be timely, accurate, useful, and consistent to enable these organizations to fulfill their functions. As demand for related services increases and organizational responsibilities increase, existing systems owned and operated by these organizations will require enhancements.

To address these increased demands in a logical, efficient, and understandable manner, a common method of describing these systems and proposed enhancements is needed that is readily available to all participating organizations. An architecture shows the relationships established by interconnections among system elements. In an ITS regional architecture, these elements include transportation user services performed, actual subsystems owned or operated by each participating organization, and the information flows among them. Key uses of the Architecture are to provide a comprehensive description of the existing transportation...
infrastructure in the region and to provide a baseline for future infrastructure and system development. The Architecture shows what regional transportation-related organizations are doing today, and the subsystems, information flows, and processes that make these activities possible. Additionally, future subsystems and information flows are also included in the architecture, to show the direction of transportation communications infrastructure evolution. Future transportation projects can be readily entered into the architecture, allowing the proposed informational connectivity to be compared with existing and planned conditions. This baseline for future infrastructure and system development is expected to be the more important of its uses, as regional ITS architectural compliance is and will remain a requirement for federal ITS project funding.

**Phase One Evaluation Results**

An important activity within the TIME Program is to consistently assess and evaluate the Program’s effectiveness. The purpose of the evaluation is to measure and document both quantitative and qualitative values such as Program efficiency, cost, public perceptions, and inter-jurisdiction cooperation/coordination. This documentation requires the development of a structured evaluation plan to be prepared and carried out by an independent evaluator. The evaluators of the TIME Program are researchers from the University of Wisconsin-Madison and Marquette University.

Several key Measures of Effectiveness (MOEs) have been identified at the national level for ITS program evaluation consistency. These measures pertain to travel time/delay, crashes, fatalities, throughput, cost, and customer satisfaction, in addition to emissions reduction and fuel savings. Also included are MOEs that relate specifically to the incident management process and TIME Program goals and objectives. These measures include the time to detect, verify, respond to, and clear freeway incidents. The success of the TIME Program will also be determined by the extent that multiple jurisdictions and agencies work together.
Phase one of the TIME evaluation has been completed and the preliminary results are summarized below.

**Gateway Patrols (Racine/Kenosha Counties)**
- 75% of stranded motorists waited 10 minutes or less for assistance
- Average clearance time 15 minutes
- 14% decrease in secondary incidents
- Public reaction positive (fast, courteous service)

**Enhanced Freeway Patrols (Milwaukee County)**
- Provided higher levels of enforcement (e.g. 29% increase in traffic stops in East-West Corridor)
- 8% decrease in secondary incidents
- Decreases in dispatch and clearance times

**Crash Investigation Sites (Racine/Kenosha Counties)**
- Reductions in secondary crashes
- Positive user perceptions
- Positive local agency perceptions
  - Reduced clearance time/worked effectively with Gateway Patrol
  - Enhanced safety for responding personnel

**Transverse Pavement Markings**
- Up to 20mph decrease in work zone freeway speeds

**User Acceptance**
• Medium to high level of awareness, low level of use of Crash Investigation Sites (due to lack of understanding or familiarity)
• Some use of cellular 911 to report incidents
• Poor awareness of roadway (location) markings and emergency freeway parking restrictions
• Variable Message Signs (VMS) and commercial radio most widely used forms of traveler information
• High majority considered timely traveler information important
• Poor overall awareness of TIME Program
• Very positive impression of TIME Program and it’s ability to improve safety and reduce traffic congestion (when presented with description of Program)
• Minimal positive perceptions of freeway services in Southeastern Wisconsin
• Positive perceptions of freeway patrols

Another important aspect of the TIME Program Evaluation is to measure how well the results of the individual test plans support the goals and objectives of the TIME Program (Table ES.1). This evaluation is necessary to determine if the TIME solutions are accomplishing their intended purposes in an effective manner.

**Table ES.1**

**Relationship of Evaluation Results to the TIME Program Goals, Objectives, and Potential Benefits**

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* Support of Goals / Objectives: H = High, M = Medium, L = Low
Program Administration

Program Administration refers to the day-to-day and recurring activities and functions necessary to sustain the on-going TIME Program. It is important to identify the roles and responsibilities in terms of frequency of occurrence and who has the lead responsibility for each activity/function (Chapter 6). Specific administrative requirements of the TIME Program include activities such as:

- **General**
  - Maintain Various ITS Databases
  - Meeting Coordination, Scheduling, and Arrangements
  - Awareness of Other Related Activities / Initiatives
  - Research Support / Coordination

- **Steering Committee**
  - Steering Committee Meetings Administration
  - Update Six-Year WisDOT District 2 ITS Work Plan
  - Blueprint Update Activities
  - TIME Annual Progress Reports
  - Technical Presentations

- **FIMT**
  - FIMT Meeting Administration
  - Technical Assistance

- **Emergency Services Committee**
  - Freeway Safety Patrol(s) Coordination / Meetings / Contracts
  - Resource Manual Updates
  - Freeway Emergency Policies and Guidelines Development
• Training Exercises / Workshops / Demonstrations
• TESCNET / WESCom Coordination

**Corridor Traffic Management Committee**
• Integrated Corridor Operations Project (ICOP) Coordination
• Operations / Maintenance Discussion

**Special Events / Construction Committee**
• Special Events / Construction Information Dissemination
• Maintain Special Event Transportation Standard Operating and Emergency Management Procedures Manual
• Meeting Coordination for Special Events and Construction Projects

**Outreach Committee**
• Update Outreach / Communication Plan
• Statewide ITS Outreach Coordination
• Public Education / Awareness / Outreach
• TIME Newsletter
• Media Coordination
• Tourism Communication

The Southeast Wisconsin Regional ITS Architecture and TIME Program Evaluation also have specific administrative needs. The Southeast Wisconsin Regional ITS Architecture utilizes language as defined by the Federal Highway Administration (FHWA) interim National ITS Architecture requirements. As new versions of the FHWA National ITS Architecture are developed and new projects/systems are identified, the Southeast Wisconsin Regional ITS Architecture will need to be updated. Smaller scale updates to the Regional ITS Architecture
may need to occur on a quarterly basis. A more comprehensive update will likely be conducted every two to three years.

An important activity within the TIME Program will be to consistently (e.g. annually) assess and evaluate the Program’s effectiveness through both quantitative and qualitative evaluation of the Program elements MOEs such as efficiency, cost, public perception, and inter-jurisdiction cooperation/coordination. Evaluation activities require the development of a structured evaluation plan to be prepared and carried out by an independent evaluator. The evaluator would work closely with the Freeway Incident Management Team (FIMT) Corridor Traffic Management Committee in identifying specific elements of the evaluation plan.

While the independent evaluator will be responsible for conducting the overall evaluation, the TIME Program administrator may provide support and guidance in areas such as:

- Schedule;
- MOE Development;
- Test Plan Preparation;
- Data Collection;
- Data Analysis; and,
- Reporting.