



# 2010 ITS Annual Report

Minnesota Department of  
Transportation

Office of Traffic, Safety and  
Technology

ITS Section



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## MESSAGE FROM THE DIRECTOR

In state fiscal year (SFY) 2010, the ITS Section in Mn/DOT's

Office of Traffic, Safety and Technology continued the important work of identifying, testing and supporting implementation



of technology that will meet transportation needs. In a future where funding for large construction projects may be elusive, technology will be a vital part of addressing safety and mobility needs. For example, in the Minneapolis/Saint Paul metropolitan area, the Metropolitan Council's 2030 Transportation Policy Plan recognized that funding constraints limited the options of building new capacity to address congestion. Instead, the plan recommended active traffic management, managed lanes and low cost high benefit targeted improvements, rather than major construction projects, as the means to best address transportation needs given projected budgets. As another example, one Mn/DOT district had plans for a one million dollar project to rebuild an intersection having crash problems. The district considered whether the problem might be addressable with a sixty thousand dollar dynamic intersection warning system instead. These examples demonstrate the need for investing in technology research, operational testing and deployment to meet transportation needs during times of funding constraints.

Mn/DOT has been a national leader through some of the projects that the ITS Section has

focused on. For example, Mn/DOT has combined two national focus areas into one project, called IntelliDrive for Safety, Mobility and User Fees. It combines Connected Vehicles (formerly IntelliDrive<sup>sm</sup>, formerly Vehicle Infrastructure Integration (VII)) and Mileage Based User Fees. With this project, 500 participants will test an in-vehicle system that uses a smart phone to provide safety warnings and alerts, provide traveler information and collect vehicle miles traveled that could be charged as a replacement for the motor fuel tax. In the area of dynamic intersection warning systems, Mn/DOT is working through the ENTERPRISE pooled fund to gain consensus among states on what an intersection warning system should look like. The pooled fund would then make recommendations for standards to include in a future Manual on Uniform Traffic Control Devices.

In SFY2010, the ITS Section completed 4 projects, started 6 projects and continued work on 14 ongoing projects. This annual report also identifies the funding used for each of the projects as well as for the program as a whole.

In addition to projects, the ITS section performed several other activities, such as support for ITS industry organizations, multiple pooled fund studies, presentations at conferences and participation on national committees as you will see in this report. You will find the history of the ITS section at the end of this report.

### **Ray Starr, Mn/DOT**

Assistant State Traffic Engineer - ITS  
Office of Traffic, Safety and Technology

ITS Section

## INTRODUCTION

### Scope of the Annual Report

The Intelligent Transportation Systems (ITS) Section of the Minnesota Department of Transportation (Mn/DOT) Office of Traffic, Safety and Technology (OTST) performs research, demonstrations, and operational tests of technology based transportation solutions – commonly referred to as ITS. In the state of Minnesota, there are a number of ITS initiatives, both in operation and in development. This document presents an

annual report of the Mn/DOT OTST ITS Section's funded activities for fiscal year July 1, 2009 through June 30, 2010. These activities include initiatives led by the ITS Section and initiatives led by other agencies in which the ITS Section played a funded supporting role. This report does not include activities performed by other entities (e.g. Regional Transportation Management Center (RTMC), other Mn/DOT districts and offices, cities, counties, universities or the private sector) unless the ITS Section played a funded role in the project.

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## CURRENT PROJECTS

### Core Focus Areas of the ITS Section

The ITS Section projects and activities promote the use of technologies in transportation. The emphasis of the ITS Section is on those initiatives that match the overall Mn/DOT direction. The ITS Section safety, mobility and innovation encompasses all five of Mn/DOT's Strategic Direction.

**Safety initiatives** reduce transportation-related fatalities and injuries through the use of new and improved technology and safety measures.

**Mobility initiatives** ease congestion, reduce commute times and improve the quality of life and economic well-being of all Minnesotans through deployment of technologies that increase system efficiencies, promote transit use, and inform travelers of conditions and options. The ITS Section fosters **innovative** solutions, develops collaborative partnerships, and promotes the research, development and deployment of technologies to accomplish Mn/DOT's strategic directions. The innovative nature of the ITS Section's projects maintains a continued **leadership** role for Mn/DOT in the industry, ensuring that Minnesota travelers benefit from the latest technologies and strategies that the world has to offer. Finally, the ITS Section operates with **transparency** through open information and communication exchanges, promoting data sharing with other agencies and the private sector.



### The ITS Section's Role in Mn/DOT's Program Delivery

The ITS Section regularly supports the technology deployments of many Mn/DOT offices and districts, and therefore has been involved in projects that range from the early stages of research, large scale demonstrations, and product deployment. However, the primary emphasis of the ITS Section is on the following types of projects:

- **Technology Development Projects** develop innovative solutions to present day-to-day problems. The origins of these developments are the needs of travelers and transportation professionals. Development of these solutions often leads to real-world products or systems that expand throughout the state and nation.
- **Operational Tests and Demonstrations** test the functionality, benefits, and costs of new or emerging technologies in real-world environments. These projects serve as a key link between research and full deployment.
- **Technology Deployment Projects** place technology solutions in the hands of travelers and transportation professionals, literally benefiting users on a daily basis. Often, the ITS Section plays a support role to the Mn/DOT office or district responsible for implementing the technology deployments.

## Current Projects

The following table identifies the current projects led by the ITS Section during Fiscal Year 2010. The following pages contain project summaries of each project.

### Fiscal Year 2010 ITS Section Active Projects

Project Title	Project Manager	Project Duration							
		SFY 06	SFY 07	SFY 08	SFY 09	SFY 10	SFY 11	SFY 12	SFY 13
Arterial Travel Time Using Blue Tooth	Rashmi Brewer					██████████			
Cooperative Intersection Collision Avoidance Systems (CICAS)	Jon Jackels		██████████	██████████	██████████	██████████	██████████		
Deployment of Arterial Travel Time Info System (DATTIS) Demo	Steve Misgen					██████████			
Integrated Corridor Management (ICM) Stage 1	Brian Kary		██████████	██████████	██████████				
Integrated Corridor Management (ICM) Stage 2	Brian Kary					██████████	██████████		
Integrated Corridor Management (ICM) Stage 3 Evaluation	Brian Kary					██████████	██████████		
IntelliDrive <sup>SM</sup> (VII) for Safety, Mobility, and User Fees	Cory Johnson					██████████	██████████	██████████	
ITS During Major Urban Reconstruction	Matt Gjersvik					██████████			
Minnesota Horizontal Curve Safety Improvement	Rashmi Brewer					██████████	██████████		
Monitoring Traffic in Work Zones: The iCone <sup>TM</sup> system	Rashmi Brewer					██████████			
Rapid Incident Clearance	Rashmi Brewer		██████████	██████████	██████████	██████████			
Rapid Incident Clearance: DUI/DWI Module	Rashmi Brewer					██████████	██████████		
Redundant Communications	Terry Haukom					██████████			
Rural ITS Safety Solution Systems (RITSS)	Jon Jackels					██████████	██████████	██████████	
Rural ITS Safety Solution Systems Evaluation	Jon Jackels						██████████	██████████	
Safe Intersections	Jon Jackels						██████████	██████████	
System Engineering for Arterial and Freeway Management	Matt Gjersvik						██████████		
Systems Engineering for ITS Applications	Rashmi Brewer						██████████		
Smart Phone Based Novice Teenage Driver Support System (TDSS)	Susan Sheehan					██████████	██████████		



# Arterial Travel Time Using Bluetooth

## Description

The Bluetooth-based travel time measurement network is on CSAH 81 in Hennepin County, with Bluetooth and GPS receivers / antennae and communications hardware to be installed at six signalized intersections. The system estimates travel time along an arterial by reading the Bluetooth addresses of Bluetooth enabled devices in vehicles passing a point on the roadway and matching them with addresses read at six different points on the roadway.

This project will follow a systems engineering approach, including field surveys (e.g., optimum placement of Bluetooth readers and antennae, power supply), developing a concept of operations and functional requirements, system design, implementation and system testing/verification, and conducting an evaluation to determine if the system meets the overall goal of the project – to obtain reliable and accurate travel time information along an arterial network in a cost-effective manner.

Other project objectives include demonstrating how travel time information may be used as a performance measure for arterial traffic management and operations, and how it might be disseminated as traveler information (e.g., displayed on Google maps); and to derive practical deployment guidelines, as well as a nucleus for subsequent expansion of the technology in Hennepin County, in Minnesota or in other states.

## Benefits

- Demonstrate the use of Bluetooth technology for obtaining cost-effective real-time and accurate travel time information along arterials
- Demonstrate how travel time information may be used to measure performance of arterial traffic management and operations

**January 2010**

**Location:**  
CSAH 81 in Hennepin County

**Partners:**  
Mn/DOT  
Iteris  
Savari Networks  
Hennepin County

**Project Cost:** \$238,004

**Project Completion Date:**  
January 2011

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Information**

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# Cooperative Intersection Collision Avoidance Systems (CICAS)

## Description

The Cooperative Intersection Collision Avoidance Systems (CICAS) initiative will determine the optimal combination of infrastructure and in-vehicle systems needed to address a full range of intersection crash problems. The CICAS initiative will integrate two types of intersection collision avoidance systems—infrastructure-based and vehicle-based. Infrastructure-vehicle cooperative systems, which comprise the bulk of the CICAS future research, unify infrastructure and in-vehicle systems to give drivers the best possible information to help avoid a collision. There are four areas of study under CICAS:

- CICAS-CBAT (Cost Benefit Analysis Tool)
- CICAS-V (Violations)
- CICAS-SLTA (Signalized Left-Turn Assist)
- CICAS-SSA (Stop Sign Assist)

Mn/DOT and the University of Minnesota are focused on warning drivers of unsafe gaps at rural thru-stop intersections in the CICAS-SSA project. CICAS-SSA is a successor to the Intersection Decision Support project and its cooperative aspect is being coordinated with the Vehicle Infrastructure Integration (VII) initiative.

## Lessons Learned

Institutional issues need to be addressed. These include concerns about privacy and liability. For the system to be successful, it must meet the needs of the drivers, road authorities, and auto manufacturers. Additional lessons learned will be documented as the CICAS-SSA project progresses.

## Benefits

- Reduced fatalities and injuries at rural thru-stop intersections
- Delayed or eliminated need for a traffic signal or other geometric improvement.

## Next Steps

Minnesota has received approval to proceed with a full-scale field operational test. The sign was activated for the general public in January 2010. This test includes the addition of two more intersections being equipped with the CICAS-SSA system as well as the development of a Driver Vehicle Interface (DVI) in cooperation with Minnesota's Intellidrive<sup>SM</sup> efforts. Minnesota will also continue working the other CICAS study areas and VII to maintain coordination on the cooperative elements of the CICAS-SSA project.

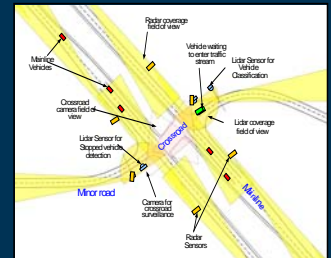
January 2010

Location:  
Nationwide Initiative

Partners:  
USDOT  
Mn/DOT  
University of Minnesota  
Auto Manufacturers

Project Cost: \$5,222,635

Project Completion Date:  
June 2012



For More  
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# Deployment of Arterial Travel Time Information System (DATTIS) Demonstration

## Description

The purpose of the Arterial Travel Time Information demonstration project is to:

- Determine how arterial travel time information should be displayed on Dynamic Message Signs and websites (such as 511) through input from focus groups and customer surveys
- Deploy and evaluate the accuracy of two arterial travel time estimation methods using real-time data. The two methods to be evaluated are the University of Minnesota's SMART SIGNAL system, and the Minnesota Arterial Travel Time System (MATT) developed for Mn/DOT.
- Using one or both systems, deploy actual real-time arterial travel time messages on dynamic message signs and on a test website.
- Obtain feedback from the motoring public to determine the usefulness of the information provided.

## Benefits

- Provide accurate and useful arterial travel time information to motoring public

## Next Steps

- Focus Group and Customer Surveys – Complete
- Implementation – Complete
- System Evaluation – July 2010
- Deployment on CMS and website – October 2010

**January 2010**

### Location:

TH 13 (Hwy 101 to Yankee Doodle)

### Partners:

Mn/DOT  
Alliant Engineering  
Athey Creek Consultants  
University of Minnesota

**Project Cost:** \$180,000

### Project Completion Date:

January 2011

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# Integrated Corridor Management (ICM)

## Description

The United States Department of transportation (USDOT) launched a major initiative to reduce congestion across all modes of transportation. The Integrated Corridor Management (ICM) Initiative is one of these initiatives to be implemented in the coming months and years to help curb congestion.

The concept behind the ICM initiative is based on the fact that freeways, arterial streets, and transit systems often incorporate considerable technology solutions to optimize performance of each individual system. The ICM initiative seeks to integrate these systems together, resulting in integrated corridor management. Therefore, the approach is to attempt to integrate existing technologies and strategies (adding some technologies as needed) to ultimately develop a fully integrated and optimized corridor.

- Stage 1: Develop Concept of Operations and Requirements – Complete
- Stage 2: Analysis and Modeling – Complete
- Stage 3: Deployment Consultation

## Benefits

Summary ICM High Priority ICM Strategies and Scenarios for I-394 is listed below:

- Center-to-Center Communications
  - Earlier dissemination
  - Video sharing
- Traveler Information
  - Earlier dissemination
  - Single website (511)
  - Comparative travel times (mode and route)
  - Arterial Travel Times
  - Parking availability at part-and-ride-lots
  - ABC garage display
- Traffic Management
  - Reduced incident times
  - Incident signal retiming plans for arterials
  - Retime ramp meters for incidents or congestion

## January 2010

### Location:

West side of Minneapolis centered on I-394. Extends as far north as Highway 55 and as far south as Highway 7, terminating eastbound in downtown Minneapolis, and westbound at I494. (approximately 8 miles)

### Partners:

Mn/DOT  
FHWA  
Athey Creek Consultants  
Others to be determined

### Project Cost:

Stage 1: \$272,189  
Stage 2: \$211,342  
Stage 3: \$117,684

### Project Completion Date:

Fall 2011



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# IntelliDrive<sup>SM</sup> (VII) for Safety, Mobility, and User Fees

## Description

IntelliDrive<sup>SM</sup>, formerly Vehicle Infrastructure Integration (VII), seeks to improve traffic safety and mobility while enhancing commerce in the areas where it will be implemented. Three separate applications have been identified in Phase I of the demonstration that Mn/DOT feels will best meet their safety, mobility and funding goals. An In-Vehicle Signing application addresses safety issues, an Enhanced Traveler Information application would improve driver mobility and a Mileage Based User Fee (MBUF) application could counteract the problem of diminishing fuel tax revenue. All of these applications will use aftermarket devices on a common in-vehicle platform. Phase I of this demonstration produced a Concept of Operations (ConOps), a set of preliminary requirements to be applied directly to the Phase II implementation, and a Phase II Implementation Scope of Work. The ConOps detailed possible implementation scenarios that describe what the IntelliDrive<sup>SM</sup> applications should do, and the preliminary requirements set constraints on the overall system. A preliminary evaluation plan was also created during Phase I to be used during and after the full deployment of the Phase II IntelliDrive<sup>SM</sup> system.

The goals of the IntelliDrive<sup>SM</sup> demonstration are to:

- Evaluate the effectiveness of in-vehicle signing for improving safety using localized applications.
- Determine if the in-vehicle signing approach being developed could be used to implement additional IntelliDrive<sup>SM</sup> applications.
- Assess if the proposed IntelliDrive<sup>SM</sup> application could be used to implement mileage-based user fees.
- Assess the viability of a non-network IntelliDrive<sup>SM</sup> safety application especially for rural deployments.
- Demonstrate the proposed IntelliDrive<sup>SM</sup> approach for providing location-specific traveler information and collecting vehicle probe data.
- Assess the feasibility of using consumer devices for implementing IntelliDrive<sup>SM</sup> applications.

## Benefits

- Potential supplement or replacement for declining gas tax revenues
- Understanding of technical issues and business models with a mileage based user fee
- Increased driver safety and mobility

January 2010

Location:  
Statewide

Partners:  
Mn/DOT  
FHWA  
Mn Dept of Revenue  
SAIC  
Mixon Hill, Inc.  
Others to be determined

Project Cost: \$6,500,000

Project Completion Date:  
Phase I – June 2009  
Phase II – To be determined

## For More Information

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# ITS During Major Urban Reconstruction

## Description

This project provided an innovative approach to work zone traffic management on the major urban reconstruction Crosstown Commons project (I-35W & TH62) that is able to be deployed with minimum effort in a short period of time. Time is a significant commodity in this large scale, fast paced urban reconstruction project. A combination of interdisciplinary expertise and experience in construction traffic management will provide an approach to address both planned and unplanned traffic situations occurring during reconstruction. The team will respond to the situation quickly to provide increased safety to motorists and construction personnel by utilizing a toolbox of knowledge and equipment from the ITS industry.

## Lessons Learned

- Ensure the contractor team is in close coordination with the prime contractor of the reconstruction project to be able to respond to a fast paced staging environment.
- Ensure data requirements are understood by both the State and the IWZ contractor to for what is acceptable for travel time use.
- Be clear how IWZ applications are offered in the budget to allow for the flexibility to respond to the changing conditions on the construction site.
- Having a separate consultant available for testing and evaluation of the deployments will assist in identifying problem areas.
- Work zones will change and relocate during the life of the construction project.

## Benefits

- Safety improvements for motorists and construction personnel.
- Less congestion in the work zone.
- Greater use of alternative routes.
- More real-time information.
- Reduced speeds during key phases. (ie. Nighttime traffic switches, etc.)

## Next Steps

- Continued operation of temporary travel time system until completion of Crosstown Commons Project.

**January 2010**

### Location:

Crosstown Commons  
Reconstruction  
(I-35W & TH62)

### Partners:

Mn/DOT  
FHWA  
Alliant Engineering  
Traffic Technologies  
StreetSmart Rentals

**Project Cost:** \$222,147

**Project Completion Date:**  
Fall 2010



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Information**

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# Minnesota Horizontal Curve Safety Improvement

## Description

A low-cost technology that may help drivers select an appropriate speed when approaching a horizontal curve is the dynamic curve warning sign (DCWS). A DCWS generally consists of a warning sign combined with a speed measuring device (e.g., radar) that activates a variable message (e.g., slow down) when vehicles are traveling above a set threshold. This project will evaluate the speed and/or crash impacts of three permanently installed DCWSs in three Minnesota counties. This project has been proposed as a supplement and expansion of an ongoing Federal Highway Administration (FHWA) national DCWS field study.

## Benefits

- Improvement to the background, knowledge, and guidance related to the implementation and potential impacts of these new sign devices
- Supplement the ongoing national study with lower volume sites in Minnesota
- Provide information that can be used to decide whether the type of sign evaluated should be implemented and its expected speed and/or safety impacts.

## Next Steps

- Suggestions for installation site selection and evaluation

**January 2010**

### Location:

Freeborn County, MN  
Meeker County, MN  
McLeod County, MN

### Partners:

Mn/DOT  
USDOT  
Freeborn County, MN  
Meeker County, MN  
McLeod County, MN  
U of M Center of Excellence for Rural Safety

Project Cost: \$200,000

Project Completion Date:  
Expected: March 2012

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# Monitoring Traffic in Work Zones: The iCone™ System

## Description of Project

This project will test an innovative traffic monitoring device designed for potential deployment in work zones. The iCone™ System is a commercially available product that provides accurate and near real-time information on vehicle speed and the level of congestion in construction sites to affiliated agencies, the media and the public at large. Each unit automatically monitors and wirelessly reports its location along with the average speed and volume of traffic in the immediate area.

Six iCone™ systems will be installed on a variety of Hennepin County and Mn/DOT work zones over the 2009 and 2010 construction seasons. The units will be evaluated both for their performance accuracy and for their effectiveness as a tool for agencies to improve work zone safety and mobility. The data collected from each iCone™ will be analyzed and shared with construction personnel, law enforcement, Hennepin County, and Mn/DOT. These agencies can then utilize the information to make improvements to the work zone traffic plan. Law enforcement will be able to use the iCone™ data to identify times when speeding tends to occur in the work zone.

## Benefits

- Addresses FHWA work zone mobility and safety requirements
- Easy to deploy
- Crash worthy
- Blends into work zones creating less distraction for drivers

**January 2010**

### Location:

Twin Cities Metropolitan Area

### Partners:

Mn/DOT  
Hennepin County  
Minnesota State Patrol  
SRF Consulting Group, Inc.  
Street Smart Rental

Project Cost: \$99,978

### Project Completion Date:

November 2010

## For More Information

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# Rapid Incident Clearance

## Description

This project will implement an automated Field Reporting (AFR) system to interface with the Minnesota State Patrol (MSP) Records Management System (RMS). With the implementation of the AFR system, four documents that are currently filled out manually and submitted by the MSP will be electronically transferred from the Trooper's laptop computers (called Mobile Data Computers or MDC's) to a central repository. This focused effort will advance the following four documents: Accident Reports, Field Reports (Incidents), Citations, and Warnings. RMS and AFR will be implemented centrally and tested by a small group of users with the intent of being deployed statewide.

## Lessons Learned

- Citations and warnings require extensive cooperation from the court systems (as well as counties).
- Minnesota State Patrol found it essential to change their business rules regarding data management.

## Benefits

- Expedite document processing of Traffic Accidents and Incident Reports.
- Enhance accident clearance time while promoting safety and efficiency of resources.
- Efficient data entry of Traffic Accident Reports to Driver and Vehicle Services.

## Next Steps

- Work on Citation and Warning Modules.

**January 2010**

**Location:**  
Statewide

**Partners:**  
Mn/DOT  
Minnesota State Patrol  
FHWA  
Intergraph Corporation  
Minnesota Driver and Vehicle Services

**Project Cost:** \$200,000

**Project Completion Date:**  
July 2010

**For More Information**

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# Rapid Incident Clearance: DUI/DWI Module

## Description

The goal of this project is to change the computer aided dispatch Driving Under the Influence/Driving While Impaired (DUI/DWI) module to meet the Minnesota State Patrol's requirements. These changes are required to meet the DWI Detection and Standardized Field Sobriety Testing Instructor Manual published by the United States Department of Transportation (USDOT) and the National Highway Traffic Safety Administration (NHTSA). In addition, it will meet the Minnesota State patrol's requirements by accelerating the processing of DWI offenders. The DUI/DWI module enables the Minnesota State Patrol to provide efficient enforcement of Minnesota roadways.

The major objectives are as follows:

- Develop the DUI/DWI module to conform to USDOT, NHTSA and Minnesota State Patrol requirements.
- Implement a revised map to enable the analysis of DUI/DWI data.
- Upgrade RMS to Release 8.2 to enable the installation of the DUI/DWI module.

## Benefits

- Enhanced safety and efficiency of Minnesota roadways.

January 2010

Location:  
Statewide

Partners:  
Mn/DOT  
FHWA  
Minnesota State Patrol

Project Cost: \$135,000

Project Completion Date:  
July 2010

For More  
Information

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# Redundant Communications

## Description

A major portion of current ITS communication infrastructure is permanently installed. Long-range connections are typically via fiber optic communications. There are situations where fiber optic backbone communications may not be available. Fiber may not yet be installed or construction activities may have portions of fiber out of service or not yet in service for extended periods of time. Additionally, areas of interest for CCTV surveillance or traffic volume tracking may be off the main fiber routes and require a bridge back to the communication backbone.

All of the above situations, and others not listed, provide opportunities to deploy ITS components via wireless connections on either a temporary or permanent basis. This project will demonstrate the ability to connect field devices, such as portable changeable message signs and traffic detectors via wireless connections.

## Benefits

- More reliable ITS functions
- Widespread use of resources can be made available to
  - Traffic operations
  - Emergency response
  - Enforcement Personnel

**January 2010**

**Location:**  
Statewide

**Partners:**  
FHWA  
Mn/DOT  
Imago  
SRF Consulting Group, Inc.

**Project Cost:** \$1,271,712

**Project Completion Date:**  
June 2010

**For More  
Information**

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# Rural ITS Safety Solutions Systems (RITSS)

January 2010

## Description

The goal of this project is to develop low-cost, readily deployable, low maintenance systems that can be used by state and local government agencies to improve safety at low-volume curves and non-signalized rural intersections.

The proposed Driver Behavior Evaluation System (DBES) represents an unobtrusive method to monitor driver behavior. Primarily, this system will record vehicle speed profiles on the approach to an intersection or curve.

The proposed Stop Sign Warning System will provide *active real-time supplemental warning* to drivers approaching the stop sign at an intersection, to alert them of the approaching stop ahead and to be more aware. This device equips a stop sign with a visual warning system such as LED flashers. The sign will flash when vehicles fail to decelerate at a safe rate for a safe stop.

The Curve Warning System provides a programmable active warning based on the speed of the vehicle as it approaches the curve and provides a warning message to the driver to reduce speed if it is excessive.

## Location:

Hennepin County  
Olmsted County  
Washington County  
Wright County

## Partners:

Mn/DOT  
Freeborn County  
Hennepin County  
McLeod County  
Olmsted County  
Otter Tail County  
Washington County  
SEH, Inc.  
NTT, LLC

Project Cost: \$189,282

Project Completion Date:  
July 2011

## Benefits

- Reduced fatalities and injuries at low volume rural thru-stop intersections
- Low cost alternative to traditional improvements of signal installation or geometric improvements at intersections and through curves.
- Readily deployable system that is easy to install by field personnel.
- The goal is to develop and deploy low maintenance reliable systems.

## Next Steps

- Continued testing and system development.
- Independent evaluation of system performance and effectiveness.
- Deployment of each system the Spring of 2010.

## For More Information

### Contact:

Jon Jackels  
Office of Traffic, Safety  
and Technology  
651-234-7377  
jon.jackels@state.mn.us



# Safe Intersections

## Description

The goal of this project is to field deploy at selected non-signalized low-volume intersections and investigate the use of Commercial Off-the-Shelf (COTS) traffic components to provide detection, processing, communications and display for three to five Intersection Conflict Warning (ICW) systems to determine feasibility.

The objective is to recommend low-cost, readily deployable, reliable, low maintenance, and cost effective systems that can be used by government agencies to improve safety on rural roads and non-signalized rural intersections.

The bottom line, output from this project will recommend three to five systems that can reduce the number and severity of crashes at rural low-volume non-signalized intersections to save lives, reduce personal injury and reduce property damage resulting from intersection collisions by raising driver awareness of potentially dangerous situations.

## Lessons Learned

- COTS products do exist from which to compile an ICW system design

## Benefits

- Improve safety
- Low cost
- Readily deployable
- Low maintenance

**January 2010**

### Location:

Mn/DOT District 4

- TH200 at CSAH 4 Mahnomen County
- TH113 at TH59 Mahnomen County
- TH29 at CSAH 5 Douglas County
- TH75 at CSAH 2 Clay County
- TH210 at CSAH 35 Otter Tail County
- TH75at CSAH Polk County

### Partners:

Mn/DOT  
Otter Tail County  
Polk County  
Short Elliott Hendrickson  
NTT, LLC  
Iteris

**Project Cost:** \$647,328

### Project Completion:

January 2013

## For More Information

### Contact:

Jon Jackels  
Office of Traffic, Safety  
and Technology  
651-234-7377  
jon.jackels@state.mn.us





# Intelligent Transportation Systems (ITS) Systems Engineering for Arterial and Freeway Management

## Description

In 1991, the Federal highway Administration (FHWA) published their 23 CFR Rule 940 which “provides policies and procedures for implementing section 5206(e) of the Transportation Equity Act for the 21<sup>st</sup> Century (TEA-21), Public Law 105-178, 112 Stat. 457, pertaining to conformance with the National Intelligent Transportation Systems Architecture and Standards.” Rule 940 further states in section 940.5 that “ITS projects shall conform to the National ITS Architecture and standards in accordance with the requirements contained in this part. Conformance with the National ITS Architecture is interpreted to mean the use of the National ITS Architecture to develop a regional ITS architecture, and the subsequent adherence of all ITS projects to that regional ITS architecture. Development of the regional ITS architecture should be consistent with the transportation planning process for Statewide and Metropolitan Transportation Planning. Mn/DOT envisions that all future ITS deployments will adhere to FHWA Rule 940, and existing systems will reach compliance upon their eventual upgrades. This can be accomplished by creating a Concept of Operations for both arterial and freeway traffic management systems and a checklist that ensures proper planning methods for ITS projects.

## Lessons Learned

- How the use of a standardized ITS Concept of Operations can lessen the time needed for design of an ITS based traffic management system
- How the use of a standardized checklist can speed up deployments of ITS based traffic management systems
- The best use of ITS for arterial traffic management
- A high level concept of the existing ITS freeway management and what needs to be done with further deployments

## Benefits

- Improved Federal compliance with CFR Rule 940
- Better management of ITS deployments in urban and rural areas
- Seamless coordination with Minnesota’s ITS architecture
- Need for individual Concepts of Operation per ITS project eliminated

**January 2010**

### Location:

Various locations in the Twin cities Metro Area and outstate districts

### Partners:

FHWA  
Mn/DOT  
Alliant Engineering  
Athey Creek Consultants

**Project Cost:** \$75,000

### Project Completion:

June 2010

## For More Information

### Contact:

Ray Starr  
Office of Traffic, Safety  
and Technology  
651-234-7050  
ray.starr@state.mn.us





# Systems Engineering for Standard ITS Applications

January 2010

## Description

The primary goal was to develop a Concept of Operations (ConOps), Functional Requirements (FRs), and ITS checklists for standard ITS applications. The final product deliverables will be used by Mn/DOT as a guide for planning, designing, and implementing ITS deployments statewide. To accomplish this, several standard ITS applications were identified: Standard Traffic signal, Grade Crossing Protection, Road Weather Information System, and Weigh-in-Motion. Each application has a standardized ConOps and FR package. Additionally, an ITS checklist for each standard application was developed as a resource for ease of completing all required project documentation. The intent is that the ConOps and FR document for each application be fairly static documents with infrequent updates, while project specific information will be provided on the associated checklist. The overall goal is to provide Mn/DOT with the assurance of project compliance required upon federal authorization.

Location:  
Statewide

Partners:  
Mn/DOT  
FHWA  
Wilbur Smith Associates

Project Cost: \$73,652

Project Completion:  
January 2010

## Lessons Learned

- Significant source information is available from FHWA on content and form of the document packages.
- Nevertheless, a fair amount of customization was required to characterize these specific applications as implemented in Minnesota.
- Careful preparation of the ConOps and FR will mean these documents should only require updating when major implementation changes are made by MN/DOT

## Benefits

- The primary benefit is that standard application ITS projects authorized by FHWA can be expedited through the review and approval process for National ITS Architecture compliance.
- The documents also lay out a philosophy and approach to standard applications that can help with policy decision and project design.

For More Information

Contact:

Rashmi Brewer  
Office of Traffic, Safety and Technology  
651-234-7063  
rashmi.brewer@state.mn.us



# Smart Phone Based Novice Teenage Driver Support System (TDSS)

## Description

This study will demonstrate the capability of a Teenage Driver Support System that can be embedded in exposure-based Graduated Drivers License (GDL) programs.

The objectives for this project are:

- To develop a demonstration of TDSS based smart-phone technology which will 1) prevent vehicle operation in the presence of alcohol or unfastened seat belts, and 2) sense and provide real-time feedback to the teen driver regarding unsafe or illegal activities (e.g., speeding, stop sign non-compliance) through the use of on-board GPS, digital maps, and system software operating on the smart phone and communicating with in-vehicle subsystems.
- To develop and demonstrate a TDSS driver interface that will be usable and acceptable to teens and parents.
- To provide multiple teens with exposure to the TDSS to solicit qualitative feedback on the perceived usability and effectiveness of the TDSS as a component of a technology-assisted GDL program.

## Benefits

- Reduced teen driver risk by motivating compliance with driving laws
- Increased teen driver safety by motivating the acquisition of good driving skills
- Greater parent awareness and involvement in the learning process of their teens

**January 2010**

**Location:**  
Statewide

**Partners:**  
Mn/DOT  
FHWA  
U of M, ITS Institute

**Project Cost:** \$500,000

**Project Completion Date:**  
May 2011

**For More  
Information**

**Contact:**

Susan Sheehan  
Office of Traffic, Safety and  
Technology  
651-234-7061  
Susan.sheehan@state.mn.us



## PROGRAMS

In 2010, the Mn/DOT OTST ITS Section continued to lead the ITS Innovative Idea Program.

### ITS Innovative Idea Program

For over ten years, the ITS Section has encouraged innovations from private sector partners, through a solicitation process where private entities propose project ideas to the ITS Section. Ideas proposed must address known transportation needs. Samples of the types of systems developed through the Innovative Idea Program include:

- A deer detection and warning system;
- A rural intersection warning system;
- A system to reduce traffic congestion in work zones;
- A ramp queue detection system; and
- Arterial travel time calculation systems.

Through the traditional Project-based RFP process, Mn/DOT identifies projects and the private sector bids on them. In contrast, the Innovative Idea Program is a way for the private sector to share their ideas for innovation by suggesting projects. This allows Mn/DOT to fund projects that address stated and known transportation needs, while helping to launch private sector products.

### *Rural ITS Safety Solution Systems (RITSS)*

*One of the current ITS Innovative Idea Projects, “Rural ITS Safety Solutions” will address the problems of rural road lane departure and intersection collisions and the resulting fatalities, serious injury and property damage. The project will also demonstrate the development of low-cost, portable systems that can be used by the state, counties and cities on rural roads at low-volume intersections to reduce crashes and move Minnesota Towards Zero Deaths. The main thrust of this project is to develop commercially viable relatively low-cost low-maintenance systems that can be deployed. Both public and private sectors are contributing to this project. Additional details about this project can be found at [www.state.mn.us/guidestar](http://www.state.mn.us/guidestar).*



## Staff Highlights

### Contract Administration



As Contract Administrator for the Office, Ron Bisek is responsible for all processes related to contracting in the office. In particular, he manages the consultant services acquisition process and programs for all ITS projects funded through this office. These processes include preparing the request for proposal, facilitating proposal review and consultant selection, conducting contract negotiations, drafting the contract documents and managing the contract signature process.

Once a contract has been executed, Ron serves as an advisor to the project manager to ensure that the contract is properly carried out and adhered to by all parties. Upon project completion, Ron is responsible to oversee the contract closeout process.

Ron also oversees and manages the Master contract Program for ITS Support Services and is responsible to oversee the contracting process for the ITS Innovative Idea program.

ITS contracts are most often unique and complex contracts that may involve public and private partnerships, specialized equipment and unproven implementation strategies.

In his duties, Ron also manages federal reporting requirements with the Federal Highway Administration to ensure that all contract reporting requirements are followed according to Federal guidelines and expectations.

Lastly, Ron is responsible for all contract document management and retention for the office so that state and Federal guidelines are followed.

### Information Technology



Donna Anderson, Information Technology Coordinator, is responsible for the Information Technology needs of the office. Donna provides support to project managers by providing technical direction and oversight regarding their computer hardware, computer software, networking and internet application needs.

Donna oversees both the internal and external website for the office. This includes building new sites or upgrading existing sites. She works closely with the Mn/DOT web group to keep up to date with current Mn/DOT standards and to make sure the sites are ADA compliant.

Donna also keeps up to date with current Mn/DOT standards for computers and peripherals. She is also responsible for purchasing new equipment and set-up.

## ACTIVITIES

### Minnesota Guidestar Board of Directors

The ITS Section provides technical and administrative support to the Minnesota Guidestar Board of Directors. The Board is comprised of 50% private sector members and 50% public and academia members. The Minnesota Guidestar Board provides strategic direction and advice for statewide application of advanced technology and information systems in transportation to save lives, time and money.

### Minnesota Guidestar Vision

Intelligent Transportation Systems will be fully integrated into the transportation system to enhance quality of life by improving safety, mobility, economic vitality and sustainability.

The Board serves as a catalyst for innovative partnerships and resource investment so desired outcomes can be achieved. Ray Starr is a support/resource for the Minnesota Guidestar Board of Directors and Executive Committee. Susan Sheehan provides administrative support to the board. To view current Guidestar Board Members go to:

[http://www.state.mn.us/guidestar/about\\_guidestar.html](http://www.state.mn.us/guidestar/about_guidestar.html)

## Organizational Activities

### ITS/Traffic Engineering Organization (TEO) Sub-Committee

While the Mn/DOT District and Central Office traffic engineers have held several meetings per year since the 1960's, these meetings were formalized through the creation of the Traffic Engineering Organization (TEO). The ITS Section coordinates and Chairs the TEO Sub-committee specific to ITS deployments, facilitating open discussions on the topics most pressing to ITS deployments statewide. In 2010, Susan Sheehan served as the Chair of the ITS/TEO Sub-committee.



## ITS Minnesota

The Intelligent Transportation Society of Minnesota (ITS Minnesota) is a voluntary, not-for-profit organization. ITS Minnesota works closely with the Minnesota Guidestar program (administered by the ITS Section) and its Board of Directors. Mn/DOT has been an active member of ITS Minnesota since its inception.

ITS America (<http://www.itsa.org/>) was established in 1991 to coordinate the development of ITS in the United States. ITS Minnesota has been a state chapter of ITS America since 1995.

ITS Minnesota has an active board of directors comprised of four officers, the past president, six elected directors, and several ex-officio directors. The board of directors includes individuals from state, county, and city DOTs, the University of Minnesota, private consultants, and private vendors, giving a balanced representation of ITS stakeholders. The chapter is managed on a volunteer basis by the board and does not utilize paid staff or a paid management consultant.

During the Fiscal Year 2010 individuals from the ITS Section held the following positions on the ITS Minnesota Board.

Mn/DOT ITS Section Staff	ITS MN Board Position	
	March 09-10	March 10-11
Ray Starr	Past President	
Matt Gjersvik	Treasurer	Secretary
Susan Sheehan	1 <sup>st</sup> Yr Director and Program Committee Chair	2 <sup>st</sup> Yr Director/
Rashmi Brewer	Education Committee	Education Committee Chair

The mission of ITS Minnesota is to foster grassroots participation and public-private partnerships in ITS, which generate interest, excitement, cooperation and progress focused on implementation results.

Mn/DOT has received a number of benefits as an active member in ITS Minnesota including:

- Events that bring national and local speakers to discuss a variety of ITS related topics.
- Networking opportunities to learn about ITS funding, new projects and programs
- Newsletters with comprehensive articles on new initiatives and project results.
- Educational seminars and tours through regular training opportunities.

For more information about ITS Minnesota visit: <http://www.itsmn.org>.



## The Joint NCITE/ITS Minnesota, ITS Technical Committee

The Joint NCITE/ITS Minnesota, ITS Technical Committee is a committee of the North Central Section of the Institute of Transportation Engineers (NCITE) and ITS Minnesota. The committee provides a forum for participants to address technical issues related to ITS and to share lessons learned. Topics from July 2009 through June 2010 included:

- Items in the Proposed Federal MUTCD
- ITS Warrants
- Breakaway Supports for ITS Devices
- ITS Planning and Architecture
- Solar Power for ITS Devices
- ITS Design Manual
- “Your Speed” Signs
- SAFTEA-LU 1201 Real Time Information Systems – Notice of Proposed Rulemaking

Ray Starr from the ITS Section was the chair of the Joint NCITE/ITS Minnesota, ITS Technical Committee from May 2008 when the committee was formed through December 2009. Committee members from the ITS Section include Jon Jackels, Susan Sheehan, Matt Gjersvik, and Rashmi Brewer.

To view meeting documents visit NCITE’s website at: <http://www.nc-ite.org/>



## National Effort

### Program Evaluation

The Rural Safety Innovation Program (RSIP) is one of several key programs under USDOT's Rural Safety Initiatives. Overall, the goal of the initiative is to improve safety on rural roads, resulting in a decrease in the loss of lives and injuries. Minnesota has deployed rural curve warning systems as one of 12 funded RSIP projects throughout the United States. In addition to deploying the curve warning systems on three curves in two different counties in Minnesota, Mn/DOT, together with project partners, is participating in a National evaluation of the overall RSIP concepts. The intent of this evaluation is to determine the effectiveness of the specific technologies being deployed, conduct a qualitative assessment of the deployment experiences at each site, facilitate a "lessons learned" discussion, and assess the specific impact of the various deployed ITS components in improving safety. Ultimately, Minnesota's participation in this national evaluation will help provide a consistent basis for evaluation that will help USDOT answer questions regarding the applicability and limitations of these technologies relative to each other and provide guidance for larger widespread deployment. Rashmi Brewer is Mn/DOT's project manager for this effort. Detailed information about the Mn/DOT's RSIP Horizontal Curve Warning project can be found at [www.state.mn.us/guidestar](http://www.state.mn.us/guidestar).



## Pooled Fund Studies

The ITS Section participates in FHWA Transportation Pooled Fund Studies. Pooled fund studies allow federal, state, and local agencies and other organizations to combine resources to support transportation research studies. In 2010 the ITS Section supported the ENTERPRISE and North/West Passage Pooled Funds.

### ENTERPRISE Pooled Fund

Mn/DOT is a member of the ENTERPRISE Pooled Fund Study (<http://enterprise.prog.org>) which is a collaboration of nine U.S. states, one Canadian province, the Federal Highway Administration, Transport Canada, and the Dutch DOT. Together, these 13 transportation agencies fund and perform projects that address specific needs in the members' agencies, that are related to advanced technologies in transportation, and that are most suited to collaborative group efforts. Each year, the ENTERPRISE group develops an annual work plan defining projects to be performed during the coming year.

The benefits of the Enterprise pooled fund are:

- Shared experiences between states;
- Pooled resources (financial and technical) to address common problems;
- Projects can develop naturally, changing their focus when required, to take advantage of new ideas.

Jon Jackels from the ITS Section represents Mn/DOT on the ENTERPRISE Pooled Fund.



### **ENTERPRISE Project: Developing Consistency in ITS Safety Solutions – Intersection Warning Systems**

*Crashes that occur at unsignalized intersections account for many fatal and serious crashes in the US. Many Strategic Highway Safety Plans call for improved design and operation of unsignalized intersections.*

*One approach to reduce crashes at unsignalized intersections is the deployment and operation of ITS technologies to warn drivers of potentially dangerous situations. These intersection warning systems and intersection collision avoidance systems offer cost effective tools to enhance highway safety.*

*Inclusion of the design and operation standards for ITS intersection warning systems in the MUTCD would enable the industry to build products to one consistent design, and to provide uniform messages and sign displays throughout the US.*

*The objective of this project is to bring together the agencies and individuals who have deployed ITS intersection warning systems to reach consensus on an approach for an accelerated uniform deployment and a recommendation for inclusion into the MUTCD.*



## North/West Passage Pooled Fund

Interstates 90 and 94 between Wisconsin and Washington function as major corridors for commercial and recreational travel. Extreme winter weather conditions, prevalent in the northern states within this corridor, pose significant operational and travel-related challenges. Idaho, Minnesota, Montana, North Dakota, South Dakota, Washington, Wisconsin, and Wyoming are predominantly rural and face similar transportation issues related to traffic management, traveler information, and commercial vehicle operations.

Recognizing the value of coordinated, cross-border collaboration for ITS deployment to address these issues, Minnesota initiated a meeting in 2002 with representatives from each of the states within the corridor. The group established itself as a Transportation Pooled Fund in 2003 through the Federal Highway Administration (FHWA).

The North/West Passage (NWP) Corridor has successfully implemented three work plans containing 13 projects. The fourth work plan focuses on enhancing the traveler information website (<http://www.i90i94travelinfo.com>), researching call forwarding between states, exploring regional permitting for the corridor as well as detailing center to center communications between states.

Mn/DOT's Research Services Section administers the pooled fund. The ITS Section provides a project manager to participate on the Steering Committee for the corridor. In 2010, Matt Gjersvik from the ITS Section was the project manager participating in monthly calls and providing overall guidance to the corridor on behalf of Mn/DOT.



### NWP Accomplishments since 2001

- North and South Dakota 511 callers can select to receive information on Minnesota's highways
- Creation of the program website ([nwpassage.info](http://nwpassage.info))
- Development of one proposal to hire a contractor to perform work in two bordering states.
- Completion of a Strategic Plan to guide the future of the corridor.
- Each state uses their own phrases to describe road events. The NWP defined and agreed upon a set of consistent event description phrases to use across the I-90 and I-94 corridor.
- Created a website to provide traveler information along a corridor ([i90i94travelinfo.com](http://i90i94travelinfo.com))
- Provided a forum for state patrol/police and DOT staff to discuss integration of systems.
- Held a workshop to identify action items for increased cross-border operation and maintenance collaboration.
- Participated in the USDOT Clarus initiative which demonstrated an integrated surface transportation weather observing, forecasting, and data management system. The result of the project was an example of all NWP states working together to develop a corridor Concept of Operations document.

For more information on the NWP corridor and to view completed project reports visit the program web site at [www.nwpassage.info](http://www.nwpassage.info).

## ITS Standards Development Support

The ITS Section continues to support development and maintenance of ITS Standards. The consistent use of standards among public and private agencies moves towards supporting an environment of information sharing and interoperability.

The ITS Section has led ITS Standard support through participation in the following efforts:

### ITS Design Manual

The ITS Section is in the process of completing an ITS Design Manual. The purpose of the ITS Design Manual is to give engineers familiar with ITS elements the process and information necessary to design ITS elements for Mn/DOT. ITS elements have many similarities to traffic signal and roadway lighting elements, but also have many unique characteristics and considerations. The manual is intended to provide consistent information for agency and consultant personnel engaged in ITS system design. The ITS Section has provided content for the manual as well as reviewed the manual in detail to ensure the manual supports ITS standards.

### National Transportation Communications for Intelligent Transportation Systems (NTCIP) Joint Committee

Ray Starr from the ITS Section participates on the NTCIP Joint Committee that oversees the working groups that develop NTCIP standards. Ray Starr's involvement in this group keeps a broad perspective of national ITS standards for consideration as each ITS related project moves forward within the ITS Section. For more information visit: <http://ntcip.org/>.

### Advanced Transportation Controller (ATC) Committee

The Application Program Interface (API) is one of three standards efforts under the direction of the ATC Joint Committee. The purpose of the group is to develop an API standard in order for software to run on the ATC controller. An ITS Cabinet Committee also exists to assist in developing cabinet and control equipment specifications. This standards effort at the national level provides for a control cabinet that can be utilized for other ITS applications. The ITS Section continues to track the activities of the ATC Committee to keep current standards in the forefront. Peter Skweres from OTST Traffic Electrical Systems Unit is a member of these working groups.



### Mn/DOT's ITS Approved Products List (APL)

An ITS component was added to Mn/DOT's Approved Products List. The intent of the APL is to assist contractors with a list of products that meet standards and specifications to be qualified for use and assist in project bids. The product list included cabinets, fiber optic cables, fiber optic materials, CCTV materials, and loop detector materials. For more information go to: <http://www.state.mn.us/products/index.html>. The ITS Section will continue to work within Mn/DOT to maintain and update the ITS APL.

To view submitted papers, please contact Susan Sheehan at: [susan.sheehan@state.mn.us](mailto:susan.sheehan@state.mn.us)

## Conferences/Papers/Workshops

The Office of Traffic, Safety and Technology staff actively promotes and highlights ITS projects at conferences and workshops. These opportunities provide a national forum to learn from other states and agencies.

Conference	Date	Paper	Mn/DOT Authors	Presenter
National Rural ITS Conference Seaside, Oregon	August 23-27, 2009	Improving Driver Behavior at Rural Intersections Intersection Warning Systems	Ray Starr Matt Gjersvik	Ray Starr Ray Starr
2010 MBUF Symposium	April 20, 2010	IntelliDrive <sup>SM</sup> (VII) for Safety, Mobility, and User Fee for Implementation	Cory Johnson	Cory Johnson
ITS MN Annual Meeting & Information Exchange St. Paul, MN	March 9, 2010	ITS Intersection Conflict Warning Activities	Jon Jackels	Jon Jackels
CTS Research Conference St. Paul, MN	April 27-28, 2010	Rural ITS Safety Solution Systems	Jon Jackels	Contractor
ITS America Houston, TX	May 3-5, 2010	Minnesota's Intelligent Work Zone Toolbox	Ray Starr/Jon Jackels/Marv Sohlo	Ray Starr
		Minnesota I-394 Integrated Corridor Management – Transitioning to Deployment Stage	Brian Kary	Ray Starr
		ITS to Address Non-Signalized Rural Intersection Safety	Ray Starr/Jon Jackels	Ray Starr

## FUNDING

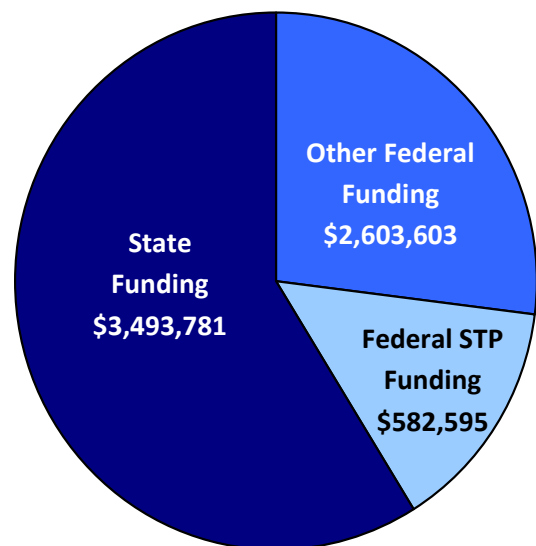
### History of the ITS Section Funding

The Intermodal Surface Transportation Equity Act of 1991 (ISTEA) provided \$10 million in earmarks to the Minnesota Guidestar program in 1991, which enabled the ITS Section to move forward. Mn/DOT provided \$2.5 million in new state funding to serve as the required match. Twenty-five percent of the earmarked funds were designated for the University of Minnesota. In subsequent years, Minnesota continued to receive annual earmarks of various amounts and state match funds, receiving its last earmark in 2004. Beginning in 2000, Mn/DOT designated \$1.5 Million per year in Surface Transportation Program (STP) federal funds from MN/DOT's "District C": to meet revised match requirements for the earmarked funds. In 2006, Mn/DOT's division directors reaffirmed ongoing funding for the ITS Section with \$1.5 Million STP funds and \$2.5 Million state funds annually in order to sustain the identity of Minnesota's ITS program.

In addition to the on-going funding sources described above, the ITS Section has secured various competitive or sole-source federal ITS research funds administered by the USDOT, such as Cooperative Intersection Collision Avoidance Systems and Integrated Corridor Management which are in addition to Mn/DOT's normal federal funding. Other funding sources include other state funds, funds from other government agencies and private sector partnership contributions.

### State Fiscal Year 2010 Funding

The total State Fiscal Year Funding for 2010 for the ITS Section was \$6,679,980. The pie chart below depicts the 2010 funds broken out by State Funding (\$3,493,781), Federal STP Funding (\$582,595), and Other Federal Funding (\$2,603,603).



*2010 State Fiscal Year ITS Section Funding*

## History of the ITS Section

In January of 1991, Mn/DOT formed the ITS Section within the Office of Traffic Engineering in the central office. The ITS Section focused on development of technology in transportation as a complement to Mn/DOT's Traffic Management Center, which, under Glen



Carlson, had operated the freeway traffic management system since 1972. Shortly after its formation, the ITS Section became its own office, called the Office of Advanced Transportation Systems (OATS), with Jim Wright as its first director. In 1996 Jim Wright and many of the OATS staff moved from OATS to Mn/DOT's Metropolitan District to oversee a metro area ITS deployment called Orion. After interim directors, Marthand Nookala took the lead of OATS upon Jim Wright's move, and was followed by Jim Kranig. In 2001, the office again joined the Office of Traffic Engineering, with Daryl Taavola, and Ray Starr succeeding as section directors.

In 1991, the program received its first earmarked funding as part of the Minnesota Guidestar program. The Activities section of this report provides a further description of the Minnesota Guidestar program. Annual earmarks enabled the section to pursue

operational test projects such as the Genesis project which provided traffic information to pagers and to personal digital assistants and the Travlink project which provided real-time transit information to travelers. In addition to pursuing technical innovation, the ITS Section looked for innovative business approaches for deploying technology, specifically public/private partnerships. An important milestone occurred when the Minnesota legislature passed a law authorizing public/private partnerships, Minnesota Statutes Section 174.02, subdivision 6a.

In an effort to move toward statewide ITS deployment, the ITS section completed a Rural ITS Scoping Study in 1994, which identified and prioritized the needs of travelers in Greater Minnesota.

In 1995, the Polaris Statewide Architecture Project outreach activities confirmed and expanded upon the Rural Scoping Study findings. The Polaris findings described the need for both rural and urban ITS applications in Minnesota, and served as the basis for development of a statewide ITS architecture.

Also in 1995, the ITS Section developed a statewide business plan for Commercial Vehicle Operations (CVO) in Minnesota. Following a comprehensive process re-engineering effort, an action plan was agreed upon with initiatives in enforcement, business processes, information dissemination and computer systems. Minnesota was selected as one of seven states to receive Federal funding for CVO model deployment, known as Commercial Vehicle Information Systems and Networks (CVISN).

In 1996-1997, the ITS Section in conjunction with Minnesota Guidestar developed its first

Strategic Plan that led to implementation of 14 separate projects. Of these, the most far-reaching was the Transportation Operations and Communication Center (TOCC) projects in Duluth, St. Cloud and Rochester. To date, nine TOCCs have been deployed across the state.

In 1998, the Statewide Advanced Traveler Information Plan was prepared to guide future coordination and implementation of traveler information in Minnesota. Subsequently, the Condition Acquisition and Reporting System (CARS) was developed, and is now the primary source of data for Mn/DOT's 511 web and phone traveler information services, initially introduced in 2002.

In 1999, Mn/DOT was one of four groups to receive funding for an Intelligent Vehicle Initiative (IVI) project dealing with specialty vehicle platforms, which created a unique partnership among Mn/DOT, FHWA, the University of Minnesota ITS Institute, and the private sector.

The year 2001 brought us a clearer picture of the need for a safer and more secure transportation system. Projects such as the TOCCs and Traveler Information Guidance and Evacuation Routing (TIGER) were completed to provide traveler information and better connectivity between rural and urban centers.

Minnesota's ITS Safety Plan was developed in 2006. The purpose of the plan was to develop ITS strategies and initiatives that reduce the number of vehicle traffic fatalities and life changing injuries on Minnesota roadways. The plan is a component document of the Minnesota Strategic Highway Safety Plan (SHSP), the Toward Zero Deaths (TZD) Program, and the Minnesota Statewide Heavy Vehicle Safety Plan (SHVSP).

Strategic Plans were issued in 1997, 2000 and 2006. These plans have provided statewide and local strategic direction to Minnesota Guidestar and the ITS Section and have initiated more than 200 ITS programs, projects and activities over the years. An update to the strategic plan is planned for SFY11.

## Future Direction

In the 2011 Fiscal Year, the ITS Section will continue to lead and support a number of technology related innovations. Planned activities include:

- Continued support of innovation through a new round of Innovative Idea project selections;
- Continued work on the IntelliDrive<sup>sm</sup> for Safety and Mobility project;
- Support the development of the 2010 Minnesota Guidestar Board of Directors Strategic Plan;
- Continued support of the Minnesota statewide ITS Architecture through regular updates;
- Continued development of the Integrated Corridor Management initiative;
- Continued IT support and contract administration for OTST office;
- Continued development of safety improvement solutions at rural intersections and horizontal curves;
- Implement District Office visits to promote ITS and develop a solicitation for district ITS deployment program.

In addition to the ITS activities within the state of Minnesota, efforts at the National level also continue to experience much progress in advancing the ITS industry. For example:

- The USDOT's Research and Innovative Technologies Administration (RITA) released the new 5-year ITS Strategic Research Plan in 2010;
- The American Association of State Highway and Transportation Officials (AASHTO) plans to prepare an IntelliDrive<sup>sm</sup> deployment plan in 2010.

The ITS Section remains in communication with national and international ITS efforts, allowing Minnesotan's to benefit from the activities in other locations while sharing the success stories of Minnesota.