



# **REGIONAL ITS STRATEGIC PLAN**

## **FOR THE MADISON METROPOLITAN AREA**

An Intelligent Transportation System (ITS) represents the collection of technologies or systems (e.g., advanced sensors, computers, communications systems) that enable multiple agencies to work together to deliver various transportation services (e.g., regional traffic control) in an efficient and cost-effective manner.

# **Executive Summary**

# Regional ITS Strategic Plan for the Madison Metropolitan Area

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Prepared by:  
HNTB Corporation

in association with:  
Toole Design Group  
ABRAZO Marketing



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*The contents of this report do not necessarily reflect the official views or policy of the U.S. Department of Transportation. Information in this report is subject to change based on the final disposition of the federal transportation reauthorization bill Moving Ahead for Progress in the 21<sup>st</sup> Century (MAP-21).*

## 1.1 Overview

In August 2015, the Metropolitan Area Transportation Planning Board (MATPB), in cooperation with the City of Madison Traffic Engineering (TE) Division/Parking Utility contracted the consulting services of a consultant team lead by HNTB Corporation to develop a Regional intelligent Transportation System (ITS) Strategic Plan for the Madison Metropolitan Area. The effort to develop the Strategic Plan included the following key work tasks:

- ITS Existing Conditions/Inventory Analysis
- Preparation of an ITS Vision and Corresponding Goals, Objectives and Performance Measures
- ITS Needs Assessment
- ITS Operational Concept
- Regional ITS Architecture
- ITS Implementation Plan

The project scope covers the approved MATPB Metropolitan Planning Area Boundary (see **Figure 1**). This area covers all of the City of Madison and the Madison Urban Area, including all or portions of 27 cities, villages and towns. The Plan is focused on the surface transportation system and its applicable interfaces with other modes.

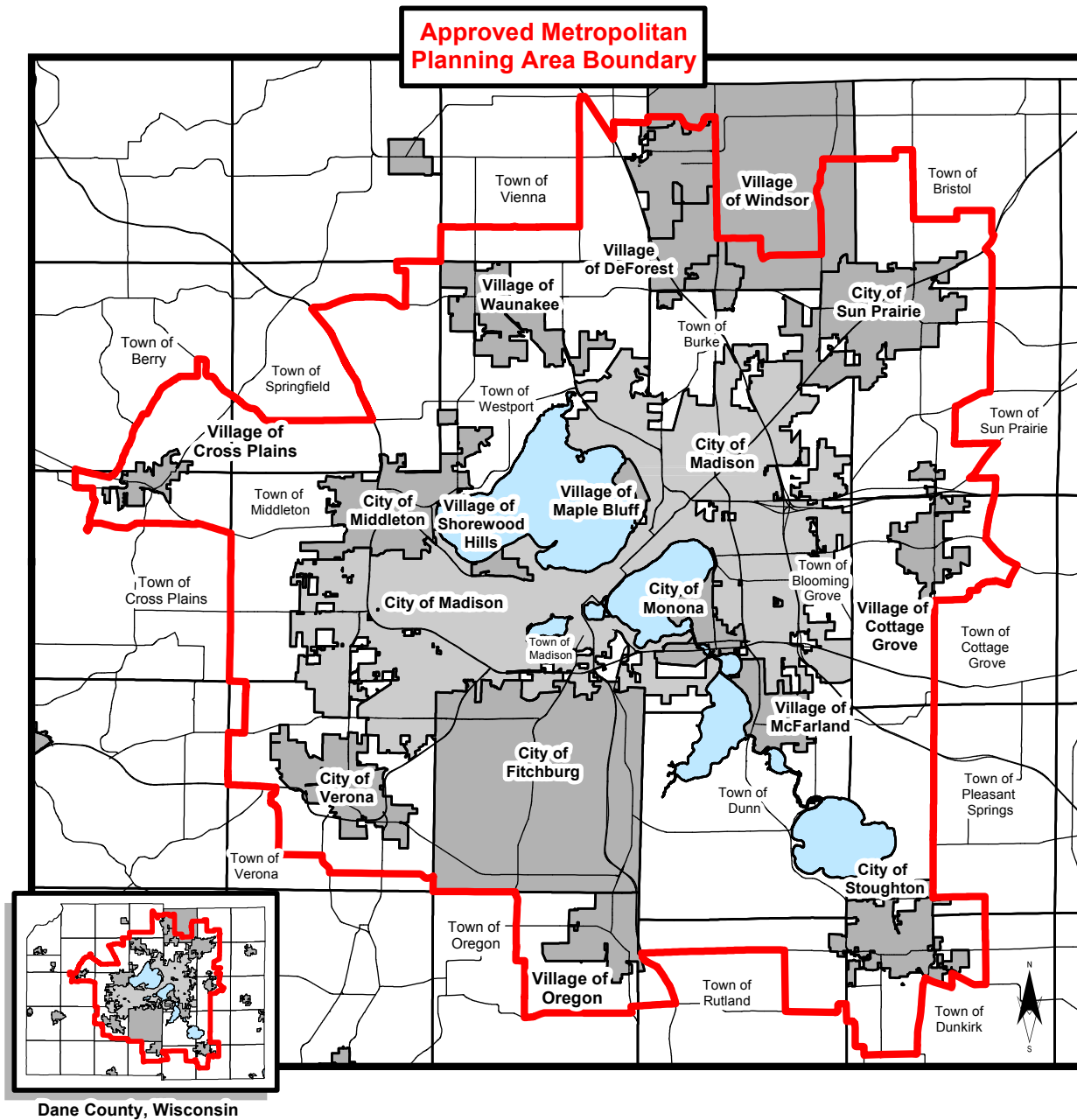
## 1.2 Why a Regional ITS Plan?

The Madison Metropolitan Area is the fastest growing region in the State of Wisconsin. The City of Madison is the second-fastest growing of Midwest cities with a population of 200,000 or more. This growth combined with the fact that the downtown City of Madison/UW-Madison campus area is located off the freeway network and sits on an isthmus has resulted in the need to better manage transportation congestion in the region. Due to the region's unique geographic constraints there are limited options for traffic circulation and because funding is a limited as ever, capacity expansion (i.e., new pavement) is becoming more and more difficult to implement. As a result, transportation systems management and operations (TSMO) strategies, including ITS and transportation demand management (TDM) strategies, by necessity must play a major role in managing congestion in the Madison Metropolitan Area.

Non-recurring congestion from crashes, disabled vehicles, work zones, adverse weather conditions and planned special events account for a significant amount of congestion, affecting travel reliability on the entire transportation system. Furthermore, the City of Madison hosts numerous special events throughout the year, and ITS strategies are particularly effective in managing congestion from special events and other sources of non-recurring congestion.

Aside from congestion management, ITS strategies also have the ability to provide many other benefits, including improved traveler safety, emergency management, improved transit speed and reliability, parking management, inter-agency communication, staff efficiency and data management. One of the MATPB's primary motivations for preparing this ITS Strategic Plan is to develop a phased approach for implementing ITS strategies so that the required data are collected and shared to fully implement the region's Congestion Management Process (CMP) and to facilitate performance based multi-modal transportation planning.

Figure 1: Regional ITS Strategic Plan Project Area



### 1.3 What is an ITS?

An Intelligent Transportation System (ITS) is a collection of technologies or systems (e.g., advanced sensors, computers, communications systems, etc.) that enable multiple agencies to work together to collectively manage a transportation network. ITS can be applied to the region's transportation infrastructure of highways, streets, bridges and to a growing number of vehicles, including cars, buses and trucks. ITS elements can also assist in the safe movement of bicycles and pedestrians and can improve transportation providers' (e.g., governments, transit agencies, emergency responders) ability to offer services to the public.

In brief, ITS technologies can perform the following functions:

- Collect and transmit information on traffic conditions. This information can be used in real-time to notify users so they can adjust their plans and by operators to better manage the transportation network. Historical information can be used to monitor how conditions change over time and to implement fixes and tweaks so that strategies can be set in place prior to when impacts are expected.
- Decrease congestion by reducing the number of traffic incidents, clearing them more quickly when they occur, and rerouting traffic flow around them to decrease emergency response times and to improve quality of life of those users that would otherwise be impacted by incidents.
- Improve the efficiency of transit, maintenance, and emergency response agencies.

## 1.4 Project Process

The foundation of the Project Team's approach to developing the Regional ITS Strategic Plan was based on the following principles:

- Comprehensive stakeholder engagement, including multi-agency workshops and needs identification
- Disciplined application of the systems engineering process
- Building from successful practices and existing infrastructure
- Development of an ITS vision and supporting goals, objectives and performance measures
- Recommendation of projects that address needs and are viable for the region within a 10 year planning horizon.

Because the essence of ITS is information exchange, it is imperative that planning, development, implementation and operations be done in a cooperative and coordinated environment. Development of the Regional ITS Strategic Plan was guided by an ITS Oversight Committee that met regularly throughout the plan's development. Agency members of the Oversight Committee included:

- Madison Area Transportation Planning Board (MATPB)
- City of Madison, Traffic Engineering Division/Parking Utility
- City of Madison, Metro Transit
- University of Wisconsin Traffic Operations and Safety (TOPS) Laboratory

In addition, a Project Advisory Committee was created. Advisory committee members participated in two locally held workshops and met twice towards the end of the process to provide input on project recommendations and implementation steps. Representatives from the following additional agencies were represented on the advisory committee:

- WisDOT, State Traffic Operations Center
- WisDOT, Southwest Region
- Dane County Highway Department
- Dane County Public Communications (911) Center
- Dane County Emergency Management
- Dane County Sheriff's Department
- UW Transportation Services
- City of Madison Police Department
- City of Madison Information Technology Department

In addition to the agency members of the Oversight and Project Advisory Committees, the following additional agencies contributed to the development of the plan through targeted outreach efforts and/or through the participation in the locally held workshops.

- Wisconsin State Patrol
- City of Madison Engineering Department
- City of Madison Fire Department
- City of Fitchburg Public Works Department
- UW-Madison Police
- Dane County Alliant Energy Center
- Union Cab

Outreach to regional transportation agencies, including the above listed agencies began with the first key phases of the project – collection of existing sources of information and development of the regional ITS element inventory.

## 1.5 ITS Element Inventory – *The Foundation*

The approach for developing the ITS Strategic Plan and for recommending specific ITS projects began by developing an understanding of existing ITS systems. Existing systems essentially represent the foundation from which future ITS efforts will be based. Therefore, it was critical to first understand what existing assets could be leveraged to enhance transportation system management and operations within the region. Current legacy systems were analyzed early in the project and throughout it to evaluate the opportunity for integrating current systems with those that are desired or planned. To be consistent with National terminology and to begin the process of mapping ITS elements to National ITS Architecture service packages the identified ITS elements that currently exist within the Madison Area were categorized into four classes:

- Field-based ITS elements
- Vehicle-based ITS elements
- Centers and center-based ITS elements
- Remote traveler support ITS elements

A summary of ITS elements discussed in existing literature and/or reported by stakeholders is provided in **Table 1**.

## 1.6 ITS User Needs – *The Problems/Issues*

Concurrent to the identification of existing ITS elements, the project team identified and documented transportation user needs. User needs specify the issues plaguing travelers and transportation operating agencies that may be satisfied through successful application of ITS elements. Understanding user needs is important because it provides the foundation from which remaining project activities were based and ultimately used to recommend specific projects to be implemented in the region.

User needs were categorized into high-level functional areas and sub areas to begin the process of mapping them to the National ITS Architecture – a nationally accepted and proven approach for defining system integration possibilities for regions like the Madison Metropolitan Area. The high-level functional areas are as follows:

- Archived Data Management & Communication
- Public Transportation
- Traveler Information
- Traffic Management
- Vehicle Safety
- Emergency Management
- Maintenance and Construction Management (MCM)
- Other (non-classified)

Table 1

Listing of Existing ITS Elements in the Madison Metropolitan Area Organized by ITS Element Class

ITS Element Class	Existing ITS Elements
Field-Based ITS Elements	<ul style="list-style-type: none"> <li>● Closed Circuit Television Cameras</li> <li>● Arterial and Transit Dynamic Message Signs</li> <li>● Ramp Meters</li> <li>● Traffic Signal Systems</li> <li>● Emergency Signal Pre-emption</li> <li>● Adaptive Signal Control Technology</li> <li>● Pedestrian and Bicyclist Hybrid Beacons and Detection</li> <li>● Speed Display Signs</li> <li>● Road Weather Information Systems</li> <li>● Parking Management Systems</li> <li>● System Detector Stations</li> <li>● Bike Counters</li> <li>● Electric Vehicle Charging Stations</li> </ul>
Vehicle-Based ITS Elements	<ul style="list-style-type: none"> <li>● Automatic Transit Passenger Counters</li> <li>● Automatic Transit Vehicle Location Systems</li> <li>● Mobile Data Terminals/Mobile Data Computers</li> <li>● Transit On-Board Fareboxes</li> <li>● Transit On-Board Video Camera System</li> <li>● Transit External Announcement System</li> <li>● Freeway Service Team Vehicles/Equipment</li> </ul>
Centers and Center-based ITS Elements	<ul style="list-style-type: none"> <li>● Statewide Transportation Operations Center (STOC)</li> <li>● City of Madison Traffic Operations Center</li> <li>● Dane County Public Safety Communications Center</li> <li>● University of Wisconsin-Madison Communications Center</li> <li>● Metro Transit Computer Aided Dispatch System</li> <li>● Dane County Emergency Management Systems</li> </ul>
Remote Traveler Support ITS Elements	<ul style="list-style-type: none"> <li>● Wisconsin 511 (Phone and Website)</li> <li>● Metro Transit Online Bus Tracking and Real-time Schedule Information</li> <li>● University of Wisconsin Emergency Notification System (WiscAlerts)</li> <li>● Social Media (various)</li> <li>● Subscription based services (various)</li> </ul>
Communications Systems	<ul style="list-style-type: none"> <li>● Metropolitan Unified Fiber Network (MUFN)</li> <li>● ITSNet</li> </ul>

The user needs were compared to the existing regional ITS asset inventory to determine the approach for ITS implementation and how new ITS elements can be meshed with existing ITS elements to meet regional transportation needs. In some cases, ITS may already be addressing some of the identified issues and needs, but perhaps not at a sufficient level and in other cases ITS may not be used at all.

To identify user needs the Project Team completed an intensive data collection effort. First, the team conducted a literature review of existing reports and studies for any previous statements of transportation system needs. Concurrent with literature collection and review, the Project Team conducted a User Needs Workshop to elicit needs from stakeholders. The User Needs Workshop, held on October 29th, 2014 in the City of Madison, provided stakeholders with an overview of the project, including background and its purpose, as well as a brief understanding of ITS and its role in transportation system management and operations. The consultant team walked stakeholders through a series of operational scenarios involving situations pertinent to the region. Stakeholders were asked a series of questions that were aimed at identifying needs affecting travel and operations within the region. A sampling of the needs identified through this process is provided below.



*Integrate and share data collected by multiple regional agencies to improve regional and individual agency operations.*

*Increase the processing speed and frequency of bus automatic vehicle location data so that transit vehicle arrival information is more accurate and timely.*

*Collect and share bicycle origin-destination information to better plan and locate bicycle infrastructure.*

*Improve multi-agency communication and data sharing during active incidents.*

*Provide/expand multi-agency access and control of regional traffic cameras.*

*Accommodate the needs of bicyclists, pedestrians and persons with disabilities at signalized intersections so these groups can safely traverse the intersection (i.e., extend signal timing when these groups are detected within the intersection).*

*Improve traffic signal operations so that they are more responsive to traffic during unexpected incidents and conditions.*

*Implement parking demand management incentives/disincentives (e.g., variable pricing) for parking during events/periods of high demand.*

*Take steps to plan for driverless cars.*

*Improve emergency management coordination, especially around jurisdictional boundaries.*

*Expand weather collection information for Arterial Corridors*

*Foster/build relationships among emergency response and municipal agencies to improve regional emergency/traffic response.*

## **1.7 ITS Vision, Goals and Objectives – The Path**

The Madison Regional ITS Vision sets forth a clear, concise and forward looking statement that defines what ITS should become, or in other words, what it should look like from the perspective of the user (e.g., drivers and operators). Due to the rapid evolution of technology the planning horizon for the Vision has been set at 10 years. Planning for technology beyond a ten year horizon is difficult if not impossible to do. Given that, the Vision for the Madison Metropolitan Area, as mutually agreed to by participating stakeholders is articulated below.

*“ITS in the Madison Metropolitan Area will further maximize the safety, efficiency, reliability and overall performance of the multi-modal transportation system through inter-agency coordination and implementation of interconnected and sustainable technologies.”*

To help move the region closer to this Vision, the project team in cooperation with regional stakeholders outlined a number of goals that will help guide ITS investment. Regional needs and the existing ITS element inventory were reviewed and based on this review the following goals were identified.

- Goal A: Improve Safety and Security for All Transportation System Users, Operators and Public Safety and Construction/Maintenance Personnel
- Goal B: Enhance or Enable Multiagency Communication, Coordination and Data Sharing
- Goal C: Enhance Transportation System Efficiency and Reliability and Reduce its Impact on the Environment
- Goal D: Enhance Attractiveness of, and Operational Support for, Alternative Transportation Modes
- Goal E: Preserve the Transportation System

Since this is the first ITS Strategic Plan for the Madison Metropolitan Area, this list of ITS goals represents a “start small” approach. This approach focuses on successfully demonstrating ITS performance in the short-term so as to help the region gain traction in developing a larger performance monitoring program and to build from successful projects. To that end, for each goal listed above a number of corresponding objectives and performance measures were developed and can be used by stakeholders in the interim to monitor and report on the performance of ITS investment. It is expected that as the region’s performance monitoring program matures and as additional ITS investment is made to collect required data that additional measures will be developed and existing measures tweaked to improve on these efforts. These actions will help demonstrate the value that ITS plays in transportation management and operations and will build momentum and support for additional ITS investment and particularly for ITS programs and projects where improvements have been measured.

## 1.8 ITS Operational Concept – *The Pieces*

The Operational Concept is a non-technical, easy to understand document that provides a high-level overview of the types of functions ITS needs to support and satisfy the Regional Vision and to address user needs. The Operational Concept begins to answer the “who, what, where, why and how” questions that surround the proposed concept.

The Operational Concept is not intended to be a design document, but rather it addresses the high-level questions that are associated with regional ITS deployment that need to be addressed prior to project identification, programming and implementation. This reduces the risk of overlooking critical stakeholder feedback and having to revisit this stage when the system is being designed and implemented. It also creates an environment where stakeholders can easily exchange ideas and input, fostering inter-agency consensus and buy-in and reducing potential adverse stakeholder reactions that may occur when they are not provided an opportunity to provide comments.

Due to the relatively large number of stakeholders in the Madison Metropolitan Area, the Operational Concept focuses on key agencies, where stakeholder participation and input has been sufficient to clearly articulate agency ITS roles and responsibilities for delivering key transportation functions. Key agencies can be defined as those that have a major role in transportation operations, which are both information providers and receivers.

Input used to develop the Operational Concept was collected primarily through stakeholder participation at the User Needs and Operational Concept Workshops (October 2014 and January 2015, respectively).

To mitigate complexities inherent to developing an ITS Operational Concept for a region as large as the Madison Metropolitan Area and to ease understanding and facilitate an environment where inter-agency consensus can be more easily achieved, the Madison Metropolitan Area ITS Operational Concept was prepared and presented as a series of functional concepts that represent “bite-sized” pieces of the overall or complete ITS concept for the Madison Metropolitan Area. These functional concepts or pieces have been developed from previously identified user needs and map directly to National ITS Architecture Service Packages. Service Packages simply represent the physical infrastructure that corresponds with and is needed to implement a particular transportation service. By using National ITS Architecture Service Packages, it is not only easier for stakeholders to understand where they fit in terms of regional ITS activity, but

it also links Madison’s Strategic ITS Plan to the National ITS Architecture – a common, consistent and required (if Federal funds are used) approach for planning and implementing ITS. This alignment ensures consistency with a nationally accepted and proven approach, helping to ensure that public investment is used in the most effective manner. Core functions that comprise the ITS Operational Concept in the Madison Metropolitan Area are illustrated in **Figure 2**. The operational concepts generally represent functional areas that can be supported through existing technologies in the marketplace though these technologies may not yet be present or implemented within the Madison region. In many cases, operational concepts lay the foundation for more sophisticated concepts that may be implemented to address regional needs in the long-term, such as connected vehicle applications and technologies. National ITS Architecture service packages that are applicable to the Madison Metropolitan Area are identified in **Table 2**.

**Figure 2: Madison Metropolitan Area ITS Core Functions**

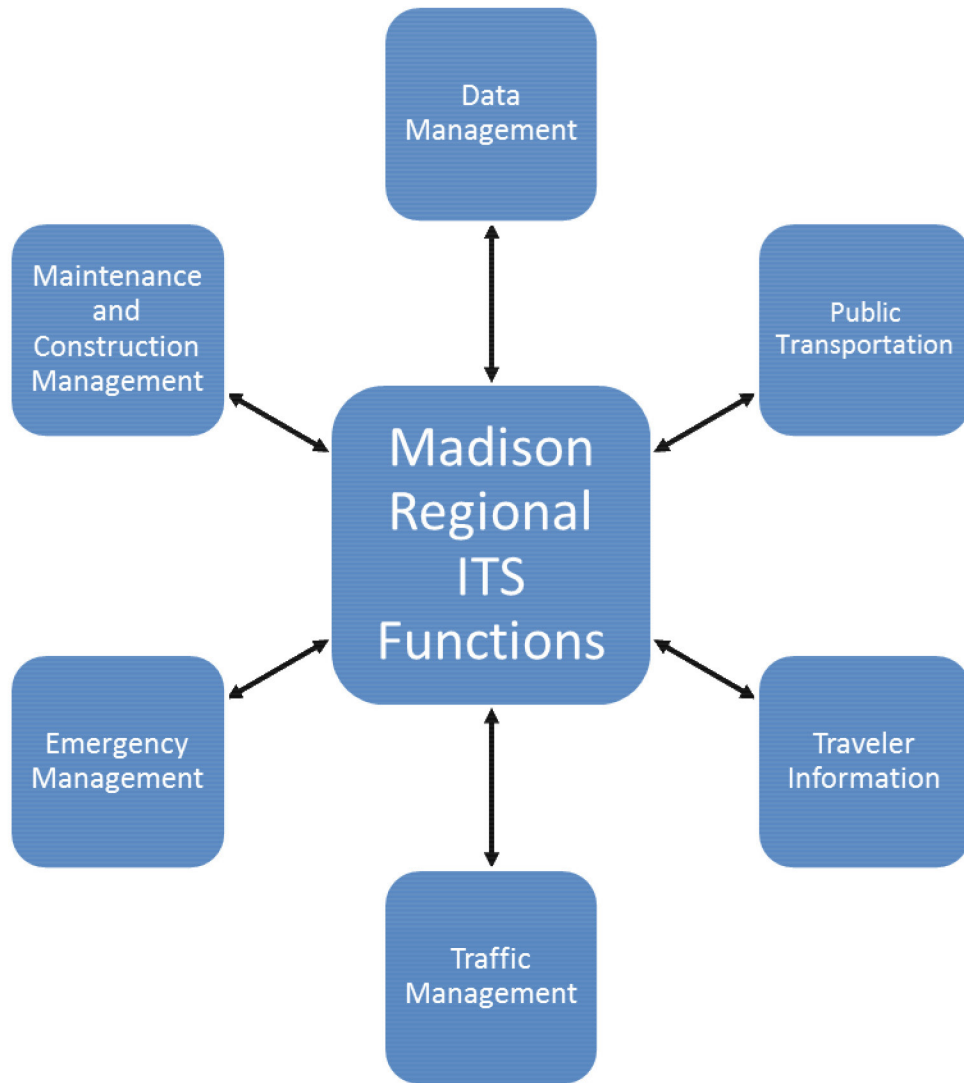


Table 2

National ITS Architecture Services Areas and Service Packages Applicable to the Madison Metropolitan Area

Archived Data Management Service Area	Traffic Management
ITS Data Mart	Network Surveillance
ITS Data Warehouse	Traffic Signal Control
Public Transportation Service Area	Traffic Metering
Transit Vehicle Tracking	Traffic Information Dissemination
Transit Fixed-Route Operations	Regional Traffic Management
Demand Response Transit Operations	Traffic Incident Management System
Transit Fare Collection Management	Transportation Decision Support and Demand Mngt.
Transit Security	Parking Facility Management
Multi-modal Coordination	Regional Parking Management
Transit Traveler Information	Mixed Use Warning Systems
Transit Signal Priority	Maintenance & Construction Management
Transit Passenger Counting	Maint. & Constr. Vehicle and Equipment Tracking
Multimodal Connection Protection	Road Weather Data Collection
Emergency Management	Weather Information Processing and Distribution
Emergency Call-Taking and Dispatch	Roadway Automated Treatment
Emergency Routing	Winter Maintenance
Roadway Service Patrols	Roadway Maintenance and Construction
Wide-Area Alert	Maintenance and Construction Activity Coordination
Traveler Information	Vehicle Safety
Broadcast Traveler Information	Automated Vehicle Operations
Interactive Traveler Information	
Dynamic Route Guidance	
ISP Based Trip Planning and Route Guidance	
Transportation Operations Data Sharing	
Dynamic Ridesharing	

### 1.9 ITS Architecture – The Framework

The Madison Regional ITS Architecture is a high-level representation or framework that illustrates and describes how existing and planned ITS elements within the region interconnect to exchange information and data. To this extent the Regional ITS Architecture can be portrayed as a “blue print” that illustrates the existing and future state of ITS integration. It identifies the individual pieces (i.e., ITS elements) that have been identified for the Madison Metropolitan Area, the functions these pieces perform, and the information and data that are exchanged. The Architecture does not define how ITS elements will be implemented, but rather defines the interactions these pieces have among each other. This helps agencies easily visualize where in the “big picture” their ITS elements fit and with what other elements they communicate.

ITS Architecture development was guided by the National ITS Architecture. The National ITS Architecture, developed and maintained by FHWA, is a common, mature framework for planning, defining, and integrating ITS elements. The National ITS Architecture reflects the contributions of a broad cross-section of the ITS community and specifically defines:

- The functions that are required of ITS to perform transportation services,
- The physical entities or subsystems where these functions reside, and
- The information and data flows that connect these functions and physical subsystems together into an integrated system.

The listing of functions, subsystems and flows contained in the National Architecture is comprehensive and is intended to serve as the underlying standardized framework from which ITS projects and their corresponding architectures are to be developed. For this reason, any locally developed architecture, including the Madison Regional ITS Architecture, reflects only a sub-set of all the possible functions, subsystems, and information flows brought forward by the National ITS Architecture.

The Madison Regional ITS Architecture was developed to be consistent not only with the National ITS Architecture but also the Wisconsin Statewide ITS Architecture. To that end, the Madison ITS Architecture was developed as a sub-architecture to the larger Statewide ITS Architecture. This was accomplished in part by using FHWA's Turbo Architecture Software Tool and the most recent version of the Statewide Architecture Turbo Architecture Database file. This approach will allow the Statewide ITS Architecture maintainer (currently the TOPS Laboratory) the ability to easily integrate the Madison Regional ITS Architecture, ensuring consistency between architectures.

Due to the complexity of the Madison ITS system and the number of interconnects that exist between existing and planned ITS elements, the Regional Architecture is illustrated as a series of wire diagrams oriented in two distinct views to ease understanding. The first view is a stakeholder oriented view that allows an individual stakeholder the ability to understand how each of its ITS elements are connected and what other agencies and elements their elements communicate with. An example of this view is illustrated in **Figure 3**. The second view is a transportation service view that allows all agencies the ability to see how regional ITS elements come together to deliver an individual transportation service. An example of the view is illustrated in **Figure 4**.

Figure 3: ITS Element Oriented View (Floating Bike Lane Signs ITS Element)

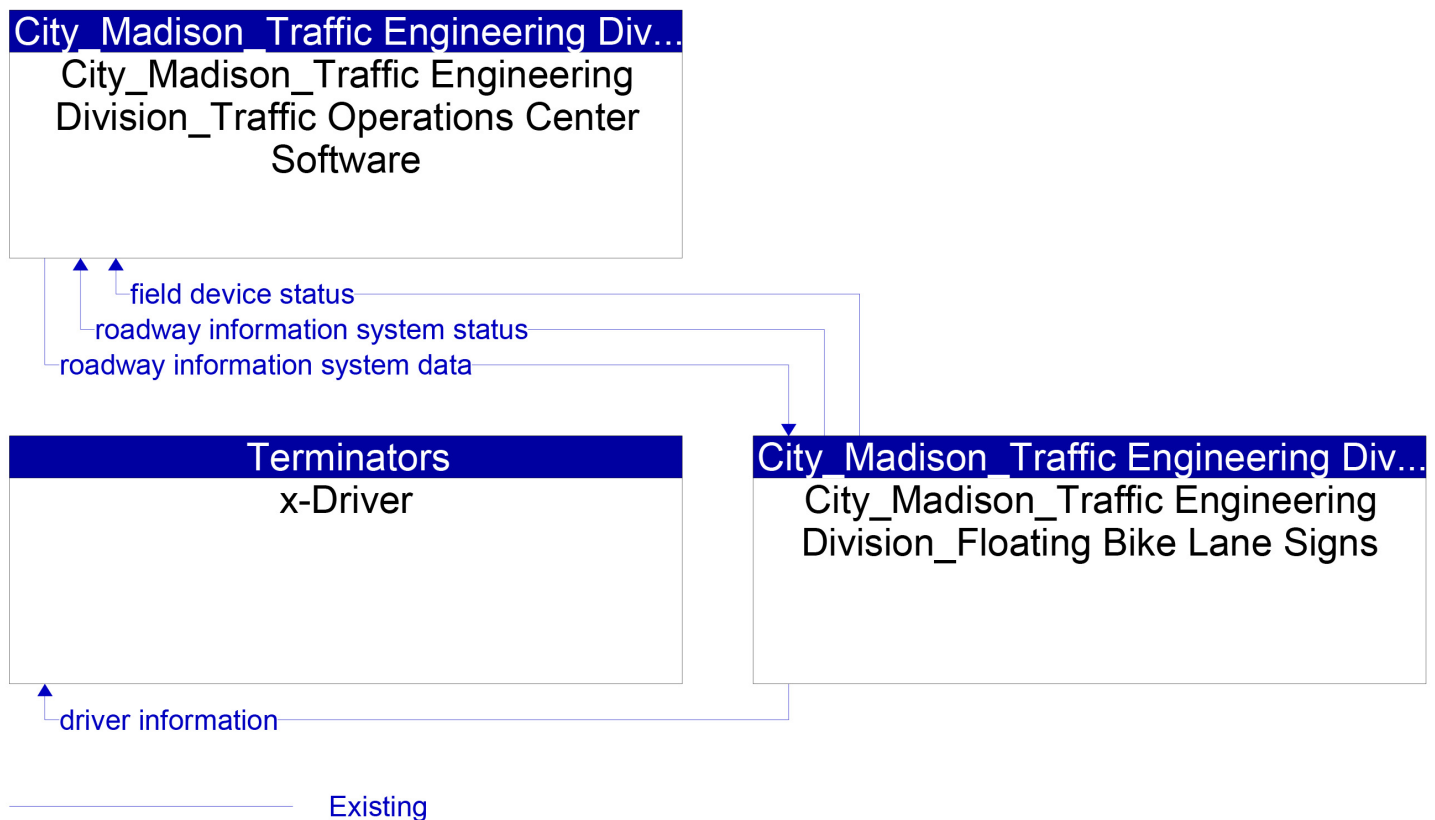
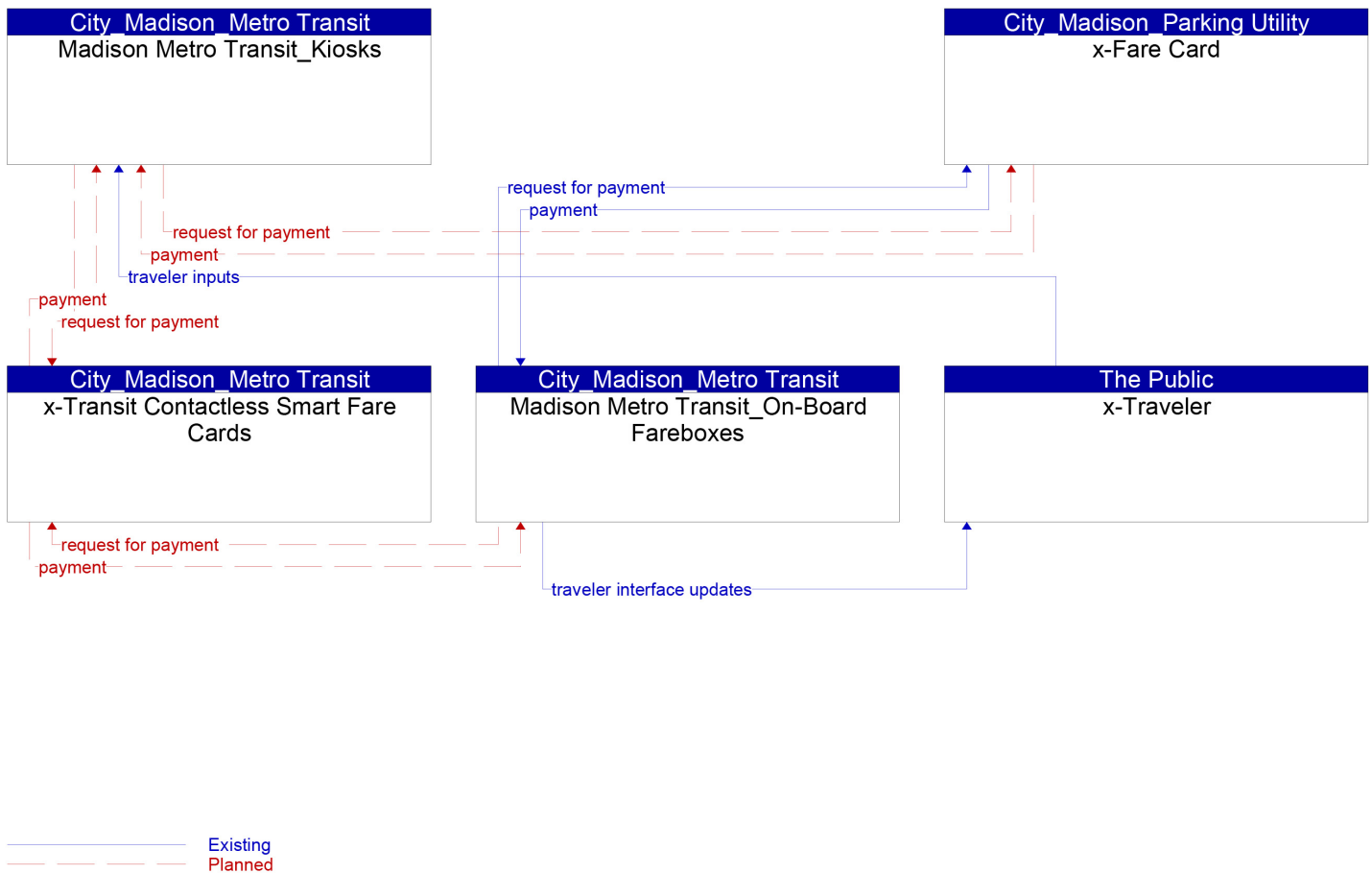


Figure 4: Service Package Oriented View (Transit Fare Collection Service Package)



### 1.10 Recommended Strategies and Projects – The Building Blocks

The ITS Implementation Plan is the last in the series of chapters that comprise the Regional ITS Strategic Plan. The purpose of the ITS Implementation Plan is to guide local transportation officials and system implementers in the effective deployment and integration of ITS technologies and operational improvements within the Madison Metropolitan Area over the next ten years. The Implementation Plan, and specifically the projects it identifies, addresses the transportation-related needs and desires expressed by regional stakeholders. However, it also takes into account the resources available for implementing ITS improvements, previous, on-going and planned ITS activity and the supporting infrastructure needed to successfully deploy them. Because technologies evolve and needs change, the Implementation Plan defines projects at a high-level so that their scope can evolve based on changes to technology and user needs. However, and with that said, projects are defined with enough detail to be further developed into detailed projects as they are programmed in the future.

The conceptual integration of ITS project in the Madison Metropolitan Area calls for implementation of 57 projects phased over the short- (0-2 years), mid- (2-5 years), and long-term (5-10 years). By phasing projects, ITS implementation can occur in a controlled, cost effective, and efficient manner, allowing benefits to be realized in the short-term while providing the needed infrastructure to support the completion of larger projects in the long-term. The high-level phasing of projects, in no particular order, is identified in **Table 3**.

ITS projects should be included within the regional transportation planning process so that they can be programmed to receive funding. ITS projects must compete with and must be mainstreamed with other “traditional” transportation improvement projects. Therefore, the list of projects is only conceptual until such time they are weighed against these other traditional projects. The timing of project implementation is not as important as their sequence. In other words, if projects must slip into a later phase it is not as critical as ensuring that all projects of a given term are implemented before proceeding to projects in a later term. This is due to the fact that projects build upon each other.

Available funding and the need for other non-ITS related transportation improvement projects will likely make it difficult to implement every project in the short –term. Given this, agencies must identify and research available funding mechanisms to find additional resources to fund ITS projects. Furthermore, the region must successfully demonstrate benefits of whatever ITS investment is made. This will build momentum and support for ITS projects, which will allow larger percentages of the funding pie to be allocated toward ITS improvements. The region’s smart small approach attempts to do this while being cognizant that there are pressing needs now that still need to be addressed.

**Table 3**  
**High-level Phasing of Proposed Projects**

<p><b>On-going and Short-term Projects (0-2 Years)</b></p>	<ul style="list-style-type: none"> <li>Traffic Signal Communications Upgrades</li> <li>CCTV Camera Expansion</li> <li>Traffic Signal Optimization for Daily Ops, TIM and PSEs</li> <li>Traffic Signal System and Controller Upgrades for CV</li> <li>Floating Bike Lane Sign Expansion</li> <li>Traffic Incident Management Responder Training</li> <li>Regional Traffic Incident Management Coordination</li> <li>Arterial Travel Times</li> <li>Pilot/Technology Evaluations (incl. before/after data)</li> <li>Performance Measurement for Operations</li> <li>ITS Advisory Committee</li> <li>Funding/Grant Research for ITS</li> <li>Sponsorship Research</li> <li>Interagency Operations Agreements/MOUs</li> <li>ITS Architecture/Strategic Plan Maintenance</li> <li>Regional Transportation Management Center (RTMC) ConOps</li> <li>Transit Radio Communication System Upgrade</li> <li>Transit Vehicle On-Board Equipment Upgrade</li> <li>Metro Transit Garage Facility Communications Improvements</li> <li>Transit Passenger Fare Card System Upgrade</li> <li>Metro Transit AVL Update</li> <li>Traffic Count Data Storage and Analysis Software</li> <li>Connected Vehicle/Technology Pilot</li> <li>Traffic Responsive Signal Systems (Phase 1)</li> <li>Vehicle/Pedestrian Detection Upgrades</li> <li>Nakoosa Trail Bus Satellite Facility ITS Technologies</li> <li>Bicycle/Pedestrian (Arterial) Crossing Warning Systems</li> </ul>
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<p><b>Mid-term Projects</b> (2-5 Years)</p>	<ul style="list-style-type: none"> <li>Incident Communication System</li> <li>Arterial DMS at Decision Points for Travel Times</li> <li>Downtown Madison Parking Wayfinding System</li> <li>UW Visitor Parking Wayfinding System</li> <li>RTMC Design/Implementation</li> <li>Preplanned Emergency Alternate Routes &amp; Signal Timing</li> <li>Transit Dynamic Message Sign (DMS) Upgrade and Expansion</li> <li>Transit Information Dissemination Study</li> <li>Transit Signal Priority (TSP) Pilot Project</li> <li>Smart Card for Transit and Parking</li> <li>Expansion of Weather/Pavement Sensors (Streets)</li> <li>Regional Data Clearinghouse (RDC) ConOps</li> <li>RDC Design/Implementation</li> <li>RDC Data Sharing Standard Operating Procedures</li> <li>Automated Motor-Vehicle and Bicycle Count System</li> <li>Center-to-Center Communications (existing centers)</li> <li>Center-to-Center Communications (planned centers)</li> <li>Traffic Responsive Signal Systems (Phase 2)</li> <li>Adaptive Traffic Signal Systems</li> <li>CV Roadside Infrastructure</li> <li>Bus Rapid Transit (BRT) Signal Priority</li> <li>Bus Rapid Transit (BRT) ITS Deployment</li> <li>Transit Vehicle Technology Evaluation Study</li> <li>Freeway Service Team Expansion</li> <li>Arterial Traffic Incident Response Teams</li> </ul>
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<p><b>Long-term Projects</b> (5-10 Years)</p>	<ul style="list-style-type: none"> <li>RTMC Operations (ongoing) incl mode choice</li> <li>Real-time Transit Vehicle CCTV Camera Image Communications Pilot</li> <li>Automatic Bridge Deicing Pilot</li> <li>Big Data Analysis Software &amp; Support</li> </ul>
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## 1.11 Next Steps

Transportation agencies within the Madison Metropolitan Area can use the Regional ITS Strategic Plan to deploy and integrate ITS elements in an efficient, cost-effective manner. However, maintenance of the Regional Plan will be critical to the success of ITS deployment and to preserve the initial investment used to develop it. While the plan is useful to guide decision making, if the plan is not updated it becomes less useful as time passes. This stems from the fact that user needs, technologies that address them, and the funding environment to support them all evolve. To be effective the plan must also evolve. Therefore, one of the first critical next steps will be to establish a regional ITS working group to track, discuss and manage regional ITS activity. The regional ITS working group should be charged with the responsibility of updating the plan but also for delving deeper into issues such as:

- Defining agency roles and responsibilities for promoting and building support for regional ITS activity and making related resources more widely available to individuals at all levels within agencies. This may include identifying areas where technical support may be needed and identifying training programs and resources that may be tapped to fill this need.
- Identifying available funding streams that can be leveraged to support recommended ITS projects.
- Identifying potential projects where public private partnerships can be leveraged to enhance services without incurring significant costs.
- Identifying mechanisms to collect report and assemble information needed to determine the performance of the system overtime. This includes collecting “before” data prior to the implementation of projects to accurately assess performance.
- Identifying agencies/individuals to shepherd projects where significant multiagency collaboration is needed.
- Identifying projects where multi-agency agreements need to be defined or where formal policy need to be developed to dictate agency roles and responsibilities prior to project implementation.