Regional Intelligent Transportation Systems (ITS) Architecture for MPOJC Region

Prepared For:

Metropolitan Planning Organization of Johnson County, Iowa
Iowa Department of Transportation
Federal Highway Administration

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Table of Contents

Introduction and Executive Summary

This Intelligent Transportation Systems (ITS) Regional Architecture Plan was developed in 2004 by the Metropolitan Planning Organization of Johnson County (MPOJC), which provides transportation planning support for the Iowa City Urbanized Area. The goal of developing a regional ITS architecture is to promote consistency in information flows amongst the agencies operating our transportation systems. The Iowa City Urbanized Area includes Iowa City, Coralville, University Heights, Tiffin, North Liberty, and portions of Johnson County within the growth area of these cities. The only "private" stakeholder is the University of Iowa; although the University of Iowa is a public entity.

Since this plan was created in 2005, agencies and municipalities in the Iowa City Urbanized Area have successfully organized a coordinated joint emergency communications facility (JECC-EMA), which serves as an information and communications clearing house for the region. Other agencies are planning for technologies such as improved real-time passenger and professional information systems, signal pre-emption for emergency vehicles, and integrated traffic signals.

ITS Overview

Intelligent Transportation System Architecture is a framework for transportation-related technologies and the sharing of technologies and information among various transportation systems and authorities. ITS includes technologies such as global positioning systems (GPS), interconnected signal systems, special event traffic control strategies, along with many other computer-based technologies. These technologies influence and improve the safe and efficient flow of transportation within the community.

A regional architecture provides the framework and the basis for operational agreements between agencies who share responsibility for the transportation network. The two main components of an Intelligent Transportation System are **subsystem** and **information flows**. Examples of a subsystem are technologies such as Dynamic Message Signs and Automated Vehicle locator (AVL) equipment. Information flows are data that is used to operate the subsystem and to make informal decisions about transportation infrastructure. Examples of information flows include real-time traffic flow information, crash data, event-related traffic flows and bridge-ice data.

1. MPOJC Transportation Planning Boundary

The transportation planning boundary for the Iowa City MPO consists of the five cities in the urbanized area plus each city's growth area. This includes Coralville, Iowa City, North Liberty, Tiffin, and University Heights. The following map (Figure

1) shows the transportation planning boundary. This planning area will be used for ITS applications for MPOJC member governments.

Figure 1. MPO Planning Boundary

File location: S:\Iowa City GIS\JCCOG_Maps\2010 UAB Boundary Revision\Boundaries.mxd
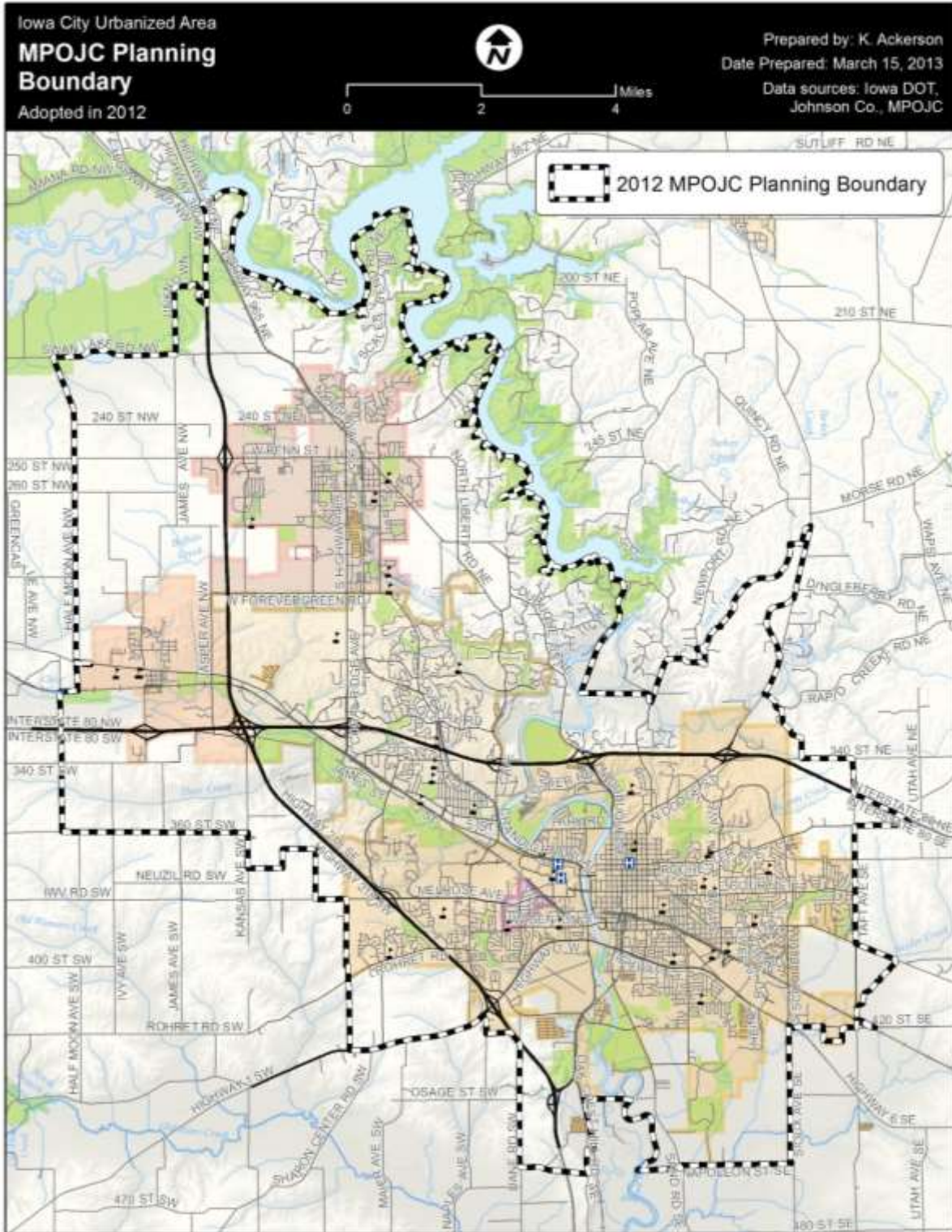
2. Metropolitan Planning Organization (MPO) Architecture

A. Stakeholders

Stakeholders are those entities that are defined within the regional architecture as public or private entities that have an interest in deployed ITS applications or future ITS applications. These entities' interest may be the actual parties that use or implement the ITS application or they may benefit by the ITS application. The stakeholders identified for the MPOJC Urbanized Planning Area are:

- **Federal Highway Administration,** Tracy Troutner
- **Iowa Department of Transportation, District 6,** Jim Schnoebelen
- **Coralville Engineering,** Dan Holderness
- **Coralville Transit,** Vicky Robrock
- **Coralville Fire Department,** Dave Stannard
- **Coralville Police Department,** Barry Bedford
- **Iowa City Public Works,** Ron Knoche
- **Iowa City Transit,** Chris O'Brien
- **Iowa City Fire Department,** John Grier
- **Iowa City Police Department,** Samuel Hargadine
- **North Liberty,** Gerry Kuhl
- **North Liberty Streets,** Dan Lange
- **Tiffin,** Steve Berner
- **University Heights,** Louise From
- **University Heights Police Department,** Ron Fort
- **Johnson County Engineering,** Greg Parker
- **Johnson County Joint Emergency Communications Center,** Tom Jones
- **Johnson County SEATS,** Tom Brase
- **Cambus,** Brian McClatchey
- **University of Iowa Planning,** Rodney Lehnertz
- **University of Iowa Parking/Facilities,** Dave Ricketts
- **University of Iowa Public Safety,** Duane Papke
- **Johnson County Ambulance Service,** Dave Dvorsky
- **Johnson County Sheriff (911),** Lonny Pulkrabek

B. How the Plan Was Created

MPOJC staff identified ITS stakeholders within the five area municipalities. Staff held meetings with each city within the urbanized area, as well as the University of Iowa and Johnson County in 2004 when the plan was originally developed. At these meetings the existing ITS inventory, planned ITS projects, and future ITS projects were identified for each entity within the urbanized area. Questions asked of each entity can be found in the Appendix.

The first update to the Plan was conducted in late 2005. This document contains the second plan update, which was completed in early 2014. During the summer of 2014, feedback was sought from stakeholders to determine if any new ITS technologies have been implemented, or are being considered, for each respective organization. The findings and results of the update are incorporated herein.

C. Urbanized Area Centers

The National ITS Architecture defined 'Center' as the term used to identify an area where ITS applications are managed or housed. Each City has its own 'Center' as identified below. The only current combined center is the Johnson County Joint Emergency Communications Center.

The Metropolitan Planning Organization of Johnson County's urbanized area centers are as follows:

Traffic Management Center- Iowa City Traffic Engineering, Coralville Streets, North Liberty Streets

Emergency Management Center- Johnson County Joint Emergency Communications Center, Iowa City Police & Fire, Coralville Police & Fire, Johnson County Sheriff

Transit Center- Iowa City Transit, Coralville Transit, University of Iowa Cambus, Johnson County SEATS

Fleet Vehicle Administration- Iowa City Streets Department, Coralville Streets, University Heights, Tiffin, North Liberty Streets

Maintenance and Construction Management- Iowa City Public Works, Coralville Public works, University Heights, Tiffin, North Liberty Streets

D. Regional ITS Applications and Inventory

ITS Applications (existing, planned, and future projects) are listed below for each municipality within the urbanized area and for Johnson County and the University of Iowa.

Iowa City

- **Iowa City Transit**

  Existing ITS Applications- transit security cameras on most buses; electronic fare boxes, upgraded fare collection software, security cameras installed on every 40' HD bus, T2 Flex access and revenue control management suite implemented at Court Street Transportation Center, real-time passenger information system with AVL (BONGO), security camera system installed at Court Street Transportation Center

  Planned ITS Applications- none

  Future ITS Applications- none

- **Iowa City Public Works**

  Existing ITS Applications- radio communications system for City trucks, wireless system for parking management of several parking garages, traffic signal system (distributed master), RR signal pre-emption at an intersection, vehicle detection cameras, intersection PTZ cameras, interconnection at new signals (where possible), joint emergency communications center

  Planned ITS Applications- none

  Future ITS Applications- RWIS for key arterials

- **Iowa City Police**

  Existing ITS Applications- 911 emergency system, improved CCTV systems, AVL/GPS mobile mapping in vehicles integrated to in-building management software, updated mobile dispatching software and records management system, P-25 compatible county-wide radio system, enhanced alarm system, joint emergency communications center

  Planned ITS Applications- Crime mapping and analysis, body-worn cameras for all officers

Future ITS Applications- none

- **Iowa City Fire**

   Existing ITS Applications- Joint emergency communications center, traffic pre-emption, mobile data computers in fire apparatus

   Planned ITS Applications- AVL for fire apparatus

   Future ITS Applications- City-wide traffic signal preemption

Coralville

- **Coralville Transit**

   Existing ITS Applications- Real time passenger information system with AVL (BONGO), monitors displaying real time passenger information, updated validating fare boxes, security cameras on all buses, transit website of routes and schedules with real time link, automated passenger counts on a portion of buses, wi-fi on all buses

   Planned ITS Applications- Update radio system (joint communications center), intermodal transportation center, monitors at intermodal transportation center for passengers displaying real time passenger information, interactive traveler information center at intermodal transportation center

   Future ITS Applications- none

- **Coralville Engineering**

   Existing ITS Applications- Hardcopy diversion/evacuation plans, traffic detection cameras installed at four reconstructed intersections

   Planned ITS Applications- Interconnection of all Highway 6 traffic signals in Coralville, 3 PTZ cameras, installation of TACTICS Central management software

   Future ITS Applications- Interconnection of First Avenue / Coral Ridge Avenue traffic signals

- **Coralville Fire**

  Existing ITS Applications- none

  Planned ITS Applications- AVL for fire vehicles

  Future ITS Applications- traffic signal pre-emption

- **Coralville Police**

  Existing ITS Applications- hardcopy diversion/evacuation plans; wireless connection to state DMV databases from police vehicles; 911 emergency system, AVL for police vehicles, joint emergency communications center, access to DOT CCTV at key traffic locations, implemented JCENS (to provide alerts to residents for emergency purposes)

  Planned ITS Applications- traffic signal pre-emption for emergency vehicles

  Future ITS Applications- none

University Heights

- **University Heights Public Works**

  Existing ITS Applications- interconnected signals (3)

  Planned ITS Applications- none

  Future ITS Applications- none

- **University Heights Police**

  Existing ITS Applications- none

  Planned ITS Applications- none

  Future ITS Applications- none

North Liberty

- **North Liberty Streets**

Existing ITS Applications- Interconnected traffic signals along Highway 965, Jones Boulevard traffic signal with pavement temperature center and weather station, Highway 965 flashing yellow arrow/thermal cameras

Planned ITS Applications- Forevergreen Road flashing yellow arrow signal, signal pre-emption at Cherry Street & Highway 965, signal pre-emption at Penn Street & Highway 965

Future ITS Applications- none

Tiffin

- **Tiffin Public Works**

  Existing ITS Applications- none

  Planned ITS Applications- none

  Future ITS Applications- none

Johnson County

- **Johnson County Sheriff's Office**

  Existing ITS Applications- hardcopy diversion/evacuation plans; 911 emergency system, joint emergency communications center, access to CCTV provided by DOT

  Planned ITS Applications- none

  Future ITS Applications- none

- **Johnson County SEATS**

  Existing ITS Applications- AVL/GPS for transit vehicles; demand response radios for transit vehicles (para-transit); scheduling software (RouteMatch) for paratransit and DRT, mobile data communicators that provide driver manifest, mapping, and voice directions

  Planned ITS Applications- Upgrade mobile data communicator system to tablets which would also provide pre- and post-inspections

Future ITS Applications- none

- **Johnson County Engineering[1]**

  Existing ITS Applications- hardcopy diversion/evacuation plans; joint emergency communications center

  Planned ITS Applications- DMS access to be provided by DOT

  Future ITS Applications- AVL/GPS for maintenance vehicles; RWIS

- **Johnson County Joint Emergency Communications Center**

  Existing ITS Applications- Enhanced 911 services; wireless 911 services; radio communications/CAD to law enforcement agencies; radio communications/paging/CAD to fire departments and Johnson County Ambulance; radio communications/paging to Johnson County Hazardous Materials Team; radio communications to University of Iowa Department of Public Safety, Iowa Department of Corrections High Risk Unit, U.S. Army Corps of Engineers, DNR-Lake McBride, DNR Conservation, and Johnson County Conservation, UIHC, Mercy Iowa City, VA hospital, North Liberty Public Works; activates and monitors Johnson County Outdoor Warning Systems; notification and monitoring point for severe weather activity for the National Weather Service

  Planned ITS Applications- none

  Future ITS Applications- none

- **Johnson County Ambulance**

  Existing ITS Applications- AVL for ambulances; 800 trunking system for ambulance service; joint emergency communications center

  Planned ITS Applications- AVL upgrade and mobile Cad connection to joint emergency communications center

  Future ITS Applications- none

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[1] As of 2006.

University of Iowa

- **University of Iowa Public Safety**

  Existing ITS Applications- Emergency notifications (Hawk Alert), emergency management, emergency procedures (including Critical Incident Management Plan), Code Blue phones, joint emergency communications center

  Planned ITS Applications- none

  Future ITS Applications- none

- **University of Iowa CAMBUS**

  Existing ITS Applications- electronic monitoring for demand response transit system, fleet management, driver safety monitoring, GPS for buses, on-board security cameras, real time passenger information system with AVL (BONGO), silent alarm, real time transit information monitors and displays, wi-fi on all buses, fleet maintenance management software, digital radio system, joint emergency communications center.

  Planned ITS Applications- automated passenger counting equipment, paratransit service scheduling and documentation system, automated stop announcement for transit fleet

  Future ITS Applications- none

- **University of Iowa Parking and Planning**

  Existing ITS Applications- parking facilities electronic monitoring, website for work zone management, VID sensor systems at intersections, security cameras at parking facilities

  Planned ITS Applications- none

  Future ITS Applications- Autonomous vehicle / driverless vehicle / driver-free vehicle / self-driving vehicle technology

Iowa Department of Transportation

  Existing ITS Applications- RWIS, temperature sensors on maintenance vehicles, dynamic message signs, CCTV cameras at

key locations, HAR system, detectors for traffic conditions monitoring, AVL for maintenance vehicles, operations center, 511ia.org traveler information website

Planned ITS Applications- none

Future ITS Applications- none

Iowa State Patrol

Existing ITS Applications- wireless communications/mobile data communications, mobile computers

Planned ITS Applications- none

Future ITS Applications- none

MPOJC

Existing ITS Applications- magnetic vehicle counters, trail counters for bicycles and pedestrians, GIS mapping, iPads with traffic counting software installed

Planned ITS Applications- crowd-sourced bicycle and pedestrian counting software (e.g. Strava)

Future ITS Applications- none

E. User Services/ Market Packages

User services define the role that ITS plays from the user's perspective. The National ITS Architecture defines thirty-three (33) user services (See Table 1) that are grouped into eight user service bundles. The US Department of Transportation and ITS America jointly defined these user services and bundles, using significant stakeholder input. The user service concept allows system or project definition to begin by establishing the high level services that will be needed to address stakeholders' problems and needs.

Table 1. National ITS Architecture User Services and User Service Bundles

User Service Bundle	User Service
Travel and Traffic Management	• Pre-Trip Travel Information

	• En-Route Driver Information • Route Guidance • Ride Matching and Reservation • Traveler Services Information • Traffic Control • Incident Management • Travel Demand Management • Emissions Testing and Mitigation • Highway Rail Intersection
Public Transportation Operations	• Public Transportation Management • En-Route Transit Information • Personalized Public Transit • Public Travel Security
Electronic Payment	• Electronic Payment Services
Commercial Vehicle Operations	• Commercial Vehicle Electronic Clearance • Automated Roadside Safety Inspection • On-Board Safety and Security Monitoring • Commercial Vehicle Administration Processes • Hazardous Materials Security And Incident Response • Freight Mobility
Emergency Management	• Emergency Notification and Personal Security • Emergency Vehicle Management • Disaster Response and Evacuation
Advanced Vehicle Control and Safety Systems	• Longitudinal Collision Avoidance • Lateral Collision Avoidance • Intersection Collision Avoidance • Vision Enhancement for Crash Avoidance • Safety Readiness • Pre-Crash Restrain Deployment • Automated Vehicle Operation
Information Management	• Archived Data Function
Maintenance and Construction Management	• Maintenance and Construction Operations

Market Packages represent slices of the architecture that address specific services like surface street control. A market package collects together several different subsystems, equipment packages, terminators, and architecture flows that provide the desired services. For the MPOJC Regional ITS Architecture, the following Market Packages were selected to provide the user services desired.

Travel and Traffic Management

Incident Management and Traffic Monitoring. Stakeholders have expressed the need to identify and verify incidents along the major travel corridors using video cameras. CCTV cameras were suggested as one alternative where

incidents can be remotely viewed and managed from a traffic management center. In addition, the sharing of the images from the cameras by other parties involved with an incident can assure that a quicker response and proper resources and actions are taken for incident management. Incident information obtained via cameras and sensors can be distributed to motorists en-route via permanent and portable message signs. Portable message signing was noted to be useful to supplement permanent signing and to aid in diverting traffic around incidents and providing guidance back to the original travel route.

Weather events can significantly affect travel in the Johnson County area. Severe weather events (e.g. high winds, severe downpours, ice, snow, etc.) are fairly common to the area. Stakeholders stated the specific need to merge weather collection and reporting operations to gain a more comprehensive view of real-time weather conditions. Much of this information is now available from the Iowa '511' program.

Pre-Trip and En-Route Information. Stakeholders stated the need to increase the distribution of pre-trip and en-route travel information. Pre-trip information can be used to assist travelers in making mode choices, travel time estimates, and route decisions prior to trip departure. This information includes (but is not limited to) roadway environment (e.g. weather, visibility) and surface conditions (e.g. ice, snow). En-route traveler information will be especially important to guide travelers in, through, and around incidents along major travel corridors and other impacted areas.

Much of this information is now available from the Iowa '511' program. Radio and television traffic reports were also mentioned. Limited traffic reporting services exist in the area today but may be expanded with the availability of information on traffic conditions along major travel corridors.

Traffic Control and Highway-Rail Intersection. Stakeholders expressed significant interest in enhancing signal coordination along and between major travel corridors, including across the major jurisdictions in the Region. In addition, providing signal pre-emption capabilities for emergency vehicles and key transit vehicles was cited as a priority. Signal coordination and signal pre-emption capabilities exist along some portions of the Region. However, cross-jurisdictional issues are considerable and would need to be addressed.

Many highway- rail crossings near signalized intersections have railroad signal pre-emption capabilities. At more remote locations, advanced warnings systems are proposed to improve the safety of the crossings.

Public Transportation Operations

Public Transportation Management, En-Route Transit Information, Public Travel Security. Transit stakeholders in the Region provide transit and traveler

information to patrons in real-time conditions. These services may be provided via kiosks or message boards at transit centers, via smartphone applications, websites, as well as en-route (using annunciators and other tools).

To improve security of transit patrons (at transit centers, pickup/drop-off points, and on-bus), the use of on-board security cameras is implemented.

Emergency Management

Emergency Notification and Personnel Security. The implementation of the Joint Emergency Communications Center has streamlined emergency management coordination efforts in the Region.

Emergency Vehicle Management. In responding to key or major incidents, the monitoring of emergency vehicle availability and progress in reaching the incident was cited as a major need for the Region in 2004. Since then, the use of AVL in all levels of emergency vehicles has been progressing. Signal pre-emption for emergency vehicles has also been implemented in some areas.

Information Management

Data Mart and Archived Data Function. Significant data and information are needed to efficiently monitor and operate the Region's transportation system. These data include: traffic volumes, vehicle classification data, vehicle speed data, weather conditions, etc. They are used for planning purposes as well as for daily operation of the facility. Several stakeholders collect this data for use in the planning and development of future ITS technologies.

Maintenance and Construction/Work Zone Management

Maintenance and Construction/Work Zone Operations. Maintenance of the I-80 and other major travel Corridors in an efficient manner, minimizing impacts to traffic as well as enhancing safety to maintenance personnel was stated as a key function within the Region by the stakeholders. Providing proper maintenance equipment and resources as well as guaranteeing the safety of maintenance personnel were stated as vital items.

User Service Mapping

User needs were mapped as closely as possible to the user services documented in the National ITS Architecture. The mapping process ensures that the stated user needs are supported by the National ITS Architecture. In many instances, a user need may not always map directly to a user service in the National ITS Architecture. New or updated user services may be added to the National Architecture over time.

Regional ITS Architecture for MPOJC Region

Based on the planned user services, the following market packages are planned:

Traffic Management
- ATMS01 – Network Surveillance (e.g. cameras, sensors, RWIS)
- ATMS03 – Surface Street Control (e.g. interconnected signals, signal pre-emption)
- ATMS04 – Freeway Control
- ATMS06 – Traffic Information Dissemination (e.g. DMS, HAR, DOT website, '511' program)
- ATMS07 – Regional Traffic Control (e.g. cross-jurisdictional coordination)
- ATMS08 – Traffic Incident Management System (devices, tools to assist detection, verification, and response procedures)
- ATMS13 – Standard Railroad Grade Crossing (enhanced safety/warning at crossings)
- ATMS16 – Parking Facility Management (integration and coordination of parking systems)

Maintenance & Construction Management
- MC01 – Maintenance and Construction Vehicle and Equipment Tracking (AVL for vehicles)
- MC03 – Road Weather Data Collection (additional and enhanced weather data collection systems and information provided automatically)
- MC06 – Winter Maintenance (enhanced systems for winter weather maintenance)
- MC08 – Work Zone Management (e.g. monitor work zone activities and manage under construction)
- MC10 – Maintenance and Construction Activity Coordination (between agencies)

Advanced Public Transportation Systems
- APTS01 – Transit Vehicle Tracking
- APTS02 – Transit Fixed Route Operations
- APTS03 – Demand Response Transit operations
- APTS04 – Transit Passenger and Fare Payment (e.g. electronic fare cards)
- APTS05 – Transit Security (e.g. on-board cameras)
- APTS06 – Transit Maintenance (automated notification)
- APTS07 – Multi-Modal Coordination
- APTS08 – Transit Traveler Information (e.g. kiosks, message boards, etc.)

Traveler Information
- ATIS1 – Broadcast Traveler Information (e.g. HAR, '511')

Commercial Vehicle Operations
- CVO10 – Hazmat Management (improved coordination and operations)

Emergency Management Operations
- EM01 – Emergency Call-Taking and Dispatch
- EM02 – Emergency Routing
- EM03 – Mayday and Alarms Support
- EM06 – Wide-Area Alert
- EM08 – Disaster Response and Recovery

Archived Data Management
- AD1 – ITS Data Mart (collect and store/share images and sensor data)
- AD2 – ITS Data Warehouse (manage and store sensor and traffic data)

F. Functional Requirements

Functional Requirements are a description of the tasks or activities that are performed by each system to provide the selected user services. The functional requirements for the Region are defined and located in the Turbo Architecture files submitted to the Iowa DOT.

G. Regional Architecture

The Appendix illustrates the MPOJC Regional ITS Architecture. The architecture is based upon the inventory and Concepts of Operations identified in the previous sections. Greater detail of the Architecture is provided electronically in the MPOJC Regional ITS Corridor Turbo Architecture files submitted to the Iowa DOT.

H. Maintenance Plan for ITS Architecture

The MPOJC Regional ITS Architecture Plan has been developed to ensure comprehensive, cooperative, and continuing transportation planning activities related to the implementation of intelligent transportation systems or ITS. It is one component of the transportation planning process. As technologies develop and evolve, so does this plan. This section outlines how the regional ITS architecture plan is used and maintained.

Integration into Planning Process

The purpose of the MPOJC Regional ITS Architecture Plan is to outline both technical and institutional linkages for the integration of transportation technologies into the multi-modal transportation system. Ultimately, use of ITS will reinforce the Region's vision of providing a safe, secure transportation

network with seamless choices and services to the users, the traveling public or meeting the needs of commerce.

The MPOJC Area Long Range Transportation Plan discusses ITS at the highest level. Subsequently, the MPOJC Regional ITS Architecture Plan provides a more complete definition of project requirements and enables the integration of transportation technologies into network improvements. The regional ITS document is viewed as a conceptual plan offering a framework for greater detail these projects move toward implementation. This is similar to identification of roadway projects in the Long Range Transportation Plan which require detailed engineering analysis prior to construction. This ITS plan operates similarly where project level architectures will be developed to refine details and specifications conceived in this document. The project architecture will provide a concise project description and identify dependence and relationships to other projects and activities. Based on this analysis, the project scope will be refined to avoid duplication and show project sequencing.

As projects develop from the regional ITS plan, potential funding sources are identified and programmed for projects. ITS may be a component in the evaluation and prioritization of projects vying for funds. If Federal funding is used, the project moves into the Transportation Improvement Program then proceeds toward implementation. The project will be identified in the Transportation Improvement Program under plan justification as a documented part of the MPOJC Regional ITS Architecture Plan.

Plan Maintenance Process

The regional ITS plan is a dynamic document. It will require changes with project implementation, technology innovations and redirection of area goals and needs. Formalizing plan maintenance will assure the ITS architecture for the MPOJC Region is current and relevant. This will allow ITS stakeholders to effectively use the document as a technical and institutional reference when implementing specific ITS plans.

Plan maintenance relies on three critical elements:

- Identification of maintenance roles and responsibilities;
- Determination of maintenance schedule or cycle and process; and
- Selection of sections or parts of the Plan to be maintained.

Roles and Responsibilities. ITS stakeholders in the MPOJC Region, with facilitation by MPOJC, will be responsible for periodic updates of the regional ITS architecture. As ITS evolves in the MPOJC Region and broadens responsibilities, plan approval may need to be taken to the MPOJC Transportation Technical Advisory Committee (TTAC) and the Urbanized Area

Policy Board (UAPB) for approval as technologies begin to be planned and deployed in the metropolitan area.   MPOJC as the MPO will be responsible for maintaining the MPOJC Regional ITS Architecture Plan document.

The TTAC board is responsible for reviewing changes and making updates to the region's ITS architecture. The board's membership and function are outlined as:

Membership – Intelligent Transportation System (ITS) Stakeholders (engineers, public works, public safety, planners) in Iowa City, Coralville, North Liberty, University Heights and Tiffin along with the smaller Johnson County communities, Johnson County, the University of Iowa, and representatives of the Coralville, Iowa City, University of Iowa, and Johnson County transit systems.

Function – To coordinate ITS planning and other transportation improvement plans, and deploy these plans in the MPOJC Region.

Schedule and Process. On-going plan maintenance is important.   The ITS Architecture Plan may be reviewed as necessary to determine a need for modifications or plan revisions. This plan maintenance process may occur off-cycle of the Transportation Improvement Program (TIP) to identify projects that may be moving forward into an annual element of the TIP. The MPO is also responsible for plan maintenance, including review of upcoming deployment activities, review of technology innovations, and status of area goals and needs.

The administrative procedures for initiating changes to the MPOJC Regional ITS Architecture Plan will be classified as either an amendment or an administrative revision. An amendment is the addition, deletion or significant modification of an ITS stakeholder, ITS project or ITS project sequencing. An amendment relates to a new ITS project that is expected to use Federal transportation dollars. An administrative revision is a minor modification of an existing ITS stakeholder, ITS project or ITS project sequencing or simple correction. In either case, the requested change will be submitted in writing to MPOJC staff. An amendment will be published and advertised consistent with the public involvement plan for the TTAC.

Maintenance of Plan Content. Sections of the plan may be more dynamic than others. The regional profile and geography may be less dynamic than the ITS Inventory or Implementation Strategy. The <u>MPOJC Regional ITS Architecture Plan 2005</u> and associated Turbo-Architecture files will be used as the baseline condition. Changes to the ITS Plan document, including the text, tables or Turbo database files, including the 2014 update, will be identified as they occur.

Maintenance Summary. Plan Maintenance is summarized as follows:

- Revisions or amendments to the ITS Plan will be directed to the MPO and will be facilitated by the TTAC;
- Review of revisions and amendments to the ITS Plan will be reviewed by for consistency, standardization and intergovernmental impacts/ coordination;
- Revisions will be made at the recommendation of the TTAC and amendments or significant plan revisions will be approved by the MPO Board or at the time when the plan geography expands beyond the metropolitan area.
- Changes to the document and database (Turbo files) will be processed by MPOJC as part of a formal update of the document.

I. Agreements

The list of agreements below was developed during the 2006 update to this document. Any existing agreements for ITS applications, such as the GPS agreement between the University of Iowa, Iowa City and Johnson County will remain in place.

- Agreement for Operation of Virtual TMC during off hours:
  The Iowa DOT Oakdale Maintenance office will need to have an agreement with the Joint Emergency Communications Center. This agreement will include allowing Johnson County Sheriff's office access to the Iowa DOT's ITS system to perform TMC operations during off hours.

- Agreement for Access to the Camera Images:
  The Iowa DOT Oakdale Maintenance office will need to have agreements with the local communities that request access to the camera images from the Iowa DOT's ITS system. This agreement will allow the local communities to tie into the Iowa DOT's ITS system as it is designed at their own expense.

- Agreement for Use of ICN fiber optics:
  The Iowa DOT will need to have an agreement with the Iowa Communications Network (ICN) to allow joint use of existing ICN conduits and/or use of fiber optic cable. This agreement may also allow the Iowa DOT to access and splice into existing ICN conduit and fiber optic cables.

- Agreement for Use of Local fiber optics:
  The Iowa DOT Oakdale Maintenance office will need to have agreements with the local communities that have requested access to the Iowa DOT's ITS system for access and joint use of the local communities existing fiber optic systems. This agreement will allow the local communities to have access to the Iowa DOT's ITS system.

- Rapid Removal/Recovery Program Memorandum of Understanding (MOU):
  The Iowa DOT will need to have an MOU between all local agencies in support of the Rapid Removal/Recovery Program.

In addition, new agreements for ITS projects will be handled on an as-needed basis between stakeholders. Assistance may be provided by MPOJC staff.

J. Standards

There are numerous ITS Standards that may be employed to guarantee interoperability and interchangeability of ITS equipment and processes used by the stakeholders in the region. A list of applicable standards for assistance with implementation of the outlined architecture is provided in the Turbo Architecture files. Several of these standards have been approved and are being used effectively. Others are dynamic and currently in review and update. It is the intention of MPOJC that its member entities will adhere at the time planning and implementation to the applicable standards set forth in the National ITS Architecture.

3. Resources

ITS Joint Program Office
http://www.its.dot.gov/

ITS ePrimer
http://www.pcb.its.dot.gov/eprimer/module1.aspx

Intelligent Transportation Society of America
http://www.itsa.org/

APPENDIX

Turbo Architecture Output