EAST-WEST GATEWAY
Council of Governments

ST. LOUIS REGIONAL ITS ARCHITECTURE
EXECUTIVE SUMMARY (STRATEGIC DEPLOYMENT PLAN)

Submitted to

East West Gateway Council of Governments

Submitted by

ITERIS Innovation for better mobility

In association with

EFK•Moen, LLC
Civil Engineering Design

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Introduction

The East-West Gateway Council of Governments (EWG) is updating the Intelligent Transportation System (ITS) Architecture for the St. Louis Metropolitan Region. The Architecture provides a framework for the planning and development of technology projects that improve the safety and efficiency of travel in the region. This framework complements EWG's Long Range Transportation Plan (LRTP and Congestion Management Process (CMP), and has identified a series of ITS projects that will further public mobility and safety through expanded collection and exchange of transportation network information, along with improved coordination between transportation agencies.

The end products of this effort are a Regional ITS Architecture and a Strategic Deployment Plan that defines the way forward in deploying ITS in the St Louis region. This summary briefly describes the Regional ITS Architecture.

Strategic Deployment Plan Development Overview

In parallel with the Architecture development, an overall deployment strategy was established. To address the specific needs of the St. Louis region, it was decided to develop the Operational Concept prior to incorporation within the ITS architecture, in order to directly address regional needs and deficiencies, particularly related to information-sharing and coordination between public agencies. The operational concept led to a deployment framework for specific projects that could address the required ITS services within the operational concept. Figure 1 below describes how the process was driven both by existing ITS systems and services (the Inventory) and by the definition of the regional ITS vision (in the form of needs). The "gap" between the current system and what is needed was established, involving the definition of stakeholder responsibilities and needed transportation functions. Both provided an underpinning for the ITS architecture and the definition of specific projects, as did the stated needs of individual stakeholders.

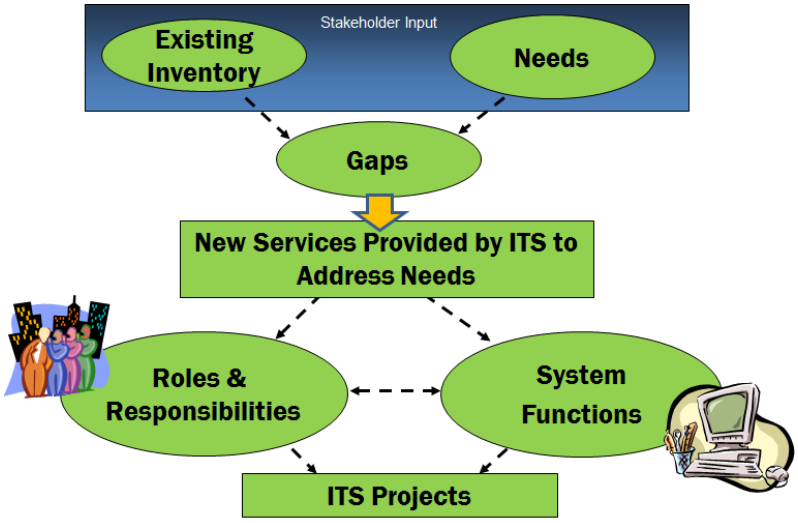

Figure 1: Development of the ITS Strategic Deployment Plan

The Strategic Deployment Plan was established as a three-level plan, focusing on regionwide projects ("Tier 1"), corridor-related projects involving multi-modal services and more targeted activities ("Tier 2"), and stakeholder-specific projects reflecting their specific needs and current plans ("Tier 3"). All projects were related to the regional ITS architecture, either directly to specific ITS services, data and components, or by reference to other projects being supported (e.g., fiber optics expansion and deployment may enable other projects).

Operational Concept and Deployment Framework

Among the issues addressed by the project team was the limited ability for agencies to exchange information in a standard format in order to reduce response time to traffic incidents. Another issue was the agency-specific orientations of traffic management activities and traveler information availability. A coordinated traffic management strategy involving adjustments of signal timings on an arterial due to a parallel freeway closure or heavy congestion currently requires manual coordination between agencies and systems as well as advance preparation. Likewise, the ability to compare alternative traffic and transit travel times for a given origin and destination is limited, due to the inability to gather all the relevant real-time information from the primary agencies in a single location. Thus, while there are multiple travel modes in the region, the operations and information strategies are not necessarily multi-modal.

The Operational Concept represents a regional ITS coordination effort for the St. Louis Region stakeholders (Missouri DOT, Illinois DOT, City of St. Louis, counties, other municipalities, Metro Transit and other transit agencies, plus EWG). In short, ad hoc coordination between individual agencies is replaced with a standardization of communications for traffic, incident and other operational information. Figure 2 presents a view of the Proposed Operational Concept for ITS in the St Louis region.

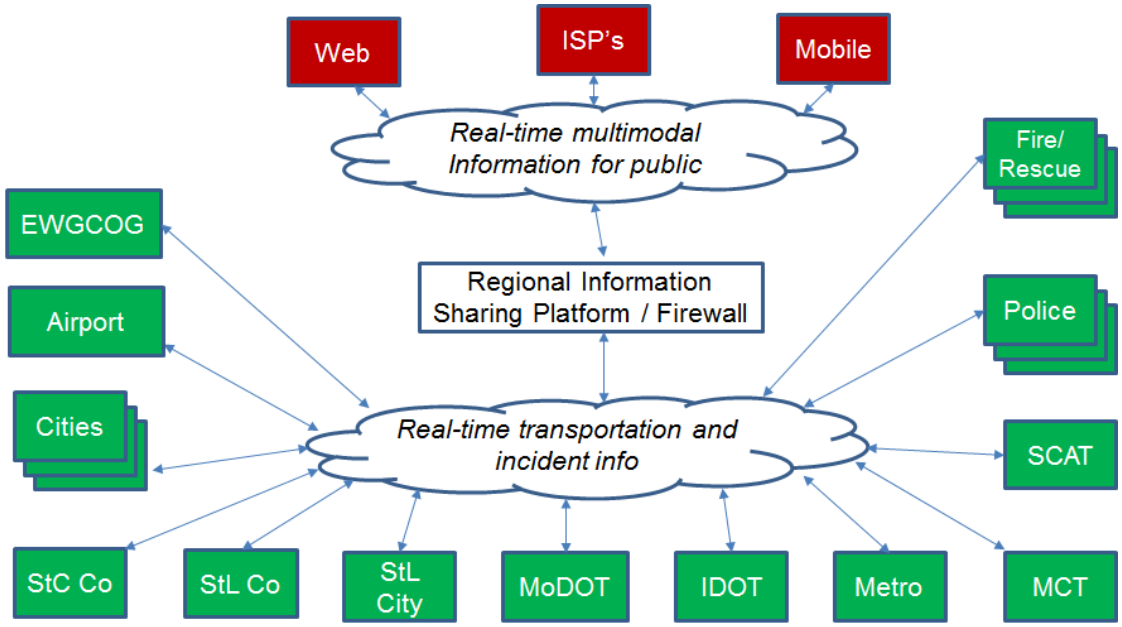

Figure 2: Proposed ITS Operational Concept for the St. Louis Region

The full build-out of the Regional ITS Architecture will occur through many individual ITS projects that will occur over the next 5 to 10 years. The first step in the SDP process was to identify projects as a subset of the larger ITS vision, taking into consideration current services, coordination issues and opportunities, as well as the future ITS services.

The proposed projects are broken down into incremental activities required to deploy the operational concept for the St Louis region. They are based on three levels of ITS initiatives:

"TIER 1" (Regional Integration) projects will support regional coordination, cooperation and multi-modal traveler information, as well as efforts to standardize and share traffic incident, event and emergency information
"TIER 2" (Integrated Corridor Management) projects will represent integrated corridor operational strategies that may also be multi-modal in nature. May impact one or more Interstate corridors as well as multiple travel modes within a particular corridor or sub-area.
"TIER 3" (Basic System Operations and Infrastructure) projects will improve or expand upon internal traffic or transit operations activities for a particular stakeholder, and will support roadway infrastructure needs where required for eventual deployment of Connected Vehicle infrastructure.

Tier 1 Initiatives

The following are the Tier 1 ITS initiatives and related projects to be deployed:

Regional ITS Data Sharing Initiative

Provide real-time data sharing and monitoring along with ability to construct, reference and report archived and historical data. The platform serves as a basis for real-time traffic and incident management coordination activities, sharing of data for coordinated traveler information in the region, and archived data management in support of CMP and other regional transportation planning efforts. The following projects are included in this initiative.

- **Regional Transportation Communications Standardization Platform (RTCSP):** The system will provide a platform for standardization of data and video exchange, leveraging off alternative platforms such as STARRS, regional fiber, or new wireless components, or all of the above. The initial phase of the project will involve a study of current communications platforms and available technologies, with recommendations made for a regional platform deployment, which should be performed as a design-build effort, leveraging functional requirements into a regional integrated network.

- **Regional Incident Data Exchange (RIDEX)**: The system would implement real-time incident data feeds for sharing with regional partners. To do this, it will be necessary to standardize data on incidents from ILSP, MSHP, county and local police and first responders, provide exchange capability using the above RTCSP infrastructure, incorporate MoDOT, IDOT, county and local access to RIDEX.

- **Active Regional Coordination for Highways & Surface Traffic Operations Network Exchange (ARCHSTONE)**: The system would implement real-time traffic data feeds, traffic signal status feeds, and video feeds or sharing with regional partners. To do this, it is necessary to standardize real-time traffic signal data (including phase, cycle length, current status), traffic flow data (freeway and arterial) and video imagery, and dynamic message sign display data, for exchange between MoDOT, counties and local agencies in the St Louis region, building on common communications media and protocols currently being implemented under projects such as Gateway Green Light (GGL), but modified as needed to be non-proprietary. Traffic data from signal systems and freeways would be shared with transit agencies so they could adjust their operations where needed. The implementation would leverage on RTCSP infrastructure, as well as current traffic management systems for responding to data from various sources, and adjusting traffic signal timings, roadside displays, etc.

- **Regional Probe Data Sharing (RPDS)**: Develop and deploy a regional strategy for obtaining and sharing probe traffic data, including either GPS-based probe data or Bluetooth-based data, that involves either coordination with an ISP or with multiple partners, in order to provide coverage on routes that do not have extensive traffic detection data or which are more conducive to routes that involve several segments (Interstate, major arterial, minor arterial, etc.)

- **Transportation Archiving and Performance Assessment System (TAPAS):** Develop the means for regional archiving of traffic data (including, as available, probe data) for review, performance assessment and visualization, including storage of incident data, ability of correlating incident data with traffic data for the same time period, and archiving of performance and traffic volume information for use by EWG for CMP activities. The system would leverage on the RIDE and ARCHSTONE initiatives that would generate regional traffic and incident data feed for archiving purposes.

Situation assessment and expert system applications using the above data as part of Integrated Corridor Management (ICM) strategies (see below) would be deployed for corridors and subareas.

1.2-Regional Multi-Modal Traveler Information System and Journey Planner

Implement a regional multi-modal traveler information system and journey planner which integrates Missouri and Illinois road and transit information from state, county, local and transit agencies. The system would enable a single set of web and mobile apps to:

- Show traffic flow, video, weather, incidents, DMS advisory messages, and real-time transit and parking information
- Provide a tool that looks at driving and transit options for specific user-generated origins and destinations, and determine various travel options and travel times for the user

The initiative is proposed to be implemented as a three-stage approach, pending availability of funding and deployment of the Regional ITS Data Sharing Initiative above:

- **Stage 1: Maintaining existing information portals** operated by MoDOT, IDOT and Metro, but with the ability to show information for other agencies' facilities as part of current website services.

- **Stage 2: Develop an initial dedicated information portal** for the region (by EWG or some other agreed neutral entity) using interim ad hoc data feeds from different agencies, and provide real-time apps and journey planning capability for web and mobile application users.
- **Stage 3: Develop a standardized dedicated information portal** which includes standardized information feeds in and out of the traveler information system, supporting not just a regional web / mobile portal but also data needed for third-party applications done within the public sector as well as by the private sector. The system would rely on implementation of a regional data sharing scheme which would allow access to the data to be handled through a regional information sharing platform along with a firewall scheme to provide secure access to the data without affecting the security or operation of the operational data and agency-to-agency coordination.

Tier 2 Initiatives

The following involves projects focused on particular major corridors and may involve multiple modes or agencies. The concept behind ICM, developed in the mid-2000s by USDOT, is to better integrate different modes of travel on the road network and offer improved options for traveling within a corridor or area within the road network. This includes optimizing the performance of the network rather than individual assets.

An ICM strategy may include:

- Corridor traffic management strategies using adaptive, or real-time responsive, strategies such as:
  - Ramp metering
  - Dynamic queue warning
  - Alternate routing schemes using adaptive signal control on adjoining and parallel arterials
  - Promotion of transit and rideshare alternatives through enhanced traveler information and journey planning functions (tying in with the Tier 1 traveler information initiative)
  - Parking availability and “next train / bus” (both MetroLink and future bus rapid transit) information near stations
  - Transit signal priority for high-use bus corridors
  - Transfer connection protection to minimize both transfer times and missed connections between adjoining bus and rail lines, as well as Metro and other transit providers’ services

- Implementation of decision support systems which address incidents, closures or major congestion (over and beyond normal), and implement strategies to provide specific traveler information messages, adjust ramp meter and traffic signal timings to encourage alternate routes, and optimize transit operations (particularly for special events or some mix of commuter peak conditions and special events)

Geographic corridors with recurring major congestion but also the availability of alternate travel routes or transit services (particularly rail or express bus) include the following, also illustrated in Figure 3:

- Downtown and East St Louis area between Grand Blvd on west and east of I-70/64/55 junction in Illinois, including all bridge approaches to downtown from both sides of the Mississippi
- I-64 from west of I-270 to downtown
- I-170 corridor from I-70 to I-64
- I-270 corridor between I-44 and Route 370
- I-70 between I-64 and I-270 including Missouri Route 370 and Missouri Route 364 as parallel routes

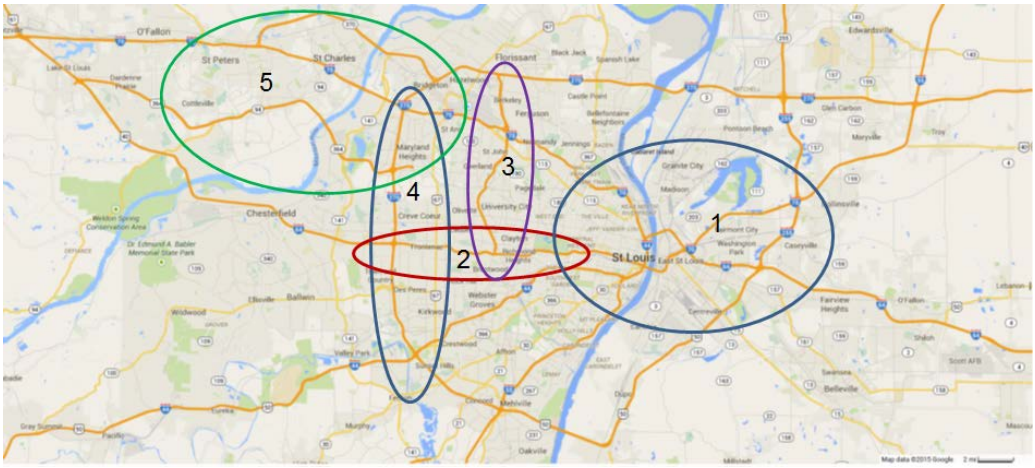

Figure 3: Preliminary View of Candidate ICM Strategy Areas

Tier 3 Initiatives

Tier 3 initiatives focus on particular systems and services that are existing or that may be managed by single agencies (or groups of agencies under existing agreements). These may consist of the following activities on primary travel routes in the region:

- Install new or additional roadside CCTV cameras
- Install new or additional traffic detection equipment
- Install new or additional dynamic message signs (DMS)
- Install new or additional road weather information systems (RWIS)
- Implement or extend fiber optic communications links or connections
- Implement or expand wireless communications networks
- Implement additional service patrol vehicles and miles of coverage
- Incorporate new or existing traffic signals within coordinated systems
- Providing additional Bluetooth or other sensors to support travel time route calculations for real-time corridors that currently do not have travel time information.
- Implement centralized traffic control systems for cities or counties without current coordination or which have substantial numbers of signals not on a state (MoDOT or IDOT) traffic control system.

Individual projects and initiatives have been identified by various stakeholders and are incorporated into the Strategic Deployment Plan. While many of the activities will primarily support or build upon current ITS services in the region, they will also support the overall operational concept, as additional data and video sources, enhanced communications, expanded traffic control systems, and upgraded components all contribute directly to the effectiveness of data that will be shared and traveler information provided, as well as ICM strategies.

APPENDIX: Strategic Deployment Plan Tables

The full build-out of the region's ITS Architecture will occur through many individual ITS projects that can occur over the next decade, depending on the level of funding that is available and the priorities established both nationally and regionally.

For Tier 1 and Tier 2, overarching initiatives are described. These include:

Tier 1 (Regional Integration):

1.1 – Regional ITS Data Sharing Initiative
1.2 – Regional Multi-Modal Traveler Information System and Journey Planner

Tier 2 (integrated Corridor Management):

2.0 – Corridor-Oriented Strategies Requiring Regional Implementation
2.1 – ICM for Corridor 1 (Gateway / Downtown / Illinois)
2.2 – ICM for Corridor 2 (I-64/East-West)
2.3 – ICM for Corridor 3 (I-170 / Mid-County/North County)
2.4 – ICM for Corridor 4 (I-270 / Lindbergh)
2.5 – ICM for Corridor 5 (Northwest)

Within each of the above initiatives, the relevant component projects are listed. However, some of the projects may be substantial in nature. Where the stakeholders have expressed concerns relative to availability of funding as well as the ability to demonstrate the effectiveness of an initiative or project, each project may be further subdivided into staged "contracts", which implement portions of the system defined either geographically or functionally, along with preliminary studies that may be required.

For Tier 3 (Basic System Operations and Infrastructure), projects are listed by the primary agency that would be deploying them.

Project Sequencing

The tables on the following pages provide guidance for project sequencing. Each project has been designated as Early Start (current to 2 year time frame), Short Term (1-3 year time frame), Medium Term (3-5 year time frame) and Long Term (5+ years). As this is done for the individual initiatives in Tier 1 and Tier 2, it does not imply specific priorities relative to all other projects, merely the relative importance of the project within the regional or corridor initiative. For Tier 3 projects, they are ranked in relative priority for each agency, given that the individual agency may either choose to fund it themselves or obtain funding through other means.

The following pages contain the initiatives and sequenced ITS projects for the St. Louis region. They are shown in Table 1 and provide the following:

- Tier 1 and Tier 2: Initiative name and description (yellow cells)

- Tier I and Tier 2: Project name and description (gray cells for overall project, white for "contracts" under the project)
- Tier 3: Agency Heading (yellow cells)
- Tier 3: Project Name and Description (white cells)
- Intent of the project / objectives and performance measures
- The ITS Service Packages the project utilizes
- Stakeholders, both primary and supporting
- The estimated project cost
- Time frame

The Tier 3 projects may include specific quantities and units. It is noted that some information was not available at the time of this study and thus, cost and other details that were not available are shown as To Be Determined ("TBD").

Table 1: Strategic Deployment Plan

Tier 1 (Regional Integration) Projects

Project # (Sequence)	Project Name	Purpose	Objectives	ITS Architecture Service Packages included	Lead stakeholder	Supporting stakeholders	Estimated Cost ($000's)	Time Frame
1.1	**Regional ITS Data Sharing Initiative**	Provide real-time data sharing and monitoring along with ability to construct, reference and report archived and historical data	• Provide regional ability for all agencies to share traffic control, traffic flow, and weather status data on arterial and freeways • Archive data for CMP activities as managed by EWG • Create operational and incident data interoperability between transportation and public safety / first responder agencies • Create coalition of transportation and public safety agencies to provide a cooperative, coordinated approach to regional transportation management	ATMS02 ATMS06 ATMS07 ATMS08 ATMS09 AD2 AD3 APTS07 MC03	Operated by designated coordination lead (recommendations for operational lead include EWG and MoDOT).	Support provided by all transportation and public safety / rescue agencies in the region, with particular members selected to oversee / coordinate specific functions.	4575	See time frames below
1.1.1	Regional Transportation Communications Standardization Platform (RTCSP)	Provide a network platform for standardization of data and video exchange, leveraging off alternative platforms such as STARRS, regional fiber, or new wireless components, or all of the above.	• Define regional transportation information exchange and coordination coalition • Define regional communications platform (wireless and wireline) enabling development of a securely protected interagency data cloud	Enables above service packages	Operated by designated coordination lead (recommendations for operational lead include EWG and MoDOT).	See above	840	See time frames below
1.1.1.1	RTCSP -Engineering Study	Identify functional and technology requirements to deploy RTCSP and prepare procurement documents	See above	See above	See above	See above	90	Early Start
1.1.1.2	RTCSP - Implementation	Implement RTCSP as basis for data and video exchange using data communication and web services platform.	See above	See above	See above	See above	750	Short Term
1.1.2	Regional Incident Data Exchange (RIDEX)	Implement real-time incident data feeds for sharing with regional partners.	• Standardize data on incidents from ILSP, MSHP, county and local police and first responders • Provide exchange capability using the above RTCSP infrastructure, incorporate MoDOT, IDOT, county and local access	ATMS08	See above, coordination required with public safety/first responders for project area	See above	1230	See time frames below
1.1.2.1	RIDEX - Engineering Study	Identify functional and technology requirements for deploying and standardizing incident data exchange standards and interfaces through RTCSP	See above	See above	See above, regionwide focus	See above	130	Early Start
1.1.2.2	RIDEX - Phase 1 (Bi-State Integration)	Deploy standardized incident data exchange at the state level (Missouri and Illinois) including DOT and Police	• Single incident data dictionary and exchange standards applicable across region and for future phases,. • Develop interface modules allowing automated data exchange between agencies.	See above	Focus on MoDOT/IDOT/MSHP/ILSP coordination	MoDOT, IDOT, MSHP, ILSP	300	Short Term
1.1.2.3	RIDEX - Phase 2 (St. Louis City and County)	Deploy standardized incident data exchange for all emergency, first responder, and transportation agencies within St Louis County including St Louis City	• Utilize standards developed and deployed in Phase 1 • Develop interface modules allowing automated data exchange between agencies.	See above	Focus on MoDOT/STL City, STL County/MSHP coordination	Support by other cities within STL County	200	Short Term

Tier 1 (Regional Integration) Projects

Project # (Sequence)	Project Name	Purpose	Objectives	ITS Architecture Service Packages included	Lead stakeholder	Supporting stakeholders	Estimated Cost ($000's)	Time Frame
1.1.2.4	RIDEX - Phase 3 (Illinois - East Metro)	Deploy standardized incident data exchange for all emergency, first responder, and transportation agencies within the East Metro (Illinois)	• Utilize standards developed and deployed in Phase 1 • Develop interface modules allowing automated data exchange between agencies.	See above	IDOT / ISHP, Madison, Monroe and St Clair Counties	Support by other cities within the 3 Counties (IL)	200	Medium Term
1.1.2.5	RIDEX - Phase 4 (Northwest Area)	Deploy standardized incident data exchange for all emergency, first responder, and transportation agencies within St Charles County	• Utilize standards developed and deployed in Phase 1 • Develop interface modules allowing automated data exchange between agencies.	See above	Focus on MoDOT/ St Charles County/ MSHP coordination	Support by cities within St Charles County	200	Medium Term
1.1.2.6	RIDEX - Phase 5 (Southwest Area)	Deploy standardized incident data exchange for all emergency, first responder, and transportation agencies within Franklin and Jerrson Counties	● Utilize standards developed and deployed in Phase 1 ● Develop interface modules allowing automated data exchange between agencies.	See above	Focus on MoDOT/ Franklin County/ Jefferson County / MSHP coordination	Support by cities within Franklin and Jefferson Counties	200	Medium Term
1.1.3	Active Regional Coordination for Highways & Surface Traffic Operations Network Exchange (ARCHSTONE)	Implement real-time traffic data feeds, traffic signal status feeds, and video feeds / sharing with regional partners.	• Standardize real-time traffic signal data (including phase, cycle length, current status), traffic flow data (freeway and arterial) and dynamic message sign display data, for exchange between MoDOT, counties and local agencies in the St Louis region • Build interface on common communications media and protocols currently being implemented under projects such as Gateway Green Light (GGL), but modified as needed to be non-proprietary. ● Share traffic control data with transit agencies to adjust their operations where needed. • Leverage RTCSP infrastructure, as well as current traffic management systems for responding to data from various sources, and adjusting traffic signal timings, roadside displays, etc.	ATMS06 ATMS07 ATMS08 APTS07 MC03	Operated by designated coordination leads (e.g., MoDOT, IDOT).	Support by all traffic operations agencies (state, county, city, along with Metro and other users of the data)	845	See time frames below
1.1.3.1	ARCHSTONE - Engineering Study	Identify functional and technology requirements to deploy ARCHSTONE and prepare procurement documents	See above	See above	See above	See above	150	Early Start
1.1.3.2	ARCHSTONE - Phase 1 (Bi-State Integration)	Implement video and data sharing at state DOT level with coordination with Metro as needed	• Deploy traffic data and video exchange for MoDOT and IDOT along with Metro coordination • Complete existing connections between MoDOT and IDOT and implement standard data exchange	ATMS06 ATMS07 APTS07 MC03	See above	Metro, MSHP, ILSP	120	Early Start

Tier 1 (Regional Integration) Projects

Project # (Sequence)	Project Name	Purpose	Objectives	ITS Architecture Service Packages included	Lead stakeholder	Supporting stakeholders	Estimated Cost ($000's)	Time Frame
1.1.3.3	ARCHSTONE - Phase 2 (St. Louis City and County)	Implement sharing of traffic control and flow data and video imagery between MoDOT, STL City, STL County, and local agencies with signals, CCTV, etc, along with Metro (supporting transit operations and signal priority)	• Standardize real-time traffic signal data (including phase, cycle length, current status), traffic flow data (freeway and arterial) and dynamic message sign display data, for exchange between MoDOT, STL City and STL County • Build interface on common communications media and protocols that can be implemented elsewhere in region (as recommended in above study) • Share traffic control data with Metro to adjust their operations where needed. • Leverage RTCSP infrastructure, as well as current traffic management systems for responding to data from various sources, and adjusting traffic signal timings, roadside displays, etc.	ATMS06 ATMS07 ATMS08 APTS07 MC03	Coordination lead MoDOT in partnership with City of STL and STL County	Metro, local agencies with signal / ITS elements	200	Short Term
1.1.3.4	ARCHSTONE - Phase 3 (Illinois - East Metro)	Implement sharing of traffic control and flow data and video imagery between IDOT and local agencies with signal control and traffic management activities, along with transit agencies as part of their operations and potential transit signal priority.	• Standardize real-time traffic signal data (including phase, cycle length, current status), traffic flow data (freeway and arterial) and dynamic message sign display data, for exchange between IDOT and counties • Build interface on common communications media and protocols • Share traffic control data with Metro and MCT to adjust their operations where needed. • Leverage RTCSP infrastructure, as well as current traffic management systems for responding to data from various sources, and adjusting traffic signal timings, roadside displays, etc.	ATMS06 ATMS07 ATMS08 APTS07 MC03	Coordination lead IDOT, working with counties	Monroe, St Clair, Madison Counties, Metro, MCT	100	Medium Term
1.1.3.5	ARCHSTONE - Phase 4 (Northwest Area)	Update Gateway Green Light (GGL) system to standardize interfaces relative to rest of region for traffic control, traffic flow and video sharing	• Enhance GGL interoperability using regional standards for data and video exchange as per above study • Share traffic control data with Metro and SCAT to adjust their operations where needed. ● Leverage current networks and RTCSP infrastructure for responding to data from various sources, and adjusting traffic signal timings, roadside displays, etc.	ATMS06 ATMS07 ATMS08 APTS07 MC03	Coordination lead MoDOT with strong support from St Charles County	Metro, local agencies with current GGL access	150	Medium Term
1.1.3.6	ARCHSTONE - Phase 5 (Southwest Area)	Implement sharing of traffic control and flow data and video imagery between MoDOT, Franklin and Jefferson Counties, and local agencies with signals, CCTV, etc,	• Standardize real-time traffic signal data (including phase, cycle length, current status), traffic flow data (freeway and arterial) and dynamic message sign display data, for exchange between IDOT and counties • Build interface on common communications media and protocols • Leverage RTCSP infrastructure, as well as current traffic management systems for responding to data from various sources, and adjusting traffic signal timings, roadside displays, etc.	ATMS06 ATMS07 ATMS08 MC03	Coordination lead MoDOT in partnership with counties	Local agencies with signal / ITS elements	125	Medium Term

Tier 1 (Regional Integration) Projects

Project # (Sequence)	Project Name	Purpose	Objectives	ITS Architecture Service Packages included	Lead stakeholder	Supporting stakeholders	Estimated Cost ($000's)	Time Frame
1.1.4	Regional Probe Data Sharing (RPDS)	Develop and deploy a regional strategy for obtaining and sharing probe traffic data, including either GPS-based probe data or Bluetooth-based data, in order to provide coverage on routes that do not have extensive traffic detection data or which are more conducive to routes that involve several segments (Interstate, major arterial, minor arterial, etc.)	Identify common technology and technical approach for accessing regional probe data including installation of Bluetooth readers, procurement of GPS data from private sector, etc.	ATMS02, AD2	EWG, with operational lead to be determined	MoDOT, IDOT, City of StL, Counties	830	See below
1.1.4.1	RPDS - Feasibility Study	Identify best engineering, procurement and technical approach for above	See above	See above	EWG	MoDOT, IDOT, City of StL, Counties	80	Early Start
1.1.4.2	RPDS - Procurement	Implement probe-based information system for traveler info and data archiving	See above	See above	Operational lead to be determined, may be public agency or private sector vendor	MoDOT, IDOT, City of StL, Counties	750	Short Term
1.1.5	Transportation Archiving and Performance Assessment System (TAPAS)	Provide regional archiving of traffic data (including, as available, probe data) for review, performance assessment and visualization, including storage of incident data, ability of correlating incident data with traffic data for the same time period, and archiving of performance and traffic volume information for use by EWG for CMP activities.	Leverage on RPDS, RIDEX and ARCHSTONE initiatives to generate regional traffic and incident data feed for archiving / CMP purposes.	AD2 AD3 ATMS09	EWG	MoDOT, IDOT, City of StL, Counties	830	See below
1.1.5.1	TAPAS - Systems Engineering Study	Identify requirements and prepare procurement documents for TAPAS	See above	See above	EWG	See above	80	Early start
1.1.5.2	TAPAS - Deployment	Implement regional transportation archive function to be used for CMP and other planning activities	See above	See above	EWG	See above	750	Short Term
1.2	**Regional Multi-Modal Traveler Information System and Journey Planner**	Implement a regional multi-modal traveler information system and journey planner which integrates Missouri and Illinois road and transit information from state, county, local and transit agencies	• Show traffic flow, video, weather, incidents, DMS advisory messages, and real-time transit and parking information • Provide tool that looks at driving and transit options for specific user-generated origins and destinations, and determine various travel options and travel times for the user	ATIS01 ATIS02 ATIS04 ATIS05 APTS08	Operated by designated coordination lead (recommendations for operational lead include EWG and MoDOT), or contracted to private sector firm	MoDOT, IDOT, City of StL, Counties. Metro, MCT, SCAT, Lambert Airport	2650	See below
1.2.1	Stage 1 - Data Sharing on Existing Sites	Establish bi-lateral connections for traffic and incident information between MoDOT, IDOT and Metro, between Lambert Airport and Metro and MoDOT, between St Louis County, St Louis City, ST Charles County and MoDOT	Supports providing data from other agencies on existing agency websites without developing a stand-alone regional traveler information service.	ATIS01 APTS08	EWG coordination, agencies would handle own interfaces	See above	150	See below
1.2.1.1	Data Sharing and Exchange	Set up traveler info feeds	Prior to ARCHSTONE deployment, provide initial web services or similar secured connections between agencies for real-time displays.	See above	See above	See above	150	Early start
1.2.2	Stage 2 - Initial Dedicated Portal with ad hoc data feeds	Add connectivity to new regional web and mobile service while maintaining Stage I feeds and current agency links	Leverage data exchange from Stage I to develop regional traveler info site with real-time traffic and transit data from multiple agencies (one-stop shop)	ATIS01 APTS08	EWG coordination, agencies would handle own interfaces	See above	150	See below

Tier 1 (Regional Integration) Projects

Project # (Sequence)	Project Name	Purpose	Objectives	ITS Architecture Service Packages included	Lead stakeholder	Supporting stakeholders	Estimated Cost ($000's)	Time Frame
1.2.2.1	Implement dedicated basic traveler information portal (web and mobile)	See above	See above	See above	See above	See above	150	Short term
1.2.3	Stage 3 - Full-service multi-modal traveler information with standardized feeds from all agencies	Based on ARCHSTONE Implementation, leverage traffic and incident information into regional system and deploy journey planner.	• Deploy real-time multimodal traveler information with journey planner • Integrate separate agency traveler information into one system.	ATIS01 ATIS02 ATIS04 ATIS05 APTS08	Operated by designated coordination lead (recommendations for operational lead include EWG and MoDOT), or contracted to private sector firm	MoDOT, IDOT, City of StL, Counties. Metro, MCT, SCAT, Lambert Airport	2500	See below
1.2.3.1	Implement real-time interactive and multimodal traveler info (web and mobile) using permanent web services platform	See above	See above	See above	See above	See above	2500	Medium term

ADDITIONAL
RECOMMENDATIONS:

a. Engineering Studies for projects 1.1.1, 1.1.2, and 1.1.3 may be done as part of a single "Systems Engineering Study for Regional Data Sharing"

TOTAL ($000's)	Tier 1	**7225**

Tier 2 (Integrated Corridor Management) Projects

Project # (Sequence)	Project Name	Purpose	Objectives	ITS Architecture Service Packages included	Lead stakeholder	Supporting stakeholders	Estimated Cost ($000)	Time Frame
2.0 Corridor-Oriented Strategies Requiring Regional Implementation								
2.0.1	MetroLink AVL integration with bus AVL	Enable tracking and coordination of bus and rail schedules and estimation of travel times	• Improve MetroLink on-time performance • Improve level of information to support Tier 1 traveler information as well as Transfer Connection Protection	APTS01	Metro		700	Short term
2.0.2	Regional Emergency Alert and Evacuation Initiative	Provides wide-area warning of hazmat/chemical incidents and manage evacuations	• Mitigate or eliminate vehicles not able to avoid an emergency closure or restricted zone • Provide advisories to traffic and police agencies to reroute traffic away from restricted zones and facilitate communication between concerned agencies.	CVO10 MC12 EM09 EM10 EM06	STARRS, MoDOT, IDOT	Other traffic and police agencies (STARRS members)	3000	See below
2.0.2.1	Engineering Study for Regional Emergency Alert and Evacuation	Address feasibility and scope along with procurement documentation for two-phase Regional Emergency Alert and Evacuation Initiative	See above	See above	STARRS	STARRS, MoDOT, others as above	200	Early start
2.0.2.2	Regional Emergency and Hazmat Alert System (REHAS)	Provides wide-area warning system for hazmat/chemical incidents	See above	See above	STARRS, MoDOT, IDOT	See above	1400	Short term
2.0.2.3	Regional Evacuation and Disaster Coordination (REDC)	Provide framework to implement evacuate and response on one or more routes	• Reduce time to evacuate or clear an evacuation or disaster zone.	EM09 EM10 EM06	STARRS, MoDOT, IDOT	Other traffic and police agencies (STARRS members)	1400	Short term
2.0.3	Dynamic Ridesharing Initiative	Enable online applications which match travelers within a particular corridor and desiring a particular travel time frame	• Increase use of rideshare • Reduce single-occupancy vehicle travel	ATIS08	EWGCOG		500	Medium term
2.1 ICM for Corridor 1 (Gateway / Downtown / Illinois)								
2.1.1	Integrated ATMS Enhancement	Upgrade current freeway management system to provide integrated real-time information and control for freeways and arterials serving the corridor	• Enhance operation of freeway management systems to share data with other agencies and incorporate enhanced information from freeways and arterials for corridor management	ATMS01 ATMS02 ATMS06 ATMS07 ATMS08	IDOT		4000	Short Term

Tier 2 (Integrated Corridor Management) Projects

Project # (Sequence)	Project Name	Purpose	Objectives	ITS Architecture Service Packages included	Lead stakeholder	Supporting stakeholders	Estimated Cost ($000)	Time Frame
2.1.2	Arterial Adaptive Signal Control in E St Louis / Route 3 subarea	Upgrade traffic signals to adaptive control in Route 3 corridor near I-70/I-55 junction, E St Louis. Includes updated central adaptive signal platform and expanded detection supporting 23 CFR 511 requirements.	• Reduce freeway and arterial congestion as a result of diversions, special events or traffic incidents	ATMS03	IDOT	City of E St Louis	1800	Short Term
2.1.3	Transfer Connection Protection at Illinois and Downtown MetroLink stations (Civic Center to Shiloh-Scott)	Enable bus services to coordinate arrival / departure with rail arrival to improve connections.	Reduce transfer wait times for riders transferring between rail and bus services	APTS11	Metro		360	Short term
2.1.4	Transit Signal Priority	Identify 4 key corridors in City of St Louis plus 1-2 corridors in IL	Reduce travel time and signal delay	APTS09	Metro	City of St Louis, MoDOT, IDOT	2000	Medium term
2.1.4.1	TSP - City of St Louis	4 corridors in city of St Louis	see above	see above	Metro	City of St Louis, MoDOT	1500	Medium term
2.1.4.2	TSP - Illinois	1-2 corridors in Illinois	see above	see above	Metro	IDOT, City of East St Louis	750	Medium term
2.1.5	Parking and travel time real-time information system - Illinois Stations	Provide real-time parking and train departure information, compare current road and rail travel times (requires AVL data from train) - estimated 8 signs, 4 lots with access sensors for parking counts	• Reduce time needed to find parking • Increase use of transit • Reduce single-occupancy vehicle travel	APTS08 ATMS17	Metro, IDOT, EWG, MCT		2500	Medium term
2.1.6	Bridge emergency monitoring and coordination	Provides emergency security monitoring and detection and alerts to regional traffic and police where needed. Includes additional CCTV and physical structure detection technologies	• Enhance coordination with other traffic and police entities in the event of an emergency bridge closure, or if multiple bridges are closed.	MC12 ATMS02 EM05	See below	See below	1320	
2.1.6.1	Poplar St Bridge	See above	See above	See above	MoDOT, IDOT	MSHP, ILSP, STARRS	220	Medium term
2.1.6.2	Stan Musial Bridge	See above	See above	See above	MoDOT, IDOT	MSHP, ILSP, STARRS	380	Medium term
2.1.6.3	Eads Bridge	See above	See above	See above	City of St Louis	St Louis Metro Police, STARRS	140	Medium term
2.1.6.4	ML King Br	See above	See above	See above	City of St Louis	St Louis Metro Police, STARRS	140	Medium term
2.1.6.5	I-270 Bridge	See above	See above	See above	MoDOT, IDOT	MSHP, ILSP, STARRS	220	Long term
2.1.6.6	I-255 Bridge	See above	See above	See above	MoDOT, IDOT	MSHP, ILSP, STARRS	220	Long term

Tier 2 (Integrated Corridor Management) Projects

Project # (Sequence)	Project Name	Purpose	Objectives	ITS Architecture Service Packages included	Lead stakeholder	Supporting stakeholders	Estimated Cost ($000)	Time Frame
2.1.7	Queue and Hazard Warning Management	Advance information on back of queue location due to congestion and accidents, includes 1/2 mile to 1 mile DMS spacings. Locate on all approaches to bridge complex, estimated 5 miles inbound and outbound from bridges (I-70, I-64-IL, I-55). Estimated 40 queue warning signs	• Reduce rear-end collisions • Reduce delays	ATMS02 ATIS01 ATMS06 ATMS01	MoDOT, IDOT		4000	Long term
2.1.8	ICM Data Hub: Gateway Corridor	Collect freeway, arterial traffic data and relevant transit location and travel time data in the corridor for archiving / analysis	• Allow quicker deployment of traffic strategies through sharing of data on parallel routes and from transit	AD2 ATMS09	EWG, MoDOT, IDOT, Metro, City of St Louis		600	Long term
2.1.9	Gateway Corridor Decision Support	Modeling and simulation using live and archived data to provide adjustments to ramp metering, signal timing, and other operational strategies	• Reduce delay and incidents through developing real-time and adjusted traffic operations strategies	ATMS07 ATMS09	MoDOT / IDOT	City of St Louis, Metro	1000	Long term
2.2 ICM for Corridor 2 (I-64 /East-West)								
2.2.1	I-64 Ramp Metering	Manage entrance ramp traffic flow at 15 locations	• Reduce congestion at ramp junctions • reduce accidents	ATMS04	MoDOT		3710	Short term
2.2.2	Transfer Connection Protection at east-west Blue Line MetroLink stations (Clayton to Grand)	Enable bus services to coordinate arrival / departure with rail arrival to improve connections.	Reduce transfer wait times for riders transferring between rail and bus services	APTS11	Metro		360	Short term
2.2.3	Traffic Signal Interconnection - Clayton Road / University City	Coordinate signal timings based on real-time traffic, between MoDOT, St Louis County and local signals using common interfaces	• Reduce freeway and arterial congestion as a result of diversions or traffic incidents	ATMS03 ATMS07	MoDOT, St Louis County, City of Clayton, University City		120	Medium term
2.2.4	Traffic Signal Interconnection - city corridors	Coordinate signal timings based on real-time traffic, between MoDOT and St Louis City using common interfaces	• Reduce freeway and arterial congestion as a result of diversions or traffic incidents	ATMS03 ATMS07	MoDOT, City of St Louis		120	Medium term

Tier 2 (Integrated Corridor Management) Projects

Project # (Sequence)	Project Name	Purpose	Objectives	ITS Architecture Service Packages included	Lead stakeholder	Supporting stakeholders	Estimated Cost ($000)	Time Frame
2.2.5	Parking and travel time real-time information system	Provide real-time parking and train departure information, compare current road and rail travel times (requires AVL data from train). Brentwood and Richmond Hts stations	• Reduce time needed to find parking • Increase use of transit • Reduce single-occupancy vehicle travel	APTS08 ATMS17	MoDOT, Metro		2500	Medium term
2.2.6	Queue and Hazard Warning Management	Advance information on back of queue location due to congestion and accidents, includes 1/2 mile to 1 mile small DMS spacings. (I-64, west of Rt 141 to Poplar St Bridge)	• Reduce rear-end collisions • Reduce delays	ATMS02 ATIS01 ATMS06	MoDOT		4000	Long term
2.2.7	ICM Data Hub: I-64 Corridor (incremental vs Corridor 1)	Collect freeway, arterial traffic data and relevant transit location / travel time data for archiving / analysis	• Allow quicker deployment of traffic strategies through sharing of data on parallel routes and from transit	AD2 ATMS09	EWG, MoDOT, St Louis County		300	Long term
2.2.8	I-64 Corridor Decision Support (incremental vs Corridor 1)	Modeling and simulation using live and archived data to provide adjustments to ramp metering, signal timing, and other operational strategies	• Reduce delay and incidents through developing real-time and adjusted traffic operations strategies	ATMS07 ATMS09	MoDOT	St Louis County, Metro	500	Long term
2.3 ICM for Corridor 3 (I-170/Mid-County/North County)								
2.3.1	Transfer Connection Protection at North Hanley MetroLink station	Enable bus services to coordinate arrival / departure with rail arrival to improve connections.	Reduce transfer wait times for riders transferring between rail and bus services	APTS11	Metro		60	Short term
2.3.2	Traffic Signal Interconnection - Mid/North STL County	Coordinate signal timings based on real-time traffic, between MoDOT and St Louis County using common interfaces	• Reduce freeway and arterial congestion as a result of diversions or traffic incidents	ATMS03 ATMS07	MoDOT, St Louis County		120	Short term
2.3.3	Parking and travel time real-time information system	Provide real-time parking and train departure information, compare current road and rail travel times (requires AVL data from train). North Hanley Station.	• Reduce time needed to find parking • Increase use of transit • Reduce single-occupancy vehicle travel	APTS08 ATMS17	MoDOT, Metro		700	Medium term

Tier 2 (Integrated Corridor Management) Projects

Project # (Sequence)	Project Name	Purpose	Objectives	ITS Architecture Service Packages included	Lead stakeholder	Supporting stakeholders	Estimated Cost ($000)	Time Frame
2.3.4	Queue and Hazard Warning Management	Advance information on back of queue location due to congestion and accidents, includes 1/2 mile to 1 mile DMS spacings. (I-170 full length)	• Reduce rear-end collisions • Reduce delays	ATMS02 ATIS01 ATMS06	MoDOT		2000	Long term
2.3.5	ICM Data Hub: I-170 Corridor	Collect freeway, arterial traffic data and relevant transit location / travel time data for archiving / analysis	• Allow quicker deployment of traffic strategies through sharing of data on parallel routes and from transit	AD2 ATMS09	EWG, MoDOT		300	Long term
2.3.6	I-170 Corridor Decision Support	Modeling and simulation using live and archived data to provide adjustments to ramp metering, signal timing, and other operational strategies	• Reduce delay and incidents through developing real-time and adjusted traffic operations strategies	ATMS07 ATMS09	MoDOT	St Louis County, Metro	500	Long term
2.4 ICM for Corridor 4 (I-270/Lindbergh)								
2.4.1	Transfer Connection Protection at Blue Line Stations (Maplewood and Shrewsbury)	Enable bus services to coordinate arrival / departure with rail arrival to improve connections.	Reduce transfer wait times for riders transferring between rail and bus services	APTS11	Metro		60	Short term
2.4.2	Tunnel emergency monitoring and coordination	Provides emergency security monitoring and detection and alerts to regional traffic and police where needed. Includes additional CCTV and physical structure detection technologies	• Enhance coordination with other traffic and police entities in the event of an emergency tunnel closure or evacuation	MC12 EM05 ATMS08	MoDOT	Lambert Airport	500	Short term
2.4.3	Traffic Signal Interconnection - Central STL County	Coordinate signal timings based on real-time traffic, between MoDOT and St Louis County using common interfaces	• Reduce freeway and arterial congestion as a result of diversions or traffic incidents	ATMS03 ATMS07	MoDOT, St Louis County		120	Medium term
2.4.4	Parking and travel time real-time information system	Provide real-time parking and train departure information, compare current road, rail and BRT travel times (requires BRT data). Shrewsbury station.	• Reduce time needed to find parking • Increase use of transit • Reduce single-occupancy vehicle travel	APTS07 ATMS17	MoDOT, Metro		700	Medium term

Tier 2 (Integrated Corridor Management) Projects

Project # (Sequence)	Project Name	Purpose	Objectives	ITS Architecture Service Packages included	Lead stakeholder	Supporting stakeholders	Estimated Cost ($000)	Time Frame
2.4.5	Queue and Hazard Warning Management	Advance information on back of queue location due to congestion and accidents, includes 1/2 mile to 1 mile DMS spacings. (I-270 between north of I-170 and south of I-44)	• Reduce rear-end collisions • Reduce delays	ATMS02 ATIS01 ATMS06	MoDOT		6000	Long term
2.4.6	ICM Data Hub: I-270 Corridor	Collect freeway, arterial traffic data and relevant transit location / travel time data for archiving / analysis	• Allow quicker deployment of traffic strategies through sharing of data on parallel routes and from transit	AD2 AD3 ATMS09	EWG, MoDOT		300	Long term
2.4.7	I-270 Corridor Decision Support	Modeling and simulation using live and archived data to provide adjustments to ramp metering, signal timing, and other operational strategies	• Reduce delay and incidents through developing real-time and adjusted traffic operations strategies	ATMS07 ATMS09	MoDOT	St Louis County, Metro	500	Long term
2.5 ICM for Corridor 5 (Northwest)								
2.5.1	Traffic Signal Interconnection - Northwest STL County	Coordinate signal timings based on real-time traffic, between MoDOT and St Louis County using common interfaces	• Reduce freeway and arterial congestion as a result of diversions or traffic incidents	ATMS03 ATMS07	MoDOT, St Louis County		120	Medium term
2.5.2	Parking and travel time real-time information system	Provide real-time parking and train departure information, compare current road and BRT travel times (requires BRT data)	• Reduce time needed to find parking • Increase use of transit • Reduce single-occupancy vehicle travel	APTS07 ATMS17	MoDOT, Metro		700	Medium term
2.5.3	Queue and Hazard Warning Management	Advance information on back of queue location due to congestion and accidents, includes 1/2 mile to 1 mile DMS spacings. I-70, Route 364.	• Reduce rear-end collisions • Reduce delays	ATMS02 ATIS01 ATMS06	MoDOT		6000	Long term
2.5.4	ICM Data Hub: NW Corridor / GGL	Collect freeway, arterial traffic data and relevant transit location / travel time data for archiving / analysis	• Allow quicker deployment of traffic strategies through sharing of data on parallel routes and from transit	AD2 AD3 ATMS09	EWG, MoDOT, St Charles County, St Louis County		300	Long term

Tier 2 (Integrated Corridor Management) Projects

Project # (Sequence)	Project Name	Purpose	Objectives	ITS Architecture Service Packages included	Lead stakeholder	Supporting stakeholders	Estimated Cost ($000)	Time Frame
2.5.5	NW Corridor Decision Support	Modeling and simulation using live and archived data to provide adjustments to ramp metering, signal timing, and other operational strategies	• Reduce delay and incidents through developing real-time and adjusted traffic operations strategies	ATMS07 ATMS09	MoDOT, St Charles County, St Louis County	Metro	500	Long term
2.5.6	Transfer Connection Protection at Future BRT	Enable bus services to coordinate arrival / departure with rail arrival to improve connections.	Reduce transfer wait times for riders transferring between BRT and other bus services	APTS11	Metro		60	Long term

TOTAL Tier 2 ($000's)	**52020**

NOTE

Data Hub and Decision Support System costs for Corridors 2-5 are incremental based on initial Corridor 1 deployment

Tier 3 (Basic System Operations and Infrastructure) Projects

Project # (Sequence)	Project Name	Purpose	Lead stakeholder	Supporting stakeholders	Unit	Quantities	Estimated Cost ($000's)	Time Frame
Missouri DOT								
3.1.1	Enhance CCTV	Improve video quality	MoDOT		each	242	1400	Medium term
3.1.2	Expand Bluetooth Readers	Improve travel time accuracy	MoDOT		interchanges	10	550	Long term
3.1.3	Add Static Destination DMS (travel time)	Support expanded travel time info for multiple destinations	MoDOT		each	80	760	Long term
3.1.4	Enhance Freeway and Arterial DMS (full matrix color)	Expand level and quality of information provided, supporting MUTCD-type messaging displays	MoDOT		each	150	24760	Long term
3.1.5	Expand Adaptive Control (arterials)	Reduce arterial congestion through improved real-time responsive operations	MoDOT		corridors	20	1500	Long term
Illinois DOT								
3.2.1	Update website to show live video and arterial data	Expand functionality and coverage for IDOT website	IDOT		Lump Sum	Lump Sum	500	Short Term
3.2.2	Arterial Adaptive Signal Control - Phase II (region outside Route 3 / E St Louis)	Upgrade traffic signals to adaptive control. Uses Phase 1 (ICM Tier 2 project) updated central adaptive signal platform and expanded detection supporting 23 CFR 511 requirements.	IDOT		Lump Sum	Lump Sum	2500	Short Term
3.2.3	Expand CCTV		IDOT		each	20	120	Medium term
3.2.4	Expand Traffic Detection to support 23 CFR 511 requirements	Standard detection as well as Bluetooth readers to provide speed and travel time data	IDOT			20	300	Medium term
3.2.5	Expand DMS (full-size)	New signs on Route 3 and other arterials approaching bridge complex plus upgrade existing 11 signs	IDOT		each	20	3400	Long term
Metro Transit								
3.3.1	Integrate electronic payment across region	Create standardized payment for transit services across region	Metro	MCT, SCAT	lump sum	lump sum	2000	Short term
3.3.2	Implementation of on-board Wi-Fi (rail)	Support traveler info, emergency data communications, customer convenience - includes router cost and 5-year wireless lease ($70/month/vehicle)	Metro		vehicles	87	395	Short term
3.3.3	Implementation of on-board Wi-Fi (bus)	Support traveler info, emergency data communications, customer convenience - includes router cost and 5-year wireless lease ($70/month/vehicle)	Metro		vehicles	374	1683	Medium term

Tier 3 (Basic System Operations and Infrastructure) Projects

Project # (Sequence)	Project Name	Purpose	Lead stakeholder	Supporting stakeholders	Unit	Quantities	Estimated Cost ($000's)	Time Frame
St. Louis City								
3.4.1	TOC co-location with Police Ops	Shared CCTV / control center, improved coordination	City of St Louis			TBD	TBD	Early start
3.4.2	Signal System Upgrade	Update current platform	City of St Louis			TBD	TBD	Short term
3.4.3	Controller Upgrades	Upgrade controllers not on current system	City of St Louis			TBD	TBD	Short term
3.4.4	Upgrade intersections to full actuation	Expand actuation at key intersections	City of St Louis			TBD	TBD	Medium term
3.4.5	CCTV Expansions	Add cameras on key corridors	City of St Louis			TBD	TBD	Medium term
3.4.6	Fiber optics extension	Add remaining signals to system	City of St Louis			TBD	TBD	Medium term
3.4.7	Adaptive control - downtown STL	Implement adaptive operations in downtown core area	City of St Louis			TBD	TBD	Medium term
St. Charles County								
3.5.1	Deployment of PTZ cameras	Increase camera coverage	St Charles County		cameras	125	1,875	Early start
3.5.2	Deployment of travel time detectors	Increase detection coverage	St Charles County		sensors	100	2,500	Early start
3.5.3	Deployment of count stations	Increase traffic count coverage	St Charles County		count stations	200	5,000	Early start
3.5.4	Initial deployment of travel time DMS on key county arterials	Use color DMS	St Charles County		signs	50	5,000	Early start
3.5.5	Deployment of weather stations	Increase weather station coverage	St Charles County		weather stations	50	500	Early start
3.5.6	Emergency signal pre-emption deployment	Implement in various locations in County	St Charles County	First responders in St Charles County	signalized ints	100	1,500	Short term
3.5.7	Probe Data Expansion	Extend to cover key routes, not just segments	St Charles County		Miles	500	5,000	Short term
3.5.8	Phase III fiber expansion (48 strand)	Implement in various locations in County	St Charles County		signalized ints	16	3,000	Medium term
3.5.9	Adaptive signal system upgrade	Add detection, other modifications	St Charles County		corridors	10	3,750	Medium term

Tier 3 (Basic System Operations and Infrastructure) Projects

Project # (Sequence)	Project Name	Purpose	Lead stakeholder	Supporting stakeholders	Unit	Quantities	Estimated Cost ($000's)	Time Frame
3.5.10	Integrate state, county and Metro sensors to support expanded TT DMS	Add detection, other modifications	St Charles County	MoDOT, Metro	miles	1000	4,000	Medium term
3.5.11	Expanded deployment of travel time DMS on key county arterials	Use color DMS	St Charles County		signs	50	5,000	Short term
3.5.12	Future fiber expansion (48 strand)	Implement in various locations in County	St Charles County		signalized ints	9	1,700	Medium term
3.5.13	Future fiber expansion (12 strand)	Implement in various locations in County	St Charles County		signalized ints	5	1,000	Medium term
3.5.14	Weather data sharing with MoDOT		St Charles County	MoDOT	lump sum	lump sum	750	Medium term
St. Louis County								
3.6.1	West County ITS Segment	Upgrades signals	St Louis County	MoDOT	signalized ints	14	TBD	Short term
3.6.2	North County ITS Segment	Upgrades signals	St Louis County	MoDOT	signalized ints	14	TBD	Short term
3.6.3	South County ITS Segment I	Upgrades signals	St Louis County		signalized ints	21	TBD	Short term
3.6.4	Maryland Hts ITS Segment	Upgrades signals	St Louis County		signalized ints	13	TBD	Short term
3.6.5	Southwest ITS Segment	Upgrades signals	St Louis County	MoDOT	signalized ints	14	TBD	Short term
3.6.6	South County ITS Segment II	Upgrades signals	St Louis County		signalized ints	22	TBD	Short term
3.6.7	Dougherty Ferry / Ballas Rd ITS	Upgrades signals	St Louis County		signalized ints	TBD	TBD	Short term
3.6.8	Advanced Loops/ITS components - 10 projects	Upgrade ITS infrastructure	St Louis County		locations	TBD	TBD	Short term
3.6.9	Clayton Rd ITS	Upgrades signals	St Louis County	MoDOT, Ladue, Frontenac, Town and Country	signalized ints	TBD	TBD	Short term
3.6.10	School Zone ITS	Upgrade ITS infrastructure	St Louis County		locations	TBD	TBD	Short term
3.6.11	Weidman Rd ITS	Upgrades signals	St Louis County		signalized ints	TBD	TBD	Medium term
3.6.12	Forsyth Blvd ITS	Upgrades signals	St Louis County	Clayton, University City	signalized ints	TBD	TBD	Medium term
3.6.13	Systemwide CCTV / PTZ upgrade	Upgrade ITS infrastructure	St Louis County		locations	TBD	TBD	Medium term
3.6.14	Seven Hills Dr ITS	Upgrade ITS infrastructure	St Louis County		signalized ints	TBD	TBD	Medium term
3.6.15	Upgrade lower-count fiber	Upgrade ITS infrastructure	St Louis County		miles	TBD	TBD	Medium term
3.6.16	Ballas Rd ITS	Upgrade ITS infrastructure	St Louis County	MoDOT, Creve Coeur		TBD	TBD	Medium term

Tier 3 (Basic System Operations and Infrastructure) Projects

Project # (Sequence)	Project Name	Purpose	Lead stakeholder	Supporting stakeholders	Unit	Quantities	Estimated Cost ($000's)	Time Frame
3.6.17	County video surveillance using MoDOT fiber	Shared resource / ITS infrastructure upgrade	St Louis County			TBD	TBD	Medium term
3.6.18	10 count stations (5 projects)	Upgrade ITS infrastructure	St Louis County			TBD	TBD	Medium term
3.6.19	ITS project - gap-closing	Upgrade ITS infrastructure	St Louis County			TBD	TBD	Medium term
3.6.20	Bennington/Amerling/McKelvey ITS	Upgrade ITS infrastructure	St Louis County			TBD	TBD	Medium term
3.6.21	South County ITS Segment III	Upgrade ITS infrastructure	St Louis County			TBD	TBD	Medium term
3.6.22	Old Halls Ferry Rd ITS	Upgrade ITS infrastructure	St Louis County			TBD	TBD	Long term
3.6.23	Barrett Station ITS	Upgrade ITS infrastructure	St Louis County			TBD	TBD	Long term
3.6.24	Lucas-Hunt ITS	Upgrade ITS infrastructure	St Louis County			TBD	TBD	Long term
3.6.25	Ladue Rd ITS	Upgrade ITS infrastructure	St Louis County	MoDOT, Creve Couer, Ladue		TBD	TBD	Long term
3.6.26	Brown Rd / JS McDonnell Blvd ITS	Upgrade ITS infrastructure	St Louis County			TBD	TBD	Long term
3.6.27	Systemwide CCTV / PTZ upgrade	Upgrade ITS infrastructure	St Louis County			TBD	TBD	Long term
3.6.28	Conway / Woods Mill Rd ITS	Upgrade ITS infrastructure	St Louis County	MoDOT, Creve Couer, Chesterfield		TBD	TBD	Long term
3.6.29	South Florissant Rd / Paul Ave ITS	Upgrade ITS infrastructure	St Louis County	MoDOT, Ferguson		TBD	TBD	Long term
3.6.30	Municipal signal connection to County System	Upgrade ITS infrastructure	St Louis County			TBD	TBD	Long term
3.6.31	Olive Blvd ITS project	Upgrade ITS infrastructure	St Louis County	MoDOT		TBD	TBD	Long term
3.6.32	Manchester Rd / JJ Kelley ITS	Upgrade ITS infrastructure	St Louis County	MoDOT		TBD	TBD	Long term
3.6.33	Roadside weather monitoring pilot	Implement road weather systems	St Louis County			TBD	TBD	Long term