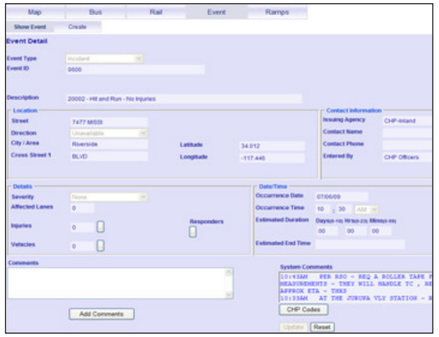
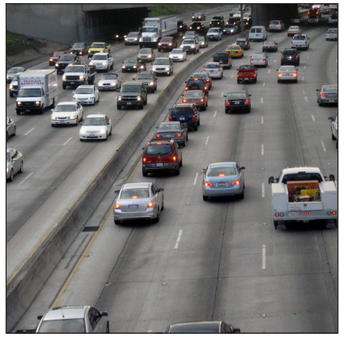
Regional Integration of Intelligent Transportation Systems (RIITS)

10-Year Strategic Plan





by IBI Group

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Los Angeles County
Metropolitan Transportation Authority

RIITS Ten-Year Strategic Plan

June 15, 2010

ACKNOWLEDGEMENTS

The Team responsible for the development of the RIITS 10-Year Strategic Plan would like to recognize the particular efforts of the following participants:

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The Team would also like to thank the numerous individuals from stakeholder agencies, as well as from internal MTA departments, that provided input and participated throughout the development of the RIITS 10-Year Strategic Plan.

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EXECUTIVE SUMMARY

WHAT IS THE RIITS STRATEGIC PLAN?

The Regional Integration of Intelligent Transportation Systems (RIITS) 10-Year Strategic Plan identifies and prioritizes future investments to enhance the functionality of the multimodal, multi-agency RIITS transportation data exchange network.

The Los Angeles County Metropolitan Transportation Authority (hereafter referred to as MTA), which administers the RIITS network, has collaborated with several MTA departments and a wide range of regional transportation operations, planning, and emergency management agencies to develop the 10-Year Strategic Plan. Stakeholder departments and agencies participated in identification of needs and opportunities and the evaluation of future Strategic Initiatives, providing valuable insights into how RIITS can be leveraged to meet the region's multimodal mobility, freight movement, sustainability, and emergency management goals. Stakeholder ideas and recommendations became the basis for developing the RIITS Strategic Vision and 10-Year Strategic Plan.

WHAT IS RIITS?

RIITS' central mission is to support the core business needs of public agencies by creating a 'one-stop shop' for real-time data about the complete transportation system.

The RIITS network combines real-time transportation data from Intelligent Transportation Systems and agencies across Los Angeles County, and in return provides value-added information on the operation of multimodal transportation systems (including freeway, arterial, and transit systems) to Partner Agencies and to the general public.

Detailed RIITS data is available to Partner Agencies through a secure web-based interface, while real-time conditions data is also available through a public information website.

THE RIITS NETWORK ENABLES PARTNER AGENCIES TO SHARE REAL-TIME TRANSPORTATION DATA TO MEET THE REGION'S FUTURE MOBILITY CHALLENGES BY:

- *IMPROVING OPERATIONAL EFFICIENCY*
- *REDUCING TRAFFIC CONGESTION*
- *IMPROVING TRANSIT PERFORMANCE*
- *INCREASING FREIGHT MOBILITY*
- *SUPPORTING INCIDENT AND EMERGENCY MANAGEMENT*
- *ENHANCING ENVIRONMENTAL SUSTAINABILITY*
- *SUPPORTING COST-EFFECTIVE TRANSPORTATION INVESTMENT STRATEGIES*

A UNIQUE REGIONAL ASSET

The RIITS network is a unique operational and technology asset in meeting the complex transportation challenges of Los Angeles County over the next 10 years and beyond.

RIITS is the only tool in the region, and one of few in the United States, that provides real-time operational information into multimodal networks across jurisdictional boundaries.

Regional agencies recognize that proactive transportation system management and operations is an essential tool for meeting Southern California's mobility, sustainability, and emergency management challenges. Through the Strategic Initiatives identified in the 10-Year Strategic Plan, the RIITS Network will have enhanced functionality to assist MTA and Partner Agencies in carrying out important transportation operations, emergency management, and transportation planning functions.

The RIITS network, as envisioned in the Strategic Plan, is a regional resource that greatly enhances the data environment for transportation agencies in Los Angeles County.

Enhanced Transportation Data Environment

- **A Comprehensive, Timely, and Reliable Regional Data Source** – The RIITS network will continue to expand its role as a 'one-stop shop' for regional transportation data derived from all participating modes and agencies, supported by investments to grow the capacity, reliability, and reach of the underlying technology network.
- **A Complementary Relationship with Other ITS Investments** – As with the present system, the RIITS network will complement other regional Intelligent Transportation System networks and investments as part of a 'network of networks' that amplifies the benefits and investments of each individual system.
- **A Public Platform for Private Innovation** – RIITS serves as a regional portal for access to accurate, reliable public transportation data by private, third-party information service providers (ISPs). RIITS will continue to embrace public-private participation to support innovation in the evolving traveler information marketplace.
- **A Platform for Regional Data Management** – RIITS is currently being enhanced with the development of the baseline Archived Data Management System (ADMS) that will capture and organize the RIITS data streams and establish a framework for analyzing transportation data to meet regional performance monitoring and planning needs.

RIITS Vision Statement

> ***To deliver multimodal transportation information services through a flexible platform to achieve regional mobility, safety, and sustainability goals.***

The RIITS Vision, developed through a collaboration of diverse stakeholders internal and external to MTA, captures values and intrinsic characteristics of the RIITS network:

- **"Multimodal"** – RIITS serves the needs of diverse passenger and freight modes across the region, including transit, freeway operations, arterial operations, commercial vehicles, ports, airports, and non-motorized transportation.

- **"Information Services"** – By integrating and disseminating transportation data from varied sources, RIITS provides value-added Information Services that are responsive to the interests and needs of RIITS public agency partners.
- **"Flexible Platform"** – Agencies leverage the data wealth of the RIITS network through a variety of tools, services, and customized applications that tailor information delivery to a particular agency's needs, customers, and business objectives.
- **"Regional Mobility, Safety, and Sustainability Goals"** – RIITS is responsive to partner agencies' core business needs and customers, enabling innovative operations, management, measurement, and planning tools that advance critical regional goals.

Responding to the Challenges of the Region

In the development of the plan, a number of challenges were identified, many of which were cross-cutting in nature and required the coordination of multiple agencies, modes, and transportation facilities across jurisdictional boundaries (including region-wide approaches).

Analysis of these challenges revealed several common critical regional needs and suggested ways the RIITS network could address these needs in an integrated, deliberate, and cost-effective manner:

- **Transportation System Management and Operations (TSMO).** RIITS provides ITS tools and services to support region-wide, intermodal, real-time operations of the transportation network. Compared to the high cost of conventional infrastructure expansion, investment in RIITS represents a cost-effective alternative.

- **Performance Measurement.** By leveraging the historical data available through ADMS, RIITS can assist MTA and Partner Agencies in measuring the performance of the multimodal transportation system and the effectiveness of transportation investments and policies.

- **Freight Mobility.** Southern California ports are critical U.S. gateways to the global economy. RIITS provides transportation data and information to support freight mobility, and most notably reduction of costs associated with congestion delays.

- **Emergency Management.** Emergency management response is highly dependent on the performance of the transportation network. RIITS will bridge the emergency management and transportation management communities to provide emergency dispatchers and field personnel with unprecedented access to real-time transportation and event information through "situational awareness".

- **Transportation Sustainability and Climate Change.** RIITS plays a key role in identifying and reducing operational inefficiencies in the transportation system and improving the quality of alternative travel modes that will reduce the carbon footprint of the region. ADMS provides a wealth of transportation data to support emerging climatic transportation analysis and measurement of the efficacy of transportation sustainability measures

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RIITS 10-YEAR STRATEGIC INITIATIVES

The MTA RIITS team worked with Partner Agencies to develop a series of Strategic Initiatives for the next 10 years, reflecting critical regional transportation needs, agency objectives, and technology trends. Each Strategic Initiative takes advantage of RIITS' unique attributes and strengths; contributes toward regional mobility, safety, and sustainability goals; and provides demonstrable value to MTA and other agencies.

The RIITS Strategic Initiatives complement and leverage existing investments; enable other regional investments such as 511 Traveler Information and Congestion Pricing; and encourage partnerships with the private sector to deliver accurate information services to agencies and travelers in Southern California. The three strategic initiative groups as well as the "Foundational Elements" that underpin the overall RIITS program are described below.

FOUNDATIONAL ELEMENTS

Foundational Elements promote the strengths of the RIITS system by reinforcing its unique attributes; address specific cross-cutting weaknesses in the existing RIITS network, such as performance and reliability; and ensure broad-based understanding and support of the RIITS network. The Foundational Elements are divided into two categories:

Institutional Foundational Elements

- Sustainable Funding
- Countywide ITS Policy and Procedures
- Interagency Partnership Agreements
- Information Service Provider Service Agreements
- Configuration Management Committee
- Agency Technical Outreach and Training

Technological Foundational Elements

- Communication Redundancy Enhancements (e.g., Network Redundancy)
- Performance Enhancements (e.g., System Re-Architecture)
- RIITS System Interface Update and Standardization (National & Industry)
- Multimodal Corridor Performance Metrics
- Demonstration Project Development

INTEGRATION OF REGIONAL NETWORKS INITIATIVES

Regional Networks Integration Strategic Initiatives leverage the value of Participating Agency ITS investments and the connectivity of the RIITS network to support advanced ITS services, including congestion pricing and multimodal traveler information. This Group also supports private sector innovation in ITS application development by providing a single, regional portal for timely and accurate agency data. These initiatives:

- Leverage the RIITS interagency platform to provide connectivity among regional ITS systems and devices;
- Provide reliable, timely, and comprehensive data feeds to other ITS applications like 511 and Congestion Pricing; and
- Allow third-party and private sector Information Service Providers to build upon the power of RIITS to deliver innovative information services.

REGIONAL DATA MANAGEMENT INITIATIVES

Regional Data Management Strategic Initiatives support advanced planning and performance measurement functions by capturing regional, multimodal operations data that currently only passes through the RIITS network on a transient basis. To do so, these initiatives:

- Build on the foundation of the baseline ADMS that is providing a data storage and management capacity to RIITS;
- Consolidate and store regional transportation data derived from multiple source systems of participating agencies; and
- Present data in a format that is accessible and valuable to participating agencies for a variety of applications.

OPERATIONS SUPPORT INITIATIVES

Operations Support Strategic Initiatives address transportation and emergency management operational stakeholders' priority requests for more integrated real-time transportation system data accessible securely through the Web. These initiatives:

- Support transportation and emergency operations in the region through real-time exchange of operations data, video, and/or event information; and
- Develop enhanced 'Situational Awareness' capabilities, providing real-time information on regional, multi-modal regional transportation system performance for operations and emergency response.

IMPLEMENTING THE PLAN

To fulfill the potential of the RIITS network, MTA and partner agencies will invest in more robust and reliable network infrastructure while adding new features and functionality to address the most pressing regional needs.

Implementation of the RIITS 10-Year Strategic Plan builds upon the current system with new services, coverage, and partner agencies to deliver high-value services in the Near Term at relatively low cost. In the Medium- and Long-Term, more advanced capabilities will be added to RIITS, with each strategic initiative building upon the data, functionality, and institutional networks of preceding investments.

The sequence of Strategic Initiatives as presented below reflects the order of RIITS network investments and enhancements necessary to achieve stakeholders' express priorities and needs. Implementation of the Strategic Initiatives and the Foundational Elements occurs incrementally and in parallel over time, recognizing the interrelationship among network investments and functional enhancements in providing value to stakeholders.

The Integration of Regional Networks Strategic Initiatives enhances the core business of RIITS in connecting regional ITS systems to support enhanced multimodal technology applications. Because RIITS is a 'one stop shop' for regional transportation data, these Strategic Initiatives allow MTA and Partner Agencies to efficiently develop and operate ITS systems and services that leverage this powerful interagency data resource. The estimated subtotal cost to fully implement the Regional Networks Integration Strategic Initiatives is $4.09 million over ten years.

The Regional Data Management Strategic Initiatives are crucial to supporting the RIITS vision and MTA's objectives for mobility, safety, and sustainability. Several Strategic Initiatives in this area will build upon the ongoing ADMS efforts and substantially enhance RIITS functionality as a performance monitoring and reporting tool. The estimated subtotal cost to fully implement the Regional Data Management Strategic Initiatives is $7.06 million over ten years.

The Operations Support Strategic Initiatives garnered the highest level of stakeholder support during development of the Strategic Plan, and will further integrate RIITS into the core business functions of existing and future Partner Agencies. The estimated subtotal cost to fully implement the Operations Support Strategic Initiatives is $20.80 million over ten years.

Foundational Elements: As discussed above, ongoing investment in the institutional and technological foundations of the RIITS network is essential to the success of the Strategic Initiatives. To support strategic growth, the MTA RIITS team will expand and evolve its role in promoting regional awareness, collaboration, and investment for both existing and future Partner Agencies. The estimated subtotal cost to fully implement the Foundational Elements is $4.58 million over ten years.

CONCLUSIONS OF THE RIITS STRATEGIC PLAN

Investment in the RIITS network contributes to the MTA mandate of delivering effective, sustainable, and cost-effective mobility options to the region. The system supports core operations, planning, and information technology business functions to proactively manage, operate, and plan the multi-modal transportation network.

RIITS is an integral part of the regional technology infrastructure that supports transportation system management and operations management, which are increasingly vital tools for making the most of the region's fiscally and physically constrained transportation network.

RIITS creates the multimodal, interagency transportation data environment necessary to support transportation operations, including regional ITS applications such as 511 traveler information, congestion pricing, and advanced freight mobility and emergency management tools.

The RIITS ADMS will support regional planning, project development, and analysis of multimodal transportation system performance with a level of insight not previously possible.

MOVING THE RIITS VISION FORWARD

While RIITS is a regional system involving many Partner Agencies, attaining the RIITS strategic vision is predicated on sustainable funding and ownership from within MTA itself. Integration of RIITS into the organization requires active stakeholder participation, policy leadership, and integration into the day-to-day operations of MTA departments.

Building upon this sustainable foundation and constituency within MTA, the RIITS program will actively seek funding opportunities and collaborative efforts with Partner Agencies to fulfill the regional potential of the RIITS vision. These efforts leverage the substantial existing institutional and technological capital already invested in the RIITS program.

This fiscal and institutional commitment will be rewarded with new tools and services that support MTA and Partner Agency core business objectives, and speak to the most pressing transportation challenges of the region.

1. INTRODUCTION AND OBJECTIVES

The MTA RIITS effort is a unique undertaking that has largely been underestimated during the early stages of its development. While MTA and many of its partner agencies are "aware" of RIITS, the current and future potential of the system is still widely misunderstood. RIITS is unique in that it:

- Represents an interagency example of a modern implementation of information sharing technology.
- Brings together data from various transportation modes in a real-time environment.
- Provides a strong institutional foundation for managing the configuration and development of the system without placing undue limitations on the participation of current and potential future partners.

RIITS could be to the region what the modern Smartphone has become to many individuals. The modern Smartphone provides an integrated source of data (videos, weather, directions, traffic, and finances) in a mobile communications device. Just like a modern Smartphone, RIITS obtains data from numerous sources using published standards and integrates that data into a single point of access. RIITS then provides multiple ways to access this data based on the type of user and their needs. The trick is that the modern Smartphone has allowed for the viral-like development of consumer driven specialized applications using the data available from many sources. RIITS, largely an agency based information tool, cannot create a viral-like environment, but the potential development directions are no less varied than the Smartphone example. The development of RIITS must be more organized and account for the prioritized needs of the current and future partners of RIITS.

This document is focused on providing a concise Strategic Plan for RIITS over the next ten years (2010 to 2020).

Unique Attributes of the RIITS Network

- Makes Near Real-Time Transportation Data available for a variety of transportation and emergency management needs
- Provides a complete regional picture of conditions on the multimodal, inter-jurisdictional transportation network.
- Leverages the power of regional ITS systems to deliver enhanced user services.
- Supports existing and emerging transportation needs such as mobility, congestion relief, environmental sustainability, and goods movement.

1.1 Goals of the Strategic Plan

The potential strategic development paths for RIITS are so varied, that this Plan was largely developed to provide prioritized direction for the system over the next ten years. The goals of this Plan are:

- Create a vision for phased development of RIITS based on stakeholder needs, emerging technologies, and policy coordination.
- Enhance the effectiveness of RIITS as a tool for MTA and partner agencies.
- Provide an actionable plan that supports the design, implementation, and funding of RIITS.

1.2 Methodology and Plan Organization

The Plan started with broad-based outreach to numerous current and potential stakeholders in RIITS. These stakeholders represent the current and potential customer base for RIITS. The continued participation of current customers and expansion of this customer base is viewed as vital to a successful future for RIITS. The customers are both the providers and users of the data that is at the heart of RIITS. Finally, these customers are both internal to MTA (as in various departments) and external (as in partner agencies and private data customers). The input of these customers was central to information and actions identified in this Plan.

Figure 1.1 displays the basic methodology that was used to develop the RIITS Strategic Plan.

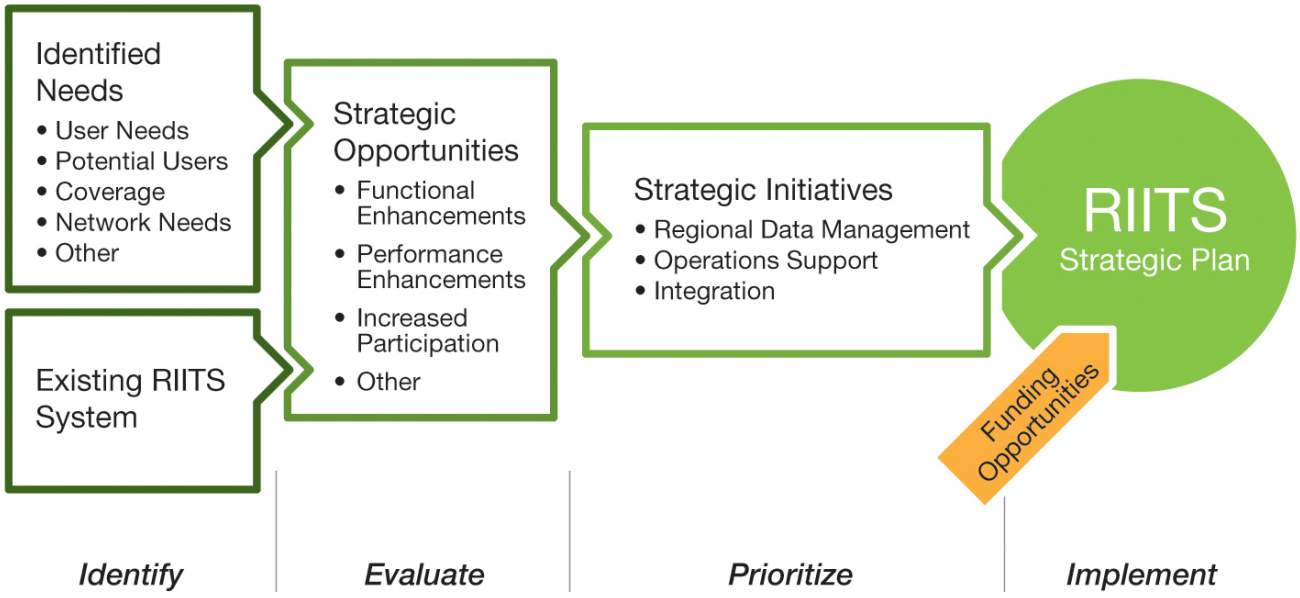

Figure 1.1 – RIITS Strategic Plan Development Process

This Plan includes the following sections (following the Introduction):

- 2.0 RIITS Current Conditions – Providing high-level background on RIITS as it currently exists.
- 3.0 RIITS Strategic Vision – Defining the guiding direction for the future of RIITS.
- 4.0 Targeted Strategic Initiatives – Outlining the strategic development paths that exist for RIITS organized into a series of candidate initiatives that were vetted with customers and then refined into a series of selected and prioritized strategic initiatives.
- 5.0 RIITS Program Supporting Measures – Providing a series of actions and steps that flush out each strategic initiative for programming and implementation purposes and provide an overall phasing with a rough order of magnitude budget.

- 6.0 RIITS Implementation Plan – Describing important organizational, funding, and policy items related to the development of RIITS.
- 7.0 Conclusions – Providing a succinct view of the overall Plan and priorities.

In addition, Appendices containing supporting documentation are provided with this Plan.

1.3 Involved Agencies and Stakeholders

The number of agencies and potential stakeholders that participated in the development of or provided input that guided the development of this Plan was impressive. Participants are listed in alphabetical order in **Table 1.1**.

Agencies Participating in the Development of the Strategic Plan	
Antelope Valley Transit Agency	Auto Club of Southern California
Beach Cities Transit	Caltrans (Districts 7, 8, 12)
California Highway Patrol	City of Burbank
City of Commerce	City of Downey
City of Glendale	City of La Mirada
City of Montebello	City of Palmdale
City of Santa Monica	City of Torrance
Culver City Bus	Federal Highway Administration
Foothill Transit	Gateway Cities Council of Governments (GCCOG)
International Warehouse Logistics Association	Long Beach Transit
Los Angeles County Public Works	Los Angeles County Sheriff's Department
Los Angeles Department of Transportation	Los Angeles Port Police
MTA (ATMS Engineering, Communications, ITS, Operations, Planning, Rapid, Security)	Norwalk Transit
Port of Los Angeles	Santa Clarita Transit
Southern California Association of Governments (SCAG)	Service Authority for Freeway Emergencies (SAFE)
Santa Monica Big Blue Bus	

Table 1.1: List of Participating Agencies

2. RIITS CURRENT CONDITIONS

RIITS is a data management system and network that gathers information from existing and future Los Angeles region intelligent transportation systems (ITS) for the purpose of providing a single point of access to regional multi-modal real time data. This data is useful for traffic congestion and incident management, as well as transit schedule adherence, and to future sustainability initiatives. As a regional transportation information and data sharing tool, RIITS is well established in terms of:

- Existing institutional structure for purposes of managing the RIITS network from a configuration and participation perspective.
- Established data input sources and output methods and agreements.
- Communications and system architecture required to support current and near term operations.

Just to provide a sense of the current scale of data and operations, the RIITS system currently obtains baseline data from:

- 1200 freeway vehicle detectors
- 100 freeway video surveillance systems
- 100 changeable message signs
- 3500 arterial traffic signals (LADOT)
- 2800 buses (MTA); 150 buses (LBT)
- MTA trains (Green and Red Lines)
- CHP incident reports
- CALTRANS freeway closures (next 24 hours)

This data can be accessed by RIITS users via four different types of distribution outlets. The four distribution outlets consist of public web pages (www.riits.net and www.metro.net), data feeds for local information service providers (ISP) and local agencies, and a map based graphical interface as illustrated in **Figure 2.1**.

Numerous maps and views are available to provide customers more focused views of available information.

Data latency between the time the data is collected from a source agency

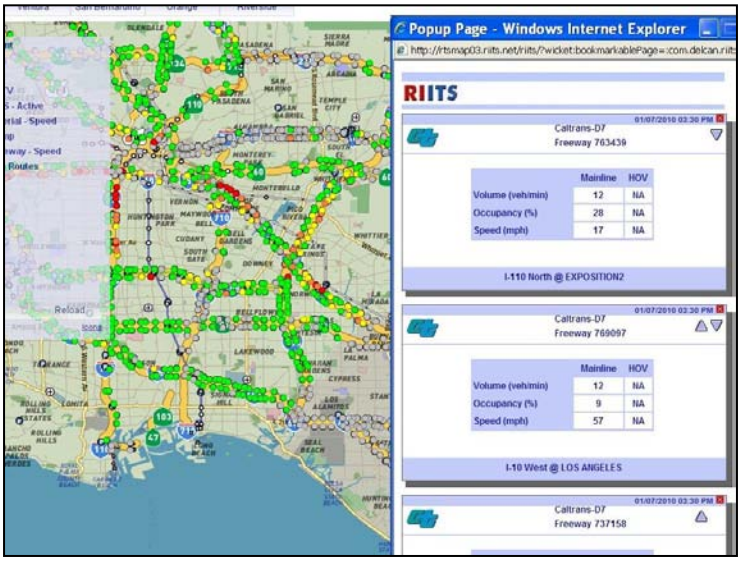

Figure 2.1 - Example of RIITS Web Based Display (www.riits.net)

to the time it is available on the RIITS system outputs generally varies from roughly 1 to 2 minutes. RIITS is dependent on source systems for information and is subject to the limitations of those source systems in terms of accuracy and timeliness of data.

2.1 RIITS Participating Agencies and Partners

Figure 2.2 displays the current RIITS network in terms of data sources and outputs. RIITS is currently the primary provider of LA County data to the Southern California 511 system. In addition to the founding agencies, Foothill Transit, LA County IEN, Caltrans District 12 (Orange County), and Caltrans District 8 (Inland Counties) will soon join the RIITS program and contribute via their systems.

RIITS currently offers a basic separator between secured agency data feeds which provide the full set of available RIITS information, and public feeds which provide a more limited set available for ISPs and general customers using the RIITS basic web based map views.

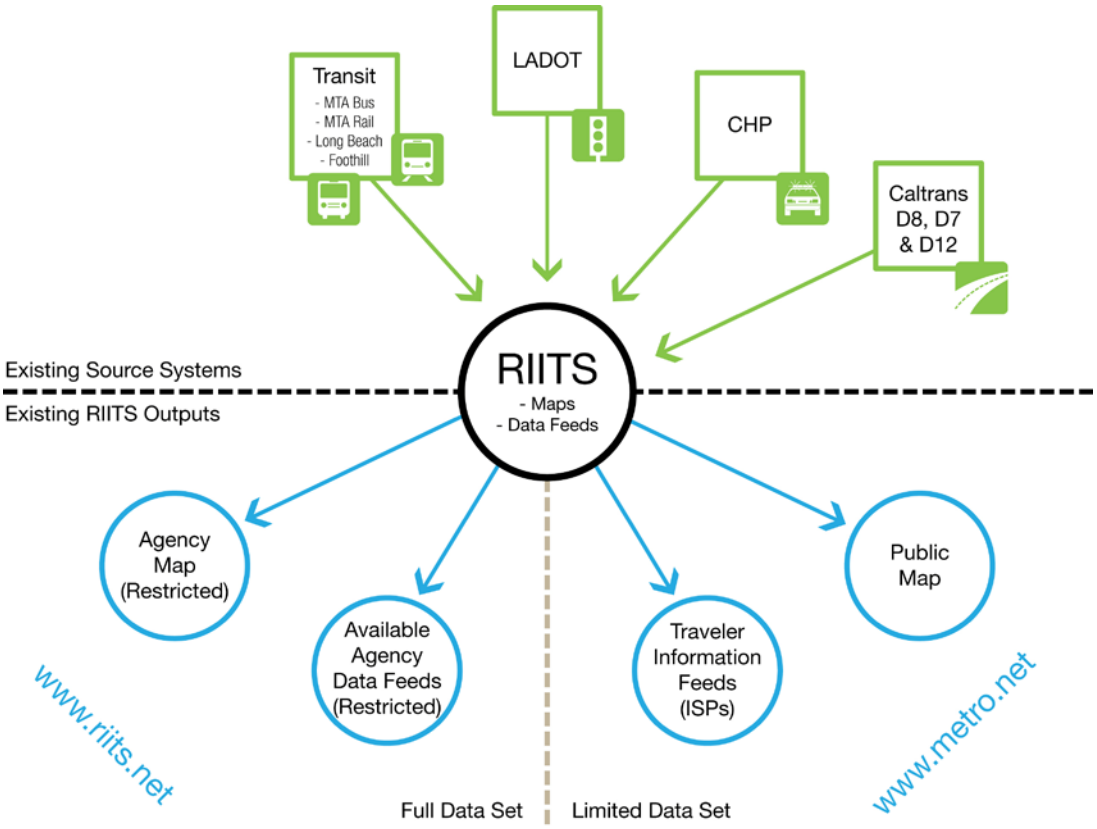

Figure 2.2 - Current RIITS Data Sources & Outputs

MTA has entered into an interagency agreement with the California Department of Transportation (Caltrans) and the City of Los Angeles Department of Transportation (LADOT) to provide interagency operational guidelines, responsibilities and procedures for inter-agency traffic operation and management for the purpose of sharing near-real time traffic information, congestion data, incident reports and operational resources. MTA is the primary sponsor of the RIITS project and administers the RIITS network. The RIITS system has been operational since November 2004 and the three founding agencies, as well as Long Beach Transit (LBT), are providing data to the RIITS system.

2.2 System Architecture and Interfaces

Figure 2.3 displays the current RIITS system architecture and key interfaces. The architecture centers around a series of RIITS interface servers (shown in green) which are the backbone of both RIITS data sources and outputs. This high-level architecture includes:

- Interfaces with a series of systems from agencies providing data to RIITS. These agencies are known as Level 1 agencies and the core sources current agencies include: LADOT, Caltrans District 7, and Long Beach Transit. These agencies can be viewed as the multimodal platform on which other agencies can be added.

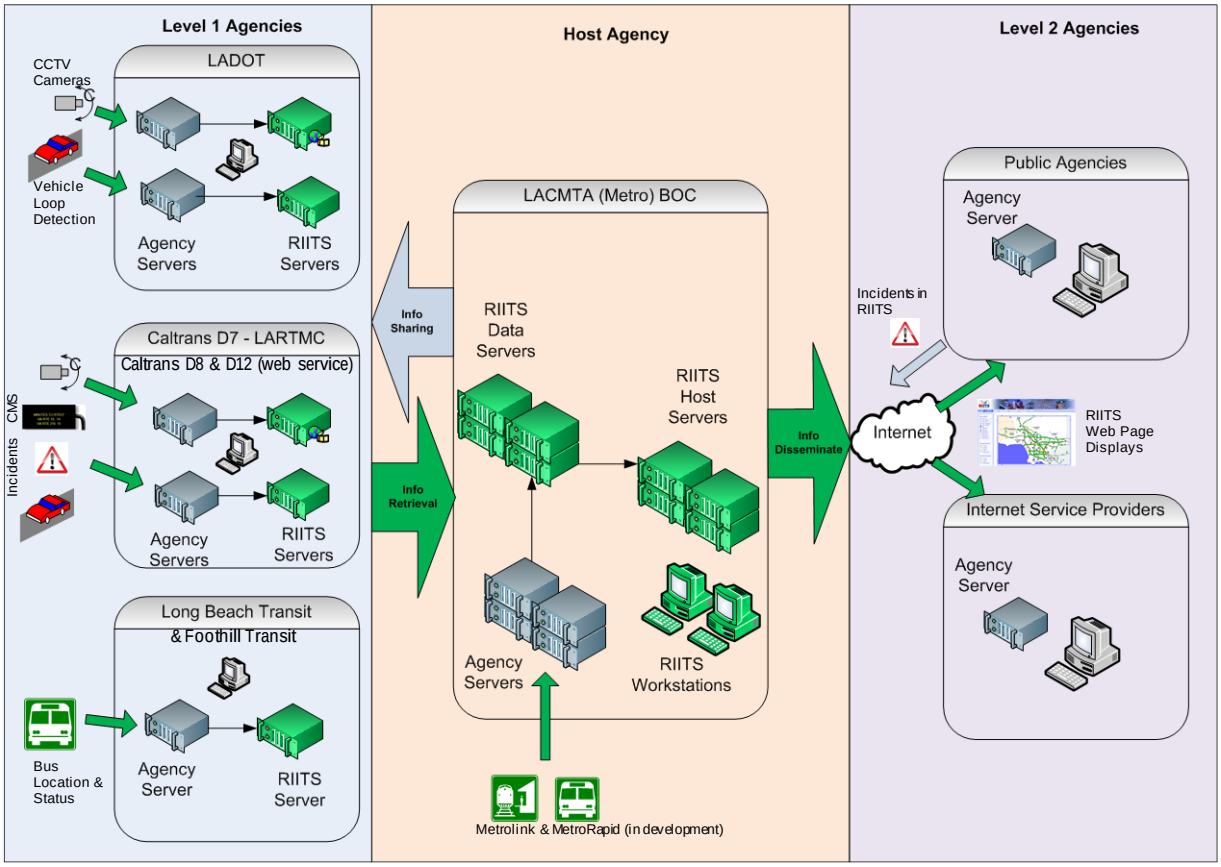

Figure 2.3 – High Level RIITS System Architecture and Key Interfaces

- In addition, the host agency (MTA) brings in data to RIITS from MTA Rail and MetroRapid (bus) systems internal within their agency. Physically, the heart of the RIITS system (those servers shown in green under MTA) is managed under contract with a private firm and is located off-site.
- Interfaces to Level 2 agencies include both restricted data feeds to public agencies, as well as publicly available information provided to Information Service Providers (ISPs) that make information available to the general public in a variety of ways.
- Underlying the interfaces and overall architecture is a communications network which links the servers shown in green and includes two fibers between the LA Regional TMC and LADOT with a secondary connection from LADOT to MTA. This fiber network has a capacity of somewhat less than 2GB per second, but current utilization is a relatively small percentage of that at approximately: 10Mbps for video streams, 14Mbps for snapshot streams, and 30 Mpbs for congestion, transit, and other information. RIITS is currently being placed on MTA's virtual private network (VPN) to provide enhanced speed and capacity for agency and private customers of RIITS outputs.
- Finally, the RIITS network is supported by a series of published standards for data formats and data feeds using widely adopted XML in cooperation with the adopted Institute of Transportation Engineers (ITE) Traffic Management Data Dictionary (TMDD) V2.1.

2.3 Administration and Program Management

The facet of the current RIITS program that is most crucial to its success to date, as well as its continued success, is an established and active institutional structure. This institutional structure provides an established Configuration Management Committee that:

- Includes all of the agency members involved in providing data to or receiving data from the RIITS network.
- Is guided by an adopted set of bylaws which protects each member's investment in RIITS and allows them to have a say in the membership and activities of the RIITS program.
- Meets every two months with a quorum of members present.
- Allows for review of system performance and new membership applications (including both agency and private customers).

The CM Committee Membership includes MTA, Caltrans District 7, and LADOT. Currently, Long Beach Transit and Foothill Transit are working towards becoming official CM members and have been attending meetings. Several other agencies have shown an interest for near-term involvement in the CM Committee.

Such an established, and to date effective, ITS institutional structure is relatively unique to RIITS and it provides a sound foundation for new

agencies to participate in RIITS without significant security concerns as they each have say in new membership. In addition, the structure builds in the ability to be flexible to adjust for future needs and address concerns as they arise in a cooperative fashion which ensures members have a say in RIITS.

2.4 Current RIITS Issues

While the RIITS network has been successful in providing baseline transit, traffic, and incident data to RIITS users, the following issues have been identified as existing in the current system:

- Current network speed/capacity is not enough to handle additional enhanced functionality such as filtered data feeds and database queries.
- The system does not store any data, so it is not possible to review transportation conditions over time.
- The system is largely reliant on MTA resources for core elements with support from key members for important interfaces, however commitments for sustained support from partner agencies are needed to ensure future system enhancement.
- Network security (while sufficient to current needs) needs to be upgraded in order to ensure the privacy of future data contributors.

3. RIITS STRATEGIC VISION

This section presents the 10-year strategic vision for the RIITS network. The vision has been developed as a result of:

- Extensive coordination with MTA departments and stakeholder agencies over the duration of the project, including existing and potential RIITS Partner Agencies;
- Identification of regional needs for which RIITS, by virtue of its broad institutional base and existing infrastructure, is well positioned to address as the preferred collaboration tool;
- Evaluation of the Strengths and Weaknesses of the RIITS Network as it currently exists; and
- An evaluation of emerging opportunities and challenges, internal and external to RIITS, which foreshadow the strategic issues to which RIITS must successfully adapt to over the next ten years.

3.1 RIITS Ten-Year Vision

RIITS VISION STATEMENT

> ***To deliver multimodal transportation information services through a flexible platform to achieve regional mobility, safety, and sustainability goals.***

The vision captures values and intrinsic characteristics of the RIITS network:

- **"Multimodal"** – RIITS serves the needs of diverse passenger and freight modes across the region, including transit, freeway operations, arterial operations, commercial vehicles, ports, airports, and non-motorized transportation.
- **"Information Services"** – By integrating and disseminating transportation data from varied sources, RIITS provides value-added Information Services that are responsive to the interests and needs of RIITS partners.
- **"Flexible Platform"** – Agencies leverage the data wealth of the RIITS network through a variety of tools, service, and customized applications that tailor information delivery to a particular agency's needs, customers, and business objectives.
- **"Regional Mobility, Safety, and Sustainability Goals"** – RIITS is responsive to partner agencies' core business needs and customers, enabling innovative operations, management, measurement, and planning tools that advance critical regional goals.

3.2 Strengths, Weaknesses, Opportunities, & Threats

The RIITS team performed a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis as a means of identifying the both existing and future issues that affect RIITS' ability to deliver unique value to the region.

This exercise allowed the RIITS team and participating stakeholders to identify issues both internal to the RIITS network (e.g., technological shortcomings of the RIITS network) as well as external factors (emerging needs and challenges facing the network). SWOT analysis was applied both to the overall RIITS program as well as to each Candidate Initiative (discussed later in this plan).

Table 3.1 presents a summary of RIITS SWOT analysis for the overall RIITS Program. The following pages present a synopsis of the program-level Strengths, Weaknesses, Opportunities, and Threats.

RIITS Program	**SUMMARY SWOT ANALYSIS**
Internal Issues	
STRENGTH	WEAKNESS
• Existing institutional and technology platform for exchanging regional transportation data.	• Lack of integration into the core business processes of internal and external customers.
External Issues	
OPPORTUNITY	THREAT
• Become the preferred provider for emerging and unmet regional information services.	• Emerging competition from public and private information services in meeting the needs of RIITS' customers.

Table 3.1: Summary of SWOT Analysis

RIITS Program - STRENGTH

Existing institutional and technology platform for exchanging regional transportation data.

RIITS represents a cooperative ITS integration project involving multiple modes, jurisdictions, and information service providers. This participation is solidified through written agreements and the ongoing participation of multiple MTA departments and other partners through the Configuration Management committee. RIITS is an identifiable brand with a record of past achievement and cooperation.

RIITS also features prominently in the regional ITS Architecture, the federally-required framework for interoperability among regional ITS systems. These assets will be important in positioning RIITS to deliver increased value to partner agencies as their needs and objectives evolve in the future.

Strategic Responses to STRENGTH

- Expand RIITS agency participation and geographic coverage to enhance the regional platform.
- Implement the vision set out in the Regional Intelligent Transportation Systems (ITS) Architecture which integrates RIITS with other ITS systems to deliver critical services to the region.
- Engage in multiple levels of marketing with existing and potential user groups, agency management, and policy makers to increase understanding of the capabilities and benefits of RIITS.
- Broaden the scope and participation in RIITS management committees commensurate with new services and user groups.
- Leverage the multimodal, intergovernmental partnership to increase competitiveness and eligibility for diversified sources of capital and operations funding.
- Evaluate opportunities for cost sharing of RIITS network enhancements or user services that are of demonstrable value to partner agencies.

RIITS Program - WEAKNESS

Lack of integration into the core business processes of internal and external customers.

RIITS is not integrated into the core business processes (e.g., day-to-day operations, performance monitoring, or planning) or technology systems of most participating agencies. Rather, it serves as an accessory that complements other more critical technology systems (e.g., operations agencies' in-house operations management systems).

In some instances, this is because of limitations in the existing RIITS system or network (e.g., timeliness of data or lack of historical data). In others, it is because RIITS has not clearly articulated its value-added proposition in relation to other mode-specific ITS systems in the region (e.g., the Advanced Transit Management System (ATMS) for MTA Bus Operations, or the Information Exchange Network (IEN) for arterial management).

Strategic Responses to WEAKNESS

- Use continuous feedback from existing and potential user groups to identify and resolve technical and functional shortcomings in the existing RIITS network.
- Identify opportunities to more seamlessly integrate with day-to-day tools and processes critical to partner agencies and MTA departments.

- Maintain a continuous dialogue with existing and potential partners to identify new information user services as partners' core business needs evolve.
- Incorporate functionality and standards that increase agency flexibility in accessing RIITS data according to their specific needs, including the ability to develop custom queries, system interfaces, or applications.
- Work with MTA departments and other partners to develop a Regional Concept for Transportation Operations (RCTO) and/or model standard operating procedures that articulate how agencies can integrate RIITS into day-to-day operations, planning, and management functions.
- Strengthen the RIITS model of regional integration by encouraging investment in system-to-system integration to deliver partners' core business services.
- Execute written agency relationships and commitments that support greater integration of systems and business practices, along with corresponding technical, maintenance, governance, and funding provisions.

RIITS Program - OPPORTUNTY

Become the preferred provider for emerging and unmet regional information services.

RIITS can provide data, services, and systems integration to realize emerging opportunities in the region. User groups whose operations transcend jurisdictional boundaries, such as goods movement, transit, and emergency services can benefit enormously from RIITS' unique ability to provide real-time "situational awareness" on the transportation network. Integrated Corridor Management (ICM), an emerging strategy to manage multiple facilities and modes simultaneously (e.g., freeways, arterials, and bus routes) requires a regional approach to operations which RIITS can facilitate.

USDOT's emphasis on performance measurement of the "total transportation system," requires synthesis of data from multiple modes and jurisdictions. RIITS could also provide empirical data for difficult-to-measure planning phenomena, such as ITS before-and-after studies, sustainability analysis, and traffic forecasting.

<u>Strategic Responses to OPPORTUNITY</u>

- Use continuous feedback from existing and potential user groups to identify and prioritize value-added services and enhancements.
- Increase the relevance of RIITS data and services within various MTA departments, including operating divisions and planning.

- Develop RIITS services tailored towards unmet regional needs and user groups such as freight, emergency management, and multimodal transit operations.
- Position RIITS as the premier regional tool for total transportation system performance measurement.
- Implement RIITS data archive functions that can support performance measurement, planning analysis, sustainability planning, and before-after studies.

RIITS Program - THREAT

Emerging competition from public and private information services in meeting the needs of RIITS' customers

There is a perception, and potentially a material threat, that RIITS will be supplanted by other regional ITS systems or emerging private-sector alternatives to the RIITS model of collaboration. Enhancement of in-house or mode-specific ITS applications by RIITS partners can dilute the value of participation in the regional RIITS system. Alternative platforms for new regional services such as incident/event reporting or video sharing could emerge from other regional or state agencies.

There are also strong indications that the private sector will play an increasingly prominent role in the delivery of traveler information to customers through mobile and in-vehicle devices. This in itself is not a direct threat to RIITS, because RIITS focuses on inter-agency information exchange rather than public traveler information. However, increased private sector participation in related activities such as traffic speed/flow data collection and dissemination (e.g., the current I-95 Corridor Coalition pilot project by Inrix) could provide alternative, non-public channels for pervasive regional transportation data.

Strategic Responses to THREAT

- Position RIITS to be the information provider of choice by incorporating features and functionality that is responsive to stated user needs.
- Focus on agency-to-agency data exchange in support of core operations, planning, and system integration objectives.
- Strengthen RIITS' complementary relationships as a backend for other key regional ITS systems such as 511 traveler information, congestion pricing, and field device integration.
- Position RIITS as a one-stop regional portal for third-party information service providers (ISPs) and third-party application developers, providing value as a single source for accurate, timely data from a multitude of public agencies.
- Leverage interagency relationships, goodwill from past successes, and written agreements to mitigate implementation risks that are outside of the RIITS program's immediate control.

3.3 Responsiveness to Critical Regional Needs

In the development of the plan, a number of themes emerged suggesting how the RIITS network could address the needs and concerns of the region in an integrated, deliberate, and cost-effective manner.

Many of these challenges are cross-cutting in their nature, for example requiring coordination of multiple agencies, multiple modes, multiple transportation facilities, and/or coordination across jurisdictional boundaries (including region-wide approaches).

Key regional opportunities of RIITS are described in **Table 3.2** below.

Critical Regional Need	RIITS Response to Need
Transportation System Management and Operations (TSMO)	RIITS will support freeway, arterial, transit, freight, and multimodal operating agencies as part of a cost-effective Transportation System Management and Operations (TSMO) response to the region's mobility, congestion, air quality, and sustainability objectives. RIITS provides ITS tools and services that supports region-wide, intermodal, real-time operations of the transportation network by a multitude of regional agencies in a coordinated fashion. Compared to the increasingly untenable costs and impacts of conventional infrastructure expansion, investment in RIITS and complementary ITS systems provides cost-effective options that can directly address many of the region's transportation needs.
Transportation Sustainability and Climate Change	Transportation is a major contributor to the problem, and the solution of, climate change and the global energy crisis. RIITS will play a key role in the transportation cultural shift that will support the more efficient and intelligent multimodal transportation network by identifying and reducing operational inefficiencies and increasing the efficiency and appeal of alternative travel modes that will reduce the carbon footprint of the region. As a planning resource, the wealth of transportation data contained within RIITS will support emerging climatic transportation analysis and measurement of the efficacy of regional sustainability measures, including measurement of the impact of ITS/operations projects funded through carbon offsets.
Performance Measurement	RIITS will assist MTA and other participating agencies in measuring the performance of the multimodal transportation system and the effectiveness of transportation investments and policies. RIITS will provide a platform to support anticipated future federal emphasis on a performance-based approach to transportation investment and could become a model for the nation. The RIITS data infrastructure will be of particular value in measuring the benefits of investments in ITS and other operational strategies that have conventionally been difficult to measure due to the nature of non-recurring congestion and the complexity and fragmentation of the transportation network.
Freight Mobility	Southern California Ports of L.A. and Long Beach are critical U.S. gateways to the global economy. Efficient freight mobility is essential to this flow of trade goods as well as the region's own manufacturing and distribution base. RIITS is a region-wide system that can provide unique services in support of freight mobility management, most notably reduction of costs associated with congestion delays. RIITS will partner with public and private entities in the freight management community to put information in the hands of dispatchers, port managers, and logistics experts to develop the next generation of freight mobility tools.

Critical Regional Need	RIITS Response to Need
Emergency Management	Emergency management agencies protect life and property against both routine and catastrophic incidents. Their ability to operate effectively on a region-wide level is highly dependent on the performance of the transportation network. RIITS will bridge the emergency management and transportation management communities to provide emergency dispatchers and field personnel with unprecedented access to real-time transportation and event information through "situational awareness." RIITS will improve the ability of emergency management to avoid areas of congestion, better respond to transportation incidents, and handle large-scale emergency response including earthquakes, wildfires, tsunamis, evacuations, security threats, and man-made emergencies.

Table 3.2: Critical Regional Needs and Responses

3.4 A Comprehensive, Timely, and Reliable Regional Data Source

The RIITS network will be a comprehensive, "one stop shop" for regional transportation data derived from all participating modes and agencies.

The RIITS network is a true 'economy of scale,' because its value is directly related to the degree of coverage and agency participation. Issues such as sustainability, freight movement, emergency management, and multimodal operations are strengthened with each additional operating agency and the additional geographic reach of the system.

For these reasons, the RIITS network must set a goal to provide comprehensive coverage of all transportation networks and modes across the entire geographic area.

The ability of RIITS to meet regional needs identified by stakeholders is highly dependent upon the ability to provide that data in an accurate and timely format, e.g. without latency that will diminish its 'real time' value.

Finally, the underlying technology architecture of RIITS must meet the demands of increasingly mission-critical ITS applications without unacceptable risks of system failure or unavailability. RIITS network investments must keep pace with the increasing scale of the system, the volume of data passing through the system, and the stringent reliability requirements of operations and emergency management agencies.

The need for increased RIITS system reliability is reflected in the proposed investment in network enhancements described in the Supporting Program Elements section of this plan.

3.5 Complementary Relationship to Regional ITS Systems

Just as with the present system, the RIITS network of the future will serve as a complement, not a competitor, to other regional Intelligent Transportation System networks and investments.

In fact, as a "network of networks," RIITS draws upon and magnifies the benefits of the constituent investments by individual partner agencies. The power of RIITS derives from the ability to link systems, amalgamate data, and redistribute that data to address needs and generate value that would otherwise not be possible.

Figure 3.1 illustrates the high-level relationship of RIITS to the other systems that both feed data into and use output data from RIITS. The existing sources that feed data into RIITS are LADOT, CHP, Caltrans Districts 7, 8, and 12, MTA Bus and Rail, Foothill Transit, and Long Beach Transit. Output data from RIITS is currently fed into the available agency data feeds and public traveler information feeds. Emerging sources that will eventually provide data to RIITS are other local cities (via IEN arterial data), Metrolink, and other transit agencies, including Foothill Transit. These new data feeds, along with the existing feeds, will be reflected on the output side with the emergence of new agency and public maps.

In addition to the new and existing operational elements, a new RIITS archive and data management feature is also emerging. An initial archive data set input will provide two years of historical Caltrans data to RIITS. Once this data is supplemented with current data from RIITS operational data feeds, data will be stored in a regional data archive and initial measures of effectiveness reports can be created.

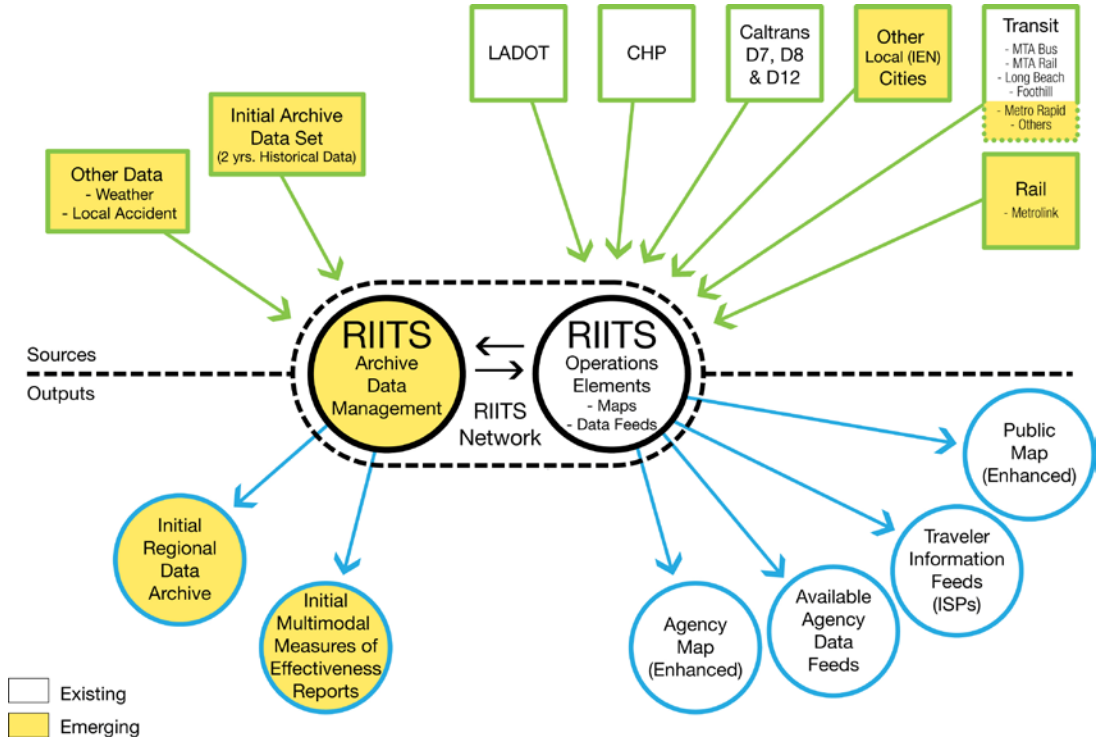

Figure 3.1: RIITS Emerging Sources and Outputs

An objective of the RIITS network of the future, as well as today, is to define clear and logical functional boundaries between RIITS and other regional systems such as the Information Exchange Network, 511 Traveler Information System, LA Congestion Pricing, and similar systems with regional reach and complementary functionality.

For example, RIITS will not 'compete' in the traveler information domain; rather it is a resource for systems like 511 to obtain accurate, timely, and comprehensive regional operations data from a variety of sources through a single interface backed by a supporting institutional structure to ensure that the RIITS backend continues to meet the needs of the 511 system's end users as technologies and objectives evolve over time.

3.6 A Public Platform for Private Innovation

One of the most successful functions of RIITS is serving as a regional portal for public transportation data for private, third-party information service providers (ISPs) as described in the current conditions discussion.

RIITS stakeholders recognize the increasing role of the private sector in delivering transportation data services and traveler information through mobile or in-vehicle devices in the future.

The RIITS network of the future will embrace this private participation and the innovation and energy of this emerging sector in developing the traveler information delivery pathways of the future.

RIITS can provide unique value to third-party information and data providers as a consolidated portal for accurate, timely, and comprehensive transportation data. Application developers, media outlets, and others can rely upon (and acknowledge) RIITS as a 'one stop shop' for data that is used to develop new and innovative services.

The public and public agencies can also benefit from dissemination of information through broad private channels using RIITS data. By making traveler information available through the public's information delivery methods of choice (e.g., cell phones, GPS devices, internet services, etc.), penetration and public acceptance of traveler information services will increase. More informed travelers, with access to reliable, public-origin data sources presented through innovative means, will result in improved transportation system management impacts as those informed travelers make better route and mode decisions, for example. This directly addresses one of the fundamental aims of ITS in improving mobility, reducing congestion, and improving emergency response capabilities.

Value provided to third-party ISPs and application developers may provide a basis for new financial relationships with private sector partners that capture the value of information provided by RIITS. Alternatively, a reciprocal exchange of private transportation data (e.g., probe flow data) could provide an equitable exchange of information that is mutually beneficial to all parties.

4. TARGETED STRATEGIC INITIATIVES

4.1 Strategic Initiatives

Based on information and ideas received through the outreach process, as well as internal discussion within the RIITS team, a set of eleven "Strategic Initiatives" was developed for discussion and review.

The Strategic Initiatives represent future programs or undertakings within the RIITS project to address identified regional transportation needs. The Strategic Initiatives are categorized into three groups by function as shown in **Table 4.1**.

Strategic Initiative Groups	Description
Group 1: Regional Data Management	**Group 1 Description:** Provides tools and services that consolidate and store regional transportation data derived from multiple source systems of participating agencies. Also presents this data in a format that is accessible and valuable to participating agencies for a variety of applications. **Response to Identified Needs and Opportunities**: Supports advanced planning and performance measurement function by capturing regional, multimodal operations data that currently only passes through the RIITS network on transient basis.
Group 2: Operations Support	**Group 2 Description:** Provides tools and services that support transportation and emergency operations in the region through real-time exchange of operations data, video, and/or event information through an integrated platform. Culminates with comprehensive 'Situational Awareness' that provides cross-jurisdictional, multi-modal, and real-time information about the regional transportation system. **Response to Identified Needs and Opportunities**: Responds to operational stakeholders' priority request for more integrated real-time transportation system data that is accessible to transportation and emergency management agencies through secure services delivered through the Web.
Group 3: Integration of Regional Networks	**Group 3 Description:** Leverages RIITS interagency platform to provide connectivity among regional ITS systems and devices. Provides reliable, timely, and comprehensive data feeds to other ITS applications as well as third-party information Service Providers and software application developers in both the public and private sectors. **Response to Identified Needs and Opportunities**: Leverages the value of Participating Agency ITS investments and the connectivity of the RIITS network to support advanced ITS services including congestion pricing, multimodal traveler information. This Group also supports private-sector innovation in ITS application development by providing a single, regional portal for timely and accurate agency data.

Table 4.1: Strategic Initiatives Grouping

4.2 Group 1 Strategic Initiatives: Regional Data Management

Group 1 Strategic Initiatives (**Table 4.2**) reflect the added value that the RIITS network can generate of the data that currently passes through the system were archived and analyzed to meet a range of planning and performance assessment functions.

The key to this Regional Data Management approach is development of the RIITS Archive Data Management (ADM) system which stores data collected currently from each source system, so that it can be analyzed to evaluate complex, multimodal, and operational phenomena.

The insight resulting from this analysis will provide MTA and Partner Agencies with a level of information and data to support infrastructure, operations, and planning decisions that has never been available in Los Angeles County at a regional scale.

Strategic Initiative Groups	Description
Group 1: Regional Data Management	
1.A. Regional Data Archive	Provide long-term storage of transportation operations data that is currently available in RIITS only on a transient basis. RIITS would serve as a regional data resource for participating agencies to support transportation system performance measurement and planning functions.
1.B. Filtered Data Feeds and Custom Queries	Allows customization/configuration of the RIITS interface in a manner that best suits the needs of a given agency. Functionality may include: the ability to receive filtered data streams/event alerts for selected items or geographic areas of interest; the ability to execute customized queries on RIITS data; and/or the ability to prepare customized queries for reporting, planning, or data exports.
1.C. Performance Measurement	Provide functionality so that data contained within the RIITS system can support "Total Transportation System" performance measurement, including analysis of multimodal corridors and benchmarking against regional mobility, safety, and environmental performance goals. This may be of particular use to integrated corridor management (ICM) and congestion pricing applications.
1.D. Travel Forecasting/Modeling	Provide predictive forecasts of future conditions minutes, hours, or days into the future. This functionality would rely upon advanced algorithms and a combination of current conditions, historical data, and other factors such as weather and events to predict future conditions. Future condition forecasts provide public agencies, the traveling public, commercial carriers, and emergency managers with better information to plan trips and avert foreseeable congestion problems.

Table 4.2: Group 1 Regional Data Management

4.3 Group 2 Strategic Initiatives: Operations Support

The Group 2 Strategic Initiatives address the most important user need expressed by transportation operations agencies during the stakeholder outreach process—real-time support for multimodal transportation system and emergency management functions. This Group leverages the RIITS network's interagency connectivity to deliver real-time information on regional transportation network conditions.

Group 2 culminates with a vision of enhanced transportation system "situational awareness" where Participating Agencies are presented with a robust user interface that delivers mapping, traffic flow data, video, and other key information directly to authorized users through the Web, regardless of whether those users are in central control centers or remote tactical field positions.

Strategic Initiative Groups	Description
Group 2: Operations Support	
2.A. Regional Event Reporting	Provide a regional platform for transportation system incident/event sharing among participating agencies, so that agencies can have greater awareness of incidents that impact their own operations (e.g., impact of a freeway incident on transit service or adjacent arterial streets).
2.B. Regional Video Sharing	Provide a regional platform for consolidating and distributing real-time transportation video for roadways, transit, and other transportation modes and facilities. The shared video provides a comprehensive surveillance tool to multiple agencies regardless of the source agency of a given video stream. The application will support operations and management, traveler information dissemination, transportation security, and interagency coordination for incident and emergency management.
2.C. Enhanced Situational Awareness	Combines event reporting, operations data, and/or regional video sharing to provide real-time information on multimodal transportation system conditions, i.e., "situational awareness," to transportation operations and emergency management agencies. Situational awareness capabilities may include traffic flow data, dynamic message sign status, transit vehicle location data, incident location information, and/or aerial imagery. This Enhanced Situational Awareness tool provides a unique perspective on regional operations and emergency management by integrating regional data sources into a robust, secure, and map-based user interface available to control center and field personnel.

Table 4.3: Group 2 Operations Support

4.4 Group 3 Strategic Initiatives: Integration of Regional Networks

Group 3 Strategic Initiatives (**Table 4.4.)** leverage the ability of RIITS to draw from multiple, and multimodal, regional ITS data sources to deliver added value and insight into operation of the total transportation system. These initiatives reflect specific ways that RIITS can promote connectivity and interoperability among ITS systems and networks of MTA and Partner Agencies to deliver this value.

Strategic Initiative Groups	Description
Group 3: Integration of Regional Networks	
3.A. Regional Portal for ISPs and Developers	RIITS is an important data source for third-party Information Service Providers (ISPs) and software application developers that are increasingly important sources of traveler information for the public. By leveraging the innovation and reach of such third-party services, RIITS can better provide timely, consistent traveler information data through diverse channels at relatively low cost.
3.B. Common ITS Field Device Broker	RIITS can serve as an intermediary to facilitate the exchange of data among regional ITS systems and field equipment, providing a central platform for system-to-system information exchange. For example, RIITS could provide a single source for real-time transit arrival information from multiple agencies to be displayed on a single electronic sign at a key transportation hub, or third-party alerts (airport, freight or parking information) on a freeway dynamic message sign.
3.C. Data Consolidator for Southern CA 511	RIITS can provide a 'one stop shop' for transportation system data to the 511 public traveler information system. In doing so, RIITS eliminates the need for the 511 systems to develop separate connections with each participating regional agency, simplifying the development and expansion of this large-scale regional ITS deployment.
3.D. Data Consolidator for Congestion Reduction Demonstration Project	RIITS can provide a 'one stop shop' for transportation system data required by the MTA freeway congestion pricing system, which calculates user tolls based upon prevailing traffic conditions in order to manage service quality for toll road users. In doing so, RIITS eliminates the need to develop separate connections with each participating regional agency.

Table 4.4: Group 3 Integration of Regional Networks

4.5 Evaluation of the Strategic Initiatives

The Strategic Initiatives were first presented as "Candidate Strategic Initiatives" for internal review. Having been derived from discussions and deliberations that took place during the outreach phase of the process, the Candidate Initiatives reflected the collective thinking of the RIITS team and other participating stakeholders.

Strengths, Weaknesses, Opportunities, and Threats (SWOT) Analysis

A Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis was performed for each of the Candidate Strategic Initiatives. This SWOT Analysis of Candidate Initiatives is presented as Appendix B.

The SWOT analysis enabled participating stakeholders to compare the benefits of the Candidate Strategic Initiatives in terms of their responsiveness to regional needs and the ability of the RIITS network to effectively implement the initiatives in a way that leverages the unique strengths of RIITS.

Each Candidate Initiative also presents potential challenges and risks of implementation. These include, but are not limited to: functional overlap with other ITS systems in the region; resources (personnel, time, and money) to effectively implement a given initiative; and risk factors that are outside the control or influence of the RIITS team.

4.6 Stakeholder Review of Candidate Strategic Initiatives

The Candidate Strategic Initiatives were presented to participating stakeholders for review, refinements, and comment. A workshop was conducted on September 17, 2009 to present the Candidate Strategic initiatives, address questions, and solicit feedback from the stakeholder group.

Stakeholders were also presented with a survey initiative that provided the opportunity to rank each Candidate Strategic Initiative in term of interest or relevance to a given agency or department (five gradients between “Low” and “High”). The survey also provided an opportunity to submit open-ended comments on each initiative.

A summary of survey responses is presented in **Table 4.8**.

Candidate RIITS Initiatives	Interest Level Ranking				
	Low	Med-Low	Med	Med-High	High
Filtered Data Feeds & Custom Queries			2	3	6
Travel Forecasting/Modeling:			3	3	5
Regional Data Archive		1	1	3	6
Performance Measurement		1	2	2	6
Regional Event Reporting				1	10
Enhanced Situational Awareness			1	3	7
Regional Video Sharing		2	1	3	5
Data Consolidator - So Cal 511		1	5	1	4
Common ITS Field Device Broker		2	2	4	3
Data Consolidator - LA Congestion Pricing	1		5	1	3
Regional Portal ISPs & Developers	2		6		3

Table 4.8: Summary of Survey Responses

4.7 Summary of Stakeholder Feedback on the Strategic Initiatives

The Candidate Strategic Initiatives were derived from input and feedback of the stakeholder community during the initial outreach process. As such they encapsulate the needs and desires of the greater RIITS network community.

The outreach process provided key insights into the Candidate Strategic Initiatives. Because RIITS is a "network of networks" whose value is derived from the commitment and sustained participation of a wide range of MTA departments and external participating agencies, it is essential that the selected Strategic Initiatives reflect a common understanding of priorities, benefits, and value to the RIITS consortium.

The following are key outcomes of the stakeholder review of the Candidate Strategic Initiatives.

RANKING OF STRATEGIC INITIATIVES

The group determined that each of the "Candidate" Strategic Initiatives was a worthwhile undertaking that should be advanced into the 10-Year Strategic Plan. However, input from the stakeholder group did result in prioritization of the initiatives.

A summary of the survey results received is presented in Table 4.8, along with a summary of key comments received for each Candidate Strategic Initiative.

- As shown in the survey feedback, Operations Support initiatives (Group 2) garnered the highest level of stakeholder support based upon responses received.

- A strong theme in the discussion of Regional Data Management (Group 1) is the need to tailor RIITS data access to the specific needs of participating users. For example, an agency with operational responsibility may prefer a 'push' of real-time data pertinent to a specific jurisdictional area; while an entity with planning responsibilities may desire the ability to run custom queries. A regional data archive system is seen as a prerequisite to support future enhancements in this area.
- Integration of Regional Networks (Group 3) was viewed favorably, but the application of these Strategic Initiatives was viewed as a more targeted endeavor affecting only a limited number of agencies or ITS systems at a given time. Performance of the RIITS network (e.g., reliability, latency) is a key prerequisite for this grouping as well.

OTHER KEY STAKEHOLDER FEEDBACK

- **Policy Considerations:** There are important policy issues that must be addressed in several areas to complement the investment in enhanced RIITS functionality. Performance measurement, regional event reporting formats, and technical standards are examples that were raised.
- **Insufficient RIITS Funding to Implement Initiatives:** Current RIITS funding levels will not be sufficient to support the level of investment in network enhancement, systems expansion, application development, or ongoing operations maintenance and support required to implement the Strategic Initiatives. The increased involvement of a broader set of participating agencies may raise additional opportunities for new funding sources or cost-sharing. It will be important to communicate the role that RIITS will play in addressing diverse, critical regional transportation and emergency management needs to advocate for funding of future system enhancements.
- **Freight and Emergency Management User Groups:** The freight and emergency management communities expressed strong support for investment in RIITS systems that support their need for reliable, real-time transportation and incident data delivered on a regional scale. Compared to some other agencies, with specific responsibilities for a geographic region, mode, or roadway classification, the freight and emergency management communities' operations are affected by region-wide phenomena that cross jurisdictional boundaries.
- **RIITS Administration and Coordination:** As functionality increases, the corresponding institutional management and oversight infrastructure of the RIITS Network needs to expand and adjust accordingly. For example, increased participation of new or expanded user groups, such as freight, emergency management, or planning, may require additional Configuration Management Committees focused on the needs and concerns of these sub-groupings.

4.8 Strategic Initiatives in the RIITS Implementation Plan

The Strategic Initiatives, vetted and refined by the RIITS team and stakeholder group, set out specific objectives for future investment in RIITS expansion, enhancement, and integration into the technological and operational backbone of Southern California.

Nonetheless, each of the Strategic Initiatives presents only a high-level summary of these future undertakings. Each represents a series of project investments as well as supporting policy and foundational initiatives to realize the end objectives set out by the Strategic Initiatives.

The remainder of this document presents specific implementation guidance to realize the Strategic Initiatives over the ten-year life of the plan.

5. RIITS PROGRAM SUPPORTING MEASURES

5.1 Foundational Elements of the Strategic Plan

RIITS is a powerful platform for a variety of tools and services to support the region's transportation and emergency management agencies. The value of RIITS derives from its ability to amalgamate disparate ITS systems and data flows to provide value in the face of diverse agency needs and business objectives.

Achieving the RIITS vision in this complex technical and institutional environment, however, requires a sustained commitment to a number "Foundational Elements" over the ten-year planning horizon.

The Foundational Elements complement the specific Strategic Initiatives by providing cross-cutting support that undergirds the entire RIITS program, as shown in **Figure 5.1**. The foundational Elements are intended to:

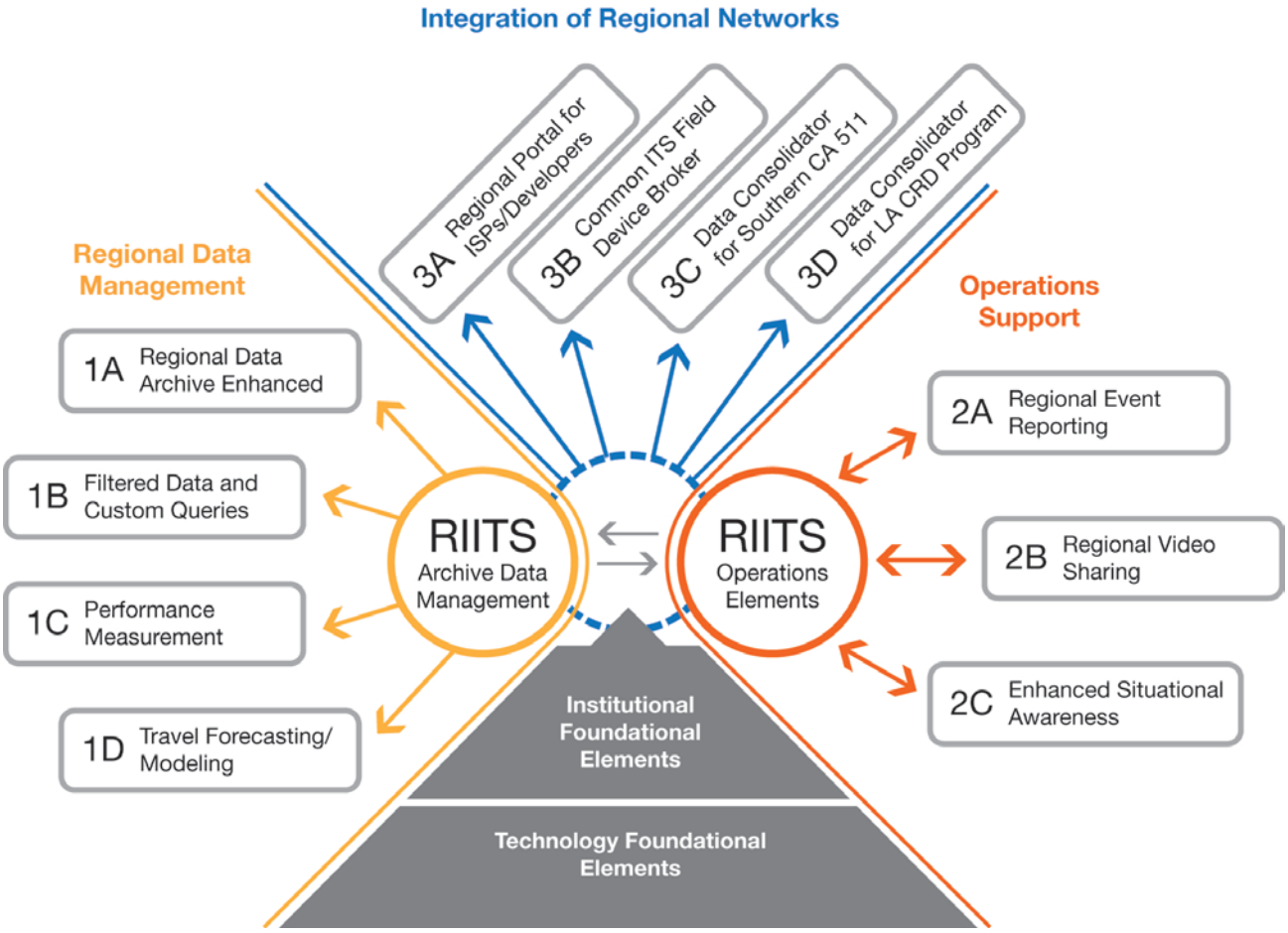

Figure 5.1: Foundational Elements Supporting RIITS Strategic Initiatives

- Promote the strengths of the RIITS system by reinforcing its unique attributes;
- Address specific cross-cutting weaknesses in the existing RIITS network, such as performance and reliability; and
- Ensure broad-based understanding and support of the RIITS network and the benefits in advancing its further development through implementation of the Strategic Initiatives.

The Foundational Elements are divided into two categories:

- **INSTITUTIONAL Foundational Elements:** These address the supporting institutional context for RIITS, including participation, awareness, policy support, and funding, which underlie the success of the RIITS network.
- **TECHNOLOGIAL Foundational Elements**: These are network, communications, and software investments that support the overall performance and reliability of the RIITS system necessary to address existing weaknesses and successfully implement the Strategic Initiatives that are important to RIITS existing and future partners.

5.2 Institutional Foundational Elements

Sustainable Funding to Support RIITS Strategic Investment and Operations

The RIITS Strategic Initiatives described in this program will require a sustained level of support for capital investment and ongoing operational support that exceeds the current RIITS program funding level of approximately $1.53M per year. Funding requirements beyond this $1.53M per year needed to implement the 10-Year Implementation Plan are described in Section 6. Current funding is largely derived from the MTA Long-Range Transportation Plan ($1.53M, escalated annually by the Consumer Price Index), with an additional contribution from LA SAFE to support a portion of operations and maintenance costs.

It is important to recognize that RIITS network costs include both capital costs of network and application development, as well as ongoing operations costs including IT network operations and maintenance and program administration. The RIITS funding strategy must acknowledge each of these components.

Potential funding strategies include:

- Internal Leveraging (funding sources within MTA)
- External Sources
- Cost Sharing with Partner Agencies
- New Strategic Partnerships

Additional funding discussion, including examples of specific programs, is provided in **Appendix E**. **Table 5.1** provides the basis, advantages, and disadvantages of specific funding sources.

Funding Source	Basis for RIITS Funding	Advantages	Disadvantages
Internal (MTA) Sources	RIITS is an MTA administered program that serves and will continue to serve the needs of a variety of MTA departments and systems including LA 511 and LA Express Lanes	Affirms and reinforces linkage between RIITS benefits and MTA core objectives (e.g., mobility, sustainability, multimodal operations)	Competition and alternative uses for funding Already the predominant source of RIITS funding
External Funding Sources	RIITS is a program of broad benefit and appeal that can be competitive for a wide variety of federal, state, and local funding sources	Many potential funding sources in a variety of areas – ITS, transit, experimental	Resource-intensive to identify and secure funding from the multitude of potential sources Grants may not provide long-term sustainability, and may not be eligible towards operations costs
Cost Sharing with Partner Agencies	RIITS partner agencies derive benefit from the data received from the system and host part of the RIITS network infrastructure	Reflects the win-win nature of RIITS participation and reflects the commitment of partner agencies Most partners are not participating in cost-sharing currently Potential for in-kind contributions	Cost sharing may be a disincentive for participation in the RIITS partnership
New Partnerships **Public Private Partnerships**	Engage new RIITS partners who can contribute to cost-sharing as part of a mutually-beneficial arrangement	Can be implemented in concert with Strategic Initiatives that involve new partners or services (e.g., emergency management)	May only be applicable to a limited number of new partners, services, and/or Strategic Initiatives May be perceived as inequitable of existing partners are not engaged in similar cost sharing
Cost Sharing with Third-Party Service Users (ISPs)	Provides a greater valuation of data and information services derived by third-party applicants from the use of RIITS data	Captures 'fair market value' of data provided to ISPs and developers, particularly for commercial applications	Costs may be a disincentive to participation in the RIITS network and be counter-productive to the overall objective of making accurate information available to a broad set of users There may be restrictions on charging fees for RIITS data derived from publically-fund RIITS infrastructure

Table 5.1: Advantages and Disadvantages of Funding Sources

RIITS Marketing and Outreach Program

The goal of the marketing and outreach program is to demonstrate the linkage between tools and services that RIITS provides and the core business concerns of RIITS customer agencies. It is important to extend awareness and support for RIITS beyond operations personnel involved with the system on a regular basis, both within MTA and other partner agencies, in order to attain the level of understanding and support necessary to implement the strategic plan.

The success of the RIITS program is predicated on the participation of numerous individual agencies each contributing to the overall network. To garner and maintain agency support, and to promote the awareness of RIITS capabilities and potential, a marketing and outreach program is a key foundational element for future RIITS success.

The marketing and outreach program is also a critical complement to the funding program, as financial support is predicated upon an understanding of RIITS benefits in relation to funding agency core businesses and funding program objectives.

The intended audience for the RIITS marketing and outreach program is multifaceted, and therefore the program itself should consist of multiple initiatives -- each tailored to a specific message and audience, but each contributing to the goal of promoting understanding and support for ongoing RIITS operation and investment.

Development of a detailed Marketing and Outreach Plan is recommended as a follow-up to this Strategic Plan to develop specific initiatives and actions for each component of the marketing plan referenced in **Table 5.2** below.

Intended Audience	Marketing and Outreach Objectives
Internal MTA Departments	• Awareness of RIITS and its capabilities • Relevance of RIITS to specific core business objectives of individual MTA departments • Ongoing assessment of RIITS functionality in light of evolving agency business needs • Identification of specific operating requirements or functional enhancements that would increase the relevance and/or effectiveness of RIITS in meeting specific needs • RIITS funding needs and specific opportunities to implement desired enhancements (e.g. joint grant applications, in-kind services)
MTA Policy Makers	• Awareness of RIITS and its capabilities • Contribution of RIITS towards meeting MTA goals and objectives • Policy implications of the RIITS Strategic Plan • RIITS funding requirements to implement strategic vision, and relationship to MTA funding programs and budgetary process

Intended Audience	Marketing and Outreach Objectives
Existing RIITS Partner Agencies	• Ongoing assessment of RIITS functionality in light of evolving agency business needs • Relevance of RIITS to specific core business objectives of individual MTA departments • Policy maker awareness of the contribution of RIITS towards meeting agency goals and objectives • Identification of specific operating requirements or functional enhancements that would increase the relevance and/or effectiveness of RIITS in meeting specific needs • RIITS funding needs and specific opportunities to implement desired enhancements (e.g., joint grant applications, in-kind services)
Potential RIITS Partner Agencies	• Awareness of RIITS and its capabilities • Relevance of RIITS to specific core business objectives of potential partner agencies • Identification of specific operating requirements or functional enhancements that would increase the relevance and/or effectiveness of RIITS in meeting specific needs • RIITS funding needs and specific opportunities to implement desired enhancements (e.g., joint grant applications, in-kind services)
Other Regional Stakeholders	• Awareness of RIITS and its capabilities • Contribution of RIITS towards regional transportation objectives • RIITS achievements • Future RIITS initiatives • RIITS funding needs

Table 5.2: Constituent Components of RIITS Marketing and Outreach Program

Configuration Management Committee and Expanded Administrative Structure

As discussed earlier in this document, the Configuration Management (CM) Committee is a key forum for RIITS participating agencies and partners. Currently, the CM consists of all agency members involved in providing to, or receiving data from, the RIITS network. It operates according to set bylaws, meets on a monthly basis, and allows for review of critical topics including system performance and new membership applications.

The Configuration Management Committee should continue to undertake this vital role. The institutional structure and relationships fostered by the CM and other avenues for agency participation are one of the core underlying strengths of the RIITS network.

As the system grows, however, both the number of participating agencies and partners as well as the range of technical and administrative issues will increase over time. For example, implementation of the RIITS Strategic Initiatives will include expansion in:

- The number of overall participating agencies;

- Increased numbers of participants for a particular mode (e.g., transit), possibly with specific needs relative to RIITS administration;
- Participation of new user groups, such as freight mobility or emergency management, with additional specific needs; and
- Increased technological complexity, including IT network infrastructure and number and type of interfaces with external agencies.

Representation of these agencies and topics of concern should continue to grow commensurate with the expansion of the RIITS network. This will require expansion of the Configuration Management committee and/or development of an extended administrative structure of sub-committees to meet the needs of the RIITS system of the future.

Future RIITS program administration could involve sub-committees organized around the central Configuration Committee which continues to address the highest-order administrative functions while also coordinating the activities of the sub-committees (see **Table 5.3**). RIITS bylaws should allow for the creation (and dissolution) of sub-committees commensurate with the perceived needs of RIITS participants.

Committee	RIITS Administrative Function
RIITS Configuration Management (CM) Committee	Responsible for core RIITS administrative functions including: • RIITS Membership/Participation • Partner Agencies Discussion Forum • Strategic Planning • System Operations/Performance Review • Capital Planning • Budgetary Review • Administrative Bylaws • RIITS Policy Issues and Recommendations • Approval of Technology Standards • Marketing and Outreach • Coordination with External Programs and Agencies
RIITS Sub-Committees	Responsible for in-depth treatment of topics such as: • Marketing and Outreach • Network Technology and Standards • Special Projects • Focus Groups for Specific Modes or User Types, such as: o Freeway Management o Arterial Management o Transit o Freight o Emergency Management o Planning

Committee	RIITS Administrative Function
Internal/External or Third-Party Committees	• Participation of RIITS administrative staff and/or partner agencies in other regional committees of interest to the RIITS program, e.g.: o Project committees o User Group Committees o Technology Committees

Table 5.3: Proposed RIITS Committee Roles and Responsibilities

A challenge for RIITS administrative personnel will be to maintain the effective institutional structure of the RIITS program while simultaneously expanding that structure to address the increased complexity of system administration in the future.

Conversely, it is important to ensure adequate participation opportunities for RIITS partners while also managing the time commitment required from a given agency for committee or sub-committee involvement.

A complementary option is through RIITS participation in other MTA or regional committees to facilitate certain functions or to extend the reach or particular programs (e.g., marketing/outreach). An example is the Arterial Management Committee in which RIITS staff and partner agencies already participate. In certain circumstances, this may improve the effective reach of RIITS staff while also minimizing staff time commitments of administrative and partner agency staff.

RIITS System Performance Metrics and Utilization

Ongoing measurement of the performance and effectiveness of the RIITS system itself is important to refining the implementation of strategic objectives, measuring their impact, and identifying RIITS tools and services that are of value to specific segments of the RIITS user community.

Performance metrics can take a variety of forms, and should be developed to measure specific objectives set out by the RIITS team and partner agencies in the course of implementing specific initiatives over the next 10 years.

From a strategic perspective, **Table 5.4** illustrates some prospective performance measures applicable to the RIITS system.

System Performance Measurement Category	Potential System Performance Metrics
RIITS System Utilization	• Website Traffic – Public Site • Website Traffic – Private Site • Utilization by Partner Agency • Utilization by Service or Feature • Registered Agency Users • Registered User Activity • Formalization of Agreements
RIITS IT Network Performance	• Network Reliability/Availability • Data Transfer Rates/Capacity • Number of External Network Interfaces • Interfaces Using Applicable RIITS Standards • Data Latency (by type, source, output, etc.) • Network Errors or Failures (critical, moderate, mild) • Response Time to Failures
RIITS User Feedback	• Public User Surveys (online) • Participating Agency Surveys • Partner Agency Feedback Form • Open-Ended User Comment Forms

Table 5.4: Candidate RIITS Performance Measures

Policy Considerations

A measure of RIITS success is the degree to which it becomes engrained in the core operations of MTA departments and other RIITS partners as an operational and planning support tool and/or as a real-time feed of high quality information to ISPs and mission-critical ITS systems.

Achieving this degree of integration as new tools and services are added through the Strategic Initiatives, and as additional partner agencies are added to the RIITS network, requires policy consistency and documentation both within the RIITS program and with external policy considerations.

Integration of the RIITS system, from a policy perspective, is demonstrated by successful assimilation of RIITS into core business practices of partner agencies and in conveyance of the value of the RIITS program to stakeholders beyond the core day-to-day user group.

The overall desired policy outcome is to position RIITS as a tool that helps MTA and partner agencies meet their own strategic visions by building upon the inherent strengths of the RIITS network to achieve regional mobility, safety, and sustainability goals. RIITS, like other transportation system management and operations tools and programs, is a powerful tool towards meeting these end goals. Policies both within RIITS and external to RIITS should reflect this potential.

A fundamental activity of the Configuration Management Committee and RIITS Administrative Staff will be to identify and implement policy revisions

or additions that are necessary to support the successful planning, funding, implementation, management, and operations of the enhanced RIITS network envisioned by this Strategic Plan (see **Table 5.5**). Marketing and outreach efforts in particular, are a critical precursor to set the foundation for improved policy development in the future.

Policy Area	Key Areas of Future Policy Development
EXTERNAL (outside of the RIITS program)	• Integration of RIITS into other MTA internal processes, including long-range planning, capital planning and budgeting, operations • Integration into similar core business concerns and processes of partner agencies • Acknowledgement of RIITS as a system management tool that can assist in achieving the strategic goals of the region and specific agencies • Formalization of the use of RIITS data for new functionality or user types (e.g., privacy concerns related to individual's data, handling of emergency management related data and video feeds) • Recognition of RIITS funding needs to achieved these strategic objectives in the RIITS program • Supporting agreements, policies, and procedures documenting the role of RIITS in regional traffic operations (e.g., Regional Concepts for Transportation Operations RCTOs) • Updates or amendments to the Regional ITS Architecture reflecting RIITS functionality and interfaces.
INTERNAL (within the RIITS program)	• Update of RIITS bylaws to reflect expanded participation and Configuration Management functions • Implementation of standards for data quality, latency, usage, etc. to support new applications. • Update of RIITS membership interagency agreement to reflect future services and user types • Implementation of updated technical standards and interface requirements • Network maintenance sharing/IT support agreements • Documentation of new/amended funding agreements, including any fee-for-data agreements with third-party Information Service Providers (ISPs) • Specific operational agreements for individual Strategic Initiatives, including data feeds or interfaces with other regional ITS systems

Table 5.5: External and Internal Key Areas of Future Policy Development

Specific policy needs of the Strategic Initiatives are addressed in the Implementation Plan, as well as the RIITS Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis in the **Appendix B**.

Organizational Options

As the functionality and participation of RIITS expands in the future, it is prudent to evaluate the institutional organization of the RIITS program within the MTA organizational structure.

RIITS is a cross-cutting program with unique characteristics that cross operational, planning, project management, information technology, and policy dimensions. This multi-faceted character makes RIITS difficult to categorize within existing organizational structures inside of MTA. In fact, the RIITS 10-Year Strategic Vision sets out that the system should provide tools and services to a broad base of users inside and outside of MTA.

At the same time, it is important that the overall RIITS program administration is structured in a way that effectively integrates a variety of processes within MTA, including real-time provision of transit services (bus and rail operations); regional transportation planning and performance measurement; capital planning and funding; policy development; and service delivery with and for a variety of external agencies with similarly diverse interests and responsibilities.

MTA is currently undergoing an organizational restructuring which hinders specific recommendations for institutional reorganization at this time. However, the following preliminary ideas should be taken into consideration in the evaluation of reorganizational strategies in the future.

- Preservation of a core, intact RIITS administrative team within MTA, with well-rounded capabilities to effectively implement the administrative, funding, technical, policy, marketing, and other core functions necessary to implement the Strategic Vision.
- Transfer of day-to-day IT support functions (e.g. network maintenance) to MTA's internal IT staff.
- Continued use of external contractors for RIITS system design and development functions for new user services, software development, or major network enhancements;
- Potential migration of the development, oversight, and maintenance of operations functionality to an operational department within MTA as real-time operations capabilities of RIITS increase.

5.3 Technology Foundational Elements

Technology Foundational Elements ensure that the RIITS network is capable of supporting the performance, reliability, and security needs of its users and applications as the scope of the system grows and the network supports increasingly critical real-time functionality.

Technological enhancements pertaining to a specific Strategic Initiative are detailed in the RIITS Implementation Plan in the action lists for those Strategic Initiatives.

Performance Reliability Enhancements (with Fiber Network Redundancy and Capacity)

Performance and reliability was voiced as a key concern among current and potential RIITS agency customers. The specific improvements required to enhance or maintain performance and reliability over time will largely be dependent on the extent of growth in RIITS functionality and active partner numbers. It is important to plan and program these concerns into the RIITS Strategic Plan in some fashion which serves as the foundation for future analysis as deployment efforts proceed. As a foundational element, performance and reliability enhancements have been roughly divided into three stages:

Stage 1 – Fiber Redundancy and System Transition

The backbone of the RIITS network currently consists of two fiber strands between LARTMC and LADOT and two fiber strands between LADOT and MTA (**Figure 5.2**).

A shortcoming of this network architecture is the presence of single points of failure within the network – in other words, there is not a redundant fiber path for RIITS data should one of these links fail. To address this shortcoming, a fiber connection between LARTMC and MTA is planned. In addition, IEN connectivity will soon be established through LA DOT as well. As shown in Figure 5.2, future additional redundant connectivity to IEN should be considered.

Fibers between LARTMC and MTA, when added, will complete a backbone fiber ring. The new segment will need four fiber strands each to implement the fiber ring topology.

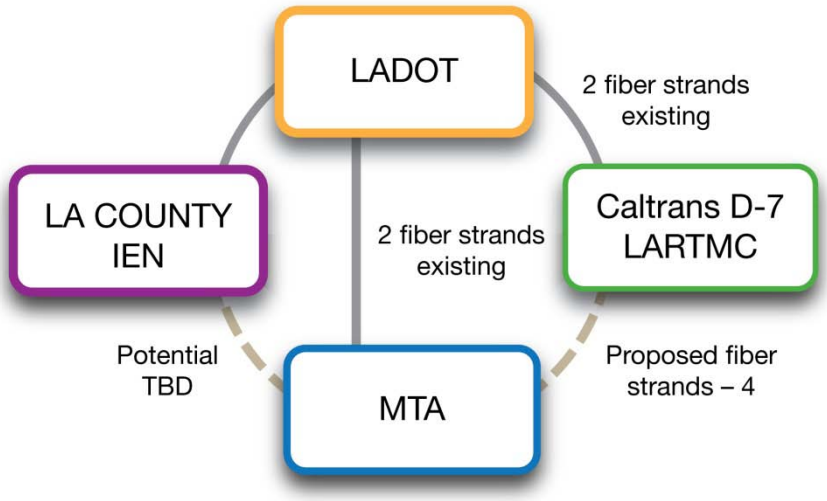

Figure 5.2. Existing and Proposed RIITS Fiber Network Backbone

Gigabit Ethernet switches are installed at all three nodes providing 1 Gbps bandwidth between each.

Of the current bandwidth available, the current utilization is:

- Approx 10 Mbps for video streams
- Approx 14 Mbps for snapshot streams
- Approx 30 Mbps for congestion, transit and CMS data

Out of the total available bandwidth of 1 Gbps, approx 50 Mbps is being utilized. RIITS staff has been in discussions with Caltrans about utilizing existing dark Caltrans fibers for this backbone. The only major expense of adding the communication link between LARTMC and MTA is the costs of additional end run fiber equipment, routers, and a short connecting run (trenching, conduit, etc.) to connect with existing MTA communications runs. The central RIITS networking equipment being used currently is sufficient to implement the additional fiber connection.

In addition to this fiber backbone improvement, possibly bringing some RIITS system operations and maintenance in-house is under consideration. This would likely require some space modifications or additional networking or server equipment.

In total the preliminary estimate for Stage 1 improvements is $1 million, and it is intended that programming for these funds would occur within the first few years of the Plan. Details for timelines are provided in Section 6.

Stages 2 & 3 – Future Performance Reliability Enhancements

Stage 2 would provide for network and central system enhancements including enhanced data backup systems and solutions, as well as improved IT management support functions. While this foundational component serves currently as a programmatic placeholder in the overall Ten-Year Plan, it is important to allow for improvements and/or replacement of existing equipment which will continue to be at the core of the overall RIITS network. This element is estimated at approximately $750,000 and would fall into the mid-term timeframe of the Plan.

Stage 3 is similar to Stage 2 except that it is estimated at $500,000 and would be undertaken near the end of the ten year timeframe. Costs are assumed to decrease over time as they would be driven by the larger RIITS actions and implementation efforts that would also enhance foundational functionality and reliability of the overall RIITS system.

RIITS Standards & System Re-architecture Update

In addition to performance and reliability enhancements, another foundational technical element for RIITS involves an overall update of data standards and the overall architecture for many of the current system to system interfaces. While these foundational elements would need to be coordinated with any on-going implementation of the actions described in

Section 6, they could be implemented separately. In addition, these efforts represent work on existing systems and interfaces and not just efforts to support the new systems or functions documented in this Plan.

TMDD Standards Update

To ensure the ability to support existing and emerging traffic operations, the RIITS Network should migrate from the Traffic Management Data Dictionary Version 2.1 (TMDD V2.1) to TMDD V3.0.

The Institute of Transportation Engineers (ITE) and the American Association of State Highway and Transportation Officials (AASHTO) are responsible for publishing the TMDD Standard for Traffic Management Center-to-Center Communications.

MTA's architecture is based on the TMDD V2.1. The advances of the TMDD V3.0 will prove useful to MTA and its partners. Ultimately, it will make sense for MTA to migrate its architecture to use TMDD V3.0 and create a more interoperable system. Given the lack of backwards compatibility, it will be crucial for MTA to follow the systems engineering process and migrate its architecture and connections with its partners using a logical plan.

The open publication of RIITS data standards to partners and potential users of RIITS data is a significant advantage to RIITS and the region. This effort should continue with new standards (data, XML, etc) being updated and published to the RIITS website.

System Re-Architecture & Update

The system to system interfaces of RIITS currently uses a mix of "push – pull" methods to obtain data or provide data to partner agency systems. The overall desire is to migrate to a more fully "push" based architecture where source systems would push data to RIITS and RIITS would be able to push data to other systems downstream. This should lower the overall implementation effort of adding additional partners and their source systems to the overall RIITS network. It will require additional work by RIITS staff to ensure that RIITS data and interface standards are well understood, and should also involve RIITS support in the development of interface middleware as necessary for source systems to push information to RIITS.

The planning for the system re-architecture, updated Concept of Operations, and a thorough system impacts review should be conducted in the near-future. Strong consideration should be given to synchronizing the updates of RIITS data standards along with the re-architecture effort.

Collectively, these efforts would be implemented in the midterm timeframe of the overall Plan, and are currently estimated to cost in the range of $1.6M over a period of a couple years.

6. RIITS IMPLEMENTATION PLAN

With the vision and strategic initiatives defined for RIITS, the remainder of the Strategic Plan is focused on the actions and steps required to carry forward the strategic initiatives in an orderly and logical fashion. This section of the Strategic Plan seeks to outline the actions and steps for each strategic initiative to provide the background necessary to plan for and program the implementation of the RIITS vision. In addition, timeline, rough order magnitude budget, and budget information is provided for each action to support programming and implementation efforts. Finally, this section provides a high-level 10-Year schedule for the strategic initiatives and actions that help to prioritize efforts.

6.1 Interrelationships and Overall Implementation Concept

All of the various strategic initiatives reviewed with RIITS stakeholders held value to one or more agencies or partners. This Strategic Plan is not resource constrained as it was clear that current resourcing levels in terms of funds and staffing would not be sufficient to support a logical phased implementation of the RIITS vision. However, it was clear from working with the stakeholders, who represent both the current and potential customer base for RIITS, that there was a relative level of effort to be applied to each grouping of strategic initiatives over time. This relative emphasis suits both the near-term and longer term RIITS customer needs, and it provides a general implementation phasing concept for the RIITS action plan.

Figure 6.1 displays a conceptual graph on the relative areas of emphasis for RIITS categorized by the strategic initiative groups. Overall this concept implies:

- Operations Support Services (Group 2) will continue to be the leading focus of RIITS development efforts over time.
- Regional Data Management Services (Group 1) will be an increasing area of emphasis, growing in conjunction with the operations support services and the Integration of Systems

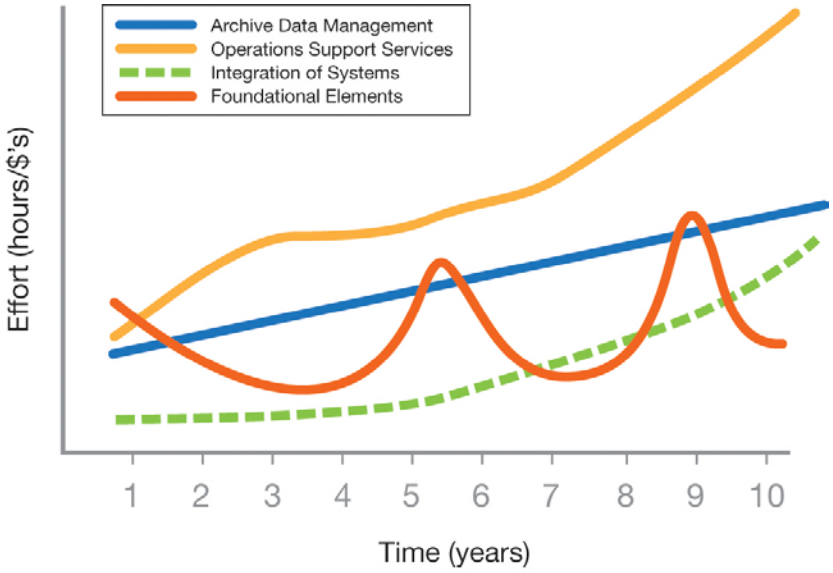

Figure 6.1 RIITS Areas of Deployment Emphasis

(Group 3) efforts. While it is anticipated that Operations Support Services will grow at an increasing rate and plateau somewhere beyond the 10-year plan horizon, Regional Data Management will grow somewhat slower and plateau sooner in terms of needed RIITS resources. This is because beyond a certain point, additional investments will not be needed in Regional Data Management and new RIITS partners will simply fit into one of the readily available categories of users for Regional Data Management. It is important to note that an important effort is already underway to implement the baseline Archive Data Management System (ADMS), and that additional actions listed in this Plan are intended to build on that effort over time.

- Integration of Systems (Group 3) will be an increasing baseline effort for RIITS, but as additional modes are covered the level of effort required should not grow as quickly as with Operations Support Services.
- Finally, foundational investments can be viewed as largely cyclical with major efforts being planned to precede major expansions in the strategic initiatives areas. Given the most recent updates and initial efforts for the ADMS project, it can be anticipated that initial foundational investments need to be made in communications and performance enhancement, but these early efforts should be fruitful for at least five years of growth in RIITS, even assuming new partners and functions likely within the next 1-4 years. Foundational elements are discussed in Section 5 of this Plan, but are included as appropriate in the deployment timeframes and discussions in this section.

Based on information received from RIITS stakeholders and staff throughout the development of this Plan, it was possible to also develop a rough RIITS program roadmap using the strategic initiatives and their associated actions. **Figure 6.2** displays a rough roadmap grouped by approximate programmatic priorities from left to right. Actions are divided into foundational elements, Group 1 Regional Data Management, Group 2 Operations Support Services, and Group 3 Integration of Regional Network Services. Overall, for the RIITS program to be successful each of these areas must move forward roughly in parallel as shown in Figure 6.1. Each area within the roadmap builds upon significant ongoing efforts including:

- Development of the baseline ADMS that will serve as the basis for all future Group 1 actions.
- Recent improvements to the RIITS map and updates to the RIITS website that will serve both to attract new customers and enhance functionality for existing customers.

- Ongoing integration efforts to bring new source data (including Metrolink and MetroRapid data) and system integration partners to RIITS.

Figure 6.2 RIITS Program Roadmap Overview

6.2 Strategic Initiatives Action Plan Descriptions

Each set of strategic initiatives and associated actions are described in the same order as Section 4 of this document without regards to phasing or priority which is discussed later in Section 6.3.

For each action a duration and timeline is included. The duration in months indicates the required time to complete an action assuming a more concentrated effort is applied. The timeline relates to the actions position in the overall ten year RIITS program which is discussed further in Section 6.3.

A rough order of magnitude budget estimate is also supplied for each action in Year 2010 dollars rounded to the nearest $1,000. These estimates are for preliminary planning and programming purposes only and should be refined as additional development efforts occur. Estimates roughly take into account:

- Labor efforts (either external or internal to MTA),
- Specialty labor or development resources,
- Hardware, software, and supporting network or other systems equipment, and
- 30% overall contingency.

Note

All budget estimates in this section are preliminary rough order of magnitude, and should be used for planning and programming purposes only.

Overall budget estimates are summarize in Section 6.3.

Group 1 – Regional Data Management Implementation Actions

Regional data management strategic initiatives represent a set of four initiatives centered on providing customers with enhanced data options from the RIITS network. These strategic initiatives include:

- 1A - Regional Data Archive Enhanced
- 1B - Filtered Data and Custom Queries
- 1C – Performance Measurement
- 1D – Travel Forecasting and Modeling

Each of these is described in greater detail in terms of actions and implementation steps on the following pages.

1A – Regional Data Archive Enhanced

Business Purpose: The development of user data management options was noted as an important priority to many RIITS stakeholders. Overall, it is viewed as crucial to RIITS support aspects of the vision that relate to mobility, air quality, and sustainability goals for the region. In addition, it

represents an expanded customer market for RIITS which is a logical extension of current functionality. Overall, the development of archived data and data management and reporting functionality is second only to the priority operations support improvements for RIITS.

Related Current Efforts: MTA is already in the process of undertaking the initial development of a baseline Archive Data Management System (ADMS), and this strategic initiative is a logical extension which would be necessary to keep in concert with the on-going development of RIITS on the operations functionality side.

Actions	Duration	Budget
1A.1 Update RIITS Institutional Structure: Concurrent with the baseline ADMS project, officially involve new MTA and partner agency representatives in the RIITS CM Committee to integrate the new user data service options into the institutional structure. This may eventually shift to a separate technical committee focused on regional data management services, but it is important that the cohesiveness of the RIITS institutional structure be maintained until regional data management services are more established.	3 months Timeline: Year 1 Qtr 1-2	$41,000
1A.2 Review Archive Data Management System Project Preliminary Outputs: An output of the baseline ADMS development effort is additional guidance and documentation on the various uses and areas of emphasis for the regional data management services. These technical results need to be reviewed in light of internal MTA and regional goals for sustainability and mobility, RIITS partner goals for data service uses resulting from outreach effort, success of outreach efforts in promoting data management service options, levels of anticipated funding at that time, new data sets becoming available to RIITS (e.g., pricing, events, other), etc. The objective of this review will be to refine the timelines and scale of the enhanced regional data archive deployment from those presented in this Plan.	4 months Timeline: Year 2 Qtr 1-2	$79,000
1A.3 Scope Enhanced Regional Data Archive: Once the review (1A.2) is complete, RIITS staff should scope the size, scale, and functionality of the regional data archive. This includes filling gaps in the initial data archive and providing sufficient capacity to support a five-year operations horizon. If it has not already occurred, it would be appropriate to scope the move of the regional data archive to internal MTA IT support at this point, and determine if continued outside development support would be appropriate.	5 months Timeline: Year 2 Qtr 3-4	$178,000
1A.4 Implement Enhanced Regional Data Archive: Following 1A.3, MTA should implement the enhanced regional data archive as an internal system deployment effort (at least for hardware and IT operations), combined with internal and external development efforts as needed. As the scale of the regional data archive grows, it is likely that MTA can gain economies of scale by bringing basic functions in house. In addition, if the regional data archive has been successful to this point, then some of the greatest demand for its use will be internal MTA planning, operations, and management functions.	23 months Timeline: Year 3 Qtr 3 to Year 5 Qtr2	$2,258,000

Key Customers: MTA planning and other internal departments focused on congestion relief and sustainability/mobility goals, councils of government, Southern California Association of Governments, universities, and agencies involved in integrated corridor management.

1B – Filtered Data and Custom Queries

Business Purpose: RIITS can provide a wealth of data through user data services to a wide range of customers, but the breadth of that data will make effective use of it more difficult. A clear customer need, indicated through outreach efforts with this Strategic Plan, was an enhanced ability to pick out relevant information by geographic area, mode, and/or corridor. In addition, the need to be able to query data relevant to individual customers was discussed.

Related Current Efforts: The baseline ADMS development effort will provide the framework needed for queries, but not the level of filtering or separation of data sets in advance into separate data tables. In addition, by the time this effort is underway, the number of modes and customers represented on RIITS would have expanded beyond the baseline ADMS investment.

Actions	Duration	Budget
1B.1 Prepare Assessment of Data Filtering Needs and Geographic Boundaries: Following at least test development of the baseline ADMS and in conjunction with the need for real-time operations data filters, assess the types and extent of data filtering required. At minimum, filtering is likely to include data source, geographic area, mode, agency, and time of day. Up front filtering of data should allow customers to setup in advance their desired data needs and quickly retrieve it, whether it is through separate database tables or other database functions allowing for more rapid queries. The final decisions on the geographic boundaries and filters should be based on CM Committee, internal MTA, and customer input.	5 months Timeline: Year 2 Qtr 1-2	$189,000
1B.2 Design Updated Database Structure: The development of custom queries and the enhanced approaches for filtering data will likely require supplemental database design. This could include new database tables, new data elements, new keys or views, etc. Database design would most likely be contracted out to a specialty firm with expertise in database design and development. As an input to this design, it is essential that MTA obtain and maintain detailed database structure information for the baseline ADMS deployment.	4 months Timeline: Year 3 Qtr 1-2	$340,000
1B.3 Enhance Database Query Functions/Tools: The initial ADMS will provide a baseline set of queries and reporting tools and functions. This will need to be enhanced early on to respond to the growing customer needs and the new and restructured data due to filtering. Queries can have a substantial impact on the performance of the system, and it will not be sufficient to simply query the broader database to generate the subset of data desired. In addition, in order to broaden the customer base for data management services, it will be important to respond to specific internal MTA and key partner needs by providing a set of readily available query tools.	11 months Timeline: Year 3 Qtr 1-4	$845,000
1B.4 Demonstrate Enhanced Data Filter and Query Functions: Following 1B.3, it will be important to create a demonstration effort of the enhanced data filtering and custom query functions. Likely candidates for this demonstration would include multi-modal corridors, integrated corridor operations, congestion reduction demonstration program, and/or sustainability and mobility managers. The demonstration could be conducted with internal MTA departments and then modified to support other regional partner needs.	4 months Timeline: Year 3 Qtr 4 to Year 4 Qtr 1	$111,000

Actions	Duration	Budget
1B.5 Review Common Queries with CM Committee and Assess Impacts to Performance and Mitigation: Once queries have been conducted over a period of time by RIITS customers, it will be important to review the type and extent of queries to consider dates/times, modes, corridors, areas, and other details of the queries. Such review can assist in two areas by maximizing the customer opportunities by sharing customer experiences, and by developing additional database and query tools to optimize system performance. In effect, development of custom queries and tools can be initialized through demonstrations, but must fit MTA goals and customer needs as identified through technical review and customer outreach.	2 months Timeline: Year 4 Qtr 3	$65,000

Key Customers: MTA planning and other internal departments focused on congestion relief and sustainability/mobility goals, councils of government, Southern California Association of Governments, universities, and agencies involved in integrated corridor management.

1C – Performance Measurement

Business Purpose: Multi-modal and interagency methods of performance monitoring are definitely an emerging need at the regional, State, and federal level. Regional goals for MTA and partner agencies throughout Southern California will demand methods of enhanced mobility performance monitoring and measurement. Examples range from methods of monitoring the impacts of the Congestion Reduction Demonstration program (CRD) to links with MTA's emphasis on enhanced sustainability and new legislation regarding carbon emissions. It is anticipated that the role of performance measurement will expand with the current federal administration. Critically, RIITS is well positioned as a common "one stop shop" for data from multiple modes and systems to support this growing customer need for performance measurement across modes and agencies.

Related Current Efforts: The baseline ADMS effort will provide initial performance reports as a proof of concept. However, it is not anticipated that this initial effort will meet even the near-term needs of what will be a rapidly growing market. If the initial efforts are successful, it can be anticipated that the demand for increasing performance measures and the associated reporting tools will be substantial. While the initial regional data archive needs to be in place in order to move forward with this strategic initiative, the expansion of performance monitoring and measurement does not necessarily need to follow the expansion of the regional data archive.

Actions	Duration	Budget
1C.1 Internal Outreach Effort on Performance Measurement: The initial ADMS effort will establish a baseline for the capabilities and concepts for performance measures and monitoring with RIITS, and this information can serve as a starting point for a broader effort with two goals: (1) broadening the understanding of the potential of RIITS as a performance monitoring and measurement tool using the initial developed reports as examples, and (2) linking emerging Federal and State requirements with regional goals and the necessary reporting elements for RIITS. It is important that RIITS become recognized as the source for regional multi-modal performance monitoring and	7 months Timeline: Year 1 Qtr 2-4	$134,000

Actions	Duration	Budget
measurement at the executive management level. The best approach is to use initial examples as leverage and hold early meetings with key management and program heads. This effort will include establishing summary marketing materials for RIITS performance measurement functions (linking regional goals and RIITS reporting functions), packaging a demonstration of RIITS performance monitoring functions, and using ADMS developed materials to outline a menu of RIITS performance measurement options.		
1C.2 Prioritization and Design of Performance Measurement and Tools: RIITS role in performance measurement is somewhat unique. It can be anticipated that RIITS will be best suited to performance monitoring and measurement that combines data from the various source systems, rather than replicating the individual detail reporting functions of these source systems. For example, RIITS is well positioned to support reporting requirements for the pending I-10 & I-110 Express Lanes, regional Integrated Corridor Management efforts, and near- or cross-county boundary assessments. Efforts may be particularly applicable to corridor level assessments comparing multiple modes in terms of travel times, speeds, and capacities in the same and/or parallel corridors. It is important to strike a balance between trying to provide sufficient reporting details and satisfying the needs of implementing a system that supports repeatable performance reports. This effort would involve contracting the design of additional performance monitoring and measurement tools using the ADMS efforts as a technical baseline. RIITS staff will need to assist in prioritizing the areas of performance measurement. It is easy to achieve detailed reporting that may be of technical use, but would largely be redundant to other systems and would not serve the needs of MTA and RIITS partner management. This would be divergent from the position of strength RIITS holds as the only current viable multi-system and multi-modal monitoring platform. Also, detailed monitoring may be viewed as an intrusion by some partners.	5 months Timeline: Year 2 Qtr 1-2	$203,000
1C.3 Development of New Performance Monitoring and Measurement Tools and Reports: Based on the design and prioritization of 1C.2 and the initial reporting platform developed for ADMS, additional performance monitoring tools and reports would be developed. This level of effort could vary widely, but it should incorporate emerging RIITS partners and new data elements as appropriate. At minimum, the tools should include both a proven reporting tool such as Crystal Reports, Brio, Cognos, or similar, and a reports dashboard for management should be developed that highlights RIITS performance monitoring capabilities related to performance monitoring at a corridor multi-modal level, as well as providing key information identified in 1C.1.	11 months Timeline: Year 3 Qtr 1-4	$839,000
1C.4 Network Modifications for Performance Monitoring Access: The RIITS network and internal MTA network will need to be adjusted to allow for access to RIITS performance reports at multiple levels throughout the MTA organization and by key partners. Access should be separate from operations functions, and should be put in place with appropriate security and permissions. For management dashboard reports, it would be appropriate to provide simple access for executive and department managers without the need for special passwords or training (e.g., click this icon on your desktop to get the latest RIITS performance dashboard report).	2 months Timeline: Year 3 Qtr 4	$418,000

Actions	Duration	Budget
1C.5 RIITS Performance Measurement Program Management: Separate from the IT and database management efforts associated with this grouping of strategic initiatives, performance measurement, monitoring, and reporting development will require continued oversight and management from staff to ensure: (a) accuracy of data; (b) availability of data; (c) management of users; (d) management and oversight for development of new reports and incorporation of performance measures over time.	108 months Timeline: Year 2 Qtr 1 to Year 10 Qtr 4	$421,000

Key Customers: MTA planning and other internal departments focused on congestion relief and sustainability/mobility goals, councils of government, Southern California Association of Governments, universities, and agencies involved in integrated corridor management. In addition high-level MTA executive management could become a critical customer who should have input to performance monitoring reports and focus areas. While universities were noted as potential customers, they are also playing key roles across the nation as partners in the development of performance measures. Such partners can assist in technical efforts, as well as supporting grant applications for research that can serve to expand or build upon initial efforts in this area.

1D – Travel Forecasting and Modeling

Business Purpose: Forecasting and modeling represents two potential emerging markets for RIITS archived data:

- MTA internally models future travel demands and mobility conditions for planning and analysis purposes. These models are likely to be improved over time due to increasing recent MTA emphasis on sustainability, mobility, and carbon footprint concerns. RIITS data provides an on-going single source of field data that can be stored and processed to provide inputs to this modeling process. Efforts in Europe have been underway to develop regional models that incorporate real-time data collected over time to improve longer-term predictive capabilities. It can be anticipated that this trend will emerge in greater strength in North American in the coming years and RIITS is well positioned for this future opportunity.

- Emerging efforts from traveler information providers are moving from simple real-time traffic conditions information, which RIITS already provides to many ISPs and 511, to enhanced near-term predictive and routing capabilities. This field is rapidly advancing in the private sector but there is a lack of single source or readily available data. Given the market area represented by the RIITS area and the emerging ADMS functions of RIITS, this area is likely to represent an increasing business opportunity over the next 3-5 years.

Related Current Efforts: There are currently no related efforts within the RIITS environment.

Actions	Duration	Budget
1D.1 Monitoring Emerging Trends: Review of this strategic initiative indicates that the opportunity has not fully matured. It is important to hold initial discussions with MTA modeling and planning staff to properly position RIITS as a resource for this area of effort. In addition, RIITS staff should review trends as they progress on the use of real-time or archived data in support of modeling and predictive routing for traveler information/navigation purposes. It is likely that research, grant, and other partnership opportunities will emerge over the next few years. Finally, RIITS staff should broach the subject of this strategic initiative with promising private partners.	53 months Timeline: Year 1 Qtr 1 to Year 5 Qtr 2	$203,000
1D.2 Partner with Private or University Interests: RIITS staff should monitor opportunities and perform preliminary outreach with current and potential contacts to assess opportunities for partnerships with private and/or university interests. As this effort was not rated highly by current RIITS customers, initial investments should be limited and the effort should only move forward if a fruitful partnership can be entered into with either grant or funding separate from on-going RIITS activities. Partnerships should require consent of the RIITS CM Committee and include consideration for RIITS resources and staffing. The opportunity exists with the appropriate partner-ship to move this strategic initiative forward with limited RIITS investment. A partnership agreement should be developed outlining responsibilities in terms of work efforts, timelines, and resource commitments, as well as the ultimate goal and a defined path for public communications.	12 months Timeline: Year 5 Qtr 2 to Year 6 Qtr 1	$154,000
1D.3 Modify RIITS Regional Data Archive and/or Filtered Data: Once a partnership is established it will likely involve supplements, modification, or adjustments to the RIITS regional data archive and filtered data/query functionality in order to support the data needs for forecasting. This effort will likely need to be contracted out to a database specialist, at least to provide the needed data to partners. Partners should retain responsibility for providing appropriate network connections to RIITS. It is crucial that these modifications be made with an eye towards minimizing impacts to the RIITS regional data archive functions. For example, on-going continuous queries of the primary regional data archive would likely result in substantial performance penalties that would impact other RIITS customers.	5 months Timeline: Year 6 Qtr 2-3	$585,000

Key Customers: The customer base for this strategic initiative will be limited to internal MTA modeling and planning staff (should MTA determine that this area of need is a priority) or more importantly it may apply to University or private traveler information partners.

Group 2 – Operations Support Services Implementation Actions

Operations support services are the highest priority grouping of strategic initiatives according to discussions with RIITS stakeholders. Currently, the majority of RIITS functionality could be classified as falling into this group, and it will continue to be a critical area of emphasis and priority. These strategic initiatives include:

- 2A – Regional Event Reporting
- 2B – Regional Video Sharing
- 2C – Enhanced Situation Awareness

Each of these is described in greater detail in terms of actions and implementation steps on the following pages.

2A – Regional Event Reporting

Business Purpose: RIITS is generally well established in being a source of transportation system conditions along freeways and a growing number of transit service routes, and it does supply information on freeway incidents from CHP and Caltrans D7. However, incident information from transit and local systems is generally lacking, and both planned and unplanned events have substantial impact on the performance of the transportation network. In discussions with current and potential RIITS customers, it was clear that enhanced event reporting was a key area of desired functional improvement that would enhance the effectiveness of RIITS for both agency and private users of RIITS data. Of particular emphasis was the commercial freight community that is seeking to enhance information to Ports and private commercial trucking operations. All customers emphasized the need for timely and accurate event information that was focused by area of need. As RIITS is not generally the source of event and incident information, this area will require substantial review to determine the best options for providing automated event information into RIITS that meets customer needs.

Related Current Efforts: RIITS does have some internal functionality that allows users to enter events or incidents, but it is significantly underutilized as RIITS customers (including potential future customers) were reluctant to enter data into their primary management systems and then re-enter it into RIITS for regional operations/information purposes. Currently, Caltrans confirmed events from the D7 ATMS are forwarded to RIITS, along with filtered CHP incident information. Both options are operationally limited.

Actions	Duration	Budget
2A.1 Update Concept of Operations, Event Definitions and Feeds: There are several potential areas of enhanced event information but unfortunately they vary in terms of source from agency to agency. It is suggested that an updated Concept of Operations be developed to incorporate near-term opportunities for enhanced event data feeds and functionality within RIITS. This effort should be conducted in coordination with 2C – Situation Awareness. While not determined, a comparatively easy starting point would be to work with emerging RIITS partners (Ports, transit agencies with CAD/AVL systems, Metrolink, etc.) to determine what events are tracked internally within their own management systems that could provide event data feeds to RIITS. For example, CAD/AVL systems generally incorporate the ability of transit operators to track events and assign codes that would include interruptions to transit service or blockages of arterials. Certain codes could be assigned to feed to RIITS. Either as part of an overall traffic management data dictionary (TMDD) standards update (or separately), update the current event definitions in RIITS to incorporate a wider range of emergency service, transit, and other customer needs. Location, extent, and duration are all critical pieces of information, but duration and end of event situations are particularly difficult to track. It is suggested that configurations be developed for RIITS to try and deal with variability in event data from different sources.	5 months Timeline: Year 1 Qtr 1-2	$213,000

Actions	Duration	Budget
2A.2 Update RIITS Design for Expanded Event Functionality: Once a new operational concept is defined and event definitions updated, the RIITS application/database design effort will be required for operational support elements of RIITS to incorporate the desired enhanced event functionality. Design should be based on the needs of current/emerging RIITS customers.	5 months Timeline: Year 1 Qtr 4 to Year 1 Qtr 1	$226,000
2A.3 Incorporate Automated Event Reporting from Current and Emerging RIITS Partners: This action is the implementation of the planning and design efforts from 2A.1 and 2A.2. As event data is already in place with current RIITS partners, it is suggested that the initial focus be on systems from which event data is not currently obtained. These would include integration efforts with the Port of Long Beach, MTA ATMS events, and possible integration with LADOT for planned events from public works system sources. It should be noted that enhanced event data will also be of interest as part of regional data management functions.	17 months Timeline: Year 2 Qtr 3 to Year 3 Qtr 4	$1,446,000
2A.4 Assess Reliability of Event Data and Determine Appropriate Feeds to ISPs and 511: While RIITS currently identifies the sources of event information, it does not assign or assess reliability. RIITS has limited control over the event data sources, but it could assign reliability ratings that take into consideration source, date/time, duration, surrounding traffic speeds, etc. Also, it may be possible to incorporate automated event detection in the future as these functions improve. RIITS staff should review the initial enhanced event data over a six-month period and consider data consistency and comparison with other sources. This could be used as a baseline for determining which data would be appropriate to provide through ISP and 511 feeds, and also how to assign additional reliability information to events for customer use.	5 months Timeline: Year 4 Qtr 1-2	$231,000
2A.5 RIITS Operational Support Oversight: The incorporation of enhanced regional event reporting will place additional operational responsibility on RIITS, particularly as agency and private customers come to rely on this information. RIITS will need to monitor and receive feedback from event source systems, and review event data on an on-going basis to assess reliability and accuracy.	102 months Timeline: Year 2 Qtr 3 to Year 10 Qtr 4	$1,453,000

Key Customers: All transit operators, emergency services, and traveler information providers in the RIITS service and surrounding areas. Local cities have indicated that they may be able to make use of such information if it is filtered to focus on their area of interest. The focus would be on transportation related or impacting events, and law enforcement or emergency service activities not impacting transportation or mobility would be excluded to avoid potential security concerns.

2B – Regional Video Sharing

Business Purpose: Given increasing awareness of homeland security and emergency response concerns, there is a growing need to maximize the

use of existing video surveillance resources. This includes transportation (traffic/transit) surveillance resources used to monitor events and mobility conditions. This strategic initiative was a high priority for several of the emergency services stakeholders who believed the availability of such information would be a substantial benefit to their operations. The purpose would be to expand the platform and video sharing functionality of RIITS to support an expanding customer base and to address the need to segregate video feeds into "secured or limited view" and "public view" feeds.

Special Note: Regional video sharing would require a substantial effort in RIITS staff and budget resources and could represent a substantial shift in terms of program focus. It is recommended that this effort only be undertaken if substantial grant or outside sources of funding can be obtained.

Related Current Efforts: RIITS currently provides up to 100 Caltrans camera feeds which display freeway conditions. While the system is capable of displaying more, current feeds are limited to those being monitored by Caltrans staff and the LARTMC. In addition, an initial test has been conducted to allow RIITS users with proper security permissions to view a subset of transit station cameras; however this functionality is largely separate from the current RIITS maps and information displays.

Actions	Duration	Budget
2B.1 Expand Existing RIITS Video Capabilities: RIITS is currently in the process of updating the RIITS conditions map. The current map does not provide indications of the status of video feeds, as it does with traffic sensor data. In addition, current limitations mean that only a handful of cameras are available as live video feeds. As part of near-term upgrades or as part of bringing on near-term new RIITS partners, the ability to display video feeds should be upgraded to enhance current performance levels, and to provide for additional information on camera types (transit station, freeway, arterial, etc.)	8 months Timeline: Year 3 Qtr 1-3	$1,003,000
2B.2 Prepare Video Sharing Platform Concept of Operations and Design: Currently RIITS video is only available directly on the RIITS network or through workstations running the RIITS map web application. In order to broaden the appeal of the RIITS video sharing capabilities, it is important to provide an enhanced video sharing capability. This capability should provide for distribution of RIITS video feeds in a format compatible for commercial cellular data network providers. This platform may need to convert some video feeds to lower bandwidth or more widely accepted commercial standards. The goal of the platform is not to provide for the actual mobile viewing devices, but instead to enable a wide range of video viewing options that provide at least two levels of security for mobile applications.	5 months Timeline: Year 3 Qtr 3-4	$575,000

Actions	Duration	Budget
2B.3 Prepare Video Sharing Agreement and Security Levels Template: As follow-up to 2B.2, RIITS staff should prepare an updated video sharing agreement that defines security levels and access, as well as partner responsibilities and RIITS video sharing and operations guidelines. It is important to establish trust between higher level security customers, including partner transportation operators, law enforcement, and emergency services. In addition, it is recommended that the video platform not specifically incorporate video recording capabilities to avoid institutional issues. It should be noted that most transportation surveillance video is taken within public rights of way well within the view of the traveling public, so sometimes security access concerns are overblown. Only non-secured video feeds should be made available through RIITS to ISPs and 511.	2 months Timeline: Year 4 Qtr 1	$169,000
2B.4 Implement Initial Video Sharing Platform with Demonstration with at Least Two RIITS Partners: The core video sharing platform will be deployed as part of RIITS, but it will be important to demonstrate the functionality and benefits of the system with a minimum of two RIITS partner agencies. This effort would need to be contracted out to a vendor specializing in video integration platforms. Video sharing functions are of keen interest to emergency services, so it may be appropriate to involve existing video sources and emerging transit video in conjunction with MTA transit security and partner law enforcement agencies. The demonstration should display the secure connection to RIITS video over commercially available data networks via a mobile laptop and handheld device, as well as over the RIITS workstation access. This effort can also serve to improve the RIITS video viewing functions over what is currently provided.	12 months Timeline: Year 4 Qtr 3 to Year 5 Qtr 2	$2,318,000
2B.5 Expand Video Sharing Platform: The demonstration effort would only serve as a proof of concept and as leverage for the RIITS marketing team to promote the broader benefits of the capability to current and emerging RIITS partners. While RIITS would retain responsibility for maintenance of the platform, RIITS partners would be responsible for their communications paths to the RIITS network for mobile access. This would be a substantial undertaking, but it has significant potential to expand the RIITS customer base and raise the overall level of interest in RIITS.	26 months Timeline: Year 6, Qtr 1 to Year 8, Qtr 1	$4,306,000

Key Customers: All RIITS agency partners, particularly transit security, transit operators, emergency services and law enforcement.

2C – Enhanced Situational Awareness

Business Purpose: The heart of the RIITS operations support functionality is in providing situational awareness to RIITS partners. This awareness is generated through two paths: (1) the integration of partner agency systems with RIITS; (2) the display of RIITS conditions information on the RIITS map and conditions tables. It was clear during the development of the Strategic Plan that the situational awareness functionality of RIITS needs to be enhanced to better meet the needs of current and emerging customers. The situation awareness tools of RIITS are currently substantially underutilized due to a combination of data overload, display performance, and lack of ability to filter data to focus on individual customer needs. As this is a primary focus of RIITS customer use, and enhancement is essential to the long-term success of RIITS, it is a key priority area for implementation.

Related Current Efforts: Some current enhancements are underway with the RIITS map which should improve the look and feel, as well as the performance of the map. The efforts should make the map more "Google-like" in terms of the customer experience. These efforts should be completed within the next six months. In addition, as new partners are added to RIITS, the usefulness of the situational awareness will proportionally increase.

Actions	Duration	Budget
2C.1 Define Enhanced Situation Awareness Functions: Given the RIITS map enhancements currently underway and the expanded participation in RIITS since the start of this Strategic Plan, it will be important to reach consensus with the RIITS CM Committee on the specific situation awareness functionality enhancements. At a minimum, outreach efforts through this Strategic Plan would indicate that enhancements should be made in the following areas: • Ability of customers to "subscribe" or otherwise indicate their data preferences (not just by mode, but by agency, geographic area, data type, etc.) for either data feeds to their systems or for their RIITS map views. • Geographic area filters for real-time data feeds and map displays, • Enhanced view settings and additional emergency service boundaries definitions in the maps, • Real-time event alerts by geographic area, • Enhanced displays of inactive field elements, • Enhanced video display functionality from the RIITS map, • Enhanced event data displays, • RIITS information ticker display, and • Other similar enhancements in conjunction with the other strategic initiatives described in this Strategic Plan. Situational awareness needs to provide some indication of the security access level of the device, data feed, and the associated user.	5 months Timeline: Year 2 Qtr 3-4	$267,000
2C.2 Design Enhanced RIITS Data Feeds and Map Display Filters and Security Levels: The redesign of the RIITS operations applications to support the enhanced levels of data filtering and security will be a substantial undertaking that should be contracted out for development with an experienced developer. It could require a substantial redesign of the RIITS database architecture and security schema. These design efforts should be conducted in a coordinated fashion with a parallel ADMS or regional data management efforts for RIITS. This effort also represents the opportunity to alter the basic data and systems interface architecture for RIITS from predominately a "grab" to a "push" approach that would reduce the loads on RIITS and should enhance performance.	12 months Timeline: Year 2 Qtr 2 to Year 3 Qtr 1	$772,000
2C.3 Design Real-Time Event and RIITS Alerts Feed: In addition to the more substantial design effort under 2C.2, there was substantial RIITS current and potential customer interest in being able to receive highlighted and filtered feeds and alerts through RIITS which would bring the operators attention to key items of interest. Within the ability to select data types and geographic areas, these alerts should allow customers to make selection of what information they receive, similar to a website RSS feed. In addition,	8 months Timeline: Year 2 Qtr 1-3	$494,000

Actions	Duration	Budget
the ability to provide RIITS systemwide status alerts and warnings of pending system maintenance and downtime would be useful. Alerts should be maintained for some period for time for review by users once they have passed across the real-time information display.		
2C.4 Establish RIITS Access Minimum Workstation Requirements: In discussions with RIITS staff and technical support consultants, it was noted that a major limiting factor for RIITS performance is the Internet connection and workstation hardware capabilities of some users. Given this is a major customer concern and that these enhanced situational awareness functions could increase the data loads significantly, it will be important to establish minimum system/workstation/network requirements for different levels of RIITS users. These should be developed by RIITS staff and provided to RIITS partners and customers for their use. These requirements can also serve as a guide for discussion with potential RIITS partners.	1.5 months Timeline: Year 2 Qtr 4	$39,000
2C.5 Implement Appropriate RIITS Maps and System Enhancements: Consistent with design efforts of 2C.2 and 2C.3, implement the appropriate RIITS system enhancements for RIITS maps, applications, and system interfaces. The testing should include both functional and performance requirements which should be developed in cooperation with the RIITS CM Committee. The cut-over of customers from the old to the new system should be staged and transitioned to limit downtime. Implementation planning will be critical as the effort may impact every RIITS customer.	17 months Timeline: Year 4 Qtr 1 to Year 5 Qtr 2	$4,011,000
2C.6 Conduct Training and Configuration Support for RIITS Partners: This situational awareness enhancement will be substantial change to the RIITS network, and should be supported by new training manuals and documentation for RIITS users. This should include hands-on training for RIITS customers which are using the system in an operational environment (such as a communications center, TMC, or dispatch center).	5 months Timeline: Year 5 Qtr 1-2	$689,000
2C.7 RIITS Operational Support Oversight: Similar to 2A.5, this effort needs to be supported by on-going operational support and oversight by RIITS dedicated staff to ensure consistent and reliable operations and performance.	84 months Timeline: Year 5 Qtr 3 to Year 10 Qtr 4	$2,587,000

Key Customers: This strategic initiative would provide substantial enhancements to RIITS operational functionality and would be of importance to all users. However, key customers would include transit operators, emergency services, Ports, local cities, and commercial freight operators through ISPs, 511, and associated data feeds.

Group 3 – Integration of Regional Networks Implementation Actions

Integration of regional network services is a strategic initiative that has been in existence since the beginning of the RIITS network. RIITS is fully

dependent on expansion of the number of customers both supplying and drawing on RIITS as an information resource; therefore, continuation of this group of initiatives is crucial. Strategic initiatives in this area include:

- 3A – Regional Portal for ISPs/Developers
- 3B – Common ITS Field Device Broker
- 3C – Data Consolidator for Southern California 511
- 3D – Data Consolidator for LA Congestion Reduction Demonstration (CRD) Program

Each of these is described in greater detail in terms of actions and implementation steps on the following pages.

3A – Regional Portal for ISPs/Developers

Business Purpose: RIITS has an existing customer base of information service providers and unique system developers which are crucial to its existence. In addition, Caltrans District 7 views RIITS as the preferred source of their data thus preventing their need to interface and deal with multiple customers for freeway data. It should be noted, it is not the intent of RIITS to be a traveler information end source provider. As an example, there was discussion from some potential commercial freight stakeholders about providing information to truckers in their cabs in a non-invasive fashion. RIITS would not be the provider of in-vehicle devices or designers of how this information is best displayed to commercial freight operators. RIITS will play the continued role of a single point of data availability. This role will become more important as the number of systems providing data to RIITS expands over time. The business purpose of this strategic initiative is to strengthen the role of RIITS as a single point of data to other information systems by ensuring that the RIITS regional portal maintains high levels of performance and functionality, and that new partners can view RIITS as a simple way to ensure the safe dissemination of their public/traveler information.

Related Current Efforts: As noted, there are numerous ISP and developer data feeds from RIITS. As the types, amounts, and filtering capabilities of the RIITS data increase over time, it will be important to keep the regional portal for ISPs and developers open and consistent, as well as providing access to the enhanced RIITS functions (security access permitting).

Actions	Duration	Budget
3A.1 Update RIITS Portal and ISP Feeds Concept of Operations and Published Standards: Following some of the design efforts noted in Group 1 and 2, it will be necessary to update the concept of operations and published standards for the ISP and developer feeds. Some of the new functionality would not be available through the portal (such as secured video feeds and event data) and other features may be unimportant to the portal customers (such as the ability to filter by geographic area). It will be necessary to outreach with portal users to determine impacts and approaches, and make them aware of changing data definitions and standards. Finally, there has been substantial commercial interest in all forms of traveler information, and it is important to enhance RIITS presence as a trusted source for a broad and ever increasing agency data set.	7 months Timeline: Year 4 Qtr 2-4	$97,000

Actions	Duration	Budget
3A.2 Incorporation of New Data Feeds, Elements, and Filtering Capabilities: Consistent with the design efforts underway with other strategic initiatives and with 3A.1, the portal will need to be adjusted to address the new data feeds, data elements, and filtering capabilities. Feeds should be tested to ensure that no secured data or video enters the portal.	2 months Timeline: Year 5 Qtr 1	$581,000
3A.3 RIITS Portal Support Oversight: As the commercial interests increase in the regional portal, the need for high performance will continue to increase. It will be important that RIITS staff monitors performance and reliability of the data feeds through the portal. Feeds from source systems that drop off need to be followed up to determine status and time for correction, not to mention the cause of the data drop.	66 months Timeline: Year 2 Qtr 1 to Year 10 Qtr 4	$776,000

Key Customers: ISPs, researchers, and data developers.

3B – Common ITS Field Device Broker

Business Purpose: The purpose is to use RIITS as a common data feed of multiple agency sources of data to single field devices. The business purpose is most likely entirely internal to MTA and partner transit operators. The most useful example would be using next bus information from different transit operators to drive a single display at a transit center served by multiple operators. This would be preferred rather than showing customers different displays on different devices or limiting information to the transit operator that owned the particular transit center.

Related Current Efforts: MTA is currently reviewing opportunities to provide enhanced customer information at bus stops. Currently, there are data lags from MTA's ATMS due to radio communications limitations that are outside of RIITS control. There are efforts underway to improve the situation that could substantially increase the opportunity to use RIITS for these types of purposes.

Actions	Duration	Budget
3B.1 Continue to Assess Common Field Device Opportunities: RIITS staff should continue to communicate internally with MTA staff responsible for transit customer information, as well as ATMS staff, to determine existing opportunities and what timing would be appropriate.	24 months Timeline: Year 2 Qtr 1 to Year 4 Qtr 4	$106,000
3B.2 Review Transit Information Field Device Demonstration: Should ATMS improvements decrease the latency of real-time bus position information, or should other partner transit operators show an interest in this opportunity, RIITS staff should determine what would be an appropriate location to test this application of RIITS. Likely locations would be those where new transit customer electronic information signs were being deployed. The architecture and standards for this sign should be reviewed and a determination made on the benefits of using RIITS in this way.	2 months Timeline: Year 5 Qtr 1	$100,000

Actions	Duration	Budget
3B.3 Design Transit Information Demonstration and Account for Common Field Device Standards: The design would largely be centered on communications concerns and data sets expected by the sign. In addition, RIITS would have to account for any modifications to the data set and commands necessary to combine appropriate next bus and transit data from two or more transit management systems and match the standards of the single electronic sign.	3 months Timeline: Year 5 Qtr 2	$165,000
3B.4 Implement Initial Transit Field Device Demonstration: Most likely in conjunction with the electronic sign or transit information deployment, RIITS would implement and test the field device and messaging control. The performance of the sign should be monitored over an extended period and compared with data available directly from the appropriate transit management systems. It will be important to separate the performance of RIITS from the predictive algorithms present in the transit management systems, as RIITS will largely be a communications go-between for multiple agencies.	5 months Timeline: Year 5 Qtr 3-4	$529,000

Key Customers: Transit operators

3C – Data Consolidator for Southern California 511

Business Purpose: LA 511 is the primary consolidated provider of regional traffic and transit conditions information. It is a primary customer of RIITS information, and the key objective is to provide 511 with a consolidated data source with high levels of performance with the least possible data latency. RIITS is not and will not be positioned to compete against 511. It would be desirable to increase the role of RIITS in providing information to 511 to simplify the myriad of institutional relationships that would otherwise be required between the desired data source providers with 511 for traveler information purposes. In addition, it is likely that regional 511 systems throughout Southern California (particularly San Diego), could make effective use of some RIITS feeds to provide traveler information to travelers to/from San Diego and Los Angeles.

Related Current Efforts: RIITS already provides some data feeds to 511 consistent with the feeds provided through the regional portal. However, there are some gaps in the data provided versus what 511 desires. In addition, there have been latency issues (due to source system configuration) with the data received by RIITS from Caltrans D8 and D12 which mean that RIITS has not been able to provide the desired data update frequency.

Actions	Duration	Budget
3C.1 Coordination with LA 511 and Other Southern California 511 Systems: RIITS should continue to work with LA 511 staff to inform them of new data sources and the enhancements to RIITS over time.	119 months Timeline: Year 1 Qtr 1 to Year 10 Qtr 4	$244,000

Actions	Duration	Budget
3C.2 Establish System Alerts: For purposes of informing 511, RIITS should seek to establish a systems alerts approach (either automated or manual) that directly notifies 511 when issues with RIITS operations and data feeds have been encountered. Such alerts could be provided through a RIITS web workstation feed, or directly through a formal communications process. These alerts should continue beyond notification of system issues and provide updates on expected timeframes for resolution.	2 months Timeline: Year 3 Qtr 2	$145,000
3C.3 Incorporation of New Data Feeds, Elements, and Filtering Capabilities: Similar to 3A, RIITS should provide new data feeds, filtering, and other appropriate functionality to 511 as it emerges within the RIITS network.	8 months Timeline: Year 4 Qtr 4 to Year 5 Qtr 2	$382,000
3C.4 Establish Network Connectivity as Appropriate: Should SANDAG 511 or other 511 providers seek data from RIITS they would need to coordinate to provide the appropriate network connections to RIITS. Maintenance and payment for the network connection would be the responsibility of the 511 systems in question.	1 month Timeline: Year 5 Qtr 2-3	$293,000

Key Customers: LA 511 and potentially other Southern California 511 (San Diego).

3D – Data Consolidator for LA Congestion Reduction Demonstration (CRD) Program

Business Purpose: The LA Congestion Reduction Demonstration program represents a substantial undertaking by MTA and partner agencies to implement new approaches to dealing with congestion and to promote mode shifts. The program includes a range of transit, freeway, and system improvements, particularly along the I-10 and I-110 corridors. This effort will serve as an excellent adjunct to the multi-modal and multi-agency capabilities of RIITS. It can serve both as a customer for RIITS data for operations and performance monitoring, as well as a source of new data elements such as congestion charges and dynamic pricing information.

Related Current Efforts: The LA Express Lanes and LA Downtown Variable Parking systems are in the design stages with implementation set to begin in 2010. RIITS staff has conducted a preliminary review of available RIITS data for potential use for dynamic pricing by the Express Lanes system.

Actions	Duration	Budget
3D.1 Coordination with LA CRD Representatives: RIITS staff should engage LA CRD/MTA representatives to assess CRD data needs from RIITS and new data elements that will become available from CRD systems. Particular opportunities would include the Express Lanes toll system and potentially the Downtown variable pricing parking system. This coordination would include discussion of funds needed to make the appropriate modifications to RIITS.	17 months Timeline: Year 1 Qtr 1 to Year 2 Qtr 2	$61,000

Actions	Duration	Budget
3D.2 Modify RIITS Feeds for LA CRD Input: RIITS data feeds would need to be adjusted to provide a subset of freeway sensor data (speeds, volumes, and status) along the approaches and segments of the I-10, I-110, and portions of I-105 corridors. This data needs to provide separate data feeds for the HOV versus the general purpose lanes at maximum 90 second latency.	2 months Timeline: Year 1 Qtr 4	$142,000
3D.3 Review and Design RIITS Data Elements for Incorporation of LA CRD Data Inputs: The CRD program represents need data elements that should be considered for incorporation into RIITS as part of the operations support and regional data archive functions. The design would need to consider receiving data from the Express Lanes toll system on the real-time dynamic pricing associated with the various segments along the Express Lanes. This would require additional data definitions for RIITS, but these definitions could be applicable across the region if the concept of dynamic pricing and managed lanes continues to develop across the region. In addition, parking information feeds on pricing and status could be incorporated into RIITS from efforts being considered by LADOT.	3 months Timeline: Year 4 Qtr 4	$239,000
3D.4 Modify RIITS Output Data Feeds, Archive Data, and Maps: Either in conjunction with improvements identified in Group 2, or separately, the RIITS data feeds to other systems and map views would need to be modified to account for the new data elements of CRD.	5 months Timeline: Year 5 Qtr 3-4	$140,000
3D.5 Monitor RIITS Opportunities for Congestion Management in Southern California: Congestion management is consistent with the regional goals for MTA and SCAG, and relates to the ability to manage mobility in a sustainable fashion. Beyond the CRD project underway in LA, the greater SCAG region is looking into congestion management opportunities. RIITS is uniquely positioned to be able to provide needed data to congestion management systems, as well as receive and forward appropriate data to 511 and through the regional portal. RIITS staff should continue to monitor opportunities as they develop in the region in this area.	60 months Timeline: Year 5 Qtr 1 to Year 9 Qtr 4	$188,000

Key Customers: MTA, LADOT, 511, other ISPs, and potentially other agencies as congestion reduction programs expand in the region.

6.3 Phasing and Overall Budget Estimates

Figure 6.3 on the next two pages displays the overall phasing for the strategic initiatives and actions identified in this Strategic Plan. This phasing is for information and program planning purposes. The initial phasing is presented in consideration of:

- General RIITS stakeholder preferences.
- On-going RIITS efforts which serve as a baseline for the strategic initiatives.
- Logical sequencing of strategic initiatives and actions based on certain actions serving as prerequisites for following actions.

It is anticipated that this phasing may change over time depending on the availability of funding or policy decisions made by MTA or the RIITS CM Committee. Figure 6.3 also displays the preliminary annual budget estimates for the RIITS program, excluding current annual expenditures in the range of $1.53M. Annual budget figures are in Year 2010 dollars and are rounded to the nearest $10,000.

Figure 6.2: Phasing and Annual Budget Estimates for RIITS Strategic Initiatives and Actions

Strategic Initiative/Action	Year 1 Qtr 1	Year 1 Qtr 2	Year 1 Qtr 3	Year 1 Qtr 4	Year 2 Qtr 1	Year 2 Qtr 2	Year 2 Qtr 3	Year 2 Qtr 4	Year 3 Qtr 1	Year 3 Qtr 2	Year 3 Qtr 3	Year 3 Qtr 4	Year 4 Qtr 1	Year 4 Qtr 2	Year 4 Qtr 3	Year 4 Qtr 4	Year 5 Qtr 1	Year 5 Qtr 2	Year 5 Qtr 3	Year 5 Qtr 4
Group 1 - Regional Data Management																				
1A Regional Data Archive Enhanced																				
1A.1 Update RIITS Institutional Structure																				
1A.2 Review Archive Data Management System Project Preliminary Outputs																				
1A.3 Scope Enhanced Regional Data Archive																				
1A.4 Implement Enhanced Regional Data Archive																				
1B Filtered Data and Custom Queries																				
1B.1 Prepare Assessment of Data Filtering Needs and Geographic Boundaries																				
1B.2 Design Updated Database Structure																				
1B.3 Enhance Database Query Functions/Tools																				
1B.4 Demonstrate Enhanced Data Filter and Query Functions																				
1B.5 Review Common Queries with CM Committee and Assess Impacts to Performance and Mitigation																				
1C Performance Measurement																				
1C.1 Internal Outreach Effort on Performance Measurement																				
1C.2 Prioritization and Design of Performance Measurement and Tools																				
1C.3 Development of New Performance Monitoring and Measurement Tools and Reports																				
1C.4 Network Modifications for Performance Monitoring Access																				
1C.5 RIITS Performance Measurement Program Management																				
1D Travel Forecasting and Modeling																				
1D.1 Monitoring Emerging Trends																				
1D.2 Partner with Private or University Interests																				
1D.3 Modify RIITS Regional Data Archive and/or Filtered Data																				
Group 2 - Operations Support Services																				
2A Regional Event Reporting																				
2A.1 Update Event Definitions and Feeds																				
2A.2 Update RIITS Design for Expanded Event Functionality																				
2A.3 Incorporate Automated Event Reporting from Current and Emerging RIITS Partners																				
2A.4 Assess Reliability of Event Data and Determine Appropriate Feeds to ISPs and 511																				
2A.5 RIITS Operational Support Oversight																				
2B Regional Video Sharing																				
2B.1 Expand Existing RIITS Video Capabilities																				
2B.2 Prepare Video Sharing Platform Concept of Operations and Design																				
2B.3 Prepare Video Sharing Agreement and Security Levels Template																				
2B.4 Implement Initial Video Sharing Platform with Demonstration with at Least Two RIITS Partners																				
2B.5 Expand Video Sharing Platform																				
2C Enhanced Situational Awareness																				
2C.1 Define Enhanced Situation Awareness Functions																				
2C.2 Design Enhanced RIITS Data Feeds and Map Display Filters and Security Levels																				
2C.3 Design Real-Time Event and RIITS Alerts Feed																				
2C.4 Establish RIITS Access Minimum Workstation Requirements																				
2C.5 Implement Appropriate RIITS Maps and System Enhancements																				
2C.6 Conduct Training and Configuration Support for RIITS Partners																				
2C.7 RIITS Operational Support Oversight																				
Group 3 - Integration of Regional Network Services																				
3A Regional Portal for ISPs/Developers																				
3A.1 Update RIITS Portal and ISP Feeds Concept of Operations																				
3A.2 Incorporation of New Data Feeds, Elements, and Filtering Capabilities																				
3A.3 RIITS Portal Support Oversight																				
3B Common ITS Field Devise Broker																				
3B.1 Continue to Assess Common Field Device Opportunities																				
3B.2 Review Transit Information Field Device Demonstration																				
3B.3 Design Transit Information Demonstration and Account for Common Field Device Standards																				
3B.4 Implement Initial Transit Field Device Demonstration																				
3C Common ITS Field Devise Broker																				
3C.1 Coordination with LA 511 and Other Southern California 511 Systems																				
3C.2 Establish System Alerts																				
3C.3 Incorporation of New Data Feeds, Elements, and Filtering Capabilities																				
3C.4 Establish Network Connectivity as Appropriate																				
3D Data Consolidator for LA Congestion Reduction Demonstration (CRD) Program																				
3D.1 Coordination with LA CRD Representatives																				
3D.2 Modify RIITS Feeds for LA CRD Input																				
3D.3 Review and Design RIITS Data Element for Incorporation of LA CRD Data Inputs																				
3D.4 Modify RIITS Output Data Feeds, Archive Data, and Maps																				
3D.5 Monitor RIITS Opportunities for Congestion Management in Southern California																				
Foundational Elements																				
F1 Marketing Plan																				
F2 Performance Reliability Enhancements																				
F3 Standards Update																				
Annual Budget Estimate	TBD				TBD				TBD				TBD				TBD			
Annual Contingency	TBD				TBD				TBD				TBD				TBD			
Total Annual Budget Estimates	TBD				TBD				TBD				TBD				TBD			

Figure 6.2: Phasing and Annual Budget Estimates for RIITS Strategic Initiatives

Strategic Initiative/Action	Year 6 Qtr 1	Year 6 Qtr 2	Year 6 Qtr 3	Year 6 Qtr 4	Year 7 Qtr 1	Year 7 Qtr 2	Year 7 Qtr 3	Year 7 Qtr 4	Year 8 Qtr 1	Year 8 Qtr 2	Year 8 Qtr 3	Year 8 Qtr 4	Year 9 Qtr 1	Year 9 Qtr 2	Year 9 Qtr 3	Year 9 Qtr 4	Year 10 Qtr 1	Year 10 Qtr 2	Year 10 Qtr 3	Year 10 Qtr 4
Group 1 - Regional Data Management																				
1A Regional Data Archive Enhanced																				
1A.1 Update RIITS Institutional Structure																				
1A.2 Review Archive Data Management System Project Preliminary Outputs																				
1A.3 Scope Enhanced Regional Data Archive																				
1A.4 Implement Enhanced Regional Data Archive																				
1B Filtered Data and Custom Queries																				
1B.1 Prepare Assessment of Data Filtering Needs and Geographic Boundaries																				
1B.2 Design Updated Database Structure																				
1B.3 Enhance Database Query Functions/Tools																				
1B.4 Demonstrate Enhanced Data Filter and Query Functions																				
1B.5 Review Common Queries with CM Committee and Assess Impacts to Performance and Mitigation																				
1C Performance Measurement																				
1C.1 Internal Outreach Effort on Performance Measurement																				
1C.2 Prioritization and Design of Performance Measurement and Tools																				
1C.3 Development of New Performance Monitoring and Measurement Tools and Reports																				
1C.4 Network Modifications for Performance Monitoring Access																				
1C.5 RIITS Performance Measurement Program Management																				
1D Travel Forecasting and Modeling																				
1D.1 Monitoring Emerging Trends																				
1D.2 Partner with Private or University Interests																				
1D.3 Modify RIITS Regional Data Archive and/or Filtered Data																				
Group 2 - Operations Support Services																				
2A Regional Event Reporting																				
2A.1 Update Event Definitions and Feeds																				
2A.2 Update RIITS Design for Expanded Event Functionality																				
2A.3 Incorporate Automated Event Reporting from Current and Emerging RIITS Partners																				
2A.4 Assess Reliability of Event Data and Determine Appropriate Feeds to ISPs and 511																				
2A.5 RIITS Operational Support Oversight																				
2B Regional Video Sharing																				
2B.1 Expand Existing RIITS Video Capabilities																				
2B.2 Prepare Video Sharing Platform Concept of Operations and Design																				
2B.3 Prepare Video Sharing Agreement and Security Levels Template																				
2B.4 Implement Initial Video Sharing Platform with Demonstration with at Least Two RIITS Partners																				
2B.5 Expand Video Sharing Platform																				
2C Enhanced Situational Awareness																				
2C.1 Define Enhanced Situation Awareness Functions																				
2C.2 Design Enhanced RIITS Data Feeds and Map Display Filters and Security Levels																				
2C.3 Design Real-Time Event and RIITS Alerts Feed																				
2C.4 Establish RIITS Access Minimum Workstation Requirements																				
2C.5 Implement Appropriate RIITS Maps and System Enhancements																				
2C.6 Conduct Training and Configuration Support for RIITS Partners																				
2C.7 RIITS Operational Support Oversight																				
Group 3 - Integration of Regional Network Services																				
3A Regional Portal for ISPs/Developers																				
3A.1 Update RIITS Portal and ISP Feeds Concept of Operations																				
3A.2 Incorporation of New Data Feeds, Elements, and Filtering Capabilities																				
3A.3 RIITS Portal Support Oversight																				
3B Common ITS Field Devise Broker																				
3B.1 Continue to Assess Common Field Device Opportunities																				
3B.2 Review Transit Information Field Device Demonstration																				
3B.3 Design Transit Information Demonstration and Account for Common Field Device Standards																				
3B.4 Implement Initial Transit Field Device Demonstration																				
3C Common ITS Field Devise Broker																				
3C.1 Coordination with LA 511 and Other Southern California 511 Systems																				
3C.2 Establish System Alerts																				
3C.3 Incorporation of New Data Feeds, Elements, and Filtering Capabilities																				
3C.4 Establish Network Connectivity as Appropriate																				
3D Data Consolidator for LA Congestion Reduction Demonstration (CRD) Program																				
3D.1 Coordination with LA CRD Representatives																				
3D.2 Modify RIITS Feeds for LA CRD Input																				
3D.3 Review and Design RIITS Data Element for Incorporation of LA CRD Data Inputs																				
3D.4 Modify RIITS Output Data Feeds, Archive Data, and Maps																				
3D.5 Monitor RIITS Opportunities for Congestion Management in Southern California																				
Foundational Elements																				
F1 Marketing Plan																				
F2 Performance Reliability Enhancements																				
F3 Standards Update																				
Annual Budget Estimate	TBD				TBD				TBD				TBD				TBD			
Annual Contingency	TBD				TBD				TBD				TBD				TBD			
Total Annual Budget Estimates	TBD				TBD				TBD				TBD				TBD			

Table 6.1 on the following page summarizes the rough order of magnitude budget estimates for each action by strategic initiative in 2010 dollars. Information in this table is rounded to the nearest $1,000 and a 30% contingency has been applied. Again, it should be noted that these items are not all inclusive of all RIITS activities, in particular the baseline management activities which are currently supported by the RIITS annual budget of $1.53M. It is assumed that the actions and initiatives noted in this document would be above and beyond that baseline activity in order to address the growth of the customer market for RIITS through functional enhancements.

Strategic Initiative/Action	Budget Estimate Year 2010 $ (Nearest $1000)
Foundational Elements	
F1 Marketing Plan & Efforts	$ 450,000
F2 Performance Reliability Enhancements (Networking, Communications, Backup, Redundancy)	$ 2,250,000
F3 Standards and System Rearchitecture Update	$ 1,620,000
Group 1 - Regional Data Management	
1A Regional Data Archive Enhanced	
1A.1 Update RIITS Institutional Structure	$ 41,000
1A.2 Review Archive Data Management System Project Preliminary Outputs	$ 79,000
1A.3 Scope Enhanced Regional Data Archive	$ 178,000
1A.4 Implement Enhanced Regional Data Archive	$ 2,258,000
1B Filtered Data and Custom Queries	
1B.1 Prepare Assessment of Data Filtering Needs and Geographic Boundaries	$ 189,000
1B.2 Design Updated Database Structure	$ 340,000
1B.3 Enhance Database Query Functions/Tools	$ 845,000
1B.4 Demonstrate Enhanced Data Filter and Query Functions	$ 111,000
1B.5 Review Common Queries with CM Committee and Assess Impacts to Performance and Mitigation	$ 65,000
1C Performance Measurement	
1C.1 Internal Outreach Effort on Performance Measurement	$ 134,000
1C.2 Prioritization and Design of Performance Measurement and Tools	$ 203,000
1C.3 Development of New Performance Monitoring and Measurement Tools and Reports	$ 839,000
1C.4 Network Modifications for Performance Monitoring Access	$ 418,000
1C.5 RIITS Performance Measurement Program Management	$ 421,000
1D Travel Forecasting and Modeling	
1D.1 Monitoring Emerging Trends	$ 203,000
1D.2 Partner with Private or University Interests	$ 154,000
1D.3 Modify RIITS Regional Data Archive and/or Filtered Data	$ 585,000
Group 2 - Operations Support Services	
2A Regional Event Reporting	
2A.1 Update Event Definitions and Feeds	$ 213,000
2A.2 Update RIITS Design for Expanded Event Functionality	$ 226,000
2A.3 Incorporate Automated Event Reporting from Current and Emerging RIITS Partners	$ 1,446,000
2A.4 Assess Reliability of Event Data and Determine Appropriate Feeds to ISPs and 511	$ 231,000
2A.5 RIITS Operational Support Oversight	$ 1,453,000
2B Regional Video Sharing	
2B.1 Expand Existing RIITS Video Capabilities	$ 1,003,000
2B.2 Prepare Video Sharing Platform Concept of Operations and Design	$ 575,000
2B.3 Prepare Video Sharing Agreement and Security Levels Template	$ 169,000
2B.4 Implement Initial Video Sharing Platform with Demonstration with at Least Two RIITS Partners	$ 2,318,000
2B.5 Expand Video Sharing Platform	$ 4,306,000
2C Enhanced Situational Awareness	
2C.1 Define Enhanced Situation Awareness Functions	$ 267,000
2C.2 Design Enhanced RIITS Data Feeds and Map Display Filters and Security Levels	$ 772,000
2C.3 Design Real-Time Event and RIITS Alerts Feed	$ 494,000
2C.4 Establish RIITS Access Minimum Workstation Requirements	$ 39,000
2C.5 Implement Appropriate RIITS Maps and System Enhancements	$ 4,011,000
2C.6 Conduct Training and Configuration Support for RIITS Partners	$ 689,000
2C.7 RIITS Operational Support Oversight	$ 2,587,000
Group 3 - Integration of Regional Network Services	
3A Regional Portal for ISPs/Developers	
3A.1 Update RIITS Portal and ISP Feeds Concept of Operations	$ 97,000
3A.2 Incorporation of New Data Feeds, Elements, and Filtering Capabilities	$ 581,000
3A.3 RIITS Portal Support Oversight	$ 776,000
3B Common ITS Field Device Broker	
3B.1 Continue to Assess Common Field Device Opportunities	$ 106,000
3B.2 Review Transit Information Field Device Demonstration	$ 100,000
3B.3 Design Transit Information Demonstration and Account for Common Field Device Standards	$ 165,000
3B.4 Implement Initial Transit Field Device Demonstration	$ 529,000
3C Data Consolidator for Southern California 511	
3C.1 Coordination with LA 511 and Other Southern California 511 Systems	$ 244,000
3C.2 Establish System Alerts	$ 145,000
3C.3 Incorporation of New Data Feeds, Elements, and Filtering Capabilities	$ 382,000
3C.4 Establish Network Connectivity as Appropriate	$ 293,000
3D Data Consolidator for LA Congestion Reduction Demonstration (CRD) Program	
3D.1 Coordination with LA CRD Representatives	$ 61,000
3D.2 Modify RIITS Feeds for LA CRD Input	$ 142,000
3D.3 Review and Design RIITS Data Element for Incorporation of LA CRD Data Inputs	$ 239,000
3D.4 Modify RIITS Output Data Feeds, Archive Data, and Maps	$ 140,000
3D.5 Monitor RIITS Opportunities for Congestion Management in Southern California	$ 188,000
Total Budget Estimate	**$ 36,370,000**

Table 6.1 Summary of Preliminary Budget Estimates by Strategic Initiative Action Item

7. CONCLUSIONS

RIITS is a unique and important resource for MTA and the region, and the 10-Year Vision for RIITS defined in this Strategic Plan is reasonable and achievable. In working to reinforce strengths and opportunities, as well as mitigate weaknesses and threats, RIITS will need to continue to expand both its basic customer base and the functionality. The success of RIITS over the next ten years will be based on the following:

- Current and Potential Customers in RIITS – RIITS has attracted a solid set of baseline customers that recognize the value of RIITS as a resource for themselves and the region. They see the value in regional integration of ITS and the information associated with these systems. However, it is clear that the operational use components of RIITS need to attract an expanded customer base. Only by demonstrating continued value and solid performance to current and emerging customers, can RIITS continue to grow and succeed. The outreach process conducted as part of this Strategic Plan and in conjunction with RIITS staff efforts has demonstrated a keen interest from a broad range of potential new customers for RIITS. These customers represent an opportunity that must be cultivated through both continued outreach and demonstrated performance improvements to RIITS.

- Institutional Structure – The greatest asset currently within the RIITS network is not a server, communications connect, or information display, it is the established institutional structure of RIITS represented by the Configuration Management Committee. As RIITS expands and as this expansion draws additional participants to RIITS, this institutional structure must remain intact. It must continue to properly represent all RIITS partners and provide a sense of participation, say in the system, and security that their resources invested in RIITS are recognized and not being abused. Regardless of organization changes in the operations and management of RIITS over time, the institutional structure must be maintained as a multi-agency and consensus based environment that addresses both the policy and technical issues associated with RIITS development.

- Performance – The performance of the RIITS network suffers from latency in source data, bandwidth or capacity constraints on user workstations, and some internal functionality of RIITS applications. It is not possible for RIITS to solely correct all of these performance issues, but it can improve system performance by implementing many of the foundational elements discuss in this Strategic Plan. End user performance is critical, and current web based performance is a limiting factor. By setting examples of proper configuration and improving performance where possible, the RIITS network can meet what is likely to be increasing customer demands for accurate, reliable, and timely information.

- Marketing – While it is known to many potential customers both internal and external to MTA, RIITS is not generally at the forefront of potential customer concerns. It is currently viewed more as a "good thing" rather than an "essential thing." RIITS will live or die by its ability to attract new customers, and by virtue of these new customers, expand the breadth and value of the information available through RIITS. It is not enough to deploy functional enhancements and then make current customers familiar with these enhancements. Marketing efforts must combine a message about the expanded value of RIITS with outreach to new potential customers.

- Functional enhancement – The current functionality of RIITS is impressive given the range of available data sources and the geographic area covered. However, functionality will need to be enhanced to both increase the attractiveness and usability of RIITS as an operational support and regional data management tool. These functional extensions are both logical uses of RIITS as a single source of data tool. Functional enhancements should prioritize operational support services, followed by regional data management and baseline integration of new systems.

In terms of the future of mobility data information and integration systems, the path is set. The functionality and efforts defined in this Strategic Plan will need to occur in order for the region to reach its objectives in terms of mobility, sustainability, and carbon emissions. RIITS currently has the lead position in being able to fulfill these market needs, it only remains to be seen if these needs will be filled by RIITS or by one or more emerging competitors. MTA and the RIITS partners would be best served in terms of costs, effectiveness, and end results if these needs are met by RIITS.

APPENDICES

A – Review of National and Statewide Initiatives and Policies for ITS in Support of Emerging Trends

B – SWOT Analysis of Candidate Initiatives

C – Outreach Meeting Notes

D – Workshop Summary and Presentation Materials

E – Opportunities for Funding Initiatives from the RIITS 10-Year Strategic Plan

F – Relationships between RIITS Strategic Initiatives and National ITS Architecture User Services

PRESENTATIONS

PowerPoint Presentation to Configuration Management Committee & RIITS Stakeholders, May 27, 2010

PowerPoint Presentation to Executive Management, June 15, 2010

Regional Integration of Intelligent Transportation Systems (RIITS)

10-Year Strategic Plan

APPENDICES

by IBI Group

with Parsons Brinkerhoff and Sarakki Associates, Inc.

June 15, 2010

Appendix A – Review of National and Statewide Initiatives and Policies for ITS in Support of Emerging Trends

November 5, 2009

Review of National and Statewide Initiatives and Policies for ITS in Support of Emerging Trends

1. INTRODUCTION

Los Angeles County Metropolitan Transportation Authority (LACMTA or Metro), in partnership with Caltrans District 7, the City of Los Angeles Department of Transportation, and the California Highway Patrol (CHP), has developed the Regional Integration of Intelligent Transportation System projects (RIITS) System Architecture and Network. The RIITS Network integrates county-wide freeway, arterial, and transit travel condition information, and disseminates it for agency and motorist use. In addition, under the RIITS umbrella, the regional ITS architecture and other operational documents are developed and maintained. By using this architecture and documents as a basis for decision-making, funding is obtained to enable the partner agencies to continuously improve the transportation services provided to the partner agencies and traveling public. The Regional ITS Program aims to position the RIITS Network as a single point of access for a real-time multi-modal transportation data base to be shared by all public agencies.

The RIITS Configuration Management (CM) committee, through this project, is overseeing development of a ten-year regional ITS strategic plan that includes a recommended program through the first five years of the plan. The RIITS ITS strategic plan will detail the implementation steps for the RIITS business plan. One goal for this project and the business plan is to optimize the region's ability to compete for and obtain ITS and operational funding from Federal and State initiatives

This report is organized as follows:

- Section 2 presents the methodology used to develop this memorandum.
- Section 3 presents existing ITS systems and academic partnerships.
- Section 4 introduces the regional emerging trends/regional needs for which the research has been performed.
- Section 5 describes national and state initiatives and policies (as applicable) addressing the elements presented in Section 4.
- Section 6 provides information on the current legislation status.
- Section 7 summarizes the findings.

2. METHODOLOGY

Documents and web sites reviewed in the development of this document include:

- RIITS Strategic Plan – Outreach Meeting Minutes from a meeting held on July 16, 2009 at Metro Headquarters.
- RIITS Business Plan presentation
- Numerous websites and reports noted in footnote form.
- RIITS Strategic Plan Stakeholder Workshop Initiative Ranking and Comment Summary

- RIITS Strengths Weaknesses Opportunities and Threats (SWOT) and Vision Statement.

This technical memorandum is being created to identify the ITS activities that are taking place on a national and statewide level and comparing these trends with the RIITS region.

3. EXISTING ITS SYSTEMS AND ACADEMIC PARTNERSHIPS

Background information is provided on a number of ITS systems and ITS-focused academic partnerships

3.1 PEER ITS SYSTEMS

There are several large ITS systems in the United States, including TRANSCOM, Gary-Chicago-Milwaukee (GCM) Corridor, Transtar, I-95 Corridor, and the Bay Area Traveler Information/511 System. Highlights of each of the systems are listed below. It should be noted that the majority of these systems provide safety, traveler information, and operations focused congestion management and are not know as data archivers or warehousers.

TRANSCOM[1] (in New York)

TRANSCOM's mission is to improve the mobility and safety of the traveling public by supporting its member agencies through interagency communication and the enhanced utilization of their existing traffic and transportation management systems.

TRANSCOM's members include the transportation agencies, departments of transportation, bridge authorities, toll/turnpike authorities, and police departments.

TRANSCOM's Operations Information Center collects and disseminates real-time regional incident and construction information, 24 hours a day, through an extensive notification network. This network links TRANSCOM to over 100 member and affiliated agencies through an alphanumeric pager system, phone, and fax.

TRANSCOM also provides these services under contract to the I-95 Corridor Coalition, as the Coalition's interim communications center. The I-95 Corridor Coalition includes the major transportation agencies in the Northeast, from Virginia to Maine. Like TRANSCOM, the Coalition seeks to link transportation providers across political and geographic boundaries. Several of TRANSCOM's members are also members of the I-95 Corridor Coalition.

The Regional Architecture consists of a central database server linked with workstations located at member agencies' facilities. Information shared through this network includes incident and construction data; variable message sign, highway advisory radio, and closed-circuit television information; and real-time traffic and transit conditions. The Regional Architecture is developing the protocols necessary to integrate existing and future ITS into the network.

[1] Transportation Operations Coordinating Committee (TRANSCOM), http://www.xcm.org/transcom.html

The network has been strengthened through coordination with the I-95 Corridor Coalition's Information Exchange Network (IEN). The IEN provides the exchange of data similar to that handled by the TRANSCOM Regional Architecture, but on a corridor-wide basis from Maine to Virginia.

Both networks use common platforms, thereby allowing members of both coalitions to access the IEN and the TRANSCOM Regional Architecture through a single workstation.

Gary-Chicago-Milwaukee (GCM) Corridor[2]

The GCM provides travelers in the corridor area with information to assist them in making efficient transportation choices and the website has the following resources:

- Real-time map of road congestion and construction data
- Construction and closure reports
- Congestion and travel time reports
- Links to video images available in the corridor
- Links to transportation-related sites in the corridor
- Illinois DOT's (IDOT's) email alert system

This corridor is starting to morph into a larger corridor coalition called the Lake Michigan Interstate Gateway Alliance that also includes Michigan.

TranStar[3] (in Houston)

TranStar is a partnership of four government agencies responsible for providing Transportation Management and Emergency Management services to the Greater Houston Region. Those agencies include the Texas Department of Transportation, Harris County, the Metropolitan Transit Authority of Harris County, and the City of Houston. The TranStar system is often recognized as a great example of freeway incident management, using state-of-the-art technologies to reduce congestion on major roadways. The focus is primarily on operations, not so much on archival and analysis of data.

Transtar monitors traffic incidents with more than 600 regional closed circuit television cameras (CCTVs), removes debris and hazardous material, communications with emergency vehicles to provide the most direct routes to incidents, sends trucks to stalled vehicles, deploys dynamic message signs (DMSs), informs travelers of expected travel times and traffic issues, and combines synchronized traffic signals, speed sensors, highway advisory radio (HAR) and ramp meters to keep the region's traffic moving.

I-95 Corridor Coalition[4] (from Florida to Maine)

The I-95 Corridor Coalition is the largest managed corridor that runs from Florida to Maine with dozens of agencies and hundreds of people involved. They have several full time staff and guaranteed Federal funds each year written into SAFETEA-LU. Additionally, they have won several additional grants to extend their program. Right now there is no comprehensive

[2] http://www.gcmtravel.com/gcm/home.jsp

[3] http://www.houstontranstar.org

[4] http://www.i95coalition.org/i95/Default.aspx

repository of data like RIITS, but there is an Information Exchange Network (IEN) that agencies can use for major interstate incident notification. Additionally, they are looking to enhance the early IEN with some new technology that can automatically pull data from existing agency systems as right now the IEN is a manual entry operation.

Traveler Information/511[5] (in the San Francisco Bay Area)

In the Bay Area, the 511 system offers up-to-the minute traffic, transit, rideshare and bicycling information. 511 is managed by a partnership of public agencies led by the Metropolitan Transportation Commission (MTC) the California Highway Patrol (CHP), and the California Department of Transportation (Caltrans). There are an additional sixty-six (66) partner agencies representing transit and para-transit agencies, management districts, commuter information services, light and commuter rail systems, ferries, and congestion relief alliances.

The 511 system receives data from its partner agencies and applies that data into its software to generate traveler information.

3.2 ACADEMIC PARTNERSHIPS

There are a few academic partnerships that are truly providing data archiving capabilities.

Portland Oregon Regional Transportation Archive Listing (PORTAL)[6]

The purpose of this project is to implement the U.S. National ITS Architecture's Archived Data User Service for the Portland metropolitan region. This system is being developed at Portland State University by students and faculty in the ITS Laboratory under the direction of Dr. Robert Bertini. Additional participants include the Oregon Department of Transportation, Metro, the City of Portland, TriMet and other regional partners. This work is supported by the National Science Foundation.

The current PORTAL system archives the Portland metropolitan region's freeway loop detector data at its most detailed level and also archives area weather data. We plan to expand the capabilities of our system and to include multimodal data sources from both Oregon and Washington.

PORTAL is the official Archived Data User Service (ADUS) for the Portland Metropolitan region as specified in the Regional ITS Architecture. PORTAL has supported projects such as the Swarm evaluation, development of Arterial Performance measures, and the 2035 Regional Transportation Plan and the Regional Freight and Goods Movement Plan. PORTAL will be a necessary tool for implementing the regions Congestion Management Process and for add valuable information to the development of transportation system plans, corridor planning, and system management and operations.

PORTAL data archives use a variety of information technologies to retrieve, store, and provide access to data. This archive implements a data warehousing strategy in that it retains large amounts of raw operational data for analysis and decision making processes, and in that these

[5] http://www.511.org

[6] http://portal.its.pdx.edu/

data are stored independently of their operational sources, allowing the execution of time-consuming queries with no impact on critical operations uses.

California PATH (Partners for Advanced Transit and Highways)[7]

California PATH was established in 1986 and is administered by the Institute of Transportation Studies (ITS), University of California, Berkeley, in collaboration with Caltrans. PATH is a multi-disciplinary program with staff, faculty and students from universities statewide, and cooperative projects with private industry, state and local agencies, and non-profit institutions.

PATH's mission is to develop solutions to the problems of California's surface transportation systems through cutting edge research. PATH develops these solutions by harnessing the knowledge of transportation researchers, working in conjunction with experts in the fields of information technology, electrical engineering, mechanical engineering, economics, transportation policy and behavioral studies. The PATH charter includes conducting leading research, planning and evaluating field operational tests, developing partnerships between academia, the public sector and private companies, and educating both students and practitioners.

The PATH Program emphasizes research directions that offer potentially large improvements in the operations of the transportation system, relative to those that can make only incremental improvements. At the same time that PATH addresses the relatively long-term, high-impact solutions, it also addresses the evolutionary steps that will be necessary to get to the long-term solutions.

PATH research is divided into four program areas:

- Policy and Behavioral Research
- Transportation Safety Research
- Traffic Operations Research
- Transit Operations Research

Guidestar[8] (in Minnesota)

Guidestar is managed by the Minnesota Department of Transportation (MnDOT) Office of Traffic, Safety and Operations in conjunction with numerous public, private, and academic partners to conduct ITS research, operational tests, and deployment projects.
The mission of Guidestar is to provide strategic direction and advice for statewide application of advanced technology and information systems in transportation to save lives, time and money. Guidestar's Board serves as a catalyst for innovative partnerships and resource investments.

Polaris is the Minnesota integrated ITS architecture and combines applicable existing systems with developing technologies from both the public and private sectors to create an interactive system with well-defined interfaces between services, functions, and components. In 2006 the Guidestar board updated its strategic plan and specifically noted that "technologies will be deployed to enhance data collection on the transportation system for purposes of planning and performance measure reporting. A variety of detection technologies will be used to allow

[7] http://www.path.berkeley.edu/
[8] http://www.dot.state.mn.us/guidestar/

managers and planners a clear view of system operations. Forecasts will be improved through the availability of more complete and accurate baseline data and locations with performance issues more quickly and clearly identified."

Center for Advanced Transportation Technology Laboratory CATT Lab)[9] in Maryland

The CATT Lab has developed a Regional Integrated Transportation Information System (RITIS) that is an automated data sharing, dissemination, and archiving tool that uses data collected in Northern Virginia, Maryland statewide, and Washington D.C. The emphasis of RITIS is on data fusion and standardization, and their relationship to data collection, regional transportation systems management, regional traveler information dissemination, and system evaluation. RITIS automatically fuses, translates, and standardizes data obtained from multiple agencies in the region in order to provide an enhanced overall view of the region's transportation network. Participating agencies are able to view regional traffic information and use it to improve their operations and emergency preparedness. RITIS uses regional standardized data to enable traveler information, including web sites, paging systems, and 511. The two main RITIS functions include—the real-time fusion and exchange of regional transportation data; and data archiving.

Performance Evaluation Monitoring System (PeMS)[10] – California

PeMS is a project conducted by the Department of Electrical Engineering and Computer Sciences at the University of California at Berkeley with the cooperation of Caltrans, California PATH and Berkeley Transportation Systems. The intent of the project is to collect historical and real-time freeway data from the freeways in the State of California in order to compute freeway performance measures.

4. EMERGING TRENDS

Based on conversations with the RIITS members[11], several themes for the evolution of RIITS over the next ten years became evident. While RIITS is a useful program and system, the aim is to create a more user-focused and effective program and network. These themes are the basis on which the research and baselines are established.

The themes for RIITS must accomplish or evolve into over the next ten years, in no particular order, include:

- The need to establish a succinct RIITS vision that identifies the value/purpose of RIITS. (The RIITS partners want to ensure that the ten year strategic plan focuses on *interagency*, not general public, sharing of information.)
- Identify the roles of real-time data, incident reporting, regional data archive, and performance measurement within RIITS
- Identify how RIITS fits or interacts with the other systems (511, Information Exchange Network (IEN), etc.)

[9] http://www.cattlab.umd.edu/index.php?page=research&a=00023
[10] https://pems.eecs.berkeley.edu/?redirect=%2F%2F%3Fdnode%3DState
[11] RIITS Strategic Plan – Outreach Meeting, held July 16, 2009 at Metro Headquarters

- Identify how private efforts may "threaten" RIITS's role (among agencies)
- Identify how to improve stakeholder outreach/awareness (within and among agencies)
- Investigate need for a major technology investment to enable RIITS to fulfill operational vision over the next ten years
- Identify required in-house capabilities (Information Technology (IT) support needs) to operate RIITS

In conjunction with these emerging themes, the RIITS business plan also presents a 5-year work program that consists of:

- Integration efforts – Metrolink, airports, ports, transit operators, emergency services, the trucking industry, and rail industry
- Expansion area – goods movement, emergency service, travel forecasting, performance and evaluation, and planning and policy analyses
- Enhancement – base map upgrade, upgrade to national standards, data archiving

Strategic opportunities were presented in the following areas:

- Expand RIITS coverage across Southern California to improve coordination across county boundaries and provide seamless information to travelers
- Support multi-modal corridor improvement initiatives with performance and evaluation tools
- Integrate ITS with goods movement
- Increase emergency/safety/security applications
- Target improvements to transportation managers and travelers to enhance decision making.

By combining the emerging trends with the RIITS work program we see a strategic opportunity, and have outlined several areas in this document. Many of the on-going opportunities and improvements to the RIITS network are taking place and are documented in the bi-monthly RIITS CM Committee meeting minutes. Areas for research include:

- Integrating ITS into the region's goods movements
- Performance measures / evaluation tools
- Improving/integrating emergency service activities
- Improving travel forecasting (including traveler information)
- Integrated Corridor Management (ICM)
- Role of ITS in global climate change

Development of the RIITS ITS Strategic Plan will aid in developing and refining the RIITS vision, the role of RIITS within other applications, funding and threats to funding, the need for a major technology improvement to support the RIITS network, and needed in-house capabilities. As a result of this ITS Strategic Plan development effort, additional ITS/Systems Engineering planning documents are likely to be created to define and document necessary improvements to more fully achieve the RIITS vision and maximize the ability to secure federal and state funding.

5. NATIONAL/STATE INTIATIVES

This section addresses the areas targeted for research identified in Section 4 and presents

activities from various states and on a national basis. The research areas are:

- Integrating ITS into the region's goods movements
- Performance measures / evaluation tools
- Improving/integrating emergency service activities
- Improving travel forecasting (including traveler information)
- Integrated Corridor Management (ICM)
- Role of ITS in global climate change

The research focused on a review of national and statewide initiatives and policy activities for ITS in the above areas.

5.1 INTEGRATING ITS INTO GOODS MOVEMENT

The Port of Los Angeles, also known as "America's Port" is one of the nation's busiest ports and is the key to Southern California's economic dominance. Combined with the neighboring Port of Long Beach, it is ranked fifth globally in terms of annual container cargo throughput. Currently, the two ports handle nearly half of the containerized trade entering the United States. This seaport sustains its competitive edge with record-setting cargo operations, and is known for its groundbreaking environmental initiatives, progressive security measures and diverse recreational and educational facilities. The Port encompasses 7500 acres, 43 miles of waterfront and features 27 cargo terminals. Combined, these terminals handle almost 190 million metric revenue tons of cargo annually. Last year, the Port moved an impressive 8.5 million TEUs, establishing a new national container record once again. The Port is also home to the nation's most secure cruise passenger complex, the World Cruise Center.[12]

Studies indicate that the demand for containerized cargo is expected to continue its phenomenal growth for at least the next 25 years, and that cargo could nearly triple over current levels. Clearly, the ability for the Ports of Los Angeles and Long Beach to accommodate this growth is crucial to the continued health of the local, regional, and national economies.[13]

Freight movement, commercial vehicle operations (CVO), and goods movement are similar phrases that apply to the area of efficiently transporting necessary materials to the appropriate destination. CVO covers many areas including

- Credential Administration
  - Electronic Funds
  - Electronic Registration/Permitting
- Safety Assurance
  - Safety Information Exchange
  - Automated Inspection
- Electronic Screening
  - Safety Screening
  - Border Clearance
  - Weight/Height Screening
  - Credential Checking
- Carrier Operations and Fleet Management
  - Automated Vehicle Location/Computer Aided Dispatch (AVL/CAD)

[12] www.portoflosangeles.org
[13] www.portoflosangeles.org

    - On-board Monitoring
    - Traveler Information
- Security Operations
    - Asset Tracking
    - Remote Disabling Systems

Technology has been applied to many of these areas and established solutions have provided a more efficient method to transport of goods by minimizing operational costs while providing more efficient goods movement service to clients. Focusing on what services or technologies that RIITS can provide to enhance goods movement in a manner that is safe, good for the environment, and good for the goods movement industry led to investigation of the following:

- Improved commercial vehicle credentials check and safety inspections
- Improved / optimized travel routing for commercial vehicles
- Improved tracking of the vehicle, the freight, and the driver
- Improved HAZMAT tracking and routing

In addition to electronic credentialing, opportunities exist for RIITS to integrate current traffic conditions and appropriately designated cargo routes (oversize loads, HAZMAT) into the route optimization / guidance technologies in many commercial vehicles. Ensuring quick identification of HAZMAT carriers in the event of an incident is an opportunity for RIITS agency-only data base. To more effectively address any HAZMAT concerns at the time an incident is detected specifically addresses the RIITS mission. Safety and security of the cargo, vehicle, and driver is a critical issue in Mexico. Given the proximity of Los Angeles to Mexico, additional opportunities exist for technologies that address safety and security of the vehicle, cargo, and drivers, but this opportunity may be better suited for an application independent of RIITS.

Select examples are provided:

Example of Improved Commercial Vehicle Operations Programs:

North/West Passage Corridor[14]

The North/West Passage Corridor encompasses the states along I-90/I-94 from Wisconsin to Washington and is an FHWA Transportation Pooled Fund (TPF) Study.

The vision of the North/West Passage Corridor is to immediately influence ongoing standards development and utilize effective methods for sharing, coordinating, and integrating traveler information across state borders. While travel information reflects the initial destiny, maintenance and operations and planning and programming are long term visions.

The goals of the corridor program are to:

1. Integrate traveler information systems that can provide information appropriate to the location and need of the traveler.

2. Develop and promote cross-border jurisdictional cooperation and coordination in the planning, deployment, operations, and maintenance of ITS infrastructure.

[14] http://www.nwpassage.info/

3. Integrate ITS projects for the North/West Passage Corridor into the state, regional, and local planning and programming processes.

In the North/West Passage Corridor states (North Dakota, Wisconsin, Minnesota, Washington, Idaho, Wyoming, Montana, and South Dakota) there are currently numerous systems for collecting, processing and integrating traveler and road maintenance information, and for delivering the information to users. However, this information is not readily shared across state borders.

Beyond the $100,000 secured for phase 1 of this project, all eight states in the corridor have committed money (a combined $400,000) for the second and third phases of this project.

PrePass [15]

PrePass started in 1983 as the, Heavy Vehicle Electronic License Plate (HELP) program. Through several phases of development, the final phase, the Crescent Project, was intended to demonstrate the integrated technologies that today form the basis of PrePass: Automated Vehicle Identification (AVI), Automated Vehicle Classification (AVC) and Weigh-In-Motion (WIM).

With federal financial support from the U.S. Department of Transportation, HELP's Crescent Project formally began in 1991 and involved six U.S. western states and one Canadian province which formed a geographic "crescent" from the Pacific Northwest to Texas.

During the next few years of deployment, PrePass developed as an intelligent transportation system that electronically verifies safety, credentials, and weight of commercial vehicles at participating state highway weigh stations, commercial vehicle inspection facilities and ports of entry.

Through August 2009, PrePass estimates that it has provided the following benefits:

Calendar Year	State Benefits	Carrier Benefits	Carrier Benefits	Carrier Benefits	Environmental Benefits
	Successful Electronic Screening Bypasses	Time Savings[a] (hours)	Fuel Savings[b] (gallons)	Operational Cost Savings[c]	Emissions Reductions[d] (metric tons)
2009 (August)	35,541,200	2,961,767	14,216,480	$303,497,616	31,382
Cumulative (since 1997)	358,632,202	29,886,017	143,452,883	$2,129,985,481	316,666

[a]Based on 5 Minutes Saved per Screening Bypass (measured in hours)

[b]Based on .4 gallons per pull-in (measured in gallons)

[c]Based on $5 per pull-in [1997-2007] (Iowa State University Center for Transportation Research and Education study performed in 1995) or $8.68 per pull-in [2008+] (FMCSA Economic Analysis and Business Case for Motor Carrier Industry Support of CVISN - Oct 2007)

[d]Measured in Metric Tons

[15] http://www.prepass.com/Pages/Home.aspx

Example for Improved / optimized travel routing and tracking of commercial vehicles: The I-95 Corridor Coalition FleetForward Final Evaluation Report - an operational test of an Advanced Traveler Information System (ATIS) for commercial vehicle operators.

> The FleetForward operational test coupled real-time traffic information with motor carriers' routing and dispatch decisions. The objective of this test was to evaluate the usefulness of traffic flow data to motor carrier operations. This early report deemed the FleetForward operational test a success and as a result slated expansion of Fleet Forward along the I-95 corridor. Goals of the operational test include improving operational efficiency of the carriers, increasing the efficiency of the overall highway system, gaining motor carrier acceptance of the highway and traffic information service, gain a sense of motor carrier usage of highway and traffic information, and to aid motor vehicles in making better use of available highway and traffic information. Many of the goals had supporting objectives that addresses safety of the highway network.[16]

Example for Improved / optimized travel routing and tracking of commercial vehicles: Washington State Department of Transportation (WSDOT) Ports of Seattle and Tacoma field operational test to provide traveler information to reduce congestion leading to a port's entrance.

> The congestion management test consisted of two separate deployments of different technologies to facilitate access to/from the Ports of Seattle and Tacoma. The goal was to use ATIS-based data to alleviate congestion at the ports' gates and access routes by providing real-time traffic information to the trucking industry. These two tests represented actual deployments in the region's advanced ATIS infrastructure. The goal of the evaluation was to document their impact on traffic operations. Both tests were deemed successful and suggested improvements are provided to better utilize the tested technologies. No specific before and after data was measured to provide quantitative assessments[17].

Example for Improved / optimized travel routing and tracking of commercial vehicles: Port of Los Angeles evaluation of Advanced Traveler Information Services (ATIS) Impacts on Truck Travel Time Reliability.

> The ability of ATIS to improve the on-time reliability of urban truck movements is evaluated through the application of the Heuristic On-Line Web-Linked Arrival Time Estimation (HOWLATE) methodology. This is a modeling analysis performed prior to the final report date of March 2004. In HOWLATE, simulated paired driver trials are conducted based on archived roadway travel times to identify how ATIS use impacts trip outcomes. Previous research using this technique evaluated ATIS impacts on commuter trips in metropolitan areas and demonstrated that travelers who receive notification of current traffic conditions prior to departure can reduce dollar-valued disutility from improved on-time reliability as well as travel time savings. In this report, we expand the application of HOWLATE to investigate the ability of ATIS to improve on-time reliability of freight movements to intermodal terminals based on a case study of the Los Angeles metropolitan area.

[16] National ITS Cost Benefit database – "FleetForward Evaluation", I-95 Corridor Coalition-sponsored work performed by Cambridge Systematics, October 2000

[17] National ITS Cost Benefit Database (– "Washington State Department of Transportation (WSDOT) Intermodal Data Linkages Freight ITS Operational Test Evaluation", USDOT, January 2003

Results indicated that for truck movements with stringent on-time requirements facing considerable variability in trip travel times, ATIS is a useful and high-value service. In particular, unfamiliar truck drivers can reap significant benefit from ATIS (averaging between $1.50 and $13 per trip). The case study also shows that truck drivers with flexible departure times can accrue more benefit from using ATIS than truck drivers with fixed departure times (averaging between $11 and $41 per trip).

Further, accrued benefit varies by terminal location and the degree of connectivity. Trips destined for intermodal terminals located in the middle of the network benefit more significantly from ATIS than trips destined for intermodal terminals on the edge of the network. In addition, the provision of travel times on connector roadways between the freeway network and the intermodal terminals reduced late arrivals by up to half in some locations.[18]

Example for Improved HAZMAT tracking and routing: HAZMAT Safety and Security Technology field operational test.

This HAZMAT Safety and Security Technology field operational test had a goal of improving homeland security protection of truck-based hazardous materials shipments. It was designed to test the ability of commercially available technology systems to reduce vulnerabilities in HAZMAT shipping while providing sufficient returns on investment to motor carriers to encourage deployment. These technologies promise to enhance not only security, but also operational efficiencies and potentially, safety.

Technology performance overall for the technologies in the field operational test was good, with most technologies performing well under operational conditions with the exception of fingerprint recognition and electronic seals. .

The wireless communication system with GPS tracking provided a positive return on investment for all four of the test scenarios, and also provided the base for vulnerability reduction, with the additional technologies providing incremental gains.

- The tested technologies showed the capability to significantly reduce the vulnerability of hazardous materials transportation, with the greatest reductions for the attack profile: theft. In the distribution of overall security and efficiency benefits between society and motor carriers, it was found that motor carriers would realize 60 to 72 percent; 81 to 92 percent; 5 to 13 percent; and 1 to 3 percent of benefits for bulk fuel, less than truckload (LTL) high-hazard, bulk chemicals, and truckload explosives operations, respectively.

The author notes that technology alone is not the complete answer to HAZMAT trucking security. At best, the technologies are estimated to reduce risk and vulnerability and therefore potential terrorist consequences by approximately 36 percent. The technology-enabled reductions in HAZMAT shipping vulnerabilities and potential deterrence effects may never be validated empirically as it may not be possible to know the degree to which security threats have been avoided.

[18] National ITS Cost Benefit database – "The Evaluation of Advanced Traveler Information Services (ATIS) Impacts on Truck Travel Time Reliability", FHWA-sponsored work by Mitretek Systems, March 2004

In summary, HAZMAT safety and security technologies can have tremendous societal cost savings well beyond the break even point for benefits and costs and can reduce the potential for terrorist consequences by approximately 36 percent. [19]

The most up-to-date information may be obtained at a TRB-sponsored North American Freight Flows Conference: Understanding Changes and Improving Data Sources. The conference was held on September 16-17, 2009, in Irvine, California and was designed to explore challenges and identify new ideas concerning the availability and application of data for program evaluation, policy formation, and business decision making associated with North American trans-border flows. The meeting assessed recent changes in the freight transportation environment and identify emerging research needs.

Additional sites that may provide useful information include:

- The National Center for Freight and Infrastructure Research and Education (CFIRE) at the University of Wisconsin-Madison has released the latest issue of its newsletter. The newsletter is designed to help CFIRE in its mission is to advance technology, knowledge, and expertise in the planning, design, construction, and operation of sustainable freight transportation infrastructure through education, research, outreach, training, and technology transfer.

- The Rand Corporation's Key Issues in Modernizing the U.S. Freight-Transportation System for Future Economic Growth, June 2009. According to this report, the efficiency of the supply chain is threatened by capacity bottlenecks in the transportation system, inefficient use of some components of the freight infrastructure, interference from commuter transport, the supply system's vulnerability to disruption, and the need to address important emission and energy constraints. Beginning in fall 2007, the Supply Chain Policy Center embarked on a project to identify the key policy issues associated with improving freight transportation and its capacity in the United States. The report documents the Rand Corporation's literature review, interviews with many stakeholders in the system, and conducting a meta-analysis of existing data and quantitative reports.

5.2 PERFORMANCE MEASURES/EVALUATION TOOLS

United States transportation operations have been a data-poor environment. It is difficult to support many performance measures where data is not currently collected, or not collected with sufficient attention to quality. With a new emphasis on transportation performance measures as a prerequisite of Federal funding, regions have been focusing on collecting more and better quality data. Caltrans has been an early-adopter and national leader helping advocate the need for better transportation data and performance measures. As RIITS is still relatively new, data collection was the foundation for development of the shared data base. The focus on data collection and utilization is and has been a primary component of the RIITS Network.

According to one AASHTO report, states use performance measures for a variety of reasons to:

[19] "Hazardous Material Safety and Security Technology Field Operational test – Volume I: Evaluation Final Report Executive Summary" USDOT Joint Program Office report prepared by SAIC, November 2004

- Support Investment Decision Making. DOTs use department-wide performance measurement programs to allocate resources, support performance driven investment decisions and enhance internal agency management of programs.
- Provide a Solid Foundation for Statewide Planning. DOTs have demonstrated that robust data and performance monitoring, teamed with actionable goals and strategic business plans, can be used to fine-tune an organization and lay the ground work to achieve short-, medium- and long-range planning goals.
- Ensure Accountability and Responsiveness to Stakeholders. Performance measurement can assist in communicating how tax dollars have been spent, and/or whether more funding is needed. This also supports "customer focus" and improved public relations and stakeholder involvement.
- Support Quantification of Program Benefits. Infrastructure programs have a long history of documenting program impacts as embodied in pavement, bridge, and maintenance management systems.
- Meet Federal and State Legislative Mandates. In some states, the legislatures require transportation agencies to engage in a formal performance measurement and reporting process. The federal government also requires certain transportation performance measures be reported by every state.[20]

Performance areas that align with RIITS include congestion and system performance, and safety. Examples in these areas include:

Example on congestion and system performance: Transportation Research Board – Strategic Highway Research Program (SHRP) on Capacity Research.[21]

> This report creates a state-of-the-art performance measurement framework that individual transportation agencies and other public agencies can adapt to support the needs of both agencies and stakeholders in the decision-making process for major transportation capacity projects. An overall performance measurement framework was developed in this report.

Example on congestion and system performance: AASHTO Committee.

> AASHTO has a standing committee on Performance Management. Material generated in this standing committee can be found at http://www.transportation.org/?siteid=97

Example on congestion, system performance, and safety: Maryland State Highway Administration's CHART program.

> Maryland CHART (Coordinated Highway Action Response Team) is a comprehensive incident management system and incident management program. One specific example cited is in June 2008, this program was estimated to save motorists and commercial traffic approximately 30 million vehicle-hours annually, equivalent to $570 million a year in cost savings just through incident clearance.[22]

[20] "State DOT's Performance Management Program: Select Examples", AASHTO, July 2007
[21] "Performance Measurement Framework for Highway Capacity Decision Making", TRB's SHRP2 report S2-C02-RR
[22] "State DOT's Performance Management Program: Select Examples", AASHTO, July 2007

Example on safety: Washington State DOT's Target Zero Highway Safety Performance Measures.

> The fatality rate on Washington's public roads has decreased 36 percent over the past 15 years (from 1.85 in 1990 to 1.17 in 2005). Washington's long-term objective is known as Target Zero, with a goal to eliminate fatal collisions on Washington's public roadway system by the year 2030. Target Zero incorporates four key components commonly referred to as the four "E"s: enforcement, engineering, education and emergency services.[23]

Example on congestion, system performance, and safety: Caltrans Transportation System Performance Measures in the Office of Performance Measures and Data Analysis (PMDA).

> Caltrans transportation system performance measures web site can be found at www.dot.ca.gov/hq/tsip/tspm

5.3 IMPROVING/INTEGRATING EMERGENCY SERVICE ACTIVITIES

Integration of emergency service activities significantly assists transportation providers in delivering better mobility while also assisting emergency responders in minimizing the time it takes to access an emergency site and manage the emergency in an effective manner.

There are many ITS solutions that enhance the integration of emergency service and transportation information. Response management may include the tracking of emergency vehicle fleets using automated vehicle location (AVL) technology and two-way communications between emergency vehicles and dispatchers. Integration with traffic and transit management systems enables emergency information and traffic condition information to be shared among the public sector entities addressing the emergency and sharing pertinent information with the traveling public.

RIITS-applicable technologies that could benefit emergency services (and vice versa) include AVL, integration of route optimization with real-time travel conditions, enhanced/shared communications (often times emergency service providers and transportation agencies need to call one another to communicate even though they may be responding to the same emergency), and shared video/still images.

Example of technologies: Transportation and Emergency Services: Identifying Critical Interfaces, Obstacles, and Opportunities[24]

> The research described in this summary examines the commitment to improved coordination among highway transportation and emergency services organizations and seeks to identify and evaluate the underlying obstacles and opportunities. Most of the findings and conclusions are based on a survey administered to transportation and

[23] "State DOT's Performance Management Program: Select Examples", AASHTO, July 2007
[24] "Transportation and Emergency Services: Identifying Critical Interfaces, Obstacles, and Opportunities", TRB Annual Meeting 2006, Kristen E. Shepherd et al

emergency services professionals in five states: Kentucky, Georgia, Tennessee, North Carolina, and South Carolina.

The respondents were asked to rate the potential benefits to improve emergency transportation operations. The following ITS technologies had the highest potential benefits indicated by both transportation and emergency sector groups:

- Interoperable radio communications
- Dynamic message signs
- Global Positioning Satellite (GPS)- and Geographic Information System (GIS)-based systems
- Closed circuit television roadway surveillance
- Enhanced 911 systems

Example of communications technology: Wisconsin Department of Transportation (WisDOT)

The Wisconsin Department of Transportation (WisDOT) has implemented a statewide digital microwave backbone infrastructure that is used to transport communications voice and data information for 172 public safety agencies throughout the State of Wisconsin. The information that is transported on the microwave system includes but is not limited to: routine daily voice communications, incident voice communications, driver license, license plate, criminal history, road sensor and Commercial Vehicle Information Systems and Networks (CVISN) information. Other low bandwidth roadway data that has or will be earmarked for transport by the statewide backbone infrastructure are included as well. The transported information is or will be available to Transportation Operating Centers (TOC), dispatch centers, public safety vehicles and emergency management centers.

The following goals were achieved:

- Safety**:** The public safety user's coverage was provided in areas where there had been none. Contact and information sharing makes law enforcement activity in these areas much safer for the officer and the general public.
- Mobility**:** This goal was attained from two different perspectives. First, the project provided an opportunity for the officers to move through several areas without loosing mobile data or voice coverage. Second, the project made handling incidents in the previously poor coverage areas much simpler and allowed for quicker incident clean up and restored traffic flow.
- Efficiency**:** It is obvious that the mobile data network is more efficient. The officers no longer have to wait until a dispatcher is free to run a request for data stored in the Department of Transportation (DOT) and Federal Bureau of Investigations (FBI) data bases.
- Productivity**:** It has been noticed that an Officer with a mobile data computer is generally twice as productive as he was before he got it.
- The environment**:** There is no negative environmental impact associated with the implementation of any of the components of this project.
- Customer Satisfaction**:** Customers are elated at the improvements to the mobile data and voice systems.
- Quality**:** Monitored the installation at all times to ensure proper installation and operation. The data and voice communications network lack of down time indicates that the system is operating flawlessly from a user perspective. As a result of the success of this program, the system has grown dramatically from

just the State Patrol to an additional 161 public safety agencies and hundreds of users. This includes Federal, State, County, Municipal, Tribal Nation and Military public safety agencies. Any public safety discipline including law enforcement, fire and (Emergency Management System) EMS can use the system if they choose to.[25]

Example of communications technology/system: Capital Wireless Information Net (CapWIN)[26]

CapWIN is primarily a subscription based communications tool that uses instant messages pushed to computers and personal digital assistants. The system offers a directory of user's names and affiliated information, and provides users the ability to view and join incidents occurring within different jurisdictions. The directory, messaging, and incident features are provided within the initial installation of CapWIN. Queries can be made within other systems such as the National Crime Information Center (NCIC) and permanent links can be created to access systems such as the Web Based Emergency Operations Center.

CapWIN applies to all Emergency Support Functions and Incident Command functions. In terms of scalability, the system is useful for small- and large-scale incidents across the full spectrum of multi-agency and multi-jurisdictional incidents and events. CapWIN is applicable across multiple levels of government: local, state, federal, tribal, and nongovernmental organizations. The system also applies to both public and private sectors.

CapWIN is applicable to any hazard where the dissemination of information is required.

The system is not classified as a traditional resource management tool as it only transmits resource information (e.g., users arrived on scene) if users communicate (type) them within the system's Instant Messaging functionality.
In terms of Communication and Information Management, CapWIN adheres to the principle of plain language (clear text). CapWIN does not have standardized documentation procedures to ensure situational awareness is maintained. The system provides a method for data sharing, but it does not provide adequate access to critical information (e.g., file-size limitation, restricted map functionality, and limited URL functionality and resource portability within chat room messages). Vulnerability concerns were identified as well.

5.4 IMPROVING TRAVEL FORECASTING

According to USDOT, "In the 10 most congested areas of the country, each rush hour traveler pays an annual 'congestion tax' of $850 to $1,600 in lost time and fuel and spends a total of almost 8 work days each year stuck in traffic."[27] Travel forecasting is a rapidly expanding focus area in the U.S. aimed at significantly improving congested conditions. The promise of benefits associated with travel forecasting is plentiful:

[25] "State Patrol Mobile Data Communications Network – Final Report and Local Evaluation", FHWA report prepared by Wisconsin Department of Transportation, April 2006
[26] http://www.capwin.org
[27] U.S. Department of Transportation, *National Strategy to Reduce Congestion on America's Transportation Network*, Washington, DC: May 2006 . Report: isddc.dot.gov/OLPFiles/OST/012988.pdf

- Predicted travel time information for motorists helps to save travel-time and improve reliability through the selection of travel routes.
- Goods movement looks to predicted travel time to reduce the delivery costs, increase the reliability of delivery, and improve the service quality.
- For transportation agencies travel-time information is an important index for traffic system operation and to manage resources (can use travel condition forecasting to determine the location and time of the next accident, and deploy valuable resources to that area in advance of the forecasted incident).

Improved travel forecasting requires planning and policy work to best understand how RIITS partners and the motoring public could best use the forecasted information. One synthesis report from Australia stresses the benefits of predicted travel time and then provides a caveat to utilization:

> *Predicted travel-time information provides the capacity for road users to organize travel schedule pre-trip and en-trip. It helps to save transport operation cost and reduce environmental impacts. Besides, accurate travel time information also helps delivery industries to promote their service quality by delivering on time. However the development of travel time estimation and prediction are suffered from the shortage of traffic data sets and too much interference from transport environment.*[28]

Great strides are currently taking place, but most seem to be in the research arena rather than in actual practice. Any methodology employed to enhance travel forecasting need to be reliable. Researchers in Holland concluded that given the vast number of academic options to predict travel time, selecting the most reliable and accurate prediction model for one particular scientific or commercial application is far from a trivial task. The authors recommend increasing the number and the diversity of the prediction models.

Current travel time information is already provided through RIITS and other Los Angeles systems. Repeated surveys have indicated that travel time information is something desired by motorists. For example, as a result of driver complaints about static messages posted on the Houston TransStar DMS, TranStar staff conducted an Internet-based survey to determine the types of information people wanted to see posted. Results of this survey indicated that drivers were primarily interested in seeing incident information (93%) and travel times (82%). Many respondents indicated that while incident information is important, they also need travel time information to better determine how incidents impact their travel.[29]

In July of this year, the Caltrans Division of Research and Innovation released a preliminary investigation finding on real-time data to improve en route decision making and reduce transportation demand.[30] The preliminary findings identified the most promising research areas related to how information is collected, transmitted and used in real time, and what effect real-

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[28] "A Review of Travel Time Predictions in Transport and Logistics", Michael A. P. Taylor et al, Proceedings of the Eastern Asia Society for Transportation Studies, Vol. 5, pp. 1433-1448; http://www.easts.info/on-line/proceedings_05/1433.pdf

[29] U.S. DOT Deployment Benefits and Lesson Learned from ITS for Traveler Information, http://www.itsdocs.fhwa.dot.gov//JPODOCS/REPTS_TE/14319.htm

[30] "Real-Time Data to Improve En Route Decision Making and Reduce Transportation Demand", requested by Nancy Chinlund, Division of Research and Innovation, Caltrans, produced by CTC & Associates LLC

time en route information has on transportation demand. This report and its findings can be accessed at:

http://www.dot.ca.gov/research/researchreports/preliminary_investigations/docs/real-time_demand_reduction_preliminary_investigation-7-6-09_2.pdf

5.5 INTEGRATED CORRIDOR MANAGEMENT (ICM) INITIATIVE

Today's fragmented transportation system includes the building blocks of freeway and arterial systems with transit systems. A better use of these facilities is to combine all the independent and fragmented assets into a large, connected, and inter-related transportation system. ICM seeks to leverage this asset by including the basic building blocks with parallel routes, under-used capacity, and non-peak travel directions to improve congestion and manage total corridor capacity.

In order to validate this ICM concept, the USDOT is implementing a 5-year program (FY06-FY11)[31] with eight pioneer sites including:

- Dallas, Texas
- Houston, Texas
- Minneapolis, Minnesota
- Montgomery County, Maryland
- Oakland, California
- San Antonio, Texas
- San Diego, California
- Seattle, Washington

The early work included a Phase 1 Foundational Research that covered the state of corridor management in the United States as well as the rest of the world, feasibility research, and initial technical guidance (such as a generic concept of operations.

Phase 2-4 are running concurrently and include:

- In the most recently proposed climate change bill (S.173[32]3 sponsored by John Kerry Phase 2 – Corridor Tools, Strategies, and Integration
- Phase 3 – Corridor Site Development, Analysis, and Demonstration
  - Concept Development (FY07)
  - System Modeling (FY08-09)
  - Demonstration and Evaluation (FY09-FY11)
- Phase 4 – ICM Outreach and Knowledge and Technology Transfer

Intelligent transportation systems and devices and inter-agency coordination are the keys to success for this initiative.

[31] U.S. DOT Integrated Corridor Management Systems, http://www.its.dot.gov/icms/index.htm

[32] http://thomas.loc.gov/cgi-bin/query/z?c111:S.1733:

Under the Dallas evaluation, transit availability and capacity is being increased, park-and-ride facilities will be improved, and intelligent transportation system elements are being deployed in the field. In addition, HOV and HOT lanes will be added, and value-pricing strategies are being explored. This project includes freeways, arterials, HOV, tolling, express bus, and light rail.

In Houston's I-10 corridor, ICM will help to manage delays through intelligent transportation systems and congestion pricing strategies; will empower travelers to make decisions with multimodal, personalized information; and will improve incident management. Houston's ICM strategy includes using its state of the art multi-agency emergency and traffic management center, TranStar. The Houston project will evaluate the following components freeways, arterials, HOV, tolling, value pricing, express bus and BRT.

For Minneapolis, ICM includes freeways, arterials, HOV, tolling, value pricing, express buses and BRT solutions. The Minneapolis ICM team is looking at combining managed lane and transit signal priority strategies to increase traffic flow along the corridor and is putting a strategic emphasis on the reliability of the equipment in the field to improve the quality and consistency of the information being sent to decision-makers in traffic management centers.

The Montgomery County, Maryland project comprises freeways, arterials, HOV lanes, commuter rail and heavy rail. The Interstate has seen rapid growth as the population has increased and commercial business has significantly increased. Additionally, there is a substantial amount of tourist traffic. Montgomery County boasts the region's busiest metro line with express buses. In Montgomery County, ICM representatives are developing the prototype Regional Integrated Transportation Information System, which will help commuters make more intelligent transportation choices. They are working to optimize traffic signals on arteries. They are also developing automatic vehicle location status systems for transit users and parking availability information to commuters. A critical part of ICM is the real-time information being provided to commuters in order to speed their commute.

San Diego has focused its efforts on using I-15 as an exploratory lab. The concepts that San Diego is testing directly parallel some of the solutions that the Los Angeles metropolitan area is considering. As San Diego and Los Angeles share similar objectives, it makes sense that LA Metro monitors the progress of San Diego's efforts and translates any lessons learned more quickly into the Los Angeles market.

Seattle faces multiple challenges including geographically constrained corridors, heavy freight traffic, and limited access facilities. In Seattle's I-5 ICM corridor, much work to reduce the level of congestion is already underway. The ICM strategies for this corridor include modifying the corridor's transit schedules to accommodate weeks of lane closure during the repaving of I-5. The city is modifying its signal timing to make traffic flow more smoothly in the corridor, and the State of Washington is securing a park-and-ride lot in the corridor with more than 500 vehicle spaces to encourage travelers to shift to buses. Agencies all along the corridor are working together to develop the ICM strategies for this popular and important commuter and freight corridor to help to speed the flow of people and goods.

Given the current administration’s desire to improve green house gas emissions and reduce the impact on global climate it is reasonable to expect a multimodal component to all ICM solutions.

5.6 IMPACT OF ITS ON GLOBAL CLIMATE CHANGE

In 2006, the California Governor signed into law AB32 – Global Warming Solutions Act[33]. This law establishes a program of regulatory and market mechanisms to achieve reductions in greenhouse gases (GHG). Statewide GHG emission requirements have been capped for 2020, based on 1990 emissions. Admittedly, the early measures do not specifically call-out the application of ITS devices and systems to address the requirements; however, ITS can and should play a significant role both now and in the future.

and Barbara Boxer), language has been included to cover "system operations improvements, including intelligent transportation systems" among the projects eligible to receive Federal funding. Earlier drafts had not specifically referenced ITS. Other eligible expenditures include public transit, bike and pedestrian infrastructure, zoning and land use changes, travel demand management (including pricing, telecommuting, carpooling) and intercity passenger rail. The Senate Environment and Public Works Committee is planning to hold hearings in October/November with a markup bill planned before the end of the calendar year.

The Senate bill does not include information about how funding generated from emissions allowances would be distributed, but staff have suggested that 1 ½ percent of the funding could be dedicated to transportation planning for green house gas (GHG) reduction and for clean and efficient transportation projects. This would be a slight increase from the 1 percent allocated in the House bill, but a significant decrease from the 10 percent called for in the CLEAN-TEA legislation.

6. CURRENT LEGISLATION STATUS

Federal performance measurement initiatives and the SAFETEA-LU reauthorization are prominent legislation efforts.

6.1 FEDERAL PERFORMANCE MEASUREMENT INITIATIVES

Despite the September 30, 2009, expiration of SAFETEA-LU, only one draft reauthorization bill exists. Introduced by T&I Committee Chairman Jim Oberstar (D-MN), the bill is heavily laden with performance measures. If this bill is an indication of what other draft authorization bills will look like, then it is clear that Congress is making performance measures a high priority. The Congressional emphasis will go beyond operational benefits. The push for performance measures may be setting the stage for stronger language in the subsequent reauthorizations.

As of November 2009, there remains uncertainty as to when SAFETEA-LU will be reauthorized. Different versions of "extensions" are currently under debate, including 1 month, 6 months, 12 months, and 18 months. At risk for Congress is when to focus public debate on increasing transportation spending, while still trying to address health care, a struggling national economy, and national security/military issues.

But regardless of when reauthorization occurs, it is expected that performance measurements will be a key to unlocking federal funding in the future because in large part performance measures introduce objectivity and reduce the opportunity for individual earmarking.

[33] http://www.arb.ca.gov/cc/ab32/ab32.htm

RIITS is heading in the right direction by having a heavy emphasis on collecting performance data now. Collection of performance data will put RIITS in the forefront of potential Federal funding. Compliance with SAFETEA-LU Sect. 1201 will further help by adding boundaries around their data quality and ensuring complete coverage.

6.2 SAFETEA-LU SECTION 1201

A Notice of Proposed Rule Making (NPRM) was published in the Federal Register Volume 74 No. 9 on 14 January, 2009. Comments were due on 14 April, 2009. Final rule development is expected in early calendar year 2010.

As the regional ITS architectures are developed and updated, they will explicitly address real-time highway and transit information needs and the systems required to meet such needs. The proposed rule will establish a real-time system management program in all States with the following capabilities:

- Monitoring, in real-time, the traffic and travel conditions of the major highways
- Sharing real-time information to address congestion problems and to facilitate national and regional highway traveler information.
- Technology and approach neutral

It is expected that this requirement will be rolled out in a two-stage deployment of:

- All Interstate highways compliant within 2 years of the final rule
- State-selected highways compliant within 4 years of the final rule

A majority of the comments received by the US DOT on its NPRM focused on these “time frame constraints.” A significant number of public agencies were uncomfortable with the 2 and 4 year guidelines, and as a result the final rule (when published) may include a change to the deadlines - possibly extending them out longer term.

As applied to RIITS, it is expected that this rule will have some impact on current data collection efforts such as minimum data refresh rates and coverage. However, these new requirements are not expected to become roadblocks for RIITS.

Compliance with the final rule will keep RIITS in the role of helping its partner and user agencies meet their Federal compliance.

Finally, it is important to recognize that during the 2 year period where compliance is being sought, a new Federal authorization will come about that may provide additional or different guidelines. The RIITS program is already heading in the right direction and enactment of Section 1201 really shouldn't have a major impact other than to add some guidelines and possible funding opportunities to their efforts

7. CONCLUSION

The majority of existing ITS systems operate as an information source for the traveling public. Few ITS systems operate under the same mission at RIITS, which takes the extra step of including internal stakeholders as a focus along with the external stakeholders. This gives RIITS the distinction of being one of a kind and offers the prospect of partnering with different

agencies both to collect and provide information useful to agencies and the traveling public. Given RIITS's rich data focus, RIITS has an opportunity to partner with educational institutions to further their research needs while developing a platform to expand RIITS's data capabilities.

The existing initiatives found across the county give RIITS the option of taking the best of what is working for other agencies and jurisdictions and applying them to Los Angeles and the unique challenges faced there. RIITS has the ability to get out in front with regional data management (such as performance measures and travel forecasting) and operations support (such as goods movement, emergency service activities, integrated corridor management and the impact of global climate change) and apply portions of those demonstration projects and integrate them into the RIITS system.

Appendix B – SWOT Analysis of Candidate Initiatives

Memorandum

To/Attention	Peter Liu, Project Manager Karen Fleming, Project Lead	**Date**	October 6, 2009
From	Randy Knapick	**Project No**	25839
cc	Don Murphy	**Steno**	rjk
Subject	RIITS 10-YearStrategic Plan: SWOT Analysis (Revised)		

This memorandum contains draft Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis in support of the development of the Regional Integration of ITS (RIITS) 10-Year Strategic Plan (Scope of Work Task 4). The attached SWOT analysis is presented for preliminary internal review and comment.

The SWOT analysis is organized into two levels: The first is a high-level summary of the RIITS system; the second, more detailed level analyzes specific areas of future opportunity ("Candidate Initiatives") for RIITS functional enhancement.

The Candidate Initiatives were identified in the course of the outreach process and associated internal discussions, categorized into three Groups as follows:

Group 1: Regional Data Management

- 1.A Regional Data Archive
- 1.B. Filtered Data Feeds and Custom Queries
- 1.C. Performance Measurement
- 1.D. Travel Forecasting/Modeling

Group 2: Operations Support

- 2.A. Regional Event Reporting
- 2.B. Regional Video Sharing
- 2.C. Enhanced Situational Awareness

Group 3: Integration of Regional Networks

- 3.A. Regional Portal for ISPs and Developers
- 3.B. Common ITS Field Device Broker
- 3.C. Data Consolidator for Southern CA 511
- 3.D. Data Consolidator for LA Congestion Pricing

Each SWOT summary includes an Overall Assessment, taking into consideration the totality of issues discussed in the SWOT assessment. During the development of the draft RIITS 10-Year Plan, the consultant team proposes that a "10-Year Plan Recommendation" be developed for each Candidate Initiative (e.g., Near-Term Initiative, Long-Term Initiative, Not Recommended).

Based on these conclusions, the relevant technological, policy, project plan, funding, marketing, etc. aspects for the recommended initiatives will be developed in the course of developing the RIITS 10-Year Plan.

RIITS SUMMARY
STRENGTHS, WEAKNESSES, OPPORTUNITIES, AND THREATS (SWOT) ANALYSIS

RIITS 10-Year Vision	SUMMARY SWOT ANALYSIS
RIITS 10-Year Vision	To provide regional multi-modal real-time information and data to transportation agencies and travelers in order to improve safety, mobility, and air quality. RIITS will achieve this vision by gathering information from the region's Intelligent Transportation Systems and providing a single point of access to regional multimodal real-time data.

Internal Issues

STRENGTHS

- RIITS is uniquely positioned in the region to provide near real-time, multimodal transportation data from ITS systems.
- Strong, existing working relationships with partner agencies.
- Standing agreements and unique institutional structure for interagency collaboration – By-Laws, Configuration Management Committee, Interagency Agreements, Countywide ITS Policy,
- Successful track record providing data to partner agencies and third-party information service providers (ISPs), including ISP service agreements.

WEAKNESSES

- RIITS data is transient; once presented in near-real time the information is purged from the system and is not available for subsequent review or analysis.
- The existing RIITS architecture and network experiences data latency and reliability issues that need to be addressed to provide many enhanced functionalities.

External Issues

OPPORTUNITIES

- Consolidation, presentation, and analysis of real-time data is increasingly important to effective management of the real-time transportation system and performance measurement.
- RIITS provides "total transportation system" awareness and data that is valuable to diverse transportation operations, planning, and emergency management agencies.
- Potential to become a preeminent source of regional multimodal transportation data for 511 and emerging third-party, private-sector traveler information systems.

THREATS

- RIITS must demonstrate the business case for agency participation based upon relevance to those agencies core business functions and needs.
- RIITS must provide a clear and distinct functional role in relation to, and integrated with, functions provided by other regional ITS systems.
- The increasing role of the private sector in transportation system management provides alternative sources of regional traveler information that may complement or compete with RIITS functionality.
- Added functionality will raise new RIITS administrative, policy, technology, and funding issues that must be addressed for successful implementation.

RIITS CANDIDATE INITIATIVES
STRENGTHS, WEAKNESSES, OPPORTUNITIES, AND THREATS (SWOT) ANALYSIS

RIITS CANDIDATE INITIATIVES

GROUP 1: REGIONAL DATA MANAGEMENT

A. REGIONAL DATA ARCHIVE

B. FILTERED DATA FEEDS AND CUSTOM QUERIES

C. PERFORMANCE MEASUREMENT

D. TRAVEL FORECASTING/MODELING

CANDIDATE INITIATIVE	1.A. REGIONAL DATA ARCHIVE
DESCRIPTION	Provide long-term storage of transportation operations data that is currently available in RIITS only on a transient basis. RIITS would serve as a regional data resource for participating agencies to support transportation system performance measurement and planning functions.

Internal Issues

STRENGTHS

- Leverages existing relationships and data feeds with participating RIITS agencies to provide enhanced functionality.
- Data available through the archive for planning and project analysis is consistent with core business needs of MTA (e.g., multimodal corridor planning and operations).
- Initial contract for archived data management system (ADMS) is currently underway.

WEAKNESSES

- Requires significant new investment in central systems and software to archive regional data that is currently purged in RIITS.
- A regional data archive requires a significant and ongoing investment for ITS maintenance and database software licensing.
- Requires development of new policies, practices, and measures to effectively use the data that is generated and stored by the system.
- Requires conops for the ADMS to ensure core business needs are met.

External Issues

OPPORTUNITIES

- Allows data analysis that provides insight into the effectiveness of ITS and Transportation System Management and Operations (TSMO) (e.g., effectiveness of incident management programs or ITS before-after studies).
- Performance measurement is an area of increasing emphasis of the federal government; may increase both the need and the funding opportunities for a regional data archive.
- Increased emphasis among regional operating agencies for performance metrics and "business intelligence" to facilitate performance-based management

THREATS

- Potential that data archiving will also be replicated at the agency level, sufficient to meet that agencies' planning, reporting, and performance measurement needs.
- Requires adoption of regional standards to ensure that archived data is preserved in a consistent quality manner.
- Requires investment (locally and nationally) in tools and analytical techniques to leverage complex multimodal traffic data.
- Long-term role of private sector as an alternative source for archived data (e.g. the INRIX National Traffic Scorecard) is uncertain but potentially significant.
-

OVERALL ASSESSMENT

This initiative uniquely serves a discrete regional need to which the RIITS architecture and institutional environment is well suited. However it will requires significant investment in technology and resources to implement.

LEVEL OF EFFORT High

CANDIDATE INITIATIVE	1. B. FILTERED DATA FEEDS AND CUSTOM QUERIES
DESCRIPTION	Allows customization/configuration of the RIITS interface in a manner that best suits the needs of a given agency. Functionality may include: the ability to receive filtered data streams/event alerts for selected items or geographic areas of interest; the ability to execute customized queries on RIITS data; and/or the ability to prepare customized queries for reporting, planning, or data exports.

Internal Issues

STRENGTHS	WEAKNESSES
• Supports the core mission of RIITS to provide a single point of access for transportation data by increasing the accessibility and usefulness of data contained within the system for individual participating agencies.	• Aside from certain real-time alerts, implementation of this functionality is contingent upon the development of a RIITS data archive to store data for future queries. • Development of sufficiently robust filtering, alert, and query capabilities to meet the requirements of varied user groups and core business applications is a significant undertaking. • Implementation of database query tools requires a commitment to ongoing IT maintenance and software costs. • Requires the change of the RIITS architecture and network to be more robust so that filtered data feeds and custom questions can be conducted for different applications and case studies.

External Issues

OPPORTUNITIES	THREATS
• Allows user groups to isolate relevant information from the vast amount of data already contained within the system. • Strongly endorsed functional enhancement from the emergency management community. • Alerts allow RIITS to “push” information to users according to criteria configured by each agency. • Increases the relevancy of RIITS to local agencies and other user groups with a very specific interest in a subset of available data, or under specific, occasional conditions (e.g., emergencies or major system disruptions).	• Implementation of customized alerts/subscriptions on the RIITS public site is powerful but more complex, and may overlap with functionality provided more effectively through the 511 system or third-party information sources.

OVERALL ASSESSMENT

Ability to filter real-time data feeds is a logical extension of RIITS and simpler to implement; more enhanced filtering or query functions represent more complex and resource-intensive investments

LEVEL OF EFFORT High

CANDIDATE INITIATIVE	1.C. PERFORMANCE MEASUREMENT
DESCRIPTION	Provide functionality so that data contained within the RIITS system can support "Total Transportation System" performance measurement, including analysis of multimodal corridors and benchmarking against regional mobility, safety, and environmental performance goals.

Internal Issues

STRENGTHS

- RIITS consolidates regional transportation data and is uniquely positioned to measure "Total Transportation System Performance."

WEAKNESSES

- RIITS data is currently not stored; this initiative is contingent on development of a Regional Data Archive capability.
- This initiative will require investment in reporting and analysis tools to facilitate performance measurement, either within RIITS or by participating agencies.

External Issues

OPPORTUNITIES

- Performance measurement is an area of growing USDOT emphasis; it will become increasingly important for regional agencies to provide evidence of the effectiveness of their programs and investments.
- The benefits of Transportation System Management and Operations (TSMO) and ITS investments are difficult to measure through conventional performance metrics; providing for more robust metrics is a powerful means of demonstrating the effectiveness of these investments towards achieving regional goals.
- Could include real-time business intelligence or "dashboard" insight into the state of the regional transportation system.
- Could use RIITS to build up a business case (such as goods movement) for before-after performance evaluation.

THREATS

- Specific requirements and funding of the anticipated USDOT performance measurement program in the next transportation authorization are not known; it is possible that future federal regulations will spawn national, state, or regional programs that are inconsistent with the proposed RIITS functionality.
- Requires a clear articulation of the added benefit to participation in the RIITS system in addition to in-house performance measurement initiatives by participating agencies.
- Requires development of tools to access and process data in a manner that meets diverse performance measurement requirements of participating agencies at a suitable level of granularity.

OVERALL ASSESSMENT

Clear and logical extension of RIITS in combination with the ADMS that provides value for MTA's core businesses; however a balance needs to be achieved in delivering performance measurement for other agencies through RIITS versus in-house systems.

LEVEL OF EFFORT Moderate

CANDIDATE INITIATIVE	1. D. TRAVEL FORECASTING/MODELING
DESCRIPTION	Provide predictive forecasts of future conditions minutes, hours, or days into the future. This functionality would rely upon advanced algorithms and a combination of current conditions, historical data, and other factors such as weather and events to predict future conditions. Future condition forecasts provide public agencies, the traveling public, commercial carriers, and emergency managers with better information to plan trips and avert foreseeable congestion problems.

Internal Issues

STRENGTHS	WEAKNESSES
• Most agencies and functions that benefit from RIITS real-time information would benefit even more from their participation if accurate future travel forecasts were available.	• Travel forecasting relies heavily on past data and trends; RIITS does not currently preserve archived data for use in future forecasts.

External Issues

OPPORTUNITIES	THREATS
• Travel forecasts offer tremendous potential to enhance the availability of information for proactively managing the multimodal transportation network. • Travel forecasting may present an opportunity to develop partnerships with an academic or research institution to assist with the development and validation of predictive algorithms.	• The development of travel forecasting algorithms is still in an incubative state and may require additional development before it can be successfully deployed on a broad scale. • Presentation of travel forecasts to public agencies and the traveling public in an effective manner will require additional research and development. • Travel forecasts require development of new policies, operational concepts, and standard operating procedures by participating agencies in order to effectively and proactively respond to this new type of information.

OVERALL ASSESSMENT

Represents an emerging future trend, however it depends upon future research and development of improved algorithms, as well as core RIITS enhancements such as ADMS implementation.

LEVEL OF EFFORT High

RIITS CANDIDATE INITIATIVES

GROUP 2: OPERATIONS SUPPORT

A. REGIONAL EVENT REPORTING

B. REGIONAL VIDEO SHARING

C. ENHANCED SITUATIONAL AWARENESS

CANDIDATE INITIATIVE	2.A. REGIONAL EVENT REPORTING
DESCRIPTION	Provide a regional platform for transportation system incident/event sharing among participating agencies, so that agencies can have greater awareness of incidents that impact their own operations (e.g., impact of a freeway incident on transit service or adjacent arterial streets).

Internal Issues

STRENGTHS

- Functionality builds upon the existing relationships and interfaces of RIITS with participating agencies.
- Basic incident reporting functionality is currently supported by the RIITS system (real-time only).

WEAKNESSES

- The effectiveness of the RIITS system will be compromised if it requires redundant data entry or is not sufficiently comprehensive in its coverage of the transportation network.
- RIITS network latency and reliability issues must be addressed to provide timely dissemination of event information.
- Archiving regional event data will enhance its value but is not currently supported by the RIITS pass-through architecture.

External Issues

OPPORTUNITIES

- RIITS is uniquely suited to serve as a regional interface for sharing of real-time multimodal event information to facilitate management of the total transportation system.
- Relates well to core businesses of operating agencies, by allowing them mitigate impacts on the systems for which they are directly responsible.
- Event information can be correlated with other transportation network data to provide a more enhanced view of transportation conditions in real-time and during incident debriefs and re-construction.

THREATS

- This initiative must be integrated with and not duplicative of in-house or statewide initiatives.
- Requires the development and adoption of regional event reporting data exchange standards and protocols by participating agencies.
- Use of the RIITS event reporting functionality must be incorporated into participating agency's operational concepts and standard operating procedures to be effective.

OVERALL ASSESSMENT

Potential to build upon existing data clearinghouse; drawing data from regional agencies for a comprehensive regional event reporting system is more complex and has a lower likelihood for success.

LEVEL OF EFFORT High

CANDIDATE INITIATIVE	2.B. REGIONAL VIDEO SHARING
DESCRIPTION	Provide a regional platform for consolidating and distributing real-time transportation video for roadways, transit, and other transportation modes and facilities. The shared video provides a comprehensive surveillance tool to multiple agencies regardless of the source agency of a given video stream. The application will support operations and management, traveler information dissemination, transportation security, and interagency coordination for incident and emergency management.

Internal Issues

STRENGTHS	WEAKNESSES
• Builds upon existing partnerships within the RIITS consortium to enhance regional data sharing and ITS integration. • Video is only accessed through RIITS as a real-time portal, but archiving requirements (and costs) remain with the source agency. • Leveraged regional cooperation to avoid redundant investment in surveillance technology.	• Requires substantial investments in additional RIITS system hardware and communications to facilitate video sharing. • A significant technology commitment by MTA that may merit increased financial commitment from other operating agencies which benefit.

External Issues

OPPORTUNITIES	THREATS
• Significant potential value to regional operating agencies as well as for inter-jurisdictional coordination and to ISPs for traveler information. • Strong interest from the emergency management community for access to transportation incident and security video. • Potential to leverage transportation/Homeland Security funds for implementation and operations.	• Success is contingent on key operating agencies (e.g. Caltrans, transit providers) to contribute video to the system. • Multiple video technology platforms and standards are currently in use by regional agencies. • Requires a coherent policy on video access, management, control, and distribution, particularly for emergency management and public traveler information applications.

OVERALL ASSESSMENT

Strong need with broad application, but substantial technical and institutional barriers need to be overcome. Prioritizing this area may divest resources from more readily implemented RIITS enhancements.

LEVEL OF EFFORT Very High

CANDIDATE INITIATIVE	2.C. ENHANCED SITUATIONAL AWARENESS
DESCRIPTION	Combines event reporting, operations data, and/or regional video sharing to provide real-time information on multimodal transportation system conditions, i.e., "situational awareness," to transportation operations and emergency management agencies. Situational awareness capabilities may include traffic flow data, dynamic message sign status, transit vehicle location data, incident location information, and/or aerial imagery. This Enhanced Situational Awareness tool provides a unique perspective on regional operations and emergency management by integrating regional data sources into a robust, secure, and map-based user interface available to control center and field personnel.

Internal Issues

STRENGTHS	WEAKNESSES
• Independent of requirements for data archiving; effective with 'pass-through' near real time data. • Web-based, secure access to RIITS is an ideal platform for delivering transportation situational awareness information to emergency management dispatch, incident command, and field positions.	• The RIITS network and data source agencies must provide sufficiently accurate and timely information (minimal latency) to be of value to the emergency management community. Additional communications redundancy may be warranted. • Development of aerial base map imagery is a high-value feature for situational awareness tools but may be a significant investment to implement and maintain.

External Issues

OPPORTUNITIES	THREATS
• Emergency management agencies have expressed a high degree of interest in situational awareness capabilities to support incident response. • Provides 'big picture' condition information to operating agencies for management of the multimodal transportation system. • Can assist in response, evacuations, and recovery associated with significant emergencies (e.g. wildfires, earthquakes, or manmade disasters). • Potential to leverage emergency management or homeland security funds for development of situational awareness functionality and interfaces to emergency management agencies.	• The specific role for RIITS as a complementary tool to existing emergency management tools will need to be better defined and understood so as not to duplicate efforts within the emergency management community. • Policies relating to security and management of potentially sensitive incident information or video must be developed if RIITS is to handle information that is not suited for distribution outside of the authorized emergency management community (e.g. to ISPs). • Core user group needs of the emergency management community may differ from transportation agencies, requiring alternative approaches to RIITS policy, configuration management, and administration.

OVERALL ASSESSMENT

Strong opportunity and logical extension of RIITS, but which requires a clear operational definition and to be promoted as a tool to operational and emergency management user groups.

LEVEL OF EFFORT Very High

RIITS CANDIDATE INITIATIVES

GROUP 3: INTEGRATION OF REGIONAL NETWORKS

A. REGIONAL PORTAL FOR ISPS AND DEVELOPERS

B. COMMON ITS FIELD DEVICE BROKER

C. DATA CONSOLIDATOR FOR SOUTHERN CA 511

D. DATA CONSOLIDATOR FOR LA CONGESTION PRICING

CANDIDATE INITIATIVE	**3.A. REGIONAL PORTAL FOR THIRD-PARTY ISPs AND APPLICTION DEVELOPERS**
DESCRIPTION	RIITS is an important data source for third-party Information Service Providers (ISPs) and software application developers that are increasingly important sources of traveler information for the public. By leveraging the innovation and reach of such third-party services, RIITS can better provide timely, consistent traveler information data through diverse channels at relatively low cost.

Internal Issues

STRENGTHS	WEAKNESSES
• Builds upon the existing relationships of RIITS with third-party Information Service Providers as a source of regional transportation data. • Alleviates the need for individual agencies to develop specific agreements and interfaces with a multitude of ISPs and application developers.	• Current RIITS data availability, comprehensiveness, and latency may not meet ISP or end user expectations of quality.

External Issues

OPPORTUNITIES	THREATS
• Allows RIITS member agencies to leverage the innovation and reach of third-party ISPs and software application developers to deliver quality, publically-derived transportation system information • The traveling public and commercial users through can access information through their preferred outlet: 511; the media; internet; mobile devices; and/or in-vehicle systems. • Potential to revisit the valuation of RIITS data to ISPs, generating an additional revenue source for RIITS maintenance and enhancement.	• Presents a potential loss of control of how transportation system data is presented and managed; will require new policies and usage agreements. • Use of public data for private gain raises policy issues on usage, source acknowledgement, and compensation that must be carefully addressed.

OVERALL ASSESSMENT	
Already a important role for RIITS and an area of growing future importance; however enhancements will be required to meet the requirements of third-party ISPs and traveler information providers.	
LEVEL OF EFFORT	Low/Medium

CANDIDATE INITIATIVE	3.B. COMMON ITS FIELD DEVICE BROKER
DESCRIPTION	RIITS can serve as an intermediary to facilitate the exchange of data among regional ITS systems and field equipment, providing a central platform for system-to-system information exchange. For example, RIITS could provide a single source for real-time transit arrival information from multiple agencies to be displayed on a single electronic sign at a key transportation hub, or third-party alerts (airport, freight or parking information) on a freeway dynamic message sign.

Internal Issues

STRENGTHS	WEAKNESSES
• Sharing information to allow more versatile use of existing ITS systems is consistent with the RIITS core mission of integrating regional ITS systems. • Builds upon existing relationships and interfaces with participating agencies to provide a new regional service.	• RIITS network latency and reliability issues must be addressed to provide timely dissemination to serve this function. • Requires intensive involvement of RIITS resources in developing, implementing, operating, and troubleshooting critical ITS infrastructure on a continuous basis.

External Issues

OPPORTUNITIES	THREATS
• RIITS provides a single central interface for exchanging information among regional field devices.	• RIITS resources and program structure may not be suited to intensive involvement in operations of field infrastructure. • If potential applications are limited, direct agency-to-agency interfaces and agreements may be better suited to the need.

OVERALL ASSESSMENT

Promising opportunity, particularly for transit operations; however the level of technical integration required may require a switch in strategic direction for RIITS towards operations. Evaluate opportunities on a case-by-case basis.

LEVEL OF EFFORT Moderate/High

CANDIDATE INITIATIVE	3.C. DATA CONSOLIDATOR FOR SOUTHERN CA 511
DESCRIPTION	RIITS can provide a 'one stop shop' for transportation system data to the 511 public traveler information system. In doing so RIITS eliminates the need for the 511 systems to develop separate connections with each participating regional agency, simplifying the development and expansion of this large-scale regional ITS deployment.

Internal Issues

STRENGTHS	WEAKNESSES
• RIITS can eliminate the need to develop and maintain separate interfaces for 511 by leveraging existing network interfaces. • Consistent with the RIITS core mission of providing value by sharing data and integrating regional ITS systems. • Builds upon existing relationships and interfaces with participating agencies to provide a new regional service.	• Data latency issues within the present RIITS system may be problematic for timely delivery of information to the 511 system. • Existing RIITS network architecture and data standards may not provide the required system availability and reliability.

External Issues

OPPORTUNITIES	THREATS
• Allows RIITS and 511 to reciprocally leverage the significant investments in ITS systems to disseminate public traveler information, while still providing distinct and complementary core functions. • Complements the existing function or RIITS to provide transportation system information to third-party information Service Providers (ISPs).	• RIITS network performance concerns may compromise its ability to deliver timely information to the 511 system in a reliable manner, 24/7. • RIITS data must adhere to stringent requirements for accuracy and quality in order to support and maintain the integrity of the 511 system and the trust of public users of 511. • In the future, private data services may assume an increasingly important role in the delivery of transportation system data as well as delivery of that information to the consumer through third-party service.

OVERALL ASSESSMENT

Already underway as an initiative; however broader application would require existing latency and data coverage gaps to be assessed and resolved.

LEVEL OF EFFORT Moderate

CANDIDATE INITIATIVE	3.D. DATA CONSOLIDATOR FOR LA CONGESTION PRICING
DESCRIPTION	RIITS can provide a 'one stop shop' for transportation system data required by the MTA freeway congestion pricing system, which calculates user tolls based upon prevailing traffic conditions in order to manage service quality for toll road users. In doing so RIITS eliminates the need to develop separate connections with each participating regional agency.

Internal Issues

STRENGTHS	WEAKNESSES
• Consistent with the RIITS core mission of providing value by sharing data and integrating regional ITS systems.	• Data latency issues within the present RIITS system may be problematic for timely delivery of information to the congestion pricing system.
• Builds upon existing relationships and interfaces with participating agencies to provide a new regional service.	• Existing RIITS network architecture and data standards may not provide the required system availability and reliability.

External Issues

OPPORTUNITIES	THREATS
• Establishes RIITS as a regional source for reliable, comprehensive traffic data to support congestion pricing, averting the need to invest in redundant traffic monitoring systems.	• Requires accurate, timely data provided with a high degree of reliability in order to support pricing algorithms and to maintain the trust of toll facility managers and users.
• Represents and opportunity to enhance the role of RIITS operationally within MTA.	• Existing RIITS network performance concerns may compromise its ability to deliver timely information to the congestion pricing system in a reliable manner, 24/7.
	• In the future, private data services may assume an increasingly important role as an alternative source for transportation system data.

OVERALL ASSESSMENT

RIITS is currently assumed to be a primary data source for the LA Congestion Pricing System, however due to the operational nature of the system, network enhancements may be required.

LEVEL OF EFFORT Moderate

Appendix C – Outreach Meeting Notes

IBI GROUP

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Minutes

To/Attention	Notes to File	**Date**	June 18, 2009
From	Randy Knapick Bill Delo	**Project No**	25839
		Steno	rjk

Subject RIITS Strategic Plan - Outreach Meeting Minutes
Arterial ITS Configuration Management (CM) Committee
Metro Gateway Center
Thursday, June 18, 2009 1:30pm

Present See attached sign-in sheet

Distribution Peter Liu (Metro Project Manager)
Karen Fleming (Metro Project Lead)
Attendees
Don Murphy (IBI Group)

Item Discussed

Item Discussed

1 Overview

This breakout session was held as part of a regular meeting of the LA County Arterial ITS Configuration Management (CM) Committee, a standing regional coordination body facilitated by Metro. Other agenda items addressed included an update on the Metro call for projects, an Information Exchange Network (IEN) project update, and other city and regional project updates.

The following are example CM agenda items of contextual relevance to RIITS:

- IEN Update: Build #3 (upgrade of the IEN) is being installed next week by TransCore. IEN is currently undergoing new development effort to increase data capacity and implement new features. (See handout distributed at the meeting).
- Steve Gota (Metro Planning – TSP Project) presented an overview of the Countywide Bus Signal Priority (BSP) project. (See handout distributed at the meeting).
- Bob Driggers (Sensys) discussed a Burbank Arterial Performance Showcase Project that is compiling travel time data that is displayed via a Google map.
- Karen Fleming (Metro) provided an update on the restoration of the RIITS-IEN network connection (still being resolved)

2 Notes from RIITS Discussion

Karen Fleming provided an overview presentation following Peter Liu's introductory remarks about the RIITS ITS Strategic Plan.

Andrew Maximous (City of Santa Monica) asked a question about the incident reporting function of RIITS – can you get notifications for events of a certain type (e.g. an event affecting Santa Monica)? Karen noted that events can show up as icons on the map but notifications are not automated. Santa Monica has a 'know before you go' application on the web – is there a way to get this event data out to the public?

The discussion item concluded that filtering of data streams to specific user needs would be useful; even more useful would be the ability to 'push' relevant information to the participating agencies.

Santa Monica asked to be signed up and had some questions about the system, including Big Blue Bus – suggesting that interagency outreach about the system would be a good idea to raise awareness. Peter noted that Metro has discussed developing an interface with Big Blue Bus in this fiscal year, but BBB has not committed yet to developing the interface.

Karen noted that at the last CM meeting the group discussed implementing features to provide additional incident information on the public site.

Bill Shao (LADOT) - cities would like to know Caltrans ramp metering

Item Discussed

information – possibly the connection through RIITS? RIITS has ramp metering data, but internet capacity is currently an issue. Cities want to know the ramp flow rates so that signals can be timed accordingly. From the discussion generated this appears to be one of the more significant regional coordination issues from the local signal engineering perspective.

Peter noted that RIITS internet capacity is going to double in the next map upgrade, so with the new map interface ramp data should be up.

Both the direct RIITS XML feeds and the map interface formats were noted to be useful to participating agencies.

Cities want access only to pertinent information – not all the data that Caltrans or RIITS can provide. The mandate of most of the CM participants was focused on a relatively limited portion of the regional network, and therefore their needs and perspectives are quite different from agencies that operate more regionally. Cities are interested in what effects their agency within (or near) their boundaries.

Information Exchange Network Build #3 will include a data filtering function – setting a precedent for a similar future RIITS functionality.

Item Discussed

A question was raised about the intended focus of the RIITS system – Karen emphasized that RIITS' focus is more on the interagency end "behind the scenes." (511 and others are interfacing with the public, and IEN more directly deals with signal control.) Metro and RIITS have no intention of wasting funds by duplicating efforts of other systems; rather, Metro desired to be complementary of these regional systems.

Jesse Glazer (FHWA) noted that future federal funding opportunities will focus more on multimodal projects and will be looking at total system performance rather than specific modes. He encouraged the group to think regionally and multi-modally.

Jesse suggested some specific use cases:

- Responding to emergencies is a major issue. Jesse is the FHWA emergency coordinator and sees that knowing the status of the roadway system in terms of closures, capacity reductions, and real-time traffic information is a major issue. Another use case is the mobilization of federal resources (e.g. FEMA) in response to emergency situations. Randy Knapick noted that there is also a need to look at smaller scale, day-to-day emergency response or incidents.
- RIITS is uniquely situated in LA County to facilitate performance monitoring and real time system status (dashboards) due to its combination of data across modes and facility types.

Often, municipalities get emergency event information from the news – which is often wrong and tardy. In general, emergency management agencies are natural stakeholders in a regional-scale real-time transportation system/event response tool.

Wayne Ko (City of Glendale) asked if RIITS was considering real-time "smart parking" information on major trip generators (downtowns, park and rides, etc.). He gave the example of Glendale in the holiday shopping season. Better guidance and information can reduce 'parking search' congestion. Glendale for one is looking at pursuing a project on this topic.

Metro is also talking with the City of LA about this type of system, possibly with an interface to RIITS. Santa Monica, The Grove, Century City, etc. have guidance systems today. Pasadena is planning a project, and Culver City has a project underway. Possibly also something to explore with the ports and LAX. Major event/regional scale parking is another possibility.

Bill Shao and George Chen spoke of the LADOT perspective, which is different from the smaller cities. LADOT already had direct connections with many peer agencies' information sources prior to RIITS – therefore RIITS is largely a 'background' application. If RIITS can expand to areas where information is not currently available, it will be more useful to LADOT.

LAPD and LADOT have groups that work together on management of

Item Discussed

special events. The city is also working internally to better manage coordination with the City's own Public Works Department coordination (e.g. better awareness of PW construction road closures). They would like other agencies to send their data into RIITS for LADOT's benefit.

Information of interest to LADOT includes: Ramp Metering data, data from the surrounding 20 cities, County data, and Metro data (including rail).

Freight community – as users to the system, they might be interested in data to support dispatch and routing. Localized issues like long-distance trains blocking intersections are particularly hard to react to. Freight is generally not an issue to traffic engineers unless it becomes an acute traffic problem (e.g. trains blocking intersections). Truck location information (scrubbed of proprietary information) might be useful for diversions, studies, etc. Gateway Cities COG is pursuing a pilot project along these lines.

Jorge Fuentes (Caltrans) noted the importance of standards for providing data to be used by agencies for forecasting, etc.

The liability aspects of data archiving is also an issue to be explored.

Is there documentation on agencies' access and use of the system? What is the level of awareness? (Do we have any data on the access to the system, e.g. public web hits and agency log-ons?)

3 Action Items

Karen Fleming to provide RIITS traffic/usage report data to IBI Group.

Karen Fleming to provide RIITS user information/registration information to interested participants.

IBI Group to investigate additional emergency management community contacts with prior interest or involvement in regional ITS coordination.

Metro

Attendance ITS

6/19/09

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Countywide Signal Priority

PROGRAM INTRODUCTION

Introduction

The Los Angeles County Metropolitan Transportation Authority (Metro) is constantly striving to improve regional mobility by increasing the efficiency and attractiveness of public transit throughout the region. As part of this endeavor, Metro has embarked upon an ambitious plan to enhance bus service along the County's most utilized transit corridors. One of the most promising tools available today to contribute to the success of the agency's service enhancement objectives is bus signal priority (BSP).

What exactly is BSP? In 2004, ITS America defined BSP as "an operational strategy that facilitates the movement of in-service buses through traffic signal controlled intersections". Simply stated, BSP is a means to grant buses preferential treatment at signalized intersections to reduce red light delay. It is important to note that signal priority is not synonymous with signal preemption. One of the major differences is that signal priority is designed to minimally alter signal operations as opposed to interrupting signal operations all together. Studies conducted in Los Angeles County and throughout the United States have demonstrated that signal priority can be implemented without having a noticeable impact upon cross street traffic.

Implementing BSP in Los Angeles County is a formidable task. There are 88 incorporated cities and many unincorporated areas within the county resulting in a diverse traffic signal control infrastructure. To address this challenge, Metro initiated the Countywide Signal Priority (CSP) Pilot Project in the late 90s that culminated in the development of a standardized countywide signal priority approach.

This introduction provides a brief overview of Metro's CSP program and a surface overview of the technology used to accomplish the program's goals and objectives. We will explore the history of the program, delve into the technological and operational approach, and discuss the nature of the multi-jurisdictional partnerships that are being established.

Countywide Signal Program History

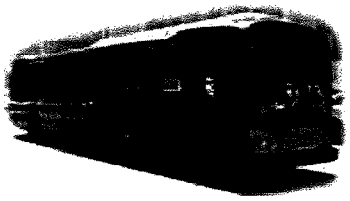
As part of its effort to test new Advanced Public Transportation System (APTS) technologies, Metro embarked upon a comprehensive effort to develop a bus signal priority system to be implemented on high ridership corridors within Los Angeles County. This effort, referred to as the CSP Pilot Project was initiated in 1998 and consisted of the design, development, deployment, testing, and evaluation of a signal priority system that could interface with the wide variety of the local traffic signal control systems owned and operated by various Los Angeles County jurisdictions. The overall goal of the pilot project was the development of a bus signal priority approach that would serve as an architectural blueprint for future multi-jurisdictional deployments. The principal objectives were to minimize delay experienced by buses and shortening round trip running times.

The CSP Pilot Project was a truly a collaborative effort bringing together multiple jurisdictions and transit operators to develop consensus on a single signal priority strategy with countywide applica-

bility. In February 2004, the system deployed as part of this effort debuted with the opening of Metro Rapid Line 710 on Crenshaw Boulevard. This event marked the first successful demonstration of signal priority operations across multiple jurisdictional boundaries in Los Angeles County.

Along the Crenshaw Boulevard corridor, 40 intersections in five different jurisdictions were targeted to receive CSP technology enhancements. Ultimately this project successfully demonstrated that signal priority technologies could reduce the time buses spend idling at red light traffic signals and significantly improve overall bus running times without adversely affecting cross street traffic.

In 2005, Metro embarked on the Countywide Metro Rapid Signal Priority Expansion Project, a follow up to the previous successful demonstration pilot. The scope of this system expansion was the deployment of signal priority along additional Metro bus corridors traversing through twenty-four jurisdictions. The focus of this first phase was to expand bus signal priority in conformance with the signal priority approach developed and tested as part of the original pilot project. The seven corridors included Pacific-Long Beach, Soto, Hawthorne, and Florence, Manchester, Garvey-Chavez, and Atlantic.



Metro has also begun to develop strategic partnerships with other transit operators in Los Angeles County to expand the implementation of CSP to additional corridors in the Gateway and San Gabriel Valley sub-regions. Additional municipal transit operator partnership discussions are underway to further expand the reach of the CSP program with further deployments anticipated in the near future. It is anticipated that by 2012, CSP will deployed at almost 500 intersections in 32 different jurisdictions in Los Angeles County.

The Technology

On-bus AVL unit generates Signal Priority request messages

The CSP technology approach is based on the concept of a "smart bus" capable of wirelessly transmitting signal priority request messages to local traffic signal controlled intersections. This approach is dependent upon three key pieces which include the on-bus system elements, a wireless communications infrastructure, and signal priority enabled traffic signal controllers.

On Bus Systems

The "smart bus concept" is dependent upon the ability of a bus to determine whether or not it is in need of priority and to initiate a request if priority is deemed necessary. This departs from the centralized signal priority approach which relies on a central system to make the priority request decision. The essential components of a CSP capable "smart bus" are an on board computer with sufficient logic to be able generate signal priority requests, a global positioning system (GPS) to provide accurate real-time location information, and a wireless radio capable of transmitting priority request messages. These three pieces together are responsible for generating priority request messages that are ultimately received by targeted local traffic control equipment without any human intervention.

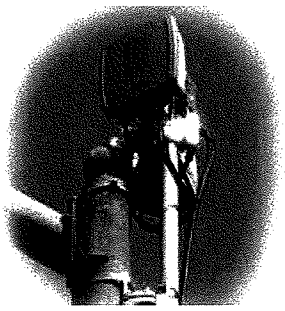
Tri-Band Antenna on the "smart bus"

Typically, Metro has installed a stand-alone unit on its dedicated CSP fleet; however, more recently,

Metro has funded several initiatives to utilize existing automatic vehicle location (AVL) equipment to meet the on-bus requirements of the CSP system. A standardized signal priority messaging protocol has been established that ensures that any on-bus system can be utilized to generate signal priority request messages if they have the features identified earlier.

Communications Infrastructure

The backbone of the CSP architecture is an IEEE 802.11b (Wi-Fi) wireless local area network (WLAN) that brokers communications between CSP equipped buses and intersections. Utilizing commercially available off-the-shelf hardware placed at strategic locations along a signal priority corridor, a ubiquitous wireless network is created that provides the necessary communications path for signal priority request messages to reach their destination at the appropriate traffic signal control cabinet.

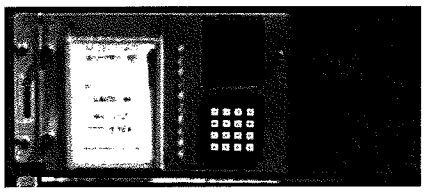


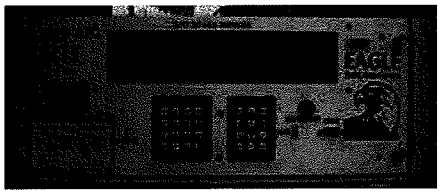
AP mounted to Traffic signal pole

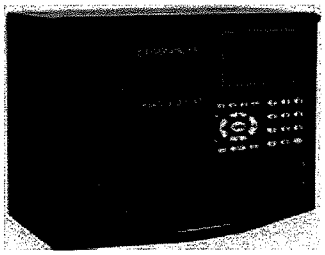
Wi-Fi was originally selected as the means to meet the CSP bus-to-intersection wireless communications requirements for a number of reasons, including its ease of implementation and interoperability, low maintenance burden, lack of ongoing lease-line costs, and its ability to meet the CSP system's speed and bandwidth needs. While Metro has and continues to investigate other wireless communications solutions, Wi-Fi continues to be the de-facto standard for the CSP program as it continues to expand.

Traffic Signal Control Hardware and Firmware

As discussed earlier, Los Angeles County has a very diverse traffic signal control infrastructure. One of the primary design objectives during the initial development of the CSP system was the ability to directly interface with the majority of traffic signal controllers in use throughout the County. To meet this objective, Metro has worked with a number of traffic signal control vendors and firmware developers, including the County of Los Angeles and the City of Los Angeles, to ensure CSP system compatibility countywide. To date, CSP can interface with 170E, 170ATC/HC11, 2070, ASC/2, and ASC/3 controllers. Furthermore, Metro has funded software development to make BI-Tran/McCain, Econolite, County LACO 4, and City of LA 2070 firmware CSP compatible.





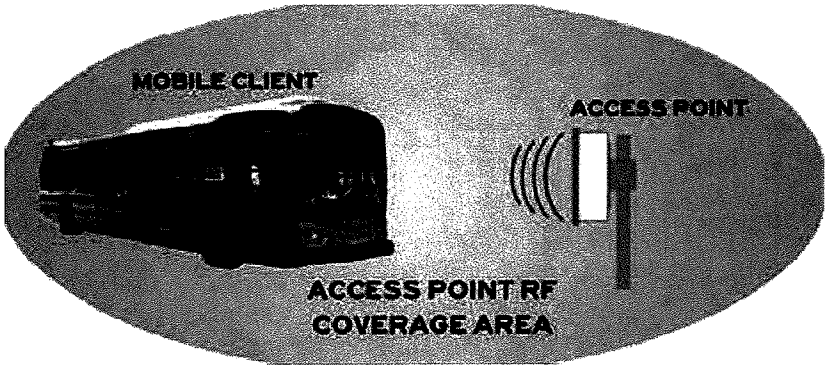


Common traffic signal controller types in use throughout the County

How It All Works

As a bus enters a CSP equipped corridor it associates with the WLAN that has been setup to provide corridor-wide wireless access. The bus is aware of its bus run assignment and operating schedule, and is constantly monitoring its location using GPS. As the bus approaches a signalized intersection it makes a determination whether or not it needs priority based upon a number of pre-configured parameters. If priority is warranted, the bus will send two messages to the WLAN. The first message sent is a Check-In that lets the intersection signal controller know that signal priority

is being requested and provides an estimated time of arrival (ETA). The second message sent is a Position Update generated five seconds after the original Check-In message. The Position Update is sent to provide a more accurate ETA as the bus gets closer to the intersection and to provide message redundancy.



Access point and mobile client in a CSP network.

Messages generated by the bus are routed through the WLAN to the traffic signal controller which then determines if and how signal priority will be granted based upon a number of rules established and agreed upon by Metro and its jurisdictional partners. Typically, only ten percent of the signal cycle is allocated to service a signal priority request in the form of an early green or green extension. As the bus clears the intersection, a Check-Out message is sent, which allows the intersection to recover any unused time.

Partnership is Key

As mentioned earlier, Los Angeles County is home to 88 incorporated cities and many unincorporated areas. Over the years, Metro has developed over a dozen strong signal priority partnerships within the region and is continuing its regional outreach efforts. The success of the program is not only dependent on the design and functional efficiency of the CSP approach, but also the participation and support of our jurisdictional partners. As such, Metro has worked throughout the region to ensure CSP is deployed as a cooperative effort with minimal burden on those local agencies responsible for traffic signal operations and maintenance.

Metro is also working with other municipal transit operators to further expand signal priority opportunities as part of a broader commitment to enhance local and regional transit services. Metro's pioneering efforts and commitment to the expansion of CSP has established a strong precedent for transit signal priority both here in Los Angeles County and throughout the nation.

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Information Exchange Network (IEN)

Multiple Corridor Server (MCS) Project – System Improvements

In 2001, TransCore developed the existing IEN software as part of the San Gabriel Valley Pilot Project in order to support a limited number of Agencies and devices. At this time, LA County and TransCore have begun work on the next phase of the LA County IEN System. The new development effort will increase the capacity of the IEN, make the distribution of data between Agencies more efficient, and add several new features to improve inter-Agency signal coordination. These improvements include the following at a minimum.

IEN MCS Software Build # 1 – Data Distribution

- **Increased System Capacity (IMPROVEMENT).** The current IEN software will be expanded to support the total number of Agencies and devices within LA County.
- **Data Throttling (IMPROVEMENT).** The IEN will be enhanced to allow administrators to control how much data is distributed to each member Agency. This change will make the IEN more flexible and allow it to support network links of different communication bandwidth.

IEN MCS Software Build #2 – MCS System Improvements

- **On-Demand Polling (IMPROVEMENT).** The IEN will be modified so that second-by-second data would only be requested from traffic control systems (TCSs) when an application window is open that requires that data. This change will greatly reduce the burden on both TCSs and IEN communications/network links.
- **Enhanced Command/Data Interface (CDI) (NEW).** Requirements for an enhanced CDI will be developed to collect more data from TCSs in support of the changes listed above. An enhanced CDI will also be developed between the IEN and the *TransSuite*® TCS. The new/improved IEN software will also continue to support the existing CDI versions previously developed by other TCS Vendors.
- **Automatic Detection of Inventory Changes (NEW).** A new feature will be added to automatically create new devices within the IEN as Agencies report them through their TCS command/data interface (CDI) programs. The IEN will also indicate which devices are no longer being reported so that administrative users can remove them.
- **Tracking IEN Component Status (IMPROVEMENT).** The IEN will monitor and report on the state of the various software components and network connections that make up the system. This will help administrators at LA County better maintain the IEN at each of the remote sites.
- **Cycle Lengths on the IEN's ATMS Map (NEW).** A new status filter will be added to the IEN's ATMS Map to allow users to compare intersection cycle lengths.

IEN MCS Software Build #3 – MCS Coordination Enhancements

- **Real-Time Time-Space Diagram (NEW).** A new application will be added to provide real-time, time-space diagrams of traffic moving through the arterial street network.
- **Automatic Detection of Signal Coordination Changes (NEW).** A new feature will be added to record communication state, timing mode, timing plan, offset, and cycle length changes for selected controllers. The IEN will compare the current coordination data with the previous week's data and alert users if this information differs.
- **Direction of the Main Street Movement (NEW).** The direction of "Main Street green" will be added to the intersection icons that are shown on the IEN's ATMS Map.
- **Data Filtering (NEW).** Filtering features will be added to the IEN user interfaces so that users can better focus on the Agencies and devices of interest to them.

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Minutes

To/Attention	Notes to File	**Date**	June 18, 2009
From	Randy Knapick Bill Delo	**Project No**	25839
		Steno	rjk
Subject	RIITS Strategic Plan - Outreach Meeting Minutes Metro Programs Metro Gateway Center Thursday, June 18, 2009 9:00 am		
Present	See attached sign-in sheet		
Distribution	Peter Liu (Metro Project Manger) Karen Fleming (Metro Project Lead) Attendees Don Murphy (IBI Group)		

Item Discussed **Action By**

1 Overview

This session provided an overview and discussion of the RIITS strategic plan oriented to internal stakeholders representing Metro programs.

2 Discussion

Following Peter Liu's introductory remarks, Karen Fleming provided an overview presentation about RIITS functionality and the objectives of the RIITS ITS Strategic Plan.

Al Martinez (Metro Transit Systems Engineering) stated that his perspective from bus operations is largely to feed data into the system. He said that there needs to be an effort to 'paint a picture of why RIITS is needed,' and communicate the value to various stakeholders.

What is the goal and the unique value of the system? Al said he needs personal clarification on what the value of RIITS is. All stakeholders need to understand what stakeholders need.

RIITS (and systems feeding RIITS) represents a significant investment in ITS infrastructure. The question for the strategic plan is – now what?

Item Discussed	Action By

There is a sense of a need for a RIITS marketing effort – to the stakeholder groups first – then possibly to the ISP community.

We should ask, from a stakeholder's perspective, what is the value of RIITS with respect to my 'normal' job.

Possibility to provide consolidated real-time information to the public – especially in areas where multiple transit providers operate like downtown LA. This may occur as the backend to a system like 511 or a station electronic display system.

Google Transit for LA is expected to go live next week.

Just having lots of data is not enough – what can be done with the data?

For a scheduler – the interest is less in real-time information to see what's going on than mining data for after-the-fact improvements to schedules and addressing operational issues. This speaks to potential opportunity for archiving functionality in RIITS. Peter Liu (Metro RIITS Program Manager) has been thinking about an archive data management system function for RIITS.

Data provided by participating agencies often has value to other agencies – (the altruistic argument for participation).

From a planning perspective – don't see a connection between RIITS and short- and long-range planning policies (e.g. goods movement project). Is the right outreach happening? Getting the right data? May lead to additional funding opportunities.

Web-based system is a value of the system.

Policy perspective (Peter) – initial vision was that internet access could bring real-time information to the divisions – more of an internal tool than a public information tool.

Roman Alarcon (Metro Bus and Rail Operations Control) – bus operations perspective – bus ops use it more of a management tool for the division. Future – would like to be able to run reports from RIITS. (Business Intelligence)

Is there a way to use RIITS to support Metro on-time performance info? Real-time information on performance metrics? Early/Late/Average/projected time to next timepoints/stops. Some reports available from ATMS; could be ported over to RIITS. The web interface is a convenience, but the benefit is INSIGHT into for example travel time performance relative to network.

Concerned about data latency/lag for dissemination of information to public agencies.

Possible introduction of Metro Rail data to improve multimodal coordination – however still need rail ops performance data (through Hastus).

Item Discussed	Action By

RIITS should be providing data synthesis – e.g. linking transit performance to network conditions.

Need to look into Metro Archiving policies. If used for customer complaints (usually within 72 hours), RIITS short-term archiving could be used.

Is RIITS providing raw data or does it synthesize? Can you run queries?

Steve Gota (Metro Planning – TSP Program) works with the regional TSP system. He notes that jurisdictions want data from Metro on when TSP is granted. They are less interested in using RIITS for TSP analysis right now because they don't have the capacity. However Steve can see how this would be useful in the future.

The original vision was to integrate with IEN to get real time intersection level performance data, and then into RIITS. However TSP needs transit position data for other metro bus operators – Santa Monica Big Blue Bus, Gardena, Culver City, etc.

RIITS is working with LADOT to get BRT data (second by second data) – all MetroRapid lines (for most of the lines – STMS GPS data will provide the rest of the coverage). All of them use LADOT's transponder system. These routes are part of TSP and have more accurate information.

Can RIITS be a bridge to bring TSP information (from Cities via IEN) to the transit operators?

A problem which 511 perceived is that it may be passed up by Google and other third party private sector initiatives. Which developments in the private sector, what is the long-term role of the public tools, especially if the Googles of the world are doing it better? Is RIITS middleware? If so, we want to minimize its role. Best to go into the plan with 'eyes wide open' of the potential of future private systems.

If transit agencies have the capability, and RIITS is easy enough, they might use if for schedule planning.

511 traveler information system integration – all want to avoid duplicative effort. 511 is tasked for providing traveler information, does RIITS represent a competing effort? Metro can do its own thing, but LA Safe is building 511.

Peter – note that RIITS is targeted primarily at interagency data sharing, not public communications – both in terms of intended purpose and due to technical issues (latency). Involvement of RIITS in 511 is related to providing CalTrans data, because CalTrans does not want to do it directly. RIITS should be thought of as a back-end tool for 511, not a competing front-end system.

The system should make data easy to retrieve – for RIITS, a benefit is

Item Discussed	Action By

that it summarizes data which reduces time for developer, also reduces risk for contractors – hesitancy to provide travel time data is mitigated because it comes from RIITS. RIITS does not have APIs (like Google), rather uses 'get' commands.
A query type tool to run customized reports drawing from the combination of data from multiple sources is a potential future option. For example, how is transit performance with respect to prevailing traffic conditions? How much delay was incurred on arterials as a result of an incident?

Need a service catalogue – what services do the agencies provide via RIITS (fields, etc.) that make the system easier for developers to use. Use more like an index rather than throughout the documentation.

From a technology perspective, RIITS is a fairly closed system. Some feel that RIITS access is difficult – need to log in, etc. Can it be made more accessible to users and developers? Are there ways to open up the system so that developers have more control and latitude with information (like Google)? Is awareness of, and access to, the system as extensive as we think?

Peter notes the sensitivity of information that is being shared (e.g. security concerns). Data may need to be scrubbed before dissemination.

There are tradeoffs of single interfaces vs. customized agency interfaces in terms of functionality and maintenance.

The growing role of private data sources (eg Inrix) was also discussed. Future travel time predictions for 511 may be bought from TeleAtlas.

There are things that nobody provides in terms of regional information, and providing it in terms that people can understand (e.g. the El Toro Y) – use it to translate positions of landmarks, neighborhoods, etc. Would allow for more precise geographic delivery of public information through 511 or private services.

Also from a 511 perspective, what can RIITS provide in terms of bus stop numbering, for better transit traveler information on a stop-by-stop basis?

RIITS as a possible interagency information repository for emergency management.

3 Action Items

IBI Group was asked to examine relevant ISO 2000 Standards

ITS Strategic Plan 6/18/09

NAME	DEPT.	PHONE
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Minutes

To/Attention	Notes to File	**Date**	June 19, 2009
From	Randy Knapick Bill Delo	**Project No**	25839
		Steno	rjk
Subject	RIITS Strategic Plan - Outreach Meeting Minutes Metro Information Technology Metro Gateway Center Friday, June 19, 2009 2:00 pm		
Present	See attached sign-in sheet		
Distribution	Peter Liu (Metro Project Manager) Karen Fleming (Metro Project Lead) Attendees Don Murphy (IBI Group)		

Item Discussed

1 Overview

Peter Liu introduced the RIITS strategic plan, noting the vision to migrate RIITS in-house. Karen Fleming provided an overview of the RIITS functionality and strategic plan objectives.

Randy Knapick discussed some of the issues raised to date by end user stakeholder groups, including:

- Potential for enhanced functionality (e.g. filtered data feeds, database queries)
- Increased agency participation and data feeds
- Potential of RIITS as a regional data archive
- Desire for reduced system latency/increase response time
- Potential role of private data sources, services, and/or third-party application developers
- The role relative to, and integration with, other regional systems (e.g. IEN and 511)
- Potential as a regional transportation event reporting tool
- Potential to support congestion pricing and/or 511

Randy then suggested some ways that these issues may impact Metro from an IT perspective:

- Enhancements to address latency/speed or other current system shortcomings
- Migration to in-house IT support and/or development
- Hardware and infrastructure needs as the system expands

Item Discussed

- Implications of hosting a long-term data archive
- Metro IT resource requirements
- Level of cooperation and resources from partner agencies and sustained support
- Regional standards for data and interfaces
- Network security

The project team is conducting this meeting to introduce the strategic plan, gain a baseline understanding of the IT perspective. As user group needs and future scenarios are developed, the IT group will be consulted again to understand the technology implications of these scenarios.

2 Discussion

Vincent – Cloud computing (web service) model seems to be the one that suits RIITS. Metro has a data center that can support the system from an infrastructure perspective. However, based on resources it may be better to continue to outsource development.

Vincent wants to try to make the system as open as possible, and feels Metro's in-house IT resources can provide a very competitive model.

Vincent asked about the nature of interfaces with other agencies. Peter discussed the existing interfaces and the intent of RIITS to serve as a real-time data clearinghouse. He noted that Metro plans to develop a data archive management system.

RIITS system development is currently outsourced to the consultant. Peter envisions bringing this work in-house to Metro. Once the site moves into production, it may be better to bring the work in-house to Metro.

A policy issue related to data archiving is determining which data is saved and for how long. This will drive the requirements for the archive from the IT perspective.

Peter expressed interest in developing a relationship with an academic institution to help with data mining and analysis of archive data (with Metro providing the actual archiving function, and possibly using the tool directly for performance measurement and other planning analysis purposes).

Daniel - Metro wants to improve data speed, including improved polling speeds and reduced latency. The existing, large agencies (LA City, LA County, Metro, Caltrans) are the major traffic providers. Additional smaller agencies (e.g. Long Beach Data, Gardena) are a drop in the bucket in comparison.

Daniel - Think that selling data will be hard – better to strip out sensitive data ("sanitize" it) and provide it to third parties for free. Peter notes that for RIITS, the goal of data received from operators is to help them address regional cross-jurisdictional congestion issues. "Making money," even recovering costs are secondary to the primary goals.

Daniel – Other agencies should be involved in developing standards for the system that work for all (adopting NTCIP?).

Joe – Metro Communications is involved in presentation of information to the public through the metro website and is working with the So Cal 511 network. He sees more agencies going toward open developer interfaces to support third-party application development.

Metro envisions updates to the RIITS website. Right now the website is completely static, but Metro does not like that for the future. If the RIITS webpage moves in-house, Joe said that IT would produce website for departments using information that they provide. Generally a

Item Discussed

marketing exec for each department is involved in website development. ADA compliance has to apply to any website developed by Metro.

A complexity of the system is that Metro needs to maintain IT systems and interfaces with participating agencies. Even if RIITS hardware is located at the partner agency's site, at some point there is an interface between RIITS and the domains managed by partner agencies. The Metro IT group generally knows which peers to go to at other agencies for maintenance and troubleshooting issues.

Many of the smaller agencies contract out their IT (e.g. Foothill Transit). Resources and dealing with IT third-party vendors may be an issue. Even LA County DOT dos not have staff available all the time, especially on weekends and off hours. Sometimes partner agency facility access by the RIITS consultants is difficult to obtain in a timely fashion due to coordination challenges and limited staffing hours.

A question was raised about the migration/IT plan for the So Cal 511 system.

Bill proposed a RIITS IT user group in the future to discuss issues, maintenance plan updates (akin to the Configuration Management committee).

Other systems also should have strategic visions (e.g. ATMS) – we should take these into account. For example, in ten years ATMS will be replacing onboard equipment, updating polling rates, and expanding with growth of the bus and rail fleets.

Also consider the lifecycles of hardware and system components (e.g. replacement plans and capital requirements for this).

3 Action Items

Karen Fleming will provide IBI Group with a copy of the RIITS IT Maintenance manual, which includes system diagrams, hardware locations, etc.

IBI Group will investigate proposed plans for a third-party developer portal as part of the 511 project with the 511 team.

IBI Group will investigate other long-range plans or visions for other systems in the region like 511 and IEN to inform this effort.

Metro

RIITS Strategic Plan
Outreach meeting

June 19, 2009

RIITS
LOS ANGELES COUNTY

C21

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Metro

RIITS Strategic Plan

Outreach meeting

June 19, 2009

RIITS

C22

Name	Title	Agency	Telephone Number	E-mail
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Minutes

To/Attention	Notes to File	**Date**	June 22, 2009
From	Bill Delo	**Project No**	25839
		Steno	bd

Subject RIITS Strategic Plan - Outreach Meeting Minutes
Goods Movement
Gateway Cities Council of Governments
Monday, June 22, 2009 9:00 am

Present See attached sign-in sheet
Eric Shen - Port of Long Beach (Participated via Teleconference)

Distribution Peter Liu (Metro Project Manager)
Karen Fleming (Metro Project Lead)
Attendees
Don Murphy (IBI Group)

Item Discussed	Action By

1 Overview

This session provided an overview and discussion of the RIITS strategic plan oriented to stakeholders representing goods movement interests.

2 Discussion

Following Peter Liu's introductory remarks, Karen Fleming provided an overview presentation about RIITS functionality and the objectives of the RIITS ITS Strategic Plan.

Patty Senecal (Int'l Warehouse Logistics Assoc.) noted that, due to regulations, the trucking industry can be severely impacted by incidents/events. She asked if RIITS had information on freeway chases.

Eric Shen (Port of Long Beach, POLB) noted that the POLB maintains very little tracking information with regard to truck movements. The clean truck program will introduce more port-owned trucks that will be equipped with on-board RFID tracking devices. However, trucks outside this program will not be equipped with the tracking devices. In reality the equipped trucks would represent a very small portion of the total and

Item Discussed	Action By

would have limited value from a tracking standpoint.

Kerry Cartwright (Port of Los Angeles, POLA) noted that POLA is implementing a clean trucks program and would also have a limited number of trucks that would be fitted with RFID tracking devices.

Jerry Wood (GCCOG) and Patty Senecal noted that any tracking of truck movements would trigger privacy concerns from the trucking companies given the potential for government agencies to use the data for taxes and fees beyond the traffic information purpose.

The trucking industry has been exploring the potential for installing voice-activating directional and traffic information systems inside trucks. This would allow for hands-free operation and information distribution.

There is a strong need for real time information for truck drivers. A key issue is how to disseminate information to the drivers when they are on the road. Potential sources include an on-board system, through truck company dispatchers and through the ports.

Another aspect in the distribution of traffic data would be the capability to provide truck drivers with alternative routes or suggestions for alternative routes with travel time information. Drivers need to know that the alternatives actually provide a less congested or faster route, or if the trip should be delayed given traffic conditions and the presence or absence of alternatives routes.

The County of Los Angeles is about to expand implemention of their traveler information system that would provide personalized freeway traffic information to subscribers. This system has been developed by the County and their consultant, Iteris. Members of the public are permitted to access the system, which provides information in Los Angeles, Orange, San Bernardino, Riverside and San Diego counties.

Several attendees noted the potential benefits of dispatchers, port staff and truck drivers to be able to access real-time video feeds of traffic conditions along specific freeways. The visual presentation of information is important for the users to fully understand traffic conditions.

The GCCOG Goods Movement ITS Integration Plan and the SANDAG Priority Corridor CVO Planning Study serve as good guides for the types of ITS improvements that would be beneficial for goods movement operations.

It was acknowledged that trucker information needs are different than private autos. Truck trips tend to be very time-sensitive and travel time information is very valuable for the industry.

The implementation of traffic information kiosks at truck stops and fueling facilities was suggested to assist long-haul and out-of-state truckers entering the region. These vehicles may not be equipped with information sources in their vehicle, so outside access to traffic information is key.

Item Discussed	Action By

3 Action Items

Metro to follow-up with BNSF and Union Pacific representatives for a separate one-on-one meeting to discuss freight needs related to RIITS.

IBI Group to review GCCOG Goods Movement ITS Integration Plan and SANDAG Priority Corridor CVO Planning Study.

Metro

RIITS Strategic Plan
Goods Movement Outreach meeting
June 22, 2009

RIITS Los Angeles County

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Minutes

To/Attention	Notes to File	**Date**	July 6, 2009
From	Nick Ayars	**Project No**	25839
		Steno	na

Subject RIITS Strategic Plan - Transit Managers Meeting Minutes

LA Metro
Wednesday, July 1st, 2009 1:00 pm

Present See attached sign-in sheet

Distribution Peter Liu (Metro Project Manager)
Karen Fleming (Metro Project Lead)
Attendees
Don Murphy (IBI Group)

Item Discussed	**Action By**

1 Overview

- MTA staff from the Communications Division gave an overview of a new transit data site where developers and other interested parties can access transit data in various formats. This data includes schedule and GIS information. It is hoped that this will help software developers create software applications that provide users reliable transit data (metro.net/developer). Normally this data was provided through public records requested, but can now be accessed easily via the webpage. (Internal discussions with Metro indicate that it may be important to make the distinction between the data site and RIITS)
- Peter Liu provided an overview of the objectives of the RIITS Strategic Plan effort.
- Desiree provided an overview of the current RIITS network and future additions and improvements, including the addition of the Blue and Gold LRT lines. Basic functions discussed included:
    - RIITS website features for Public and Agency users
    - Event data
    - RIITS data feed
- The agencies were curious as to if the public could obtain bus route

Item Discussed	Action By

closure/detour information via the RIITS website. It was indicated to them that this information can be accessed via RIITS.

- There was a solid level of general interest in the presentation with some questions during Desiree's presentation on RIITS functionality. At least two agency representatives specifically requested the opportunity to view the website and obtain better knowledge of the bus data queries and event data and how they are coordinated between the modes of transportation as presented in real time. There was interest from Metro Rail Operations, Gardena Transit, Montebello Transit and Long Beach Transit.
- We will need feedback from agencies regarding their view of the RIITS program. Discussion guides were provided to the various attendees for them to review and pass onto their staff. Desiree indicated she would follow up with the transit agency managers to see who we should discuss RIITS issues with at their respective agencies.

2 Action Items

Follow-up discussion with Peter/Desiree following the meeting led to the agreement that some agencies may be contacted by phone if they have sound knowledge or RIITS and their input is straight-forward, while others may be better served by a face-to-face meeting. Desiree would assist in making the determination of which group agencies fall into during her follow-up discussions with the in the 1st or 2nd week of July.

General Managers' Group Meeting
Sign-In Sheet

C29

	Name	Agency
1	ART IDA	CULVER CITYBUS
2	MARTIN GOMBERT	COMMERCE
3	Bob Hildebrand	Cardena
4	DAVIDE PUGLISI (MIKE CANNELL)	METRO OPS (RAIL)
5	Randy Floyd	AVTA
6	THERESA CLARK	NORWALK TRANSIT
7	Andre Colaiace	Access Servi n
8	Susan Lipman	Santa Clarita Transit
9	MARK MACONNEL	METRO
10	JAMES LEFFON	CALDOT
11	PAUL TAYLOR	Metro
12	Kim Turner	Torrance Transit
13	LAN-CHI LAM	METRO - COMMUNICATIONS
14	Maya Enfield	" "
15	Bryan Kenaghan	LB Transit

General Managers' Group Meeting
Sign-In Sheet

C30

	Name	Agency
16	Tony Moreno	City of La Mirada "La Mirada Transit"
17	Martha Butler	METRO
18	KATHY DRAYTON	METRO SFV
19	Carol Inge	Metro
20	Aurora Jackson	Montebello
21	FIONA DIAZ	BCT
22	Jim Mills	Torrance Transit
23	Corie Hill	Santa Clarita Transit
24	ROGER MOLIERE	METRO
25	TERRY MATSUMOTO	MTA
26	Paula Faust	Metro - SGV
27	Samantha Blackshire	Culver City Bus
28	DAVID FEINBERG	SANTA MONICA'S BIG BLUE BUS
29	David Suarez	foothill Transit
30	Andy Kulkarni	Foothill Transit

General Managers' Group Meeting
Sign-In Sheet

C31

	Name	Agency
31	David Reyno	Foothill Transit
32		
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Minutes

To/Attention	Notes to File	**Date**	July 14, 2009
From	Nick Ayars	**Project No**	25839
		Steno	na

Subject RIITS Strategic Plan - CM Committee Meeting Notes

LA Metro
Wednesday, July 14th, 2009 1:30 pm

Present See attached sign-in sheet
Carri Sable - Long Beach Transit (Participated via Teleconference)

Distribution Peter Liu (Metro Project Manager)
Karen Fleming (Metro Project Lead)
Attendees
Don Murphy (IBI Group)

Item Discussed	Action By

1 Overview

The RIITS Strategic Plan project team met with members of the RIITS Coordination Management Group to provide an overview of the RIITS Strategic Plan and ask the group for input on future RIITS capabilities.

2 Discussion

LADOT is currently one of the primary data providers for RIITS. Currently they receive little feedback about loss of data from the RIITS network and operators can be frustrated if communications between LADOT and the RIITS network is down. LADOT would like to see a daily status report regarding the data flow so they can engage in proactive maintenance. They would also like to see independent links to RIITS for each of the data providing agencies so if one link fails the system will continue to operate.

LADOT stressed that proactive system monitoring is important to help power failure recovery. They would also like the ability to approve ISP users accessing their data on a one by one basis. Would also like to see a RIITS map that is easier to read and the ability to subscribe to individual data feeds (e.g. arterials and intersections). While a lot of data is pushed into RIITS there is not much feedback, LADOT would like to see more feedback from the

Item Discussed	Action By

network.

CALTRANS District 7 is currently happy to continue sharing data and is supportive of future RIITS improvements as long as there is no interference with operations. District 7 is currently looking at new maintenance and operations tasks regarding RIITS.

Long Beach Transit would like RIITS to provide notification when data is not being received. Additionally, they would like to receive feedback on how useful their data is to other agencies. Due to the RIITS interface there is currently lag time which results in the data displayed via RIITS being fairly stale. LBT was also concerned with the current RIITS map, saying that it is too cumbersome and not user friendly. They are looking forward to being able to use the redesigned map more often.

Rex Gephardt (Metro Rapid) would like to see live RIITS demonstrations to transit operators in order to spark interest in the program. If RIITS is able to capture average transit vehicle transit speeds along arterial segments the data could be very useful for scheduling purposes.

3 Action Items

None.

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Minutes

To/Attention	Notes to File	**Date**	July 16, 2009
From	Randy Knapick	**Project No**	25839
		Steno	rk

Subject RIITS Strategic Plan - Outreach Meeting Minutes
Transportation Policy, Planning, and Funding
Metro Headquarters
Thursday, July 16, 2009 10:30 am

Present See attached sign-in sheet

Distribution Peter Liu (Metro Project Manager)
Karen Fleming (Metro Project Lead)
Attendees
Don Murphy (IBI Group)

Item Discussed	**Action By**

1 Overview

The purpose of this breakout session was to initiate a dialogue regarding funding needs and opportunities for RIITS, particularly with respect to Metro's Long and Short Range Transportation Plans (LRTP and SRTP respectively).

2 Discussion

Peter Liu provided an introduction to the RIITS strategic plan.

Karen Fleming provided a brief overview of highlights from the RIITS Business Plan. She noted the consistency of the RIITS mission statement and goals with Metro policy, the growth in RIITS participation by regional agencies, and the near-term objectives for RIITS enhancement, integration, and expansion.

Karen also discussed RIITS' existing funding mechanism, $1.3 million annual funding through the Long Range Transportation Plan indexed to inflation. Additionally LA SAFE contributes approximately $100k per annum to support its additional 24/7 system availability and maintenance requirements.

Item Discussed	Action By

Randy summarized three ways in which RIITS relates to Metro's planning and policy activities:

1. RIITS is the Los Angeles County Regional ITS Architecture. It is an ITS program administered by Metro and is responsible for Metro's Intelligent Transportation Systems Policy. Consistency and self-certification is required by ITS project proponents to use federal funding.

2. RIITS represents an investment that addresses regional Transportation System Management and Operations (TSMO) goals by providing agencies with a tool that allows them to better manage the network.

3. RIITS has value to the Metro planning process which includes performance measurement, project/corridor evaluation, and regional transportation analysis.

Heather Hill reviewed the status of RIITS funding in the draft Long-Range Transportation Plan. Looking at the latest numbers, RIITS is programmed for $38.1 million (2009 dollars) over the 20-year plan horizon. Heather noted that this is slightly higher than the $36.3 million last Spring due to updated inflation assumptions in latest model run.

Heather stated that in her opinion the RIITS program has regional value, and that the RIITS strategic plan should help to emphasize this value to a policy maker audience.

Heather shared her advice for preparing the strategic plan in a manner that supports policymaker understanding and supports future requests for funding:

- Assess unmet needs over the next 10 years – exactly what improvements will be needed. Heather showed example from the Metro rail program from the SRTP.

- Develop a conceptual cost estimate for each program element. Use a current-year dollar estimate for each component.

- Have the inventory and cost estimates prepared before the development of the next SRTP (Spring of 2010, assuming the LRTP is approved this fall).

- After the unconstrained list of 'wants' is identified, the RIITS team should be specific about priorities for a fiscally-constrained program. Initiatives can be vetted with CM committee, agency partners, other stakeholders, etc. to determine these priorities.

- Promote marketing elements of the plan to get increased attention about the applications and value RIITS can provide. For example, if LA Times.com is using RIITS data, Metro should take some credit for that. (Perhaps require data source acknowledgement as part of interagency/ISP agreements?)

Item Discussed	Action By

Heather noted that the LCD monitors in the Metro lobby have helped to create visibility within Metro.

- Emphasize the positive technical aspects to Metro, such as the ability of a data archive to be used for before and after analysis, performance analysis, etc. It also helps if this work is on the leading edge from a national perspective.

- Be specific about the benefits, and differentiate between the short- and long-term benefits. (i.e., How quickly can Metro and partner agencies realize the return on investments?)

The LRTP defines System-Level Performance Measures and Project-Level Performance Measures. Heather referenced page 91 of the draft LTRP technical document of the LRTP (system measures) and page 99 (project measures).

Randy noted the significant value to Metro of pervasive data collection and storage through a RIITS data archive is the ability to better capture multimodal performance metrics and project benefits, e.g. congestion and delay due to non-recurring event and the impacts of more robust transportation management approaches.

Randy noted that the current static Performance Measures cannot really effectively capture real-time operations phenomena very well, even though congestion-related delay and TSMO investments are an increasingly important part of transportation need and benefits.

Karen asked about the definition of the Short Range timeframe. Heather responded that short range is defined as 5 years typically, but the current SRTP plan was extended to 10 years because of a funding crunch similar to that which the region is currently experiencing.

Heather asked at what point in time the RIITS data archive could benefit before-and after studies and regional modeling. Peter replied that this was likely a long-term benefit but that the federal congestion reduction pilot corridors were drawing a lot of attention.

Randy suggested that the RIITS data “archive” might be renamed to give it a more active-sounding name (e.g. “performance measurement database”). “Archiving” suggests that we are “mothballing” data and may not be as compelling to a policy or stakeholder audience.

Heather recommended focusing on these two current congestion reduction corridors as short term pilot implementation projects to expedite the realization of benefits and demonstrate the proof of concept.

Heather requested that the team include Stacey Alameda in future RIITS meetings to continue to feed information up to Heather and involve RIITS at critical LRTP and SRTP decision points.

Heather recommended that the RIITS ‘strategic plan’ be renamed. ‘Strategic’ in Metro Countywide Planning parlance means ‘unfunded.’

Item Discussed	Action By

(as an example, see highways example of unfunded project wish lists in the SRTP, pp 30-31.) Heather suggested "Business Plan" or something similar.

Karen asked about the status of the Short-Range Transportation Plan update. Heather indicated that there is nothing in the works yet – all energies are focused on the Long Range Plan approval. SRTP would be a follow-up effort next Spring.

For the draft LRTP, Heather requested a current list of RIITS unmet needs – Karen should communicate this to Stacey to get it in the plan. This information will be updated after the board adopts the plan, so it should be provided by mid-August.

Heather recommended that the detailed RIITS strategic/business plan be ready by Spring 2010 to align with Metro's LRTP/SRTP processes.

Because RIITS receives funding through the LRTP it is ineligible for the Call For Projects.

Heather suggested that the $100 administrative fee for ISPs to access RIITS data may be too low. Peter discussed the history of this low fee, specifically how the Metro board felt that wide dissemination of RIITS data would serve a public good and should be encouraged.

Ashad Hamideh asked about the possibility of public private partnerships. Peter responded that in the early days of RIITS, the national experience was suggesting that PPPs were not a promising source of alternative revenue for ITS. However RIITS does partner with private entities (e.g., ISP) in disseminating information.

Ashad would like to see the strategic plan address alternative funding/grant sources (homeland security, energy, housing, etc.) for various program components.

Ashad asked if the project can assess how pioneering RIITS is for performance measurement on a national scale, and how this might translate into funding/demonstration grants.

Gloria Anderson noted that there is a website for searching for all federal grants – though it is time consuming.

Metro

RIITS Strategic Plan
RIITS Policy Outreach meeting
July 16, 2009

RIITS

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Minutes

To/Attention	Notes to File	**Date**	July 23, 2009
From	Nick Ayars	**Project No**	25839
		Steno	na

Subject RIITS Strategic Plan - Public Safety Stakeholders Meeting Notes

LA Metro
Wednesday, July 23rd, 2009 1:30 pm

Present See attached sign-in sheet

Distribution Peter Liu (Metro Project Manager)
Karen Fleming (Metro Project Lead)
Attendees
Don Murphy (IBI Group)

Item Discussed	**Action By**

1 Overview

The RIITS Strategic Plan project team met with public safety stakeholder to provide an overview of the RIITS Strategic Plan and ask the group for input on how future RIITS upgrades could benefit their operations.

2 Discussion

Access to onboard transit cameras was raised by LAPD Emergency Operations officers – downloads are currently done at the terminals. Perceived as useful for hostage situations, etc. RIITS team will talk with Bus Operations about this. Same question regarding rail station and system cameras. Chuck explained that rail station video is available to police units with internet access. Currently station video is archived for 20 days; onboard cameras for 72 hours. Incident data can be stored for up to one year.

Julia (LA Port Police) would like to integrate RIITS data into their agency GIS map. RIITS does not currently have a GIS data output but the XML feed could be integrated and provide map information. She was particularly interested in integrating information about nonworking traffic signals.

Caltrans does not want to give out traffic video that can't be controlled –

Item Discussed	Action By

therefore they only currently give 100 of 400 cameras. RIITS could request that video be given unless Caltrans turns them off. Don differentiates between public dissemination and dissemination to law enforcement/operations agencies. Have a follow-up discussion with Caltrans on options for expanding video sharing.

RIITS does not currently have access to PTZ (Pan-Tilt-Zoom) features of cameras through the four existing rail feeds – the system is simply acting as a conduit and does not 'interfere' with operations. Agencies could contact the operations center directly if they would like access to PTZ features. This would still be controlled through the EOC but contacting agencies could be fed the video stream.

Emergency management stakeholders have the desire to be able to control video to assess and manage incident scenes. RIITS can look into it as a potential future features. A participant noted that WMATA has this ability currently.

Don notes that the lack of standardization of camera control systems is a complicating factor. Operationally/institutionally, who controls where the camera is pointing during an event. It would also be useful to know who the camera owner is, so that they can be contacted in the event of an emergency situation.

Jesse – FHWA – their primary interest is in event information – e.g. I-5 Tunnel truck fire, wildfires. In these events, FHWA and FTA get calls from D.C. for status information. Jesse is looking to move away from having to make phone calls to evaluate situations, up to and including providing headquarters with access to the tools.

Additionally, Jesse states that FEMA wants information, e.g. road closures in order to relocate equipment. This suggests that having some graphical representation and event information in road closures would be useful. FEMA needs this information in real time. For wildfires, FEMA found that commercial ISPs were simply not reliable – e.g. showing free flow on freeways that were closed. Points out how under emergency situations these everyday tools can fall short.

Karen illustrated the RIITS event entering tools, including the ability to draw events on the map, commenting features, etc. A question was asked if it was redundant to the CHP system [maybe we need to investigate police CAD interfaces?] Karen responded that this information is supplemental to CHP data. With new map, Karen states that it should be easier to view additional detail on events.

What would make RIITS more useful to EM agencies?

- Strategic – Situational awareness – like Boston – more cameras, more data, secure access. Would like to access secure information from a portable device in the field

- Tactical – on the subway car, outside the bus, etc. – want to be able to get access to video and as much information as possible before they go into a situation.

Item Discussed	Action By

- Julia (LA Port Police) would like to see more data provided through the XML feed.

Peter notes that RIITS can facilitate a C2C connection – from the emergency management centers, it's possible to disseminate to units in the field. However, incidents are often run from field commanders or field control centers.

Currently LADOT event data is provide in a text format, it was noted that it would be helpful if it could be provided in GPS (or another mapping) format.

For emergency management purposes – security is very important. Perhaps there is incident-level security functionality that needs to be addressed? Don noted that the Configuration Management Committee formally manages access and changes through (unanimous) vote.

What is practical in terms of tool usage and data entry during an emergency? If manual text entry does not work, maybe more automated interfaces are needed. Don notes that operating agencies may have pre-defined codes for event types that could be entered into the system.

Some emergency management agencies already have WebEOC for interagency incident command.

Maybe specific incident types get pushed back and forth if they are of mutual interest (e.g. major freeway incidents).

The stakeholders feel that aerial basemapping would be useful based on their needs and the information it can provide.

3 Action Items

Metro

RIITS Strategic Plan
Security, Emergency Management, and Incident Response Outreach meeting
July 23, 2009

RIITS
LOS ANGELES COUNTY

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Metro

RIITS Strategic Plan
Security, Emergency Management, and Incident Response Outreach meeting
July 23, 2009

RIITS LOS ANGELES COUNTY

C43

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Appendix D – Workshop Summary and Presentation Materials

RIITS Strategic Plan Stakeholder Workshop Initiative Ranking and Comment Summary

Candidate RIITS Initiatives	Interest Level Ranking	Stakeholder Comments
REGIONAL DATA MANAGEMENT		
Filtered Data Feeds & Custom Queries: Provides customization and presentation of RIITS data that is tailored to the needs of a specific participating agency – e.g. filtered data streams, event alerts for items of interest, or development of customized reports.	Low: Med-Low: Med: 2 Med-High: 3 High: 6	LASD and Port Police feel this is an essential tool for incident management and early warning. The information should be scalable to the affected area for manageable analysis. GCCOG would like to see two way feedback and requests that private industry information is protected.
Travel Forecasting/Modeling: Predicts future conditions on the transportation network minutes, hours, or days in the future based on real-time and historical condition information.	Low: Med-Low: Med: 3 Med-High: 3 High: 5	GCCOG says that the precision of the models is important especially in regards to SB375. LASD states that models can enable emergency operations planning, providing the models are valid/accurate. Sensitivity needs to be addressed.
Regional Data Archive: Provides long-term storage of transportation operations data that is currently only available in RIITS on a transient basis.	Low: Med-Low: 1 Med: 1 Med-High: 3 High: 6	GCCOG believes that this data is important for VMT analysis (SB375) and would like to know what type of data will be recorded and how precise will it be? LASD sees this feature as a core enabling capability. Port of LA mentioned that content quality of the data is very important.
Performance Measurement: Provide functionality to support "Total Transportation System" performance measurement to support analysis of multimodal corridors and benchmarking against regional/agency mobility, safety, and environmental goals.	Low: Med-Low: 1 Med: 2 Med-High: 2 High: 6	GCCOG would like to know how performance will be measured and if VMT reduction can be measured. SCAG says this meshes well with their policies and performance measures.
OPERATIONS SUPPORT		
Regional Event Reporting: A real time, regional platform for transportation system incident/event sharing across the multimodal network, to assist with operations and incident management	Low: Med-Low: Med: Med-High: 1 High: 10	Port of LA believes this initiative is critical to crime incident reporting. GCCOG states that this is very useful for the logistics industry, but information must be very precise and timely to be useful. Alternative routes and their availability should be made available. LASD believes this should be integrated with pub safety information at multiple domains.
Enhanced Situational Awareness: A real-time system to provide information on the state of the multimodal transportation system, combining traffic, transit, incident data video, and other inputs in a robust map-based platform	Low: Med-Low: Med: 1 Med-High: 3 High: 7	Jerry from GCCOG would like clarification on what this means and how this will be useful and valid. LASD believes that would be valuable to integrate with LA County Enterprise and GIS platforms. This is a valuable tool for incident management.

Candidate RIITS Initiatives	Interest Level Ranking	Stakeholder Comments
Regional Video Sharing: A regional platform to consolidate and distribute real-time transportation video among participating transportation and emergency management agencies.	Low: Med-Low: 2 Med: 1 Med-High: 3 High: 5	Both LASD and LA Port Police believe this would be incredibly useful in incident/emergency operations management. GCCOG would like to see this feature eventually send data to their future sub-regional TMC. CALTRANS points out that matching incentive funds need to be provided to participating agencies.
INTEGRATION OF REGIONAL NETWORKS		
Data Consolidator - So Cal 511: Serve as a back end to the 511 regional traveler information system, providing a 'one stop shop' for regional transportation system data from multiple agencies.	Low: Med-Low: 1 Med: 5 Med-High: 1 High: 4	GCCOG believes this data will be very useful so long as it is provided in real time.
Common ITS Field Device Broker: Facilitate the exchange of data among regional ITS systems and shared field equipment. *Example: Display Metro Bus service alerts on a electronic message sign within an adjacent Metro Rail station.*	Low: Med-Low: 2 Med: 2 Med-High: 4 High: 3	CALTRANS wants this to incorporate standard compliance in policy making decisions to promote technology that meets or exceeds standards (National ITS Architecture). SCAG says that a low cost, effective method to convey info is through Twitter.
Data Consolidator - LA Congestion Pricing: Serve as a back end to provide transportation system condition information to support operations and dynamic tolling for the MTA freeway congestion pricing program.	Low: 1 Med-Low: Med: 5 Med-High: 1 High: 3	
Regional Portal ISPs & Developers: Provide a regional data portal for private and third-party Information Service Providers and application developers to provide timely, consistent traveler information through diverse channels.	Low: 2 Med-Low: Med: 6 Med-High: High: 3	Jerry from GCCOG would like clarification on what this means and how this will be useful and valid. LASD believes that would be valuable to integrate with LA County Enterprise and GIS platforms. This is a valuable tool for incident management.

RIITS Strategic Plan
Stakeholder Workshop
Thursday, September 17, 2009, 1:30-4:00pm

AGENDA

1:30-1:45 **Welcome and Introductions**
- Introduction/Meeting Logistics
- Welcome Messages
- Self-Introduction of Participants

1:45-1:55 **Objectives and Overview**
- RIITS Strategic Plan Overview
- Workshop Objectives

1:55-2:10 **Strategic Opportunities for RIITS**
- Emerging Themes
- Introduction to the Candidate Initiatives
- Discussion Objectives and Questions

2:10-2:45 **Discussion: Regional Data Management Initiatives**
- Introduce Candidate Initiatives
- Open Discussion

2:45-3:00 **Break**

3:00-3:25 **Discussion: Operations Support Initiatives**
- Introduce Candidate Initiatives
- Open Discussion

3:25-3:50 **Discussion: Integration of Regional Networks Initiatives**
- Introduce Candidate Initiatives
- Open Discussion

3:50-4:00 **Wrap-Up and Next Steps**
- Review Major Points of Discussion
- Next Steps

4:00 **Adjourn**

Please return your completed survey/comment sheet before you leave today. Thank you for participating.

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Regional Integration of ITS (RIITS)

RIITS Strategic Plan

Stakeholder Workshop
September 17, 2009

RIITS Strategic Plan Stakeholder Workshop

WELCOME AND INTRODUCTIONS

Agenda

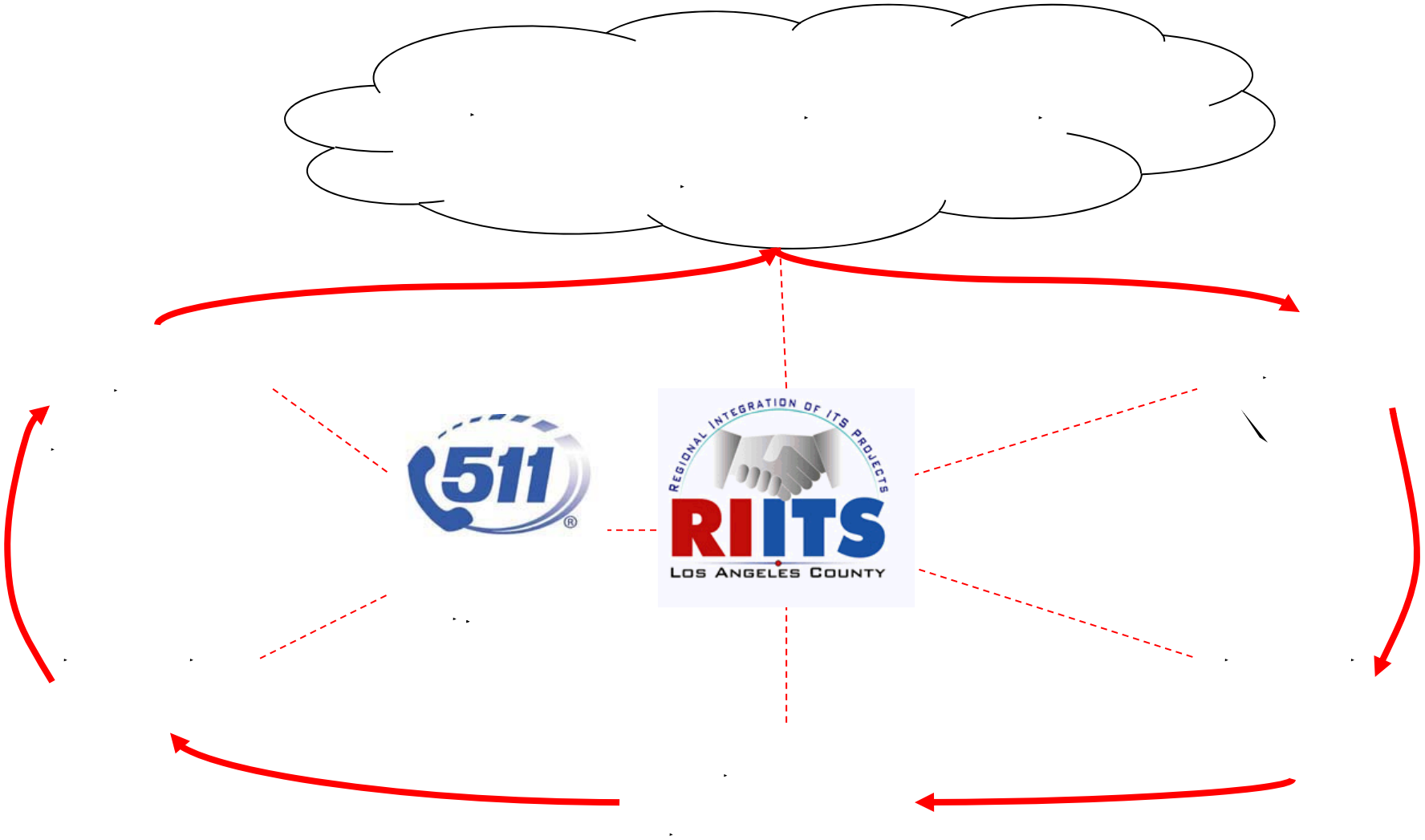
- Objectives and Overview
- Review of Strategic Opportunities for RIITS
- Open Discussion: Candidate Initiatives
- Wrap-Up and Next Steps

RIITS Strategic Plan Stakeholder Workshop

OBJECTIVES AND OVERVIEW

RIITS Vision

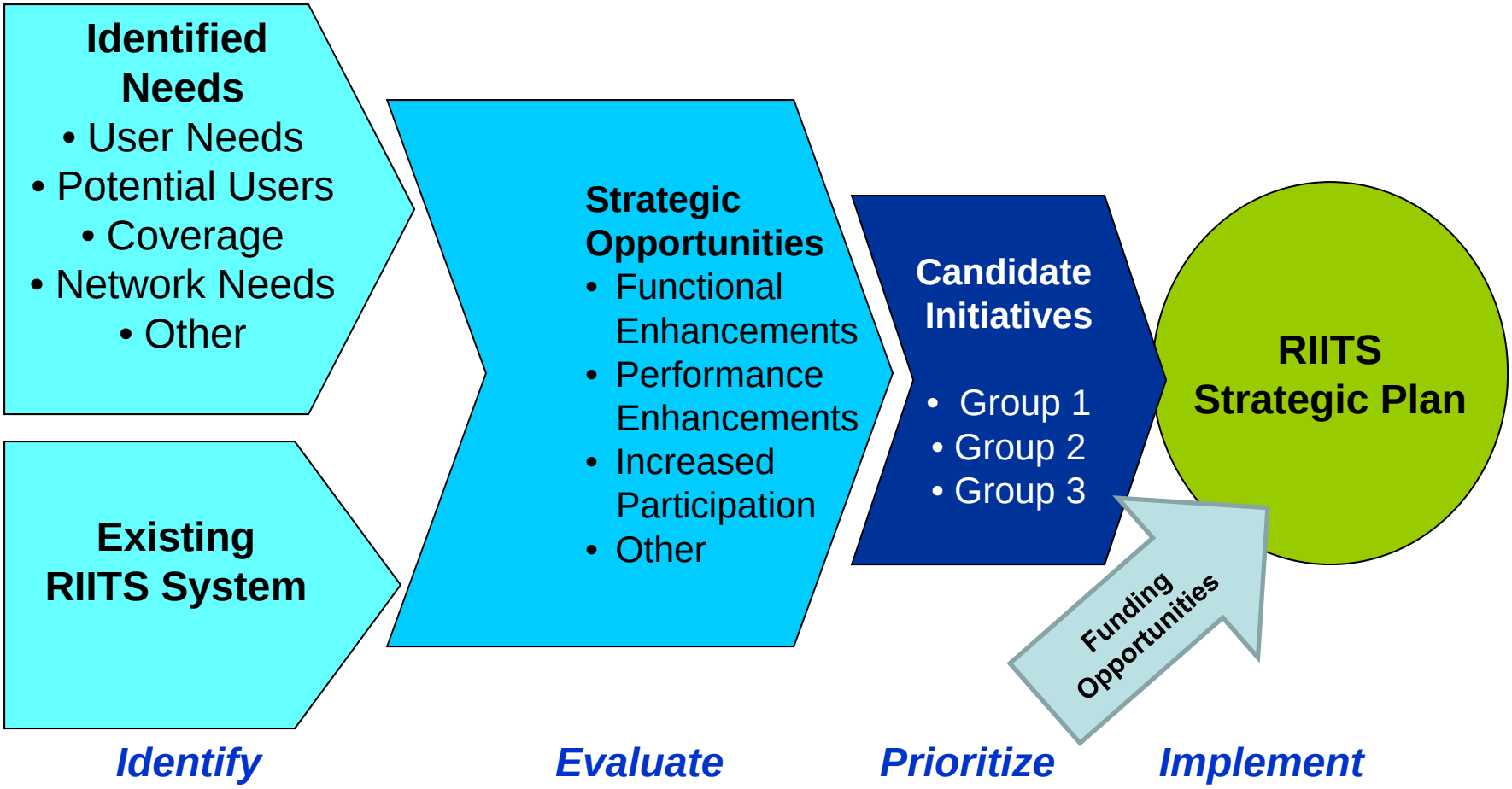
- **Metro data management program and network** that gathers information from Intelligent Transportation Systems (ITS) for the purpose of providing a single point of access to regional multi-modal real time data


511
REGIONAL INTEGRATION OF ITS PROJECTS
RIITS
LOS ANGELES COUNTY

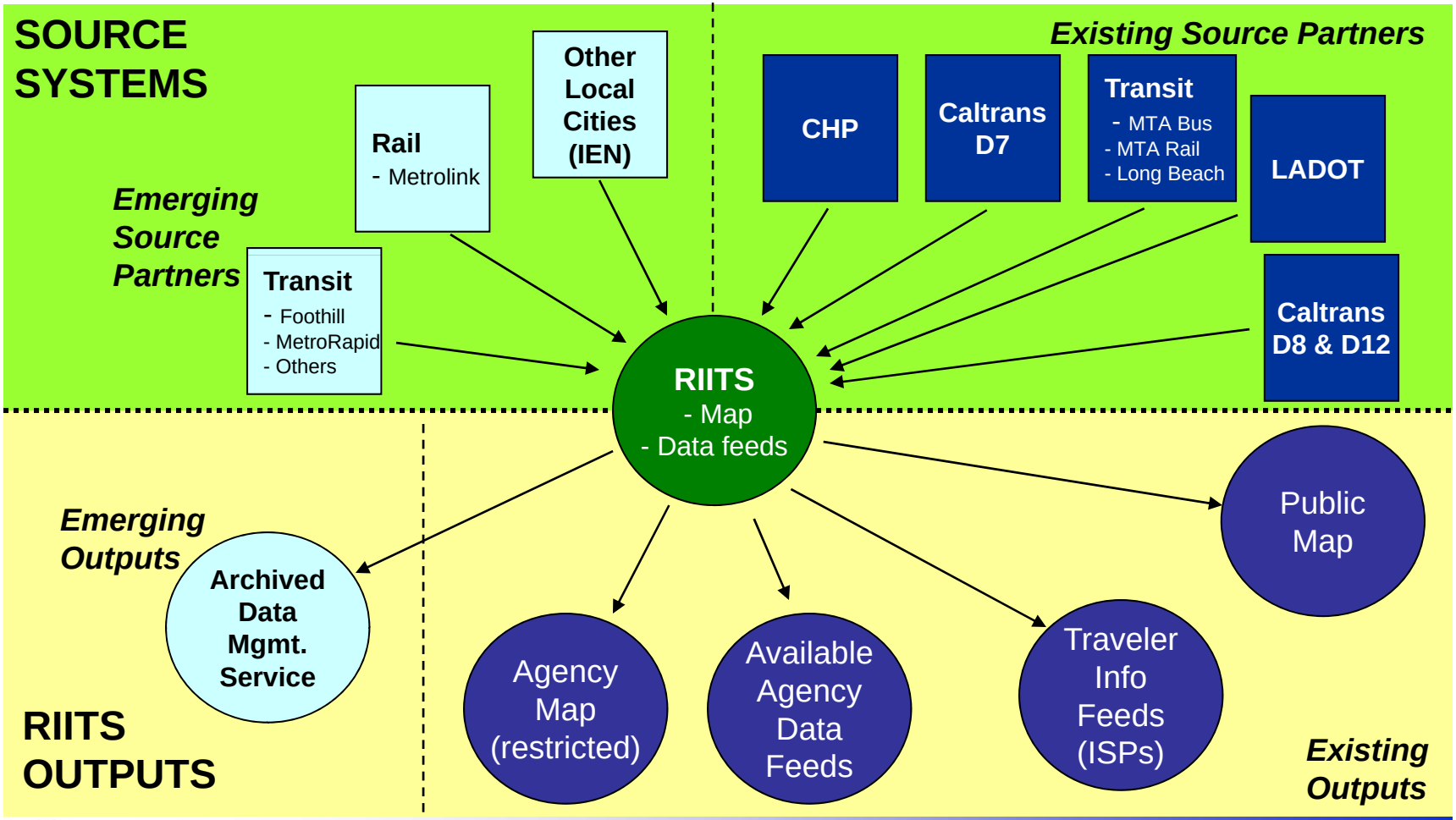
Purpose of the RIITS Strategic Plan

- Create a vision for phased improvements based on stakeholder needs, emerging technologies, and policy coordination
- Enhance RIITS effectiveness as a tool for MTA and participating agencies
- Provide an actionable plan to design, implement, fund, and manage the RIITS system

From Needs to Implementation



Current & Emerging System Relationships



Goal: Provide Value to the MTA and Partner Agencies

- Responsive to the needs of the MTA, partner agencies, and the region
- Relevance to agencies' core businesses
- Strategic growth and enhancement to increase value to partner agencies
- Increased understanding of the value of RIITS among users and decision makers

Identifying Needs: Outreach

- Completed extensive outreach effort
- Excellent feedback and interest in potential of RIITS
- Specific ideas for future enhancements

- Public Safety
- Goods Movement
- Arterial ITS Group
- MTA Internal Stakeholders
- Transit General Managers Group
- Additional Transit and Rail Agencies
- RIITS Configuration Management

Unique Attributes of RIITS

- Comprehensive, Regional Perspective
- Multimodal
- Near-Real Time Data
- Pervasive Access (web-based)
- Public and Secure Agency Access
- Central to Regional ITS Architecture

RIITS Strategic Plan Stakeholder Workshop

REVIEW OF STRATEGIC OPPORTUNITIES

Coverage, Content, and Participation

- The value of RIITS as a ‘one-stop shop’ for regional ITS data is dependent to the success of voluntary partnerships
  - Multimodal Coverage
  - Agency Participation
  - Geographic Extents

Functional Enhancements

- RIITS can provide additional tools and services that enhance its relevance and value to regional agencies
  - Emergency/Situational Awareness
  - Regional Video Sharing
  - Regional Data Archive
  - Performance Measurement
  - Reporting and Query Tools

Regional ITS Integration

- RIITS can connect networks and devices to support regional ITS integration
  - Backend for 511, LA Congestion Pricing
  - Shared use field devices
  - Developer/ISP data portal
  - Regional data archive/clearinghouse

RIITS Performance Enhancements

- Upgrades to the RIITS network will improve its reliability and effectiveness
  - National and Regional Standards
  - Address Latency Issues
  - Improve Network Redundancy
  - Increase Communications Bandwidth
  - Enhance Network Security
  - Website Enhancement/ADA Compliance

RIITS Strategic Plan Stakeholder Workshop

CANDIDATE INITIATIVES

Candidate Initiatives

- A set of “Candidate Initiatives” has been developed that address areas of strategic opportunity
  - Group 1: Regional Data Management
  - Group 2: Operations Support
  - Group 3: Integration of Regional Networks

Candidate Initiatives:
1. Regional Data Management

A. Regional Data Archive
B. Filtered Data Feeds and Custom Queries
C. Performance Measurement
D. Travel Forecasting/Modeling

Candidate Initiatives:
2. Operations Support

A. Regional Event Reporting
B. Regional Video Sharing
C. Enhanced Situational Awareness

Candidate Initiatives:
3. Integration of Regional Networks

A. Regional Portal for ISPs and Developers
B. Common ITS Field Device Broker
C. Data Consolidator for Southern CA 511
D. Data Consolidator for LA Congestion Pricing

Objectives of Today's Workshop

- Review RIITS strategic opportunities emerging from the outreach process
- Obtain feedback on candidate initiatives for stakeholder agencies
- Identify stakeholder priorities and interests in candidate initiatives to support development of the RIITS Strategic Plan

Discussion Questions for Today

- How valuable is the candidate initiative to your organization?
- What needs would this candidate initiative address?
- What do you see as key opportunities or challenges?
- Are there other candidate initiatives that we might be considering?

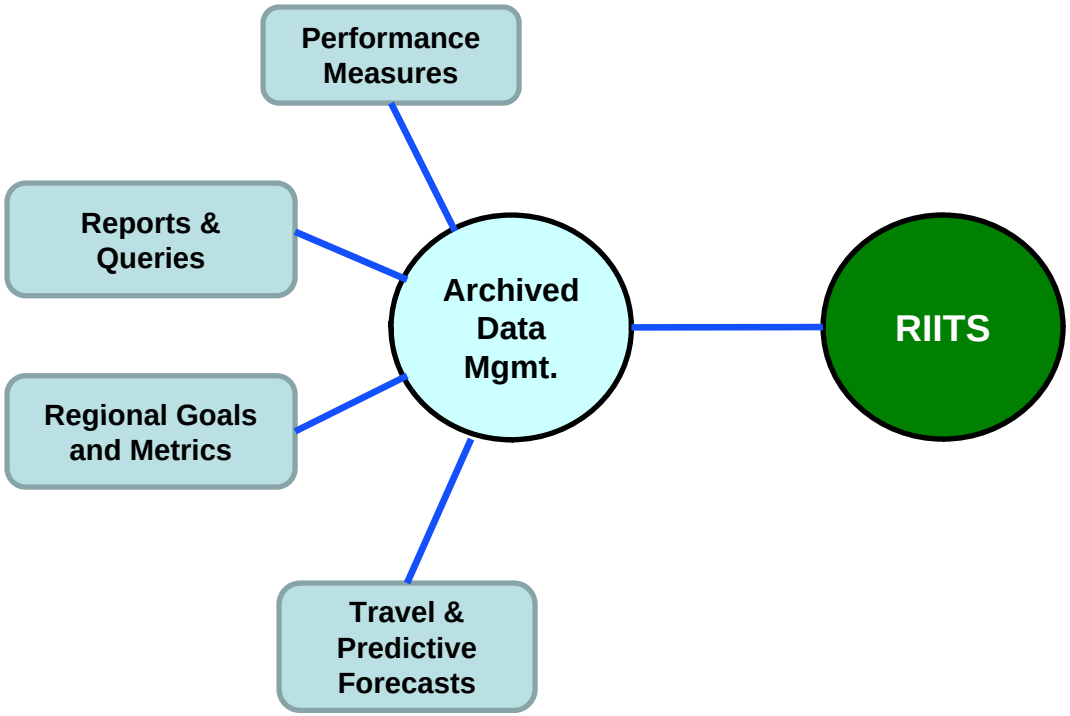
Candidate Initiatives Group 1 Discussion:

REGIONAL DATA MANAGEMENT

Candidate Initiatives:
1. Regional Data Management

A. Regional Data Archive
B. Filtered Data Feeds and Custom Queries
C. Performance Measurement
D. Travel Forecasting/Modeling

1.A. Regional Data Archive



1.A. Regional Data Archive

Overview of the Candidate Initiative	
Description	Provides long-term storage of transportation operations data that is currently only available in RIITS on a transient basis
Motivating Need and Benefit	Archived data can be used to support a wide range of planning and performance measurement functions. RIITS is uniquely suited given its multi-agency breadth and existing data feeds from participating agencies

1.A. Regional Data Archive

Implications for RIITS and Partner Agencies	
Level of Effort	High
Technology	Significant investment in new central database systems to archive data that currently passes through the RIITS system
Policy	The type of data and level of details needs to be addressed, as do procedures to ensure the quality and accuracy of data
Partner Agencies	The relationship to in-house data archiving systems, as well as planning and performance measurement applications, needs to be determined

1.B. Filtered Data Feeds and Custom Queries

Overview of the Candidate Initiative	
Description	Provides customization and presentation of RIITS data that is tailored to the needs of a specific participating agency – e.g. filtered data streams, event alerts in a specific area, or development of customized reports.
Motivating Need and Benefit	Many RIITS users have specific areas of functional or geographic interest. The ability to filter the growing body of RIITS data increased its accessibility and relevance to a broader user group.

1.B. Filtered Data Feeds and Custom Queries

Implications for RIITS and Partner Agencies	
Level of Effort	Moderate
Technology	Requires implementation of central software and user interface to support customized access
Policy	Low policy implications, though supporting diverse user needs increases the complexity of the solution
Partner Agencies	Requires consideration of specific data needs necessary to address operational and management objective

1.C. Performance Measurement

Overview of the Candidate Initiative	
Description	Provide functionality to support “Total Transportation System” performance measurement to support analysis of multimodal corridors and benchmarking against regional/agency mobility, safety, sustainability, and environmental goals
Motivating Need and Benefit	Support analysis in the growing area of transportation performance measurement, including the impacts of ITS and transportation system management measures

1.C. Performance Measurement

Implications for RIITS and Partner Agencies	
Level of Effort	Moderate
Technology	Requires development of tools and interfaces to present and analyze system performance data – in real time (e.g. “dashboard” applications) or drawing upon an archived data management system
Policy	Development of the tools must be coordinated with emerging agency, state, and federal performance measurement initiatives
Partner Agencies	Value depends on specific agency objectives and willingness to adopt PM metrics

1.D. Travel Forecasting

Overview of the Candidate Initiative	
Description	Predicts future conditions on the transportation network minutes, hours, or days in the future based on real-time and historical condition information. Can also support more robust regional modeling for transportation, air quality, and climate analysis.
Motivating Need and Benefit	Predictive service allows agencies and travelers to make more informed decisions based on anticipated conditions Currently an active area of transportation research

1.D. Travel Forecasting

Implications for RIITS and Partner Agencies	
Level of Effort	High
Technology	Extensive development and validation of software tools to predict and present future traffic conditions. Requires prior investment in a data archive to provide historical data to support prediction
Policy	Policies on the use and dissemination of predictive travel information do not exist today
Partner Agencies	Need to identify the potential applications and procedures as related to core business needs

Group 1 Discussion Questions: Regional Data Management

- Are these tools valuable to your agency?
- What needs would they address?
- Is there additional value of a regional vs. an in-house approach?
- What opportunities and challenges do you see?
- Are there other candidate initiatives worth considering?

RIITS Strategic Plan Stakeholder Workshop

BREAK

Candidate Initiatives Group 2 Discussion:

OPERATIONS SUPPORT

Candidate Initiatives:
2. Operations Support

A. Regional Event Reporting
B. Regional Video Sharing
C. Enhanced Situational Awareness

2.A. Regional Event Reporting

Overview of the Candidate Initiative	
Description	A real time, regional platform for transportation system incident/event sharing across the multimodal network, to assist with operations and incident management
Motivating Need and Benefit	Events within one portion of the transportation network can impact operations of other agencies. Sharing event and incident information can improve operational response to these occurrences

2.A. Regional Event Reporting

Implications for RIITS and Partner Agencies	
Level of Effort	High
Technology	Software development as well as standards and protocols for event data sharing. Interfaces to other regional systems would be required
Policy	Requires procedures governing input, distribution, and presentation of event data
Partner Agencies	Requires institutional commitment to populating the system with data

2.B. Regional Video Sharing

Overview of the Candidate Initiative	
Description	A regional platform to consolidate and distribute real-time transportation video among participating transportation and emergency management agencies
Motivating Need and Benefit	Desire among participating agencies to have greater visual awareness of real-time transportation network conditions, across modes, without redundant investments in field hardware

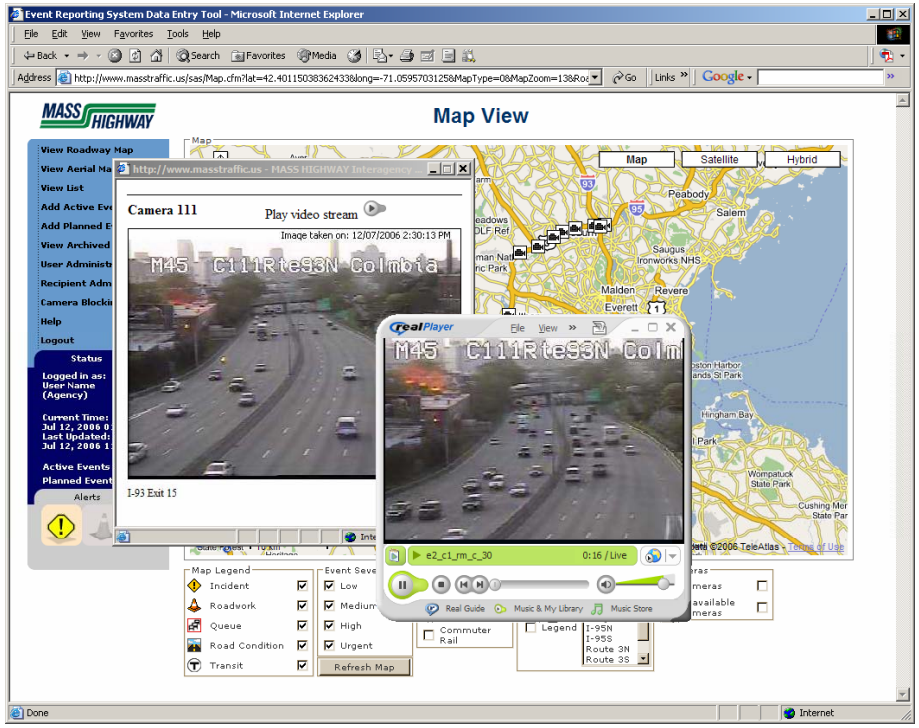
2.B. Regional Video Sharing

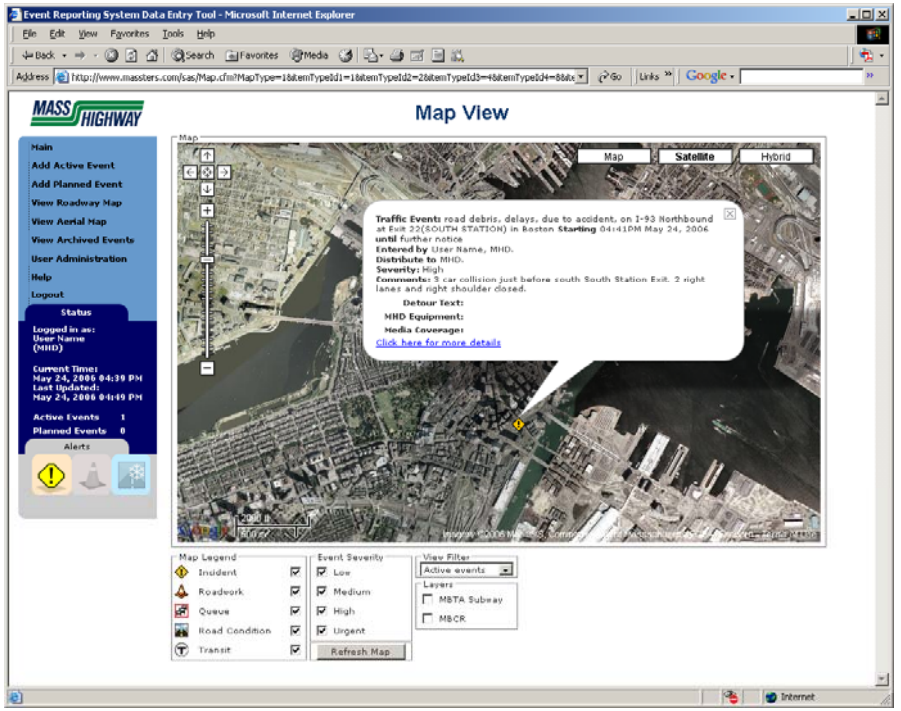
Implications for RIITS and Partner Agencies	
Level of Effort	Very High
Technology	Requires significant investment in central hardware, software, and networking. Need to address multiple video standards and platforms in use in the region
Policy	Requires agreement on video sharing and distribution policies for sensitive or public video
Partner Agencies	Commitment to cost, technology, and policy requirements

2.C. Enhanced Situational Awareness

Overview of the Candidate Initiative	
Description	A real-time system to provide information on the state of the multimodal transportation system, combining traffic, transit, incident data video, and other inputs in a robust map-based platform
Motivating Need and Benefit	Both transportation and emergence management agencies share the need for accurate and timely information to manage daily operations, as well as incident and emergency scenarios (including disasters)

Example – Boston, MA





2.C. Enhanced Situational Awareness

Implications for RIITS and Partner Agencies	
Level of Effort	Very High
Technology	Significant integration of mapping, data, and potentially video infrastructure with associated investments in backend systems and interfaces
Policy	Will require policies and user groups reflecting the expanded role of emergency management partners
Partner Agencies	The relationship to existing operational tools and procedures needs to be well defined

Group 2 Discussion Questions: Operations Support

- Are these tools valuable to your agency?
- Will they complement, conflict, or overlap other in-house or regional tools?
- How would you use regional data to support your operations?
- Do you see opportunities or challenges?
- Are there other candidate initiatives worth considering?

Candidate Initiatives Group 3 Discussion:

INTEGRATION OF REGIONAL NETWORKS

Candidate Initiatives:
3. Integration of Regional Networks

A. Regional Portal for ISPs and Developers
B. Common ITS Field Device Broker
C. Data Consolidator for Southern CA 511
D. Data Consolidator for LA Congestion Pricing

3.A. Regional Portal for ISPs and Developers

Overview of the Candidate Initiative	
Description	Provide a regional data portal for private and third-party Information Service Providers and application developers to provide timely, consistent traveler information through diverse channels.
Motivating Need and Benefit	The role of third-party information providers and information delivered through consumer and in-vehicle devices is expected to grow dramatically in the coming years. RIITS can leverage the innovation and reach of this sector to serve end users through their preferred information channel.

3.A. Regional Portal for ISPs and Developers

Implications for RIITS and Partner Agencies	
Level of Effort	Low/Medium
Technology	May require adaptation of existing ISP interfaces and implementation of an application developer portal
Policy	Requires policies on data usage, cost, and standards
Partner Agencies	Agencies must consent to the terms of use for data disseminated through this method

3.B. Common Field Device Broker

Overview of the Candidate Initiative	
Description	Facilitate the exchange of data among regional ITS systems and shared field equipment. Example: Display Metro Bus service alerts on a electronic message sign within an adjacent Metro Rail station
Motivating Need and Benefit	Allows use of a single field device by multiple operating agencies. Can also be used to convey status information of field devices (e.g. signal status, sign status, HOT lane status) to other agencies' regional operations centers.

3.B. Common Field Device Broker

Implications for RIITS and Partner Agencies	
Level of Effort	Moderate/High
Technology	Requires central system enhancements to facilitate communications exchange, and possibly additional network interfaces to connect to the applicable field devices and centers
Policy	Requires a parallel effort to establish rules and protocols for device control and data exchange by all agencies involved
Partner Agencies	Development of appropriate technical interfaces, policies, and standards for a given application

3.C. Data Consolidator for So Cal 511

Overview of the Candidate Initiative	
Description	Serve as a back end to regional traveler information 511 system(s), providing a 'one stop shop' for regional transportation system data from multiple agencies
Motivating Need and Benefit	Provides a streamlined architecture to facilitate implementation and expansion of 511, taking advantage of RIITS' existing agency interfaces

3.C. Data Consolidator for So Cal 511

Implications for RIITS and Partner Agencies	
Level of Effort	Moderate
Technology	Requires investment in RIITS central systems to improve network performance and redundancy to support the operational needs of the 511 system
Policy	Requires possible additional agreements to maintain the requirements for data quality and system availability
Partner Agencies	Data provided to RIITS for ultimate dissemination to 511 must adhere to applicable standards

3.D. Data Consolidator for LA Congestion Pricing

Overview of the Candidate Initiative	
Description	Serve as a back end to provide transportation system condition information to support operations and dynamic tolling for the MTA freeway congestion pricing program
Motivating Need and Benefit	Leverages existing RIITS interfaces with freeway management systems to support an emerging technology through synthesis of real-time transportation network information

3.D. Data Consolidator for LA Congestion Pricing

Implications for RIITS and Partner Agencies	
Level of Effort	Moderate
Technology	Requires investment in RIITS central systems to improve network performance and redundancy to support the operational needs of the congestion pricing system
Policy	Requires reciprocal agreement to maintain the requirements for data quality and system availability
Partner Agencies	Data provided to RIITS for used to support congestion pricing must adhere to applicable standards

Group 3 Discussion Questions

- How can regional integration of ITS systems benefit your agency?
- Do you see a need to provide access to your data to ISPs or application developers?
- Do you see applications for shared use field devices or device status information?
- Are there other candidate initiatives to consider?

RIITS Strategic Plan Stakeholder Workshop

WRAP-UP AND NEXT STEPS

Wrap-Up Discussion

- Review Major Points of Discussion
- Additional Outreach
- Survey/Comment Sheets

Next Steps

- SWOT Analysis of Candidate Initiatives – Sept 2009
- Draft RIITS Strategic Plan – Oct 2009
  - Need and vision
  - Recommended future initiatives
  - Funding and administrative needs
  - Project implementation plan
- Completion of RIITS Strategic Plan – Nov 2009

RIITS Strategic Plan Stakeholder Workshop

THANK YOU!

FOR YOUR INTEREST AND PARTICIPATION

COMMENT & INPUT FORM: RIITS STRATEGIC PLAN WORKSHOP (September 17, 2009)

During of following the workshop discussion please use this form to rate the relative importance and/or interest of each of the candidate initiatives to you and your agency/department. Please provide your name, agency/department, and e-mail so that we can follow-up with any questions or information. Use the space for comments to note any important thoughts, issues, interests, or concerns you may have about the individual initiatives. Additional space for general comments is provided on the back of this form. **THANK YOU!**

NAME: _____ **AGENCY/DEPARTMENT:** _____ **E-MAIL:** _____

Candidate RIITS Initiatives & Descriptions	Interest or Relevance to Your Agency or Department	Comments or Thoughts
REGIONAL DATA MANAGEMENT		
Regional Data Archive: Provides long-term storage of transportation operations data that is currently only available in RIITS on a transient basis.	Low Med High ☐ ☐ ☐ ☐ ☐	
Filtered Data Feeds & Custom Queries: Provides customization and presentation of RIITS data that is tailored to the needs of a specific participating agency – e.g. filtered data streams, event alerts for items of interest, or development of customized reports.	Low Med High ☐ ☐ ☐ ☐ ☐	
Performance Measurement: Provide functionality to support "Total Transportation System" performance measurement to support analysis of multimodal corridors and benchmarking against regional/agency mobility, safety, and environmental goals.	Low Med High ☐ ☐ ☐ ☐ ☐	
Travel Forecasting/Modeling: Predicts future conditions on the transportation network minutes, hours, or days in the future based on real-time and historical condition information.	Low Med High ☐ ☐ ☐ ☐ ☐	
OPERATIONS SUPPORT		
Regional Event Reporting: A real time, regional platform for transportation system incident/event sharing across the multimodal network, to assist with operations and incident management	Low Med High ☐ ☐ ☐ ☐ ☐	

Candidate RIITS Initiatives & Descriptions	Interest or Relevance to Your Agency or Department	Comments or Thoughts
Regional Video Sharing: A regional platform to consolidate and distribute real-time transportation video among participating transportation and emergency management agencies.	Low Med High ☐ ☐ ☐ ☐ ☐	
Enhanced Situational Awareness: A real-time system to provide information on the state of the multimodal transportation system, combining traffic, transit, incident data video, and other inputs in a robust map-based platform	Low Med High ☐ ☐ ☐ ☐ ☐	
INTEGRATION OF REGIONAL NETWORKS		
Regional Portal ISPs & Developers: Provide a regional data portal for private and third-party Information Service Providers and application developers to provide timely, consistent traveler information through diverse channels.	Low Med High ☐ ☐ ☐ ☐ ☐	
Common ITS Field Device Broker: Facilitate the exchange of data among regional ITS systems and shared field equipment. Example: Display Metro Bus service alerts on a electronic message sign within an adjacent Metro Rail station.	Low Med High ☐ ☐ ☐ ☐ ☐	
Data Consolidator - So Cal 511: Serve as a back end to the 511 regional traveler information system, providing a 'one stop shop' for regional transportation system data from multiple agencies.	Low Med High ☐ ☐ ☐ ☐ ☐	
Data Consolidator - LA Congestion Pricing Info: Serve as a back end to provide transportation system condition information to support operations and dynamic tolling for the MTA freeway congestion pricing program.	Low Med High ☐ ☐ ☐ ☐ ☐	

OTHER COMMENTS/THOUGHTS:

Metro

RIITS Strategic Plan
Stakeholder Workshop
September 17, 2009

RIITS Los Angeles County

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Metro

RIITS Strategic Plan
Stakeholder Workshop
September 17, 2009

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Metro

RIITS Strategic Plan
Stakeholder Workshop
September 17, 2009

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Appendix E – Opportunities for Funding Initiatives from the RIITS 10 – year Strategic Plan

November 5, 2009

Opportunities for Funding Initiatives from the RIITS 10-year Strategic Plan

November 3, 2009

Background

In developing RIITS initiatives, it was understood that some have immediate potential for funding, while others are longer term, or do not currently have a readily identifiable funding source. This paper attempts to identify funding from internal sources, external sources, and partnerships.

Internal Leveraging (funding from sources available to MTA)

MTA has state and federal sources of funding, including federal STP, CMAQ, and planning funds. Most of these sources already have a fair amount of competition, such as for transit and road projects, but there are two potential programs:

> State Planning and Research (SPR): State Planning and Research funding has been used in other states for ITS deployment and support, including ITS software. It is possible that SPR funding could be used for ITS upgrades, especially for an Archived Data Management System (ADMS), which would support numerous other RIITS applications. The availability of SPR funding depends on the individual policies of Caltrans to sub-allocate these funds.
>
> Performance Management (near future): by all indications, performance management will be a large part of the future transportation authorization bill, and some new program funding might even be made available in the extension bills under consideration by Congress. MTA should actively engage Caltrans and the FHWA California Division Office, to identify emerging programs for performance management systems ($300 million in administration's program extension proposal). Performance Management funds could be used for data archiving or other services.

Partnering (Identifying collaborators for funding initiatives)

There are two potential sources of partnership to share the burden and benefits of some RIITS initiatives.

> Universities: Private and public colleges and universities are natural partners for some RIITS initiatives, such as data archiving. In fact, the most advanced ADMS are housed in universities, in strong partnership and collaboration with a DOT or local government entity. Academic institutions have the added benefit of bringing research funding to the table, through federal DOT sources (SPR Part 2) and through other public and private sources (such as grants, endowments, etc). For example the Portland Oregon ADMS is funded in part by a grant from the National Science Foundation.
>
> Homeland Security: the U.S. Department of Homeland Security offers a number of grant programs that could be a source of funding for RIITS operational initiatives.
>
> > *Emergency Operations Center Grant Program* ($34 million in 2009): mostly for interoperable emergency operations centers, there are some RIITS operations initiatives which could benefit from this funding.

Interoperable Emergency Communications Grant Program ($48.5 million in 2009): is a broader program could also fund a number of RIITS operations initiatives, especially for data sharing.

Most homeland security grants must be run through the California Office of Homeland Security, and conform to California's homeland security master plan. Partnership with emergency response agencies is a natural prerequisite to pursue these programs.

External Funding (funding from external and innovative sources)

There are other potential sources of funds, which might have varying degrees of probability for success:

Federal Economic Stimulus Grants (Phase 2): The first round of stimulus funding was so well received, Congress and the administration are considering a second round of discretionary funding. RIITS initiatives would likely need to address the previous stimulus program imperatives, which were job creation, sustainability, livability, partnership and innovation.

Earmarks: could come from either the reauthorization bill (now delayed) or through the annual appropriation process. While earmarks are somewhat disdained by state DOT's, they remain an effective funding source if congressional support can be secured.

HOT Lane Program Data Archive and Analysis Services: If RIITS is the data manager for the Los Angeles HOT lanes program, funding should be available for the data collection, analysis and archive function. Program funding could be a part of the overall HOT lane project budget, if the financial planning for the project is still fluid.

Appendix F – Relationships Between RIITS Strategic Initiatives and National ITS Architecture Services

March 18, 2010

Strategic Initiative/Action	ITS User Services	Travel and Traffic Management										Public Transportation Management				Electronic Payment	Commercial Vehicle Operations						Emergency Management			Advanced Vehicle Safety Systems						Information Management	Maintenance & Construction Management
		Pre-Trip Travel Information	En-Route Driver Information	Route Guidance	Ride Matching & Reservation	Traveler Services Information	Traffic Control	Incident Management	Travel Demand Management	Emissions Testing & Mitigation	Highway Rail Intersection	Public Transportation Management	En-Route Transit Information	Personalized Public Transit	Public Travel Security	Electronic Payment Services	Commercial Vehicle Electronic Clearance	Automated Roadside Safety Inspection	On-Board Safety & Security Monitoring	Commercial Vehicle Administrative Processes	Hazardous Material Security & Incident Response	Freight Mobility	Emergency Notification & Personal Security	Emergency Vehicle Management	Disaster Response & Evacuation	Longitudinal Collision Avoidance	Intersection Collision Avoidance	Vision Enhancement for Crash Avoidance	Safety Readiness	Pre-Crash Restraint Deployment	Automated Vehicle Operation	Archived Data	Maintenance & Construction Operations
Group 1 - Regional Data Management																																
1A Regional Data Archive Enhanced		■	□	□			□	□	□			□									□	■		□	□						■	
1B Filtered Data and Custom Queries		■					□	□	□			■				□					□	■		□	□						■	
1C Performance Measurement		■	□	□			□	□	□			□				■					□	□		□	□						■	□
1D Travel Forecasting and Modeling		■	□	□			□	□	□			□	□			□					□	■		■	■						■	
Group 2 - Operations Support Services																																
2A Regional Event Reporting		■	□	■			□	■			□	■	□		■	□					■	■		■	■						□	□
2B Regional Video Sharing		■					□	■			□	■			■	□					■	□		■	■							□
2C Enhanced Situational Awareness		■		■			□	■			□	■	□		■	□					■	■		■	■						□	□
Group 3 - Integration of Regional Network Services																																
3A Regional Portal for ISPs/Developers		■	■	■					■				■		□						□	■			■							
3B Common ITS Field Device Broker		□					■		□				■		■							□											
3C Data Consolidator for Southern California 511		■	■	■					■				■		□						□	■			■							□
3D Data Consolidator for LA Congestion Reduction Demonstration (CRD) Program		■	■	■			■		□				□			■									□						□	□

■ Directly Supports or Implements □ Indirectly Supports

Figure F.1: Relationships of RIITS Strategic Initiatives/Actions to National ITS Architecture User Services

Regional Integration of Intelligent Transportation Systems (RIITS)

10-Year Strategic Plan

POWER POINT PRESENTATIONS

by IBI Group

with Parsons Brinkerhoff and Sarakki Associates, Inc.

June 15, 2010

Regional Integration of ITS (RIITS)
10-Year Strategic Plan

Configuration Management Committee
& RIITS Stakeholders

May 27, 2010

Agenda

- Overview of RIITS 10-Year Strategic Plan:
  - Vision of RIITS
  - Goals of the Strategic Plan
  - Stakeholder Outreach
  - Strategic Initiatives
- RIITS Implementation Plan
  - Structure of Strategic Initiative Actions
  - Summary of Overall Timeline & Preliminary Budget Estimates
  - Near-Term Actions
- Elements of Success for RIITS
- Questions & Answers

RIITS 10-YEAR STRATEGIC PLAN OVERVIEW

RIITS Strategic Vision

To deliver *multimodal* transportation *information services* through a *flexible platform* to achieve *regional mobility, safety, and sustainability goals*.

Goals of the RIITS Strategic Plan

- Create a strategy for phased improvements based on stakeholder needs, emerging technologies, and policy coordination.

- Enhance RIITS effectiveness as a tool for MTA and partner agencies.

- Provide an actionable plan to design, implement, fund, and manage the RIITS system.

RIITS Strategic Objectives

- Responsive to Critical Regional Needs
- Comprehensive, Timely, and Reliable Regional Data Source
- Complementary Relationship to Regional ITS Systems
- Data Conduit for Third-Party Innovation

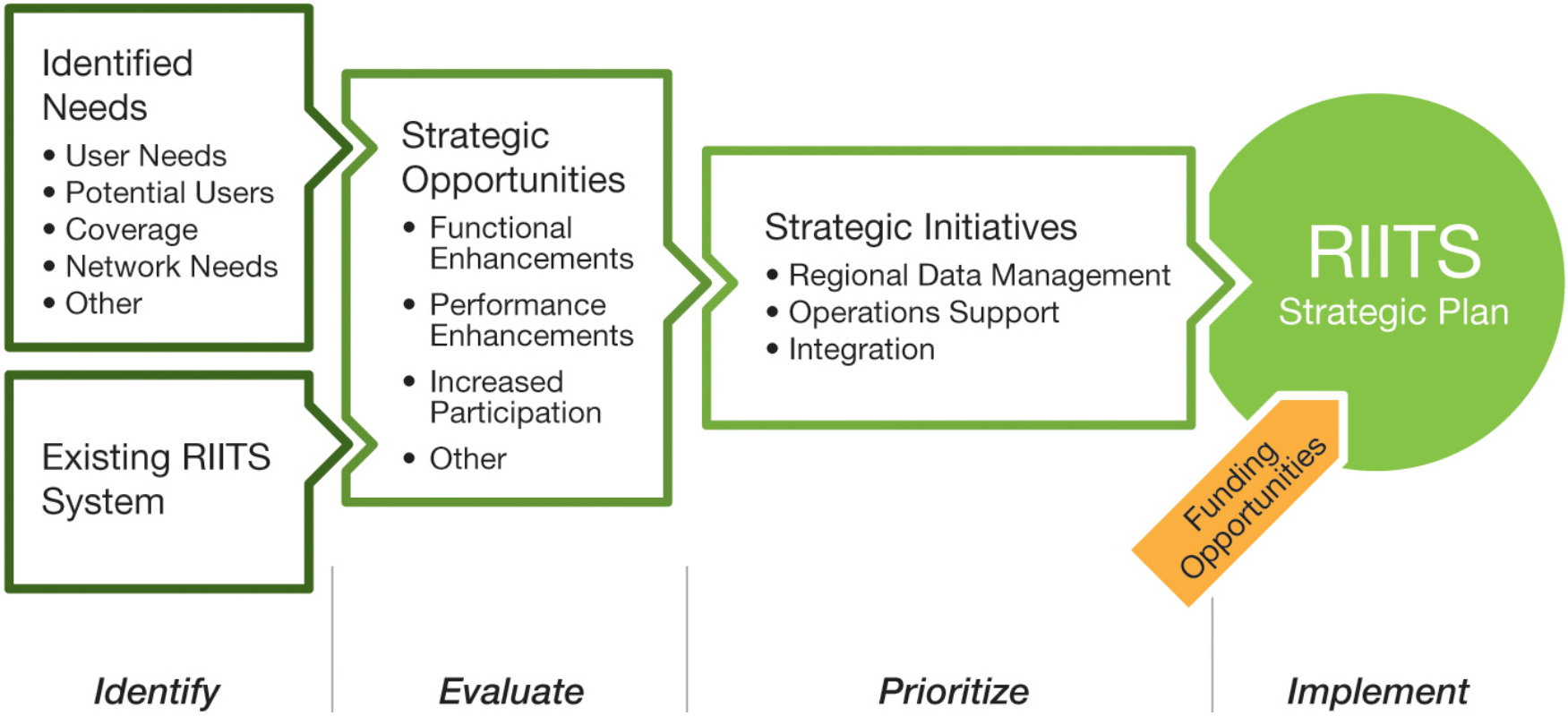
Status

- Final Draft Strategic Plan Complete Including Revisions for Comments Received
- Final Draft Executive Summary in Development
- Consider Any Comments and Questions from CM Committee
- Final Plan Ready for Distribution Next Week

Participating Agencies

Agencies Participating in the Development of the Strategic Plan	
Antelope Valley Transit Agency	Auto Club of Southern California
Beach Cities Transit	Caltrans (Districts 7, 8, 12)
California Highway Patrol	City of Burbank
City of Commerce	City of Downey
City of Glendale	City of La Mirada
City of Montebello	City of Palmdale
City of Santa Monica	City of Torrance
Culver City Bus	Federal Highway Administration
Foothill Transit	Gateway Cities Council of Governments (GCCOG)
International Warehouse Logistics Association	Long Beach Transit
Los Angeles County Public Works	Los Angeles County Sheriff's Department
Los Angeles Department of Transportation	Los Angeles Port Police
MTA (ATMS Engineering, Communications, ITS, Operations, Planning, Rapid, Security)	Norwalk Transit
Port of Los Angeles	Santa Clarita Transit
Southern California Association of Governments (SCAG)	Service Authority for Freeway Emergencies (SAFE)
Santa Monica Big Blue Bus	

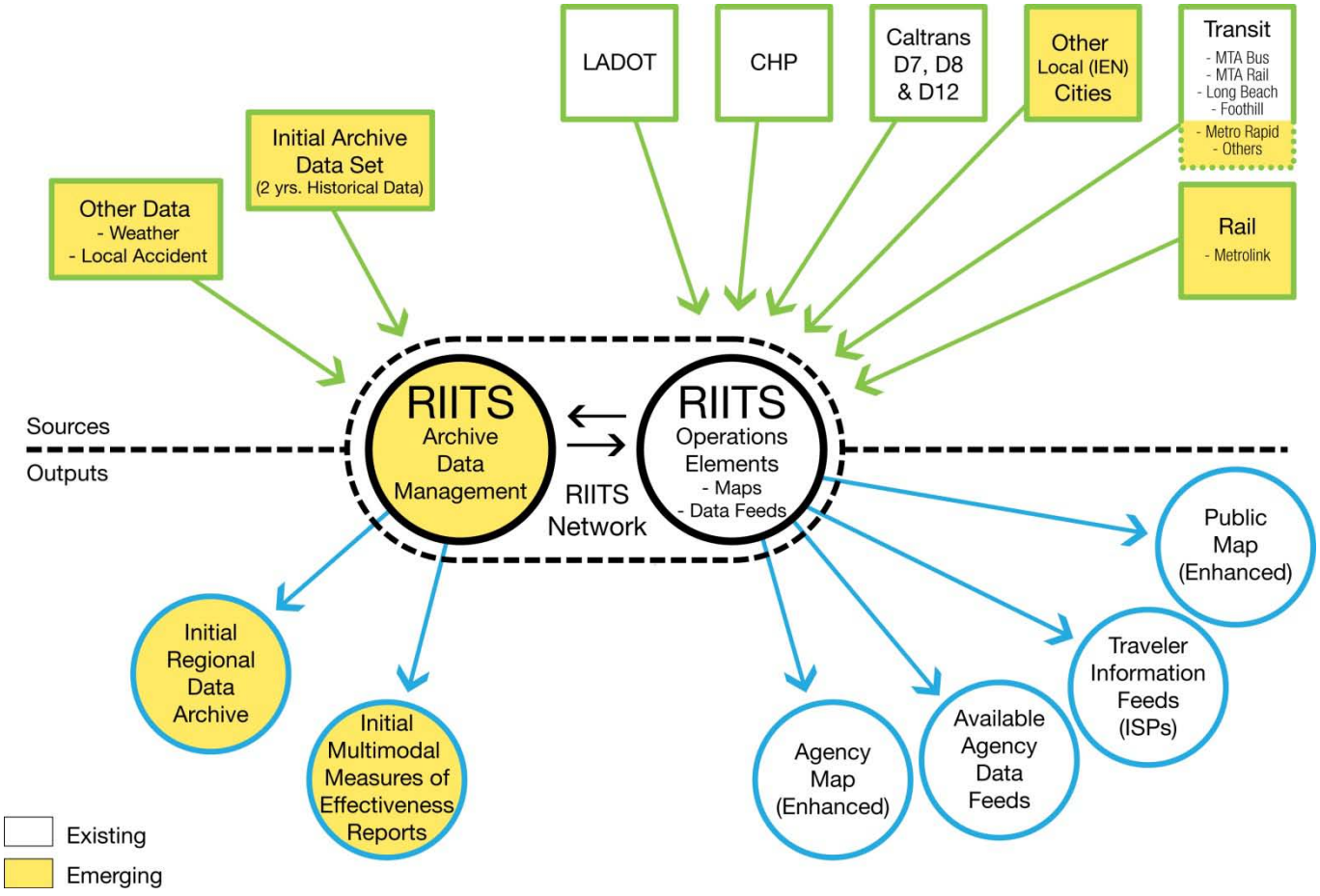
From Needs to Implementation



Unique Attributes of RIITS

- Comprehensive, Regional Perspective
- Multimodal
- Near-Real Time Data
- Pervasive Access (web-based)
- Public and Secure Agency Access
- Central to Regional ITS Architecture
- Emerging Regional Data Management Resource

Current & Emerging System Relationships



SWOT Analysis Summary

RIITS Program	**SUMMARY SWOT ANALYSIS**
Internal Issues	
STRENGTH	WEAKNESS
• Existing institutional and technology platform for exchanging regional transportation data.	• Lack of integration into the core business processes of internal and external customers.
External Issues	
OPPORTUNITY	THREAT
• Become the preferred provider for emerging and unmet agency regional transportation information services.	• Emerging perceived competition from public and private information services in meeting the needs of RIITS' public agency partners.

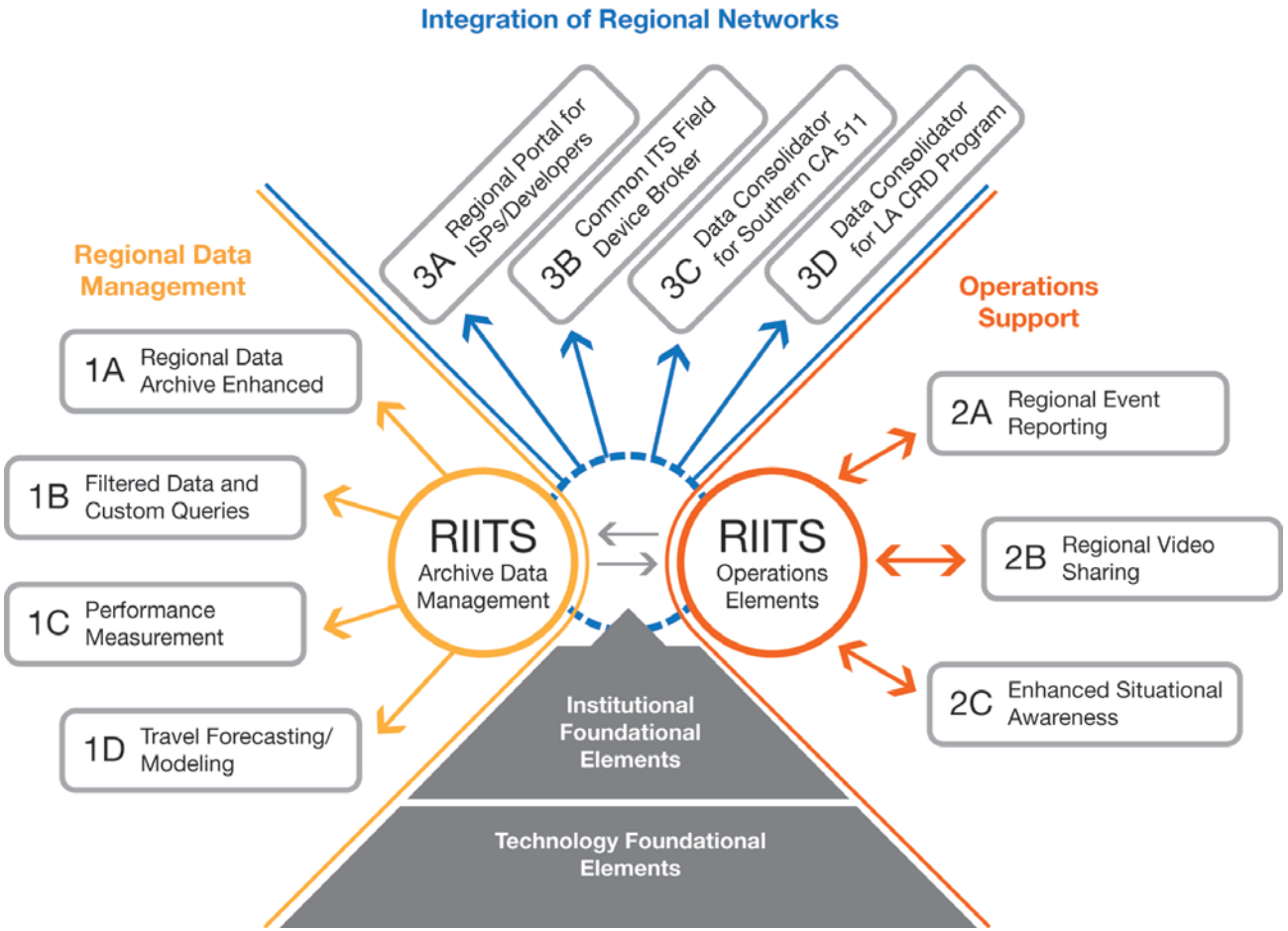
RIITS Response to Critical Regional Transportation Needs

- Transportation Systems Management & Operations
- Performance Measurement
- Freight Mobility
- Emergency Management
- Transportation Sustainability & Climate Change

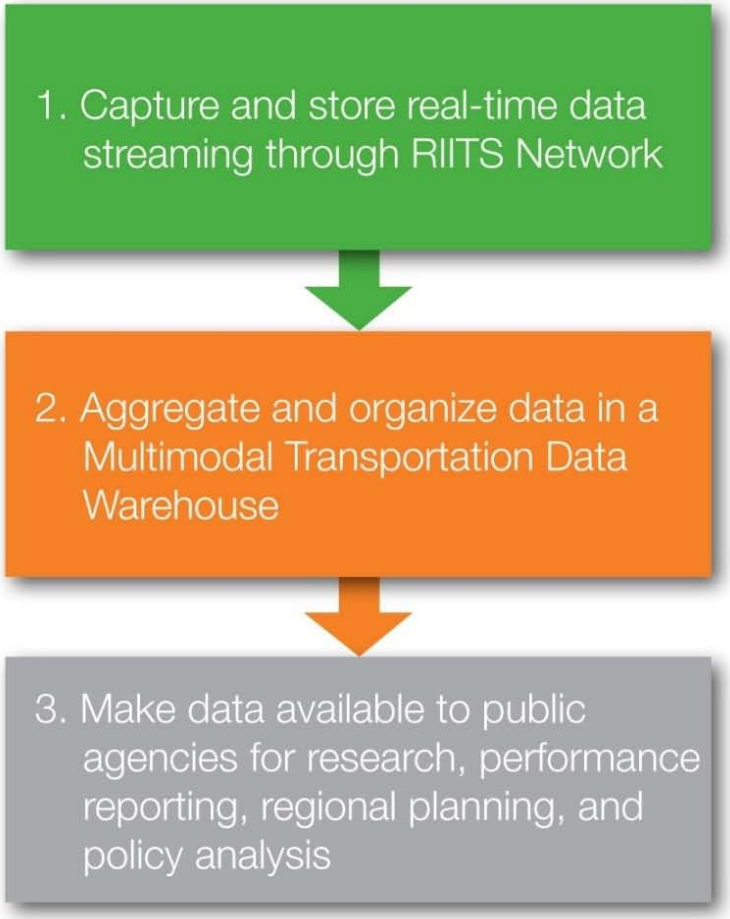
Strategic Initiatives: Building on RIITS

Strategic Initiative Groups	Highlights
Foundational Elements	• Institutional ➢ Program Development & Technical Outreach ➢ CM Committee Updates • Technological ➢ Performance-Reliability Enhancements ➢ Standards and System Re-architecture (push)
Group 1 – Regional Data Management	• Builds Upon Baseline ADMS Deployment • Significant Enhancements to: ➢ Archived Data Capacity ➢ Robust Performance Monitoring ➢ Filters, Queries, Reports on Data
Group 2 – Operations Support	• Supports Transportation and Emergency Operations: ➢ Operations Data ➢ Filtered Events Information ➢ Shared Video • Enhances “Situational Awareness”
Group 3 – Integration of Regional Networks	• Leverage RIITS Interagency Data Conduit • Timely Data Feeds to 511, LA CRD, Others

Strategic Initiatives: Building on RIITS

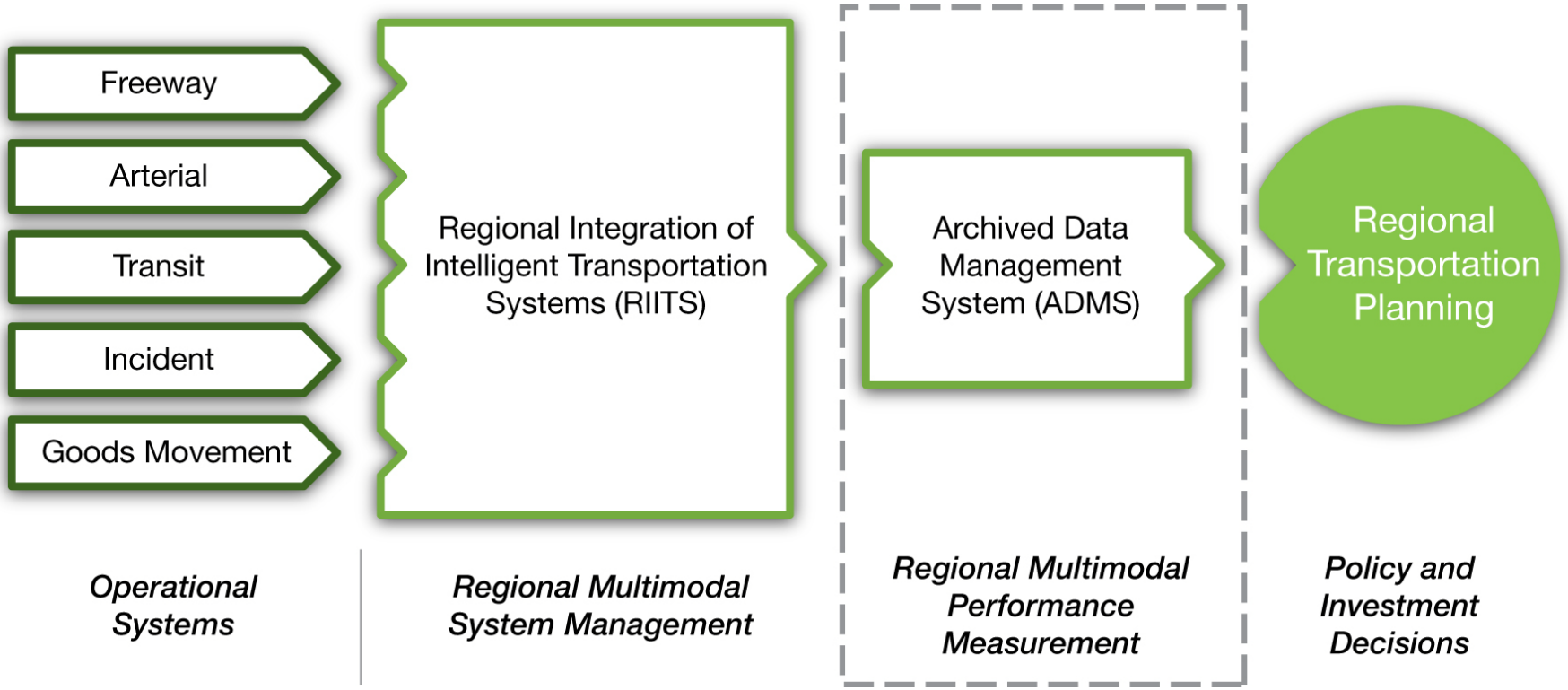


Archive Data Management System (ADMS): A New Role for RIITS



ADMS is a "one stop shop", delivering transportation services to address the mobility, safety, and sustainability goals of MTA, the Los Angeles county region, and beyond.

ADMS Data Sources and Applications

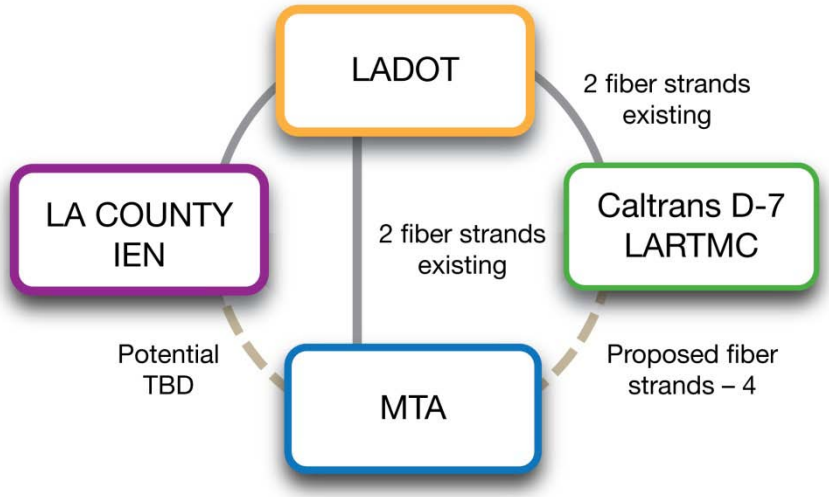


Foundational Elements – Institutional

- Sustainable Funding
- Program Development & Technical Outreach
- CM Committee
- Administrative Infrastructure
- System Performance Metrics
- Update of the LA/Ventura Regional ITS Architecture
- Other Policy Considerations

Foundational Elements - Technical

- Performance & Reliability Enhancements:
  - Network
  - Maintenance/Support
- Standards:
  - Update (TMDD, other)
  - Transition for Existing Users
  - Publishing
- System Re-Architecture:
  - Push
  - Reduced Latency



RIITS Value Proposition to Participating Agencies

- A strategic vision that responds to the business needs of regional agencies
- Greater value through increased coverage, participation, and performance
- Accurate timely operations data tailored to agency needs
- More powerful tools for managing and analyzing regional data through archived data
- A platform for regional collaboration and innovation
- A one-stop data conduit for third-party application developers and regional ITS systems

RIITS 10-Year Strategic Plan

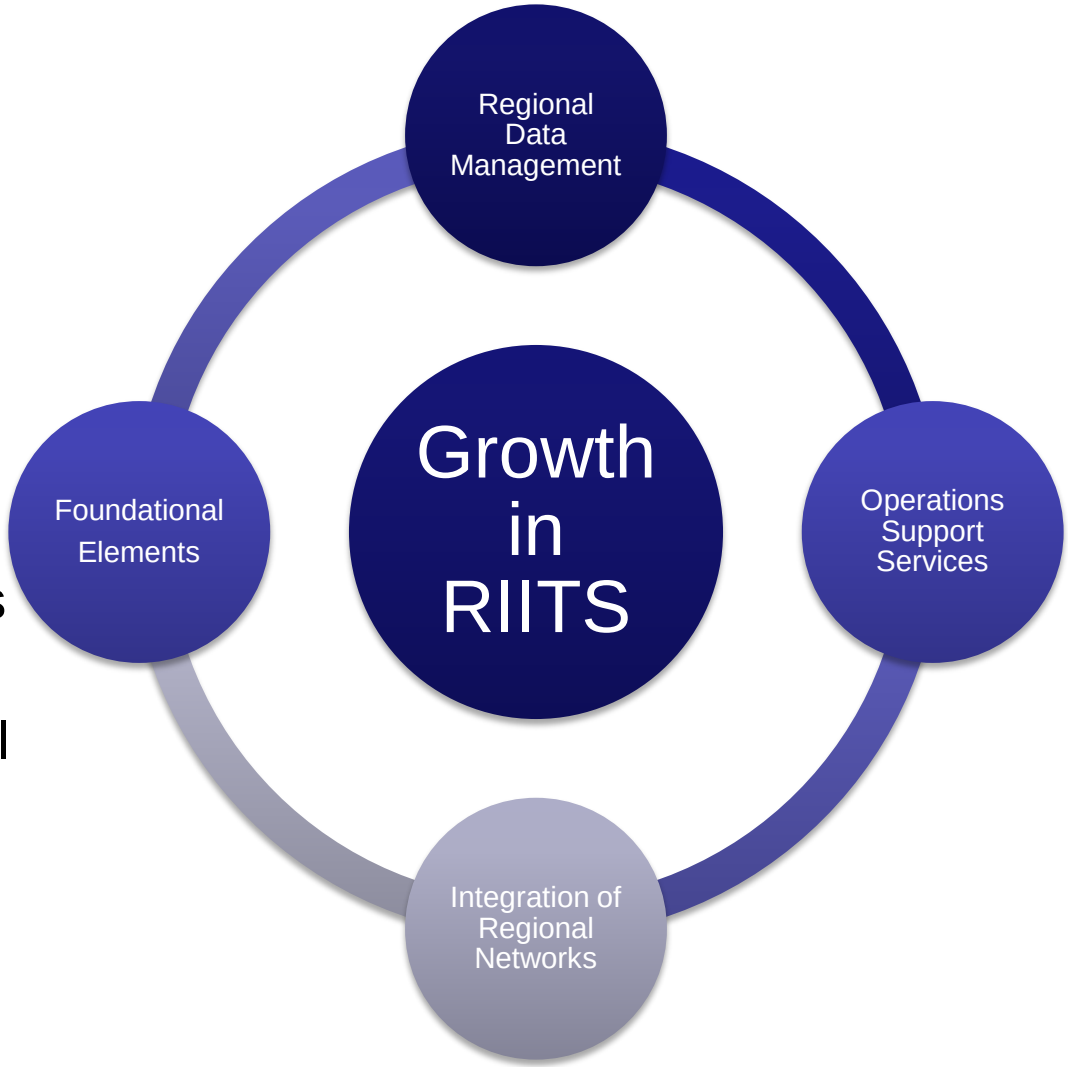
RIITS Implementation Plan

RIITS Implementation Plan

- 10-Year Horizon
- Near, Medium, and Long-Term Initiatives
- Estimated Cost: $36.5M
  - Over 10 Years
  - In Addition to Current $1.5M in Funding

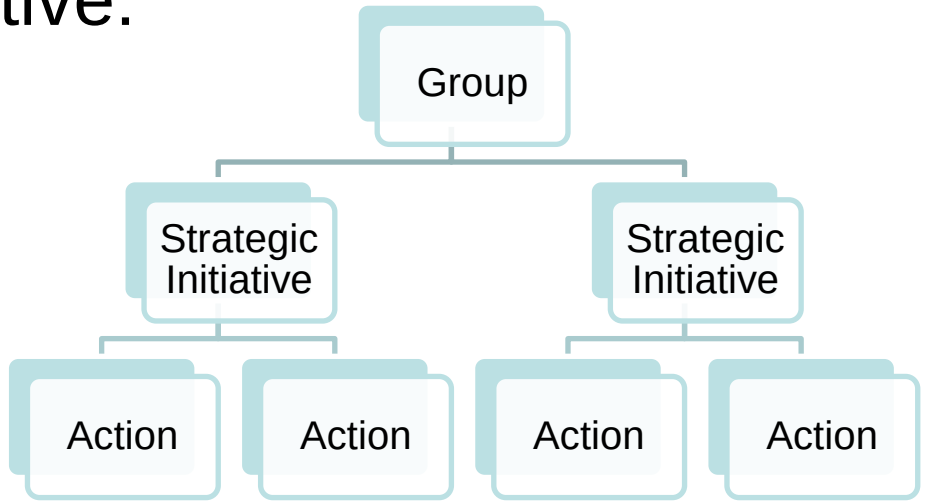
Balancing RIITS Implementation

- Strategic Initiatives within RIITS Program are Intertwined
- Growth in RIITS Agency Users:
  - Expands Usefulness for All RIITS Users
  - Strains Foundational Resources
  - Brings New Demands



Structure of Strategic Initiative Descriptions

- For Each Strategic Initiative:
  - Title
  - Business Purpose
  - Related Current Efforts
  - Actions:
    - Description
    - Duration/Timeframe
    - Budget
  - Key Agency Customers



Structure of Strategic Initiative - Actions

- Assessment &/or Concept of Operations
- Design &/or Prototype
- System Implementation
- Demonstration
- On-Going Support & Operations

Group 1 -Regional Data Management		
1A	**Regional Data Archive Enhanced**	
	1A.1	Update RIITS Institutional Structure
	1A.2	Review Archive Data Management System Project Preliminary Outputs
	1A.3	Scope Enhanced Regional Data Archive
	1A.4	Implement Enhanced Regional Data Archive
1B	**Filtered Data and Custom Queries**	
	1B.1	Prepare Assessment of Data Filtering Needs and Geographic Boundaries
	1B.2	Design Updated Database Structure
	1B.3	Enhance Database Query Functions/Tools
	1B.4	Demonstrate Enhanced Data Filter and Query Functions
	1B.5	Review Common Queries with CM Committee and Assess Impacts to Performance and Mitigation
1C	**Performance Measurement**	
	1C.1	Internal Outreach Effort on Performance Measurement
	1C.2	Prioritization and Design of Performance Measurement and Tools
	1C.3	Development of New Performance Monitoring and Measurement Tools and Reports
	1C.4	Network Modifications for Performance Monitoring Access
	1C.5	RIITS Performance Measurement Program Management

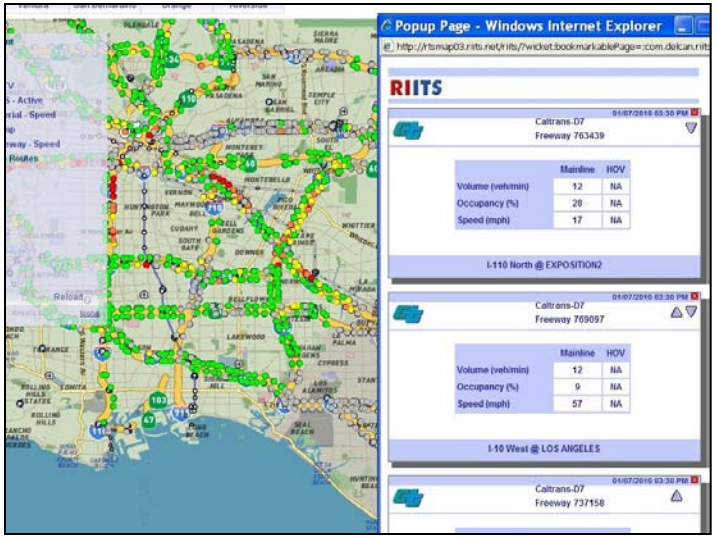
Preliminary Budget Estimates by Strategic Initiative

Strategic Initiative / Action	Budget Estimate Year 2010 $ (Nearest $1000)
Foundational Elements	
F1 Program Development and Technical Outreach Efforts*	$ 714,000
F2 Performance Reliability Enhancements (Networking, Communications, Backup, Redundancy)*	$ 2,250,000
F3 Standards and System Rearchitecture Update*	$ 1,620,000
Group 1 - Regional Data Management	
1A Regional Data Archive Enhanced	$ 2,556,000
1B Filtered Data and Custom Queries	$ 1,550,000
1C Performance Measurement	$ 2,015,000
1D Travel Forecasting and Modeling	$ 942,000
Group 2 - Operations Support Services	
2A Regional Event Reporting	$ 3,569,000
2B Regional Video Sharing	$ 8,371,000
2C Enhanced Situational Awareness	$ 8,859,000
Group 3 - Integration of Regional Network Services	
3A Regional Portal for ISPs/Developers	$ 1,454,000
3B Common ITS Field Device Broker	$ 900,000
3C Data Consolidator for Southern California 511	$ 1,064,000
3D Data Consolidator for LA Congestion Reduction Demonstration (CRD) Program	$ 669,000
Total Budget Estimate (rounded to the nearest $1,000)	**$ 36,533,000**

- All Estimates are Preliminary for Planning and Programming Purposes
- More Detailed Breakdown in the Plan

Phasing Strategic Initiatives & Actions

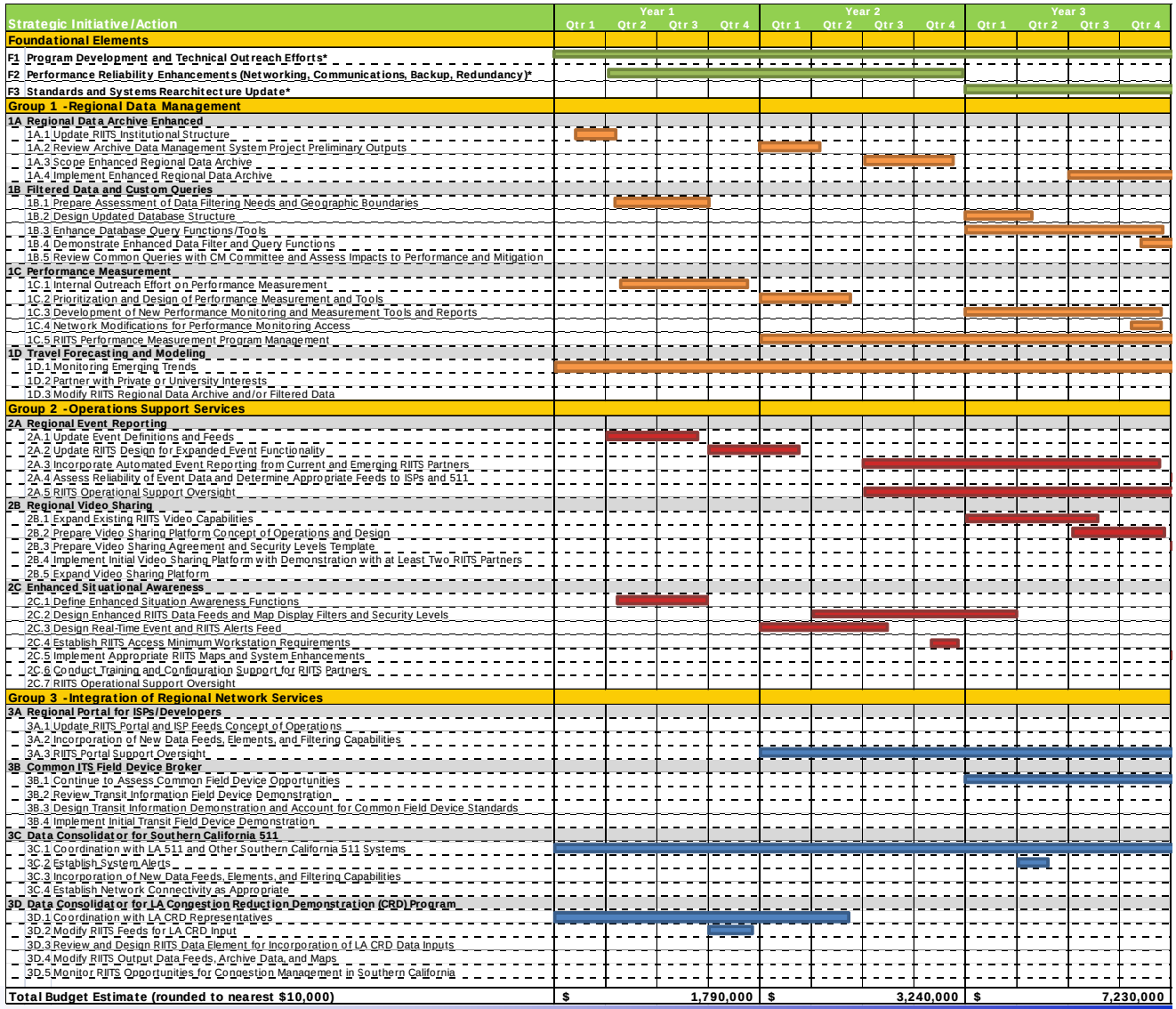
- Starting Point:
  - Baseline ADMS Currently Underway
  - Recent RIITS Map Updates



- Phasing Based On:
  - Stated Priorities from Outreach Efforts
  - Logical Progression of Actions
  - Duration of Actions
  - Iterative Feedback from Plan Review

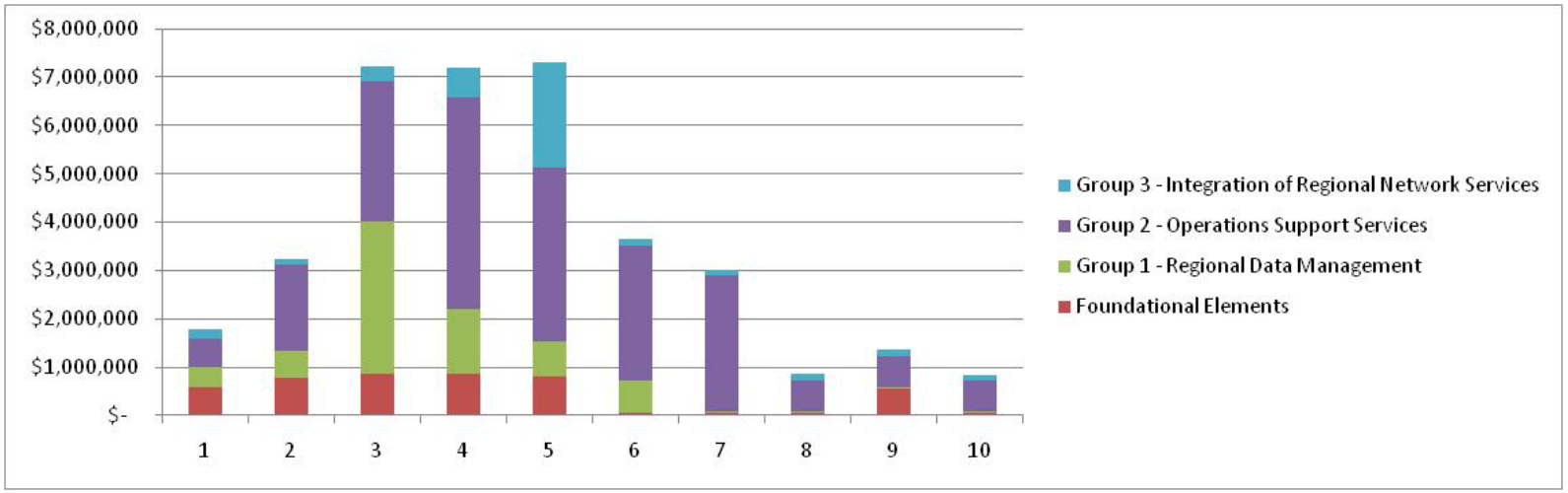
Phasing & Annual Budget Estimates

- Not Fiscally Constrained
- On-Top of Current $1.5M
- Assumes Baseline ADMS

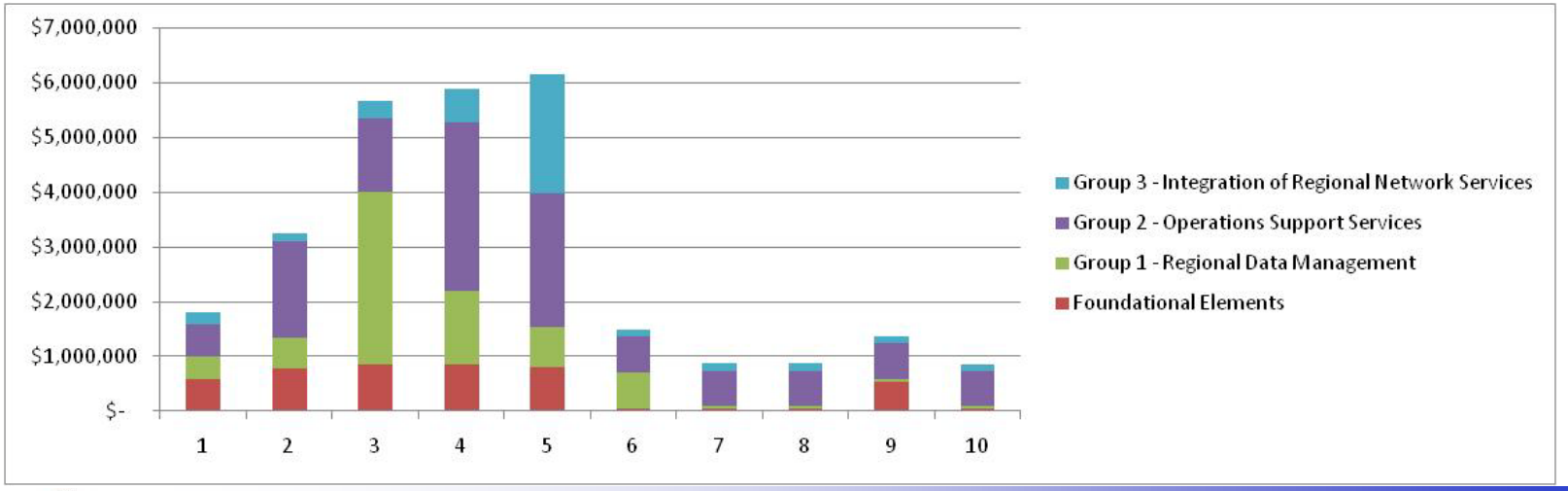


Breakdown of Annual Budgets

All Strategic Initiative Actions



Without Regional Video Sharing



Potential Funding Sources

- Plan Explores Funding Opportunities for:
  - MTA Internal Funds
  - External Funding
  - Cost Sharing with Partners
  - New Public-Public or Public-Private Partnerships
  - Cost Sharing with Third Parties Using RIITS Services

Recognizing:

RIITS Meets Key Regional Objectives

Technical Outreach Keyed with RIITS Performance

Key Near-Term Actions (Years 1-2)

- Program Development & Technical Outreach
- Update RIITS Institutional Structure for ADMS
- 1st Stage Performance/Reliability Enhancements
- Build on Baseline ADMS for Assessment & Concepts for Data Filtering & Performance Monitoring
- Define Regional Events & Situational Awareness Needs
- Coordination with LA Congestion Reduction Demonstration Program and 511.

Elements of Success for RIITS

Summary: Elements of RIITS Success

- Demonstrate Continued & Enhanced Value
- Update & Strengthen Institutional Structure
- Enhance Performance & Minimize Data Latency
- Expand & Press Forward with Technical Outreach
- Enhance Both Operational and Archived Data Functionality

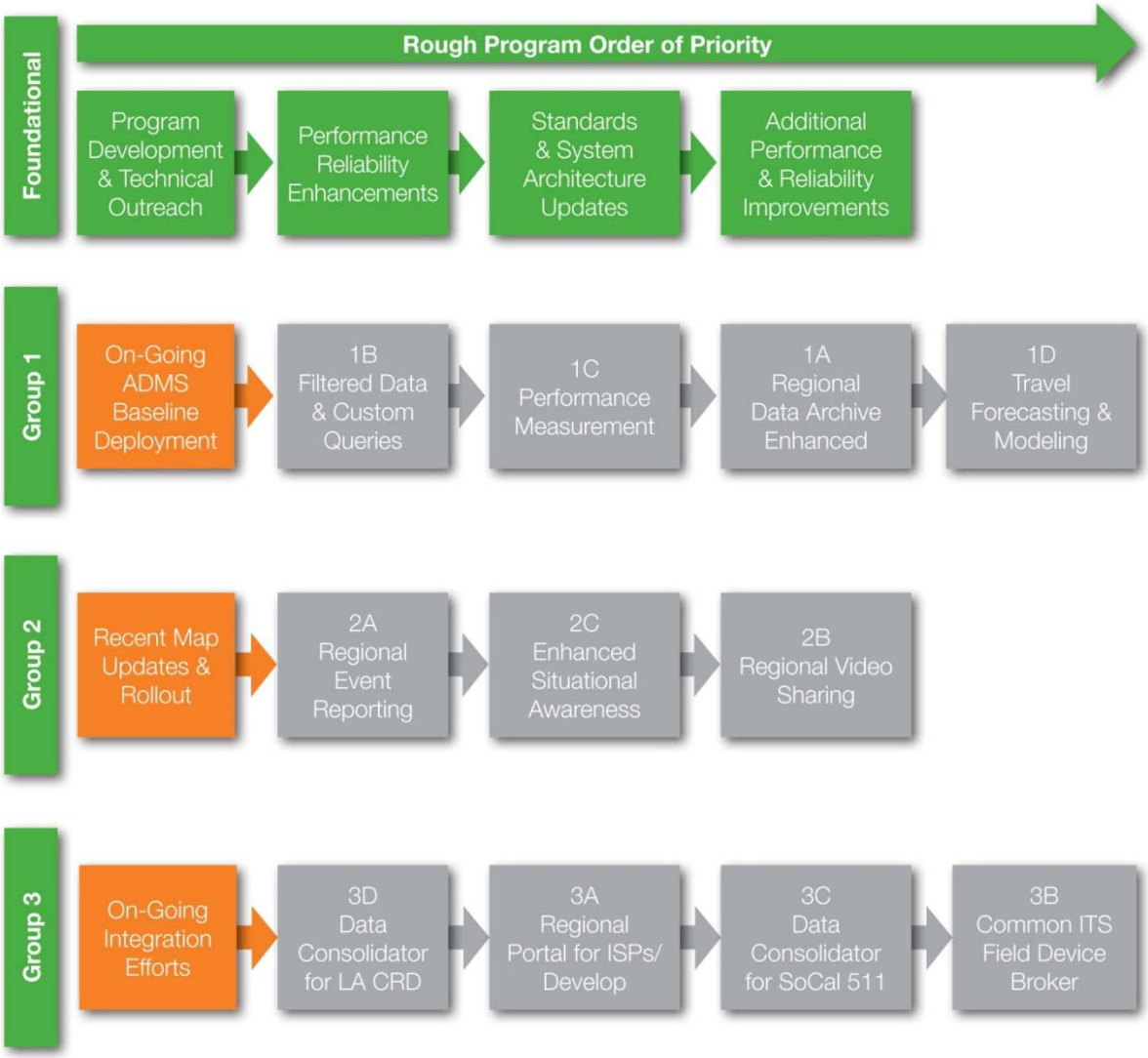
RIITS 10-Year Strategic Plan

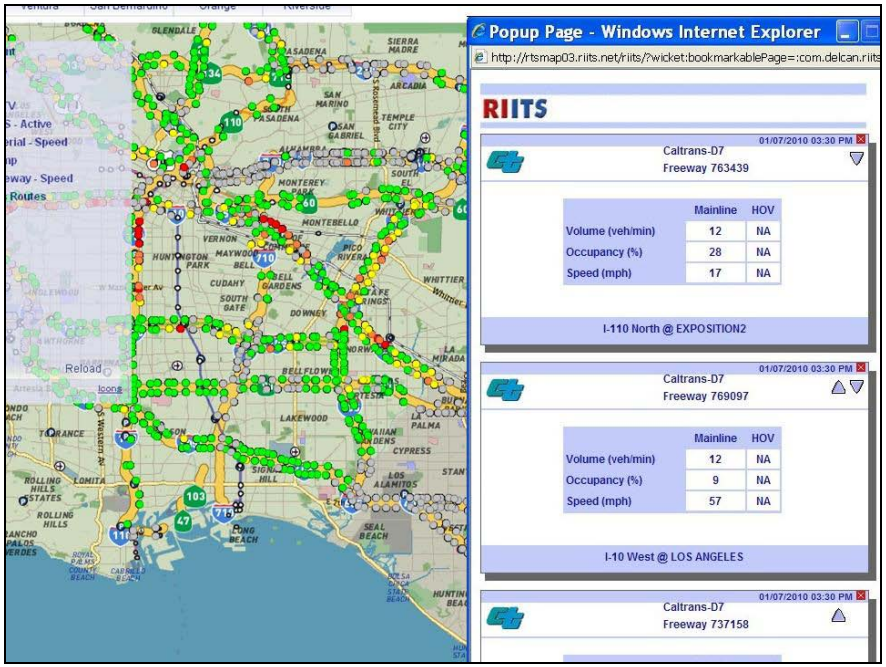
QUESTIONS/DISCUSSION

RIITS 10-Year Strategic Plan

THANK YOU!

Rough Priority by Group Over 10-Years




Popup Page - Windows Internet Explorer
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RIITS
01/07/2010 03:30 PM
Caltrans-D7
Freeway 763439
Mainline
HOV
Volume (veh/min)
12
NA
Occupancy (%)
28
NA
Speed (mph)
17
NA
I-110 North @ EXPOSITION2
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Caltrans-D7
Freeway 769097
Mainline
HOV
Volume (veh/min)
12
NA
Occupancy (%)
9
NA
Speed (mph)
57
NA
I-10 West @ LOS ANGELES
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Caltrans-D7
Freeway 737158
Reload

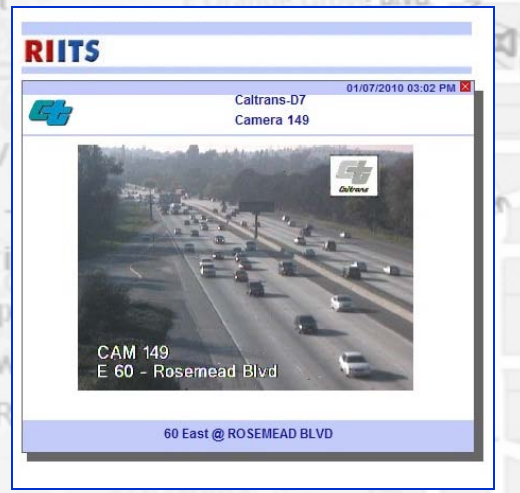
Regional Integration of ITS (RIITS)
10-Year Strategic Plan

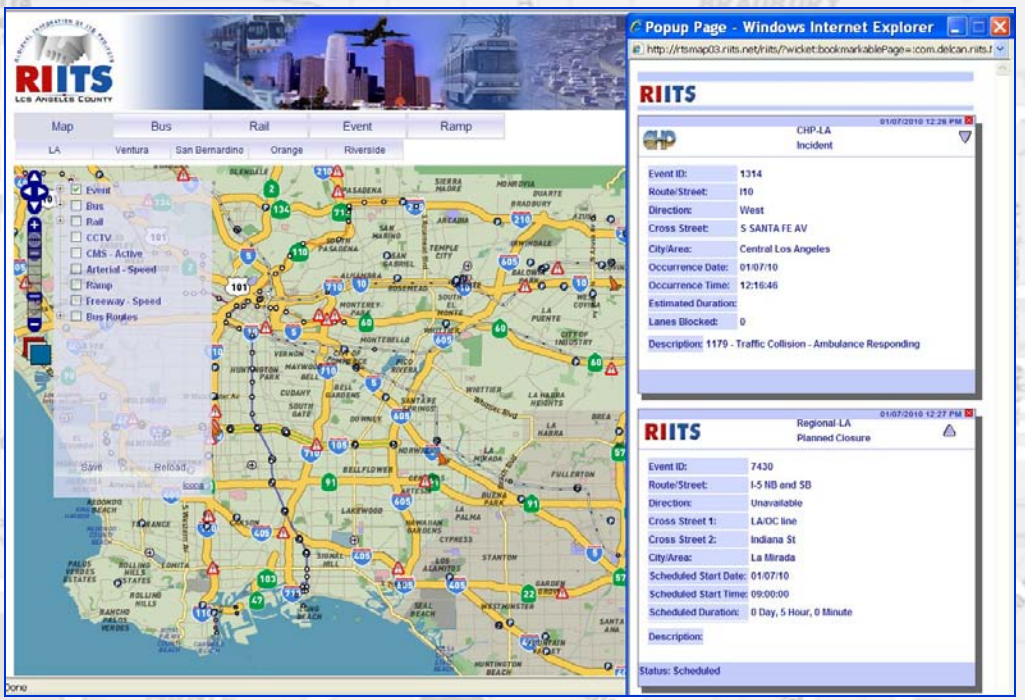
Executive Management Presentation

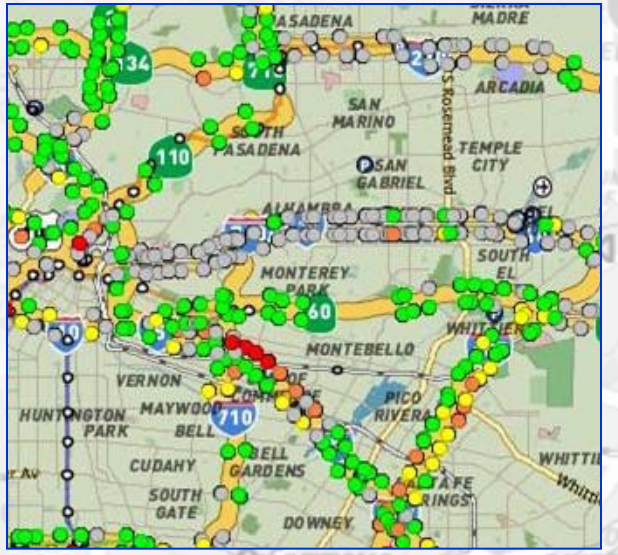
June 15, 2010

Unique Attributes of RIITS

- Interagency, multimodal perspective on the regional network
- Near real-time data environment
- Web-based platform accessible from anywhere
- Secure agency access to the network
- Central to Regional ITS Architecture and standards
- Emerging regional data management resource







RIITS Connects
Public Agency ITS Systems
Across Southern California

What is the RIITS Strategic Plan?

- Articulates a vision for the RIITS system that provide value to the core businesses of MTA and partner agencies

- Identifies and prioritizes future investments to enhance the functionality of the multimodal, multi-agency, RIITS network

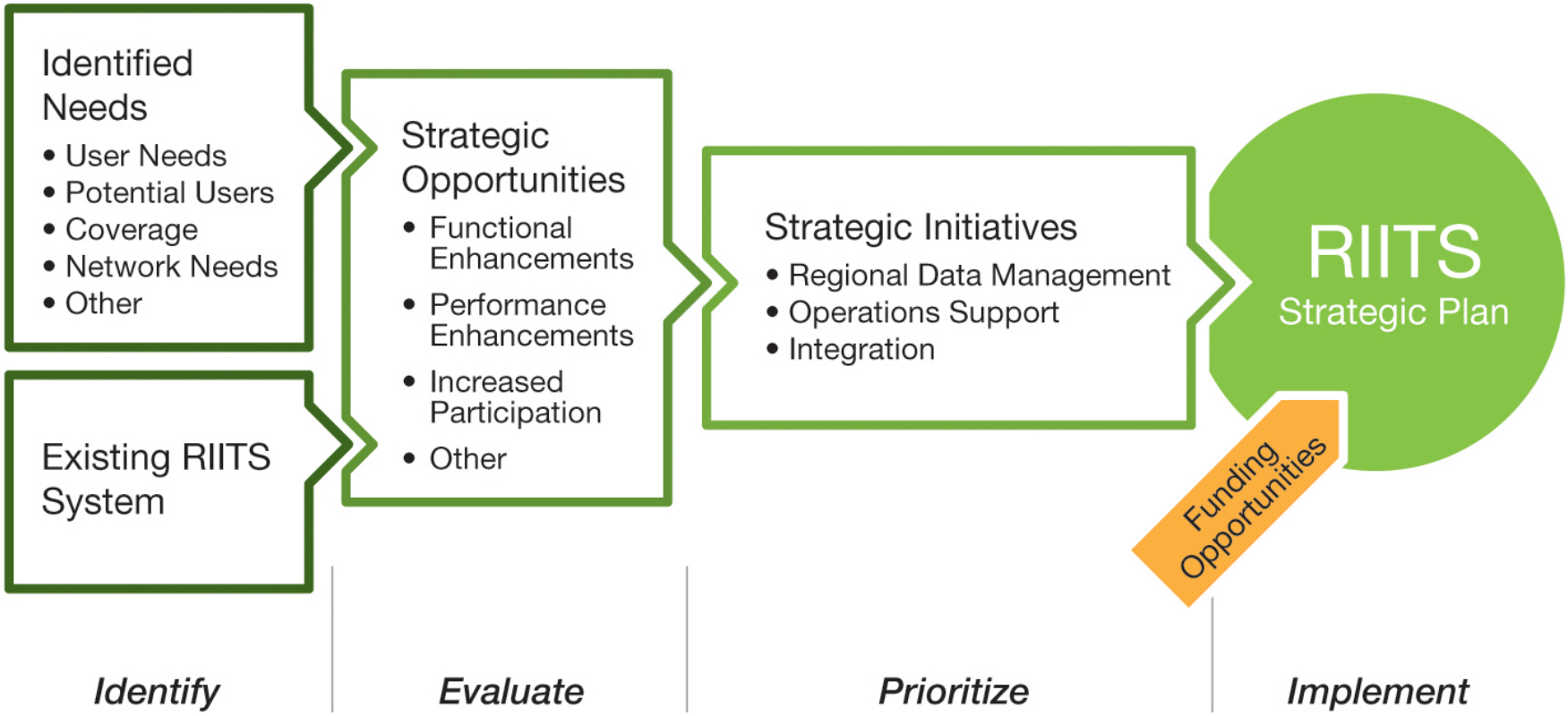
RIITS Strategic Vision

To deliver *multimodal* transportation *information services* through a *flexible platform* to achieve *regional mobility, safety, and sustainability goals*.

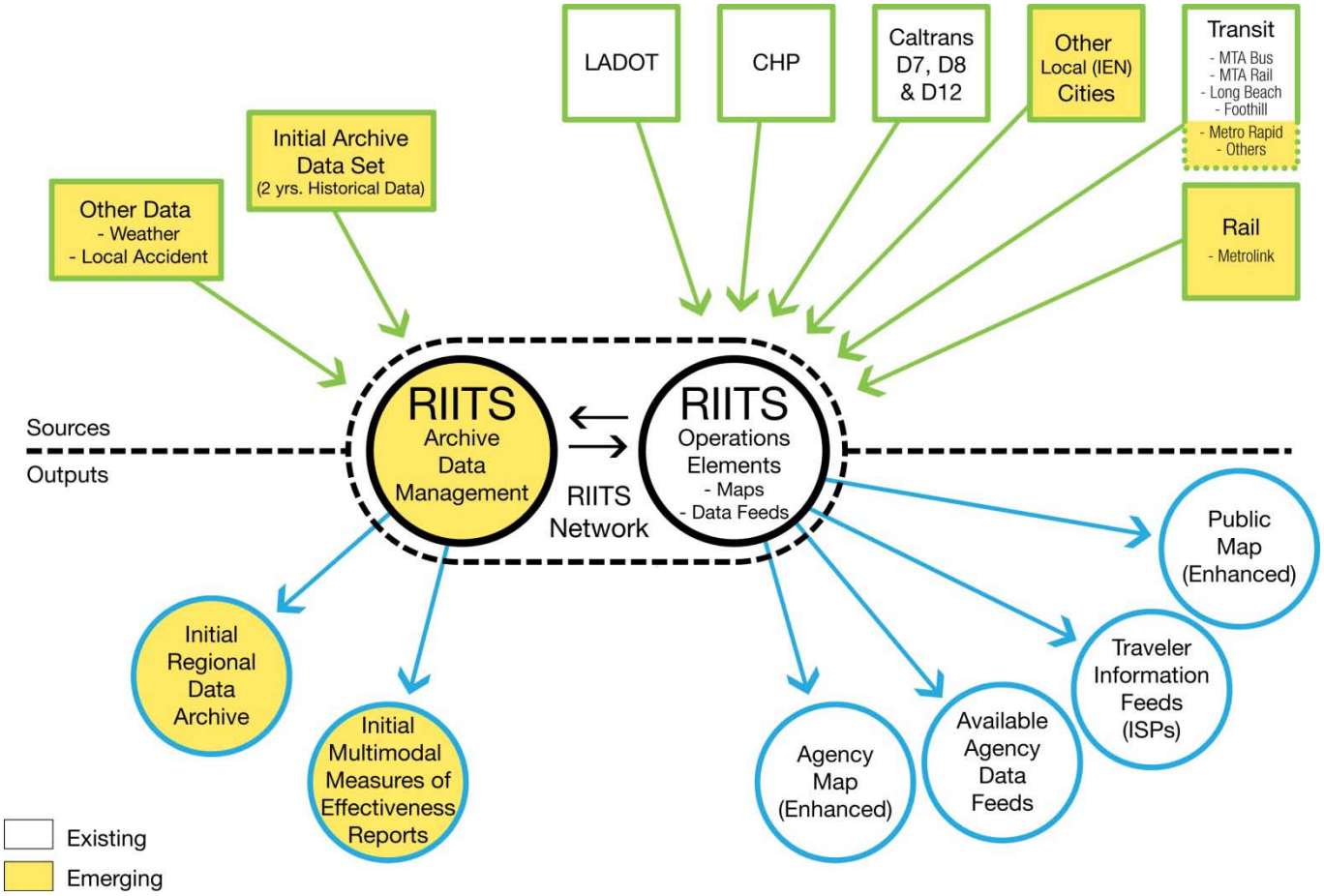
Participating Departments and Agencies

Agencies Participating in the Development of the Strategic Plan	
Antelope Valley Transit Agency	Auto Club of Southern California
Beach Cities Transit	Caltrans (Districts 7, 8, 12)
California Highway Patrol	City of Burbank
City of Commerce	City of Downey
City of Glendale	City of La Mirada
City of Montebello	City of Palmdale
City of Santa Monica	City of Torrance
Culver City Bus	Federal Highway Administration
Foothill Transit	Gateway Cities Council of Governments (GCCOG)
International Warehouse Logistics Association	Long Beach Transit
Los Angeles County Public Works	Los Angeles County Sheriff's Department
Los Angeles Department of Transportation	Los Angeles Port Police
MTA (ATMS, Engineering, Communications, ITS, Operations, Planning, Rapid, Security)	Norwalk Transit
Port of Los Angeles	Santa Clarita Transit
Southern California Association of Governments (SCAG)	Service Authority for Freeway Emergencies (SAFE)
Santa Monica Big Blue Bus	

From Needs to Implementation



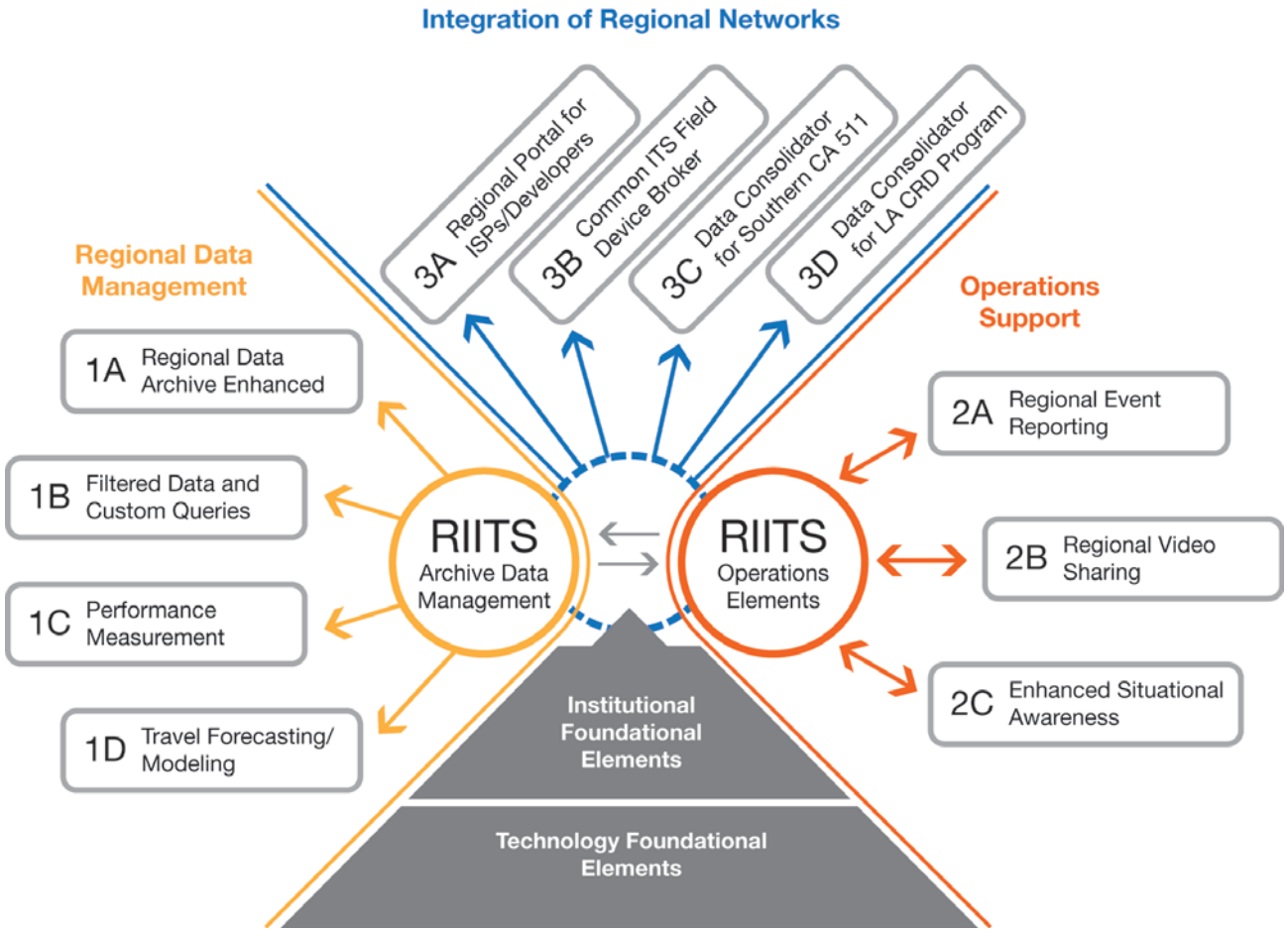
Current & Emerging System Relationships



RIITS Responds to Critical Transportation Needs of MTA and Partner Agencies

- Cost-effective solutions to mobility needs
- Efficient operation of the multimodal network
- Corridor performance measurement
- Regional freight mobility
- Emergency management
- Sustainability & climate change

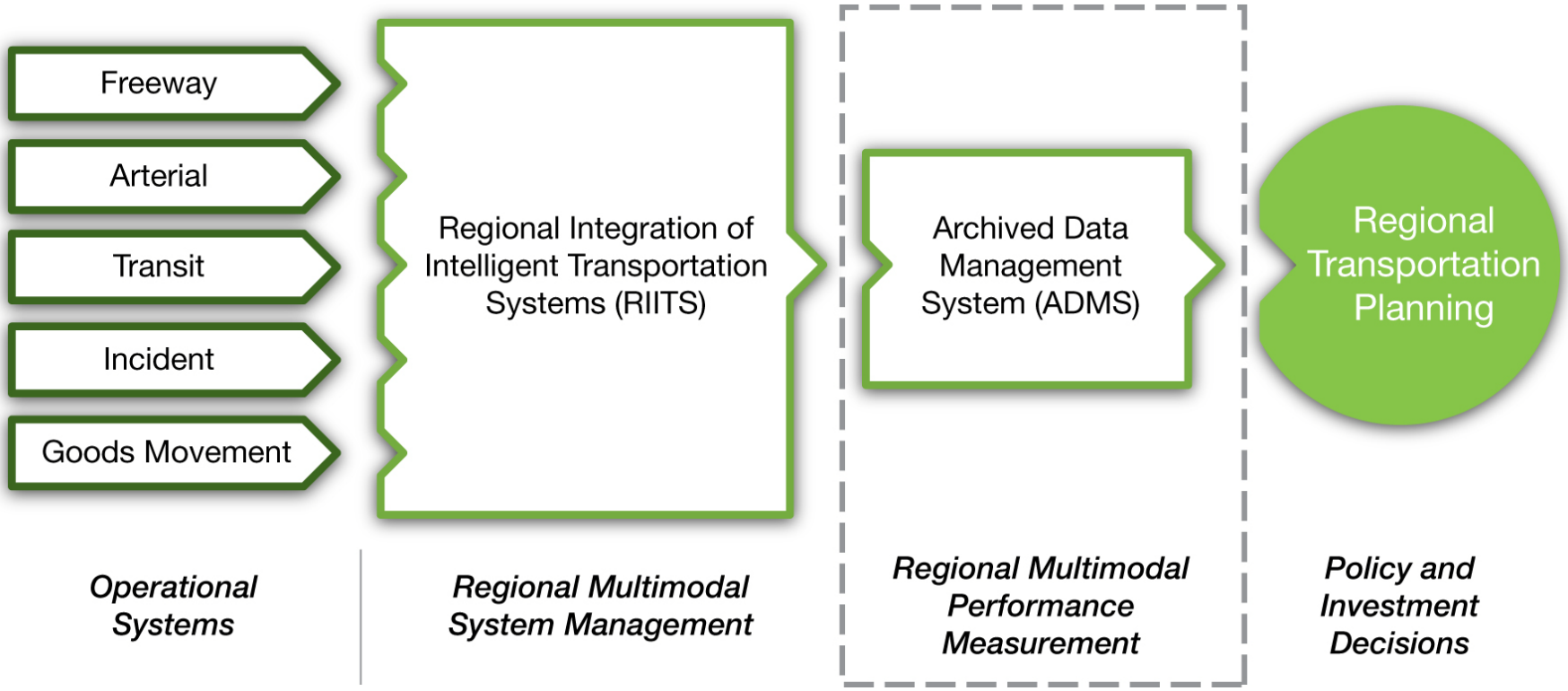
Strategic Initiatives:
Supporting the Core Businesses of RIITS Partners



Foundational Elements
Enable Growth in RIITS Services and Value

- Sustainable funding for RIITS capital investment and operations
- Stakeholder partnership, outreach, and technical collaboration
- Performance and reliability enhancements to the RIITS technology network

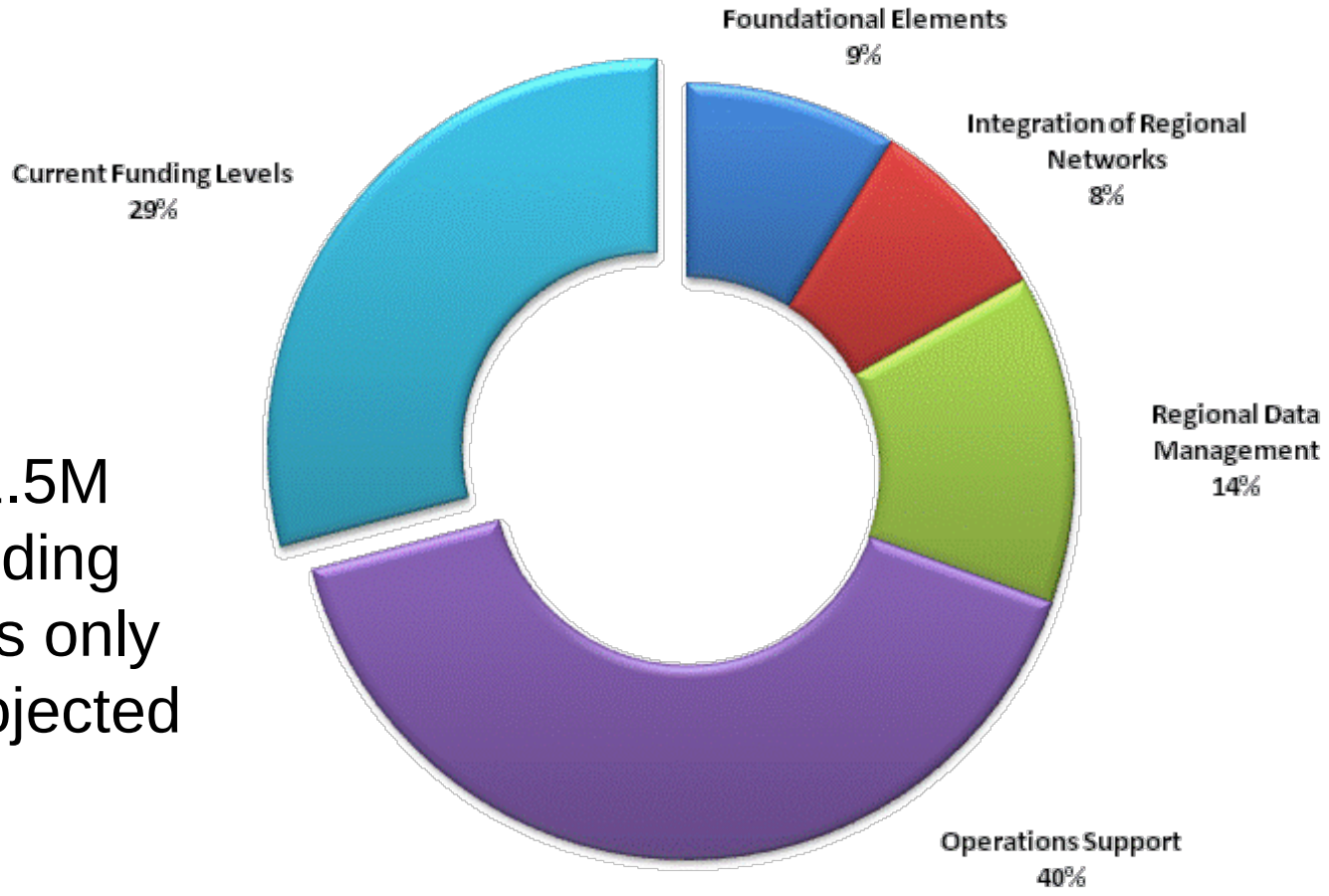
Archived Data Management System (ADMS) for Planning and Performance Measurement



RIITS Implementation Plan

- 10-Year Planning Horizon
- Continuous Investment in Foundational Elements to Support Strategic Initiatives
- Near, Medium, and Long Term Initiatives based on Stakeholder Priorities

RIITS Implementation Plan Funding Need Additional $36.5 Million over 10 Years



- Current $1.5M annual funding level meets only 29% of projected need

RIITS Value Proposition to MTA

- A strategic vision that responds to MTA core business functions
- A data environment that supports regional ITS applications like 511 and congestion reduction
- Transportation system and program performance measurement with multiagency, multimodal data
- Real-time operations support tailored to departmental needs
- Enhanced coverage, performance, and functionality from future investments in the network

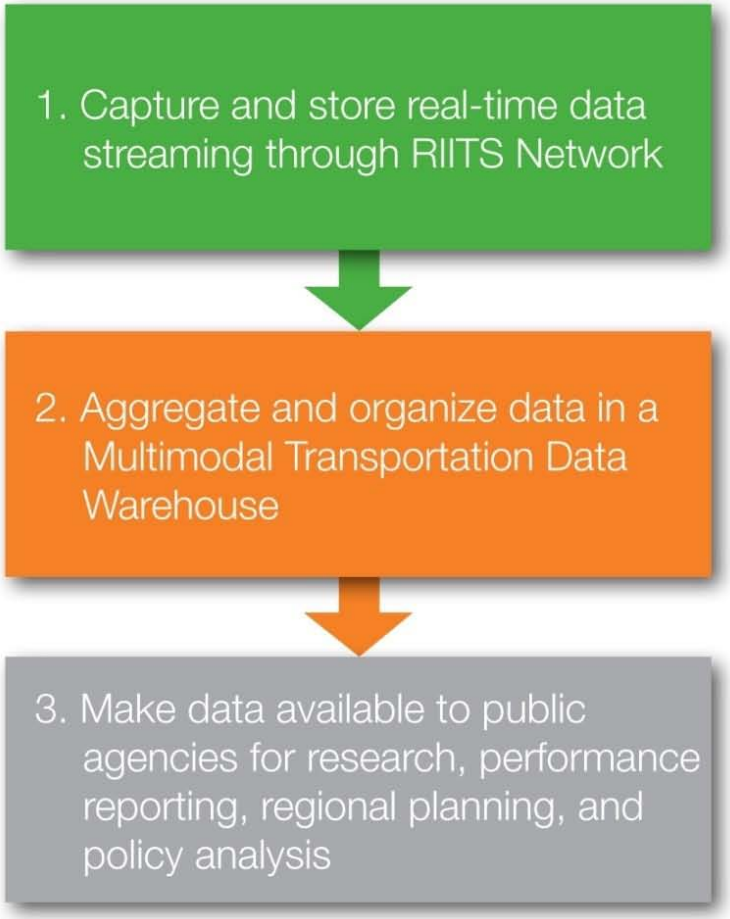
Moving the RIITS Vision Forward

- MTA ownership and sustainable funding are key to achieving the RIITS vision
- Leverage MTA reorganization to increase visibility among MTA Departments that benefit from RIITS
- Opportunistically seek external funding sources

RIITS 10-Year Strategic Plan

THANK YOU!

Archive Data Management System (ADMS): A New Role for RIITS



ADMS is a "one stop shop", delivering transportation services to address the mobility, safety, and sustainability goals of MTA, the Los Angeles county region, and beyond.