Gateway Cities
ITS Integration Plan
for Goods Movement

Technical Memorandum No. 2
Proposed Projects

Prepared for:

in partnership with:

Prepared by:

Kimley-Horn
and Associates, Inc.

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TM2.1 SUMMARY

The Gateway Cities Council of Governments (GCCO G), in support of cleaner air and reduced congestion, is interested in furthering technology application and connections within the transportation system. By nurturing technology in this field, the COG believes that increased efficiencies, in the movement of goods in particular, can be realized through the southeast Los Angeles area resulting in a better quality of life for its 2.5 million residents. These technologies, known as Intelligent Transportation Systems (ITS), have been proven to work better and result in greater benefits to drivers when connected to one another to share more information. The purpose of this ITS Integration Plan is to determine where technologies can have a positive impact and where they should be connected to provide a safer and more mobile transportation system for residents and business owners.

This ITS Integration Plan has a heavy emphasis on goods movement and the private sector as a critical partner in developing solutions that will be effective. Numerous regional and statewide studies and plans have looked at the specific issue of freight and the importance of freight mobility to the regional, state and national economy. This Integration Plan has a different perspective, which is illustrated in the graphic shown in Figure 1. Each component of the hundred dollar bill (described below) demonstrates that the benefits of goods movement can not be realized without the successful addition of the different components to complete the “bill.” The benefits for this ITS Integration Plan are accomplished through:

- Coordinated, Active Operations – The day-to-day business of both the public and private sector is improved through operations that are coordinated with the appropriate parties and actively monitored for performance and future improvements.
- Technology Infrastructure – The deployment of advanced technology infrastructure, such as a communication backbone or field equipment to monitor Port terminals, provides information to both the private and public sector.
- Business Decision/Information Flow – The private sector uses information to make more informed business decisions, which not only impact their bottom line, but increase efficiency.
- Public Decision/Information Flow – The public sector uses information to make decisions that impact their constituents and to guide infrastructure investments.
- Policy and Investment Decision-Making – Both the private and public sectors work together to make Policy and Investment decisions based on the information flows specific to their industry by working together toward a common goal and mutually beneficial partnership.
This technical memorandum, Technical Memorandum #2 (TM2), is the second interim deliverable that will be incorporated into an ITS Integration Plan for the Gateway Cities Area. TM2 builds on the needs and gaps previously identified in the earlier tasks, and identifies specific projects and strategies to address those needs. TM2 contains the following information:

TM2.1.1 Fundamental Objectives

The fundamental objectives outline the plan for meeting the needs identified in TM1. Solutions range from installing field infrastructure to establishing unique, cutting edge, institutionally challenging technology solutions. A summary of the fundamental objectives are shown below. Some have the potential to be met in the short-term and others require further stakeholder involvement to fully develop mutually beneficial solutions to achieve the objectives. Those objectives with short-term potential for implementation are labeled as SHORT-TERM here and specific projects are recommended to in the following section.

1. **Fill Infrastructure Gaps** – SHORT-TERM - completing detection and communications on freeways and arterials throughout the region. A variety of technologies will accomplish the coverage and the data will be used to develop a plethora of information to be shared with trucks, dispatchers, rail operators, public agencies, and the general public.

2. **Arterial Travel Information** – SHORT-TERM - very few places in the country have attempted a full scale arterial travel time program. This concept would require extensive
detection and would be tailored to determining and sharing information regarding delays on key allowable arterial truck routes.

3. **Truck Data** – SHORT-TERM - Numerous projects are recommended to collect anonymous truck-specific data such as speeds, idling, and other related truck information (all anonymous).

4. **Freight-Focused Traveler Information** (on-board and web-based) - SHORT-TERM - Several projects will provide information valuable to trucks and truck companies back to drivers and dispatchers such as real-time truck-experienced delays on freeways and arterials, turnaround times at terminals and queue delays behind terminal gates, and real time dynamic routing for trucks.

5. **Drayage Turnaround Times and Queue Detection** – SHORT-TERM - data collected will be used to fill in much needed gaps in information for trucks regarding how long it will take to pick-up containers at the Ports of Long Beach and Los Angeles.

6. **Comprehensive Goods Movement Scheduling System** – though likely to be institutionally challenging to deploy, a scheduling system that relies on international, real-time container tracking has the potential to improve air quality, reduce congestion, and improve the bottom line for trucking companies and rail companies alike.

7. **Strategy for Truck Safety and Credentialing** – to improve safety, stakeholders are working to revamp the truck inspection system through improved policy and increased operations in the Gateway Cities Area. Technology will likely play a major role in the solution, given the lack of real estate available for building new inspection stations in the subregion.

**TM2.1.2 Proposed Projects**

Projects are defined in terms of functionality to achieve the objectives outlined above. These proposed projects, combined, will achieve the fundamental objectives described above. A subsequent implementation plan will show the sequencing (based on requisites and priorities) of these projects and intending implementation timeline. A business plan will provide a structure by which funding may be identified and applied and the potential involvement of the private and the public sector in funding such improvements.

The following list of projects is defined in this section:

1. Freeway Detection Infrastructure
2. Arterial Infrastructure
3. Arterial Travel Times
4. Queue Detection And Terminal Turn Times
5. Goods Movement Transportation Management
6. Truck Fleet Communications Program
7. Comprehensive Performance Monitoring System
8. Existing Sources – Truck Fleet Data Collection And Agreements

Further discussions and project concept development are required among impacted stakeholders to define the following long-term projects.

1. Port Reverse 911 Emergency Notification Call System
2. Comprehensive Goods Movement Scheduling System (Container Tracking)
3. Truck Parking Coordination
4. Vehicle Enforcement Strategies, Systems and Sites Study
5. Congestion Pricing Initiatives
6. Integration And Policy Task Force

TM2.1.3 Institutional and Policy Issues

This stage of the ITS Integration Plan defines core concepts that will shape how the Gateway Cities region better integrates freight and goods movement into all aspects of operating and planning for the regional transportation network. The following topics are for consideration in future steps and project development.

- Strong Private/Public Partnership in Developing Future Solutions
- Private sector participation/business model framework
- Data sharing/privacy issues
- Local agency ‘equity’
TM2.2 INTRODUCTION AND OVERVIEW

The Gateway Cities Council of Governments (GCCOOG), in support of cleaner air and reduced congestion, is interested in furthering technology application and connections within the transportation system. By nurturing technology in this field, the COG believes that increased efficiencies, in the movement of goods in particular, can be realized through the southeast Los Angeles area resulting in a better quality of life for its 2.5 million residents. These technologies, known as Intelligent Transportation Systems (ITS), have been proven to work better and result in greater benefits to drivers when connected to one another to share more information. The purpose of this ITS Integration Plan is to determine where technologies can have a positive impact and where they should be connected to provide a safer and more mobile transportation system for residents and business owners.

TM2.2.1 Objectives and Regional Focus on Goods Movement

This ITS Integration Plan has a heavy emphasis on goods movement and the private sector as a critical partner in developing solutions that will be effective. Numerous regional and statewide studies and plans have looked at the specific issue of freight and the importance of freight mobility to the regional, state and national economy.

As agreed upon by the stakeholders discussed above, the objectives of this ITS Integration Plan for goods movement are to:

- Identify existing and planned ITS projects and systems in the region and assess their ability to meet the unique needs of freight and goods movement;
- Summarize the specific needs of freight and goods movement stakeholders;
- Identify and incorporate other appropriate stakeholders into the plan development process;
- Document key initiatives that could support safer and more efficient goods movement;
- Identify opportunities and gaps in current agency ITS plans and programs;
- Develop potential strategies and solutions for innovative applications, partnerships and projects;
- Identify where updates to regional ITS architectures should focus to best integrate freight and goods movement with transportation/traffic management; and
- Summarize in an ITS Integration Plan that identifies deployment, partnerships, business model approaches, and timeframes to best leverage investment and involvement by the public and private sectors.

TM2.2.2 Report Contents and Organization

This technical memorandum is the second interim deliverable that will be incorporated into an ITS Integration Plan for the Gateway Cities Area. Technical Memorandum #1 summarized the current ITS initiatives in the region (and relevant statewide programs and initiatives) and where there are gaps in those programs in terms of addressing the unique needs of goods movement. A key focus of Technical Memorandum #1 was to identify needs specific to freight and goods movement in the region – needs included both public agency transportation management/operations perspectives as well as the needs of port operations, private freight/drayage, rail, warehouses, and other important private sector perspectives. Within the needs discussion, there may be opportunities to enhance current agency projects or programs, or implement new technology applications or integration strategies to be able to effectively address the identified gaps.
Technical Memorandum #2 (TM2) builds on the needs and gaps previously identified in the earlier tasks, and identifies specific projects and strategies to address those needs. Because this is an ITS Integration Plan, there is a very strong focus on technology applications, regional integration priorities, as well as some innovative applications and infrastructure that are ‘outside of the box’ of the traditional public-sector ITS and transportation management arena. The unique nature of this project will require collaboration between public sector and private industry stakeholders in order to bring these programs to fruition.

The third deliverable in the series will be an Integration Plan that will identify a coordinated concept of operations, project implementation timeframes, and business plan considerations for the identified strategies.

This memorandum fits into the overall GCCOG ITS Integration Plan as follows:

**GCCOG ITS Integration Plan**

- Technical Memorandum 1: Inventory, Existing Conditions, and Needs Assessment
- Technical Memorandum 2: Proposed Projects
- Gateway Cities ITS Integration Plan
  - Concept of Operations
  - Business Plan
  - Implementation Plan
  - Executive Summary

**Section 1 - Introduction** – overview of TM2 and relationship of this deliverable to the overall project development.

**Section 2 - Fundamental Objective Development Process** – This section describes the process used to identify and develop fundamental objectives, and includes a schematic showing the inputs and outcomes.

**Section 3 - Fundamental Objectives** – This section identifies several fundamental objectives that have been discussed with GCCOG stakeholders as priority initiatives. These are presented in ‘big picture’ detail within this section, and each includes specific projects that will incrementally build out the concept functionality. Projects are mapped to the needs from Technical Memorandum #1.

**Section 4 - Proposed Projects** – This section defines specific projects that together would combine or integrate to achieve the fundamental objectives described in the previous section. The projects are described geographically, functionally, and include stakeholders, and institutional and integration issues for consideration.

**Section 5 - Institutional and Policy Issues** – This section identifies some key considerations that will influence how the region could continue to plan for integration, as well as some overarching policy and partnership frameworks that will enable continued deployment and enhanced operations. Some of these issues will be addressed in more detail as part of the Business Model discussions in the Integration Plan.
TM2.3  **Fundamental Objectives Development Process and Methodology**

An important focus of this Integration Plan is to move from needs and issues to tangible programs that can be implemented to address the high priority freight and transportation management needs of the region. This task marks a key shift in the direction of the Integration Plan and begins to identify some core Freight/Goods Movement objectives, and then looks at some specific project building blocks that will be required to implement those concept-level programs.

The process used to develop these objectives incorporated several different inputs. Stakeholder needs and issues were a key factor driving the development of these objectives. These objectives also factor in current ITS programs and planned enhancements to be able to leverage the investment being made by agencies in the region. Task 1 research also yielded some important information about innovative applications and approaches that could potentially have applicability to the GCCOG region and the need to better plan for and manage the regional transportation system and the demands of freight/goods movement traffic. **Figure TM2-2** below shows a high-level process diagram of inputs to the objective development process.

![Figure TM2-2 - Gateway Cities' Integration Plan Objectives Development Process](image)

At this stage of the planning process, it was important to develop these objectives with a certain amount of flexibility; it may take several years to implement some of these concepts, and one or more key projects to provide the technical, partnering or infrastructure ‘foundation’. Many of these objectives are dependent on technologies or systems that may still be in the development stages, or would need to be adapted or modified to meet some of the unique and very specific needs of the freight/goods movement community as well as the transportation management and operations agencies.

Based on Technical Memorandum #1 (TM1), seven fundamental objectives are shown in Section 3. These seven objectives address the fundamental ITS needs developed in TM1. Each is structured in a consistent format to provide an overview of the objective, identify key stakeholders that would be involved (either as leaders, champions or participants) and their role, a high-level description of the functionality, as well as identify any key dependencies, such as existing systems, institutional issues, or dependency on another project or program. For each objective, there are specific projects that would be required to implement in order to achieve the full functionality envisioned to address key stakeholder needs. In many instances, there are also policy and institutional issues that would need to be addressed.
at the project and concept/program level. Detailed project write-ups follow this section. For ease of traceability, **Table TM2-1** summarizes the objectives, related specific projects and the needs that would be addressed.

**Table TM2-1 - Summary of Fundamental Objectives and Mapping to Needs**

<table>
<thead>
<tr>
<th>Fundamental Objectives</th>
<th>Mapping to Needs*</th>
<th>Specific Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fill Infrastructure Gaps</td>
<td>4, 5, 6, 7</td>
<td>Freeway Detection Infrastructure, Arterial Infrastructure, Congestion Pricing</td>
</tr>
<tr>
<td>2. Arterial Travel Information</td>
<td>1, 2, 3, 6</td>
<td>Arterial Travel Times</td>
</tr>
<tr>
<td>3. Truck Data</td>
<td>2, 3, 5, 8, 9, 11</td>
<td>Truck Fleet Communication, Existing Truck Data Sources</td>
</tr>
<tr>
<td>4. Freight-Focused Traveler Information (on-board and web-based)</td>
<td>1, 2, 6, 8, 9, 10, 11,13, 15, GMTM, Truck Parking Coordination</td>
<td></td>
</tr>
<tr>
<td>5. Drayage Turnaround Times and Queue Detection</td>
<td>3, 7, 8</td>
<td>Queue Detection and Terminal Turn Times</td>
</tr>
<tr>
<td>7. Strategy for Truck Safety and Credentialing</td>
<td>12, 13, 14, 15</td>
<td>Port Reverse 911, Vehicle Enforcement Strategies, Integration and Policy Task Force</td>
</tr>
</tbody>
</table>

*Abbreviated list of Stakeholder Needs/Gaps from Technical Memorandum 1

**Real-time Traveler Information**

- Implement a subregional real-time traveler information program, accessible via phone (511), web and in-vehicle systems.
- Identify freight-specific real-time traveler information needs, and the preferred ways to deliver that information.
- Look at a range of business models and potential partnerships to support data collection and data fusion.

**Deployment and Integration of Field Infrastructure**

- Need monitoring infrastructure on freight-critical corridors (I-710, I-110) including cameras and detection, and there needs to be a mechanism to share that information with those agencies and operators who need it.
- Need accurate truck volume counts (freeways and arterials) to support real-time operations, decision making, and longer-term planning.
- Explore opportunities for innovative real-time data collection on key freeway and arterial corridors to fill gaps where there is no (or limited) infrastructure.

**System Integration**

- Need to ‘push’ real-time transportation system data to the Port operations centers, and vice versa. Also need to implement interfaces with neighboring Caltrans districts for seamless freeway monitoring and interjurisdictional continuity.
Goods Movement

- Provide the trucking industry with real-time information on turn-times for projected delays inside marine terminals at the two Ports so they can plan their schedules and operation more efficiently.
- There needs to be a direct link between transportation management agencies and the goods movement industry (vehicle or dispatch) to provide real-time and two-way information exchanges.
- Provide information in multiple languages, specifically Spanish.
- Need a standardized, Port-wide appointment system.
- Provide more truck inspection and weight monitoring facilities.

Policy/Institutional Needs

- There needs to be improved coordination for real-time operations strategies, particularly between state, regional, and local agencies and the Ports.
- There is a need to revisit policy for weight enforcement.
- Freight (and private sector) needs to be an important partner in the planning and implementation process for any ITS strategies at the regional level.

TM2.4  FUNDAMENTAL OBJECTIVES

This section outlines the fundamental objectives that together comprise a program to meet the needs identified as having potential to be solved or mitigated by technology application and/or integration. The basis of this program is to build on and connect to a greater extent the existing technology and communications programs and infrastructure currently in place or being planned for the Gateway Cities area.

In cases where existing program plans have noted potential for the solutions to vary prior to deployment, they are described in this document as being planned but documented in the project descriptions and subsequent implementation plan in order to emphasize the importance of completing those projects. Reasons for potential variance include such issues as the program/project being in early stage planning/design, potential funding shortfalls, or the particular phase or solutions sought here are longer-term phases or lower priorities to the existing programs. Where these solutions are critical to the success of this overall program or to component projects therein, it was deemed important to document them as such to avoid losing momentum in deployment into the short-term future. In some cases where current project plans are for the long-term, interim or short-term solutions are proposed that will be carefully designed to transition smoothly into the long-term solutions when deployed and tested.

Where existing or planned programs or projects have strong confidence of the solution set, programmed funds, and a strong champion(s) moving the projects ahead, those projects are noted as being existing or planned as appropriate.

TM2.4.1  Filling Infrastructure Gaps

TM2.4.1.1 Description

Several transportation challenges identified in the Gateway Cities subregion point to the need for additional detection to remotely and accurately know current truck travel conditions on state routes (and potentially other transportation facilities). Many projects, both current and planned, seek to fill some of these infrastructure gaps, in varying timeframes and with varying priorities; therefore, this concept documents the need for
completion of the detection gaps on freeways and supplemental truck-specific speed and occupancy data on all freeways in the study area to complete this concept. Existing infrastructure, currently funded projects, and recommended detection to fill in the gaps are illustrated in Figure TM2-3. Table TM2-2 also summarizes the infrastructure gaps.
Table TM2-2 – Freeway Detection Infrastructure Gaps

<table>
<thead>
<tr>
<th>Route</th>
<th>Limits</th>
<th>Detection needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-710</td>
<td>From southern terminus to I-5</td>
<td>No detection infrastructure; some portions planned as a part of ATMIS project</td>
</tr>
<tr>
<td>I-110</td>
<td>From southern terminus to I-105</td>
<td>No detection infrastructure; some portions planned as a part of ATMIS project</td>
</tr>
<tr>
<td>SR 91</td>
<td>From I-110 to County line</td>
<td>Detection existing; no truck-specific data available</td>
</tr>
<tr>
<td>I-605</td>
<td>From SR 91 to SR 60</td>
<td>Detection existing; no truck-specific data available</td>
</tr>
<tr>
<td>I-105</td>
<td>From I-110 to I-605</td>
<td>Detection existing; no truck-specific data available</td>
</tr>
<tr>
<td>I-405</td>
<td>From I-105 to I-605</td>
<td>Detection existing; no truck-specific data available</td>
</tr>
</tbody>
</table>

**TM2.4.1.2 Objective**

The highest priority noted among stakeholders in this region is to have remote knowledge of freeway travel conditions, including truck travel conditions, especially along the I-710 and I-110 accessing the Ports of Long Beach and Los Angeles.

**TM2.4.1.3 Sponsors/Major Stakeholders**

**California Department of Transportation (Caltrans) District 7** – I-710 and I-110 ownership and operational responsibility; any detection and communications infrastructure on Caltrans Right of Way will be owned by Caltrans and/or governed by Caltrans policies and directives.

**County of Los Angeles Department of Public Works** – ownership and operational responsibility of signals in unincorporated areas; operational and maintenance responsibility of intersections in Maywood, Huntington Park, Bell, Bell Gardens, Cudahy, Lynwood, and La Mirada jurisdictions. Ownership, operational responsibility and ongoing upkeep and improvements to IEN, a system that allows for exchange of intersection timing data within the County.

**Cities within the Gateway Cities subregion** – allowing key arterial truck routes including Compton, Paramount, Bellflower, Norwalk, Downey, Santa Fe Springs, Long Beach, Lakewood, South Gate, Cudahy, Bell, Maywood, Commerce and Pico Rivera. Ownership, operational responsibility and maintenance of city signals in right-of-way will be operated respective to the cities’ operation systems as applicable.

**Ports of Long Beach and Los Angeles** – are planning to fund infrastructure through ATMIS on some portions of freeway and arterials in the region but mostly within the Ports. Ownership and operational responsibility of Traffic Management Centers (TMCs) and the computer system that will allow monitoring and control of connected field device elements.
within the Ports to be maintained by the Ports of Long Beach and Los Angeles. Ownership and maintenance of equipment on Ports’ Right-of-Way will be the responsibility of the Ports of Long Beach and Los Angeles.

**Private Companies** – to deploy and outfit additional field detection in partnership with respective agencies, Caltrans, County of Los Angeles Department of Public Works, Federal Highway Administration, Ports of Long Beach and Los Angeles and alternative public agencies and to actively participate in all ITS solutions.

**Gateway Cities Council of Governments** – to facilitate the implementation of transportation system information infrastructure projects within the Gateway Cities subregion in partnership with respective agencies and private industry.

**TM2.4.1.4 Functionality**

Expansion of current data collection devices and the addition of technologies and infrastructure to provide more and specific truck data on freeways. This data collection will also allow provision of valuable real time information to truckers (and dispatchers) while in transit (critical element).

**TM2.4.1.5 Current Status**

Caltrans has existing detection on most freeways within the region with the exception of I-710, I-110 south of I-405, and SR47. While most of the freeway segments include additional technology elements such as ramp and connector meters, Closed Circuit Television Cameras (CCTV), and electronic message signs, this project specifically details the need for detection for lane by lane general travel conditions as well as for truck specific volumes and occupancies. Caltrans’ standard technology for detection on freeways is inductive loops placed at approximately half-mile spacing. Existing detection data is collected on a lane-by-lane basis, but does not currently include classification stations to determine the truck specific travel conditions.

A POLB/POLA project currently in the planning phase plans to deploy detection and fiber connections to segments of I-710, I-110, and SR47. Exact spacing and geographic extents of these elements have not been finalized. The control and monitoring functions of ATMIS are an integral part of the Port of Long Beach Security Operations Center. Additional traffic management functions are envisioned to be handled by other technical staff in the Port.

Caltrans has several projects that are not funded that would complete the detection (and other related technology elements) within this region. The lack of funding today means that these projects are unlikely to be deployed in the short term (3-5 years).

The specific projects below address this concept in two phases, short- and long-term, in order to fill this high priority gap as quickly as possible while still recognizing the long-term intent to have the detection consistent with Caltrans policies in terms of technology, spacing, and ownership.

**TM2.4.1.6 Potential Political or Institutional Barriers**

One of several solutions to aggressive, short-term implementation is to seek out a private partner to install and maintain freeway detection in the short-term. Caltrans District 7 has a current agreement in the Ventura County area allowing a private company to provide detection on US 101 in Ventura County. Challenges with this model relate to the private
business model and resale of data, while benefits are speed of implementation, improved
data quality, and reduced or negligible capital and maintenance costs. In some cases, the
public sector has limited access to and/or limited reuse and distribution options for data
collected in this manner. Another option is to supplement data with truck GPS data. Careful
consideration of “cleansing” the proprietary data will be crucial to the success of any
partnership in this scenario. This truck-based data collection is described in a subsequent
project concept.

TM2.4.1.7 Specific Projects

Freeway Detection Infrastructure — Fund and deploy Caltrans’ standard projects for
detection and related communications on I-710 and I-110. The freeway detection can be
implemented in two phases – temporary, short-term detection and more permanent long-
term detection. Additionally, truck-specific data will be collected by outfitting state routes
with joint classification and occupancy sensors to determine truck volume, occupancy, and
speeds.

Comprehensive Performance Monitoring Program — In line with recent federal work,
performance measures that are specific to freight and are meaningful to both the public and
private sectors include travel time reliability, velocity, profitability and return on
investment. The data described in several of these project concepts would provide valuable
data for calculating reliability from the location and time data points and can be used to
support value of investments thus garnering further support for future phases and/or projects
in the region.

TM2.4.1.8 References

- Transportation Management System for District 7 Congestion Relief Program 2007
  Update, Delcan (January 2007).
- Chmielewski, Darek. Interview. Interview with Darek Chmielewski, Caltrans District -
TM2.4.2 Arterial Travel Information

TM2.4.2.1 Description

As part of addressing the need for real-time traveler information, this concept addresses the need for real-time information on key arterials that service large truck volumes. Connectors between the ports and the freeways are vital to goods movement as well as to intermodal rail yards, warehouses, and distribution centers. Collecting and providing direct information regarding arterial delays, incidents, scheduled construction and events would benefit truck operators, the ports, and network traffic and facilitate specific routing and rerouting of trucks. This objective also addresses the basic need of local agencies for increased infrastructure to facilitate basic traffic management and long-term infrastructure planning. Figure TM2-4 highlights major truck routes within the Gateway Cities subregion on which this objective would focus.
Figure TM2-4 - Gateway Cities Truck Routes

TM2.4.2.2 Objective

A prominent need noted among stakeholders in this region is to have real-time travel information catered to trucks. This objective addresses the arterial component of that need as well as provides basic infrastructure necessary for local agencies to actively manage traffic signal timing, maintain signals with reduced staff efforts, and better plan for long
term infrastructure improvements. The specific projects address the resource challenge of staffing on the part of some local agencies.

**TM2.4.2.3 Sponsors/Major Stakeholders**

**County of Los Angeles Department of Public Works** – ownership and operational responsibility of signals in unincorporated areas; operational responsibility (under contract) of intersections in Maywood, Huntington Park, Bell, Bell Gardens, Cudahy, and Lynwood jurisdictions. Ownership, operational responsibility and ongoing upkeep and improvements to IEN, a system that allows for exchange of intersection timing data within the County.

**Cities within the Gateway Cities subregion** – ownership and operational responsibility on key allowable arterial truck routes through the region. Ownership, operational responsibility and maintenance of city signals in right-of-way will be operated respective to the cities’ operation system or other contract agreements.

**Ports of Long Beach and Los Angeles** – are planning to fund infrastructure through a project currently in the planning/design phase (ATMIS) on some portions of freeway and arterials in the region, in close proximity to the Ports. Ownership and operational responsibility of Traffic Management Centers (TMCs), computer system, and equipment in Ports’ Rights-of-Way will be the responsibility of the Ports of Long Beach and Los Angeles.

**Private Companies** – may be part of a short-term detection solution to deploy and outfit additional detection in partnership with respective owning agencies.

**Gateway Cities Council of Governments** – facilitate the implementation of transportation system information infrastructure projects within the Gateway Cities subregion in partnership with respective agencies.

**Los Angeles Metropolitan Transportation Authority (Metro)** – owner and operator of Regional information sharing system called Regional Integration of Intelligent Transportation Systems (RIITS).

**LA SAFE** - will provide and maintain traveler information for Southern California via web and phone outlets.

**TM2.4.2.4 Functionality**

Since arterial segments are an important part of truck routes to and from the ports and other goods movement destinations, this project will provide additional infrastructure and integration capabilities to provide meaningful data to support decisions made by the trucking companies. The project has two proposed phases:

- The first proposed phase of this objective would provide real-time data on incidents and notification data for ongoing maintenance (for example, pavement condition due to extra truck loads).
- The second proposed phase of this objective would take the aggregated data, process it, and provide real-time truck, freight, and credentials travel times along key arterials for key stakeholders.
TM2.4.2.5 Current Status

Currently there are several software systems in place or planned for the near term that allow for remote monitoring and control (timing plan changes) of signalized intersections. Communications media are in place in a limited number of locations throughout the region to communicate with the intersections. The communications are a critical part of being able to remotely monitor and “control” intersections.

Arterials in Southern California are generally outfitted with advanced detection (using either inductive loops or video detectors) as a part of the existing infrastructure. Advanced detection (detection that is upstream or in advance of an intersection) allows for signalized intersections to operate more effectively by noting the presence of vehicles at approaches. In order to provide travel information on arterials, the existing detection will not be sufficient. Additional detection, preferably located downstream, or as vehicles exit the intersection, will be needed to collect data regarding vehicle behavior without the stop-and-go issues of the approaches.

Once the communications and detection are in place in the field, a central computer system will need to collect the data, process it to determine arterial travel times or delays, and then send the information out. The specific concepts described in the next section of this report will outline in more detail how existing systems such as existing signal systems, RIITS, and the IEN will be an integral part of this solution. Additionally, the computer system that processes the data can also act as an interim basic traffic signal system for agencies who do not currently have systems in place. This adds a great deal of value to local agencies and to the general traveling public as well.

This project will outfit key arterial truck routes with the communications and detection required to calculate arterial travel conditions. In the course of establishing communications with intersections for this purpose, the basic intersection operations will be facilitated as well.

TM2.4.2.6 Potential Political or Institutional Barriers

One challenge to arterial traveler information is the existence of differing signal systems at various stages of maintenance, sophistication and deployment in neighboring jurisdictions. Thus, adjacent jurisdictions may have incompatible signal systems, communication systems or detection collecting data at different granularities. The specific projects combined recommend a solution that mitigates this issue.

TM2.4.2.7 Specific Projects

Truck Fleet Communication - Pilot Project and Full Deployment – This pilot program (in the conceptual stage) led by Gateway Cities COG may act as both an outlet for information to be sent to trucks, dispatchers, and other users and will also provide valuable truck-specific data to supplement the downstream detection on arterials.

Goods Movement Transportation Management – Operations of goods movement projects and programs could include operating this arterial travel time system and related projects and programs.

Pilot Arterial Travel Time Software – an integrated software solution that would support data collection (as an interim solutions for agencies that do not have traffic management systems in place and for supplemental data from trucks and other sources), analysis and
dissemination (as appropriate to existing and planned traveler information or truck services outlets) for arterials travel conditions.

**Arterial Infrastructure** – Phased deployment on key allowable truck routes including (but not limited to) Atlantic Avenue, Lakewood Boulevard, South Alameda Street, Firestone Boulevard, Rosecrans Avenue, and Alondra Boulevard, for two purposes: 1. remote signal timing/ops and 2. to determine arterial travel conditions. Another component of this project could be to accurately count trucks on arterials using existing detection or other devices. This truck count data could then be archived and made accessible for future planning uses.

**Comprehensive Performance Monitoring Program** – In line with recent federal work, performance measures that are specific to freight and are meaningful to both the public and private sectors include travel time reliability, speed, profitability and return on investment. The data described in several of these project concepts would provide valuable data for calculating reliability from the location and time data points and can be used to support value of investments thus garnering further support for future phases and/or projects in the region.

### TM2.4.3 Truck Data

**TM2.4.3.1 Description**

There is a need for accurate truck data by individual trucking companies, rail companies and public sector agencies. Information desired includes real-time truck locations for routing and decision making purposes, container tracking and destination information for improvement of rail and drayage company operations and credential and safety information for enforcement purposes (see Strategy for Truck Safety and Credentialing).

**TM2.4.3.2 Objective**

A series of projects, some connected, or integrated, and others more individual will collect critical information regarding trucks, containers and safety and credentials for a variety of uses and purposes. The stakeholders have identified a need for accurate truck volume data collected in real-time. The data must be anonymous and cannot contain proprietary information but could be available for specific trucking companies through a secure computer system.

**TM2.4.3.3 Sponsors/Major Stakeholders**

- **California Department of Transportation (Caltrans) District 7** – owner and operator of highways and associated field infrastructure; fund, design and build truck enforcement facilities
- **California Highway Patrol** – operate truck enforcement facilities and provide enforcement on state owned roadways
- **Local Agencies** – fund, design and build local arterials; local courts set fees for infractions (on a case-by-case basis) and collect for truck safety infractions as identified by CHP
- **Federal Highway Administration** – providing oversight and funding for some projects; encourage innovative solutions to transportation needs.
Gateway Cities Council of Governments – facilitate the implementation of transportation system information infrastructure projects within the Gateway Cities subregion in partnership with respective agencies. Liaison between cities, transportation agencies, and private sector. Currently studying opportunities for additional truck enforcement facilities in the Gateway Cities region.

Metro – owner and operator of regional information sharing database (RIITS – Regional Integration of Intelligent Transportation Systems);

LA SAFE - provide and maintain traveler information (planned) in Southern California.

Trucking industry (truck drivers and dispatch) – provide anonymous data regarding truck locations.

Rail companies – receive data regarding container locations, schedules and end point destinations.

Shipping companies – provide container location, schedule, and end point destinations.

**TM2.4.3.4 Functionality**

The objective is to collect various and disparate data regarding trucks, containers and credentials (see Strategy for Truck Safety and Credentialing). Several projects will provide the combined functionality as outlined below.

**TM2.4.3.5 Current Status**

**TM2.4.3.5.1 Truck Location Data**

Currently, many trucking companies have GPS units on their trucks to track the truck locations. Companies with large fleets such as advanced, route-based delivery companies like FedEx and UPS and large trucking companies like SWIFT have advanced computer systems in place and use the vehicle location information to proactively operate their businesses. Companies with smaller fleets are less likely to be using the tracking information on a dynamic basis in their daily operations – generally speaking, dispatchers determine which shipments to pick up and when and truck drivers make decisions about the route to take within the given parameters. Truck location data is not currently shared in any way with other companies or the public sector.

Several private traveler information companies are known to have agreements with companies that own and track fleets of trucks and use the truck location information to supplement other travel data. The identities of the fleet owners and the details of the agreements are kept very confidential. USDOT also has truck tracking data that is sanitized to discard confidential information.

The Gateway Cities COG is leading an upcoming pilot project to outfit a sample group of trucks with equipment to monitor truck location, idle times, speeds, and other valuable truck-specific data. If successful, a more wide-spread deployment will provide a larger data set.

**TM2.4.3.5.2 Container Tracking**
Very little if any container tracking is currently in place, or if it is in place, the information is not provided to trucking or rail companies. Rail companies know only the quantities of containers (based on quotas set by the rail companies) that will be arriving each business day from each container terminal, but not which containers, when they will arrive within the day or where they are ultimately destined for. Likewise drayage companies are informed when the containers are to be picked up, but do not have as much reliable, advance notice to proactively plan truck and driver schedules.

TM2.4.3.5.3 Credential and Safety Data

There is one enforcement facility in the Gateway Cities region – it is currently not being operated. Several locations in the region have weigh-in-motion devices on roadways, but they only collect historic data and are not affiliated with enforcement stations or static scales and thus are not useful for enforcement purposes. Likewise, projects in the planning phase may deploy additional weigh-in-motion sites within the Ports, but again, these sites seek to collect historical data, but not enforcement.

The Gateway Cities COG is currently investigating options for additional enforcement facilities within the region. Solutions may involve technology in order to offset or minimize the needed real estate required for a traditional enforcement facility. As a part of this study, the COG is also evaluating impediments to the success of enforcement within the region at policy and institutional levels.

TM2.4.3.6 Potential Political or Institutional Barriers

The primary barrier to obtaining truck data (location and specific truck information) is the apprehension of the private sector to provide data that is proprietary or could give competitors an edge. The proposed pilot project will demonstrate to the trucking industry that the data from their trucks can be cleansed to become anonymous data points and that the industry will benefit from the data exchange by receiving valuable truck-specific traveler information.

A further challenge is the sheer number of trucking companies, which may make it difficult to collect a large enough sample size but will need to be part of any ultimate solution.

Challenges to enforcement facilities relate to the overall governance and operational structure of the ownership, enforcement, and funding streams. State agencies fund and enforce the facilities, while fees for infractions are addressed similar to other moving violations: violators receive a ticket, appear later at a local court, and the fees paid go to local jurisdictions. The fee structure is inconsistent and does not financially support nor provide incentive to maintain the enforcement program. Solutions here will either come from local agencies (perhaps facilitated by the availability of aggregated daily or annual truck volume data on key local arterial routes) or solutions may stem from an overhaul of the fee and operations structure of the system.

The most challenging impediment to container tracking is the need for terminal operators/shippers to come to the table as primary partners and stakeholders. To attract this involvement, benefits to the shippers will need to be clearly defined or policy (likely at a national level) may be required.
TM2.4.3.7 Specific Projects

**Truck Fleet Communications Pilot Project** – This pilot project led by Gateway Cities COG (in cooperation with FHWA) will provide aggregated, real-time traveler information to trucks, truck dispatchers, public agencies, and other interested parties. Two-way radio systems and on-board location systems will be installed for three months on a sample set of drayage company trucks for data collection and data transmission. Types of data collected will include real-time truck location and engine data and security notifications (via panic buttons). Data will be consolidated for data aggregation, processing and dissemination. Fastest route and alternative route information will be provided to truck drivers (and dispatchers) for decision support. Trucking companies would be able to delay and reschedule trips accordingly, while avoiding idling, and would reduce trip times by finding trip destinations sooner.

**Truck Fleet Communications: Full Program** – The pilot project above may be rolled out on a larger scale, depending on the findings of the pilot program.

**Existing Sources – Truck Fleet Data Collection and Agreements** - Additionally, it may be a strong opportunity for supplemental fleet data from larger fleets already outfitted with tracking technologies (and advanced systems to collect and analyze the data) to be collected as an additional component to the full-scale roll-out.

**Goods Movement Transportation Management** – Agencies and locations will be determined for GMTM and may include operation of these data collection efforts and related projects and programs.

**Truck Safety and Credentialing** – a current project being led by GCCOG is evaluating opportunities to increase the truck enforcement and safety screening within the region. The credentialing information may be collected through the RFID tag program currently required at the Ports.

**Container Tracking** – a project as a part of this program would facilitate container tracking in order to provide container location and destination information to rail companies. The information may also be useful to drayage companies in scheduling drivers and managing trucks/fleets.

**Comprehensive Performance Monitoring Program** – In line with recent federal work, performance measures that are specific to freight and are meaningful to both the public and private sectors include travel time reliability, velocity, profitability and return on investment. The data described in several of these project concepts would provide valuable data for calculating reliability from the location and time data points and can be used to support value of investments thus garnering further support for future phases and/or projects in the region.

**TM2.4.4 Freight-Focused Traveler Information (On-Board and Web-Based)**

**TM2.4.4.1 Description**

Existing real-time traveler information sources often do not provide useful (or precise) data for freight decisions. Trucks experience differentials in speed and delays from passenger cars and additional data critical to trucking business is not available at all (delays at and within container terminals at the Ports and on allowable arterials). Freight-focused traveler information would provide targeted decision support data to goods movement carriers and...
other key stakeholders. This freight information would be both passive and active: 1) monitored by dispatch, or by truck drivers pre-trip (passive; accessible via a web portal cell phone, or on-board systems), and (2) pushed to trucks and rail companies (active; via the dispatch radio interface, to on-board systems, or via cell phone). The following data would be included:

- Truck-specific traveler information on freeways and arterials in the Gateway Cities Area, including arterial and freeway delays, incidents, emergency situations, and weather conditions;
- Port and container terminal delays including queues outside terminals and average turntimes within terminals; and
- Fastest and alternate truck routes, specific to individual trucks, during incidents, congestion, emergencies and adverse weather.
- Based on other models, the freight-focused traveler information should also interface with the following:
  - Interface with real-time cargo container status – arrival/departure times and gate locations (see specific project for Container Tracking), and
  - Interface with accurate, reliable truck reservation system (see specific project for Comprehensive Goods Movement Scheduling System).

**TM2.4.4.2 Objective**

Provide robust, accurate, reliable, safe, secure freight-specific data available in real-time and via two-way media.

**TM2.4.4.3 Sponsors/Major Stakeholders**

**Trucking industry (truck drivers and dispatch)** – receive real-time (anonymous) data regarding travel conditions (delays) experienced by trucks; have the ability to send emergency or major incident data via low-accident-risk methods (such by pressing one of three ‘panic’-type buttons depending on the type or severity of incident); receive shortest and fastest route information specific to a particular vehicle based on current travel conditions.

**Caltrans District 7** – owner and operator of state routes and associated field infrastructure.

**Federal Highway Administration** – providing oversight and funding for some projects; encourage innovative solutions to transportation needs.

**Gateway Cities Council of Governments** – providing funding for some component projects; liaison between cities, transportation agencies, and private sector.

**Metro** – owner and operator of Regional information sharing database (RIITS – Regional Integration of Intelligent Transportation Systems);

**LA SAFE** - provide and maintain traveler information in Southern California (planned).

**Goods Movement** – Additional key stakeholders for this information will also be railroad companies, terminal operators, shippers, distribution centers, and warehouses.
**TM2.4.4.4 Functionality**

This project will increase and integrate the capabilities within and impacting the Gateway Cities subregion to collect, process and disseminate freight-related real-time data and information.

**TM2.4.4.5 Current Status**

Currently within the Gateway Cities subregion, freight-specific traveler information does not exist. Existing traveler information systems provided by the public and private sectors (information service providers) provide travel conditions on freeways for the general traveling public. Some static information, such as allowable state-owned truck routes and related weight restrictions) is or will be provided by planned projects such as TIMI – a statewide web portal for Caltrans-based traveler information.

Some truck drivers and dispatch use available information in a limited manner, but more often truck drivers relay information to one and another via cell phone or cb radio in an informal (but reliable) way.

Existing and planned projects and programs in the surrounding region provide opportunities to disseminate the information via standard methods (web, phone) and may provide opportunity for more advanced dissemination methods in the near and long-term future. RIITS, a system designed to share regional transportation data, can provide the foundation for data dissemination to multiple sources, including “raw”, but cleansed (to be anonymous for private trucking companies providing data), data for public agency use. LA SAFE is planning a Southern California traveler information program to be provided via web and phone (511). This system would provide another outlet for providing information for passive access in the mid- to long-term. The IEN, a system designed for sharing arterial-based information may provide a basis for the data collection end described in a different report. Multiple public and private companies currently provide traveler information that could also provide the information for passive access.

Elsewhere, as a business model, freight-specific traveler information is currently being investigated at the Port Authority of New York and New Jersey. With the FIRST (Freight Information Real-Time System for Transport) project, data such as cargo arrival times, gate locations, real-time travel conditions on access roads and freeways, and reservation system data, will also be collected from multiple private and public sources, consolidated, and disseminated to freight carriers and other agencies in an integrated fashion.

**TM2.4.4.6 Potential Political or Institutional Barriers**

As explained in the truck data project concept, a challenge posed by freight-specific data collection is to alleviate concerns of private sector trucking and logistics companies regarding the anonymity and privacy of any data they provide for such an effort. This concern will be addressed through data cleansing and written agreements.

**TM2.4.4.7 Specific Projects**

**Truck Fleet Communications Pilot Project** – This pilot project led by Gateway Cities COG (in cooperation with FHWA) will provide aggregated, real-time traveler information to trucks, truck dispatchers, public agencies, and other interested parties. Two-way radio systems and on-board location systems will be installed for three months on a sample set of drayage company trucks for data collection and data transmission. Types of data collected
will include real-time truck location and engine data and security notifications (via panic buttons). Data will be consolidated for data aggregation, processing and dissemination. Fastest route and alternative route information will be provided to truck drivers (and dispatchers) for decision support. Trucking companies would be able to delay and reschedule trips accordingly, while avoiding idling, and would reduce trip times by finding trip destinations sooner.

**Truck Fleet Communications: Full Program** – The pilot project above may be rolled out on a larger scale, depending on the findings of the pilot program.

**Goods Movement Transportation Management** – One function may include to operate these data collection efforts and related projects and programs.

**Truck Travel Information Integration** - A specific focus on dissemination through a variety of media/outlets includes passing the truck travel data to LA SAFE (METRO), to/through RIITS, to TIMI, to private sector ISPs, to eModal, etc. This project describes a full program that brings together or confirms that all projects above are fully interconnected so as to achieve the greatest dissemination of the information.

**Comprehensive Performance Monitoring Program** – In line with recent federal work, performance measures that are specific to freight and are meaningful to both the public and private sectors include travel time reliability, velocity, profitability and return on investment. The data described in several of these project concepts would provide valuable data for calculating reliability from the location and time data points and can be used to support value of investments thus garnering further support for future phases and/or projects in the region.

**TM2.4.4.8 References**


**TM2.4.5 Drayage Turnaround Times and Queue Detection**

**TM2.4.5.1 Description**

A significant gap in traffic management and information sharing at the Ports is a lack of real-time information about truck turnaround and queuing times at terminals. This project will implement detection technologies and supporting systems to provide real-time information about truck movement within the Port terminal areas. It will build on currently planned projects such as the Ports ATMIS project that currently plans to install queue detection at 10 of the container terminals in the two ports.

**TM2.4.5.2 Objective**

The proposed project would address the trucking industry’s need for real-time information on turn-times and estimated delays inside the terminal areas – a critical aspect of their trip lengths and business decision making. Trucking companies and intermodal freight facilities
will greatly benefit from this information, which can be used to manage drayage schedules and operations more efficiently. An additional objective would be to provide transportation management agencies with information about delays and queues within the terminal, in order to estimate potential impacts on the surrounding transportation networks. Conversely, an effective solution would be able to show real benefits in terms of reduced idle times and improved air quality. This data sharing mechanism will facilitate real-time and responsive coordination between transportation management agencies and the goods movement stakeholders and facilitate air quality improvements and clean air conformance.

**TM2.4.5.3 Sponsors/Major Stakeholders**

**Trucking companies** – Active beneficiaries of the resulting information; provide truck data to facilitate determination of current travel conditions.

**Terminal Operators** – As the Ports continue to grow, terminal operators may benefit from this project concept.

**GCCOG** – Secure funding to implement the required information technology backbone: centralized database, application server and data translator. Facilitate the outreach program of project deliverables.

**Ports of Long Beach and Los Angeles** - Establish connections between ATMIS and the Port-Community portal systems (eModal and VoyagerTrack).

**eModal and VoyagerTrack** – manage trucking/shipping industry web portals that could be an outlet to effectively present truck travel conditions information including the new truck turn-times and queuing information of each marine terminal. One or both of these companies could develop customizable turn-times and queuing information alert and report systems as an adjustment to their current business models (this is a recommendation of this report, not a current plan of these companies).

**PierPass & eModal** – Distribute RFID tags to trucking companies and drivers, and register and activate the distributed tags. These stakeholders may be involved pending the final technology decision.

**TM2.4.5.4 Functionality**

While a variety of technology options could provide this information, this project focuses on geofencing as the most promising technology solution. Using a computer program, a geofence can be drawn around each container terminal and utilizing time and date stamps from GPS units mounted on trucks, employ a computer algorithm to estimate current turn times within a given terminal on an hourly basis. Given that the GPS data would be properly cleansed so as to be anonymous to the trucking company or particular vehicle, terminal turn times can be estimated and shared with the drayage industry as a way of improving efficiencies and reducing idle times (improving air quality). The same technology may be used to supplement or fill in gaps of queue detection leading up to terminal gates. Current projects have plans to use traditional inductive loop detectors to monitor queues as well.

Ideally, it will aggregate data to provide an overall ‘turn time’ status or delay status within the terminals during a specified time period (preliminarily defined as one hour), but a more
detailed application could provide vehicle-specific turn times which could then be transmitted to trucking/drayage dispatch facilities if desired.

All the raw data would then be fed into a port-wide (POLB/POLA) centralized database (or the local TMC). An Application Server would then run algorithms to process the data in order to determine the real time turnaround and queuing times. This information will be posted on a proposed one-stop Port-Community web portal, where the information could be accessed by trucking and drayage operators, Port operations, and transportation management agencies. Enhanced features could enable registered drayage providers and truckers to receive alerts based on customizable parameters (via e-mail or text message when turn-times and queuing exceed a pre-defined threshold). Stakeholders would also be able to generate customized reports on turn-times and queuing information to plan ahead dispatch schedules and fleet utilization deficiencies.

**TM2.4.5.5 Current Status**

Currently, the POLB/POLA ATMIS project has plans to deploy queue detection (in the form of inductive loops) at the access to ten of the container terminals in the Ports. The project is currently in the planning stage.

**TM2.4.5.6 Potential Political or Institutional Barriers**

Due to the competition among terminal operators, some terminal operators may oppose this type of program. The GPS-based technology solution may eliminate some concerns as it does not require any equipment to be installed on or near the terminals.

Additionally, as explained in the truck data concept, a challenge posed by freight-specific data collection is to alleviate concerns of private sector trucking and logistics companies regarding the anonymity and privacy of any data they provide for such an effort. This concern will be addressed through data cleansing and written agreements.

**TM2.4.5.7 Specific Projects**

**Goods Movement Transportation Management** – One function would be to operate these data collection efforts and related projects and programs.

**Queue Detection and Terminal Turn Times** – utilization of a variety of GPS-based truck data or design and deployment of any required field infrastructure for data collection; geofencing program and associated algorithm to calculate queue lengths and turntimes at and approaching terminals; dissemination of information through available channels.

**Comprehensive Performance Monitoring Program** – In line with recent federal work, performance measures that are specific to freight and are meaningful to both the public and private sectors include travel time reliability, velocity, profitability and return on investment. The data described in several of these project concepts would provide valuable data for calculating reliability from the location and time data points and can be used to support value of investments thus garnering further support for future phases and/or projects in the region.

**TM2.4.5.8 References**

- Strategic Trucking Program Overview, Port of Vancouver (January 2006)
• Smart Freight: ICT Analysis – Port of Melbourne Supply Chain, Bovis Lend Lease (November 2004)
• Terminal Appointment System Study, Roche Ltée, Groupe-conseil and Levelton Consultants Ltd (March 2006)

**TM2.4.6 Comprehensive Goods Movement Scheduling System**

**TM2.4.6.1 Description**

This project would establish a centralized and standardized system for overall scheduling of goods movement centered around the pick-up and drop-off of goods at the Ports of Long Beach and Los Angeles. Stakeholders would be able to access terminal gate booking information as well as other valuable port-wide information (including goods movement performance measures and roadway traffic conditions) from one single point web portal and phone system.

**TM2.4.6.2 Objective**

This objective addresses the need to more effectively manage the overall movement of goods throughout the region. A centralized, standardized system used by marine and terminal operators (shippers), rail, truck, distribution centers and warehouses, has the potential to greatly improve the efficiencies of the individual companies involved while at the same time improving the traffic flows on the network.

**TM2.4.6.3 Sponsors/Major Stakeholders**

**Ports of Long Beach and Los Angeles** – Facilitate the formation of a Goods Movement Scheduling Committee. Implement or otherwise support recommendations made by the Committee.

**Goods Movement Scheduling Committee** – Work with experts in logistics, transportation (all modes and partners: rail, trucking, shippers/terminal operators, customers, public sector, etc.) and information technology to study options for implementing a centralized scheduling system. Identify challenges, review other existing systems, recommend improvements and develop specific requirements to accommodate the unique container truck logistics needs within the Ports of Long Beach and Los Angeles. Provide oversight for the program once in place to ensure effective operations and use, identify impediments to effective operations as they occur, and put in place effective solutions.

**Terminal Operators** – Agree to adopt and actively utilize the new system as a new platform to exchange information with truckers. Share the necessary internal terminal data via the existing information technology systems that they possess.

**Trucking companies and truckers** – Effectively utilize the new system. Make the necessary updates on the new centralized system according to the dispatch activities in the field.

**Rail Companies** - Effectively utilize the new system.

**Shippers** – employ container tracking and utilize the scheduling system effectively.
TM2.4.6.4  Functionality

The implementation of a centralized scheduling system must be flexible to accommodate all the diverse needs of shippers, terminals, rail and trucks. In order to make scheduling reliable and accurate, the system should be capable of handling cancellations and re-assigning reserved time that has been missed or cancelled; provide a ‘buffer’ window for truckers; allow reservations via multiple channels (internet, telephone), and allow multiple reservations in sequence across terminals. The centralized reservation system should also be capable of reporting performance measures in terms of overall system reliability and quantifiable metrics related to reduced truck turn-times, improved gate efficiency, and other measures.

The design of the centralized scheduling system web portal should consider all terminal operators’ investments in existing appointment systems (eModal and VoyagerTrack) and integrate them to fit all the unique terminal operating practices. The system would also incorporate container tracking and interim and ultimate destination information. The system would track pre-defined schedules as well as incorporate actual resulting schedules experienced in order to actively fine-tune the system over time – both operationally (how it is used by various parties) and functionally (changes needed to the software or processing to achieve better results).

For example, the new centralized scheduling system must provide the following functions and capabilities to process import container pickup and deliveries:

- Shippers employ container tracking system and enter associated details such as contents (HAZMAT or other critical loads), customs clearance details, interim (e.g., container going to ICTF for rail delivery to the east coast) and ultimate (e.g., knowing the ultimate destination is Chicago enables rail to better plan for the container’s arrival) destinations and related constraints (e.g., customer requires delivery by a certain date and time).
- Shipper notifies terminal operators (via system) of pending arrival of containers and expected arrival date/time.
- Terminal operator logs container arrivals and has the ability to effectively manage container stacking and storage and effectively schedule pick-ups in a reliable manner.
- Drayage company logs on to web portal and checks availability status of multiple containers across all terminals at the Ports of Long Beach and Los Angeles. Companies can then plan the optimal schedule to conduct multiple container pick-up or drop-off at the terminals based the real-time terminal performance measures, roadway traffic conditions and terminal equipment availability.
- Fees are paid online (reduce manual processing time at the gate).
- Terminal uses the booked demand to coordinate the resources internally.
- Trucker is verified through a centralized database at terminal gate (connection to RFID program).
- Rail companies can track container destined for their trains in real-time to be aware of estimated arrival times and ultimate destinations to effectively manage their resources and increase throughput of the rail yards.
- Container owner can track all of its containers going through the Ports of Long Beach and Los Angeles at one single point and generate its own customized status report.
TM2.4.6.5  Current Status

There are existing reservation systems in place that are used and trusted to varying degrees by the different container terminal operators/drayage companies. One of these systems (eModal) is used by the majority of the terminals. While the systems in place do appear to be effective operationally as a reservation system solution, eModal appears the most likely existing platform to build on for information dissemination and scheduling.

The rail companies have existing computer systems that are very advanced and are used to manage their respective businesses aggressively based on historical hourly data (e.g., plan for truck arrivals in each hour based on the volume of trucks that arrived during this hour on this date last year, the year before, etc.) and could be integrated with the project concept.

TM2.4.6.6  Potential Political or Institutional Barriers

Challenges with the private sector involvement are the most likely to impede progress toward this goal due to the highly competitive nature of the goods movement industry.

Due to the competition among terminal operators, some terminal operators may oppose this type of program. Union challenges may also be forthcoming as concerns over technology reducing job or pay opportunities may arise.

Since both eModal and VoyagerTrack are proprietary systems, they may oppose being integrated with the new centralized scheduling system. Thus, terminal operators may be reluctant to adopt the new reservation system as eModal and VoyagerTrack are usually interfaced with terminal operation systems which the terminal uses for internal operations inside the gates.

Rail and drayage companies, based on their business models and bottom line efficiency objectives, may be the most likely to support this concept.

TM2.4.6.7  Specific Projects

Container Tracking – a recommended project as a part of this program would facilitate container tracking in order to provide container location and destination information to rail companies. The information may also be useful to drayage companies in scheduling drivers and managing trucks/fleets.

Comprehensive Performance Monitoring Program – In line with recent federal work, performance measures that are specific to freight and are meaningful to both the public and private sectors include travel time reliability, velocity, profitability and return on investment. The data described in several of these project concepts would provide valuable data for calculating reliability from the location and time data points and can be used to support value of investments thus garnering further support for future phases and/or projects in the region.

TM2.4.6.8  References


TM2.4.7  Strategy for Truck Safety and Credentialing
TM2.4.7.1 Description

This concept would establish a truck safety and inspection program in the Gateway Cities region that greatly increase the ability of enforcement agencies to monitor and inspect the high volumes of truck traffic on the region’s freeways. With limited available right-of-way or adjacent land on freeway corridors, as well as limited to no available land near the ports, vehicle inspection would need to utilize technologies and systems that are not necessarily part of ‘traditional’ truck inspection stations. Systems implemented as part of this project would ideally be able to screen driver credentials, be capable of detecting overweight vehicles, support a broader safety/enforcement program in the region, as well as support stricter air quality/pollution mitigation programs.

TM2.4.7.2 Objective

Current congestion levels on freeway corridors elevates the risk level for safety and mobility (for trucks as well as passenger traffic) when unsafe trucks are traversing the network. Agencies have little to no capabilities to inspect and detect trucks that violate safety or weight requirements. Freight truck traffic in general deteriorates pavement at a much faster rate than typical passenger vehicles, and overweight trucks are a big contributor to reduced pavement lifespan on the region’s freeways. The large number of trucks utilizing the region’s freeway network makes it nearly impossible to inspect all trucks in a manner that is cost-effective or even logistically feasible using traditional inspection (static scale) and enforcement facilities.

I-710 has more truck involved accidents than any other freeway in California – this ranges from at least one truck-related accident to up to five per day. The only existing static truck scale station is at I-405/Carson; there are presently no truck monitoring capabilities on I-710. Weigh-in-motion allows trucks to be weighed while traveling and can eliminate the need for some trucks to stop, thus improving overall freeway mobility as well as reducing the number of idling trucks (which has obvious air quality implications).

There are several angles to this objective:

- Implement systems and processes that will allow for ‘virtual’ truck inspections on freeways to enhance enforcement and reduce the number of unsafe trucks or on the region’s transportation network
- Minimize the need for right-of-way or adjacent land that is typically needed for a traditional inspection station (parking, inspection facilities, staff facilities, etc.)
- Establish a network of permanent inspection facilities that will not only improve current inspection and enforcement activities, but will serve the region as truck traffic continues to grow

TM2.4.7.3 Sponsors/Major Stakeholders

**California Highway Patrol** – Responsible for Commercial Vehicle Operations (CVO) enforcement. Would be responsible for operation of future inspection sites. In partnership with other agencies, lead efforts for outreach, education and awareness of new inspection facilities. Address any legal/privacy issues, as well as identify potential new legislative requirements relative to new technologies or alternate facility design.

**Caltrans** – Deployment and operational support for integrated systems as part of the truck vehicle inspection program. Dedicate right-of-way for needed infrastructure. Coordinate
with CHP to obtain data for planning purposes, as well as for pavement preservation forecasting. Work with CHP for outreach, education and awareness efforts.

**Local Agencies** – fund, design and build local arterials; local courts set fees for infractions (on a case-by-case basis) and collect for truck safety infractions as identified by CHP to be received by local agencies.

**Gateway Cities COG** – Partner with CHP and Caltrans to move forward feasible alternatives from the Commercial Vehicle Enforcement Strategies, Systems and Sites Study. Provide funding support for pilot deployments and evaluations. Help support evaluation efforts to determine if technologies and systems are meeting requirements.

**TM2.4.7.4 Functionality**

There are some overarching parameters that will influence how, or if, this objective can be feasibly implemented, as well as *where* on the freeway network it could be implemented. The current congestion levels and limited right-of-way on I-710 and other key freeway corridors means that traditional truck inspection and weigh station facilities are not likely feasible. In order to provide the broadest enforcement coverage and minimize the disruption to freeway traffic flow, Weigh-in-Motion (WIM) is being recommended along key freeway segments, particularly north and southbound I-170 and I-110 servicing the Ports. WIM would allow trucks to be weighed as they pass over the scale (at freeway travel speed) without stopping. WIM will capture data about trucks passing over them to include individual axle and axle groups, axle spacing, gross vehicle weights, and speed of the vehicle.

*WIM as a stand-alone application will not address all of the enforcement and safety monitoring capabilities that would be needed with this concept.* Although WIM will help to identify overweight vehicles, additional systems and technologies would be required to support credentialing inspections, safety monitoring (overall ‘road worthiness’ of vehicles) and air quality monitoring. A traditional inspection facility could require up to 45 minutes of time per vehicle for these kinds of comprehensive inspections. The urban freeways in the Gateway Cities’ area do not provide sufficient space for such facilities, nor is it practical to impose that kind of delay on truck vehicles. This would have significant trickle-down effects to overall port operations, multimodal transfer facility yards, warehouses and distribution centers, as well as severe economic impacts to the individual drivers themselves (who are very dependent on quantity of runs per day to generate their income).

In order to enhance WIM capabilities, one option would be to include video monitoring near each WIM installation. A pilot project in Saskatoon, Canada implemented a video camera and video capture card which was synchronized with the WIM scale and took an image of every commercial vehicle that crossed over the WIM scale. That image was then correlated to the weight record of the vehicle. This provides valuable data for planning and forecasting purposes, but the Saskatoon deployment site took this concept one step further by developing a real-time web-based application whereby enforcement officials could view the image of the truck along with the corresponding vehicle record information (weight, axle, etc.). There was even an option for accessing this data by web-enabled PDA/hand-held computers, which may be more conducive to enforcement officers in the field.

Data and information obtained from the WIM and any associated virtual monitoring equipment (that could include safety measures as well) could be utilized in real-time for monitoring and enforcement, but this data will also provide valuable information for longer-term planning purposes.
**TM2.4.7.5 Current Status**

There is one enforcement facility in the Gateway Cities region – it is currently not being operated. Several locations in the region have weigh-in-motion devices on roadways, but they only collect historic data and are not affiliated with enforcement stations or static scales and thus are not useful for enforcement purposes. Likewise, projects in the planning phase may deploy additional weigh-in-motion sites within the Ports, but again, these sites seek to collect historical data, but not enforcement.

GCCOG is currently conducting a study looking at commercial vehicle enforcement strategies, systems and sites for the Gateway Cities and surrounding area. This study is in progress and is taking a detailed look at priority needs and issues, pros and cons of different CVO enforcement approaches, the impact of urban parameters and the feasibility of safety and enforcement approaches in the urban area, and resource and infrastructure requirements to support such a program. This study will be concluding in the Spring of 2008. Due to the oversaturation of the existing network and the limited available space/right-of-way for permanent inspection facilities, it is very likely that technology will play a key role to help provide this inspection capability with minimal disruption to the network.

California Highway Patrol and Caltrans are currently looking at the feasibility of a permanent inspection facility on I-710.

Pending the outcomes of these efforts, costs and potential integration opportunities will need to be explored.

**TM2.4.7.6 Potential Political or Institutional Barriers**

A major challenge to having consistent and effective enforcement facilities in California relates to the overall governance and operational structure of the ownership, enforcement, and funding streams. State agencies fund and enforce the facilities, while fees for infractions are addressed similar to other moving violations: violators receive a ticket, appear later at a local court, and the fees paid go to local jurisdictions. The fee structure is inconsistent and does not financially support nor provide incentive to maintain the enforcement program. Solutions here will either come from local agencies (perhaps facilitated by the availability of aggregated daily or annual truck volume data on key local arterial routes) or solutions may stem from an overhaul of the fee and operations structure of the system.

The success of this objective will be very dependent on CHP’s involvement and buy-in to the enforcement strategies, which could result in significant changes to how the enforcement division currently operates. Some of these systems may represent very new technologies to the enforcement community, and increasing their confidence and comfort level with these tools will be an important step in the development process.

Implementing any sort of ‘virtual’ monitoring capability, including WIM and more importantly video systems that would capture and record images and data would require a detailed look at potential privacy concerns. There may need to be a specific policy put in place that differentiates these monitoring applications on freeways from the typical detector and CCTV installations that are very common on California freeways. Those systems do not record information about specific vehicles and store that data for enforcement purposes. Furthermore, it would require legislation in California to be able to implement an automated enforcement program. Currently, the state law in California only authorizes the use of enforcement camera technology for red light running and grade crossing violations; new
legislation would need to be introduced to cover photo/CCTV integration with any automated CVO enforcement program.

The commercial vehicle operators also will need to support this project concept for it to be effective and successful. Issues such as confidentiality and privacy from the freight/goods movement operators’ perspectives will need to be addressed to avoid any barriers to implementation and operations.

**TM2.4.7.7 Specific Projects**

**Commercial Vehicle Enforcement Strategies, Systems and Sites Study** - Specific projects for potential implementation will be identified through this current GCCOG effort (scheduled for completion in early 2008). The key stakeholders in that project – CHP, Caltrans and GCCOG – will develop an action plan of next steps. Recommendations from that study could include site-specific projects, as well as a more robust regional network of multiple sites that could be integrated with current transportation system monitoring and operations activities.

**Comprehensive Performance Monitoring Program** – In line with recent federal work, performance measures that are specific to freight and are meaningful to both the public and private sectors include travel time reliability, velocity, profitability and return on investment. The data described in several of these project concepts would provide valuable data for calculating reliability from the location and time data points and can be used to support value of investments thus garnering further support for future phases and/or projects in the region.

**TM2.4.7.8 References**


**TM2.5 RECOMMENDED PROJECTS**

This section defines, in more detail each of the composite projects that combined will achieve the fundamental objectives described previously. The coordinated integration of all of these projects (existing, programmed, and recommended) is the path to the greatest benefits in the subregion. The projects are divided into two types – those prioritized for short-term implementation and those that will require further stakeholder involvement to meet the needs and objectives identified. Putting the short-term projects into action has the potential to wield significant benefits to the region and the state and national economy: reductions in air quality, congestion, and accidents as well as increased efficiencies that will lend to the ability for the Ports to accommodate current container volumes and future growth as currently projected. A subsequent implementation plan will show the sequencing (based on requisites and priorities) of these projects and intending implementation timeline. A business plan will provide a structure by which funding will be identified and applied and the potential involvement of the private and the public sector in funding such improvements (including operation and maintenance costs).
Figure TM2-5 depicts a summary of how the projects would be integrated; working in a coordinated manner from infrastructure deployment through operations with a foundation of coordinated public and private sector decision making. This coordinated, integrated approach accommodates the greatest benefits to the region.

The following list of projects is defined in this section:

1. Freeway Detection Infrastructure
2. Arterial Infrastructure
3. Arterial Travel Times
4. Queue Detection And Terminal Turn Times
5. Goods-Movement Transportation Management
6. Truck Fleet Communications Program
7. Port Reverse 911 Emergency Notification Call System
8. Comprehensive Performance Monitoring System
9. Existing Sources – Truck Fleet Data Collection And Agreements
10. Truck Travel Information Integration

Further discussions and project concept development are required among impacted stakeholders to define the following long-term projects.

1. Comprehensive Goods Movement Scheduling System (Container Tracking)
2. Truck Parking Coordination
3. Vehicle Enforcement Strategies, Systems and Sites Study
4. Congestion Pricing Initiatives
5. Integration And Policy Task Force

There are also several critical projects that are underway and in the planning stages or for other reasons such as funding challenges, risk not constructing or implementing components that have been deemed critical to the success of projects being recommended as a part of this program. These projects, and their associated critical components, are outlined in Section 4.1.

TM2.5.1 Critical Programmed Projects

Several projects that are currently in the roll-out or planning phases contain solutions that are integral to the success of transportation improvements in the subregion as outlined above. These projects are outlined briefly here and included in the subsequent implementation plan report in order to illustrate the dependencies. In some cases, the projects above seek to fulfill some of the planned, but unprogrammed solutions in the short-term in order to jump start the improvements outlined in this program. In these cases, the solutions outlined above are not intended to be duplicative, but rather to supplement or speed up implementation of the related ongoing projects.

TM2.5.1.1 RFID program

A mandate by the Ports of Long Beach and Los Angeles, effective December 2007, requires RFID tags to be utilized on all trucks accessing the Ports. The tags and the tag readers at terminal access points that are currently or will soon be in place as a part of this program, may be useful in other programs such as the Vehicle Enforcement Strategies, Systems, and Sites Study for remotely or virtually collecting certain truck and driver data necessary for enforcement. Likewise, future expansion of some programs may find that RFID readers installed throughout the Gateway Cities region and beyond may be an effective and cost effective way of collecting additional origin-destination data useful to long-term infrastructure and policy planning related to goods movement.

TM2.5.1.2 POLB/POLA ATMIS – Freeway and Queue Detection and Traveler Information Components

The ATMIS project, currently completing the high-level design and moving into detailed design phase, is recommending detection on I-110, I-710, and SR47 as well as queue detection on the approaches to ten of the thirteen container terminals at the Ports. Additionally, this project intends to disseminate traveler information to trucks in the future. Several projects described above rely on the completion of this field infrastructure and recommend dissemination to trucks in part via the ATMIS traveler information component. The freeway-based detection was noted as the most critical gap in the Gateway Cities region in terms of data availability and priority to local and regional public agencies and private industry. The ATMIS project is noted here and in the subsequent implementation plan to emphasize that if future funding or other variables affect these particular
components, the gaps will need to be filled by other means. Figure TM2-5 (courtesy Siemens, October 2007) shows the proposed ATMIS detection.
Several projects currently being led by LADPW on behalf of local agencies throughout Los Angeles County are proposing to implement centralized traffic signal systems to enable local agencies to monitor and manage arterial traffic signals. In addition, these projects will establish communications between these central computer systems and the traffic signals in the field – a requisite for effectively utilizing the systems. At this time, there are numerous proposed systems and associated center-to-field communications that are not yet purchased or deployed. Recommended projects outlined above include short-term solutions that can either supplement these programs by adding communications that would not otherwise be possible to establish in the short-term given funding shortfalls, or can act as interim solutions until the central systems are purchased and installed. It is the intent of this Gateway Cities ITS Goods Movement Plan to build on or enhance these existing projects and not to duplicate their components or functionality. Figure TM2-7 shows LADPW projects as planned detection.
Figure TM2-7 – Arterial Detection

The following projects have the potential to be short-term solutions.
TM2.5.2 Freeway Detection Infrastructure

TM2.5.2.1 Project Description

Caltrans has existing detection on most freeways within the region with the exception of I-710, I-110 south of I-405, and SR47. This project will fill these gaps and provide for detection technologies (and the associated, required communications infrastructure) to determine lane-by-lane general travel conditions as well as truck-specific delays. The existing Caltrans infrastructure can provide the majority of lane by lane data in the short term, but needs to be supplemented by:

- Completing the basic infrastructure on missing segments of I-710, I-110, and SR47
- Supplementing existing data on all other regional routes as necessary to account for detection that is not working or not connected (Caltrans estimates that approximately 60% of their detectors are not functioning for various reasons — this error rate is acceptable for their transportation management purposes as the stations [average at one point on a freeway across all lanes] provide average data; given the 40% error rate, however, existing detection may not be accurate enough to extract ample, lane-by-lane data)
- Collection of truck-specific data on all regional routes (Existing detection data is collected on a lane-by-lane basis, but does not have the ability to categorize by vehicle classification or vehicle length classification)

Caltrans has plans for filling gaps on I-710, I-110 and SR47 through two means:

- Some of the detection is likely to be completed by a Ports-funded project, ATMIS
- The remainder would be funded through future, as yet unidentified, funds

The detection described above is needed in the short-term and has been cited by project stakeholders as the most critical need in the region. This project defines a strategy to fill those gaps described above in the short-term, with the understanding that as Caltrans secures funding in the future, they will replace this short-term solution with inductive loop detection according to their statewide guidelines. Both short-term and long-term portions of the solution will be included in the subsequent implementation plan report. The project assumes that the currently planned ATMIS-proposed detection and associated communications infrastructure will be built in the short-term (three years) and as such does not overlap with those segments. If ATMIS plans change, this project should be revised to fill those additional gaps.

Freeway and truck-specific data will be transmitted to Caltrans District 7 Traffic Management Center (TMC) in Glendale. At the TMC the data is aggregated and outputted and made available to the State’s traveler information systems, the Freeway Performance Measurement System (PeMs) and the Regional Integration of Intelligent Transportation Systems (RIITS). Through RIITS, Caltrans data can then be exchanged with additional public sector agencies as well as private traveler information reporting companies (who also get Caltrans data from PeMs).
**TM2.5.2.2 Project Champion/Sponsor**

**California Department of Transportation (Caltrans)** – ownership, maintenance and operational responsibility of any detection and communications infrastructure on Caltrans Right of Way; Caltrans policies, directives, and design guidelines will also apply.

**Gateway Cities COG** – may provide funding support and other project support through construction

**TM2.5.2.3 Funding Considerations**

Caltrans does not currently have funding identified for their planned solutions on I-710, I-110 and SR47 except the portions currently proposed to be funded through the ATMIS project by the Ports. The short-term in-fill portion of this project may be accomplished through identification of a public-sector funding source or through a partnership with a private company. For the longer term, permanent sources of funding for these types of projects should be identified and developed. There are several private traveler information service providers that will provide and install their own detection under an agreement with the State. The agreement terms will vary based on negotiations, but are likely to involve some limitations on the use and reuse of the data collected by public agencies.

**TM2.5.2.4 Proposed Project Alternative**

Figure TM2-8 depicts the proposed solution for filling freeway detection gaps in the short-term. Side-fire radar is recommended using wireless communications to transmit data between stations and back to a central location to be communicated to Caltrans TMC in Glendale. Vehicle probes will also be pursued to supplement data with truck-specific data. The approach is described in the Truck Fleet Communication project and the Existing Sources – Truck Fleet Data Collection and Agreements project both described later in this chapter.
Figure TM2-8 – Freeway Detection

Legend
- Green: Proposed Limited Detection (ATMIS)
- Yellow: Recommended Detection
- Blue: Existing and Funded Detection

*Existing Detection includes projects currently under construction and full SR 47 coverage (ATMIS)
### Table TM2-3 – Freeway Detection Infrastructure Gaps

<table>
<thead>
<tr>
<th>Route</th>
<th>Limits</th>
<th>Detection needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-710</td>
<td>From southern terminus to I-5</td>
<td>No detection infrastructure; some portions planned as a part of ATMIS project</td>
</tr>
<tr>
<td>I-110</td>
<td>From southern terminus to I-105</td>
<td>No detection infrastructure; some portions planned as a part of ATMIS project</td>
</tr>
<tr>
<td>SR 91</td>
<td>From I-110 to County line</td>
<td>Detection existing; no truck-specific data available</td>
</tr>
<tr>
<td>I-605</td>
<td>From SR 91 to SR 60</td>
<td>Detection existing; no truck-specific data available</td>
</tr>
<tr>
<td>I-105</td>
<td>From I-110 to I-605</td>
<td>Detection existing; no truck-specific data available</td>
</tr>
<tr>
<td>I-405</td>
<td>From I-105 to I-605</td>
<td>Detection existing; no truck-specific data available</td>
</tr>
</tbody>
</table>

### TM2.5.2.5 References

- Caltrans information received from District 7 staff between July 2007 and January 2008.

### TM2.5.3 Arterial Infrastructure

#### TM2.5.3.1 Project Description

The intent of this project is to enable the collection of downstream data (from trucks and personal vehicles) that is necessary in order to determine arterial travel times. In the process of achieving that goal, the phased deployment of downstream detection and communications on key allowable truck routes including (but not limited to) Atlantic Avenue, Lakewood Boulevard, South Alameda Street, Firestone Boulevard, Rosecrans...
Avenue, and Alondra Boulevard, will achieve an additional benefit: it will provide the capability for remote signal timing and monitoring at intersections that do not currently have communications in place.

It is important to note that Los Angeles County Department of Public Works (LADPW) is currently administering a program, funded primarily through LA METRO, to provide for traffic signal systems and remote communications with signals in this region. This project will supplement that program with additional access to intersections, and will utilize existing (or programmed) communications deployed as a part of that project where available. Existing software systems and infrastructure will be used wherever available and not duplicated. Data will be collected from existing systems through the IEN, as possible. Figure TM2-9 depicts the basic process of travel time determination on arterials. This is described in more detail in the project: *Arterial Travel Times* below.

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Figure TM2-9 – Arterial Travel Times
Many of the 27 cities in the Gateway Cities region currently have or will soon be procuring advanced traffic signal systems for monitoring and control of signalized intersections on arterials throughout the Gateway Cities region. Still, there remain several gaps in this infrastructure:

- Many intersections do not currently have communications connecting them back to a centralized computer system, as such, control/monitoring of the signals is not possible nor is advanced functionality as in travel time determination.

- No downstream or mid-block detection exists in the area. One or the other is necessary to collect quality data for travel time calculations because at the point where traffic passes advanced/presence detector zones (on approaches to intersections) traffic flow is unstable and a vehicle stopping for a red light is not discernible from other causes such as recurring congestion or construction activities.

- Several agencies do not currently have centralized traffic signal systems; some have plans to procure them in the short to mid-term. A software system (or multiple systems) is needed to receive the data for aggregation and calculation of travel times.

- The inability to monitor truck traffic along arterial highways.

Any infrastructure, communications, or software provided by this program can be replaced by or supplemented with future infrastructure, computers or software as desired by the local agencies.

**TM2.5.3.2 Project Champion/Sponsor**

**Local Agencies’ Departments of Public Works** – Each agency will maintain ownership and operational and maintenance responsibilities in line with current responsibilities and/or agreements.

**Gateway Cities COG** – may provide funding support through construction and operations.

**Caltrans** – ownership and maintenance responsibility for any equipment installed on state routes in line with Caltrans policies

**TM2.5.3.3 Funding Considerations**

GCCOG would likely secure the funding for the field infrastructure in accordance with the approval of each of the local agencies involved. Ownership and maintenance responsibilities of field equipment would fall to local agencies as well. This funding would be supplemental to any funding outlays from Los Angeles County DPW’s program and would be coordinated with them.

**TM2.5.3.4 Proposed Project Alternative**

Downstream detection and communications will be deployed on key allowable truck routes including (but not limited to) Atlantic Avenue, Lakewood Boulevard, South Alameda Street, Firestone Boulevard, Rosecrans Avenue, and Alondra Boulevard as depicted in Figure TM2-10. The first phase will serve primarily to support the Arterial Travel Times project (see below) outfitting approximately 15 miles of Atlantic Boulevard with wireless communications at signalized intersections and downstream detection. A second phase will extend the limits to include the other primary truck routes noted in the table below. Future
phases would further in-fill additional arterial truck routes in accordance with the performance of the arterial travel time program.

Figure TM2-10 – Arterial Detection with Signal Systems
Table TM2-4 – Arterial Detection

<table>
<thead>
<tr>
<th>Phase</th>
<th>Route</th>
<th>From</th>
<th>To</th>
<th>Distance (miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Atlantic Boulevard</td>
<td>Willow Street</td>
<td>I-5</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>Lakewood Boulevard</td>
<td>Willow Street</td>
<td>I-5</td>
<td>11.5</td>
</tr>
<tr>
<td>2</td>
<td>South Alameda Street</td>
<td>I-110</td>
<td>I-10</td>
<td>19</td>
</tr>
<tr>
<td>2</td>
<td>Firestone Boulevard</td>
<td>I-110</td>
<td>I-605</td>
<td>10.5</td>
</tr>
<tr>
<td>2</td>
<td>Rosecrans Avenue</td>
<td>I-110</td>
<td>I-605</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>Alondra Boulevard</td>
<td>I-110</td>
<td>I-605</td>
<td>10</td>
</tr>
</tbody>
</table>

TM2.5.4 Arterial Travel Times

*TM2.5.4.1 Project Description*

The freeway network in the Gateway Cities area may not always provide the fastest origin-to-destination route for truckers due to incidents, closures, destinations, or simply peak period traffic congestion, which warrants the truck drivers to utilize the arterial network to reach their destinations. The purpose of this project is to develop and implement the software needed to calculate travel times on key arterial truck routes to calculate and disseminate that information to truckers. Information dissemination is likely to be accomplished through a variety of projects including the future Southern California 511 project, POLB/POLA ATMIS, private information providers, and private goods movement portals such as eModal. A pilot project, or first phase would develop and implement the software, outfit 15 miles of Atlantic Boulevard (phasing is dependent on the Arterial Infrastructure project phasing shown above) as a proof of concept, and develop and implement coordinated operating procedures with related projects, public sector agencies, and private partners. A subsequent phase would extend the geographic boundaries to outfit additional key arterial roads and expand the data store to include additional sources of information such as additional probe data from large and small fleets of trucks that traverse the area.

As a side benefit, the software could also provide basic traffic signal operations functionality and IEN connectivity to facilitate basic management capabilities in cities that don’t have a system or as a short-term solution until their new systems are purchased.

*TM2.5.4.2 Project Champion/Sponsor*

GCCOG - serve as regional champion, secure funding, and potential operating agency; develop coordinated operational strategies, assemble task force/working group to confirm priority corridors, spearhead coordination with freight stakeholders and potential private partners.

Cities and LA DPW – potentially deploy additional detection; partner in reviewing design plans and construction oversight for roadway-based infrastructure; take over ownership and
maintenance responsibilities of field infrastructure and operating local signal systems as appropriate.

**Private partner** – this project provides an excellent opportunity for private sector involvement, which could include supplementing public agency data collection private technology companies for in-vehicle systems.

**Freight/Goods Movement** - private/public partnership with the trucking companies and other logistics industry members based on the companies that would want the arterial travel time information to be disseminated to their trucks and dispatchers. Partnering with the trucking industry could justify some cost-sharing strategies.

**TM2.5.4.3 Project Alternatives**

Field data is needed from mid-block or downstream detection or from probes. This baseline data collection is described in the previous project.

The selection of the data collection method(s) will impact the required algorithm design for calculating travel times. A model of arterial corridor analysis should define roadway segments that are then are subdivided into links between data collection points (nodes). Comparison of the data collected at each of the nodes will determine the time required for traffic to travel from one node to another. The system shall be scalable so as to be capable of being modified to include additional data types and for geographic expansion without the need for major system re-design.

Off-the-shelf centralized traffic signal systems provide one portion of the functionality required for this project: communicating with the field equipment. Several off-the-shelf systems recently deployed in Los Angeles County area have (or will soon have) interfaces built to connect to the IEN for data sharing. The software for arterial travel times should build from this basis so as to avoid duplication of expense.

Figure 10 depicts the project architecture – the way various components fit together to comprise the resulting project. Wherever possible, existing systems and infrastructure will be utilized.
Figure TM2-11 – Program Architecture

TM2.5.4.4 Funding Considerations

Capital costs for a system that provides travel times would generally be provided by the public sector. Historically, traveler information business models based on cost recovery and profit (a private sector business model requirement) have not been widely successful. This would be especially true in an isolated region (the Gateway Cities area as compared to a nation-wide service, for example). There may be an opportunity to provide incentive-based private sector operations at a cost to the public sector (contracted out) or potentially direct private sector operations for profit, but this option would limit provision to the private company’s business decisions and profit margins, largely taking decision control away from the public sector.

TM2.5.4.5 Proposed Project Solution

An off-the-shelf system should be purchased as a baseline to build from, preferably one that also offers an IEN interface for data sharing. A pilot or first phase would then customize the software to allow for determination of arterial travel times on Atlantic Boulevard, coinciding with the first phase of the arterial infrastructure project (above). Following this
proof of concept, subsequent phases would expand upon the functionality, data source types, and geographic coverage.

**TM2.5.4.6 References**


**TM2.5.5 Queue Detection and Terminal Turn Times**

**TM2.5.5.1 Project Description**

This project establishes technology solutions to provide information on truck turnaround times at the terminals and on the approaches (queues outside of container terminals or at other key locations). Stakeholders would be able to optimize truck movements within terminals by being alerted to the arrival of trucks and containers at the terminals. In order to accurately calculate truck turnaround times in detail, this project would implement advanced tracking technologies that would enable real-time truck location/activity history reporting.

**TM2.5.5.2 Project Champion/Sponsor**

**Trucking companies:** Outfit trucks with GPS, according to agreement with GCCOG and educate their registered truck drivers.

**Terminal Operators:** may need to provide detailed coordinate information and layout of terminal facilities.

**GCCOG:** Secure Federal and/or local funding for the initial capital investment. Implement the required information technology backbone: centralized database, application server and data translator.
**Ports of Long Beach and Los Angeles:** Establish connections between ATMIS and the Port-Community portal systems. Lead reconfiguration efforts on the Port-Community web portal to enhance reporting and information dissemination.

**TM2.5.5.3 Funding Considerations**

Publicly-provided funding is the most likely candidate for the infrastructure and computer systems required to facilitate this project. It is also likely that an emphasis on GPS as the primary technology solution could rely more heavily on negotiating agreements with private trucking and shipping companies as a valid method to substantially increase the available data points at a minimal cost to the public or private sectors.

**TM2.5.5.4 Proposed Project Alternative**

Detecting queues and terminal turn times can be accomplished through a variety of different technologies. In general, detection devices are deployed in the field and/or inside the trucks. Truck Tag ID, Time Stamp and Location information are tracked and recorded throughout every container truck’s movement within the terminals and the vicinity.

All the raw data would then be fed into a centralized database. An Application Server runs algorithms to process the data in order to determine the real time truck turnaround times and queue. Information would then be shared with traveler information systems in the area, through RIITS, and is recommended to be broadcast to a web portal.

The web portal could comprise a “Performance Dashboard” which summarizes the tracked and measured container turn-times and queuing information. Enhanced features on the web portal systems could also enable registered drayage providers and truckers to receive alerts based on customizable parameters via e-mail or cellular phone text message when turn-times and queuing exceed a pre-defined threshold. Stakeholders would also be able to generate customized reports on turn-time and queue information to facilitate dispatch schedules and fleet utilization. The optional addition of RFID readers along key truck routes on either freeways or arterials will be able to provide the most comprehensive freight-specific traveler information to the truckers servicing the Ports of Long Beach and Los Angeles.

Information would also be disseminated to safety-conscious in-vehicle devices through the Truck Fleet Communication Program.

**TM2.5.5.5 References**

- Strategic Trucking Program Overview, Port of Vancouver (January 2006).
- Smart Freight: ICT Analysis – Port of Melbourne Supply Chain, Bovis Lend Lease (November 2004).
- Probe RFID Installation Assessment for the Maricopa Association of Governments (MAG) Integrated Corridor, Transcore (April 2007).
• Riding the Wave on Ship Container Seal and Tracking Systems, University of Washington (June 2005).


• Terminal Appointment System Study, Roche Ltée, Groupe-conseil and Levelton Consultants Ltd (March 2006).


**TM2.5.6 Goods Movement Transportation Management**

**TM2.5.6.1 Project Description**

An agency or agencies and associated locations need to be finalized for operations of proposed projects. This project describes functionality to provide transportation performance monitoring, air quality management, and goods movement related traveler information and traffic management (where needed) not currently being provided by local or regional agencies. The project would provide much needed project development and support, a forum for continued dialogue among public sector and private companies; and manage numerous technology projects that support transportation management in the subregion. It will have to be determined during implementation studies – part of next phase on steps- whether this “center” could be housed separately or consolidated into operations of an existing facility (or facilities). The functions and activities of this goods movement management center will have to be studied in the next phase to determine its necessity, viability and cost-effectiveness and how this activity will be funded. A dedicated goods movement transportation management center would have to over come these “hurdles” (plus more) in order to be implemented (either as a separate structure or combined into an existing center). An operational agency (public, private or combination) would have to be established for this.

The project would, at a minimum,

• manage a transportation performance measurement program to monitor the return on investment of various projects and programs to attract future funding to the subregion;

• deploy and operate a system to provide much needed travel times and construction/event information to the general public and goods movement communities;

• provide support to local agencies in terms of back-up or primary operations, construction and event scheduling input, and other operational support as desired by each local agency in agreement with GCCOG;

• provide outreach to local citizens and facilitate cooperative endeavors among public and private sector partners that operate in the subregion;

• collect and disseminate data, through existing regional programs, to proactively manage the transportation network (including the precise “real-time” goods movement information needed by private industry and the possible archival of historic data); and

• provide a forum in which transportation agencies and private sector partners can continue to collaborate.
The project would require staff with the ability to make real-time traffic decisions. It would provide an opportunity to perform functions that are important on a subregional level, but do not fall under the purview of any one city. The regional issue of goods movement’s impact on congestion and air quality is one example.

**TM2.5.6.2. Project Champion/Sponsor**

GCCOG could champion this project. A management structure similar to the COG’s with added private sector membership could oversee the operations – this structure, however, would be developed in a subsequent implementation plan effort with input from all stakeholders.

**TM2.5.6.3 Project Alternatives**

There are many options for carrying out this project. It could be a new facility, dictated by the operational and staffing needs or a converted space in the COG’s or a city’s transportation department. A conceptual design, detailed concept of operations, and preliminary site plans would provide input to a site analysis as a next step in developing this project.

The project could provide staff 24 hours a day, 7 days a week, or as determined by the operational needs of the subregion. Because of the extended peak periods in the area and the additional congestion caused by off-peak truck trips, extended hours may be needed.

**TM2.5.6.4 Funding Considerations**

Permanent funding to operate such a facility would have to be secured and may include partnership with other public agencies for both capital and ongoing operating and maintenance costs. Private sector contributions would also be examined for operational funding. This would include development of a possible public-private partnership. Private funding would in part depend on the benefits received for private companies and would have to be clearly “spelled out” in agreements. Projects that will be operated by the project may provide portions of the funding for capital and ongoing operations.

Costs for a project of this type can vary greatly and are contingent primarily on the final concept of operations and related staffing requirements to be developed in the implementation plan.

The funding for ongoing operations of the project would need to be identified before proceeding with this alternative.

**TM2.5.7 Truck Fleet Communications Program**

**TM2.5.7.1 Project Description**

GCCOG is embarking on a project that is intended to address the current lack of real-time communications to trucks and truck dispatchers in the GCCOG area. Deployment of vehicle-specific technologies including GPS and mobile data terminals (MDTs) will enable en-route communication to truckers about important real-time traffic and road condition information while supplementing available data regarding travel conditions on freeways and arterials. Data to be collected from the trucks for traffic and incident management uses in the GCCOG area will be cleansed of truck and company information making the useful
travel condition data anonymous. The program will be rolled out in a pilot demonstration phase and expanded in future phases if the program is a success.

The system will provide a clearinghouse for information that can benefit a number of different trucking companies, public sector agencies and the general public, providing data to a vast array of stakeholders throughout the subregion and beyond. The pilot demonstration phase will operate over the course of a three to six month timeframe with approximately 25 local trucks from at least two trucking companies in partnership with GCCOG and a trucking industry non-profit organization.

The full scale system is envisioned to operate 24 hours a day, with as many as 50,000-70,000 trucks distributed among a number of trucking companies, operating in an array of trucking market segments. In a full scale system, the principal of system-wide bidirectional communications could extend to other, larger geographic areas and could warrant a longer term public/private partnership of key stakeholders. The additional data provided by the full scale project could include freight-specific traveler information to and from trucks en-route and additional information from Caltrans including lane-by-lane aggregated data for detailed traffic pattern analysis.

The following table outlines the types of data that the project will seek to supply/share during the pilot demonstration. Other recommended information that can be provided that will benefit goods movement operations will be accepted. The system will be responsible for generating and delivering reports providing data useful for active traffic management, analysis and long-term infrastructure planning.

<table>
<thead>
<tr>
<th>Data Type</th>
<th>Data Source</th>
<th>Trucking Companies and Employees</th>
<th>Public Agencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company Proprietary – Not to be</td>
<td>AVL, including reports</td>
<td></td>
<td>None</td>
</tr>
<tr>
<td>distributed to other public or</td>
<td>Specific truck ID, idle time location, duration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>private Pilot participants</td>
<td>Engine on/engine off time stamp</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Engine data bus information</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Routing and redirection information to drivers</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Specific truck, location reports</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Images of changes to bills of lading, manifests</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distributed to all Pilot</td>
<td>Unscheduled traffic incidents</td>
<td></td>
<td>Scheduled incidents</td>
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<tr>
<td>Demonstration Program participants</td>
<td>Suspected terrorism (if any)</td>
<td></td>
<td>Unscheduled incidents</td>
</tr>
<tr>
<td></td>
<td>Panic Button messages</td>
<td></td>
<td>Suspected terrorism (if any)</td>
</tr>
<tr>
<td></td>
<td>Emergency notification</td>
<td></td>
<td>Sigalerts</td>
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<tr>
<td></td>
<td>HAZMAT unusual occurrences</td>
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<td>Traffic reports</td>
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<tr>
<td></td>
<td>Anonymous truck speed (including idle), location</td>
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<td>Emergency</td>
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<td></td>
<td>IF on freeway or arterial</td>
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<td>notification</td>
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<td></td>
<td>Aggregated (anonymous) truck speed, location</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>reports (freeways and arterials only)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Gateway Cities Council of Governments, 11/2007

**TM2.5.7.2 Project Champion/Sponsor**

The GCCOG is championing this pilot demonstration project in partnership with other local public agencies and private companies.
**TM2.5.7.3  Project Alternatives**

The intent of the project is to employ a data consolidator that can gather data and facilitate integration of the collected information to trucking companies, trucks and public agencies and will provide public and private stakeholders aggregated reporting and access to the data. A portion of the data transmittal architecture will rely on the RIITS system for the public agency sharing of traffic management data. Several types of real-time traffic congestion data are currently available from public sector agencies such as CalTrans, CHP, and Metro via the RIITS network. This Pilot Demonstration Program will subscribe to the RIITS network to be able to access and share additional information to other public agencies, the general public and private goods movement companies.

The technologies needed to deploy the system include:

- Two-way on-board vehicle messaging and AVL system equipment;
- Mobile data terminals to collect information from the data buses and be able to transmit the information to a centralized database;
- “Panic buttons” installed on-board trucks for emergencies; and
- A data consolidator that will gather data and facilitate communication of information to truckers, trucking companies and public agencies.

All of these technologies are available individually and will require integration to achieve the objectives of this project.

**TM2.5.7.4  Funding Considerations**

This pilot project is currently funded by GCCOG. Funding is not yet identified for subsequent phases. Business plan considerations may include the option of future phases including supplemental data through agreement with existing private truck fleets already outfitted with GPS transmitters; supplemental data collected from traveler information service providers who already have agreements with private fleets and are effectively collecting and utilizing fleet data in traveler information systems; ongoing operations and maintenance costs to be supplemented by one or more private data consolidators through subscription service fees; and other potential private partnerships or public cost sharing.

**TM2.5.7.5  References**


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**TM2.5.8  Port Reverse 911 Emergency Notification Call System**
TM2.5.8.1 Project Description

This web-based, community-alert notification system would be designed to make mass telephone calls to the truck drivers, truck dispatchers, and other goods movement companies that are registered to the system with emergency/alert information about major incidents, emergencies or closures that could affect Port access. The system would be activated by Port authorities during evacuation notices, imminent or perceived threat to health, life or property on or around Port property or disaster notifications. When emergencies or incidents occur on or surrounding Port property that would close down operations at the Port and halt all trucking operations, a reverse 911 system would notify registered users of the emergency (as shown in the communications diagram above) to help them make informed decisions on their travel or scheduling prior to entering the traffic congestion resulting from Port closure. Truckers, drayage dispatch operations, warehouses, and intermodal facilities, among others, can register their phone numbers (mobile or landline) for notifications.

Subsequent phases of this program could extend the functionality to include messaging to in-vehicle devices deployed as a part of the Truck Fleet Communications Program (described above), messaging to other web and phone-based traveler information systems serving the region (both publicly and privately provided), general public registration for residents of the Gateway Cities subregion and additional source information from within and surrounding the GCCOG area.

TM2.5.8.2 Project Champion/Sponsor

Due to the primary origination of the emergency notifications that would be transmitted, the Port of Long Beach and Port of Los Angeles public safety authorities would be a likely candidate to champion this project.

An alternate or co-champion would be for GCCOG (or operating agency) to build this system from a potential subregional TMC. This alternative may provide an impetus for the system to be more far-reaching and address emergencies outside of the purview of Port property.

It is encouraged for the project champion(s) to partner with local public safety agencies, private trucking companies, rail companies and local agencies to initiate and manage this project as it will require input from many different stakeholders throughout implementation of the project.

TM2.5.8.3 Project Alternatives

There are a number of technologies and private companies that have trademarked systems that could be used for the Port reverse 911 system. The system that is used for the City of San Diego is the Reverse 911® Interactive Community Notification System. The City of Long Beach has subscribed to the Mass Call technology of Sigma Communications.
CodeRED® is a private party system that has been purchased by cities in Florida and Georgia. An important advantage for purchasing a privately developed reverse 911 system rather than housing the telephone database internally is that the emergency notifications will not tie up the Port telephone lines when the system is activated. The second justification would be that a private vendor may have access to additional outgoing telephone lines necessary to expand the current system to a larger volume of recipients than originally planned, thus not limiting the functionality of the system in the event of an emergency.

The registered users of the reverse 911 system will be required to provide the telephone number where they can be notified, plus the name, address, and contact information for the dispatch operations of their trucking company. All drayage truckers who routinely travel to and from the Port within the Gateway Cities and surrounding area are suggested to be registered to the system. Long-haul trucks that periodically travel into the Gateway Cities area are suggested to register their dispatching location contact information to allow the emergency notification that transmits to their dispatchers to be relayed to the long-haul truckers in the vicinity of the Ports. The registered telephone numbers are stored in a database managed by either the Ports, another operating agency, or a contracted private company. When an emergency happens, if the decision is made to activate the system, the database manager is notified to record the emergency message and then activate the reverse 911 system, which then calls all of the registered telephone numbers in the database.

The number of calls the system makes is proportional to the cost of the system – a system that can make 240,000 calls in one hour will cost more than one that can make 450 calls in one hour. There could be approximately 50,000-70,000 drayage and long-haul truckers in the Gateway Cities area at any given time and therefore the reverse 911 system should be sized for a minimum of 70,000 telephone numbers in one hour for emergencies at the Ports. Provisions for increased scalability should be built-in to the requirements of the project. If additional telephone lines are needed to increase the quantity of messages sent, one option that the City of San Diego Reverse 911® system uses is to connect the system to the police (or other local) reverse 911 system to utilize their telephone lines for the mass call. This could effectively double the number of outgoing messages depending on the capabilities of the secondary reverse 911 system. Other options for this project should include messages that can be disseminated in data form through emails or text messages, or including a potential interactive feature where the recipients of the calls could at the touch of a button request additional information or assistance in the case of an evacuation.

**TM2.5.8.4 Funding Considerations**

Depending on the type of technology, which entity will maintain the system, and the security requirements of the registered numbers, there may be multi-year contract arrangements for maintenance of the registered databases made with a private entity. A potential funding opportunity is Homeland Security grants which provided the funds to support the City of San Diego and City of Long Beach reverse 911 systems. For this project, Port and Maritime Security grants should be explored. Considering that all telephone numbers in the system database need to be registered individually and therefore could increase the cost of the system, there may be a potential for cost recovery for the annual cost of the system based on a fee per registered telephone number.
TM2.5.8.5 References


TM2.5.9 Comprehensive Performance Monitoring Program

TM2.5.9.1 Project Description

Many of the identified concepts mark some potentially innovative strategies that will need to be evaluated or assessed to determine if those strategies are truly having a positive impact on the transportation network. A formal performance monitoring program can provide a reporting process for continuously monitoring and measuring the actual impact of various strategies, thus providing the support needed to attract future transportation funding to the region. This program should be tied to all of the core components of this program:

- Technology infrastructure
- Coordinated operations
- Private business decisions and information streams
- Public business decisions and information streams
- Policy and investment decision making

This program will serve as a valuable feedback tool to ensure that investments in these programs and projects are having the desired impact on transportation operations, safety, and mobility. This will help GCCOG and its partners in the region to refine strategies or expand programs that are demonstrating significant, positive impact.

As so many of the negative impacts of the transportation demand in the region can be tied to air quality impacts, it is recommended that air quality measurement also be a core component of the resulting program. Additional, air quality sensors placed throughout the region, in addition to other existing and future data to be collected from specific projects and programs before and after they are implemented, can provide critical insight into the effectiveness of transportation improvements at an infrastructure, technology or policy level, as well as at a community level.

To expand upon the program, the air quality sensors and accompanying central system, coupled with other programs such as truck holding/parking, truck-based travel time programs, and queue and terminal turn times, can provide a unique and powerful opportunity to actively manage air quality in the region.

For example, if air quality is nonconformant within a 5-mile radius of the Ports and terminal turn times are slow or a major incident has closed I-710, the truck holding/parking program can identify facilities outside of the nonconformant zone and recommend holding vehicles
in those identified areas until conditions are acceptable within the zone (if that type of precision can be developed). Likewise, through active management, other policies or project concepts can be tested in partnership with local public agencies and private companies to affect positive change in air quality. The measured reductions in emissions can be used as positive proof of improvements to attract future funding to effective programs and projects.

This air quality monitoring program would have to be thoroughly and completely coordinated with and “vetted” through SCAQMD. This would avoid redundancy and lead to a determination of the best way to collaborate (including reporting functions). The analysis and reporting function must be supported and useful to SCAQMD (and other air quality agencies) in order to be implemented and successful.

A formal performance monitoring plan will need to be developed for the GCCOG region, which identifies:

- who will be responsible for overseeing the various monitoring activities,
- what data would be needed (source, data type, frequency)
- how often measures would be evaluated
- how measures would be reported and shared with other entities

Different measures (as well as historical or archived data) will apply to different systems, or even to different segments of the roadways and freeways. There are quantitative measures that will rely on analysis of various data to determine actual performance or impacts. Quantitative measures include travel times (including delays), idle times, vehicles miles traveled (VMT), Truck VMT, incident response times, incident clearance times, air quality levels, freeway and arterial volumes, ramp volumes, number of ‘hits’ or calls to a traveler information service, number of CVO enforcement violations, and others. For the GCCOG region, freeway and arterial travel times, truck volumes/utilization of specific corridors, air quality levels, and CVO safety enforcement statistics will be among the most pivotal quantitative measures.

Other types of measures will also be important to be able to identify the overall impact of certain strategies. Measures such as number of agencies connected to RIITS or IEN, number of subscribers to a video relay/distribution service, number of freight/cargo containers utilizing RFID or on-board systems, number of transactions on a scheduling system are just a few atypical measures that could convey to local and state decision makers the actual ‘reach’ of certain strategies.

**TM2.5.9.2 Project Champion/Sponsor**

GCCOG or the operating agency could build and manage this system. Future phases could coordinate with or provide a service to other local and regional public agencies such as Caltrans, POLB, POLA, and municipalities.

**TM2.4.1.5 Funding Considerations**

While funding is not identified for this project, funds are most likely to come from public sources. This showcase project has great potential to attract future funding to the region.
through the measured results provided as an output and as such, may be self-sustaining in future phases.

**TM2.5.10 Existing Sources – Truck Fleet Data Collection and Agreements**

**TM2.5.10.1 Project Description**

Several projects and programs outlined above (such as the Truck Fleet Communication Program and the Arterial Travel Times) propose utilizing trucks as probes in order to extract truck-specific data on travel times on freeways and arterials. Additionally, there is a great deal of data available from the private sector that can supplement this new equipment. Many trucks are already outfitted with GPS equipment that can be collected or utilized through agreement directly with fleet owners or with private traveler information service providers.

**TM2.5.10.2 Project Champion**

GCCOG would be the most likely candidate to champion this effort, given their proven track record of success in establishing agreements with drayage companies in the subregion for data use.

Caltrans may choose to lead or at least be significantly involved in any agreements relative to their right-of-way. This would more likely apply to data extracted through field-based equipment and not to fleets operating on or traversing state routes.

**TM2.5.10.3 Funding Considerations**

Business plan considerations would need to address the use or reuse of this existing data based through agreement with owning companies. In the case of private information service providers, for example, there may be limitations on the use, reuse or distribution of the data, based on the fee and/or business model of the owning company.

**TM2.5.10.4 Project Alternatives**

Large fleets such as those owned by large trucking companies or ground-shipping services such as FedEx or UPS have the potential to provide a large volume of data, with the fewest number of agreements.

Agreements with existing private traveler information service providers would serve to avoid the legwork of negotiating numerous individual agreements, but are likely to pose the greatest restrictions on use and/or cost for the purposes desired in this program.

Continuation of the efforts started by GCCOG to enter into agreement with individual companies may take the most work, but could result in substantially lower cost or free data. It is possible that data can be extracted from existing GPS equipment in lieu of installing new equipment.

The following projects are potential projects in the long term because they require further discussions with stakeholders and additional project concept development.
TM2.5.11 Comprehensive Goods Movement Scheduling System (Container Tracking)

TM2.5.11.1 Project Description

Current studies and interviews show that the existing reservation systems in place at some terminals at the Ports are ill used and ineffective, yet needed to improve efficiencies on the part of many of the private businesses involved in moving goods through this region. A single, accurate, and reliable system is needed that extends beyond the current reservation systems to include the supply chain from shipping companies to rail, including terminal operators, drayage and delivery services in between. A container-based tracking system as a part of this program would provide much needed advance notice to rail companies when containers are en-route in order to better manage their operations and improve throughput at the intermodal yards. A single system for the entire POLB/POLA supply chain would fill in many information gaps among private parties to improve their own operations and improve throughput at terminals, increase the number of turns that drayage companies are able to accomplish (without increasing the number of vehicles on the roads), and overall reduce the idling, parking, and container storage that currently occurs in the system today. This system could also form the basis of an automated system for moving containers in the future.

TM2.5.11.2 Project Champion

Champions for this effort may be GCCOG or the POLB/POLA from a public sector standpoint, but would require close partnership with either shipping companies, terminal operators, and/or customs/customs agents to deploy. As similar or the same needs may exist at other major ports in the US, a partnership with peers throughout the Country may be beneficial.

TM2.5.11.3 Project Alternatives

Challenges with this proposed system are abundant and include the challenges of protecting proprietary information while providing access to the same data by allowable parties, involvement of terminal operators who have already invested in existing reservation systems and have the challenge of union restrictions to contend with, and the highly competitive nature of the goods movement industry overall. Also, while this type of project would directly benefit private industry, the resulting benefits to the general public and public sector agencies representing them may be less visible or obvious.

A container-tracking based system provides the opportunity to short circuit many of these challenges and also brings another likely partner to the table: homeland security. There is value in tracking containers while at sea to note any anomalies in the travel patterns that could trigger security concerns about the contents or whereabouts of some shipments.

The complexity of this type of groundbreaking endeavor would require further study to establish the detailed functional requirements and feasibility of desired effectiveness measures as a result.
TM2.5.12 Truck Parking Coordination

TM2.5.12.1 Project Description
With substantial concerns about air quality conformity in the Gateway Cities Region, a comprehensive and proactively managed truck parking and holding program could provide active solutions to undesirable or illegal on-street truck parking.

TM2.5.12.2 Project Champion
GCCOG could champion this program.

TM2.5.12.3 Funding Considerations
The ability to measure and show actual results can be in large part a catalyst for attracting further funding for program expansion or for related programs in the subregion.

TM2.5.13 Vehicle Enforcement Strategies, Systems and Sites Study

TM2.5.13.1 Description
This concept would establish a truck safety and inspection program in the Gateway Cities region that greatly increase the ability of enforcement agencies to monitor and inspect the high volumes of truck traffic on the region’s freeways. With limited available right-of-way or adjacent land on freeway corridors, as well as limited to no available land near the ports, vehicle inspection would need to utilize technologies and systems that are not necessarily part of ‘traditional’ truck inspection stations. Systems implemented as part of this project would ideally be able to screen driver credentials, be capable of detecting overweight vehicles, support a broader safety/enforcement program in the region, as well as support stricter air quality/pollution mitigation programs.

This project includes:

- Implement systems and processes that will allow for ‘virtual’ truck inspections on freeways to enhance enforcement and reduce the number of unsafe trucks or on the region’s transportation network
- Minimize the need for right-of-way or adjacent land that is typically needed for a traditional inspection station (parking, inspection facilities, staff facilities, etc.)
- Establish a network of permanent inspection facilities that will not only improve current inspection and enforcement activities, but will serve the region as truck traffic continues to grow

TM2.5.13.2 Sponsors/Major Stakeholders

California Highway Patrol – Responsible for Commercial Vehicle Operations (CVO) enforcement. CHP would be responsible for operation of future inspection sites. In partnership with other agencies, lead efforts for outreach, education and awareness of new inspection facilities. Address any legal/privacy issues, as well as identify potential new legislative requirements relative to new technologies or alternate facility design.
Caltrans – Deployment and operational support for integrated systems as part of the truck vehicle inspection program. Dedicate right-of-way for needed infrastructure. Coordinate with CHP to obtain data for planning purposes, as well as for pavement preservation forecasting. Work with CHP for outreach, education and awareness efforts.

Local Agencies – fund, design and build local arterials; local courts set fees for infractions (on a case-by-case basis) and collect for truck safety infractions as identified by CHP to be received by local agencies.

Gateway Cities COG – Partner with CHP and Caltrans to move forward feasible alternatives from the Commercial Vehicle Enforcement Strategies, Systems and Sites Study. Provide funding support for pilot deployments and evaluations. Help support evaluation efforts to determine if technologies and systems are meeting requirements.

TM2.5.13.3 Functionality

There are some overarching parameters that will influence how, or if, this project concept can be feasibility implemented, as well as where on the freeway network it could be implemented. The current congestion levels and limited right-of-way on I-710 and other key freeway corridors means that traditional truck inspection and weigh station facilities are not likely feasible. In order to provide the broadest enforcement coverage and minimize the disruption to freeway traffic flow, Weigh-in-Motion (WIM) is being recommended along key freeway segments, particularly north and southbound I-170 and I-110 servicing the Ports. WIM would allow trucks to be weighed as they pass over the scale (at freeway travel speed) without stopping. WIM will capture data about trucks passing over them to include individual axle and axle groups, axle spacing, gross vehicle weights, and speed of the vehicle.

WIM as a stand-alone application will not address all of the enforcement and safety monitoring capabilities that would be needed with this concept. Although WIM will help to identify overweight vehicles, additional systems and technologies would be required to support credentialing inspections, safety monitoring (overall ‘road worthiness’ of vehicles) and air quality monitoring. A traditional inspection facility could require up to 45 minutes of time per vehicle for these kinds of comprehensive inspections. The urban freeways in the Gateway Cities’ area do not provide sufficient space for such facilities, nor is it practical to impose that kind of delay on truck vehicles. This would have significant trickle-down effects to overall port operations, multimodal transfer facility yards, warehouses and distribution centers, as well as severe economic impacts to the individual drivers themselves (who are very dependent on quantity of runs per day to generate their income).

In order to enhance WIM capabilities, one option would be to include video monitoring near each WIM installation. A pilot project in Saskatoon, Canada implemented a video camera and video capture card which was synchronized with the WIM scale and took an image of every commercial vehicle that crossed over the WIM scale. That image was then correlated to the weight record of the vehicle. This provides valuable data for planning and forecasting purposes, but the Saskatoon deployment site took this concept one step further by developing a real-time web-based application whereby enforcement officials could view the image of the truck along with the corresponding vehicle record information (weight, axle, etc.). There was even an option for accessing this data by web-enabled PDA/hand-held computers, which may be more conducive to enforcement officers in the field.

Data and information obtained from the WIM and any associated virtual monitoring equipment (that could include safety measures as well) could be utilized in real-time for
monitoring and enforcement, but this data will also provide valuable information for longer-term planning purposes.

**TM2.5.14 Support of Future Infrastructure (including Congestion Pricing)**

Future roadway infrastructure will require technology support to maximize effectiveness in the transportation and goods movement system. I-710 expansion, including truck-only lanes, should include basic detection technologies as well as more advanced support for potential congestion pricing and/or tolling initiatives. Congestion pricing has the potential to reduce congestion throughout the region (not just on I-710) while at the same time raise funds for future congestion in the transportation system. Congestion pricing can be accomplished using Fastrac, or a similar toll tag, such as is currently done on the SR91 high occupancy toll lanes, or could be zone-based, with tolls collected using video technologies, such as the London Congestion Charge Zone program. Congestion pricing could be applied to general use of lanes, roads, or zones, or could be specific to Port areas or the Gateway Cities subregion for trucks.

Other potential technology support could be provided for managing or monitoring truck-only lanes or supporting an automated container movement system.

**TM2.5.15 Integration and Policy Task Force**

Given the infancy of the ITS Working Group and the cutting edge nature of several of the recommended projects, it is recommended that the ITS Working Group continue to convene as a private-public partnership. In addition to ongoing working and technology issues, the group should be expanded (either through its current membership if appropriate or through a secondary policy-level task force) to address issues and challenges such as:

- coordination for real-time operations strategies, particularly between state, regional, and local agencies and the Ports;
- Liaison with long-term planning throughout SoCal and the nation;
- Policy relating to private sector as a crucial and needed partner in the planning and implementation process for ITS strategies and policies at the regional level;
- Management and/or operational oversight of the Gateway Cities subregional TMC role, operational strategies, staffing, legal issues and future endeavors.

**TM2.6 INSTITUTIONAL ISSUES AND CONSIDERATIONS**

This stage of the ITS Integration Plan defines core concepts that will shape how the Gateway Cities region better integrates freight and goods movement into all aspects of operating and planning for the regional transportation network. The following topics are for consideration in future steps and project development. These are several of the overarching potential policy-level impacts and anticipated or current institutional challenges that will require a strong foundation of cooperation to support the success of the overall program.

**Strong Private/Public Partnership in Developing Future Solutions** - A long-standing challenge in the GCCOG region (although not exclusive to this region) is the ability to engage and maintain involvement from the freight/goods movement community. This challenge stems in part from the lack of availability or interest to be involved and in part from lack of trust of the public sector to treat the industry as a true and equal partner. As such, transportation agencies would be wise to approach technology and infrastructure projects from an industry-wide perspective; the ultimate success of a region-wide approach to enhancing and integrating goods movement and freight needs will require
ongoing and active participation from key representatives within both stakeholder groups. GCCOG has made excellent strides in terms of engaging the freight and goods movement community of stakeholders as part of several projects, but their ongoing involvement will be critical to the continued progress toward many of the enhancements identified in this integration plan.

**Private sector participation/business model framework** – concepts and strategies emphasized several opportunities for private sector to be involved, either as a technology provider, data integrator, data collector, or key operational partner. Careful consideration needs to be given to defining a conscientious business model and framework that factors in private involvement (and the existing business models of each partner) as a primary component – is there sufficient market opportunity that will attract or encourage private sector involvement? Does the solution set somehow improve the bottom line for each different partner (efficiency, number of truck turns, quantity of container throughput, etc.)

Data sharing with private sector (traveler information service providers) also raises different issues. Public sector is used to providing its data/information at no charge, and private sector is very accustomed to using free public sector data. Would public sector be willing to pay for data from the private industry? From a private partner business model perspective, the most successful models point to the private sector serving in a contracted role (i.e., guaranteed $$ from public sector for the services they provide). Any sort of subscription model in traveler information is a big risk for private sector (traveler information service providers) - and may not result in a sustaining service if they can not generate sufficient profit.

**From a data sharing/privacy perspective** – policy needs to be developed to clearly spell out what kinds of data can and will be shared. Trucking/goods movement companies may want to benefit from project concepts that can provide them with real-time status information, but the downside could be they don’t want to make ‘their’ data part of the data pool. Think about the cell phone tracking debate – no one likes the idea that you can be ‘tracked’ with the technology that is in your cell phone, but if you call 911, you certainly want emergency responders to be able to find your exact location in seconds. It’s a trade off – freight/trucking may need to compromise on some of their data that gets incorporated into any regional approach, however, the benefit that they could receive could outweigh any compromises. Policies will need to clearly spell out the data sharing framework, and any partnerships established will need to agree on the parameters for data sharing. If freight/goods movement feels too compromised when it comes to their data, they won’t be a participant.

**Local agency ‘equity’** – how fines/fees are distributed to local agencies needs to be revamped. A consistent state policy is needed that establishes an equitable and reasonable framework whereby funds get distributed to local agencies from CVO/enforcement fees and fines as well as the potential construction, operation, and maintenance of these facilities. This could support local agency pavement rehab on truck routes, perhaps a percentage could be designated to support ‘regional’ projects such as signal coordination/integration on priority arterials for travel times, etc.