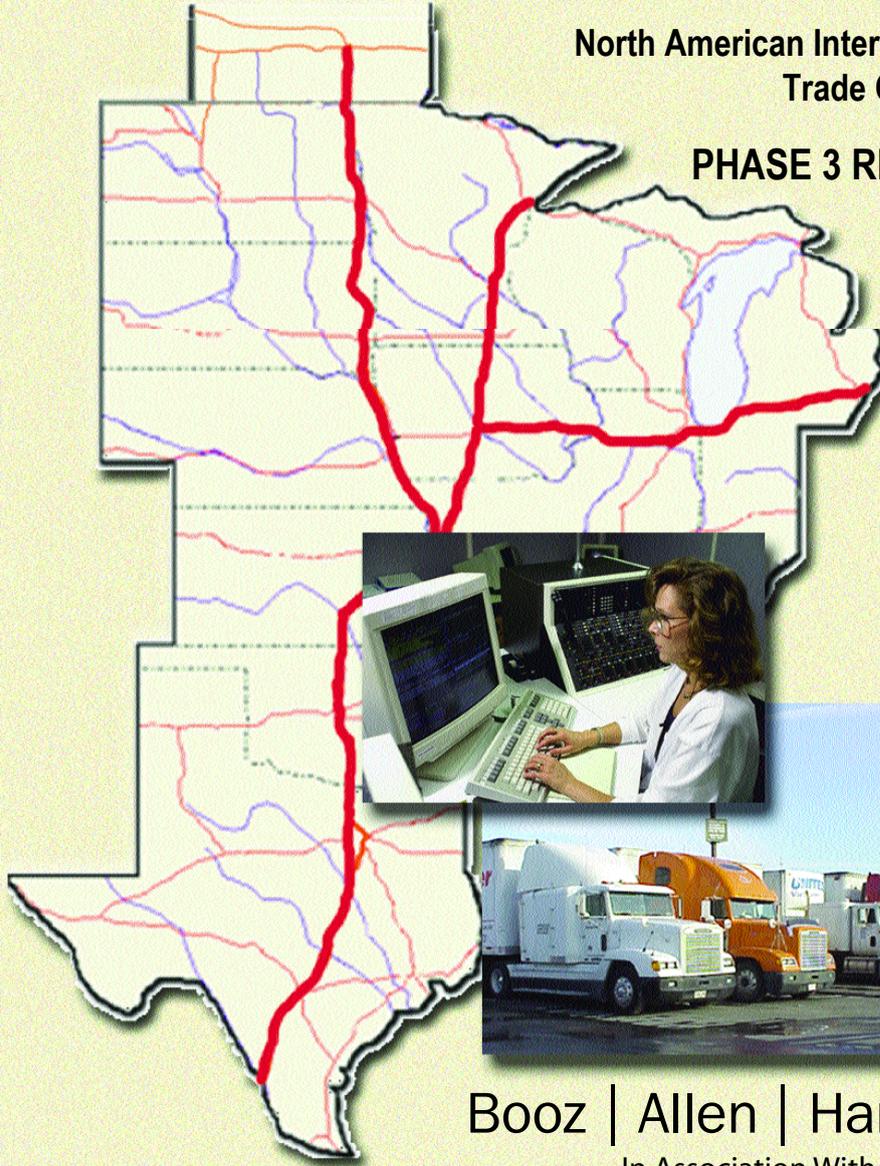
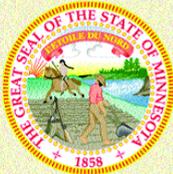




# North American International Trade Corridor DEVELOPMENT PLAN

Comprehensive and Coordinated ITS/CVO Plan  
for the  
North American International  
Trade Corridor

PHASE 3 REPORT



Booz | Allen | Hamilton

In Association With

ATA Foundation

TransCore

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## ACRONYMS

ACE	Automated Commercial Environment
ASC	Accredited Standards Committee
ASTM	American Society for Testing and Materials
ATIS	Advanced Traveler Information Systems
CCTV	Closed Circuit Television
CDL	Commercial Drivers License
CDLIS	Commercial Driver License Information Systems
CMO	Customs Modernization Office
CVIEW	Commercial Vehicle Information Window
CVISN	Commercial Vehicle Information Systems and Networks
CVO	Commercial Vehicle Operations
CVSA	Commercial Vehicle Safety Alliance
DBMS	Data Base Management System
DMV	Division of Motor Vehicles
DOB	Date of Birth
DOT	Department of Transportation
DSRC	Dedicated Short Range Communication
DUNS	Dun and Bradstreet Numbering System
EPA	Environmental Protection Agency
EDI	Electronic Data Interchange
EFT	Electronic Funds Transfer
EPA	Environmental Protection Agency
ETA	Estimated Time of Arrival
FAQs	Frequently Asked Questions
FDA	Food and Drug Administration
FHWA	Federal Highway Administration
FIS	Federal Inspection Services
FMCSA	Federal Motor Carrier Safety Administration
GIS	Geographic Information System
HazMat	Hazardous Materials
HTML	Hyper Text Markup Language
IEEE	Institute of Electrical and Electronics Engineers
IFTA	International Fuel Tax Agreement
INS	Immigration and Naturalization Service
I-P-O	Input-Process-Output
IRP	International Registration Plan
ITDS	International Trade Data System
ITS	Intelligent Transportation System
JIT	Just In Time
JPO	Joint Powers Organization
LAN	Local Area Network
MCSAP	Motor Carrier Safety Assistance Program
MOU	Memorandum of Understanding

NAFTA	North American Free Trade Agreement
NAITC	North American International Trade Corridor
NASCO	North America's Superhighway Coalition
OOS	Out-of-Service
OS/OW	Oversize/Overweight
PNV	Park 'n View
PRISM	Performance and Registration Information Systems Management
PSAP	Public Service Answering Point
PUC	Public Utility Commission
ROW	Right-of-Way
SAFER	Safety and Fitness Electronic Records
SSRS	Single State Registration System
TMC	Traffic Management Center
TS	Transaction Set
USDA	United States Department of Agriculture
USDOT	United States Department of Transportation
VIN	Vehicle Identification Number

## 1.0 EXECUTIVE SUMMARY

### 1.1 ENHANCING A CRITICAL TRADE CORRIDOR

The North American International Trade Corridor (NAITC)—which comprises I-35, I-29, and I-80/I-94—is a critical trade route for goods traveling between North American Free Trade Agreement (NAFTA) countries and to and from destinations across the United States. Every transcontinental east-west interstate highway, the Trans-Canada highway, and the major lines of several transcontinental railroads cross the corridor. Along or near the corridor are several major rail intermodal facilities, as well as several international cargo and passenger airports. The corridor also connects major ports on the Mississippi and Missouri rivers.

*Facilitating the flow of trade along the Corridor is expected to have critical economic benefits for not only the region, but also for the entire U.S. economy.*

Because of the Corridor's critical importance to the regional and national economies, the eight corridor states (Iowa, Kansas, Minnesota, Missouri, North Dakota, Oklahoma, South Dakota, Texas), the Province of Manitoba, North America's Superhighway Coalition (NASCO), and the Ambassador Bridge have established a formal agreement to support the integration of freight services to reduce regulatory and administrative burdens and support carriers operating along the corridor. These improvements will be critical to realizing the full economic benefits of increased international trade made possible by NAFTA, and will help to minimize adverse environmental, safety, and congestion impacts on the already busy interstate system. Development of the NAITC Comprehensive and Coordinated Intelligent Transportation Systems for Commercial Vehicle Operations (ITS/CVO) Plan is a critical step toward achieving the trade corridor vision.

### 1.2 THE NAITC VISION

The benefits of implementing the plan are expected to be significant, and include:

- Facilitating growth in international trade
- Minimizing adverse environmental, safety, and congestion impacts of more trade
- Improving motor carrier safety and enforcement capabilities
- Improving motor carrier efficiency and reduce the cost of doing business
- Streamlining motor vehicle regulatory and administrative processes
- Increasing access to trade and motor carrier support services
- Promoting economic development and business expansion

These and other goals will be accomplished by:

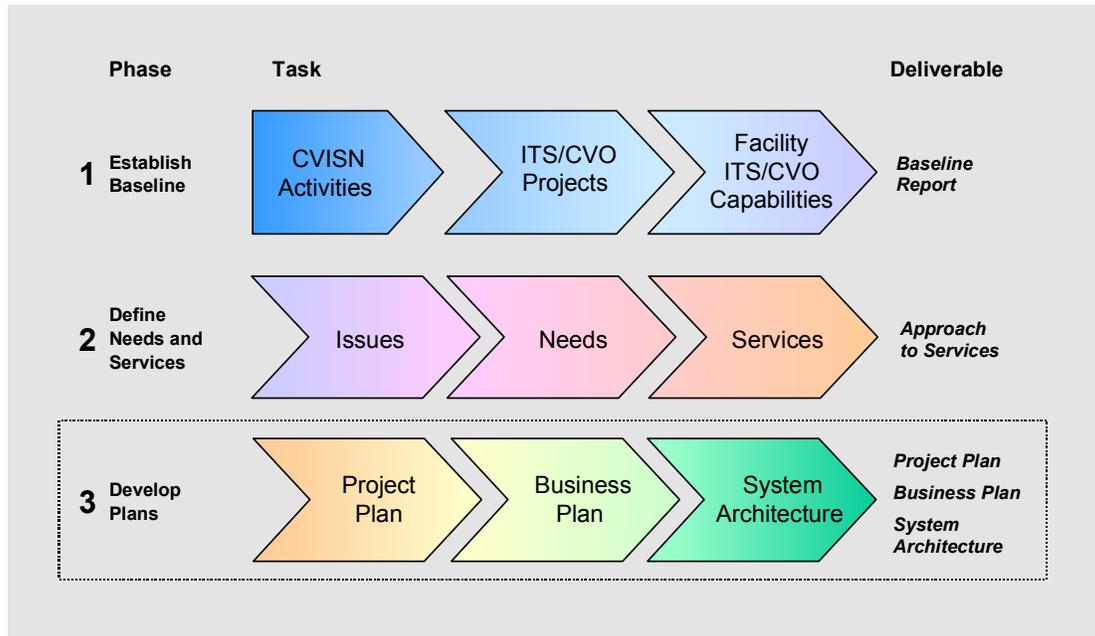
- Developing interoperability among State and Federal electronic systems for commercial vehicle enforcement along the corridor
- Providing traveler information necessary for commercial vehicle travel along the corridor
- Integrating ITS/CVO services with existing private-sector facilities and technical capabilities along the corridor.

*Coordinated business processes and modern information exchange built on high-speed communications networks will be the backbone of an integrated NAITC system.*

The NAITC vision and strategy are based on operations improvements rather than on traditional capital investments in road infrastructure, allowing for rapid implementation and results. Instead of depending on a road infrastructure, these services and applications depend on an information infrastructure, or "infostructure," to provide raw data and communication links. The infostructure includes the technologies and systems for collecting data, as well as the devices for delivering information. Many infostructure systems are already in place and collecting valuable data along the corridor. The challenge is in harnessing the information collected to create valuable user services. At present, data is collected through a series of disparate systems and processes. The NAITC strategy is to connect these systems and processes to enable data integration. This will, in turn, lead to development of more viable services, such as corridor traveler information, one-stop shopping for credentials and permitting, and single-point enforcement.

### 1.3 A PHASED APPROACH

Figure 1 shows the three phases of the NAITC Comprehensive and Coordinated ITS/CVO Plan: (1) establish baseline, (2) define needs and services, and (3) develop plans. This document consolidates the three deliverables developed for the third and final phase: the Project Plan, the Business Plan, and the System Architecture.



**Figure 1: Corridor ITS/CVO Project Flow**

The first phase resulted in a **Baseline Report** that described existing ITS/CVO capabilities and systems. Stakeholders were surveyed and documents reviewed to obtain a complete picture of user needs, data interfaces, regional systems, and expectations for the future.

The second phase produced an **Approach to Services** that focused on corridor user needs and how those needs could be met through integrated user services. Open forms were held with corridor stakeholders to gather user needs, and services were defined that focused on improving safety and operational efficiencies through the sharing of data among stakeholders and providing new capabilities for capturing and accessing data. The report identified 17 user services and presented a unified framework for integrating processes and stakeholders to accomplish the NAITC vision.

The final phase and its corresponding deliverables, which are presented in this document, provide a roadmap to guide the ITS/CVO initiative as projects for sharing information and integrating services along the corridor. The **Project Plan** examines the relationship between user services, business processes, and projects, and identifies specific projects and their phasing to achieve critical program objectives. The **Business Plan** specifies how these systems can be implemented and sustained, and provides insights into the roles of individual stakeholders. The **System Architecture** describes an end state reflecting a comprehensive understanding of user services and the related business processes needed for a fully functioning, integrated ITS/CVO corridor. The architecture is presented as information flows and functions that support corridor CVO

processes, an approach for implementing the process functions and data requirements, and the public sector stakeholders involved with each process.

## 1.4 PROJECT PLAN

The Project Plan provides the critical linkage between the user services and business processes identified in earlier phases, and the projects and architecture that are essential to implementation. Projects are defined and developed within four tracks:

- **CVO Administrative Services** – supporting "back end" regulatory and informational needs of motor carriers and agencies
- **Electronic Screening, Clearance, and Safety Assurance Services** – designed to automate screening of commercial vehicles
- **Trip Management Services** – providing motor carriers with road, traffic, and other operation-based information
- **Fleet Management Services** – supporting "back office" business functions for motor carriers

This plan includes descriptions of 11 specific projects, with each project's purpose, potential benefits and outcomes, and implementation phasing. The projects are phased through 4 steps; pilot, initial service, service expansion, and full services. The timeframes presented reflect the funding cycles that drive implementation. The pilots are proposed to begin this fiscal year with results available by early summer to support input into the FY2003 budget process. The subsequent phases are aligned with the annual federal budget cycle, i.e., project phase transitions occurring in the fall of each year.

## 1.5 BUSINESS PLAN

The Business Plan groups the 17 user services identified in the Phase 2 Report into the same categories as the Project Plan based on function. The section provides details on service users, benefits, provision of services (including necessary investments in technology), and current business models used to implement and sustain each category of services.

In addition, it presents a five-step approach to addressing organization management, service delivery, funding, and institutional issues:

- Develop a corridor-wide program decision-making and delivery platform overseen by a multi-jurisdictional authority.
- Identify and prioritize corridor services, taking into account need, availability, and cost, starting with the initial value-based prioritization.
- Develop service delivery mechanisms and a comprehensive communications architecture showing systems linkages and interfaces.

- Develop program costing principles and budgets based on existing fees and new investment.
- Provide ongoing service management, evaluation, and troubleshooting, as well as education and promotion.

## **1.6 SYSTEM ARCHITECTURE**

The System Architecture presents a view of a completely integrated system for sharing corridor data in support of user services and business processes. The nine business processes listed constitute the foundation of the information system architecture.

1. Regulatory and Enforcement Data Collection and Distribution
2. Corridor CVO Regulatory and Trade Requirements Repository
3. Electronic Roadside Clearance
4. Electronic Credentialing
5. Electronic Permitting
6. Incident Management
7. Electronic Border Clearance
8. Traveler Information
9. Private-Sector Freight Management Electronic Services

Six of the processes (Processes 3 through 8) map directly to CVO services; the remaining three (Processes 1, 2, and 9) are essential for supporting integration of and access to these services. Processes are depicted using information flow diagrams that show the complex and varied interrelationships of specific inputs, outputs, and functions. In addition, descriptions of implementation approaches, stakeholder involvement, and areas requiring corridor governance are included.

## **1.7 NEXT STEPS**

This report, and its predecessors, is envisioned to provide a tool for the corridor stakeholders to take the next steps in corridor development. The project plan is the roadmap for that development, the business models are the recommended approaches for deployment funding and sustainability, and the architecture is the long-term goal, or target, for corridor information sharing.

The initial step is to form a corridor organization. In addition to the necessity of becoming a fundable entity for the expansion of corridor services, a corridor organization with multi-jurisdictional authority is needed to collectively undertake the numerous policy, governance, and program planning decisions that must be overcome to advance integrated corridor ITS/CVO services.

Pilot projects must commence as soon as possible to facilitate the program and technology decisions necessary for wider service deployments. These pilot lessons learned must be captured within the timeframe required for the corridor organization to participate in annual federal budget deliberations.

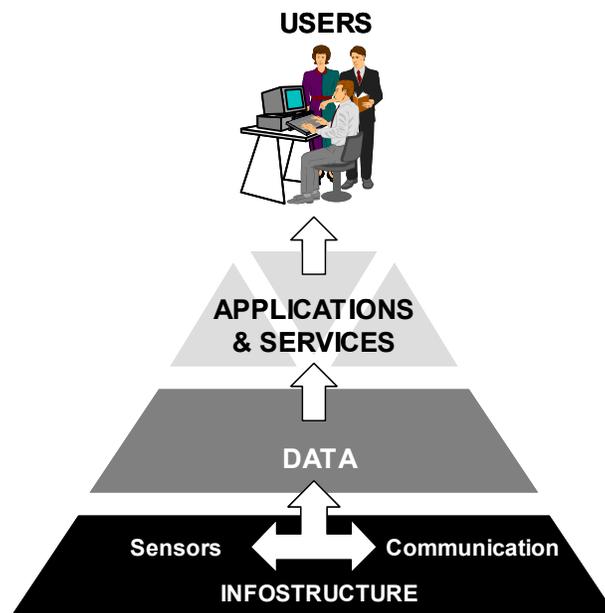
## 2.0 PROJECT PLAN

The project plan provides a roadmap for delivering the integrated ITS/CVO user services defined in Section 3 of the Phase 2 report. As stated in Section 4.2 of that report, the key trait of an integrated service is one that shares information corridor-wide for service delivery. Achieving this level of information sharing necessitates the introduction of data collection and distribution functions for corridor services. These functions are captured in a set of business processes, which act as enablers of integrated user services.

Implementing these functions will occur through a series of discrete projects that focus on:

- Developing and deploying software applications and supporting databases
- Integrating and deploying communications
- Deploying families of sensors

Figure 2 shows a conceptual view of the project implementation focus. The term “infostructure” is used to describe the communications infrastructure necessary to collect sensor data and to distribute data between applications and services.



**Figure 2: Project Implementation Focus**

## 2.1 PROJECT CATEGORY DEFINITION

The envisioned corridor ITS/CVO user services were grouped into four categories in the Phase 2 report:

- Credential Administration
- Electronic Clearance/Screening
- Safety Assurance
- Operations.

Subsequent analysis has realigned the user services based on stakeholders responsible for implementation and on location. These revised user service categories are shown in Table 1.

**Table 1: User Service Groupings**

Category	User Service
<b>Credential Administration</b>	Apply and Receive Registrations Electronically
	Apply and Receive Fuel Tax Credentials Electronically
	Apply and Receive Special Permits Electronically
	Electronic Access to Motor Carrier Regulations/Safety Inspection Reports
<b>Electronic Screening, Safety, and Security</b>	Electronic Clearance for Roadside Safety Inspections
	Electronic Border Crossings
	Electronic Clearance for Weight Inspections
	Roadside Safety Inspections Using Automated Diagnostics
	Electronic Driver Logs for Inspection by MCSAP Inspectors
<b>Trip Management</b>	Automated Toll Lanes
	Real-Time Access to Traffic and Road Conditions
	Internet-based Weather Information (route-specific)
	Internet-based Truck/Rest Stop Availability
<b>Fleet Management</b>	Electronic Fuel Management/Payment Services
	Electronic Load Finding/Matching Services
	Driver Kiosks for Email Access, Information Access

Corresponding sets of business processes were also associated with each user service category as shown in Table 2. One of the business processes, the Corridor-wide Data Collection and Distribution Process, is not shown in Table 2 because its data collection and distribution processes are common to all four-user service categories.

**Table 2: Business Process Groupings**

Category	Business Process
<b>CVO Administration</b>	Corridor CVO and Trade Regulatory Requirements Compilation and Storage
	Electronic Credentialing
	Electronic Corridor Permitting
<b>Electronic Screening, Safety, and Security</b>	Electronic Roadside
	Electronic International Border
<b>Trip Management</b>	Electronic Incident Management
	Electronic Traveler Information
<b>Fleet Management</b>	Electronic Freight Management

## 2.2 CORRIDOR TRANSPORTATION SYSTEM DEFINITION

The four categories provide for deployment of applications, communications, and sensors through a series of discrete projects. These deployments will occur throughout the transportation system centered on the Interstate Highways of I-35, I-29, I-80, and I-94 stretching from Laredo, Texas, in the south, to Winnipeg, Manitoba, and the Ambassador Bridge in Detroit, Michigan, at the northern end of the corridor. The large geographic expanse, diverse stakeholders, and numerous business processes necessitate a common framework for defining the corridor transportation system. Table 3 illustrates the diverse stakeholders and transportation elements of the corridor transportation system.

**Table 3: Transportation System Characterization**

Transportation System Element	Representative Public-Sector Stakeholder	Representative Private-Sector Stakeholder
<b>Rolling Stock</b>	Law Enforcement Cars	Power Units
	Snow Plows, Maintenance Trucks	Trailers, Chassis
	Emergency Response Vehicles	Tow Trucks
<b>Infrastructure</b>	Right-of-Way (ROW) – Rural	Terminals along ROW
	ROW – Metropolitan	Rest Stops
	Facilities along ROW	Truck Stops
<b>Administrative Offices</b>	State Regulatory Offices	Headquarters
	Law Enforcement Offices	Administrative Offices
	State Department of Transportation (DOT) Offices	Service Centers

### **2.3 CORRIDOR IMPLEMENTATION STRATEGY**

The corridor-wide data collection and distribution functions share a data center as common infrastructure. The corridor strategy begins with the creation of a data center to support concept validation through a series of pilots being implemented concurrently. The pilots implement key software applications with carefully specified sensor data and manageable communication capabilities.

Once the value-added service has been demonstrated to the prospective users, a sustainable business model will be implemented and the pilot moves into an operational environment. The sensor data and communications are gradually expanded throughout the corridor until corridor-wide services are fully implemented. Ultimately, the corridor stakeholders will have to agree upon the corridor enterprise architecture, the placement of permanent data centers, a governance structure, and other operations and maintenance approaches for sustained corridor-wide operations.

The following sections describe the projects within each of the four categories discussed; (1) Credential Administration, (2) Electronic Screening, Safety, and Security, (3) Trip Management, and (4) Fleet Management. The projects represent the capabilities needed to implement integrated corridor services in the four categories. The projects are defined from the functions illustrated in the process diagrams of the final section of this document, the information architecture. Only the functions that are new or are necessary to integrate a service corridor-wide become projects. The non-shaded functions in the architecture process diagrams are those that exist today.

Each of the project descriptions contains an explanation of the project, the project phases, the products of each phase, and the recommended development sequence. Dates are not included in the project sequences since project timing and timeframes will depend on funding availability and the policies and commitments of the evolving corridor organization. The project phases and steps within them provide a roadmap for the development of more detailed plans as the corridor organization matures and as sources of project funding are identified and secured.

### **2.4 PROJECT CATEGORY 1 – CREDENTIAL ADMINISTRATION**

The Credential Administration project category encompasses four discrete functions for the electronic management of credentials and permits for CVO: integrated corridor requirements, credentials application distribution, invoice consolidation, and multi-jurisdictional permitting. Tables 4 and 5 on the following pages provide an overview of the development phases of the credential administration projects. The focus is on processing International Registration Plan (IRP) and International Fuel Tax Agreement (IFTA) credentials and Oversize/Overweight (OS/OW) permits for operations within the corridor. The primary stakeholders are State CVO regulatory agencies and private-

sector carriers operating commercial vehicle fleets. This involves the administrative offices elements of the corridor transportation system.

The approach is to develop a common portal and supporting database for interstate carriers based in the corridor to electronically conduct the administrative functions identified. This portal and database would include linkages to each State's legacy system for actual processing of each transaction.

Initial projects would focus on piloting the portal and database. The interface with individual State legacy systems would be added incrementally. The State requirements can be added early in the process and made available to carriers to assist with annual filings. The other significant interface is with the Electronic Screening, Safety, and Security project track, allowing real-time access to authoritative credentials information in the roadside environment.

**Table 4: Credential Administration Projects Overview**

<b>Phase</b>	<b>Project Title</b>	<b>Overview</b>
	Credentials Application Distribution	Develop detail requirements, design and deploy portal for Illinois and Missouri
<b>Pilot</b>	Integrated Corridor Requirements	Implement IRP, IFTA, OS/OW requirements repository as part of portal for Illinois and Missouri
	Multi-Jurisdictional Permitting	Develop detailed requirements, conduct make/buy analysis, implement a multi-jurisdictional OS/OW permitting function for Illinois, Missouri, Kansas, and Iowa
	Invoice Consolidation	Develop detailed requirements, conduct make/buy analysis, develop and integrate with Credentials Application Distribution function (Illinois, Missouri)
	Credentials Application Distribution	Incorporate pilot lessons learned, update design and deploy production portal for Illinois, Missouri, and one other adjoining corridor State
<b>Initial Service</b>	Integrated Corridor Requirements	Incorporate pilot lessons learned, update design and deploy production IRP, IFTA, OS/OW requirements repository as part of portal for Illinois, Missouri, and an adjoining corridor State
	Multi-Jurisdictional Permitting	Incorporate pilot lessons learned into requirements, update design, and implement a production multi-jurisdictional OS/OW permitting function for Illinois, Missouri, Kansas, and Iowa
	Invoice Consolidation	Incorporate pilot lessons learned into requirements, update design, implement a production invoice consolidation function, and integrate with production Credentials Application Distribution function for Illinois, Missouri, and an adjoining corridor State
	Credentials Application Distribution	Add three States to the production system
<b>Service Expansion</b>	Integrated Corridor Requirements	Add three States to the production system, develop Federal Trade Regulation requirements, update design, and implement in production system
	Multi-Jurisdictional Permitting	Add three States to the production system, conduct feasibility study of linking with other multi-jurisdictional permitting systems
	Invoice Consolidation	Add three States, conduct market assessment to determine if additional service providers are warranted
	Credentials Application Distribution	Add remaining States/Provinces to the production system
<b>Full Service</b>	Integrated Corridor Requirements	Add remaining States/Provinces to the production system, incorporate lessons learned into requirements, update design, and implement production Federal Trade Regulation system
	Multi-Jurisdictional Permitting	Add remaining States/Provinces to the production system
	Invoice Consolidation	Add remaining States/Provinces to the production system

**Table 5: Credential Administration Projects Roadmap**

<b>Project Title</b>	<b>Pilot</b>	<b>Initial Service</b>	<b>Expanding Service</b>	<b>Full Service</b>
<b>Credentials Application Distribution</b>	Develop detail requirements, design and deploy portal for Illinois and Missouri	Incorporate pilot lessons learned, update design and deploy production portal for Illinois, Missouri, and one other adjoining corridor State	Add three States to the production system	Add remaining States/Provinces to the production system
<b>Integrated Corridor Requirements</b>	Implement IRP, IFTA, OS/OW requirements repository as part of portal for IL and MO	Incorporate pilot lessons learned, update design and deploy production IRP, IFTA, OS/OW requirements repository as part of portal for IL, MO, and an adjoining corridor State	Add three States to the production system, develop Federal Trade Regulation requirements, update design, and implement in production system	Add remaining States/Provinces to the production system, incorporate lessons learned into requirements, update design, and implement production Federal Trade Regulation system
<b>Multi-Jurisdictional Permitting</b>	Develop detailed requirements, conduct make/buy analysis, implement a multi-jurisdictional OS/OW permitting function for Illinois, Missouri, Kansas, and Iowa	Incorporate pilot lessons learned into requirements, update design, and implement a production multi-jurisdictional OS/OW permitting function for Illinois, Missouri, Kansas, and Iowa	Add three States to the production system, conduct feasibility study of linking with other multi-jurisdictional permitting systems	Add remaining States/Provinces to the production system
<b>Invoice Consolidation</b>	Develop detailed requirements, conduct make/buy analysis, develop and integrate with Credentials Application Distribution function (Illinois, Missouri)	Incorporate pilot lessons learned into requirements, update design, implement a production invoice consolidation function, and integrate with production Credentials Application Distribution function for Illinois, Missouri, and an adjoining corridor State	Add three States, conduct market assessment to determine if additional service providers are warranted	Add remaining States/Provinces to the production system

### 2.4.1 Credentials Application Distribution

The credentials application distribution process ensures that applications are complete before forwarding them to appropriate credentialing agencies. Carriers submit applications to the credentials application distribution system. The system checks applications for completeness and requests missing information from the applicant. Completed applications are distributed to one or more credentialing agencies for review and approval status.

The interface system will provide carrier users with an electronic “application” into which the user enters the appropriate fleet data. This application may be presented to the user as an electronic version of a standard printed form, or it may appear as a spreadsheet or data file, which the user would modify to reflect fleet changes. Once the applicant has completed the application, they will submit it for validation. During the validation process, the system will inspect each field in the form for the presence and format of required and optional data elements. If required elements are missing, or if any data element is incorrectly formatted, the interface system will notify the user that corrections are necessary, and will provide guidance as to what is needed. Once the application has been completed and validated, the interface system will make it available to the credentials application distribution subsystem for transmission to the appropriate agency system.

Pilot – During the pilot phase of the credentials distribution application project, a number of tasks will be accomplished. Because this application is effectively going to be directing “data traffic” between systems, the pilot project needs to demonstrate the ability of the system to accurately and efficiently forward applications. As with any system pilot, the process begins with the identification of requirements, then proceeds through the design and development process into operations, and concludes with the completion of testing.

Because this is an information distribution system, the requirements definition process must include data collection to define the systems interfaces, user needs, and to at least some extent, the business processes employed by the agencies receiving the application. This will involve a combination of interviews with operations and technical staff at each agency, and the review of available technical specifications for current and planned systems. The product of this step is a requirements document containing the information necessary to proceed to system design and development.

Because off-the-shelf components and subsystems may offer a known level of capability and performance, the design and development process should begin with an assessment of available options. The requirements identified in the previous phase should contain enough information to determine if a suitable solution already exists. Once off-the-shelf options are assessed and selected, and the desired components are

procured, the remaining elements in the requirements must be designed and developed.

The nature of the application distribution function is such that most or all of the design and development will consist of software coding and establishing connectivity between components. The software must manage user access, data presentation, data entry, data validation, and application transmission. This will include any encryption necessary to secure the data, and development of file formats consistent with requirements imposed by legacy systems interfaces. Design and development will be accomplished in a modular fashion, using commercially available tools such as ERWin. The products from this phase will be design documentation and an application ready for limited testing.

Once initial development is completed, a limited system test will be performed using simulated transactions. This will allow the developers to assess the basic functionality and performance of the system, and provide feedback essential to fine-tuning the application prior to pilot operations. Simulated transactions will be designed in cooperation with representatives from Illinois and Missouri, and will be developed and submitted for processing in a manner that will allow for the evaluation of the system's ability to handle processing demand in a timely manner. The results from the limited testing will then be used to make adjustments to software or hardware components in preparation for pilot testing.

The final step prior to full deployment is integrated pilot testing. During this step, end-to-end processing of a limited amount of real transactions will be processed, and the results analyzed to verify that applications are handled appropriately. To accomplish this, accounts will be established for a select few applicants, and each will be encouraged to submit at least a portion of their applications through the electronic credentialing system. Once the number of transactions that have been successfully processed reaches a level that provides confidence that the system is functioning acceptably, the system will be ready to be rolled out to a larger body of users, as deemed appropriate by the representatives of each of the State agencies.

Initial Service – Upon the completion of pilot testing, the system will be modified and/or upgraded to accomplish two things: to correct any issues identified during the pilot, and to provide the additional capacity necessary to accommodate use by a larger body of applicants. It is expected that, since most issues will have been identified during integration testing prior to the pilot, much of the work to be accomplished during this phase will consist of transforming the pilot system into a “production” system. In addition, any provisional arrangements or agreements established for the pilot will be finalized, and to the extent necessary, codified into standard practice.

Also during this phase, an additional corridor State will be added to those using the system. Because legacy systems typically vary from State to State, this will likely require

some level of requirements identification, design and development, and pre-rollout testing. The development of different user interfaces may be necessary, as well. Lessons learned during the initial development and pilot testing will be applied as appropriate throughout this phase of the project. The final product of this phase will be a fully functional, production system, along with the supporting documentation necessary to operate and maintain it.

Service Expansion – The remaining elements of this project are designed to extend the system to the remaining States and Provinces on the corridor. During this stage, three additional jurisdictions will be added to the production system. As in the Initial Service phase, some level of requirements identification, design and development, and pilot testing will be conducted, though on a progressively smaller scale as confidence in and knowledge of the deployed system increases.

Full Service – The project will be considered completed when the remaining States and Provinces have been provided the functionality. Again, some design and development will be required. Obviously, to the extent possible, code and components will be reused as the expansion of service extends to the rest of the agencies responsible for credentialing along the corridor.

The sequence of actions and the products produced are illustrated in Figure 3.

Phase	Activities	Products
Pilot	<ul style="list-style-type: none"> <li>• Requirements definition</li> <li>• Design and development</li> <li>• Limited, integration, and pilot testing</li> </ul>	<ul style="list-style-type: none"> <li>• Requirements document</li> <li>• Detailed design</li> <li>• Pilot system</li> </ul>
Initial Service	<ul style="list-style-type: none"> <li>• System upgrade/scaling</li> <li>• Issue resolution</li> <li>• Additional design, development,</li> </ul>	<ul style="list-style-type: none"> <li>• Production system</li> <li>• Additional requirements</li> <li>• Additional design</li> </ul>
Service Expansion	<ul style="list-style-type: none"> <li>• System scaling</li> <li>• Issue resolution</li> <li>• Additional design, development,</li> </ul>	<ul style="list-style-type: none"> <li>• Production system</li> <li>• Additional requirements</li> <li>• Additional design</li> </ul>
Full Service	<ul style="list-style-type: none"> <li>• System scaling</li> <li>• Issue resolution</li> <li>• Additional design, development,</li> </ul>	<ul style="list-style-type: none"> <li>• Production system</li> </ul>

**Figure 3: Credential Applications Distribution Project Sequence**

### 2.4.2 Integrated Corridor Requirements

The integrated corridor requirements process stores information about CVO regulatory and trade requirements within a data repository. User requests are translated into a query to the requirements repository. User requests for information are input through a user interface system and a query of the requirements repository is made. Query results are compiled into a user-friendly format and are presented through the user interface. Information updates are input to the repository from participating jurisdictions and trade agencies when changes to rules and regulations apply.

The corridor requirements system will provide corridor users with a single point of access to the authoritative sources of information regarding commercial vehicle operations in the jurisdictions on the corridor. Since this needs to be a public access site, and no “transactions” will occur between the site and the individual agency systems along the corridor, there will not be a need to develop controlled-access interfaces or encryption schema. Users will be able to access the information either by selecting from a pre-designed list of “frequently asked questions” (FAQs), or through a common language help index. They will then be presented with information regarding regulatory requirements, points of contact, and links to other appropriate sites or forms.

The sequence of actions and the products produced by phase follow a similar course as illustrated in Figure 3, and are described in the following paragraphs.

Pilot – The pilot phase of the corridor requirements repository project will consist of two primary components: collecting and digitizing the appropriate guidance documentation, and developing and testing the web-based user interface. Since this project will result in the deployment of a “read-only” site, the design and development effort should be relatively simple and straightforward. The system will be integrated with the permitting and credentials sites developed under different projects.

Guidance documentation will be gathered from Illinois and Missouri representatives. It will then be categorized and converted to electronic format for inclusion in the site content. Documentation will include regulations regarding operation in each of the States, electronic copies of paper forms, and informational documents currently offered by the participating agencies. In addition, carrier representatives will be consulted regarding additional useful information to be included in the site. The site will also incorporate links to Federal information sources.

Once the documents are gathered, the site design and development will be completed. Where possible, documents on the site will incorporate Hyper Text Markup Language (HTML) links to guide the user through the library of available information. Based on the information available, a series of topical FAQs and a user navigation site index will be prepared and incorporated into the site. Prior to pilot testing, the site will be tested

by a small group of test staff and potential users. Adjustments will then be made, as necessary, and the site will be rolled out to the pilot test groups in Illinois and Missouri.

Initial Service – Since this site is informational rather than transactional, lessons learned during the pilot will likely be limited to such issues as ease of navigation and availability of needed information. User comments will be collected through an email link on the site, and the content and navigation links will be modified where appropriate. Once the modifications have been made, information from one additional adjoining State will be captured and converted to add to the content of the site. The process used will be similar to that used for the pilot effort, to include some limited testing prior to rollout.

Service Expansion – Service expansion for the corridor requirements project will consist of adding information content and performing basic functional testing for an additional three States. Again, the pilot process will be employed to accomplish the site expansion.

Full Service – Addition of content and testing for the remaining corridor jurisdictions will complete the process of providing a full service corridor requirements site. Throughout the development and rollout, and the operation of the site, comments will continue to be collected from users, and adjustments made as necessary.

### **2.4.3 Multi-Jurisdictional Permitting**

The multi-jurisdictional permitting process enables a carrier to submit a single application for permits from one or multiple corridor jurisdictions. An interface system accepts application information and fees from the motor carrier and forwards it to appropriate permitting agencies. These agencies issue eligible permits to the applicant and send notifications to the interface system. The interface system informs the applicant of impending permit issuance and provides any accompanying instructions.

This is the most technically and operationally challenging CVO Administrative project. The system to be developed will combine the application and distribution functions for several potentially unique processes, each with immediate safety implications. Though dimensional limits and routing instructions are typically similar among jurisdictions, differences are common, and require the application of different evaluation criteria. Hence, although application input will be somewhat consistent across jurisdictions, the decision support logic and approval thresholds will vary measurably. Among the most daunting of challenges will be the capture and distribution of data elements of similar content, but different format. The system must also incorporate the ability to provide the applicant with the status of individual permit applications, and allow for payment of fees.

The sequence of actions and the products produced by phase follow a similar course as illustrated in Figure 3, and are described in the following paragraphs.

Pilot – The pilot phase of the multi-jurisdictional permitting project needs to demonstrate the ability of the system to accurately and efficiently populate and forward applications. This pilot will begin with the identification of requirements, then proceed through the design and development process into operations, and conclude with the completion of testing.

This system must serve as an information collection, analysis, and distribution system. The requirements definition process must include data collection to define the systems interfaces, user needs, and the business processes employed by the agencies receiving the applications. This will involve a combination of interviews with operations and technical staff at each agency, and the review of available technical specifications for current and planned systems. The product of this step is a requirements document containing the information necessary to proceed to system design and development.

The design and development process will begin with an assessment of existing capabilities. The requirements identified should contain enough information to determine if functionality designed into the credential application distribution system should be reused. Once off-the-shelf options are assessed and decided upon, and the desired components are obtained, the remaining elements in the requirements must be designed and developed.

System design and development will consist of software coding and establishing connectivity with agency systems. The software must manage user access, data presentation, data entry, data validation, and application transmission. This will include provisions for manual review by permitting agents and engineering staff within each responsible agency. Design and development will be accomplished in a modular fashion, using commercially available development tools. The products from this phase will be design documentation, and a system ready for limited testing.

Once initial development is completed, a limited system test will be performed using simulated transactions. This will allow the developers to assess the basic functionality and performance of the system, and provide feedback essential to fine-tuning the application prior to pilot operations. Simulated transactions will be designed in cooperation with representatives from Illinois, Missouri, Kansas and Iowa, and will be developed and submitted for processing in a manner that will allow for the evaluation of the system's ability to handle concurrent multi-jurisdictional processing. The results from the limited testing will then be used to make adjustments in preparation for pilot testing.

The final step prior to full deployment is integrated pilot testing. During this step, end-to-end processing of a limited amount of real transactions will be processed, and the results analyzed to verify that applications are handled appropriately. To accomplish this, accounts will be established for a select few applicants, and each will be encouraged to submit multi-jurisdictional applications through the permitting system. Once the number of transactions that have been successfully processed reaches a level that provides confidence that the system is functioning acceptably, the system will be ready to be rolled out to a larger body of users, as deemed appropriate by the representatives of each of the State agencies.

Initial Service – Upon the completion of pilot testing, the system will be modified and/or upgraded to correct any issues identified during the pilot, and to provide the additional functionality necessary to accommodate use by more applicants. It is expected that, since most issues will have been identified during integration testing prior to the pilot, much of the work to be accomplished during this phase will consist of transforming the pilot system into a “production” system. In addition, any provisional arrangements or agreements established for the pilot will be finalized, and to the extent necessary, codified into standard practice.

Service Expansion – The remaining steps for this project are designed to extend the system to the remaining States and Provinces on the corridor. During this stage, three additional jurisdictions will be added to the production system. As in the Initial Service phase, some level of requirements identification, design and development, and pilot testing will be conducted, though on a progressively smaller scale as confidence in and knowledge of the deployed system increases.

Full Service – The project will be considered completed when the remaining States and Provinces have been provided the functionality. Again, some design and development will be required. Obviously, to the extent possible, code and components will be reused as the expansion of service extends to the rest of the agencies responsible for credentialing along the corridor.

#### **2.4.4 Invoice Consolidation**

The invoice consolidation process generates a combined fee requirements statement for all approved credentials. The fee requirements statement is communicated to the motor carrier through the interface system. The carrier prepares and submits payment to the treasury unit who, in turn, notifies the applicant and credentialing agencies of payment receipt. Individual payments are distributed to appropriate jurisdictions per the corridor organization charter and agreements.

This capability will add to the functionality of the credentials application distribution function, allowing applicants to pay fees for approved credentials on-line. To make this

possible, the invoice consolidation component must be able to calculate fees for each application, notify the applicant, allow him to choose one of several payment methods, and execute the funds transfer with the appropriate financial institution and credentialing agency.

A number of commercial off-the-shelf electronic payment solutions are available to achieve at least the financial transaction portion of this functionality. Once the requirements are established, a make/buy analysis will be performed to determine if any are acceptable for implementation.

The sequence of actions and the products produced by phase follow a similar course as illustrated in Figure 3, and are described in the following paragraphs.

Pilot – The pilot phase of this project will demonstrate the ability of the system to accurately manage the invoicing and electronic funds exchange processes. This pilot will begin with the identification of requirements, then proceed through the design and development process into operations, and conclude with the completion of testing.

This system will incorporate information collection, analysis, and distribution capabilities. The requirements definition process will include data collection to define the systems interfaces, user needs, and the business processes employed by the agencies receiving the payment, and the financial institutions with whom the transactions will be completed. This will involve a combination of interviews with operations and technical staff at each agency, and with at least one financial institution. It will also require the review of available technical specifications for current and planned systems. The product of this step is a requirements document containing the information necessary to proceed to system design and development.

Before the design stage begins, a technical and operational analysis of available electronic payment solutions will be conducted. This make/buy analysis will consist of the evaluation of off-the-shelf systems' ability to satisfy the requirements identified. The criteria applied to this analysis will consist of a combination of performance and cost measures designed to compare the life-cycle requirements for commercial systems and custom applications.

Once the make/buy decision is made, the design and development process will begin with an assessment of existing capabilities. The requirements should contain enough information to determine how the system will be integrated into the credentials distribution application. After the off-the-shelf components are obtained, the remaining elements in the requirements must be designed and developed.

System design and development will consist of software coding and establishing connectivity with agency and financial systems. The software must manage user access,

data presentation, data entry, data validation, and payment exchange. It must also provide a means for authorized members of the agencies and financial institutions to audit transactions. Design and development will be accomplished in a modular fashion, using commercially available development tools. The products from this phase will be design documentation, and a system ready for limited testing.

When initial development is completed, a limited system test will be performed using simulated transactions. This will allow the developers to assess the basic functionality and performance of the system, and provide feedback essential to fine-tuning the application prior to pilot operations. Simulated transactions will be designed in cooperation with representatives from Illinois and Missouri, and the appropriate financial institution. They will be developed and submitted for processing in a manner that will allow for the evaluation of the system's ability to manage concurrent transaction processing. The results from the limited testing will then be used to make adjustments in preparation for pilot testing.

The final step prior to full deployment is integrated pilot testing. During this step, end-to-end processing of a limited amount of real transactions will be processed, and the results analyzed to verify that applications are handled appropriately. To accomplish this, applicants that already have accounts for the credentials application will be encouraged to pay for them through the invoice consolidation system. Once the number of transactions that have been successfully processed reaches a level that provides confidence that the system is functioning acceptably, the system will be ready to be "rolled-out" to a larger body of users, as deemed appropriate by the representatives of each of the State agencies.

Initial Service – Upon the completion of pilot testing, the system will be modified and/or upgraded to correct any issues identified during the pilot, and to provide the additional functionality necessary to accommodate use by more applicants, including those in one adjoining State. It is expected that, since most issues will have been identified during integration testing prior to the pilot, much of the work to be accomplished during this phase will consist of transforming the pilot system into a "production" system. In addition, any provisional arrangements or agreements established for the pilot will be finalized, and to the extent necessary, codified into standard practice.

Service Expansion – During this step, three additional States will be added to the system. As in the Initial Service phase, some level of requirements identification, design and development, and pilot testing will be conducted, though on a progressively smaller scale as confidence in and knowledge of the deployed system increases.

It is also during this stage that a market assessment will be conducted to determine if additional services and/or service providers are warranted. If the make/buy analysis

produced a recommendation for private sector, off the shelf services, their performance, levels of service, and regions of service will be reassessed.

Full Service – The project will be considered completed when the remaining States and Provinces have been provided the functionality. Again, some design and development will be required. Obviously, to the extent possible, code and components will be reused as the expansion of service extends to the remaining agencies responsible for credentialing along the corridor, and the financial institutions with whom transactions will be conducted.

## **2.5 PROJECT CATEGORY 2 – ELECTRONIC SCREENING, SAFETY, AND SECURITY**

The Electronic Screening, Safety, and Security project category encompasses five discrete functions for the electronic management of CVO screening: carrier enrollment, vehicle approach notification, electronic screening, integrated international trade filings, and transportation pre-arrival assessment. Tables 6 and 7 on the following pages provide an overview of the development phases of the electronic screening, safety, and security projects. The focus is on electronic screening of commercial vehicles on the corridor State highways and at international ports of entry, including sharing results to improve resource utilization within the corridor. The primary stakeholders are State CVO enforcement agencies and private-sector carriers operating commercial vehicle fleets within the corridor. This involves the highway ROW (rural and metropolitan) and operational facilities along the highway ROW.

The approach is to develop seamless communications from the commercial vehicle to the roadside to the administrative offices—in particular, to develop a wireless Local Area Network (LAN) at the State roadside facilities based on the ITS America Dedicated Short Range Communications (DSRC) standard. The application will be an open architecture to accommodate the various roadside software applications deployed today (e.g., Aspen). The application will be integrated with State and Federal systems to support each of the five functions previously identified. This includes linkage to each State’s legacy system for uploading transactions and access to credentials, safety, and security information resident in administrative offices.

Initial projects would focus on piloting the end-to-end communications, leveraging existing electronic screening functions and international port of entry pre-arrival assessments. The interface with individual State legacy systems would be added incrementally to improve electronic screening results by accessing authoritative credential, safety, and security information in the roadside environment. The carrier enrollment function would be integrated with Federal and State processes to minimize duplication of data and the burden on the private sector.

The sections that follow will use the same format as the projects in the CVO Administration section, with the exception of the Integrated International Trade Filings and Transportation Pre-Arrival Assessment projects. These are almost completely Federal projects, but they will have a great influence on the efficiency of international border crossings at each end of the corridor. They are included because the corridor organization needs to be aware of Federal trade system projects and to have a voice in the definition of future trade system requirements. Project phasing and products are not included with the descriptions of these two projects, but ongoing dialogue with the Federal agencies involved should allow the corridor organization to shape their definition.

**Table 6: Electronic Screening, Safety, and Security Projects Overview**

Phase	Project Title	Overview
<b>Pilot</b>	Carrier Enrollment	Define corridor requirements, Federal, State, and local jurisdictions interface requirements. Implement carrier enrollment capabilities for the pilots.
	Vehicle Approach Notification	Define roadside facility operations requirements, design roadside communications, and implement on-board vehicle and roadside communications capabilities in Texas and Oklahoma.
	Electronic Screening	Define roadside facility operations requirements, conduct market assessment, and prepare make/buy analysis for electronic screening tools, implement make/buy decision in Texas and Oklahoma.
	Integrated International Trade Filings	Review U.S. Customs, Immigration and Naturalization Service (INS), United States Department of Agriculture (USDA), Food and Drug Administration (FDA), United States Department of Transportation (USDOT) requirements Automated Commercial Environment (ACE) and International Trade Data System (ITDS), develop data center databases to receive and store information. Integrate with Electronic Screening and border risk-assessment tools.
<b>Initial Service</b>	Transportation Pre-Arrival Assessment	Develop border operations requirements, design border risk-assessment tools, and implement at select border crossing sites in Texas.
	Carrier Enrollment	Incorporate pilot lessons learned into corridor requirements. Update interface requirements of Federal, State, and local jurisdictions. Update and deploy production carrier enrollment capabilities in Texas, Oklahoma, and Missouri.
	Vehicle Approach Notification	Incorporate pilot lessons learned into roadside facility operations requirements, update and deploy production roadside communications, and implement on-board vehicle and roadside communications capabilities in Texas, Oklahoma and Missouri.
	Electronic Screening	Incorporate pilot lessons learned into roadside facility operations requirements. Update and deploy production electronic screening tools in Texas, Oklahoma, and Missouri.
<b>Service Expansion</b>	Integrated International Trade Filings	Incorporate pilot lessons learned in requirements, update data center databases to receive and store information. Update and integrate with Electronic Screening and border risk-assessment tools.
	Transportation Pre-Arrival Assessment	Incorporate pilot lessons learned into border operations requirements. Update border risk-assessment tools. Implement production system at select border crossing sites in Texas.
	Carrier Enrollment	Add three States to the production system.
Vehicle Approach Notification	Add three States to the production system.	

Phase	Project Title	Overview
	Electronic Screening	Add three States to the production system, conduct feasibility study of linking with other multi-jurisdictional electronic screening initiatives.
	Integrated International Trade Filings	Expand requirements to accommodate new agencies. Update data center databases to receive and store information. Update and integrate with Electronic Screening and border risk-assessment tools.
	Transportation Pre-Arrival Assessment	Add States and conduct market assessment to determine if additional service providers are warranted.
	Carrier Enrollment	Add remaining States/Provinces to the production system.
	Vehicle Approach Notification	Add remaining States/Provinces to the production system, incorporate lessons learned into requirements, update design and implement production Federal Trade Regulation system.
<b>Full Service</b>	Electronic Screening	Add remaining States/Provinces to the production system.
	Integrated International Trade Filings	Expand requirements to accommodate new agencies. Update data center databases to receive and store information. Update and integrate with Electronic Screening and border risk-assessment tools.
	Transportation Pre-Arrival Assessment	Add remaining State/Provinces to the production system.

**Table 7: Electronic Screening, Safety, and Security Projects Roadmap**

<b>Project Title</b>	<b>Pilot</b>	<b>Initial Service</b>	<b>Expanding Service</b>	<b>Full Service</b>
<b>Carrier Enrollment</b>	Define corridor requirements, Federal, State, and local jurisdictions interface requirements. Implement carrier enrollment capabilities for the pilots	Incorporate pilot lessons learned into corridor interface requirements of Federal, State, and local jurisdictions. Update and deploy production carrier enrollment capabilities in Texas, Oklahoma, and Missouri	Add three States to the production system	Add remaining States/Provinces to the production system
<b>Vehicle Approach Notification</b>	Define roadside facility operations requirements, design roadside communications, and implement on-board vehicle and roadside communications capabilities in Texas and Oklahoma	Incorporate pilot lessons learned into roadside facility operations requirements, update and deploy production roadside communications, and implement on-board vehicle and roadside communications in Texas, Oklahoma and Missouri	Add three States to the production system	Add remaining States/Provinces to the production system, incorporate lessons learned into requirements, update design and implement production Federal Trade Regulation system
<b>Electronic Screening</b>	Define roadside facility operations requirements, conduct market assessment, prepare make/buy analysis for electronic screening tools, implement make/buy decision in Texas and Oklahoma	Incorporate pilot lessons learned into roadside facility operations requirements. Update and deploy production electronic screening tools in Texas, Oklahoma, and Missouri	Add three States to the production system, conduct feasibility study of linking with other multi-jurisdictional electronic screening initiatives	Add remaining States/Provinces to the production system
<b>Integrated International Trade Filings</b>	Review U.S. Customs, INS, USDA, FDA, USDOT requirements ACE and ITDS, develop data center databases	Incorporate pilot lessons learned in requirements, update data center databases to receive and	Expand requirements to accommodate new agencies. Update data center databases to	Expand requirements to accommodate new agencies. Update data center databases to receive

Project Title	Pilot	Initial Service	Expanding Service	Full Service
<p><b>Transportation Pre-Arrival Assessment</b></p>	<p>to receive and store information. Integrate with Electronic Screening and border risk-assessment tools</p> <p>Develop border operations requirements, design border risk-assessment tools, and implement at select border crossing sites in Texas</p>	<p>store information. Update and integrate with Electronic Screening and border risk-assessment tools</p> <p>Incorporate pilot lessons learned into border operations requirements. Update border risk-assessment tools. Implement production system at select border crossing sites in Texas</p>	<p>receive and store information. Update and integrate with Electronic Screening and border risk-assessment tools</p> <p>Add States and conduct market assessment to determine if additional service providers are warranted</p>	<p>and store information. Update and integrate with Electronic Screening and border risk-assessment tools</p> <p>Add remaining State/Provinces to the production system</p>

### 2.5.1 Carrier Enrollment

Carriers enrolling in the corridor roadside screening process will provide the necessary information to the designated corridor authority. The appropriate responsible authority for this purpose will need to be determined by the corridor organization. It is anticipated that the information and identifiers provided by the motor carriers will allow corridor jurisdictions to verify a carrier's operating authority, insurance, and safety history as a prerequisite to participation. The interfaces and processes for performing the jurisdictional verifications of carrier eligibility will be developed during the pilot phase. The criteria for carrier eligibility will also need to be determined by the corridor organization.

The sequence of actions and the products produced by phase follow a similar course as illustrated in Figure 3, and are described in the following paragraphs.

Pilot – During the pilot phase of the carrier enrollment project, a number of tasks will be accomplished. Because any electronic roadside screening system requires participating carriers to meet certain eligibility requirements, the pilot project needs to demonstrate the ability to identify interested carriers and to assist them through a straight forward enrollment process. As with any pilot, the process begins with the identification of requirements, then proceeds through the design and development process into operations, and concludes with the completion of testing.

The requirements for carrier enrollment should be consistent corridor wide. This implies the need for the corridor organization to create an authority responsible for carrier enrollment, to develop a standard enrollment process, and to establish corridor criteria for carrier eligibility. Once these fundamental requirements are established, the means to verify carrier eligibility must be understood. Federal, State/province, and local jurisdiction interface requirements will be determined for access to the appropriate information systems to verify carrier eligibility.

The design for initial carrier enrollment capabilities will be developed. Current designs of pilot States/province will be reviewed, and new operations concepts and key scenarios developed. Once the participating pilot jurisdictions are determined, any necessary State/province interface system changes will be identified, and the defined interfaces for carrier eligibility verification will be implemented.

As the carrier enrollment capabilities for the participating pilot jurisdictions are being prepared, a carrier outreach and education program will assist in the initial enrollment.

Initial Service – Corridor requirements for carrier enrollment will be updated with lessons learned from the pilot. Interface requirements of Federal, State, and local

jurisdictions will be updated. Carrier enrollment capabilities will be deployed for Texas, Oklahoma, and Missouri.

Service Expansion – During the service expansion phase, three States/province will be added to the carrier enrollment system.

Full Service – The full service phase will roll out the carrier enrollment system and processes to the remaining States/province.

### **2.5.2 Vehicle Approach Notification**

The vehicle approach notification process is the process by which a vehicle enrolled in the electronic screening program is identified upon approach to a corridor roadside inspection station. Roadway sensors detect the approaching vehicle and read some form of vehicle identification, which is forwarded to the electronic screening function at the roadside. The vehicle detection function is anticipated to be performed by DSRC roadside equipment reading truck-mounted transponders. The transponders will provide the identifiers necessary to initiate the roadside screening process. DSRC has been deployed widely in the existing commercial vehicle screening programs, namely PrePass and NorPass, as well as toll applications. American Society for Testing and Materials (ASTM) standards cover the radio frequency communications medium and its protocols. Institute of Electrical and Electronics Engineers (IEEE) standards for DSRC cover the messages exchanged between the transponders and the roadside equipment.

The vehicle approach notification concept uses truck-mounted transponders to communicate an identifier that is used by the roadside system. The identifier is associated with the credentials and safety records of the participating carrier. There are options for the implementation of the screening process itself, which will be discussed in the Electronic Screening section.

The sequence of actions and the products produced by phase follow a similar course as illustrated in Figure 3, and are described in the following paragraphs.

Pilot – The pilot phase of the project needs to define the requirements for vehicle approach notification, the selection of pilot roadside facilities, and the operations concept for the pilot. After these steps are accomplished, the roadside communications infrastructure will be designed and deployed at the pilot roadside facilities. Participating carriers enrolled through the Carrier Enrollment process previously described will be equipped with transponders compliant with the pilot DSRC technology and standards. These roadside pilot sites are proposed to be implemented in Texas and Oklahoma. There is considerable north/south trade flow through these States and contiguous States can be added as the project expands.

Initial Service – Lessons learned will be collected throughout the pilot phase, which will be incorporated into roadside facility operations requirements. The initial service phase will upgrade the pilot roadside communications systems in Texas and Oklahoma, and will expand deployment to include on-board vehicle and roadside communications capabilities in Missouri. Additional roadside facilities in all three States will be selected by the corridor organization.

Service Expansion – Roadside facilities in at least three States/province are added to the production system. The DSRC capabilities, configuration, and deployment process should be well understood from the experience of the previous phases. The service expansion phase will deploy a mature system in the geographic areas selected by the corridor organization, as well as maintain those sites already deployed.

Full Service – Roadside facilities in the remaining corridor States/province are added, and the deployed sites are maintained.

The sequence of actions and the products produced are illustrated in Figure 8.

### **2.5.3 Electronic Screening**

The purpose of the Electronic Screening process is to assess in real time the bypass status of an approaching vehicle and driver, and to relay the bypass status to the driver. Upon receipt of an identifier from the Vehicle Approach Notification system, the screening process can occur in two basic ways. The first is simply to check the identifier against a local look up table of enrolled, and therefore approved, carriers. Associated with each carrier is a list of vehicles and drivers that reside in the local look up table. The advantage of this method is that it eliminates the need for a real time communications link to a centralized database and any associated response delays. However, this requires a periodic synchronization of the central and local database tables, which implies brief periods when they may be inconsistent. The second potential process involves a check with a centralized database for each vehicle approach. The Electronic Screening system queries the Corridor CVO Regulatory and Enforcement Data Center for the vehicle's and driver's current bypass status. This method will require a dedicated, high-speed communications link with the centralized Data Base Management System (DBMS). The cumulative response times associated with the communications and the systems will need to be minimal, and this may prove to be impractical with remote facilities from a cost perspective.

The corridor organization will assess the different methods and provide direction. The corridor organization will also need to establish the bypass criteria. It may consist of both credentials and safety status elements, and may or may not be the same as the carrier enrollment criteria. Roadside facilities may wish to adjust the criteria or bypass threshold based on current road, traffic, and facility conditions. Regardless of which

bypass screening method is used, a bypass status signal is sent to the vehicle's driver indicating whether the vehicle is to pull-in for inspection or may continue without stopping.

Communications with the Corridor CVO Regulatory and Enforcement Data Center will be necessary for either screening method because both enrolled and non-enrolled vehicles and drivers that are stopped for inspection will need to be checked for their credentials and safety status.

The sequence of actions and the products produced by phase follow a similar course as illustrated in Figure 3, and are described in the following paragraphs.

Pilot – The pilot phase of the project will establish the screening system and process requirements. These requirements will include:

- Screening criteria
- Method of screening (local look up tables or centralized database queries)
- Screening software requirements
- Hardware functional requirements
- Interface requirements (with the Vehicle Approach Notification system and the Corridor CVO Regulatory and Enforcement Data Center)
- Communication system requirements.

The pilot sites will be the same as those selected for the Vehicle Approach Notification pilot. The screening system will be deployed at those sites on a schedule integrated with the Vehicle Approach Notification pilot. The pilot evaluation will include finalize the system processes such as the screening method and the system performance specifications such as communication and system response times.

Initial Service – The lessons learned through the pilot evaluation will be incorporated into the design and requirements of the screening system. Approved changes will be incorporated into the deployed systems, and the upgraded system configuration will be deployed at the same additional sites as those selected for the Vehicle Approach Notification system.

Service Expansion – The screening system and its interaction with interfaced systems will continue to be refined. The system will be rolled out to additional sites on the same schedule as the Vehicle Approach Notification system, while the initial sites are maintained per the service agreements established by the corridor organization.

Full Service – Corridor deployment is completed according to the site selection and deployment schedule established by the corridor organization. The maintenance of all

sites, including the current versions of software packages, database management systems, and operating systems, will be performed per the service agreements established by the corridor organization.

#### **2.5.4 Integrated International Trade Filings**

The Integrated International Trade Filings process is the process administering private sector information submittals to the appropriate Federal trade and transportation agencies for border clearance assessments. Required information about the goods, carrier, vehicle and driver are inputs to the process. The precise information required is dependent on the type of goods carried, their ultimate destination, and other factors pertinent to trade regulations. In this process, the goods and transportation information are forwarded to appropriate Federal trade agencies for pre-arrival assessments. Goods related information is electronically submitted to the Federal agencies with a regulatory role in the type of goods being imported or exported, and transportation related information is electronically submitted to the Transportation Pre-arrival Assessment Process. Once assessments are returned by these Federal agencies, they are provided to the border inspection agencies, e.g., the U.S. Customs Service, for final border crossing clearance assessments.

The U.S. Customs Service as a part of the Customs Modernization contract is reengineering the current system administering trade declaration filings. This process began in 2001, and the schedule for trade system redevelopment is not yet well defined. The integration of other Federal agency requirements into Customs Modernization will establish the systems and processes for two important functions necessary to streamline corridor border crossings.

The first function is an integrated filing system that will satisfy all Federal trade agency information requirements through a single filing portal. This will simplify and reduce the filing burden for both the private and public sectors. The ITDS pilot developed a limited integrated filing system. The ITDS pilot supported the international trade processes of multiple Federal agencies with international trade responsibilities. The international trade processes supported by ITDS included data collection, processing, use, and storage. It is anticipated that the ITDS pilot will provide requirements for the Customs Modernization systems, which ultimately will become the central data collector for all Federal agencies that, by law, require international trade data and the single point for accessing this data.

The second function, the Transportation Pre-arrival Assessment Process, will provide an electronic approach for the Federal Motor Carrier Safety Administration (FMCSA) to verify a carrier's credentials and review its safety history before its vehicle and driver enters the country. This process will also allow the FMCSA information systems to create a census of foreign motor carriers that operate in the U.S. and to accumulate

safety history records over time. The FMCSA was one of the Federal agencies that participated in the ITDS pilot. The initial Federal agencies to participate in Customs Modernization have not been determined.

Although the Integrated International Trade Filings process and systems are not the development purview of the corridor organization, the corridor organization can work with the FMCSA to represent its interests in the Customs Modernization definition and development. The border crossings at the northern and southern end of the corridor should be considered as pilot sites that help establish the processes and requirements for the secure and expedited international border crossings of the future.

### **2.5.5 Transportation Pre-Arrival Assessment**

The purpose of the Transportation Pre-Arrival Assessment process is to make an assessment of a carrier's operating authority and vehicle and driver fitness to travel in the jurisdiction into which it is entering. This project will support the Integrated International Trade Filings project as the screening process for one of the Federal trade agencies, the FMCSA. The FMCSA was established within the USDOT on January 1, 2000, pursuant to the Motor Carrier Safety Improvement Act of 1999 [Public Law No. 106-159, 113 Stat. 1748 (December 9, 1999)]. Formerly a part of the Federal Highway Administration (FHWA), the FMCSA's activities contribute to ensuring safety in motor carrier operations through enforcement of safety regulations, targeting high-risk carriers and commercial motor vehicle drivers; improving safety information systems and commercial motor vehicle technologies; strengthening commercial motor vehicle equipment and operating standards; and increasing safety awareness. The Administration supports the development of compatible motor carrier safety requirements and procedures throughout North America in the context of the NAFTA. It supports programs to improve the safety performance of motor carriers operating in border areas through special grants to States for enforcement activities and, in cooperation with other Federal agencies, it supports the development of State safety inspection facilities. It is through these activities that the corridor organization should seek representation in border-related screening processes.

In the transportation border-screening process envisioned, carrier, vehicle, and driver information are received as inputs through the Integrated International Trade Filings process and forwarded to the Corridor CVO Regulatory and Enforcement Data center. After verification of this information is returned and any additional information received, an assessment is made within the Transportation Pre-Arrival Assessment process about carrier, vehicle, and driver compliance with U.S. regulations and requirements. This transportation assessment is then returned to the Integrated International Trade Filings function.

This approach has a precedent in that the FMCSA participated in the ITDS pilot as an integrated agency. Information was collected for carriers, vehicles and drivers that registered to participate in the pilot. This information was used by FMCSA to verify the carriers' operating authority, insurance and safety history, and the drivers' Commercial Driver's License (CDL) validity. ITDS then stored the information resulting from FMCSA's review in its carrier and driver tables. FMCSA was to take action based on its carrier and driver review as it deemed appropriate, but the ITDS pilot was ended shortly after it began when the September 11, 2001 terrorist attacks placed all ports of entry on heightened states of alert.

## **2.6 PROJECT CATEGORY 3 – TRIP MANAGEMENT**

The Trip Management category encompasses two discrete functions for the management of commercial vehicle trips within or through the corridor: regional incident information distribution and corridor traveler information distribution. Tables 8 and 9 on the following pages provide an overview of the development phases of the trip management projects. The focus is on providing seamless corridor operations for the stakeholders within the corridor. The primary stakeholders are private-sector carriers operating commercial vehicle fleets, and public-sector users from State and local jurisdictions within the corridor. This involves all elements of the transportation system that constitutes the corridor.

The approach is to integrate trip-specific capabilities and leverage the seamless communications already identified in the Electronic Screening, Safety, and Security category—in particular, expand the seamless communications network into private-sector service providers along the highway right-of way to utilize the DSRC standard. The user will be able to choose from a variety of services depending upon individual needs. The regional incident information distribution application will be integrated with State and local jurisdictions responsible for emergency response, work zones, traffic management, and homeland security. The corridor traveler information distribution application will allow users to “pull” data using pre-defined templates. Both applications will use an open architecture to accommodate the wide variety of sensors being deployed along the highway ROW.

Initial projects would focus on piloting the expansion of the end-to-end communications, validating the corridor traveler information system, and demonstrating the ability to integrate and distribute incident information. The interfaces with individual State and local Advanced Traveler Information Systems (ATIS) and Traffic Management Centers (TMCs) would be added incrementally to expand corridor coverage. The regional incident information distribution interface to the corridor traveler information system would be extended from the metropolitan areas into the rural areas as the communications coverage in the corridor expands.

**Table 8: Trip Management Projects Overview**

<b>Phase</b>	<b>Project Title</b>	<b>Overview</b>
<b>Pilot</b>	Corridor Traveler Information Distribution	Define user templates. Identify private-sector connectivity. Develop detailed requirements. Design and implement pilot for Missouri, Iowa, and Minnesota.
	Regional Incident Information Distribution	Define detailed requirements. Define interface requirements to Corridor Traveler Information Distribution function. Design and implement pilot for Missouri, Iowa, and Minnesota.
<b>Initial Service</b>	Corridor Traveler Information Distribution	Incorporate pilot lessons learned into user templates, detailed, and private sector interface requirements. Update design and implement production system for Missouri, Iowa, and Minnesota.
	Regional Incident Information Distribution	Incorporate pilot lessons learned into detailed and interface requirements. Update design and implement production system for Missouri, Iowa, and Minnesota.
	Corridor Traveler Information Distribution	Add three States to the production system.
<b>Service Expansion</b>	Regional Incident Information Distribution	Add three States to the production system.
	Corridor Traveler Information Distribution	Add remaining States/Province to the production system.
<b>Full Service</b>	Regional Incident Information Distribution	Add remaining States/Province to the production system.

**Table 9: Trip Management Projects Roadmap**

<b>Project Title</b>	<b>Pilot</b>	<b>Initial Service</b>	<b>Expanding Service</b>	<b>Full Service</b>
<b>Corridor Traveler Information Distribution</b>	Define user templates. Identify private-sector connectivity. Develop detailed requirements. Design and implement pilot for Missouri, Iowa, and Minnesota	Incorporate pilot lessons learned into user templates, detailed, and private sector interface requirements. Update design and implement production system for Missouri, Iowa, and Minnesota	Add three States to the production system	Add remaining States/Provinces to the production system
<b>Regional Incident Information Distribution</b>	Define detailed requirements. Define interface requirements to Corridor Traveler Information Distribution function. Design and implement pilot for Missouri, Iowa, and Minnesota	Incorporate pilot lessons learned into detailed and interface requirements. Update design and implement production system for Missouri, Iowa, and Minnesota	Add three States to the production system	Add remaining States/Provinces to the production system

### 2.6.1 Corridor Traveler Information Distribution

The purpose of the Corridor Traveler Information Distribution process is to implement an integrated ATIS/CVO system. The benefits of an integrated ATIS/CVO system can be high for the corridor States, both in terms of enhancing the efficiency of a significant economic sector in the corridor (trucking), but also in terms of overall improvements in highway operations through enhanced communications.

Operational tests of ATIS/CVO, i.e., FleetForward, GCM, and AZTECH, have proven the viability and utility of ATIS/CVO. They have also defined the specific informational content, delivery modes, and presentation formats that would maximize the utility of ATIS/CVO for motor carriers, as summarized below.

- **Type of Information Required** – Exception-based information (i.e., non-recurring events such as roadway accidents, construction, severe weather, off-peak congestion, or special events which the motor carriers can not normally anticipate) is most useful to carriers. Non-exception based information (normal time-of-day travel times, standard speeds, etc.) is helpful, but not essential.
- **Focus** – Customized Information focused on carrier-specified routes is most helpful. Also important is incident clearance times or expected delays.
- **Coverage** – 24 by 7 coverage is most useful to the broad market.
- **Geography** – National or regional coverage, reflecting major and minor roadways and metropolitan and rural areas, is needed.
- **Delivery Modes** – One integrated data stream or source will maximize user friendliness. Delivery modes should include both information push and pull. Information Push is notification by a signaling device, e.g., a pager, fax, phone, or email. Information Pull is carrier-initiated polling of an ATIS/CVO system for firms using integrated computer-aided routing and dispatching systems.
- **Quality and Dependability of Information** – Information must be detailed, accurate, dependable (no lapses in service) and timely enough to support routing and dispatching decisions.

The development phases for the integrated ATIS/CVO system(s) will work through the conceptual and technical issues associated with the desired features described above, namely:

- **Granularity of Information** – Currently information is gathered and distributed in diverse formats, uneven coverage areas, and with inconsistent details between sources (levels of description).
- **Data Sharing** – There is little sharing of information between jurisdictions in the corridor. This represents both procedural and technical issues.
- **Operational Constraints** – The hours of ATIS coverage provided by some TMCs are limited – generally to the peak commuter times. In addition, the level of

surveillance/roadway monitoring and technologies currently used are disparate due to budget constraints, legacy systems, jurisdictional authority and responsibilities.

The sequence of actions and the products produced by phase follow a similar course as illustrated in Figure 3, and are described in the following paragraphs.

Pilot – The pilot phase of the project will establish the requirements, scope, and service area of a pilot ATIS/CVO system. The capabilities of private sector service providers will be assessed and make/buy decisions made. As a result, traveler information service provider contracts will be negotiated as required. The initial content and format of ATIS information will be determined, along with the area and hours of coverage. Data sharing methods and their requisite interfaces will be developed.

Initial Service – After the pilot phase of the ATIS/CVO project, the deployed system will be upgraded per the lessons learned through the pilot, and the deployment area and interfaces will be expanded. Traveler information service provider contracts will be modified as necessary to accommodate the growth.

Service Expansion – The service expansion phase takes place after the definition of the ATIS/CVO system is mature and ready for broader corridor deployment. The previous phases will have determined how many ATIS/CVO centers are required, their locations, and capabilities. The user interfaces will be standardized regardless of which data center is actually being interfaced, and the service expansion phase will continue the integration of capabilities between ATIS/CVO service centers.

Full Service – The full service phase completes the corridor-wide deployment of ATIS/CVO capabilities. Traveler information service provider contracts will be maintained and continuously evaluated for performance. Infrastructure and services will be maintained and managed per the roles and responsibilities established within the corridor organization's strategic and operational plans.

## **2.6.2 Regional Incident Information Distribution**

The purpose of the Regional Incident Information Distribution process is to support the coordination of incident responses amongst affected jurisdictions and to provide for the dissemination of incident information. It is essential to this process that regions have incident management plans in place that guide the information sharing, coordination, and response policies between the region's jurisdictions.

Throughout the corridor, there exists several traffic management and traveler information systems designed to improve roadway operations through incident/adverse condition detection and notification to operations/responding

personnel and the general motoring public. The capabilities developed for the Regional Incident Information Distribution process will leverage these existing capabilities and will enhance incident information sharing between responding agency dispatch and operations organizations. The process includes regional incident information distribution centers that will receive incident notification information and will facilitate the execution of the appropriate regional incident response plan. The methods of facilitation will include information sharing between dispatchers and responders and providing incident information updates to traveler information service providers, the media, CVO operators, and the traveling public.

The sequence of actions and the products produced by phase follow a similar course as illustrated in Figure 3, and are described in the following paragraphs.

Pilot – The pilot phase of the Regional Incident Information Distribution project will establish the requirements, scope, and service area of a pilot incident information distribution system. The service area will be dictated by the coverage of the regional incident response plan chosen for execution and evaluation through the pilot. The initial content and format of incident information will be determined, along with the area and hours of coverage. Data sharing methods and their requisite interfaces will be developed.

Initial Service – After the pilot phase of the project, the deployed system will be upgraded per the lessons learned through the pilot, and the deployment area and interfaces will be expanded. Operations concepts for regional incident response will be re-evaluated and regional incident response plans updated as necessary. The deployed system will be expanded as required to cover the incident response dispatch and operations centers within the initial incident response region, and the development of the next regional incident information distribution system will begin.

Service Expansion – The number of incident information distribution centers required, their locations and capabilities, and the definition of their interfaces will mature in the initial service phase. The service expansion phase will continue the integration of capabilities within the incident information distribution centers and will achieve broader corridor deployment.

Full Service – The full service phase completes the corridor-wide deployment of incident information distribution capabilities. Infrastructure and services will be maintained and managed per the roles and responsibilities established within the corridor organization's strategic and operational plans as well as the regional incident response plans.

## **2.7 PROJECT CATEGORY 4 – FLEET MANAGEMENT**

The Fleet Management category does not encompass any specific functions at this time. The track allows private-sector carriers operating within the corridor to tailor fleet management functions to their individual needs—in particular, identifying opportunities to leverage the seamless end-to-end communication capabilities developed in the three previous project categories. Future functions could be in the areas of electronic management of fuel and payments, load matching, terminal operations, and cargo monitoring. In addition, there may be opportunities to electronically link on-board diagnostics for brakes and tires with Electronic Screening, Safety, and Security initiatives. Again, the focus is on providing seamless corridor operations for the stakeholders within the corridor. The primary stakeholders are private-sector carriers operating commercial vehicle fleets, and public-sector fleet operators from State and local jurisdictions within the corridor. This involves all elements of the transportation system that constitutes the corridor.

The approach is to integrate fleet management capabilities and leverage the seamless communications already identified in the Electronic Screening, Safety, and Security into the three previous categories – in particular, expand the seamless communications network into private-sector service carriers operations along the highway ROW through the DSRC standard. The user will be able to choose from a variety of services depending upon individual needs.

Initial projects may focus on piloting the expansion of the end-to-end communications, validating business interoperability, and confirming private-sector return on investment.

## **3.0 BUSINESS PLAN**

### **3.1 INTRODUCTION AND BACKGROUND**

Phase 2 of the NAITC Comprehensive and Coordinated ITS/CVO Plan project examined the transportation needs of corridor stakeholders and ITS/CVO user services available to address those needs. It also defined ways to deploy ITS/CVO user services corridor-wide.

The identified user needs focused on improving safety and operational efficiencies through data sharing among stakeholders, as well as new capabilities for information capturing and accessing information. It was shown that many of the stakeholder needs can and are being met through the deployment of ITS/CVO technologies at the State level in the corridor. To maximize the effectiveness of the technologies for all stakeholders across jurisdictions, they should be implemented at the corridor level.

Phase 2 identified 17 primary services for corridor-wide implementation:

1. Electronic application and receipt of registrations
2. Electronic application and receipt of fuel tax credentials
3. Electronic application and receipt of special permits (OS/OW and Hazardous Materials (HazMat))
4. Electronic access to motor carrier regulations and safety inspection reports
5. Electronic clearance for roadside safety inspections
6. Electronic clearance for weight inspections
7. Electronic Border Crossings
8. Roadside safety inspections using automated diagnostics
9. Electronic drivers logs for inspection by Motor Carrier Safety Assistance Program (MCSAP) inspectors
10. Real-time access to traffic and road conditions
11. Internet based weather information (route specific)
12. Internet based truck/rest stop availability
13. Load posting of HazMat shipments for responders
14. Fleet Management Services
15. Electronic fuel management and payment services at truck stops
16. Electronic load finding/matching services
17. Driver kiosks for email and information access

This Phase 3 document provides descriptions of these user services and their practical functions, identifies the appropriate roles of the public and private sectors in the provision and management of the services, examines potential funding scenarios, and provides a business framework for coordinated corridor-wide deployment of ITS/CVO services.

### **3.2 AGGREGATION OF SERVICES**

In consideration of the practical development and implementation of the 17 ITS/CVO user services identified in Phase 2, the services have been grouped into four functional categories for business plan development. This section describes the functional groupings, their envisioned operational characteristics, users of the services and the perceived benefits they may accrue, and implementation plan summaries for each of the four categories.

### **3.3 CVO ADMINISTRATIVE SERVICES**

#### **3.3.1 Service Description**

**CVO Administrative Services** are designed to support CVO administrative or “back office” regulatory and informational needs of motor carriers and agencies. The ITS/CVO user services in this category include:

- Electronic application and receipt of registrations
- Electronic application and receipt of fuel tax credentials
- Electronic application and receipt of special permits (OS/OW and HazMat)
- Electronic access to motor carrier regulations and safety inspection reports

These user services involve the automation of regulatory functions and enhancement of data communication capabilities in order for State agencies to conduct paperless transactions between motor carriers and agencies. A motor carrier can apply for and receive IRP, IFTA, and special permit credentials (OS/OW, hazardous materials transport, or trip permits for any corridor State) electronically from the carrier's home office or kiosk location. Typically included is the ability to pay fees and taxes through electronic funds transfer or other means (e.g., credit cards or debit accounts).

To support motor carriers' safety management and regulatory compliance programs, real-time access to current inspection results and information regarding regulatory requirements can be made available electronically.

### 3.3.2 Service Users and Benefits

These regulatory and operating credentials are focused on **motor carrier users**. The ability to automate and process credentials electronically is strongly supported by the trucking industry. It is expected that motor carriers will experience reduced administrative costs, reduced turnaround time and down time for receipt of credentials or international border clearance. **Public-sector agencies** will have reduced administrative costs associated with reduction and/or elimination of current levels of paperwork, data entry, materials and postage. The public-sector agencies will also have access to other current credential and safety information to screen and possibly deny issuance of credentials to delinquent or unsafe motor carriers.

### 3.3.3 Provision of Services

For the end user, the infrastructure supporting these processes requires a data interface between the motor carriers and the agencies. In many State deployments underway throughout the nation, the public/private interface is Internet based. On the agency side, numerous administrative systems must be integrated and linked—possibly through a portal—prior to the motor carrier interface. Additionally, linkages via data center(s) or information clearinghouse(s) need to be developed to enable the exchange of information between agencies and across jurisdictions. The enabling areas of technology investment by stakeholders are presented in Table 10.

**Table 10: CVO Administrative Services  
Areas of Enabling Technology Investment**

ITS/CVO User Services	Public-Sector Technologies/Systems	Private-Sector Technologies/Systems
<ul style="list-style-type: none"> <li>• Electronic application and receipt of registrations</li> <li>• Electronic application and receipt of fuel tax credentials</li> <li>• Electronic application and receipt of special permits (OS/OW and HazMat)</li> <li>• Electronic access to motor carrier regulations and safety inspection reports</li> </ul>	<ul style="list-style-type: none"> <li>• Internet</li> <li>• Electronic Data Interchange (EDI) Dial-In Connect</li> <li>• Carrier-Agency</li> <li>• Interface/Portal</li> <li>• Agency System Integration</li> <li>• Data Clearinghouses</li> <li>• Geographic Information System (GIS), Routing</li> <li>• Software for special permits (OS/OW, HazMat).</li> </ul>	<ul style="list-style-type: none"> <li>• Internet</li> <li>• EDI Dial-In Connect</li> <li>• Electronic Funds</li> <li>• Transfer</li> <li>• Carrier System Integration with Carrier-Agency Interface/Portal</li> </ul>

In developing the infrastructure, enabling legislation is likely needed and institutional agreements will have to be established to support new approaches to communications, common funds transfer mechanisms, digital documentation and signatures, data privacy, and system security.

Motor carriers see value in integrating some of their back-office administrative systems with the public-private interface to create seamless administrative processes. The interfaces described herein would provide the capability for such administrative benefits.

### **3.3.4 Current Business Models**

Currently, private-sector providers conduct the majority of credentialing, fuel tax administration, and permitting services as a value-added service to alleviate carrier regulatory burdens. They allow motor carriers to interact with the service providers via multiple modes – Internet, phone, or fax – to obtain necessary credentials and file tax returns. The service providers act as intermediaries and handle the interactions with public agencies for the motor carriers. These services are provided to motor carriers for flat or transactional fees, or on a subscription basis.

One large vendor provides their customers with a software suite enabling electronic requests or receipt for credentials and fund-transfer capabilities. To the motor carrier, this solution emulates many of the functions of the Carrier Administrative Services group.

## **3.4 ELECTRONIC SCREENING, SAFETY, AND SECURITY SERVICES**

### **3.4.1 Service Description**

**Electronic Screening, Safety, and Security** services are designed to automate the screening of commercial vehicles for size/weight, safety status, and credential compliance at roadsides, weigh stations, ports of entry and border crossings. The ITS/CVO user services in this category are:

- Electronic clearance for roadside safety inspections
- Electronic clearance for weight inspections
- Electronic Border Crossings
- Roadside safety inspections using automated diagnostics
- Electronic drivers logs for inspection by MCSAP inspectors

As envisioned, vehicles could be screened upstream of an inspection site using weigh-in-motion and vehicle-classification technologies. The vehicles would be identified

using transponder or license plate reader technologies after which automated credential and safety status verification can be conducted by polling State and Federal data sources possibly by way of a centralized data repository. If the vehicle/motor carrier fall within the acceptable criteria, then the driver can be notified via wireless communication technologies or automated signage indicating that further stops or inspections are not required.

For international border crossings, motor carriers can electronically obtain declaration and trade requirement information in advance of trips, then electronically file all necessary forms and information. This information can be made available to officials to facilitate crossings at international borders.

### **3.4.2 Service Users and Benefits**

Focused screening and targeting of non-compliant or high-risk carriers for inspection (rather than the entire motor carrier population) allows safe and compliant motor carriers to reduce the number of en route stops and delays, thus improving operational efficiencies. This may provide numerous indirect benefits including: reduced traffic congestion; just-in-time (JIT) enhancements including improved freight delivery times; improved roadway safety; and, better/targeted utilization of scarce enforcement resources.

If a motor carrier is inspected, automated diagnostics, computer-aided log verification tools, or access to on-board data collect systems could possibly reduce inspection time and improve the consistency of inspection results.

### **3.4.3 Provision of Services**

The infrastructure supporting these processes include weigh-in-motion sensors, vehicle size/width classification, automated vehicle identification, and the infrastructure to verify information in real-time. If a vehicle or driver is inspected, the results of the inspection should be immediately available to downstream inspection officials via landline or mobile communications link to a data repository that would also function to disseminate information back to state and federal databases. Further, real-time access by a motor carrier to its own fleet data could prove beneficial to asset tracking and utilization. The areas of stakeholder enabling technology investment are presented in Table 11.

### **3.4.4 Current Business Models**

There are two notable electronic clearance business models in the U.S.: Pre-Pass, provided by HELP, Inc., and NORPASS, administered by TransCore.

The Pre-Pass business model consists of private-sector investment for the deployment and operation of the necessary equipment and software to screen vehicles for weight, safety, and credentials compliance – at mainline speeds. Motor carriers are pre-qualified for participation in the program and pay for the service through transactional or by-pass event fees (\$0.99 per by-pass event to a maximum of \$3.96 per truck per day) and transponder units are provided to participating motor carriers at no fee. The program is administered with oversight by a Board of Directors consisting of HELP, Inc. officers, motor carrier executives, and State government officials to ensure operations, data privacy, and the integrity of the screening process.

The NORPASS business model depends on public-sector investment in facilities and public/private investment in infrastructure and uses private sector contracted support for administration of the program. Motor carriers are pre-qualified based on safety and compliance performance, subject to periodic updating of information. Operational costs of the program are recouped through a flat \$45 per transponder annual fee to motor carriers.

**Table 11: Electronic Screening, Safety, and Security Services  
Areas of Enabling Technology Investment**

ITS/CVO User Services	Public-Sector Technologies/Systems	Private-Sector Technologies/Systems
<ul style="list-style-type: none"> <li>• Electronic clearance for roadside safety inspections</li> <li>• Electronic clearance for weight inspections</li> <li>• Electronic Border Crossings</li> <li>• Roadside safety inspections using automated diagnostics</li> <li>• Electronic drivers logs for inspection by MCSAP inspectors</li> </ul>	<ul style="list-style-type: none"> <li>• Mobile Data</li> <li>• Communications and Terminals</li> <li>• Land-Based Communications and Terminals</li> <li>• Agency System Integration</li> <li>• Data Clearinghouses</li> <li>• Vehicle Identification Technologies (Transponder or License Plate Readers)</li> <li>• Weigh-In-Motion</li> <li>• Sensors Internet</li> <li>• EDI Dial-In Connect</li> <li>• Roadside Electronic Log Verification Software</li> <li>• Automated Vehicle Diagnostic Systems</li> </ul>	<ul style="list-style-type: none"> <li>• Vehicle Transponders Electronic Logs/Vehicle Data Access Ports</li> <li>• Internet</li> <li>• EDI Dial-In Connect</li> <li>• Carrier System Integration with Carrier-Agency Interface/Portal</li> </ul>

### **3.5 TRIP MANAGEMENT SERVICES**

#### **3.5.1 Service Description**

**Trip Management** services are designed to provide motor carriers with a variety of operation-based information including road and traffic information, and availability of trucking-related services to enable carriers to better utilize fleet assets. The services associated with Trip Management are rapidly expanding as business processes change and technology evolves. Typical services include:

- Real-time access to traffic and road conditions
- Internet-based weather information (route specific)
- Internet-based truck/rest stop availability
- Automated toll lanes
- Load posting of HazMat shipments for responders

Many of the Trip Management Services rely, to a large extent, on public-sector data and information developed through government agency systems such as traffic management and incident response systems. Much of the data is already incorporated into traveler information services for the general motoring public. It is envisioned that traveler information will be collected and customized for CVO purposes from the various public-sector agencies and other sources (commercial truck services providers) throughout the corridor and fused to form a comprehensive CVO traveler information stream. This data stream could support numerous presentation formats to motor carriers to enhance their decision-making capabilities.

A corollary service involves the posting of HazMat shipments by motor carriers to a secure data repository to enable emergency incident responders rapid access to information about the load, appropriate company contacts, and any carrier designated HazMat spill cleanup contractors.

Another service that is functionally included in the Trip Management service category is automated toll lanes in which a transponder-equipped truck can clear toll facilities without stopping, with the toll collected automatically via pre-agreement from the motor carrier.

#### **3.5.2 Service Users and Benefits**

##### **3.5.2.1 ATIS**

The timely dissemination of roadway and incident information to the public is an important part of a successful public information program. Appropriate diversion of

traffic can maintain traffic flows and reduce the occurrence of secondary or upstream incidents. Information designed to meet the specific needs of motor carriers in terms of geographic scope, times of day, detail, alternate routing instructions, and other trucking-specific information can enhance acceptance of the trip management services, resulting in reduced numbers of large vehicles in incident queues.

The private-sector benefits include: reduced costs from better route planning; improved driver satisfaction; and improved safety. For motor carriers who operate under many regulatory and operational constraints, advanced notice of travel conditions and available services may enable dynamic rerouting and scheduling to service their customers in a cost effective and timely manner. Public-sector benefits include improved traffic flows and improved safety.

### ***3.5.2.2 Automated Tolls***

Automated toll lanes provide benefit to motor carriers through reduced en route delays and fuel costs, reduced administrative costs, and in some cases, toll discounts can be realized. The public sector benefits through reduced administrative costs, potentially increasing use and revenues, congestion mitigation and resulting air quality benefits.

### ***3.5.2.3 Electronic HazMat Postings***

Posting of load information can facilitate timely and safe response to HazMat incidents via rapid lookup of materials and carrier contact/responder information. This has the potential of reducing incident clearance times, appropriate containment of spills, and reduced liability/cleanup costs for both motor carriers and government agencies.

## **3.5.3 Provision of Services**

Traveler information dissemination provides a logical extension of ongoing traffic and incident management activities in the corridor by providing timely and accurate information about roadway conditions and other travel-related subjects (weather conditions, rest stop space availability, trucking-related services) to motor carriers in multiple formats and dissemination modes.

The compilation and repackaging of roadway condition and other traveler information can be conducted either through information clearinghouse(s) or via multiple value-added information providers. The combined information stream can be provided directly to motor carriers for integration with their in-house routing and dispatching/communications suites, or formatted for map-based internet presentations, or delivered in text formats via fax, email, or wireless communications directly into the truck cab. Table 12 presents the envisioned enabling technology investments required for the provision of Trip Management services.

**Table 12: Trip Management Services  
Areas of Enabling Technology Investment**

ITS/CVO User Service	Public-Sector Technologies/Systems	Private-Sector Technologies/Systems
<ul style="list-style-type: none"> <li>• Real-time access to traffic and road conditions</li> <li>• Internet-based weather information (route-specific)</li> <li>• Internet-based truck/rest stop availability</li> <li>• Automated toll lanes</li> <li>• Load posting of HazMat shipments for responders</li> </ul>	<ul style="list-style-type: none"> <li>• Roadway Sensors, Closed Circuit Television (CCTV) Communications</li> <li>• Operations Centers</li> <li>• Agency System Integration</li> <li>• Data Clearinghouses</li> <li>• Public/Private Sector Information Portals</li> <li>• Automated Toll Lanes</li> </ul>	<ul style="list-style-type: none"> <li>• Communications and Interfaces with Public Sector Operations Centers</li> <li>• IT for Data Fusion, Storage and Distribution</li> <li>• Internet</li> <li>• Carrier System Integration</li> <li>• Vehicle Transponders</li> </ul>

### 3.5.4 Current Business Models

#### 3.5.4.1 ATIS

There are several examples of Trip Management functions in the commercial market place keyed on ATIS. These are generally focused on passenger vehicle/commuter travel needs, but business models are developing to provide specific and customized information for motor carriers.

One notable business model for ATIS is the SmarTraveler service by SmartRoute Systems. The service was initially established in Boston, Massachusetts, using public funding. Expansion to other cities was also heavily subsidized through public financing. Overtime, operations and service expansion was increasingly funded through service access agreements and the sale of advertising to private sector firms. Last year, SmartRoute Systems was purchased by Westwood One, a large communications firm, and is being a run as a self-supporting business unit.

Examples of ATIS specifically designed for CVOs include recent operational tests of the service FleetForward on the east coast and the FleetOnline tests in the Gary-Chicago-Milwaukee corridor and in Arizona. Though these were not fully deployed services, they provide good examples where public sector funding was used to collect and disseminate information on roadway conditions, and the private sector developed the applications to incorporate the information stream into motor carrier routing and dispatching systems. Motor carriers expressed interest in the systems and indicated a willingness to pay a nominal monthly access fee or premium for decision support software to use the service if certain additional functions are added.

### **3.5.4.2 Automated Toll Collection Functions**

In the Northeast and Midwest, EZ-Pass – a transponder-based vehicle identification toll collection program – allows enrolled vehicles to pass through toll plazas without stopping to pay cash. The program is designed to increase throughput and reduce congestion during the toll collection process. Overseen by a regional consortium of toll authorities, public investment is used to equip toll facilities and administer the program. These investment and operations costs are recouped as part of the toll collected via automatic deduction from a pre-established user account. The public sector realizes the benefits of increased throughput of automated toll lanes in terms of reduced congestion and improved air quality, and as such, offer toll discounts to EZ-Pass users.

## **3.6 FLEET MANAGEMENT SERVICES**

### **3.6.1 Service Description**

Fleet Management services represent a category of informational and commercial services that support motor carrier back office business functions. These services include:

- Electronic fuel management and payment services at truck stops
- Electronic load finding/matching services
- Driver kiosks for email and information access.

These services allow motor carriers to more closely manage their operations and reduce costs through:

- Pre-arranged service/product discounts;
- Funds transfers with electronic paper trails;
- Access to real-time load information to reduce empty vehicle miles; and
- The ability for drivers to retrieve/access operational information such as new dispatches or road closures.

The primary technologies supporting these services include private sector databases, EDI, electronic funds transfer, smart cards, internet systems and transactions, and applications software.

### **3.6.2 Service Users and Benefits**

As stated previously, the benefits to motor carriers include product/service discounts, reduced administrative costs, and improved asset utilization. Private sector providers of these services typically do so on a transactional or subscription-fee basis, or as a value-

added feature of more comprehensive service offerings. In the latter instance the services are often used to build sales of a primary product or service (i.e., being competitive in the sale of diesel fuel or truck stop services).

### 3.6.3 Provision of Services

Currently, this group of services is primarily provided and used by the private sector. However, in their current presentation they may not fully serve the I-35 corridor stakeholders in terms of seamless corridor features or corridor-wide information delivery. Possible public sector roles would facilitate the linking of frequent trading partners and trucking-related services along the corridor to enhance the flow of operational information. Such information could include advance notification to shippers, receivers or intermodal facilities of approaching trucks; or pick up/transfer/delivery notification along logistics chains to enhance shipment tracking. In many cases, the public sector infrastructure already exists, thus minimizing additional investment needs. A public-private joint venture may be the most effective method of delivering a corridor-based Fleet Management System. Table 13 presents the areas of technology investment to enable the Fleet Management Services.

**Table 13: Fleet Management Services  
Areas of Enabling Technology Investment**

ITS/CVO User Service	Public-Sector Technologies/Systems	Private-Sector Technologies/Systems
<ul style="list-style-type: none"> <li>• Electronic fuel management and payment services at truck stops</li> <li>• Electronic load finding/matching services</li> <li>• Driver kiosks for email and information access</li> </ul>	<ul style="list-style-type: none"> <li>• Internet</li> <li>• Facilities (Kiosks) for Information Access</li> </ul>	<ul style="list-style-type: none"> <li>• Electronic Funds Transfer</li> <li>• Internet</li> <li>• EDI Dial-In Connect</li> <li>• Carrier System Integration</li> </ul>

### 3.6.4 Current Business Models

Web-based load posting, driver, and equipment services are available to motor carriers from several vendors. Notable are: TruckersB2B.com, GetLoaded.com, Park & View (PVN.com) and LTL.com. These services are provided either as business-sponsored enterprises (direct contribution or financed via advertising revenues), subscription-based to end users, or a combination of both.

### 3.7 DEVELOPING A COMPREHENSIVE CORRIDOR DEPLOYMENT PLAN FOR ITS/CVO SERVICES

CVO service users and providers have a great interdependence that on myriad databases and applications that provides the backbone of the services along the entire corridor. In an effort to create a seamless system among the participating states, a comprehensive corridor deployment plan must be developed.

This section presents a business plan overview for developing a single comprehensive program, including organization management, service delivery, funding, and institutional issues.

#### 3.7.1 Develop a Corridor-Wide Program Platform

The first step in deploying a corridor program is the creation of a program decision-making and delivery platform.

Corridor-wide deployment of the ITS/CVO services described herein is predicated on the ability to seamlessly share appropriate regulatory and operational data among stakeholders in the corridor. Consequently, a multi-jurisdiction management structure is necessary to develop, maintain, fund and promote the service programs. One of the more common vehicles for managing multiple jurisdiction programs is a Joint Powers Organization (JPO). The JPO's overall role would include:

- Providing program oversight
- Championing the corridor ITS/CVO program to high-level decision makers, promoting strategic planning
- Establishing funding mechanisms
- Promoting legislative changes to enable corridor-wide information exchange.

Specific functions of the JPO include:

- **Management** – Staff and manage full range of programs and services. Decision-making would be based on JPO Board-approved work plan.
- **Technical** – Oversee establishment of standards and architecture, enable/oversee technical support for the deployments, and track deployment progress.
- **Financial** – Administer the funding (based on program priorities, available resources, and new opportunities), provide financial tracking of individual projects within the program, and establish electronic payment/funds transfer capabilities.
- **Institutional/Legal** – Develop recommendations and approaches to regulatory harmonization, assuring stakeholder input and support, and drafting of legislative language to enable ITS/CVO user services.

### 3.7.2 Identify and Prioritize Corridor Services

Since the primary function of the Corridor program is service delivery, the second step in the deployment plan is the identification and prioritization of corridor services that will have utility for users.

While 17 key services were originally identified for consideration, their relevance and readiness are at different points. In order to develop early success stories, the JPO should prioritize corridor services by need and availability (includes cost issues). A service prioritization matrix (Table 14), which considered the interests of both the public and private sectors, was developed and approved by the NAITC Board. The matrix provides a useful starting point for service delivery.

**Table 14: Service Priorities**

Priority Class	User Service
A	Apply and receive registrations electronically
A	Apply and receive fuel tax credentials electronically
A	Apply and receive OS/OW permits electronically
A	Electronic clearance for roadside safety inspections
A	Electronic border crossings
A	Real-time access to traffic and road conditions
B	Electronic clearance for weight inspections
B	Automated toll lanes
B	Internet-based weather information (route-specific)
C	Load posting of HazMat shipments for responders
C	Roadside safety inspections using automated diagnostics
C	Electronic driver logs for inspection by MCSAP inspectors
D	Electronic access to motor carrier regulations/safety inspection reports
D	Internet-based truck/rest stop availability
D	Electronic fuel management/payment services at truck stops
D	Electronic load finding/matching services
D	Driver kiosks for email access, information access

### 3.7.3 Develop Service Delivery Mechanisms

Once the relevant services are identified, their delivery mechanisms and back-room configurations must be determined (in order to develop costs and implementation strategies). The majority of work in this area will focus on two fronts:

- What back-room public sector technologies and connections are needed to create a seamless system or service?
- What information format and delivery mechanisms are needed by the end-user to access and use the service?

In many cases, the public-sector system linkages and interfaces will be singular and linear. But given the technology variations in the private sector, multiple delivery mechanisms may be (initially) needed. For instance, beyond internet access via computers, some motor carrier credentialing may still to require the use of telephones and fax machines.

### **3.7.4 Develop Program Costing Principles and Budgets**

Once services and their delivery mechanisms are identified, budgets and costing principles can be developed. These would likely be based on existing transaction fees for those services that presently occur, and jointly developed (between public sector and end-users) costs for new or revised services.

The infrastructure to support the ITS/CVO services may not require significant new investment on the part of corridor stakeholders. However, some investment will be needed for initial deployment, continuing operations, and possible expansion of systems and capabilities. Primary sources for deployment funding might include:

- Federal revenues (e.g., ITS earmarks and deployment grants, MCSAP funding, congestion mitigation and air quality grants, construction and operations funding, etc.)
- State funds (i.e., CVO regulatory and enforcement budgets, public safety budgets, infrastructure construction and operations budgets, statewide e-government deployment programs, etc.)
- Cost-sharing by private business vendors (product/service development or enhancement), and transportation end user fees.

### **3.7.5 Provide Services**

Service provision includes ongoing service management, evaluation and troubleshooting, and service education and promotion. Two key areas for consideration under service provision are institutional issues and sustainability.

#### **3.7.5.1 Institutional Issues**

As mentioned previously, the underlying precept of corridor-wide deployment of ITS/CVO services is the real-time exchange of CVO information between authorized stakeholders. It should be noted that the success of the ITS/CVO deployments will

strongly depend upon end-user perception and acceptance of business benefits and risks—with emphasis on risks. Two important areas of risk that must be addressed include:

- Data privacy/access and data use.
- Interoperability/multi-use of technology systems.

These are elaborated in the following:

**Data Privacy, Access and Use** – The types of data that can be collected through ITS/CVO technologies and how it might be used is one of the most important stakeholder issues documented in nearly every ITS/CVO Institutional Issues study conducted. The basis of this issue is concern by motor carriers that information generated could be used to enable new levels of regulatory burden, taxes, user fees, or that sensitive proprietary information could be accessed by unauthorized entities and used to undermine a motor carrier’s competitive position.

To overcome these concerns, codes and regulations must be developed which will establish clear limits on data access and use. These limits should be developed with the objective of only collecting the minimal data requirements of each stakeholder group to enhance their core regulatory or business functions, and should be codified with the consent of each potentially affected group. Additionally, system administrators must ensure adequate security to prevent unauthorized data access. Legal liability and tort issues may need to be created.

**Interoperability/Multi-Use of Technology Systems** – Interoperability of ITS/CVO technologies and systems is another important institutional issue that must be addressed to ensure functionality and end-user participation in services. Previous ATA Foundation research shows that the highest perceived value for, and participation in, ITS/CVO services are with those in which requirements for participation involve the use of technologies currently widespread in use (proven, cost-effective technologies requiring little or no modifications for participation in ITS/CVO services)<sup>1</sup>.

The public/private sector interfaces should provide an open architecture to enable the end users to seamlessly integrate the corridor ITS/CVO capabilities with their current systems. This applies to back office as well as vehicle-to-roadside systems. One function of the JPO could be to ensure interoperability of deployed systems with those in other regions and those in use by private sector end users.

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<sup>1</sup> Motor Carrier Technologies—Fleet Operational Impacts and Implications for Intelligent Transportation Systems/Commercial Vehicle Operations, *October 1999*.

### **3.7.5.2 Sustainability**

Once deployed, the ITS/CVO services need to be operated, maintained, and periodically upgraded to evolving technology standards. For the CVO Administrative services and the Electronic Screening, Safety, and Security services, funding for these operations can be derived from agency operating budgets at current levels or at nominally increased levels due to higher operating efficiencies and subsequently reduced labor costs. Additionally, the ITS/CVO services would enhance the agencies' ability to meet their core business functions. It is expected that while motor carriers would realize reduced regulatory burdens, the majority of them would not be inclined to pay additional user fees or premiums for these services.

The Trip Management services, particularly the dissemination of travel-related information, may provide opportunity for public/private cost-sharing for provision of the services. Highway operations groups would realize benefits of reduced congestion and enhanced incident management programs through the collection and coordination of roadway information. Their role in these activities are in line with their core business functions and should continue to be funded through the agencies' operating budgets.

For both the Trip Management and Fleet Management services, opportunity exists for private sector cost sharing through information user access fees or private sector investment in systems to access, repackage, and disseminate information to end users. It should be stressed that the level of private sector investment or willingness to pay for the information will be based on the ability of the services to provide operational efficiencies that outweigh costs. This derived value for information and services will be carefully assessed by private sector stakeholders for profitability and longevity. The public sector role should be to encourage free access of non-proprietary information and possibly provide funding for enhancing the information stream(s) to "seed" new information services.

## 4.0 SYSTEM ARCHITECTURE

It is necessary to coordinate and aggregate various CVO data in order to achieve **integrated** corridor user services and business processes. Data is currently being gathered by separate program centers that already exist in sections of the corridor, such as regional ATIS centers and regional service centers. These existing data collection sources include credentialing, special permitting, international border screening, roadside screening, and other enforcement actions. The sharing of corridor data to produce integrated services is the focus of the business processes contained in this section. Collectively, they represent an **information architecture** for corridor user services. This architecture represents the “end state” for corridor information sharing processes. It is understood that the architecture will be implemented over time as governance and technology decisions are made and concepts are proven per the project plans and business models previously described.

### 4.1 INFORMATION ARCHITECTURE OVERVIEW

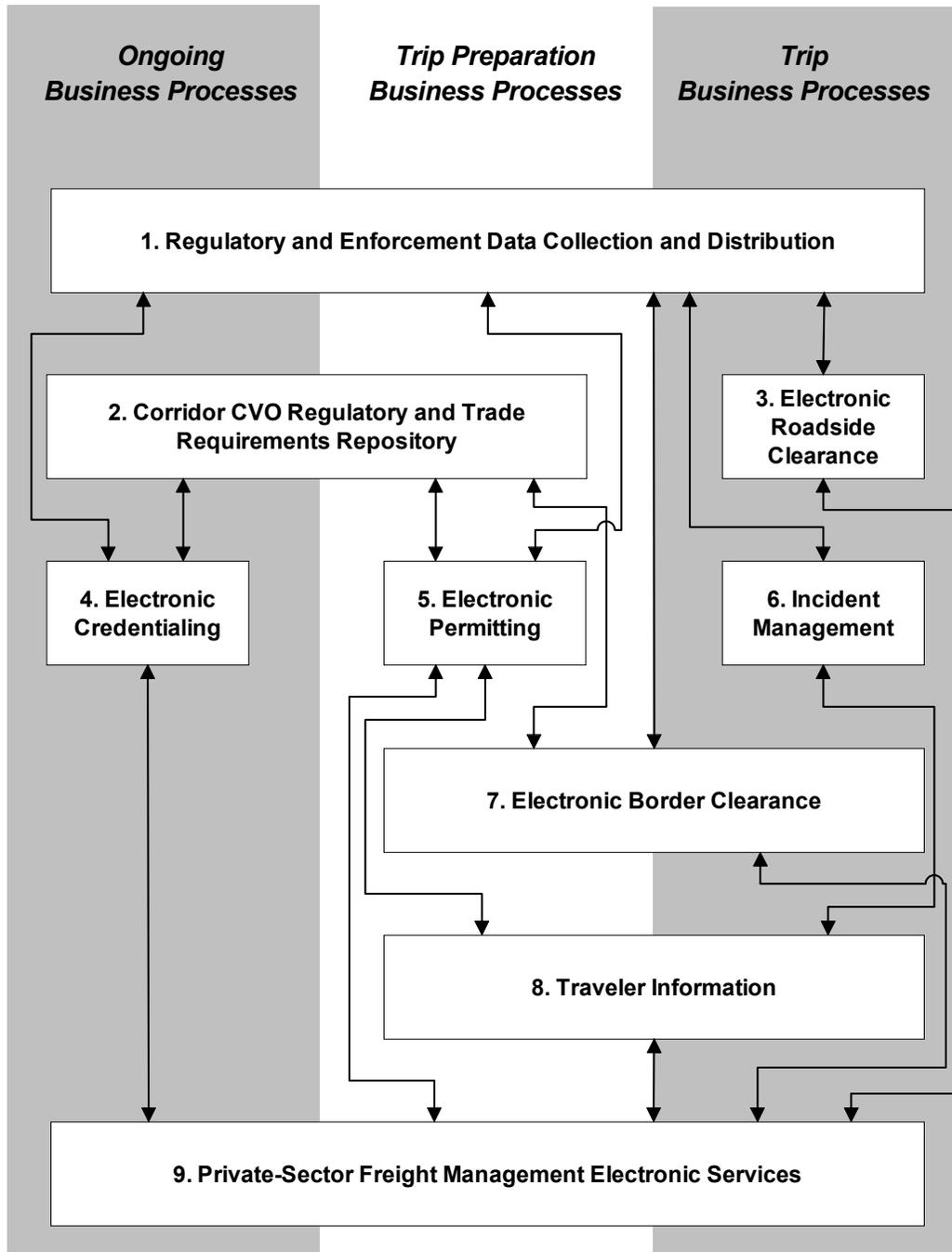
Figure 4 shows the corridor business processes and their applicability to ongoing business processes, trip preparation business processes, and trip business processes. Individual processes that span ongoing business, trip preparation, or real-time trip process areas are shown in the figure as extended rectangles spanning the appropriate areas. This figure uses arrows to show what processes exchange information with each other. Information exchange lines between processes are repeated as necessary left to right to illustrate information connectivity within each of the three business process areas. An information exchange line on the border between two process areas means that information exchange occurs in support of both process areas.

The majority of the business processes of Figure 4 map directly to corridor CVO user services, but three processes exist solely in support of the integration of and access to corridor user services. These are:

- Process 1 - Regulatory and Enforcement Data Collection and Distribution,
- Process 2 - Corridor CVO Regulatory and Trade Requirements Repository, and
- Process 9 - Private-Sector Freight Management Electronic Services.

The development of an integrated data center (represented by Process 1) to collect regulatory and enforcement data from existing local, state, and federal data collection sources will provide timely CVO information to corridor operations. A data center(s) will be capable of collecting, aggregating, and then distributing the data to public and private providers of corridor user services. These user services would be created to support ongoing business processes, trip preparation processes, and real-time trip update processes as depicted in Figure 4.

Likewise, the development of a corridor CVO regulatory and trade requirements repository (represented by Process 2) will provide users with access to the CVO regulatory requirements of corridor jurisdictions and international trade filing requirements. This repository will support ongoing business activities such as applying for or renewing credentials and trip preparation activities such as applying for permits and preparing international trade declarations.



**Figure 4: Corridor Business Processes**

The final process of the three is referred to as freight management electronic services (represented by Process 9). This process represents the information exchange interfaces necessary for the private sector to access and utilize corridor user services. Some of the data on motor carriers and motor carrier programs can benefit carriers and the public. To the extent that the data can be made available without violating privacy or confidentiality principles, there is potential benefit from providing access to it.

## 4.2 SECTION CONTENT

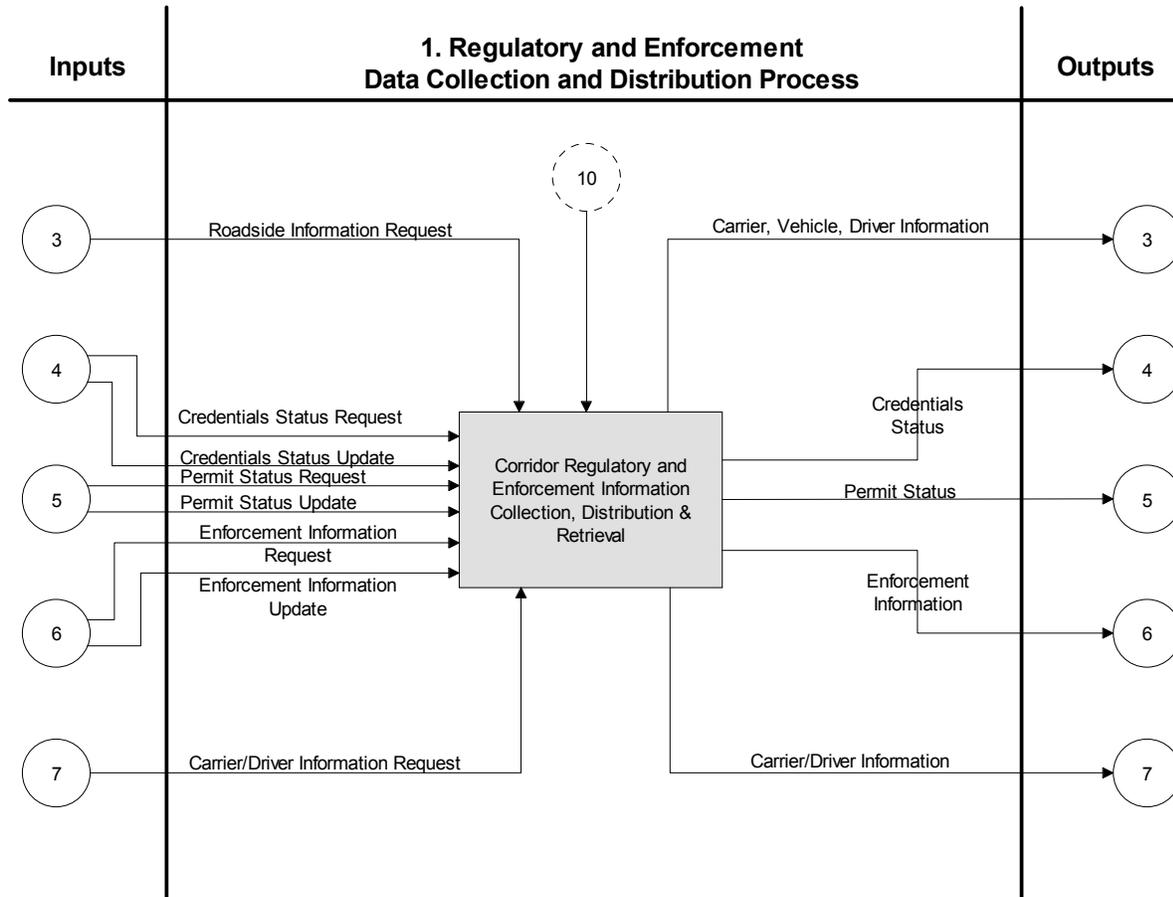
The sections that follow describe the processes presented in Figure 5. There are eight sections covering Process 1 through Process 8. Each section contains process descriptions, a diagram depicting their information flows, applicable process stakeholders, and any governance inputs necessary to implement the processes. Process 9, Private-Sector Freight Management Electronic Services, is not represented as a stand-alone process since it primarily embodies private sector interfaces to access corridor user services. Process 9 is represented within the other eight processes as an interface.

The information flow diagrams for processes 1 through 8 are presented as Input-Process-Output (I-P-O) diagrams. The format of the I-P-O diagrams is as follows.

- The information inputs are shown on the left, process functions in the middle, and information outputs on the right
- Shaded functions within the diagrams represent functions that are new or are necessary to integrate a service corridor-wide. Non-shaded functions are those that exist today, but are not integrated corridor-wide
- In the cases where processes 1 through 8 interface with one another, the interfacing process is represented as a circle within an I-P-O diagram. The legend below shows how the processes of Figure 1 are represented within the I-P-O diagrams
- Process 10, corridor organization input, is added to highlight the areas that require a legal, policy, and systems framework for data sharing.

## 4.3 PROCESS 1: REGULATORY AND ENFORCEMENT DATA COLLECTION AND DISTRIBUTION

The purpose of the Regulatory and Enforcement Data Collection and Distribution Process is to create a corridor public sector data center for collecting and distributing current information about individual motor carriers' regulatory and enforcement records. The data center(s) will collect and distribute information that is necessary for corridor regulatory compliance and is currently in agency databases of record. The objective is for authorized public sector personnel to be able to use this information in real time from anywhere along the corridor. Figure 5 shows the I-P-O diagram for Process 1.



**Legend:**

- 3 Electronic Roadside Clearance Processes
- 4 Electronic Credentialing Processes
- 5 Electronic Permitting Processes
- 6 Incident Management Processes
- 7 Electronic Border Clearance Processes
- 10 Corridor Governance Processes

**Figure 5: Information Flow Diagram for Process 1**

**4.3.1 Information Flows**

The data center provides information for, and is updated during, regulatory and enforcement actions related to commercial vehicle travel along the corridor. It is updated during corridor electronic processes or manually by authorized public agency personnel. The corridor processes providing input to or receiving output from this process are:

- 3. Electronic Roadside Clearance
- 4. Electronic Credentialing

5. Electronic Permitting
6. Incident Management
7. Electronic Border Clearance.

The dotted-lined circle labeled "10" represents the corridor governance input that establishes the policy and rules by which data will be accessed and used.

#### **4.3.1.1 Inputs**

**Roadside Information Request** – The Electronic Roadside Clearance process (#3) may access the Regulatory and Enforcement Data Center. Roadside enforcement personnel and systems access the data center to obtain current carrier, vehicle, and/or driver regulatory and enforcement information. A Roadside Inspection Agent or electronic system sends a standard formatted data request to the data center for carrier, vehicle, and/or driver regulatory and enforcement information in support of roadside inspection or enforcement activities.

**Credentials Status Request** – The Electronic Credentialing process (#4) may access the Regulatory and Enforcement Data Center. Credentialing agencies and systems access the data center to verify motor vehicle records related to credentials. An electronic credentialing system or credentialing agency personnel sends a standard formatted data request to the Regulatory and Enforcement Data Repository System to obtain the current status of a motor vehicle's credentials.

**Credentials Status Update** – The Electronic Credentialing process (#4) may access the Regulatory and Enforcement Data Center. Credentialing agencies and systems access the data center to update the current status of a motor vehicle's credentials. An electronic credentialing system or credentialing agency personnel sends a standard formatted data request to the Regulatory and Enforcement Data Repository System to update the credentials status.

**Permit Status Request** – The Electronic Permitting process (#5) may access the Regulatory and Enforcement Data Center. Permitting agencies and systems access the data center to verify motor vehicle records related to special permitting. An electronic permitting system or permitting agency personnel sends a standard formatted data request to the Regulatory and Enforcement Data Center to obtain the permit status information.

**Permit Status Update** – The Electronic Permitting process (#5) may access the Regulatory and Enforcement Data Center. Permitting agencies and systems access the data center to update vehicle records related to special permitting. An electronic permitting system or permitting agency personnel sends a standard formatted data request to the Regulatory and Enforcement Data Center to update permit status information.

**Enforcement Information Request** – The Incident Management process (#6) may access the Regulatory and Enforcement Data Center. An enforcement officer accesses the data center to verify motor vehicle and driver records during an enforcement action. An enforcement officer sends a standard formatted data request to the Regulatory and Enforcement Data Center to obtain motor vehicle and driver records.

**Enforcement Information Update** – The Incident Management process (#6) may access the Regulatory and Enforcement Data Center. An enforcement officer accesses the data center to update motor vehicle and driver records during or after an enforcement action. An enforcement officer sends a standard formatted data request to the Regulatory and Enforcement Data Center to update motor vehicle and driver records.

**Carrier/Driver Information Request** – The Electronic Border Clearance process (#7) may access the Regulatory and Enforcement Data Center. Border Inspection Agents and systems access the data center to check motor carrier and driver records related to international border clearance. An International Border Inspection Agent or electronic system sends a standard formatted data request to the Regulatory and Enforcement Data Center to obtain motor carrier and driver records.

#### **4.3.1.2 Processes**

**Corridor Centralized Regulatory and Enforcement Information Collection, Distribution and Retrieval** - This function is necessary for storing records about motor carrier regulatory status and safety so that they may be accessed anywhere along the corridor. This process provides the ability to collect, distribute, and retrieve information. To accomplish this function, a combination of a local repository for rapid retrieval of relatively static information and agency system of record access for more dynamic information is foreseen.

The function will store or access records on individual motor carriers related to the following activities:

- Roadside screening and inspection
- Motor vehicle credentialing
- Motor vehicle special permitting
- Enforcement actions against the carrier
- International border screening and inspection

Enforcement personnel may use the function to check carrier records during inspection and enforcement activities. To perform this data distribution function, the data center is linked to corridor jurisdiction CVO systems. Updates are made when corridor regulatory status or enforcement information is changed through electronic systems. Enforcement personnel may update records by accessing the system. Information requests are received by the system in

standard format and information responses are output. Security provisions will protect information from unauthorized access or manipulation.

**Corridor Governance** – The corridor organization (process #10) described in the project plan will need to provide policy guidance regarding the information content, access, distribution, and use. It is expected that corridor jurisdictions will need to agree to the governance policy in order to access and distribute information via the data center. In addition to policy, operational issues such as the standard data format for distribution must be agreed upon.

#### 4.3.1.3 Outputs

**Carrier Information** – The Regulatory and Enforcement Data Center sends a standard formatted reply with the requested carrier, vehicle, and/or driver regulatory and enforcement information to the requesting Roadside Inspection Agent or electronic system (process #3).

**Credentials Status** – The Regulatory and Enforcement Data Center sends a standard formatted reply with the requested information about a motor vehicle's credentials to the requesting electronic credentialing system or credentialing agency personnel (process #4).

**Permit Status** – The Regulatory and Enforcement Data Center sends a standard formatted reply with the requested motor vehicle records related to special permitting to the requesting electronic permitting system or permitting agency personnel (process #5).

**Enforcement Information** – The Regulatory and Enforcement Data Center sends a standard formatted reply with the requested motor vehicle and driver records to the requesting enforcement officer (process #6).

**Carrier/Driver Information** – The Regulatory and Enforcement Data Center sends a standard formatted reply with the requested motor carrier and driver records to the requesting Border Inspection Agents and systems (process #7).

#### 4.3.2 Implementation Approach

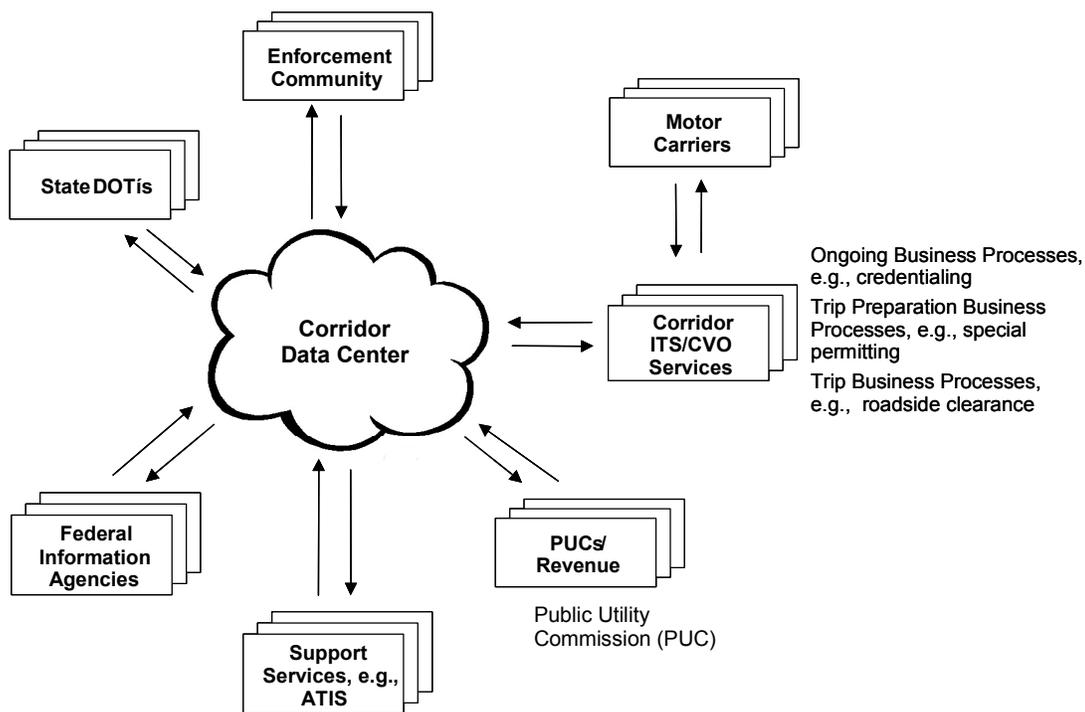
According to the draft *Model Motor Carrier Program Best Practices for AAMVA's Motor Carrier Community, A Product of the Motor Carrier Services Committee* dated October 19, 2001, jurisdictions should make authoritative credential and safety data available electronically to other jurisdictions and agencies that support credential issuance, program compliance, and safety enforcement. This recommendation is consistent with the findings of the preceding corridor study phases. Accessible data should include:

- Safety data (unsatisfactory and conditional ratings; inspections, citations and crashes by plate, Vehicle Identification Number (VIN), carrier)
- IRP, IFTA and OS/OW account status (good standing or not)

- Reasons for other than good standing status on IRP, IFTA and OS/OW accounts
- IRP and IFTA mileage data (total; by jurisdiction; other categories such as off-road)
- IRP cab card and IFTA license data (whether currently valid; issuance and expiration dates; states with weights)
- OS/OW permit data, including conditions and restrictions and whether the permit is issued for the carrier or the vehicle,
- Application status, including pending applications, denied applications and reasons for denial.
- Financial responsibility (types and levels of coverage).

The data should be available to jurisdiction users throughout the corridor on a demand basis (within a few seconds). Users include motor carrier credentialing and enforcement personnel.

Figure 6 depicts the corridor data center concept that is at the heart of the Regulatory and Enforcement Data Collection and Distribution Process. A data center or integrated data centers are necessary to achieve the type of timely data distribution recommended above.



**Figure 6: Data Center Concept**

As a data starting point, it is recommended that the Commercial Vehicle Information Systems and Networks (CVISN) data sets be adopted where applicable. The relevant data sets are described under the following processes:

3. Electronic Roadside Clearance
4. Electronic Credentialing
5. Electronic Permitting
6. Incident Management
7. Electronic Border Clearance.

The corridor data center will access federal systems such as the Safety and Fitness Electronic Records (SAFER) system and corridor state Commercial Vehicle Information Exchange Window (CVIEW) or CVIEW-like systems that provide access to jurisdictional data on carriers and vehicle. The data center could also access driver information through the Commercial Driver License Information Systems (CDLIS).

The primary identifiers listed in Table 15 should be used as a starting point for corridor information exchange identifiers and are consistent with the CVISN program's recommended primary identifiers.

**Table 15: Information Exchange Identifiers**

Major Entities	Primary Identifiers	Information Users
<b>Carrier</b>	DOT Number Dun & Bradstreet Unique Numbering System (DUNS) Number	Inspector
<b>Vehicle</b>	VIN License Plate Number	CV Administrative Offices
	Transponder Number	Electronic Roadside Screening
<b>Driver</b>	CDL Number	Enforcement Officer

### 4.3.3 Stakeholders

The stakeholders involved in the data center processes include all of the participating public-sector corridor jurisdictions. The stakeholders for each user service will be included in the appropriate process sections, that is:

3. Electronic Roadside Clearance
4. Electronic Credentialing
5. Electronic Permitting
6. Incident Management
7. Electronic Border Clearance.

Table 16 identifies the corridor public-sector stakeholders responsible for Federal systems data interfaces. As stated above, Federal and State system data center interfaces will be necessary to access the type of regulatory and enforcement data needed by the querying processes.

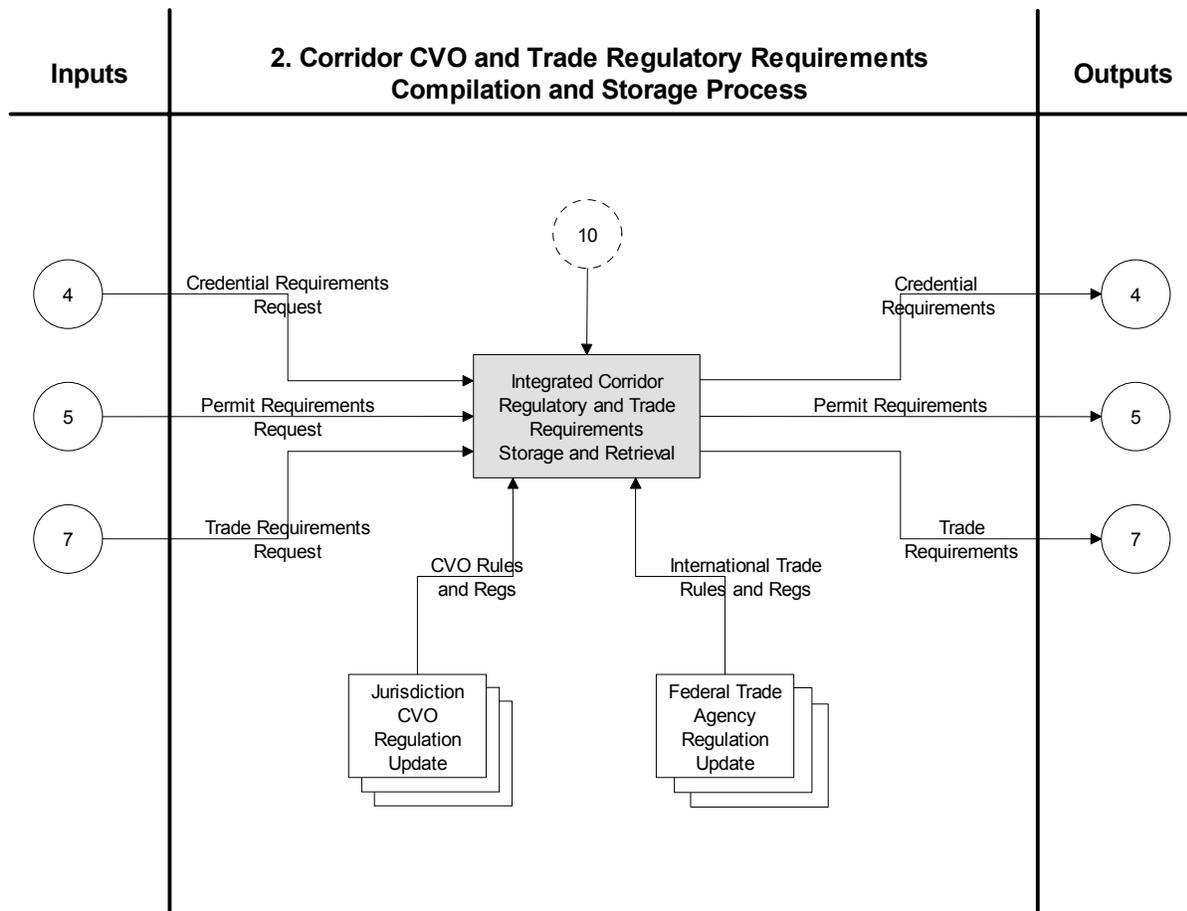
**Table 16: Process 1: Public-Sector Stakeholders**

	<b>Manitoba</b>	<b>North Dakota</b>	<b>South Dakota</b>	<b>Minnesota</b>	<b>Iowa</b>	<b>Kansas</b>	<b>Missouri</b>	<b>Oklahoma</b>	<b>Texas</b>
<b>Maintain inspection records</b>	Carrier profiles, Transport Safety and Regulation, Mandatory Safety Inspections and driver profiles, Division of Driver and Vehicle Licensing, Transportation and Government Services	Highway Patrol, Motor Carrier Division	Highway Patrol, Motor Carrier Enforcement	DOT, Office of Motor Carrier Services	DOT, Motor Vehicle Division, Motor Vehicle Enforcement	Highway Patrol	State Highway Patrol, Commercial Vehicle Enforcement	Oklahoma Highway Patrol, Commercial Vehicle Enforcement	Texas Department of Public Safety, Commercial Motor Vehicle Enforcement
<b>Data reporting to Federal Systems</b>									
<b>-MCMIS</b>	CVSA Inspections, Transport Safety and Regulation, Transportation and Government Services	Highway Patrol, Motor Carrier Division	Highway Patrol, Motor Carrier Enforcement	DOT, Office of Motor Carrier Services	DOT, Motor Vehicle Division, Motor Vehicle Enforcement	Highway Patrol	State Highway Patrol, Commercial Vehicle Enforcement	Oklahoma Highway Patrol, Commercial Vehicle Enforcement	Texas Department of Public Safety, Commercial Motor Vehicle Enforcement

	Manitoba	North Dakota	South Dakota	Minnesota	Iowa	Kansas	Missouri	Oklahoma	Texas
<b>-Licensing and Identification</b>	Division of Driver and Vehicle Licensing, Transportation and Government Services	DOT, Drivers' License and Traffic Safety Division	Department of Commerce and Regulation	Department of Public Safety, Driver and Vehicle Services Division	DOT, Motor Vehicle Division, Driver Services	Department of Revenue, Division of Motor Vehicles, Motor Carrier Services	Department of Revenue, Driver Licensing Bureau	Oklahoma Department of Public Safety, Drivers' License Services	Texas Department of Public Safety, Commercial Motor Vehicle Enforcement
<b>Provide CDLIS Input</b>	Division of Driver and Vehicle Licensing, Transportation and Government Services	DOT, Drivers' License and Traffic Safety Division	Department of Commerce and Regulation	Department of Public Safety, Driver and Vehicle Services Division	DOT, Motor Vehicle Division, Driver Services	Department of Revenue, Division of Motor Vehicles, Driver Control Bureau	Department of Revenue, Driver Licensing Bureau	Oklahoma Department of Public Safety, Drivers' License Services	Texas Department of Public Safety, Commercial Motor Vehicle Enforcement

#### 4.4 PROCESS 2: CORRIDOR CVO REGULATORY AND TRADE REQUIREMENTS REPOSITORY

The Corridor CVO Regulatory and Trade Requirements Compilation and Storage Process is the process by which the Corridor CVO and Trade Regulatory Requirements Data Repository is used and maintained (see Figure 7).



**Legend:**

- 4 Electronic Credentialing Processes
- 7 Electronic Border Clearance Processes
- 5 Electronic Permitting Processes
- 10 Corridor Governance Processes

**Figure 7: Information Flows Diagram for Process 2**

#### 4.4.1 Information Flows

The data repository provides information for corridor users that need the CVO regulations of certain corridor jurisdictions or international trade agency requirements. The repository is to provide information relative to all participating corridor jurisdictions and federal international trade agencies. The corridor processes providing input to or receiving output from this process are:

4. Electronic Credentialing
5. Electronic Permitting
7. Electronic International Border Clearance

The dotted-lined circle labeled "10" represents the corridor governance input that establishes the policy and rules by which data will be accessed and used.

##### 4.4.1.1 Inputs

**Credential Requirements Request** – The Electronic Credentialing process (#4) may access the requirements repository to obtain the base state requirements for a motor vehicle's credentials. An electronic credentialing system or motor carrier sends a standard formatted information request to the repository system.

**Permit Requirements Request** – The Electronic Permitting process (#5) may access the requirements repository to obtain jurisdiction and route specific requirements for specific trip permits. An electronic permitting system or motor carrier sends a standard formatted information request to the repository system.

**Trade Requirements Request** – The Electronic Border Clearance process (#7) may access the requirements repository to obtain federal agency trade requirements for specific commodities/loads that will cross an international border. An electronic import/export system or motor carrier sends a standard formatted information request to the repository system.

##### 4.4.1.2 Processes

**Integrated Corridor Regulatory and Trade Requirements Storage and Retrieval** – This process stores information about CVO regulatory and trade requirements within a data repository. User requests are translated into a query to the requirements repository. User requests for information are input through a user interface system and a query of the requirements repository is made. Query results are compiled into a user-friendly format and are presented through the user interface. Information updates are input to the repository from participating jurisdictions and trade agencies when changes to rules and regulations apply.

**Jurisdiction CVO Regulation Update** – This process updates the requirements repository when changes are made to CVO regulations and requirements. Multiple regulating jurisdictions along the corridor may send updates to the data storage process to direct changes to the data repository.

**Federal Trade Agencies Regulation Update** – This process updates the requirements repository when changes are made to regulations and requirements governing international trade. Federal trade agencies may send updates to the data storage process to direct changes to the data repository.

**Corridor Governance** – The corridor organization (process #10) described in the project plan will need to provide policy guidance regarding the information content and access provisions of the repository. It is expected that corridor jurisdictions will need to agree to the governance policy in order to access and distribute information via the data repository. In addition to policy, operational issues such as the standard data format for distribution and the frequency of requirements update must be agreed upon.

#### **4.4.1.3 Outputs**

**Credential Requirements** – The requirements repository sends a standard formatted reply with the requested credential requirements information to the requesting electronic credentialing system or motor carrier (process #4).

**Permit Requirements** – The requirements repository sends a standard formatted reply with the requested jurisdiction and route specific permit requirements to the requesting electronic permitting system or motor carrier (process #5).

**Trade Requirements** – The requirements repository sends a standard formatted reply with the requested federal agency trade requirements for specific commodities/loads that will cross an international border to the requesting electronic import/export system or motor carrier (process #7).

#### **4.4.2 Implementation Approach**

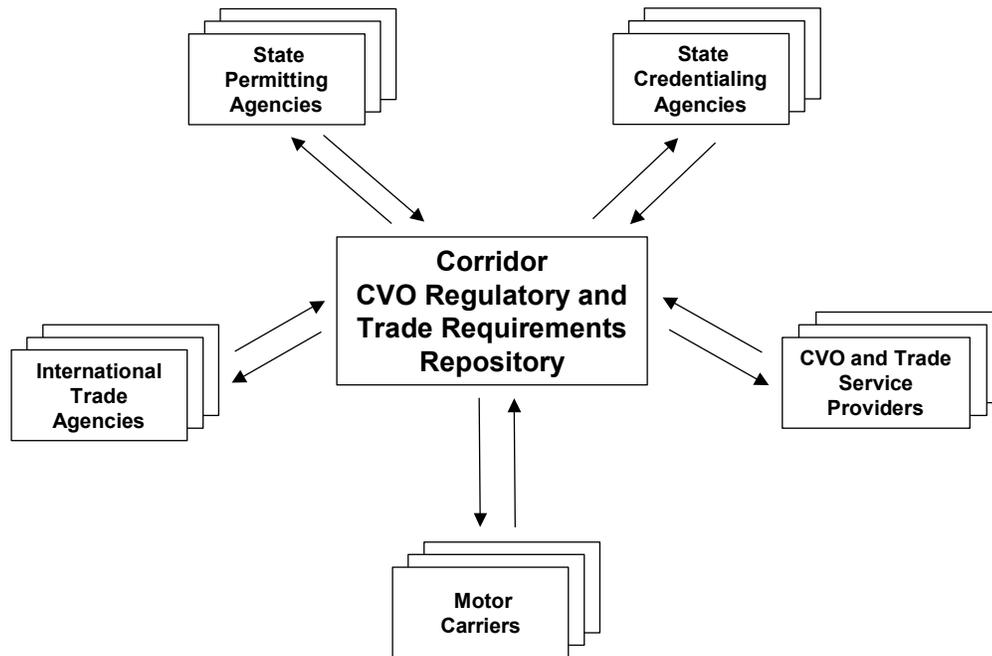
The Corridor CVO Regulatory and Trade Requirements Compilation and Storage Process is realized through a regulatory and trade requirements repository. The repository is used and maintained by the corridor stakeholders illustrated in Figure 8.

The information within the data repository process is CVO regulatory and international trade focused. As a starting point for the exchange of CVO regulatory data, it is recommended that the CVISN data sets be adopted where applicable. The relevant data sets are described in the appropriate process sections, that is:

4. Electronic Credentialing,

## 5. Electronic Permitting.

Trade data for import and export commodity requirements exist from a variety of sources. Appropriate links to federal and international trade agencies and resources will be described further under Process 7: Electronic International Border Clearance.



**Figure 8: Data Repository Schematic**

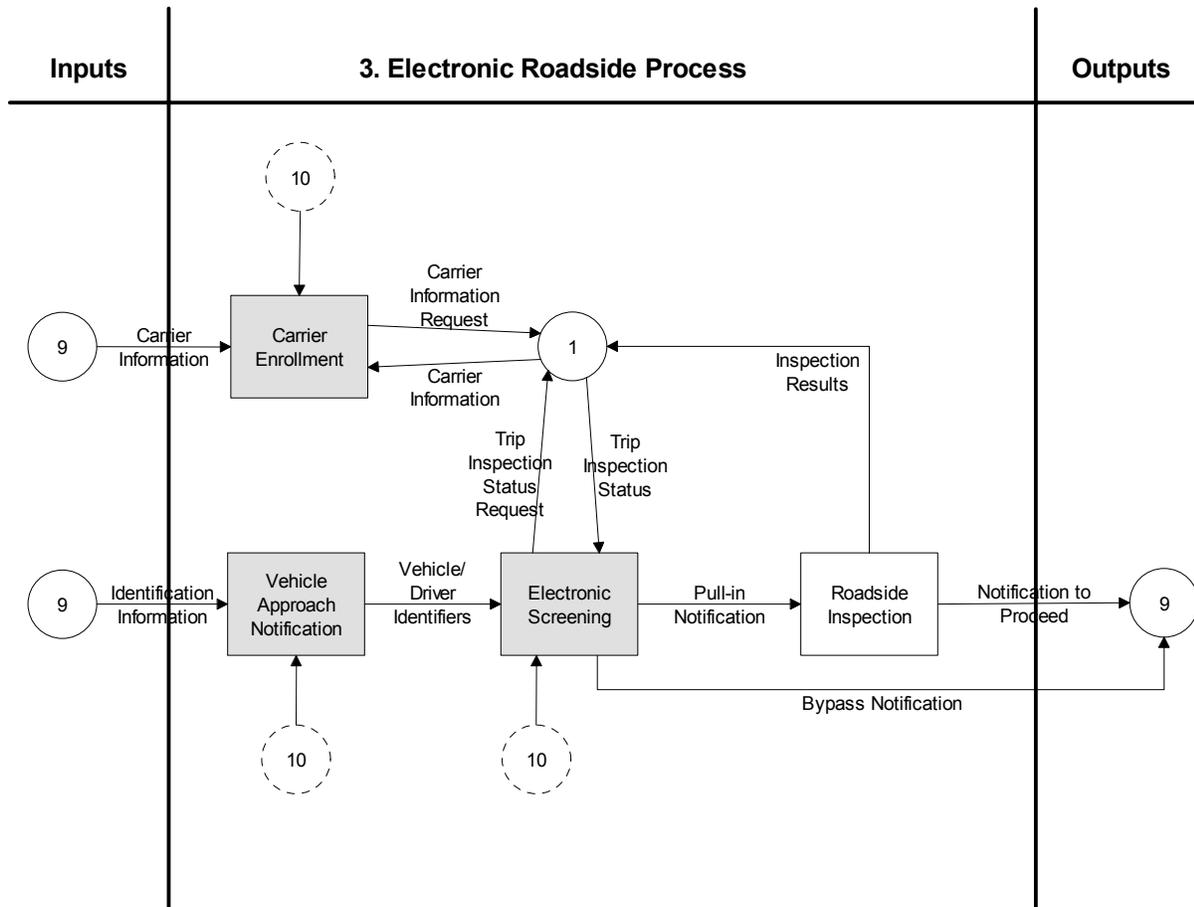
### 4.4.3 Stakeholders

The stakeholders involved in the data repository processes include all of the participating public-sector corridor jurisdictions and private sector carriers and service providers involved in credentialing, permitting, and international border movements. The stakeholders for each user service will be included within the appropriate sections:

3. Electronic Roadside Clearance
4. Electronic Credentialing
5. Electronic Permitting
6. Incident Management
7. Electronic Border Clearance.

### 4.5 PROCESS 3: ELECTRONIC ROADSIDE CLEARANCE

The electronic roadside process enables a commercial vehicle to be identified and its credentials and safety information checked electronically upon approach to a public inspection station. Vehicles meeting legal specifications may be allowed to bypass the inspection station without stopping, saving the carrier time and enabling enforcement jurisdictions to better utilize personnel resources (see Figure 9).



**Legend:**

- 1 Regulatory and Enforcement Data Collection and Distribution Processes
- 9 Private-Sector Freight Management Electronic Processes
- 10 Corridor Governance Processes

**Figure 9: Information Flow Diagram for Process 3**

### 4.5.1 Information Flows

An enrolled vehicle is identified through automatic vehicle identification technology upon approach to a roadside inspection station. The vehicle's credentials, operating status and safety history are checked electronically. Compliant vehicles are notified to bypass the facility, while others are notified to pull-in for inspection. Stopped vehicles are inspected through the same process as those vehicles not enrolled for electronic screening. After inspection the driver is notified of any enforcement action or cleared to proceed. The Corridor CVO Regulatory and Enforcement Data Center is updated so that other jurisdictions have the information available.

#### 4.5.1.1 Inputs

**Carrier Information** - Carriers (process #9) choosing to enroll in the corridor roadside screening process will provide the necessary information for the carrier and its vehicles and drivers, e.g.:

- Carrier – Carrier name, address, and DOT number,
- Vehicles – License plate numbers and/or VINs,
- Drivers – CDL numbers.

**Identification Information** – As vehicles approach a roadside weigh/inspection station, the vehicles (process #9) provide or transmit some form of identification, e.g., transponder identifier or license plate numbers.

#### 4.5.1.2 Processes

**Carrier Enrollment** – Carriers choosing to enroll in the corridor roadside screening process will provide the necessary information. It is anticipated that the information and identifiers will allow corridor jurisdictions to verify a carrier's operating authority, insurance, and safety history as a prerequisite to enrollment.

**Vehicle Approach Notification** – The vehicle approach notification process is the process by which a vehicle enrolled in the electronic screening program is identified upon approach to a public roadside inspection station. Roadway sensors detect the approaching vehicle and read some form of vehicle identification, which is forwarded to the electronic screening process.

**Electronic Screening** – The purpose of the electronic screening process is to relay vehicle bypass status to the driver. Upon receipt of a vehicle identifier, the electronic screening system queries the Corridor CVO Regulatory and Enforcement Data Center for the vehicle's current bypass status. Based on the bypass status returned, a signal is sent to the vehicle driver indicating whether the vehicle is to pull-in for inspection or may bypass the inspection facility without stopping.

**Corridor CVO Regulatory and Enforcement Data Check** – The purpose of the interface to this process is to provide vehicle bypass status to the electronic screening system when queried. The Corridor CVO Regulatory and Enforcement Data Center (process #1) maintains records related to a vehicle's bypass status and a check flag indicating current eligibility for bypass. Bypass eligibility is based on adherence to the pre-determined enrollment requirements. The data center can also be queried to determine if a vehicle and/or driver has been inspected already within a certain time period.

**Roadside Inspection** – Those vehicles receiving notification to pull-in must go through a manual inspection process. This is the same process used for vehicles not enrolled in electronic screening. Based on the results of the manual inspection, the vehicle driver is notified to proceed or enforcement action is taken against the vehicle. Results of the inspection and actions taken are sent to the Corridor CVO Regulatory and Enforcement Data Center.

**Corridor Governance** – The corridor organization (process #10) described in the project plan will need to provide policy guidance regarding three areas; carrier enrollment, roadside notification, and electronic screening.

- **Carrier Enrollment** – The corridor organization must define the enrollment process, information requirements, enrollment criteria, and minimum acceptable safety standards
- **Roadside Notification** – The technology used for roadside notification must be interoperable along the corridor and therefore requires a corridor decision
- **Electronic Screening** – The screening criteria should be consistent along the corridor with the exception of random checks.

In addition to policy, operational issues such as standard identifiers, message formats, and how soon after an inspection the inspection data is to be available must be agreed upon.

#### **4.5.1.3 Outputs**

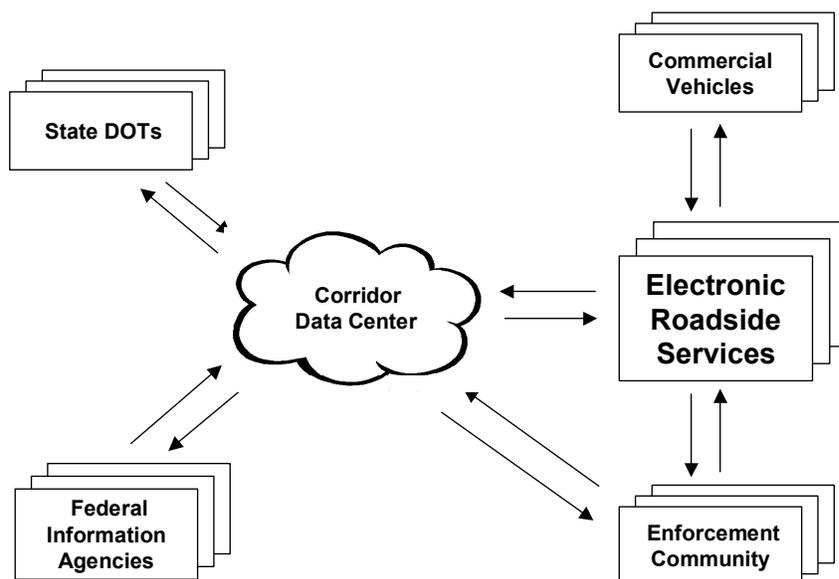
**Bypass Notification** - Vehicles and drivers (process #9) cleared to bypass will be sent a bypass notification via the communication technology.

**Notification To Proceed** – Inspected vehicles and drivers (process #9) will be notified of their approval to proceed.

#### **4.5.2 Implementation Approach**

The Electronic Roadside Process is implemented through the application of automated vehicle detection systems and electronic screening. The screening relies on the

availability of information, either real time or during a carrier enrollment process. If roadside screening is accomplished with a check against enrolled carriers, a model used today in many States, it is still recommended that real time safety and credentials information be made available to enforcement personnel at the roadside. A real time data link to the roadside provides any additional information required by the inspector, allows inspectors to query for information on unenrolled carriers, and allows other corridor roadside facilities to see the results of inspection actions in a timely fashion. As the Figure 10 illustrates, the Corridor CVO Regulatory and Enforcement Data Center is the mechanism for this information exchange for all participating corridor jurisdictions.



**Figure 10: Data Center Information Exchange Schematic for Roadside Services**

#### 4.5.2.1 Roadside Data

The CVISN snapshot for roadside use is included below in Figure 11. The snapshot contains carrier, vehicle, and driver identifiers as well as safety and credentials information. What is important from a corridor perspective is that all participating states, provinces, and jurisdictions agree on the data to be shared. The CVISN snapshot is a starting point, but the data center could distribute tailored snapshots if necessary. The non-CVISN and CVISN jurisdictions would provide the requested information for their base-state carriers, and the corridor data center would distribute the data in snapshot format to any participating corridor jurisdiction requesting the data. The corridor data center would access the SAFER system as well as corridor state CVIEW or CVIEW-like systems that provide access to jurisdictional data on carriers and vehicle. The data center could access driver information through the CDLIS.

### 4.5.2.2 Carrier Enrollment Data

The data elements contained in the following CVISN transaction set (Figure 19) represent the starting point for the data required for carrier enrollment in electronic screening programs.

Accredited Standards Committee (ASC) X12 EDI Transaction Set (TS) 286  
(Volume VII – Electronic Screening Enrollment Transactions)

**Figure 11: CVISN Snapshot**

Data → ↓Snapshot	Identifier/Census Data	Safety Information	Credential Information
Carrier	<ul style="list-style-type: none"> <li>● <sup>1</sup>Primary Carrier ID;</li> <li>● Other IDs (e.g., Taxpayer ID, DUNS, IRP account, etc.);</li> <li>● Names;</li> <li>● Addresses;</li> <li>● Type;</li> <li>● Operations Characterization</li> </ul>	<ul style="list-style-type: none"> <li>● Safety Ratings;</li> <li>● Accident, Inspection &amp; Violation Summaries;</li> <li>● Safety Review History;</li> <li>● <sup>1</sup>Last OOS*;</li> <li>● PRISM* Data</li> </ul>	<ul style="list-style-type: none"> <li>● Carrier Registration;</li> <li>● Fuel Tax Data;</li> <li>● Insurance Data;</li> <li>● HazMat Registration;</li> <li>● <sup>1</sup>Permit Data;</li> <li>● Electronic Screening Enrollment;</li> <li>● Carrier Check Flags (e.g., IRP &amp; IFTA flags)</li> </ul>
Vehicle	<ul style="list-style-type: none"> <li>● <sup>1</sup>VIN;</li> <li>● <sup>1</sup>Vehicle Plate ID</li> <li>● Other IDs (e.g., Plate, IRP Account, CVIS Default Carrier, Transponder, Title Number);</li> <li>● Vehicle Description</li> </ul>	<ul style="list-style-type: none"> <li>● Last Inspection Overview;</li> <li>● Inspection &amp; Violation Summaries;</li> <li>● <sup>1</sup>Last OOS;</li> <li>● CVSA* Decal Data;</li> <li>● PRISM Data</li> </ul>	<ul style="list-style-type: none"> <li>● Apportionment (i.e., Cab Card Data);</li> <li>● <sup>1</sup>Permit Data;</li> <li>● Electronic Screening Enrollment;</li> <li>● Vehicle Check Flags: (e.g., Registration Check Flag)</li> </ul>
Driver (Future)	<ul style="list-style-type: none"> <li>● <sup>1</sup>Driver Unique ID;</li> <li>● <sup>1</sup>Home State;</li> <li>● Names;</li> <li>● Address;</li> <li>● DOB*, Sex;</li> <li>● Citizenship</li> </ul>	<ul style="list-style-type: none"> <li>● Last Inspection Overview;</li> <li>● Accident Summary;</li> <li>● Inspection &amp; Violation Summaries;</li> <li>● <sup>1</sup>Last OOS</li> </ul>	<ul style="list-style-type: none"> <li>● Driver Check Flags (e.g., DMV* Check Flag)</li> </ul>

● As of April 2001, fields populated in the SAFER database for interstate  
Note: 1 = Data are current; all other data are historical

\*CVSA ñ Commercial vehicle Safety Alliance

\*DMV ñ Division of Motor Vehicles

\*DOB ñ Date of Birth

\*OOS ñ Out-of-Services

\*PRISM ñ Performance and Registration Information Systems Management

### 4.5.3 Stakeholders

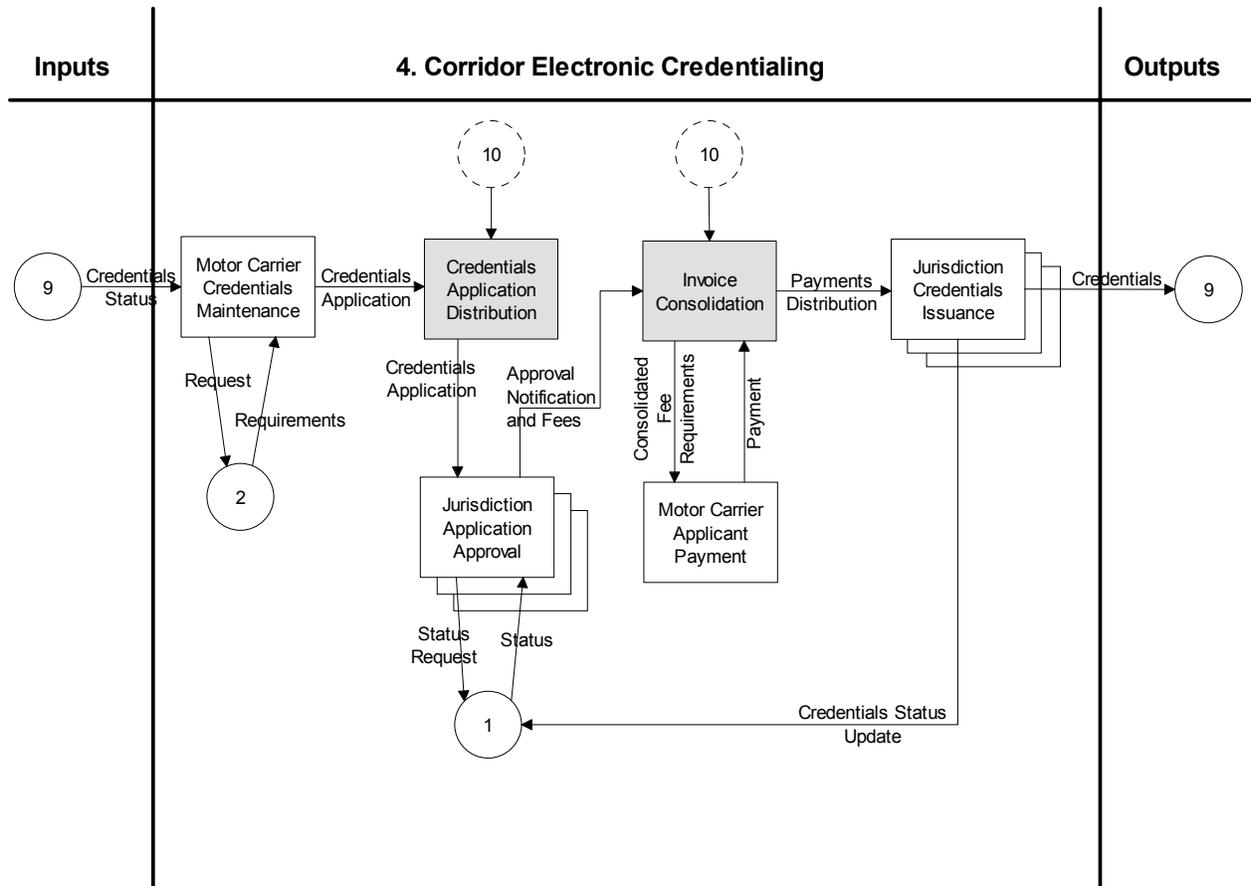
The stakeholders involved in the electronic roadside processes include all of the participating public-sector corridor jurisdictions, the CVO enforcement community, and private sector motor carriers. The public sector roadside information stakeholders are listed in Table 17.

**Table 17: Process 3: Public-Sector Stakeholders**

	<b>Manitoba</b>	<b>North Dakota</b>	<b>South Dakota</b>	<b>Minnesota</b>	<b>Iowa</b>	<b>Kansas</b>	<b>Missouri</b>	<b>Oklahoma</b>	<b>Texas</b>
<b>Roadside vehicle inspection</b>	Compliance and Regulatory Services-- Transportation and Government Services	Highway Patrol, Motor Carrier Division	Highway Patrol, Motor Carrier Enforcement	Dept. of Public Safety, State Patrol Division, Commercial Vehicle Enforcement Section	DOT, Motor Vehicle Div., Motor Vehicle Enforcement	Highway Patrol	State Highway Patrol, Commercial Vehicle Enforcement	Oklahoma Highway Patrol, Commercial Vehicle Enforcement	Texas Dept. of Public Safety, Commercial Motor Vehicle Enforcement
<b>Maintain inspection records</b>	Carrier profiles, Transport Safety and Regulation, Mandatory Safety Inspections and driver profiles, Division of Driver and Vehicle Licensing-- Transportation and Government Services	Highway Patrol, Motor Carrier Division	Highway Patrol, Motor Carrier Enforcement	DOT, Office of Motor Carrier Services**	DOT, Motor Vehicle Div., Motor Vehicle Enforcement	Highway Patrol	State Highway Patrol, Commercial Vehicle Enforcement	Oklahoma Highway Patrol, Commercial Vehicle Enforcement	Texas Dept. of Public Safety, Commercial Motor Vehicle Enforcement
<b>Electronic Screening - Establish criteria</b>	N/A								N/A
<b>- Maintain records</b>	N/A	Highway Patrol, Motor Carrier Division	Highway Patrol, Motor Carrier Enforcement	Dept. of Public Safety, State Patrol Division, Commercial Vehicle Enforcement Section	DOT, Motor Vehicle Div., Motor Vehicle Enforcement	Highway Patrol and Kansas Turnpike Authority	State Highway Patrol, Commercial Vehicle Enforcement	Oklahoma Tax Commission, Motor Vehicle Section	
	N/A	Highway Patrol, Motor Carrier Division	Highway Patrol, Motor Carrier Enforcement	Dept. of Public Safety, State Patrol Commercial Vehicle Enforcement Section	Dept. of Transportation, Motor Vehicle Div., Motor Vehicle Enforcement	Highway Patrol	State Highway Patrol, Commercial Vehicle Enforcement	Oklahoma Tax Commission, Motor Vehicle Section	

### 4.6 PROCESS 4: CORRIDOR ELECTRONIC CREDENTIALING

The purpose of the Electronic Credentialing Process is to enable a motor carrier company to apply for, receive, and renew vehicle credentials electronically. Credentials include carrier operating authority, vehicle registrations, and fuel tax. Operating authority and vehicle registration must be updated yearly, while fuel tax is reconciled on a quarterly basis (see Figure 12).



**Legend:**

- 1 Regulatory and Enforcement Data Collection and Distribution Processes
- 9 Private-Sector Freight Management Electronic Processes
- 2 Corridor CVO and Trade Regulatory Requirements Storage Processes
- 10 Corridor Governance Processes

**Figure 12: Information Flow Diagram for Process 4**

A motor carrier submits credentials applications and renewal information through an interface system. The interface checks applications for completeness before forwarding them to appropriate credentialing agencies. These agencies review applications to determine application approval status. They access external and internal databases for regulatory and enforcement data, when necessary. For approved applications, invoices for required fees are generated and provided to the motor carrier through the interface system. Once payment is received, appropriate credentials are issued to the motor carrier and the Corridor CVO Regulatory and Enforcement Data (process #1) is updated.

#### **4.6.1 Information Flows**

##### **4.6.1.1 Inputs**

**Credentials Status** – Carriers (process #9) will maintain the current status of their fleet credentials. Credential renewal, the purchase of new vehicles, and the disposal of vehicles will initiate the process.

##### **4.6.1.2 Processes**

**Motor Carrier Credentials Maintenance** – Fleet operators must apply for and update vehicle credentials on a regular basis. The motor carrier credentials maintenance process is the process by which the motor carrier company or fleet operator keeps track of vehicle credentials status and determines the need for updates. Personnel responsible for this activity may access the Corridor CVO Regulatory and Trade Requirements Repository, process #2, to determine applicable regulatory requirements. Once the requirements for new credentials or updates are determined, credentials application information for all relevant jurisdictions are output to the Credentials Application Distribution sub-process.

**Corridor CVO Regulatory and Trade Requirements Repository** – This process enables a fleet operator to determine credentials regulatory requirements for jurisdictions along the corridor by accessing a data repository of this information (process #2). A request is submitted for operating authority, vehicle registration, and/or fuel tax requirements, and the credentials requirements are returned.

**Credentials Application Distribution** – The credentials application distribution process ensures that applications are complete before forwarding them to appropriate credentialing agencies. Carriers submit applications through an interface system. The system checks applications for completeness and requests missing information from the applicant. Completed applications are distributed to one or more applicable credentialing agencies for review and approval status.

**Jurisdiction Application Approval** – The appropriate jurisdictions administer their credentials applications. Credentials administration may include multiple agencies within those jurisdictions depending on the credentials requested. Credentialing agencies receive application information and access the Corridor CVO Regulatory and Enforcement Data Center, if necessary, to check the status of carrier credentials. They determine approval status and provide notification and fee information to the Invoice Consolidation sub-process.

**Corridor CVO Regulatory and Enforcement Data Check** – This process provides a carrier’s credentials status. A query is made to the Corridor CVO Regulatory and Enforcement Data Center (process # 1) from a corridor jurisdiction, and credentials status is returned.

**Invoice Consolidation** – The invoice consolidation process generates a combined fee requirements statement for all approved credentials. The fee requirements statement is communicated to the motor carrier through the interface system. The carrier prepares and submits payment to the treasury unit who, in turn, notifies the applicant and credentialing agencies of payment receipt. Individual payments are distributed to appropriate jurisdictions per the corridor organization charter and agreements.

**Motor Carrier Applicant Payment** – This is the process by which a motor carrier decides upon the method to be used (Electronic Funds Transfer (EFT), Credit Card, Check) and initiates the selected method to satisfy the outstanding invoice.

**Jurisdiction Credentials Issuance** – The purpose of this process is to issue credentials to the applicant. This is done by the credentialing agencies upon notification of fee payment receipt.

**Corridor CVO Regulatory and Enforcement Data Update** – In this process, credentialing agencies update the Corridor CVO Regulatory and Enforcement Data Center (process # 1) with notification of credentials status changes.

**Corridor Governance** - The corridor organization (process # 10) described in the project plan will need to provide policy guidance regarding two areas; Credentials Application Distribution and Invoice Consolidation. These two sub-processes provide motor carriers a single place for credentials and fee payment, and fuel tax apportionment and payment.

- **Credentials Application Distribution** – The corridor organization must define the “standardized” user interface and credentials application processes for operating authority, vehicle registration and fuel tax, information requirements, and jurisdiction participation criteria.

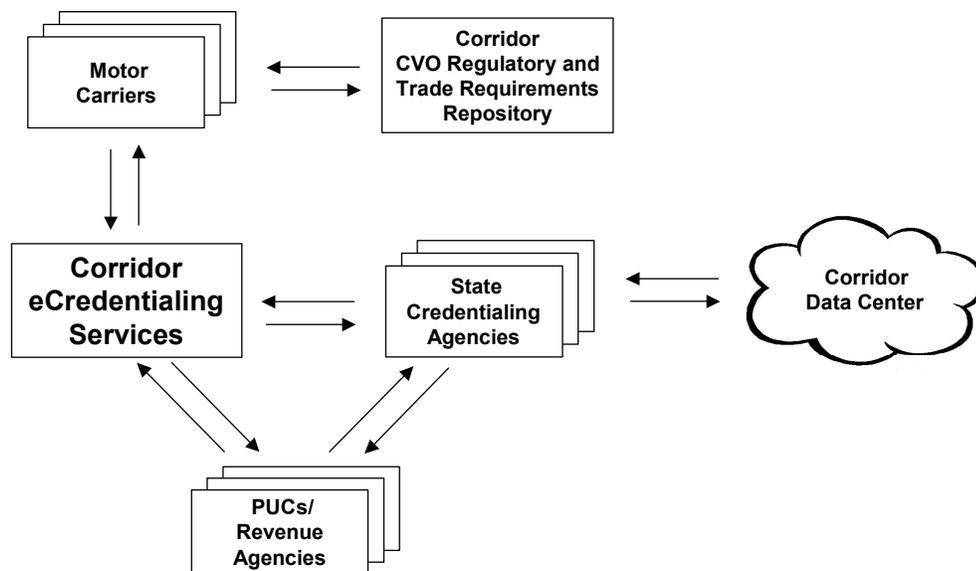
- **Invoice Consolidation** – The corridor organization must agree on the invoicing approach, the use of electronic funds transfer, and the funds distribution process and timing.

#### 4.6.1.3 Outputs

**Credentials** – Carriers (process #9) will receive their fleet credentials from the appropriate jurisdictions.

#### 4.6.2 Implementation Approach

The Corridor Electronic Credentialing Process is implemented through the application of e-credentialing services. These services will provide motor carriers a single interface for credentials applications and credentials payments as shown in Figure 13.



**Figure 13: Credentialing Services Interfaces**

Vehicle and credential information should comply with the requirements and guidelines administered by the IRP, the IFTA, and the Single State Registration System (SSRS) programs. The data elements contained in the CVISN transaction set 286 represent the starting point for the IRP and IFTA credentials data exchanges.

Accredited Standards Committee (ASC) X12 EDI Transaction Set (TS) 286  
Volume I – IRP Credential Transactions  
Volume III – IFTA Credential Transactions

### **4.6.3 Stakeholders**

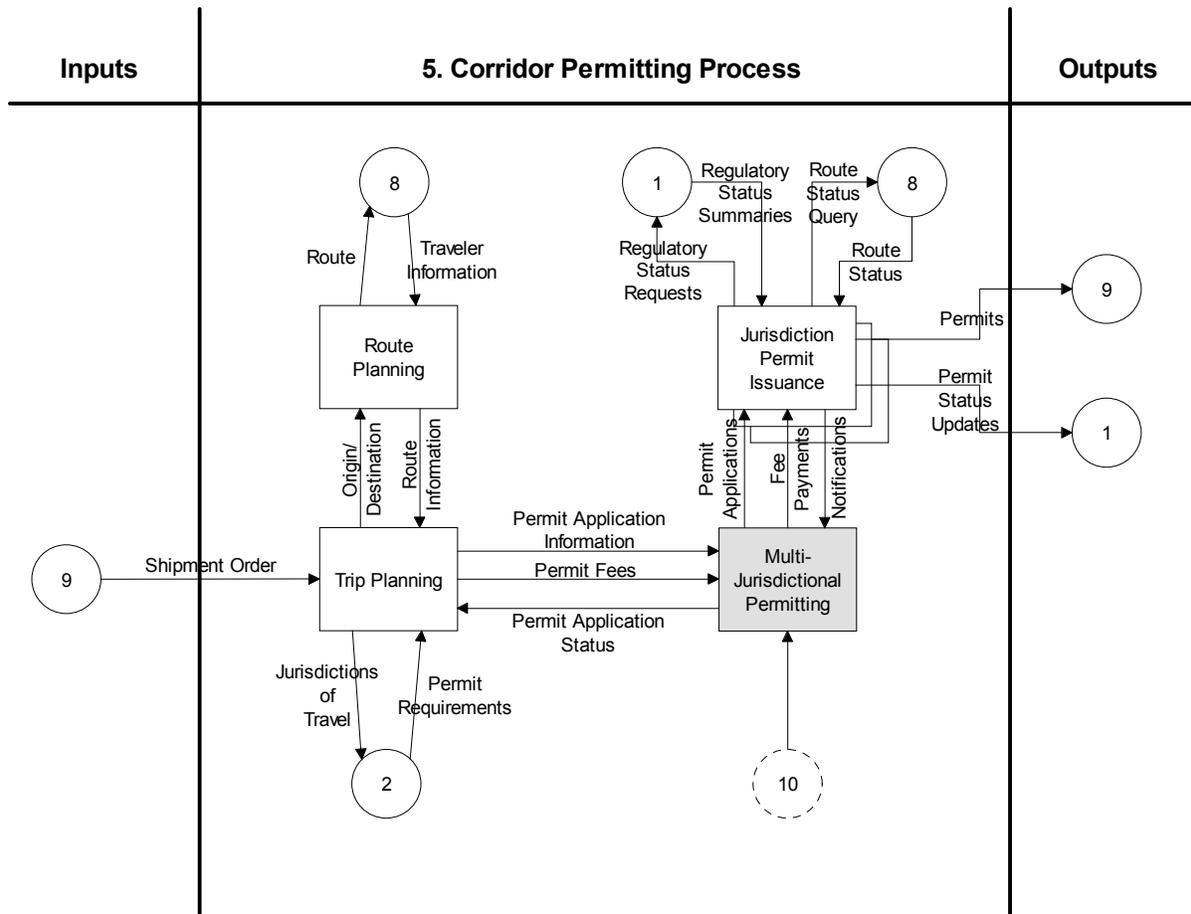
The public sector corridor stakeholders of the IRP, IFTA, and SSRS programs are listed in Table 18.

**Table 18: Public-Sector Stakeholders for Process 4**

	<b>Manitoba</b>	<b>North Dakota</b>	<b>South Dakota</b>	<b>Minnesota</b>	<b>Iowa</b>	<b>Kansas</b>	<b>Missouri</b>	<b>Oklahoma</b>	<b>Texas</b>
<b>IRP</b>	Commercial Vehicle Registration, Division of Driver and Vehicle Licensing--Transportation and Government Services	DOT, Motor Vehicle Div., Motor Carrier Section	Dept. of Revenue, Div. Of Motor Vehicles	Dept. of Public Safety, Driver and Vehicle Services Division	DOT, Motor Vehicle Div., Motor Carrier Services	Dept. Of Revenue, Div. Of Motor Vehicles, Motor Carrier Services	Highway Reciprocity Commission (Missouri Department of Revenue)	Oklahoma Tax Commission, Motor Vehicle Section	Texas DOT, Vehicle Title and Registration Section
<b>IFTA</b>	Department of Finance	DOT, Motor Vehicle Div., Motor Carrier Section	Dept. of Revenue, Div. Of Motor Vehicles	Dept. of Public Safety, Driver and Vehicle Services Division	DOT, Motor Vehicle Div., Motor Carrier Services	Dept. Of Revenue, Div. Of Taxation, Motor Carrier Services	Highway Reciprocity Commission (Missouri Department of Revenue)	Oklahoma Tax Commission, Motor Vehicle Section	Texas State Comptrollers Office
<b>SSRS</b>	Motor Transport Board & Transport Safety and Regulation--Transportation and Government Services	DOT, Motor Vehicle Div., Motor Carrier Section	Public Utilities Commission, Transportation Div.	DOT, Office of Motor Carrier Services	DOT, Motor Vehicle Div., Motor Carrier Services	Kansas Corporation Commission	Dept. of Economic Development, Div. Of Motor Carrier and Railroad Safety	Oklahoma Corporation Commission, Transportation Division	Texas DOT Motor Carrier Division

### 4.7 PROCESS 5: CORRIDOR PERMITTING

The Electronic Permitting Process enables a carrier or designated representative to apply for special permits required by law for travel through one or multiple corridor jurisdictions. These may include permits for transporting OS/OW, or HazMat (see Figure 14).



**Legend:**

- 1 Regulatory and Enforcement Data Collection and Distribution Processes
- 9 Private-Sector Freight Management Electronic Processes
- 2 Corridor CVO and Trade Regulatory Requirements Storage Processes
- 10 Corridor Governance Processes
- 8 Traveler Information Processes

**Figure 14: Information Flow Diagram for Process 5**

Once a shipment order is received, the carrier will determine a route based on the origin and destination of travel and available traveler information. Based on the route, the carrier will determine permit and fee requirements for the jurisdictions of travel. The carrier will then submit requested information and fee payments to appropriate regulatory agencies through a multi-state permit application process. In return, the carrier will receive permits for travel.

#### **4.7.1 Information Flows**

##### **4.7.1.1 Inputs**

**Shipment Order** – Carriers (process #9) will receive an order to transport cargo that may be over dimension, overweight or hazardous. This will initiate the corridor permitting process.

##### **4.7.1.2 Processes**

**Trip Planning** – The purpose of this process is for a carrier or representative to prepare for a trip after a shipment order is received. This process includes determining vehicle routing and obtaining appropriate trip-related permits.

**Route Planning** – The purpose of this process is for a carrier to determine a route for a trip based on trip origin and destination, available traveler information, and approved routes for the type, dimensions, and weight of the cargo to be hauled.

**Traveler Information** – The traveler information process (#8) receives route definition from the route planning process and returns information about the status and restrictions applicable to the route.

**Corridor Regulatory Requirements Check** – A carrier must know the permit requirements, information to submit, and fee requirements of the jurisdictions of travel. Process #2 enables the carrier to check these requirements for the jurisdictions of travel prior to submitting applications.

**Multi-State Permitting** – This process enables a carrier to submit a single application for permits from one or multiple corridor jurisdictions. An interface system accepts application information and fees from the motor carrier and forwards it to appropriate permitting agencies. These agencies issue eligible permits to the applicant and send notifications to the interface system. The interface system informs the applicant of impending permit issuance and provides any accompanying instructions.

**Jurisdiction Permit Issuance** – Individual permit issuing agencies check permit applications received and issue permits based on receipt of required information and

fees and compliance with regulations. These agencies may also use traveler information processes to verify the acceptability of the proposed routes.

**Regulatory and Enforcement Data Collection and Distribution** – Jurisdiction Permit Issuance may send regulatory status requests to this function. The Regulatory and Enforcement Data Collection and Distribution Process (#1) will respond to the Jurisdiction Permit Issuance process with regulatory status summaries for each jurisdiction specified in the request.

**Traveler Information** – The traveler information process (#8) receives the proposed routes from the Jurisdiction Permit Issuance process and returns information about the status and restrictions applicable to the route.

**Corridor Governance** – The corridor organization (process #10) described in the project plan will need to provide policy guidance regarding the criteria for jurisdiction participation, the standardization of information requirements, the methods of fee payment and distribution, and the minimal acceptable response time for permit application response.

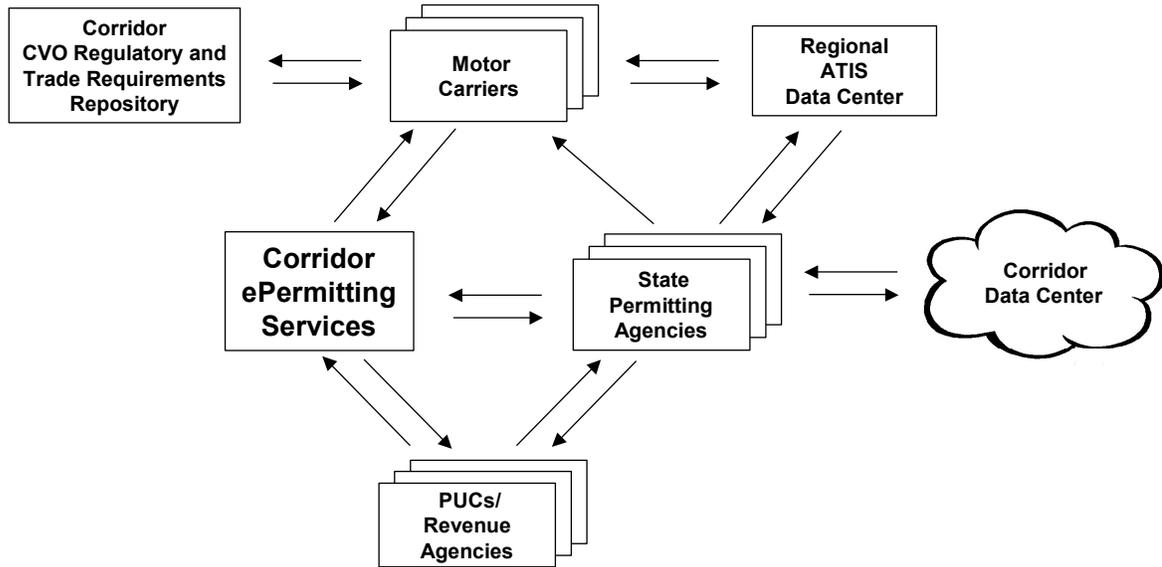
#### **4.7.1.3 Outputs**

**Permit Status** – Separate jurisdictional permit status updates are sent to this process (#1) from each jurisdiction.

**Permits** – Separate jurisdictional permits are sent to the motor carrier (process #9) from each jurisdiction.

#### **4.7.2 Implementation Approach**

The Corridor Permitting Process is implemented through the application of e-permitting services. These services will provide motor carriers a single interface for permit applications for all participating jurisdictions as shown Figure 15.



**Figure 15: e-Permitting Data Interfaces**

The data that makes up the permit applications for over dimension, overweight, and hazardous material permits must include the information required by the corridor jurisdictions. The Corridor CVO Regulatory and Trade Requirements Repository (process #2) will house the permit application data requirements for each participating corridor jurisdiction and for each type of permit. The repository will be accessible to motor carriers in support of their trip preparation processes. It would be beneficial over time to work as a corridor toward the standardization of permit data requirements in order to streamline the application processes for both the public and private sectors.

The data elements contained in the CVISN transaction set 286 represent the starting point for the oversize/overweight permit data exchanges.

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Regarding hazardous materials permit data, it can be seen in the following public sector stakeholders table that considerable coordination is necessary for not only the standardization of HazMat data requirements, but also in the approach to HazMat regulation. There is considerable variation in HazMat regulation stakeholders, policies and procedures amongst the corridor States.

### **4.7.3 Stakeholders**

The public sector corridor stakeholders of the permitting programs are listed in Table 19.

**Table 19: Public-Sector Stakeholders for Process 5**

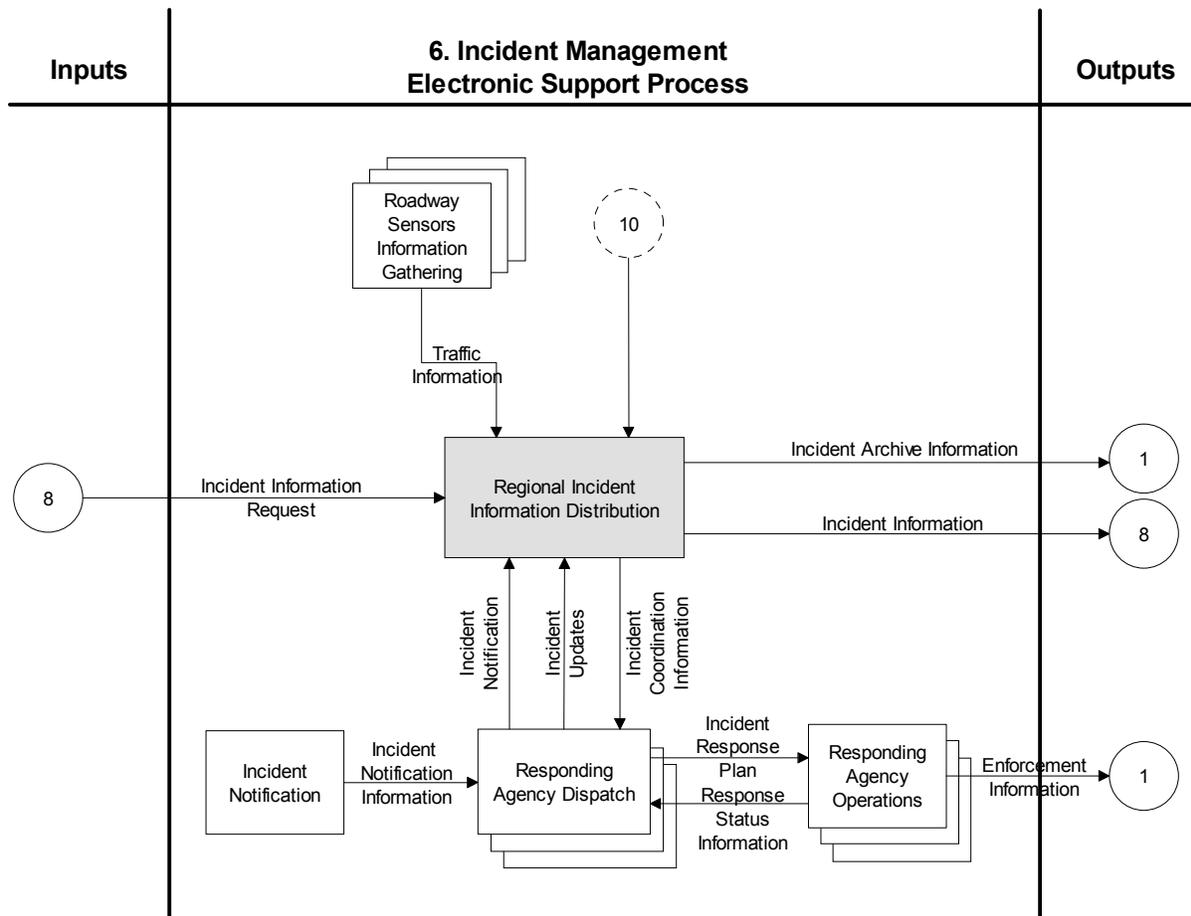
	<b>Manitoba</b>	<b>North Dakota</b>	<b>South Dakota</b>	<b>Minnesota</b>	<b>Iowa</b>	<b>Kansas</b>	<b>Missouri</b>	<b>Oklahoma</b>	<b>Texas</b>
<b>OS/OW Permits</b>	Compliance and Regulatory Services-- Transportation and Government Services	Highway Patrol, Motor Carrier Division	Highway Patrol, Commercial Vehicle Div.	DOT, Office of Motor Carrier Services	DOT, Motor Vehicle Div., Motor Carrier Services	DOT, Bureau of Traffic Engineering, Special Permits Section	DOT, Motor Carrier Services	Oklahoma Dept. of Public Safety, Size & Weight Permit Division	Texas DOT Motor Carrier Division issues permits. Tx Dept. of Public Safety enforces permits
<b>HAZMAT Permits</b>	Department of Environment	N/A*	N/A*	Dept. of Transportation, Office of Motor Carrier Services*	N/A*	N/A*	N/A*	Oklahoma Corporation Commission, Transportation Division	N/A*
		*North Dakota Department of Health issues Hazardous Waste Permits for carriers transporting hazardous wastes.	*South Dakota does not require a Special Permit to transport hazardous material or hazardous waste. However, South Dakota does require trucking companies to fill out a hazardous waste notification form if the trucking company is based in South Dakota and transports hazardous waste.	*Minnesota requires hazardous materials registration for carriers transporting HazMat in placarded quantities, and for carriers transporting hazardous wastes.	*Iowa does not require special permits for HazMat or hazardous waste transportation	*The Division of Environment of the Kansas Department of Health and Environment administers the Kansas Hazardous Waste Transportation Registration program. Hazardous Waste Transporter must pay an annual monitoring fee of \$250.00 and must also obtain an Environmental	*Missouri Dept. of Natural Resources, Div. Of Environmental Quality issues permits for carriers transporting hazardous wastes.		* Texas DOT Motor Carrier Division- Assigns HazMat Routes, but does not issue permits.

SYSTEM ARCHITECTURE

	Manitoba	North Dakota	South Dakota	Minnesota	Iowa	Kansas	Missouri	Oklahoma	Texas
						Protection Agency (EPA) identification number.			

**4.8 PROCESS 6: INCIDENT MANAGEMENT ELECTRONIC SUPPORT PROCESS**

Often several agencies are involved with handling an incident, and in some cases two or more jurisdictions must work together to address all the concerns. Jurisdictions can use technology to improve the techniques for handling incidents, particularly regarding interagency and inter-jurisdiction cooperation. Incident Management enables fast and efficient clearance of traffic incidents through organized inter-agency cooperation and distribution of accurate traffic and incident information. Integrated information gathering and communication processes supported by ITS infrastructure can significantly improve incident management practices (see Figure 16).



**Legend:**

- 1 Regulatory and Enforcement Data Collection and Distribution Processes
- 8 Traveler Information Processes
- 10 Corridor Governance Processes

**Figure 16: Information Flow Diagram for Process 6**

After an incident occurs, an incident management information center detects an incident through traffic data collection devices or receives notification of an incident via a responding agency dispatcher or system. Appropriate response personnel are dispatched to the incident scene to provide assistance and clear the incident. Responders send incident status updates and information requests to the regional coordination center and receive information as required. The center may also receive and process real-time information about traffic conditions and incident status updates from electronic information collection devices in the on the roadway. The center provides appropriate incident information and updates to traveler information service providers for distribution to the media, the traveling public, and other users. Incident notification, dispatch, response operations, incident information updating, and information distribution are carried out according to a pre-determined incident management plan. Finally, information about the incident and response activities are archived according to pre-determined archiving practices.

#### **4.8.1 Information Flows**

##### **4.8.1.1 Inputs**

**Incident Information Request** – The Traveler Information process (#8) requests incident information updates for distribution to traveler information users.

##### **4.8.1.2 Processes**

**Regional Incident Information Distribution** – The purpose of the Incident Management Information Distribution function is to collect, synthesize, and provide incident-related information to pre-determined users. An Incident Management Information Center receives notification of an incident from responding agency dispatchers or systems. The Information Center collects real-time data and information about the incident and traffic conditions around the incident through various detection devices and from responders. Detection devices may include roadway sensors, closed circuit television cameras, and traffic probe vehicle. Raw data from detection devices are processed into meaningful information within the Center. The Center makes information available in useful form to incident responding agencies. Information may be provided to the agencies in response to a request or through periodic updates. Incident and traffic information is also provided continuously or periodically to the Traveler Information Distribution Function. Finally, information about the incident and response activities is provided to the Incident Information Archive. All information distribution activities are conducted according to pre-determined procedures.

**Incident Notification** – The Incident Notification process is the process by which individuals involved in an incident notify public responders, e.g., a 911 call is placed to

a Public Service Answering Point (PSAP). The PSAP notifies appropriate responding agencies and the Incident Management Information Center of the incident.

**Responding Agency Dispatch** – The purpose of the Responding Agency Dispatch process is to provide direction to personnel responding to an incident. Notification of an incident is received by one or more responding agencies. These agencies act according to a pre-determined incident management plan to dispatch personnel to the scene. The responding agencies may request and receive additional information about the incident from the Incident Management Information center. This information may assist in decision-making about units to dispatch and on-site activities. Responding agencies may also communicate among one-another to coordinate incident response activities. Once personnel are on the scene, the responding agencies may relay information about the incident and incident clearance status reports to the Incident Management Information center.

**Responding Agency Operations** – Responding Agency Operations refer to incident response, incident clearance, and enforcement activities that take place at the incident scene. This may involve personnel from multiple responding agencies performing different functions. On-site personnel may receive instructions from a central dispatch or command office and may provide incident information and status updates to the command office or Information Center. In addition, a record of enforcement actions taken must be sent to the Regulatory and Enforcement Data Center (process # 1). Response activities and coordination will be conducted according to a Regional Incident Management Response Plan.

**Roadway Sensor Information Gathering** – The Incident Management Information center may receive data about traffic conditions near the incident from electronic sensors in or along the roadway. Raw data is fed on a periodic basis from the sensors to the information center, where it is processed into useful information.

- Live video images of the incident scene may be available in areas equipped with closed circuit television cameras. Control specifications will be sent from the information center to cameras near the incident scene. Live images will be returned.
- Probe vehicles may gather data to provide information about the speed of traffic flow. Probes may be automatic vehicle location devices on transit vehicles, police vehicles, or other public fleets, or private vehicles equipped with transponders or cellular phones. Probes provide location data continuously or at reader-points along the roadway. This data is sent to the Information Center where it can be compiled into traffic speed information.

**Corridor Governance** – The corridor organization (process # 10) described in the project plan will need to provide policy guidance regarding the definition of incident coordination regions, incident notification methods, dispatch coordination processes,

response operations coordination, incident information updating processes, incident information distribution criteria, and incident information archiving practices, i.e., regional incident management plans must be developed for the corridor regions and their participating jurisdictions.

#### **4.8.1.3 Outputs**

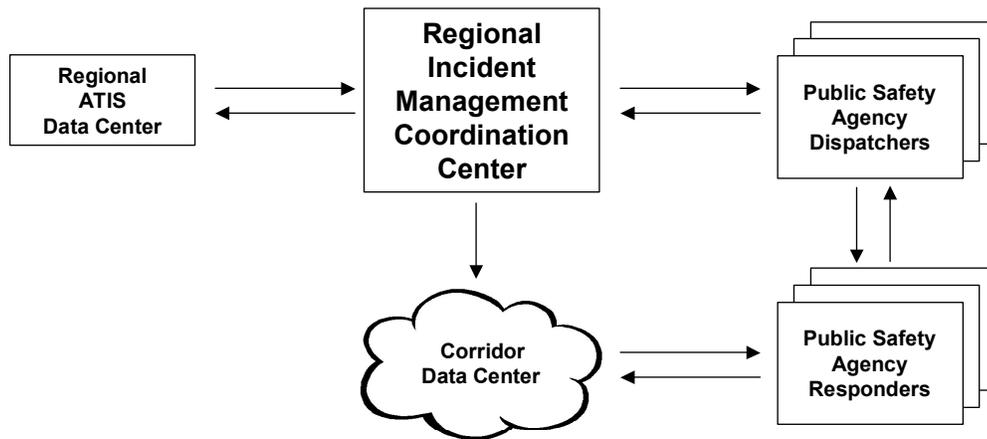
**Incident Information Archive** – The purpose of the Incident and Information Archive is to create and store a permanent record of incident and response information (process #1). This information may be used at a future point for such purposes as debriefing of response activities, training, research, or traffic modeling and simulation for transportation planning. Information will be archived according to predetermined guidelines.

**Incident Information** – Incident information updates are sent to the Traveler Information process (#8) for distribution to traveler information users.

**Enforcement Information** – A record of any enforcement actions taken at an incident scene are sent to the Corridor Regulatory and Enforcement Data Center (process #1).

### **4.8.2 Implementation Approach**

The Incident Management Electronic Support Process is implemented through the application of regional incident management coordination centers. These centers will provide the mechanism for information sharing and response coordination amongst jurisdictions and public safety responders. Figure 17 depicts their role in coordination. It is envisioned that the centers provide information and guidance to public safety dispatchers in accordance with established regional incident management plans, provide incident related information to traveler information systems, and provide incident archival information to the corridor regulatory and enforcement data center.



**Figure 17: Regional Incident Management Coordination Center Data Interfaces**

The data content of the incident management information flows will be developed as a byproduct of the regional incident management plans for the corridor regions.

### 4.8.3 Stakeholders

The State-level public sector corridor stakeholders of the incident management programs are listed in Table 20. In addition to the state agency stakeholders listed, there are many local agencies not listed that will need to be included in the development of regional incident management planning.

**Table 20: Public-Sector Stakeholders for Process 6**

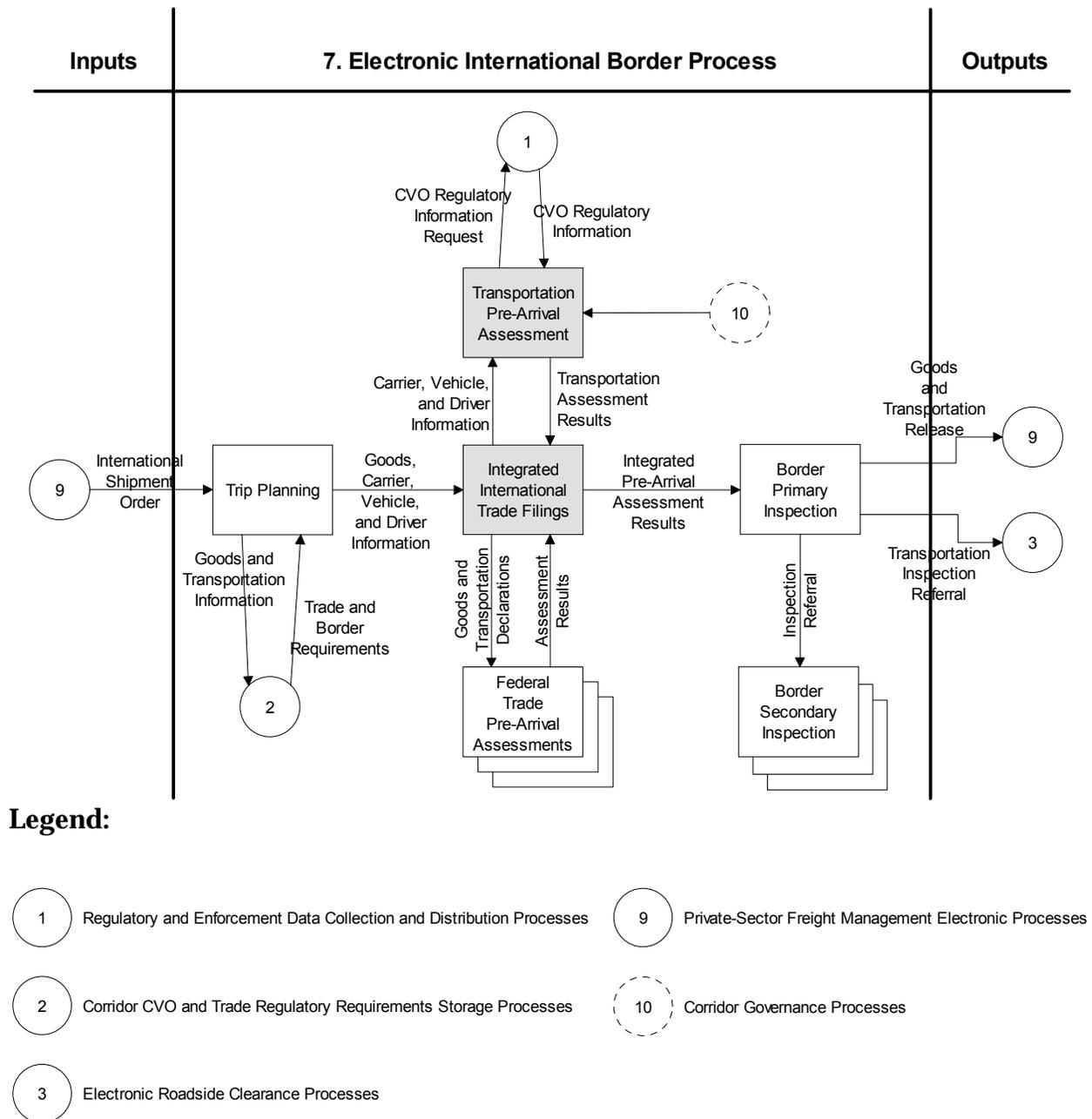
	<b>Manitoba</b>	<b>North Dakota</b>	<b>South Dakota</b>	<b>Minnesota</b>	<b>Iowa</b>	<b>Kansas</b>	<b>Missouri</b>	<b>Oklahoma</b>	<b>Texas</b>
<b>Statewide Incident Management point-of-contact</b>		Highway Patrol	DOT, Office of Research	Dept of Public Safety, Division of Emergency Management	Iowa State Patrol		State Emergency Management Agency (Lead), then State Highway Patrol both within Dept. of Public Safety	Oklahoma Civil Emergency Management	Texas Dept. of Public Safety, Div. Of Emergency Management
<b>HazMat response</b>	Department of Environment	Highway Patrol first responds, then State Fire Marshall has responsibility	Highway Patrol, and Dept. of Environmental and Natural Resources- Division of Environmental Services	DOT, Office of Motor Carrier Services*	Iowa State Patrol and DOT, Motor Vehicle Enforcement and Dept. Of Natural Resources, Compliance and Enforcement Bureau, Emergency Response Unit	Highway Patrol and Division of Emergency Management	State Highway Patrol secures the scene, re-routes traffic, etc. then Dept. of Natural Resources, Div. Environmental Quality, Environmental Services Program has responsibility	Oklahoma Highway Patrol	Texas Dept. of Public Safety, Div. Of Emergency Management

SYSTEM ARCHITECTURE

	Manitoba	North Dakota	South Dakota	Minnesota	Iowa	Kansas	Missouri	Oklahoma	Texas
				* The Duty Officer at the Division of Emergency Management distributes response requests, transportation-related incidents are generally assigned to Mn/DOT's Office of Motor Carrier Services					

### 4.9 PROCESS 7: ELECTRONIC INTERNATIONAL BORDER

The Electronic International Border process enables motor carriers or their designated representatives, in advance of arrival at the border, to obtain all necessary international trade regulations and procedures, to pre-file the proper trade declarations, and to receive advance border clearance status where applicable. These include transportation, customs, and immigration clearances. The process enables electronic filing and transmission of all required information (see Figure 18).



**Figure 18: Information Flow Diagram for Process 7**

After receiving an international shipment order and determining a route of travel, a motor carrier or designated representative must determine international border clearance requirements for the shipment. The company may access the trade and CVO regulatory requirements information repository to determine these requirements. Based on these requirements, the carrier electronically submits required information through an integrated international trade filing system. The system sends goods and driver information to appropriate federal agencies for assessment of border clearance status. Carrier, vehicle, and driver information undergo separate assessments to determine fitness to operate within the jurisdictions of travel. This information is verified through the Corridor CVO Regulatory and Enforcement Data center and an assessment is made about fitness to operate. Results of the federal agencies' assessments and the transportation assessment are forwarded to the international border compound prior to arrival of the vehicle. Upon arrival of the vehicle at the border, border inspectors determine the need for additional actions based on both the advance and real time assessments. Goods and drivers with proper federal clearances are released from the border compound. A decision is also made about whether to clear the vehicle for travel or refer it for roadside safety inspection outside of the border compound.

#### **4.9.1 Information Flows**

##### **4.9.1.1 Inputs**

**International Shipment Order** – The process begins with the order from a shipper, importer, or exporter to a motor carrier (process #9) to transport goods across an international border.

##### **4.9.1.2 Processes**

**Trip Planning** – The purpose of this process is for a carrier or representative to prepare for a trip once a shipment order is received. This process includes determining vehicle routing, jurisdictions of travel, border crossing point, and appropriate international trade and transportation requirements.

**International Trade Requirements Check** – A carrier must know the international trade requirements for border crossings. This process enables the motor carrier or representative to access a Corridor Regulatory and Trade Requirements Data Repository (process #2) to determine these requirements.

**Integrated International Trade Filings** – This is the process of submitting information to the appropriate federal trade and transportation agencies for border clearance assessments. Required information about the goods, carrier, vehicle and driver are inputs to the process. Goods and transportation information are forwarded to appropriate federal trade agencies for pre-arrival assessments. Transportation-related

information is input to the Transportation Pre-arrival Assessment Process. Once assessments are returned, they are provided to the appropriate federal agencies for assessments at the border crossing.

**Federal Trade Pre-Arrival Assessment** – Goods and driver declarations are received by appropriate federal agencies. Each agency reviews information and assesses border clearance eligibility, which it returns to the Integrated International Trade Filing Process. Multiple federal agencies may be involved in the pre-arrival assessments process, e.g. Customs, the INS, and the USDA.

**Transportation Pre-Arrival Assessments** – The purpose of this process is to make an assessment of the carrier's operating authority and vehicle and driver fitness to travel in the jurisdiction into which it is entering. Carrier, vehicle, and driver information are received as inputs to the process and forwarded to the Corridor CVO Regulatory and Enforcement Data center. After verification of this information is returned and any additional information received, an assessment is made within the Transportation Pre-Arrival Assessment Process about the vehicle transport eligibility status. This transportation assessment is returned to the Integrated International Trade Filings function.

**Corridor CVO Regulatory Information Check** – The purpose of this function is to verify information submitted to the Transportation Pre-Arrival Assessment function and provide additional regulatory and enforcement information to aid the assessment process. The Corridor CVO Regulatory and Enforcement Data center (process # 1) is the source of this information.

**Border Primary Inspection** – The purpose of this function is to determine the clearance status of the goods, vehicles, and drivers arriving at an international border crossing. Pre-arrival assessment results are received prior to the vehicle arrival at the border. Upon arrival of the vehicle, assessment results are used to determine the need for additional federal inspections or eligibility to clear the border. If additional inspection is necessary, required information is forwarded to the Border Secondary Inspection function, which returns final inspection results, after completion. Based on the inspection results and pre-arrival assessment information, the vehicle is cleared from the compound. Legal goods are released. Vehicles are either cleared for transport or referred for roadside safety inspection by the local jurisdiction outside the border compound.

**Border Secondary Inspection** – The purpose of this process is to perform federal inspections on goods, vehicles, or drivers that do not meet primary clearance requirements. This function is not expected to include vehicle or driver inspections for transportation regulatory compliance purposes.

**Corridor Governance** – The corridor organization (process #10) described in the project plan will need to provide policy guidance regarding inspection resources and facilities that could be made available to work with the corridor’s international border crossings. In addition, the Integrated International Trade Filings function described above represents a Federal function that has been piloted in the ITDS of the U.S. Customs Service. Customs has begun an initiative known as Customs Modernization to integrate existing Customs systems into an enterprise solution. The future, or replacement, for ITDS and the function it serves will be determined through the development activities of the Customs Modernization Office (CMO). The corridor organization will need to monitor CMO progress and, to the extent possible, participate in its activities.

#### **4.9.1.3 Outputs**

**Goods and Transportation Release** – Goods, vehicles, and drivers (process #9) are released from the international border compound.

**Transportation Inspection Referral** – Vehicles and/or drivers needing further inspection for transportation regulatory compliance purposes are referred to the designated roadside inspection facility within the border state. Inspections or documentation reviews are performed at the state roadside facility (process #3) based on the reason(s) for the referral.

#### **4.9.2 Implementation Approach**

The Electronic International Border Process is implemented through the application of integrated electronic systems for the filing of trade declarations and the pre-arrival electronic screening for compliance with both trade and transportation regulations for the countries of travel. The screening is anticipated to be performed by each agency with a regulatory function in international trade and transportation, e.g., the FMCSA for commercial vehicles entering the U.S. The compliance screening results will be made available to the federal border inspectors by the time the commercial vehicle arrives at the Customs primary booth. These systems and processes are largely under the purview of the ongoing U.S. Customs Modernization initiatives, and the corridor organization will need to follow and participate in those initiatives to the maximum extent possible.

The carrier, vehicle, and driver information collected from the international trade declarations are envisioned to primarily be identifiers. These may include the following.

Carrier Information:

- DOT Number and/or
- Carrier DUNS Number

**Vehicle Information:**

- Transponder Number and/or
- VIN and/or
- License Number
- License State/Province
- License Country

**Driver Information:**

- CDL Number and/or
- Name

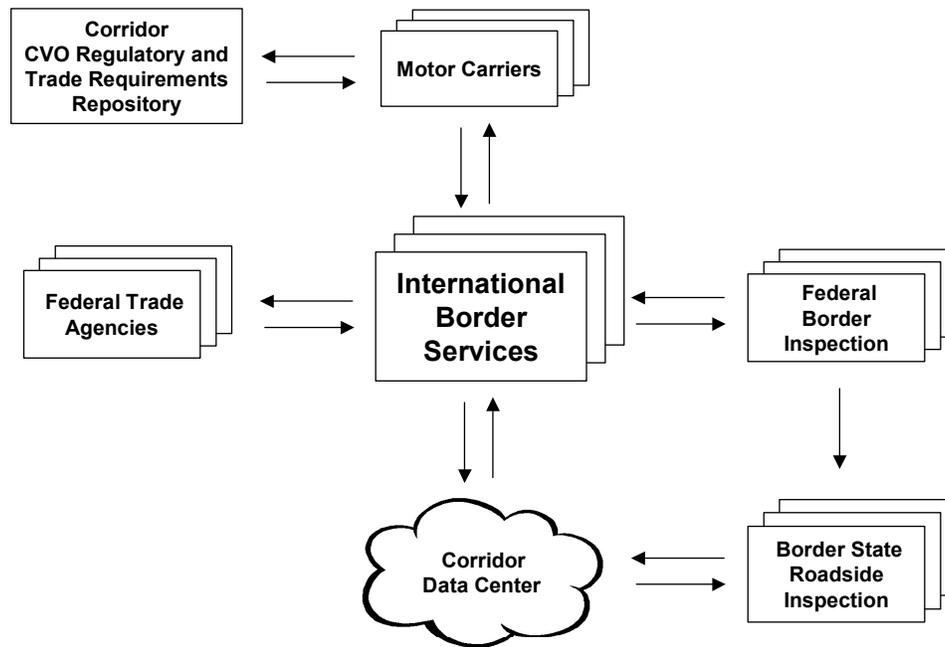
**Trip Equipment (trailer):**

- Equipment Type Code
- Equipment Number and/or
- License Number
- License State/Province
- License Country

**Transportation Related Goods Information:**

- Hazardous Indicator – Yes/No
- Hazardous Material Code
- Gross Shipping Weight
- Empty Indicator – Yes/No

The data provided for the Transportation Pre-Arrival Assessment is envisioned to be consistent with the data provided for roadside assessments, i.e., the CVISN snapshot data included in the Electronic Roadside Process section (see Figure 19 for data interface information).



**Figure 19: International Border Services Data Interfaces**

### 4.9.3 Stakeholders

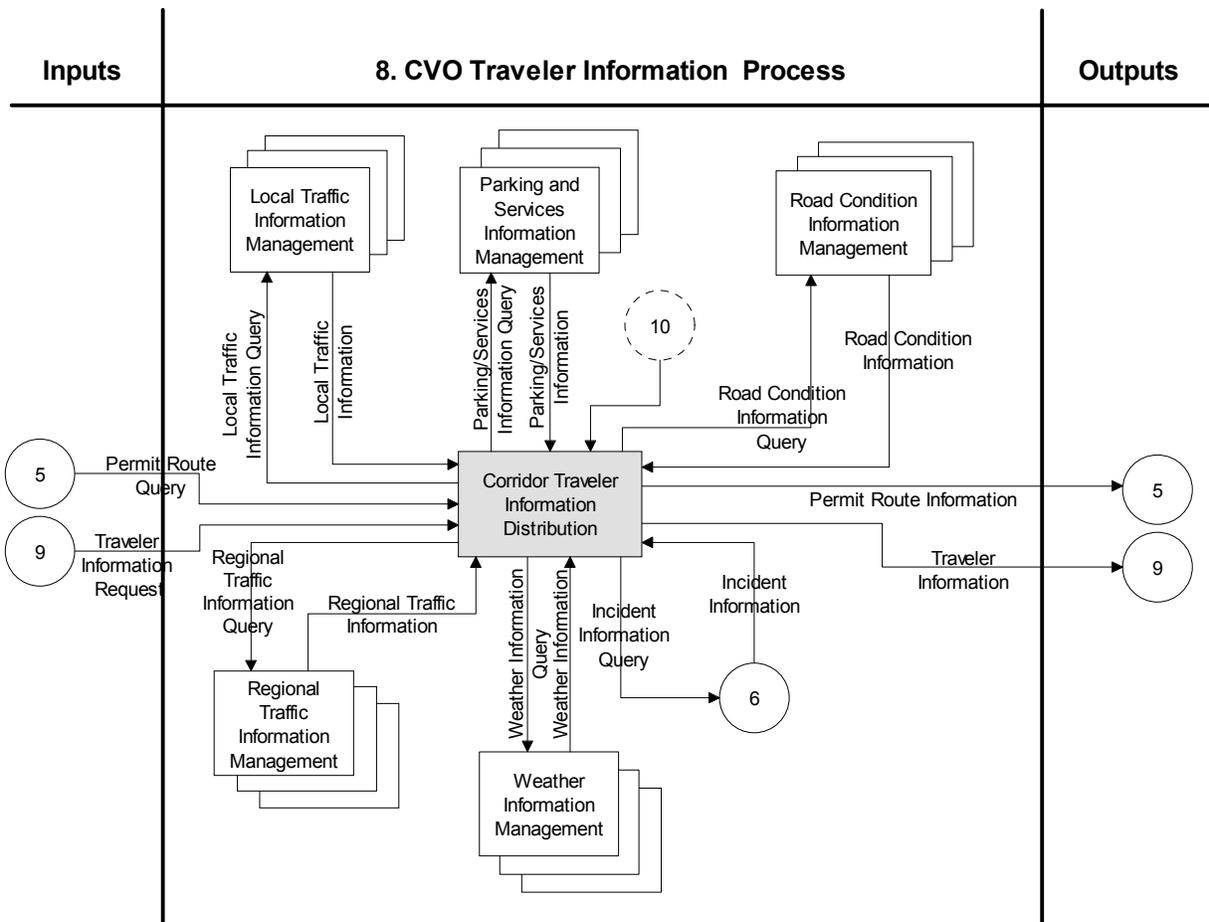
The public sector corridor stakeholders of the federal CVO information programs are listed in Table 21. The roadside inspection stakeholders are included because it is envisioned that commercial vehicle and driver inspections related to CVO regulatory compliance will be conducted by State CVO enforcement officers, not by the border Federal Inspection Services (FIS). There may not be space allocated at international border ports of entry for commercial vehicle and driver inspections, so the international border operations concept would include a border FIS agent directing the driver to proceed to a designated roadside facility for inspection.

**Table 21: Public-Sector Stakeholders for Process 7**

	Manitoba	North Dakota	South Dakota	Minnesota	Iowa	Kansas	Missouri	Oklahoma	Texas
<b>Roadside inspection</b>	Compliance and Regulatory Services--Transportation and Government Services	Highway Patrol, Motor Carrier Division	Highway Patrol, Motor Carrier Enforcement	Dept. of Public Safety, State Patrol Division, Commercial Vehicle Enforcement Section	DOT, Motor Vehicle Div., Motor Vehicle Enforcement	Highway Patrol	State Highway Patrol, Commercial Vehicle Enforcement	Oklahoma Highway Patrol, Commercial Vehicle Enforcement	Texas Dept. of Public Safety, Commercial Motor Vehicle Enforcement
<b>Data reporting to Federal systems</b>									
<b>- MCMIS</b>	CVSA Inspections, Transport Safety and Regulation--Transportation and Government Services	Highway Patrol, Motor Carrier Division	Highway Patrol, Motor Carrier Enforcement	DOT, Office of Motor Carrier Services	DOT, Motor Vehicle Div., Motor Vehicle Enforcement	Highway Patrol	State Highway Patrol, Commercial Vehicle Enforcement	Oklahoma Highway Patrol, Commercial Vehicle Enforcement	Texas Dept. of Public Safety, Commercial Motor Vehicle Enforcement
<b>- Licensing and Identification</b>	Division of Driver and Vehicle Licensing--Transportation and Government Services	DOT, Drivers' License and Traffic Safety Division	Dept. of Commerce and Regulation	Dept. of Public Safety, Driver and Vehicle Services Division	DOT, Motor Vehicle Div., Driver Services	Dept. Of Revenue, Div. Of Motor Vehicles, Motor Carrier Services	Dept. of Revenue, Driver Licensing Bureau	Oklahoma Dept. Of Public Safety, Drivers' License Services	Texas Dept. of Public Safety, Commercial Motor Vehicle Enforcement
<b>Provide CDLIS Input</b>	Division of Driver and Vehicle Licensing--Transportation and Government Services	DOT, Drivers' License and Traffic Safety Division	Dept. of Commerce and Regulation	Dept. of Public Safety, Driver and Vehicle Services Division	DOT, Motor Vehicle Div., Driver Services	Dept. Of Revenue, Div. Of Motor Vehicles, Driver Control Bureau	Dept. of Revenue, Driver Licensing Bureau	Oklahoma Dept. Of Public Safety, Drivers' License Services	Texas Dept. of Public Safety, Commercial Motor Vehicle Enforcement

**4.10 PROCESS 8: CVO TRAVELER INFORMATION**

The CVO Traveler Information process provides accurate and current information about travel and roadway conditions in multiple formats for various customers. Information is collected from multiple sources, processed, packaged and distributed in various information service products (see Figure 20).



**Legend:**

-  Electronic Permitting Processes
-  Private-Sector Freight Management Electronic Processes
-  Incident Management Processes
-  Corridor Governance Processes

**Figure 20: Information Flow Diagram for Process 8**

Customers of CVO Traveler Information are expected to include news and media organizations, public agencies, commercial vehicle drivers, and commercial vehicle dispatchers. Public agencies may use the information for traffic management and

transportation planning, while commercial vehicle customers may use the information for:

- Pre-trip routing and dispatching,
- En-route rerouting and rescheduling,
- Asset tracking and management,
- Monitoring driver performance variance versus schedules,
- Notification to customers of updated driver Estimated Time of Arrival (ETAs),
- Determining feasibility of new load opportunities.

Traveler information must be agglomerated from various sources, processed into useful information service products, and distributed to customers. This process enables these activities.

A corridor traveler information data system collects, processes, and fuses information and raw data from various public and private sources, including:

- Local Traffic Information Management
- Regional Traffic Information Management
- Parking and Services Information Management
- Weather Information Management
- Road Conditions Information Management
- Incident Information Management (process #6)

Information is received in standard formats. The Data System processes and fuses the data to create useful information outputs. The Data System may be held within the public or the private sector, or multiple data systems that exchange information may be developed, depending on the CVO Traveler Information Business Model selected by the Corridor Management Governance (process #10 in the diagram).

Fused traveler information must then be packaged into information service products for distribution. Distribution may be done directly by the Data System manager or by public/private partnerships. The types of information service products and partnership arrangements for information exchange must be determined through the CVO Traveler Information Business Model.

#### **4.10.1 Information Flows**

##### **4.10.1.1 Inputs**

**Permit Route Query** – The corridor jurisdiction permit issuance process (#5) sends proposed routes for over dimension, overweight, or hazardous loads to the traveler information process for status and restrictions applicable to the routes.

**Traveler Information Request** – Motor carriers or other users (process #9) of traveler information services send requests for traveler information.

##### **4.10.1.2 Processes**

**Local Traffic Information Management** – Local Traffic Information refers to information from local traffic management centers owned by local jurisdictions or private entities. This information may include:

- Real-time travel speed and congestion information on area roadways
- Incident information
- Special event notifications
- Road closures and restrictions
- Alternative travel routes
- Static or dynamic tolling rates.

Static information and real time updates will be provided to the Corridor Traveler Information Data System through a predetermined process. Applicable information from the Corridor Traveler Information system may be provided in return. The Corridor Management Governance must make arrangements with Local Traffic Information Managers to determine information exchange specifications and procedures.

**Regional Traffic Information Management** – Regional Traffic Information is traffic information for a multi-jurisdictional area. It may be a metropolitan area, rural area, or state. It includes the same types of information as for local areas but on a regional scale. Predetermined information will be exchanged between Regional Traffic Information Management Centers and the Corridor Traveler Information system. The Corridor Management Governance must make arrangements with Regional Traffic Information Managers to receive the desired information and determine a process for data exchange.

**Parking and Services Information Management** – Parking and Services Information refers to information about parking and rest stop availability and services for drivers and vehicles along the corridor. This information will be provided by service operators within the private sector or an Information Service Provider that collects this

information. Traveler information products may be sent in return to provide services within rest stops and other facilities. The Corridor Management Governance must make arrangements with these operators or information managers to receive the desired information and determine a process for data exchange.

**Weather Information Management** – Basic weather information to provide warnings of potentially unsafe travel conditions is available from public and private weather service providers. The Corridor Management Governance must make arrangements with weather service providers to determine specifications and a process for receiving desired information.

**Road Conditions Information Management** – Road Conditions Information refers to information about construction and maintenance work along the corridor and connecting roadways as well as real-time information about the road surface conditions from road-weather systems or other sensor systems. This information is usually owned by state departments of transportation or other public highway operators. The Corridor Management Governance must work with these agencies to determine a standard process for sending this information to the Corridor Traveler Information data system.

**Incident Information Management** – Information about incidents may be provided by local, regional, or state law enforcement agencies, public service answering points, traffic managers, or regional incident management information centers (process #6). The Corridor Management Governance must make arrangements with these entities to determine specifications and a process for receiving the desired incident information.

**Corridor Governance** – The corridor organization (process #10) described in the project plan will need to provide policy guidance regarding the information exchange specifications, procedures, and update frequency:

- Between local and regional traffic management centers and the traveler information data center(s),
- For receiving parking and service information from parking service operators,
- For receiving weather information from weather service providers,
- For receiving construction, maintenance, and road surface condition information from corridor agencies,
- For receiving incident information from corridor agencies or regional incident management centers.

### **4.10.1.3 Outputs**

**Permit Route Query** – The traveler information process sends route status and restrictions to the corridor jurisdiction permit issuance process (#5) for proposed over dimension, overweight, or hazardous load routes.

**Traveler Information Request** – The traveler information process sends traveler information to motor carriers or other requesters (process #9) of traveler information services.

### **4.10.2 Implementation Approach**

The development of an integrated ATIS/CVO system will require a high level of coordination and investment. The benefits of such a system can be high for the corridor States, both in terms of enhancing the efficiency of a significant economic sector in the corridor (trucking), but also in terms of overall improvements in highway operations through enhanced communications.

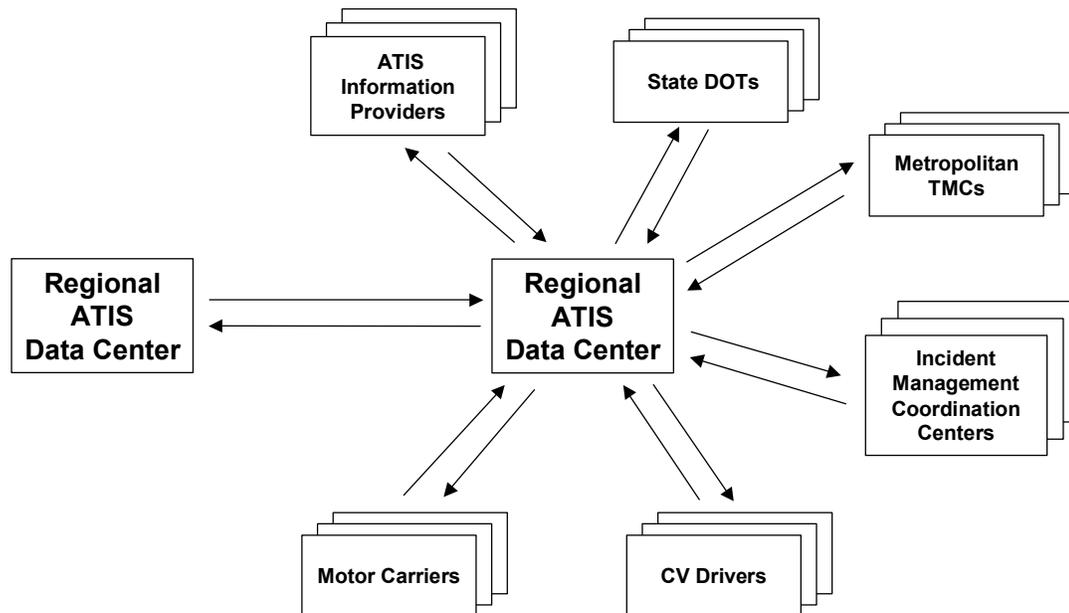
Additionally, a coordinated approach to ATIS/CVO among the corridor States can provide economies of scale and joint funding opportunities. Several approaches can be taken to achieve an effective corridor-wide ATIS/CVO system(s). The following presents potential strategies for implementing an ATIS/CVO program in the corridor. These activities could be strongly enhanced under the auspices of a regional authority or corridor organization.

- Formalize traffic operations relationships/dialogs to support regional data sharing and establish the necessary organizational structure(s) and/or Memoranda of Understanding (MOU) between parties.
- Establish a regional communications network linking Transportation Management Centers along corridor. A model can be found in the I-95 Corridor Coalition Information Exchange Network. The network can be used to support agency information exchange for improved highway operations/incident response and notification. It can also provide a single source or data stream supporting ATIS/CVO routing and dispatching software or notification systems that could provide incident reporting coverage for the non-metropolitan areas. The network should be consistent with the National ITS Architecture and technical Standards.
- Establish incident reporting format standards/procedures for posting to inter-jurisdictional network. This would include common incident descriptors and procedures for opening and closing incident events or other notifications. Message strings should be consistent with SAE J2XXX message standards.
- Develop quality assurance processes for the reporting of incident information. These would include the timely opening and closing of incident or event notifications, compliance with established descriptors for incidents or events, and procedures to

assure non-peak hour incident and event reporting is conducted according to standards.

- Develop relationships with private sector software and communications providers to develop applications for the ATIS/CVO information stream. These could include augmentation of the data stream for the inclusion of additional information of value to motor carriers.
- Demonstrate/publicize the benefits of the ATIS/CVO system to all potential stakeholders.
- Encourage stakeholders to advance ATIS-ATIS/CVO services by pursuing additional funding or establish revenue-generating business relationships to enhance/expand current levels of coverage.

Figure 21 illustrates the regional ATIS data center interfaces.



**Figure 21: Regional ATIS Data Center Interfaces**

The data content of traveler information messages for corridor or regional traveler information centers will be determined over time through pilot or development activities and service provider agreements. However, Table 22 expands on traveler information content based on the data needed to support the identified applications of traveler information. Typical data collection mechanisms and data integrators are also included.

### 4.10.3 Stakeholders

The public sector corridor stakeholders of the ATIS programs are listed in Table 23. Incident management points of contact are also included since incident management is seen as not only a user but also as a provider of traveler information.

**Table 22: Data Collection Mechanisms and Providers**

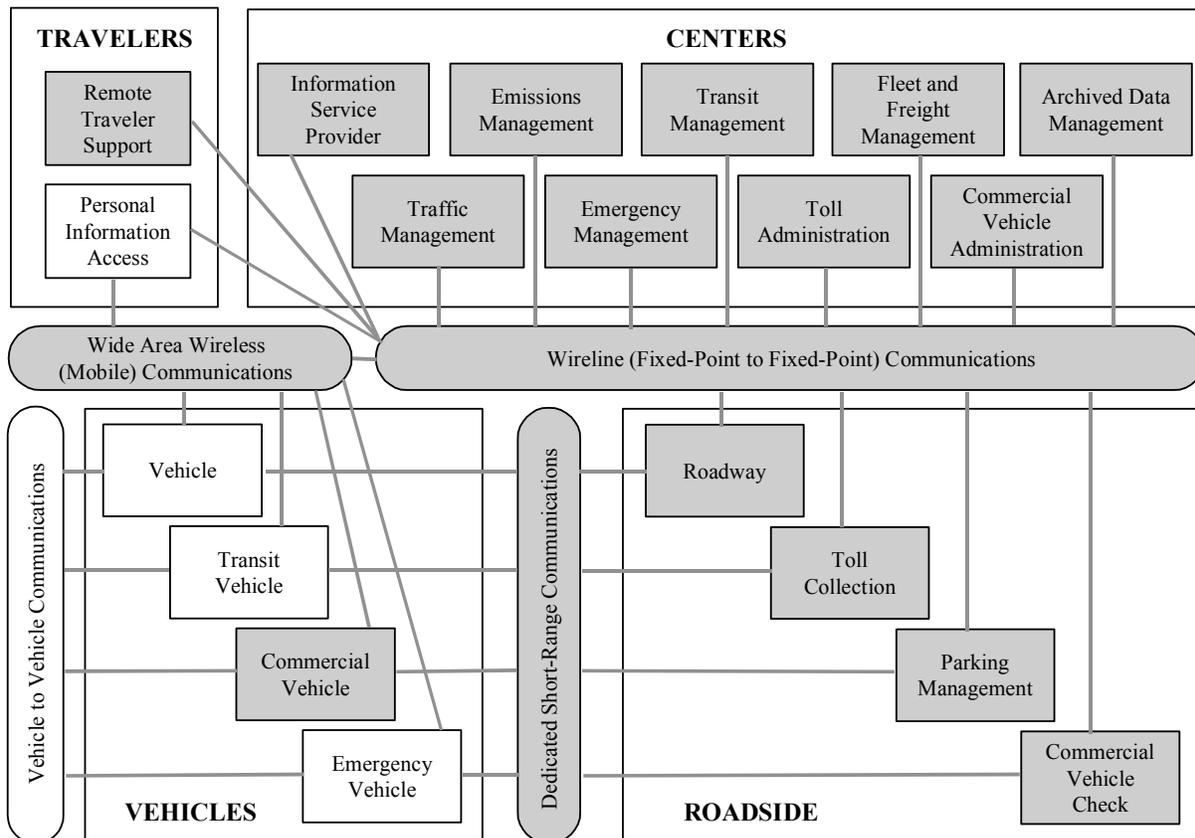
Information Content	Data Collection Mechanisms	ATIS Information Providers
Metropolitan Area Real-Time Traffic/Congestion Levels Incident Notification Traffic Speeds Estimated Travel Times Static Construction Advisories Dynamic Routing	Video Probes Loop Detectors Public Safety Agency Roadside Reports Traveler Call-Ins Construction Plans From DOTs Special Event Coordinators/ Promoters	DOTs' Transportation Operations Centers
State-Level Construction Advisories Major Non-Metro Freeway Incident Notification	Public Safety Agency Roadside Reports Traveler Call-Ins Construction Plans From DOTs	DOTs' Transportation Operations Centers Public Safety Agencies
Major Roadway Weather Advisories/Closures Forecasted Surface/ Weather/Roadway Conditions	Remote Sensors Public Safety Agency Roadside Reports Traveler Call-Ins	DOTs' Transportation Operations Centers Public Safety Agencies National Weather Service Value-Added Weather Forecasting Services
Dynamic Parking/Rest Stop Space Availability Static Rest Stop Services	Visual Observation-Manual or Automated Database Updating Park 'n View (PNV) Periodically Updated Databases-Interstate America, DOTs	Private Sector Truck Stop Operators DOTs Value-Added Information Providers

**Table 23: Public-Sector Stakeholders for Process 8**

	<b>Manitoba</b>	<b>North Dakota</b>	<b>South Dakota</b>	<b>Minnesota</b>	<b>Iowa</b>	<b>Kansas</b>	<b>Missouri</b>	<b>Oklahoma</b>	<b>Texas</b>
<b>Statewide ATIS point-of-contact</b>	N/A	DOT, Road and Traveler Information	Dept. of Transportation, Operations, Road and Traveler Information	DOT; Office of Advanced Transportation Systems	There is not an ATIS per se, however, the Dept. of Transportation, Maintenance Operations has information available at rest areas, travel centers and web site	DOT		There is not an ATIS per se, however, the Dept. of Transportation, has information available at rest areas, travel centers and web site	N/A
<b>Statewide Incident Management point-of-contact</b>		Highway Patrol	DOT, Office of Research	Dept of Public Safety, Division of Emergency Management	Iowa State Patrol		State Emergency Management Agency (Lead), then State Highway Patrol both within Dept. of Public Safety	Oklahoma Civil Emergency Management	Texas Dept. of Public Safety, Div. Of Emergency Management

**4.11 ITS NATIONAL ARCHITECTURE CONSISTENCY**

The corridor information architecture described in this report encompasses a great deal of the scope of the ITS National Architecture. Figure 22 highlights the areas of the ITS National Architecture that correlate to the corridor architecture.



**Figure 22: ITS National Architecture**

The implementation of the corridor ITS user services, identified in the Phase 2 Report, and their associated processes, described in this report, require considerable definition and guidance by a coalition of corridor stakeholders. The projects recommended in the Project Plan section include pilot projects to develop the corridor governance, stakeholder, and functional understanding necessary to move into integrated production systems. However, it is understood from the beginning that the development and deployment of these integrated user services will be guided by the National Architecture and its standards.