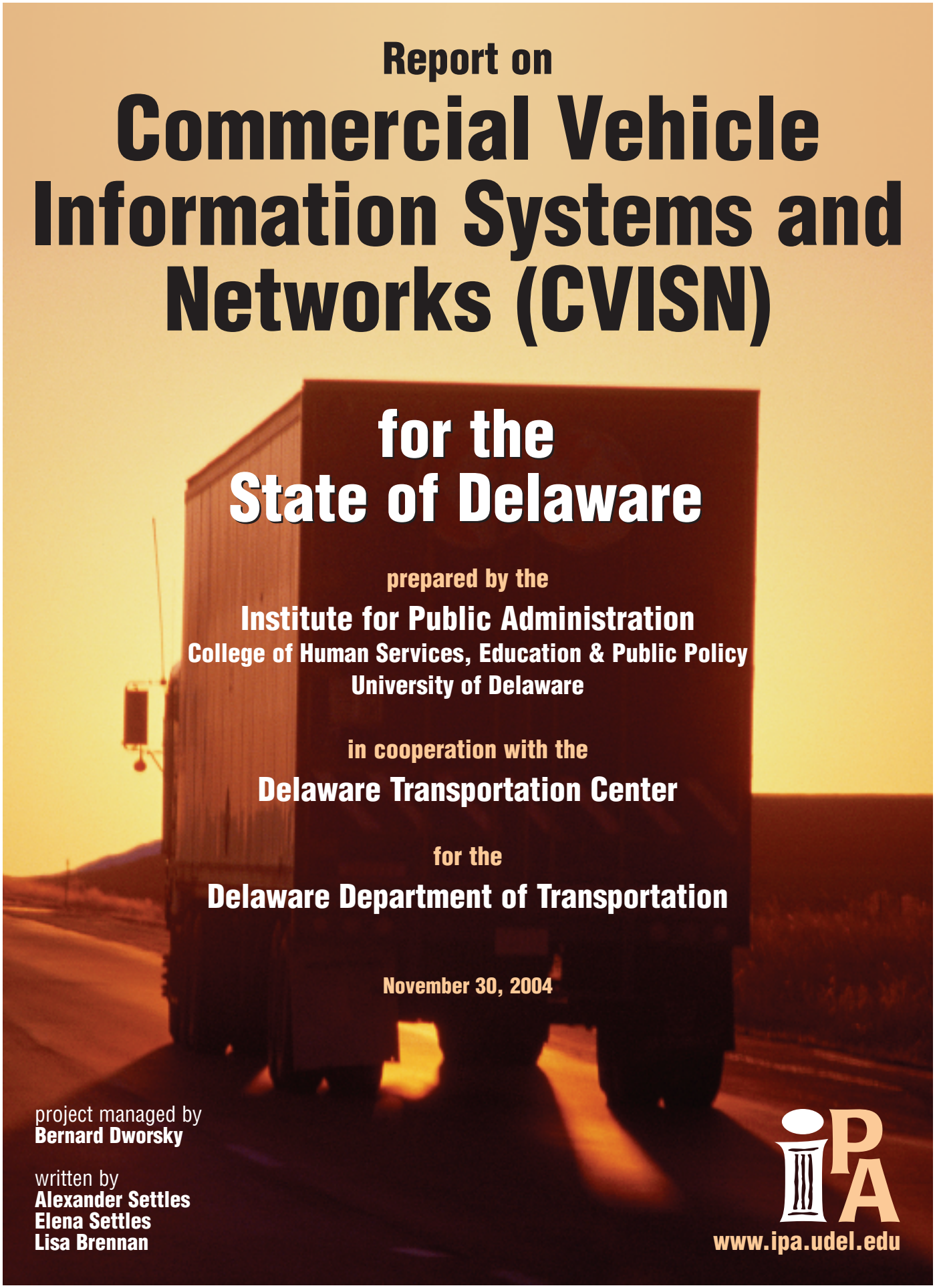

# Report on
# Commercial Vehicle Information Systems and Networks (CVISN)

## for the State of Delaware

prepared by the

**Institute for Public Administration**
**College of Human Services, Education & Public Policy**
**University of Delaware**

in cooperation with the

**Delaware Transportation Center**

for the

**Delaware Department of Transportation**

November 30, 2004


project managed by
**Bernard Dworsky**

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**Alexander Settles**
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**Lisa Brennan**


www.ipa.udel.edu

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# Glossary of Terms and Abbreviations

| | |
|---|---|
| ASPEN | Allows roadside enforcement operations to record and report safety inspections, citations, and accident data. |
| ASAP | Automated Safety Assessment Program. Software that allows for reporting of compliance information collected from motor carriers. |
| AVI | Automatic vehicle identification. Systems allowing interface with vehicle transponders and computers to permit searching for vehicle credentialing and safety information. |
| CDLIS | Commercial Driver License Information System. Provides past performance information on commercial vehicle drivers. |
| CMV | Commercial motor vehicle |
| CVIEW | Commercial Vehicle Information Exchange Window. CVIEW permits state officials to retrieve snapshot data for interstate and intrastate carriers, vehicles, and drivers. CVIEW can interface with SAFER to provide interstate exchange of snapshots. |
| CVISN | Commercial Vehicle Information Systems and Networks. A collection of information systems and communications networks providing support to commercial vehicle operations. |
| CVISN MDI | Commercial Vehicle Information Systems and Networks Model Deployment Initiative. |
| CVO | Commercial Vehicle Operations |
| CVRP | Commercial Vehicle Registration Process. |
| DMV | Division of Motor Vehicles |
| DNREC | Department of Natural Resources and Environmental Control |
| DOT | Department of Transportation (United States and Delaware) |
| DSRC | Dedicated short range communications |
| EDI | Electronic Data Interchange. A series of standards in which documents can be exchanged between computers over telephone lines or the Internet. |
| FMCSA | Federal Motor Carrier Safety Administration |
| FOT | Field operation tests |
| FTE | Full-time employees |
| HAZMAT | Hazardous materials |
| HELP Prepass | Automatic vehicle identification system using a transponder carrying credential information for a commercial vehicle. The system allows roadside enforcement personnel to pre-certify a vehicle and choose whether the vehicle can bypass a weigh station or must stop. Lights on the transponder indicate roadside enforcement decision to allow a vehicle to bypass a station or seeking the vehicle for inspection. |
| IFTA | International Fuel Tax Agreement. The clearinghouse supports base state agreements and permits access to confidential tax information for members. |

| | |
|---|---|
| IRP | International Registration Program. The clearinghouse supports base state agreements and processes information from states in order to compute jurisdiction fees and allow for funds transfer. |
| ISS | Inspection Selection System. |
| ISTEA | Intermodal Surface Transportation Efficiency Act |
| IT | Information technology |
| ITS | Intelligent Transportation Systems |
| IVI | Intelligent Vehicle Initiative |
| I-95 Coalition Corridor | Alliance comprising transportation agencies, toll authorities, and associated agencies from Maine to Florida. |
| Legacy Systems | Technology currently in use, to include hardware and software. The term often refers to pre-Internet or obsolete systems. |
| Mark IV Fusion CVO Transponder | Transponder integrating multiple protocols, eliminating the need for separate transponders for different functions. |
| MCMIS | Motor Carrier Management Information System. Stores commercial vehicle operations safety data. |
| MCSAP | Motor Carrier Safety Assistance Program |
| MCSIP | Motor Carrier Safety Improvement Process. MCSIP is a process within PRISM in which carriers that do not improve their safety performance face successively harsher penalties. Eventually, FMCSA may declare the carrier and imminent hazard and suspend their vehicle registrations. |
| MFTA | Motor Fuel Tax Administration (Delaware) |
| Model states | Original states chosen to implement CVISN, on which the remaining states would base their implementation. |
| Mom and pop | Companies, often family runs, with small fleets and numbers of employees. |
| National Safety Information Exchange Database | Makes driver, carrier, and vehicle safety information available to roadside enforcement personnel. |
| NLETS | National Law Enforcement Telecommunications System |
| NMVTIS | Motor Vehicle Titling Information System. Provides titling information for all vehicles. |
| NORPASS | Partnership to enhance commercial vehicle safety and efficiency. Participating motor carriers receive a transponder which emits a radio frequency and has a unique identification number. The transponder allows roadside readers to capture information about the vehicle stored on the transponder. Lights and tones can be emitted from the transponder to communicate information with the driver, such as clearance to proceed without entering a weigh station or requiring roadside inspection. |
| One-chair shop | Operation where all required credentialing paperwork can be completed by a single individual. |
| Oregon Green Light | Proprietary system for screening commercial vehicles in Oregon, similar to NORPASS and Pre-Pass. |

| | |
|---|---|
| OS/OW | Oversize/overweight |
| PIQ | Past Inspection Query. Search for previous inspections completed for a commercial vehicle. |
| PRISM | Performance and Registration Information Systems Management. PRISM links vehicle registration with a motor carrier's safety rating through the USDOT number. During the registration process, state official's can check the safety information for a carrier and deny registration to unsafe carriers under state laws. FMCSA sponsors the PRISM program. |
| SAFER | Safety and Fitness Electronic Record. Collects snapshots and reports on drivers, vehicles, and carriers and provides them to user systems. |
| SafeStat | A system which computes indicators and categories for carriers using inspection, crash, review, enforcement case, and citation data. The values are update weekly to FMCSA's PRISM Central Site and periodically to MCMIS for carriers. SafeStat can also be used to target carriers for roadside screening with the proper interfaces. |
| SAFETYNET | Allows for the collection of safety inspections and the ability to report them to FHWA for use by other agencies. |
| Safety Fitness Rating | Rating of carrier based on safety data algorithms. |
| SDM | SAFER Data Mailbox. Facilitates electronic exchange of information, such as snapshots, inspection reports, crash data, and compliance reviews. |
| Snapshots | Summary of important enforcement information without the length of a complete report. Snapshots include information such as identifiers, demographic information, safety history, and credentials information. |
| TDMA protocol | Time Division Multiple Access. Technology that allows multiple simultaneous transmissions using through-the-air bandwidth, such as with digital cellular telephone transmissions. |
| TEA-21 | Transportation Efficiency Act for the 21st Century |
| Turn-key | A computer system sold as a total package with hardware and software included and installed by the vendor. |
| XML | eXtensible Markup Language. Computer language standard, which tags data so it can be read and interpreted by a variety of Web browsers, software, servers, and clients. |
| XCVIEW | XML version of CVIEW developed by Washington, which can share CV and carrier data with SAFER and other states. |

# *Executive Summary*

The following study examined Commercial Vehicle Information Systems and Networks (CVISN) and evaluated the impacts of electronic-screening, electronic-credentialing, and safety information exchange on commercial vehicle operations in Delaware. CVISN is a collection of information systems and communications networks supporting commercial vehicle operations (CVO). These include information systems owned and operated by governments, motor carriers, and other stakeholders. The CVISN program provides a framework or "architecture" enabling government agencies, the motor carrier industry, and other parties engaged in CVO administration, safety assurance, and regulation to electronically exchange information and conduct business transactions. The goal of the CVISN program is to improve the safety and efficiency of CVO.

CVISN can produce cost savings for agencies and motor carriers, enhance the efficiency and effectiveness of CVO, and improve CVO safety. To achieve these benefits, however, CVISN must be deployed according to consistent standards, and its major systems, such as electronic-credentialing, electronic-screening, and safety information exchange, must be fully integrated. CVISN is typically divided into three components: electronic-credentialing, safety information exchange, and electronic-screening. In addition to these components, e-government technologies can be used to add an online government-to-business transaction service to provide the credentials on-line and on-demand.

The development of a CVISN program for Delaware should be interconnected to other programs related to CVO. The state of Delaware is implementing the Performance and Registration Information Systems Management (PRISM) program to improve the CVO credentialing process to screen out unsafe carriers during the registration process. The CVISN program needs to incorporate e-government activities undertaken by the Delaware Department of Technology and Information.

This report reviewed the current situation in Delaware and examined the activities of other states to determine the appropriate course for the CVISN program. The report describes the multitude of programs connected with CVISN, provides an overview of the status in Delaware, and outlines a possible path forward. If the state approves CVISN, the next step in the process will be to develop detailed implementation plans for the CVISN components.

The report recommends Delaware consider a multi-stage implementation process to deploy CVISN. The first stage would involve the development of an electronic-credentialing system that would be compliant and could interact with the safety data-exchange. The electronic-credentialing system would involve a CVISN/PRISM–compliant IRP and IFTA upgrade that would be able to interact with the national SAFER database. The second stage would be to develop the CVIEW and ASPEN technology that would allow inspection users to connect into the SAFER databases to do roadside inspection using the up-to-date SAFER database. CVIEW would be used at inspection stations and ASPEN at roadside stops. The third stage would be the deployment of electronic-screening at weigh stations in Delaware. Currently, the

only Delaware weigh station is at Blackbird on U.S. Rt. 13. A new weigh station design with WIM and AVI is planned along U.S. Rt. 301 near the Delaware–Maryland border.

The recommended deployment schedule will take advantage of the significant benefits from a CVISN/PRISM deployment by first improving the electronic-credentialing process before undertaking the capital-intensive expansion of the screening facilities. The Delaware State Police is the only police force in Delaware trained to conduct safety inspections, which would not likely change due to the adoption of CVISN. The report recommends limiting the investment in capital outlays for roadside inspection, unless operations and maintenance are increased to staff roadside inspections. Adherence to the memorandum of agreement entered into by the Delaware Department of Transportation and the Delaware State Police will improve operations and maintenance at existing and future stations, making investments in capital necessary.

The report also recommends a series of workshops, policy forums, and training sessions be conducted to better educate commercial vehicle operators on the deployment issues related to CVISN and to build support for the e-government aspects of the project. End-user input will be crucial to the development of on-line transaction services and the effective selection of transponder technology.

# Introduction

The Delaware Department of Transportation requested that the Institute for Public Administration revisit the issues related to the Commercial Vehicle Information System and Networks (CVISN) and the appropriateness of CVISN for Delaware. The following report examines the current situation of CVISN implementation across the U.S., provides insight into what aspects of CVISN would best fit Delaware, and identifies the steps that should be taken to implement an appropriate CVISN program for Delaware.

The state of Delaware has been involved in CVISN implementation since the mid-1990s - as part of the I-95 Corridor Coalition. The Coalition has undertaken projects in the past to encourage the implementation of a coordinated CVISN deployment strategy for the I-95 corridor. CVISN will continue to be an important issue for Delaware beyond participation in the I-95 Corridor Coalition. The U.S. Department of Transportation has encouraged states to adopt CVISN as part of the Intelligent Transportation Systems (ITS) program managed by the Federal Motor Carrier Safety Administration (FMCSA). CVISN has it origins in the ITS part of the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) and was reauthorized in the 1998 through the Transportation Equity Act for the 21st Century (TEA-21). States nearby Delaware, such as Maryland and Virginia, were model states in the late 1990s and were CVISN Level 1–compliant by Fiscal Year (FY) 2001. Delaware has experience deploying ITS systems using transponders, such as the EZ-Pass toll collection system. The state of Delaware is studying the implementation of a new Weigh-In-Motion (WIM) program that would need to be integrated with CVISN deployment.

The report summarizes the research efforts to address the questions related to CVISN deployment in Delaware. The report identifies how CVISN could work in Delaware, examines Delaware's Commercial Vehicle Operations, assesses the CVISN experience of deployment in other states, and examines planning and implementation of CVISN in relation to administrative, technical, legal, regulatory, safety issues, interagency arrangements, and private-sector participation. The report begins with an overview of CVISN and definition of the components of CVISN required for Level 1 compliance. The latter sections of the report deal with the options available to the state of Delaware for CVISN implementation and identify possible actions based on an examination of Delaware operations and experiences of other states. These sections also provide an overview of Delaware CVO and include information from interviews with state officials, Delaware CVO industry representatives, users of truck freight services, private-sector consultants, and other states officials involved in CVISN operations and deployment.

# What is CVISN?

The Intelligent Transportation Systems (ITS) is a cooperative public/private initiative to research, develop, test, and evaluate advanced electronic and information systems that can improve the safety, operational efficiency, and productivity of the existing surface transportation infrastructure. It includes the ITS research and development program and the ITS deployment incentives program. The ITS research and development program supports the development of the next generation of ITS technologies, including the Intelligent Vehicle Initiative (IVI); the development and maintenance of the National ITS architecture and standards; and the deployment of integrated ITS systems through guidance documents, training, and technical assistance. The budget proposes an additional $120 million for ITS deployment within the increase in research contract authority. The ITS deployment incentive program supports the integration of existing ITS systems in metropolitan areas, integration and infrastructure deployment in rural areas; and the deployment of the Commercial Vehicle Information Systems and Networks.

Intelligent Transportation Systems are transportation systems, utilizing information, communication, sensor, and control technologies to achieve improved levels of performance. The U.S. DOT has developed a National ITS Program Plan for ITS, which provides a new vision for surface transportation in America. The ITS Program includes seven major elements:

- Travel and Transportation Management
- Travel Demand Management
- Public Transportation Management
- Electronic Payment
- Commercial Vehicle Operations (ITS/CVO)
- Emergency Management
- Advanced Vehicle Control & Safety Systems

The ITS/CVO element includes the ITS technologies, which uniquely support Commercial Vehicle Operations (CVO). The scope of CVO includes the operations associated with moving goods and passengers via commercial vehicles over the North American highway system and the activities necessary to regulate these operations. It includes activities related to safety assurance, commercial vehicle credentials and tax administration, roadside operations, freight and fleet management, and vehicle operation. The term Commercial Vehicle Information Systems and Networks refers to the ITS information system elements that support CVO. CVISN includes information systems owned and operated by governments, carriers, and other stakeholders. It excludes the sensor and control elements of ITS/CVO.

The primary goals of CVISN are the improvement of safety of commercial vehicle operators (CVO) and the increase in efficiency of state government credentialing and screening activities. The components of CVISN have evolved over time as technologies have changed and as states have developed, deployed, and operated information systems to support CVO. The term CVISN refers to the assortment of information systems and

communications networks that support CVO. The Federal Motor Carrier Safety Administration (FMCSA) directs the development of the CVISN framework that provides information-systems architecture to implement the various information and networks that support CVO. The CVISN Architecture is part of the National Intelligent Transportation Systems Architecture specified in ISTEA and reauthorized in TEA-21.

The CVISN framework consists of standards for information and communications technologies for the processing of CVO safety inspections, registration, and fuel tax payment and short-range communication technology for electronic-screening of vehicles. CVISN technologies address the three components of electronic-credentialing systems that support electronic submission, processing, approval, invoicing, payment, issuance of credentials, electronic tax filing, and auditing; participation in clearinghouses for electronic accounting; and distribution of registration fee payments among states. The safety information exchange portion of CVISN interconnects national and state databases to allow for coordinated review of registration and safety data. Electronic-screening systems allow transponder-equipped commercial vehicles to provide expedited information to inspection stations, improve inspection efficiency, and allow commercial vehicle operators who have maintained good safety and legal status to bypass roadside inspection and weigh stations. The information used in the screening process resides in the national safety information exchange database.

Commercial vehicles are defined in U.S. 49 CFR as those used for interstate or intrastate commerce to transport passengers or property. Commercial vehicles are greater than 10,001 pounds gross vehicle weight, designed to transport more than 16 passengers, or carry federally regulated hazardous materials in quantities requiring placards. In general, the focus of CVISN has been on the motor carrier industry, heavy trucks in the freight hauling service, and the government agencies that regulate the operation of such vehicles. CVISN relates solely to the credentialing, screening, and safety information exchange related to commercial vehicles. The screening technologies used through CVISN do not at this time have applications to private-sector CVO screening or logistics management. Although CVISN predates the demand for improved security of goods shipments, the program applications can benefit homeland security functions. The eventual addition of driver snapshots and credentialing will assist public safety and homeland security officials. The combination of electronic driver, truck, and carrier screening will aid in deterring cargo theft, human trafficking, and vehicle hijacking.

## CVISN Official Management and Oversight

In 1996, the United States Department of Transportation (USDOT) sponsored the CVISN Model Deployment Initiative (CVISN MDI) to demonstrate the technical and institutional feasibility, costs, and benefits of CVISN user services and encourage further deployment. The initial participants included two prototype states (Maryland and Virginia) and eight pilot states (California, Colorado, Connecticut, Kentucky, Michigan, Minnesota, Oregon, and Washington). CVISN services and technologies are expected to improve highway safety, simplify government administrative credentialing operations, enhance

productivity, and reduce delays for safe and legal carriers. An important component of the CVISN MDI is an independent evaluation of these benefits as well as the costs to deploy and maintain the systems on a national level. Currently, all 50 states and the District of Columbia are in various stages of CVISN planning and deployment.

CVISN is managed on two levels within the U.S. DOT: within the DOT's ITS Joint Program Office, which coordinates ITS deployment between agencies, and within the Federal Highway Administration (FHWA) Office of Motor Carriers and Highway Safety's Office of Technology Evaluation and Deployment.

Commercial Vehicle Information Systems and Networks (CVISN) is planned to be a fully integrated collection of commercial vehicle information systems operated by states, the Federal Highway Administration, and carriers to support safe, seamless commercial vehicle transportation throughout North America, as pictured in Figure 1.

**Figure 1. Vision of CVO Shipping Operations. Year 2005**


*Source: Richeson, 2000. Figure 3-2.*

A Report to Congress on *Providing Carrier-, Driver-, and Vehicle-Specific Information to the Roadside* has been prepared. It describes progress by the FHWA in planning for the design, deployment, and maintenance of an integrated collection of commercial vehicle information systems to provide needed carrier- , driver- , and vehicle-specific information to enforcement officers and other users in the motor carrier community. From the enforcement officer's perspective, these information systems are necessary to maintain and improve highway safety as the volume of motor carrier activity increases throughout North America[1]. The SAFER system is the second phase of the Motor Carrier Safety

Assistance Program (MCSAP) in which states and the FHWA are working to improve roadside inspection and reporting information.

## Safety Information Exchange Systems

### SAFER

The **Safety and Fitness Electronic Record System (SAFER)** is a national data-exchange system developed by the Federal Motor Carrier Safety Administration (FMCSA). SAFER provides standardized carrier, vehicle, and driver datasets in both snapshot and report modes of information retrieval. SAFER is available to users over a nationwide data network and allows the user to pull information concerning an interstate carrier, vehicle, and/or driver in real time. SAFER supports the storage and exchange of vehicle and driver inspection reports, the exchange of Carrier Profile Reports, compliance review data, crash data, and enforcement data. The SAFER system was designed to use the Electronic Data Interchange (EDI) formats for input and output data that predate Internet-based information exchange protocols. SAFER, also, interfaces with the Motor Carrier Management Information System (MCMIS), SAFETYNET 2000, and the Licensing and Insurance and Commercial Driver's License Information System (CDLIS).

SAFER acts as a national data repository, drawing on existing motor carrier databases for safety information. Users can view carrier snapshots, which provide general identification information, safety records and ratings, out-of-service inspections, and crash data, on-line and in real time.[2] Additionally, users can submit inspection information to SAFER for use by other law enforcement agencies. Currently, the SAFER system provides only information on interstate carriers.[3] In the future, SAFER will allow users to pull safety and credentialing information on intrastate carriers, vehicles, and drivers.[4]

### CVIEW

The **Commercial Vehicle Information Exchange Window System (CVIEW)** is an information storage and retrieval system the primary focus of which is to provide exchange of intrastate and interstate snapshots and reports for carriers, vehicles, and drivers within a state. CVIEW or an equivalent system assembles and maintains the credentials portions of interstate snapshots and assembles and stores intrastate snapshots. A distributed, state-level version of the SAFER system, CVIEW or its equivalent is a key element of each state's CVISN design. CVIEW collects information from the CVO credentialing and tax systems to formulate segments of the interstate carrier, vehicle, and driver snapshots and reports for exchange within the state and with the SAFER system. The prototype and pilot CVISN states have implemented CVIEW.

While SAFER represents the national database, CVIEW operates as the state data-exchange counterpart at fixed and mobile roadside inspection stations.[5] CVIEW permits states to have more control and flexibility by providing an interface with state legacy systems. The system draws on interstate-carrier information from the SAFER database and maintains intrastate information within CVIEW. The interface ability of CVIEW lets

states customize their information based on other systems they use to gather pertinent data and import it into a central database to create comprehensive carrier snapshots for use in roadside enforcement operations. CVIEW, also, can communicate directly with the ASPEN system.[6]

**ASPEN**

ASPEN refers to the software applications that reside on the client system for recording and transmitting inspections electronically. States can decide to use ASPEN, developed by the FMCSA, or some equivalent system. Laptop computers with ASPEN are deployed for use in roadside inspections. The ASPEN system consists of the following elements: recording inspection data electronically; electronically transmitting inspection reports to SAFER, either directly or via CVIEW; electronically retrieving the inspection reports from SAFER, either directly or via CVIEW; and downloading carrier snapshots via subscription processing to support the Inspection Selection System (ISS).

ASPEN is a pen-based system that allows enforcement personnel in the field to transfer inspection data to SAFETYNET for use by commercial vehicle enforcement agencies nationwide.[7] ASPEN also gives enforcement personnel the ability to run a Past Inspection Query (PIQ) to get copies of a particular vehicle's recent inspections[8] In combination, these technologies provide a data source for enforcement personnel to use in targeting vehicles for inspection to increase the number of unsafe vehicles and drivers placed out-of-service. The eventual addition of driver credentialing and safety data along with vehicle data within the SAFER system will aid in deterrence and prevention of commercial vehicle hijacking as well as give law enforcement the capability to screen commercial vehicles more closely to determine when hijacking has occurred and how to respond based on the cargo carried by the particular vehicle.

**ISS**

The **Inspection Selection System (ISS)** is a component of ASPEN and was developed in response to a 1995 Congressional mandate that called for the use of prior carrier-safety data to guide the selection of commercial vehicles and drivers for roadside inspections. The system was developed cooperatively between the Upper Great Plains Transportation Institute and the FMCSA. ISS displays an inspection prioritization score from 1 to 100 and also provides an inspection recommendation and likely areas of noncompliance based on previous inspections. ISS contains a full page of carrier statistics that are valuable to inspectors at the roadside. The initial inspection-selection algorithm, developed in 1995, was based primarily on a carrier's history of out-of-service (OOS) violations. The next-generation algorithm, ISS-2, was introduced in 1999 and is not yet fully implemented. ISS-2 is based on the more comprehensive SafeStat algorithm, which broadens the criteria and focuses in large part on crashes.

The ISS is normally installed on a hand-held notebook or laptop computer utilizing the ASPEN driver/vehicle-inspection software. When an inspector is ready to conduct an inspection, the DOT or ICC number can be entered into the software, and the computer then displays pertinent carrier information and the current ISS inspection value. The system is not vehicle-specific, but provides a score under the carrier for which the

particular truck is operating. A recommendation is given for inspection based on the value of the score. Where the ISS is used to select vehicles for inspection, several vehicles will usually be rated, and the vehicle with the highest value will be selected for inspection.

**MCMIS**

The **Motor Carrier Management Information System (MCMIS)** is a national system run by FMCSA to consolidate and process motor carrier safety data from sources throughout the U.S. MCMIS contains safety records of active intrastate and interstate motor carriers, safety and compliance reviews, roadside inspection records, and crash records. MCMIS also carries a Safety Fitness Rating based on algorithms that evaluate all of a carrier's safety data. It supplies carrier ID and safety data history for each interstate-carrier via the SAFER system to the ASPEN ISS.

**PRISM**

The **Performance and Registration Information Systems Management Program (PRISM)** consists of two components. The first part is the Commercial Vehicle Registration Process (CVRP) that connects vehicle registration to the carrier's safety record. Unsafe operators are identified during the registration process and denied registration or renewals. Registration denials act as a strong motivator for unsafe operators to improve their safety record. The vehicle registration process identifies CVO involved in interstate commerce by their unique USDOT number when they register their vehicles, and the safety fitness of each carrier can then be checked prior to issuing vehicle registrations. The second component of the PRISM system is the Motor Carrier Safety Improvement Process (MCSIP) that operates in concert with CVRP to identify motor carriers and hold them responsible for the safety of their operation. The performance of unsafe carriers is improved through a comprehensive system of identification, education, awareness, safety monitoring, and treatment. The PRISM program is separate from the CVISN program at the FMCSA and can be implemented as a stand-alone system. PRISM funding is also separate from CVISN grant funding, but jointly funded programs are possible and exist in some states. The state of Delaware recently executed a PRISM grant agreement, which secures up to $500,000 in federal funds for PRISM implementation. Funding will be released upon development and approval by FMCSA of a PRISM Implementation Plan.

## Integration of Systems

SAFER operates as a database for the exchange of safety information at the national level. CVIEW systems perform the storage-and-retrieval function on a state level. The delivery of interstate safety, registration, and taxation information to the roadside may be handled by an interstate clearinghouse, such as MCMIS, the International Registration Plan (IRP), and the International Fuel Tax Agreement (IFTA), and distributed via SAFER.

MCMIS supplies SAFER information to prioritize vehicles for inspection at the roadside. Updates of information occur on a weekly basis. SAFER, also, will create CDs with snapshots of carrier and later vehicle safety data that can be distributed to all ASPEN sites within a state.

**SAFER Data Mailbox (SDM)**
The SAFER Data Mailbox (SDM) facilitates the exchange of information between roadside inspection sites and administrative centers by acting as a temporary repository for data files and messages. Inspection data from the roadside will be transmitted from ASPEN to SAFER via the SDM. Information is stored in the SDM for 45 days. Through SDM, states can retrieve stored inspection data. The roadside agency applies to SDM for the information via the Past Inspection Query (PIQ). SDM transmits inspection reports directly from the roadside to the SAFER system and retrieves previous inspection reports by performing a Past Inspection Query (PIQ) on individual vehicles and drivers. The SDM was originally developed to help identify trucks that violate out-of-service (OOS) orders. ASPEN units communicate directly to CVIEW or SAFER using wireless connections, such as cellular, cellular digital, and/or satellite technology.

**Safety Status Measurement System (SafeStat)**
SafeStat (Safety Status Measurement System) is an automated analysis system developed for the Federal Motor Carrier Safety Administration (FMCSA). The system combines current and historical safety performance data to measure the relative safety fitness of interstate commercial motor carriers. SafeStat enables the FMCSA to quantify and monitor the safety status of motor carriers and guides the deployment of resources to focus on carriers posing the greatest safety risk.

SafeStat evaluates the safety status of individual motor carriers with respect to the rest of the motor carrier population in four analytic Safety Evaluation Areas (SEAs): Accident, Driver, Vehicle, and Safety Management. The system uses up to 30 months of motor carrier safety and normalizing data to develop measures and indicators in the four SEAs. The four SEA values are then combined into an overall safety status assessment, known as a SafeStat score (SafeStat).

## Transponders

Three types of transponders are in use with the CVISN program: Heavy Vehicle Electronic License Plate (HELP) PrePass, NORPASS, and Oregon Green Light. HELP PrePass had been selected by 21 states as of 2002,[9] giving it the widest acceptance. The PrePass system has used private capital to build the infrastructure for automatic vehicle identification (AVI) with the intent to recover costs through user fees to the carriers for each site bypassed.[10] PrePass assists participating states in the marketing of the transponder and provides transponders for vehicles. As of 2002, NORPASS, the second private-sector system deployed at existing weigh and inspection stations, had been implemented in nine states in the U.S. and various Canadian provinces. NORPASS, like PrePass, markets to carriers, manages enrollment, and performs periodic validations of

carrier status. In contrast to the PrePass program, states participating in NORPASS are responsible for building the AVI infrastructure. The Oregon Department of Transportation independently developed and administers the Green Light Mainline Pre-clearance System for transponders and AVI infrastructure.

Depending on the transponder deployed, interoperability is possible between CVISN and EZ-Pass networks. In 2002, the New York State Thruway Authority issued the Mark IV Fusion CVO transponder that supports both the IAG protocol used for EZ-Pass toll collection system and the TDMA protocol used by weigh station pre-clearance systems.[11]

## CVISN Level 1 Compliance and Funding

### CVISN Level 1 Compliance

To accomplish Level 1 deployment, states must:

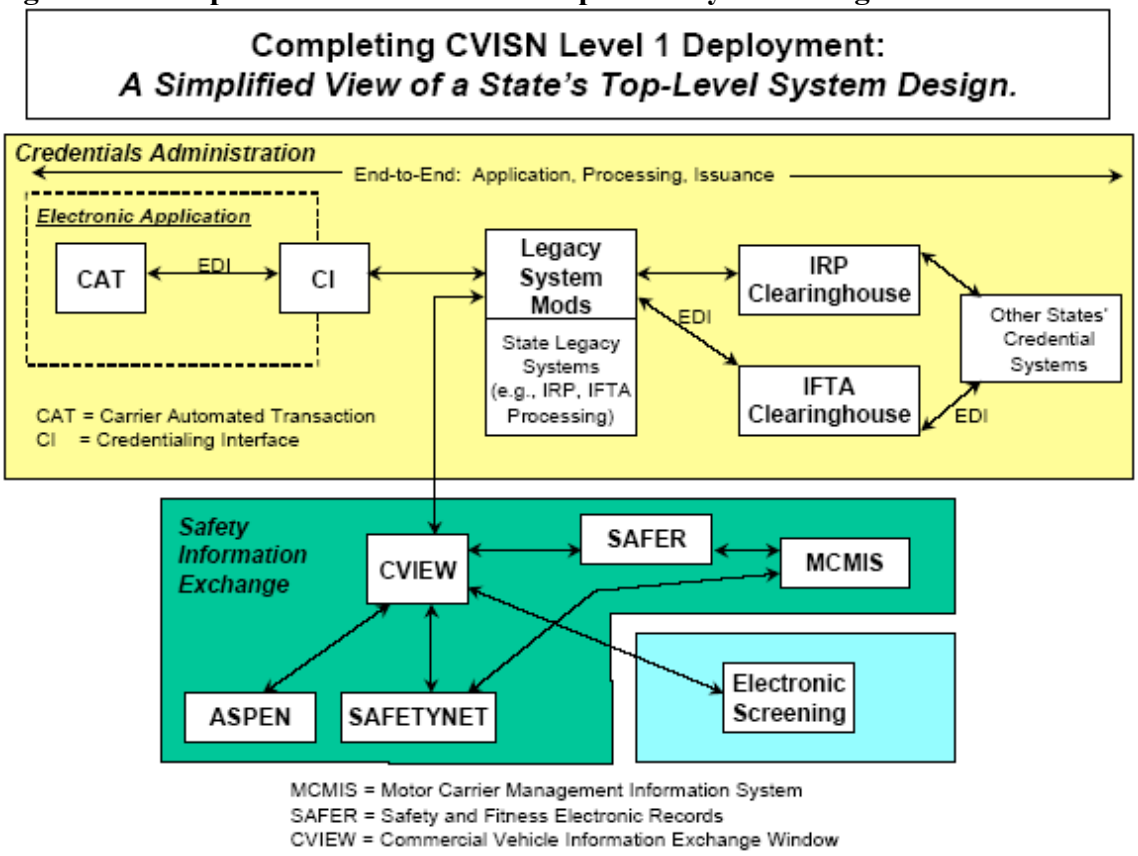
- Establish an organizational framework among state agencies and motor carriers for cooperative system development.
- Create a state CVISN System Design conforming to the CVISN architecture that can evolve to include new technology and capabilities.
- Implement specific capabilities in the following three areas:

    1. **Safety Information Exchange**: Facilitate the collection, distribution and retrieval of motor carrier safety information at the roadside. This can be satisfied with the deployment of ASPEN (or equivalent) at all major inspection sites. The state must also have a connection to the Safety and Fitness Electronic Records (SAFER) system to provide exchange of interstate-carrier and vehicle snapshots among states. The Commercial Vehicle Information Exchange Window (CVIEW) or equivalent system must be implemented at the state level for exchange of intrastate and interstate snapshots within the state and connection to SAFER for exchange of interstate snapshots.
    2. **Electronic-screening:** Allow commercial vehicles that maintain good safety and legal status to bypass roadside inspection and weigh stations, saving time and money for participating carriers, and allowing states to devote more resources toward removing unsafe and noncompliant carriers. The state must have implemented the screening at a minimum of one fixed or mobile inspection site and be able to replicate the screening capability at other facilities.
    3. **Electronic-credentialing:** Assist in the areas of electronic submission, processing, approval, invoicing, payment, issuance of credentials, electronic tax filing and auditing, and participation in clearinghouses for electronic accounting and distribution of registration fee payments among states. Compliance consists of implementing automated processing for carrier application, state application processing, credential issuance, and

tax filing for at least International Registration Plan (IRP) and International Fuel Tax Agreement (IFTA) credentials and to be prepared to extend this capability to other credentials, such as intrastate commercial vehicles, titling, oversize-overweight (OS/OW), carrier registration, and hazardous material (HAZMAT). Compliance does not require states to include an e-payment option with automated application processes. In fact, Maryland lacks an e-payment option. The state needs to have built a connection to the IRP and IFTA Clearinghouses. Further standards include at least ten percent of the transaction volume be handled electronically, a readiness to bring on more carriers as they sign up, and a readiness to extend to branch offices where applicable.

Figure 2, below, provides an overview for the CVISN Level 1 deployment.

**Figure 2. A Simplified View of a State's Top-Level System Design.**




*Source: Richeson, 2000. Figure 3-1.*

**CVISN Level 1 Funding**

The FMCSA currently provides federal grants of up to $2.5 million for CVISN core deployment (Level 1). States that receive CVISN funds are required to develop a CVISN Business Plan, participate in CVISN workshops, and develop a CVISN Program Plan and Top-Level System Design. Planning and design phases are estimated to cost

approximately $50,000 and $350,000, respectively. To be eligible for deployment funding, states are required to certify their CVISN activities are consistent with National ITS and CVISN architectures and available standards and agree to execute a successful interoperability test. States are required to provide a 50% match for all CVISN funding. FMCSA allows states to apply a soft match from other federal sources of up to 60% of the states' matching funds for CVISN. The maximum federal share of CVISN funds, including grant and soft match, is 80%.

Since its scheduled sunset on September 30, 2003, six extensions have maintained funding levels for transportation. The most recent extension lasts until May 31, 2005, and includes CVISN funding. The 109th Congress will take office in January 2005 and may pass new transportation legislation.

## CVISN Level 2 Compliance and Funding

CVISN Level 2 compliance includes CVISN Level 1 items and the following additional components:

All the elements of the three capability areas, outlined below, must be implemented using applicable architectural guidelines, operational concepts, and standards.

- **Safety Information Exchange**
  - Crash and citation data collected electronically at site for ten percent of enforcement personnel.
  - Voluntary use of Automated Safety Assurance Program (ASAP) by 10 percent of state motor carriers.
  - Support electronic carrier safety audits.
  - Use onboard safety monitors as inputs to inspections.
- **Electronic-screening**
  - Participation in interoperability agreements among screening programs.
  - Implemented at major weigh stations and inspection sites with significant commercial vehicle traffic.
  - Ready to replicate at other sites.
- **Electronic-credentialing**
  - Electronic payment for credentials.
  - End-to-end processing (i.e., carrier application, state application processing, payment, and credential issuance) of intrastate registration, titling, OS/OW, carrier registration and HAZMAT credentials.
  - Connection to National Motor Vehicle Title Information System (NMVTIS) and electronic federal carrier registration system.
  - "Paperless" vehicle, without a requirement for hard copies of credentials on a vehicle.
  - Support for electronic state IRP and IFTA audits.
  - At least 50% of the total transaction volume handled electronically.

CVISN Level 2 compliance expands the electronic transaction and payment components of CVISN program elements. At CVISN Level 2 compliance the state has not only improved its information exchange activities, but deployed a robust e-government application to eliminate the need for paper credentialing, in-person payment, and paper-based enforcement activities.

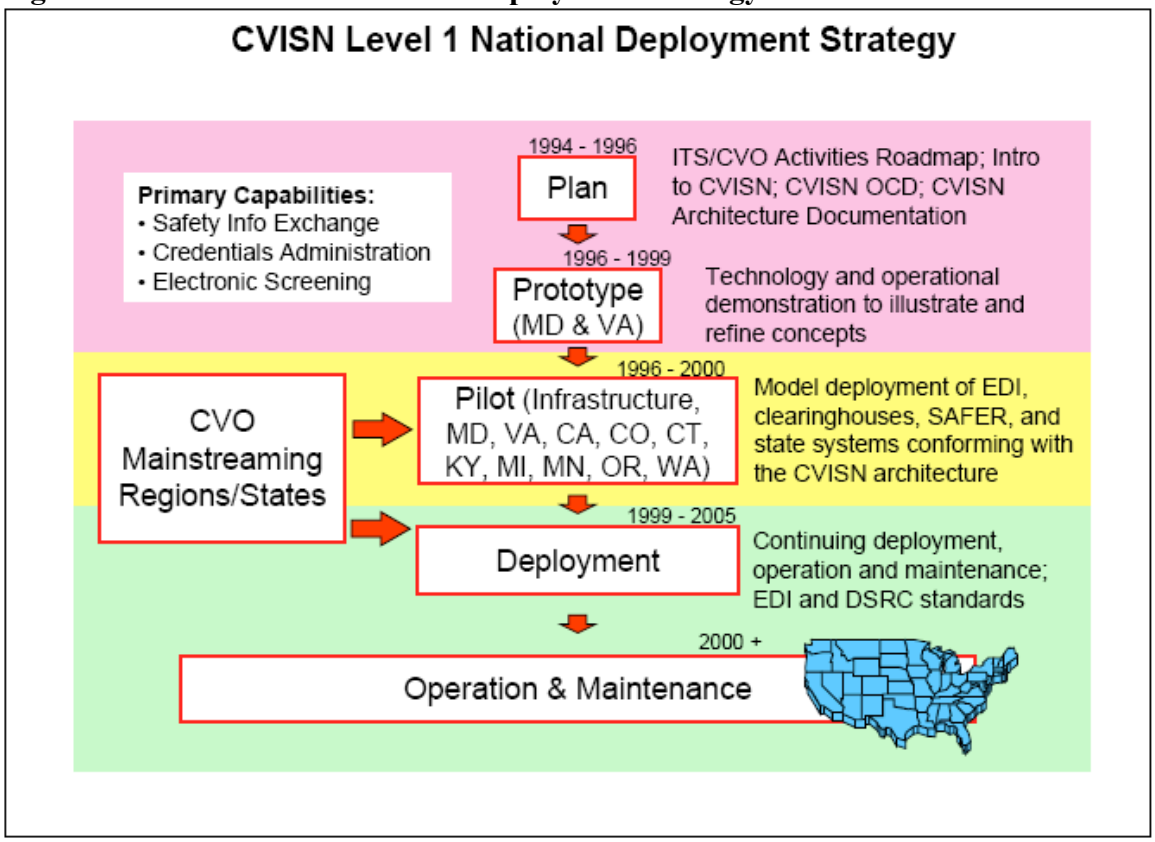
**CVISN Level 2 Funding**

Funding for expanded deployment (Level 2 and beyond) of CVISN is determined based on the amount of funds that remain after the core deployment grants have been made and by the number of states that request expanded deployment grants. The maximum amount that a state can receive for expanded deployment is $1 million per fiscal year. In order to receive funding, states are required to demonstrate a successful deployment of CVISN Level 1 as described above. As with CVISN core deployment grants, states are required to provide a 50% match, and FMCSA allows states to apply a soft match of up to 60% of the states' matching funds. Again, the maximum federal share of funds for expanded CVISN deployment, including grant and soft match, is 80%.

# *U.S. States' CVISN Experience*

National CVISN implementation consists of five major phases, with several already having been completed. First, management plans and technical architecture frameworks required for coordination of subsequent phases were developed. In the second phase, the technology was prototyped in an integrated manner within two states in order to demonstrate operational concepts and validate requirements. Third, the approach was piloted in a limited number of states, allowing for manageable testing and evaluation prior to widespread deployment. Expansion of the program beyond the pilot states to an equal number of partner states will follow the third phase. Each partner state will coordinate with a pilot state within their region, which should allow for smoother expansion. In the final phase, CVISN will be available for deployment in all interested states. At the beginning of the final phase, the technology, concepts, costs, and benefits should be well documented through the pilot and partner states. Further deployment to interested states will involve lower risk and less difficulty, resulting from previous testing and evaluation of the system.

**Figure 3. CVISN Level 1 National Deployment Strategy**




*Source: Richeson, 2000. Figure 5-1.*

## Best Practices

Maryland and Virginia were the CVISN prototype states. Connecticut, Kentucky, Michigan, Minnesota, Colorado, Washington, Oregon, and California became pilot states. An additional 32 other states took the first step in CVISN compliance by completing an *ITS/CVO Business Plan* detailing how their state's agencies will cooperate to implement a statewide CVO system. States participating in CVISN agree to meet certain requirements, known at this time as "CVISN Level 1." Those requirements are as follows:

- Establish an organizational framework for cooperative systems development between state agencies and motor carriers.
- Establish a state CVISN system design that conforms to the federal architecture.

As of 2002, nine states had implemented CVISN to Level 1 compliance. Kentucky, Maryland, Virginia, and Washington were each funded to meet CVISN Level 1 compliance in FY 2001. California, Colorado, and Minnesota were funded in FY 2002, followed by Connecticut and Michigan in FY 2003. Seven states had progressed through the planning stages to be ready for fully funded deployment with 18 more states partially funded for deployment. Seven more states were in the design stage, and ten more states were in the planning stages. Delaware is in the group of states in the design stage. Delaware actively uses the SAFER database portion of CVISN but, at present, has only completed the CVISN Business Plan.[12]

The state of Oregon developed the CVISN/Oregon Green Light program to improve the electronic–screening process and the safety and efficiency of commercial vehicle operations.[13] The Green Light program involved modernizing 21 Oregon weigh stations with a new system allowing safe and legal trucks equipped with transponders to be weighed and pre-cleared past stations at highway speed.[14] The project included the installation of weigh-in-motion (WIM) scales and pole-mounted automatic vehicle identification (AVI) readers that collect information from on-board transponders, allowing the screening system to check a truck's size, weight, and height and connect that information with the carrier's records related to vehicle registration, tax payments, and safety. Inspection station personnel can then verify the registration and clear vehicles that meet weight, size, and height standards and have safe registration records to proceed through the station without stopping.

## Cost Estimates from U.S. States for CVISN Deployment

The *Evaluation of the Commercial Vehicle Information Systems and Networks (CVISN) Model Deployment Initiative* report of 2002 presented a collection of detailed data for examining the CVISN costs of two prototype states, Maryland and Virginia, and three

pilot states, Kentucky, Connecticut, and Oregon. The report indicated that the actual deployment and operation costs in two states, Kentucky and Maryland, "demonstrated that electronic-credentialing could offer states substantial cost savings, depending on the level of motor carrier participation."[15] The up-front investments averaged $700,000 to deploy an end-to-end IRP credentialing system. The annual pre-CVISN operating costs varied by state and ranged from $63 to $138 for each carrier account. The post-CVISN evidence suggested that state costs were reduced by almost 35% for each participating carrier. If states are able to obtain a 50%-participation rate by motor carriers, the annual cost savings to each state after deployment were estimated to be between $40,000 and $140,000.

The following tables outline the costs found in the *Evaluation of the Commercial Vehicle Information Systems and Networks (CVISN) Model Deployment Initiative* report. Table 1 outlines the annual costs for the deployment of five electronic sites based on the costs of the prototype and model states. The significant part of the annual cost is full-time equivalent (FTE) positions for each site.

**Table 1. Cost-CVISN Annual Costs for Five Electronic-screening Sites**

| Cost Element | Expanded Cost($) |
|---|---|
| Static Scale & 15 FTEs (3/site) | 697,150 |
| CVISN Upgrades (AVI, WIM, snapshot) | 391,080 |
| Total for Five Sites | **1,088,230** |

*Source: Orban 2002a. Table 6-8.*

Table 2 outlines the elements in the total deployment costs for electronic-screening. A reduction in deployment cost exists for each additional site, which provides some economies of scale for larger states. Delaware will experience growing economies of scale with additional sites. Currently, DelDOT is committed to building five new WIM sites.

**Table 2. Elements of Total Deployment Costs for Electronic Screening**

| Cost Element | Cost ($) for the First Site | Cost ($) for Each Additional Site |
|---|---|---|
| AVI Reader | 15,000 | 15,000 |
| Scale, WIM, Mainline | 125,000 | 125,000 |
| Electronic Signs/Loop Detectors | 10,000 | 10,000 |
| Administrative/other | 27,000 | |
| Communication equipment | 123,000 | 123,000 |
| Consultant (software development) | 166,712 | |
| Interfaces | 25,000 | |
| Personal Computer (3 desktop) | 10,000 | 10,000 |
| Retrofit fixed weigh scale | 20,000 | 20,000 |
| Training, PC (3 persons) | 240 | 240 |

| Cost Element | Cost ($) for the First Site | Cost ($) for Each Additional Site |
|---|---|---|
| Training, Info Technology (3 persons) | 300 | 300 |
| TOTAL | **522,252** | **303,540** |

*Source: Orban 2002a. Table 6-7.*

## State-Specific Costs

The development of an electronic-credentialing system for IFTA was underway in Kentucky and Maryland at the time of Model Deployment Initiative report analysis. The report estimated that, for a projected additional investment of $65,000 for the IFTA deployment, these states could realize additional annual cost savings of approximately $150,000, assuming 50% of the accounts file IFTA credentials electronically. The report stated that the deployment cost for IFTA electronic-credentialing is lower than the cost for a comparable IRP system, in part because IFTA processing would use many of the same systems developed for IRP.[16] Additional cost savings could be expected when trip-related credentials, such as hazardous materials and oversized-overweight permits are filed electronically. At the time of the report neither state had begun deployment of these systems.

The deployment of a Safety Information Exchange at the roadside that included a statewide upgrade to ASPEN capability was reported by Connecticut to cost $31,000 for infrastructure upgrades, plus $4,800 for equipment and training for each enforcement unit, consisting of one patrol car and one officer or inspector.[17] The development of a wireless telecommunication and SAFER mailbox capability was an additional cost of $1,000 per unit.[18] Kentucky deployed a CVIEW-equivalent system for a reported cost of $325,000. Based on the information collected in the MDI report and assuming a state has 50 mobile enforcement units, the one-time start-up costs for full CVISN deployment of safety information exchange statewide, including wireless telecommunication, SAFER Data Mailbox, and CVIEW, was estimated by the report to be $650,000. Examining the post-CVISN annual operating and capital costs, a statewide deployment including 50 mobile units was estimated to result in increased costs to the state of $160,000, in contrast to the estimated $2.7 million a state spends in labor and annual operating costs without CVISN.[19]

In the states examined by the report, the largest cost for CVISN was the deployment of electronic-screening equipment. The analysis of other states will also demonstrate the high cost of deployment of AVI and WIM facilities. Roadside electronic-screening has a large, one-time capital cost to deploy basic screening equipment (AVI and WIM). A single weigh station was reported by Kentucky to cost $150,000, and upgrading the site to electronic snapshot capability was reported to result in nearly $375,000 in one-time deployment costs.[20] The outlined costs did not include the cost of land, buildings, or fixed scales. Since states can reuse investments in software development, economies of scale exist in the deployment of additional facilities. The estimated incremental costs for

full electronic-screening capabilities at one site were reported to be approximately $300,000, a savings of $225,000 per site compared to the cost of the first screening site for Kentucky.[21] The report further detailed that the annual capital replacement and operating costs would increase by approximately $75,000 per site to support full CVISN electronic-screening.[22]

The report includes the following estimate to deploy and maintain five CVISN sites:

> To illustrate the cost impacts, assume that a state wished to equip and staff five existing roadside weigh stations for CVISN electronic-screening. Based on pre-CVISN annual capital and operating costs, plus salary and benefits for three full-time staff per weigh station, a state would already be incurring nearly $700,000 in annual costs for these five sites before CVISN technology was introduced. The deployment costs for full electronic-screening capabilities at five sites are approximately $1,725,000. The total annual capital replacement and operating costs at these five sites (not counting one-time start-up costs) would increase by nearly $400,000.[23]

**Maryland**

Maryland, as a prototype state, has detailed information concerning its investments. Maryland invested $464,802 (1996-1999) to deploy IRP (VISTA) for electronic-credentialing. It was noted that about 30% of funding was for in-house development labor, and 30% was for equipment purchases. Other major cost drivers included administrative costs and contract costs. Once the IRP electronic-credentialing system was operational, Maryland spent about $28,541 to add on the IFTA electronic-credentialing function. Table 3 below provides the components and associated costs for the IRP and IFTA systems deployed in Maryland according to the Orban (2002b) report.

**Table 3. IRP and IFTA VISTA Deployment Costs for the State of Maryland**

| Cost Element | IRP (VISTA) | IFTA (VISTA) |
|---|---|---|
| **Equipment** | $131,626 | $15,051 |
| **Contract** | $84,637 | $216 |
| **In-house labor** | $150,395 | $12,202 |
| **Communication** | $777 | - |
| **Administration/travel** | $97,367 | $1,072 |
| **TOTAL** | **$464,802** | **$28,541** |

*Source: Orban et al. (2002b)*

The Orban (2002b) report also listed that the Operations and Maintenance (O&M) costs decreased after deployment of electronic-credentialing. Prior to deployment, the annual O&M, including labor to administer or manage each carrier account, cost about $138.20 for approximately 6,500 accounts. After deployment, the annual O&M cost was reduced to $91.950 for each account.[24]

**Kentucky**

Kentucky invested $935,906 to deploy IRP (non-VISTA) electronic-credentialing, as shown in Table 4. In Kentucky, the state had its own in-house credentialing system and did not need a third-party provider to support VISTA credentialing activities. Once the IRP electronic-credentialing system was operational, Kentucky spent about $98,650 to add on the IFTA electronic-credentialing function, as shown in Table 5. The Orban (2002b) report indicated about 81% of IFTA start-up costs were attributed to software development.

**Table 4. Costs of IRP Deployment Electronic-credentialing**

| IRP Cost Element | Cost ($) |
|---|---|
| **Hardware server** | 65,000 |
| **Software development** | 420,000 |
| **Legacy system modification** | 225,000 |
| **In-house and contractor labor** | 169,640 |
| **Training state** | 960 |
| **Travel** | 3,750 |
| **Administrative** | 11,250 |
| **Project management** | 26,250 |
| **Training carriers** | 6,556 |
| **Showcase** | 7,500 |
| **TOTAL** | **935,906** |

*Source: Orban et al. (2002b)*

**Table 5. Costs of IFTA Deployment Electronic-credentialing**

| IFTA Cost Element | Cost ($) |
|---|---|
| **Software development** | 80,000 |
| **In-house labor** | 1,600 |
| **Staff training, state** | 800 |
| **Travel** | 1,250 |
| **Administrative** | 3,750 |
| **Project management** | 8,750 |
| **Showcase** | 2,500 |
| **TOTAL** | **98,650** |

*Source: Orban et al. (2002b)*

Kentucky reported a decrease in operations and maintenance costs for credential administration after system deployment. Prior to deployment, the annual operations and maintenance costs, including labor to administer or manage each carrier account, cost about $62.54 for 4,400 accounts. After deployment, annual O&M cost dropped to about $39.54 for each account.[25]

**Texas**

In 2002, the state of Texas estimated the total costs of CVISN deployment at $9,557,877. Table 6 provides the cost breakdown for Texas: $643,614 for development of the CVIEW-equivalent software (TexVIEW) $2,006,877 for upgrading IRP and IFTA, and $310,000 to add an e-government component for online credentialing. The state of Texas will update its Motor Carrier Credentialing System and Intra-State Registration program for an estimated $327,000. To begin to meet the CVISN Level 2 compliance, Texas also plans to include the Oversize/Overweight permitting system for an additional $8,000. The total for the upgrade of the credentialing project would amount to $2,108,263, or 22% of the total project costs. The electronic-screening project would account for $6,430,000, or 67% of the total project costs. The costs do not include a transponder or carrier enrollment and management component.

**Table 6. CVISN Deployment Cost Breakdown for the State of Texas**

| WBS | Project | Estimated Cost | Timing |
|---|---|---|---|
| **1.0** | **Program Management** | $0 | Phase 1 |
| **2.0** | **System Engineering and Integration** | $226,000 | Phase 1 |
| **3.0** | **Safety Project** | | |
| 3.4 | Texas Commercial Vehicle Information Exchange Window (TexVIEW) | $543,614 | Phase 2 |
| 3.5 | TexVIEW Client (Including SIDS functions) | $100,000 | Phase 2 |
| 3.6 | SAFETYNET | $0 | Phase 2 |
| **4.0** | **Credentials Project** | | |
| 4.4 | International Registration Plan (IRP) | $1,020,000 | Phase 2 |
| 4.5 | International Fuel Tax Agreement (IFTA) / Interstate Trucker Permit | $443,263* | Phase 2 |
| 4.6 | Texas One-Stop - Credentialing Interface (CI) | $250,000* | Phase 3 |
| 4.7 | Texas One-Stop - Website | $60,000* | Phase 3 |
| 4.8 | Motor Carrier Credentialing System | $262,000 | Phase 2 |
| 4.9 | Intra-State Registration (SSRS) | $65,000* | Phase 2 |
| 4.10 | Oversize / Overweight Permitting | $8,000 | Phase 2 |
| **5.0** | **Electronic Screening Project** | | |
| 5.4 | Roadside Systems | $80,000 | Phase 2 |
| 5.5 | Screening | $180,000 | Phase 3 |
| 5.6 | Site Mods, Site Construction | $6,250,000* | Phase 2 |
| 5.7 | Carrier E-Screening Enrollment (TBD) | | Phase 4 |
| **6.0** | **Evaluation** | $50,000 | Phase 3 |
| | **TOTAL** | **$9,537,877** | |

*Source: Texas CVISN Program Plan, Using Technology to Maximize Highway Safety and Improve Government and Industry Productivity, Version 1.0, 2002, Texas Department of Transportation*

**Washington**

Prior to deployment, Washington made the estimates represented in Table 7 for CVISN development. Unlike some states, Washington developed the CVIEW and SAFER software in-house. Based on the CVISN cost estimates, deployment in 13 sites would cost around $15.3 million.

**Table 7. Washington State DOT CVISN Costs**

| Cost Type | Description | Cost ($) |
|---|---|---|
| Development | Electronic-credentialing ; MVS Express (VISTA RS & RT) | 560,000 |
| | In-house development of CVIEW, ROC, etc. | 340,000 |
| Deployment | CVISN IT equipment per weighing site; includes network equipment, servers, workstations, displays, printers, and software | 70,000 |
| | IT equipment for headquarters; includes large server and backup server | 60,000 |
| | AVI per site | 200,000 |
| | WIM per site | 900,000 |
| Ongoing (annual) | O&M, IT lifecycle, ongoing development | 900,000 |

*Source: Orban 2002a. Table 6-15.*

**Delaware**

The cost of implementing CVISN in the state of Delaware will depend on the scale of deployment of the electronic-screening system and enforcement action. The development of credentials administration and safety-information exchange have typically been the smaller-cost items in large states, such as Washington, Kentucky, and Maryland. The largest portion of the estimated and actual project costs have been the infrastructure costs to reconfigure weigh stations with computer upgrades, WIM and AVI devices, and the purchase of mobile computer hardware for in-car police enforcement. Table 8 depicts the estimated costs for CVISN Level 1 deployment.

**Table 8. State Costs to Implement CVISN Level 1**

| Functional Area | Low-End Costs | High-End Costs |
|---|---|---|
| Safety Information Exchange | $0.25M | $1M |
| Credentials Administration | $0.5M | $2M |
| Electronic-screening | $0.5M | $1.5M |
| **Total Cost Range** | **$2.25M** | **$6.5M** |

*Source: Table 6-1 from Peter and Barnes 2001.*

# *CVISN in Delaware*

The Delaware CVISN Planning Team, which includes representatives of DelDOT's MFTA and IT department, DMV, DNREC, and the State Police, produced its first CVISN business plan in 1998. DelDOT also participated in two CVISN Field Operation Tests (FOTs) in conjunction with the I-95 Corridor Coalition. Uncertainty in the direction of the federal CVISN program and the appropriate responsible party at the state level caused the original project to lose momentum. After several years of inaction, DelDOT initiated plans to implement CVISN by reestablishing a CVISN planning team, and the CVISN planning process. This commitment and initiative is demonstrated by the recent grant agreement with FMCSA for PRISM program development, which will establish a solid foundation for future CVISN networking and interface requirements

While the state has reestablished the CVISN Planning Team and recently entered into a PRISM grant agreement, significant work remains for complete CVISN implementation. Currently, MFTA manages information manually and with an obsolete mainframe system. MFTA employs seven IRP clerks, two hauling-permit clerks, one IRP supervisor, one IFTA supervisor, and six auditors, who must audit three percent of the industry each year. Through elimination of negative consequences of ineffectual information management, such as duplication of efforts and inaccurate data, employees and departments could experience increased efficiency, resulting in time and cost savings. Although the implementation of CVISN will not reduce the number of personnel needed in the office, more efficient operations would permit clerks to collect the highway use tax directly, rather than relying on the Internal Revenue Service, and provide greater oversight to ensure registration of only safe vehicles. More efficient operations in the form of a "one-chair shop," where one employee can complete all commercial vehicle registration functions, will offer convenience to customers, potentially drawing registrants to the state and revenue from related audits. Initially, the state can expect slow implementation of CVISN as carriers and staff learn the technology's capabilities.

The industry size, according to the MFTA, amounts to about 6,000 trucks and 2,000 accounts. The industry is primarily represented by small-sized "mom and pop" operations with one or two trucks, dump trucks, and the poultry industry. One of the large accounts in the state is AT Systems, an armored-car service. Penske Truck Leasing, which recently relocated out of the state, had approximately 200 trucks, representing a sizeable portion of Delaware's commercial vehicle operations. According to a MFTA representative, Delaware will continue to lose portions of the commercial vehicle industry unless CVISN is implemented to facilitate the electronic-credentialing process for customers. The limited size of the industry in Delaware also presents difficulty to implementing changes, as the smaller-sized operations are unable to successfully lobby for changes in the system, legislation, permits, etc.

The Delaware Motor Transport Association (DMTA) has a membership of approximately 200, which includes a number of large companies, such as Perdue, Mountaire, Yellow Freight Transportation, Roadway, Wal-Mart, and FedEx, and many small "mom and pop" operations. One representative of the DMTA described Delaware as "lucky" to have

a good-sized, stable poultry industry. Although DMTA represents a majority of the industry before the state legislature, at the time of the interview state officials had not contacted them regarding CVISN. According to DMTA, their membership has not expressed concerns or complaints over the current credentialing process. In the opinion of one DMTA representative, the credentialing process has become rather efficient, with the implementation of IRP, larger companies having employees certified to conduct self-inspection, and only an hour in Dover needed to complete the remaining paperwork.

Although Delaware has not implemented CVISN, entities within the state participate in portions of the program or will in the near future. The Motor Fuel Tax Administration within the Department of Transportation currently participates in the International Registration Plan Clearinghouse (IRP) and will soon implement the Performance and Registration Information Systems Management (PRISM) program. The Delaware State Police already upload information into SAFETYNET regarding out-of-service orders (OOS) and access Department of Motor Vehicles records from Delaware and other states using laptop computers in trooper vehicles. CVISN allows the information gathered through IRP, IFTA, and SAFETYNET, along with other data to be accessed as a comprehensive view for roadside enforcement.

For Delaware, the areas of safety CVISN would need to address are general roadside enforcement, which screens vehicles in transit to ensure they meet legal requirements, and the potential hijacking of commercial vehicles for terrorist activities. CVISN provides ways of assisting these operations and meeting these threats, but the current enforcement infrastructure of Delaware does not support the use of CVISN in these ways.

## Implementation in Delaware

Despite the benefits in safety brought by the outlined technologies coupled with commercial vehicle transponders with electronic manifests, Delaware currently lacks the infrastructure to take full advantage of the benefits. Increasing safety by decreasing the number of unsafe commercial vehicles and drivers requires effective commercial vehicle enforcement and prevention of the credentialing of commercial vehicles deemed unsafe by the FHWA. The Motor Fuel Tax Administration has placed an emphasis on implementing the PRISM system, which will connect with the federal safety database and inform MFTA clerks if the FHWA has classified a vehicle being registered as unsafe to avoid credentialing a potentially dangerous vehicle. By implementing the PRISM system, the state will conduct initial safety screening and make more effective use of a CVISN technology.

The following three tables contrast the current and CVISN systems of credentialing, screening, and safety.

**Table 9. Credentialing Comparison**

| Current system | Possible improvements with CVISN |
|---|---|
| First, MFTA establishes whether the customer is eligible to credential the truck in Delaware. The operator must have a physical location in Delaware. Incorporation in Delaware is Next, the customer completes the title work at DMV, then returns to MFTA to complete the credentialing. | CVISN would allow MFTA to do DMV processing, eliminating the need for customers go to both offices for one vehicle. For the first year, DOT would complete IRP/IFTA for trucks. In the second year, MFTA would be able to complete the credentialing online with the fees being calculated when the information is entered. CVISN would increase customer convenience, improve Delaware's image among CVO, and draw additional revenue through the imposition of minor fees on a larger volume of commercial vehicles. MFTA would benefit from the transferability of information between IRP and IFTA, permitting automatic download of truck mileage from one program into the other. |

**Table 10. Screening Comparison**

| Current system | Possible improvements with CVISN |
|---|---|
| Screening is done manually at the weigh station at Blackbird and could be done by specially trained DSP officers. Screening is not conducted by non-DSP officers. | Electronic-screening will assist in selecting CVO with poor safety records for screening, while allowing those with excellent records to by-pass the weigh station. Deployment of AVI at the existing weigh station or future WIM sites will allow for selective enforcement of CVO with poor safety records. Provision of transponders by DMV, or a third party provider, will also allow Delaware based CVO to benefit from electronic-screening systems in neighboring states. |

**Table 11. Safety Comparison**

| Current system | Possible improvements with CVISN |
|---|---|
| The state of Delaware participates in the IRP and IFTA programs. Delaware uses SAFER and ASPEN, but not CVIEW. | By implementing CVISN the DMV and DSP will have better access to safety information exchange databases and will be able to use CVIEW to access and verify this data at registration and during inspection. |

## DMV Technical Support

CVISN could have significant benefit for Delaware. If Delaware does not implement CVISN, the state is likely to be at a distinct disadvantage as other states move forward and offer more favorable operating conditions for the industry.

There are a number of persistent problems:

- A number of mandates will be implemented before CVISN, including Social Security Online Verification by September 2004, Hazmat regulations by January 1, 2005, and a number of other responsibilities. Completing these tasks in time will pose a challenge.
- The design of computer systems should be revised, and interoperability needs to be present to make the new system work.
- The transponders should be compatible. The three companies currently selling them do not communicate with each other, which results in different standards and systems. Incompatibility precludes unified and exchangeable information databases.
- Funding remains a challenge. Pilot-project states received substantial initial federal funding support, but the states bear the continuing costs of operations and maintenance themselves. A careful calculation and feasible estimates are needed for the costs of CVISN implementation and upkeep over time.
- Lack of communication between state officials and the industry impede successful implementation of the system. Making an effort to understand the industry, its operational system, its needs, and its limitations, conveys a sense of importance and investment on the part of the state to the industry. Actions such as delaying adoption of the IRP and not having open lines of communications have not created a receptive industry.
- Analysis of traffic history and patterns across the state is important for policymaking decisions. In order to acquire complete information, industry representatives need to be surveyed and questioned about their operations, their expectations, their needs, and how the state can help them.
- The state needs to raise industry, law enforcement, and state officials' awareness of the purpose of CVISN components and their benefits. Although CVISN will directly impact the American Trucking Association (ATA) and independent owner-operator associations, the state has not educated them on its use.

- Strategic location of WIM stations within the state and in relation to the Port of Wilmington would reduce instances of weigh station avoidance.
- The current systems and various operational components need to be well mapped out and documented. The results may reveal many components and steps already completed, lowering the total cost of and timeframe for full CVISN implementation.

## Delaware State Police

### Operations

Roadside screening in the state consists of one weigh station located on Route 13 North in Townsend, with one full time state trooper and two civilian size-and-weight-enforcement technicians. The construction of State Route 1 has made the Blackbird weigh station obsolete, as commercial vehicles can avoid the station and reach the same destination by taking SR1.

In terms of information systems, the State Police have computers inside their vehicles and can access Delaware's DMV database and other states' databases through the National Law Enforcement Telecommunications System (NLETS) system. Before IFTA, Delaware State Troopers had access to Delaware's fuel tax information, but the capability has since been removed. According to a representative of the State Police, they have no interaction with surrounding states and no technology available to allow reading of other states' information. The Delaware State Police would like to have information on carrier ratings, recent inspections, and validity of IFTA tags. Although other states own software for such credentials, the lack of a common standard makes the information databases incompatible. Interconnectivity of commercial vehicle enforcement information electronically has precedent. Carrier ratings are based on inspections and accidents. When a commercial vehicle is placed out-of-service, it is not supposed to leave the station. Once the station closes, however, nobody can prevent the operator from taking the vehicle. Each night weigh station personnel prepare an electronic report with out-of-service information and upload it to SAFETYNET. If a vehicle placed OOS leaves, the next state inspector can check to see whether the vehicle has been placed out-of-service. Weigh stations like the one planned on U.S. 301, with CVISN, would have the capability to identify trucks placed OOS in other states prior to the truck reaching the station. Advance notification can give law enforcement the ability to ensure the vehicle does not bypass the station, through escort or other means.

In 2002, the Federal Highway Administration (FHWA) stated, "the most important benefit expected from the deployment of CVISN technologies, especially electronic-screening and safety information exchange, is a reduction in CMV-related crashes through improved enforcement of the [Federal Motor Carrier Safety Regulations] FMCSRs."[26] Delaware saw 1048 traffic crashes involving commercial vehicles, with 15 fatalities and 395 injuries, in 2003.[27] According to Delaware's Annual Traffic Statistical Report for 2003, the Delaware State Police Truck Enforcement Unit recorded 1130 federal safety violations distributed across equipment, log book, general, and

maintenance violations.[28] The FHWA's assertion would mean fewer crashes and, in turn, fewer deaths and injuries in Delaware.

**Table 12. Commercial Vehicle Inspections in Delaware in 2001-2003**

| | 2001 | 2002 | 2003 |
|---|---|---|---|
| Inspections | 4067 | 4572 | 4039 |
| Number of trucks declared out-of service | 1032<br>Rate: 25.4 % | 939<br>Rate: 20.5 % | 913<br>Rate: 22.6% |
| Number of drivers declared out-of-service | 233<br>Rate: 5.7 % | 295<br>Rate: 6.5 % | 214<br>Rate: 5.3 % |
| Seatbelt Arrests and or Assessments | * | 147 | 189 |
| Arrests for Dangerous Moving Violations by Commercial Motor Vehicles | 599 | 1250 | 767 |

* Data not available
*Source: Delaware State Police.*

Increased safety requires more inspections. Each year Delaware inspects about 4,000 trucks, and 23% are placed out-of-service, which is consistent with the national average of trucks placed out-of-service, as demonstrated in Table 12 above. After a steady annual increase in the number of vehicles weighed on fixed and portable scales from 1999 to 2002, the number of vehicles weighed dropped 17% in 2003.[29] CVISN's mobile technology, such as ASPEN and CVIEW, would allow size-and-weight technicians and enforcement officers to target vehicles based on carrier information prior to the weigh station and use the Blackbird weigh station and four fixed scales maintained by the Delaware Solid Waste Authority for inspections.[30]

Currently, the Delaware State Police have no fixed scales on an interstate system, but has two sets of portable scales for use on seven fixed weigh pads throughout the state.[31] The Delaware Size and Weight Enforcement Plan Annual Update for FY 2004 lists locations on both I-495 and I-95 suitable for portable scale operations. With fixed weigh pads, Weigh-in-Motion (WIM) in the mainline road in those locations and ASPEN or CVIEW, troopers could target inspections in an effort to reduce the number of unsafe vehicles and drivers on busy interstates.

**Memorandum of Understanding**

CVISN has the potential to augment current size and weight enforcement to address safety and security issues present with CVO. Furthermore, appropriate technology would allow troopers to access the information collected by CVISN pilot states like neighboring Maryland.

At the current level of staffing and resources, DSP does not meet federal size-and-weight enforcement requirements. Recently, the state of Delaware has taken action to comply with Federal requirements. First, DelDOT has invested in the design and development of

new weight enforcement and inspection facilities. Second, DelDOT and the Delaware Department of Safety and Homeland Security (DSHS) have entered into an agreement for the funding of facilities, equipment, and personnel to directly support Delaware's Size and Weight Enforcement Program.

As of October 2004 DelDOT had begun designing a Truck Weigh Station and Inspection Facility for a proposed site located on U.S. Rt. 301near the Delaware/Maryland state line. Truck travel comprises up to 35% of traffic volume on U.S. 301. The new location will have a weigh-in-motion (WIM) scale and over-height detector to identify vehicles exceeding the legal limits. Vehicles in violation of height or weight limits would receive notification to enter the station through a series of static, directional, and variable message signs. Using a deceleration lane, the vehicle would enter the Truck Weigh Station and Inspection Facility passing through the static-scale area for height/weight verification by the Delaware State Police. After weight and height confirmation, troopers might direct a vehicle to proceed to the off-loading parking area for further scrutiny. Once the truck has completed the weight and inspection process, it will exit the weigh station using the acceleration lane to merge back onto U.S. 301. The facility's design incorporates DelTrac elements, including CCTV, VMS, and traffic sensors, and provides for the future integration of CVISN to enable electronic-screening and real-time safety-information exchange. The engineer's estimate of total project cost for the Truck Weigh Station and Inspection Facility is $3,387,738. The estimated cost of the WIM/Static Scale system is $479,278.

Currently, DelDOT is evaluating locations for future facilities, including a site south of the current Blackbird station on U.S. Rt. 1, as well as a station along I-95. DelDOT plans to deploy additional weigh-in-motion facilities at strategic locations throughout the state to enhance truck weight enforcement efforts.

In August 2004 the Delaware Secretaries of Transportation and Safety and Homeland Security entered into the "Memorandum of Agreement for Operation of the State of Delaware Vehicle Size and Weight Enforcement Program," in which DelDOT committed to fund operation and maintenance for the planned facilities. Under the MOA DelDOT is responsible for the funding of facilities, equipment, and personnel, including the following:

- Land purchasing
- Design and construction of facilities and/or pull off sites with the exception of a Safety Inspection Barn
- Routine maintenance of the facility
- Cleaning and upkeep of the inside of the building
- Major repair of structural components
- Weigh system installation, maintenance, repair, and replacement. This includes fixed, portable, and weigh-in-motion scales along with associated computers, computer programs, signage, and communications equipment
- Submission of the Delaware Annual Size and Weight Enforcement Plan

DSP maintains responsibility under the agreement for:

- Conducting weighing and enforcement activity as described in the State's Size and Weight Enforcement Annual Plan
- Assisting DelDOT in the preparation of Delaware's Annual Size and Weight Enforcement Plan
- Submission of data required by the agreement

The MOA includes funding for a total of six trooper positions and six civilian positions as follows:

- FY 2005 DelDOT will fund three Trooper positions and One Civilian position
- FY 2006 DelDOT will fund two additional Trooper positions and one additional Civilian position
- FY 2007 DelDOT will fund one additional Trooper position and one additional Civilian position

The level of personnel funding is based on maintaining the current operations hours of 40 hours per week at the Blackbird weigh station, similar operations hours at the future U.S. Rt. 301 weigh station, and random statewide portable weighing operations. Table 13 below provides a summary of estimated costs to expand the State's Size and Weight Enforcement Program through FY 2007.

**Table 13. Size and Weight Enforcement Program Costs**

**Truck Weight Enforcement Program Costs**
(2004 Est., 2005-2007 Projected)

| | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|
| Personnel Costs | $ 229,944 | $ 474,052 | $ 647,792 | $ 751,164 |
| Other Capital and Operating Costs | $ 78,966 | $ 277,257 | $ 285,739 | $ 233,042 |
| Total Costs | $ 308,910 | $ 751,309 | $ 933,531 | $ 984,206 |

**Notes**
-- Projected Costs for FY 2005 to 2007 = 2004 FY Est. Cost + MOA Projected Costs.
-- No inflation factor added to cost estimate.
-- See "MOA" and "Size and Weight Enforcement Annual Plan" for detailed cost breakdown.

## Port of Wilmington

The Port of Wilmington has not specifically looked at the CVISN transponder technology, but a separate plan for electronic manifests for commercial vehicles approaching and entering the port has been considered. The Port of Wilmington's electronic manifest plan would allow gate operators to read the information and determine the internal destination of the vehicle to make transport to and from the port more efficient. With the electronic manifest on a transponder, the port would also want to track movements on the grounds to monitor for suspicious behavior. Both the Delaware State Police and the Port of Wilmington expressed the need for universal coverage of vehicles in their jurisdiction by the transponders and instantaneous response from the transponders if they are to prove successful.

The shipment volume of the Port of Wilmington varies depending on the season and its related goods. As one of the highest-volume ports for fruit and fruit juice concentrate, the "fruit season" constitutes a sizable portion of the Port of Wilmington's business. The "fruit season" runs from Christmas to the beginning of May, and approximately 1,000 trucks enter the port daily. All shipments from overseas and other localities have the potential to bring unwanted species or disease. To prevent harmful outbreaks, fumigation standards and procedures exist. As with any rule, some might choose to avoid compliance. Fruit flies related to shipments of Moroccan clementines to the Port of Wilmington could pose a public-health or native-environment problem. CVISN technology would allow tracking of shipments from port to retail, as well as any fruit flies. Tracking could avert a public health crisis and collect data on repeated offenders to end their entry into the port. From early May to the end of August, New Zealand kiwi and apples make up the majority of commerce, as well as meat and fish. During the time period directly following fruit season, the number of trucks entering the port daily drops to 800. Between September and Christmas, the port has 450 trucks entering daily, primarily dealing with juice, meat, and fish. Dole, Chiquita, Volkswagen, and Audi have the largest operations at the Port of Wilmington.

According to a representative of the Port of Wilmington, commercial trucks at the port are registered primarily outside of Delaware. The same representative estimated that 10-15% of trucks are registered in Delaware, 40% in Canada, 20% in Ohio, and 10% in Pennsylvania and New Jersey during the "fruit season" and only 2% off-season. The Port of Wilmington currently employs eleven guards with stations for the inbound, outbound, and truck lanes.

The Port of Wilmington participates in a program entitled Port Inland Distribution Network (PIDN), which operates as a spoke and wheel program. Currently, the Port of New York/New Jersey cannot handle the container volume of the Port of Los Angeles/Long Beach, but would like to do so in the future. The PIDN program is expanding and intends to create strategic ports. Making the Port of Wilmington a strategic port would involve moving facilities around the corner from their present location. Dole and Chiquita combined bring 1,500 containers weekly into the port. PIDN would increase the number of containers to 5,000 per week and increase the number of

commercial vehicles at the port. Two special entry ports exist at the Port of Wilmington, but this number may need to be increased, if the port becomes part of PIDN. An intermodal line from Wilmington directly to Harrisburg would decrease the number of Canadian and Midwest drivers coming into the Port of Wilmington.

Port officials see the benefit of electronic-credentialing as speed and the ability to read the truck-and-driver information. An example was given of an Air Force program called PICS, in which commercial vehicle drivers are given a card with a slot in it that can be placed somewhere in the cab. As the truck approaches a port, the driver places whichever finger he prefers in the slot. When the card reads the finger, identifying the truck, the card sends a signal to the gate. The eventual addition of driver snapshots would provide the Port of Wilmington with a similar system of pre-cleared information. The Port has recently been C-TPAT certified. *Customs-Trade Partnership against Terrorism (C-TPAT)* is a joint initiative between U.S. Customs and businesses. The government-industry program is designed to increase security at U.S. borders with industry participation on a voluntary basis. The system creates a more secure path for container shipments. The ability to obtain information of containers, shippers, and rivers, would support such security programs.

# *Findings and Conclusions*

The development of the CVISN Business Plan should take into account the various federally supported safety-data-exchange programs. One possibility for Delaware would be to combine the CVISN and PRISM programs and implement a registration data management system complying with CVISN Level 1 and the standards for PRISM implementation. The CVISN program's intent is to remove unsafe vehicles through efficient selection of CVO during the screening and inspection process, while the PRISM process assigns safety scores for CVO to prevent the registration of unsafe operators.

The selection of transponders will be an important component of the CVISN Business Plan. The Oregon State Department of Transportation chose to develop its own transponder system to maintain control over the information and cost. The choice of NORPASS or Pre-Pass would remove the burden of marketing the transponder to carriers and the development of transponder software and protocols. Both private vendors offer turn-key solutions. The drawbacks of these prepackaged systems are in the ownership of information and loss of control over setting fee structures and investment decisions in AVI equipment.

The development of CVISN may need to be submitted through the Department of Technology and Information's E-Government Business Process Analysis Worksheet (BPAW) for review and comment. The BPAW collects information concerning new e-government activities and includes a business-justification analysis prior to the investment in new e-government projects. The BPAW focuses on the cost estimates of the project for initial development, deployment, and maintenance. DTI requires the agency to develop a project "Goals and Objectives" statement describing the web activity and importance of the project to the agency. A statement of the services the new e-government activity will provide to the citizens of Delaware is required. The e-government description includes whether the project will publish information on the Internet, undertake transactions with web users or provide integrated automated business processes. The BPAW defines fully integrated automated business processes as those that enable interactions and transactions between multiple organizations, applications and databases, both internally and externally, functions include ordering, delivery, accounting and reporting.[32]

Increased safety through CVISN technology requires additional staffing and infrastructure from the state in order to be effective. The level of state police staff, weigh stations, and sites in Delaware makes the benefit of CVISN roadside enforcement technologies extremely limited. While the use of CVISN screening programs like PRISM prior to credentialing a vehicle reduces the number of unsafe vehicles on the states highways, the bulk of the reduction would occur through roadside enforcement. The MOA between DelDOT and DSP will allow additional roadside enforcement, increasing the overall safety benefit.

# Recommendations

Although certain aspects of this evaluation are based on limited data from early deployments in other states, it is clear that CVISN will be a good investment for Delaware and support improvement in the service provided to Delaware CVO. CVISN can produce cost savings for agencies and motor carriers, enhance the efficiency of commercial vehicle operations, and improve CVO safety. However, to achieve these benefits, CVISN must be deployed according to consistent standards, and its major systems, electronic-credentialing, electronic-screening, and safety-information exchange, must be fully integrated. Some of the major findings from this evaluation and the implications for future deployment are highlighted below.

Electronic-credentialing could bring the benefit of automated processing, including application, state processing, issuance, and tax filing, of at least International Registration Plan (IRP) and International Fuel Tax Agreement (IFTA) credentials and a readiness to extend to other credentials, such as intrastate, titling, oversize/overweight (OS/OW), carrier registration, and hazardous material (HAZMAT). Potentially, electronic payment of fees or taxes and connection to the IRP and IFTA Clearinghouses could be implemented.

The CVISN program has focused on improvement in the electronic connections among governments. The program was conceived prior to the widespread use of the Internet, and some states, most notably Maryland, are CVISN Level 1–compliant without an electronic government interface with CVO. Maryland deployed CVISN without an on-line registration and renewal process. Other states have added an e-government component to the registration process. The state of Washington has an integrated e-government portal for CVISN that allows registration, renewals, requests for other credentials, and on-line payments.

The development of an on-line government component to business for a Delaware CVISN program would be a key piece of improving the service provided to CVO. Other Division of Motor Vehicles services, such as driver license renewals, have not been placed on-line due to security and fraud concerns. Washington's deployment experience indicates the possibility for states to securely issue and renew CVO credentials. If the Department of Transportation chooses to add online service to the CVISN deployment, then additional coordination with the Delaware Department of Technology and Information (DTI) will be required. DTI has an E-Government Business Process Analysis Worksheet that will need to be completed, and there are specific policies that will need to be addressed prior to deployment of a new e-government solution. The deployment of an on-line payment system will also necessitate compliance with the e-payment policies of DTI and a determination of the appropriateness of the use of the DTI designated third party e-payment provider.

Delaware has executed a Letter of Intent and Grant Agreement with FMCSA for PRISM, which provides funding for the improvement of the electronic-credentialing program to enhance the electronic-credentialing process. PRISM can be used to begin the process to

update Delaware's credentialing process to bring it into CVISN Level 1 compliance. Any update of the electronic-credentialing system should be both PRISM and CVISN-compliant. The state of Delaware PRISM Grant will provide up to $500,000 for the PRISM upgrade, based on the development and approval by FMCSA of a PRISM implementation plan. PRISM training and implementation plan development were scheduled to begin in October 2004.

Safety Information Exchange can be enabled through the use of software for access to centralized safety data at all major inspection sites, connection to the Safety and Fitness Electronic Record (SAFER) system so states can exchange "snapshots" of information on interstate carriers and individual vehicles, and implementation of the Commercial Vehicle Information Exchange Window (CVIEW), or equivalent, system for exchange of intrastate snapshots and for integration of SAFER and other national/interstate data. Important safety benefits could be achieved by increasing the number of out-of-service orders issued, thereby deterring motor carriers and drivers from violating safety regulations. The benefits directly include improved targeting of enforcement activities on high-risk carriers, resulting in more OOS orders for the same number of inspections performed, and indirectly include increased compliance with motor carrier safety regulations resulting from stricter enforcement.

Electronic-screening performed at one or more fixed or mobile inspection sites will have time-saving benefits. In particular, dedicated short-range communication (DSRC) technologies can provide reliable communication between moving vehicles and roadside enforcement operations. Most of the growth in electronic-screening has occurred since the emergence of three programs: HELP (Heavy Vehicle Electronic License Plate) PrePass, NORPASS (North American Preclearance and Safety System), and Oregon's Green Light.

The state of Delaware should review the use of software for the electronic-credentialing, safety data-exchange, and screening process developed by prototype and model states. One example is that the state of Washington developed XCVIEW, which is an XML version of CVIEW. Washington's XCVIEW was designed to share commercial vehicle and carrier data with other states and with the SAFER system. The XCVIEW software is based on the Internet standard of XML instead of the pre-Internet EDI (electronic data-exchange) first developed by the John Hopkins University Applied Physics Lab (JHU/APL). The Washington State Department of Transportation makes the software available in the public domain.[33]

The report recommends Delaware consider a multi-stage implementation process to deploy CVISN. The first stage would involve the development of an electronic-credentialing system that is compliant and able to interact with the safety-data exchange. The electronic-credentialing system would involve a CVISN/PRISM-compliant IRP and IFTA upgrade that would be able to interact with the national SAFER database. The second stage would be to develop the CVIEW and ASPEN technology that would allow inspectors to connect into the SAFER databases to do roadside inspection using the up-to-date SAFER database. CVIEW would be used at inspection stations and ASPEN at

roadside stops. The third stage would be the deployment of electronic-screening at all weigh stations in Delaware. Currently, the only Delaware weigh station is at Blackbird on route U.S. Rt.13. A new weigh station WIM and AVI is currently being designed for U.S. Rt.301 near the Delaware/Maryland border. The recently signed MOA between DelDOT and DSP will provide additional resources to operate and maintain additional weigh stations.

The recommended deployment schedule will take advantage of the significant benefits from a CVISN/PRISM deployment by first improving the electronic-credentialing process before undertaking the capital-intensive expansion of the screening facilities. The Delaware State Police is the only police force in Delaware trained to conduct safety inspections and would remain so with the adoption of CVISN. The report recommends limiting the investment in capital outlays for roadside inspection unless and until operations and maintenance funding is increased to staff roadside inspections. The additional resources for DSP, agreed upon with DelDOT, will expand roadside enforcement operations, justifying capital outlays. Time constraints on federal funds availability make expediency in beginning CVISN implementation critical. Hesitation could lead to loss of federal funding for CVISN capital outlays.

Further, the report recommends conducting a series of workshops, policy forums, and training sessions to better educate commercial vehicle operators on the deployment issues related to CVISN and to build support for the e-government aspects of the project. Effective communication and information exchange, as well as collaboration among all the parties concerned, are essential to successful program outcomes. End-user input will be crucial to the development of on-line transaction services and the selection of transponder technology. Without end-user buy-in, industry adoption of the technology will face many obstacles and could limit the effectiveness of the program.

# *Future Data Needs*

As CVISN technologies mature and expand and more efficient solutions are developed, cost and benefit information will need to be updated and new analyses performed to help the state forecast costs and savings. Additional data types are needed to demonstrate CVISN-technology safety impacts once deployed. Examples of roadside enforcement data needed to document CVISN benefits include vehicle and driver OOS rates for motor carriers in various safety-risk categories, electronic-screening bypass rates, and trends in safety-compliance rates through CVISN deployment.

Further detailed analysis could be performed in order to specifically estimate the impact of implementing CVISN in Delaware during various stages of the program. A number of issues and specific questions for examination are suggested below.

The safety-benefits analysis could address the following research questions:

- What is the impact of CVISN on the number of crashes, injuries, and fatalities involving CVO?
- What is the impact of CVISN on rates of driver and carrier compliance with Federal Motor Carrier Safety Regulations (FMCSR)?
- To what extent does CVISN help roadside safety enforcement officials identify high-risk commercial vehicles and motor carriers?
- To what extent does CVISN help roadside safety enforcement officials identify OOS violators?

A cost analysis or a cost-benefit analysis can be performed for the CVISN evaluation and could consider the following major cost-related questions:

- What are/were the baseline costs associated with CVO processes prior to CVISN technology deployment?
- What are the one-time start-up costs to the state of Delaware to deploy CVISN systems, and what are the key drivers or major elements contributing to those costs?
- What recurring annual capital, labor, operating, and maintenance costs does the state incur as it uses CVISN technologies? What are the key drivers or major elements contributing to those costs?

In order to measure customer satisfaction with CVISN deployment, various surveys and other measures can be carried out, including:

- A motor carrier survey
- A driver survey
- Interviews with state CVO administrators
- Surveys and focus groups with state CVO inspectors

It is important that mail surveys of motor carriers be designed to be representative of the trucking industry in the state. In-depth, semi-structured personal interviews could be used

to ask the respondents about roadside safety and weight inspections and electronic-credentialing methods.

Examples of deployment tracking data that may be useful include numbers of

- Carriers participating in electronic-credentialing
- Types of credentials that can be processed electronically
- Carriers/trucks enrolled in electronic-screening programs
- Inspectors using ASPEN or equivalent to conduct inspections
- Vehicles screened using the Inspection Selection System

[1] http://www.jhuapl.edu/cvisn/introcvisn/index.htm
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[3] Ibid.
[4] Ibid.
[5] Orban, JohnE. et al. Evaluation of the Commercial Vehicle Information Systems and Networks (CVISN) Model Deployment Initiative. (Washington, DC: US DOT), 2002a.
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[13] Ibid.
[14] Ibid.
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[20] Ibid.
[21] Ibid.
[22] Ibid.
[23] Ibid.
[24] Orban, JohnE. et al. Evaluation of the Commercial Vehicle Information Systems and Networks (CVISN) Model Deployment Initiative. (Washington, DC: US DOT), 2002b.
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[29] Ibid, 86.
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[32] BPAW, 2002: 2
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*Appendix*

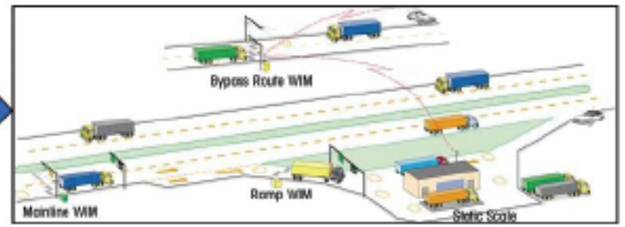
# COSTS AND BENEFITS OF CVISN IN DELAWARE

*"(With the Oregon Green Light Program,) truckers save time and fuel that would be spent getting on and off the road and idling in weigh station lines, chances for accidents are lessened, and the state and taxpayers save money that would have been spent on added staffing and weigh station facilities."*

John Sallak, Director of Safety,
Oregon Trucking Associations


*"I have been pleased with the Green Light system in Oregon. On the whole, its accuracy has been high, both for weighing and for credentials checks. This is especially important to me because it lends credibility and flexibility to our motor carrier enforcement program. Because of the weighing, recording, and sorting aspects of the system, I am able to deploy more of my resources away from the traditionally heavily staffed work areas and into the field where they are more likely to find violators."*

Laura R. Troxell,
Senior Officer, Woodburn District




## PUBLIC

### BENEFITS

- Increased safety by reducing the number of unsafe commercial vehicles on roads
- Reduced number of vehicles idling while waiting for inspections, leading to lower levels of air pollution and the associated health implications
- Lower operating losses by carriers leading to fewer product cost increases

### COSTS

- **Opportunity cost– the money being used for CVISN could be used for a variety of other programs**
- **Potential increase in the volume of truck traffic, caused by greater efficiency and cost reductions in use of commercial vehicles for just-in-time delivery**

## STATE GOVERNMENT

### BENEFITS

- More efficient roadside enforcement, through targeted inspections
- Increased administrative efficiency by eliminating some tasks and allowing additional tasks to be completed
- Compliance with FMCSA standards and improvement of standing with the federal government

### COSTS

- **Additional capital costs for weigh and inspection stations to be in compliance with FMCSA**
- **Additional operations and maintenance costs for personnel and upkeep at the facilities**
- **Education and training costs for state personnel and industry representatives**

## INDUSTRY

### BENEFITS

- Reduced time needed and improved ease in obtaining credentials
- Reduced time in weigh and inspection stations, leading to lower operating costs
- Deterrence of cargo theft and vehicle hijacking
- Improved environmental impact, assisting in meeting EPA mandates

### COSTS

- **Transponder purchase and vehicle outfitting costs**
- **Loss of anonymity**
- **Potential for technology to be used for additional law enforcement functions**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