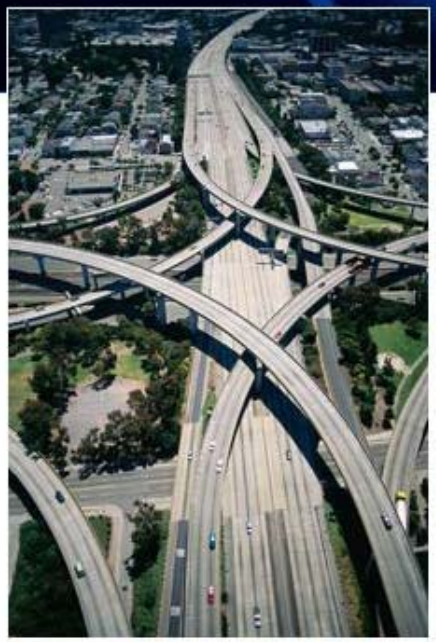

Introductory Guide to CVISN

Baseline Version 1.0
November 2008

Baseline Version
This document has completed internal and external reviews of previously published drafts and preliminary versions. All comments received to date have been incorporated or addressed.

This document and other CVISN-related documentation are available for review and downloading by the ITS/CVO community from the FMCSA CVISN site on the World Wide Web. All updates to this document will be maintained and published on that site. The URL for the CVISN site is:
http://cvisn.fmcsa.dot.gov/

Please note:
This document is disseminated in the interest of information exchange. This report does not constitute a standard, specification, or regulation.

Additional review and comments to this document are welcome. Please send comments to:

Julie Lane
Federal Motor Carrier Safety Administration
1200 New Jersey Avenue, S.E.,
Room W66-406, Technology Division (MC-RRT)
Washington, DC 20590

Phone: 202-385-2391
E-Mail: Julie.Lane@dot.gov

Valerie B. Barnes
The Johns Hopkins University
Applied Physics Laboratory
11100 Johns Hopkins Road
Laurel, MD 20723-6099

Phone: 717-352-0131
E-Mail: Valerie.Barnes@jhuapl.edu

Table of Contents

List of Figures

List of Tables

1. INTRODUCTION

This guide is intended to answer basic questions about the Commercial Vehicle Information Systems and Networks (CVISN) Program. It is primarily intended for state administrators of motor carrier programs related to safety, credentials, fuel tax, and size and weight regulation. This guide is intended to help these state administrators establish a program to deploy new CVISN capabilities in their state. Table 1–1 details the content of this *Introductory Guide to CVISN*.

This guide provides a first introduction to CVISN that can be read cover-to-cover by a person new to the subject. This guide is also useful as a reference for someone who may be familiar with some aspects of CVISN but does not have a clear picture of how all the parts fit together.

This document uses acronyms and terminology that may be new to you. Please refer to the *CVISN Glossary* [Reference 1] for a list of acronyms and definitions of terms.

Federal and state regulations apply to motor carriers. This guide assumes that you are already somewhat familiar with Commercial Vehicle Operations (CVO) governmental functions such as safety regulation, the International Registration Plan (IRP), the International Fuel Tax Agreement (IFTA), and weight enforcement. However, there may be some readers who will not be, such as specialists in just one aspect of CVO or information system developers. Someone in each state will be an expert in each of these areas and can help you to understand aspects new to you and provide good background material. Various state agency associations and trade associations are also good sources of information.

Table 1–1. Content of *Introductory Guide to CVISN*

Chapter	Content
1 – Introduction	
2 – What is CVISN?	Definitions of terms and objectives What CVISN will do for safety information sharing, credentials administration, and electronic screening Key operational concepts What systems comprise CVISN
3 – What CVISN Capabilities Should A State Deploy First? Core CVISN	What is Core CVISN What does Core CVISN look like and what does a state have to do Core CVISN deployment process
4 – How Can a State Build on Core Capabilities? Expanded CVISN	What is Expanded CVISN Expanded CVISN deployment process Long-term vision
5 – What Benefits Are Expected from CVISN?	Benefits of safety information sharing, credentials administration, and electronic screening Benefits to states and motor carriers
6 – How Do States Achieve Interoperability?	Common guiding principles Common concepts of operations Architecture Interoperable technology Information-sharing standards
7 – Resources	Funding Information Tools and communications Expertise References Contacts

2. WHAT IS CVISN?

This chapter provides a summary of what CVISN (pronounced "see-vision") is. But sometimes the forest gets lost in the trees. Figure 2–1 shows you a picture with some familiar parts – a truck, a motor coach, some Federal Motor Carrier Safety Administration (FMCSA) and state systems, and networks that link them together. These are all part of CVISN.

2.1 What is the definition of CVISN?

CVISN

The collection of information systems and communications networks that support commercial vehicle operations.

CVISN stands for Commercial Vehicle Information Systems and Networks. CVISN refers to the collection of information systems and communications networks that support commercial vehicle operations (CVO).

These include information systems owned and operated by governments, motor carriers, and other stakeholders. The FMCSA is not trying to create a new information system, but rather to create a way for existing and newly designed systems to exchange information through the use of standards and available communications infrastructure and to enable public and private sector CVO systems to operate more efficiently and effectively.

2.2 What is it?

CVISN is a nationwide program managed by the FMCSA. The CVISN Program provides a framework or "architecture" that enables CVISN stakeholders – government agencies, the motor carrier industry, and other parties engaged in commercial vehicle safety assurance, regulation, and operations – to share and use information and technology to improve safety and security and to conduct business transactions electronically.

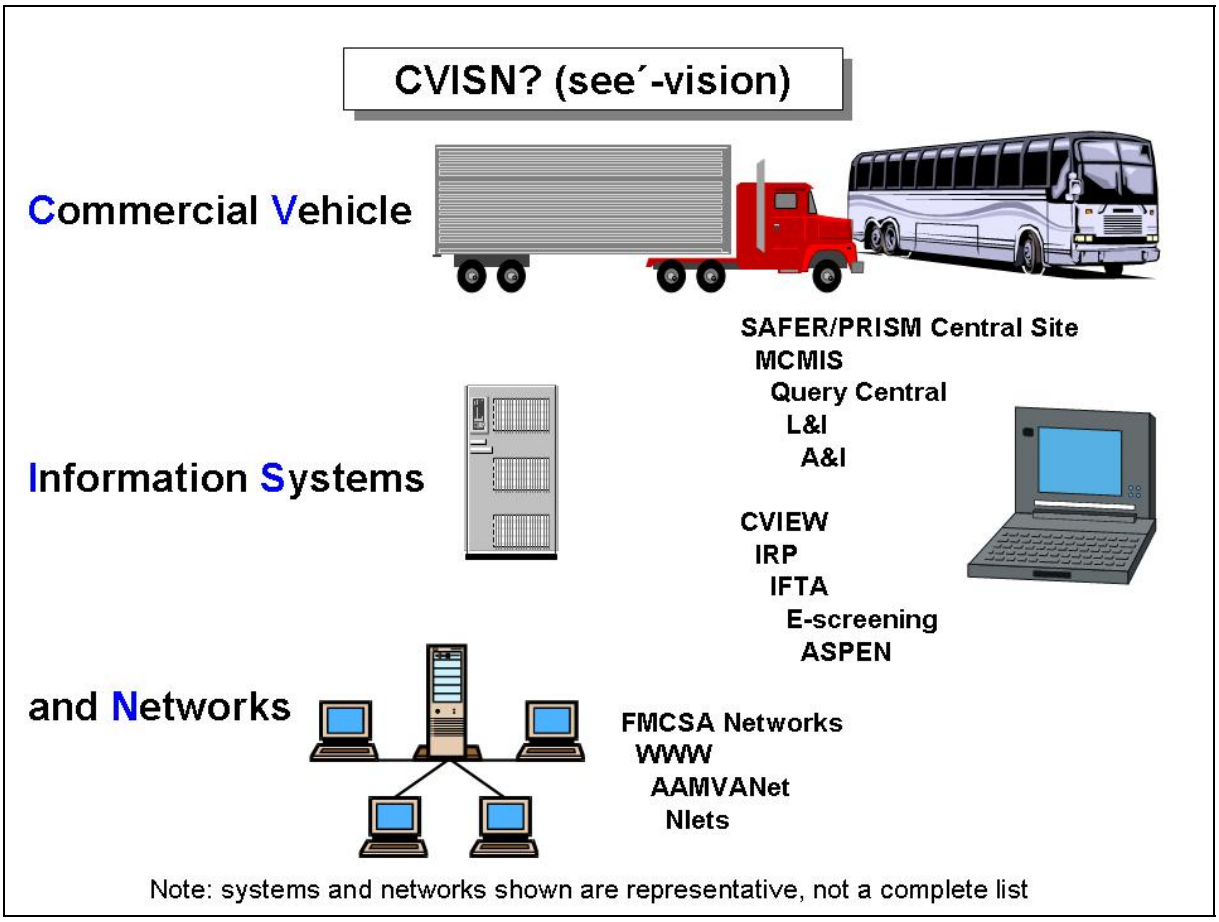

Figure 2–1: What is CVISN?

CVISN exists in the context of a larger universe. FMCSA recognizes the importance of maintaining healthy relationships with our partners across several groups:

- Primary stakeholders
  - CVO industry
  - State DOT agencies
  - State law enforcement
  - Other state agencies
- Organizations to which the stakeholders belong
- Other federal agencies and programs

The CVISN Program continues to collaborate and coordinate with our partners to achieve the vision we all share for improved safety, security, and productivity.

Terminology is often confusing because terms are commonly used in ways that are not always precise and logically consistent. The following definitions are those that have been generally accepted among stakeholders.

ITS (Intelligent Transportation Systems) – Electronics, communications, or information processing used singly or in combination to improve the efficiency or safety of a surface transportation system.

CVO – The motor carrier operations and motor vehicle regulatory activities associated with the commercial movement of goods, including hazardous materials and passengers. With respect to the public sector, includes the issuance of operating credentials, the administration of motor vehicle and fuel taxes, and roadside safety and border crossing inspection and regulatory compliance operations.

ITS/CVO – The ITS elements that support commercial vehicle operations. These include information systems, networks, sensor systems such as weigh-in-motion (WIM), technologies such as brake testing equipment, border crossing systems, and the components of the intelligent commercial vehicle. The National ITS Architecture defines these commercial vehicle operations user services: commercial vehicle electronic clearance, automated roadside safety inspection, on-board safety and security monitoring, commercial vehicle administrative processes, hazardous materials security and incident response, and freight mobility.

CVISN –The collection of information systems and communications networks that support commercial vehicle operations. CVISN includes information systems owned and operated by governments, carriers, and other stakeholders.

The *CVISN Architecture* [Reference 3] is the CVO part of the National Intelligent Transportation Systems (ITS) Architecture [Reference 4]. It includes standards for communications technologies such as vehicle-to-roadside communications via dedicated short range communication (DSRC). These standards are being developed to promote interoperability and efficiency. The Transportation Equity Act for the 21st Century (TEA-21) [Reference 34] and the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) [Reference 35] required all ITS projects funded by the Highway Trust Fund to be consistent with the national architecture and applicable standards, provisional standards, and protocols. CVISN grants also require consistency with the National ITS Architecture, CVISN Architecture, and available standards.

International Trade Modernization – Efforts to improve and modernize systems and information exchange to facilitate international trade. In this context, the focus is on legal, safe, and secure border crossing of goods transported by commercial vehicles.

Figure 2–2 shows how the terms and architectures fit together.

The FMCSA sponsors and coordinates a set of activities to research and deploy ITS/CVO technologies to assist trucks and motor coaches in moving safely and freely throughout North America. The CVISN Program is one element of that research and deployment effort.

2.3 What is the CVISN Program trying to accomplish?

The primary objective of the CVISN Program is to develop and deploy information systems that will support new capabilities in three areas:

- Safety Information Sharing
- Credentials Administration
- Electronic Screening

The CVISN Program is using an approach based on an **open architecture and standards** so that these capabilities may be deployed, from a motor carrier's perspective, in a manner that is interoperable from state-to-state. The architecture will also enable the addition of further capabilities in the future. An overview of the vision for each of the current capability areas follows.

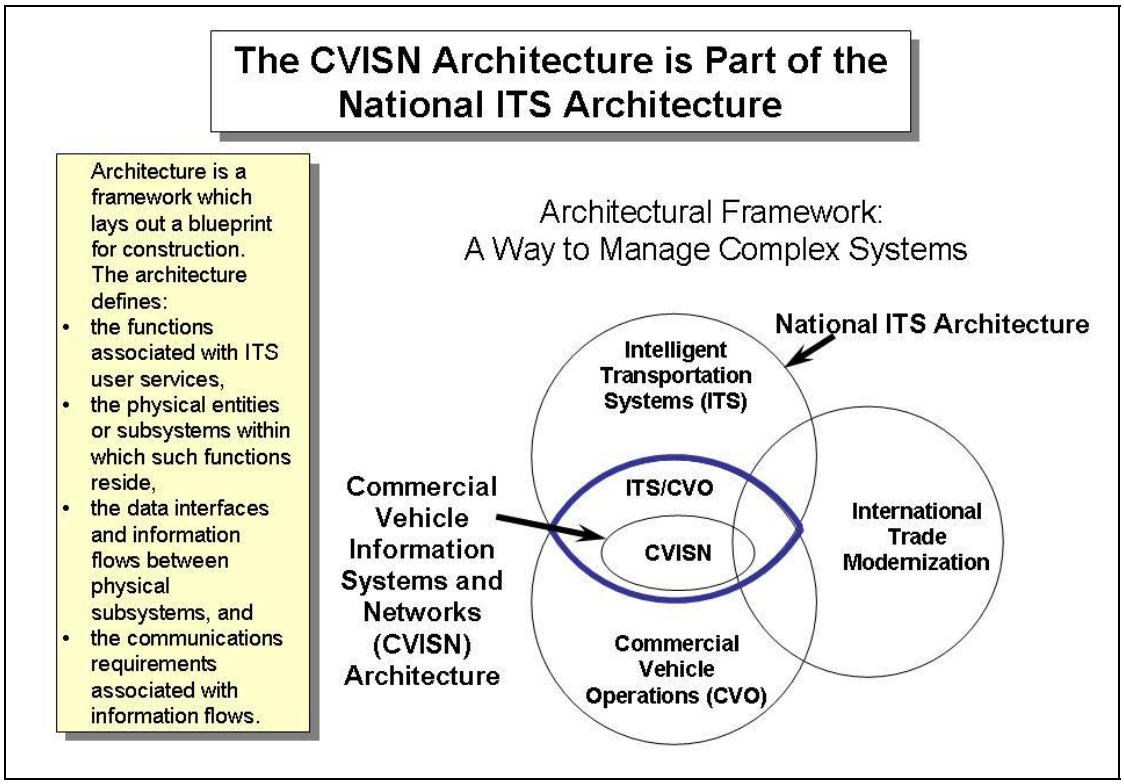

Figure 2–2: Architecture Relationships

2.4 What will the CVISN Program do for Safety Information Sharing?

CVISN is a mindset for sharing information. In the past, states and the federal government often acted as islands of information and systems. One goal of the CVISN Program is to achieve interconnection and interoperability among state, federal, and private systems to share safety information more effectively.

For a number of years, the Federal Highway Administration (FHWA) and FMCSA have funded states through the Motor Carrier Safety Assistance Program (MCSAP) to perform safety inspections of selected commercial vehicles at the roadside and to perform audits of the safety processes of selected motor carriers at their terminals. Now CVISN grants support states that are enhancing their safety processes and systems. FMCSA maintains a central Motor Carrier Management Information System (MCMIS) to collect safety data. In the past, MCMIS inputs were entered from paper forms, and outputs were available as printed reports. The CVISN Safety Information Sharing capability area is intended to provide improved electronic exchange of MCMIS and other safety information among state and federal systems that support both roadside and office activities. FMCSA's information technology modernization project, COMPASS (Creating Opportunities, Methods, and Processes to Secure Safety), will streamline roadside activities and make it even easier to access and share safety information.

A key aspect of this capability area is the automated collection of the results of the vehicle and driver inspections via a system called ASPEN (see Figure 2–3). This application is used by law enforcement officers at the roadside to enter the results of driver and vehicle inspections as they perform the inspection. This improves the entry accuracy and enables them to submit the reports immediately using whatever kind of connection is available. ASPEN utilizes several other applications that pull data from remote sources.

In a typical state configuration, the inspection reports are sent from ASPEN to the CVISN system called SAFER (Safety and Fitness Electronic Records) at the national level. SAFER relays the reports to MCMIS. SAFER also makes the inspection reports available to roadside systems in other states.

SAFER supports the PRISM (Performance and Registration Information Systems Management) program as well as CVISN. For this reason, the SAFER system is sometimes shown on diagrams as the "SAFER/PRISM Central Site". The International Registration Plan (IRP) and the process for commercial vehicle registration within the states provide the framework for the PRISM program. Using the registration process, PRISM establishes a system of accountability by ensuring that no vehicle is plated without first identifying the motor carrier responsible for the safety of that vehicle during the registration year. Many states implement both CVISN and PRISM. Efforts must be coordinated to insure both programs' objectives are met in a cost-effective manner.

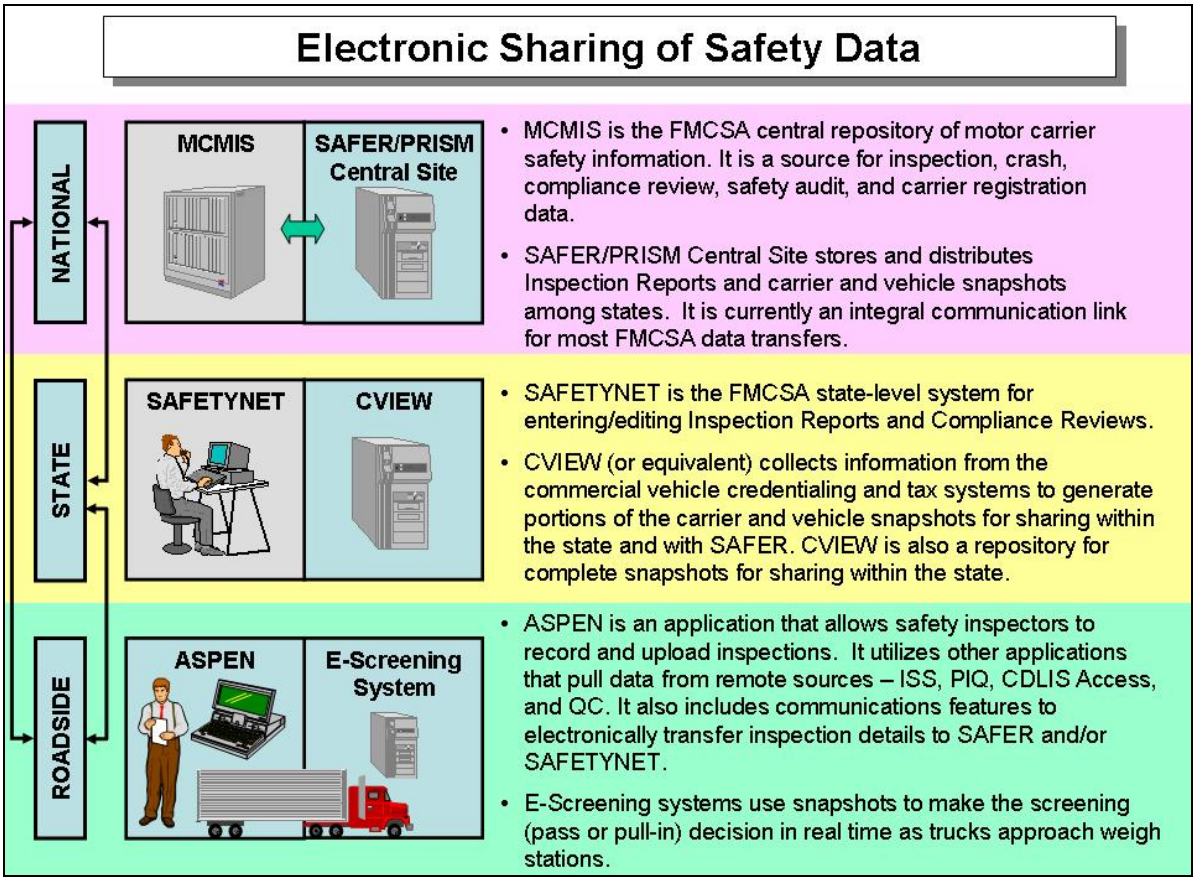

Figure 2–3: Electronic Sharing of Safety Data

Snapshots are standardized sets of safety and credentials data that are needed by automated systems, enforcement personnel, and administrative personnel to make safety and regulatory decisions. Snapshots are currently defined for carriers and vehicles.

The SAFER system makes much of the MCMIS safety data available online to safety analysts and law enforcement personnel. SAFER receives an extract of subsets of MCMIS data and stores them for retrieval as motor carrier and vehicle "snapshots." Snapshots are standardized sets of safety and credentials data that are needed by automated systems, enforcement personnel, and administrative personnel to make safety and regulatory decisions. For example, the carrier snapshot contains the name and United Sates Department of Transportation (USDOT) Identification Number of the carrier, several statistical safety indicators, tax payment, and other regulatory data items. State CVISN systems called CVIEWs (Commercial Vehicle Information Exchange Window), or their equivalents, send cab card (vehicle registration) and other data to SAFER. SAFER assembles snapshots from the MCMIS and CVIEW data.

SAFER distributes snapshots in several ways, including a Web site that is available to the general public (http://safer.fmcsa.dot.gov/). It distributes the snapshots to CVIEW that in turn distributes them to roadside sites and administrative users within the state. Implementing a CVIEW to support safety information exchange reduces the burden on state legacy systems and centralizes the state interfaces with FMCSA systems. Maintaining snapshots within the state CVIEW also provides a repository of useful safety and credentials information that all state legacy systems can use.

A key feature of the snapshot data is that changes are automatically distributed to users. Source systems recognize when a significant change has occurred and forward these data proactively to SAFER. SAFER uses the change notice to update snapshot data and forwards the data to users (e.g., state CVIEW systems) who have subscribed to the update service. A state may subscribe to the carrier snapshots for all carriers registered to operate in its state.

2.5 What will the CVISN Program do for Credentials Administration?

The credentialing process involves registering to operate as a motor carrier, demonstrating the required liability insurance, registering and titling vehicles, paying federal heavy vehicle use tax, paying fuel taxes, applying for special oversize/overweight (OS/OW) permits, applying for special hazardous materials hauling licenses and permits, and complying with other state-specific regulations. The state processes the applications, often with a combination of manual and automated systems. Some sort of invoicing and payment is involved, which may or may not use electronic payment mechanisms.

Anyone who has had to title or register a personal vehicle can appreciate the magnitude of a motor carrier's task that includes credentialing many hundreds of vehicles. Most states today have extensive information systems used to process all the credentialing aspects of commercial motor vehicle operations. Before CVISN, motor carriers typically submitted applications on a variety of paper forms. After CVISN is implemented, carriers are able to perform many credentialing activities electronically.

There are two central concepts for this capability area:

- Allow motor carriers to apply for, pay for, and receive credentials electronically, and
- Enable states to share information about credentials and fees paid electronically. This includes supporting the International Registration Plan (IRP) and International Fuel Tax Agreement (IFTA).

A goal of CVISN is to provide end-to-end automation of these credentialing processes. By end-to-end we mean the electronic application, processing, fee collection, issuance and distribution of CVO credentials, tax filing and auditing, and support of multistate information exchange and processing agreements. CVISN states have implemented Web-based "one-stop shops." These are Web sites where carriers can accomplish many credentialing activities using their Web browsers.

The exact information systems design used by each state will vary. A typical design is shown in Figure 2–4. In this example, the state has a Credentialing Web Site that provides access for the carrier via a Web browser.

The state's Web site may perform initial error checking and transaction archiving, and then route the transaction to the appropriate state agency system to process the particular submission. For example, vehicle registration requests or renewals might go to the department of motor vehicles while fuel tax payments might go to the comptroller's office. The actual processing of the form would be done in a system operated by a particular agency. This system would typically be a "legacy"

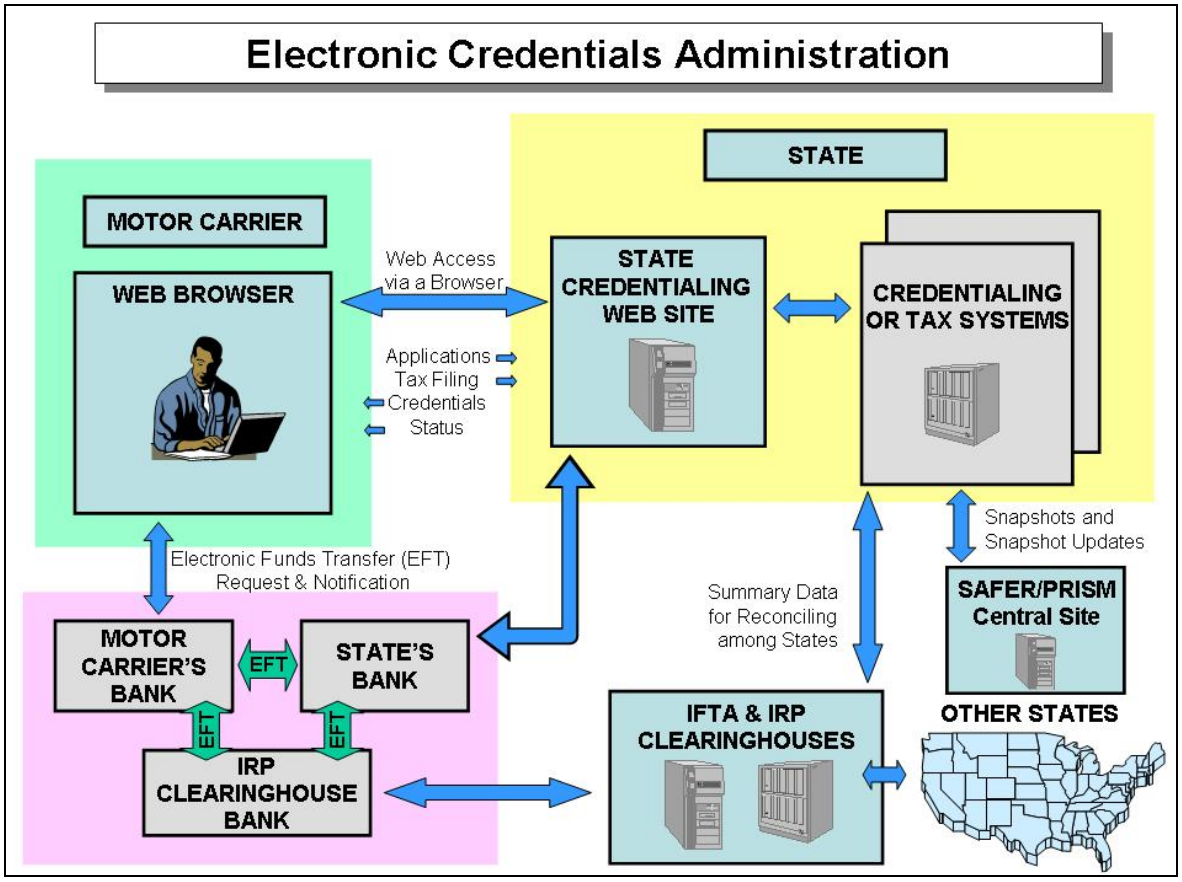

Figure 2–4: Electronic Credentials Administration

(previously existing) system that had been modified to include a new interface for accepting electronic transactions from the credentialing Web site instead of accepting manual entries of information from state agency clerks, who processed the paper applications in the past. Part of the processing might include cross-checks to other systems, such as verifying that a carrier who was requesting to register a vehicle was current on tax payments or checking that the vehicle was properly titled and not stolen. The details of the processing are different for each transaction.

In general, the processing includes error checking, cross checks with other databases, fee calculations, invoicing, payment, and issuance of some type of decal, sticker, plate, or paper document. The ultimate goal is to eliminate paper documents altogether. That will take many years to achieve. In the interim, some states will allow larger carriers to print their own paper documents. Decals and metal plates will need to be mailed to smaller carriers, although larger carriers will be able to maintain an inventory of these items at their sites, just as some states allow car and truck dealers to do today.

Another aspect of credentialing is sharing information among multiple states. States have evolved a number of "base-state agreements" over the years, including IRP and IFTA. These agreements allow a carrier to designate a base state that it deals with. That base state, in turn, provides information and fee payments to other states. For example, a carrier may operate in Maryland and 10 surrounding states. The carrier could choose to register its vehicles in Maryland as the base state. When registering its vehicles, the carrier would specify the percentage of each vehicle's mileage that is expected to occur in each of the 11 states. The state of Maryland would process the registration information, calculate the fees based on the differing rates for each state, and exchange the necessary information and fee payments with each state. This is a great simplification for carriers. Before the IRP, carriers had to separately register and obtain license plates from each state for each vehicle that would operate in the state.

The further improvement that CVISN brings to this situation is the development of an IRP Clearinghouse and an IFTA Clearinghouse to allow the states to exchange data and fees electronically rather than via paper reports. At this time, only the IRP Clearinghouse actually initiates the transfer of funds among states' banks. The IFTA Clearinghouse calculates the transfer amounts, but relies on the states to actually initiate the transfers.

As mentioned earlier, states update the SAFER snapshots for carriers and vehicles with credentials information. This lets all states know, for instance, which vehicles have registered to operate in their jurisdiction.

2.6 What will the CVISN Program do for Electronic Screening?

Most automobile drivers have gone past weigh stations on major highways. Signs direct trucks to pull into these stations to have their weight checked to ensure that they are within federal and state regulations. Overweight trucks can cause excessive road wear. Federal law generally limits gross vehicle weight to a maximum of 80,000 pounds, with corresponding maximum weights on each axle. At a typical weigh station, trucks slow down or stop at a scale that weighs each axle and total vehicle gross weight. At this time vehicle size (length, width, and height) may also be checked. While the vehicle is slowing and/or stopped on the scale, law enforcement personnel check it for the proper decals and any obvious safety problems. If they observe any problem, they will ask the driver to pull into an inspection area

at the site for a more thorough examination. They may also pull in a small, random sample of vehicles without any obvious safety problems for safety inspections. The process may result in a delay from 30 seconds to 45 minutes or more. This can be a significant cost to some types of trucking operations. At some high-traffic stations, queues can back up onto the highway, forcing temporary closure of the station to avoid a safety hazard.

The third key component of CVISN is electronic screening (or e-screening). E-screening means that a commercial vehicle on the road is identified automatically, and its safety is assessed. Typically, states deploy e-screening capabilities at staffed weigh stations. As a vehicle approaches the site, sensors identify it and check safety (and, in some cases, credentials status) for the vehicle and associated carrier. Safe and legal vehicles are allowed to bypass without slowing down or stopping (see Figure 2–5).

This capability requires installation of weigh-in-motion (WIM) scales in the main highway or on the ramp to measure the weight of trucks while they are moving. A truck that is equipped with a DSRC transponder (see Figure 2–6) can be interrogated by roadside readers just before the vehicle goes over the scale. This reader obtains unique identifying information from the transponder.

A Roadside Operations Computer (ROC) in the weigh station can use this identifier to look up information about the vehicle and the associated carrier using the snapshot information provided by SAFER. License plate readers can support the e-screening process by identifying vehicles not equipped with DSRC transponders. Static scales on the ramp give a more accurate weight.

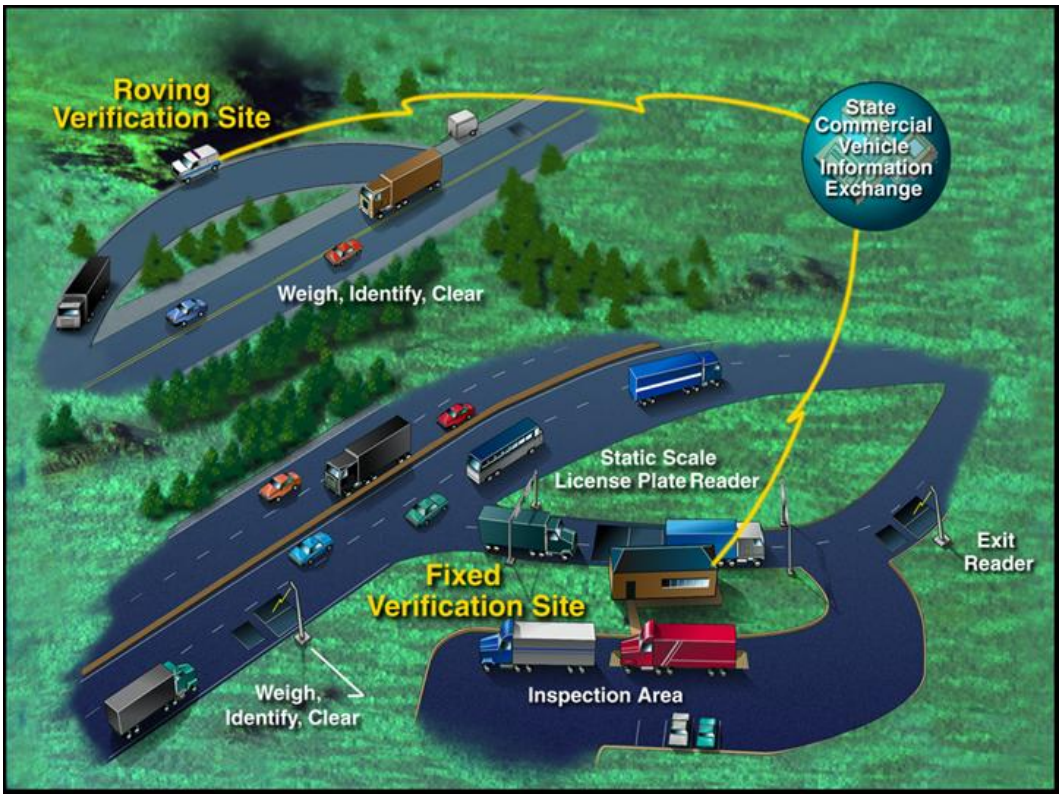

Figure 2–5: Electronic Screening Operational Concept

There are several major components of the recommended electronic screening algorithm:

- Weight and size screening
- Safety screening on the carrier and vehicle safety history derived from snapshots
- Credentials screening, based on specific credential violations or history information contained in snapshots
- Match with current "hot list" for a vehicle or carrier
- A random selection factor to randomly pull in a selected percentage of vehicles
- Other criteria set by the jurisdiction.

Selection for pull-in should be made even if only one component denies bypass, regardless of the other conditions.

The electronic-screening (e-screening) system checks the available data against the screening criteria. If the checks are good, the DSRC reader sends back a message to the transponder that says the truck is cleared and does not need to pull into the static scale ramp.

Figure 2–6 illustrates a typical setup for e-screening equipment. The transponder is mounted on the windshield and has red and green indicators. The green light signals the driver to proceed; the red light to pull into the scale.

Prior to participation in an e-screening program, the carrier, vehicle, and transponder information must be provided through an enrollment process. By restricting each transponder to installation on a specific vehicle, a direct relationship is established between the transponder ID and the vehicle identification

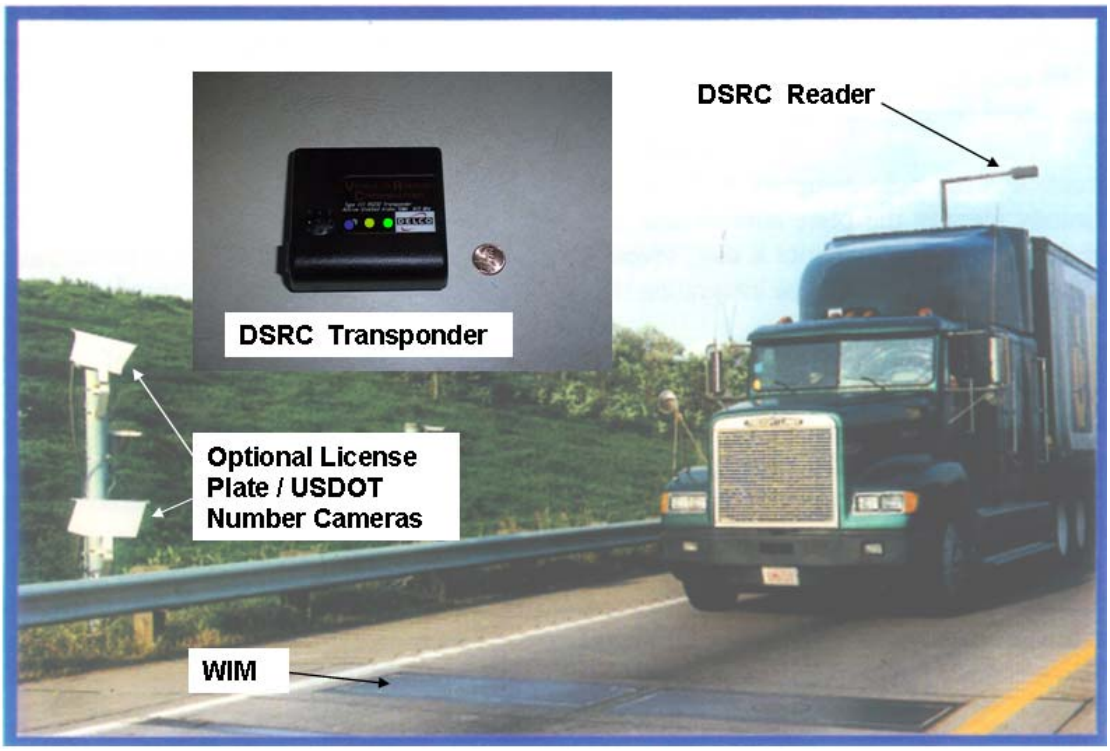

Figure 2–6: Example of Electronic Screening Equipment

number (VIN). Vehicle snapshots contain a transponder ID field to record this information. During the e-screening enrollment process, it is possible to set specific jurisdictions that should not receive the transponder ID information for a particular vehicle. SAFER restricts access to the transponder ID fields according to the "opt out" jurisdictions specified in each vehicle's record.

To perform e-screening, the truck must be identified. Not all trucks have transponders, so states are using different methods to identify those trucks. License plate readers and USDOT number readers can successfully read the characters of interest ~40–65% of the time, depending on lighting, reflectivity, contrast, and other factors.

At Virtual Weigh Stations, some states capture the identifiers, weigh the vehicle, and perform automated safety and/or credentials assessments. If enforcement staff are available, they may intercept a vehicle targeted by the automated checks.

2.7 What are the key operational concepts in CVISN?

The term "operational concept" generally means "how a system is used in various operational scenarios." "System" is used here in a broad sense to include people and manual processes as well as automated information, sensor, and control systems. New operational concepts are adopted in order to solve a problem in the current operations or to take advantage of new knowledge or technology that enables improvements in current operations. The key CVISN operational concepts are summarized in Table 2–1.

Table 2–1. Operational Concepts

Key CVISN Operational Concepts
▪ Share data among safety, credentialing, and screening processes.
▪ Focus safety enforcement on high risks.
▪ Electronic credentials and paperless vehicles.
▪ Provide credentialing services via the World Wide Web.
▪ Ubiquitous (but secure) electronic data access.
▪ Standard snapshots and reports for carrier and vehicle information.
▪ Mainline screening and automated roadside operations.
▪ Conform to the architecture to achieve interoperability.
▪ Flexible deployment options.

Share data among safety, credentialing, and screening processes – The CVISN Program is structured to encourage states to design and deploy these three elements in parallel. Doing so enables the synergy of being able to use data from one area to improve the processes of another. For example, CVISN supports the PRISM concept to base the decision to grant a truck registration renewal on the prior safety history of the carrier.

Focus safety enforcement on high risks – Enhanced data exchange will allow all activities to focus resources on high risk operators. Providing enforcement personnel with current, detailed, accurate information about carriers, vehicles, and drivers allows them to do a better job selecting vehicles for inspection and allows them to focus on carriers, drivers, and vehicles that have the highest safety risk.

Electronic credentials and paperless vehicles – The "paperless vehicle" concept is supported, i.e., electronic records become primary and paper records become secondary. Electronic access to credentials information makes it possible to no longer require that commercial vehicles carry copies of credentials and decals onboard. Instead, credentials would be checked and verified electronically. The concept is to support the complete credential life cycle electronically: application, fee payment, credential issuance, revenue distribution, modification, renewal, audit, sanctioning, appeals, and inspection. Data exchange between the public and private sectors will be accomplished using formats and protocols defined in open standards. Paper could be produced from the electronic information if and when required.

Provide credentialing services via the World Wide Web – Allow carriers to use a Web browser to apply for, renew, and obtain credentials.

Ubiquitous (but secure) electronic data access – Good business processes can be enhanced through improved automated access to accurate information. Information sharing within a single jurisdiction and across jurisdictions using electronic networks is a cornerstone of the CVISN initiative. Information systems are only as good as the quality of the data they use. Data must be accurate, current, and safe from tampering or unauthorized disclosure.

Standard snapshots and reports for carrier and vehicle information – Standard information exchange is supported via carrier and vehicle (and, eventually, driver) snapshots. CVISN involves multiple applications and interfaces among hundreds of state agencies and thousands of carriers. Information exchange will be enabled through the use of standards. Many elements of CVISN require information about the current and past safety performance and credentials status for carriers, vehicles, and drivers. Collecting the most-used information into standard messages will simplify systems because interfaces can be defined once rather than negotiated between every pair of stakeholders. Carrier and vehicle snapshots containing safety and credentials data are implemented in SAFER now. Driver snapshots may be considered for the future.

Mainline screening and automated roadside operations – Electronic screening is provided for vehicles equipped with interoperable DSRC transponders. E-screening can also be provided for other vehicles if they can be identified using other techniques (e.g., license plate readers and/or USDOT number readers). Stopping a truck or bus costs time and money and is inconvenient. Through automation, the current weigh station screening process and safety inspection process can be greatly expedited using technologies such as weigh-in-motion, hand-held computers, brake testing, and communications networks. To support e-screening, CVISN supports the use of open standards for vehicle-roadside interactions. These standards apply not only to electronic screening, but also to toll, traffic, fleet applications, and border crossing processes throughout North America. The use of open standards for communicating between the vehicle and the roadside will allow a single transponder to be used for multiple applications throughout the states (and eventually North America).

Conform to the architecture to achieve interoperability – Interoperability is assured by a process of architecture conformance checks throughout a project's life cycle, culminating in execution of standardized interoperability tests. Interoperability is achieved through conformance to the CVISN Architecture. Interoperability of deployed systems is verified through testing. If a tested system is changed, the interoperability tests are re-run as part of the re-validation process.

Flexible deployment options – The CVISN architecture provides a common technical framework and a basis for developing interface standards. It does not specify a particular design for states or carriers; it allows them to select from a wide range of options to meet their particular needs. The architecture only constrains design options in areas necessary to achieve interoperability and compatible practices. In this context, interoperability means that systems and components deployed by different organizations (or by the same organization) work together to accomplish shared functions. As technology changes, so will the architecture. Before incorporating new technologies into the architecture, feasibility should be demonstrated. Several technology options and implementation choices are likely to continue to support the CVISN architecture's concepts and standards. Stakeholders choose the approach that best fits their business needs and available resources.

2.8 What systems comprise CVISN?

Figure 2–7 illustrates how the systems operated by different stakeholders can be viewed as part of one, large, whole system of systems – CVISN. Tables 2–2 through 2–4, following the figure, provide brief descriptions of each system. Some of these components are not part of the initial deployment of CVISN. Please see the next chapter to understand what is part of the initial "Core CVISN" deployment.

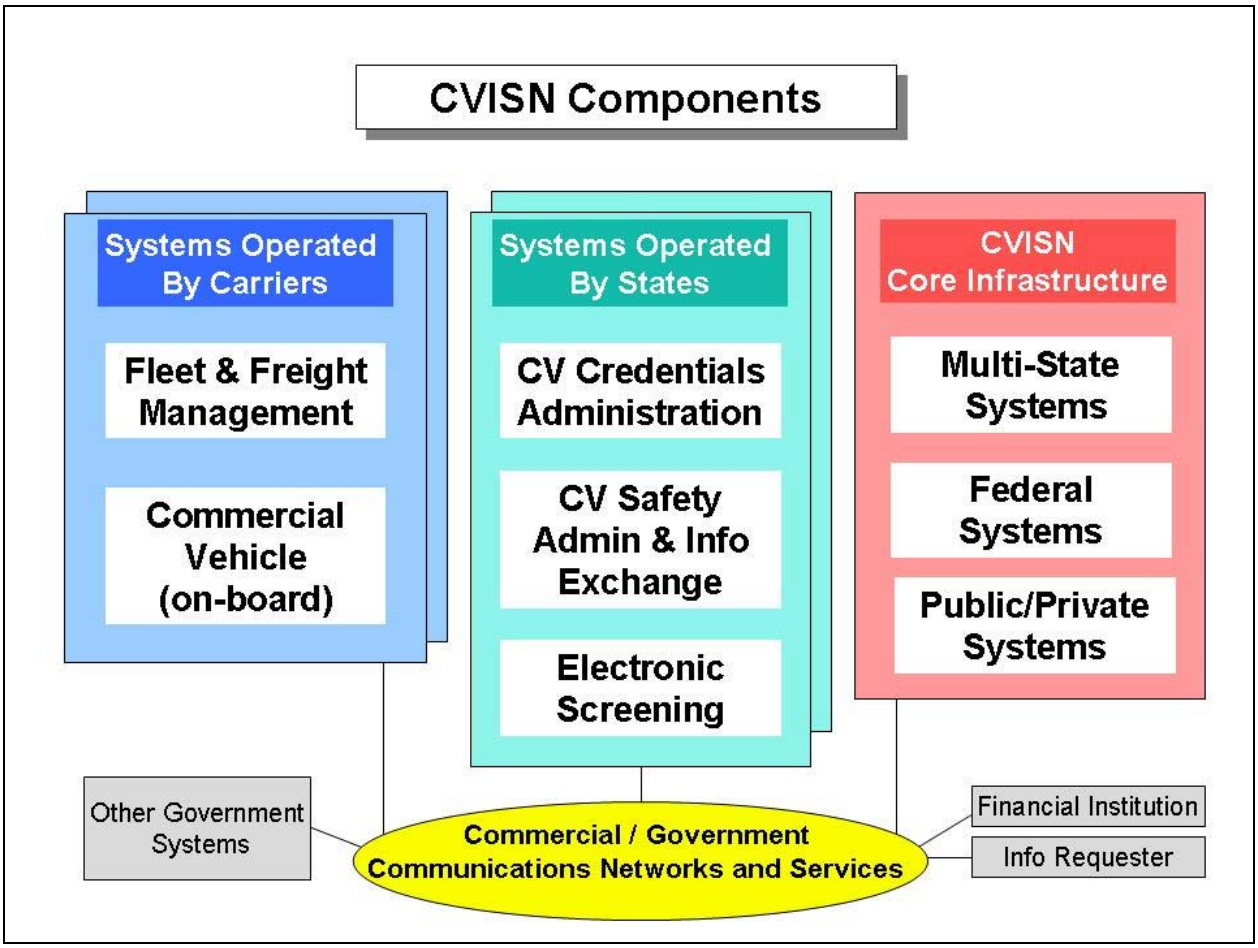

Figure 2–7: CVISN Components

Table 2–2. Examples of Carrier Systems

Category	System	Description
Fleet & Freight Management	Internet Tools	Provide a Web browser for credentialing and tax activities. Provide the capability to monitor trips, shipments, driver, and vehicle performance, and other information.
	Other Carrier Systems	Provide for routing, location, safety and security monitoring, HazMat information sharing, border crossing support.
Commercial Vehicle (CV)	On-Board Systems	Provide communications, identification, information collection and sharing, safety and security monitoring and alerts.

Table 2–3. Examples of State Systems

Category	System	Description
CV Credentials Administration	State Web sites	Support electronic credentialing, often implemented as a portal for registration and permitting
	International Fuel Tax Agreement	Allow carriers to register for fuel tax credentials and process fuel tax returns
	International Registration Plan	Register commercial vehicles for payment of interstate vehicle license fees on the basis of fleet miles operated in various jurisdictions
	Intrastate registration	Register commercial vehicles that normally operate within the state
	OS/OW Permitting	Issue Oversize/Overweight permits
	Titling	Title new and used vehicles
	Commercial Driver's License/ Driver's License (CDL/DL)	Maintain CDL records and issue licenses and renewals
	Treasury	Process electronic payments
	Hazardous Material (HazMat)	Issue HazMat permits
CV Safety Admin & Info Exchange	CVIEW	Provide for the electronic exchange of: • interstate carrier and vehicle safety and credential data between state source systems, users (e.g., at roadside sites), and SAFER • intrastate carrier and vehicle safety and credential data between state source systems and users (e.g., at roadside sites)
	Compliance Analysis and Performance Review Information (CAPRI)	Support compliance reviews and safety audits
	SAFETYNET	Support entry, access, analysis, and reporting of data from inspections, crashes, compliance reviews, assignments, and complaints
	ASPEN (or TraCS – Traffic and Criminal Software)	Record commercial driver/vehicle roadside inspection details
	Inspection Selection System (ISS)	Return the carrier snapshot which includes critical safety performance indicators to assist in determining whether an inspection is warranted
	Past Inspection Query (PIQ)	Retrieve recent inspection reports
	Citation & Accident	Record citation and accident data
Electronic Screening	Roadside Operations	Process snapshots and control site traffic
	Screening System	Make pass/pull-in decision for each CV approaching the site
	Sensor/Driver Communications	Process vehicle measures and communicate with driver

Table 2–4. Examples of Core Infrastructure Systems that Support CVISN

Category	System	Description
Multi-State Systems	Commercial Driver Information System (CDLIS)	Report and access commercial driver identification, commercial driver's license, and driver history information
	International Registration Plan (IRP) Clearinghouse	Administer IRP base state agreement; enable IRP jurisdictions to electronically exchange motor carrier and fee information
	International Fuel Tax Agreement (IFTA) Clearinghouse	Administer IFTA base state agreement; allocate fuel taxes among jurisdictions
	National Motor Vehicle Titling Information System (NMVTIS)	Verify the information on the paper title with the electronic data from the state that issued the title
	Nlets (International Justice and Public Safety Information Sharing Network)	Provide the capability to exchange criminal justice and public safety-related information via a switching network linking local, state, and federal agencies together
	Unified Carrier Registration (UCR)	Administer the registration of interstate motor carriers, motor private carriers transporting property, leasing companies, brokers, and freight forwarders under the Unified Carrier Registration Act of 2005 [part of Reference 35]
Federal Systems	Motor Carrier Management Information System (MCMIS)	Capture and store safety data from field offices through SAFETYNET, CAPRI, and other sources
	Safety and Fitness Electronic Record (SAFER) / Performance and Registration Information Systems Management (PRISM)	Display carrier and vehicle information; store, manage, and share snapshots; respond to queries
	Licensing & Insurance (L&I)	Enter and display licensing and insurance information regarding authorized for-hire motor carriers, freight forwarders, and property brokers
	Query Central (QC)	In response to a query, retrieve safety compliance and enforcement data from various sources about commercial motor vehicle drivers, vehicles, and carriers
	Data Qs (DQ)	Record and monitor challenges to FMCSA data
	National Hazardous Materials Route Registry (NHMRR)	National repository of routes, which are either designated for transportation of HazMat or restricted from use by HazMat carriers
	Internal Revenue Service (IRS) Heavy Vehicle Use Tax (HVUT)	Support e-filing for carriers and payment verification for states
Public/Private Systems	E-Screening Enrollment	Collect and evaluate requests from carriers to participate in electronic screening

3. WHAT CVISN CAPABILITIES SHOULD A STATE DEPLOY FIRST? CORE CVISN

The Federal Motor Carrier Safety Administration (FMCSA) refers to the basic capabilities for using Commercial Vehicle Information Systems and Networks (CVISN) as "Core CVISN." Capabilities beyond the Core set are called "Expanded CVISN." FMCSA made the distinction to encourage states and motor carriers to deploy specific sets of capabilities incrementally. The definition of Core CVISN has been baselined. The definition includes capabilities a state would deploy, capabilities motor carriers in a state would deploy, and capabilities for several critical national systems, referred to as core infrastructure systems.

States and motor carriers should start by deploying Core CVISN capabilities.

3.1 What is Core CVISN?

Figure 3–1 illustrates the three main areas of Core CVISN:

- Safety Information Sharing
- Credentials Administration
- Electronic Screening

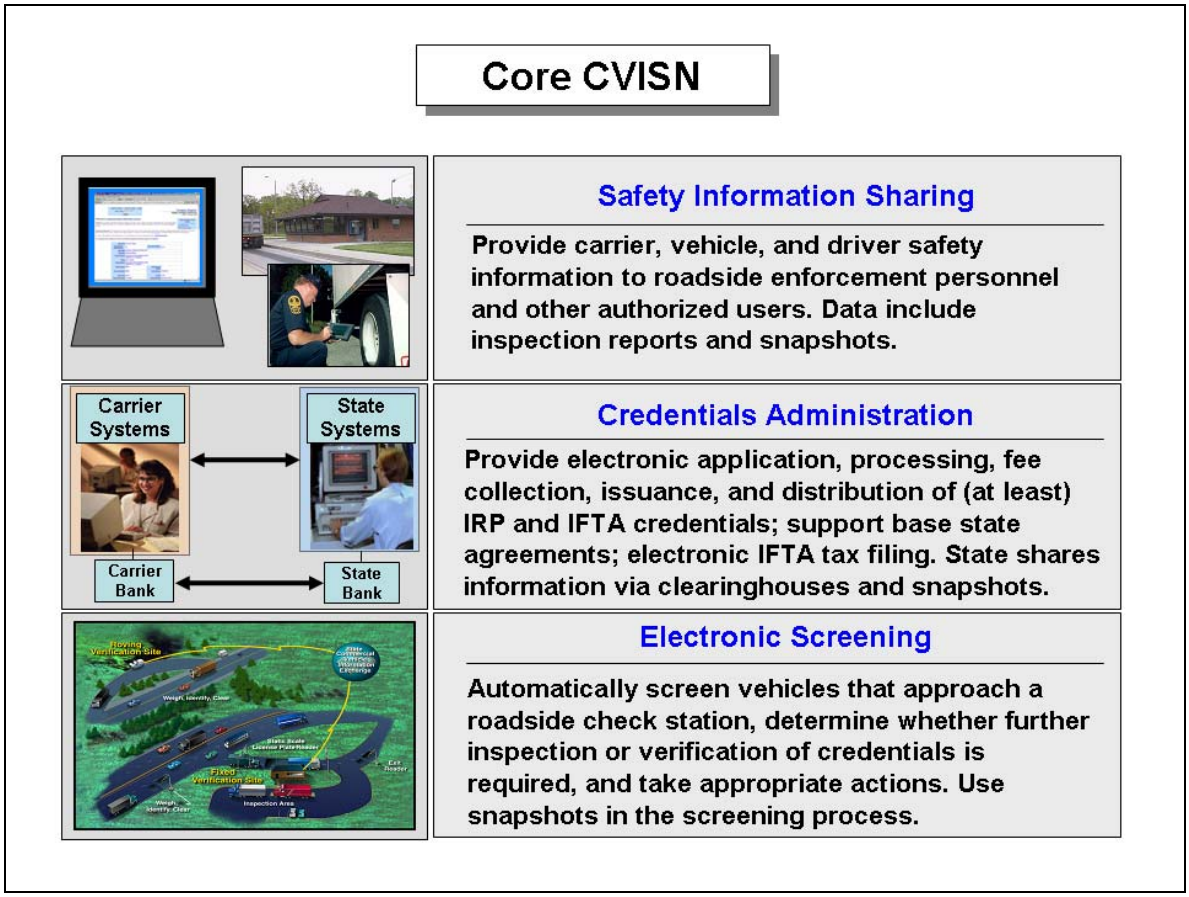

Figure 3–1: Core CVISN

Table 3–1 summarizes, at a high level, what states are required to deploy to achieve Core CVISN compliance. The CVISN Operational and Architectural Compatibility Handbook (COACH) [Reference 8] provides additional details.

Table 3–1. States: Core CVISN Requirements

Capability Area	State Core CVISN Requirements
	▪ *An organizational framework for cooperative system development has been established among state agencies and motor carriers.* ▪ *A state CVISN System Design has been established that conforms to the CVISN Architecture and can evolve to include new technology and capabilities.* ▪ *All the elements of three capability areas (below) have been implemented using applicable architectural guidelines, operational concepts, and standards.*
Safety Information Exchange	▪ Inspection reporting using ASPEN (or equivalent) at all major inspection sites. ASPEN data sent to SAFER (Safety and Fitness Electronic Records) directly or indirectly. ▪ Connection to the SAFER system to provide exchange of interstate carrier and vehicle snapshots among states. ▪ Implementation of the Commercial Vehicle Information Exchange Window (CVIEW) (or equivalent) system for exchange of intrastate and interstate snapshots within state and connection to SAFER for exchange of interstate snapshots. **- OR -** ▪ Utilization of SAFER option for exchange of inter- and intrastate data through snapshots. (The SAFER option is described in the *CVISN System Design Description* [Reference 9].)
Credentials Administration	▪ Automated electronic processing via Web-based or computer-to-computer solutions from carrier to state (processing includes carrier application, state application processing, credential issuance, and tax filing) of at least International Registration Plan (IRP) and International Fuel Tax Agreement (IFTA) credentials; ready to extend to other credentials [intrastate, titling, oversize/overweight (OS/OW), carrier registration, and hazardous material (HazMat)]. Note: processing does not necessarily include e-payment. ▪ Update SAFER with credential information for interstate operators as actions are taken. ▪ Update CVIEW (or equivalent) with interstate and intrastate credential information as actions are taken. ▪ Connection to IRP and IFTA Clearinghouses. ▪ At least 10 percent of the transaction volume handled electronically; ready to bring on more carriers as carriers sign up; ready to extend to branch offices where applicable.
Electronic Screening	▪ Use snapshots to support screening decisions. ▪ Implemented at a minimum of one fixed or mobile inspection site. ▪ Ready to replicate at other sites.

To achieve CVISN's goals, states need to share information with FMCSA and with each other. CVISN "core infrastructure" systems support that information sharing. FMCSA maintains several core infrastructure systems. Multi-state organizations (e.g., IRP, Inc.) maintain others. [Reference 9].

Table 3–2 describes Core CVISN requirements for some of the key core infrastructure systems. All of the requirements for core infrastructure systems have been implemented.

Table 3–2. Core Infrastructure Systems: Core CVISN Requirements

System	Core CVISN Requirements for Infrastructure Systems
All the capabilities outlined below have been implemented using applicable architectural guidelines, operational concepts, and standards.	
SAFER	▪ Supports storage and exchange of carrier and vehicle snapshots including safety and limited credentials data. ▪ Supports storage and exchange of vehicle and driver Inspection Reports. ▪ Supports exchange of Carrier Profile Reports, compliance review data, crash data, and enforcement data. ▪ Supports XML (eXtensible Markup Language) and Web services for input and output data. ▪ Interfaces to Motor Carrier Management Information System (MCMIS), SAFETYNET, Licensing and Insurance, and Commercial Driver's License Information System (CDLIS).
MCMIS	▪ Interface to SAFER to provide carrier census data. ▪ Interface to SAFER to provide carrier safety data [overall inspection summaries, OOS (out-of-service) inspection summaries, violations, safety rating data, review data].
IRP Clearinghouse	▪ Accepts registration and fee information ("recaps") from IRP jurisdictions. ▪ Facilitates the electronic exchange and reconciliation of registration information and fees among IRP jurisdictions. ▪ Streamlines this information exchange process by enabling IRP jurisdictions to electronically exchange motor carrier and fee information between jurisdictions. ▪ Establishes an electronic remittance netting function with concurrent Electronic Funds Transfer (EFT) capability through a central IRP bank. ▪ Tracks all amounts due to/from a base jurisdiction, to/from all foreign jurisdictions, and provides reports on the information.
IFTA Clearinghouse	▪ Web site for IFTA manuals, tax rate matrices, news, and calendar. ▪ Accepts transmittal data and profile data from states. ▪ Supports flat file interfaces for input and output data. ▪ Generates transmittal reports.
Licensing and Insurance (L&I)	▪ Interfaces to SAFER to provide licensing and insurance data for snapshots.

3.2 What does Core CVISN look like when deployed in a state?

Figure 3–2 provides a simplified view of a state's top-level design to complete Core CVISN. The *CVISN System Design Description* [Reference 9] provides additional details. Each state's design must conform to the National ITS Architecture and its CVO components represented in the CVISN Architecture.

The figure shows high-level boxes that represent major components of a state's top-level CVISN system design. The large yellow box at the top shows systems that support credentials administration. The large teal section at the bottom contains safety information exchange systems. Roadside systems are shown in the aqua box at the bottom right. Typical connections among the systems are shown; these may differ somewhat, depending on choices the state makes.

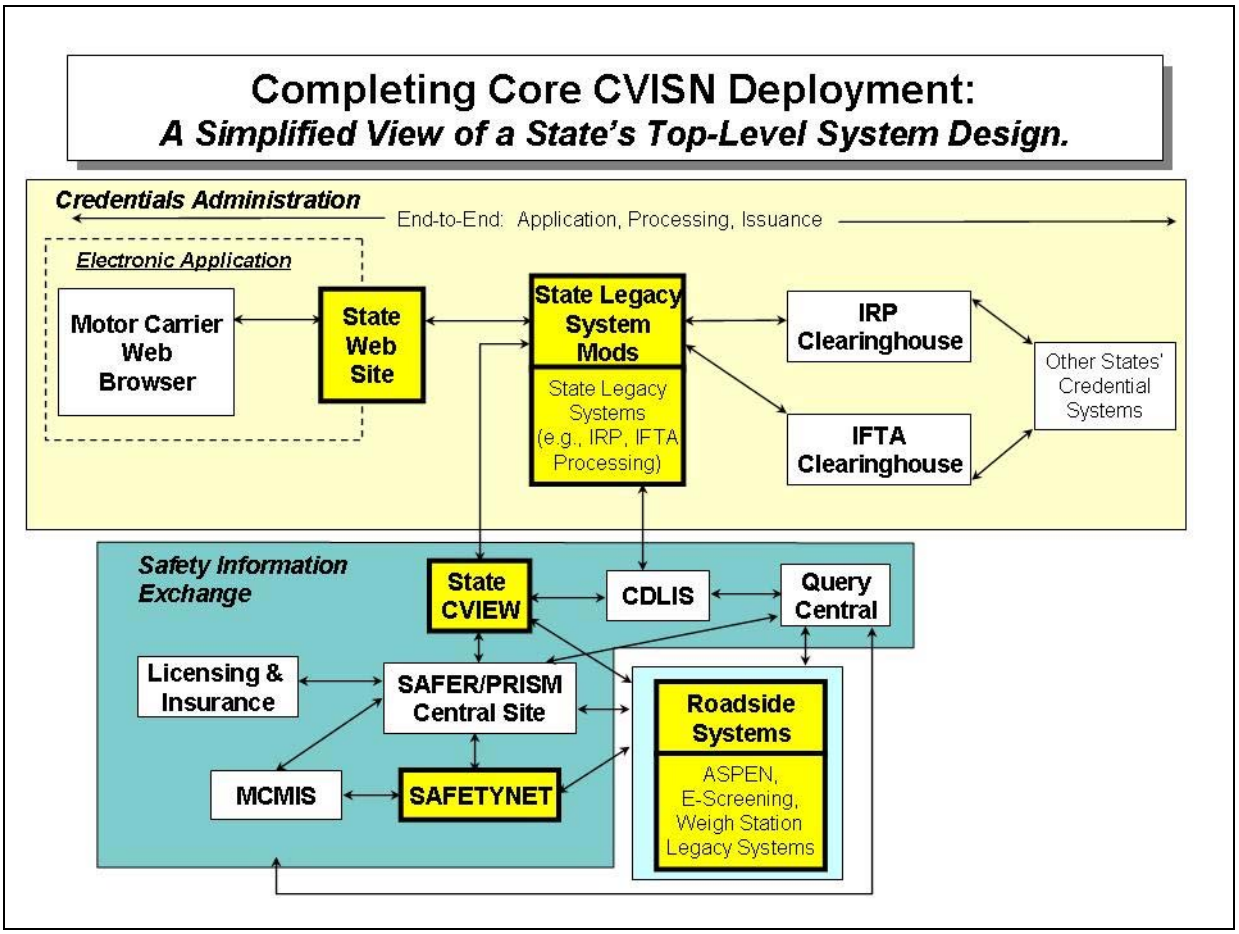

Figure 3–2: Simplified View of a State's Top-Level System Design

3.3 What must be done to deploy Core CVISN?

Core Commercial Vehicle Information Systems and Networks (CVISN) includes three types of systems: national systems, state systems, and carrier systems. The national systems include those listed earlier as part of the core infrastructure systems. All the national systems have been deployed and are operational. FMCSA updates its *CVISN National Program Management Plan* [Reference 21] annually to explain how FMCSA manages the CVISN Program at a national level.

State systems are being deployed by each state. Typically, each state partners with a few carrier representatives to develop requirements and to test pilot versions of CVISN capabilities. After the state's systems have been proven with a few carriers, it is anticipated that many other carriers will begin to use the CVISN services available.

FMCSA strongly recommends that Intelligent Transportation Systems/Commercial Vehicle Operations (ITS/CVO) project teams use the process shown in Figure 3–3 to minimize risk and achieve conformance with the National ITS Architecture and the CVISN Architecture. The recommended state deployment strategy for Core CVISN consists of three key steps:

- Planning,
- Design, and
- Implementation and Deployment.

Sections 3.3.1 – 3.3.5 describe the steps in more detail.

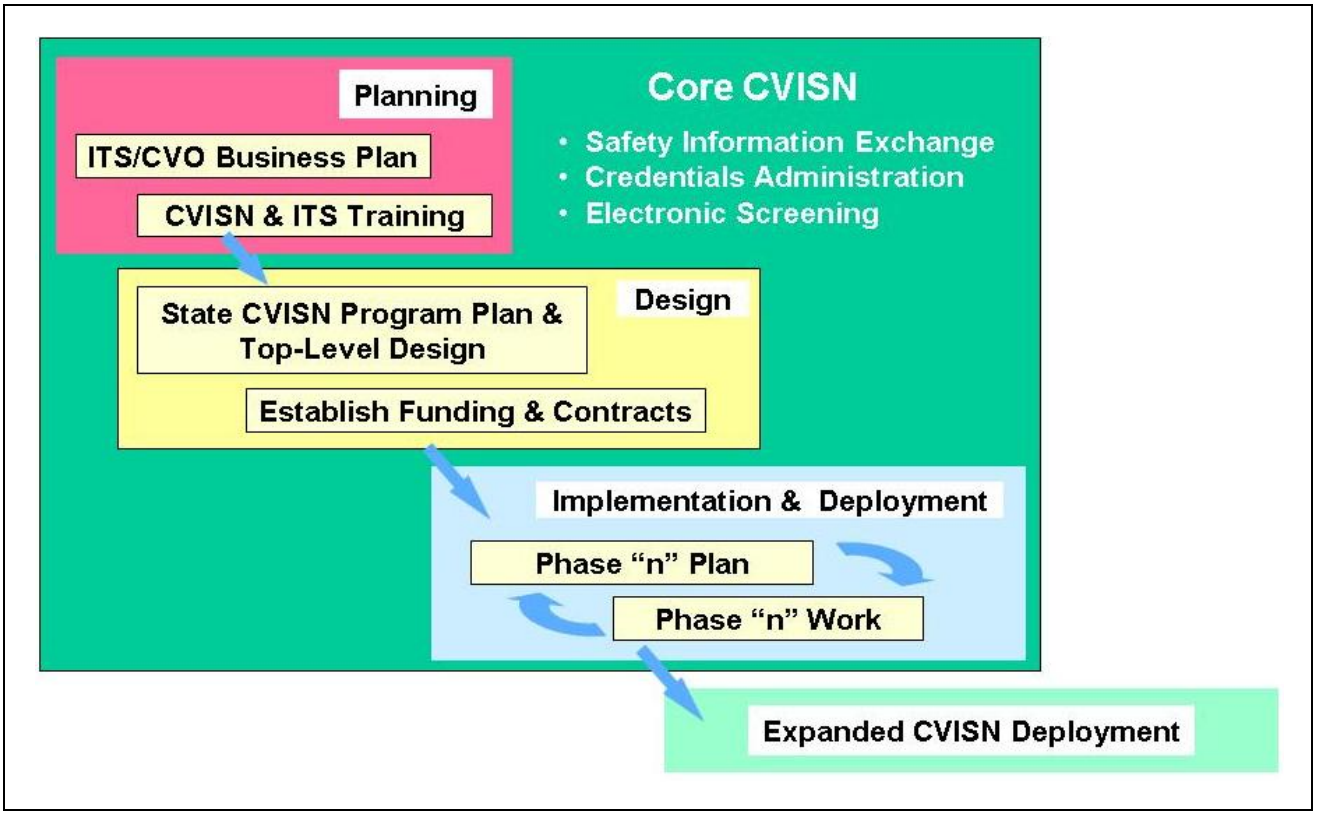

Figure 3–3: Core CVISN Deployment Process

Planning – This step includes development of an ITS/CVO Business Plan and optional participation in CVISN and ITS training courses. These elements promote ITS/CVO awareness and are essential to effective coalition building among the state agencies involved in CVO and with industry.

Design – As part of this step, the state establishes its CVISN program team. The team should include a CVISN program manager and a system architect. Next, the state develops a CVISN Program Plan and Top-Level Design. Once the plan and design are approved, the state identifies funding sources and can establish contracts to support the implementation and deployment phase.

Implementation and Deployment – In the final step (actually a series of steps or phases), the state buys or builds subsystems and integrates them into their operations to achieve deployment of Core CVISN capabilities.

The recommended Core CVISN deployment process is intended to build on the experiences of states that have already deployed CVISN. Several vendor products are now available as commercial off-the-shelf items (although modifications may be required in each state). The evaluation results and operational experience gained by the CVISN states can also greatly benefit subsequent states.

FMCSA and other CVISN stakeholders share information about a range of CVISN topics via the official CVISN Web site [Reference 22] and the less formal CVISN Collaboration site [Reference 23]. The official CVISN Web site holds formally-released CVISN documents and information. The CVISN Collaboration site supports informal communication and collaboration including meetings, deployment status, grants, architecture issues, workshops, working group and ad hoc team activities, and links to other sites. The official CVISN Web site is open to the public. Contact FMCSA to get access to the CVISN Collaboration site.

3.3.1 ITS/CVO Business Plan

An ITS/CVO Business Plan embodies a state's vision for CVO over the next 3 to 5 years. All jurisdictions have completed an ITS/CVO Business Plan. The plan defines the major projects to be undertaken. These may include projects to change policies, improve business processes, and construct facilities (e.g., weigh station upgrades) as well as technical, system development projects.

The objectives of the plan are to:

- Establish an ongoing CVO planning process.
- Promote public/private partnerships.
- Provide justification for obtaining ITS/CVO funding.
- Guide the integration of new ITS/CVO technologies.
- Establish public/private forums with broad membership to enable ongoing planning, issue identification, and issue resolution.

The plan should include:

- Goals and Objectives (Why?)
- Projects (What? Where?)
- Technical Approach (How?)
- Organizations and Management (Who?)
- Schedules and Milestones (When?)
- Funding (How much?)

3.3.2 CVISN and ITS Training

The optional training courses are designed to build awareness of and commitment to CVISN and ITS. CVISN or ITS training is available from different sources. See section 7.3 for pointers to training options.

3.3.3 State CVISN Program Plan and Top-Level Design

The State CVISN Program Plan is the logical next step for states that have completed their ITS/CVO Business Plan. The business plan has a strategic focus and defines program goals and projects at a conceptual level. The program plan has a technical focus and defines specific projects the state plans to undertake. The program plan also defines the organizational structure that will implement the projects, the budget, and schedule.

The State CVISN Top-Level Design should identify system requirements, software requirements, interface requirements, and top-level design of the system hardware, software, and networks. Typically, the state's top-level design will include tables, diagrams, and text that identify top-level requirements, design elements, interfaces, and the computers and networks that will support CVISN functions.

FMCSA can provide a template for a merged CVISN Program Plan/Top-Level Design document. The document should contain these elements:

- Introduction
- Program Objectives and Project Descriptions
- System Design
- Procurement Strategy/Products
- Build Definitions/Program Schedule
- Funding Resources/Program Budget
- Design/Deployment Issues

Table 3–3 summarizes what a state must do to complete Core CVISN. Each state makes specific plans and describes their top-level design. The state captures the results of those planning and design efforts in its CVISN Program Plan/Top-Level Design.

Table 3–3. Key Tasks Involved in Core CVISN Deployment

Activity or System	Key Tasks Involved in Core CVISN Deployment
Coordination: Program Formation	▪ Form a Commercial Vehicle Operations (CVO) Working Group of stakeholder representatives, including motor carriers. ▪ Develop an ITS/CVO Business Plan.
Coordination: Program Management	▪ Assign a Program Manager, System Architect, and Program Administrator. ▪ Develop a State CVISN Program Plan.
Coordination: System Engineering	▪ Develop a Top-Level Design that supports the required business processes. Note: this document may be combined with the CVISN Program Plan. ▪ Develop technical specifications for all the subsystems, including specifications for XML or other information-sharing transactions. ▪ Define and execute a comprehensive integration and test effort. ▪ Design networks and communications to connect all subsystems.
State Web Site	▪ Coordinate with other Web site development efforts in the state. ▪ Develop or acquire credentialing Web site hardware, software, and communications.
IRP Legacy System	▪ Modify existing IRP system to accept supplemental and renewal transactions via the credentialing Web site. ▪ Connect to IRP Clearinghouse.

Activity or System	Key Tasks Involved in Core CVISN Deployment
IFTA Legacy System	▪ Modify existing IFTA system to accept supplemental and renewal transactions and quarterly tax filings via the credentialing Web site. ▪ Connect to IFTA Clearinghouse.
CVIEW (or equivalent)	▪ Develop or acquire CVIEW hardware, software, and communications.
SAFETYNET	▪ No changes expected.
ASPEN (or equivalent)	▪ Acquire hardware and communications support for the FMCSA ASPEN software. ▪ Install systems and train personnel.
E-Screening System	▪ Work with motor carriers to define the e-screening program and criteria for the jurisdiction. Set up a pilot program. ▪ Develop or acquire e-screening hardware, software, and communications that support dedicated short range communication (DSRC) standards and/or other means to identify vehicles. ▪ Enroll carriers.
Weigh Station Legacy Systems	▪ Modify the existing weigh station scales and signage to interface with the e-screening system. ▪ Expand and improve power and communications facilities. ▪ Potentially reconfigure lanes for e-screening.
Networks and Communications	▪ Implement networks and communications to connect all the subsystems.

States should be aware that FMCSA is in the process of modernizing its information technology systems. The program is called COMPASS. COMPASS will affect how states and motor carriers interact with FMCSA's systems and how they share data. FMCSA plans to provide access to its systems and the data FMCSA manages via a Web site called the FMCSA Portal. FMCSA is deploying COMPASS through a series of releases. See the *COMPASS Fact Sheet* [Reference 10] for more information.

Each state must submit its CVISN Program Plan/Top-Level Design for FMCSA approval before receiving CVISN grant funds. The design must conform to the National ITS Architecture and the CVISN Architecture.

To prepare the CVISN Program Plan/Top-Level Design and accomplish the program's goals, the state forms the CVISN Program Team. Figure 3–4 illustrates the makeup of a typical team.

Successful CVISN teams have strong support from

- A sponsor who is a high-ranking member of the state's Department of Transportation and
- The state's motor carrier industry.

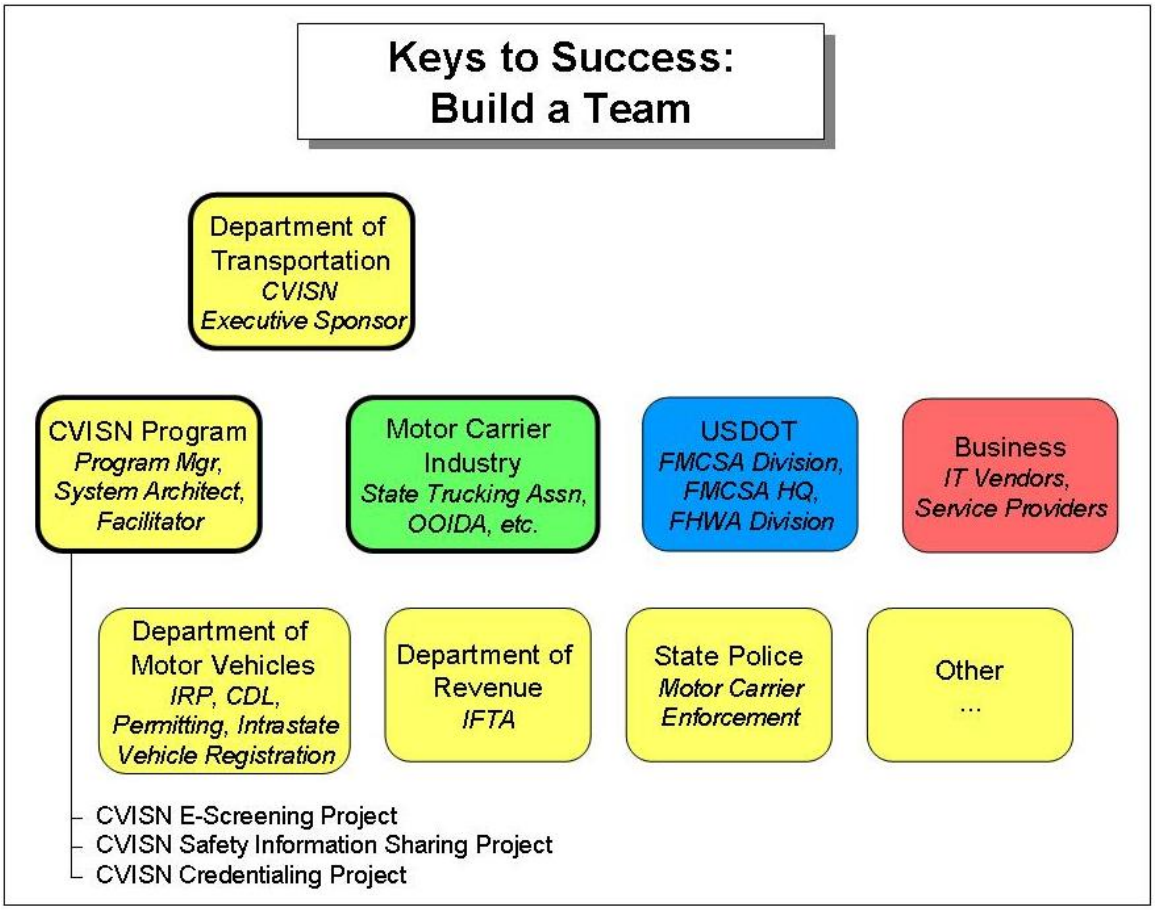

Figure 3–4: CVISN Program Team

The CVISN Program Team includes representatives from the organizations that will implement, use, and maintain the CVISN capabilities and systems. The team is normally led by the CVISN Program Manager, with support from the CVISN System Architect. Typically, active members of the team include representatives from: motor carriers; state agencies that manage commercial vehicle credentialing, manage revenue, and conduct motor carrier enforcement; information technology vendors and service providers; and FMCSA division staff. A Memorandum of Agreement helps to formalize the program and secure a commitment among all participating state agencies.

3.3.4 Establish Funding and Contracts

Funding sources typically fall into three main categories: federal, state and local, and private. There are many models for successful CVISN funding. Public-private partnerships are prevalent in the electronic screening programs. Federal funding was made available through the SAFETEA-LU legislation. SAFETEA-LU, a highway reauthorization act, was enacted on August 10, 2005, as Public Law 109-59. This legislation authorized $100 million in federal deployment funds to support states' implementation of Core and Expanded CVISN functionality. States are using the Internet to provide ever-increasing citizen services. States often tap into statewide communication

infrastructure improvement initiatives that provide connectivity bandwidth, computer upgrades, and improved customer service.

Typical sources used to implement CVISN capabilities include:

- FMCSA grants (CVISN, PRISM, Border, MCSAP)
- Federal-aid highway programs
- Congressionally-designated projects
- State legislative appropriations
- State agency operating budgets
- Public-private partnerships
- User fees

Section 4126 of SAFETEA-LU authorizes funding for the CVISN Grant Program in FY 2006–2009. Congress must appropriate the funds each year. The maximum amount of federal CVISN grant funds to be made available to a state is $3.5 million, under Section 4126 of SAFETEA-LU for FY 2006–2009. Nominally, $2.5 million are expected to be applied to Core CVISN deployment and $1 million to Expanded CVISN deployment. To qualify for federal funds under SAFETEA-LU, states must match the federal amount requested.

Note that SAFETEA-LU expires at the end of FY 2009. It is unknown what the future funding levels for CVISN will be and how the CVISN Grant Program will be structured for FY 2010 and beyond under the succeeding surface transportation authorization legislation.

Once funding is in hand, a state may procure services, software, and/or hardware to support its CVISN projects.

3.3.5 Incremental Deployment

The next step is to develop or modify systems to implement the design. Deploying Core CVISN capabilities is a major undertaking that typically takes several years. In order to reduce risk, FMCSA strongly recommends that states use an incremental deployment approach. It is critical that this large program be broken into a series of 3- to 6-month time periods called phases. Defining phases takes a big job and breaks it into small, manageable pieces. Specific results or products are defined for each phase. These are defined in detail for each phase just before it begins, and more broadly for subsequent phases. If a state completes the first couple of development phases on time and meets all the objectives, this provides assurance that the plan is realistic. If not, it allows the state to revise the plan and take corrective action prior to committing extensive resources to a project that is not properly structured for success. Incremental development and measurable milestones ensure stakeholder participation and feedback and real visibility into program or project progress.

When a state applies for CVISN grant funds from FMCSA, the application must define measurable milestones at various stages throughout each project. This supports the incremental deployment approach.

As components are developed, the state integrates them into a "system of systems" and tests to ensure that they work together. Upon completion of Core CVISN capabilities, the state completes interoperability tests as recommended in the *CVISN Operational and Architectural Compatibility Handbook (COACH) Part 1* [Reference 8] and fills out the Core CVISN Checklist. FMCSA certifies the state as Core CVISN Compliant when all requisite steps have been accomplished.

States are expected to maintain and continue to operate the CVISN systems. CVISN goals and benefits will be realized only if jurisdictions continue to participate in and support the Core CVISN capabilities. FMCSA and the CVISN states are planning to implement some sort of "performance monitoring" approach to help focus on continuing support and use of CVISN capabilities.

4. HOW CAN A STATE BUILD ON CORE CAPABILITIES? EXPANDED CVISN

4.1 What is Expanded CVISN?

The Expanded CVISN initiative builds on Core CVISN to continue to enhance the safety, security, and productivity of commercial vehicle operations and to improve access to and quality of information about commercial vehicle operations for authorized public and private sector users.

Through extensive outreach in 2004, the FMCSA engaged stakeholders to identify the capabilities necessary to achieve the goals of Expanded CVISN. FMCSA established a working group in each of four program areas:

- Driver Information Sharing
- Enhanced Safety Information Sharing
- Smart Roadside
- Expanded E-Credentialing

Figure 4–1 illustrates how Expanded CVISN builds on Core CVISN capabilities. The clouds show how the core capabilities will expand.

Core CVISN focused on exchanging safety information about motor carriers and commercial vehicles. A component of Expanded CVISN will explore how information about commercial drivers could be shared as well. Also, Expanded CVISN will examine what additional safety information could be shared among a larger group of authorized stakeholders with a focus on ensuring data quality.

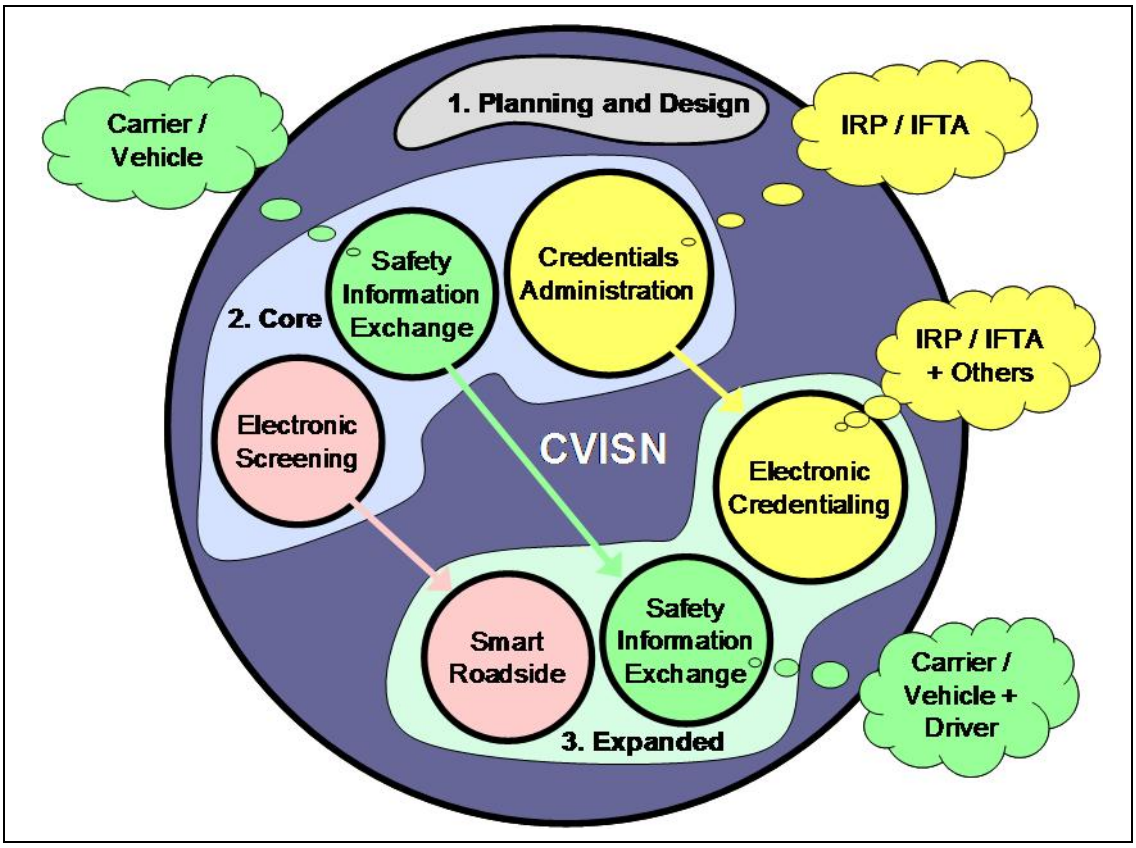

Figure 4–1: Expanded CVISN Builds on Core CVISN

Core CVISN electronic screening functions will be expanded towards an integrated view of roadside operations with flexible deployment options to enhance the safety, security, and productivity of commercial vehicle operations. "Smart Roadside" is the name FMCSA is using for its vision of future roadside operations. Smart Roadside capabilities may include additional options for identifying vehicles, carriers, and drivers; wireless roadside inspections; virtual weigh stations; and other capabilities focused on improving safety.

The Core CVISN electronic International Registration Plan (IRP) and International Fuel Tax Agreement (IFTA) credentials functions will be expanded to consolidate the process for multiple credentials, include electronic payment options, and improve access to credentials data for authorized users.

FMCSA has brought together state agencies with the appropriate federal agencies, motor carrier industry, and private sector information technology community to define a "menu" of potential additional CVISN capabilities for the Expanded CVISN initiative. Instead of stipulating a fixed set of capabilities that each state should implement for Expanded CVISN, the stakeholder community has adopted a "cafeteria" approach through which each state will deploy those Expanded CVISN capabilities that meet its needs.

References 11–17 provide more detail about Expanded CVISN.

4.2 Expanded CVISN Deployment

To become eligible for an Expanded CVISN deployment grant, states must first complete Core CVISN deployment and be certified as compliant by FMCSA. States that received more than $3.5 million in federal CVISN funding are not eligible for additional Expanded CVISN funding from FMCSA.

After completing Core CVISN deployment, the state can build on those capabilities for Expanded CVISN. The state could deploy core capabilities to more sites, deploy to more carriers, or add new capabilities. To deploy Expanded CVISN capabilities, the state should follow the same basic steps as shown for Core CVISN deployment.

The process starts with updating the state's CVISN Program Plan/Top-Level Design (or completing a separate Expanded CVISN Program Plan/Top-Level Design) to reflect the enhancements that the state chooses to incorporate. Before receiving CVISN grant funds, the state must submit the CVISN Program Plan/Top-Level Design, which shows their Expanded CVISN plans, for FMCSA approval. The design must conform to the National ITS Architecture and the CVISN Architecture.

The state then secures funding and proceeds with implementation and deployment. Under SAFETEA-LU, after completing Core CVISN, a state may apply to receive CVISN grant funds to deploy Expanded CVISN capabilities. Some states deploy Expanded CVISN capabilities without federal funding.

While states can deploy a wide variety of capabilities as part of their Expanded CVISN programs, FMCSA has decided to focus its resources on a limited number of key capabilities. FMCSA's support for these key capabilities includes architecture and standards development and maintenance, as well as formal training/technical assistance. States opting to implement an Expanded CVISN capability other than these high-priority capabilities are responsible (where applicable) for ensuring conformance with the National ITS and CVISN Architectures.

4.3 What is the long-term vision for CVISN?

With continuing rapid changes in technology and business practices, it is impossible to say for sure what may lie beyond Core and Expanded CVISN. Beyond those program areas envisioned thus far, some specific areas that now seem to hold promise for implementation include:

- Extension to integrate other CVO user services such as onboard safety monitoring, automated inspections, hazardous materials incident management, freight and fleet management, and intermodal freight functions.
- Closer integration with other ITS services for traffic management, traveler information, and incident response.
- The use of DSRC at the 5.9-MHz frequency band, other means of RFID (Radio Frequency Identification), and optical technologies (e.g., license plate readers) to identify vehicles.

Even though it is not possible to define all the specifics now, it is reasonable to assume that new technologies will continue to open opportunities for improving the safety and efficiency of CVO. The CVISN Program and its associated architecture, standards, deployment experience, institutional structures, and stakeholder relationships will provide a good foundation for assimilating future technologies into CVO.

Figure 4–2 illustrates the long-term vision for shipping operations. FMCSA envisions that commercial vehicle operations will have become much more efficient, largely due to the availability of accurate information in electronic form. FMCSA is working with FHWA and TSA (Transportation Security Administration) to achieve this vision.

In the vision for the future, carriers may purchase vehicles already equipped with a variety of productivity and safety improvements: mobile communications systems, navigation and tracking systems, on-board vehicle monitors, electronic on-board recorders, collision avoidance devices, crash restraints, and vision enhancement equipment. Many of these systems are available today – some in prototypes and others in production vehicles. In the future, most trucks may be equipped with communications devices to transmit to and receive messages from roadside, carrier, port, and other systems.

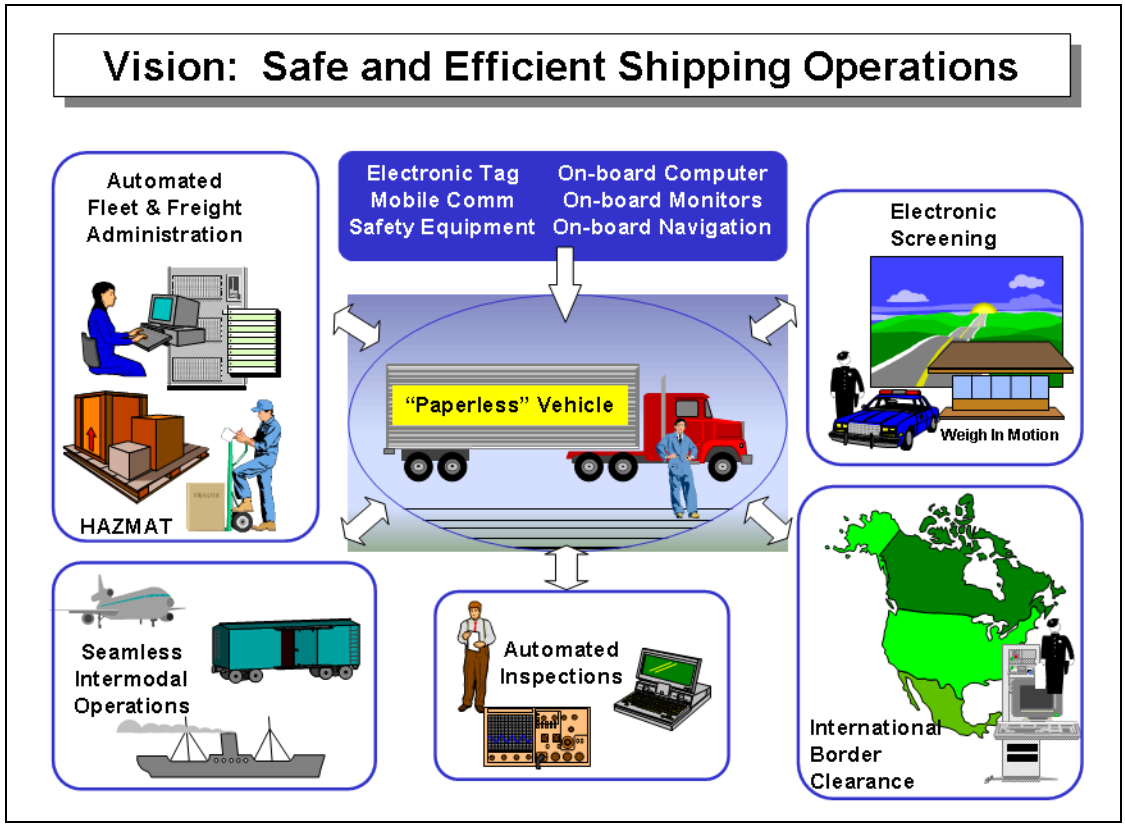

Figure 4–2: Vision: Safe and Efficient Shipping Operations

In the future, en route delays at weigh stations may be virtually eliminated. Electronic screening may be used to check the vast majority of vehicles at mainline speeds. A vehicle could transmit vehicle, carrier, driver, and specially regulated load-type identifiers to roadside readers. The identifiers could be used to access information stored in government information systems. Safety, credentials, tax, and permit information may be checked at mainline speeds. Carriers may be able to operate trucks with no paper credentials onboard. Carriers may maintain trip logs electronically and share the logs with enforcement wirelessly.

There may be little or no delay at international border crossings due in part to advance notification about the shipments being carried. Routine shipments will be cleared well in advance of the vehicle approaching the border, and, more often than not, the vehicle will pass with less than a minute delay.

When inspections occur, they may be conducted quickly with the aid of automated safety inspection equipment. Wireless inspections may occur routinely and often. Safe vehicles may rarely stop for full inspections.

Electronic transactions could support intermodal interchange among trucks, railroads, ships, and air freight lines. Trailers and containers may be equipped with a standard intermodal tag. This tag could be read on highways, on rail lines, at truck and rail terminals, and at shipyards.

Many aspects of this long-term vision for shipping operations are being realized today. Figure 4–3 illustrates the long-term vision for handling electronic business transactions. Already, many large carriers use fleet management systems to optimize schedules, routing, and maintenance. In the future, accurate highway and traffic data may be more readily available to support routing. Carriers may choose to track vehicles throughout North America. Many carriers may maintain databases of the location of each shipment. Standards may support cross-carrier queries and tracking, so a shipper could find the location of its shipment via an electronic query. HazMat handling data required to respond to HazMat incidents may be available online to emergency personnel.

It is envisioned that the vast majority of CVO business transactions will be conducted electronically. This includes transactions among carriers, shippers, government agencies, insurance companies, and other CVO stakeholders.

In the future, carriers may apply and pay for most credentials electronically, including registration, HazMat permits, and oversize/overweight (OS/OW) permits. They may file and pay fuel taxes electronically. Carriers may deal with a base state for all business transactions, including registration, permits, taxes, and screening. The base state could handle any allocation of fees or taxes to other states, simplifying carrier administration. Credentials may be distributed electronically. In the paperless vehicle concept of the future, no cab cards, stamps, decals, or paper permits would be required for participating carriers.

Information from one process (e.g., registration) could be made available to other processes (e.g., fuel tax) in a timely manner. This would avoid redundant data entry, improve data accuracy, and provide data to support better decision making. As part of today's PRISM process, cross-checks enable states to deny registration to carriers with poor safety histories.

Some aspects of audits may be conducted electronically with participating carriers. Government systems may send queries to carrier systems. The responses may be compared to government records, and the audit may be completed with little or no manual intervention.

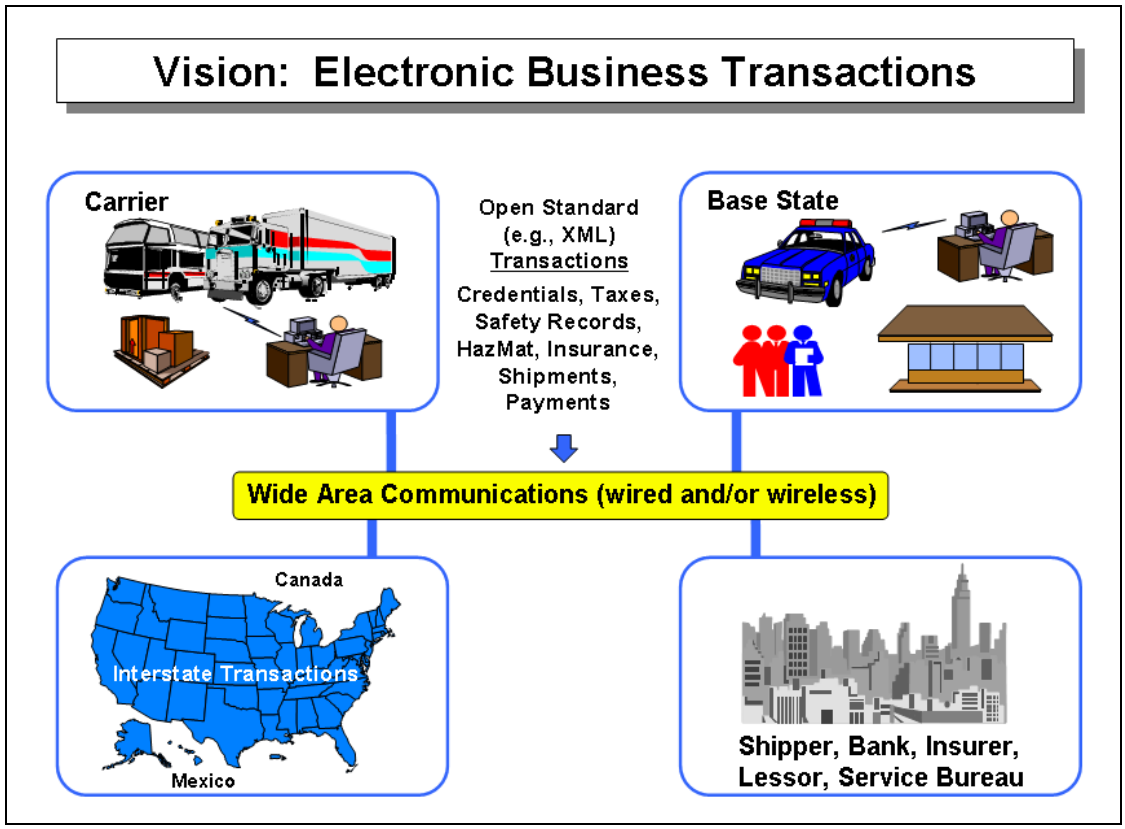

Figure 4–3: Vision: Electronic Business Transactions

States may deal with carriers electronically and with each other electronically. They could routinely interchange electronic information about business transactions relating to safety, registration, taxes, and screening.

Shipping transactions may be primarily electronic. Shippers may place orders, track freight movement, receive invoices, and make payments electronically.

In the future, state highway planning and enforcement operations may be planned and managed based on comprehensive, timely information. The information may be gathered as a by-product of the administrative processes and roadside processes. It will be anonymous; in other words, carrier and driver identifiers will be removed, and only the overall statistics will be used.

Data privacy and integrity will be assured via encryption and password techniques. In addition, the legal issues associated with the privacy laws will be supported.

Many aspects of the vision for electronic business transactions are in place today. Other aspects are in prototype or pilot stages of development.

CVISN is already helping to achieve the long-term vision for commercial vehicle operations.

5. WHAT BENEFITS ARE EXPECTED FROM CVISN?

This chapter summarizes benefits from two perspectives. First, benefits are listed by capability area: safety information exchange, credentials administration, and electronic screening. Next, benefits are summarized for two major stakeholder groups: states and carriers.

These benefits are based on analysis of CVISN deployment to date as reported in *Final Summary Report CVISN Business Case* [Reference 18]. The evaluations were completed in 2006 and 2007 by Battelle, Cambridge Systematics, Inc., and the American Transportation Research Institute.

5.1 Benefits by Capability Area

Table 5–1 is derived from Table 2 in Reference 18. The table summarizes the main benefits from each capability area. Some benefits arise from more than one area.

5.2 Summary of Benefits of CVISN to States

As stated in Reference 18, sections 3.1 – 3.4, the benefits to states of implementing Core CVISN include:

General Benefits

- "States have used CVISN deployment as a means of fostering interagency cooperation and lifting institutional barriers, improving relationships among various State departments.
- CVISN has applications to the increasingly important security field, through the sharing of CVO information across agencies and jurisdictions."

Table 5–1. CVISN Benefits

Benefit	Safety Info Sharing	Electronic Screening	Credentials Admin
Increased ease of permit application process			■
Instant access to online data at inspection sites	■	■	
More complete level of enforcement, focused on noncompliant drivers	■	■	
Improved level of customer service			■
Document processing cheaper, faster, and more efficient			■
Improved motor carrier/state relations	■	■	■
Reduced number of inspections of low-risk vehicles	■	■	
Reduced delays for inspected vehicles		■	
Improved motor carrier safety keeps costs down	■	■	■
Improvement in data quality and accuracy	■	■	■
Reduced costs (recovery of investment)		■	■
Get trucks into service more quickly			■
Increase in driver morale and on-time delivery		■	
Improved carrier access to electronic records		■	■
Availability of good, timely technical support			■

Qualitative Benefits from Safety Information Sharing

- "Electronic processing, file downloads, and remote wireless access to historic databases have enabled inspectors in some States to reduce by half the time required to inspect a truck and prepare an official report.
- While the total amount of time spent by the State in conducting inspections may remain the same, the portion of their time that safe and compliant trucks spend in inspections should eventually decline."

Qualitative Benefits from Credentials Administration

- "Electronic credentialing provides States with financial rewards through greater speed and accuracy of information exchange, and labor savings.
- State employees can approach their electronic credentialing work in a more structured manner, compared to serving the majority of customers face-to-face.
- Administrators and enforcement personnel have more timely access to required information.

- States can make improved analyses of the long-term impact of changes to policies and practices, using measured data from CVISN systems.
- Businesses in remote locations have more reliable access to current information from the State.
- Through automation, CVISN brings to light problems in data quality, enabling State officials to make needed changes."

In addition to the benefits cited above, electronic transactions open the door to 365/24/7 hours of operation.

Qualitative Benefits from Electronic Screening

- "States can better enforce registration, licensing, weight, size, and tax regulations through electronic screening.
- Safe and legal motor carriers receive economic and efficiency benefits from electronic screening, which helps the States by encouraging more carriers to operate in compliance with safety regulations."

5.3 Summary of Benefits of CVISN to Motor Carriers

As stated in Reference 18, sections 3.1 – 3.4, the benefits to motor carriers from implementing Core CVISN include:

General Benefits

- "In States that use CVISN technologies, carriers that offer discount services at the expense of safety or observance of the law are more likely to be caught, reducing the perceived cost of compliance for the more safety-conscious carriers.
- The successful implementation of CVISN has repeatedly been linked to active involvement and support from motor carrier organizations. As such, the development of a CVISN program in a State represents the chance for motor carriers to influence policies and procedures.
- The increased visibility and familiarization of roadside enforcement procedures and systems has greatly reduced animosity and apprehension between commercial vehicle drivers and members of the enforcement community. The two groups understand that they must work together in order to make a safer, more efficient system.
- Motor carriers are able to operate with increased levels of efficiency and effectiveness, and with fewer delays and a more predictable schedule, all of which benefits shippers as well as carriers, thereby helping generate new and repeat business."

Qualitative Benefits from Safety Information Sharing

- "Carriers benefit from safer roads when law enforcement officials are able to target the highest-risk carriers from among the traffic stream.
- Improved safety enforcement based on accurate past inspection history and other relevant factors should – in the long term – encourage fleet managers and drivers to comply with safety regulations.
- The reduced numbers of high-risk vehicles on the road should level the playing field for all carriers, increasing the fairness of competition.
- Once real-time inspection reports are available online, multiple inspections of the same vehicle at nearly the same time should be reduced."

In addition to the benefits cited above, sharing safety information reduces the risk of a safe carrier being involved/affected by a crash (because fewer unsafe vehicles are on the road),

may lower insurance premiums, and reduces delays and congestion.

Qualitative Benefits from Credentials Administration

- "CVISN allows motor carriers to place new trucks on the road faster to begin earning revenue because credentials can be issued far faster. This may save days in the process when comparing traditional mail service with computer processing.
- Motor carrier access to the credentialing system(s) from their own offices may save trips to agency offices entirely and in other cases reduces the wait time at the agency since paperwork has already been completed.
- Last-minute credentialing can be conducted through the use of temporary permits while official documents are sent in the mail.
- CVISN reduces the administrative burden in regulatory compliance, due to electronic credential applications and tax filings. All compliance needs can be handled through a dedicated software interface or terminal.
- Companies save labor on applications. One carrier reported saving about one hour of administrative labor per power unit per year (FMCSA 2004).
- The ease with which permits can be obtained decreases the chance of a carrier having to send trucks out without the appropriate permit.
- Companies reduce their costs and bureaucracy as credentialing conforms to a standard, system-wide architecture.
- Electronic credentialing helps to bring uniformity of credentialing services across North America."

In addition to the benefits cited above, electronic transactions open the door to 365/24/7 hours of operation and virtually eliminate waiting lines.

Qualitative Benefits from Electronic Screening

- "Through mainline electronic screening, safe and legal carriers are able to incur less delay and provide more efficient movement of freight, saving time and money.
- Carriers improve safety related to reduction in backups onto the mainline.
- Vehicles avoid wear and tear on mechanical systems (clutches, brakes, and drive trains) caused by stopping and starting at weigh stations.
- Drivers can operate more safely without having to slow down, speed up, and merge as often in traffic, which should lead to fewer truck-involved crashes.
- Improved motor carrier safety helps keep costs down (especially insurance).
- Bypass time savings result in fuel savings.
- Electronic screening programs eliminate or reduce the time that enrolled vehicles spend at weigh stations and ports of entry, thereby increasing productivity by allowing drivers to spend more of their time driving.
- Increased efficiencies will enable carriers to guarantee more on-time deliveries and facilitate the more efficient flow of goods, thereby reducing costs further.
- Electronic screening helps to level the playing field for all trucking operations through close monitoring of the drivers. CVISN technology will motivate all drivers and carriers to comply with laws and regulations.
- CVISN technology can help drivers with good safety and performance records to have opportunities to find employment and can help companies to promote the safety records of their drivers."

5.4 Economic Analysis of Benefits

The *Economic Analysis and Business Case for Motor Carrier Industry Support of CVISN* [Reference 20] provides tangible estimates for monetary benefits to carriers for e-credentialing and e-screening. The analysis indicates

- Significant, near-immediate financial benefits to carriers from taking part in Web-based credentials administration.
- Substantial benefits to carriers from enrolling their trucks in electronic screening programs.

The business case also provides an outline of the reasons – both pro and con – that carriers use to decide whether to adopt CVISN technologies for their companies. States should find the report of value in prioritizing and planning their CVISN activities.

This Page Intentionally Blank

6. HOW DO STATES ACHIEVE INTEROPERABILITY?

What is interoperability? In the CVISN world, it means that systems and components deployed by different organizations (or by the same organization) work together to accomplish shared functions. This means, for instance, that the systems are able to exchange and use information.

As an example, under the International Registration Plan, the owner of a commercial vehicle that operates in multiple states registers that vehicle in a "base state." When the vehicle travels to another state, the law enforcement staff may want to check that it is registered for operation there. This means that states need to share information about what vehicles are registered to operate in each jurisdiction. If states don't use a common identifier, they won't be able to share and access data effectively.

Using standard identifiers for key entities of interest is one aspect of interoperability.

CVISN stakeholders achieve interoperability by using:

- common guiding principles
- common concepts of operations
- architecture
- interoperable technologies
- information sharing standards

Several documents provide guidance for implementing interoperable CVISN solutions as shown in Table 6–1 below.

Table 6–1. Interoperability Guidance

Interoperability Item	Document
Common guiding principles	*COACH Part 1*, Chapter 2.
Common concepts of operation	*COACH Part 1*, Section 4.1, and Tables 4.1-1, 4.2-1, 4.3-1, and 4.4-1. *CVISN System Design Description*, Chapter 2.
Architecture	*CVISN Architecture*. *CVISN System Design Description*, Chapter 1.
Interoperable technologies	*COACH Part 1*, Tables 4.1-2, 4.2-2, 4.3-2, and 4.4-2. *CVISN System Design Description*, Chapter 3.
Information sharing standards	*COACH Part 1*, Chapter 5. *CVISN Architecture*. *CVISN System Design Description*, Chapters 3 and 4. DSRC Standards. *SAFER Interface Control Document (ICD)*. IRP Clearinghouse, CDLIS, and IFTA Clearinghouse documentation.

6.1 Common Guiding Principles

Guiding principles provide a foundation for cooperation, interoperability, and making decisions. For the Bill and Melissa Gates Foundation, "principles guide what we do, why we do it, and how we do it." Statements of guiding principles capture concepts and guidelines supported by the Commercial Vehicle Operations (CVO) community to provide a top-level checklist of fundamental guidelines for CVISN activities. CVO stakeholders should ensure that their actions are consistent with the principles.

The guiding principles in the *COACH Part 1* [Reference 8] were originally developed under the auspices of the Intelligent Transportation Systems (ITS) America CVO Program Subcommittee [References 29, 30, 31]. There are three categories of guiding principles in the *COACH*: ITS/CVO Guiding Principles, Fair Information Principles, and ITS/CVO Interoperability Guiding Principles.

6.2 Common Concepts of Operation

Concepts of operation describe a system's characteristics from the user's viewpoint. The concepts are based on an interpretation of the guiding principles and the state of existing and emerging technologies.

There are four categories of concepts in the *COACH Part 1*: (1) general concepts, and those that apply to the capability areas of Core CVISN: (2) safety information exchange and safety assurance, (3) credentials administration, and (4) electronic screening. The *CVISN System Design Description* [Reference 9] provides additional explanations for many of the high-level concepts described in the *COACH Part 1*.

CVISN states review the concepts in the *COACH Part 1* and indicate their commitment to each concept in the *COACH* tables. Agreeing with basic concepts creates a common high-level understanding of how the state's systems will operate once CVISN is deployed.

6.3 Architecture

As discussed briefly in Chapter 2, architecture provides a blueprint for construction of the information systems and networks to support CVISN objectives.

Two architectures are involved: the National ITS (Intelligent Transportation Systems) Architecture and the CVISN Architecture. The CVISN Architecture is a more detailed architecture consistent with, and derived from, the National ITS Architecture.

Figure 6–1 illustrates how architecture and standards help to achieve interoperability.

6.3.1 What is the National ITS Architecture?

The United States Department of Transportation's (USDOT's) ITS Program developed the National ITS Architecture. The National ITS Architecture was defined and baselined in 1996 and is updated as needed (approximately every other year). ITS has been interpreted to be a "system of systems." Its architecture serves as the master blueprint to achieve the USDOT's vision of building a transportation system that is international in reach, intermodal in form, intelligent in character, and inclusive in nature.

The National ITS Architecture is an organized approach to implementing, in a consistent manner across the U.S., the various ITS user services envisioned for the next 20 years or more. It is a framework that lays out the boundaries, players, and strategies for the process of information management. This

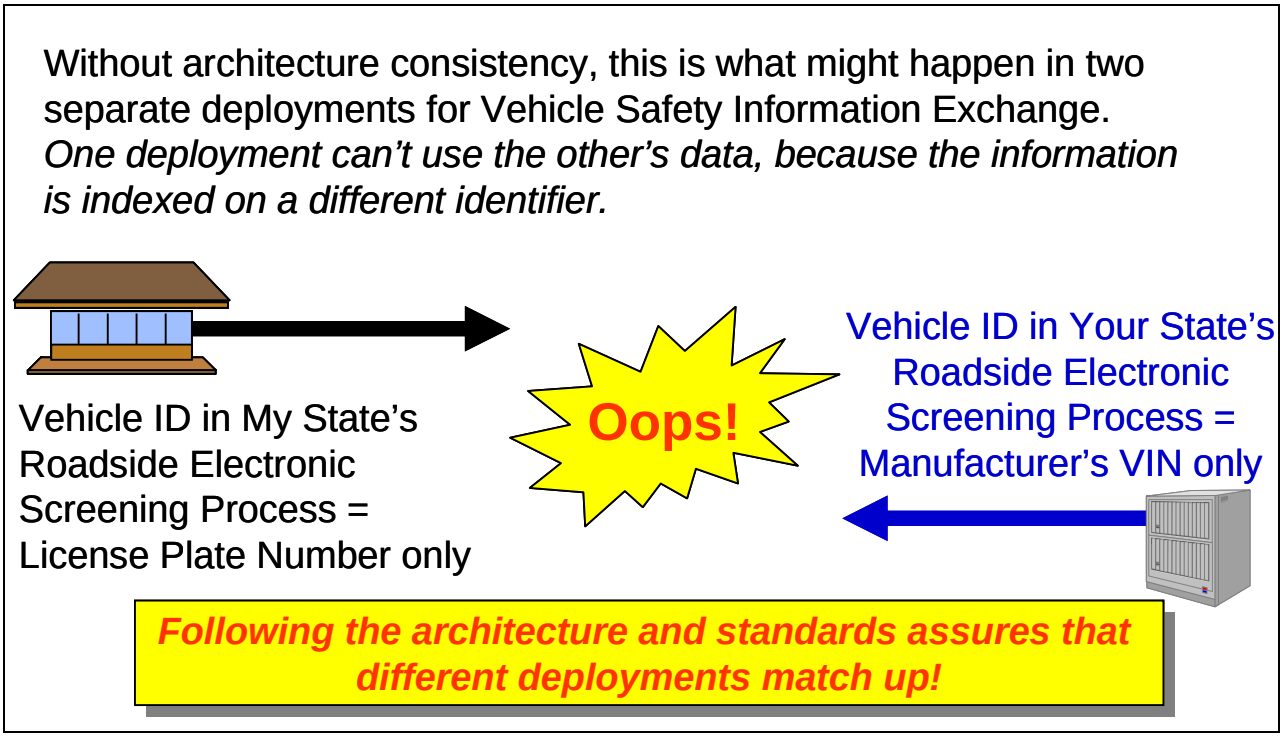

Figure 6–1: Architecture and Standards Help Achieve Interoperability

framework provides guidance in developing standards and making deployment decisions that result in safety, efficiency, economies of scale, and national interoperability. The development of the National ITS Architecture was the first step toward achieving the vision Congress put forth for ITS in 1991: a vision of a seamless, multimodal, national intelligent transportation system that would have a consistent personality across this country.

> ***National ITS Architecture***
>
> *A framework which lays out a blueprint for construction. The architecture defines :*
>
> - *the functions associated with ITS user services,*
> - *the physical entities or subsystems within which such functions reside,*
> - *the data interfaces and information flows between physical subsystems, and*
> - *the communications requirements associated with information flows.*

The National ITS Architecture is comprised of several "subsystems" that are components of the overall ITS. Commercial Vehicle Operations (CVO) involves four of these subsystems:

- Fleet and Freight Management (center subsystem)
- Commercial Vehicle Administration (center subsystem)
- Commercial Vehicle Check (roadside subsystem)
- Commercial Vehicle (vehicle subsystem)

Figure 6–2 is a version of the National ITS Architecture's "sausage" diagram that highlights the CVO-unique subsystems with thick borders and shading.

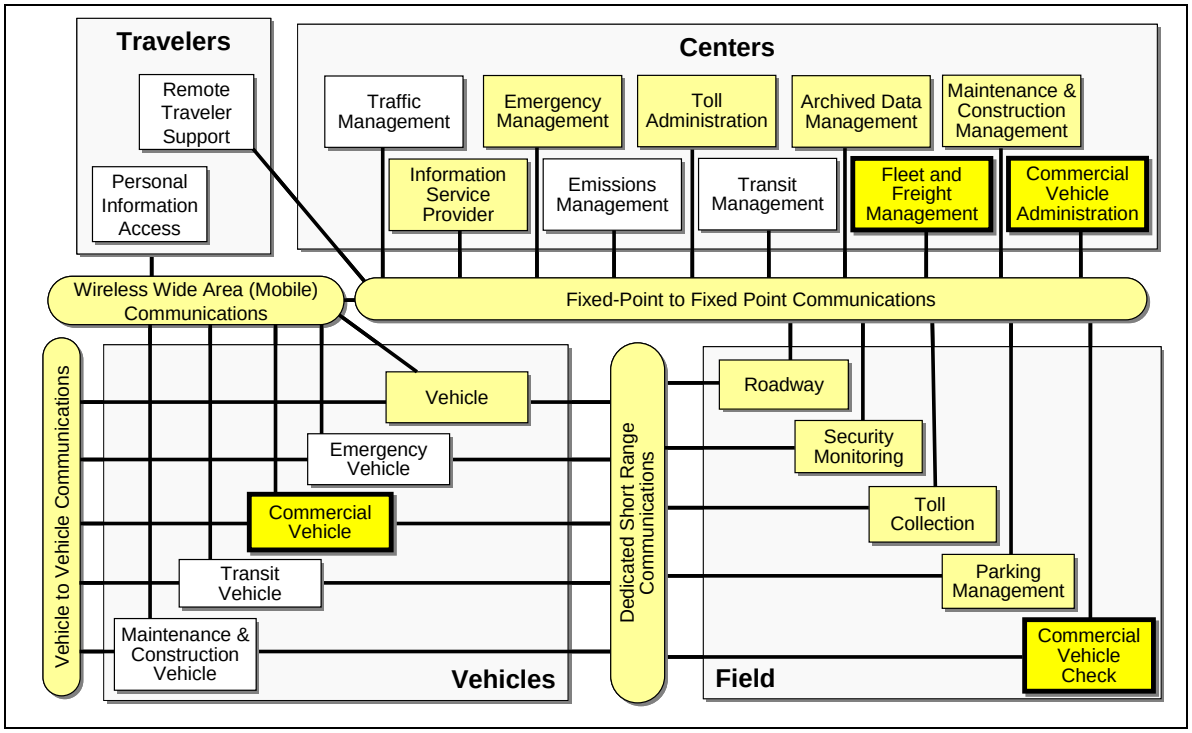

Figure 6–2: CVO Subsystems in the National ITS Architecture

6.3.2 What is the CVISN Architecture?

The Commercial Vehicle Information Systems and Networks (CVISN) Architecture is a framework that serves as guidance for stakeholders in the CVO community to develop information systems, standards, interfaces, and subsystems to support identified user services. These user services are based upon stakeholder needs and requirements, and are an outgrowth of analyzing "operational scenarios" within the commercial motor vehicle environment.

The CVISN Architecture is a more detailed architecture consistent with, and derived from, the National ITS Architecture.

The top-level picture of the CVISN Architecture in Figure 6–3 shows the CVO-unique subsystems from the National ITS Architecture, the equipment packages (shown as round-cornered boxes) in those subsystems, the other subsystems and terminators they connect to, and where standards apply. Equipment packages are the building blocks that make up the subsystems. Terminators represent the people, systems, and general environment that connect to elements inside the CVISN Architecture.

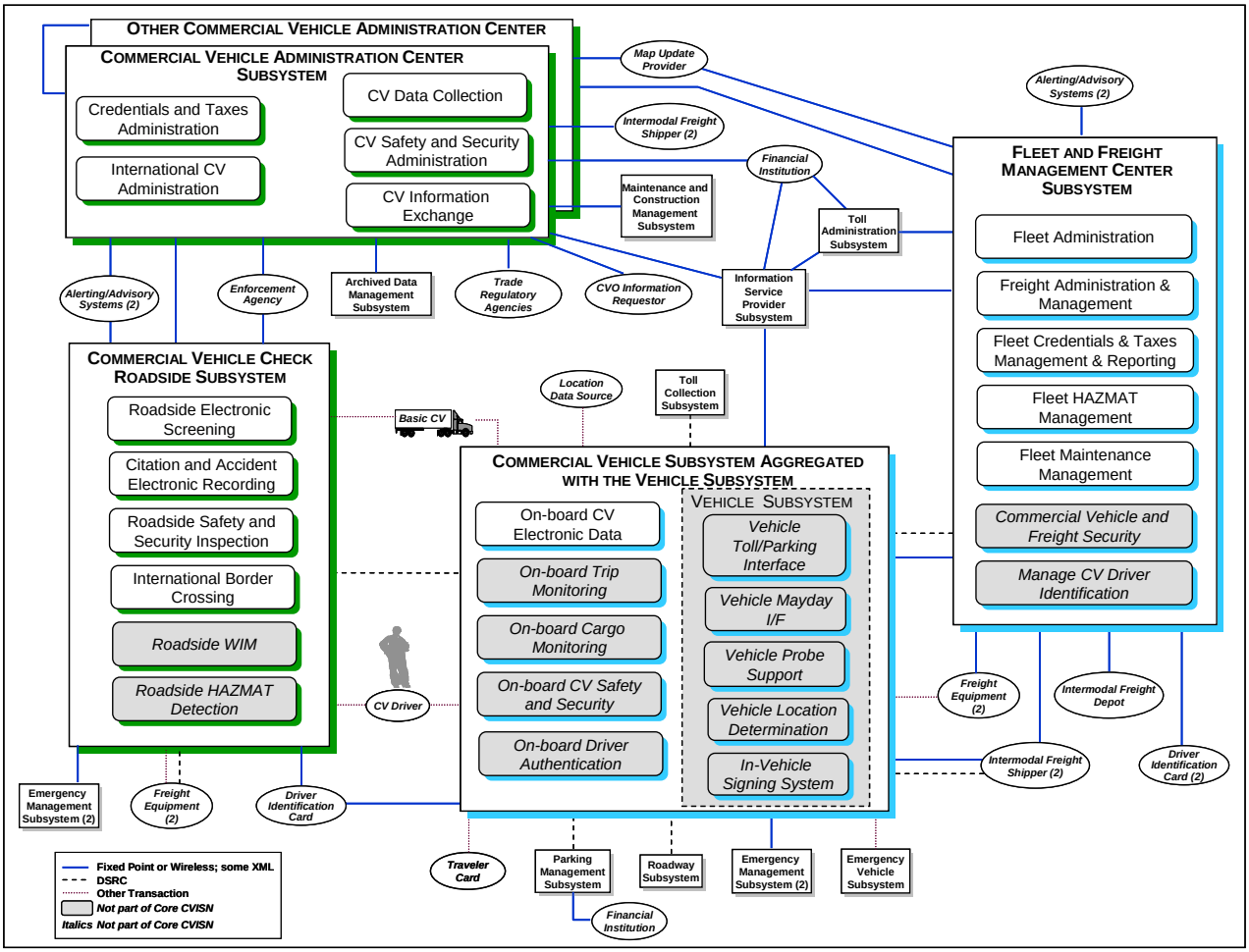

Figure 6–3: Simplified CVISN Architecture Diagram

The *CVISN Architecture* [Reference 3] includes tables defining the subsystems, terminators, equipment packages, and architecture flows that comprise the architecture. All information is consistent with the National ITS Architecture. Reference 3 also contains appendices that describe the recommended primary identifiers and Expanded CVISN capabilities.

The *CVISN System Design Description* [Reference 9] provides additional detail beyond the CVISN architecture. It describes the CVISN core infrastructure systems (e.g., MCMIS and SAFER) and what they do for the states. The *CVISN System Design Description* also provides a generic state CVISN design. The document also explains how all the elements fit together.

6.3.3 What should States do to align with the CVISN Architecture?

To align with the CVISN Architecture and achieve interoperability, states must satisfy a set of criteria. The *COACH Part 1* [Reference 8] spells out the detailed criteria. Basically, the *COACH* requires deployed systems to

- Adhere to open interface standards,
- Support CVISN operational concepts, and
- Use shared process and data definitions.

State systems should be designed to meet (or exceed) those criteria.

6.4 Interoperable Technology

The technology to support CVISN includes computers, sensors, communications and networks, software, system services, and security equipment. To be interoperable, the technologies must support the exchange and use of information.

The *COACH Part 1* checklists define compatibility requirements for processes and top-level compatibility requirements for state designs. Many CVISN system design decisions fall entirely within the state's purview. Interoperability among in-state components often is a state-imposed requirement. For interoperability across the nation, CVISN requires that a minimal set of criteria be met (as defined in the *COACH Part 1*).

The *CVISN System Design Description* provides additional guidance and information about state systems. The document describes a typical state design to help new states understand the choices others have made to achieve interoperability.

The *CVISN System Design Description* also explains what the core infrastructure systems do to support CVISN and identifies the interfacing technologies used by those systems.

6.5 Information Sharing Standards

Standards for information sharing focus on:

- Policies and related procedures to assure that data are maintained and updated in a timely fashion;
- Standard identifiers for key entities; and
- Data exchange standards between the vehicle and the roadside and among information systems.

States review and indicate a level of commitment to the data maintenance and update policies in the *COACH Part 1*. State systems should be designed to meet (or exceed) those criteria.

The CVISN Architecture recommends that the stakeholder community adopt and use standard primary identifiers for carrier, vehicle, transponder, driver, shipment, and international trip in all data exchanges. As illustrated in

Figure 6–1, using standard identifiers enables information sharing.

There are two key types of interfaces where standards apply: those between the vehicle and roadside, and those among information systems.

The standards for dedicated short range communications (DSRC) are intended to meet the requirements that depend on transferring information between vehicles and roadside devices. Typically, this type of communication links a moving commercial vehicle entering a communications zone with stationary roadside communications equipment. Today in CVISN, DSRC is used in electronic screening as illustrated in Figure 2–6. A transponder mounted on the vehicle communicates with a reader along the roadside. In some cases, the "roadside communications equipment" or "reader" may be installed on a mobile enforcement vehicle that is also in motion. Marking standards support the identification of the carrier associated with a vehicle. In the future, additional standards may apply to the interfaces between vehicles and the roadside. For instance, if the concept of universal identification is adopted, then there may be a standard for radio frequency identification (RFID) applied to commercial vehicles so that they can be identified by any jurisdiction.

The second type of interface where standards apply is among information systems. In CVISN, these include interfaces between state systems and core infrastructure systems. The systems exchange credential and safety information. The *CVISN System Design Description* describes the interactions. For specific details about each interface, state system designers should review the specifications related to the core infrastructure systems (e.g., CDLIS, SAFER).

This Page Intentionally Blank

7. RESOURCES

Resources relating to CVISN implementation fall into these categories:

- Funding
- Information
- Tools and communications
- Expertise

This chapter describes each kind of available resource. Each section gives guidance about how to access the resources.

7.1 Funding

Under the Safe, Accountable, Flexible, Efficient Transportation Equity Act – A Legacy for Users (SAFETEA-LU), USDOT was authorized to issue grants to jurisdictions in support of the jurisdictions' deployment of Core and Expanded CVISN functionality. The legislation authorized $25 million per year for a four-year period (Federal Fiscal Years 2006–2009) for this purpose. Under the legislation, FMCSA was given the discretion to determine how the $25 million will be divided among the CVISN components (Core and Expanded), as well as among the jurisdictions.

Under SAFETEA-LU in Federal Fiscal Years 2006–2008, FMCSA made CVISN grant awards totaling more than $60.5 M to 42 jurisdictions. FMCSA is proposing to continue funding for CVISN grants under the next transportation reauthorization bill. The latest version of the *CVISN National Program Management Plan* outlines the grant program [see Reference 21].

Future grant programs will be administered via http://www.grants.gov. Information about grant opportunities to support CVISN deployment will be provided in telecons, Webinars, and on FMCSA-controlled Web sites.

FMCSA supports research activities to explore potential new technologies. Other FMCSA programs support modernization initiatives and ongoing operations and maintenance. Several funding opportunities (e.g., CDLIS Modernization, Safety Data Improvement

Program, PRISM) support activities that are synergistic with CVISN.

Jurisdictions plan and fund transportation activities using state resources. Agencies involved typically include those that support commercial vehicle credentialing, revenue collection, information technology, public safety, and enforcement.

Public-private partnerships offer another way to fund CVISN activities.

Activities within jurisdictions should be coordinated so that solutions benefit all aspects of safety, security, operational efficiency, and mobility.

7.2 Information

There is a wealth of information available about CVISN. This Guide points out several documents and pertinent Web sites. Section 7.5 of this chapter lists the references used in this document.

The FMCSA CVISN Web site is the public repository of official CVISN documents. The site is in the process of being updated. The new configuration will include a document library, what's new, Webinars, training, FAQs (frequently asked questions), architecture, Core CVISN, and Expanded CVISN. Anyone can access the site and download information.

FMCSA's CVISN Web site lists the CVISN contacts in each jurisdiction.

FMCSA's Web site contains information of interest to CVISN stakeholders. The site includes sections on rules and regulations, registration and licensing, forms, safety and security, facts and research, and cross border activities.

Many CVISN jurisdictions have Web sites related to their CVISN activities. FMCSA's Web site has a page called Related Links. Links to each jurisdiction's DOT Web site are provided.

The CVISN Collaboration site is more informal. This site provides a place for CVISN stakeholders to announce and organize information related to CVISN meetings that involve multiple jurisdictions, discuss topics of interest, and share works-in-progress. The site also supports activities of working groups, ad hoc teams, Program Managers, and the CVISN Architecture Configuration Control Board. The CVISN Grants section includes sample documents and FAQs related to the grant process. To view the site, each user must establish an account. Contact FMCSA to request access. Users of the site have permission to upload and download information on most pages.

Because the CVISN Program is fairly mature, chances are there is something written down about whatever you need. If you can't find it, ask FMCSA.

7.3 Tools and Communications

FMCSA offers Web conferences (Webinars) to promote safety programs, to inform and educate target audiences, and to spotlight safety program benefits. Anyone may participate for free. Material from past Webinars may be downloaded from the FMCSA Web site. CVISN topics in 2008 included "Addressing CVISN Data Quality Deployment Issues" and "CVISN Match Possibilities." Visit the site to see what is scheduled for the future.

CVISN Workshops offer a chance for stakeholders to work on issues and share lessons learned. FMCSA sponsored CVISN Deployment workshops in March 2007 and December 2008.

Teleconferences are used to keep lines of communication open and information flowing among CVISN stakeholders.

- Every month, CVISN Program Managers are invited to participate in a telecon. During the call, FMCSA provides an update on federal activities and other activities related to CVISN. Each jurisdiction is given a chance to report on progress and problems.
- Every month, CVISN System Architects are invited to participate in a CVISN Architecture Configuration Control Board telecon. The standard agenda includes a report on SAFER changes, a discussion of problems reported by users, review of action items, review of open CVISN architecture change requests, other issues, and reports from focus groups.
- FMCSA establishes working groups or ad hoc teams to work on specific issues. Meetings are announced via the CVISN Collaboration site. In 2008, two ad hoc teams were active: Expanded CVISN Roadside and Expanded CVISN COMPASS Coordination.

Contact FMCSA to learn more about any of the regularly-scheduled telecons.

Training is available. Training courses are designed to build awareness of and commitment to CVISN and ITS. CVISN or ITS training is available from different sources. The ITS Professional Capability Building Program lists various resources for ITS training:

- Federal Highway Administration Resource Center Operations Team [Reference 24]
- The National Highway Institute [Reference 25]
- Consortium for ITS Training and Education (CITE). CITE also offers courses specific to CVISN: *Introduction to ITS/CVO and CVISN* (CVISN 101) and *Advanced CVISN* (CVISN 102). [Reference 26]
- National ITS Architecture Training Courses [Reference 27]

Some courses are available on-line and can be taken at the student's convenience. Some are also offered in a "blended" format, with a specific time schedule, conference calls with an instructor, Web-based learning, and interaction with other students via a discussion board. Others are offered periodically or upon request. In some cases, training can be customized for the jurisdiction.

Turbo Architecture is a tool that supports development of regional and project ITS architectures using the National ITS Architecture as a starting point. The tool helps users maintain consistency between regional and project architectures. The tool also supports generating a variety of architecture reports and diagrams.

7.4 Expertise

Many jurisdictions have completed Core CVISN deployment. New team members and new jurisdictions can learn from those who have extensive CVISN knowledge in your own or other jurisdictions. The contact sources and tools listed in the previous sections are good ways to identify who might have the insight you need.

Join one or more of the teleconference groups to exchange ideas. Often your peers are wrestling with (or have already solved) similar problems.

Many jurisdictions have hired consultants to help them develop their CVISN Top-Level Designs/Program Plans, manage their CVISN programs, and design systems to support CVISN. Vendors offer products for e-credentialing, CVIEW, and other CVISN

functions. Contact your peers in other jurisdictions to learn about their experiences.

FMCSA also has limited technical and programmatic support resources to help jurisdictions. If your jurisdiction has a specific need, contact your local FMCSA office or FMCSA headquarters.

7.5 References

1. JHU/APL, *Commercial Vehicle Information Systems and Networks (CVISN) Glossary*, NSTD-08-0717, V3.0, Baseline Version, November 2008, http://cvisn.fmcsa.dot.gov.
2. *Reference deleted.*
3. JHU/APL, *CVISN Architecture*, POR-02-7364 V3.0, December 2006, http://cvisn.fmcsa.dot.gov. [The latest version will be maintained on the FMCSA CVISN Web site. The document is due to be updated.]
4. U.S. Department of Transportation ITS Joint Program Office, *The National ITS Architecture*, V 6.0, April 2007, maintained by Iteris, http://www.iteris.com/itsarch/.
5. PrePass Web site, http://www.prepass.com/Pages/Home.aspx.
6. NORPASS Web site, http://www.norpass.net/.
7. Safety and Fitness Electronic Records (SAFER) Web site, http://safer.fmcsa.dot.gov/.
8. JHU/APL, *CVISN Operational and Architectural Compatibility Handbook (COACH) Part 1, Operational Concept and Top-Level Design Checklists*, V4.0, November 2008, http://cvisn.fmcsa.dot.gov. [The latest version will be maintained on the FMCSA CVISN Web site.]
9. JHU/APL, *CVISN System Design Description*, POR-97-6998 V3.0, April 2003, http://cvisn.fmcsa.dot.gov. [The latest version will be maintained on the FMCSA CVISN Web site. The document is due to be updated in 2008.]
10. FMCSA, *COMPASS Fact Sheet*, http://www.fmcsa.dot.gov/about/what-we-do/keyprograms/compass-factsheet.htm
11. JHU/APL, *Expanded Commercial Vehicle Information Systems and Networks (CVISN) Summary Report*, SSD-PL-05-0202, June 2005, http://cvisn.fmcsa.dot.gov.
12. JHU/APL, *Expanded CVISN Driver Information Sharing Capability Report: Driver Snapshots*, SSD-PL-05-0194, June 2005, http://cvisn.fmcsa.dot.gov.
13. JHU/APL, *Expanded CVISN Driver Information Sharing Capability Report: Access to Driver Data*, SSD-PL-05-0195, June 2005, http://cvisn.fmcsa.dot.gov.
14. JHU/APL, *Expanded CVISN Enhanced Safety Information Sharing Capability Report: Safety Data Quality*, SSD-PL-05-0196, June 2005, http://cvisn.fmcsa.dot.gov.
15. JHU/APL, *Expanded CVISN Enhanced Safety Information Sharing Capability Report: Carrier Access to Safety Data*, SSD-PL-05-0197, June 2005, http://cvisn.fmcsa.dot.gov.
16. JHU/APL, *Expanded CVISN Smart Roadside Capability Report: Roadside Access to Data*, SSD-PL-05-0198, June 2005, http://cvisn.fmcsa.dot.gov.
17. JHU/APL, *Expanded CVISN Smart Roadside Capability Report: Virtual Roadside Sites*, SSD-PL-05-0199, June 2005, http://cvisn.fmcsa.dot.gov/.
18. U.S. Department of Transportation, *Final Summary Report CVISN Business Case*, 15 October 2007, http://ntl.bts.gov/lib/jpodocs/repts_te/14404_files/casesummary.pdf.
19. FHWA-JPO-04-029, EDL # 13980, FMCSA-RT-04-110, *CVISN Electronic Credentialing for Commercial Vehicles in Washington State, A Case Study*, September 2004, http://ntl.bts.gov/lib/jpodocs/repts_te/13980_files/washington.pdf.

20. U.S. Department of Transportation, *Final Report Economic Analysis and Business Case for Motor Carrier Industry Support of CVISN*, 2 October 2007, http://ntl.bts.gov/lib/30000/30200/30233/14406_files/14406.pdf.
21. FMCSA Technology Division, *Commercial Vehicle Information Systems and Networks (CVISN) National Program Management Plan*, December 2007, https://partners.jhuapl.edu/BA/hp/cvisn/CVISNGrants/General_Docs/FY%202008%20%20National%20CVISN%20Program%20Plan_FINAL.pdf.
22. FMCSA CVISN Web site, http://cvisn.fmcsa.dot.gov/.
23. CVISN Collaboration site, https://partners.jhuapl.edu/BA/hp/CVISN.
24. FHWA Resource Center Operations Team training Web site, http://www.fhwa.dot.gov/resourcecenter/teams/operations/courses.cfm.
25. National Highway Institute ITS courses Web site, http://www.nhi.fhwa.dot.gov/training/list_catalog.aspx?cat=t&key=&num=137&loc=&sta=&tit=&typ=&lev=&ava=&str=&end=&drl=.
26. Consortium for ITS Training and Education (CITE) Web site, http://www.citeconsortium.org/curriculum.html.
27. U.S. Department of Transportation, National ITS Architecture Training Courses Web site, http://www.its.dot.gov/arch/archdep_trng.htm.
28. John A. Volpe National Transportation Systems Center, *SAFER Interface Control Document (ICD)*, Version 8.1 – DRAFT, June 2008, http://cvisn.fmcsa.dot.gov. [The latest version will be maintained on the FMCSA CVISN Web site.]
29. Intelligent Transportation Society of America, *ITS CVO Guiding Principles*, last update 27 March 1998.
30. Intelligent Transportation Society of America, *Fair Information Principles for ITS/CVO*, last updated 12 January 1999.
31. Intelligent Transportation Society of America, *Interim ITS/CVO Interoperability Guiding Principles*, last updated 12 January 1999.
32. Federal Government Grants Web site, http://www.grants.gov.
33. Federal Motor Carrier Safety Administration Web site, http://www.fmcsa.dot.gov/.
34. Transportation Equity Act for the 21st Century (TEA-21), Public Law 105-178, 9 June 1998, http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=105_cong_public_laws&docid=f:publ178.105.
35. Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), Public Law 109-59, 10 August 2005, http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=109_cong_public_laws&docid=f:publ059.109.

7.6 Contact Information

As of October 2008, CVISN contacts at FMCSA Headquarters are:

- Julie Lane, Julie.Lane@dot.gov, 202-385-2391.
- Quon Kwan, Quon.Kwan@dot.gov, 202-385-2389.
- Jeff Secrist, Jeff.Secrist@dot.gov, 202-385-2367.

States should also contact their local FMCSA division office.

This Page Intentionally Blank