



The Federal Motor Carrier Safety Administration (FMCSA) is using Commercial Vehicle Information Systems and Networks (CVISN) “levels” to allow definition of a specific set of capabilities that can be deployed incrementally by a state and its motor carriers. The definition of CVISN Level 1 has been baselined. The definition of CVISN Level 2 is being developed. Possible elements for Level 3 and beyond are being collected to support planning.

The level definitions include 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.

3.1 What is CVISN Level 1?

Tables 3-1 and 3-2 summarize what is required for CVISN Level 1. Table 3-1 describes requirements for states. Table 3-2 describes requirements for the core infrastructure systems. The detailed requirements for CVISN Level 1 are provided in the *CVISN Operational and Architectural Compatibility Handbook (COACH)* [JHU/APL, POR-97-7067, 1997 – 1999].

3.2 What Does CVISN Level 1 Look Like When Deployed in a State?

A state must develop or otherwise acquire new systems and modify some existing systems to implement the CVISN Level 1 capabilities. **There are many ways to do this and still be in conformance with the National Intelligent Transportation Systems (ITS) Architecture and standards.** A typical way that is modeled on the approaches taken by the CVISN prototype states, Maryland and Virginia, is shown in Figure 3-1.

A more complete description of a generic state design is included in the *CVISN System Design Description* [JHU/APL, POR-97-6998, April 1999].

3.3 What Must Be Done to Deploy CVISN Level 1?

Implementing CVISN Level 1 is a significant undertaking for a state. A brief summary of key tasks and products involved is provided in Table 3-3. Chapter 6 provides more information on a recommended process for a state to follow in this endeavor.

Table 3-1 State CVISN Level 1 Capabilities

| Capability Area | State CVISN Level 1 Capabilities |
|------------------------------------|---|
| | <ul style="list-style-type: none"> ▪ <i>An organizational framework for cooperative system development has been established among state agencies and motor carriers.</i> ▪ <i>A State CVISN System Design has been established that conforms to the CVISN Architecture and can evolve to include new technology and capabilities.</i> ▪ <i>All the elements of three capability areas (below) have been implemented using applicable architectural guidelines, operational concepts, and standards.</i> |
| Safety Information Exchange | <ul style="list-style-type: none"> ▪ ASPEN (or equivalent) at all major inspection sites. ▪ Connection to the Safety and Fitness Electronic Records (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. |
| Credentials Administration | <ul style="list-style-type: none"> ▪ Automated processing (i.e., 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. ▪ 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 | <ul style="list-style-type: none"> ▪ Implemented at a minimum of one fixed or mobile inspection site. ▪ Ready to replicate at other sites. |

Table 3-2 CVISN Core Infrastructure Systems CVISN Level 1 Requirements

| System | CVISN Core Infrastructure Systems CVISN Level 1 Requirements |
|--|--|
| <i>All the capabilities outlined below have been implemented using applicable architectural guidelines, operational concepts, and standards.</i> | |
| SAFER | <ul style="list-style-type: none"> ▪ 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 Electronic Data Interchange (EDI) formats for input and output data. ▪ Interfaces to Motor Carrier Management Information System (MCMIS), SAFETYNET 2000, Licensing and Insurance and Commercial Driver's License Information System (CDLIS). |
| IRP Clearinghouse | <ul style="list-style-type: none"> ▪ Accepts recap data from states. ▪ Supports EDI formats for output data. ▪ Performs remittance netting and uses the banking system for funds transfer. |
| IFTA Clearinghouse | <ul style="list-style-type: none"> ▪ Web site for IFTA manuals, tax rate matrices, news and calendar. ▪ Accepts transmittal data and profile data from states. ▪ Supports EDI formats for input and output data. ▪ Generates transmittal reports. |
| Licensing and Insurance | Interface to SAFER to provide licensing and insurance data for snapshots. |
| RSPA HAZMAT | <i>FMCSA Research and Special Program Administration Hazardous Materials (HAZMAT) System. No change required to current operational capability.</i> |
| ASAP/CAPRI | <i>No change required to current operational capability.</i> |
| CDLIS | <i>No change required to current operational capability.</i> |
| NMVTIS | <i>Not included in CVISN Level 1 capability.</i> |

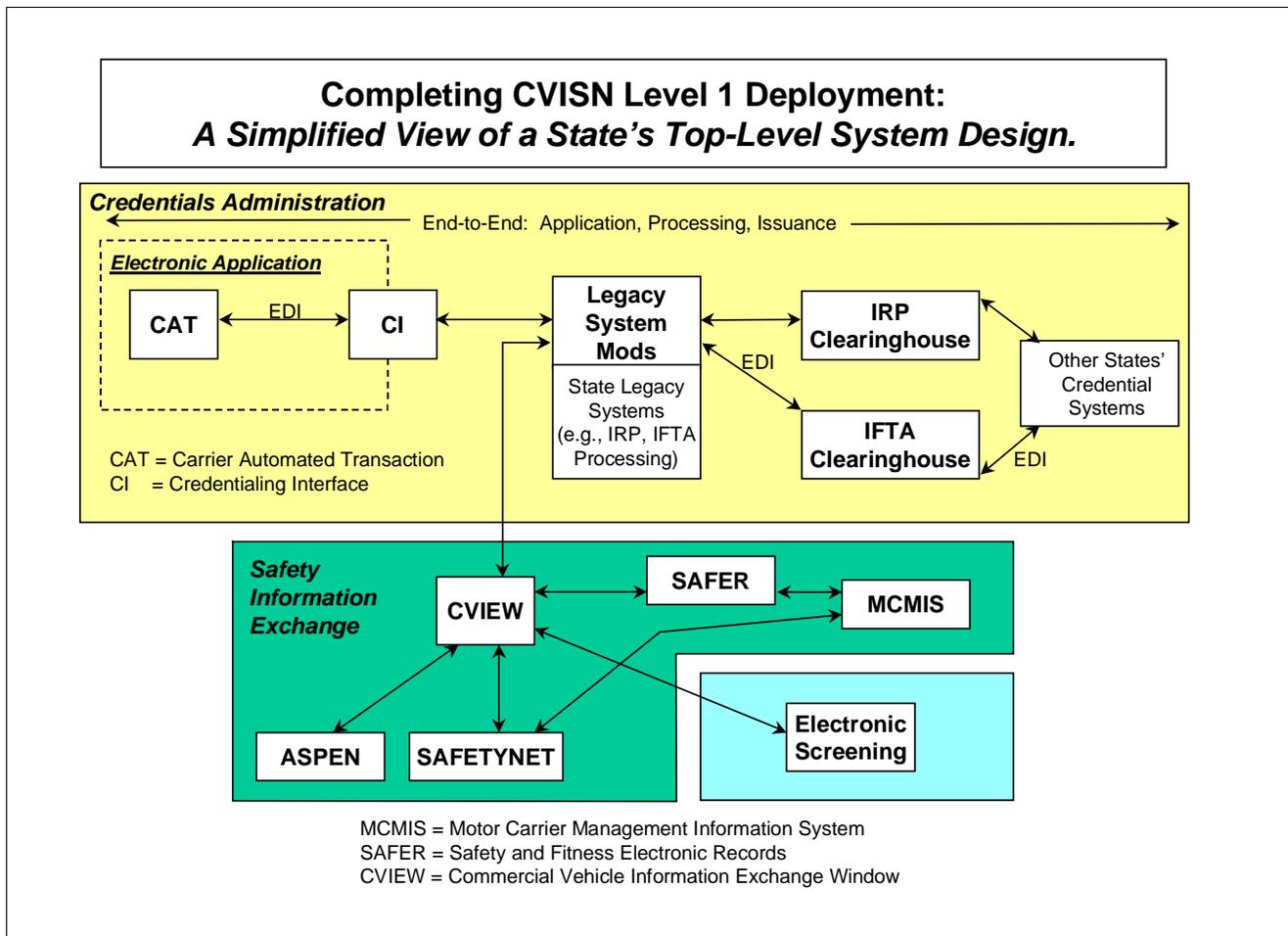


Figure 3-1 A Simplified View of a State's Top-Level System Design

3.4 What is CVISN Level 2 (Preliminary Definition)

CVISN Level 1 was defined as a pragmatic means of setting a goal that was ambitious but achievable. It purposely excluded many capabilities that were desirable and feasible with today's technology in order to control project scope and cost. If funding is available, these capabilities will be included in a future

Level 2 phase of the CVISN Program.

A preliminary definition of the capabilities a state would implement for CVISN Level 2 is provided in the Table 3-4. The final definition will evolve in a cooperative effort among FMCSA, states, and other CVO stakeholders.

Table 3-3 Key Tasks Involved in CVISN Level 1 Deployment

| | Activity or System | Key Tasks Involved in CVISN Level 1 Deployment |
|-------------------------------|------------------------------------|---|
| Coordination | Program Formation | <ul style="list-style-type: none"> ▪ Form a Commercial Vehicle Operations (CVO) Working Group of stakeholder representatives including motor carriers. ▪ Develop a CVO Business Plan. |
| | Program Management | <ul style="list-style-type: none"> ▪ Assign a Program Manager, System Architect, and Program Administrator. ▪ Develop a State CVISN Program Plan. |
| | System Engineering | <ul style="list-style-type: none"> ▪ Develop a top-level system design that supports the required business processes. ▪ Develop technical specs for all the subsystems including specifications for EDI transactions. ▪ Define and execute a comprehensive integration and test effort. ▪ Design networks and communications to connect all subsystems. |
| New System Development | ASPEN (or equivalent) | <ul style="list-style-type: none"> ▪ Acquire hardware and communications support for the FMCSA ASPEN software. ▪ Install systems and train personnel. |
| | CVIEW (or equivalent) | Develop or acquire CVIEW hardware, software, and communications. |
| | CAT (or equivalent) | <ul style="list-style-type: none"> ▪ Enlist several motor carriers to be the first users of the new electronic credentialing capability. ▪ Develop or acquire carrier automated transaction (CAT) software that supports EDI transactions for data exchange. ▪ Work with carriers to install CAT and train users. |
| | CI | Develop or acquire credentialing interface (CI) hardware, software, and communications that support EDI transactions for data exchange. |
| | E-Screening System | Develop or acquire e-screening hardware, software, and communications that support dedicated short range communication (DSRC) standards. |
| System Modifications | Networks and Communications | Implement networks and communications to connect all the subsystems. |
| | IRP Legacy System | Modify existing IRP system to accept supplemental and renewal transactions from the CI. Connect to IRP Clearinghouse. |
| | IFTA Legacy System | Modify existing IFTA system to accept supplemental and renewal transactions and quarterly tax filings from the CI. Connect to IFTA Clearinghouse. |
| | Weigh Station Legacy System | <ul style="list-style-type: none"> ▪ 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. |

Table 3-4 Preliminary State CVISN Level 2 Requirements

| Capability Area | State CVISN Level 2 Capabilities |
|--|--|
| <ul style="list-style-type: none"> ▪ <i>CVISN Level 2 includes CVISN Level 1 plus the following...</i> ▪ <i>All the elements of three capability areas (below) have been implemented using applicable architectural guidelines, operational concepts, and standards.</i> | |
| Safety Information Exchange | <ul style="list-style-type: none"> ▪ Crash and Citation Data collected electronically at site for 10 percent of enforcement personnel. ▪ Voluntary use of Automated Safety Assurance Program (ASAP) by 10 percent of state motor carriers. ▪ Support electronic carrier safety audits. ▪ Use onboard safety monitors as inputs to inspections. |
| Credentials Administration | <ul style="list-style-type: none"> ▪ Electronic payment for credentials. ▪ End-to-end processing (i.e., carrier application, state application processing, payment, and credential issuance) of intrastate registration, titling, OS/OW, carrier registration and HAZMAT credentials. ▪ Connection to National Motor Vehicle Title Information System (NMVTIS) and electronic federal carrier registration system. ▪ “Paperless” vehicle: no requirement for paper credentials on vehicle. ▪ Support for electronic state IRP and IFTA audits. ▪ At least 50 percent of the total transaction volume handled electronically. |
| Electronic Screening | <ul style="list-style-type: none"> ▪ Participation in interoperability agreements among screening programs. ▪ Implemented at major weigh stations and inspection sites where there is significant traffic. ▪ Ready to replicate at other sites. |

3.5 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 CVISN Level 2. Some specific areas that now seem to hold promise for implementation beyond Level 2 include:

- ♦ Extension to integrate other CVO user services such as onboard safety monitoring, automated inspections, HAZMAT incident management, freight and fleet management, and intermodal freight functions.
- ♦ Closer integration with other ITS services for traffic management, traveler information, and incident response.
- ♦ Driver snapshots to distribute a standardized set of driver safety and credentials information.

- ♦ The use of eXtensible Markup Language (XML) standard transactions as a supplement to traditional X12 EDI for some business transactions.
- ♦ The use of DSRC at the 5.9-MHz frequency band.

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 and ITS/CVO Programs may conclude as separate entities. But the CVO community will continue to improve safety and efficiency. 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.

In the remainder of this section, we try to look ahead to the year 2005 and describe the vision for CVO shipping operations and the underlying business transactions.

Figure 3-2 illustrates the vision for CVO shipping operations by the year 2005. It is envisioned that trucking operations will have become much more efficient, largely due to the availability of accurate information in electronic form.

In 2005, carriers are able to equip their vehicles with a variety of productivity and safety improvements: mobile communications systems, navigation and tracking systems, onboard vehicle monitors, collision avoidance devices, crash restraints, and vision enhancement equipment.

Most trucks are equipped with ITS DSRC transponders that transmit messages to and receive messages from the roadside.

Enroute delays at weigh stations have been virtually eliminated. Electronic screening is used to check the vast majority of vehicles at mainline speeds. A screening message transmits vehicle, carrier, driver, and specially regulated load-type identifiers to roadside readers. The identifiers are used to access information stored in government information systems. Safety, credentials, tax, and permit information are checked at mainline speeds. Carriers that participate in screening programs can operate trucks with no paper credentials onboard.

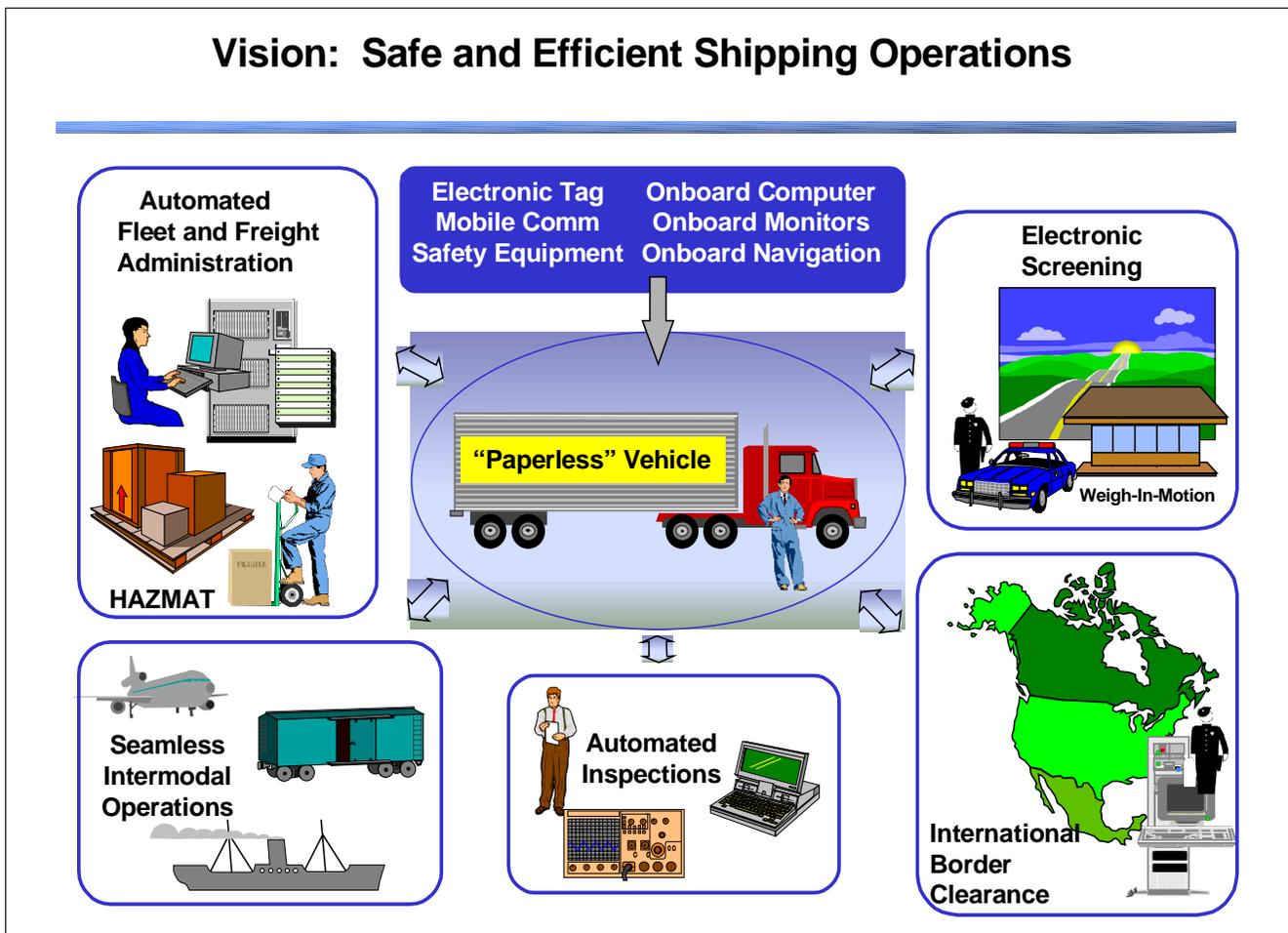


Figure 3-2 Vision of CVO Shipping Operations – Year 2005

Carriers that voluntarily adopt driver alertness management programs and equipment are exempted from maintaining trip logs. Other carriers maintain trip logs electronically.

International border crossings occur with little or no delay. Routine shipments are cleared by use of EDI well in advance of the vehicle approaching the border, and more often than not, the vehicle passes with less than a minute delay.

When inspections occur, they are conducted quickly with the aid of automated safety inspection equipment.

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

Carriers use fleet management systems to optimize schedules, routing, and maintenance. Accurate highway and traffic data are available to support routing. Carriers can choose to track vehicles throughout North America. Many carriers maintain databases of the location of each shipment. Standards are available to support cross-carrier queries and tracking, so a shipper can find the location of their shipment via an electronic query. HAZMAT handling data required to respond to HAZMAT incidents are available online to emergency personnel.

Figure 3-3 illustrates the vision for handling CVO electronic business transactions by the year 2005. It is envisioned that the vast majority of CVO business transactions are being conducted electronically. This includes transactions among carriers, shippers, government agencies, insurance companies, and other CVO stakeholders.

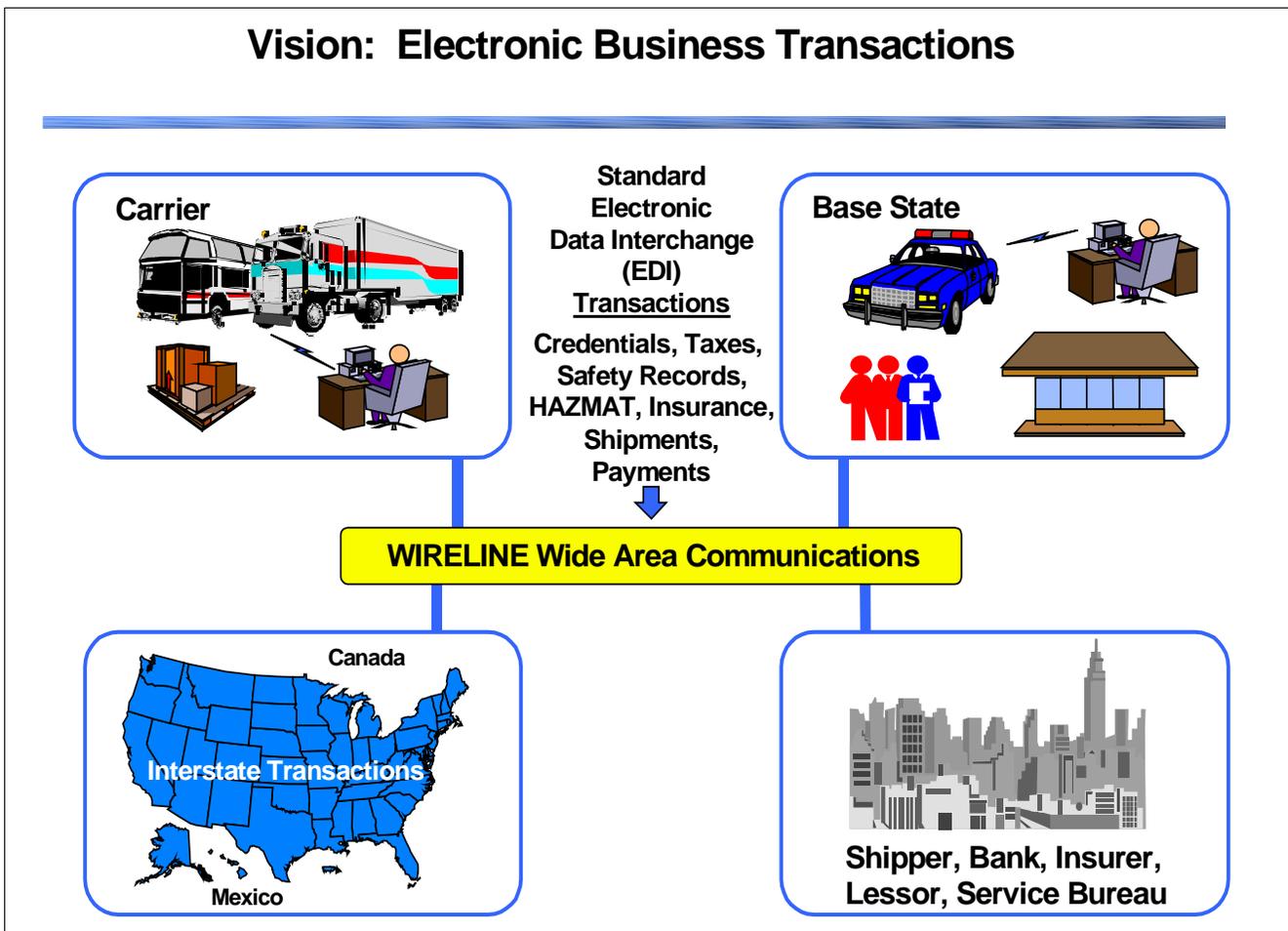


Figure 3-3 Vision of Electronic Business Transactions – Year 2005

In 2005, carriers apply and pay for credentials electronically, including registration, HAZMAT permits, and oversize/overweight (OS/OW) permits. They file and pay fuel taxes electronically. Carriers deal with a base state for all business transactions, including registration, permits, taxes, and screening. The base state handles any allocation of fees or taxes to other states, simplifying carrier administration. Credentials are distributed electronically. No bingo cards, stamps, decals, or paper permits are required for participating carriers.

Information from one process (e.g., registration) is available to other processes (e.g., fuel tax) in a timely manner. This avoids redundant data entry, improves data accuracy, and provides data to support better decision making. It permits crosschecks such as denying registration to a carrier with a poor safety history.

Some aspects of audits are conducted electronically with participating carriers. State systems send queries to carrier systems. The responses are compared to state records and often the audit is completed with little or no manual intervention.

States deal with carriers electronically, and states also deal with each other electronically. They routinely interchange electronic information about business transactions relating to safety, registration, tax, and screening. Shipping transactions are primarily electronic. Shippers place orders, track freight movement, receive invoices, and make payments electronically.

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

Data privacy and integrity are assured via encryption and password techniques. In addition, the legal issues associated with the Privacy Act of 1974 are supported.

