

The TEA-21 ITS Deployment Program

Interim Report 2000



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In June 1998, Congress passed the Transportation Equity Act for the 21st Century (TEA-21) authorizing Federal surface transportation programs for highways, highway safety, and transit for 1998-2003. We are now at the midpoint of TEA-21, and this is an appropriate time to assess the progress of the Intelligent Transportation Systems (ITS) Deployment Program. This brochure describes the objectives and results of the TEA-21 ITS Deployment Program to date, highlighting key program accomplishments and benefits in the areas of integrated deployment, safety, mobility, and efficiency.

What is the Role of the ITS Deployment Program in TEA-21?

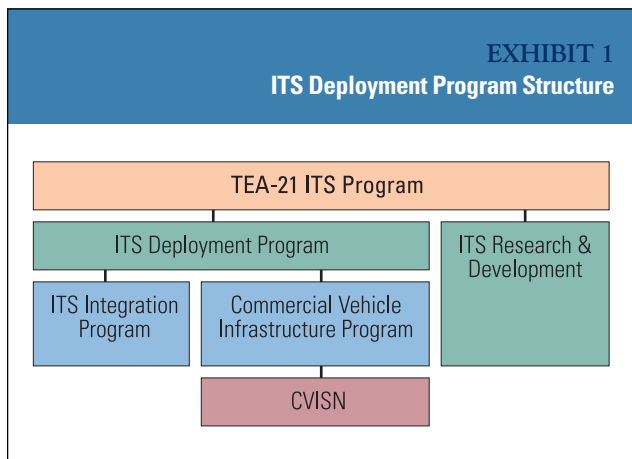
The national ITS Program is integrated, intermodal, and interactive, with two general components – intelligent infrastructure and intelligent vehicles. TEA-21 supports this vision through:

- **Deployment activities**, which include ITS interoperability and integration in both metropolitan and rural areas, as well as the commercial vehicle ITS infrastructure; and
- **Research and development activities**, which include the Intelligent Vehicle Initiative, architecture and standards development, and technical assistance and training.

As shown in Exhibit 1, TEA-21 created a two-part ITS Deployment Program:

- **The ITS Integration Program**, with the goal to increase integration and interoperability of ITS systems in metropolitan and rural areas; and
- **The Commercial Vehicle Infrastructure Program**, aimed at improving the safety and productivity of commercial vehicles and drivers, as well as reducing the costs associated with Federal and State regulatory requirements.

As authorized in TEA-21, the ITS Deployment Program is a discretionary program to be competitively awarded to States and local jurisdictions. However, each year since the



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EXHIBIT 2
USDOT Oversight Process

- 1 Congress sets out criteria in TEA-21
- 2 USDOT develops criteria as guide for implementation
- 3 Congress identifies specific sites as candidates for funding
- 4 USDOT solicits projects from sites designated by Congress
- 5 USDOT ensures projects meet TEA-21 criteria
- 6 USDOT monitors project implementation and evaluation

passage of TEA-21, Congress has designated areas to receive **ITS Deployment Program** funding as part of the annual appropriations process. In FY2000 the funding was directed to 75 State and local jurisdictions. While the U.S. Department of Transportation (USDOT) does not advocate the “earmarking” of the ITS Deployment Program, the USDOT has established an oversight process to ensure that these funds are used in compliance with the requirements of TEA-21. This oversight process is shown in Exhibit 2 above.

The ITS Integration Program Leverages Funding to Maximize Benefits

In order to qualify for funding under the ITS Integration Program, projects must meet ITS Integration Program criteria and provide matching funding that equals the ITS funds being provided (60 percent of these matching funds can come from other Federal sources; 40 percent must be from non-federal sources) as shown in Exhibit 3. These funding requirements encourage localities to develop partnerships (especially with the private sector) that leverage Federal funds, maximize benefits and, in some cases, generate revenues. This helps to ensure strong local support and serves to weed out weak projects.

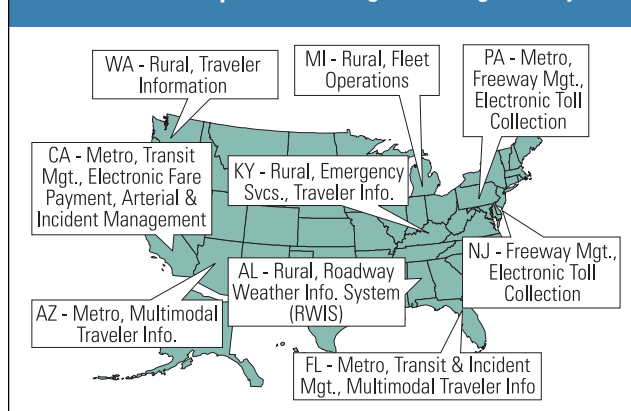
EXHIBIT 3
ITS Integration Program Criteria

- Contribute to **national deployment** goals and objectives;
- Demonstrate a strong commitment to stakeholder **cooperation and partnering**;
- Encourage, maximize and leverage **private sector involvement** and financial commitment;
- Demonstrate conformity to **national architecture** and standards;
- Demonstrate inclusion in statewide or metropolitan **transportation planning** processes;
- Ensure long-term **operation and maintenance** without continued reliance on Federal ITS funds;
- Demonstrate that personnel have the necessary **technical skills/training** for effective operations;
- Mitigate adverse impacts on **bicycle/pedestrian** transport and safety; and
- In the case of a rural area, meet other goals or **economic development** criteria.

The ITS Integration Program Creates Partnerships and Integrates Systems

A review of the projects being funded under the ITS Integration Program demonstrates that the program criteria and matching requirements contained in TEA-21 ensure that the selected projects meet the goals of the program. For example, many of the FY 1999 project proposals demonstrated strong partnerships among States, local governments, and the private sector. Project submissions

EXHIBIT 4
Examples of ITS Integration Program Projects



reflected a roughly 80%-20% split between metropolitan and rural projects, respectively (TEA-21 requires that rural areas receive at least 10 percent of the funds).

The metropolitan projects showed deployment and/or integration activity in varying degrees across almost all the key integration areas used to categorize ITS infrastructure:

- **High levels of integration** with Freeway Management, Incident Management, and Arterial Management Systems;
- **Moderate levels of integration** with Traveler Information, Transit Management, and Emergency Management Systems; and
- **Lower levels of integration** with Electronic Toll Collection, Electronic Fare Payment, and Highway-Rail Intersections.

Rural projects most heavily represented travel information and emergency services, but also included projects that addressed traveler safety and security, public travel and mobility, infrastructure operations and maintenance, and fleet operations and maintenance.

A commitment to evaluation is a key component of all the FY 1999 Integration program projects. All Integration Program projects are required to undertake a local or self-evaluation. In addition, seven projects were selected to participate in national, independent evaluations.

EXHIBIT 5
Integration Program Highlight: Dade County, Fl (Metro)

Objective: To provide Miami-Dade, Broward, and Palm Beach tri-county region with multi-modal real-time traveler information.

Key Features:

- Part of regional ITS "Sunguide" initiative that targeted Advanced Traveler Information Systems as the most effective congestion minimization and data dissemination tool for the area.
- Provides information to travelers on freeway operations, arterial status, toll road performance, and transit status.
- Partnership with 11 public sector transportation organizations (highway, toll, police, transit) plus resource investment and revenue generation requirement of private Information Service Provider (ISP).

Key Benefits:

- Project time frame requires delivering real-time multimodal traveler information to public users via multiple media at no charge within one year of completion.
- ISP will use/leverage both public and private resources.
- ISP to generate revenues through advertising and other means to become self-sufficient in three years.

Of the seven projects chosen for national evaluation, five were in metropolitan areas and two were in rural areas. Three of the seven projects were selected to be “case study” and “lessons learned” evaluations, focusing on institutional issues and challenges and successful strategies to overcome these challenges. Four projects were selected to be system impact evaluations, focusing on obtaining high quality “before and after” comparisons of system performance.

A review of the projects that received funding for FY99 and FY00 shows variation both in the types of ITS systems being integrated and also in how project participants have structured projects to take maximum advantage of participants’ strengths and resources. Some of the projects stand out, for example, because of their extensive and **innovative partnership plans** – not only between and among public sector stakeholders, but with the private sector as well. These partnerships were often necessary for project execution.

The benefits of partnering are clear – the ability to leverage funds and create resource synergies (with information, technology, expertise, and physical resources). The proposed **Miami-Dade** project, for example, is a partnership of 11 public sector transportation agencies plus a private Information

EXHIBIT 6 Integration Program Highlight: Riverside, CA (Metro)
<p>Objective: Enhance fixed-route, demand-responsive, and non-traditional transit services (such as smart shuttles) through the use of Automatic Vehicle Location (AVL), Global Positioning Systems (GPS), onboard displays, and advanced communication devices.</p> <p>Key Features:</p> <ul style="list-style-type: none"> • Enhance automated fare collection efforts and operational performance through use of real-time telemetric monitoring of route/time performance and ridership. • Automated monitoring of critical vehicle safety and maintenance systems. • Integration of customer information with system dispatch in real-time. <p>Key Benefits:</p> <ul style="list-style-type: none"> • Integration fulfills a benefits data need in the area of electronic fare payment and transit management systems maintenance. • Time frame allows speedy evaluation results – complete demo is expected within 36 months of kick-off. • Continues partnership of regional transportation planning and transit agencies. • Consistent with Priority Corridor and National architecture.

EXHIBIT 7 Integration Program Highlight: Spokane, WA (Rural)
<p>Objective: Install a Roadway Weather Information System (RWIS) that will communicate information necessary to help road maintenance crews and the public make informed travel decisions and that will be integrated into regional ITS systems.</p> <p>Key Features:</p> <ul style="list-style-type: none"> • Provides information on current weather conditions, road surface conditions, border crossings, flooding, slides, and any other pertinent situations. • Project approach includes installation of video cameras, RWIS stations, and highway advisory radios, with data and images transmitted to public via the Internet. <p>Key Benefits:</p> <ul style="list-style-type: none"> • Integration of three rural ITS components plus expected data on rural applications of ITS. • Evaluate effects on freight mobility and NAFTA, as well as on tourism demand.

Service Provider (ISP). The public/private partnership approach was pursued aggressively as the stakeholders agreed that it was the most efficient way to jumpstart the integration process and deliver traveler information to the users as quickly as possible and in the most cost effective manner.

Under contract, the ISP uses some public sector infrastructure and resources (fiber optic lines, advanced vehicle location (AVL) data, databases, etc.,) while also contributing its own resources (funds, personnel, software, programming, etc.). The ISP is expected to provide services free of charge to the public within one year, but also must develop its program in concert with the public agency deployment plan. The ISP is also expected to generate revenues to meet and exceed its own operating needs while sharing revenues with partners. (The public share of the revenue is reinvested to further expand public sector infrastructure in the region.)

Other integration projects, such as in **Delaware River, PA** and the **State of New Jersey**, take advantage of the existence of **legacy systems** that are already proven to work and work well. These projects deploy innovative service and system integrations while keeping the expense of deploying new and unproven systems to a minimum. These projects piggyback on the existing regional ITS architecture and infrastructure; use of legacy systems minimizes costs and maximizes interoperability.

Many rural projects, such as in **Spokane, WA**, use Roadway Weather Information Systems (RWIS) and other systems including video cameras and Highway Advisory Radio (HAR) to improve safety on roads in rural areas prone to adverse weather conditions. This **safety benefit** extends not only to motorists but also to state road maintenance crews who may need to spread salt, plow snow, or close off roads for ice. In addition, these systems assist the state with managing tourism-oriented traffic, advising motorists of site congestion/closings, alternate routes, and road conditions.

Still other integration projects focus on **alternative modes** of transportation, such as transit (or on projects integrating ITS across modes that include transit). The **Riverside, CA** integration project, for example, uses a variety of technologies to enhance fixed-route, demand-responsive, and other transit services. These technologies locate and track vehicles, facilitate fare payment, optimize system performance by monitoring vehicle maintenance and safety systems, facilitate information transfer to and from dispatch, and keep track of route ridership and efficiency.

In the **State of New Jersey**, a coalition of 15 transportation agencies is using the preexisting regional ITS system (which facilitates electronic toll collection and freeway management) as a base to integrate additional traffic and transit operations via the use of toll tags as probes. These projects not only benefit transit users, but also increase systemwide efficiencies as traffic and transit operations interact.

EXHIBIT 8
CVISN Electronic Credentialing Highlight: Kentucky

Objective: Kentucky has pursued electronic credentialing as part of the statewide Empower Kentucky Program. Begun in 1996, Empower Kentucky aims to save costs by simplifying and automating processes within all government agencies through e-commerce. The State's transportation officials have designed an electronic credentialing system that will provide "one-stop-shopping" by enabling motor carriers to register and pay fees and taxes electronically via the Internet.

Key Features:

- Consolidation of 11 forms into one electronic form.
- Develop a web interface.
- Several physical interface locations (weigh station, library, county clerk's office).
- New regulation allows electronic payments.
- Planning assistance from University of Kentucky.

EXHIBIT 9
CVISN Safety Information Exchange Highlight: Maryland

Objective: The State of Maryland is implementing and deploying safety information exchange systems as part of its CVISN Level 1 deployment. These systems allow inspectors to use computers to make inquiries of federal safety information systems to obtain previous carrier, driver, and vehicle inspection information. These computers are also used to record inspections and transmit the data to the appropriate state and federal safety and credentialing information systems. As a result, high-risk carriers that have a history of out-of-service vehicles and/or higher than average accident rates can be identified, and this information passed on to federal and state authorities in a timely and accurate manner.

Key Features:

- Approximately 50 percent of Maryland State Police (MSP) and Transportation Authority Police (MdTAP) now have the capability to make electronic inquiries of the national motor carrier safety database, as well as electronically record inspections and transmit the data to appropriate state and federal systems.
- By mid-2000, Maryland expects to acquire additional computers so all MSP and MdTAP inspectors have this electronic capability.

The Commercial Vehicle Infrastructure Program Focuses on States' Gradual Deployment of New Technology

The focus of the Commercial Vehicle Infrastructure Program is to meet the TEA-21 requirement of deploying Commercial Vehicle Information Systems and Networks (CVISN) in the majority of states by 2003. The overarching goal of the CVISN program is to improve the **safety and productivity** of commercial vehicles and drivers while reducing costs associated with operating and regulating commercial vehicles. CVISN provides a standard communications infrastructure that enables existing and new data collection and management systems to exchange information efficiently in order to **save time, lives, and money**. Essentially, the CVISN program brings the efficiencies and cost-savings that the private sector enjoys from **e-commerce** to the field of commercial vehicle regulation in three major areas:

- **Safety Information Exchange;**
- **Electronic Credentials Administration;** and
- **Electronic Screening.**

Safety Information Exchange systems support automated roadside inspections to increase targeted enforcement of high-risk commercial vehicle carriers and drivers. These

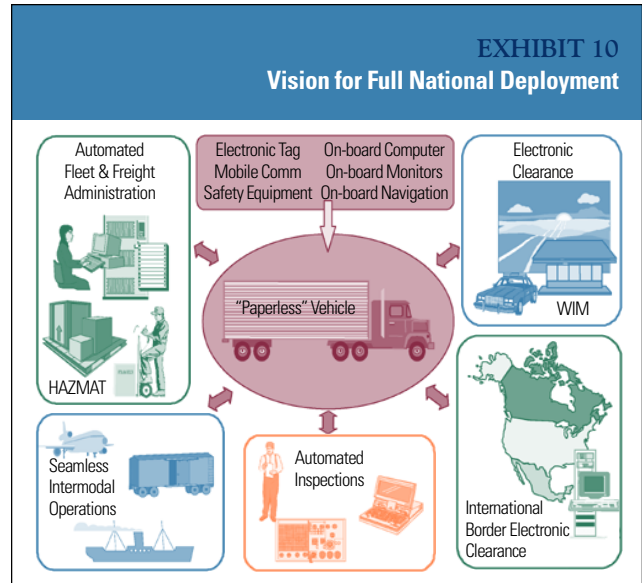
systems help USDOT meet its strategic goal of promoting highway safety. This may be one of the most important and significant benefits of CVISN.

Electronic Credentials Administration systems focus on Internet-based electronic credentialing and automated tax reporting and/or filing. These systems are often an integral part of many states' efforts to use the Internet and e-commerce to facilitate "one-stop shopping" for commercial vehicle operations. Not surprisingly, these systems increase the efficiency of a variety of administrative processes for both carriers and government agencies.

Electronic Screening Systems focus on technologies that facilitate automated vehicle screening and weighing (i.e., weigh-in-motion) at weigh stations and automated border crossings. These systems allow state inspection officials to focus on high-risk operators while enabling safe and legal carriers to move freight more efficiently.

Because the goal of CVISN is to establish a **consistent, nationwide infrastructure for data exchange**, execution of the CVISN Program differs somewhat from the ITS Integration Program. While requiring interoperability, the structure of the ITS Integration Program allows projects to more closely match the characteristics and needs of individual states and localities. In contrast, CVISN requires greater standardization of each state's planning and deployment efforts. The vision for a fully deployed national program is illustrated in Exhibit 10.

The USDOT recommends that states follow a standard implementation path and it has defined three steps to reach "Level 1" CVISN Implementation as illustrated in Exhibit 11. **Step 1** focuses on CVISN planning. **Step 2** focuses on CVISN system design. **Step 3** focuses on implementation and deployment of the three CVISN systems.



In total, 42 states are currently in various stages of CVISN deployment. As shown in Exhibit 12, states have made substantial progress through the CVISN program. The first two "prototype" states that began testing CVISN Level 1 systems and capabilities – Maryland and Virginia – have made the greatest progress toward Level 1 completion. Both are nearing Step 3 completion and are now in the final stages of testing.

The next eight states that began deployment of CVISN are referred to as "pilot" states: California, Colorado, Connecticut, Kentucky, Michigan, Minnesota, Oregon, and Washington. Of those, Kentucky is closest to complete deployment. The remaining pilot states are working toward full deployment as funding permits.

EXHIBIT 11 CVISN Implementation Path			
Step	1. Planning	2. Design	3. Deployment
Activities	Develop ITS/CVO Business Plan	Establish CVISN Project team, Project plan and Top-Level Design	Complete CVISN Level 1 deployment
Estimated Cost	\$50,000	\$350,000	\$2,600,000
Estimated Time	15 months	18 months	36 months

USDOT encourages all states that receive appropriations to use these funds for CVISN activities and **continue to move steadily toward full deployment**. USDOT is committed to providing all interested remaining states with the CVISN architecture and available standards, tools, training/workshops, and guidance necessary to achieve their CVISN deployment goals.

The ITS Deployment Program Contributes to Nationwide Advancement of ITS Deployment

In 1996, the USDOT set a goal of deploying an ITS infrastructure across the United States within 10 years. The 78 largest metropolitan areas were selected for monitoring. TEA-21 brought increased emphasis on statewide and rural ITS deployment efforts along with a goal of deploying CVISN in the majority of states by 2003. Significant progress is being made toward these goals. At the end of 1999, 48 metropolitan areas had met the goal of basic integrated ITS infrastructure and ten localities are providing rural ITS services. In 2000, five States will have completed deployment of CVISN Level 1 and 37 other states will be working toward that goal, with most of these states past the planning level.

As described above, the ITS Deployment Program provides incentives that leverage federal ITS funds and encourage the integration of federal, state, local, and private sector resources. ITS deployment projects move ITS beyond the major metropolitan areas to cities and states nationwide.

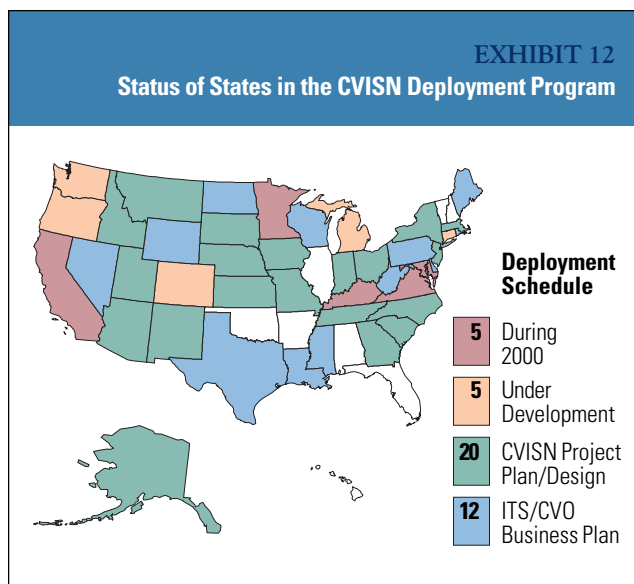


EXHIBIT 13

CVISN Electronic Screening Highlight: Washington State

Objective: Washington State DOT (WSDOT) is implementing and deploying an electronic screening system that will work hand-in-hand with its safety information exchange capabilities to increase efficiency, reduce infrastructure maintenance costs, and focus inspections on high-risk commercial vehicles with poor records. According to a cost/benefit analysis required by the State legislature, Washington IT Feasibility Study, CVISN will return \$1.28 in public sector benefits for every \$1 spent.

Key Features:

- Unique proof-of-concept—First “at-speed” site in the world to weigh commercial vehicles and electronically screen their credentials, safety records, and permits from the mainline highway.
- Self-imposed tax—Washington Trucking Association (WTA) proposed and lobbied for a \$2.8 million annual increase in the commercial vehicle trip permit and fuel tax to fund CVISN and weigh-in-motion deployment. WTA recognizes that the trucking industry will realize \$7 of savings for every \$1 spent on funding CVISN as reported by the American Trucking Association.
- Rapid deployment—Four additional sites will be deployed by 2001; Twenty-one (21) total sites will be installed throughout the State by 2003.

They provide quantification and evaluation of the benefits of ITS integration and produce “lessons learned” that can guide future ITS deployments. The ITS Deployment Program has played an important role in the past success of ITS. Given its incentive structure, broad geographic base, and emphasis on developing integration lessons, it should continue to support the future growth of ITS.

The execution of the ITS Deployment Program provides an example of a **disciplined, cooperative, and transparent** process designed to maximize and leverage federal, state, local, and private sector resources and adhere to the requirements of TEA-21.

For more information
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