WESTERN STATES TRANSPARENT BORDERS PROJECT: IMPLEMENTING TRANSPARENT BORDERS - RECOMMENDED ACTIONS

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16. ABSTRACT

The Western States Transparent Borders Project involved an assessment of the institutional barriers to implementing transparent border technologies for interstate commercial vehicle operations (CVO) in Idaho, Montana, Nevada, Oregon, Utah, Washington, and Wyoming. The results of the fact finding and associated analysis were documented in two sets of reports. Two reports were produced for each participating state, and reflected the individual structure, needs, and operations of that state. These reports are "Description of Current State Practices" and "Institutional Barriers and Recommended Actions." This report provides a summary of these two sets of reports, as well as conclusions drawn since the publishing of those reports.

The project team determined that the key barriers to transparent border system implementation are 1) a lack of a mandate from top management or the low priority for commercial vehicle operations within various state agencies,; 2) a lack of communication about the status of, need for, cost of, and benefits from intelligent vehicle highway system (IVHS) CVO initiatives between and within state agencies; 3) a lack of a compelling argument to expend scarce resources on IVHS CVO initiatives, and 4) a lack of standards for technologies and procedures needed for IVHS CVO.

To surmount these barriers requires that any selected course of action provide for: 1) affordable participation for both state agencies and private firms; 2) national leadership to initiate the program; 3) small and incremental program development steps to keep initial costs low, demonstrate early success, and build support for the system; 4) development of compelling arguments for implementation of the transparent borders program; 5) top management support for program implementation; and 6) dedicated funding for system development and implementation.

The project team recommends a phased implementation of an electronic credential verification system for all seven participating states. A description of the proposed system is included in this report.

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WESTERN STATES TRANSPARENT BORDERS PROJECT

FINAL REPORT

IMPLEMENTING TRANSPARENT BORDERS RECOMMENDED ACTIONS

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DISCLAIMER

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THE WESTERN STATES TRANSPARENT BORDERS PROJECT

The Western States Transparent Borders Project involved an assessment of the institutional barriers to implementing transparent border concepts for interstate commercial vehicle operations (CVO) in Idaho, Montana, Nevada, Oregon, Utah, Washington, and Wyoming.

THE TRANSPARENT BORDERS CONCEPT

The transparent borders concept, in its simplest sense, is the removal of the need for commercial vehicles to stop at state borders to demonstrate compliance with each state's regulatory requirements. Transparent borders can be achieved through administrative measures, systems, or methods and procedures that reduce institutional impediments to interstate commercial truck traffic and its regulation.

THE ANTICIPATED BENEFITS OF TRANSPARENT BORDERS

The major benefits anticipated from implementing transparent borders are increased efficiency for interstate commerce, reduced operating costs for motor carriers, more effective regulation by state agencies, improved enforcement, and enhanced safety.

INSTITUTIONAL BARRIERS TO IMPLEMENTING TRANSPARENT BORDERS

The project identified several significant, persistent strategic barriers to implementing transparent borders. Not all strategic barriers were found in each of the participating states. Once these strategic barriers have been addressed, a series of tactical barriers, also identified during the study, can readily be addressed during implementation.

The following are the key strategic barriers that obstruct transparent borders implementation:

- lack of a mandate from top management or the low priority for commercial vehicle operations within various state agencies,

- lack of communication about the status of, need for, cost of, and benefits from intelligent vehicle highway system (IVHS) CVO initiatives between and within state agencies,
- lack of a compelling argument to expend scarce resources on IVHS CVO initiatives, and
- lack of standards for technologies and procedures needed for IVHS CVO.

RECOMMENDED SOLUTION

The study recommends a phased implementation approach that builds a constituency of support based on the benefits participating states experience from transparent borders. This approach will help to establish a compelling argument for implementing transparent borders solutions. At the same time, specific direction and leadership from the federal government is needed to develop national standards, ensure state participation, and provide incentives for national organizations (e.g., International Registration Plan, International Fuel Tax Agreement, American Trucking Associations, National Private Truck Council) to work together for the good of all.

The following are the key factors that a transparent borders program requires to overcome the strategic barriers identified in the study:

- affordable participation in transparent borders systems;
- national leadership to initiate the program;
- small and incremental program development steps to keep initial costs low, demonstrate early success, and build support for the system;
- development of compelling arguments for implementation of the transparent borders program;
- top management support for program implementation; and
- dedicated funding for system development and implementation.

IMPLEMENTATION—A PHASED APPROACH TOWARD ELECTRONIC CREDENTIAL VERIFICATION

The recommended solution involves phased implementation of the technological and procedural systems that allow the electronic verification of credentials and, over time, the automated bypassing of weigh stations through vehicle preclearance. The phased approach is recommended as a strategy for addressing the strategic barriers identified by the study. The initial phases of such an approach will provide (for both state agencies and motor carriers) low risk improvements to existing systems at a low or moderate cost.

The initial phase for system development will require the following steps:

- creating a single, multi-state database for all annually updated, interstate, credential information;
- replacing annual on-board credentials with electronic tags; and
- creating automated verification systems in each state.

Subsequent phases will involve enhancing this database to provide preclearance capabilities for motor carriers and other functions desired by the trucking industry.

The preclearance mechanisms developed for use with the central database will differ from state to state, depending on the particular commercial vehicle enforcement emphasis of each state. Potential enhancements to the central database to provide automated preclearance of commercial vehicles at weigh stations include the following:

- tying the credentials verification system to in-motion weigh scale sorting systems, whether those systems be mainline or conventional designs,
- adding safety information or inspection records to the electronic database,
- adding temporary authority credentials to the verification database,
- providing additional enhancements that address state-specific needs, and
- incorporating advanced technology applications when they become available for safety, commercial driver's license (CDL), or electronic log book verification.

ESTABLISHING A TRANSPARENT BORDERS PROGRAM—THE NEXT STEP

For the seven states in this consortium, the project team recommends the following steps be initiated to address the strategic barriers identified above and to provide momentum toward the adoption of transparent border systems.

- Select the best organizational structure to lead this effort and define the roles and responsibilities of each of the participants of that group.
- Identify the anticipated funding sources and mechanisms.
- Complete the initial system design.
- Develop cost estimates for that system design.
- Obtain consensus from participating states to move forward.

I. INTRODUCTION

This final report presents the study results and recommendations from the Western States Transparent Borders Project. The project team believes that the study results provide clear direction on the next steps that must be taken if progress will be made toward transparent borders.

THE WESTERN STATES TRANSPARENT BORDERS PROJECT

The Western States Transparent Borders Project involved an assessment of the institutional barriers to implementing transparent borders for interstate commercial vehicle operations (CVO) in Idaho, Montana, Nevada, Oregon, Utah, Washington, and Wyoming. The project's recommendations are based upon extensive fact finding, analysis of the information collected, and the collaborative involvement of working groups in each of the participating states.

The fact finding and analysis included the following tasks:

- conducting structured interviews with the key individuals from all the agencies engaged in the regulation and enforcement of commercial vehicle operations in each of the states;
- conducting structured interviews with key individuals in each of the participating states who are responsible for the administrative and data management functions necessary to support the regulation of commercial vehicle operations;
- collecting information, and documenting and analyzing business procedures and data management practices associated with commercial vehicle operations;
- conducting structured interviews with trucking industry representatives in the participating states;

- reviewing literature on current intelligent vehicle highway system (IVHS) CVO implementation efforts and related interstate CVO systems; and
- collaborating with multi-agency, state working groups in the development and review of the project's recommendations.

MAJOR WORK PRODUCTS

The results of the fact finding and associated analysis were documented in detail in two sets of reports. A separate report was produced for each participating state and reflected the individual structure, needs, and operations of that state. These reports are described below.

- **Description of Current State Practices**—This report documented the regulatory requirements, organizational structures, and enforcement practices in each of the participating states. For each of the business areas, the report included a high level of business process analysis and an assessment of data management practices. This report provided the analytical basis for defining institutional barriers and identifying a recommended practical solution.
- **Institutional Barriers and Recommended Actions**—This report described and analyzed the importance of the strategic and tactical barriers that must be overcome before transparent border solutions can be implemented in each of the participating states. Having identified the barriers, the report described a recommended solution and implementation path that will provide what the project team believed is the best opportunity for the individual state to overcome institutional barriers and progress toward implementing transparent borders.

FINAL REPORT STRUCTURE

This report is organized into four main sections.

Section II. Transparent Borders. This section describes the transparent borders concept and the problems confronting commercial vehicle operators and regulators that transparent borders solutions seek to address. The section summarizes the anticipated benefits of transparent borders and the progress made to date in implementing them.

Section III. Institutional Barriers To Implementing Transparent Borders. This section presents the study findings concerning the institutional barriers to implementing transparent borders. The findings are drawn from the detailed analysis of conditions in the seven participating states. The findings distinguish between the strategic and tactical barriers to implementation.

Section IV. Recommended Solutions. This section defines an approach for implementing transparent borders that should be able to successfully overcome the strategic institutional barriers identified in the study. The section outlines critical success factors for the recommended solution and a conceptual overview of the solution.

Section V. Implementation Approach. This section describes the next steps for addressing institutional barriers and successfully implementing a transparent border solution. The section provides an outline of the work program's major steps and suggests an implementation mechanism for using the findings from this study as the basis for developing a program that can successfully implement transparent border solutions.

II. TRANSPARENT BORDERS

This section describes the transparent borders concept, the benefits anticipated from transparent borders, and progress to date in implementing transparent borders across the nation.

THE TRANSPARENT BORDERS CONCEPT

The transparent borders concept, in its simplest sense, is the removal of the need for commercial vehicles to stop at state borders to comply with each state's regulatory requirements. Transparent borders are any administrative measures, systems, or methods and procedures that increase the efficiency of interstate commercial truck traffic and its regulation. Currently, when motor carriers enter many states, they must stop at state borders and other check points to show compliance with each state's regulatory requirements and administrative procedures.

Furthermore, not only must trucks show compliance, but they must comply with regulations that vary widely among states. This variation increases the number and complexity of the transactions required for a carrier to be in compliance on an interstate journey. It is believed to provide significant barriers to the efficiency of the nation's transportation system, the productivity of motor carriers, and the competitiveness of the national economy.

Transparent border solutions are aimed at reducing the burden associated with regulatory compliance both within and among states. These solutions include the application of advanced technologies and various measures designed to generate more uniform regulations or multi-state approaches to ensuring regulatory compliance.

THE ANTICIPATED BENEFITS OF TRANSPARENT BORDERS

Transparent borders are expected to result in direct benefits to state government and the motor carrier industry. The general public welfare is also anticipated to benefit from the implementation of transparent borders.

The major benefits anticipated are described below.

- **Increased Efficiency For Interstate Commerce**

  A central element of the federal Intermodal Surface Transportation Efficiency Act (ISTEA) is increasing the efficiency and competitiveness of the nation's transportation infrastructure. Transparent borders will reduce the costs currently incurred in meeting the administrative requirements, driver time lost to credentials and safety checks, high driver turnover, and wear and tear on equipment.

- **Improved Enforcement**

  States use a variety of procedures (business processes) to verify that drivers and trucks have the required legal credentials and are in safe operating condition. The transparent borders concept involves improved procedures for identifying trucks that comply with the regulations and those that may not be in compliance. The benefit of increasing the effectiveness of identifying noncompliant motor carriers is that enforcement actions can be undertaken efficiently.

- **Improved Competitive Environment, Increased Safety**

  Motor carriers that are in compliance are often at a competitive disadvantage to those that operate illegally. Therefore, the industry will benefit from the improved enforcement. The greater is the effectiveness of enforcement, the greater will be the benefits to citizens. These benefits will arise from increased safety, collection of user fees and taxes, and creation of a fairer operating environment.

- **Simplified Paperwork And Reduced Administration**

  Ensuring compliance with regulatory requirements relating to safety certification, vehicle permitting, size and weight, operating authority, licensing, registration, user fees, fuel and other taxes, and driver licensing generates considerable administrative effort and overhead for the motor carrier industry and government. Simplified paperwork will likely increase the productivity of the motor carrier industry and government alike.

- **Reduced Congestion At Ports Of Entry**

  Ports of entry throughout the study area become congested when trucks arrive at a faster rate than they can be processed. This causes trucks to decelerate, idle, and at times (depending upon location) back up onto the highway, interfering with mainline traffic operations.

  These delays increase the cost and frustration of doing business for the motor carriers. In urbanized areas congestion also causes air pollution problems. From the government's perspective, fixed staffing levels and limited resources for facility improvements at congested weigh stations limit the stations' ability to implement safety and enforcement improvements, or even to maintain existing service and enforcement levels.

PROGRESS TO DATE IN IMPLEMENTING TRANSPARENT BORDERS

The benefits of transparent borders have been the subject of attention for many years. The inefficiencies arising from the lack of standardized procedures and uniformity in regulatory requirements have been a focus of the federal government, state governments, and the motor carrier industry since the early 1960s. However, the fact that only limited progress has been made over the last 30 years indicates the persistence and resilience of the institutional barriers confronting transparent borders.

Standardization Of Permitting And Tax Reporting

Efforts were made from the 1960s through the 1980s to standardize equipment, permitting, and tax reporting. Most had a limited effect because of many of the same institutional barriers identified in this study: the absence of agreement on the uniformity to be adopted and a lack of information about the problem presented to top decision makers.

The International Registration Plan (IRP) and the International Fuel Tax Agreement (IFTA) are examples of success in moving toward transparent borders. These programs enable motor carriers to carry out all paperwork and payment transactions through a single base-state instead of through each state individually. The Federal Highway Administration is committing over $8 million over the next several years to expand the IRP and IFTA programs, focusing its efforts on increased use of data communications and electronic funds transfer systems.

Recognition Of Potential For IVHS Applications

Recognition is now widespread that advances in information systems and emerging IVHS commercial vehicle programs offer opportunities for implementing transparent borders. Applications of advanced technology will allow agencies to work around the lack of uniformity and standardization of regulatory requirements by increasing the speed and reducing the cost of transactions and by providing opportunities to design new business processes associated with motor carrier regulation.

HELP Program

The Heavy Vehicle Electronic License Plate Program (HELP) is one of the longest running IVHS programs. It has spent almost ten years testing and demonstrating much of the technology that is proposed for inclusion within transparent borders alternatives, including weigh in motion (both conventional systems and mainline screening systems), automatic vehicle identification of trucks, and transfer of commercial

vehicle information between states. Efforts are underway to make the system developed during the HELP project fully operational.

Advantage I-75

The Advantage I-75 project was developed to surmount many of the problems initially encountered by the HELP program. Advantage I-75 developed an oversight committee that had a more widespread organizational basis, with particular emphasis on including all agencies that would be impacted by automating weigh station functions. Advantage I-75 is demonstrating many of the same types of technologies tested in the HELP program, but it has selected a very different system architecture that provides different operational characteristics than the architecture demonstrated in the HELP program.

III. INSTITUTIONAL BARRIERS TO IMPLEMENTING TRANSPARENT BORDERS

This section presents the project's findings concerning the institutional barriers to transparent borders. The section outlines the strategic barriers that constitute the major impediment to implementing transparent borders. Once these strategic barriers have been addressed, a series of tactical barriers, also identified, can readily be addressed during implementation.

STRATEGIC BARRIERS

These are barriers that impact the ability of individual states or groups of states to make long-term decisions that set strategic direction and establish a departmental or statewide mandate to address transparent borders problems. These strategic barriers are the critical barriers to implementing transparent borders. If strategic barriers are addressed, many of the tactical barriers to transparent borders may be more easily reduced. Put simply, top management support will provide the mandate and the impetus to resolve many of the institutional barriers.

Below are the key strategic barriers.

- **Lack Of a Mandate or Priority For Top Management**

  In many of the participating states there is little policy direction from top management for transparent borders. Consequently, no mandate exists to make the organizational and administrative changes necessary to address the tactical barriers to transparent borders. Where a mandate does exist, initiatives must compete with other priorities for resources.

- **Lack of Communication About IVHS CVO Initiatives**

  Top managers can not establish a mandate for transparent borders unless they understand the costs and benefits from these systems and understand how these systems impact their agency. Many of the decision makers

within the study states are not sufficiently informed about transparent borders issues. This is primarily true because of the large number of states, agencies within states, and divisions within agencies that must participate in transparent borders projects. Because of the large number of participants in these efforts, keeping all agencies (and agency decision makers) informed and working toward the same goals is extremely difficult. There is a clear need for better and broader communication of the issues that transparent borders address within state agencies, between state agencies, and between states.

- **Lack Of A Compelling Argument**

  No one has convinced state agencies and the motor carrier industry that transparent borders are not only beneficial, but also more important and cost effective than other projects competing for scarce resources. Middle and upper level managers are limited in their ability to justify transparent borders by the lack of any systematic analyses of their potential benefits. Little effort has been undertaken to assess the range of benefits and costs for different transparent border approaches. This information is essential for any compelling case to be made to top management.

- **Lack Of Standards For Technologies and Procedures**

  In states where top management does support transparent borders programs, implementation is stalled by the lack of standards for

  - vehicle transponders,
  - communications protocols between vehicles and the roadside,
  - communications protocols between state databases,
  - forms and procedures, and
  - information collection.

  States are correctly cautious about committing to a standard that may change or may not be the same as those adopted by neighboring or other states.

TACTICAL BARRIERS WITHIN STATES

The project identified a number of tactical barriers that also inhibit transparent borders implementation and that will need to be addressed once a mandate and priority have been established from top management for implementing transparent borders. These barriers are described below.

- **Distribution Of Regulatory Responsibilities Between Different State Agencies Within States**

  Often the assignment of responsibilities (tax collection, permit issuance, vehicle registration, weight enforcement, etc.), and hence the organizational structure, for regulating commercial vehicles is distributed across a number of agencies. Within agencies, responsibilities are often distributed among a number of branches. This distribution of business functions related to transparent borders causes disagreement over the importance of different functions and system requirements. Table 1 on the next page illustrates some of these differences between states.

- **Different Physical Locations For Undertaking Business Functions Related To Transparent Borders**

  States have different physical locations for performing the various functions that relate to commercial vehicle regulation. This situation increases the cost of system development and increases the difficulty in maintaining communications between different business functions. "One-stop shopping" approaches are a response to this situation.

- **Different Levels Of Advanced Technologies Adaptation Within Agencies**

  The plans for, and use of, IVHS applications for commercial vehicle operations vary greatly within states. Thus, while some states have pushed for more rapid and advanced IVHS CVO deployment, other states have hesitated to begin any deployment, as their existing systems are not prepared for these advances.

Table 1
Comparison of State Regulatory Structures
For Interstate Commercial Vehicle Operations

	ID	MT	NV	OR	UT	WA	WY
Number of State Agencies Involved	4	3	3	4	5	4	2
Interstate Vehicle Taxation Method and Lead Agency							
IRP	Yes ITC	Yes MDT	Yes NDMV	Yes OPUC	Yes UTC	Yes WDOL	Yes WTD
IFTA	Yes ITC	Yes MDT	Yes NDMV	No[1] OPUC	Yes UTC	Yes WDOL	Yes WTD
Weight Distance Tax	Yes ITD	No	No	Yes OPUC	No	No	No
Permit Issuance							
OS/OW[2]	ITD	MDT	NDOT & NDMV	OPUC & ODOT	UDOT	WSDOT	WTD
Authority[3]	ITD (R) & ITC (F)	MDT & MPSC	NDMV	OPUC	UTC	WDOL (F,R) & WUTC (O)	WTD

- **Different Levels Of Automation Supporting Key Business Functions**

  At the heart of the regulatory requirements affecting transparent borders are data management and communication. The characteristics of each

[1] Oregon recently joined IFTA, but does not collect fuel taxes.
[2] Includes all temporary permits for loads or vehicle configurations in excess of federal standards.
[3] Includes temporary fuel tax (F), vehicle registration (R), and operating authority (O)

state's data management infrastructure for regulating and managing commercial vehicle operations related to transparent borders are key variables that affect barriers to transparent borders. These characteristics include the level of automation at ports of entry and the extent of intra- and interagency data communication.

TACTICAL BARRIERS AMONG STATES

The project identified a wide variation in statutory requirements and administrative practices among the states. Again, the project found that these barriers can be addressed if top management demonstrates support for implementing transparent borders. In such an environment, any institutional changes (administrative and legislative) necessary for implementing transparent borders can be more successfully addressed.

Below are descriptions of the tactical barriers among the states that must be addressed as part of transparent border system implementation.

- **Different Starting Points For a Transparent Borders Program**

  The participating states have varied bases from which to implement transparent borders. They range from states that have taken a leadership role in demonstrating the feasibility of transparent borders to states in which no port of entry operations are performed. Some states (for example Oregon) have already created centralized database systems which combine the majority of information needed by enforcement and regulatory personnel, and have installed a significant amount of communications infrastructure. Other states, such as Washington, do not have a single source for these types of data, and do not have adequate communication infrastructure in place to meet transparent border system requirements.

- **Variation In Regulatory Requirements**

Wide variation among states in the regulatory requirements for commercial vehicles engaged in interstate commerce will persist as a major barrier. This lack of uniformity must be factored into implementation on a state by state basis.

The primary differences between states are in oversize/overweight vehicle regulation (that is, the weights and vehicle configurations that exceed federal guidelines that are permitted to travel in each state), how permits for these OS/OW loads are issued, and the tax and fee systems used by the states.

For example, divisible loads up to 105,500 pounds can be carried in all seven states so long as the appropriate permit (temporary or annual) has been obtained or registration fee paid. However, 105,500 pounds is the maximum divisible load allowed in Oregon, Idaho, and Washington, while Wyoming allows 117,000 pounds (registration only, no extended weight divisible load permits are issued), Nevada and Utah allow permits for up to 129,000 pounds, and Montana permits up to 130,000 pounds.)

Allowable vehicle configurations also differ between states. (For example, Oregon and Utah both allow triple trailers trucks, while the other participating states don't.)

The effects of differing weight and configuration laws makes the process of tracking permitted vehicle configurations and loads between states much more complex than it would be if all states maintained similar laws. It means that a single software system is not appropriate for all states, but must be customized to meet each states specific regulatory structure.

Another example is in the differences tax codes have on system design. Oregon and Idaho are the only states in the consortium that use a weight distance tax (although Nevada is considering it), but they use it differently.

Idaho uses weight distance taxes in addition to fuel taxes and registration fees. Oregon does not use fuel taxes. Thus, a data collection and reporting system built for Oregon will not meet Idaho's requirements.

- **Variation In Policies and Practices For Executing Transparent Border Related Functions**

States have differing policies and priorities that have created variations in how states issue their permits, collect their taxes and fees, and conduct enforcement. However, examples of commonalties among states do exist; these are based upon the requirements of multi-state programs such as IFTA, IRP, and Motor Carrier Safety Assistance Program (MCSAP) safety inspections.

Barriers to be surmounted include issues like the different mixes of fixed and mobile enforcement between the states. (The extremes are Nevada with essentially no fixed enforcement sites and Oregon with a heavy investment in infrastructure at fixed facilities.)

Barriers also take place in the different ways permits are issued, ranging from Washington's heavily distributed system (many permits are available at all County offices) to Nevada's (where most permits must be obtained through the central DOT offices.

As with vehicle weight laws and taxation systems, the fact that these systems are different does not make implementation of transparent borders impossible, it simply makes the design of the total transparent border data sharing system more complex and reduces the opportunity for cooperating states to find economies of scale by building one computer system that meets multiple state's needs.

- **Lack Of Accepted Standards For Advanced Technology Applications**

The application of advanced technology to further transparent borders is limited by a lack of agreed upon standards. These standards are necessary

to ensure that trucks can use the same transponder when passing through a number of states. Similarly, enabling states to access one another's databases in a meaningful way requires multi-state standards, including common communications protocols, data formats, data definitions, and other items.

Table 2 illustrates some of these differences between states.

Table 2
Example Differences In State Regulations and Transparent Border System Readiness

	ID	MT	NV	OR	UT	WA	WY
Existing Infra-structure	POEs (some database connec-tion to central)	POEs (no current database connec-tion to central)	No POEs	POEs (heavy database connec-tion to central)	POEs (strong database connec-tion to central)	POEs (no current database connec-tion to central)	POEs (no current database connec-tion to central)
Computer Operating Systems Used[4]	IBM, PC-LAN	IBM	IBM, Bull, Mini, PC	IBM, Mini	IBM, LAN	IBM, Unisys, Mac PC-LAN	IBM
Legal Divisible GVW	105,500	130,000	129,000	105,500	129,000	105,500	117,000
Legal Number of Trailers	doubles	doubles	triples	triples	triples	doubles	doubles

[4] IBM = IBM Mainframe, Bull = Bull Mainframe, PC = MS-DOS based personal computer, LAN = Local area network, Mini = mini computer, Mac = Macintosh, Unysis = Unisys mainframe

Funding

A final tactical barrier to transparent border system implementation that is both within and between states, is the states' inability to identify funding sources for the design and construction of the system enhancements necessary for transparent borders transactions. Given the current economic climate characterized by declining transportation revenues, increasing infrastructure needs, and increasing costs for highway construction and maintenance, states are finding it very difficult to justify new expenditures on regulatory systems. This is especially true when such system enhancements do not immediately and substantially decrease regulatory cost or increase state revenue. Because significant economic incentives to build the system enhancements are lacking, it is unlikely that the majority of states will set aside sufficient state resources to construct these systems. As a result, the majority of states in the consortium are seeking federal funds to help construct these systems.

While ISTEA provides the flexibility to use existing federal funds for these purposes, our discussions with the consortium states revealed that transparent border functions are not successfully competing for existing funds, except on a case by case basis within individual states. Widespread, successful implementation of the enhancements needed for transparent border operation will require a more reliable, more consistent funding source. To achieve this, the project team recommends that the federal government (probably through FHWA) set aside specific funding in future appropriations for the construction of transparent border systems.

Such a funding mechanism would be similar to the current MCSAP funding process, wherein specific federal allocations must be spent in a limited number of ways. In the case of transparent borders, such funds could be used to develop software enhancements that would allow states to share data; purchase equipment to interrogate electronic tags on trucks or allow enforcement officers in the field to access master database files; or install equipment at existing enforcement sites. Each state would have

some leeway in using those funds, and FHWA would have an oversight role to ensure that the funds were used appropriately to achieve the desired outcome.

This approach would provide dedicated funds for setting up transparent border systems, and it would also allow individual states to focus funds on the areas most in need of enhancement. This would help build support for the program, and it would give states incentives to work together to gain the most benefit from these funds.

IV. RECOMMENDED SOLUTIONS

This section recommends an approach to implementing transparent borders that is designed to overcome the strategic barriers. The recommended solution is a phased approach that will build a constituency of support based on the benefits participating states experience from early transparent borders implementation efforts. This experience will help to establish a compelling argument for implementing, over the long term, full transparent borders solutions.

The remainder of this section describes the factors that will be critical to the success of the proposed solution and then presents a conceptual overview of the solution.

CRITICAL SUCCESS FACTORS

The following are the critical factors that must be addressed to develop a successful transparent borders program that will overcome the strategic barriers identified by this project.

- **Make Participation Low Cost and Minimal Risk**

  The transparent borders concept is not currently a high priority in the participating states. Thus, development of the program must include recognition that other priorities are competing for state agencies' resources. Such recognition means that, in the initial phases, state participation must be low cost and low risk to decrease resistance to proposed projects.

- **Take Small Program Development Steps That Build Support**

  Given the low state-level priority for transparent borders, a solution structured to provide a phased approach to implementation is necessary. This approach will demonstrate that benefits can be realized and build momentum for the larger, more complete program.

- **Provide External Leadership To Initiate The Program**

  In most of the participating states the active constituency advocating implementation of transparent border systems is small or nonexistent. External leadership is required to make the case that the interests of all the participating states will be advanced by working together to implement transparent borders.

- **Have The Program Make The Compelling Argument**

  Documentation is needed to compellingly demonstrate that implementing transparent borders will produce sizable benefits. The development of such documentation will require a benefit-cost assessment that indicates the advantages of transparent borders solutions over traditional approaches to relieving weigh station congestion and improving agency and trucking company efficiency. This documentation must also show that implementing transparent border improvements is more cost effective than doing nothing.

- **Gain Top Management Support Through The Program**

  Involving top management in the implementation will ensure greater understanding of the problems that are being addressed and help produce the commitment to create the necessary multi-state solution.

- **Provide Dedicated Funding At The National Level**

  The federal government, probably through FHWA, should set aside specific funding in future appropriations for the construction of transparent border systems. A dedicated funding source similar to the MCSAP program dedicated towards transparent border implementation and operation would help alleviate many of the barriers listed above.

THE RECOMMENDED SOLUTION—A PHASED APPROACH TOWARD ELECTRONIC CREDENTIAL VERIFICATION

The recommended solution involves designing a phased approach for implementing technological and procedural systems that will allow the electronic verification of credentials and the automated bypassing of weigh stations through vehicle preclearance. The phased approach is recommended as a strategy for addressing the strategic barriers identified by the study.

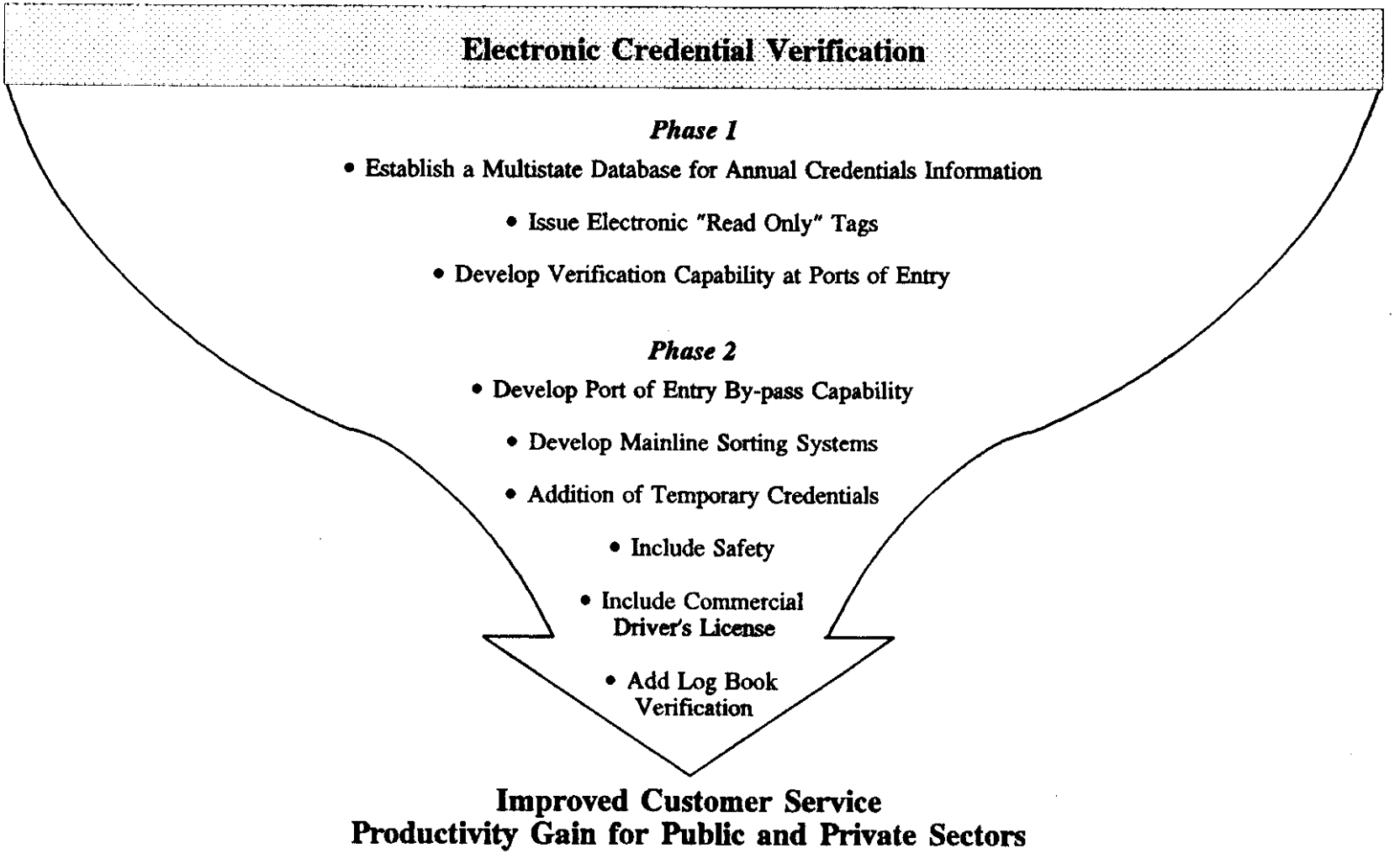
The initial phases of such an approach will provide low risk improvements to existing systems (for state agencies and private motor carriers) and will move participating states toward transparent borders at a relatively moderate cost. These recommendations are based on the premise that successful early implementation and demonstrable benefits will provide the impetus necessary to overcome the strategic barriers and lay the groundwork necessary to move toward transparent borders.

The phased nature of the implementation path is depicted in Figure 1. The conceptual design of this implementation path identifies a first phase which can be readily implemented if funding needs are met. Subsequent work will then be performed, provided that additional funding becomes available and participating states feel that the benefits to be gained outweigh the expected costs.

Phase I—Electronic Credentials Verification System Implementation

Phase I is designed to provide modest benefits at a low risk and moderate to low cost to state agencies and motor carriers. The result of the system is that motor carriers will have a reduced administrative burden, and states will have a more effective process for verifying the annual credentials of passing vehicles.

Figure 1. Phased Implementation of Transparent Borders



Phase I requires the following steps.

1. **Create a Single, Multi-state Database For All Annually Updated, Interstate Credential Information**

   The annual credentials information (data items) for each of the participating states would be stored in the database. This database would be designed to provide the participating states with annual credentials information. The database would enable each state to access information relating to the IRP, IFTA, interstate operating authority, insurance, and any other annual credentials participating states wished to include.

   Among the issues to be addressed by the detailed system design would be defining the data elements within the system, methods for transferring and reporting data, and procedures for updating and maintaining data. The major departures required from current practices in the participating states would be the requirements for adding vehicle identification information to IFTA and interstate operating authority carrier records and adding identification numbers for each tractor, truck, and trailer registered in the IRP.

2. **Replace Annual On-Board Credentials With Electronic Tags**

   The database described above would store all the information required to verify the annual interstate credentials for a specific vehicle. Therefore, verifying that a truck had the required annual credentials would involve matching the truck to the database. The recommended solution is to use a simple, "read only" electronic vehicle tag that would provide a unique vehicle identification number. We recommend that the tag be built directly into a license plate that would replace the existing apportioned plates. The issuing state would also provide a single piece of paper verifying that the vehicle carried valid interstate credentials.

The replacement of existing paper credentials would not be mandatory to achieve transparent border benefits. However, replacement of paper credentials would provide administrative savings to the participating trucking fleets and thus provide an incentive to participate in the electronic tags program.

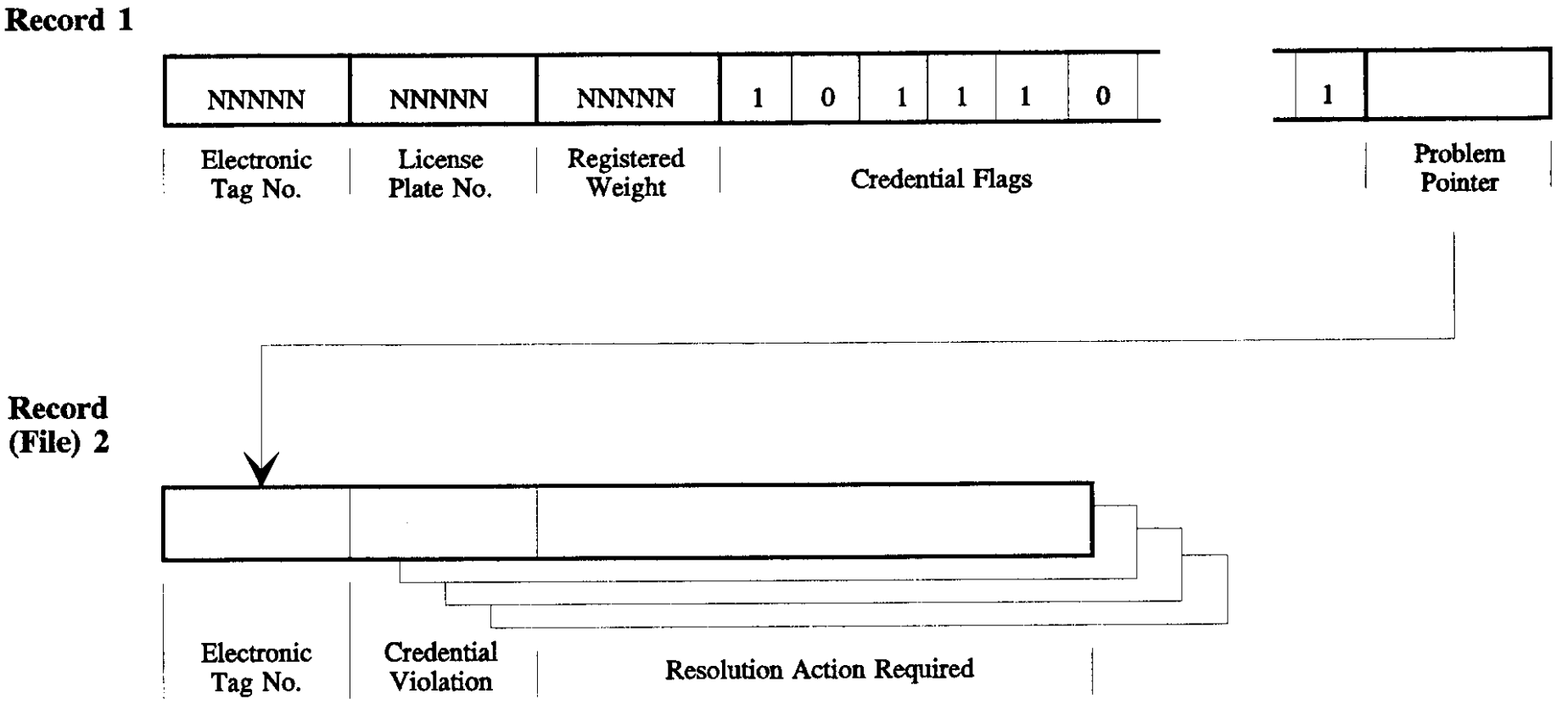
Participation in the program would be voluntary, and motor carriers would be able to register in the conventional fashion. The incentive to participate would arise from the benefits of not carrying numerous paper copies of annual credentials and from use of sorting or prescreening electronic vehicle identification systems. The anticipated cost of the tags is between $10 and $30.

3. Create Automated Verification Systems

The recommended approach to verification involves matching the unique vehicle identification number on the electronic tag to a verification database that would indicate the vehicle's status with respect to annual credentials. The simplest version of this verification database would be a file with one record for each tagged vehicle. Each record would contain the electronic tag number, the license plate number, a flag for each credential (1 = credential is valid for this state, 0 = the credential is not valid), registered weight, and a problem pointer. If a problem existed, the pointer would access a second record that described the action an enforcement officer should take when the vehicle was stopped.

Figure 2 illustrates the simple design proposed. A benefit of the simple design is that both manual and automated reference capabilities would be possible. The credentials verification system could be installed on a laptop computer for use in existing weigh stations and for roadside use.

Figure 2. Electronic Credentials Verification Data Recall



For automated weigh stations, the reader could be even hung from the window of the weigh station to perform credentials checks.

Phase II—Electronic Credentials Verification System Implementation

Phase II involves a series of steps that may take the participating states closer toward transparent borders. These steps will differ for the participating states and as each state enhances the initial credentials verification systems.

Phase II involves the following steps.

1. **Tie the Credentials Verification System To Conventional Weigh-in-motion Sorting Scales**

   This step involves using the sorter scale facilities (WIM systems, bypass lanes, and signing) already in place, under development, or planned in the participating states. Other options include improvements within existing fixed weigh stations, such as adding an AVI reader connected to WIM scales to establish a sorter scale bypass capability.

2. **Create Mainline Sorting Systems Tied To the Credentials Verification System**

   This step requires installing WIM scales connected to the electronics credentials verification database in mainlines upstream of existing, fixed weigh stations. The electronic tag would be read and the credential status verified. Mainline sorting would require overhead signs or in-vehicle messaging to tell drivers whether they could bypass the port of entry.

3. **Add Temporary Credentials To the Verification Database**

   This step provides a mechanism for incorporating additional credentials, such as temporary permit credentials, to the electronic credentials verification database. Adding temporary permits would involve improving the speed with which the database was updated and would require additional data management and system design requirements. It is

unlikely that oversize/overweight permits that required special routing could or should be added to such a system.

4. **Perform Additional Tailoring To Address State Specific Needs**

The participating states are expected to provide additional capabilities to the initial system to meet their specific priorities. For example, the recommended design would allow states to include data maintained on intrastate carriers.

5. **Incorporate Advanced Technology Applications When They Become Available For Safety, CDL, and/or Electronic Log Book Verification**

These are the final range of enhancements that could be considered for addition to the recommended solution. However, in the safety area, they would require additional on-board devices and investment by the motor carrier industry in a number of technology applications still under development. Electronic log book verification is a technological possibility but likely to be prohibitively expensive in the near term. Verification of driver status would include examining commercial driver's license, hours in service, and condition.

V. IMPLEMENTATION APPROACH

This section outlines the process, major work steps, and suggested responsibilities for implementing the recommended transparent borders program. The implementation approach distinguishes between three major work elements. Included in the first step are the tasks that are necessary for program initiation. These are designed to fully scope the program and secure the initial participation of all or a subset of the current transparent border study states. The second step comprises the work tasks that fully define the requirements of the system to be constructed and that allow preparation of an implementation plan that includes detailed specifications and costs. The third step consists of the tasks necessary for establishing an operational electronic credentials verification system in the participating states. The major implementation tasks are illustrated in Figure 3.

ESTABLISHING A TRANSPARENT BORDERS PROGRAM - THE FIRST STEP

To implement the recommended transparent borders approach, a series of work tasks must be undertaken to address the strategic barriers identified by this project. The tasks are designed to closely define the program and each state agency's responsibilities, as well as to secure commitment from key state-level and federal decision makers.

Define Roles, Responsibilities, and Organizational Structure

The transparent borders approach involves establishing a multi-state consortium committed to the overall implementation path. To maintain communications among the participating states (and the other states in the nation), the next transparent borders effort needs an effective organizational structure and clearly defined agency roles. The selected organizational structure can be viewed as the pilot of a national effort, and the system developed should be designed to enable either nationwide extension or compatibility with other regional initiatives.

Figure 3. Establishing a Transparent Borders Program (continued)

Performing System Design Tasks

I. Prepare System Design Specifications

- Select Contractor
- Establish Working Groups
- Define Requirements
- Evaluate Hardware/Software/Communications
- Prepare Design Document
- Prepare Detailed Specifications

II. Select Electronic Tags, Reader Device, Design Processors

- Establish Working Group
- Define Tag and Vendor Devices
- Purchase Tags
- Establish Distribution Procedures

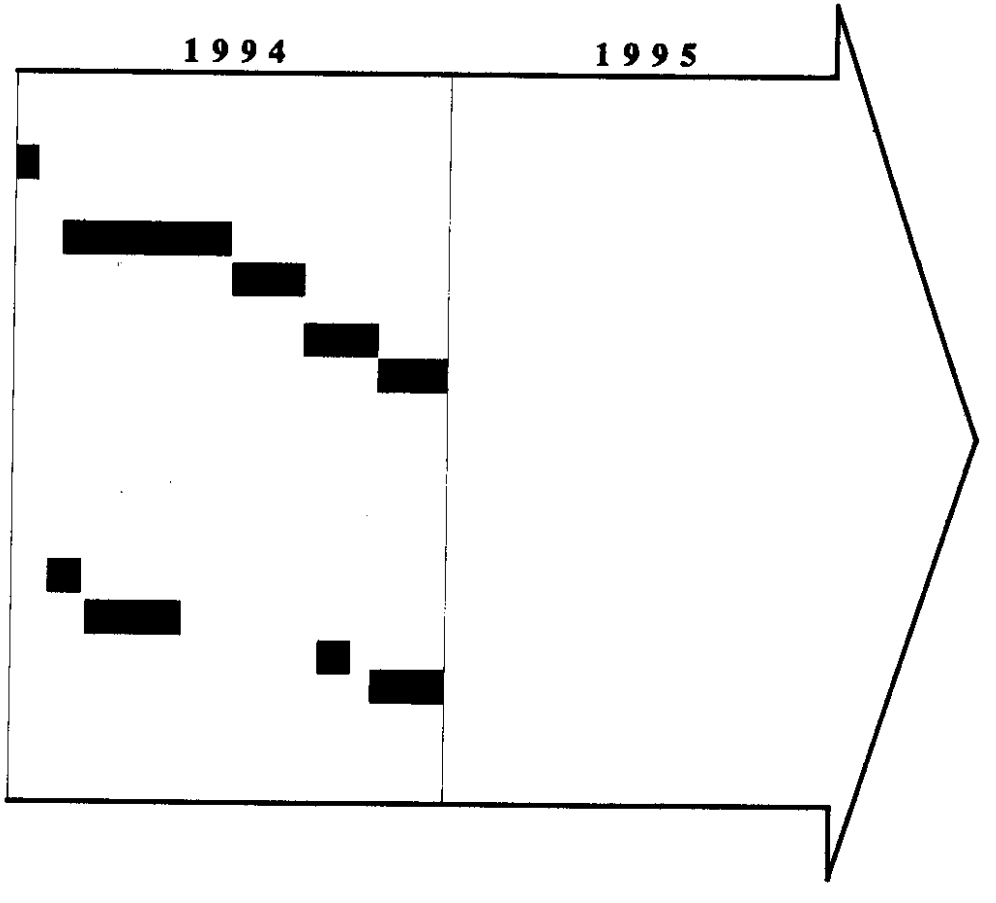


Figure 3. Establishing a Transparent Borders Program

The Next Step

I. Define Agreed Roles, Responsibilities, and Organizational Structure

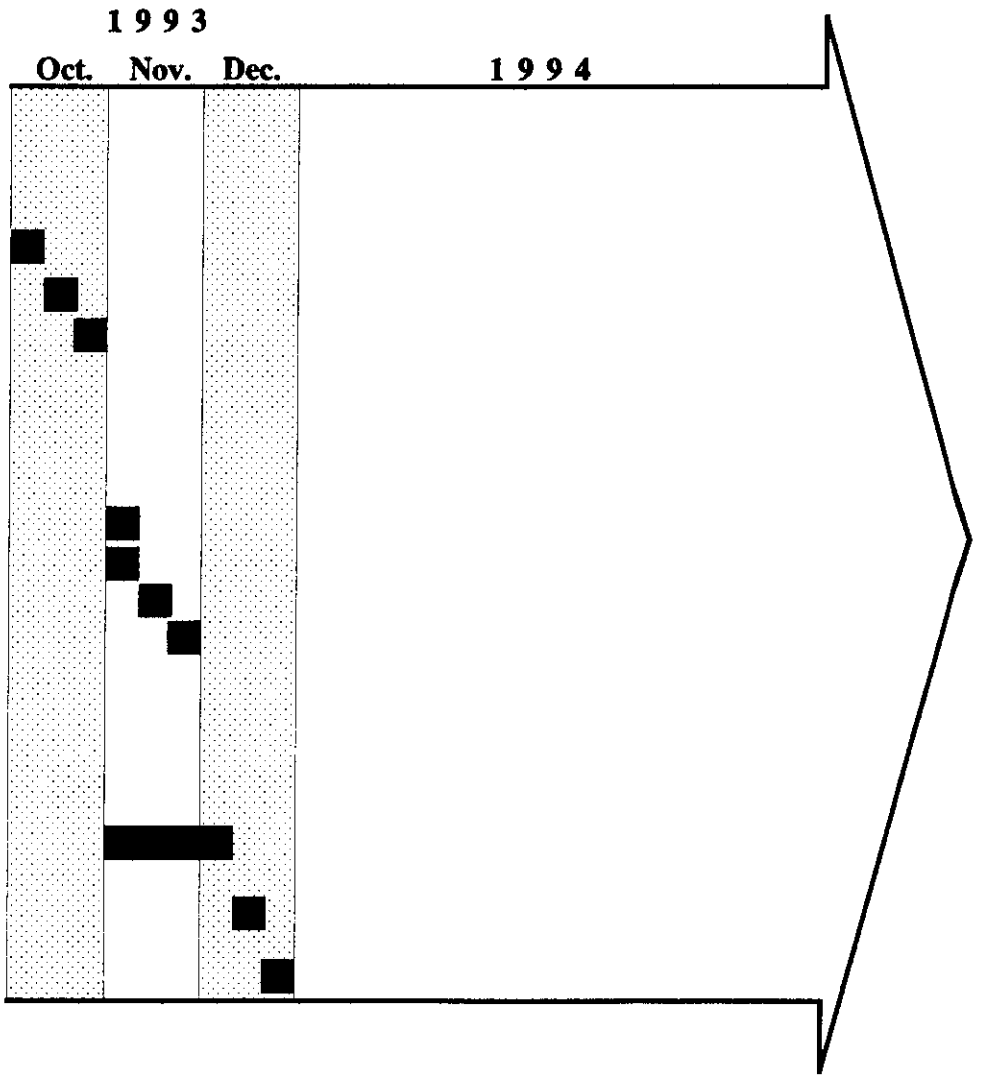
- Work with FHWA to Identify Recommended Structure
- Present Recommended Structure
- Refine Structure as Necessary

II. Prepare Detailed Systm Design Work Plan

- Define State Level Tasks and Effort
- Identify Procurement Needs
- Determine Costs of System Design
- Specify State Agency and Federal Funding Level

III. Secure Federal, State and Motor Carrier Participation

- Establish FHWA Leadership Commitment
- Secure Top State Management Support
- Secure Motor Carrier Participation



The participating states believe that FHWA participation and funding will be essential for overcoming the strategic barriers identified earlier in this report. To develop an agreed upon organizational structure will involve the following steps:

- working with the FHWA to identify a recommended organizational structure,
- identifying anticipated funding mechanisms and sources,
- presenting a recommended organizational structure to the state working groups, and
- refining the recommended organizational structure as necessary.

The most appropriate organizational structures are either an enhancement of the HELP structure (particularly to reduce the overall size of the bureaucracy, while at the same time increasing the participation of non-DOT agencies), a continuation of this consortium, or the use of an existing national organization (IRP and IFTA).

Prepare a Detailed Work Plan For Undertaking System Design Tasks

To make progress, the participating states need to understand the cost of their participation and the expected results of future work. A detailed work plan should be developed that defines the anticipated level of state agency, FHWA, and contractor assistance required to develop detailed system design documentation. The work plan will specify timelines and identify the responsibilities of each state, FHWA, and each private contractor.

This task is a prerequisite for program development and securing state agency participation. It will define the effort (staffing and potential acquisition) involved. A good deal of the information needed to prepare this work plan can be drawn from this project's work products. The remaining information must come from careful analysis of each state's existing computer hardware and software and its plans for existing and future enforcement actions.

Preparing the work plan will involve the following work steps:

- defining state agency tasks and effort,
- identifying anticipated procurement needs (including hardware and software enhancements),
- determining the costs of preparing system design specifications, and
- specifying the state agency and federal funding needed.

Secure Federal, State, and Motor Carrier Participation

The preceding tasks will provide the detailed scope that is necessary to secure preliminary participation in the program. This information will be used as a basis for working with the state agencies and FHWA to secure top management support for participation and funding.

Securing participation in the program will involve the following work steps:

- establishing FHWA leadership commitment,
- securing support from top management in state agencies, and
- securing motor carrier participation.

PERFORMING SYSTEM DESIGN TASKS

Once funding, organizational structure, and state participation have been established, implementation will involve undertaking the major work tasks necessary to define the specifications for the multi-state repository and the individual states' verification system. These tasks will involve detailed specification of requirements and implementation of the work tasks defined in the preceding steps.

Prepare System Design Specifications

This work task involves undertaking the steps for information systems development necessary to prepare system specifications for the central repository of interstate credentials information and the verification system to be established in each state.

Contractor assistance will be required to devise the system development tasks. The contractor will need to provide project management and information systems

planning support. Project management will involve establishing multi-agency working groups in each of the participating states to define requirements for the credential verification system and a multi-state working group to define requirements for the central repository.

The following are the major work tasks in this effort:

- develop an RFP for contractor support,
- select a contractor,
- establish state agency and multi-state working groups,
- define functional and system requirements,
- evaluate existing hardware, software, and communications capabilities and identify needs, and
- prepare a design document, detailed specifications, and an associated implementation plan.

Select Electronic Tags, Reader Devices, and Design Processes For Deployment

This task involves the work necessary for selecting and purchasing electronic tags and readers. It will require establishing a working group that includes the participating states, motor carrier industry representatives, and the FHWA. Tag selection will build upon work already undertaken in the participating states and coordinate with work underway elsewhere.

The contractor selected to manage and undertake the system development tasks will also staff this working group. With contractor assistance, the individual states will establish business processes for promoting and distributing the tags and installing the readers.

Selecting the tags and reader devices will involve the following work steps:

- defining the electronic tag and reader device requirements,
- selecting the appropriate tags and readers,
- establishing funding for purchase of the tags and readers,
- purchasing tags, and
- establishing procedures for distributing tags.

DEPLOYING THE ELECTRONIC CREDENTIALS VERIFICATION SYSTEM

In the final stage of implementing the first phase of the recommended transparent borders solution, a contractor should be selected to establish and perhaps also maintain the central database. This final step will also involve individual states developing and testing their verification systems. During this stage tags will be distributed and reader devices installed. The detailed work tasks for this final step will be those developed as part of the initial step.

The major work tasks will include the following:

- developing, testing, and refining the central repository,
- developing, testing, and refining credentials verification systems in each state, and
- distributing tags, and installing and testing reader devices in each state.