



## **Advantage I-75 Mainline Automated Clearance System**

Final Report

Part 5 of 5: Jurisdictional Issues Individual Evaluation Report

Prepared for

The Advantage I-75 Evaluation Task Force

Submitted to

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*An Iowa State University Center*

*Jurisdictional Issues*

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## INTRODUCTION

This report is part five of the Advantage I-75 Mainline Automated Clearance Systems (MACS) Project. The purpose of this report is to document the jurisdictional issues encountered in the implementation of electronic screening technologies for commercial vehicle operations in the participant states and provinces. The report also documents whether or not states will continue using MACS or an enhanced version of electronic screening, and motor carriers' reactions to using the MACS version of electronic screening.

This report is organized as follows:

- { Purpose of the Evaluation: This section of the report provides an introduction and background to the evaluation. This section also explains the purpose, goals, hypotheses, and objectives of the evaluation.
- { Evaluation Objectives: This section describes evaluation objectives pertaining to the systematic examination of the policies, procedures, and areas of jurisdiction of each of the states and provinces, and all parties within the Advantage I-75 MACS partnership involved in commercial vehicle operations.
- { Identification of State Agencies: This section describes each of the states in terms of institutional roles in governing commercial vehicle operations.
- { Identification of the Decision Making Processes: This section describes a state decision making process in terms of adapting electronic screening.
- { Advantages and Disadvantages of Electronic Screening: This section describes the advantages and disadvantages of electronic screening as uncovered in this study.
- { Identification of Motor Carrier Decision Making Process: This section documents the responses from the participating motor carriers pertaining to their experiences with electronic screening.
- { Identification of Advantages and Disadvantages Considered by Motor Carriers: This section describes the advantages and disadvantages of electronic screening as reported by participating motor carriers.
- { Document State, Regional and National Issues: This section describes the issues encountered by each state and the partnership in terms of "lessons learned" and implementing the field operational test.

- { Approaches Attempted to Solve Issues: This section describes the approaches used to alleviate problems, issues, and conflicts encountered by Advantage I-75 MACS.
- { Survey Results: This section describes the results of the survey of the state agencies involved in the Advantage I-75 MACS project.
  
- { Conclusions: This section includes a discussion of the benefits of electronic screening.

## PURPOSE OF EVALUATION

The purpose of the jurisdictional issues evaluation was threefold. The first and primary purpose was to determine the partner states' intent to continue to offer the Advantage I-75 MACS, or an enhanced form of electronic screening. A second purpose was to determine if motor carriers' intended to continue participation in Advantage I-75 MACS, or an enhanced form of electronic screening. The third purpose was to document jurisdictional issues and impediments to implementing Advantage I-75 MACS and actions planned by those jurisdictions to overcome those issues.

An important objective of the Advantage I-75 Field Operational Test was to provide an actual operating environment for the partners to experience and to collect data and information necessary to make decisions regarding the continuation of Advantage I-75 MACS services and electronic screening. Therefore, the evaluation provided information for states and motor carriers to make decisions that may change their business practices.

As the foundation of the evaluation, the Advantage I-75 MACS test goals, as stated in the May 10, 1996, Individual Evaluation Test Plan, are as follows:

- Assess whether or not states or provinces will continue to offer Advantage I-75 MACS services, or an enhanced version of electronic screening after the operational test is completed.
- Assess whether or not motor carriers will continue to participate in Advantage I-75 MACS services after the operational test is completed.
- Record all significant institutional issues addressed during the operational test and document the resolution to the issues.

The test hypotheses that resulted from these goals were:

- The Advantage I-75 MACS Operational Test will provide jurisdictions with sufficient information to support a decision whether or not to offer Advantage I-75 MACS or an enhanced form of electronic clearance or verification in their jurisdictions.
- The Advantage I-75 MACS Operational Test will provide motor carriers with sufficient information to support a decision whether or not to adopt Advantage I-75 MACS or an enhanced form of electronic clearance or verification.
- The jurisdictional agencies involved in Advantage I-75 MACS will establish new or enhanced relationships and or methods for resolving jurisdictional issues as a result of the operational test.

The jurisdictional issues portion of the Advantage I-75 MACS evaluation examined several items including interstate, intrastate, and regional issues with regard to the implementation of electronic clearance systems. As part of the evaluation, agency staff members and motor carriers were interviewed and surveyed to obtain their views and opinions of the processes leading to electronic screening. The examination then set out to determine whether or not the states and province in the project planned to continue with electronic screening, or an enhanced form of MACS.

## EVALUATION RESULTS

The jurisdictions participating in the Advantage I-75 MACS project are Michigan, Ohio, Kentucky, Tennessee, Georgia, Florida, and the Province of Ontario. Since an important objective of this evaluation was a systematic examination of the policies, procedures, and areas of jurisdiction of each of the states and provinces, all parties within the Advantage I-75 MACS partnership involved in commercial vehicle operations were included in the evaluation.

The objectives of the jurisdictional issues evaluation, as stated in the May 10, 1996, Individual Evaluation Test Plan are as follows:

1. The Advantage I-75 Operational Test will identify the key jurisdictional agency positions that are, by charter and mission, empowered to support/make a decision on whether or not to adopt MACS or an enhanced form of electronic clearance/verification.
2. The Advantage I-75 Operational Test will identify the decision making process in place in each jurisdiction to address adopting MACS or an enhanced form of electronic clearance/verification.
3. The Advantage I-75 Operational Test will identify key advantages and disadvantages considered by jurisdictions when deciding whether or not to adopt MACS or an enhanced form of electronic clearance/verification.
4. The Advantage I-75 Operational Test will identify the key motor carriers decision making process in place to address adopting MACS or an enhanced form of electronic clearance/verification.
5. The Advantage I-75 Operational Test will identify key advantages and disadvantages considered by motor carriers when making the decision to adopt MACS or an enhanced form of electronic clearance/verification.
6. Document state, regional and national issues as they arise.
7. Document attempts to solve issues, or lessons learned, as a result of the implementing the project.

The evaluation set out to determine what types of legal and institutional processes are used to decide whether or not to adopt electronic screening and/or to continue MACS on Interstate 75. Specifically, the study examined organizational issues, regulatory and legal issues, human resource issues, financial issues, and other issues on which states wanted to elaborate.

The issues raised within a given state in this study demonstrated similarities to previous studies of institutional issues and to the interstate issues that were cited in those previous studies. For example, as in the earlier studies, Advantage I-75 MACS found that upper management support was central to the project's success. In the case of Advantage I-75 MACS, agency staff members from two states specifically cited the support that they had from upper management. In fact, at the beginning of the project, the governors of each participant state signed a letter expressing their support of the project.

The support from the governors provided a firm foundation for the accomplishments of the operational test.

Methods of motor carrier safety administration and regulation generally vary from state to state. Within the Advantage I-75 MACS partnership, one state utilizes a single agency to administer all motor carrier functions while another state has five agencies handling the routine administrative and safety regulatory functions that every interstate motor carrier must fulfill. Obviously the issues associated with interstate cooperation also vary based on the number and types of agencies involved with the regulatory functions. For example, the issues in Kentucky, a state with just one agency-the Kentucky Transportation Cabinet-administering the motor carrier regulatory functions, are different from the issues faced in Michigan, a state with five agencies involved in motor carrier regulatory and administrative functions.

To further illustrate the similarities and differences among the Advantage I-75 MACS participants a survey of the partnership was attempted. The survey, which was adapted from the Volpe National Transportation Systems Center Study of 1994<sup>1</sup>, was designed to develop a deeper understanding of the states' processes leading to the implementation of electronic screening and to explain the conflicts and alliances that occur in developing a large project such as this. The results of that survey are discussed later in this section.

To avoid redundancy, however, this study does not directly investigate the issues between agencies in each state as other FHWA-sponsored institutional issues studies have done, but instead focuses on the decision making processes and the advantages and disadvantages of electronic screening in each of the participating states and province. This section lists the states and the province in the Advantage I-75 MACS project and their organizational structures pertaining to motor carrier administrative and regulatory functions and electronic screening.

### ***Results of Evaluation Objective 1: Identify Key Jurisdictional Agency Positions***

For this evaluation objective, we have identified the key agencies in each state and province within the partnership. These agencies have various responsibilities pertaining to commercial vehicle operations and electronic screening. Table 1 refers to the agencies with primary responsibility for mainline electronic screening. These responsibilities are described here.

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<sup>1</sup> *IVHS Institutional Issues and Case Studies, Advantage I-75 Case Study*, DOT-VNTSC-FHWA-94-10, FHWA-SA-94-056, Final Report April 1994.

## *Kentucky*

The Commonwealth of Kentucky is the lead state in the Advantage I-75 MACS project. Kentucky, through the Kentucky Transportation Cabinet and the University of Kentucky Transportation Center, has been very active in promoting the project and working to ensure its success.

The Kentucky Transportation Cabinet (KTC) is the primary agency responsible for administering the commercial vehicle program, including the construction and maintenance of the weigh stations. The KTC's other responsibilities include a) Administration of Kentucky's Intrastate Tax System, b) Issuance of Oversize and Overweight Permits, c) Administration of the Single State Registration System (SSRS), d) Administration of the Kentucky Weight-Distance Tax, and e) Administration of the International Fuel Tax Agreement (IFTA) and International Registration Plan (IRP). The Kentucky Transportation Cabinet is also responsible for constructing and maintaining the extensive road system that consists of some 14,403 miles, including 762 miles of interstate highways. Overall, Kentucky has some 73,158 miles of roads and highways. The state highway system also includes 15 permanent weigh stations in Kentucky.

Regarding mainline electronic screening of commercial vehicles presently, there are four weigh stations in Kentucky that are equipped with electronic screening as part of the Advantage I-75 MACS project. These stations are the southbound station in Kenton County, the northbound station in Scott County, and both stations in Laurel County. These stations are also equipped with mainline weigh-in-motion scales for enhanced weight enforcement capabilities.

Of the sites that are currently utilizing mainline electronic screening, the stations in Kenton and Scott Counties, are equipped with ramp weigh-in-motion (WIM) sorters, along with bypass lanes. These stations are subject to heavy volumes of traffic, yet never close due to full queues. The two stations in Laurel County close frequently due to full queues. These stations are currently being relocated to a nearby site. Once construction of the new facilities is completed, these stations will have include ramp bypass lanes and mainline electronic screening.

Besides the use of fixed scale facilities, Kentucky uses portable scale teams on alternate routes in its truck enforcement program.

## *Florida*

Florida has been part of the Advantage I-75 MACS project since the inception of the project in 1990. Presently there are three weigh station sites in the project: the White Springs stations in Hamilton County, the Wildwood stations in Marion County, and the Punta Gorda stations in Charlotte County. At each site there are northbound and southbound facilities. The Wildwood and Punta Gorda stations are both equipped with high-speed weigh-in-motion (WIM) ramp sorters. The White Springs stations have only recently been re-constructed to include high-speed ramp WIM sorters. All of these stations are equipped with mainline electronic screening capabilities. Florida has also equipped its weigh stations on I-95 with high-speed ramp WIM sorters and currently has plans to follow the same scenario at the three existing weigh stations on I-10.

Florida DOT is also responsible for constructing and maintaining the extensive road system that consists of some 11,921 miles, including 1,472 miles of interstate highway highways. Overall, Florida has some 60,009 miles of roads and highways. The state highway system also includes 23 permanent weigh stations in Florida.

Regarding mainline electronic screening of commercial vehicles, a site that is currently using mainline electronic screening is near Port Charlotte, five miles south of US Highway 17 on Interstate 75. Both the northbound and southbound weigh stations are equipped with two static scales and a bypass lane. The scales are situated on either side of the scale house office. The posted speed of the bypass lane is 45 mph. The volume of commercial vehicle traffic is moderate, with approximately 205 vehicles per hour traveling through the station.

Within the state of Florida there are two principal agencies responsible for administering the commercial motor vehicle (CMV) program. These two agencies are the Florida Department of Transportation (FDOT) and the Florida Department of Highway Safety and Motor Vehicles (DHS&MV). The Department of Transportation is primarily responsible for; a) Enforcement of CMV size and weight laws, b) Issuance of oversize and overweight permits, and c) Enforcement of CMV registration laws.

The DHS&MV is primarily responsible for; a) Enforcement of traffic laws, b) Issuance of drivers' licenses, c) Accident investigations, d) Enforcement of DUI and related laws, and e) Other traffic enforcement related matters. Besides the use of fixed scale facilities, Florida uses portable scale teams on alternate routes in its truck enforcement program.

## *Georgia*

Another partner in the Advantage I-75 MACS project since 1990 is the State of Georgia. Presently there are six weigh stations in the Advantage I-75 MACS program, that are equipped with mainline electronic screening. They are: the northbound and southbound stations near Ringgold in Catoosa County, the northbound and southbound stations near Forsyth in Monroe County, and the northbound and southbound stations near Valdosta in Lowndes County. In addition to the AVI equipment, these stations are equipped with ramp weigh-in-motion sorters.

Through the use of the ramp weigh-in-motion sorters and bypass lane, these stations are able to accommodate the truck traffic most of the time. There are, however, periods of time in which the scales are forced to close for short intervals, due to the queue build up.

Within the State of Georgia, there are three principal agencies with responsibilities for commercial vehicle operations. They are the Department of Transportation, the Department of Public Safety, and the Public Service Commission.

Part of the responsibilities of Georgia's Department of Transportation include: a) Vehicle size and weight enforcement, b) Issuance of oversize and overweight permits, c) Intelligent transportation systems, d) Portable scale teams, and e) Various traffic operations planning and administration. The Georgia Department of Transportation, moreover, has other responsibilities than regulatory enforcement. These responsibilities include the construction and maintenance of the highway system. Georgia's road network consists of 111,746 miles, of which 17,809 miles are state maintained. Included in the state highway system are 1,241 miles of interstate highways representing just over one percent of the total highway mileage. GDOT also maintains 19 permanent weigh stations throughout the state.

The State Patrol Division of the Georgia Department of Public Safety also has responsibilities for regulating commercial vehicle operations. Some of these responsibilities are: a) Commercial driver's license issuance, b) Accident investigations, c) Enforcement of DUI and drug cases, d) Occupant restraint enforcement, and e) Enforcement of various traffic laws.

The Georgia Public Service Commission also has responsibilities with regard to commercial vehicle operations. Under a cooperative agreement with the Department of Transportation, the PSC regulates motor carrier safety and hazardous materials transportation. Some of PSC's responsibilities include: a) Vehicle safety inspections, b) Driver safety inspections, c) Hazardous materials safety inspections, d) Certification and registration of motor carriers, e) Ensure carriers maintain proper levels of insurance, and f) Maintain database of all inspections.

## *Tennessee*

Another partner in the Advantage I-75 MACS project is the State of Tennessee. Currently, mainline electronic screening of commercial vehicles is utilized at its Knox County weigh stations, just west of the city of Knoxville. These weigh stations are a single static scale design, with heavy traffic. The northbound scale sits atop a small hill, and trucks labor to reach the top and enter the scale. The Knox County site is an ideal location for electronic screening because of its dated design and high traffic volume; approximately 430 trucks per hour pass by the weigh station. Obviously because of the physical limitations of these facilities, they cannot accommodate all the commercial vehicle traffic. Moreover, because of safety concerns, trucks are allowed to pass the weigh stations if the queue leading to these scales is full. If the trucks were not allowed to bypass the weigh station, the queue would reach the mainline highway. Therefore, approximately 66 percent of the trucks approaching this facility continue past the weigh station, and are not physically checked by officials. Consequently, the Advantage I-75 project provides officials with a method of electronically screening commercial vehicles that otherwise would not be screened.

Within the State of Tennessee, there are two principal agencies with responsibilities for governing commercial vehicle operations. These two agencies are the Departments of Transportation and Safety. The Tennessee Department of Safety, having evolved from its original state police force, is responsible for enforcement of the various laws governing transportation safety. Its responsibilities include: a) Driver's license issuance, b) Vehicle title and registration, c) Accident investigation, d) School bus inspections, e) Enforcement of commercial vehicle laws and regulations, f) Enforcement of DUI and drug cases, and g) Auto theft investigations. Other areas of responsibilities include staffing the fixed weigh stations and portable scale teams.

The Department of Transportation is responsible for constructing and maintaining the extensive road systems, including the 16 permanent weigh stations in Tennessee. Tennessee's road system stretches 85,037 miles. 13,552 miles are on the state maintained highway network, representing 16 percent of the total highway miles within the state. These highways also carry 75 percent of the total traffic. Included in the state highway system are 1,062 miles of interstate highways. Although the interstate system consists of just over one percent of the total highway mileage, it carries one quarter of all traffic in Tennessee.

## *Ohio*

The State of Ohio is another participant in the Advantage I-75 MACS project. Presently there are two weigh stations in the project: The northbound station in Wood County, near the city of Bowling Green and the southbound station in Hancock County near the city of Findlay, Ohio. These stations are single static scale type with no bypass lane. These stations are subject to frequent queue buildup that cause the stations to close periodically.

Currently electronic screening is utilized at the weigh stations near Findlay and Bowling Green that are equipped with a single static scale. These stations are subject to moderate to heavy traffic volumes, processing approximately 212 trucks per hour. Over 1,500 transponder-equipped truck pass each site monthly, with about 85 - 95 percent of them being given "green light" electronic clearances. The primary reason for not receiving a "green light" clearance is possible weight overload detected by the mainline weigh-in-motion (WIM) system.

Within Ohio, there are three principal agencies responsible for administering the commercial motor vehicle program. These agencies are the Ohio Department of Transportation, the Ohio Department of Public Safety, and the Public Utilities Commission of Ohio. The Department of Transportation (ODOT) is primarily responsible for construction and maintenance of the highways, including the weigh stations, and enforcement of the size and weight laws for commercial vehicles. The Department of Public Safety (ODPS), which includes the Ohio State Patrol and Bureau of Motor Vehicles, is primarily responsible for the enforcement of traffic laws, accident investigations, enforcement of DUI laws, issuance of commercial drivers' licenses, and other traffic related enforcement matters. The Public Utilities Commission of Ohio (PUCO) is responsible for regulated the safety related aspects of the truck and bus industry. The PUCO registers and reviews motor carriers to ensure compliance with state and federal regulations. The PUCO is the "lead agency" for the federal Motor Carrier Safety Assistance Program (MCSAP), and driver-vehicle inspection are performed by both the PUCO and State Patrol. The State Patrol also staffs the truck weigh stations while the PUCO uses portable scales on alternate routes.

The Ohio DOT is responsible for developing and maintaining the state's extensive highway network, which consists of 18,315 miles, of which 1,573 miles are interstate highway. The state maintained roads carry approximately 65 percent of the total traffic in the state. Overall the state has some 114,642 miles of roadway. ODOT also maintains 19 permanent weigh stations.

## ***Michigan***

The State of Michigan is another partner in the Advantage I-75 MACS project. Currently, mainline electronic screening is utilized at the set of weigh stations located approximately five miles north of the Ohio state line near the city of Monroe, Michigan. These stations are a single static scale design, equipped with ramp weigh-in-motion sorters and a bypass lane. These weigh stations process approximately 500 trucks per hour. While the queues at the stations are full at peak hours, the stations do not close. Trucks are, however, required to enter the weigh stations when they are open. Therefore, trucks do periodically queue-up on the shoulders of the mainline highway at peak traffic intervals.

Within the State of Michigan there are five principal agencies responsible for regulating commercial vehicle operations. These five agencies are the Department of Transportation, the Department of State Police, the Public Service Commission, the Department of State, and the Department of Treasury. These agencies have separate and distinct areas of governance over commercial vehicle operations.

Regarding commercial vehicle regulatory enforcement, the Michigan Department of Transportation is responsible for issuing oversize and overweight permits.

The Michigan Department of State Police (MSP) by statute and a cooperative agreement with the Michigan Department of Transportation, is responsible for commercial vehicle size, weight, and safety enforcement. The MSP is also responsible for the physical operations and maintenance of the 22 permanent weigh stations. Other responsibilities include various traffic enforcement duties, including the use of portable scale teams on alternate routes.

The Michigan Public Service Commission (PSC) regulates commercial vehicle operations through its administration of the single-state-registration-system (SSRS) and certification of for-hire carriers.

The Department of State is responsible for commercial vehicle registration including administration of the International Registration Plan (IRP). The DOS also issues the commercial driver's license (CDL).

The Department of Treasury is responsible for fuel tax collection, reporting, and the administration of the International Fuel Tax Agreement (IFTA).

The Michigan Department of Transportation is responsible for construction and maintenance of the state's extensive road network. Michigan's road system consists of 119,113 miles, of which 9,583 miles are state maintained highways. Included in the state highway system are 1,240 miles of interstate highways representing just over one percent of the total highway mileage.

## ***Ontario, Canada***

The Province of Ontario is also a partner in the Advantage I-75 MACS project. Presently there are seven weigh stations in the project: The eastbound station in the town of Whitby; the eastbound and westbound stations at Halton near the town of Milton; the eastbound and westbound stations Middlesex, near the City of London; and the eastbound and westbound stations at Essex near the City of Windsor. Of this group, only the westbound scale at Essex is not equipped with a ramp WIM sorter. The remaining stations are equipped with ramp WIM. All of the stations are subject to heavy traffic requiring the scales to close periodically.

Currently, mainline electronic screening commercial vehicles is utilized at the seven sites, mentioned previously. These stations are subject to heavy traffic volumes. The Essex stations process approximately 153 trucks per hour, the Halton stations process approximately 232 trucks per hour, and the Middlesex stations process approximately 600 trucks per hour.

The Ministry of Transportation of Ontario (MTO) is the principal agency for administering the commercial vehicle program. In addition to being the primary agency for construction and maintenance of the highways, the MTO is responsible for the enforcement of the commercial vehicle size and weight laws, commercial vehicle operator registration and licensing, issuance of oversize and overweight permits, and other traffic related enforcement matters.

The MTO is responsible for developing and maintaining the province's extensive highway network, which consists of 16,400 kilometers (10,185 miles) of provincial highways. The MTO also maintains a total of 44 permanent weigh stations and uses portable scales on alternate routes.

**Table 1: Key Agencies for Electronic Screening by Jurisdiction**

<b>Jurisdiction</b>	<b>Key Agency</b>
Kentucky	Kentucky Transportation Cabinet State Office Building Frankfort, KY 40622
Florida	Florida Department of Transportation 605 Suwanne St. Tallahassee, FL 32399
Georgia	Georgia Department of Transportation 935 E. Confederate Ave Atlanta, GA 30316
Tennessee	Department of Safety 1150 Foster Ave Nashville, TN 37219
Ohio	Ohio Department of Transportation 1980 W. Broad St. Columbus, OH 43215
Michigan	Michigan State Police 4000 Collins Rd. Lansing, MI 48890
Ontario	Ministry of Transportation Ontario 1201 Wilson Ave Downsview ON M3M 1J8

## ***Results of Evaluation Objective 2: Identify the Decision Making Process***

In each state there is a decision making process that begins with building a base of knowledge and information, as described in Figure 5.1. The problems or issues that are identified and examined by staff members, through direct observation or by information given by members of the public. When issues arise, the staff investigates the specific problem areas, collect facts and evidence then reports their findings to the agency supervisor. While the specifics may differ somewhat from each individual state, the decision-making process generally includes the following steps:

**Step 1: Identify Problem.** Upon receiving the information from the staff the agency then sets forth to formally identify the problem.

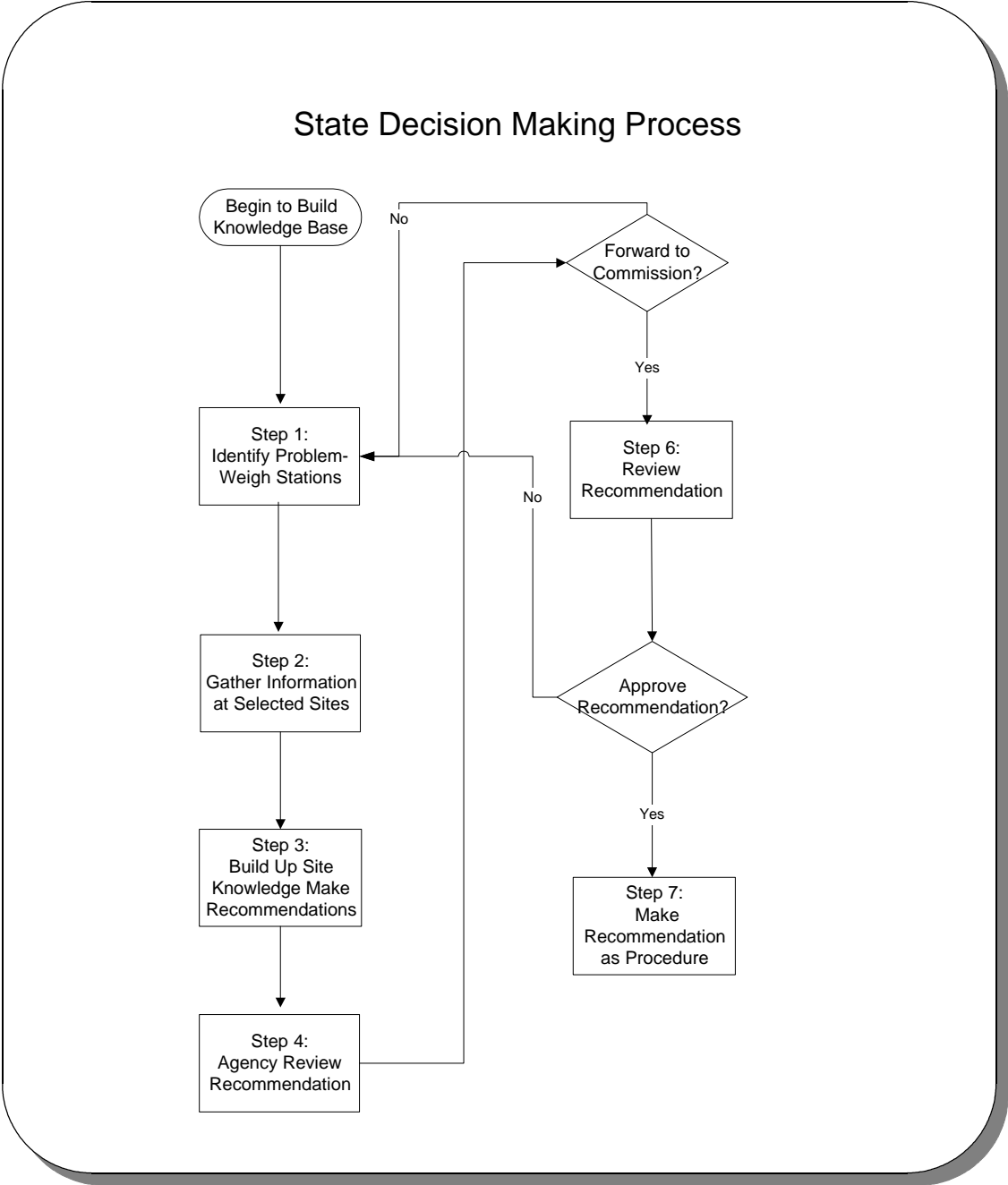
**Step 2: Gather Information.** After identifying the problem of congested weigh stations, the next step is to gather information at selected sites. The agency has to determine the extent of the problem, who is involved and what can be done about it.

**Step 3: Build up Site Knowledge and Make Recommendations.** After determining the extent and nature of the problem, the staff will address resolutions to the problems and make recommendations to the agency head.

**Step 4: Agency Review of Recommendation.** The agency head will then determine if there is merit to the proposal, based on agency mission and budget considerations, and then decide if the recommendations will be forwarded to the Commission. If there are shortcomings in the proposal, it goes back to Step 1 for further refinement of the problem. Otherwise the proposal goes forward to the Transportation Commission.

**Step 5: Commission Review of Recommendation.** The Commission reviews the agency recommendation. If there are any requests for more information it goes back to the agency. Otherwise it is approved.

**Step 6: Adopt Recommendation.** If the recommendation is approved by the commission, it is adopted as procedure by the agency.



**Figure 5.1: State Decision Making Process**

### ***Results of Evaluation Objective 3: Identify the Advantages and Disadvantages of Electronic Screening to States and Provinces***

The third objective of the of the evaluation was to identify key advantages and disadvantages considered by the jurisdictions to address adopting electronic screening or an enhanced form of electronic screening or verification.

Many jurisdictions today are experiencing overcrowding at their weigh station facilities. One method available to alleviate the overcrowding is to employ electronic screening of commercial vehicles. Among the advantages identified by the Advantage I-75 MACS project of utilizing mainline electronic screening are:

1. Reduce queues at weigh stations. Using electronic screening at weigh stations permits compliant vehicles to bypass the weigh stations, decreasing the need to require all trucks to enter the weigh station. Thus, with fewer trucks entering the weigh station, queues decrease.
2. Ability to screen more vehicles. Using electronic screening at weigh stations allows states to check more vehicles than before. In addition to checking the vehicles that enter the weigh station, enforcement officials are screening vehicles on the mainline as well.
3. The capacity of the weigh station is not compromised. Using electronic screening at weigh stations means that the capacity of the weigh station will not be exceeded. As more trucks are equipped with transponders and screened on the mainline, the weigh station can continue to operate without having to expand significantly and still accommodate the non-transponder equipped trucks.
4. Target enforcement resources more efficiently. Using electronic screening at weigh stations allows enforcement personnel to concentrate their activities on possibly non-compliant vehicles that have not been checked. As the transponder-equipped trucks are screened on the mainline, non-transponder equipped trucks can then be checked by weigh station personnel.
5. Using electronic screening reduces the cost of motor carrier compliance. Using electronic screening at weigh stations reduces the cost of compliance by targeting enforcement resources and using them more efficiently.
6. Protect weigh station infrastructure. Using electronic screening at weigh stations protects the facility's infrastructure because there are fewer vehicles driving over the access ramps and scale platforms.

Among the disadvantages of electronic screening at weigh stations are:

1. Transponder market penetration. While not specifically a disadvantage, the issue of significant transponder penetration in the marketplace is a challenge to productive electronic screening. Therefore, for the jurisdictions to realize significant benefits of electronic screening, there must be thorough market penetration of transponders. The more trucks screened and cleared on the mainline, the more benefits are realized by the participants. Depending on the type of system the states employ, they must develop innovative methods to distribute transponders to the motor carriers wanting to use them.
2. Ensuring the system is interoperable with other electronic screening systems. Electronic screening systems cannot be deployed in a vacuum. There are presently three electronic screening systems in the United States. Each truck with a transponder should be screened by each system. Federal initiatives require interoperability with other systems to ensure "transparent borders" between states.
3. Cost of system upgrades. Because of the multitude of new and evolving technologies and new applications of high technology, there is a potential for required system upgrades that must be planned and accounted for.
4. Specialized maintenance personnel, parts, and equipment. Traditionally, personnel in state departments of transportation and other agencies have specialized in road construction and law enforcement. Rarely have these departments developed personnel that have sufficient technical expertise to effectively procure and maintain all ITS equipment and functions. Such a need for specialized knowledge may be beyond some public agencies, and some may not want to become expert in or add expert staff to handle the development of systems, due to budget or staffing restraints.
5. Data privacy and information exchange. An issue for several partners in the Advantage I-75 MACS project was data privacy and information exchange. Both public and private sectors are concerned with the potential numerous uses of data. Motor carriers do not want the data generated by electronic screening to be used to "target" them for enforcement activities. The carriers choosing to use electronic screening are concerned that they may lose the competitive advantage gained from that technology, if they are treated differently by the enforcement agencies. Motor carriers using the electronic screening technology want a "level playing field" when it comes to enforcement and do not want to be treated differently from other carriers that are not using the technology. Likewise, the public sector has similar concerns for screening carriers, and ensuring that the data generated by electronic screening are secure. The public sector does not want any information generated by electronic screening to be used, or misused, for purposes other than what it is intended for, i.e., to screen compliant commercial vehicles.
6. Acceptance by enforcement personnel. Many enforcement personnel in commercial vehicle safety, believe it is imperative that each commercial vehicle must pass through the weigh station for weight and visual checks. Others believe, however, that queues building up on the highway and slow moving vehicles entering the highway from weigh stations pose safety hazards that are potentially more significant than the potential hazards posed by allowing electronically screened vehicles to bypass the weigh stations. Whatever position one advances, however, electronic

screening must not compromise the safety mission of the enforcement agencies. The operational test demonstrates that electronic screening can accomplish its goals and not compromise safety.

#### ***Results of Evaluation Objective 4: Identify Motor Carrier Decision Making Process***

As part of the evaluation, the participating motor carriers were surveyed about Advantage I-75 MACS project and what decisions they could make pertaining to electronic screening. 120 surveys were mailed, and 31 were returned for a response rate of twenty-six percent. The survey revealed several interesting results.

Result 1: The responding motor carriers indicated that they were either satisfied or somewhat satisfied with the system. Most of the carriers' satisfaction lay in the fact that the Advantage I-75 MACS saved them time because drivers did not have to wait in long lines to enter the weigh stations. The carriers that were most satisfied with the system were the ones that enrolled the earliest. Twenty one carriers of the thirty one that responded to the survey, enrolled in the program within the first year of the test. These twenty one carriers also indicated that they were the most satisfied with Advantage I-75 MACS.

The motor carriers were also asked to list their reasons for their satisfaction or dissatisfaction with Advantage I-75 MACS. As stated previously, the carriers were generally satisfied with the performance of Advantage I-75 MACS. The reasons indicated for their satisfaction were related to transit time savings, and those drivers were pleased with the system

Result 2: Next, the motor carriers were asked to elaborate on the process they used to reach their decision to enroll in the program. Twenty-five respondents indicated that it was a business decision to reduce travel time and increase customer service. Nine respondents also indicated that they wanted to reduce the business costs of operating their trucks. Thus, their decisions were based on anticipated reductions in fuel and maintenance costs.

Finally, motor carriers were also asked if they would pay an additional fee for electronic screening services. The responses from this question were wide-ranging. Ten carriers stated that a nominal fee would be in order. Eleven carriers responded that since they currently pay enough in taxes, any additional fees would be out of line. This question was designed to seek out what support, if any, there is for a fee structure to make the system self-supporting. From the responses received, however, there does not appear to be a firm consensus among the Advantage I-75 MACS project respondents on the issue of paying an additional cost for electronic screening. One respondent indicated that if the fees were dedicated to system operation and maintenance, the imposition of fees would be acceptable to his company. If the fees were to go into the states' general funds, however, then any additional fees would be unacceptable.

***Results of Evaluation Objective 5: Identify Advantages and Disadvantages Considered by Motor Carriers***

As part of the evaluation motor carriers were asked to consider any advantages and disadvantages they determined as a result of using electronic screening. The advantages they stated were the following:

1. Participating motor carriers indicated that they joined Advantage I-75 MACS to cut travel time and reduce business costs (fuel, equipment maintenance, etc.).
2. Other reasons listed by the motor carriers indicated their reasons for enrolling in the program were related to safety, either public safety or driver safety. They felt that, by keeping the drivers on the mainline and reducing travel time, they would reduce driver fatigue as well.
3. Carriers indicated that drivers viewed automated clearance as reducing the "hassle factor" that sometimes occurs at weigh stations; the fact that drivers can continue past the stations without further scrutiny was a pleasant element of the system.

The disadvantages motor carriers cited pertaining to using electronic screening:

1. Motor carriers would like the system to be expanded and utilized beyond weigh stations, such as at agricultural inspection stations, Canadian customs stations, and toll booths.
2. Motor carriers indicated that the auditory signal of the transponder needs to be louder because the signal was hard to hear at times.
3. The current system of approving carriers for electronic screening is lengthy and needs to be shortened.

### ***Results of Evaluation Objective 6: Document State, Regional, and National Issues***

The evaluation objectives included identification of legal and institutional issues encountered during the project, or likely to be faced if states want to continue offering electronic screening. These issues could also be termed "lessons learned" resulting from implementing a large demonstration project. Overall, the project demonstrated that electronic screening, even in its early stage, is technically viable and increasingly acceptable as a method of commercial vehicle monitoring and enforcement. Participants in the Advantage I-75 MACS project are confident in the concept of electronic screening and perceive the program as a success. The participants also believe that there have been positive benefits produced as a result of this project, including the realization of the potential public and private sector benefits of Advanced Vehicle Identification (AVI) technology and electronic screening of commercial vehicles.

During the operational test several issues arose and lessons were learned and documented. These lessons could provide valuable assistance for future ITS projects. These major lessons include the following:

- { From the beginning, the project partners knew that upper management buy-in of the project was crucial to its success. Obtaining the support of the governors by signing an agreement to support the project and provide matching funds helped facilitate the project and overcome many institutional uncertainties.
- { The evaluation must be built into the project from the beginning. Evaluation is expensive and complex, but productive. All participants must be brought in on the original evaluation plan and program decisions. Input is required from all participants.
- { There must be a clear, concise plan of action that is followed. Achieving the necessary results from a given proposed plan of action is not always possible. The political system is complex and unpredictable; therefore gaining the support necessary to sponsor and champion a course of action is difficult. However, a lead agency can obtain the desired results of agreement, support, and follow-through with a clear and concise plan action.

## ***Results of Evaluation Objective 7: Attempts to Solve Issues***

As with any large project covering numerous jurisdictions, problems and conflicts arose and had to be alleviated. During the implementation of the project, several approaches were attempted to solve these problems and conflicts. Some of the major issues are listed here.

1. Partnerships require communication, commitment and trust. With the large number of parties involved in this project, clear communication was essential to ensure success. Essentially, the jurisdictions have worked together to move the project along and keep each participant living up to its commitments. With few exceptions, the public and private sectors have worked together to implement electronic screening at weigh stations. Future ITS projects will want to develop routine communication time tables to achieve program success.
2. Large research projects require cooperation and compromise from all parties. The interstate nature of electronic screening and commercial vehicle operations requires aggressive cooperation between states due to the need for interoperability and coordination of functions, operation, and maintenance among the partner states. For example, electronic screening is intended to increase highway efficiency by allowing safe, legal, and weight-compliant commercial vehicles to pass the weigh stations. Increased productivity results for both motor carriers and enforcement agencies as compliant vehicles save time and money by being allowed to pass and enforcement efforts are focused on possible non-compliant vehicles. Such electronic screening functions required that data regarding the vehicles' credentials be either stored and read from the vehicle or stored and read from a shared database.

For the process to succeed, the partners had to agree to the status and accessibility of the commercial vehicle information. For example, it had to be decided whether to update the data daily, monthly, quarterly, etc. The status and accuracy of the data on vehicle credentials could vary widely from jurisdiction to jurisdiction. Such differences in the status and accuracy of the data could reduce the benefits of electronic screening. If the accuracy of information available on the electronic screening system lags behind actual vehicle credentialing, newly credentialed vehicles could be required to stop for compliance checks even though they are in compliance, thus eliminating the benefits of electronic screening for these commercial vehicles and affected enforcement agencies.

Subsequently, the implementation of Advantage I-75 MACS required the partners to cooperate and coordinate in the development of standards and protocols for the design, operation, and maintenance of the system. Without such cooperation, the goals of increased highway efficiency and safety would not be met as electronic screening would not be able to transcend state borders.

3. There must be early, verifiable benefits to be effective. Because of the high deployment costs involved in electronic screening, the risks are great. Therefore, to be effective and

keep the partners involved the project, the benefits of electronic screening had to be demonstrated and verified early in the project. Also, the power of the partnership demonstrated the benefits of electronic screening through the economy of scale, and eliminating redundant costs of each state conducting its own procurement of equipment.

4. Business Practices Must Change. The technology in use can readily be made compatible with other systems. In many states, the commercial vehicle regulatory responsibilities are distributed among several agencies. There are also legal impediments in states that do not recognize today's technologies. Regulations that refer to “written communication” and “paper” credentials hinder the expansion of technology. The extent of interagency cooperation also varies from state to state. As the states and their agencies strive to meet their objectives, they will proceed toward greater interagency coordination and cooperation in ITS/CVO activities and deployment.

## *Survey Results*

As part of the evaluation the staffs of the state agencies participating in the project were sent a survey. The original sample of this study consisted of six states, one Canadian province, and 12 agencies with jurisdiction over commercial vehicle operations. The jurisdictions participating are Michigan, Ohio, Kentucky, Tennessee, Georgia, Florida, and Ontario, Canada. Since an important objective of the evaluation was a systematic assessment of the states' decision making processes and whether or not the states will continue to offer electronic clearance, each agency within the Advantage I-75 MACS partnership was included in the survey.

The questionnaire used was developed and adapted from the Volpe study of IVHS institutional issues conducted in 1993. The Volpe framework was used as a basis for the questionnaire, and issues germane to the Advantage I-75 MACS project were inserted into the existing survey. A copy of the survey questionnaire is included in the Appendix.

The fifteen-page survey was then mailed to the department heads of each participating agency, covering the issues described previously. Several follow-up contacts by telephone and electronic mail were made to each potential survey participant. The response rate, however, was not significant enough to draw any conclusions.

Notwithstanding, several observations about the project could be made from the comments and responses that were received. They are:

- { Some staff members, particularly lower-level staff, felt left out of the decision-making processes and communication exchanges pertaining to the implementation of electronic screening at weigh stations.
- { Some members of the partnership felt that the project was moving too slowly and were impatient at the apparent lack of progress.
- { Members of some agencies are concerned about the funding methods that will be used to continue electronic screening. These staff members are concerned whether it will publicly or privately financed.

## CONCLUSIONS

As a primary goal, the Advantage I-75 MACS operational test was to demonstrate and evaluate the jurisdictional issues involving electronically screening commercial vehicles at weigh stations. This evaluation of jurisdictional issues among the Advantage I-75 MACS partnership was designed to provide states and motor carriers with information to support decisions about continuing or discontinuing electronic screening or an enhanced form of electronic clearance and verification.

The first goal of the evaluation was to determine whether or not states, along with Province of Ontario will continue to offer electronic screening of motor vehicles. This first goal of the evaluation was reached, as the states in the partnership, along with the Province of Ontario, have agreed to offer electronic screening, as shown in Table 2.

**Table 2: States and Provinces Adopting Electronic Screening**

Ontario	Yes
Michigan	Yes
Ohio	Yes
Kentucky	Yes
Tennessee	Yes
Georgia	Yes
Florida	Yes

The second goal of the evaluation was to determine whether or not motor carriers will continue to participate in Advantage I-75 MACS after the operational test is completed. From the beginning of the Advantage I-75 MACS project, there has been involvement with the motor carriers. Carrier representatives were active participants from the beginning on policy-making committees, evaluation committees, and the alpha test groups. Motor carriers have been instrumental in seeing the project through to its conclusion and beyond. The participating carriers are eager to tout the benefits of electronic screening at the weigh stations. Established systems that can reduce motor carriers' transit times to their destinations, are welcome improvements along the corridor. Thus, our findings conclude that there is support from the industry to continue with electronic screening of commercial vehicles.

The third goal of the evaluation was to record all significant institutional issues addressed during the operational test and document the resolution to issues addressed. The first institutional issue addressed in the evaluation of the Advantage I-75 MACS is that to facilitate the implementation of the system, technical standards and information sharing must be agreed to early on in the project. Within Advantage I-75 MACS, the transponder capabilities, communications protocols, data definitions, and vehicle and

carrier identifications were decided upon at the beginning, in order to eliminate problems later on in the project.

The second institutional addressed is that there must be "buy-in" from upper management in order to succeed. Obtaining the backing of the governors by having them sign an agreement to support the project and provide matching funds helped facilitate the project and overcome many institutional uncertainties

Finally, future ITS projects should seriously consider the methods developed by Advantage I-75 MACS. This method includes a lead agency to facilitate the project and lead representatives from each jurisdiction in close contact with the lead agency to enhance communication. While there were issues that caused minor delays in the project because of uncertainties, with few exceptions, the parties made the commitment to work together to satisfactorily complete the goals and objectives for the project. The lessons learned from this project will serve others well in future ITS projects.