ITS Field Operational Test Summary

Advantage I-75 Mainline Automatic Clearance Project

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Introduction

The Advantage I-75 Mainline Automatic Clearance Project ITS Field Operational Test consisted of a series of tests designed to evaluate different aspects of using the Mainline Automatic Clearance System (MACS). The project facilitated efficient motor-carrier operations by allowing transponder-equipped and properly documented trucks to travel any segment along the length of Interstate 75 at mainline speeds, bypassing most weigh or inspection stations. Advantage I-75 applied transponder technology and decentralized control while allowing each state to retain its constitutional and statutory authority relative to motor carriers and their operations.

The operational test has ended but the partners agreed to continue system operations for at least one year after the end of the testing period at their own expense. The Final evaluation report is expected in March 1998.

Project Description

The complete Advantage I-75 project consisted of four planned tests: Motor Carrier Fuel Consumption Test, Weigh Station Test, Jurisdictional Test, and System Test. In addition, portions of the test evaluation used a computer simulation. The four tests and the simulation intended to prove three hypotheses:

- Reduction or elimination of stops at weigh stations by trucks will produce measurable fuel savings
- Reduction or elimination of stops at weigh stations by trucks will produce measurable travel time savings
- Cumulative reduction or elimination of stops will create the potential to improve delivery times.

The Interstate 75/Highway 401 corridor stretches from Florida through Georgia, Tennessee, Kentucky, Ohio, and Michigan and continues into Ontario. Figure 1 shows the I-75/Highway 401 corridor.

The project equipped approximately 4,500 trucks with transponder devices that emitted the truck's unique identification code. Automated Vehicle Identification (AVI) readers were installed at 29 weigh stations on the I-75/Highway 401 corridor. When a transponder-equipped truck approached one of the AVI reader-equipped weigh stations, the reader identified the truck. Using information electronically recorded about the truck, the system verified its weight and credentials. The system signaled the truck to either by-pass the weigh station or enter it for weighing or inspection processing. The total time for this communication process was less than one second.

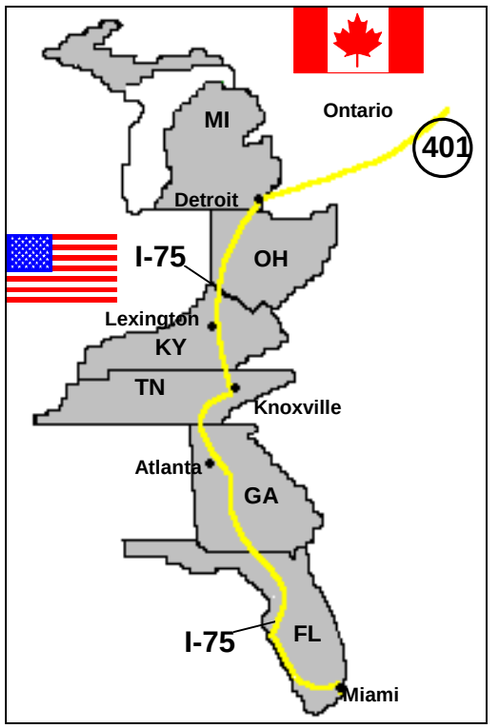

Figure 1: The I-75/Highway 401 Corridor

The Fuel Consumption Test was conducted under controlled conditions using nearly identical trucks operating over a loop of interstate highway. This test compared fuel usage between trucks that were signaled to stop at the weigh station and those that by-passed the station. This comparison tested the hypothesis that a reduction or the elimination of stops at weigh stations by transponder-equipped trucks will result in measurable fuel savings for each equipped truck.

In the Weigh Station Test, test personnel compared the difference in travel times of trucks electronically cleared to by-pass a weigh station to those that had to enter it. Test personnel also gathered information to run and validate the simulation program. This test attempted to prove that the reduction or elimination of stops at weigh stations by transponder-equipped trucks would result in travel time savings for that truck.

The Jurisdictional Test had two purposes. One purpose was to determine whether partner states intended to continue to offer the MACS (or some enhancement to it) and whether motor carriers intended to continue participating in the MACS. The second purpose was to identify issues and barriers to implementing the MACS. Test personnel conducted interviews with state officials and motor carrier decision-makers to collect their views on these issues. Test personnel also prepared questionnaires that the officials and decision-makers completed.

The System Test evaluated whether the MACS satisfied the goals of the project. The test compares the performance of the as-built MACS during the two-year project to the performance levels specified by project planning documents.

The Simulation used data collected during the Weigh Station Test to evaluate the effect that the MACS has on weigh station queue length and the number of unauthorized bypasses due to overcrowding. The simulation uses a previously developed and proven weigh station model. The simulation is necessary because the current percentage of transponder-equipped vehicles is too small to produce a noticeable effect on queues and bypasses.

Test Status

Data collection and analysis for the Advantage I-75 project continued until October 1997. The Fuel Consumption Test has been completed. The Weigh Station Test, the Simulation, the System Test, and the Jurisdictional Test are continuing. Final results will be available in March 1998.

The Fuel Consumption Test verified the basic hypothesis that reducing or eliminating stops at weigh stations would result in measurable fuel savings. Estimated fuel savings differed according to the type of scale at the weigh station. At static type scales, fuel savings were between 0.16 and 0.18 gallons per station. At ramp Weigh-In-Motion (WIM) type scales, the fuel savings varied

between 0.06 and 0.11 gallons per station. At the single high-speed ramp WIM type scale, fuel savings averaged 0.05 gallons per station.

Legacy

Near the end of the Field Operational Test, the Advantage I-75 Policy Committee passed a motion to continue to provide electronic screening for a year beyond the conclusion of the FOT. The cost of the continuation is being borne by the state agencies involved. This action indicates that the partner states intend to continue to support the use of the MACS. Test participants are redesigning the MACS based on lessons learned during the FOT. Participants agree that the test promoted further deployment of ITS/CVO.

Test Partners

Kentucky Transportation Center, University of Kentucky

Federal Highway Administration

Florida Department of Transportation

Georgia Department of Transportation

Kentucky Transportation Cabinet

Michigan Department of Transportation

Several Motor Carrier Industry Firms

Ohio Department of Transportation

Ontario Ministry of Transportation

Tennessee Department of Transportation

References

Center of Transportation Research & Education, Iowa State University, Advantage I-75 Motor Carrier Fuel Consumption Individual Evaluation, DRAFT Final Report, July 1997