References related to Field Operational Tests (FOTs) are organized by project, and the first nine are in the same order as Table 1. Information on other tests and useful resources are also included here. The item numbers refer to references cited in the text.

1. **Electronic Supply Chain Manifest (ESCM)**

The U.S. Department of Transportation (USDOT), Federal Highway Administration (FHWA) and the Federal Aviation Administration (FAA) co-sponsored this FOT of an air cargo security and logistics tracking system from 2000 to 2002. The goal was to assess potential improvements in efficiency and security of an Internet-based electronic manifest system compared to traditional processes and paper-based manifest systems. The ESCM was used in some later FOTs, notably the Hazmat FOT, and is the basis for the EFM project. For more information, contact Michael Onder, FHWA, at Michael.Onder@fhwa.dot.gov.


2. **Pacific Northwest FOTS**

This series of tests and demonstrations began in 1999 and continues today. The FOTs have focused on in-bond container movements that arrive in the United States but are destined for Canada, and vice versa. The key nodes have been the ports of Seattle, Tacoma, and Vancouver, BC, plus the border crossing at Blaine, WA. The goals included improved efficiency for truckers, shippers, and enforcement officials, plus improved compliance with Customs requirements at the international border. For more information, contact Michael Onder, FHWA, at Michael.Onder@fhwa.dot.gov.

Appendix A. References and Point of Contact


3. FREIGHT INFORMATION REAL-TIME SYSTEM FOR TRANSPORT (FIRST)

The Port Authority of New York and New Jersey developed FIRST, and the 2001-2003 FOT sponsors included FHWA and the I-95 Corridor Coalition. FIRST’s goals were to mitigate terminal gate congestion and help draymen and terminals operate more efficiently. The approach was an IT system to combine accurate near real-time information on queues and traffic delays with terminal pickup and delivery scheduling interfaces. The original goal included a driver/container appointment component. For more information, contact Randy Butler, FHWA, at Randy.Butler@fhwa.dot.gov.


4. CARGO*MATE

Cargo*Mate is a commercial container chassis tracking system enhanced and tested with cooperative funding from DOT. It is a tool to improve the visibility and management of chassis fleets and, when they are loaded, the containers and cargo associated with the chassis. Cargo*Mate concentrates on highway movements between the port, the shipper/receiver, and intermediate terminals. FHWA, beginning in 2002, sponsored FOTs to assess Cargo*Mate performance in four different operational scenarios. For more information, contact Michael Onder, FHWA, Michael.Onder@fhwa.dot.gov.


5. FREIGHT INFORMATION HIGHWAY (FIH) AND CHASSIS TRACKING

The FIH tested a new approach for freight data information exchange. FHWA spon-
sored this FOT between 2001 and 2003 to examine the feasibility and assess the benefits of a new set of data transfer standards and associated applications, which would allow for the automated translations of the current railroad and ocean carrier Electronic Data Interchange (EDI) business data exchange formats into a new XML-based format. The XML-based format is more readily integrated with advanced web-based business communications tools that allow companies and agencies to exchange information without changes to their own systems. This is intended to facilitate interoperability with other members of the freight industry, such as trucking companies and freight consolidators. FIH project participants integrated the newly defined standards and data dictionaries into existing commercial cargo visibility software products.

The FOT included additional chassis tracking that built on previous Cargo*Mate FOTs and defined benefits and system integration requirements to more effectively use chassis tracking data in the future. For more information, contact Randy Butler, FHWA, at Randy.Butler@fhwa.dot.gov.


6. HAZMAT SAFETY AND SECURITY

The Federal Motor Carrier Safety Administration (FMCSA) managed this 2003-2004 FOT with participation from FHWA and numerous private participants to assess the safety and security potential of technology suites tailored for four hazmat operating scenarios. The four scenarios were bulk fuel delivery, less than truck load high hazard shipments, other bulk hazards, and truckloads of explosives. The emphasis in this FOT was on rapid implementation of off the shelf technologies. Many of the technologies employed had been tested in previous FOTs, but they had not been integrated nor applied to hazardous materials. Commercially available asset tracking technology was the cornerstone of the FOT and facilitated integration of other technologies.

The test was completed in May 2004 and the independent evaluation report has not yet been made available to the public. For more information, contact Joe DeLorenzo, Federal Motor Carrier Safety Administration, Joseph.DeLorenzo@fmcsa.dot.gov; and Michael Onder, FHWA, at Michael.Onder@fhwa.dot.gov.

*Executive Summary, Volume I*, July 15, 2004  
*Synthesis, Volume II*, October 11, 2004

7. **APEC STAR BEST & SMART AND SECURE TRADELANES (SST)**


This paper is the source of the economic benefit analysis in the SST Phase 1 report. For more information, contact Professor Lee, Stanford University, Graduate School of Business, lee_hau@gsb.stanford.edu.


8. **OPERATION SAFE COMMERCE (OSC)**

Operation Safe Commerce (OSC) is the most concentrated and richly-funded set of intelligent freight technology field tests. The focus is end-to-end security on international surface container movements. DHS spent $58 million in Phase 2 on 18 separate trade lane tests transiting Seattle/Tacoma, Los Angeles/Long Beach, or New York/New Jersey. OSC includes many technologies and process solutions relevant to intelligent freight on-board monitoring applications: e-seal, door, and light-based intrusion detection; chemical, radiation, and biological detection sensors; non-intrusive X-ray, gamma ray, and infrared scanners. DHS will make the OSC evaluation reports available some time after this report is finished, and readers should watch for them.

9. **ELECTRONIC FREIGHT MANIFEST (EFM)**

Because EFM is a new initiative, no project reports are available at this time. For information about the EFM initiative, contact Michael Onder, FHWA, at Michael.Onder@fhwa.dot.gov or visit www.ops.fhwa.dot.gov/freight/intermodal/efm_program_plan.htm.
10. IN-BOND CONTAINER AND TRAILER E-SEAL TESTS
Ronald Char, Johns Hopkins University, Advanced Physics Lab, Briefing on “In-Bond Container Tracking Projects,” November 12, 2004. For more information, contact Ron Char at ronald.char@jhuapl.edu.

11. “SMART BOX” TEST
At this time, there is no substantive public information about this project or its findings to date, only references to it in speeches by the U.S. Customs and Border Patrol (CBP) Commissioner and occasional pieces in the trade press. For information, please contact James Carson, CBP’s Seal Program Manager, at james.carson@dhs.gov.

12. SAFE INTERMODAL TRANSPORT ACROSS THE GLOBE (SIMTAG)
Related reports and information are available at www.simtag.org or contact Mariana Andrade, ERTICO—the European ITS association—at m.andrade@mail.ertico.com.

OTHER USEFUL RESOURCES


This brief analysis estimates the total cost of U.S. cargo theft, including unreported and indirect losses; the cost is well over one percent of U.S. Gross Domestic Product. This loss implies greater dollar returns for intelligent freight technologies that can reduce pilferage and theft.

This report evaluates the CVISN technology that has been deployed in many states for use in weigh stations and other trucking operations. CVISN technology was also included in the Pacific Northwest FOTs.


This report discusses how companies manage supplier performance and supply disruptions. It provides insights into what leaders do differently in managing supplier performance.


This 2001 survey of transportation industry Web sites is useful background for web-based freight services. Direct requests for the report to the Director, Office of Information and Logistics, 617-494-2467.


A useful tool for assessing long-term technology trends across different freight modes.


This report provides information about web services software, a system designed to support interoperable machine-to-machine interaction over a network. It has an interface described in a machine-processed standard format and then allows communications amongst other systems using XML. The EFM FOT is using web services software.


The report documented discussions and informal assessments by the Volpe National Transportation Systems Center, of the Norfolk International Terminal and other terminals operated by the Virginia Port Authority. For more information about the report, contact Nancy Cooney, cooney@volpe.dot.gov.


25. U.S. Department of Energy, TRANSCOM (Transportation Tracking and Communications) System, DOE Shipment Tracking Assessment, prepared by the U.S. Department of Transportation, Volpe National Transportation Systems Center, December 2004. For more information, contact Ruth Hunter at hunter@volpe.dot.gov.