

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](mailto:Michael.Onder@fhwa.dot.gov).

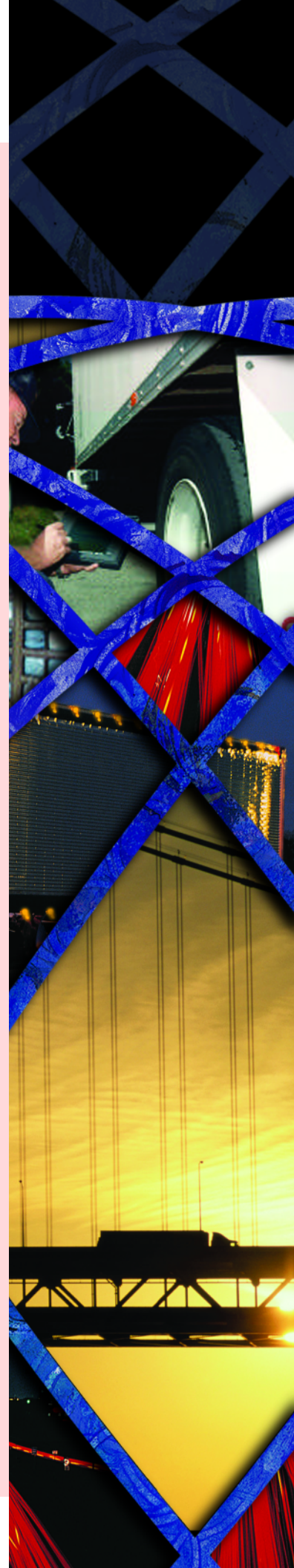
1.A. U.S. Department of Transportation, *Electronic Intermodal Supply Chain Manifest – Freight ITS Operational Test Evaluation Final Report*, prepared by Science Applications International Corporation, December 2002, available at [www.itsdocs.fhwa.dot.gov//jpodocs/repts\\_te//13769.html](http://www.itsdocs.fhwa.dot.gov//jpodocs/repts_te//13769.html).

1.B. U.S. Department of Transportation, *Electronic Freight Manifest Benefit Calculations (revised)*, prepared by Science Applications International Corporation, October 2004. For more information, contact Michael Onder, FHWA, at [Michael.Onder@fhwa.dot.gov](mailto: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](mailto:Michael.Onder@fhwa.dot.gov).

2.A. U.S. Department of Transportation, WSDOT Intermodal Data Linkages - Freight ITS Operational Test Evaluation Final Report. Part 1: Electronic Container Seals Evaluation, prepared by Science Applications International Corporation, December 2002, available at [www.itsdocs.fhwa.dot.gov//jpodocs/repts\\_te//13770.html](http://www.itsdocs.fhwa.dot.gov//jpodocs/repts_te//13770.html).



U.S. Department of Transportation, Part 2: *Freight ITS Traffic Data Evaluation*, prepared by Science Applications International Corporation, January 2003, available at [www.itsdocs.fhwa.dot.gov/jpodocs/repts\\_te/13781.html](http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13781.html).

2.B. U.S. Department of Transportation, *Washington State - British Columbia International Mobility and Trade Corridor (IMTC) ITS-CVO Border Crossing Deployment Evaluation Final Report*, prepared by Science Applications International Corporation, October 2003, available at [www.itsdocs.fhwa.dot.gov/jpodocs/repts\\_te/13952.html](http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13952.html).

### 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](mailto:Randy.Butler@fhwa.dot.gov).

U.S. Department of Transportation, *Freight Information Real-Time System for Transport – Evaluation Final Report*, prepared by Science Applications International Corporation, October 2003, available at [www.itsdocs.fhwa.dot.gov/jpodocs/repts\\_te/13951.html](http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13951.html).

### 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](mailto:Michael.Onder@fhwa.dot.gov).

U.S. Department of Transportation, *Cargo\*Mate Chassis Tracking – Field Operational Tests Evaluation Final Report*, prepared by Science Applications International Corporation, September 2004.

### 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](mailto:Randy.Butler@fhwa.dot.gov).

U.S. Department of Transportation, Evaluation of the Intermodal Freight Technology Working Group Asset Tracking and “Freight Information Highway” Field Operational Test Final Report, prepared by Science Applications International Corporation, September 2003, available at [www.itsdocs.fhwa.dot.gov/jpodocs/repts\\_te//13950.html](http://www.itsdocs.fhwa.dot.gov/jpodocs/repts_te//13950.html).

## 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](mailto:Joseph.DeLorenzo@fmcsa.dot.gov); and Michael Onder, FHWA, at [Michael.Onder@fhwa.dot.gov](mailto:Michael.Onder@fhwa.dot.gov).

6.A. U.S. Department of Transportation, *Hazmat Safety and Security Field Operational Test Final Report*, August 31, 2004.



6.B U.S. Department of Transportation, *Hazmat Security Technologies Field Operational Test Evaluation Final Report*:

*Executive Summary, Volume I*, July 15, 2004

*Synthesis, Volume II*, October 11, 2004

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

7.A U.S. Trade Development Agency, *APEC STAR-BEST Project Cost – Benefit Analysis*, prepared by Thomas J. Wilson and Greg Hafer, Bearing Point, November, 2003. For more information, contact Thomas J. Wilson at [twilson@bearingpoint.net](mailto:twilson@bearingpoint.net).

7.B. Hau L. Lee and Seungjin Whang, “Higher Supply Chain Security with Lower Cost: Lessons from Total Quality Management,” *International Journal of Production Economics*, December 2004.

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](mailto:lee_hau@gsb.stanford.edu).

7.C. Strategic Council for Security Technology, *Smart and Secure Tradelanes Phase One Review, Network Visibility: Leveraging Security and Efficiency in Today’s Global Supply Chains*, November 2003. For more information, contact Lani Fritts, SST Program Manager, Savi Technology, at [lfritts@savi.com](mailto:lfritts@savi.com).

## **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](mailto:Michael.Onder@fhwa.dot.gov) or visit [www.ops.fhwa.dot.gov/freight/intermodal/efm\\_program\\_plan.htm](http://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](mailto: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, CBPs Seal Program Manager, at [james.carson@dhs.gov](mailto:james.carson@dhs.gov).

## 12. SAFE INTERMODAL TRANSPORT ACROSS THE GLOBE (SIMTAG)

Related reports and information are available at [www.simtag.org](http://www.simtag.org) or contact Mariana Andrade, ERTICO—the European ITS association—at [m.andrade@mail.ertico.com](mailto:m.andrade@mail.ertico.com).

## OTHER USEFUL RESOURCES

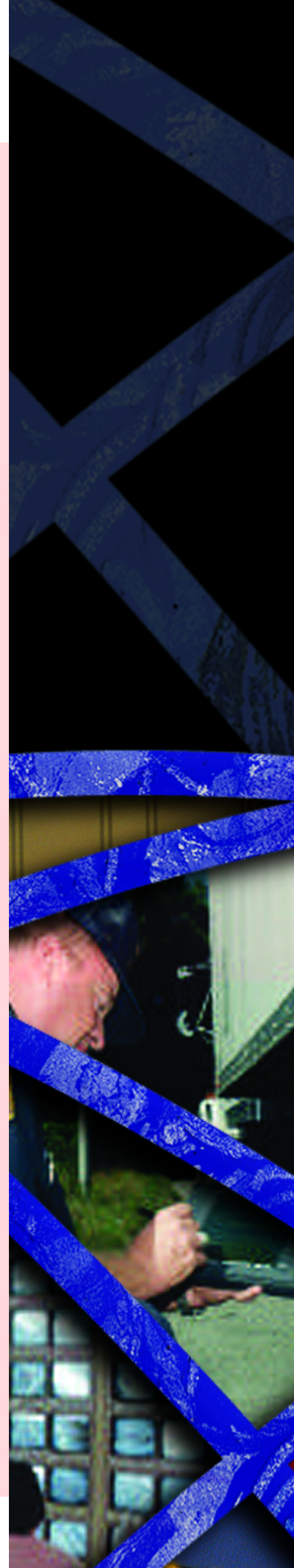
13.A. U.S. Department of Transportation, Federal Highway Administration, *Network View of ITS Freight Technology Benefits*, prepared by Delcan, Inc, December 4, 2004. For more information, contact Michael Onder, FHWA, at [Michael.Onder@fhwa.dot.gov](mailto:Michael.Onder@fhwa.dot.gov).

13.B. Delcan, Inc., “Dude, Innovative Finance: Does it Have a Future, or What’s the Deal, Man?” prepared for Hudson Institute, March 2003.

14. Michael Wolfe, “In This Case, Bad News is Good News on Cargo Security,” *Journal of Commerce*, July 26, 2004.

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.

15. U.S. Department of Transportation, *Evaluation of the Commercial Vehicle Information System and Networks (CVISN) Model Deployment Initiative*, prepared by Science Applications International Corporation, March 2002, available at [www.its-docs.fhwa.dot.gov/jpodocs/repts\\_13677.html](http://www.its-docs.fhwa.dot.gov/jpodocs/repts_13677.html).



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.

16. U.S. Department of Transportation, Federal Highway Administration, Office of Operations, *Intermodal Freight Technology Challenges, Concerns, and Future Directions*, 2004, available at [www.ops.fhwa.dot.gov/freight/intermodal/ift\\_overview.htm](http://www.ops.fhwa.dot.gov/freight/intermodal/ift_overview.htm).

17. Aberdeen Group, *New Strategies for Transportation Management. How Transportation Management Practices are Changing to Meet Today's Market Pressures*, sponsored by Manugistics, I2, Lean Logistics, and Manhattan Associates, September 2004, available at [www.aberdeen.com/summary/report/transportation\\_092404.asp?spid=30410002](http://www.aberdeen.com/summary/report/transportation_092404.asp?spid=30410002)

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

18. U.S. Department of Transportation, Federal Highway Administration, *Technology to Enhance Freight Transportation Security and Productivity*, prepared by Michael Wolfe, North River Consulting Group, 2003, available at [www.ops.fhwa.dot.gov/freight/publications/sec\\_tech\\_appx/security\\_tech\\_appx.htm](http://www.ops.fhwa.dot.gov/freight/publications/sec_tech_appx/security_tech_appx.htm).

19. U.S. Department of Defense, Transportation Command Center, *Categorization of Web-based Transportation Portals*, prepared by U.S. Department of Transportation, Volpe National Transportation Systems, August 27, 2001.

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.

20. U.S. Department of Transportation, Federal Highway Administration, "Trends in Intermodal Freight Identification Technology," prepared by Michael Wolfe, The North River Consulting Group, 1998, available at [www.ops.fhwa.dot.gov/freight/intermodal](http://www.ops.fhwa.dot.gov/freight/intermodal).

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

21. "Advanced Container Security Devices," Agency Announcement 04-06 (BAA04-06), Homeland Security Advanced Research Projects Agency, March 12, 2004.

22. WC3 Working Group, “Web Services Architecture,” available at <http://www.w3.org/TR/2004/NOTE-ws-arch-20040211/>.

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.

23. U.S. Department of Defense, Technical Support Working Group, Norfolk Security Demonstrations, *Port Entry Point Screening Project - Phases I and II Final Report*, prepared by U.S. Department of Transportation, Volpe National Transportation Systems Center, February 18, 2004.

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](mailto:cooney@volpe.dot.gov).

24. U.S. Department of Defense, Navy Ammunition Logistics Center, *DTTS Overview, Safety & Security Outside the Fence Line*, available at <http://www.dodait.com/conf/techexchange082003/HARLEYAITCONF4AUG03.pdf>. The Defense Transportation Tracking System requires commercial motor carriers that carry DOD arms, ammunition, and explosives to use mobile long-distance vehicle tracking systems with coverage of the continental United States—in effect, a requirement for satellite communications. The system has been operating successfully for over a decade.

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](mailto:hunter@volpe.dot.gov).

