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The North American Transportation Security Center - SERRI Analysis Update

Kentucky Transportation Center
College of Engineering, University of Kentucky, Lexington, Kentucky

in cooperation with
Kentucky Transportation Cabinet
Commonwealth of Kentucky

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Executive Summary

There are over 800,000 hazardous materials (hazmat) shipments over the nation's roads each day. According to the **U.S. Department of Homeland Security** (DHS), terrorist activity related to the transportation of hazardous materials represents a significant threat to public safety and the nation's critical infrastructure. Specifically, the federal government has identified the government's inability to track hazmat shipments on a real-time basis as a significant security vulnerability.

In 2004, the **U.S. Federal Motor Carrier Safety Administration** (FMCSA) completed a study to determine if "smart truck" technology such as GPS tracking, wireless modems, panic buttons, and on-board computers could be used to enhance hazmat shipment security. The FMCSA study concluded that "smart truck" technology will be highly effective in protecting hazmat shipments from terrorists. The FMCSA study also concluded that "smart truck" technology deployment will produce a huge security benefit and an overwhelmingly positive return on investment for hazmat carriers.

The FMCSA study led to the **U.S. Transportation Security Administration's** (TSA) Hazmat Truck Security Pilot (HTSP). This congressionally mandated pilot program was undertaken to demonstrate if a hazmat truck tracking center was feasible from a technology and systems perspective. The HTSP project team built a technology prototype of a hazmat truck tracking system to show that "smart truck" technology could be crafted into an effective and efficient system for tracking hazmat shipments. The HTSP project team also built the Universal Communications Interface – the XML gateway for hazmat carriers to use to provide data to a centralized truck tracking center.

In August 2007, Congress enacted the 9/11 Act (PL110-53) that directs TSA to develop a program - consistent with the Hazmat Truck Security Pilot - to facilitate the tracking of motor carrier shipments of security-sensitive materials. In June 2008, TSA took a major step forward in establishing a national hazmat security program by issuing guidance for shipments of Tier 1 Highway Security Sensitive Materials (HSSMs), the riskiest shipments from a security perspective. TSA's Tier 1 HSSM guidance includes Security Action Items which specify security measures – including vehicle tracking – that TSA believes are prudent security measures for shippers and carriers to follow. Compliance with TSA's Tier 1 HSSM guidance is voluntary but TSA is expected to issue regulations based on the Tier 1 HSSM Security Action Items that will make compliance mandatory.

Establishment of a Tier 1 HSSM truck tracking center is critical to implementation of a Tier 1 HSSM regulatory program based on the Security Action items by TSA. The HTSP technology prototype was an excellent first step toward an operational Tier 1 HSSM truck tracking system, however, it falls far short of what TSA needs in an operational system.
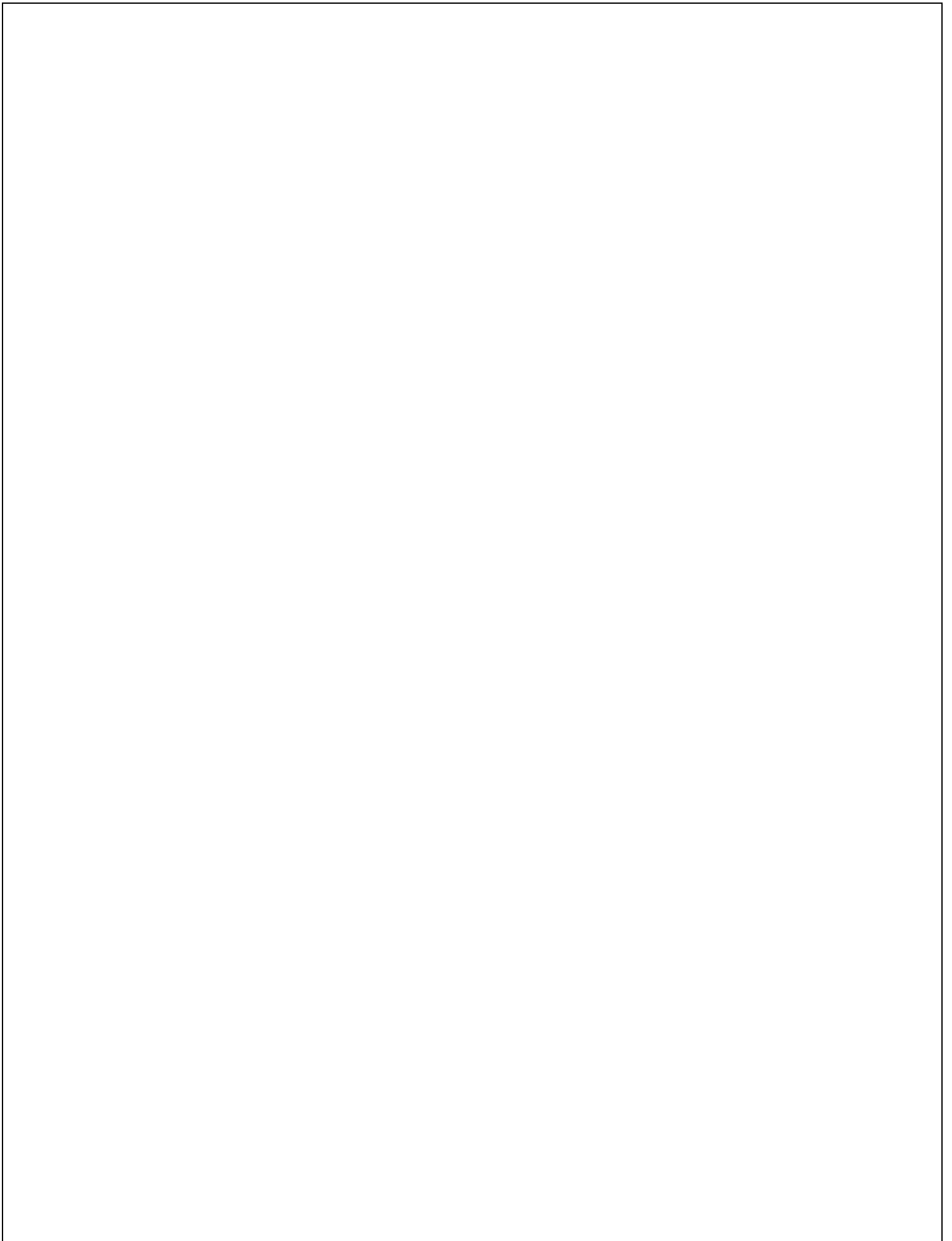
The Kentucky Transportation Center at the University of Kentucky completed a study December 2008 that examined market drivers that would influence the design and operation of a Tier 1 HSSM truck tracking system. The study was funded by the South East Region Research Initiative (SERRI).

The objective of this deliverable is to update the SERRI report with a specific focus on two items:

1. new or enhanced fleet tracking vendor product and service offerings; and

2. programmatic conditions that have changed since December 2008.

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Appendix A – Integrated Trucking Security Solutions: Qualcomm, Safefreight and PeopleNet

Appendix B - ACE Truck E-manifest (U.S. Customs & Border Protection)

1.0 TSA's hazmat regulatory focus is on Tier 1 Highway Security Sensitive Materials.

DOT's Pipeline and Hazardous Materials Administration (PHMSA) published a notice in the *Federal Register* on **June 27, 2007** advising that the Transportation Security Administration had assumed the lead role from PHMSA for rulemaking addressing the security of motor carrier shipments of hazardous materials.

The action was consistent with the respective transportation security roles and responsibilities of the Department of Transportation and DHS as delineated in a Memorandum of Understanding (MOU) signed September 28, 2004. TSA and PHMSA reinforced TSA's security role in an Annex to that MOU signed August 7, 2006.

The PHMSA also used the Federal Register notice to withdraw an Advanced Notice of Proposed Rulemaking (ANPRM) related to hazmat transportation security that the PHMSA had published on July 16, 2002. The ANPRM solicited comments on a variety of security measures that might be required of hazmat carriers to improve hazmat supply chain security including the use of vehicle tracking and monitoring systems, emergency warning systems, and remote shut-offs. Follow-up action to the ANPRM had been put on hold in light of the FMCSA's Field Operations Test and TSA's Hazmat Truck Security Pilot as well as the shifting responsibilities of DOT and DHS.

With the 7/27/2007 *Federal Register* notice, TSA assumed lead federal responsibility for all future security regulations for hazmat motor carriers.

1.1 TSA's current security program incorporates/enhances earlier DOT guidance.

On June 26, 2008, almost one year to the day that TSA formally assumed the lead federal responsibility for hazmat transportation security regulations, TSA issued guidance for shippers and carriers of highway security-sensitive materials. The guidance was issued by TSA's Assistant Administrator for Transportation Sector Network Management. [1] TSA's guidance recognizes two tiers of highway security-sensitive materials.

1. **Tier 1 Highway Security-Sensitive Materials (Tier 1 HSSM) —** HSSM transported by motor vehicle whose potential consequences from an act of terrorism include a **highly significant** level of adverse effects on human life, environmental damage, transportation system disruption, or economic disruption. A full list of Tier 1 HSSM may be found in **Appendix B**.

2. **Tier 2 Highway Security-Sensitive Materials (Tier 2 HSSM)** - HSSM transported by motor vehicle whose potential consequences from an act of terrorism include **moderately significant** level of adverse effects on human life or health, environmental damage, transportation system disruption, or economic disruption. A full list of Tier 2 HSSM may be found in **Appendix B**.

TSA developed its guidance in conjunction with other Federal agencies including DOT's Pipeline and Hazardous Material Safety Administration (PHMSA) and DOT's Federal Motor Carrier Safety Administration (FMCSA). The TSA guidance builds upon existing PHMSA and FMCSA hazmat regulations including PHMSA's hazmat safety regulatory provisions in 49CFR172.704 and 172.800 that require hazmat carriers to develop and implement security programs and to train employees in security matters. TSA has, however, enhanced earlier guidance to strengthen en-route security measures for shippers and carriers of high-risk materials.

TSA's guidance is not mandatory for hazmat shippers and receivers. Shippers and carriers are, however, advised by TSA to implement security programs consistent with TSA June 26th guidance.

TSA has the lead responsibility for hazmat transportation security rulemaking.

TSA's recognizes two classes of highway security-sensitive materials:

- Tier 1 which can cause highly significant adverse effects from terrorist actions; and

- Tier 2 which can cause moderately significant adverse effects from terrorist actions.

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[1] Letter to Highway and Motor Carrier Stakeholders; John P. Sammon, Assistant Administrator, Transportation Sector Network Management, US Transportation Security Administration; June 26, 2008.

1.2 TSA recommends more stringent security measures for Tier 1 highway security-sensitive materials.

As illustrated in **Figure 1**, TSA listed 23 Security Action Items (SAI) in its June 26th guidance. The SAIs were divided into four categories 1). general security; 2). personnel security; 3). unauthorized access; and 4). en-route security.

Figure 1. TSA HSSM Security Action Items

TSA HSSM Security Action Items	
General Security: 1. Security Assessment and Security Plan Requirements. 2. Awareness of Industry Security Practices. 3. Inventory Control Process. 4. Business and Security Critical Information **Personnel Security:** 5. Possession of a Valid Commercial Drivers License - Hazardous Materials Endorsement. 6. Background Checks for Highway Transportation Sector Hazmat Employees other than Motor Vehicle Drivers with a Valid CDL with HME. 7. Security Awareness Training for Hazmat Employees. **Unauthorized Access:** 8. Access Control System for Drivers. 9. Access Control System for Facilities Incidental to Transport.	**En-Route Security:** 10. Establish Communications Plan. 11. Establish Appropriate Vehicle Security Program. 12. Establish Appropriate Cargo Security Program. 13. Implement a Seal/Lock Control Program. 14. High Alert Level Protocols. 15. Establish Security Inspection Policy and Procedures. 16. Establish Reporting Policy and Procedures. 17. Shipment Pre-Planning, Advance Notice of Arrival, and Receipt of Confirmation Procedures. 18. Preplanning Routes. 19. Security for Trips Exceeding Driver Hours of Service. 20. Dedicated Truck. 21. Tractor Activation Capability. 22. Panic Button Capability. 23. Tractor and Trailer Tracking Systems

SAIs 17-23 apply only to Tier 1 HSSM shipments.

TSA recommends that shippers and carriers of Tier 2 HSSMs adopt the first sixteen SAIs. Additionally, TSA recommends that shippers and carriers of Tier 1 HSSMs, the riskiest materials from a security perspective, adopt the first sixteen SAIs as well as TSA's security action items 17-23. A discussion of TSA's security action items 17-23 follows.

SAI #17 calls for close coordination between shipper and receiver including establishment of communication systems to establish ETA and to track delivery schedules.

Security Action Item #17. Shipment Pre-Planning, Advance Notice of Arrival and Receipt Confirmation Procedures with Receiving Facility – The shipper (consignor), motor carrier and receiver (consignee) should conduct shipment pre-planning to ensure shipments are not released to the motor carrier until they can be transported to destination with the least public exposure and minimal delay in transit. Shipment pre-planning should include establishing the estimated time of arrival (ETA) agreeable to consignor, motor carrier, and consignee; load specifics (shipping paper information), and driver identification. When shipments are in transit, the motor carrier should coordinate with consignee to confirm the pre-established ETA will be met, or agree on a new ETA. Upon receipt of the shipment consignees should notify the shipper that the shipment has arrived on schedule and materials are accounted for. Methods for advance notice and confirmation of receipt of shipments include electronic mail and voice communications. When practical, consignees should immediately alert the appropriate shipper or motor carrier if the shipment fails to arrive on schedule or if a material shortage is discovered. Methods for immediate alert notifications should be made by voice communications only. Where immediate notification is not practical (for example at unmanned facilities), the consignor, the motor carrier, and consignee should agree on alternate confirmation (method and time) of delivery and receipt. Consignees should make every effort possible to accept a shipment that arrives during non-business hours due to unforeseen circumstances.

Security Action Item #18. Preplanning Routes – Employers should ensure preplanning of primary and alternate routes. This preplanning should seek to avoid or minimize proximity to highly populated urban areas or critical infrastructure such as bridges, dams, and tunnels. Policies governing operations during periods of Orange or Red alert levels under the Homeland Security Advisory System should plan for alternate routing for TIER 1 HSSM shipments away from highly populated urban areas and critical infrastructure. The motor carrier or law enforcement officials may determine when to implement alternate routing. Drivers should be encouraged to notify the company's dispatch center when substantial en-route deviation is necessary.

> **SAI #18** suggests shippers and carriers establish primary and alternate routes. Carriers should avoid highly populated urban areas or critical infrastructure during Orange or Red alerts.

Security Action Item #19. Security for Trips Exceeding Driving Time under the Hours of Service of Drivers Regulation (49 CFR Part 395) – Employers should examine security in light of hours of service available and take steps to mitigate the vulnerabilities associated with extended rest stops for driver relief. Examples include methods such as constant vehicle attendance or visual observation with the vehicle, driver teams, or vetted companions. Other examples include arranging secure locations along the route through mutual agreement with industry partners and stakeholders, or State weigh stations and inspection facilities that provide law enforcement protection.

> **SAI #19** suggests carriers take security precautions when trips are interrupted so that drivers meet hours of service requirements.

Security Action Item #20. Dedicated Truck – Employers should implement policies to ensure that, except under emergency circumstances, contracted shipments remain with the primary carrier and are not subcontracted, driver/team substitutions are not made, and transloading does not occur unless the subcontractor has been confirmed to comply with applicable Federal safety and security guidance and regulations and company security policies.

> **SAI #20** suggests that Tier 1 shipments not be subcontracted or transloaded unless the subcontractor is security cleared.

Security Action Item #21. Tractor Activation Capability – Employers should implement security measures that require driver identification by login and password or biometric data to drive the tractor. Companies should provide written policies and instructions to drivers explaining the activation process.

Security Action Item #22. Panic Button Capability – Employers should implement means for a driver to transmit an emergency alert notification to dispatch. "Panic Button" technology enables a driver to remotely send an emergency alert notification message either via Satellite or Terrestrial Communications, and/or utilize the remote Panic Button to disable the vehicle.

> **SAI #21** suggests that carriers user in-cab devices that require drivers to log-in to drive the tractor. **SAI #22** suggests that drivers have access to a panic button (in-cab and/or remote).

Security Action Item #23. Tractor and Trailer Tracking Systems – Employers should have the ability of implementing methods of tracking the tractor and trailer throughout the intended route with satellite and/or land-based wireless GPS communications systems. Tracking methods for the tractor and trailer should provide current position by latitude and longitude. Geo-fencing and route monitoring capabilities allow authorized users to define and monitor routes and risk areas. If the tractor and/or trailer deviates from a specified route or enters a risk area, an alert notification should be sent to the dispatch center. An employer or an authorized representative should have the ability to remotely monitor trailer "connect" and "disconnect" events. Employers or an authorized representative should have the ability to poll the tractor and trailer tracking units to request a current location and status report. Tractor position reporting frequency should be configured at not more than 15-minute intervals. Trailer position reporting frequency should be configured to provide a position report periodically when the trailer has been subject to an unauthorized disconnect from the tractor. The reporting frequency should be at an interval that assists the employer in locating and recovering the trailer in a timely manner. The tractor and trailer tracking system should be tested periodically and the results of the test should be recorded

> **SAI #23** suggests the use of tractor **and** trailer tracking systems. Systems should allow for route adherence tracking and monitoring of trailer "connect" and "disconnect".

Figure 2 lists Tier 1 HSSMs and the number of annual U.S. shipments of each HSSM.

Figure 2. TSA Tier 1 HSSMs

DOT Hazard Class	Hazmat Placard	Threshold Quantity	Number of Annual U.S. Shipments [2]
Division 1.1 Division 1.2 Division 1.3 Explosives		Any quantity	Domestic - 11,868 NAFTA – 524
Division 2.2 Non-Flammable Gas (also meeting the definition of a material poisonous by inhalation)		Anhydrous ammonia (UN1005) in single bulk packaging >300 L or 3000 kg	Domestic - ~~563,771~~ [3] NAFTA - ~~6,767~~
Division 2.3 Toxic (Poison) Gas Division 2.3 Toxic (Poison) Gas		Hazard zone A & B >5lbs. in a single package Hazard zone C & D in single bulk packaging >3000L or 3000kg	Domestic - 960,871 NAFTA - 8,233
Class 3 Flammable Liquids (also meeting the definition of a material poisonous by inhalation)		PG I in single bulk packaging > 3000 L or 3000 kg	Domestic - ~~62,015,889~~ [4] NAFTA - ~~119,816~~
Division 6.1 Poisonous Materials (also meeting the definition of a material poisonous by inhalation)		Hazard zone A & B > 5 lbs. in a single package	Domestic - 307,244 NAFTA - 18,213
Division 6.1 Poisonous Materials (also meeting the definition of a material poisonous by inhalation)		Hazard zone C & D in single bulk packaging > 3000 l or 3000 kg	
Class 7 Radioactive Materials		IAEA Code of Conduct Category 1 and 2 materials including Highway Route Controlled quantities as defined in 49 CFR 173.403 or known as radionuclides in forms as RAM-QC by the Nuclear Regulatory Commission	Domestic - 7,777 NAFTA - 7,265
Class 8 Corrosive Materials (also meeting the definition of a material poisonous by inhalation)		Packing group I and II in single bulk packaging > 3000 L or 3000 kg	Domestic - ~~4,548,595~~ [5] NAFTA - ~~95,703~~
Other Materials		Any quantity of chemicals listed by the Chemical Weapons Convention on Schedules.	unknown
			Domestic – 1,287.760 [6] NAFTA – 34,235

[2] Data on the number of Tier 1 HSSM shipments was provided by David Cooper, Program Manager, Highway & Motor Carrier Division, U.S. Transportation Security Administration. Data represents 2005 projections for US domestic and NAFTA truck traffic for select hazmat commodities.

[3] This figure includes shipments of Tier 2 Division 2.2 Non-Flammable Gases (subsidiary hazard Oxidizer Division 5.1).

[4] This figure includes shipments of : 1). Class 3 Flammable Liquids (PGI and II in single bulk packaging > 300L or 3000 kg; and 2). Class 3 Flammable Liquids (any quantity desensitized explosives) – both of which are Tier 2 HSSM.

[5] This figure includes shipments of Class 8 Corrosive Materials (Packing group I in single bulk packaging > 3000L or 3000kg) which is a Tier 2 HSSM.

[6] This figure does not include Tier 1 Division 2.2 Non-Flammable Gas (also meeting the definition of a material poisonous by inhalation) **or** Tier 1 Class 3 Flammable Liquids (also meeting the definition of a material poisonous by inhalation) **or** Class 8 Corrosive Materials (also meeting the definition of a material poisonous by inhalation). Data is unavailable on the number of these shipments.

2.0 Smart truck technology is a core component of a Tier 1 HSSM truck tracking program.

Smart truck technology will be a core component of a Tier 1 HSSM truck tracking program. This section describes how hazmat carriers currently use smart truck technology and how the technology will support implementation of a hazmat truck tracking center.

2.1 What is smart truck technology; how is it used by hazmat carriers?

As illustrated in **Figure 3**, a typical smart truck technology deployment connects truck-mounted smart truck devices to a commercial fleet tracking data center via a wireless modem on the truck. This set-up allows fleet managers to track the location and status of the trucks in their fleets on a real-time basis via an internet connection. Fleet managers use GIS tools (mapping, routing, reporting) and in-cab messaging systems to monitor and manage fleet activity.

Figure 3. Truck-mounted smart truck devices are connected to a commercial fleet tracking center by a wireless modem on the truck making the truck a "rolling office".
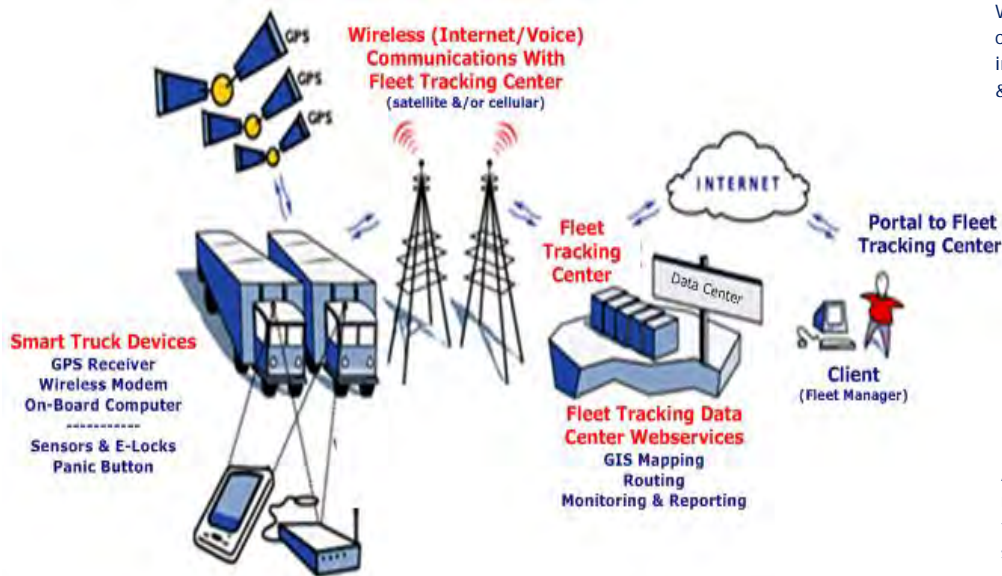
Wireless communications systems connect "smart truck" systems with interactive data centers using satellite &/or cellular networks.

An interactive data center lets fleet managers track vehicles on a real-time basis, monitor on-board sensors, and communicate with drivers. GIS tools support mapping and routing.

Various components of a smart truck system are described below.

- **Smart Truck Devices—** A smart truck deployment would minimally involve installation of a GPS satellite receiver and a wireless modem on the truck. The GPS receiver is used to pinpoint the exact physical location of the truck using signals from GPS satellites. The position of the truck is transmitted to a fleet tracking center via the truck's wireless modem over a wireless communications network. Additional devices increase smart truck functionality. Sensors and telemetric devices can monitor a wide variety of truck conditions (brake wear, tire pressure, trailer temperature, engine RPM, etc.), and when connected to an on-board computer (and wireless modem) can supply a continuous stream of live data to fleet managers. Other devices and sensors that are typically connected to an on-board computer include electronic locks, panic buttons, and biometric devices. Like the popular OnStar™ service, smart truck devices connected to an on-board computer can be monitored and/or activated by a remote command center as long as there is a wireless connection to the truck's on-board computer.

A GPS receiver and a wireless modem is the core technology base for a truck-based smart truck technology system.

- **Wireless Communications** (with Global Positioning System) — A smart truck interacts with the fleet tracking center via wireless modem and a wireless communications network. The truck can use satellite or cellular services for its wireless communications network. Satellite communications networks have traditionally been the choice of long-haul fleet managers, however, systems based on global system for mobile communications / general packet radio service (GSM/GPRS) cellular wireless networks have experienced tremendous growth. GSM/GPRS cellular systems provide extensive national coverage and are less expensive than satellite communication systems – especially for the needs of mobile service workers. Hybrid satellite/cellular systems that automatically switch between satellite and cellular systems based on network coverage are also available.

- **Fleet Tracking Center Webservices** — Once a truck is connected to the fleet operations center, the truck driver and the fleet manager have access to a rich selection of webservices.

  Geographics Information System (GIS) Mapping Software — The position of a truck is transmitted over a wireless network (cellular or satellite) to a server at a fleet tracking center and then on through to the client (e.g. fleet manager). Usually position/location is reported once/minute or when a truck changes its route or direction. Software at the fleet tracking center uses truck position/location in conjunction with GIS mapping software. The client can view a truck's location on a map on a real-time basis. Also, the software provides the client with the ability to automatically monitor the position/location of trucks and receive reports when trucks deviate from routing set by the client. GIS tools normally available to the client include geo-fencing, geo-routing, geo-zoning, and mapping services.

  - **Geo-fencing** of mobile assets to construct a digital, geographic "fence". The client can set "fences" on a map on a truck-specific basis. When the truck "breaks" the fence, the client is automatically notified.

  - **Geo-routing** to enforce dangerous route protocols. An electronic buffer is set around a specific road or hauling route. If a truck deviates from its prescribed route, the client is automatically notified.

  - **Geo-zoning** a digital geographic boundary of any shape or size around high-risk areas such as tunnels or nuclear facilities. If a truck crosses into the landmarked area, the client is automatically notified.

  - **Mapping services** allow the fleet manger access to services such as determining the nearest vehicle to a specific location, viewing the history of a vehicle and polling for current vehicle information.

- **Intelligent Onboard Computers (OBC) with Wireless Communications** — An onboard computer (PDA or fixed device) is a data processing units that receives and analyzes information from sensors and other devices on the vehicle and then store/present the information in a convenient and easily accessible manner. The OBC is connected to the truck's wireless modem enabling a wireless internet connection on the truck. Various smart truck devices can be connected to the OBC and monitored/controlled by the fleet operations center via the wireless connection. Devices/services that the OBC/wireless setup enables include the following.

  - **Mobile worker access to web services and back-office systems.** The OBC/wireless setup essentially allows the truck to become a rolling office. The mobile worker (driver) can use a data terminal or a PDA and the truck's wireless internet connection to tie to web services and corporate back-office systems hosted on servers at the fleet operations center.

  - **Panic buttons.** Panic buttons (dashboard or key fob) allow drivers to send emergency alert messages to the fleet tracking center &/or fleet dispatchers. If used with an OBC, a driver-carried panic button unit can be used to remotely disable the truck.

  - **Vehicle disablement and e-locks.** Connecting the OBC/modem with vehicle operating systems allows dispatcher-initiated remote vehicle shutdowns and trailer door locking/unlocking. Electronic cargo locks (e-locks) prevent unauthorized cargo access.

  - **Security alert notification** Connecting the OBC/modem with vehicle operating systems allows security alerts to be sent to pre-established contacts when onboard sensors, including trailer disconnect, tamper, volumetric, door (e-lock), radiation, temperature are tripped.

GIS-based tools support sophisticated asset tracking programs.

Sensors connected to an on-board computer allow fleet managers to track a wide variety of conditions on a truck using browser-based systems.

- **Biometrics and smartcards—** These devices are used to positively identify drivers to shippers, consignees, and to their vehicles. Smartcards with predetermined driver-specific information can be used with biometric fingerprint scanners to validate drivers' identities and record drop off, pickup, and truck start up events. When used in the truck, the "bio-login" process sends alerts to dispatchers if an unauthorized person attempts to operate the truck.

- **Routing, Monitoring & Reporting Software** — Software at the fleet operations center allows fleet manager to set up efficient routes and to monitor route compliance. The software also provides detailed operational reports to the fleet manager.

    - **Enhanced route planning** is provided through efficient routing optimization.

    - **Schedule adherence** provides the ability to track how well a vehicle adheres to a planned schedule and issue alerts whenever a vehicle deviates from the path. Users can build schedules using their in-house planning system and upload to the fleet operations center. Notifications such as "behind schedule", or "stopped too long" may be sent to the fleet manager.

    - ✓ **Forensic software** provides a log of location, speed, working hours, idle time, alarms and vehicle history.

    - ✓ **Command center/ activity reports** automatically access all fleet location and vehicle usage data through detailed activity reports and enable the verification and validation of a wide range of fleet activity from business mileage reporting to "on-the-job times".

A typical smart truck hardware setup (GPS, wireless modem, OBC) costs $1,000-$2,500/per truck. Fleet management services using cellular networks cost about $50/truck/month (higher for satellite based systems).

Many trucking companies have already installed smart truck fleet tracking systems. Over the past 15 years, for example, Qualcomm has installed its commercial communications and vehicle tracking technology on more than 500,000 commercial vehicles. Qualcomm is far from alone in a crowded marketplace. Many firms offer fleet tracking systems and services and some, such as PeopleNet and Safefreight Technology, specialize in hazmat fleet tracking/security systems. In addition, companies such as Savi/Lockheed Martin are integrating smart truck and RFID technology into enterprise supply chain systems to protect hazardous materials shipments (refer to URLs below for additional information). [7] [8]

Commercial smart truck systems are widely available and inexpensive to deploy. Companies are increasingly integrating smart truck/RFID technologies into enterprise supply chain systems to protect hazmat shipments.

2.2   What are the building blocks of a Tier 1 HSSM truck tracking center?

Figure 3 presents a general schematic of a Tier 1 HSSM truck tracking center. As indicated in Figure 3, six basic functional components – or building blocks - are needed to build a hazmat truck tracking system.

1. An **XML-based interface** with fleet tracking vendors feeds data from truck-mounted smart devices to a hazmat truck tracking center.

2. A **web interface** (portal) allows shippers and carriers to interact with the truck tracking center (registration, e-manifest, e-route) and to submit/view corporate data.

3. The hazmat truck tracking operations center **merges data** flowing into it to create actionable information for government agencies.

4. A **risk (business rules) engine** provides dynamic risk profiling of hazmat shipments between gate-out and gate-in to identify "risky" shipments.

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[7] Qualcomm http://www.qualcomm.com/qwbs/solutions/home_sec_overview.shtml
Safefreight Technology http://www.safefreight.com/index.php
PeopleNet http://www.peoplenetonline.com/
Savi/Lockheed Martin Chemical Custody Supply Chain Solution http://www.savi.com/solutions/so.chem.chain.sht ml

[8] For an overview of smart truck technology - "*Homeland Security and the Trucking Industry*", July 2005, University of Minnesota and American Transportation Research Institute
http://www.atri-online.org/research/results/Homeland%20Security%20Trucking%20Industry%20ATRI%20Final.pdf

5. Business **process workflow processing and data processing** results are displayed on desktops and workstations in a truck tracking operations center.

6. A **communications infrastructure** supports efficient interaction/consultation with government action agencies, hazmat carriers, and first responders.

Figure 3. Building blocks of a hazmat truck tracking center.
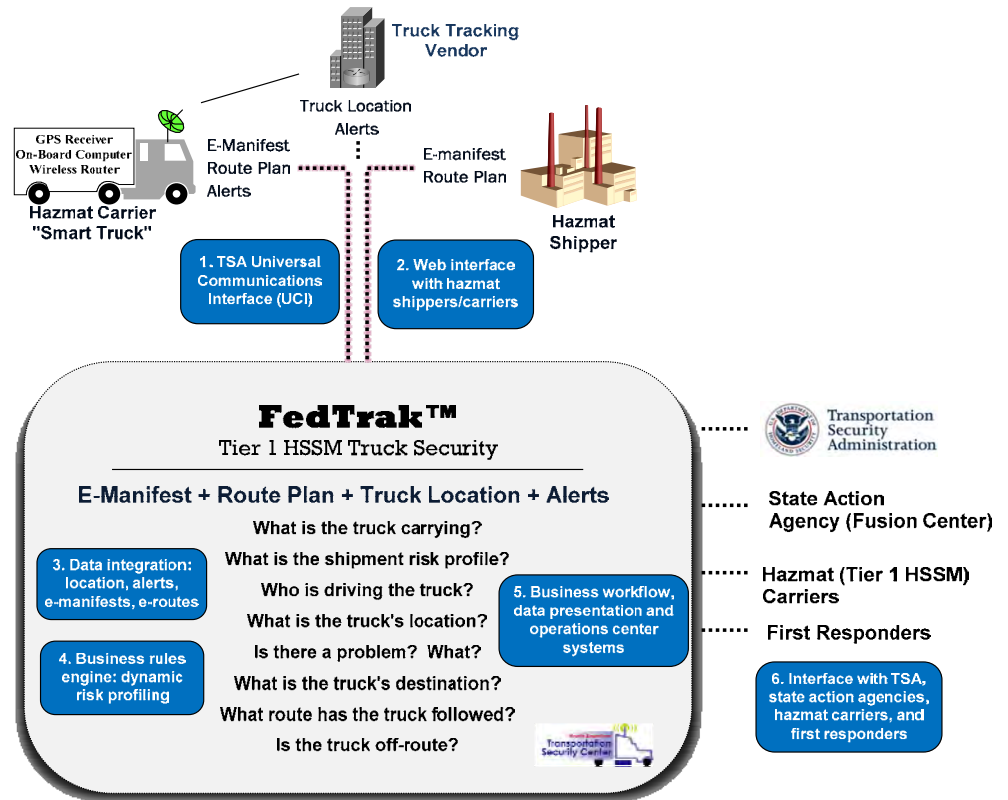
3.0 Hazmat fleet tracking vendors are positioned to meet TSA Tier 1 HSSM regulatory requirements.

TSA intends to issue regulations for Tier 1 HSSM shipments that will be based on the Security Action Items TSA published on June 26, 2008. TSA's Tier 1 HSSM regulations will likely require Tier 1 HSSM carriers to deploy smart truck technology and to submit data to a Tier 1 HSSM truck tracking center via fleet tracking vendors such as Qualcomm, Safefreight and PeopleNet. Qualcomm, Safefreight, and PeopleNet – like other fleet tracking vendors - have mature smart truck products and services and are well positioned to meet the future regulatory needs of Tier 1 HSSM carriers.

This section highlights the product/service offerings of fleet tracking vendors in relation to anticipated TSA Tier 1 HSSM regulatory requirements.

3.1   TSA regulations will likely require Tier 1 HSSM shippers, carriers, and fleet tracking vendors to implement truck tracking programs and submit data to a Tier 1 HSSM truck tracking center.

Figure 4 describes key regulatory elements that TSA is likely to include in a Tier 1 HSSM regulatory program. **Figure 5** describes the technology implications of a TSA Tier 1 HSSM regulatory program.

Figure 4. Potential TSA Tier 1 HSSM regulations.

Potential Tier 1 HSSM Regulatory Elements		
Tier 1 HSSM Shippers	**Tier 1 HSSM Carriers**	**Fleet Tracking Vendors**
• Register with TSA Tier 1 HSSM truck tracking center. • File electronic manifest with TSA Tier 1 HSSM truck tracking center before "gate out".** • File electronic route plan with TSA Tier 1 HSSM truck tracking center before "gate out". ** • May not release a Tier 1 HSSM shipment to a driver that does not have a CDL with a hazmat extension or to a carrier that does not possess a hazmat safety permit. ** Requirement may also be satisfied by shipper's carrier	• Deploy compliant smart truck devices and use compliant Fleet Tracking Vendor. • Register with the TSA Tier 1 HSSM truck tracking center. • Use the services of a truck tracking vendor that has TSA Tier 1 HSSM truck tracking center compliant systems and service offerings. • Respond to inquiries and alerts issued by the TSA Tier 1 HSSM truck tracking center. • Must have the ability to communicate with a driver hauling a Tier 1 HSSM shipment. • Provide drivers of Tier 1 HSSM shipments the ability to send a panic alert.	• Report the location of a carrier's vehicle hauling a Tier 1 HSSM shipment to the TSA Tier 1 HSSM truck tracking center in a manner and at a polling frequency specified by the Transportation Security Center. • Report alerts and messages from installed smart truck devices on the carrier's vehicle to the TSA Tier 1 HSSM truck tracking center in a manner specified by the TSA Tier 1 HSSM truck tracking center.

Figure 5. Implications of TSA's Tier 1 HSSM Security Action Items

Implication of SAI 17 – SAI 23 for Tier 1 HSSM Shipments	
Tier 1 HSSM Carrier Technology Deployment	
Core Technology Suite	Truck-mounted GPS receiver On-board computer Wireless modem.
Additional Devices	Untethered trailer tracking system Driver authentication & vehicle immobilization system In cab &/or remote driver panic buttons
Functional Requirements **Tier 1 HSSM Truck Tracking System**	

    ✓   Users must be able to enter an electronic manifest (load type/quantity; shipper, carrier and receiver information; driver information; vehicle information; estimated time of arrival).

    ✓   Users must be able to enter primary and alternate routes (electronic route plan).

    ✓   System should automatically monitor route adherence and send alerts as needed. Also, monitor location shipment location in relation to critical infrastructure. Dynamic risk profiling of shipments.

    ✓   System should process alerts (panic button, untethered trailer tracking, vehicle immobilization) from truck

tracking vendors.

✓ System must be able to accept "gate out" and "gate in" notifications.

✓ System should monitor shipment chain-of-custody between "gate out" and "gate in".

✓ The business processes underlying the TSA Tier 1 HSSM requirements should be automated with monitoring systems serving as the messaging mechanism.

✓ System should be able to alert en-route carriers/drivers that Orange or Red conditions have been implemented by DHS and that alternate routing should be taken.

✓ System should be able to accept carrier input that the driver is delayed (ETA change) or that the driver is taking an alternate route.

3.2 TSA's Security Action Item #23 suggests TSA will require Tier 1 HSSM carriers to deploy untetethered trailer tracking systems.

Section 1.2 describes TSA Security Action Item #23, Tractor and Trailer Tracking Systems. SAI #23 suggests that Tier 1 HSSM carriers deploy untethered trailer tracking systems to detect unanticipated trailer disconnects between shipment "gate out" and "gate in".

In late 2004, FMCSA completed the Hazardous Materials Safety and Security Field Operational Test. The FOT included an element to test a basic untethered trailer tracking (UTT) system. This system provided trailer position and identification information to a dispatcher on a regular basis.

The House of Representatives Report 107-722, *Department of Transportation and Related Agencies Appropriations Bill*, directed the FMCSA to conduct further study into untethered trailer tracking (UTT) systems. According to the report:

FMCSA conducted a Congressionally-mandated study on untethered trailer tracking systems, completing the study December 2005.

> *"…Truck trailers pose a significant potential security threat since they provide an easy means to transport dangerous cargos. In addition, the inability to track freight movements causes inefficiencies in the intermodal freight transportation system, increasing operating costs and congestion, and decreasing safety, economic competitiveness, and air quality. While commercially available technology can track a trailer when it is tethered to a cab, commercially available technologies are needed to track and control an untethered trailer. … the Committee has provided the funding to leverage existing technology and develop an untethered trailer tracking and control system that will provide real-time trailer identification, location, geo-fencing, unscheduled movement notification, door sensors, and alarms."*

A number of fleet tracking vendors offer untethered trailer tracking systems. Equipment costs are low.

The FMCSA evaluated commercial UTT systems completing its study in December 2005.[9] The study found that the market for UTT products and services was well served by a number of fleet tracking vendors and that the cost of an UTT system, including software, hardware, antennas and transponders, ranges from approximately $600 to $900 for the system with monthly maintenance fees starting at approximately $12 to $70 per month per trailer. Sections 3.2.1 – 3.2.4 are drawn from FMCSA's UTT study.

3.2.1 How do UTT systems work? [10]

Untethered trailer tracking systems are comprised of communications and computer technologies for tracking a trailer when it is connected to and disconnected from a truck tractor. These systems use satellite-tracking Global Positioning System technology, supplemented by satellite or cellular communications technologies to monitor and track the locations of trailers. Date and time-stamped position reports with the longitude and latitude of a tracked trailer can be sent to a carrier on a regular, event, or on-demand basis via a website, or they can be downloaded to carrier fleet management systems.

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[9] Untethered Trailer Tracking and Control System; FMCSA; December 2005
http://www.fmcsa.dot.gov/facts-research/research-technology/report/untethered-dec05/untethered-dec05.pdf

Untethered Trailer Tracking and Control System Operational Requirements Document; FMCSA; August 2005.
http://www.fmcsa.dot.gov/facts-research/research-technology/report/untethered/untethered-trailer-tracking.pdf
[10] This overview is taken from FMCSA's description of UTT technology; FMCSA Commercial Motor Vehicle Safety and Security Systems Technology – Untethered Trailer Tracking Systems http://www.fmcsa.dot.gov/facts-research/systems-technology/product-guides/untethered-trailer-tracking.htm

Currently available systems allow carriers the flexibility to input asset management settings for their own operations, such as assigning identification numbers to tracked trailers, determining how alerts are generated, and setting up the time intervals for receiving information. For most systems, the location of a single trailer or multiple trailers can be viewed in a map format that includes historical locations and the most recent location of a trailer in various views, including views of the country, region, city, and street where the trailer is located. Also, trailers can be viewed within a specific distance from a specified landmark, longitude/latitude, or population center. Tabular views of output files can show a carrier's fleet and detailed position history of individual vehicles in transit. Using this information, dispatch, logistics, and management personnel can locate assets, respond to shipping and delivery demands, and identify underutilized trailers.

Some UTT systems may be configured to establish geo-fence boundaries around individual trailers. A geo-fence is an electronic boundary that a user can create to monitor trailer location and movement. For example, a user could locate a trailer on a map and draw a geo-fence around the trailer position by clicking and dragging a mouse. The geo-fence may be assigned to a trailer or to groups of trailers. Geo-fences may also be removed or inactivated for trailers or groups of trailers at any time. Once the geo-fence is set and configured to provide an alert, the system will send a notification to the user if the trailer crosses the geo-fence boundary. Typically, the system will send an alert when a trailer exits or enters the boundary through an email or pager notification. Several systems also provide event-driven exception reporting. Exception-driven reporting will allow the system to monitor trailer position and check for geo-fence breaks frequently, but only send a message if a geo-fence break is detected. Frequent checking for geo-fence breaks without sending frequent messages lowers messaging costs and increases battery life. Geo-fencing can also be utilized in conjunction with some systems that provide trailer connection and disconnection notification information to the carrier's on-site personnel so that they are aware of this tractor trailer information.

Currently available UTT systems may be integrated with sensors that transmit information back to fleet managers and dispatchers. Various types of sensors are capable of detecting cargo presence, temperature, volume, radiation, gas leaks, motion, and door openings and closings. For example, an ultrasonic cargo sensor can detect the presence of cargo in the trailer by indicating if the trailer is unloaded or loaded. A cargo event is defined as the transition from completely unloaded to partially or completely loaded or vice-versa. The systems can be configured to wake up to check the cargo status at a predefined frequency. Utilizing event-driven exception reporting, a status message is sent only when the cargo status changes.

As another part of the system, a door sensor can monitor an open or closed door event on the trailer. A door event is defined as the transition from open to closed or from closed to open. The trailer door sensor can work in combination with the cargo sensor, so that only those door state changes that might affect cargo are sent to the user. For example, it is possible to configure the system to send door open events if there is cargo in the trailer and to ignore door open events if the trailer is empty.

Most systems integrated with sensors generate trailer position information with every message and status report, which is provided to a fleet manager's or dispatcher's computer. Position information can be user-configured to be generated and sent at predetermined time intervals, and it can also be generated and sent upon demand from the dispatcher's computer. The position reporting frequency is configurable, and many systems have a store and forward capability, if there is a loss of signal.

In most cases, UTT unit terminals are compact, low-profile, and environmentally rugged enclosures, designed to be easily installed on the top of or inside the trailer. UTT systems require a power source and power management strategy for long periods of inactivity, since trailers maybe stored in terminals for long periods of time. Currently available systems can be recharged when the trailer is connected to the tractor via the electrical connector (pin 7 on the J560 7-way connector). Some systems can be recharged via solar cells.

Possible limitations of UTT systems may include a loss of signal, cellular channel traffic overload, or equipment problems, such as limited battery life.

3.2.2   The FMCSA developed functional specifications for UTT systems and conducted a field test of commercial trailer tracking systems.[11] [12]

As directed by Congress, FMCSA administered a pilot test for the development of a UTT system in 2005. The purpose of this pilot was to test a UTT system that met specific functional requirements and could improve the safety and security of trailers and shipments at each phase of its movement – pick up, delivery, receipt, and storage.

Eight functional specifications were developed for UTT systems. The eight specification areas are described below.

1. **Near real-time trailer identification.** Trailer identification is established via position reports sent from the UTT system terminal on the trailer. The UTT system terminal monitors the Global Positioning System (G for its location, checks other on-board sensors, and sends this information over the air (OTA). The information presented to the user includes the trailer identification number (ID) and trailer type, as well as the user Standard Carrier Alpha Code (SCAC). The user can view the host software to find the latest trailer location and status on a map. Trailer locations are displayed relative to predefined landmarks or street or highway intersections. The trailer status refers primarily to three key pieces of information: whether the trailer has cargo or is empty, whether the door is open or closed, and whether the trailer is connected or disconnected to a tractor. If the latest scheduled report is not sufficiently current, the user can request an update from the UTT system terminal. The request will be answered immediately if the terminal is awake. Otherwise, the request will be queued until the next scheduled wake-up time.

2. **Time of trailer connection and disconnection.** The time of trailer connection and disconnection refers to the time that a trailer is physically connected or disconnected from a tractor. For example, a trailer is typically disconnected from the tractor when the tractor-trailer arrives at a destination where the trailer may be unloaded while the tractor departs to pick up and move another trailer.

3. **Trailer location and mapping.** Trailer positions are established via GPS or other locating technology. The UTT system terminal is configurable to wake up to check for positions at user-defined intervals. Once the position has been established, the coordinates are reported to the user visually at the carrier site through a map interface. Although latitude and longitude are provided, the user would normally see the trailer's position on a map with reference to highways, streets, intersections, or user-defined landmarks.

4. **Geo-fencing.** A geo-fence is an electronic boundary that a user can create to monitor trailer location and movement. Geo-fences may be created, viewed, and edited visually on an interactive map. For example, a user could locate a trailer on a map and draw a geo-fence around the trailer position by clicking and dragging a mouse. The geo-fence may be assigned to a trailer or to groups of trailers. Once the geo-fence is set and configured to provide an alert, the terminal will send a notification to the user if the trailer crosses the geo-fence boundary. The geo-fence will send an alert when a trailer exits or enters the boundary through an email or pager notification. Geo-fences may also be removed or inactivated for trailers or groups of trailers at any time.

   The UTT system will provide an on-board geo-fence with event-driven exception reporting. Exception-driven reporting will allow the UTT system to monitor trailer position and check for geo-fence breaks frequently, but send a message only if a geo-fence break is detected. Frequent checking for geo-fence breaks without sending frequent messages lowers messaging costs and increases battery life.

   A geo-fence might be used to ensure that a trailer remained in a general area, such as the Los Angeles basin. In this example, the user would create a geo-fence around Los Angeles and then assign that geo-fence to a trailer or group of trailers.

The FMCSA developed functional specifications for untethered trailer tracking systems and conducted tests of commercial systems.

Geo-fences can be built around a trailer or a geographic area.

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[11]Untethered Trailer Tracking and Control System; FMCSA; December 2005
 http://www.fmcsa.dot.gov/facts-research/research-technology/report/untethered-dec05/untethered-dec05.pdf

[12] Untethered Trailer Tracking and Control System Operational Requirements Document; FMCSA; August 2005.
 http://www.fmcsa.dot.gov/facts-research/research-technology/report/untethered/untethered-trailer-tracking.pdf

If a trailer was taken from the Los Angeles area, an alert would be generated and the user notified. This type of geo-fence might permanently remain in effect if this trailer or group of trailers were meant to stay in that area indefinitely. A geo-fence could also be created around a particular destination, such as a receiving warehouse. When the trailer entered this geo-fence, an alert would be generated so that the user would know that the trailer was delivered within a certain timeframe.

Using the UTT system, a user can set a self-centered geo-fence, which provides a quick way to set a geo-fence without forcing the user to locate the area on the map. A self-centered geo-fence uses the position of the trailer at the time of receiving the "set self-centered geo-fence" command to create the geo-fence boundary. The user does not have to create the geo-fence on a map or choose settings for that geo-fence. As with any geo-fence, an alert will notify the user if the trailer breaks the geo-fence boundary while the geo-fence is active.

5. **Trailer cargo sensing.** As a part of the UTT system, an ultrasonic sensor detects the presence of cargo in the trailer by indicating if the trailer is unloaded or loaded. A cargo "event" is defined as the transition from completely unloaded to partially or completely loaded or vice-versa. The UTT system terminal wakes up to check the cargo status at a predefined frequency, and a status message may be sent depending on user-chosen settings. For example, an erroneous detection could occur if a person walks into the trailer at the moment the sensor is taking a reading of cargo status. In this case, assuming the person exits the trailer, a second check would show the true unloaded state of the trailer. Validation of cargo events decreases the probability of erroneous state detections.

6. **Trailer door sensing.** As a part of the UTT system, the trailer door sensor monitors for an open or closed door on the trailer. A door event is defined as the transition from open to closed or from closed to open. The trailer door sensor can work in conjunction with the cargo sensor, so that only those door state changes that might affect cargo are sent to the user. For example, it is possible to configure the system to send door open events if there is cargo in the trailer and to ignore door open events if the trailer is empty.

7. **Alerts.** Alerts are generated by the UTT system host software and presented to the viewer through an alert icon that is displayed near the trailer ID. Alerts are based on a combination of user-preferred settings and events which are generated from the mobile terminal. Alerts are used to notify the user of events, such as geo-fence violations. Alerts can be configured to be forwarded to email or pager addresses.

8. **Software requirements.** Requirements for the software that is visible to the system user are included in this section. The UTT system-provider hosts this software that may be accessed by users through the Internet. Using the software, the user may view information, such as trailer positions and cargo, door, geo-fence, or connection events, or configure settings for the system such as landmarks, trailer groups, and user accounts. Additional software requirements are listed in sections above describing time of trailer connection and disconnection, trailer location and mapping, geo-fencing, alerts, and incorporation of fleet management tools.

3.2.3 What are the benefits/costs of UTT? [13]

Untethered trailer tracking can provide an added measure of efficiency and security to commercial vehicle operations. In the United States, the trucking industry uses approximately three times as many trailers as tractors; therefore, loaded and empty trailers can be subject to both theft and terrorism. Trucking companies often buy excess trailers in order to have empty ones on hand to ensure that their most expensive assets - their tractors - are kept busy, leading to the availability and accessibility of trailers and unattended cargo. Due to a lack of manpower and adequate trailer storage facilities, these trailer stockpiles may be either inaccurately assessed or unknowingly disbursed at various locations, increasing their vulnerability to misuse. When a trailer is removed from its dropped location and erroneously moved or parked, a trucking company typically conducts lengthy searches to locate it. As a result, both inefficient operations

Ultrasonic sensors can be used to detect if a trailer is loaded or unloaded.

The FMCSA study described the benefit of untethered trailer tracking systems. Systems cost $600-$900/truck to deploy.

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[13] FMCSA Commercial Motor Vehicle Safety and Security Systems Technology – Untethered Trailer Tracking Systems
http://www.fmcsa.dot.gov/facts-research/systems-technology/product-guides/untethered-trailer-tracking.htm

and security risks prevail in these situations. To reduce the inefficiencies and vulnerabilities relating to the lack of visibility of trailers and their cargo, UTT tracking systems can provide the location of trailers along with additional information, such as cargo and door status indications, trailer movements, and trailer connections and disconnections.

Enhanced operational efficiency and security are major benefits of UTT systems. Assuring the location and movement of trailers can improve security and operational efficiency by allowing timely recovery of lost or stolen trailers. Trailer yard operational performance can become more efficient through improved record keeping with the automated processes of these systems, since time is not wasted by manually searching for lost trailers. Technology for tracking trailers enables a quick response to find trailers and a tracking capability for thefts in progress. Trailer tracking also provides information about where a trailer has been and how long it was missing.
relating to the lack of visibility of trailers and their cargo.

The UTT system can also be used to maintain an accurate inventory of cargo and trailers in the yard for secure and efficient operations. Yard operations can be better integrated with dock operations to efficiently transfer and accurately track the processing of both inbound cargo deliveries and outbound shipments, particularly high risk loads. Resulting performance benefits of enhanced cargo operations would be improved on-time deliveries, a reduction in yard congestion, and better cargo theft detection and recovery.

The installed cost of UTT systems varies depending upon the type of technology and various sensors that are included with the system. Most systems are a combination of hardware, software, installation, maintenance/service, and recurring monitoring and use fees. The cost of an UTT system, including software, hardware, antennas and transponders, ranges from approximately $600 to $900 for the system with monthly maintenance fees starting at approximately $12 to $70 per month per trailer, depending upon the type of plan that is purchased. Some plans include a flat fee, while others are based on a flat fee in addition to per-message or air-time usage fees. This price does not reflect the price of servers and dispatch systems, which can vary depending on the customers. The inclusion of various other sensors to the system incurs additional costs. For example, cargo and door sensors cost approximately $50 each. The systems can be installed by the manufacturer or experienced technicians utilizing detailed manufacturer guidelines.

A number of truck tracking vendors offer commercial untethered trailer tracking systems.

3.2.4   Who offers UTT products and services?[14]

As illustrated in **Figure 6**, the market for UTT products and services is well served by a number of truck tracking vendors. Note: Figure 4.2.a is not a complete list of UTT vendors.

Figure 6. The market for UTT products is served by a number truck tracking vendors.

Fleetilla, Inc. 1745 Fritz Dr. Trenton, MI 48183 Phone: 734-699-6153 www.fleetilla.com	**GE - Trailer Fleet Services** Phone: 800-333-2030 www.trailerservices.com	**Interlink Logistics, Inc.** Corporate Headquarters 6658 W. Robinwood Lane Franklin, WI 53132 Phone: 630-258-3078 www.cargotracs.com/truckload.asp	**PAR Logistics Management Systems** 5152 Commercial Drive East Yorkville, NY 13495 Phone: 315-738-0600 ext:846 http://www.parlms.com
PeopleNet 1107 Hazeltine Blvd, Suite 350 Chaska, Minnesota 55318 Phone: 888-346-3486 Fax: 952-368-9320 www.peoplenetonline.com	**QUALCOMM Incorporated** 5775 Morehouse Drive San Diego, CA 92121-1714 Phone: 858-587-1121 www.qualcomm.com	**Safefreight Technology (USA)** 8000 N.E. Parkway Drive Suite 200 Vancouver, Washington 98662 Phone: 360-256-1280 Fax: 360-397-0167 www.safefreight.com	**Skybitz** 22455 Davis Drive Suite 100 Sterling, VA 20164 Phone: 703-478-2364 Fax: 703-478-3301 www.skybitz.com

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[14] FMCSA Commercial Motor Vehicle Safety and Security Systems Technology – Untethered Trailer Tracking Systems
http://www.fmcsa.dot.gov/facts-research/systems-technology/product-guides/untethered-trailer-tracking.htm

3.3 TSA's Security Action Item #21 suggests TSA will require Tier 1 HSSM carriers to deploy vehicle immobilization systems.

Section 1.2 describes TSA Security Action Item #21, Tractor Activation Capability. SAI #23 suggests that Tier 1 HSSM carriers deploy driver authentication/vehicle immobilization systems to prevent unauthorized drivers from gaining or maintaining control of Tier 1 HSSM shipments.

FMCSA's Hazardous Materials Safety and Security Technology Field Operational Test quantified the security costs and benefits of smart truck technology. After the FOT, Congress directed FMCSA to undertake the Untethered Trailer Tracking and Control Security project. These projects used wireless communication systems and GPS tracking as base technologies and included the wireless transmission of tracking data to law enforcement and emergency responders, in addition to the carrier. It was determined that additional technologies, including panic buttons, driver identification, and vehicle disabling could be built onto the wireless communication system to obtain additional security benefits.

In FY 2005, the House of Representatives Conference Report 108-792 directed the FMCSA to conduct further testing of smart truck technologies, including vehicle immobilization systems (VIS). There are different types of vehicle immobilization systems. Some utilize on-board electronics to immobilize the vehicle's engine or braking system to gradually decelerate a vehicle in transit or prevent its initial operation. Others can be engaged remotely using a combination of on-board computers integrated with wireless communications; or non-remotely, utilizing technologies that the driver, operator, or, in some instances, the vehicle itself could execute locally. The systems can be activated manually or automatically based on pre-programmed security conditions.

> FMCSA conducted a Congressionally-mandated study on vehicle immobilization systems, completing the study November 2007.

The FMCSA evaluated commercial VIS products and services and found that the market for VIS products/services was well served by a number of fleet tracking vendors.[15] The incremental cost for a VIS system is about $500-$700/truck.

The FMCSA developed eight detailed functional specifications for UTT systems 1). near real-time trailer identification; 2). time of trailer connection and disconnection; 3). trailer location and mapping; 4). geo-fencing; 5). trailer cargo sensing; 6). trailer door sensing; 7). alerts; 8). software systems. The FMCSA also developed detailed functional requirements for vehicle immobilization systems.

Sections 3.3.1 – 3.3.4 are drawn from the FMCSA studies on vehicle immobilization systems.

3.3.1 What is a vehicle immobilization system? [16]

There are different types of vehicle immobilization systems. Some utilize on-board electronics to immobilize the vehicle's engine or braking system to gradually decelerate a vehicle in transit or prevent its initial operation. Others can be engaged remotely using a combination of on-board computers integrated with wireless communications; or non-remotely, utilizing technologies that the driver, operator, or, in some instances, the vehicle itself could execute locally. The systems can be activated manually or automatically based on pre-programmed security conditions.

> Vehicle immobilization systems fall into two categories: 1). remote disabling systems; and 2). non-remote disabling systems.

Remote vehicle disabling systems typically rely on a wireless communication system to provide their basic functionality. They can be integrated with panic buttons and on-board computers requiring user identification and/or password log-ins. For non-remote systems, a keypad or key-fob may be utilized as a part of these systems for arming, disarming, and controlling the security system at the asset itself. Non-remote manual systems can also involve the use of in-cab shut-off devices to other vehicle systems, such as electronic ignitions and air brakes.

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[15] Vehicle Immobilization Technologies: Best Practices for Industry and Law Enforcement; FMCSA; November 2007
swww.fmcsa.dot.gov/facts-research/research-technology/report/VIT-**Best-Practices**-Law-Enforcement-Nov2007.pdf

[16] The sections is taken from the overview of vehicle disabling systems on the Federal Motor Carrier Safety Administration Website;
http://www.fmcsa.dot.gov/facts-research/systems-technology/product-guides/vehicle-disabling.htm

Remote disabling systems enable a control center to prevent a truck from being used by an unauthorized driver or to stop a moving truck.

Remote vehicle disabling systems provide authorized users at remote locations such as an operations center the ability to prevent an engine from starting, prevent movement of a vehicle, and to stop or slow a moving vehicle. Remote disabling allows a dispatcher or other authorized personnel to gradually decelerate a vehicle by downshifting, limiting the throttle capability, or bleeding air from the braking system from a remote location. Some of these systems provide advance notification to the driver that the vehicle disabling is about to occur. After stopping a vehicle, some systems will lock the vehicle's brakes or will not allow the vehicle's engine to be restarted within a certain timeframe.

Remote disabling systems can also be integrated into a remote panic and emergency notification system. In an emergency, a driver can send an emergency alert by pressing a panic button on the dashboard, or by using a key-fob panic button if the driver is within close proximity of the truck. Then, the carrier or other approved organization can be remotely alerted to allow a dispatcher or other authorized personnel to evaluate the situation, communicate with the driver, and/or potentially disable the vehicle.

Non-remote disabling systems enable authorized drivers to stop a moving truck; prevents unauthorized drivers from driving the truck.

Non-remote vehicle disabling systems provide authorized users the ability to restrict or prevent vehicle operation in three ways: through the use of wireless technology when they are near the vehicle; through on-board actions by the driver/operator; or through a combination of both. Non-remote vehicle disabling systems include driver identification authentication technologies, tamper detection alerts, brake locks, and emergency notification panic buttons for disabling the truck in case of an emergency or other event.

A single sign-on module is utilized for driver authentication in order to initiate the operation of a vehicle. The driver uses passwords, pin numbers, or biometrics to start the vehicle and to access other on-board wireless communications applications. All activities related to the use of the vehicle are associated with the driver signed-in at the time. This information can be used for dispatch, driver performance, and driver log purposes.

Several different types of technologies can be used to non-remotely disable a vehicle. Panic buttons carried by the driver or within reach of the driver inside the vehicle can be activated to disable a vehicle or send out an emergency notification. Electronic ignition systems allow the driver to automatically activate the system when the key is removed from the ignition and reactivate the system when the key is replaced into the ignition. A relatively low-cost means of vehicle disabling is the utilization of a brake lock device to prevent the movement of the vehicle. A brake lock device shuts down the air line from the tractor to the air brakes in the tractor (and if hooked up, to the trailer). Release of the brake lock system is the only way to move the vehicle.

3.3.2 *The FMCSA evaluated vehicle immobilization systems and developed functional requirements.*

Important components of vehicle disabling systems are hardware mechanisms that restrict vehicle use. Some are on-board computer technologies that identify the driver to allow authorized use while preventing unauthorized use. Others utilize mobile communication technologies that allow a remote dispatcher or other operator to communicate with the driver and/or the vehicle, and if necessary, activate the vehicle disabling system.

Driver authentication is a vital part of many vehicle disabling systems. Intelligent on-board computers can be utilized for driver identification through global login access where a driver enters login information into a cab-based interface. Similar to a username and password on a computer system, global login is an authentication feature of some wireless communications systems. Through the use of a driver login process, the login information (user ID and password) entered into the truck-based interface by

the driver is verified by preset procedures both locally on the vehicle and over the air using the wireless communication system. If this verification fails, various configurable alerts and resulting actions can be triggered up to and including vehicle disabling with the aid of an on-board computer.

Other authentication technologies utilized in several vehicle disabling systems range from PIN number entry to biometric-based systems. The most common biometric-based technologies for vehicle disabling utilize driver fingerprints. If the driver's fingerprint matches the fingerprint information on a biometric smart card carried by the driver, then the driver is verified and able to start the vehicle. If a match is not made, the vehicle cannot be started and the fleet dispatcher is typically notified of the failed attempt.

Vehicle disabling systems can be integrated with many on-board wireless communications systems that include other features, such as door sensors, cargo sensors, temperature sensors, electronic cargo seals, and trailer connection and disconnection systems. For example, if an on-board computer system detects a loss of signal from the communication network or tampering of electronic cargo seals, a pre-determined vehicle disabling protocol can be initiated.

Additional monitoring processes using on-board sensors that detect changes in load volume, door status, exposure to radiation, or temperature can a generate security alert notification that will trigger a vehicle disabling protocol. In vehicles that monitor trailer information, a vehicle disabling protocol can be prompted when a trailer has been disconnected from its assigned tractor or when a trailer door lock system has been violated.

Vehicle disabling protocols can also be activated by critical changes in the status of important vehicle systems. Since on-board computers monitor processes such as coolant temperature and engine oil pressure, a message can be sent to the driver and dispatcher about these conditions alerting them that systems are at unsafe levels. Then, a vehicle can be prevented from starting if unsafe system parameters are discovered prior to vehicle usage. Carriers with refrigerated units are significant users of this feature.

Vehicle disabling can be utilized by authorized personnel with a wireless communication system's geo-fencing feature. Dispatchers or fleet operators can create a geo-fence or defined electronic boundary made up of geo-coded points for particular vehicles or routes. If a vehicle enters a restricted geo-fenced area, or exits the defined areas, the dispatcher or fleet operator can be alerted to take necessary actions to secure the vehicle. Currently, no systems available in the U.S. have the capability of engaging automatic vehicle disablement for geo-fence violations. Singapore's Hazmat Transport Vehicle Tracking System does, however, have the ability to automatically immobilize vehicles with geo-fence violations.

Oak Ridge National Laboratory conducted a field evaluation of commercial immobilization systems.

A study conducted by Oak Ridge National Laboratory for the FMCSA sorted vehicle immobilization technologies into two categories: 1). Vehicle Disabling Technologies (VDTs); and 2). Vehicle Shutdown Technologies (VSTs). VDTs are immobilization technologies that impede **restarting** a vehicle. They can be activated when the vehicle is moving or stationary, but the VDT will only immobilize the vehicle the next time an attempt is made to start it. VSTs, on the other hand, are technologies that cause a vehicle to **lose power while it is moving** and will cause it to eventually come to a stop, as well as impede the restarting of the vehicle after the technology has been triggered. While there are VIT systems that are composed only of a VDT, those that have vehicle shutdown capabilities always have vehicle disabling capabilities as well. [17]

Figure 7 illustrates the technology components of VSTs and VDTs.

At the core of a vehicle immobilization system is an electronic vehicle immobilization device (eVID).

At the core of most vehicle immobilization systems is an electronic vehicle immobilization device (eVID), (Item 1 in Figure 7) mounted somewhere in the engine compartment of the equipped vehicle. This device can be activated remotely and/or locally to impair the performance of the vehicle via acceleration control, throttle reduction, power reduction or engine shutdown.
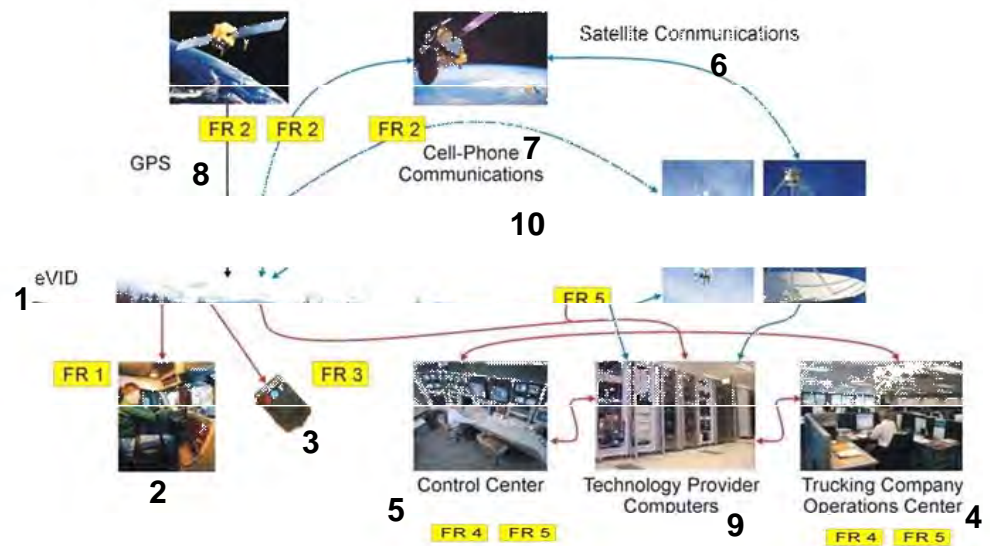
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[17] The remainder of this subsection is taken from Vehicle Immobilization Technologies: Best Practices for Industry and Law Enforcement; FMCSA; November 2007 swww.fmcsa.dot.gov/facts-research/research-technology/report/VIT-**Best-Practices**-Law-Enforcement-Nov2007.pdf

Figure 7. Technology components of a vehicle immobilization system.

Usually the default mode of the eVID is "active." That is, vehicles equipped with an eVID device cannot be started until the eVID is deactivated. The deactivation of the device can be achieved through different means (Item 2 in Figure 7) which range from keypads— the most common, where the driver enters a predefined code—to swipe cards and RFID (Radio Frequency Identification) tokens, up to biometric devices. Usually, the eVID is activated automatically when the driver shuts down the engine, but it can also be triggered when one of the cabin doors is opened while the engine is running (hijack prevention mode).

The eVID can be activated locally by the driver of a vehicle by use of a key fob.

Outside the cabin, with the engine idling, the eVID can be activated locally (i.e., at a short range) by the driver of the vehicle. This is done through a key fob device (Item 3 in Figure 7) similar to those used to lock/unlock the doors of passenger cars, but usually requiring two buttons to be pressed at the same time to avoid unintentionally triggering the device. The eVID can also be activate remotely by the dispatcher (Item 4 in Figure 7) or the technology provider (Item 5 in Figure 7) if the vehicle is equipped with a wireless communication system, generally satellite (Item 6 in Figure 7) or cellular communications (Item 7 in Figure 7), or both. This remote activation also requires a GPS device (Item 8 in Figure 7) that provides location information for the vehicle.

When activated, the system forwards the vehicle's location and eVID status to the technology provider's computers (Item 9 in Figure 7) using the available communication links (Items 6 or 7 in Figure 7). Conversely, from the technology provider's computers and using the same communication links, messages can be sent to the eVID, including those that initiate the shutdown of the vehicle while it is moving.

For the case of a local vehicle disablement (for example, when the eVID enters into a tampering mode after a given number of authentication attempts have been made and failed), the device generally disables the vehicle without waiting to receive a message from the central computers (i.e., the decision is made at the device level on the truck). However, the device sends a message to the technology provider's computers indicating the problem at hand (in the previous example, conveying that the device has entered into a tampering mode). In some cases, this message is immediately forwarded to the owner of the vehicle through e-mails or phone messages, so the trucking company can take some action (e.g., contacting the driver to determine the nature of the problem). In other instances, the vendor's control center manages the problem directly and, subsequently, notifies the owner.

Two different models for vehicle shutdown were described in the study. In the first model, the trucking company's operation center (Item 4 in Figure 7) has direct access to

the eVID (Item 1 in Figure 7) through the technology provider's computers (Item 9 in Figure 7) and the available communication links (Items 6 and/or 7 in Figure 7). The trucking company can then send a message to the eVID that initiates the shutdown (or disablement) process without any other exogenous intervention. The second model adds a technology provider's control center (Item 5 in Figure 7), which is the one that ultimately sends the message to the eVID to start the shutdown process. In this model, the technology provider's control center identifies the location of the vehicle in distress (Item 8 in Figure 7) and contacts the law enforcement organization with jurisdiction in that area. The shutdown process is initiated only when law enforcement personnel (Item 10 in Figure 7) are in visual contact with the truck and when they determine that is safe to do so. Of course, this involvement of law enforcement personnel is also possible in the first model, although it is a cumbersome process for the trucking company since it would have to have up-to-date contact information for all the law enforcement jurisdictions in the country.

For purposes of the project study, FMCSA identified five functional requirements (FRs) of interest for VITs.

- FR1: Vehicle disablement if the vehicle senses an unauthorized driver

- FR2: Vehicle disablement/shutdown in the event of a loss of signal

- FR3: Remote vehicle disablement/shutdown by the driver

- FR4: Remote vehicle shutdown by the dispatcher

- FR5: Remote vehicle shutdown by law enforcement

Functional requirement 1 falls into what has been defined in this document as a VDT, while FRs 4 and 5 fall under the VST umbrella.   FRs 2 and 3 would be applicable to both VDTs and VSTs, depending on whether the vehicle is stationary or moving.

The five functional requirements are mapped onto Figure 7. While all of the FRs involve the eVID in this generic VIT system, FR1 is restricted to the truck cabin, the driver, and the driver's interaction with the vehicle immobilization device. Notice that this particular FR can also be satisfied by means other than an eVID; that is, there are mechanical (e.g., brake locks) and other types of devices that can make the vehicle undrivable unless the device is disengaged.

Functional requirement 2 implies the activation of the eVID when one or more of the communication links, either GPS or data transfer, become unavailable for a given period of time. In general, the VIT systems that satisfy this FR allow the user to define the interval of time that needs to elapse before a loss of signal causes a vehicle shutdown. Loss of signal can also produce a vehicle disablement if, for example, a communication wire (e.g., antenna wire) is physically severed or even if somebody tampers with the antenna itself (e.g., covers the antenna with a metal dome) while the truck is idling. Remote disablement/shutdown by the driver (FR3) is accomplished, in general, by a key fob device that allows that driver to send a short range wireless message to the eVID for its activation. This can be achieved while the vehicle is idling (i.e., vehicle disablement) or if someone commandeers the vehicle while the driver is away but at a short range (i.e., vehicle shutdown), such is the case of a vehicle theft at a truck stop.

While the first three functional requirements involve VIT system components that are on the vehicle itself (e.g., in-cabin driver authentication devices for FR1, and antennas and communication systems for FR2) or at a very short distance (e.g., key fobs carried by drivers for FR3), FRs 4 and 5 involve VIT system components that can be located anywhere in the country. A remote vehicle shutdown relies on spatial information regarding the location of that vehicle and bi-directional communication links between centralized computers and the onboard eVID. Those computers can be accessed by an external control center and/or by the trucking company dispatcher. By mapping the vehicle's location information provided by the GPS device, it is possible to determine safe places to initiate the shutdown process or to provide information to law enforcement at the scene to identify the vehicle that is about to be shutdown. The bidirectional communication links with the vehicle serve to receive this spatial information and to send a message to the eVID to initiate the shutdown process.

3.3.3   What are the benefits/costs of vehicle immobilization? [18]

Depending on the actual vehicle disabling technologies utilized, fleet operators can have additional connectivity and communication with their drivers and vehicles compared with fleets not utilizing such technologies. When vehicle disabling systems are integrated with on-board communications and tracking systems, fleet managers can actively monitor security parameters, vehicle routes, performance, maintenance, and fuel usage—whether the vehicles are running locally or on a long-haul. These monitoring capabilities provide operational efficiency benefits for fleet management optimization by providing information about vehicle operation from origin to destination.

Vehicle disabling systems can improve secure operations of carriers who haul high-value or high-risk cargo, such as hazardous materials. Access can be limited to authorized drivers by dispatchers or fleet managers who can manage driver authentication codes and truck identifications, change codes over the air, and disable the vehicle, if necessary. To help prevent theft, a valid driver authentication code can be required before a vehicle can be started or moved. Also, if there is tampering with any integrated security device or fleet management system, the vehicle can be placed in a secure state and an alert can be sent over the air to the carrier. Carriers can also change driver authentication codes and secure a vehicle if a driver suddenly leaves the company, but still has access to the vehicle. The capability to disable the vehicle over the air is also available if dispatchers become aware of a stolen or hijacked vehicle. Even if a truck is moving, the vehicle's speed can be gradually reduced to allow the vehicle to be brought to a safe and controlled stop.

Technologies, such as ignition locks and brake locks can also be used to minimize vehicle theft by prohibiting vehicle movement. These security devices are permanently installed in the vehicle, and they must be utilized in order to operate the vehicle.

The cost of vehicle disabling systems depends upon the type of system installed (i.e., a simple on-board system versus a multi-functional system), the number of systems purchased, and the type of installation required. The costs for less complex on-board systems (such as an ignition lock or brake lock) range from under $100 to over $300 per unit, plus installation costs. Installation for these units could be done by a local technician.

The costs for basic, non-wireless driver authentication systems utilizing keypad entry range from approximately $500 to $700 per vehicle, plus installation costs. Installation for some of these units could be completed by a local technician.

The costs for systems integrated with on-board wireless communications and multi-functional features range from approximately $2,000 to over $3,000 per vehicle, plus installation costs. Installation for some of these systems can be completed by a trained technician who is familiar with the technology. However, for technical and/or security reasons, some systems require manufacturer installation only. In addition to installation costs, some vehicle disabling systems (especially remote monitoring systems) may also require a monthly fee for maintenance and monitoring.

3.3.4   Who offers vehicle immobilization systems?

The market for VIS products and services is well served by a number of vendors including those listed in **Figure 8**.

Figure 8. Vehicle immobilization system vendors

AirIQ, Inc. Product: OnBoard™ 1099 Kingston Road, Suite 233 Pickering, ON, Canada L1V 1B5 Phone: 905-831-6444 Toll Free: 888-606-6444 http://www.airiq.com	**GPS Management Systems** Product: Asset Tracking 480 E. Northfield Drive, Suite 500 Brownsburg, IN 46112 Phone: 800-914-8247 Fax: 317-852-0742 http://www.gpsmanagement.com	**Magtec Products (USA), Inc.** Product: M5K 871 Coronado Center Drive, #200 Henderson, NV 89052 Phone: 888-624-8320 E-mail: info@magtecproducts.com http://www.magtecproducts.com

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[18] The sections is taken from the overview of vehicle disabling systems on the Federal Motor Carrier Safety Administration Website; http://www.fmcsa.dot.gov/facts-research/systems-technology/product-guides/vehicle-disabling.htm

QUALCOMM Incorporated Product: Vehicle Command & Control 5775 Morehouse Drive San Diego, CA 92121-1714 Phone: 858-587-1121 http://www.qualcomm.com	Safefreight Technology (USA), Inc. Product: SmartFleet™ 8000 N.E. Parkway Drive, Suite 200 Vancouver, WA 98662 Phone: 360-944-6722 Fax: 360-253-6424 http://www.safefreight.com	Satellite Security Systems, Inc. (S3) Product: GlobalGuard 6779 Mesa Ridge Road, Suite 100 San Diego, CA 92121 Phone: 858-638-9700 http://www.satsecurity.com

The VIT products of two vendors, Magtec Products and GlenHugh Enterprise, are highlighted below.

MAGTEC Products, Inc.

The MAGTEC® VIT technology provides various features and capabilities, including a driver authentication system, vehicle protection logic, hijack code, maintenance code, and an acceleration control system, among other features (MAGTEC, 2005). The MAGTEC Authentication System includes a keypad used by the driver to enter a pre-assigned PIN or a driver authentication code; without a correct code, the onboard eVID would not allow the truck to be started. The Protection Logic component is an automated vehicle disabling technology that allows the driver to leave the truck idling and will prevent any unauthorized person from driving that truck. The system also offers a hijack code or under-duress code, which once entered and after some predefined period of time, will send a distress message to the dispatcher. However, regardless of any communication system, the hijack feature will always work and disable/shutdown the vehicle; that is, once the hijack feature is activated by the driver, the vehicle will shutdown. The maintenance code feature allows the dispatcher to generate a one-time maintenance access code that can be used for a preset period of time (up to 99 hrs). If the truck is in maintenance mode and someone attempts to steal the vehicle, the truck will enter into a shutdown sequence after the maintenance period has expired.

> MAGTEC offers an integrated security package that includes a number of features including driver authentication and vehicle immobilization.

The Acceleration Control System™ (ACS) is the core of the MAGTEC VIT system. It is an eVID that restricts the acceleration capability of the vehicle, diminishing the maximum speed achievable by the vehicle by constant intervals triggered at predefined periods of time (see the Qualcomm section for more details about MAGTEC's ACS). These parameters, which define the shutdown process, are configurable over the air. This is a very important feature, particularly for FR5, which would allow the vehicle to be shut down quickly if so required (for example, in less than a mile, instead of shutting down gently over several miles). MAGTEC's remote deceleration technology has not, as of yet, been used in a real situation, but their idle protection technology (which ultimately uses the same VIT) has been used many times.

MAGTEC indicated that a customer could get a system that includes only the driver authentication portion of the technology without the disabling/shutdown technology. However, the VIT functionality portion of the technology is inherently part of the system and would be wired but not active. The VIT functionality could, in theory, be activated (if the vehicle has communication capabilities) even if the customer has not chosen to use that technology.

Other features include geo-fencing capabilities (for those vehicles equipped with GPS and communication systems), back office software and communication technologies for customers that do not want to go with complete packages (such as the one offered by Qualcomm), and, shortly, the availability of technology that will protect the trailer/cargo (at the present time, only the tractor is protected).

GlenHugh Enterprise (GHE)

GHE provides a modular platform consisting of different modules that cover different FRs. Specifically, the GHE platform consists of four separate modules that provide different levels of protection and can be configured to any communications carrier.

Module 1 (573): The 573 PPI, with driver authentication, is the primary immobilization system that ensures that a truck cannot be started and driven by an unauthorized operator. Disabling up to three vital circuits of the vehicle, the 573 system will not allow an unauthorized driver to start and drive the vehicle. GHE makes available authentication codes for lost codes via toll-free and fleet identification. The 573 PPI is an Underwriters Laboratory of Canada certified device.

Module 2 (898): The 898 Safe-Stop Immobilizer, with driver authentication, allows the truck to idle with the key removed. If a thief attempts to steal the vehicle while it is idling, As soon as the brakes are disengaged, any change in the engine revolutions triggers an engine shutdown. This device is being used by many trucking companies and public service fleets.

Module 3 (211): For FRs 1, 3, and 4, GHE's anti-hijack technology is adaptive and can be customized to any specific fleet requirement triggered by various initiating events such as pressing a button or opening the driver's door, the latter being a main feature for the company's anti-hijack technology. The primary goal is focused on safely bringing the vehicle to a stationary position and to distance the driver from the hijacker as quickly as possible. The hijacker has to gain access to the truck cab and when the door or brake valve is opened, the shutdown sequence is automatically initiated. The driver then has the option to allow the vehicle to shutdown, cancel shutdown, or offer the hijacker access to an override button that will immediately send an alert signal to the dispatcher, indicating that an unauthorized driver has taken control of the vehicle. Once this is done, the dispatcher has the option to shutdown the vehicle. The shutdown sequence consists of slowly opening and closing the fuel line while the truck retains power. The truck comes to a slow, albeit jerky, stop as the vehicle runs out of fuel. The relay timing increases so that the moving vehicle's engine slows down until it stops. During this shutdown sequence, the truck lights are also flashing and the horn or siren is sounding loudly.

Module 4 (1r2): The 1r2 provides the dispatcher with the ability to prevent a vehicle equipped with this device from starting. This is achieved remotely via a message sent wirelessly to the vehicle. Once the message has been sent and the device is activated, the vehicle will not start and an alarm (buzzing sound) will be heard, indicating that the vehicle has been immobilized.

3.4 Fleet tracking vendors offer integrated hazmat truck security solutions that will be able to meet all TSA Tier 1 HSSM requirements.

A number of fleet tracking vendors have developed integrated trucking security solutions that will meet TSA Tier 1 HSSM requirements. Three companies are prominent leaders in developing an integrated approach – Qualcomm, Safefreight and PeopleNet.

Promotional literature from Qualcomm, Safefreight, and PeopleNet are contained in **Appendix A**.

3.5 Truck-based tracking systems are key components of corporate RFID/supply chain systems.

Smart truck technology deployments save companies money and have the potential to improve hazmat transportation security. Supply chain/RFID technology offers similar benefits.

Radio frequency identification (RFID) and other automatic identification technologies including electronic seals, biometrics, sensors and GPS satellite location systems are used to provide real-time information on the location and state of assets in the supply chain. In a typical RFID system, individual objects are equipped with a tag. The tag contains a transponder with a digital memory chip that is given a unique electronic identification code. RFID tags can be read-only (passive) or read-write (active). They can be attached to almost anything including pallets, cases of product, vehicles, company assets, high value electronics, and livestock. Radio-frequency waves transfer data between a reader and an RFID tag on a movable item to identify, categorize, and track. The reader initiates tag collection by sending a message to the tag. The tag responds by transmitting its tag ID code to the reader as well as any data collected by the tag. The reader forwards the tag ID/data to a middleware platform that filters and aggregates tag data before it is passed on to system servers and consumed in software applications.

Readers can be either fixed or mobile. Fixed readers can be installed at any location, ideally where the tags frequently pass such as gates or chokepoints, at

a point of sale, or in a warehouse. Mobile readers are usually small, handheld devices with a tethered cable or wireless communication. RFID data collection is fast, reliable, and does not require physical sight or contact between reader/scanner and the tagged item. This non-line of sight advantage means that tags can be read through snow, fog, ice, paint, dirt, grime, and other visually and environmentally challenging conditions.

The North American Preclearance and Safety System (NORPASS), pioneered by the **Kentucky Transportation Center**, is an example of an RFID system. NORPASS-enrolled trucks traveling over the Interstate highway system are equipped with RFID tags. As a truck approaches a truck weigh station, sensors in the pavement weigh the truck [19] and its tag (truck identity) is interrogated by roadside RFID readers. The truck's identity is used by the NORPASS system to look up the corporate safety record of truck's parent company in the NORPASS database. If the parent company's safety record is acceptable and the truck's weight is within weight limits, the NORPASS system sends a signal back to the truck lighting a green bulb on the dashboard indicating that the truck may bypass the weigh station. A poor safety record or overweight truck causes a red bulb to be lit on the dashboard indicating that the trucker must stop at the weigh station. Bypassing weigh stations save truckers time and money. Almost 60,000 trucks are enrolled in NORPASS in twelve states and two Canadian provinces.

The North American Preclearance and Safety System (NORPASS), pioneered by the Kentucky Transportation Center, is an example of how RFID systems improve transportation efficiencies.

RFID and smart truck technologies are enabling tools for corporate supply chain management (SCM) systems. Leading RFID technology firms such as IBM and Savi have developed tailored SCM applications to support hazmat distribution by chemical and petroleum firms. For example, Savi/Lockheed's *Chemical Custody Supply Chain Solution* enables firms to use smart truck/RFID technology to lower costs and enhance shipment security. [20]

The **Chemical Custody Supply Chain Solution** is a full-featured web-based SCM/RFID application that provides continuous on-line tracking, security monitoring and management of hazardous material containers and their contents from point of origin to destination. Savi/Lockheed designed the Chemical Custody Supply Chain Solution specifically to enhance hazmat supply chain security. The Savi/Lockheed Chemical Chain of Custody Solution can match the physical location of a container and its contents with shipment documents, inventory records, expected routes and destinations, and other pertinent information. Using data gleaned from a variety of automatic identification technologies such as RFID, electronic seals, biometrics, sensors, and GPS tracking systems, companies can receive a variety of alerts: if a shipment fails to arrive at a location as expected, if the shipment goes off route, if the shipment was tampered with, if the shipment was handled by someone without proper authority, etc. Alerts can be used to notify security, operational managers, and law enforcement agencies if there is a breach in security protocol.

Supply chain/RFID technology offers cost savings and improved hazmat transportation security.

The Chemical Custody Supply Chain Solution is notable for several reasons.

- *Marketing message.* To date, RFID/SCM vendors have marketed their products by emphasizing the cost savings and service enhancements they offer. With the Chemical Custody Supply Chain Solution, the marketing campaign has emphasized hazmat security as an important, if not the chief, benefit of its product. Savi/Lockheed's message reflects the market's readiness for products and services that address the threat of terrorist actions in the hazmat supply chain. Benefits cited include:
  - reduced liability risk;
  - brand protection;
  - increased security;
  - streamlined operational processes;
  - increased asset utilization and return on assets;
  - reduced asset inventory; and
  - reduced capital investment, lease, rental, and demurrage costs.

Savi's sales message reflects the market's readiness for products & services that protect hazmat shipments from terrorists.

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[19] Trucks are not required to stop or slow down to be weighed. "Weigh in motion" sensors embedded in the pavement record the truck's weight as it passes over; the truck's weight/tag ID is instantly transmitted to the NORPASS system.

[20] Savi/Lockheed Chemical Chain of Custody Solution; http://www.savi.com/solutions/so.chem.chain.shtml

- *Chain of custody as a functional focus.* The Chemical Custody Supply Chain Solution was designed to track hazardous materials as custody changed from one party to another. Strict chain of custody maintenance is enabled by the use of electronic records (shipping papers), RFID tags, and GPS tracking systems. Maintenance of chain of custody for waste shipments is a key regulatory objective of EPA's hazardous waste program. Hazardous wastes are a subset of the larger hazmat universe.

- *FMCSA vision relationship/extension.* The Chemical Custody Supply Chain Solution is a step toward implementation of the FMCSA's vision for hazmat security. It is XML-based and data flow to and from a PSRC would be relatively easy to arrange.

4.0 Singapore's security agency is operating a hazmat truck tracking system; off-route trucks are automatically immobilized.

In July 2005, Singapore began operating its HazMat Transport Vehicle Tracking System (HTVTS). The HTVTS is operated by the **Singapore Civil Defence Force** (SCDF), the government agency responsible for protecting the country from terrorist attacks. Singapore is one of the largest petrochemical hubs in the world. Over $21 billion has been invested in Singapore's petrochemical facilities at Ayer Merbau, and the economic output from these facilities accounts for 4%-5% of Singapore's GDP. The events of 9/11 were the catalyst for development of the HTVTS. Singapore has a landmass of only 300 square miles and a population of 4 million (dense urban development across the island). Disruptions in Singapore's hazmat supply chain due to terrorist action could be disastrous – both to the safety of Singaporeans and to Singapore's economy. Singapore's regulations require hazmat carriers to deploy "smart truck" technology and to report shipment information on a real-time basis. The HTVTS is the implementing tool for anti-terrorism regulations issued by SCDF that require:

1. fleet operators to obtain a transport license for trucks that haul security sensitive hazardous materials;

2. hazmat drivers to obtain a Hazmat Transport Driver Permit;

3. fleet operators to install a GPS tracking device and special license plates on trucks hauling (or having the capacity to haul) security sensitive materials;

4. trucks hauling regulated hazmat loads to follow approved hazmat transportation routes during approved transportation hours.

Singapore's HTVTS provides the SCDF real-time tracking of hazmat trucks. Alerts from trucks straying out of authorized routes or traveling during unauthorized hours are immediately sent to SCDF enforcement personnel by the HTVTS. Beginning October 2007, hazmat trucks are automatically immobilized by the HTVTS if the trucks violate route requirements.

The CNN International© video (control/click on link) provides an overview of Singapore's HTVTS.

5.0 TSA's FY2009 Trucking Security grant program is intended to promote smart truck technology deployment by Tier 1 HSSM carriers.

TSA's FY2009 Trucking Security Program (TSP) is intended to promote smart truck technology adoption by Tier 1 HSSM carriers and to promote implementation of TSA's Security Action Items by shippers and carriers of Tier 1 highway security-sensitive materials.

TSP funding will be primarily focused on the purchase and installation of equipment and systems related to tractor and trailer tracking systems. Under the FY 2009 TSP, $7,000,000 will support the adoption and implementation of security initiatives such as tractor and trailer tracking systems, panic button capability, tractor activation capability,

and plans and monitoring and analysis systems and centers.

6.0 TSA's Tier 1 HSSM system can adopt elements of the U.S. Customs and Border Protection ACE truck e-manifest system.

The **U.S. Customs and Border Protection** (CBP), an agency of the U.S. Department of Homeland Security, is responsible for protecting the nation's borders and for promoting the free flow of legitimate goods into the country. In early 2001, CBP began a large, multi-year effort to rebuild and modernize its information systems. CBP's Automated Commercial Environment (ACE) – CBP's new information system - will arm CBP personnel with the tools and information they need to decide which incoming shipments should be targeted for inspection at the border. ACE will also automate time-consuming and labor-intensive transactions so that legitimate shipments can move through ports and border crossing quickly and efficiently.

In 2002, Section 343(a) of the Trade Act of 2002 (PL 107-210) required CPB to:

"promulgate regulations providing for the transmission to the Customs Service, through an electronic data interchange system, of information pertaining to cargo destined for importation into the United States or exportation from the United States, prior to such importation or exportation."

CBP issued regulations under 19 CFR Section 123.92 that requires all trucks crossing customs from Canada destined to the U.S.A. with freight on board to submit an electronic truck manifest to CBP before arriving at the border.[21] If a truck arrives at customs without submitting a Manifest electronically, it will be refused access into the United States. A truck returning to the United States empty or entering Canada from the United States is not required to submit an E-Manifest.

The ACE truck e-manifest will help create a secure and streamlined environment for processing and releasing cargo at the land borders. It was launched in conjunction with the deployment of the CPB's ACE Secure Data Portal, which will bring enhanced security and commercial account capabilities to all land border ports across the nation. Carriers can use the ACE Secure Data Portal or commercial Electronic Data Interchange (EDI) systems to create an e-manifest and submit it along with mandatory advance cargo information to CBP in advance of a shipment. This allows CPB to pre-screen the crew, conveyance, equipment, and shipment information before the truck arrives at the border. E-manifests allow CBP officers focus their efforts and inspections on high-risk commerce, minimizing unnecessary delays for legitimate, low-risk commerce.

6.1 E-manifests and RFID systems speed trucks past CBP inspection stations.

The ACE e-manifest capability consolidates previously separate cargo release systems into a single, integrated computer interface for CBP officers and allows truck carriers to prepare and submit electronic truck manifests prior to arrival at a land border port of entry. With advance access to truck cargo information, CBP officers are able to pre-screen trucks and shipments, and dedicate more time to inspecting suspicious cargo without delaying the border crossings of legitimate carriers. E-manifests are also more efficient with an average processing time that is 33 percent faster than a traditional paper manifest.

The ACE **truck e-manifest** system uses electronic manifests and RFID to speed truckers through border inspection posts.

Since November 2007 when ports in Alaska went on-line, e-manifest use has been mandatory at all 99 U.S. land border ports.

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[21] Truck e-manifest Federal Register notices are listed below.

- Modification to data elements required for participation in the truck e-manifest program - 70 FR 13514, March 21, 2005
- Ability of truck carriers to use third parties to submit manifest information in the ACE test - 71 FR 15756, March 29, 2006
- Ability of third parties to submit manifest information on behalf of truck carriers via the ACE secure data portal – 72 FR 50, March 15, 2007

As illustrated in **Figure 9**, when a truck approaches the border crossing, the e-Manifest is automatically retrieved along with the matching pre-filed entries, in-bond requests, and other release declarations for the CBP Officer to view and process. The e-manifest must be transmitted at least one hour prior to the carrier's arrival at the border. The CBP Officer can either release the truck, or hold the truck for further processing.

Figure 9. ACE Truck E-Manifest.
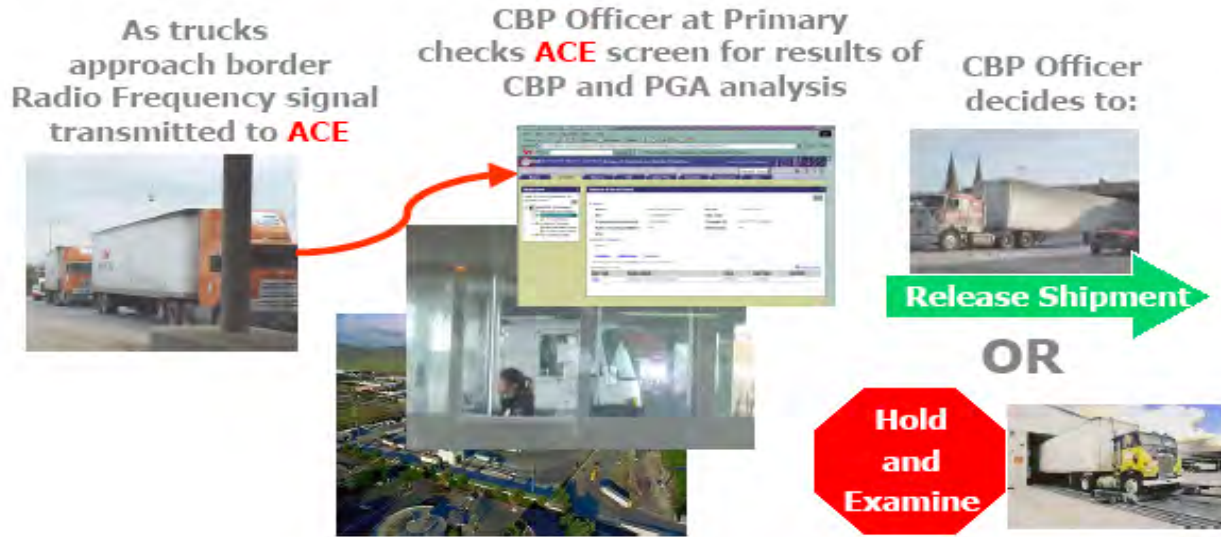
Receiving the electronic manifest information early allows CBP and other border security agencies to pre-screen the manifest through multiple checks before the truck arrives at the port. The receipt of e-Manifests enables CBP Officers to focus their efforts and inspections on high-risk commerce, thereby minimizing unnecessary delays for legitimate, low-risk commerce.

From the Carrier's perspective, a huge benefit of ACE is that Carriers no longer have to pay import duties and fees on a transaction-by-transaction basis. Beginning June 2004, Carriers are issued a monthly statement by CBP and can make one monthly payment for all transactions. This changes a business practice begun by Customs in 1789 in which customs duties and fees were processed one entry at a time.

The ACE truck e-manifest system offers highway carriers the ability to move goods across the border faster and more efficiently. In addition to expedited trade flows, **Figure 10** lists benefits that ACE truck e-manifest offers the government and the trade community.

The ACE **truck e-manifest** system saves carriers money and expedites the flow of trade across the border.

Figure 10. ACE Truck E-Manifest Benefits

Enhanced border protection	• Availability of pre-arrival information • Cargo tracking; access to more accurate and timely transaction information • Multi-agency enforcement collaboration
Enhanced efficiency and lower costs	• Promote information sharing among federal, state, and local governments • Accelerate border clearance • Eliminate paper systems
Trade facilitation	• Single-window transaction filing for the trade community • Harmonization of government data requirements • Online access to data • Improved visibility of conveyance and cargo status

6.2 Carriers can use CBP's portal to submit a truck e-manifest; CBP's e-manifest has 70 data elements.

The ACE truck e-manifest creates a secure and streamlined environment for processing and releasing cargo at the land borders.

Carriers are able to file an e-Manifest through the ACE Secure Data Portal or by utilizing the services of a U.S. Customs and Border Protection (CBP) tested solution provider. Carriers may opt to use another party to file the trucking e-Manifest on their behalf, such as Customs brokers, border processing centers, or other carriers. Truck carriers without an ACE portal account may use a third party with an ACE portal account to electronically transmit truck manifest information via the ACE portal on their behalf.

> The ACE **truck e-manifest** has 70 data elements.

A step-by-step guide for creating and submitting an electronic manifest has been prepared by CBP.[22] The guide may be found in **Appendix B**.

There are two ways an e-manifest can be submitted to CBP.

1. The ACE Secure Data Portal provides a web-based method to submit data to CBP. The portal is readily accessible on the Internet and is free to all users. Portal users key data in manually and then submit information directly to CBP.

2. Electronic data interchange (EDI) is an electronic transmission of data directly from one computer system to another. Information sent to ACE via EDI will be validated and processed. E-manifests can be sent to ACE either by the carrier or by a third party service bureau. Carriers have three options for using CBP-tested EDI software.

> Carriers can prepare and submit e-manifests on CBP secure portal or let others submit e-manifests on their behalf.

   - Self-developed EDI interface – A carrier develops in-house software that is tested by CBP and interfaces with ACE.

   - Software application provided by a software vendor – A carrier utilizes software provided by a vendor that has been tested by CBP. Often, these software applications enable carriers to pull the data required to populate the eManifest from the software they use in their daily business practices.

   - Service provider – A carrier employs a third party to enter and/or transmit manifest data on his or her behalf. This third party is using software that has been tested by CBP.

In the ACE Secure Data Portal, truck carrier accounts are organized by Standard Carrier Alpha Codes (SCACs). There are five sets of master data that can be stored in the truck carrier's ACE account. Storing these items will reduce the time it takes to create a manifest. This information may be stored in an account for future retrieval, or they can be entered each time a manifest is prepared. These sets of master data are as follows:

> Carriers with accounts on CBP's portal can keep their shipping data on file to make e-manifest preparation fast and easy.

1. Drivers/Crew

2. Conveyance (power units)

3. Equipment (trailers, containers, chassis etc.)

4. Shipper (names and addresses)

5. Consignee (names and addresses)

CBP lists the following benefits of preparing and submitting e-manifests via its secure portal.

- Easy-to-use, simple screens, including a unique auto-complete feature on forms, allows anyone to step in and complete a manifest quickly and efficiently;

- Straightforward dashboard screen, updated in real-time, giving an at-a-glance view of all shipments and their status;

- Powerful search and filter features, to quickly and easily locate a manifest;

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[22] http://www.cbp.gov/xp/cgov/trade/automated/modernization/carrier_info/electronic_truck_manifest_info/

- Easy-to-read data entry screens for shipment information;
- Automatic shipment status notifications sent via e-mail to trade chain partners;
- Create and print all the forms and reports to clear Customs, including the ACE cover sheet;
- Complete submission history of all shipment and reporting activity for tracking and compliance auditing.

The truck e-manifest has 70 data elements. Data elements (1) – (12) listed below are the core data elements for the truck e-manifest. Data elements (13) – (70) are included on the e-manifest as applicable. Those that are relevant to hazmat shipments are also listed below.

CBP requires the submission of a extensive data on each in-coming shipment of goods.

(1) Conveyance number, and (if applicable) equipment number (the number of the conveyance is its Vehicle Identification Number (VIN) or its license plate number and State of issuance; the equipment number, if applicable, refers to the identification number of any trailing equipment or container attached to the power unit. For purposes of this test, both the VIN and the license plate number are required);

(2) Carrier identification (i.e., the truck carrier identification SCAC code (the unique Standard Carrier Alpha Code) assigned for each carrier by the National Motor Freight Traffic Association);

(3) Trip number and, if applicable, the transportation reference number for each shipment (The transportation reference number is the freight bill number, or Pro Number, if such a number has been generated by the carrier.);

(4) Container number(s) (for any containerized shipment, if different from the equipment number), and the seal numbers for all seals affixed to the equipment or container(s);

(5) The foreign location where the truck carrier takes possession of the cargo destined for the U.S.;

(6) The scheduled date and time of arrival of the truck at the first port of entry in the U.S.;

(7) The numbers and quantities for the cargo laden aboard the truck as contained in the bill(s) of lading (this means the quantity of the lowest external packaging unit);

(8) The weight of the cargo, or, for a sealed container, the shipper's declared weight of the cargo;

(9) A precise description of the cargo and/or the Harmonized Tariff Schedule (HTS) numbers to the 6-digit level under which the cargo will be classified.

(10) Internationally recognized hazardous material code when such cargo is being shipped by truck;

(11) The shipper's complete name and address, or identification number.

(12) The complete name and address of the consignee, or identification number.

(13) DOT number;

(14) Person on arriving conveyance who is in charge;

(15) Names of all crew members;

(16) Date of birth of each crew member;

(17) Commercial driver's license (CDL)/drivers license number for each crew member;

Some of CBP's e-manifest data elements are specific to hazmat shipments (see yellow highlighted items).

(18) CDL/driver's license State/province of issuance for each crew member;

(31) Hazmat endorsement for each crew member;

(42) Conveyance insurance company name;

(43) Conveyance insurance policy number;

(44) Year of issuance;

(45) Insurance amount.

(65) Hazmat contact;

• • •

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Appendix A

Integrated Trucking Security Solutions

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TRUCKING ANTI-TERRORISM

CARGO INSURANCE

FLEET INSURANCE

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FLEET MANAGEMENT ISSUES

Transportation and Homeland Security Issues

Every industry has challenges to contend with on a daily basis. Major issues facing the trucking industry include the rising cost of cargo and fleet insurance, cargo theft, trucking anti-terrorism and homeland protection. Companies like Safefreight Technology focus their efforts on tackling these issues by providing technology solutions that encompass railway, marine and trucking security along with fleet management, communications and logistics. While our current products and services have been initially developed for the North American market, our scalable, communications agnostic platform makes them suitable for international markets as well.

Fleet Insurance

The trucking industry has been hit hard by the aftermath of the 9/11 terrorist attacks. Fleets who haul high risk materials are deemed especially susceptible to future attacks (ie. hazmat, dangerous goods carriers) and rising insurance costs. Those trucking companies who transport high value goods that potentially fund terrorist activities also face heavy insurance premiums.

Safefreight provides carriers with **fleet security** and **management solutions** that can help mitigate fleet insurance costs while providing productivity gains through tracking, diagnostic and reporting technology. Our **SmartFleet® System** delivers mobile intelligence and helps you reduce risk by enhancing cargo and vehicle security.

Cargo Theft

Worldwide, cargo crimes account for estimated direct merchandise losses of as much as $50 billion a year. Cargo crime is unique among contraband supply methods because it has the lowest cost structure – lower than in smuggling, counterfeiting or product piracy. Conversely, it offers organized crime groups the highest potential profit margins.

Safefreight helps shippers and carriers combat cargo crime with **customized telematic solutions** that enable the secure and efficient management of cargo conveyances. Our solutions provide vehicle and cargo protection by through deterrence, immediate alarm notification, and location information.

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Trucking Anti-Terrorism

Concern over weapons of mass destruction being deployed through the transportation

system is an ongoing reality. The U.S. Department for Homeland Security (DHS) remains vigilant against the threat of ussing heavy transport vehicles as vehicle-borne improvised explosive devices (VBIEDs). According to DHS, some terrorist planners consider trucks to be one of the best tools to breach security measures and carry explosives since the U.S. airline industry significantly increased security procedures. Terrorist planners have considered how heavy vehicle drivers acquire training and Commercial Driver's Licenses (CDLs) with hazardous materials (HAZMAT) endorsement.

While hazardous materials (hazmat) and intermodal carriers are most affected by enhanced security measures, agriculture/food shipping, government and emergency vehicles are also at risk. Security solutions involve a mix of training, public awareness and proven technology - including vehicle/auto tracking and cargo security.

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Safefreight Stands on Guard

Safefreight's customized approach to helping freight transportation partners combat these industry issues' result in made-to-measure solutions that meet a range of business objectives. Solutions from Safefreight let you capitalize on the powerful new advantages of the real-time enterprise - accelerating revenue growth, productivity, operational efficiency and profitability.

Make faster, better decisions. Create a more secure, streamlined supply chain. **Contact us** to find out how.

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Cargo Insurance

Cargo crime and theft has grown to epidemic proportions, with the latest figures suggesting losses of over $25 billion a year in the United States. The risks to shipping fleet owners and supply chain partners are continually reassessed by insurance brokers, and the premiums keep rising as a result.

While insurance can help you recover some of the losses, your best defense is a system that prevents theft in the first place. **Safefreight** can equip shippers and carriers with the security, tracking and monitoring tools that will protect cargo and improve **fleet productivity**. Our **SmartFleet® System** combines cargo security and asset management functionalities that bring immediate ROI and peace of mind.

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vendors but we chose Safefreight because of their user-friendly internet application and their commitment to customer service."
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AMEC Carting

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YOUR FLEET MANAGEMENT SYSTEM FOR VISIBILITY ON DEMAND

Your Fleet Management System for Visibility on Demand

Safefreight's **GPS fleet tracking system** – SmartFleet®- is a uniquely robust fleet management solution that delivers anytime, anywhere visibility on demand.

SmartFleet® gives you the power to manage your vehicles, trailers and other mobile assets more effectively by delivering the online tools you need to:

- support driver safety
- optimize security
- reduce operating costs
- maximize productivity

SMARTFLEET
S Y S T E M

Available Networks
CDMAX
GSM/GPRS/SMS
Satellite

SmartFleet® telematic technology comprises a web based GPS vehicle tracking device, asset-to-Internet software and cell or satellite communications.

Contact Us for a Free Demo >>

GPS Vehicle Tracking Devices

Safefreight's SecurityGuard® **GPS vehicle tracking devices** are the asset mounted hardware components of our fleet management solution.

With the ability to merge cellular and satellite communications with location awareness, asset condition monitoring and control, SecurityGuard® delivers the leading edge platform for real time tracking, management and security of your mobile assets.

SECURITYGUARD
SG 500
0007872

commitment to customer
service."
Guy Mazzola
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Additional enhancements can be added to the device, such as sensors (door openings, temperature, seatbelt indicator) and output devices such as sirens, strobe lights and keypad for local alarm activation.

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Fleet Management Software

SmartFleet® Manager is a Safefreight-hosted web application that empowers you to leverage real-time fleet information to manage mobile assets and drivers directly online through an internet portal.

This **fleet management software** – also known as "software-as-a-service" - boosts productivity, customer service, safety and security by automating and streamlining fleet management. You can enjoy unparalleled productivity, revenue growth and business intelligence - simply with the click of a mouse.

North American maps are served up from Safefreight's secure web server, enabling you to locate and view fleet and other mobile assets, review historical fleet reports and monitor asset location, condition and security status in real time.

This interface provides you with the functionality to create and modify business rules for event and alert monitoring and response, asset reporting intervals, geo controls like geo-fencing and fleet productivity report generation.

This application is also a useful forensic tool following accidents or thefts.

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The GPS Vehicle Tracking Solution for your Fleet

Our solutions offer you the following benefits:
- Better vehicle/equipment utilization
- Enhanced workforce productivity
- A safer workplace
- Reduced risk of theft and expedite vehicle/equipment recovery
- Lower fuel costs
- Reduction in idling and carbon emissions
- Better customer service through timely reporting of asset location
- An easier way to manage fuel tax rebates and simplify fuel tax reporting
- More accurate scheduling of maintenance
- Reduce or level rising insurance premiums

Safefreight's fleet tracking and management system will optimize the productivity, safety and security of your fleet operations, and ultimately improve your bottom line. **Contact us** today to find out how we can help meet your business goals.

Contact Us for a Free Demo >>

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GPS VEHICLE TRACKING DEVICES

Empower Your Fleet with SecurityGuard® GPS Vehicle Tracking Devices

SecurityGuard® GPS vehicle tracking devices are the vehicle mounted or cargo embedded component of Safefreight's telematic **GPS fleet tracking** and management system - SmartFleet®.

Location and sensor information captured through SecurityGuard® devices is communicated wirelessly and made immediately available to you online through our web-based **fleet management software** - SmartFleet® Manager.

Use SecurityGuard® to monitor location and condition of:

- Trucks and tractors
- Trailers – tethered and un-tethered
- Heavy equipment
- Portable equipment
- Containers and other cargo conveyances
- Cargo and packages

SG 200: Ideal for tracking of packages and cargo conveyances (trailers, containers, boxes and packages)
- Portable, assisted GPS tracking device that you can poll or program for automated reporting
- Temperature monitoring capability
- Geo-fence capability.
- Rechargeable, replaceable high capacity lithium ion battery offers you a maximum of 21 days "always on" power
- Works on CDMA cellular networks

SG 300: Affordable basic tracking and monitoring solution for vehicle, trailer and assets out of cell coverage areas
- "Place and play" installation (no harnesses, external power or antennas)
- Long life battery of 7 years (2 updates/day) - Provides years of service.
- Integrated motion sensor sends message on start and stop of motion
- Geo-fence capable
- Operates under all weather conditions
- Works on the Globalstar satellite communications network for the best coverage across North America

SG 150: Ideal for basic AVL and vehicle management

reporting
- Two digital inputs and onboard firmware that supports multiple exception based alerts
- Built-in or external antennas and easy to install
- Operates on the GSM/GPRS cellular network

SG 410 Ideal for more advanced driver/vehicle management and vehicle reporting
- Four digital inputs and onboard firmware that supports multiple exception-based alerts
- Captures almost 3 weeks of data when outside of cell coverage area
- Geo-zone capability
- Blue-tooth capability that interfaces with other Bluetooth devices in the vehicle
- Works on GSM/GPRS or CDMA cellular networks.

SG 500 A highly robust solution for more complex driver/vehicle/trailer management and security
- Eight digital inputs
- Weather-resistant housing
- Capable of multiple daily alerts customized to your business rules – like speeding, trailer door openings and vehicle curfews.
- Multi-zone temperature monitoring feature for reefer trailers
- Provides a high level of actionable business intelligence for fleet managers.
- Optional dual mode (satellite/cellular) capability
- Works on the CDMA cellular and Orbcomm satellite communication networks

Contact Safefreight to find out how installation of SecurityGuard® telematic fleet tracking devices will position your fleet for better productivity, safety and security, and to take advantage of new business opportunities.

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commitment to customer service."
Guy Mazzola
AMEC Carting

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FLEET MANAGEMENT SOFTWARE

Easily Manage Your Fleet with Precision

SmartFleet® Manager is a Safefreight-hosted web application - the online component of the SmartFleet® **GPS tracking system**.

SmartFleet® Manager empowers you to leverage real-time fleet information to manage vehicles and drivers directly online through an internet portal.

This "software-as-a-service" boosts productivity, customer service, safety and security by automating and streamlining fleet management. Enjoy unparalleled productivity and business intelligence - simply with the click of a mouse.

North American maps are served up from Safefreight's secure web server, enabling you to locate and view fleet and other mobile assets, review historical fleet reports and monitor asset location, condition and security status in real time.

Standard SmartFleet® Manager Features

- Easiest to use fleet management application in the industry
- Web based - No software to buy or map updates to download
- Extremely fast and large premium maps
- Dispatching list view with quick-view maps
- Search! feature to find any vehicle, driver or location
- 45+ customizable reports
- Animated breadcrumb trails
- Run saved reports with one click or set them up to be emailed automatically
- 10+ real-time alerts with geo-fencing
- Major and minor vehicle maintenance tracking
- Programmable event based reporting with store and forward when out of cell coverage
- Historical data retained for later analysis and audit
- Unlimited number of account sub-users
- Easy bulk import of landmarks
- Turn by Turn routing and directions
- Route optimization

- Satellite Imaging underlay
- Real time notification and custom reports of vehicle sensor data

commitment to customer service."
Guy Mazzola
AMEC Carting

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A Virtual Dashboard on your Fleet and Drivers

Only SmartFleet® Manager features the Fleet Overview Dashboard, the single source for all of your critical fleet information.

This powerful tool gives you a global overview of your fleet's status as well as summaries of recent activity so that you can make more informed decisions that help you run your business more efficiently and safely.

With SmartFleet® Manager, you know exactly when your drivers start their shifts, where they are, how many stops they make and what time they complete their routes.

SmartFleet® Manager also gives you the ability to re-route drivers to save valuable fuel and time.

SmartFleet® Manager is also equipped with a robust alerting functionality and exception engine. These alerts are customized to *your* specific business rules.

Data is made available in real-time and through a range of exception alerts and reports that offer detailed, *actionable metrics* to optimize the management of fleet assets and drivers.

Set up for vehicle, fleet, driver or teams. Alerts appear in your inbox, and can also be delivered to your phone, pager or desktop via e-mail.

Standard alerts include:
- **Idle** Vehicle Idles longer than a specified time
- **Marker** Arriving or departing selected marker/landmark
- **Not at valid category** Vehicle stops at a location that is not in an approved category
- **Speeding Vehicle** exceeds specified speed
- **Stopped Vehicle** is stopped at a location for longer than specified time
- **Stopped not at any marker** Vehicle stops at a location that is not a Marker
- **Usage** Vehicle is used outside specified hours
- **Zone** Vehicle departs specified geographic area
- **Maintenance** When a vehicle is due for specific maintenance
- **Drivers** license and insurance renewal alerts

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Accelerate Productivity, Strengthen Safety – With Strategic Use of Data

Take an informed look at the historical performance of your drivers and fleet

SmartFleet® Manager offers standard vehicle reporting features that summarize important asset and driver behavior.

Run reports by vehicle, fleet,

driver or team. All are
generated in an easy-to-read format that can be printed or saved.

Standard reports include:
- Daily Summary
- Utilization
- Maintenance
- Manifest
- Marker
- Mileage
- HR Reports
- Sensor Activity
- Stop Report

Custom sensor and business intelligence reports can also be developed to meet your specific business objectives.

Ask us for a free demo to show you just how easy it is to manage your fleet online with SmartFleet® Manager fleet management software.

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   GPS FLEET MANAGEMENT

   GPS FREIGHT TRACKING

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Home / Fleet Management Resources
FLEET MANAGEMENT TECHNOLOGY

Delivering Mobile Intelligence With Advanced Trucking Fleet Management Technology

As innovators in mobile asset management technology for vehicle and equipment fleet management, Safefreight Technology can supply you with a system that will enhance your fleet operations and reduce your security risk.

Safefreight has re-defined asset fleet management with our ininovative approach to security, productivity and accountability. Our **SmartFleet® System** integrates **global positioning systems (GPS)**, **geographic information systems (GIS)**, **security** and the Internet to enhance customer relations, strengthen security and improve operating efficiencies.

Market Leading Software and Hardware

Safefreight Technology is a leading provider of advanced asset tracking, security protection and monitoring, event management and productivity reporting products for a number of industries such as:

- Construction Industry
- Oil and Gas Industry
- Transportation Industry

Our **SmartFleet® System** integrates a unique combination of localized wireless alarms and sensors with real-time tracking through terrestrial, satellite, and internet technologies. Strengthen your link in the supply chain with our smart onboard devices - **SecurityGuard™**, **EnCompass™** - and our asset-to-internet software application - **SmartFleet® Manager**.

Fleet Visibility 24/7 With Global Positioning Systems (GPS)

GPS, or global positioning systems, is founded on a constellation of orbiting satellites that transmit radio signals to ground station receivers worldwide. Safefreight's rugged, onboard smart devices - **SecurityGuard™** and **EnCompass™** - use a GPS receiver to capture location information, which is communicated wirelessly along with security, and diagnostic information to Safefreight's Operations Center. You receive or poll aset information from your web enabled device through our user-friendly software application, **SmartFleet® Manager** to provide you with visibility of your fleet 24/7.

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tracking...
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Guy Mazzola
AMEC Carting

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Dual-Mode Wireless Communications

Safefreight offers a complete suite of cellular and satellite communication platforms so that you can choose the coverage, capacity and frequency that best meets your business objectives. Through Safefreight's proprietary technology, dual-mode capability allows you to combine terrestrial and satellite communicationns that automatically selects the optimal network to give you the coverage you need at the lowest price. Get the information you need 24/7 whether your assets are in Manhattan or Yellowknife.

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Geographic Information Systems (GIS)

Safefreight's technology employs GIS in it's **SmartFleet® Manager** software application to provide mapping and location information related to **fleet management and security** . Geographic Information Systems, or GIS, is a valuable tools that store, record, and analyze spatial data. This information is then translated into maps or other geographic products. GIS technology integrated in SmartFleet® Manager will promote efficiencies and productivity within your trucking fleet management system.

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SmartZone™ Virtual Perimeters

From your desktop, you can draw a radius of security to guard against asset theft or mismangement with one of the following tools:

Geo-fence

A digital fence around your asset provides a secure perimeter. Once this asset-centric fence is broken, an alert is imeediately sent that notifies you or your designated call center of the breach.

Geo-zone

Plot a digital geographic perimeter of any shape around your customer's locations or high-risk landmarks (like nuclear facilites) and receive arrival and departure notifiaction as your assets cross the perimeter. These notifications can be tied to a specific action, such as disarming the **SecurityGuard™** device on the trailer remotely once your cargo enters a secured client drop-off point.

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Trucking Fleet Management Technology that Delivers Results

Safefreight's talented team of IT and engineering professionals will deliver solutions that meet your business objectives. Take control, improve operations and ensure efficient and timely deliveries - inquire today to see how Safefreight can provide customized fleet solutions that work for you.

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Home / Security Solutions / Hazmat Security Technologies

HAZMAT SECURITY TECHNOLOGIES

Keep your Hazmat Drivers, Trucks and Trailers Secure and Safe

With Safefreight's custom fleet management and **GPS fleet tracking system** - SmartFleet® - critical security and location information is collected by a vehicle-mounted **GPS device** – SecurityGuard™ - and communicated wirelessly by cellular or satellite, and served to the customer online via Safefreight's internet software – **SmartFleet® Manager**.

This hazmat transportation fleet solution provides security, tracking, monitoring, control and reporting capability for hazmat shippers with dry vans, tank trailers and the trucks that haul them. With the addition of our **fleet emergency software** – SafeAlert! - you effectively mitigate security threats related to the movement of hazardous materials and dangerous goods like:

- radioactive nuclear waste
- explosives
- chemicals
- petroleum and petrochemical products

Hazmat Transportation Security Simplified with Custom Fleet Security Solution

Safefreight's integrated fleet tracking and management software offers a compelling combination of onboard deterrence plus instant notification and location monitoring – powerful features that put you in control.

Safefreight's perimeter of security provided by our onboard security system along with SmartFleet's® scalable, open architecture allows for the integration of additional security and productivity functionality. Hazmat shippers and carriers will benefit from the following features and services:

- **24/7 situational awareness**
- Enhanced route planning through more efficient, safe routing optimization.
- **Security alert notification** to pre-established key contacts when onboard sensors, including tamper, volumetric, door, radiation, temperature are tripped.

- **Trailer disconnect** notification when a trailer has been disconnected to its assigned truck, or if it is connected to an alien truck.
- **Geo-fencing** provides a digital, geographic perimeter of security. Once this asset-centric fence is broken, an alert is immediately sent to notify key contacts of the breach.

"We looked at a number of vendors but we chose Safefreight because of their user-friendly internet application and their commitment to customer service."
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- **Geo-zoning** a digital geographic boundary of any shape around high-risk areas such as nuclear facilities. If your vehicle crosses into the landmarked area, you'll know about it instantly so that you can take immediate action.
- **Panic buttons** that alert dispatch or call centers to driver distress or emergency situations when the button is activated by the driver.
- **Forensic software** of vehicle history that provides a log of location, speed, working hours, idle time, alarms
- Full integration of software and systems into existing platforms, along with training, support and resources that will ensure smooth transition for your business.

Safefreight's Hazmat Security Technology Stands On Guard for You

 When it comes to fleet security and driver safety, Safefreight stands in a class of its own. Our technology has been selected for the Transportation Security Administration's **Hazmat Truck Security Program**. Safefreight is the only hazmat security provider to build a standards compliant direct link to the HTSP Universal Communications Interface (UCI) which will be providing location and on-board sensor data in real time to the **TSA Truck Tracking Center**.

Contact us to find out you can mitigate security and safety threats to your drivers and fleet with Safefreight's SmartFleet® System.

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CARGO TRAILER ALARMS

Cargo Trailer Tracking and Security

Whether you manage a fleet of cargo trailers or sell utility trailers to motorcycle or sporting enthusiasts, Safefreight Technology has developed wireless trailer alarms and systems that will keep cargo safe. Our patented trailer security system has been designed to be open and scalable, and takes the guesswork out of monitoring and managing the security and productivity of your trailers – whether you own one or one thousand.

Safefreight's GPS Tracking and Alarm Systems

Safefreight's onboard security device – **SecurityGuard™** - functions similar to a personal car alarm, but is designed with additional features that provide advanced communication capabilities. The system uses wireless sensors that, when tripped, sets off a local alarm.

The alarm provides an audible alert (siren) and a visual alert (strobe light, flashing headlights) to attract attention and frighten off a would-be burglar. In addition, these alarms can send a signal to a driver's pager if the driver is not currently at the vehicle. Other sensors, such as smoke detectors, refrigerator temperature sensors, door sensors, can also be connected to the alarm system.

In addition to deterring theft through onboard alarms, key contacts are notified immediately through wireless communications when an event occurs. The alarm is transmitted to your dispatch office or a monitoring center where trained professionals are available 24/7 to take action so that your emergency never gets a chance to escalate. Our state-of-the-art monitoring system stands on guard 24/7 and alerts you to anything that might compromise the safety and security of your trailer and its cargo.

Your Solution to Cargo Trailer Theft

Safefreight's trailer security solutions have been designed for application to a variety of trailers including commercial transportation trailers, utility trailers, motorcycle cargo trailers, recreational vehicle trailers and boat trailers. Our technology can also be easily adapted to fit on motor coaches and recreational vehicles.

Contact our sales department to find out how Safefreight can provide you with a trailer security solutions that meets your needs.

"We looked at a number of vendors but we chose Safefreight because of their user-friendly internet application and their commitment to customer service."
Guy Mazzola
AMEC Carting

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Solutions starting at $39.95/month
including hardware

Dallas, TX February 9, 2009 - Dairy Farmers of America (DFA) Southwest Area Council has chosen to implement the SmartFleet GPS **trailer tracking**...
-Read More-

Home / Security Solutions / Trucking Security

TRUCKING SECURITY

Are your drivers, trucks and reputation at risk?

Get peace of mind with SmartFleet® - an easy to use **GPS tracking system** with onboard security that alerts you as soon as a truck or trailer violation takes place. You know immediately if:

- There is an unauthorized entry to your trucks or trailers
- A trailer has been un-tethered or hitched to an alien truck
- A truck, trailer or shipment is off route
- Perishable cargo is at risk
- Your trucks or other vehicles are speeding
- A driver hits the panic button

The security system functions like a car alarm - but with advanced communication capabilities. SmartFleet® uses wireless **truck security sensors**, smoke detectors and temperature sensors to immediately activate alarms and internet alerts.

Manage your trucks with the click of a mouse

SecurityGuard® is the **vehicle tracking device** on your trucks and trailers that captures critical security and location information. It communicates wirelessly through a server to your desktop computer, PDA or phone via our internet application, SmartFleet® Manager.

With our **GPS trucking software** – SmartFleet® Manager - you can track and manage your trucks with the click of a mouse with:

- Automatic Vehicle Location (AVL)
- Vehicle history replay, stop history
- Vehicle arming/disarming
- Custom landmarks
- Maintenance schedules

Poll your vehicles on demand or have your transportation assets "report home" on your schedule - whether it's minute by minute, daily or weekly. Access historical vehicle data through detailed **online fleet reports**.

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Enhance Customer Service and Transportation Security

From your desktop, you can draw a digital radius around your truck and trailer assets to improve customer service or guard against theft with the following land-marking tools:

Geofence: A digital fence around your transportation assets provides a secure perimeter. Once this asset-centric fence is broken, an alert is immediately sent that notifies you or your designated call center of the breach.

Geozone: Plot a digital geographic perimeter of any shape around customer locations, and receive arrival and departure notification as your truck or trailer crosses the perimeter.

+ BACK TO TOP

Strengthen your Truck Security with GPS Technology

Knowing the location and security status of your assets can mean the difference between profit and loss, and could have an impact on your business operations. Get the SmartFleet® GPS truck transportation security system working for you.

Contact Us for a Free Demo >>

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Home / Security Solutions / Security Sensors

SECURITY SENSORS

Powerful Truck Trailer Security Systems

Safefreight's fleet and cargo theft prevention system, combined with fleet location management tools will help keep you in control, improve operations and ensure customers get their shipments intact and on time.

Our **SecurityGuard™** security system includes proprietary and generic sensors. Cargo sensors, such as temperature sensor monitors the fluctuation in air temperature within the trailer. SecurityGuard™ sensors protect the integrity of the mobile communications and asset mounted hardware components.

Output Devices

Sirens / Strobe lights - Stop thieves dead in their tracks with our 60,000 candlepower strobe and 126db siren.

Pager - Drivers/operators will receive real-time alert notification of unauthorized events that occur to their assets.

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Door Alarms, Door Sensors and More

Standard and optional security features range from door sensors to alarms and sirens to digital fences. With effective monitoring and theft deterrents, it's like having your own security guard in every truck, trailer or auto in your fleet.

Door Sensors - This basic magnetic product is activated when doors, panels or other items are opened or closed.

Keypad / Keyfob - Our 12-key keypad or optional keyfob component allows for arming, disarming and controlling the security system at the asset itself. All keycodes are saved in the **SecurityGuard™** system and reflected to **SmartFleet® Manager**. Keycodes can also be manipulated by **SmartFleet® Manager**.

Accelerometer - Our **SecurityGuard™** devices are equipped with a low power 2-axis accelerometer that offers the following capabilities or alerts: power management, hookup detection, geofence violation, collision, shock, etc.

Glass Breakage - Our glass break sensors can detect when glass has been cracked or shattered. Either acoustic or profile mounted.

Smoke / Heat Detectors - Safefreight can recommend which of our smoke detectors

is best for your application - ionization or photoelectric. Ionization detectors respond more quickly to flaming fires with smaller combustion particles; photoelectric detectors respond more quickly to smoldering fires.

Other features that Safefreight has under development include volumetric sensors and tractor / trailer identification systems.

Contact us to find how our **SecurityGuard™** wireless security solutions meet your business requirements.

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HOMELAND LOGISTICS

Homeland Logistics and Transportation Security

Tens of millions of tons of toxic chemicals, radioactive nuclear waste, commercial explosives, flammable gasoline and other hazardous materials are transported every year by trucks and trains across North America's cities and countryside. Since September 11, 2001, little has been done to secure shipments from attacks by terrorists, which could, in the worst case scenario, expose cities to leaks of deadly chemicals or explosions. This type of act could compromise homeland security and kill or seriously injure thousands, possibly even millions, of citizens.

Transportation Security Threats

While commercial aviation remains a possible target, terrorists may turn their attention to other modes. Opportunities to do harm are as great, or greater, in maritime or surface transportation. Every day, up to 76,000 tanker trucks carrying hazardous cargo travel across the United States. A typical gasoline tanker truck carries as much fuel as the planes that hit the World Trade Center.

Terrorists have used trucks filled with explosives in some of the worst terrorist attacks in history, including the 1998 Africa embassy bombings and the first World Trade Center attack in 1993. The 1993 Oklahoma City domestic terrorism attack by Timothy McVeigh killed hundreds and destroyed a federal building with a truck carrying common agricultural chemicals. Thousands of commercial trucks on the road carry more hazardous materials every day than any of the trucks used in those previous notorious attacks.

The scenario for sea-going containers is even more daunting. Over 20 million freight containers are currently circulating the world with about seven million of them passing through U.S. ports every year. Only about 2% of these are physically inspected. Security concerns run high that these containers may harbor terrorists, explosives, or other hazardous materials.

Department of Transportation and Department of Homeland Security Programs

A programs initiated by the Federal Motor Carrier Safety Administration within the Dept. of Transportation tests the feasibility of technologies and systems that may reduce the risk of terrorist attacks. Testing was conducted on real-time tracking of hazardous cargo, emergency warning systems, identification of off-course vehicles in comprising locations, and the ability to remotely intercept (stop or slow) a vehicle that provides a threat.

While the U.S. Department of Homeland Security (DHS) and other governments have

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taken preliminary steps through programs such as CTPAT, Container Security Initiative and Operation Safe Commerce to ensure the security of cargo entering and being transported within its borders, transportation security and homeland logistics remains a concern.

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Safefreight – Your Homeland Security Transportation Specialist

Safefreight Technology has developed a system that provides complete situational awareness and control of fleet assets to mitigate security threats related to transportation. Through this system, critical security and location information is gathered through the vehicle or container-mounted **SecurityGuard™** smart device. This information is communicated wirelessly (either by cellular or satellite) and served to the customer's desktop through Safefreight's Internet application – **SmartFleet® Manager**. Together, **SecurityGuard™** and **SmartFleet® Manager** provide security, tracking, monitoring, control and reporting capability for dry van and tank trailers, the power units that haul them and intermodal containers.

With its unique, patented combination of rugged hardware and sophisticated software, the **SmartFleet® system** provides a mobile asset security and fleet management solution to help meet the business and security objectives of North America's transporters. By consulting one of our technical specialists, we will work with you to develop a strategy that meets your business needs.

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Home / Security Solutions / Hazmat Security Technologies

HAZMAT SECURITY TECHNOLOGIES

Keep your Hazmat Drivers, Trucks and Trailers Secure and Safe

With Safefreight's custom fleet management and **GPS fleet tracking system** - SmartFleet® - critical security and location information is collected by a vehicle-mounted **GPS device** – SecurityGuard™ - and communicated wirelessly by cellular or satellite, and served to the customer online via Safefreight's internet software – **SmartFleet® Manager**.

This hazmat transportation fleet solution provides security, tracking, monitoring, control and reporting capability for hazmat shippers with dry vans, tank trailers and the trucks that haul them. With the addition of our **fleet emergency software** – SafeAlert! - you effectively mitigate security threats related to the movement of hazardous materials and dangerous goods like:

- radioactive nuclear waste
- explosives
- chemicals
- petroleum and petrochemical products

Hazmat Transportation Security Simplified with Custom Fleet Security Solution

Safefreight's integrated fleet tracking and management software offers a compelling combination of onboard deterrence plus instant notification and location monitoring – powerful features that put you in control.

Safefreight's perimeter of security provided by our onboard security system along with SmartFleet's® scalable, open architecture allows for the integration of additional security and productivity functionality. Hazmat shippers and carriers will benefit from the following features and services:

- **24/7 situational awareness**
- Enhanced route planning through more efficient, safe routing optimization.
- **Security alert notification** to pre-established key contacts when onboard sensors, including tamper, volumetric, door, radiation, temperature are tripped.

- **Trailer disconnect** notification when a trailer has been disconnected to its assigned truck, or if it is connected to an alien truck.
- **Geo-fencing** provides a digital, geographic perimeter of security. Once this asset-centric fence is broken, an alert is immediately sent to notify key contacts of the breach.

"We looked at a number of vendors but we chose Safefreight because of their user-friendly internet application and their commitment to customer service."
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- **Geo-zoning** a digital geographic boundary of any shape around high-risk areas such as nuclear facilities. If your vehicle crosses into the landmarked area, you'll know about it instantly so that you can take immediate action.
- **Panic buttons** that alert dispatch or call centers to driver distress or emergency situations when the button is activated by the driver.
- **Forensic software** of vehicle history that provides a log of location, speed, working hours, idle time, alarms
- Full integration of software and systems into existing platforms, along with training, support and resources that will ensure smooth transition for your business.

Safefreight's Hazmat Security Technology Stands On Guard for You

 When it comes to fleet security and driver safety, Safefreight stands in a class of its own. Our technology has been selected for the Transportation Security Administration's **Hazmat Truck Security Program**. Safefreight is the only hazmat security provider to build a standards compliant direct link to the HTSP Universal Communications Interface (UCI) which will be providing location and on-board sensor data in real time to the **TSA Truck Tracking Center**.

Contact us to find out you can mitigate security and safety threats to your drivers and fleet with Safefreight's SmartFleet® System.

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Solutions starting at $39.95/month
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Home / Industry Solutions / Trailer Tracking

TRAILER TRACKING

Strengthen Trailer Fleet Management with SmartFleet® Trailer Tracking

The SG500 trailer tracking solution is part of the SmartFleet® **GPS fleet tracking system** that provides the data that empowers you to:

- Improve driver/trailer productivity
- Enrich customer service
- More effectively manage detention billings
- Mitigate cargo loss and insurance claims
- Enhance maintenance scheduling
- Monitor trailer temperatures

Contact Us for a Free Demo >>

Manage Your Trailer Fleet with Ease

With the click of a mouse, you can manage your entire trailer fleet over the internet with SmartFleet® Manager **fleet management software**.

SmartFleet's exception based reporting means you are alerted when one of your trailer fleet business rules is broken. Alerts can be set around:

- Landmarks (like customer yards)
- Idling
- Door openings (including "door open not at authorized location")
- Speeding

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- Temperature
- Low battery

... and more!

Knowing where your trailers are is just the start. Cut costs through enhanced productivity and security. The SmartFleet® trailer tracking solution features:

- **Asset Location** - Provides mapped real-time asset location and tracking using an online web application. Know where your asset is 24/7.
- **Asset Security** - Immediately reports and responds to asset anomalies or breaches, based on customer-defined parameters (e.g. vehicle entry). Arm and disarm the system by keypad or remotely over the air.
- **Mileage & Hours of Operation** - Tracks and provides asset mileage and hours of operation data. Allows efficient scheduling of asset maintenance.
- **Geofencing** - Provides notification when the asset has moved beyond a certain radius from its original position. Invisibly secure your asset from theft or unauthorized use outside of a work area.
- **Geozones** - Define multiple geographical zones or areas and be notified of zone entry, exit or speeding violations. Track when vehicles enter a work site or monitor asset speeds in school or construction zones.
- **Configurable Scheduled Reporting** - Device reporting intervals can be defined so that your mobile assets report in on your schedule, whether it's minute by minute, daily, weekly, by distance traveled, or when a pre-programmed event occurs in the field.
- **Battery Power** - Provides an optional internal rechargeable battery the device can run from. When coupled to an external source such as a vehicle, the system recharges itself.
- **Speed Detection** - Provides notification of an asset speed violation. Enforce and influence positive driver behaviour.
- **Flexible Peripheral Integration** - Device is scalable and can support a variety of peripheral hardware to meet customer needs and requirements. Further enhance security of your mobile assets or customize sensor inputs and outputs.

Safefreight's team of engineers can also customize a solution to meet your needs. If you want to find out more about how to improve the management and security of you trailer fleet, please **contact us**.

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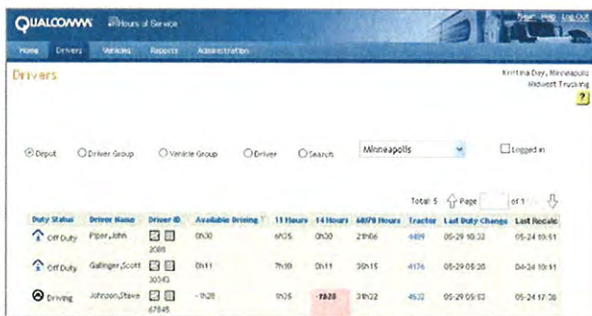
Dashboard

Service Fleet Manager

Service Fleet Manager for local fleets frees you from having to manually track vehicles. Although you don't physically ride along with your drivers, you achieve the same result: saving time, avoiding unnecessary costs and making the best use of your resources.

The service graphical displays and comprehensive summary reports provide what you need to know—the way you need to see it—easily and simply.

Driver Availability

Mobile Computing Platform 100 Series

The Mobile Computing Platform 100 Series is specifically engineered to optimize transportation companies operations, and enhance safety, efficiency, and productivity while improving the drivers in-cab experience.

The services, integrated features, and professional services benefit your entire operation from customer service to dispatch.
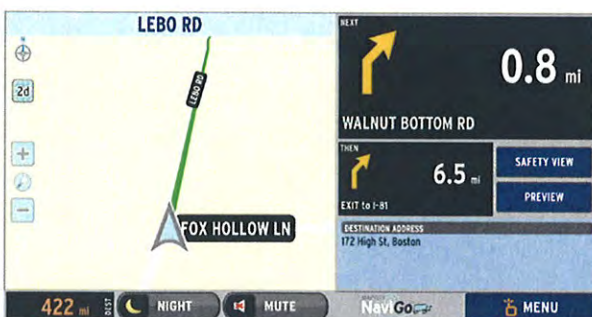
Navigation

Mobile Computing Platform 200 Series

The Mobile Computing Platform 200 Series is an end-to-end solution that enables transportation companies to transform the cab into a mobile operations center and fleets into a network of terminals. Multimode communication solution makes working with your drivers transparent and efficient giving you increased productivity, better customer service, and more loaded miles. In two words: more revenue.

The services, integrated features, and professional services benefit your entire operation from customer service to dispatch.

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Platform Portfolio

	Service Fleet Manager	MCP100	MCP200
	Service Fleet Manager gives companies visibility into their mobile assets	The Mobile Computing Platform 100 Series is specifically engineered to optimize transportation companies operations	The Mobile Computing Platform 200 Series is an end-to-end solution that enables transportation companies to transform the cab into a mobile Operations Center.
Vehicle Location Data	✔	✔	✔
Geo-fence Capability	✔	✔	✔
Speed	✔		
3rd Party Application	✔	✔	✔
Text and Macro Messaging		✔	✔
Vehicle Maintenance		✔	✔
Performance Monitoring		✔	✔
Hours of Service		✔	✔
Navigation		✔	✔
In-Cab Scanning		✔	✔
DTTS		✔	✔
Content Delivery Service		✔	✔
Automated Arrival & Departure		✔	✔
Critical Event Reporting		✔	✔
AMBER Alert Highway Network		✔	✔
Web Access			✔
In-Cab Training			✔

Learn how you can use actionable information to gain control of your business, stay competitive and increase profitability.

Call us at 800-348-7227 or visit OmniVisionMobileServices.com and let us show you how you can save time and money.

Contact Us

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**Mobile Computing Platform
200 Series**

OmniVision Transportation Services, on MCP200 Series, will drive your fleet efficiency and customer service into the future.

→ The Mobile Computing Platform 200 Series is an end-to-end solution that enables transportation companies to transform the cab into a mobile operations center and fleets into a network of terminals. Working with your drivers becomes transparent and efficient giving you increased productivity, better customer service, and more loaded miles. In two words: more revenue.

FEATURES

OmniVision Transportation services enable productivity with safety at the forefront, providing tools needed to communicate effectively and work efficiently on the road. Some key features include:

Text-to-speech

The text-to-speech feature helps to improve productivity by allowing drivers to safely access incoming messages without distractions or having to stop the truck.

Premium content delivery

Audio messages can be broadcast simultaneously to your entire fleet, ensuring timely delivery of critical information.

Over-the-air upgrades

Improved uptime results as features and service enhancements are deployed quickly without touching the truck or taking vehicles off of the road.

Multi-mode communication

Wi-Fi enables video training and access to your company's intranet.

BENEFITS

OmniVision Transportation services integrate features, applications, and professional services that benefit your entire operation—from customer service to dispatch—while improving driver satisfaction.

Increased customer service

Drivers get critical customer information when they need it.

Improved productivity

Features such as text-to-speech, premium content delivery, and navigation enable improved efficiencies and drive-time optimization.

Improved safety

Industry-leading user interface engineered to minimize distractions and provide the driver with only the information he needs while the truck is moving.

Simplified compliance

Hours of service are automatically tracked for the driver.

Lower operational costs

Operational profiles enable custom configuration of services for specific fleet requirements.

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QUALCOMM

An innovative edge for operators & drivers

Hours of Service

Critical Event Reporting

→ Services

Qualcomm is committed to providing services that continuously improve the value of mobile communications. Our innovative services can be customized through operational profiles to maximize value based on the unique needs of your fleet.

Asset Management Service

Tethered trailer tracking provides near real-time tractor/trailer ID, trailer location, and status information when connected to the Qualcomm Mobile Computing Platform 200 Series.

Automated Arrival & Departure

Monitors beginning and end of trip details to improve scheduling and billing management.

Content Delivery

Provides a consistent, reliable, and secure way to use audio recordings to communicate critical information to your drivers. The service provides the ability to broadcast pre-recorded messages to the driver.

Critical Event Reporting

A comprehensive, actionable view of safety oriented, event-driven data summarized by vehicle and driver.

Driver Notification Service

Allows important in-cab messages sent from dispatch to also be copied to the drivers' mobile phone.

Hours of Service

An electronic on-board recording system that automatically creates driver logs which are fully compliant with the latest rules and regulations of the Federal Motor Carrier Safety Administration.

In-Cab Scanning

In-Cab Scanning provides drivers a way to send documents to their home office for back-office processing without having to leave their truck.

In-Cab Training

Train safer and more productive drivers during stops and loads with the leading interactive training tool, Pro-TREAD. The intuitive training software offers more than 50 lessons covering topics from fuel-efficient driving and fatigue management to defensive driving and emergency maneuvers. With a teaching style adapted from the U.S. Army's most battlefield critical tasks, Pro-TREAD engages the driver with real-world situations and checks their progress along the way.

Intranet Access

MCP200 series browser gives drivers access to back office information such as payroll, email, and critical customer information.

Navigation

Accurate routes, integrated to your TMS system, enable increased productivity, safer driving, enhanced customer satisfaction, and ultimately enabling you to improve your bottom line. Maptuit® NaviGo,™ a real-time, hybrid, in-cab navigation service provides professional truck drivers and trucking companies with accurate, up-to-date, interactive maps for increased routing efficiency and improved driver satisfaction.

Performance Monitoring

Performance Monitoring tracks vehicle and driver performance affecting fuel consumption through a direct interface with the vehicle's sensor inputs or on-board data bus. The Fuel Manager module within Performance Monitoring provides robust querying and data visualization tools to help turn data into actionable information.

In-Motion User Interface

The In-Motion User Interface provides advanced functionality to manage visual displays available to driver(s) for use while in motion based on the log-in status of driver(s).

Vehicle Maintenance

Qualcomm's Vehicle Maintenance service helps reduce repair costs by providing near real-time alerts for the most common fault codes and relevant vehicle diagnostic information to proactively detect, diagnose and service vehicles.

In-Cab Training

Navigation

Fuel Manager Dashboard

Hardware, software and communication options can be configured to meet the needs of your fleet.

→ Getting More from Your Technology Investment

The **Qualcomm Alliance Program** facilitates integration of Qualcomm solutions with leading providers of complementary technologies and services to better meet the needs of our shared customers.

Qualcomm Professional Services can supplement your internal resources with assessment, integration, custom development and programming, training, business intelligence and predictive modeling services to help you create sustainable operational efficiencies that will differentiate your business performance from your competition.

The **Qualcomm Services Portal** allows you to access the full suite of web-based fleet management services, including satellite mapping. The Services Portal leverages web services and XML-based standards to securely deliver data that can be integrated to your enterprise systems.

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Automated Arrival & Departure

Better Data for Better Fleet Management

→ Qualcomm's Automated Arrival & Departure (AA&D) service meets the needs of the transportation and logistics industry by automatically tracking arrival and departure times at both planned and unplanned stops—eliminating the manual entry process for drivers. Through AA&D's accurate driver-performance data, status updates, and records of excessive detention, fleet managers can pro-actively manage costs while improving revenues and customer service.

Load screen

FEATURES

- Automatic, accurate, timely arrival and departure information
- Documented proof of on-time arrival and departure
- Measurement of excessive detention
- Reporting of unplanned stops
- Seamless integration with leading dispatch systems

BENEFITS

- Manage routes and fleets more efficiently
- Reduce manual procedures and guess-work
- Increase driver and dispatch productivity
- Improve accuracy for detention billing and rate negotiations
- Manage irregular driving patterns and unauthorized stops
- Enhance driver and customer satisfaction

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→ Knowledge equals increased profits for carriers

An obstacle facing truckload and private fleet carriers is the lack of reliable and timely fleet information. This data is critical for reducing costs, improving route efficiency, measuring driver performance, and maximizing revenue. AA&D plays a vital role in addressing these needs.

Risk and Loss Prevention

At the heart of risk management is the ability to identify unauthorized truck usage, unplanned stops, and irregular driving patterns. Through AA&D's accurate and timely documentation, fleet managers can address risk factors to mitigate potential losses.

Streamlined Operations for More Loaded Miles

AA&D's automated supply of data translates directly into efficiency. By eliminating manual data collection and processing, AA&D improves accuracy and consistency.

A Complete Package on Leading Qualcomm Platforms

AA&D requires no additional in-vehicle hardware, and it is a valuable addition to the OmniTRACS® mobile communications system and OmniVision™ Transportation services. Included in the service are all associated messaging, software, and standard over-the-air upgrades.

Learn how you can use actionable information to gain control of your business, stay competitive and increase profitability.

Call us at 800-348-7227 or visit OmniVisionTransportation.com and let us show you how you can save time and money.

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Products and Services

Mobile Content and Services

Asset Management

OmniVision Transportation

MCP200 Series

MCP100 Series

OmniTRACS

OmniVision Metro

OmniVision Mobile Workflow

Utility Providers

You may also be interested in:

Customer Support

About QES

Contact QES

Reduce fleet operating costs

Improve customer service

Features you'll like:

Choice of communication - multi-mode (Wi-Fi/Terrestrial with Satellite optional), or terrestrial/satellite only

Text-to-speech capability and a color touch-screen display help enhance the driver experience and productivity

Platform safety, flexibility, and scalability means we're helping to meet the unique needs of your fleet today and into the future

Over-the-air upgrades keep your trucks on the road, where they belong

Through operational profiles, you can tailor solutions that meet the unique needs of your fleet

Seamless interoperability with other Qualcomm platforms including OmniTRACS® Mobile Communications system and Asset Management for Trailers and Containers

Platforms:

Mobile Computing Platform 200 Series
No other end-to-end solution reaches quite so far into the cab

Mobile Computing Platform 100 Series
Qualcomm's Mobile Computing Platform 100 Series is specifically engineered to optimize transportation companies operations.

OmniTRACS® Mobile Communications System
Driving efficiency, productivity, and customer service into the future

Top

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OMNIVISION transportation

Reduce fuel consumption and turn your data into action with FUEL MANAGER.

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UNLIMITED VALUE. ONE PRICE.

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QUALCOMM ENTERPRISE SERVICES™

omniVISION transportation

Asset Management for Trailers and Containers

Gain Visibility to Manage Bottom-line Profitability

→ Asset visibility—timely information about the load status and location of trailers—is key to the operational efficiency of your fleet. Qualcomm offers two solutions to help improve your bottom line: Untethered Asset Management service and Tethered Asset Management service as a part of the OmniVision™ Transportation suite of services.

Untethered Asset Management Service

For carriers seeking maximum return on investment, enhanced asset and cargo security, and improved asset utilization, the untethered asset management service is a stand-alone platform that automatically monitors both tethered and untethered trailers independently of truck-based mobile information systems. The service offers an optional solar charging capability for use on equipment with limited access to external power, such as containers.

Untethered Asset Management Service — Services Portal dashboard

FEATURES

- Position and event reporting throughout the US, Canada, and Mexico
- Communicates when connected or disconnected from the tractor
- Over-the-air firmware upgrades
- Integration with existing dispatch software
- Optional solar charging system
- Optional door and cargo sensors
- Near real-time, dynamic data
- **NOW AVAILABLE for refrigerated trailers**
- **NOW AVAILABLE — Tire pressure monitoring**

BENEFITS

- Monitor the status and location of trailers and containers in near real-time
- Increase driver and tractor productivity
- Optimize asset utilization and trailer pool inventory
- Enhance detention billing and improve carrier accountability
- Increase asset and cargo security
- Create valuable reports for operations and planning
- Improve customer service with accurate and timely information
- Maintain visibility in harsh environments

KNOWLEDGE UNLEASHED.
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Improve customer satisfaction and proactively manage risk

— NEW! —

UNTETHERED REFRIGERATED TRAILER MANAGEMENT

- View detailed information on your refrigerated trailers
- Receive proactive notification alerts for critical reefer events
- Assign severity levels to specific OEM reefer alarms
- Centralize the management of your refrigerated and non-refrigerated trailers
- Customize your reefer profiles and monitoring plans
- Search by refrigerated trailer attributes and health status
- Identify your refrigerated trailers with reefer specific icons
- Integrate to all functions through web services

Tethered Asset Management Service

Tethered trailer tracking provides near real-time positive tractor/trailer ID, trailer location, and status information about tethered trailers when connected to tractors equipped with the OmniExpress, OmniTRACS, or OmniVision system. It has a basic range of upgrade options, configurations, and diagnostic services. For example, the reefer monitoring option reports the temperature status of your refrigerated trailers and alerts you to potential problems such as temperatures outside optimum range—helping to protect your valuable cargo and ultimately guard you against loss costs. Tethered trailer tracking can integrate with fleet dispatch software, furnish accurate location data, and issue near real-time notices of trailer connect and disconnect events—still providing a clear advantage to fleets that do not require an untethered solution.

To better serve customers, carriers can respond to customer requests for trailers more promptly and with greater precision and confidence.
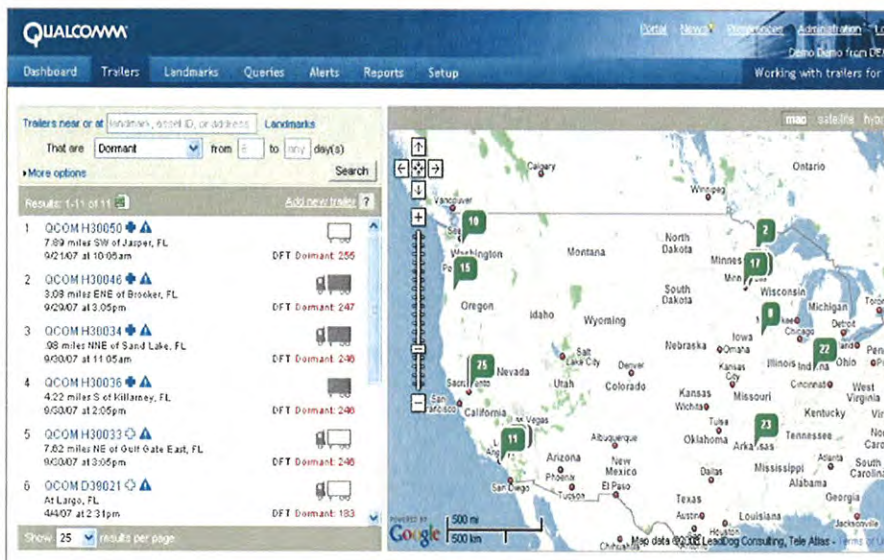
Untethered Asset Management Service — advanced search functionality

→ PRODUCT COMPARISON

Standard Features	Untethered Asset Management Service	Tethered Asset Management Service
Position reporting in Canada, the US, and Mexico	Yes	Positioning via OmniExpress, OmniTRACS, and OmniVision system
Multi-mode cellular coverage	Yes	Coverage via OmniExpress, OmniTRACS, and OmniVision systems
Communicates when disconnected from tractor	Yes	No
Over-the-air firmware upgrades	Yes	No
Configurable reporting intervals	Yes	Yes
Connect and disconnect notification	Yes	Yes
Integration with existing dispatch software	Yes	Yes
Rechargeable battery	30 to 60 days	Can only run off vehicle power
Diagnostic and installation field service tools	Yes	Yes-limited
Modular design supports multiple installation configurations	Yes	No
AS400 and Web-based software	Yes	Yes
Satellite mapping	Yes	Mapping via OmniExpress, OmniTRACS, and OmniVision systems
Foreign tractor visibility	Yes	No
Trailer pool optimization	Yes	No
Power messages	Yes	No
Message suppression	Yes	No
Group support and reporting	Yes	No
Map based landmark management	Yes	No
Event and temporary notifications	Yes	No
Emergency tracking	Yes	No
Multiple antenna choices and mounting options	Yes	No antenna required
HERO certification	Yes	No
Ruggedized	Yes	Yes
Optional Features		
NEW Reefer monitoring and notification	Yes	Yes
NEW Tire pressure monitoring	Yes	No
Support for third-party sensors	Yes	No
Trip reporting	Yes	No
Solar charging system	Yes	No
Virtual boundary alerts	Yes	No
Door open/closed sensors	Yes	No
Cargo sensors	Yes	No

Getting More from Your Technology Investment

The **Qualcomm Alliance Program** facilitates integration of Qualcomm solutions with leading providers of complementary technologies and services to better meet the needs of our shared customers.

Qualcomm Professional Services can supplement your internal resources with assessment, integration, custom development and programming, training, business intelligence and predictive modeling services to help you create sustainable operational efficiencies that will differentiate your business performance from your competition.

The **Qualcomm Services Portal** allows you to access the full suite of web-based fleet management services, including satellite mapping. The Services Portal leverages web services and XML-based standards to securely deliver data that can be integrated to your enterprise systems.

Learn how you can use actionable information to gain control of your business, stay competitive and increase profitability.

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**Mobile Computing Platform
200 Series**

OmniVision Transportation Services, on MCP200 Series, will drive your fleet efficiency and customer service into the future.

→ The Mobile Computing Platform 200 Series is an end-to-end solution that enables transportation companies to transform the cab into a mobile operations center and fleets into a network of terminals. Working with your drivers becomes transparent and efficient giving you increased productivity, better customer service, and more loaded miles. In two words: more revenue.

FEATURES

OmniVision Transportation services enable productivity with safety at the forefront, providing tools needed to communicate effectively and work efficiently on the road. Some key features include:

Text-to-speech

The text-to-speech feature helps to improve productivity by allowing drivers to safely access incoming messages without distractions or having to stop the truck.

Premium content delivery

Audio messages can be broadcast simultaneously to your entire fleet, ensuring timely delivery of critical information.

Over-the-air upgrades

Improved uptime results as features and service enhancements are deployed quickly without touching the truck or taking vehicles off of the road.

Multi-mode communication

Wi-Fi enables video training and access to your company's intranet.

BENEFITS

OmniVision Transportation services integrate features, applications, and professional services that benefit your entire operation—from customer service to dispatch—while improving driver satisfaction.

Increased customer service

Drivers get critical customer information when they need it.

Improved productivity

Features such as text-to-speech, premium content delivery, and navigation enable improved efficiencies and drive-time optimization.

Improved safety

Industry-leading user interface engineered to minimize distractions and provide the driver with only the information he needs while the truck is moving.

Simplified compliance

Hours of service are automatically tracked for the driver.

Lower operational costs

Operational profiles enable custom configuration of services for specific fleet requirements.

An innovative edge for operators & drivers

Hours of Service

Critical Event Reporting

→ Services

Qualcomm is committed to providing services that continuously improve the value of mobile communications. Our innovative services can be customized through operational profiles to maximize value based on the unique needs of your fleet.

Asset Management Service

Tethered trailer tracking provides near real-time tractor/trailer ID, trailer location, and status information when connected to the Qualcomm Mobile Computing Platform 200 Series.

Automated Arrival & Departure

Monitors beginning and end of trip details to improve scheduling and billing management.

Content Delivery

Provides a consistent, reliable, and secure way to use audio recordings to communicate critical information to your drivers. The service provides the ability to broadcast pre-recorded messages to the driver.

Critical Event Reporting

A comprehensive, actionable view of safety oriented, event-driven data summarized by vehicle and driver.

Driver Notification Service

Allows important in-cab messages sent from dispatch to also be copied to the drivers' mobile phone.

Hours of Service

An electronic on-board recording system that automatically creates driver logs which are fully compliant with the latest rules and regulations of the Federal Motor Carrier Safety Administration.

In-Cab Scanning

In-Cab Scanning provides drivers a way to send documents to their home office for back-office processing without having to leave their truck.

In-Cab Training

Train safer and more productive drivers during stops and loads with the leading interactive training tool, Pro-TREAD. The intuitive training software offers more than 50 lessons covering topics from fuel-efficient driving and fatigue management to defensive driving and emergency maneuvers. With a teaching style adapted from the U.S. Army's most battlefield critical tasks, Pro-TREAD engages the driver with real-world situations and checks their progress along the way.

Intranet Access

MCP200 series browser gives drivers access to back office information such as payroll, email, and critical customer information.

Navigation

Accurate routes, integrated to your TMS system, enable increased productivity, safer driving, enhanced customer satisfaction, and ultimately enabling you to improve your bottom line. Maptuit® NaviGo,™ a real-time, hybrid, in-cab navigation service provides professional truck drivers and trucking companies with accurate, up-to-date, interactive maps for increased routing efficiency and improved driver satisfaction.

Performance Monitoring

Performance Monitoring tracks vehicle and driver performance affecting fuel consumption through a direct interface with the vehicle's sensor inputs or on-board data bus. The Fuel Manager module within Performance Monitoring provides robust querying and data visualization tools to help turn data into actionable information.

In-Motion User Interface

The In-Motion User Interface provides advanced functionality to manage visual displays available to driver(s) for use while in motion based on the log-in status of driver(s).

Vehicle Maintenance

Qualcomm's Vehicle Maintenance service helps reduce repair costs by providing near real-time alerts for the most common fault codes and relevant vehicle diagnostic information to proactively detect, diagnose and service vehicles.

In-Cab Training

Navigation

Fuel Manager Dashboard

Hardware, software and communication options can be configured to meet the needs of your fleet.

→ **Getting More from Your Technology Investment**

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Qualcomm Professional Services can supplement your internal resources with assessment, integration, custom development and programming, training, business intelligence and predictive modeling services to help you create sustainable operational efficiencies that will differentiate your business performance from your competition.

The **Qualcomm Services Portal** allows you to access the full suite of web-based fleet management services, including satellite mapping. The Services Portal leverages web services and XML-based standards to securely deliver data that can be integrated to your enterprise systems.

Learn how you can use actionable information to gain control of your business, stay competitive and increase profitability.

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Omni**TRACS**®
MOBILE COMMUNICATIONS SYSTEM

OmniTRACS® SYSTEM
FOR TRANSPORTATION

For trucking and construction equipment fleets, the OmniTRACS system offers a powerful set of communication and position-tracking features that can help reduce operating costs, and enhance productivity and security.

MANAGING TRANSPORTATION FLEETS AND CONSTRUCTION EQUIPMENT

The OmniTRACS system goes beyond merely promoting efficiency and provides the tools needed for a proactive approach to fleet and service/delivery vehicle management. Fleet data, for example, can help enable customers to identify routes that yield a greater revenue stream. This is important for trucking because one of the keys to profitability is billable miles.

For service and delivery vehicles, the OmniTRACS system helps increase the productivity of support teams by streamlining their communications, tracking, and dispatch.

The OmniTRACS system also helps increase the security and safety of vehicles and their operators. Tamper-alert systems, panic alarms, and satellite-tracking capabilities help minimize the risk of loss due to tampering and theft, and help facilitate quick recovery by providing timely location information for law-enforcement agencies.

STANDARD FEATURES

- Automatic satellite vehicle positioning
- Two-way text and data communications
- QTRACS® fleet management system to display data from OmniTRACS system
- Customizable reports
- AS/400 server, Windows® server, or Web-hosted operation
- Reliable message delivery
- QUALCOMM Network Operations Centers (NOCs)
- QUALCOMM Professional Services support seamless data integration with:
  - Back-office applications
  - SensorTRACS® performance monitoring service
  - Vehicle maintenance service
  - Tethered trailer tracking service
  - T2 Untethered TrailerTRACS™ asset management system

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THE OmniTRACS SYSTEM

STRATEGIC MANAGEMENT AND REDUCED COSTS

The OmniTRACS system opens a new world of strategic fleet and equipment management. The Automated Arrival and Departure (AA&D) feature records vehicle arrival and departure times without driver intervention. This enables dispatchers to monitor driver performance, bill accurately, and verify and inform customers of detention events or any other unforeseen delays. Armed with this data, carriers can negotiate better fee arrangements and charge customers who are responsible for excessive delays.

Creating customized reports with the OmniTRACS system makes it easier to keep track of key information. For example, by evaluating data accumulated over time, transportation fleet managers can identify which customers and which routes yield the most billable miles. Using this information, carriers can select routes that consistently earn maximum revenues.

The OmniTRACS system can also help improve customer satisfaction by providing accurate status and location updates during a trip, which allows dispatchers to notify customers about unexpected delays. It helps fleet managers identify drivers that make unplanned stops, accrue excessive idle time, or accumulate out-of-route mileage as well as providing detailed information on fuel consumption. The dynamic management of carrier fleets and equipment is made possible by providing dispatchers the ability to easily recall vehicles in transit if a load or equipment rental is cancelled. Drivers can also be quickly diverted to pick up extra freight or equipment, or make additional service calls, creating an opportunity to earn new revenues without investing in additional resources.

OmniTRACS System Options

- Additional connectivity to third-party devices and peripherals using OmniExpander™
- Driver authentication
- Wireless panic button
- Driver and vehicle performance monitoring
- Trailer/vehicle monitoring
- Tamper-detection alerts
- Automated Arrival and Departure
- Remote vehicle disablement
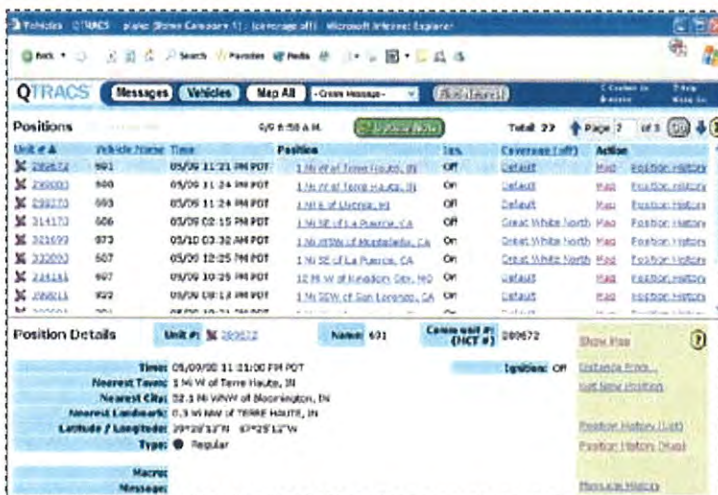
Two-Way Messaging—QTRACS fleet management system displays the time and date of messages, and supports return-receipt confirmation. Messages can be freeform or pre-formatted for users to fill in the blanks.
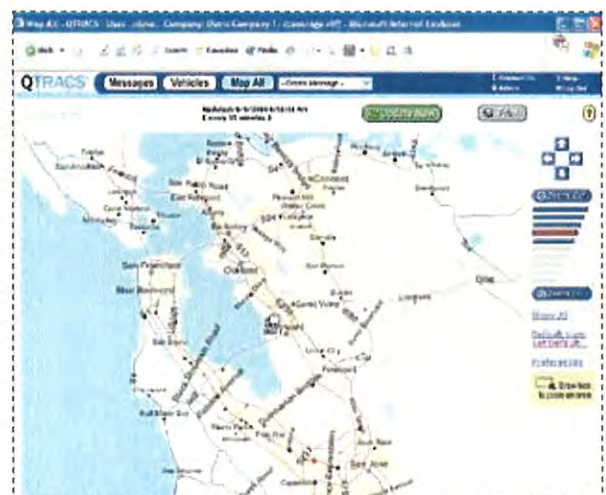
Scalable Mapping—Maps enable users to zoom in on mobile unit locations and landmarks. Mobile units can be color coded to distinguish groups or current status.

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Innovative Products and Services

Say "goodbye" to stagnant, expensive technologies that do not evolve with your business needs. And "hello" to PeopleNet, where technology and services are developed collaboratively to give you exactly what you need and not what you don't. The platform, applications and support available to you represent the most advanced innovation ever assembled to meet the dynamic needs of fleets.

Highlights of the PeopleNet system:

- Modular equipment so you can choose the hardware options that are best for your fleet
- A Web-based interface that's easy for users to access and use
- g3 onboard computer, giving you near-limitless power and versatility
- Precise GPS satellite tracking that lets you pinpoint a vehicle at any time
- Two-way, in-vehicle data and voice communications to ensure efficient communication throughout the supply chain
- OTAP™ (over-the-air-programming) which allows PeopleNet to make system upgrades without taking your vehicles off the road
- PerformX™ vehicle performance monitoring and reporting tool
- PACOS, the industry's first automated messaging and geofencing platform for exception-based communications and automated arrival and departure notification
- eDriver Logs® to take the paperwork out of the traditional Hours of Service log book process and catch the EOBR wave of the future
- Online business tools, including Fuel Tax Reporting and more to make your business run more efficiently
- Onboard Event Recording, which enables effective accident reconstruction and driver management
- Activity standards for accurate assessment of out of route miles and detention times
- A proactive and dedicated customer service team that is available 24/7 to answer your questions and professional services to help ensure ROI attainment.
- A 3-year onboard computer warranty, standard.

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  g3 Onboard Computing
  System

  Wireless Network

  Over The Air
  Programming

  Integration Services /
  PeopleNet Link

  > **PeopleNet Fleet**
  Manager Web
  Interface

  g3 Services

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PeopleNet Fleet Manager™ Web Interface

Control of your fleet is at your fingertips with the PeopleNet Fleet Manager™. Manage your fleet via the web through the PeopleNet Fleet Manager. PeopleNet was the first to utilize the Internet for its fleet management offering and remains the leading provider of Web-based solutions.

The PeopleNet Fleet Manager provides you with secure control of your communications and fleet management functions, including:

- Online mapping
- Two-way data communications
- eDriver Logs®
- Advanced reporting
- Online billing/usage
- Fleet settings and preferences
- PerformX™ vehicle and driver performance information (from engine)
- Start/stop reporting
- Activity (learned) standards
- PACOS geofencing and automated messaging management
- User management to add, delete and control user security and access rights
- Group management for divisional information control

Access to PeopleNet Fleet Manager is included with the PeopleNet system at no charge. Updates to the system are delivered frequently with no annual maintenance fees. Access can be provided to a single user, across your enterprise and/or to customers who want truck visibility.

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  > **g3 Onboard Computing System**

  Wireless Network

  Over The Air Programming

  Integration Services / PeopleNet Link

  PeopleNet Fleet Manager Web Interface

  g3 Services

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g3 Onboard Computing System

PeopleNet g3. Open. Multi-network. Smart. The PeopleNet g3 gives you near-limitless versatility to match your most important fleet productivity challenges. Bandwidth, processor, memory, peripheral and integration constraints are no longer a concern with PeopleNet g3. It begs the question, "Where do you want to go?"

With g3, you get:

- Mobile communications, onboard computing and fleet management in one powerful platform
- Multi-network with nearly 100 wireless carriers utilized across digital and analog channels to provide the highest levels of coverage, bandwidth and cost effectiveness
- Up to 500x the bandwidth of first-generation satellite devices
- Unlimited hardware connectivity with USB support
- Pinpoint GPS accuracy enabled through WAAS (Wide Area Augmentation System) technology
- Open development platform through g3 Services™ for rapid and custom development of new applications

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Wireless Network

PeopleNet's wireless network gives you the unique blend of coverage, bandwidth and cost effectiveness that is unmatched in the industry. PeopleNet customers benefit from more than 10 years of experience in managing and delivering wireless services to the transportation industry. The multi-network PeopleNet wireless network gives you an unmatched balance of bandwidth, cost effectiveness and coverage across North America. With nearly 100 wireless carrier relationships in place across multiple channels, PeopleNet users can benefit from the power, speed and cost effectiveness of digital communications with the reliability and coverage of traditional analog communications.

Calls are monitored by our world-class network management team and communications flow through our state-of-the-art Network Operations Center (NOC). You don't have to worry about managing cellular carrier relationships and billing with PeopleNet. We package the communications service for you in an easy-to-understand, simple billing format and ensure network sustainability, quality and reliability though our Wireless Assurance Plan.

How the system works.

1. The onboard computer receives and stores GPS data.

2. Onboard computer transmits location and message data via the multi-network wireless platform to the PeopleNet Network Operations Center (NOC).

3. The PeopleNet NOC processes data and passes information via the Internet or other secure connection to you, the customer, your back office system provider and to others across the supply chain as desired.

4. You view the information via the PeopleNet Fleet Manager interface and/or through your back office software.

5. Messages can also be created and sent to the driver through the PeopleNet system.

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Product Platform

> Applications

  > Locating & Messaging

  PACOS Geofencing & Automated Messaging

  Automated Fuel Tax

  Onboard Event Recording

  eDriver Logs

  PerformX Engine Connectivity

  Trailer Tracking Solutions

  Activity Standards

  In-Cab Navigation Solutions

  Handheld / Portable Solutions

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Locating & Messaging

Keeping your promises by keeping track. The PeopleNet system lets you quickly and accurately locate each of your vehicles. The in-cab base unit uses GPS data enhanced by WAAS (Wide Area Augmentation System) to pinpoint the vehicle's location, direction and speed. This information is available to you whenever you need it on the PeopleNet Fleet Manager™ Web-based interface.

PeopleNet allows you to:

- Track your valuable assets
- View trucks on a standard and/or satellite image-based map
- Predict delivery times
- Print mileage and route reports
- Determine vehicle speeds
- Know time at a location (start/stop)

Empower your customers, save time. Reduce service calls by allowing shippers to access vehicle location information. Customers can use a designated password and log on to the Web-based interface to see where their shipments are.

Measure it to improve it. PeopleNet location capabilities allow you to generate vehicle activity reports that include as much information as you need: GPS location points, hours worked, number and duration of stops, time moved and miles traveled.

Options to give you the information you need. From maps of the entire country or of local streets, you can view your whole fleet, a single truck, or even find the 10 closest vehicles to a certain location through the PeopleNet Fleet Manager.

Communicate more efficiently across the supply chain. With PeopleNet, you can stay in contact with reliable, flexible, affordable messaging options:

- Drivers and dispatchers can send as many deferred messages as they wish-at no extra charge! Because of the efficiency of the PeopleNet network, which allows for real-time and batch messaging, deferred messages piggyback on the next data call between the truck and dispatcher. Communicating this way has the potential to significantly reduce a fleet's messaging costs and to simplify complex billing programs, which traditionally have counted each character as a billable unit.
- E-mail allows drivers and dispatchers to stay in close contact through messages sent to and from the vehicle. E-mail also allows drivers to be closer to loved ones when they're on the road. PeopleNet offers personal driver e-mail free of charge.
- Preprogrammed messages are standardized text messages that can be sent instantaneously between driver and dispatcher. Choose from more than 100 industry-standard messages.
- Voice communication via the PeopleNet voice network allows in and outbound calls and access to free voice mail. Usage can be limited with call allotments and restrictions, and there is no monthly access fee.
- Forms messages automate dialogs regarding everyday work tools like load assignments, routing instructions or proof of delivery. New forms can be created and edited via a scripting engine located within the PeopleNet Fleet Manager.
- Decision tree forms allow for simplified driver interaction by only asking drivers questions relative to the situation they are in and based upon prior questions.
- Dispatchers can create and transmit custom forms such as manifests and bills of lading.
- Larger blocks of data can be sent as one, rather than as several billable messages.
- Signature capture and bar code capabilities through handheld devices allow for proof of delivery and pickup, inventory management and more.

- Drivers are able to work with multiple messages without losing valuable information. See the next generation of exception-based locating and messaging: PACOS

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Locating & Messaging

> **PACOS Geofencing & Automated Messaging**

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PACOS Geofencing & Automated Messaging

Let your drivers drive and the onboard computer communicate with PACOS. Now you can automate communication across the supply chain, from pick up to delivery. PACOS solutions replace current, outdated processes for communicating key in-transit, arrival and departure events. Whether you need to know that a load's on time or only when a driver's going to be late, PACOS™ Automated Messaging and Exception Management improves efficiencies, customer service, safety and revenue.

Click here to view an on-line video presentation.

With PACOS you can:

- Increase the efficiency of stops and improve supply chain communication through PACOS messages, which are generated automatically based on a geo-fence that's created around a location or event.

- Get more efficient pick ups/drop offs, higher compliance and lower communication costs with automated messaging. This service from PeopleNet delivers automatic and accurate updates across the supply chain.
- Lower overall communication costs and increase dispatcher effectiveness with communications and reporting based on exceptions in addition to or in place of traditional time-based communications, e.g. hourly updates.
- Increase efficiency of automated paper-based manifest processes. Through PACOS, load and route information is automatically delivered to the driver upon arrival through an automated manifest that is integrated with your dispatch system.
- Increase route compliance and identification, decrease detention times and ensure security by tracking truck routes to determine route progress vs. plan, rolling ETA, stop frequency/duration and out-of-route activities.
- Increase performance by evaluating driver, route and load activities that are tracked through automated reconciliation.
- Simplify driver interaction with Onboard Trip Management, which allows drivers to view trips, stops, and actions for each stop.

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Trailer Tracking Solutions

Manage your assets end to end with PeopleNet trailer tracking solutions! Asset monitoring doesn't stop with the tractor. PeopleNet provides end-to-end vehicle management through key developments and partnerships.   (Insert end-to end vehicle management image)

Untethered Trailer Tracking. PeopleNet customers can now benefit from key relationships with leading Untethered Trailer Tracking partners including AirIQ and SkyBitz. Both solutions are compatible with the PeopleNet system and can be viewed (linked to) through the PeopleNet Fleet Manager.

Tethered Trailer Tracking. Using the latest in RFID technology, PeopleNet will be launching a comprehensive tethered trailer tracking solution in the near future which will provide key visibility to asset cost drivers such as:

- Trailer hooked/unhooked status and identification
- Tire pressure variances
- Reefer temperature
- Door open/closed status

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Handheld / Portable Solutions

If portability is a key need for your technology decision PeopleNet offers several solutions to choose from:

Portable g3. Perfect for fleets with rental vehicles that require frequent switching of onboard computing units between vehicles, the portable option is a self-contained system in a ruggedized box. Installation takes less than 10 minutes and requires no drilling or fixed mounting within the cab.

Tethered/Untethered Bar Code Scanning Device. Capture bill-of-lading form information, cargo bar code information or other through an in-cab tethered option or Blue Tooth enabled mobile option that can extend outside the cab.

Handheld Computing Options. PeopleNet has partnered with a leading company to offer an advanced handheld solution that works in conjunction with your g3 Onboard Computer. This application allows for portable signature capture, bar coding, paperless form completion, and digital photographs and turns the mobile device into a multimedia clipboard. This automation and faster process translates into improved service and financial results.

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PerformX™ Engine Connectivity

Increase fuel economy and manage drivers with PerformX™. PerformX is a real-time driver and vehicle performance evaluation tool. It monitors your vehicles' engines (ECM connectivity) to help you better manage operating costs and run your fleet more effectively. PerformX monitors a vehicle's performance by communicating with the engine's data bus. This information is delivered to you via real-time alarms or scheduled data downloads; you'll know how your trucks are performing on the road from speed, RPM, distance, PTO usage, fuel efficiency and idle time.

- PerformX does not require costly software or monthly transaction charges
- PerformX is compatible with all heavy-duty truck engines
- PerformX upgrades are made quickly and easily, without vehicle downtime, through our unique OTAP® [over-the-air-programming] wireless technology

PerformX lets you:

- Improve vehicle fuel efficiency by helping you reduce idle times, increase kilometers per gallon and decrease over-RPM and speeding.
- Instantly identify when a vehicle is speeding or if it starts or stops suddenly. You're then notified of the truck's exact location.
- See engine performance data as it occurs. You don't have to wait until the vehicle returns to your facility to retrieve its diagnostic data. You'll have the information you want, precisely when you need it.
- Set an odometer alarm to schedule vehicle maintenance.
- Customize the reports, so you develop critical performance baselines relevant to your fleet.
- Compare drivers across key measurements such as KPL, Idle Times, or other.
- Receive critical ECM data without worrying about character counting or data restriction; all data is delivered with every breadcrumb update at no charge.

Exception-based alarms. Improve vehicle and driver productivity by setting alarm parameters in conjunction with your fleet's goals. Via an e-mail alarm, PerformX will immediately notify you when a vehicle exceeds designated speed limits, suddenly stops or starts, or requires scheduled maintenance.

Fault Codes. Remote fault code monitoring allows the notification of urgent vehicle distress signals at virtually the same time they are indicated to the driver by instruments on the vehicle's dash. Management will be able to make critical decisions, which could include how to respond to a roadside breakdown. Immediate knowledge of significant vehicle problems can also prevent future potential breakdown situations.

OBDII capability. Keep driver and vehicle management consistent across the fleet. The PerformX OBD-II capability allows the vehicle monitoring module of PeopleNet's g3 solution, that draws data from the engine control module on a vehicle, to also be used for other vehicles including light trucks, vans, SUVs and cars.

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Onboard Event Recording

Managing driver performance and accident reconstruction. With Onboard Event Recording you can proactively manage driver behavior, reconstruct accidents and transfer recorded event data real-time. With the ability to access second-by-second recorded data, fleets can monitor driver habits, alter behavior, take corrective action and potentially prevent accidents.

With Onboard Event Recording fleets can:

- Activate three types of event recordings: sudden acceleration, sudden deceleration and manual trigger
- Customize MPH thresholds that trigger events per vehicle
- Transfer vital event data in real-time - either urgently or on the next data call. Onboard events are never erased
- Proactively manage driver habits to reconstruct events based on details such as time of event, odometer reading, vehicle speed, engine speed, and GPS location and direction
- Capture 60, 120, or 170 seconds before and 30 seconds after to accurately reconstruct accidents
- View data from the web interface, via PDF, or download a .csv file to customize your own reports or interface with additional accident reconstruction tools.

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Appendix B

ACE Truck E-manifest
(U.S. Customs & Border Protection)

What's Inside:

Introduction of e-Manifest: Trucks

In compliance with the Trade Act of 2002, the e-Manifest: Trucks capability enables carriers to submit electronic truck manifests to U.S. Customs and Border Protection (CBP) prior to a truck's arrival at a United States land border crossing. The e-Manifest: Trucks feature introduces electronic filing of manifests, which offers the trade community increased efficiency by saving valuable time at the border, reducing processing time, and offering online status tracking of trips. In addition, CBP Officers are provided with consolidated information that will help them expedite legitimate trade while keeping America's borders secure.

Carriers are required to submit an e-Manifest one hour prior to arrival into the United States. Carriers' loads that qualify under the Free and Secure Trade (FAST) program must submit their electronic declaration at least one half hour prior to their arrival at the U.S. border.

With the implementation of the Advanced Cargo Rule, trucks are required to submit an automated cargo manifest (e-Manifest) through the web-based ACE Secure Data Portal or Electronic Data Interchange (EDI) software that has been tested with CBP. Carriers can determine which approach best suits the needs of their business.

ACE Secure Data Portal

- The ACE Secure Data Portal provides a web-based method to submit data to CBP. The portal is readily accessible on the Internet and is free to all users. Portal users key data in manually and then submit information directly to CBP.

Electronic Data Interchange

- EDI is an electronic transmission of data directly from one computer system to another. Information sent to ACE via EDI will be validated and processed. e-Manifests can be sent to ACE either by the carrier or by a third party service bureau.

It is recommended that you have at least two methods to submit e-Manifests in case one of your transmission methods is not available. If Customs & Border Protection is capable of receiving e-Manifests, you are required to send your manifest electronically.

There are three options when using CBP– tested EDI software:

1) **Self-developed EDI interface** – A carrier develops in-house software that is tested by CBP and interfaces with ACE.

2) **Software application provided by a software vendor** – A carrier utilizes software provided by a vendor that has been tested by CBP. Often, these software applications enable carriers to pull the data required to populate the e-Manifest from the software they use in their daily business practices.

3) **Service provider** – A carrier employs a third party to enter and/or transmit manifest data on his or her behalf. This third party is using software that has been tested by CBP.

The EDI standards that are supported in ACE are: The American National Standards Institute accredited standards committee X12 (ANSI ASC X.12) and the United Nations Electronic Data Interchange for Administration, Commerce and Transport (UN EDIFACT).

Tested EDI Vendors

The Office of Information and Technology has assembled a list of companies/persons who have developed and tested e-Manifest software and offer this software to the trade community. This list does not include third parties who offer ACE electronic truck manifest data processing services using one of these tested software packages. Inclusion on this list does not constitute any form of an endorsement by CBP as to the nature, extent, or quality of the services, which may be provided. Inquiries concerning specific capabilities should be addressed to the individual organization. On the CBP.gov website, there is a comprehensive list of fully tested vendors. For this information, go to: www.cbp.gov/modernization, "Truck Carrier Information on ACE," "ACE Electronic Truck Manifest Software Developers".

For a list of tested EDI software parties and other information pertaining to EDI technology go to http://www.cbp.gov/xp/cgov/trade/automated/modernization/carrier_info/etruck_tech_info/

For specific information on filing Electronic Truck Manifest using EDI, please contact TJ Wright at tj.wright@dhs.gov or at (703) 650-3121.

The instructions provided below are designed to supplement the web based https://nemo.customs.gov/ace_online/ . You can log into this site by entering user01 as the user ID, and 1Password as the password.

ACE training guides and Web Based training are available at http://www.cbp.gov/xp/cgov/trade/automated/modernization/ace_welcome/

Storing Account Information in the ACE Secure Data Portal

In the ACE Secure Data Portal, truck carrier accounts are organized by Standard Carrier Alpha Codes (SCACs). Carriers may own multiple companies that all operate under different SCACs. To choose a SCAC, follow the steps below:

1. Log in with your User ID and Password.
2. Select the **Accounts** tab.
3. In the "*Task Selector*" under "*View*," select **Carrier.**

4. Select **Go.**

5. In the "*Account Selector List"* portlet, you have 2 options to view the sub accounts associated to the Top account, by selecting either **Acct Name** or **SCAC**. You may also "*Sort By*" selecting the drop down. Select from the options listed and select **Go.**
6. Click on the **+** sign beside the top folder.
7. Click on the name or SCAC (depending on the view you selected) of the sub account you will be working on. If only one SCAC is associated with the top account, select the name or SCAC below the top account, or if multiple SCACs are included in the account, select the appropriate name or SCAC.

Two Options:

View by Name

View by SCAC
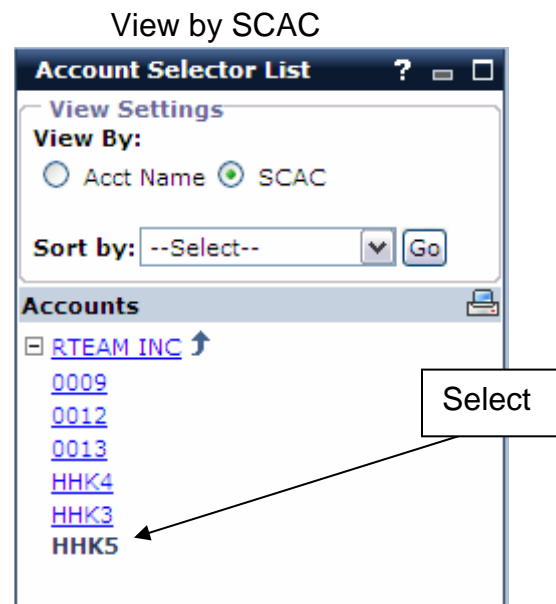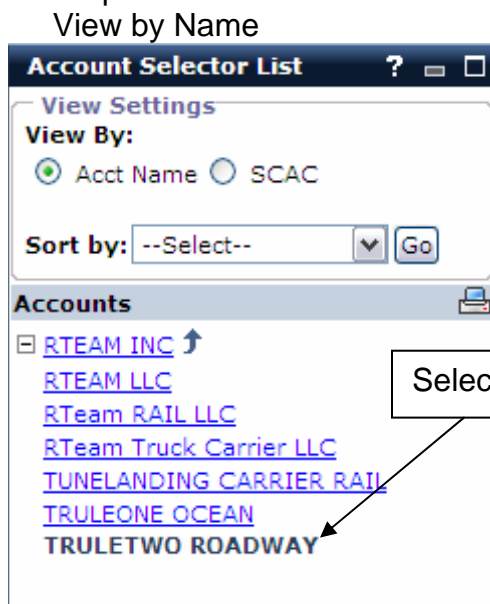
To ensure you are viewing the information of the appropriate carrier, the appropriate SCAC or Name must be selected within the account list.

Storing Information in an ACE Account

To assist in the entering of data into an electronic manifest, there are 5 sets of master data that can be stored in the truck carrier's ACE account. Storing these items will reduce the time it takes to create a manifest. This information may be stored in an account for future retrieval, or it can be entered each time a manifest is prepared. These sets of master data are as follows:

1. Drivers/Crew
2. Conveyance (power units)
3. Equipment (trailers, containers, chassis etc.)
4. Shipper (names and addresses)
5. Consignee (names and addresses)

A company/person must have an ACE Portal account to submit an e-Manifest through the ACE Portal. Application information may be found at http://www.cbp.gov/xp/cgov/toolbox/about/modernization/carrier_info/ace_portal _lp.xml

It is faster and easier to prepare an e-Manifest if information is stored in the account first.

There are three types of ACE users: Trade Account Owner (TAO), Proxy Account Owner (PTAO), and Trade User. Only Trade Account Owners and Proxy Account Owners may store information to the Account through the "*Accounts*" tab.

1. There are 7 blue hyperlinks located at the bottom of the *"Carrier"* portlet.
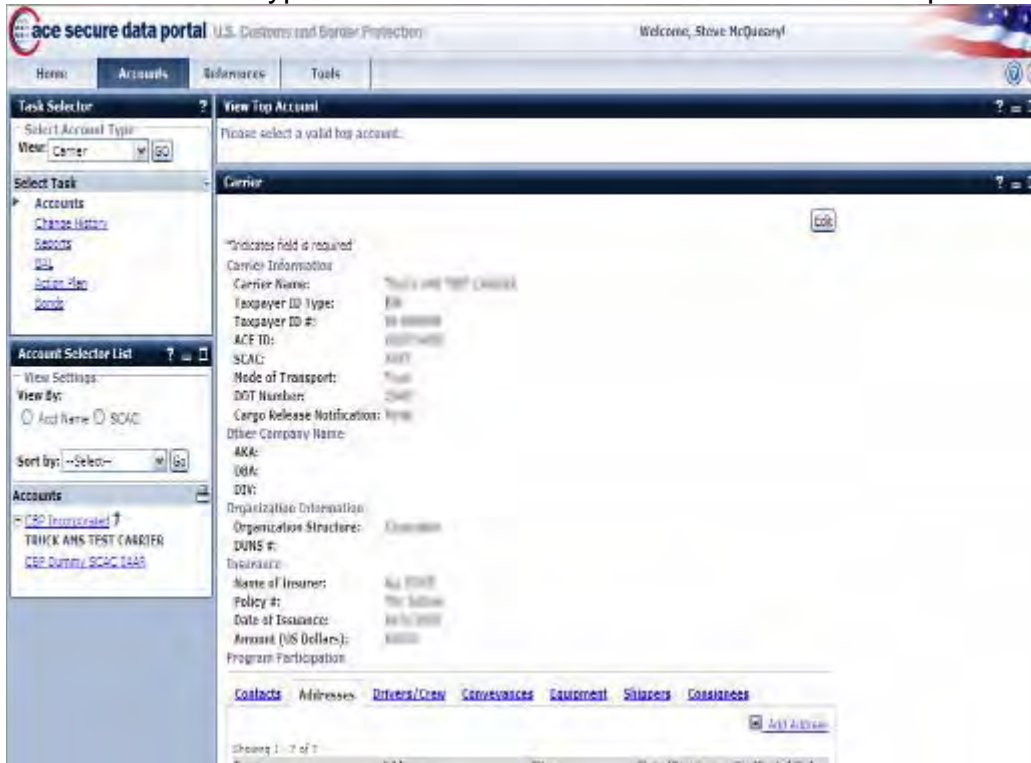
2. Click on any of the blue links, and on the line below to the right a new blue link will appear that says *"Add…"*. Examples: "*Add Driver,*" "*Add Conveyance,*" "*Add Equipment,*" "*Add Shipper*" or "*Add Consignee.*"

Adding Drivers/Crew to an Account

Drivers that have been issued FAST cards are not to be stored in your account. They are associated to the manifest by their FAST ID number as you create the manifest.

To add a non-FAST driver to your account, select the **Driver/Crew** hyperlink, and then select **Add Driver** on the right side. Drivers can now be stored in multiple carrier accounts. Before a new driver can be created, search for the driver in ACE. To search for a driver, follow the steps below:

1. Select **Drivers/Crew.**
2. Select **Add Driver.**
3. Enter "*Last Name."
4. Enter "*First Name."
5. Enter "Date of Birth" (mm/dd/yyyy).
6. Enter "Commercial/Enhanced Driver's License #."
7. Select the authorization box.
8. Select **Search** to continue, or **Cancel** to cancel this search.

Driver/Crew
*Indicates field is required
Search for Truck Driver / Crew Member
* Last Name:
* First Name:
* Either Date of Birth OR Driver's License # is required. Enter both to narrow search results.
Date of Birth: (mm/dd/yyyy)
Commercial/Enhanced Driver's License #: (Enter numbers and letters only)
☐ Your use of the FIRST NAME, LAST NAME, DATE OF BIRTH, and/or COMMERCIAL/ENHANCED DRIVER LICENSE NUMBER for the referenced individual constitutes your acknowledgement to CBP that you are authorized to access his/her personally identifiable information.
Search   Cancel
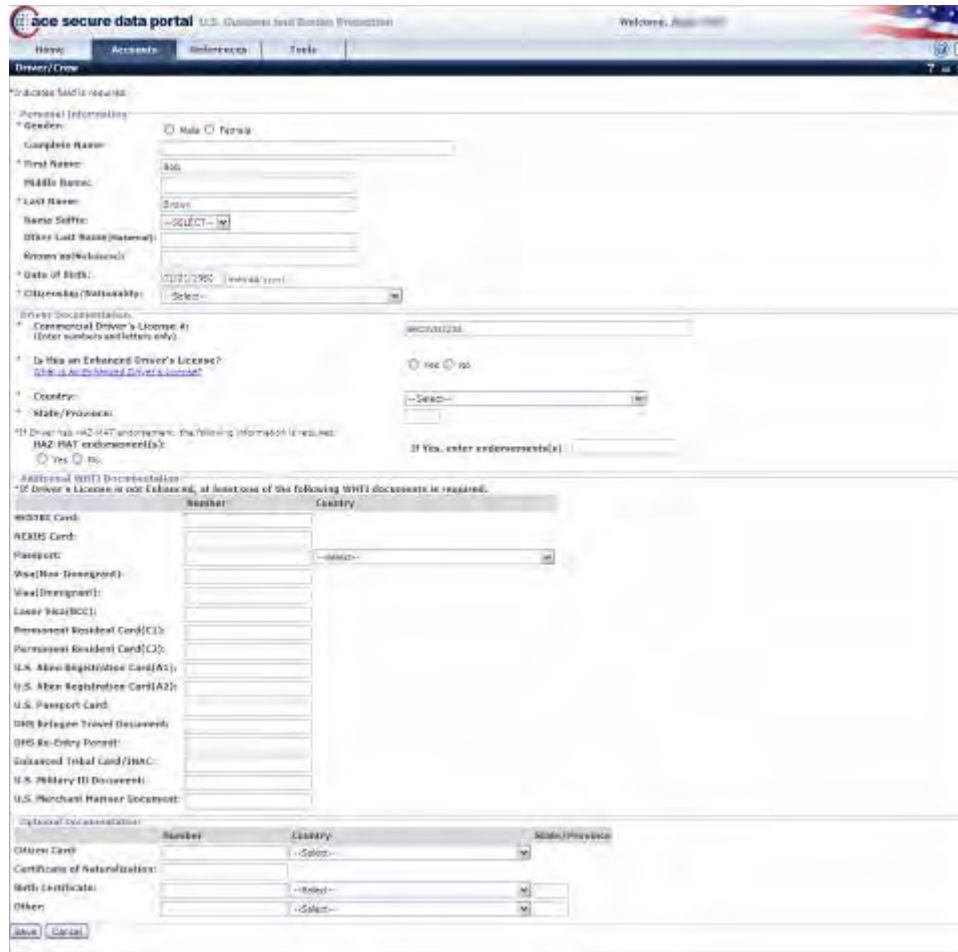
* Throughout the document, an asterisk (*) represents information that is mandatory; other information may be either conditional or voluntary.

* Either Date of Birth or Commercial Drivers License (CDL) # is required. Enter both to narrow search results.

If the driver exists in ACE, his name will appear with a round radio button to the right of the last name. To add this driver to your ACE account select the radio button to the right of the last name then select **Add Driver to Account**. If your search does not return any driver information, select **Create New Driver.** The "Driver/Crew" screen will appear.

Driver/Crew
No entries found.
*Indicates field is required
Search for Truck Driver / Crew Member
* Last Name: Brown
* First Name: Bob
* Either Date of Birth OR Driver's License # is required. Enter both to narrow search results.
Date of Birth: 01/01/1960 (mm/dd/yyyy)
Commercial/Enhanced Driver's License #: BROWN1234 (Enter numbers and letters only)
☑ Your use of the FIRST NAME, LAST NAME, DATE OF BIRTH, and/or COMMERCIAL/ENHANCED DRIVER LICENSE NUMBER for the referenced individual constitutes your acknowledgement to CBP that you are authorized to access his/her personally identifiable information.
Search   Cancel

Last Name ⇕	First Name ⇕	Date of Birth ⇕	CDL # ⇕
Create New Driver Cancel			

Create New Driver

Step 1: Personal Information

1. Select appropriate "*Gender."
2. Fill in "Complete Name."

3. Ensure *"*First Name"* is populated correctly.
4. Fill in *"Middle Name."*
5. Ensure *"*Last Name"* is populated correctly.
6. Select *"Name Suffix"* from the drop down.
7. Fill in *"Other Last Name (maternal)."*
8. Fill in *"Known as (nickname)."*
9. Ensure *"*Date of Birth"* is populated correctly.
10. Select *"*Citizenship/Nationality"* from the drop down list.

STEP 2: Driver Documentation

1. Enter *"*Commercial Driver's License #."*
2. Select the **yes** or **no** radio button to answer the question *"*Is this an Enhanced Driver's License?"*
3. Select the *"*Country"* from the drop down.
4. Select the 2 digit abbreviation *"*State/ Province"* code from the drop down list.
5. Select **yes** or **no** for *"*HAZ_MAT Endorsement(s)."*
6. Enter endorsements if you answered *"Yes"* in **"If Yes, enter endorsements."**

*An Enhanced Driver's License is a WHTI compliant travel document, If the Driver has an Enhanced Driver's License you may skip step 3 "**Additional WHTI Documentation**" and select SAVE.*

Step 3: Additional WHTI Documentation

If Driver's License is not an Enhanced Driver's License you are required to enter at least one WHTI Compliant Travel Document. Choose from the following types of documents along with the corresponding information (if applicable) that is needed. There are 16 options available:

Additional WHTI Documentation
*If Driver's License is not Enhanced, at least one of the following WHTI documents is required.

	Number	Country
SENTRI Card:		
NEXUS Card:		
Passport:		--Select--
Visa(Non-Immigrant):		
Visa(Immigrant):		
Laser Visa(BCC):		
Permanent Resident Card(C1):		
Permanent Resident Card(C2):		
U.S. Alien Registration Card(A1):		
U.S. Alien Registration Card(A2):		
U.S. Passport Card:		
DHS Refugee Travel Document:		
DHS Re-Entry Permit:		
Enhanced Tribal Card/INAC :		
U.S. Military ID Document:		
U.S. Merchant Mariner Document:		

1. Enter *"SENTRICard"* number.
2. Enter *"Nexus Card"* number.
3. Enter *"Passport"* number, and then select country from drop down list.
4. Enter *"Visa (Non-Immigrant*)" number.
5. Enter *"Visa (Immigrant)"* number.
6. Enter *"Laser Visa (BCC)"* number:
7. Enter *"Permanent Resident Card (C1)"* number.
8. Enter *"Permanent Resident Card (C2)"* number.
9. Enter.*"U.S. Alien Resident Card (A1)"* number.
10. Enter *"U.S. Alien Resident Card (A2)"* number.
11. Enter *"U.S. Passport Card"* number.
12. Enter *"DHS Refugee Travel Document"* number.
13. Enter *"DHS Re-entry Permit"* number.
14. Enter "*Enhanced Tribal Card/INAC"* number.
15. Enter "*U.S. Military ID Document"* number.
16. Enter *"U.S. Merchant Mariner Document"* number.
17. Select **SAVE** at the bottom of the page to add this Driver to your account unless you choose to enter optional information in step 4.

If you selected "*Save,*" the "*Driver/Crew*" portlet will appear showing the Name, ACE ID, and CDL# for the driver, select **OK** to store this driver to your account

Step 4: **Optional Documentation**
This information is optional and is not required.

1. Enter *"Citizen Card"* number and then select "*Country"* from drop down list.
2. Enter *"Certificate of Naturalization"* number.
3. Enter *"Birth Certificate"* number and then select "*Country"* and "*State/Province"* from the drop down lists.
4. Enter "*Other"* number and then select "*Country"* and "*State/Province"* from lists.
5. Select **SAVE** at the bottom of the page to add this Driver to your account,

Adding Conveyances to an Account

Conveyance is the term used to refer to the power unit of a truck. This is usually the cab or tractor portion of a tractor trailer. In the case of a box truck or dry van it is usually the complete unit. Conveyance details can be stored in ACE and associated with a carrier's account. Conveyances are identified by their Vehicle Identification Number (VIN). This allows one conveyance to be stored in multiple carrier accounts.

1. Select the **Conveyances** hyperlink.
2. Select **Add Conveyance.**

3. Enter *"*VIN/SERIAL#."*
4. Select the box next to the authorization disclaimer.
5. Select **Search**.
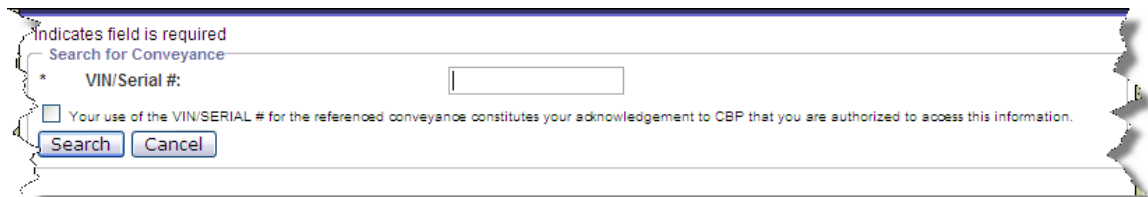
6. If your search returned a match, enter the Conveyance number you want to use to identify this conveyance in the *"*Conveyance # field."*
7. Select **Add Conveyance To Account** to save to your account, or **Cancel** to exit this action. The conveyance information shown includes the VIN, Conveyance #, Conveyance Type, and License plate(s).
8. If your search did not return any results, a message in red will appear "No vehicle match found." Select **Create Conveyance**.

9. Enter the number in which you will identify this conveyance in the "*Conveyance # field."*
10. Select the description of the conveyance from the *"*Conveyance Type,"* drop down menu.

11. Click on ***Add License Plate** link located on the right side of the portlet.
12. Enter license plate number in "*License Plate# field."
13. Select the "*Country of Registration" from the drop down menu.
14. Select the "*State/Province" from the drop down menu.
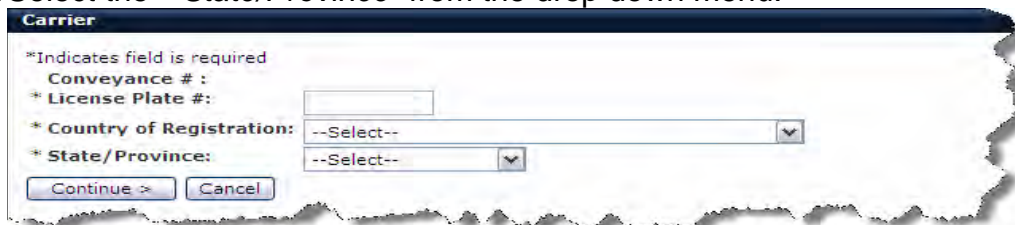
15. Select **Continue.**
16. Select **Save.**

To edit Conveyance #, Conveyance types, and license plate information, select the conveyance from the carrier *Accounts* page by clicking on **Conveyances**, and then selecting the *conveyance #* of the conveyance you wish to change.

You may not edit Conveyance information if a transponder has been associated to the VIN #. This data is updated in ACE by the Customs Transponder and Decal registration process. Information is provided at:
http://www.cbp.gov/xp/cgov/travel/pleasure_boats/user_fee/user_fee_decal.xml
.

1. Select the conveyance from the Carrier Account page by clicking on **Conveyances**, and then selecting the conveyance # of the conveyance you wish to change.

2. Click on the box below "*User Agreement*" and select **Accept.**
3. Select **Edit,** to change information or, **Remove Relationship**. If you choose to "*Remove Relationship*" of the conveyance from your account, a pop up window

will appear asking for confirmation to remove the conveyance.

4. Select **Edit** to change the "*Conveyance #*," "*Conveyance Type*" or "*License Plates*." To change the Conveyance #, or Type, delete the information you wish to change, and enter the correct information. To add a license plate, select **Add License Plate.**
5. Enter the *"*License Plate #."*
6. Select the "*Country of Registration"* from the drop down menu.
7. Select the "*State/Province*" from drop down menu.
8. Select **Continue.**
9. Select **Save.**
10. To change a "*License Plate #*," click on the license plate # (the license plate will be displayed as a blue link).
11. Select **Edit** to change the "*License Plate #*," "*Country of Registration,*" or "*State/Province.*"
12. Select **Continue.**

Adding Equipment to an Account

Equipment can be a trailer, chassis, or container as well as other non-self-propelled articles.
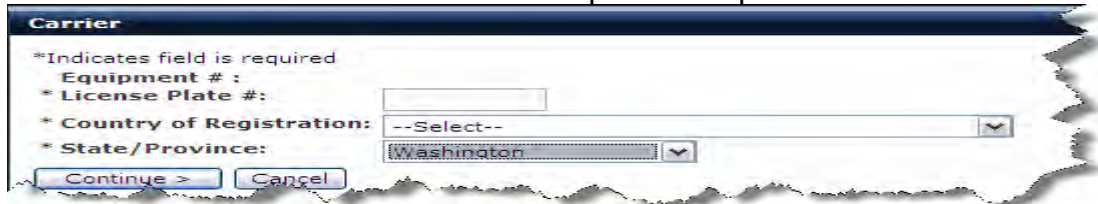
1. Select **Equipment.**
2. Select **Add Equipment.**
3. Enter "*Equipment #."*

4. Select the "*Equipment Type" from the drop down menu, choose the closest description or if none applies, select **other**.

5. Enter the "VIN/SERIAL#." (Optional)
6. *Select **Add License Plate.** One license plate is required.

7. Enter "*License Plate."
8. Select the "*Country of Registration" from the drop down menu.
9. Select the "*State/Province" from the drop down menu.
10. Select **Continue.**
11. Select **Save.**

Adding Shippers to an Account
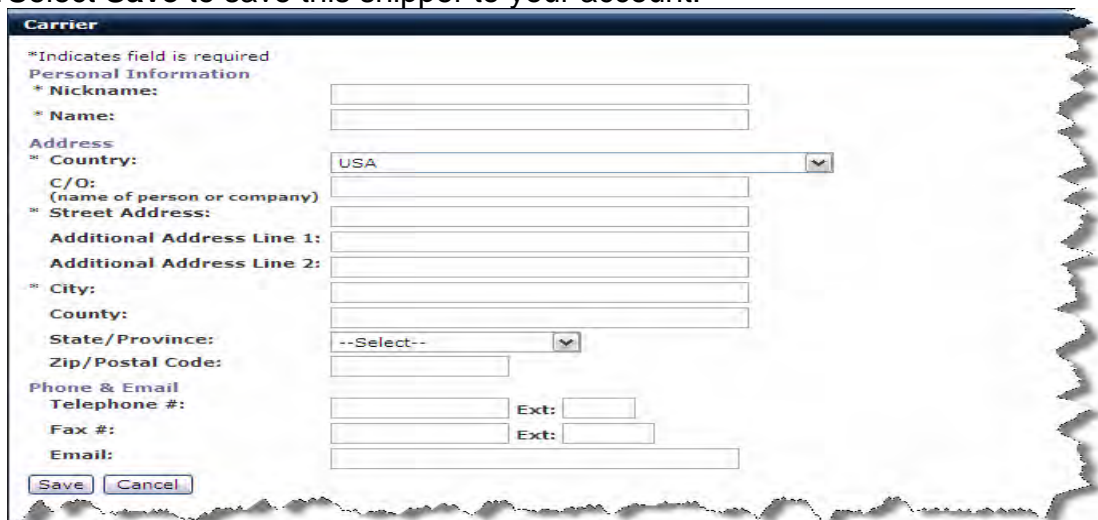
You may save 500 Shippers to your account.

1. Select **Shippers.**
2. Select **Add Shipper.**

3. Enter the "*Nickname" of the shipper. This is the name by which the shipper will file within your account and will not appear on the manifest. In many cases, ACE users just enter the actual shipper name.
4. Enter the "*Name" of the shipper.
5. Select the "*Country" from the drop down menu.
6. Enter the "C/O" (name of person or company) (not mandatory).

7. Enter "*Street Address."
8. Enter "*Additional Address Line 1." (Conditional use if needed)
9. Enter "Additional Address Line 2." (Conditional use if needed)
10. Enter "*City."
11. Enter "County." (Optional)
12. Select "*State/Province" from drop down menu. (This is mandatory even though the * indicator does not appear.)
13. Enter "Zip/Postal Code." (This is mandatory even though the * indicator does not appear.)
14. Enter "Telephone #." (Optional)
15. Enter "Fax #." (Optional)
16. Enter "Email." (Optional)
17. Select **Save** to save this shipper to your account.

Carrier

*Indicates field is required
Personal Information
* Nickname:
* Name:

Address
* Country: USA
C/O:
(name of person or company)
* Street Address:
Additional Address Line 1:
Additional Address Line 2:
* City:
County:
State/Province: --Select--
Zip/Postal Code:
Phone & Email
Telephone #:   Ext:
Fax #:   Ext:
Email:

[Save] [Cancel]

Adding Consignees to an Account

You may save 500 Consignees to your account.
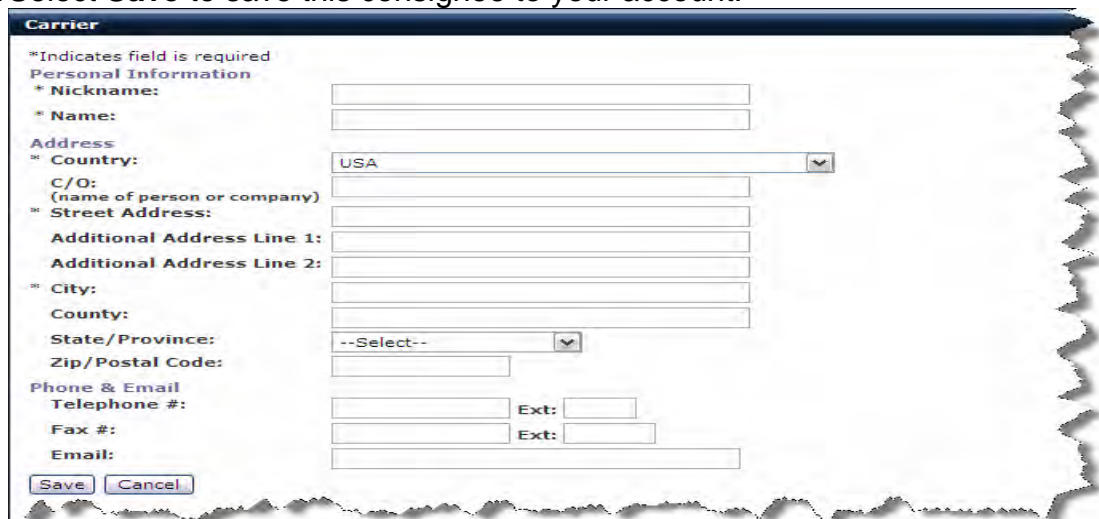
1. Select **Consignee.**
2. Select **Add Consignee.**

Contacts	Addresses	Drivers/Crew	Conveyances	Equipment	Shippers	Consignees
						Add Consignee

3. Enter the "*Nickname" of the consignee. This is the name by which the consignee will file within your account and will not appear on the manifest. In many cases, ACE users just enter the actual consignee name.
4. Enter the "*Name" of the consignee.

5. Select the **"** *Country"* from the drop down menu
6. Enter the *"C/O."* (name of person or company) (not mandatory)
7. Enter "* *Street Address."*
8. Enter "*Additional Address Line 1."* (Conditional use if needed)
9. Enter *"Additional Address Line 2."* (Conditional use if needed)
10. Enter "* *City."*
11. Enter "*County."* (Optional)
12. Select "* *State/Province"* from drop down menu. (This is mandatory even though the * indicator does not appear.)
13. Enter "*Zip/Postal Code."* (This is mandatory even though the * indicator does not appear.)
14. Enter "*Telephone #."* (Optional)
15. Enter "*Fax #."* (Optional)
16. Enter "*Email."* (Optional)
17. Select **Save** to save this consignee to your account.

Getting to the Manifest Portlet

1. Select the **Tools** tab, then select **Manifest Tools** from the Task Selector.

2. From the "*Account Selector List"* select the **+** sign located beside your top account and one or more sub accounts will appear below the top account.
3. Click on the **Name of the Carrier** or **SCAC** for the account for which you are creating the manifest.
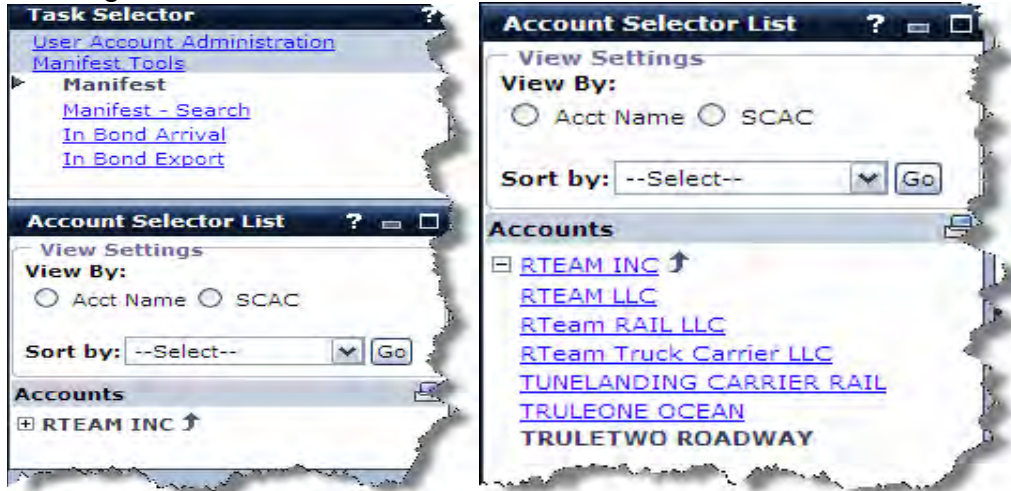
4. Select **Manifest Tools,** from the "*Task Selector*" menu.
5. Select **Manifest**. This will open the "*Manifest"* portlet*.*

The manifest portlet serves several functions. The top portion is a search screen to allow users to search for manifests by a range of trip #'s, arrival dates, shipment control #, and by status. Filing status is typically used to locate the following:

1. Preliminary Manifest (Manifest that has been created, but not submitted),
2. Completed (Manifest that has been submitted), and
3. Completed Amended (Manifest that has been submitted, and later amended).
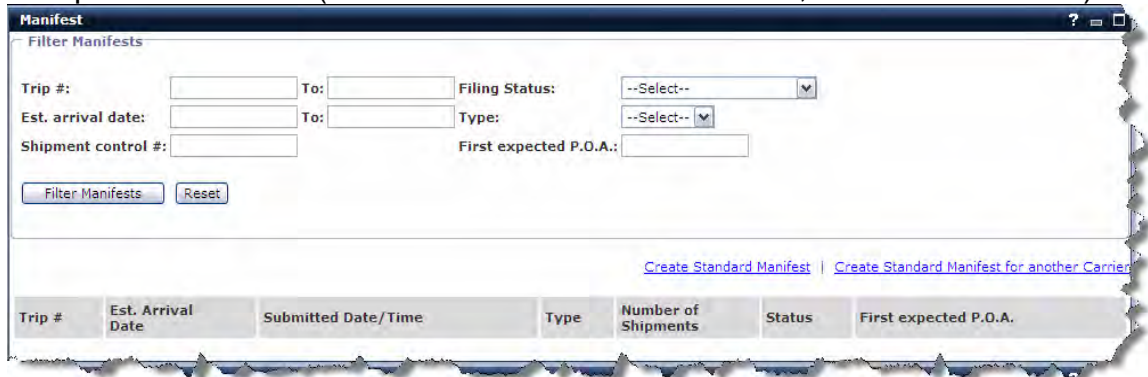
Below the "*Filter Manifest"* portlet there are two blue links, "*Create Standard Manifest,"* and "*Create Standard Manifest for another Carrier."*

Carriers that have an ACE Secure Data Portal can create manifests on behalf of any Carrier that has a valid SCAC, with their permission.

Creating Standard Manifest

Select **Create Standard Manifest** hyperlink. This will open the "*Manifest – Create Standard Manifest"* portlet, where information of the trip will be entered.

Notice some trip information is already populated at the top of the screen, Carrier SCAC, Carrier name, ACE ID, Filling status, and SCAC of Manifest preparer.

Trip Information

```
Manifest - Create Standard Manifest
* Required
  Trip Information
    Carrier SCAC: HHK5   Carrier name: TRULETWO ROADWAY    ACE ID: 0000203692    Filing status: PL
    Manifest preparer: HHK5
  * Trip #:                        HHK5  [          ]
  * Est. date of arrival at first port in U.S.:  [          ]  (mm/dd/yyyy)
    Acceptable dates
  * Est. time of arrival at first port in U.S.:  [          ]  (hh:mm local military time)
    Acceptable times
  * First expected port of arrival:  [          ]  Lookup Port Code
    In-transit indicator:        ○ Yes  ◉ No
```

1. Enter *"Trip #."* This is a unique number for this carrier.
2. Enter *"*Estimated date of arrival at first port in U.S."* Use format shown to the right of the data field (mm/dd/yyyy). Click on **Acceptable dates** to view message on *Acceptable Dates.*
3. Enter "***Estimated time of arrival at first port in U.S."* Use format shown to the right of the data field (military time, hours, followed by a colon and minutes). Click on **Acceptable times** to view message on *Acceptable Times.*
4. Enter port code for "*First expected port in the US,"* which is a Schedule D number. If you do not know the port code, you can find it by clicking the "*Lookup Port Code*" link. Click on **Lookup Port Code**, select the "*State,"* select **Search**, then click on the radio button beside the correct port, scroll to the bottom of the page, and select **Continue.**
5. *"In-Transit indicator"* is not currently in use, but will be available in the future

Conveyance

The next portion of the screen pertains to conveyance, the power unit. You will provide conveyance information either by looking up an existing conveyance stored in your

account, or by creating a one time conveyance. A conveyance must be added to the manifest by either selecting *"Lookup Conveyance"* or *"Create-one time Conveyance."*

1. If you have stored your conveyances in your account, select **Lookup Conveyances.** If you have not stored the Conveyance to your account, proceed to step 4, *"Create One-time Conveyance."*
2. There are seven pieces of data you may search by, but most carriers enter the ID number they stored with their conveyance in their account. This field is case sensitive; if you stored the truck with an ID of 12A, and you search by 12a, no results will be found. You may also search by entering any or all of the items listed. To lookup a truck by *"ID number,"* leave the field *"Type"* as the default selection of *"--Select--"* and type the ID number you stored with the conveyance in your account. After entering this information, select **Continue.**

3. Using your mouse, left click on the radio button that corresponds to the correct conveyance, and select **Add to Trip.** If your search did not produce the conveyance you were searching for, you can either *"Create One Time Conveyance"*, or *"Cancel"* and perform another search.
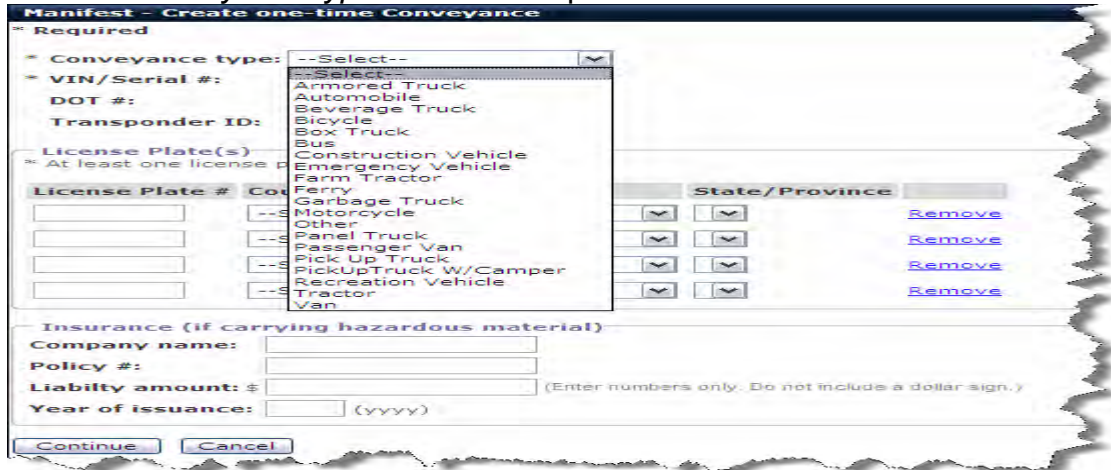
4. Select **Create One-time Conveyance** if you have not stored this conveyance in your account.
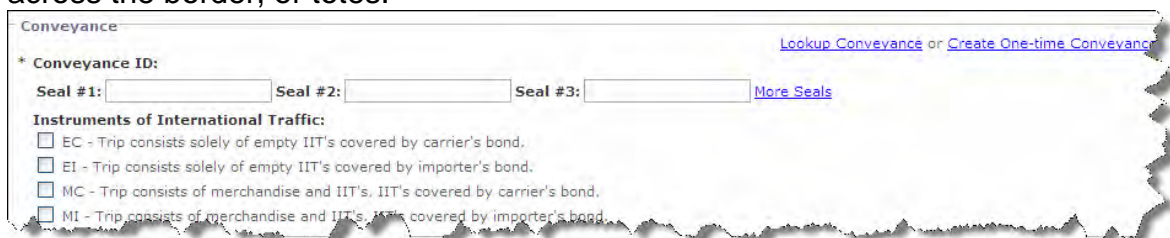
5. Select "*Conveyance type" from the drop down menu.

6. Enter "*Vin/Serial #."
7. Enter "*DOT #." If you do not have a DOT #, enter "**9**" six times.
8. Enter "Transponder ID." It is not mandatory.
9. Enter "*License Plate #." At least one license plate is required.
10. Use the drop down menu to select "Country of Registration" and "State/Province."
11. If you are not transporting Hazardous material, select **Continue.**
12. If you are transporting Hazardous materials, enter "Company name" of the insurance company.
13. Enter "Policy #" of the insurance policy.
14. Enter "Liability amount $."
15. Enter "Year of issuance," which is the year the policy was issued.
16. Select **Continue.**

In this "Conveyance" section you can also record Seal #'s and report Instruments of International traffic (IIT's), if transported on the conveyance.

17. Enter "Seal #'s" if you have seals on your conveyance. You may enter them in Seal #1, #2, #3, and select more seals if needed.
18. "Instruments of International Traffic" (IIT's) that are transported in the Conveyance must be reported. Check the IIT description that applies. Examples of IIT's might be engine racks that are used to transport engines back and forth across the border, or totes.

Instruments of International Traffic must be covered under a specific Instruments of International Traffic bond; either the Importer or Carrier must have a bond to cover the IITs on board. Sometimes this process is referred to as CFR 10.41a which is the citation within the Code of Federal Regulations Title 19 that explains this process.

Crew Member(s)

There are three options available to add crew members to a manifest:

1. Add Crew Member by ID;
2. Lookup Crew Member; and
3. Create One-time Crew Member.

"Add Crew Member by ID" allows users to add crew members to a manifest by searching for crew members by travel document information. This is the only method that can be used to add a driver to a manifest if the driver participates in the Free and Secure Trade (FAST) program.
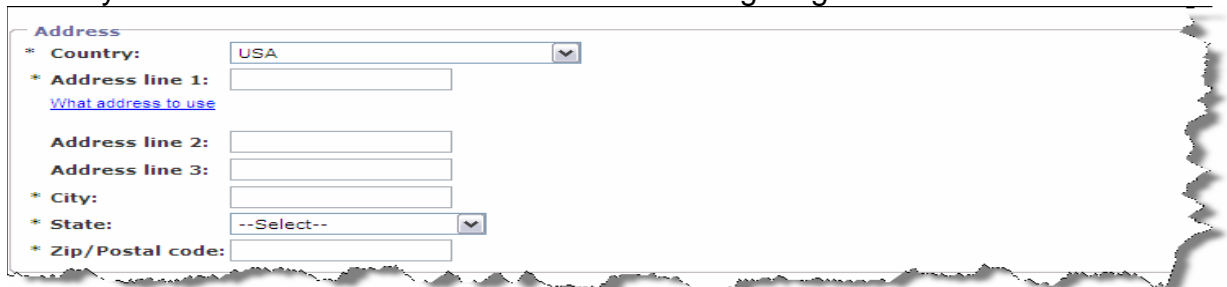
FAST drivers cannot be stored to the carrier's account and must be entered by reporting the FAST proximity card number. The card number can be added in the "Add Crew Member by ID" selection.

1. Select the travel document on which you wish to search by from the *"Travel document"* drop down menu.
2. Enter the *"Travel Document #."*
3. Enter *"Country (If Applicable)."* Do not enter the country information if "*FAST Driver Prox Card Serial #"* was selected.
4. Enter *"State (If Applicable)."* Do not enter the state information if "*FAST Driver Prox Card Serial #"* was selected.
5. Select **Continue.**

If the Crew Member was entered by FAST ID, you will be returned to the Trip Screen where you may continue to add trip information. For all others, continue with steps 6 through 14.

6. Enter *"*US Address for Driver"* for all non-FAST drivers. A U.S. address where the driver will be at some point during this trip must be provided. This could be a delivery address to where the driver will be delivering cargo.

7. Select **USA** in "**Country"* drop down menu.
8. Enter the US address in *"*Address line 1."*
9. Enter "*Additional Address Line 2* (Conditional use if needed)."
10. Enter "*Additional Address Line 3* (Conditional use if needed)."
11. Enter the *"*City."*
12. Select the *"*State"* in the drop down menu.
13. Enter the "**Zip/Postal code."*

14. **Scroll down to the bottom of the page** and *select **Continue.**

"Lookup Crew Member" is the second option for adding a driver to a manifest. You may lookup Crew members that you have stored in your account.

1. Select **Lookup Crew Member.**
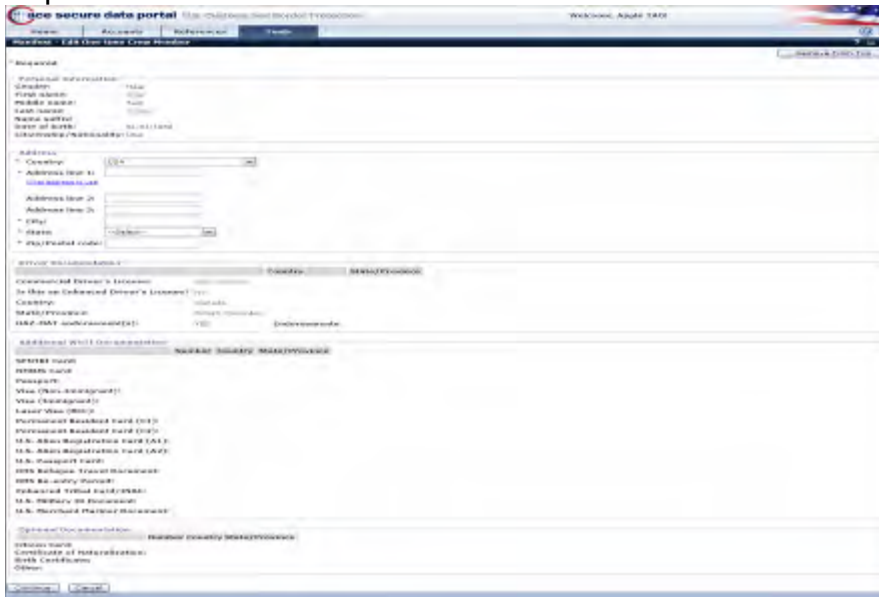
2. Enter *"*Last name."* This is the only mandatory data that must be entered for this search. To narrow the search parameters, enter the First, Middle name, and/or date of birth.

3. Enter *"First name."*
4. Enter *"Middle name."*
5. Enter *"Date of birth"* in the format shown.
6. Select **Search.**
7. Select the radio button left of the Crew member's name.

8. Select **Add to Trip.**
9. If your search did not return the Crew member you were searching for, you can either *"Create One Time Crew member"* or *"Cancel"* and perform another search.
10. If you selected *"Add to Trip,"* another screen will appear where you will be required to enter a US address for the Crew member.

11. Add *"*US Address for Driver"* which is mandatory for all non-FAST drivers. A US address must be provided where the driver will be at some point during this trip. This may be a delivery address where the driver will deliver the load.

12. Select **USA** in the *"*Country"* drop down menu.
13. Enter *"*Address line 1."*
14. Enter "*Additional Address Line 2* (Conditional use if needed)."

15. Enter "*Additional Address Line 3* (Conditional use if needed)."
16. Enter the *"*City."*
17. Select the *"*State"* in the drop down menu.
18. Enter "**Zip/Postal code.*"
19. *Select **Continue.**

"Create One-time Crew Member" is the third option to add a crew member to a manifest.

Select **Create One-time Crew Member.**

Personal Information

1. Select appropriate *"Gender."*
2. Enter *"*First name."*
3. Enter *"*Middle name," which is* optional.
4. Enter *"*Last name."*
5. Enter *"*Suffix,"* if applicable
6. Enter the "**date of birth.*" (mm/dd/yyyy)
7. Enter "*Citizenship/Nationality*," from the drop down list

US Address for Driver

Add *"*US Address for Driver"* which is mandatory for all non-FAST drivers. A U.S. address must be provided where the driver will be at some point during this trip. This may be a delivery address where the driver will deliver the load.

1. Select **USA** from the *"*Country"* drop down menu.
2. Enter *"*Address line 1."*
3. Enter "*Additional Address Line 2* (Conditional use if needed)."
4. Enter "*Additional Address Line 3* (Conditional use if needed)."
5. Enter the *"*City."*
6. Select the *"*State"* from the drop down menu.
7. Enter "**Zip/Postal code*."

Driver Documentation

1. Enter the "*Commercial Driver's License #.*"
2. Select "**Yes"* or *"No"* for the *"Is this an Enhanced Driver's License?"*
3. Enter "**Country"* that issued the license.
4. Enter the "*State or Province" in which the license was issued.
5. Select "*Yes"* or "*No"* from the "**HAZ-MAT endorsement(s)"* drop down menu.
6. If "*Yes*," enter **Endorsement(s).**

Additional WHTI Documentation

Note: Additional Documentation: you are required to provide at least **one** of the following:

1. Enter *"SENTRI card"* number:
2. Enter *"NEXUS card"* number:
3. Enter *"Passport"* number and then *s*elect country from list.
4. Enter *"Visa(Non-Immigrant)"* number.
5. Enter *"Visa (Immigrant)"* number.
6. Enter *"Laser Visa (BCC)"* number.
7. Enter *"Permanent Resident card (C1)"* number.
8. Enter *"Permanent Resident card (C2)"* number.
9. Enter *"U.S. Alien Registration Card (A1)"* number.
10. Enter *"U.S. Alien Registration Card (A2)"* number.
11. Enter "*U.S. Passport Card"* number.
12. Enter "*DHS Refugee Travel Document*" number.
13. Enter "*Enhanced Tribal Card/INAC Card"* number.
14. Enter "*U.S. Merchant Mariner Document"* number.

Optional Documentation
This information is optional. If you are not going to enter the optional documents, select **Continue** at the bottom of the page.

1. Enter "*Citizens Card"* number.
2. Enter "*Certificate of Naturalization"* number.
3. Enter "*Birth Certificate"* number.
4. Enter "*Other."*
5. Select **Continue.**

Passenger(s)

"Create One-time Passenger" is used for recording individuals that are not considered crew members.
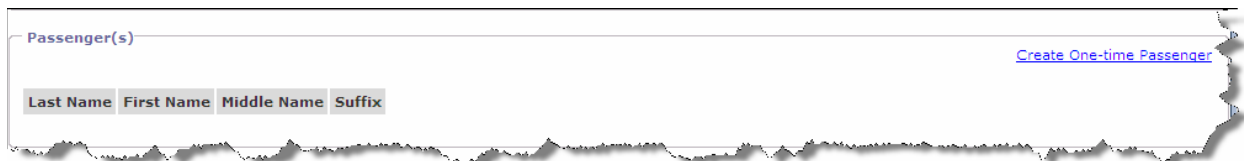
> *All passengers crossing in the vehicle must be reported on the Manifest. Passengers can not be stored in a carrier's ACE account, and must be created each time as "One-time Passengers".*

> *U.S. and Canadian citizens under the age of 16, may present a birth certificate, consular report of birth abroad, naturalization certificate or Certificate of Canadian Citizenship. Birth certificate can be an original, photocopy or certified copy. If they are travelling with one of these documents, do not declare them on the Manifest. Verbally declare the children to the CBP Officer upon entering the United States.*

1. Select **Create One-time Passenger** if there are passengers to report.
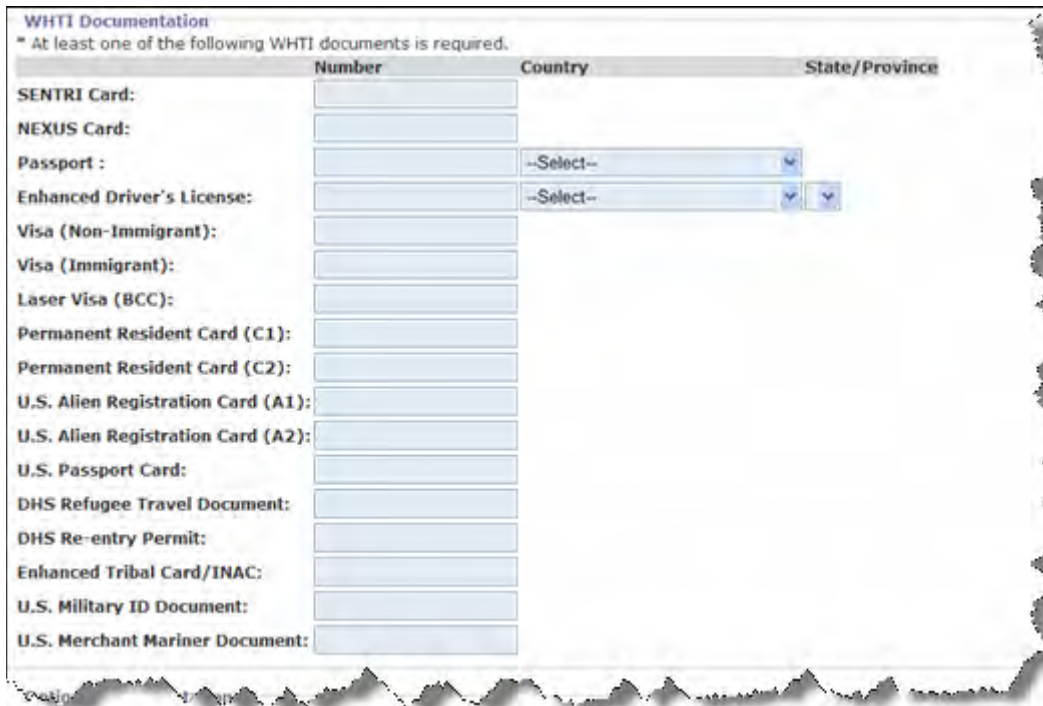
Personal Information

1. Select appropriate *"*Gender."*
2. Enter *"*First name."*
3. Enter *"*Middle name," which is* optional.
4. Enter *"*Last name."*
5. Enter *"*Suffix,"* if applicable.
6. Enter the "*date of birth." (mm/dd/yyyy)
7. Enter "**Citizenship/Nationality.*

WHTI Documentation

*Note: Travel Documents: you are required to provide **one** of the following*

1. Enter *"SENTRI card"* number:
2. Enter *"NEXUS card"* number:
3. Enter *"Passport"* number and then *s*elect country from list.
4. Enter *"Visa(Non-Immigrant)"* number.
5. Enter *"Visa (Immigrant)"* number.
6. Enter *"Laser Visa (BCC)"* number.
7. Enter *"Permanent Resident card (C1)"* number.
8. Enter *"Permanent Resident card (C2)"* number.
9. Enter *"U.S. Alien Registration Card (A1)"* number.
10. Enter *"U.S. Alien Registration Card (A2)"* number.
11. Enter "*U.S. Passport Card"* number.
12. Enter "*DHS Refugee Travel Document*" number.
13. Enter "*Enhanced Tribal Card/INAC Card"* number.
14. Enter "*U.S. Merchant Mariner Document"* number.

Optional Documentation

This information is optional. If you are not going to enter the optional documents, select **Continue** at the bottom of the page.

1. Enter "*Citizens Card"* number.
2. Enter "*Certificate of Naturalization"* number.
3. Enter "*Birth Certificate"* number.
4. Enter "*Other."*
5. Select **Continue.**

The next portion of the screen pertains to equipment which includes trailers, containers, chassis, etc. You will provide equipment information either by looking up existing equipment stored in your account, or by creating one time equipment records.

Equipment

Equipment must be added to the manifest by either selecting **Lookup Equipment**, or **Create One-time Equipment.**

Equipment(s)

Lookup Equipment or Create One-time Equipment

How to edit equipment seals

Equip #/License Plate #   Type   Seal Number(s)

1. If you have stored your equipment in your account, select **Lookup Equipment.** If you have not stored equipment to your account, proceed to step 12 – "*Create One-time Equipment.*"

There are five pieces of data you may search by, but most carriers search by entering only the "Mark + number" data element, which is identified as the "Equipment #" in the Account / Equipment record. This field is case sensitive; if you stored the trailer as 12A, and search by 12a, no results will be found. You may also search by entering any or all of the items listed.

2. Select **Lookup Equipment** (search by entering data in one field).
3. Select the *"Type"* from the drop down menu. You can leave this as the defaulted "*–Select—*" when looking up by "*Mark+ number."*

Manifest - Lookup Trip Equipment

Enter identifying information and click Continue.

Type: --Select--

--Select--
20ft ClosedTopSeaCnt
20ft OpenTop Sea Cnt
40ft ClosedTopSeaCnt
40ft OpenTop Sea Cnt
Mark (if applicable) + number: Auto Carrier Trailer
BeverageRack Trailer
License Plate Binivel
Chassis
Country: --Select-- Chem Heat Insu Tank
Chem HeatUninsu Tank
State/Province: Chem UnheatInsu Tank
ChemUnheatUninsuTank
Number: ClosTopOthLgthSeaCnt
Closed Gondola
Control Temp Reefer
Continue   Cancel Control Temp Trailer
Double Drop Trailer
Drop Back Trailer
Shipment Equipo Ferroviario E
FixdRackDoubDropTrlr
FixdRackSingDropTrlr
Flat Rack Trailer
Flatbed Trailer
Flatbed W/Headboards
Flatbed W/No Headbds
Food Grade Liq Tank
Furgon 50'
Furgon 60'
Gas Heat Insu Tank
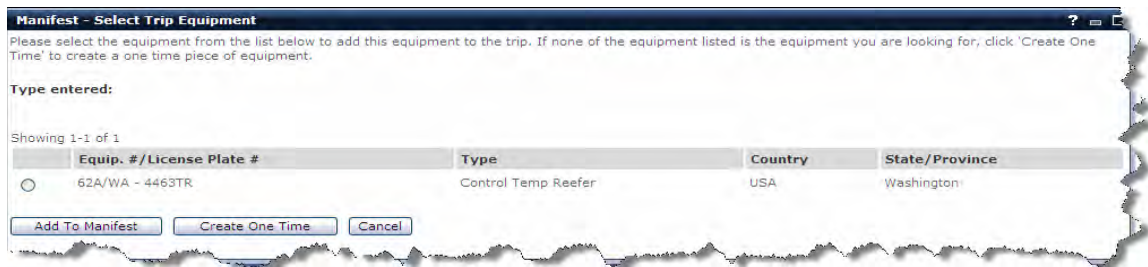
4. Enter the equipment number you stored in your account to identify this piece of equipment in *"Mark (if applicable) + number."* (This is the fastest way to search. No other data is required to look up equipment that you have saved in your account. You can select the equipment at this point and skip to step 9.)
5. Select the *"Country"* that issued the license plate from the drop down menu.
6. Select the *"State/Province"* in which the license was issued from the drop down menu.
7. Enter the license plate number in the *"Number"* field.
8. Select **Continue.**
9. Left click on the *radio button* beside the equipment
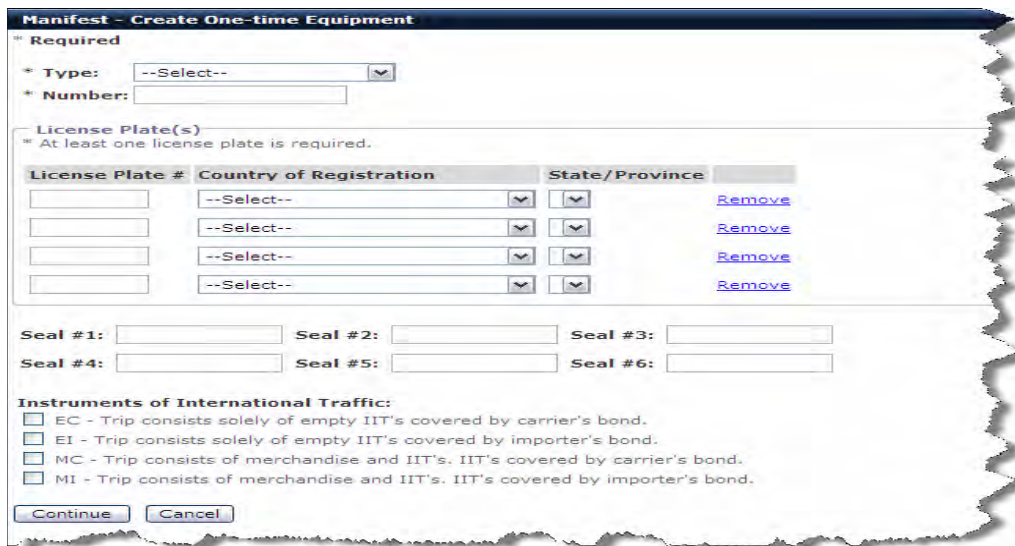
10. Select **Add To Manifest.**
11. If the search did not locate your equipment, you may select **Cancel** to initiate a new search, or **Create One Time** to create equipment just for this trip. It will not be stored to your account.
12. Select **Create One-Time Equipment** to add equipment for this trip.

13. Select the *"*Type"* from the drop down menu.
14. Enter the *"*Number"* you have chosen by which to identify this equipment.
15. Enter the *"*License Plate #."*
16. Select *"*Country of Registration"* from the drop down menu.
17. Select *"*State/Province"* of registration from the drop down menu.
18. If you have seals on your equipment, you may enter them in the seal in *"Seal #1, #2, #3,"* and select more seals if needed.
19. Equipment must be reported if they are "*Instruments of International Traffic (IIT's)."* Examples of IIT's might be engine racks that are used to transport engines back and forth across the border, lift vans, cargo vans, shipping tanks or totes. Check of the *IIT* selection that applies.

Instruments of International Traffic must be covered under a specific Instruments of International Traffic bond; either the Importer or Carrier must have a bond to cover the IIT's on board. Sometimes this process is referred to as CFR 10.41a, which is the citation within the Code of Federal Regulation Title 19 that explains this process.

20. Select **Continue** to add the equipment to the manifest.
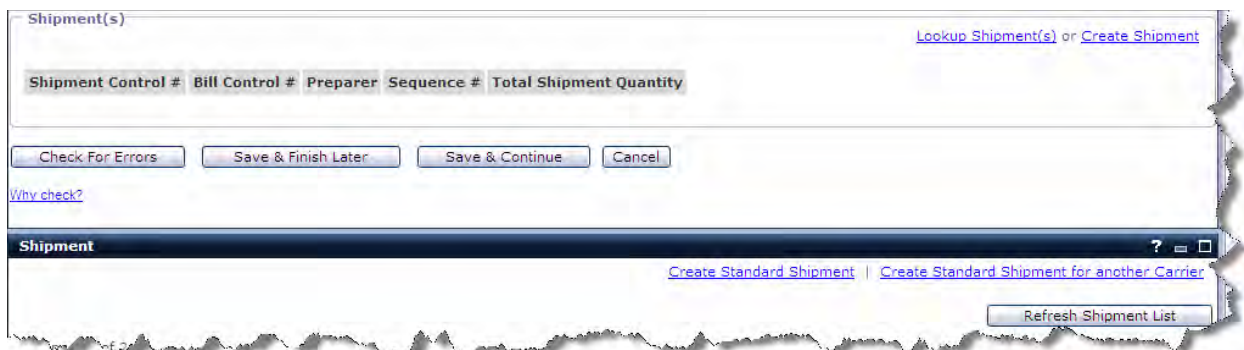
It is strongly recommended that you select Save & Continue before proceeding. This will keep you from losing this data in the event that your internet service is disrupted, or if ACE should time out while you are completing the manifest.

Creating Standard Shipments

The Trip information is now complete. The next step is to add the shipment information to the manifest. ACE was designed to accommodate different business processes of carriers. From the "*Manifest*" portlet, you have two options: "*Look Up Shipment(s),*" and "*Create Shipment.*" Just below the "*Manifest*" portlet is a third option located in a separate portlet, called *"Shipment(s)."* In the "*Shipment*" portlet you may create a shipment that is not associated with a trip/manifest. This is useful if you have shipment information in advance, and would like to create and store shipments and later add them to a manifest by selecting the "*Lookup Shipment(s)"* feature located at the bottom of "*Manifest – Create Standard Manifest*" screen.

To add a shipment to a manifest that you are creating, either select **Lookup Shipment(s)** to add a shipment you created earlier, or select the **Create Shipment** link.

If you wish to create a shipment to add to a trip you are currently building, you must select from within the "Manifest – Create Standard Manifest" portlet the "Create Shipment" link located beside the "Lookup Shipment Link". If you create the shipment in the "Shipment" portlet, which is located below the "Manifest - Create Standard Manifest" portlet, you will create an un-associated shipment resulting in a shipment not linked to any manifest.

Creating a Shipment from the Manifest

Procedurally, creating an unassociated shipment from the "*Shipment*" portlet is nearly the same as creating a shipment from the manifest screen. However, by creating the shipment record from within the *"Manifest – Create Standard Manifest"* portlet the system will automatically associate the shipment with the manifest you are creating. In the next example we are going to continue with the trip we have been creating, and create a shipment for that trip.

1. Select **Create Shipment** (the option to the right of *Lookup shipment(s).)*
2. Shipment release type defaults to "PAPS" as this is the most common release type and means that you are expecting either a customs entry to be filed against the shipment or an electronic In-bond request (known as QP) to be made via the Automated Broker Interface (ABI) system. Use the *"Shipment release type"* drop down menu to select other release types.
3. Enter the *"Shipment Control #"* (SCN) after the pre-populated SCAC. (Limit 16 characters including the four-digit SCAC code). This number must remain unique, and must match what the broker or entry filer reports in his customs entry or QP electronic In-bond request. This number must match in order for the manifest shipment to link to the entry or QP In-bond, and this link must occur for your truck to be released. This number could be the carrier's pro-bill number, the broker's entry number or a PAPS number, but must be a unique number agreed upon by both parties.

When a carrier reports a shipment record, a unique "Shipment Control Number" (SCN) is required to be reported along with other shipment details. It is imperative that when an entry or In-bond request is filed by a broker or a self-filing importer they report the exact same SCN or numbers in their entry declaration. One entry or In-bond request can be filed against multiple shipments; however, each SCN must be reported on the entry or QP bond.

4. Do not use *"Bill Control #"* field at this time. This field was implemented to accommodate the reporting of house bills of lading (bill control numbers) in association with master bills of ladings (shipment control numbers). At this time customs brokers should only report a shipment identifying number at the master bill of lading level in their customs entry and it must be equal to the SCN reported by the carrier. Neither party should report Bill Control Numbers or House Bills of Lading numbers in manifest or entry for land border crossings at this time.

5. Do not use *"Bill Issuer Code"* at this time.

6. Use the *"Shipment Identifier"* field to communicate any number (i.e., purchase order number, invoice number) from carrier to entry filer via the ABI Broker Download message. This is a free text field (limit 50 characters) and is not used by CBP.

7. Select a *"*Port/ Point of Loading"* from the drop down menu. If you are reporting an in-bond shipment, or wish to utilize the broker download capabilities, you must select "*Schedule K*" from the drop down list. In the second field, you may either enter the 5-digit Schedule K Code, or use the lookup feature by selecting "*Lookup Schedule K.*"

8. When the Lookup Schedule K portlet appears, select the "*country*" and then the appropriate *"State/Province.*"

9. Select **Search**. The corresponding Schedule K number will appear. This number can be used to identify either a Mexican State or Canadian Province. If you are not requesting an in-bond shipment or utilizing broker download you could report an IATA airport code or a city name of where the cargo was loaded onto the conveyance.

10. Enter *"Place of Receipt."* This field is currently optional.

11. Enter *"Service Type."* This field is currently optional.

12. Enter *"Transfer destination FIRMS code"* to identify a bonded facility to which the cargo will be transferred. This field is currently optional.

Select **Yes** in the *"FDA freight indicator"* drop down menu if the shipment is an In-bond shipment and the commodity requires the reporting of Food and Drug information according to Bio-Terrorism Act requirements.

Shipper

There are four ways to add a shipper to your shipment. Method 2, 3 or 4 are most commonly used.

1. Shipper ID: Enter the shipment identification number in the corresponding field, and click the **Validate ID** button to validate the shipper identification number. The address recorded in the companies' ACE Account will be recorded for CBP to see.

The "Shipper ID" should only be used if the shipper or consignee requests that you report an ACE or FAST identification number, or a DUNS number (Dun and Bradstreet Unique Numbering System), and if you have prior approval from CBP. In most cases, this method should not be used.

2. Select **Find Shipper** if you have already stored shippers in your account. Shippers are displayed alphabetically by their nickname. Select the appropriate letter listed in the alphabetic list or *"All"* to display all shippers. Click on the **+** sign beside the shipper's nickname to add the shipper's name and address to the shipment. This will return you to the shipment screen and the shipper's information will populate into the name and address fields.

3. If the shipper is not listed, select **New Shipper** or fill in the name and address fields to create a one-time shipper**.** You may create a new shipper and store them in your account for future use by clicking on the radio button to the left of *"New Shipper",* and entering a nickname to the right of *"New Shipper."* Then type the name and address of the shipper. This will save the name and address details to your account for future lookup capability when creating shipments.

4. If you elect not to save the shipper for future shipments and want to create a one-time shipper record, type the name and address directly into the fields on the screen.

   - Enter the shipper's full name in *"*Name."* (limit 40 characters)
   - Enter the address in *"*Address line 1."*
   - Enter the address in *"*Address line 2,"* if applicable.
   - Enter the address in *"*Address line 3,"* if applicable.
   - Enter the *"*City"* name. (limit 40 characters)
   - Select the shipper's *"*Country"* from the drop down menu.
   - Select the *"*State or Province"* from the drop down menu.
   - Enter *"*Zip/Postal code."* (limit 10 characters) (Canada Postal codes must be entered with a space between the first 3 and last 3 characters).
   - Enter *"Telephone."* This field is optional.
   - Enter *"Email."* This field is optional.

Consignee

Consignee functionality is identical to shipper. There are four ways to add a consignee to your shipment.

1. Consignee ID: Enter the shipment identification number in the corresponding field, and click the **Validate ID** button to validate the consignee identification number. The address recorded in the companies' ACE Account will be recorded for CBP to see.

> *The "Consignee ID" should only be used if the shipper or consignee requests that you report an ACE or FAST identification number, or a DUNS number (Dun and Bradstreet Unique Numbering System), and if you have prior approval from CBP. In most cases, this method should not be used.*

2. Select **Find Consignee** if you have already stored consignees in your account. Consignees are displayed alphabetically by their nickname. Select the appropriate letter listed in the alphabetic list or *"All"* to display all chippers. Click on the **+** sign beside the consignee's nickname to add the consignee's name and address to the shipment. This will return you to the shipment screen and the consignee's information will populate into the name and address fields.

3. If the consignee is not listed, select **New Consignee** or fill in the name and address fields to create a one-time consignee**.** You may create a new consignee and store them in your account for future use by clicking on the radio button to the left of *"New Consignee",* and entering a nickname to the right of *"New Consignee".* Then type the name and address of the consignee. This will save the consignee's name and address in your ACE account for use in future shipments.

4. If you elect not to save the consignee for future shipments and want to create a one-time consignee record, type the name and address directly into the fields on the screen.

- Enter the consignee's full name in *"*Name."* (limit 40 characters)
- Enter the address in *"*Address line 1."*
- Enter the address in *"*Address line 2,"* if applicable.
- Enter the address in *"*Address line 3,"* if applicable.
- Enter the *"*City"* name. (limit 40 characters)
- Select the consignee's *"*Country"* from the drop down menu.
- Select the *"*State or Province"* from the drop down menu.
- Enter *"*Zip/Postal code."* (limit 10 characters) (Canada Postal codes must be entered with a space between the first 3 and last 3 characters).
- Enter *"Telephone."* This field is optional.
- Enter *"Email."* This field is optional.

Party

Although options listed in *"Party"* section are optional, carriers are encouraged to utilize this feature to access *"Broker Download."* Click **Add Party** to display the *"Add Party - Select Party Type"* screen. This link allows the user to select from "*Additional Party*, *Broker Download* or *Secondary Notified Party*" functions. Select one of these options from the drop down menu.

Broker Download

1. Select **Broker Download to** send a copy of the shipment record to the entry filer via the Automated Broker Interface (ABI).
2. Select **Go.**
3. Enter the "**Filer code.*" (3 alphanumeric characters)
4. Enter *"*Port code."* You can select the U.S. port code where your truck will cross. However, you may need to ask the Customs broker what port code will work best for them. You can use the "*Lookup Port Code*" function to find Schedule D codes for U.S. Customs ports of arrival.
5. Enter *"Office Code"* if the filer has more than one office within the port.
6. Select **Continue.**

Broker Download gives the Customs broker or entry filer access to the same information you provided on your e-manifest shipment record such as quantity, description and SCN number. This is not sufficient information for a Customs broker to prepare an entry. Continue to supply the broker with all of the information you previously provided.

Additional Party

1. Select **Additional Party** to report the name and address of an additional party to the transaction.
2. Select **Go.**

3. Select the *"Entity Identifier"* in drop down menu.
4. Type name and address of the additional party.
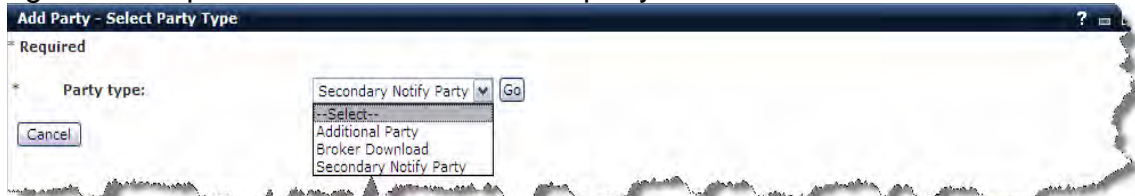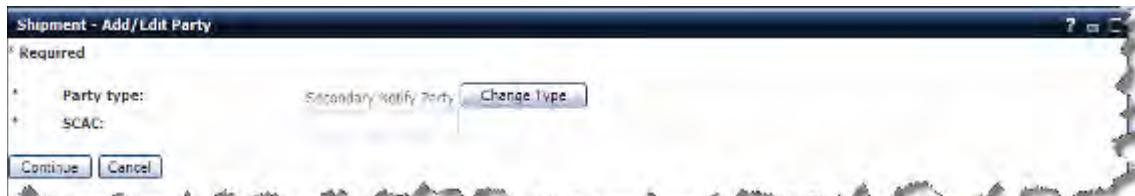
Secondary Notify Party

1. Select **Secondary Notify Party** to request that customs status messages posted against a shipment are sent to a second party.

2. Select **Go.**
3. Enter the "*SCAC*" of the party to whom you wish the Customs status messages to be sent.

4. Select **Continue.**

Equipment

This section is used to specify where the shipment is located. Cargo may be loaded in the conveyance, or in the equipment. This step must be completed to successfully add the shipment to the trip/manifest.

To add this shipment to the trailer/equipment on this manifest:
1. Select *"Trip"* in the *"Select Equipment by"* drop down menu.

2. Select **ADD.**

3. Click on the radio button beside the trailer in which the shipment is loaded.
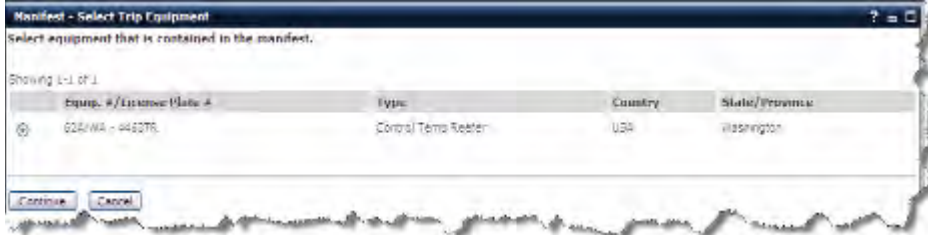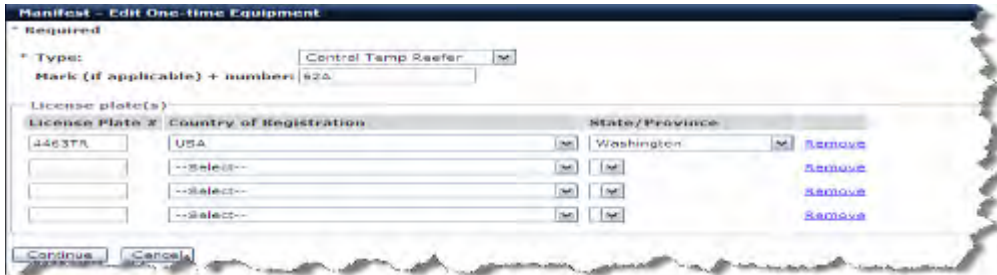
4. Select **Continue.**

5. If the information shown is correct, select **Continue.**
6. You can confirm this shipment was added to the trailer because the equipment # and trailer license appear under equipment.
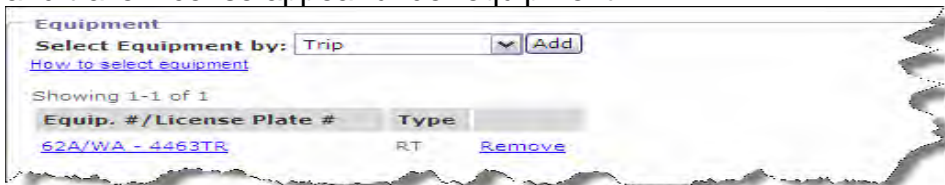
7. To add this shipment to the conveyance on this manifest means that the freight is actually loaded in the power unit i.e. truck cab or box truck:

8. Select *"Conveyance"* in the *"Select Equipment by"* drop down menu.
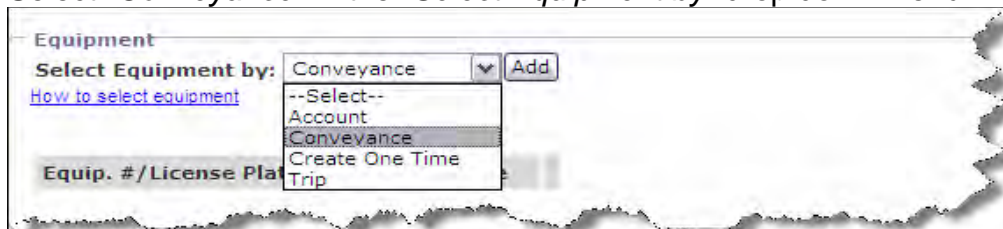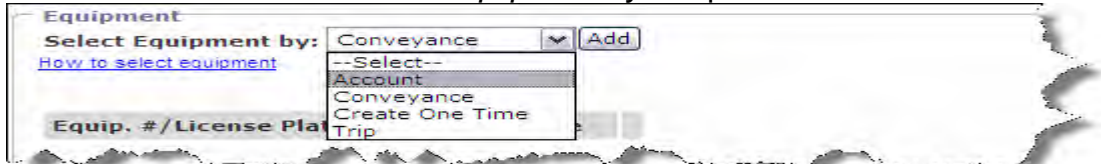
9. Select **Add.** This will take you back to the "*Equipment*" portlet.
10. You can confirm this shipment was added to the conveyance because the word "*Conveyance*" appears under "*Equip. #*" and "*Type.*"
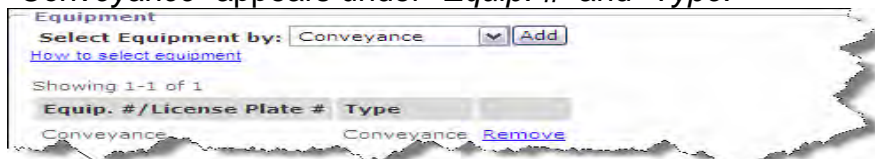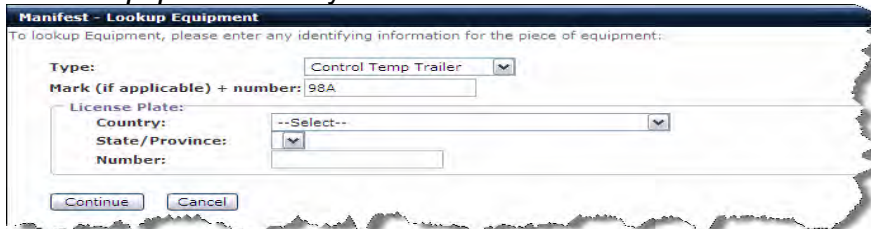
If you did not add equipment to this manifest from the manifest screen you may add the equipment to this shipment, and add the equipment to the manifest by following these steps:
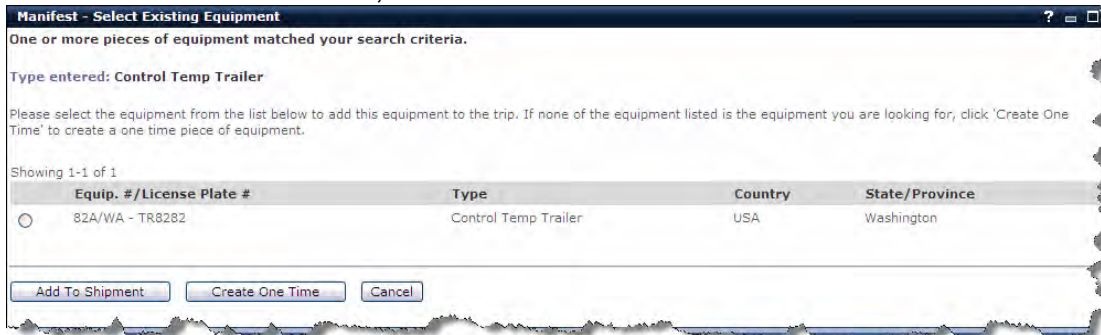
1. Select *"Account"* in the *"Select Equipment by"* drop down menu.

2. Select "*Type*" of equipment from the drop down menu.
3. Enter the *"Mark (if applicable) + number"* which is equivalent to the data element titled *"Equipment #"* in your Account master data.
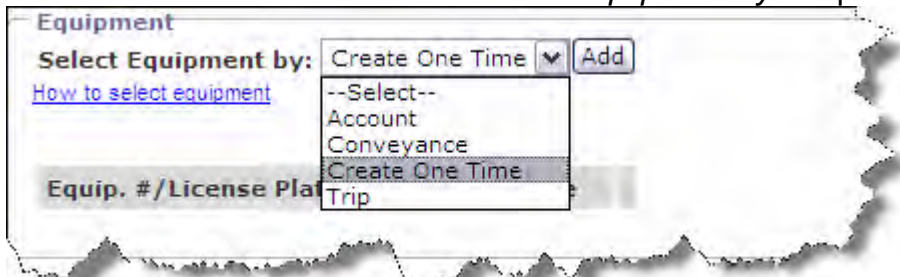
4. Select **Continue.**
5. If the search located your equipment, select the corresponding radio button, then select **Add Shipment.** If the search did not locate your equipment, you may select **Create One Time** to create the equipment for this shipment. Select **Cancel** to exit this section, or to start a new search.
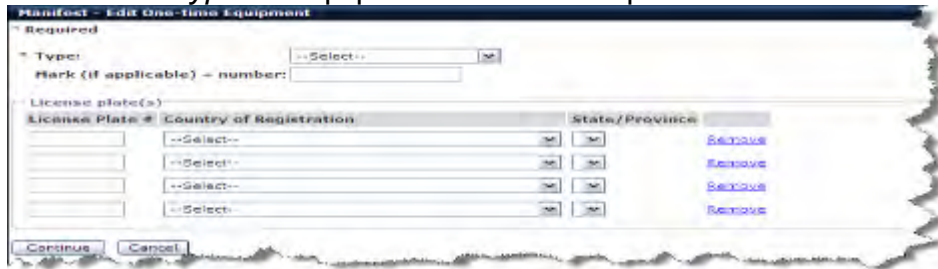
The last option is to "*Create One Time*" equipment by following these steps:

1. Select *"Create One Time"* in the *"Select Equipment by"* drop down menu.

2. Select **Add.**
3. Select the *"Type"* of equipment from the drop down menu.

4. Enter a "*Mark + number*" which is equivalent to *"Equipment #"* in your account master data. This should be the trailer or container number.
5. Enter the *"*License Plate #."*
6. Enter the *"*Country of Registration."*
7. Enter the *"*State/Province."*
8. Select **Continue.**

*If you elected to add the equipment by either the "Account" option, or "Create One Time Equipment," you must select **Save** and **Continue** from the manifest screen to view the trailer on the manifest. If you do not, it will appear that there is no equipment on the manifest.*

Commodity

The description of the goods, their lowest external packaging unit and quantity, as well as gross weight, are always required to be reported with a shipment record. Additional data may be required depending on the shipment release type declared. The description below pertains to a PAPS shipment release type.

Pallet is not an acceptable unit of measure. You must report the lowest external packaging unit. If there are 240 cases containing 2400 cans on 5 pallets, you will report 240 cases, not 5 pallets nor 2400 cans. Even if the goods are shrink-wrapped, you are required to report the actual number of cases. Note: Under "Quantity Unit of Measure," skid is available in the drop down menu, but this does not refer to a pallet, it is used as a description of an Item that is mounted on a skid.
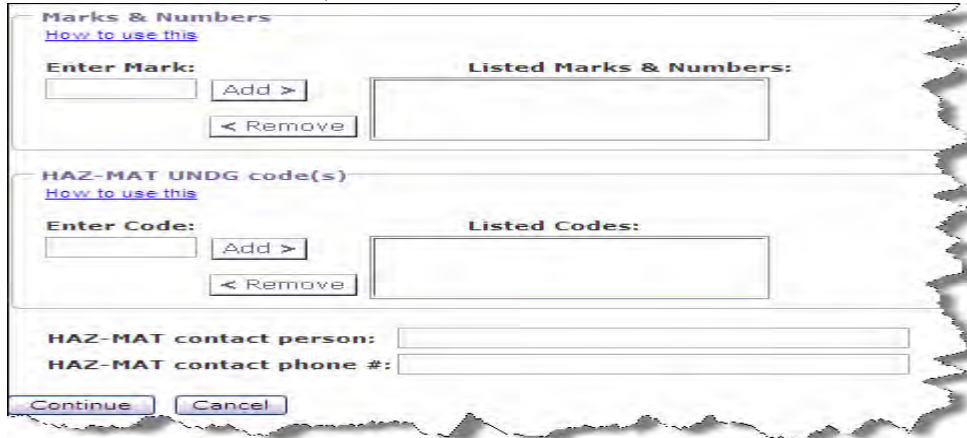
1. Select ***Add Commodity.**

2. Enter a numeric value for *"*Shipment quantity"* and select the appropriate packaging unit description from the drop down list.

3. Enter the *"*Weight"* in the first field and select the unit of weight used from the drop down menu.
4. Enter the "*Description" of the merchandise. The description needs to be specific. "Freight of all kinds" or "various goods" are not acceptable descriptions.
5. Enter *"Vehicle Identification Number"* only if your shipment is a vehicle.
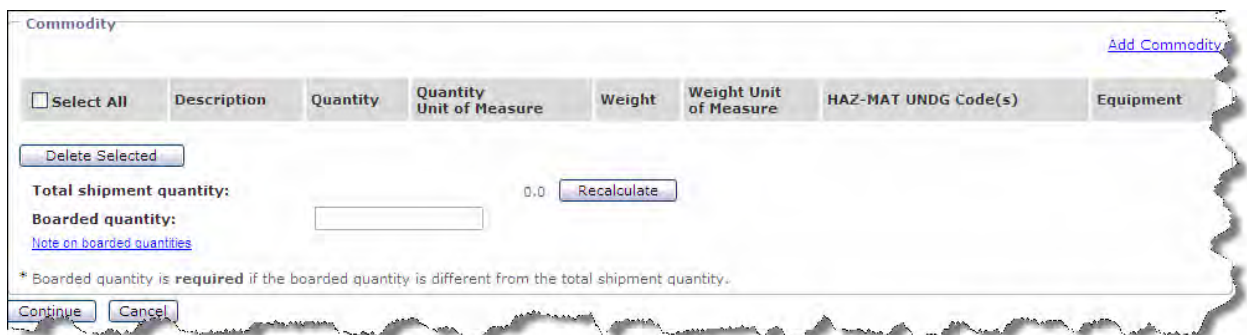
6. Enter *"Marks & Numbers"* to report marks and numbers that may be listed on the exterior of the packages. This field is optional.

7. *"HAZ-Mat UNDG codes(s)"* is conditional. If your shipment falls under this classification, you are required to enter the United Nations Dangerous Goods (UNDG) code in the "*Enter Code"* field. Select **Add >** to add the number into the *"Listed Codes"* area. You may report multiple UNDG codes. If you need to remove a UNDG code, select the code to remove and click the **< Remove**.

8. Enter the "*HAZ-MAT contact person"* if this shipment contains Hazardous Materials (HAZ-MAT). ."

9. Enter the *"HAZ-MAT contact phone"* if this shipment contains Hazardous Materials. (HAZ-MAT code, contact person and contact phone number are required if the shipment includes Hazardous Materials)

10. Select **Continue.** This will return you to the shipment screen. If you need to change any of the commodity information you may edit directly from the shipment screen. If you change the quantity, be sure to select **Recalculate.**

11. *"Boarded Quantity"* is only to be used if the shipment is a split shipment being shipped on multiple manifests but with the same Shipment Control Number (SCN).

If you have additional commodities to report on this shipment, select Add Commodity to add additional commodity lines. If you have multiple packaging descriptions such as totes, barrels, sacks etc. you should report those as additional commodity lines.

12. Select **Continue** and you will be returned to the Manifest/Trip screen, and then select **Save and Continue** located at the bottom of the manifest page.

Submitting an e-Manifest

There are four options located at the bottom of the *"Manifest"* portlet: Check for Errors, Save & Finish Later, Save & Continue, and Cancel.

To send the manifest to CBP, you must first *"Check For Errors."*

- **Check For Errors:** If your manifest is complete, all the data is accurate and you are ready to send your manifest.

  1. Select *"Check For Errors"*
  2. If there are any errors, they will appear in red at the top of the *"Manifest"* portlet. If you are unable to correct the errors, contact Technology Support at 1-866-530-4172.

     The ACE System Error Log is located in the ACE Training and Reference Guide at the following link:
     http://www.cbp.gov/xp/cgov/trade/automated/modernization/ace_welcome/ace_e_manifest_for_trucks/

  3. If there are no errors, scroll down to the bottom of the manifest and select **Send to Customs.** (If you need to change any information select **Change Information**.)
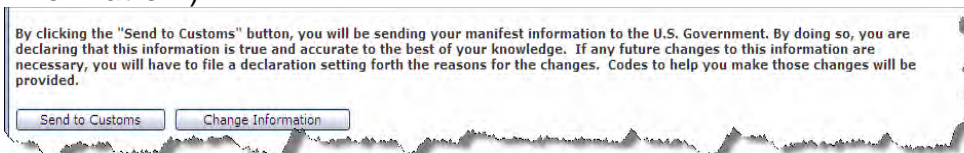
  4. Your screen will refresh and you will be notified that your manifest has been successfully sent to CBP.
  5. From the completed manifest screen, you may print the cover sheet.
  6. Select *"Print Cover Sheet"* and a window will appear containing the cover sheet.
  7. Select the printer icon located on the tool bar of the pop up window.

*If the cover sheet does not appear as a pop up window or print, select **Tools** from the tool bar located at the top of your browser, select pop up blocker, and select turn off pop up blocker.*

- **Save & Finish Later:** Select this option if the manifest is not complete or if you need to make changes. This will save your manifest as a preliminary manifest.
- **Save & Continue:** Select this option to save your work as you are creating a manifest and shipments. The ACE Portal was designed to time out after several minutes, and should this occur, your information may be lost if you have not used the Save & Continue feature. This could also protect your data in the event of a power failure or disruption of your internet service.
- **Cancel:** If you choose to cancel this manifest without saving it, select **Cancel**.

Creating Unassociated Shipments

The unassociated feature allows the carrier to create shipments prior to the creation of the manifest. You may have shipment information for which you wish to create and store shipment records for now and add them to a manifest in the future. In an unassociated shipment you are not required to select equipment from the shipment screen because you will link the shipment to the manifest and its equipment later.
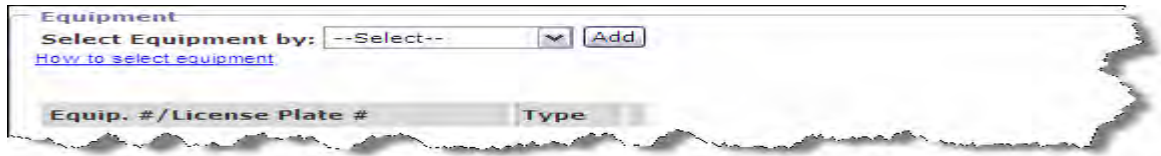
1. Locate the "*Shipment*" portlet located below the "*Manifest*" portlet.

2. Select **Create Standard Shipment.**
3. Follow the steps listed in the *"Creating a Shipment from the Manifest"* section of this document.
4. You do not need to select anything in the equipment section of "*Shipment.*" You will select that after you add the shipment to the manifest. See "*Lookup Shipments*" in the next section of this document.
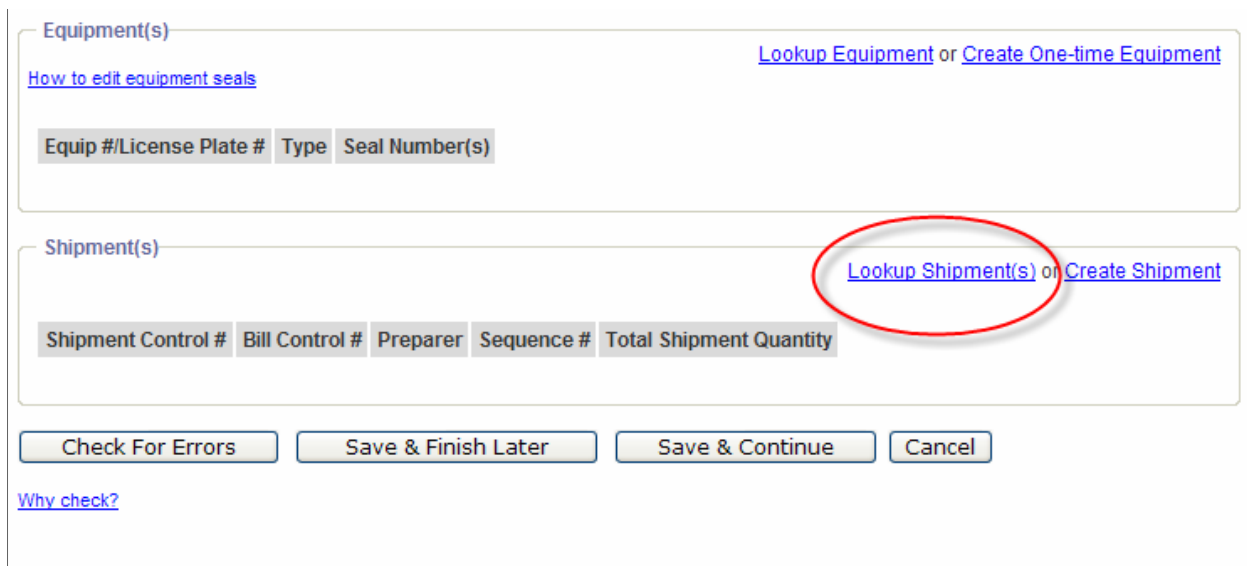
5. Select **Save** after completing shipment information.

Lookup Shipment

Once an unassociated shipment is created you will be able to associate that shipment to a trip by selecting the **Create Standard Manifest** link in the "*Manifest*" portlet then selecting the **Lookup Shipment(s)** link at the bottom of the "*Manifest – Create Standard Manifest*" portlet. This feature allows carriers to add shipments previously created to a Trip.

1. Select **Lookup Shipments** which is located near the bottom of the "*Manifest – Create - Standard Manifest*" portlet.
2. There are 2 ways you can search for shipments, either by utilizing the "*Filter Shipments*" options, or by scrolling though the pages by selecting the page numbers that may be located above the "*Add Selected*" button. The maximum number of shipments displayed per page is 10.

3. *"Filter Shipments"* allows you to search by entering in a range of Shipment Control Numbers or specifying HAZ-MAT by selecting **Yes** or **No** from the drop down menu, or by entering the Port/Point of loading.

4. Previously created unassociated shipments will appear near the bottom of this portlet. You can add the shipment/s to the trip by clicking in the box to the left of the Shipment Control #**,** or you may add all the shipments to your trip by clicking **Select All.** You are then returned to the "*Manifest*" portlet.

5. * You must scroll to the bottom of the "*Manifest"* portlet and click on the Shipment Control # of the shipments that you added to the manifest.

6. Scroll down in the "*Shipment"* portlet until you come to equipment.

7. Choose ***Select Equipment by** then select the appropriate choice as discussed in Equipment section of Create Standard Shipment from the Manifest.
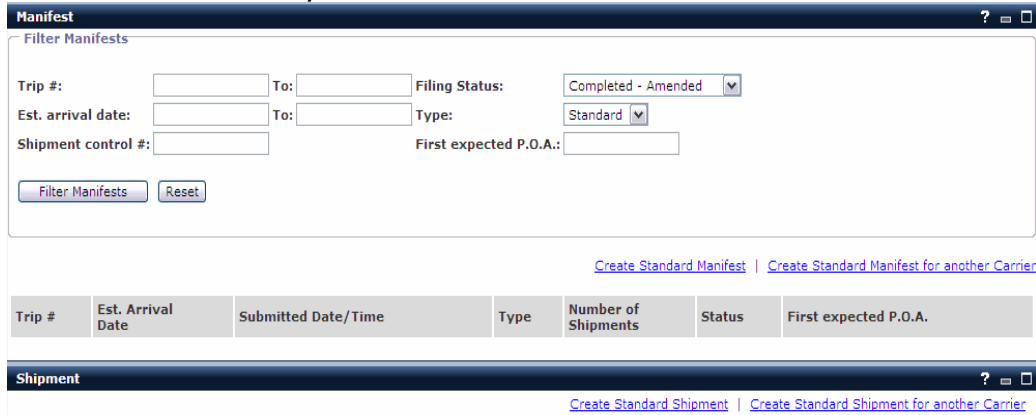
8. Select **Continue** at the bottom of the shipment screen.

Additional Options

Two other options exist for creating manifests and un-associated shipments:

1. *"Create Standard Manifest for another Carrier"* and

2. *"Create Standard Shipment for another Carrier"*.

The creation of the actual manifests and shipments remains the same. The only difference is that a new portlet will ask you for a valid SCAC for either the "*Manifest Owner*" or the "*Shipment Issuer*".
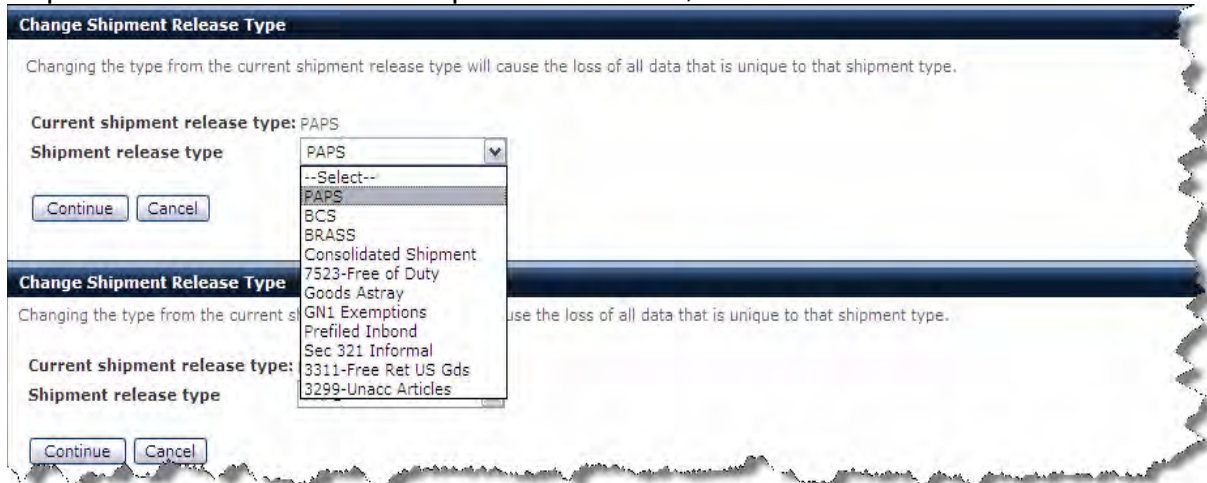
Additional Shipment Types

Prior to creating a shipment, you must first determine how the shipment will be released. ACE currently can accommodate 11 different shipment release types. For certain shipment types you must have specific documentation such as the Customs and Border Protection Form (CBPF) 3311, 3299 or 7523. Other shipment release types may require additional data such as pre-filed In-bond, Sec. 321 or BRASS.

- PAPS - Pre Arrival Processing System: This is the most common shipment release type, and the shipment type in the ACE Portal defaults to PAPS. This shipment release type should be used when you know that a Customs Broker or self filing importer is filing a customs entry or QP electronic in-bond request via the Automated Broker Interface (ABI)

- BCS - Border Cargo Selectivity: This release type was developed for a carrier to use if the entry filer did not report a Shipment Control Number in the Master Bill of Lading field of the Customs entry. However, since the delivery of ACE, CBP's policy has been to require that all shipments include a Shipment Control Number (SCN) therefore all entries filed via ABI must report the SCN in the Master Bill of Lading number field of the ABI entry or QP In-bond request. Therefore the BCS shipment release type should not be used.

- BRASS - Border Release Advance Selectivity Subsystem (BRASS): BRASS is an automated system designed to expedite the processing of certain repetitively shipped products. (Authorized BRASS participants only). If you are using BRASS, there is one additional data element required, which is the C4 code. The C4 code is the number represented on the BRASS bar code. It is important for the carrier to communicate with the broker whenever BRASS shipments are crossing. The C4 code is reported in the commodity screen.

- Section 321 Informal: This release type is used for certain shipments of values less than $200. In order to use this shipment type, please refer to the Federal regulations and/or a licensed Customs broker. There are two additional data elements, "*Value*" and "*Country of origin*" that are required and are reported in the commodity screen.

- Consolidated Shipment: This shipment release type was developed to support Master Bill / House Bill relationships. At this time, CBP requires that only one number, the SCN, be used to identify an individual shipment. Therefore Master Bill / House bill relationships are not to be reported in truck e-Manifests at this time.

- 7523-Free of Duty: No additional data elements are required. If a carrier identifies this shipment release type, they will be required to present the appropriate documentation.

- Goods Astray: When a carrier identifies a shipment release type as "*Goods Astray*" they have asked for release of the merchandise under the exemptions referenced in U.S.C. Title 19, 141.1 (v), "articles exported from the U.S., which are articles returned within 45 days after such exportation from the United States as undeliverable and which have not left the custody of the carrier or foreign customs service." The carrier is required to send two additional data elements one is the *"Export Date."* This is the date that the cargo left the United States and went astray into Canada or Mexico. The other data element is a check box titled *"Carrier/Foreign Customs Control."* By selecting this box you are declaring that the goods have not left either your or the foreign countries' customs service control while in the foreign country.

- GN1 Exemptions: No additional data elements are required when reporting this shipment release type. When a carrier identifies a shipment release to be GN1 they are requesting that the shipment to be released under rules governing exemptions to U.S.C. Title 19 Section 141.4. This includes corpses, records, diagrams… with regard to business… operations, articles returned from space, aircraft parts or equipment removed from a U.S. aircraft because of accident, etc.

- 3311 Free Returned U.S. Goods: Additional data elements that are required to be reported are "*Value"* and *"Country of Origin."* If a carrier identifies this shipment release type they will be required to present the appropriate documentation.

Manifest – CBP 3311 Declaration for Entry of Returned American Goods:

- 3299 Unaccompanied Articles: No additional data elements are required. If a carrier identifies this shipment release type they will be required to present the appropriate documentation.

- Pre-filed In-bond: Carriers may request in-bond moves themselves through ACE. There are three types of in-bond movements that can be requested via ACE e-Manifest: Trucks.

If a Customs broker or other self-filing entity is filing an electronic in-bond request, known as QP, through the Automated Broker Interface (ABI), it is recommended that you create a shipment release type PAPS. ACE will automatically link the QP In-bond to your shipment as long as the QP In-bond request references the carrier's SCN exactly.

In-bond Shipment Information – Pre-Filed In-bond

Within the *"Shipment – Create Standard Shipment"* portlet, select **Change** for *"Shipment release type"* to change the shipment release type. Select **Prefiled In-bond** in the *"Shipment release type"* drop down menu. Select **Continue.** This takes you back to the "*Shipment – Create Standard Shipment*" portlet. Enter all required data fields, as indicated by * in the "*Shipping Information*," "*Shipper*," "*Consignee*," "*Party*," "*Equipment*," and "*Commodity*" portlets. Additional data fields are required for pre-filed in-bond shipments. In the "*In-bond Information*" portlet, select one of the three in-bond entry types within the *"In-bond Entry Type"* drop down menu.

1. Select **Immediate Transportation** (IT=61) if the cargo is moving under bond from the port of arrival to a U.S. destination.
2. Select **Transportation and Exportation** (T&E=62) if the cargo is moved under bond from the first port of arrival to a U.S. destination, and is scheduled to be exported from the United States.
3. Select **Immediate Exportation** (IE=63) when merchandise is moved under bond from the first port of arrival to a U.S. destination, and is scheduled to be immediately exported.

Enter the following data fields to continue:

1. Enter the four-character district / port code known as the "*Schedule D*" code in the *"In-bond destination"* field.

2. Enter the carrier SCAC in *"Onward Carrier (SCAC)"* if the shipment will be transferred to a different carrier.

3. Enter the IRS number of the carrier whose bond is being obligated in the *"Bonded Carrier (IRS#)"* field.
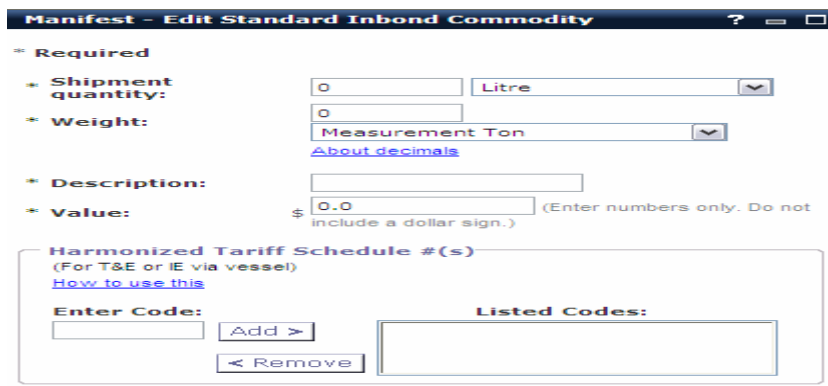
4. Enter the 9 digit Customs-assigned in-bond number in the *"In-bond #"* field. Contact your local Customs office, and they will assign a bank of numbers for you to use. **Disregard the onscreen prompt that states "if left blank, Shipment control # will be used." This functionality should not be used without CBP direction.**

5. Enter IRS # of the carrier in *"Transfer carrier (IRS#)"* field if the carrier is going to locally transfer the cargo to another carrier.

If you selected "*Transportation & Exportation*" or "*Immediate Exportation*" in the "*In-bond Entry Type,*" the following data elements are also required:

6. Enter the Schedule K code for the *"*Foreign Port of Destination."*

7. Enter the *Estimated date of U.S. departure."*

8. Enter the "*Mexican Pedimento Number"* for all exports to Mexico.

In the "Commodity" portlet, value and a HTS code are required. If you do not know the HTS #, go to the "Action" drop down below your name, select references, and select the HTS tab.

Additional In-bond Methods, QP/WP

There are currently two methods for a carrier to link a QP/WP, an electronic in-bond request filed via ABI, to their manifest. The two methods are: PAPS to QP, or manually link QP un-associated shipment to an e-Manifest.

1. **PAPS to QP:** As of February 2, 2008, QP/WP requests will automatically be linked to truck ACE e-Manifest PAPS (Pre Arrival Processing System)

Providing the Right Information to the Right People at the Right Time and Place

shipments. The carrier creates a shipment record that is identified as a PAPS shipment release type. The broker files the QP through ABI and reports the Shipment Control number in the Master Bill of Lading field of the QP message, the e-Manifest PAPS shipment will be automatically linked to the QP In-bond record. The Shipment Control number reported in the e-Manifest shipment must be identical to the Master Bill of Lading record recorded in the QP in-bond request. A message "QP on file" will be sent to the carrier's transaction listing which is located in the Account Type, Carrier, Transactions Tab, and can currently only be accessed by the Trade Account Owner.
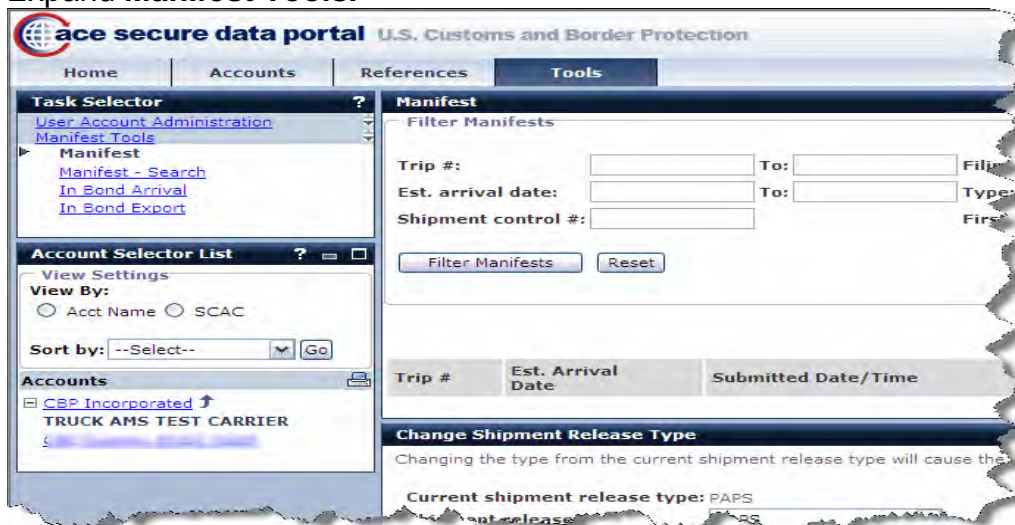
2. **Manually link QP un-associated shipment to an e-Manifest:** The carrier links an unassociated shipment record that was created in ACE by the filing of a QP in-bond message to a manifest by using *"Look up Shipment"* in the ACE portal. QP In-bond declarations automatically create preliminary shipments in ACE from the QP data and deposit it in the carrier's "*Shipment*" portlet. ACE Secure Data Portal filers must harmonize the equipment reported in the shipment record with the equipment reported in the trip. A QP delete by the QP filer will delete the carrier's shipment record.

Customs and Border Protection Form 7512 is still required to accompany QP/WP In-bond shipments. However, if you have requested the in-bond moved directly from your manifest declaration as a Pre-filed In-bond, the printed Cover Sheet with specific additional data elements is all that is required to accompany the shipment. For more details go to http://cbp.gov/xp/cgov/trade/automated/modernization/carrier_info/electronic_truck_manifest_info/inbond_info/

Arriving and Exporting In-bonds via ACE

1. Select the **Tools** tab.
2. Expand **Manifest Tools.**

To report the arrival of an in-bond shipment via ACE, follow the steps below:

1. Select the **In-Bond Arrival** from the *"Task Selector"* drop down menu.
2. Select **Equipment Number, In-bond Number** or **Shipment Control Number in the** *"Find In-bonds where"* drop down list.

3. In the field to the right, enter the appropriate number.

4. Report the schedule D code for the U.S. district/port of the arrival port that was reported in the in-bond request in the *"and Destination Port is:"* field.

5. Enter the date range in which the in-bond was filed in the two fields next to *"and Filing Date range is:"*

6. Select **Search** to search for the in-bond shipment that matches your criteria. Either a specific in-bond or a list of in-bond shipments will display.

7. Select the shipments you wish to arrive by checking the box to the left of the shipment record or click in the *"select all"* box to arrive all of the shipments that have displayed.

8. Enter the date that the first part of the shipment arrived at its in-bond destination port in the *"Arrival Date"* field.

9. Enter the time the shipment arrived at the in-bond destination port using a 24 hour methodology (HH:MM).

10. Enter the schedule D code for the U.S. district / port of arrival in *"Arrival Port."*

11. Click on **Arrive Selected In-bond(s)** to report the arrival of this or these shipments.

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To Export In-bond Shipments:

1. Select the **In-Bond Export** from the *"Task Selector"* drop down menu.

2. Select **Equipment Number, In-bond Number** or **Shipment Control Number** in the *"Find In-bonds where:"* drop down and enter the appropriate number in the field to the right.

3. Report the schedule D code for the U.S. district/port of the arrival port that was reported in the in-bond request in *"Arrival port is"* field.

4. Enter the date range in which the in-bond was filed in the two fields next to *"and Filing Date range is." This field in optional.*

5. Select **Search** to search for the in-bond shipment that matches your criteria. Either a specific in-bond or a list of in-bond shipments will display.

6. Select the shipments you wish to report as having been exported by checking the box to the left of the shipment record or click in the *"select all"* box to export all of the shipments that have displayed.

7. Complete the following fields:

   - Enter the date that the shipment was exported from the United States in *"Export date."*
   - Enter the time the shipment was exported from the United States using a 24 hour methodology (HH:MM) in *"Export time."*
   - Enter the schedule D code for the U.S. district / port of export (i.e. 5101 for the Miami, Florida seaport) in *"Export Port."*
   - Enter the name of the carrier that the shipment was laden on for export *in "Export Conveyance name."*
   - Select the "*Mode of Transportation*" that the shipment was exported on from the drop down list.
   - Click on **Export Selected In-bond(s)** to report the export of this or these shipments.

Note: Currently, when reporting the arrival or export of an in-bond shipment the first response may say "In-bond shipment ####### did not get any response from ACS please try again later". This means that your request was sent to the in-bond system but a response has not yet come back from the in-bond system.*

You may receive a message that says "In-bond data not found for In-bond #######" upon your first or subsequent attempts. Receipt of this message means that your in-bond arrival message has been accepted by ACS. The date, time and port of arrival fields will disappear from the in-bond arrival or export screens. This also means that your message has been accepted by ACS and you should receive a message in your Transactions Tab that says "ARR In-bond comp move" or "EXP In-bond comp move".*

* ########### equals your SCN number.

Additional ACE Resources

ACE Training and Reference (ACE e-Manifest Information):
http://www.cbp.gov/xp/cgov/trade/automated/modernization/ace_welcome/ace_e_manif
est_for_trucks/

User Fee Decals and Transponders (For updating Conveyances associated to
Transponders):
http://www.cbp.gov/xp/cgov/travel/pleasure_boats/user_fee/user_fee_decal.xml

In-bond documentation can be found at:
*http://cbp.gov/xp/cgov/trade/automated/modernization/carrier_info/electronic_truck_man
ifest_info/inbond_info/*

For additional assistance, take the web-based training (WBT) titled "*Multi-Modal
Manifest and ESAR Enhancements.*"

The URL for the ACE Online Training
Center and the required user name and
password are:

https://nemo.customs.gov/ace_online

User name = user01

Password = 1Password
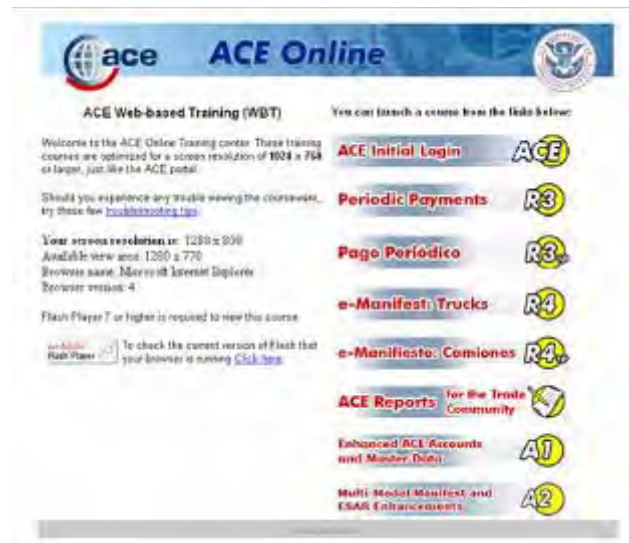
Do you need additional assistance with the e-Manifest: Trucks? If you are a
trade caller or if you are calling outside the United States, please contact
Technology Support at 1-866-530-4172.

Appendix: Data Elements

On September 13, 2006 Customs and Border Protection published a general notice in the Federal Register (FR) at 68 FR 68175 that specified the data elements that would be required as mandatory, conditional or optional in an e-Manifest that would be filed by a land border carrier to comply with the Advance Cargo Rule. The FRN can be found at

http://a257.g.akamaitech.net/7/257/2422/06jun20041800/edocket.access.gpo.gov/2004/pdf/04-20585.pdf

The following data elements are listed in the FRN.

1.	Conveyance number, and (if applicable) equipment number (the number of the conveyance is its Vehicle Identification Number (VIN) or its license plate number and State of issuance; the equipment number, if applicable, refers to the identification number of any trailing equipment or container attached to the power unit. For purposes of this test, both the VIN and the license plate number are required).
2.	Carrier identification (i.e., the truck carrier identification SCAC code (the unique Standard Carrier Alpha Code) assigned for each carrier by the National Motor Freight Traffic Association)
3.	Trip number and, if applicable, the transportation reference number for each shipment (The transportation reference number is the freight bill number, or Pro Number, if such a number has been generated by the carrier. For purposes of this test the SCN and, if applicable, the associated Bill Control Number (BCN) are required).
4.	Container number(s) (for any containerized shipment, if different from the equipment number), and the seal numbers for all seals affixed to the equipment or container(s) (For purposes of this test, seal numbers will be enforced in FAST on the southern border).
5.	The foreign location where the truck carrier takes possession of the cargo destined for the U.S.
6.	The scheduled date and time of arrival of the truck at the first port of entry in the U.S.
7.	The numbers and quantities for the cargo laden aboard the truck as contained in the bill(s) of lading (this means the quantity of the lowest external packaging unit; numbers referencing only containers and pallets do not constitute acceptable information; for example, a container holding ten pallets with a total of 200 cartons should be described as 200 cartons).
8.	The weight of the cargo, or, for a sealed container, the shipper's declared weight of the cargo.
9.	A precise description of the cargo and/or the Harmonized Tariff Schedule (HTS) numbers to the 6-digit level under which the cargo will be classified. (Generic descriptions, specifically those such as Freight of All Kinds (FAK), general cargo, and Said To Contain (STC) are not acceptable.).
10.	Internationally recognized hazardous material code when such cargo is being shipped by truck.

11.	The shipper's complete name and address, or identification number (The identity of the foreign vendor, supplier, manufacturer, or other similar party is acceptable (and the address of the foreign vendor, etc., must be a foreign address). By contrast, the identity of the carrier, freight forwarder, consolidator, or broker, is not acceptable. The identification number will be a unique number to be assigned by CBP upon the implementation of the Automated Commercial Environment.).
12.	The complete name and address of the consignee, or identification number. [The consignee is the party to whom the cargo will be delivered in the U.S., with the exception of Foreign Cargo Remaining On Board (FROB).] The identification number will be a unique number assigned by CBP upon implementation of the Automated Commercial Environment).
13.	Department of Transportation (DOT) number.
14.	Person on arriving conveyance who is in charge.
15.	Names of all crew members.
16.	Date of birth of each crew member.
17.	Commercial driver's license (CDL)/drivers license number for each crew member.
18.	CDL/driver's license State/province of issuance for each crew member.
19.	CDL country of issuance for each crew member.
20.	Travel document number for each crew member.
21.	Travel document country of issuance for each crew member.
22.	Travel document State/province of issuance for each crew member.
23.	Travel document type for each crew member.
24.	Address for each crew member. [For purposes of this test, this is defined as the physical location, in the U.S., where a crew member will actually be on this particular trip. This could include a consignee's location, a hotel, a truck stop, or a family or friend's location. Those individuals possessing a FAST ID are exempt from the U.S. address requirement.]
25.	Gender of each crew member.
26.	Nationality/citizenship of each crew member.
27.	Method of transport (defined as the mode by which the merchandise crosses the international border).
28.	Conveyance type.
29.	Conveyance State/province of registration.
30.	Equipment State/province of registration.
31.	Hazmat endorsement for each crew member.
32.	Names of all passengers.
33.	Date of birth of each passenger.
34.	Travel document number for each passenger.
35.	Travel document country of issuance for each passenger.
36.	Travel document State/province of issuance for each passenger.
37.	Travel document type for each passenger.
38.	Gender of each passenger.
39.	Nationality of each passenger.

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40.	Import/export/in-transit indicator.
41.	Conveyance country of registration.
42.	Conveyance insurance company name.
43.	Conveyance insurance policy number.
44.	Year of issuance.
45.	Insurance amount.
46.	Transponder number.
47.	Shipment release type.
48.	Equipment type.
49.	Equipment country of registration.
50.	Conveyance or equipment instrument of international traffic indicator.
51.	Estimated date of U.S. departure (for use with T&E or IE).
52.	In-bond destination.
53.	Onward carrier (the SCAC code of the carrier to whom the in-bond goods are being transferred).
54.	Foreign port of unloading.
55.	Place of receipt.
56.	Service type (the type of shipping contract).
57.	Party, ID number, and type (for any other party to the transaction listed on the trucker's bill of lading).
58.	C–4 code.
59.	Shipment identifier (any number that the carrier may wish to pass on to the broker (i.e., purchase order, commercial invoice, etc.)
60.	Paperless in-bond number.
61.	In-bond CF–7512 number.
62.	Bonded carrier ID number.
63.	Transfer carrier (intended to be the cartman, local carrier).
64.	Transfer destination firms code.
65.	Hazmat contact.
66.	FDA freight indicator (identifies Food and Drug Administration (FDA) jurisdiction over the shipment; this is not the prior notice requirement as set forth in the Bio-Terrorism Act).
67.	Country of origin of the cargo.
68.	Value.
69.	Entry type code.
70.	The submission of the following information is considered optional upon the discretion of the submitting party: Marks and numbers (on packaging to be distinguished from numbers required by advance cargo information).