

**Santa Teresa
RFID E-Screening Demonstration
Project Evaluation**



**U.S. Department of Transportation
Federal Motor Carrier Safety Administration**

Qevqdt 2009

FOREWORD

The Safe, Accountable, Flexible, Efficient Transportation Equity Act—A Legacy for Users (SAFETEA-LU, Public Law 109-59), Section 5503 – Motor Carrier Efficiency Study, set-aside funding to examine the application of wireless technology to improve the safety and efficiency of trucking operations in the United States. The intent of this section is to enter into partnership with the motor carrier and wireless technology industries to cooperatively identify and test promising applications and devices in a real-world environment, and to promote the adoption and use of successful solutions by an array of motor carriers.

The Federal Motor Carrier Safety Administration (FMCSA) was assigned responsibility for administering this program via the Motor Carrier Efficiency Study (MCES). The program will be completed in two Phases. Phase I consists of the completion of activities pursuant to the first two objectives listed above. The actual field tests will be conducted under Phase II of the program.

The results of these work tasks are summarized in this MCES Final Report. This Report, which also serves as the 2007 Report to Congress for the program, constitutes one of seven reports developed under Phase I of the MCES. The others are:

- Motor Carrier Efficiency Study Final Literature Review Report: A Primer on Wireless Technologies and Freight Inefficiencies for Motor Carrier Operations, March 5, 2007.
- Motor Carrier Efficiency Study Analysis Methodology Development Report, February 11, 2007.
- Motor Carrier Efficiency Study Stakeholder Summary Report, May 31, 2007.
- Motor Carrier Efficiency Study Inefficiencies Report, July 2007.
- Motor Carrier Efficiency Study Analysis of Wireless Technologies, December 7, 2007.
- Motor Carrier Efficiency Study 2006 Annual Report, October 2007.

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SI* (MODERN METRIC) CONVERSION FACTORS

Table of APPROXIMATE CONVERSIONS TO SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
LENGTH				
in	inches	25.4	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
AREA				
in ²	square inches	645.2	square millimeters	mm ²
ft ²	square feet	0.093	square meters	m ²
yd ²	square yards	0.836	square meters	m ²
ac	acres	0.405	hectares	ha
mi ²	square miles	2.59	square kilometers	km ²
VOLUME				
Note: Volumes greater than 1000 L shall be shown in m ³				
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallons	3.785	liters	L
ft ³	cubic feet	0.028	cubic meters	m ³
yd ³	cubic yards	0.765	cubic meters	m ³
MASS				
oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2000 lb)	0.907	megagrams (or "metric ton")	Mg (or "t")
TEMPERATURE				
°F	Fahrenheit	$5 \times (F-32) \div 9$ or $(F-32) \div 1.8$	Temperature is in exact degrees Celsius	°C
ILLUMINATION				
fc	foot-candles	10.76	lux	lx
fl	foot-Lamberts	3.426	candela/m ²	cd/m ²
Force and Pressure or Stress				
lbf	poundforce	4.45	newtons	N
lbf/in ²	poundforce per square inch	6.89	kilopascals	kPa

Table of APPROXIMATE CONVERSIONS FROM SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
LENGTH				
mm	millimeters	0.039	inches	in
m	meters	3.28	feet	ft
m	meters	1.09	yards	yd
km	kilometers	0.621	miles	mi
AREA				
mm ²	square millimeters	0.0016	square inches	in ²
m ²	square meters	10.764	square feet	ft ²
m ²	square meters	1.195	square yards	yd ²
ha	hectares	2.47	acres	ac
km ²	square kilometers	0.386	square miles	mi ²
VOLUME				
mL	milliliters	0.034	fluid ounces	fl oz
L	liters	0.264	gallons	gal
m ³	cubic meters	35.314	cubic feet	ft ³
m ³	cubic meters	1.307	cubic yards	yd ³
MASS				
g	grams	0.035	ounces	oz
kg	kilograms	2.202	pounds	lb
Mg (or "t")	megagrams (or "metric ton")	1.103	short tons (2000 lb)	T
TEMPERATURE				
°C	Celsius	$1.8C + 32$	Temperature is in exact degrees Fahrenheit	°F
ILLUMINATION				
lx	lux	0.0929	foot-candles	fc
cd/m ²	candela/m ²	0.2919	foot-Lamberts	fl
Force & Pressure or Stress				
N	newtons	0.225	poundforce	lbf
kPa	kilopascals	0.145	poundforce per square inch	lbf/in ²

* SI is the symbol for the International System of Units. Appropriate rounding should be made to comply with Section 4 of ASTM E380. (Revised March 2003, Section 508-accessible version September 2009)

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LIST OF ABBREVIATIONS AND SYMBOLS

Acronym	Definition
ACE	automated commercial environment
ATRI	American Transportation Research Institute
CBP	U.S. Customs and Border Protection, USDHS
CDL	commercial driver's license
CMV	commercial motor vehicle
CVIEW	Commercial Vehicle Information Exchange Window (CVISN component)
CVSA	Commercial Vehicle Safety Alliance
DMS	dynamic message sign
FAST	Free and Secure Trade Program
FMCSA	Federal Motor Carrier Safety Administration, USDOT
HELP	Heavy Vehicle License Plate, Inc.
IBC	international border crossing
ID	identification
ITDS	International Trade Data System, CBP
ITS	Intelligent Transportation System
L&I	license and insurance
LIFIS	Licencia Federal Information System
MCMIS	Motor Carrier Management Information System
MCSAP	Motor Carrier Safety Assistance Program
MTD	Motor Transportation Division, State of New Mexico
MX	Mexico
OOS	out of service
QC	Query Central (FMCSA information system)
RFID	radio frequency identification device

Acronym Definition

ROC	roadside operations computer (CVISN component)
SAFER	Safety and Fitness Electronic Records (FMCSA information system)
USDOT	U.S. Department of Transportation
UNM	University of New Mexico
VIN	vehicle identification number

EXECUTIVE SUMMARY

The Santa Teresa radio frequency identification device (RFID) E-Screening Demonstration Project uses RFID transponders to electronically screen commercial vehicles through New Mexico's state border-crossing facility at Santa Teresa, New Mexico. The Phase I demonstration project is being conducted to test the following hypotheses:

- RFID transponders are a reliable means of vehicle/driver ID for use in state international border crossing (IBC) e-screening applications.
- In-station e-screening at state IBCs has the potential to reduce the time required to process enrolled vehicles/drivers for an inspection selection decision.
- In-station e-screening at state IBCs has the potential to enable enforcement officers to increase the number of vehicles and drivers subject to full compliance verification as part of inspection selection decision.
- In-station e-screening at state IBCs has the potential to enable enforcement officers to focus limited resources more directly on potentially higher-risk/noncompliant carriers/drivers.
- In-station e-screening at state IBCs has the potential to reduce the time required for enrolled safe and compliant vehicles/drivers to process through the site.
- In-station e-screening at IBCs has the potential to increase state IBC capacity/throughput.

PROJECT DESCRIPTION

Project Team

The project team is comprised of the following organizations:

- University of New Mexico's (UNM's) Alliance for Transportation Research Institute (ATRI).
- Parker Young.
- Heavy Vehicle License Plate, Inc. (HELP)/PrePass.
- TransCore.

Project partners include the following:

- New Mexico Border Authority.
- New Mexico Division Office of the Federal Motor Carrier Safety Administration (FMCSA).
- New Mexico Department of Public Safety: Motor Transportation Division (MTD).

Schedule and Budget

The project was implemented for under \$200,000 via an Intelligent Transportation Systems (ITS) earmark. All members of the project team contributed to project cost share. The project concept of operations was developed in November 2006, and the system functional and technical

requirements were developed in December 2006. The system was designed, tested, and installed at the end of February 2007; it was operational, and vehicle enrollment began, on March 5, 2007. The last data download from the screening system for evaluation purposes was conducted on May 12, 2007.

Concept of Operations

An RFID reader on the ramp approach to MTD's Santa Teresa Port captures the transponder identification (ID) number or "tag number" from the Free and Secure Trade (FAST) or User Fee tag on the vehicle windshield. Enrolled drivers with US Customs and Border Protection (CBP)-issued driver ID cards are instructed to display their driver ID cards; the reader also reads the transponder number from the driver ID cards.

The transponder IDs are transmitted to the local screening system. The screening system roadside operations computer (ROC) displays the transponder number, basic identifying information about the driver or vehicle, and the results of the screening decision.

If the screening results show that either the vehicle or the driver is not enrolled in the program, an alarm sounds, and an MTD officer or FMCSA inspector parks the truck, notes the issue date of the Commercial Vehicle Safety Alliance (CVSA) decal on the truck, and brings the driver and his paperwork into the office for enrollment and verification.

When that driver or truck next enters the Santa Teresa Port, the RFID reader reads the vehicle and driver ID tags and transmits the tag numbers to the local screening system, triggering a screening query to the local database. Vehicles are screened to validate:

- Currency of truck (power unit) CVSA decal.
- Currency of power unit registration.
- Federal operating authority status of carrier operating the vehicle.
- Current insurance.
- For driver tags, commercial driver's license (CDL) status.

Results of the screening decision are displayed on the ROC, along with identifying information.

Where results of the automated query result in a "pass" indicator (indicating that the vehicle/driver is compliant for all factors verified by the e-screening system), the MTD/FMCSA inspector has the option of waving the vehicle/driver through or pulling the vehicle out of the queue for a random inspection compliance check.

Where results of the automated query result in a "fail" indicator (indicating that the vehicle/driver is noncompliant for one or more factors verified by the e-screening system), the ROC sounds an alarm and displays a "fail" message, along with the factors generating the "fail" (e.g., "check registration," "check CDL," or "check operating authority," etc.). Actions taken based on the "fail" decision are at the discretion of the officer processing the vehicle.

Major Evaluation Findings

Fourteen carriers participated in the initial 10-week demonstration. Five drivers and 100 trucks were enrolled in the system. More than 5,500 transponder reads were recorded during the 10-week period; of those, more than 2,400 were reads of enrolled transponders.

Results of the Phase I demonstration test indicate that the test met the objectives defined in the hypotheses, as outlined in Table 1 below.

Table 1. Summary of Demonstration Test Results

Premise Tested in Demonstration Project	Summary Results
RFID Technology can be used to reliably identify vehicles/drivers at ramp speeds.	99+% read rate
In-station e-screening can reduce the time required to process vehicles for inspection selection.	Full electronic verification of enrolled vehicles was routinely accomplished via the e-screening system in less than one (1) second, vs. 15 minutes required to manually verify all items checked by the screening system.
In-station e-screening has the potential to increase the number of vehicles/drivers routinely subject to full compliance verification.	Subsequent to the e-screening system implementation, the number of vehicles screened for full compliance was increased by 300%. If all transponder-equipped vehicles through the port had been enrolled, the increase would have been more than 800%. There is potential for significantly higher increases at higher-volume facilities.
In-station e-screening focuses limited enforcement resources on noncompliant/ unknown vehicles/drivers.	The system positively identified compliant/noncompliant vehicles more than 99% of the time, enabling officers to focus their efforts on vehicles with “fail” reads and on those which were not transponder-equipped.
In-station e-screening has the potential to reduce processing time for compliant vehicles.	On-site observations over an eight-hour time period indicated that each vehicle pulled out of the queue for credentials verification, Level 1 inspection, and/or other form of review, and found to be fully compliant upon completion of the review, spent an average of 27 minutes in the review/inspection process. Average time saved, when distributed among all vehicles in the queue, was 1.8 minutes per vehicle.
In-station e-screening provides the potential to increase capacity/throughput.	The volumes at Santa Teresa are too low to draw meaningful conclusions—positive or negative—regarding this hypothesis.

Limitations of Operational Concept

From a technical and operational standpoint, the system performed as it was intended to perform. However, there are several key limitations to use of the system in broader applications when considering “full-service” e-screening needs. These limitations are related primarily to two factors:

- Schedule and budget parameters of the Phase I demonstration project (project initiation in fall of 2006, with a required end date of May 31, 2007, and budget of less than \$200,000).
- Subset of International Trade Data System (ITDS) currently being exchanged between CBP and FMCSA not yet available for use by secondary facilities.

The key limitations of the operational concept are outlined below.

- On-site enrollment is time-consuming and thus a limitation to wide deployment, particularly when considering application in large, high-volume facilities.
- An on-site enrollment process requiring manual updates in the field limits data currency and can result in false “fail” reads (for example, a new CVSA decal has been issued, but the enrollment database has not been updated to reflect issuance of the new decal).
- Both the truck and the trailer are required to display a current CVSA decal. Trailers are not equipped with separate RFID tags. Within the Phase I demonstration project parameters, there was no way to electronically identify the trailer, and thus no way to electronically verify the currency of the trailer’s CVSA decal.
- Drivers of carriers participating in the FAST program are likely to have driver ID cards. Drivers participating only in the User Fee transponder program (among carriers enrolled in the Santa Teresa Phase 1 Demonstration Project) did not have CBP-issued driver ID cards.
- Because the system was originally developed as a six-week demonstration, with very limited funding, the screening decision is displayed only inside the MTD/FMCSA facility on the ROC. The demonstration period was extended to 10 weeks at the behest of the participating fleets and MTD.

Addressing Limitations

The Santa Teresa Project Team has identified a variety of possible ways to address the limitations of the Phase 1 demonstration. Central to these solutions is the potential to access the subset of the ITDS data set currently being shared by CBP with FMCSA.

Motor carriers and other eligible parties are required to file an electronic manifest with CBP prior to entering the United States through all Southern land ports. The e-manifest is filed via the CBP Automated Commercial Environment (ACE) Truck Manifest System at least 24 hours prior to a trip. Data from the manifest are “packaged” by CBP’s ITDS system and electronically transmitted to each of the Federal government agencies which require documentation for clearing or licensing cargo.

FMCSA receives a data packet related to truck, trailer, driver from each e-manifest filed. FMCSA electronically verifies the data transmitted, and then transmits the verified data set (with check flags to indicate potential compliance issues) back to CBP.

The Santa Teresa Project Team has identified a need to interface the subset of ITDS data verified by FMCSA with e-screening systems at Southern- and Northern-state IBCs. Access to the ITDS data subset would address many of the limitations identified in the Phase 1 Santa Teresa Demonstration Project, including:

- Access to the ITDS data set would obviate the need for on-site enrollment (the RFID tag number on the power unit would be linked to key vehicle/carrier identifiers such as VIN, plate number, and carrier USDOT number via the ITDS data set).
- The ITDS data set ties the power unit, trailer, and driver together on a per-trip basis. If the power unit can be identified via the RFID tag, the driver and trailer can be identified and screened electronically, even in the absence of driver and trailer RFID tags.
- Access/interface to the ITDS data set, combined with related access/interface to Safety and Fitness Electronic Records (SAFER)/Commercial Vehicle Information Exchange Window (CVIEW), Motor Carrier Management Information System (MCMIS), and other centralized data sources, addresses the issue of data currency.

Interface of the e-screening system with a dynamic message sign (DMS) and handheld devices will provide capabilities to notify officers of the screening decision and to direct drivers.

1. INTRODUCTION

1.1 DOCUMENT SCOPE AND PURPOSE

This document is the final report of the Santa Teresa Radio Frequency Identification Device (RFID) E-Screening Demonstration Project. It provides an overview of the project and the results of the project evaluation effort, and describes potential enhancements to the e-screening system which could increase its utility in future applications, both for near-term enhancements to the limited operational concept, and for longer-term development of a “full-service” e-screening application for secondary border facilities at both Southern and Northern borders.

1.2 BACKGROUND

Thousands of Mexican-domiciled commercial vehicles cross into the United States every day through international border crossings (IBCs) in New Mexico, Texas, Arizona, and California. At present, virtually all commercial truck trips northbound from Mexico to the US are drayage trips. The truck, or power unit, drops or unloads the trailer at a warehouse within the US Commercial Zone, then turns around, reloads—or, more frequently, picks up another trailer in Mexico—and makes one or more additional northbound “drop and hook” trips per day.

Currently, most Mexican-domiciled trucks are permitted to travel only within the commercial zone in the United States—a limited geographic area generally extending 3 to 20 miles north of the municipalities along the US-Mexican border. In New Mexico, the commercial zone extends throughout Dona Ana and Luna Counties, considerably more than 20 miles north of the border.

To gain entry into the United States, Mexican trucks must proceed through designated commercial land ports. Each set of commercial land ports includes a Mexican Customs facility on the Mexican side of the border, and a series of US Federal and state facilities on the US side of the border. Trucks crossing into the United States from Mexico are first processed through a facility operated by US Customs and Border Protection (CBP). A variety of other Federal agencies are typically co-located at the CBP site, including the Drug Enforcement Administration and the Department of Agriculture. Having been processed through this first facility, the vehicle then proceeds through clearance processes conducted by state Motor Carrier Safety Assistance Program (MCSAP) agencies and Federal Motor Carrier Safety Administration (FMCSA) border inspectors.

State and FMCSA operations may be located within the CBP site, with state, FMCSA, and CBP personnel operating out of the same “booths,” as at Nogales. Alternatively, the state and FMCSA may share a facility separate from the CBP site, as in New Mexico. In other locations, such as Texas, FMCSA operates out of a limited area of CBP sites, and the state operates its own facilities outside the CBP compound. In all cases, vehicles proceed through CBP clearance and inspection processes first, and then proceed through FMCSA/state processes.

FMCSA and state MCSAP inspectors are tasked with ensuring that Mexican vehicles entering the United States meet specific safety and compliance requirements related to:

- Driver credentials such as commercial driver's license (CDL) status, class, and restrictions.
- Federal operating authority status.
- Proof of insurance at the appropriate coverage level.

State MCSAP agencies are also concerned with validating:

- Mexican vehicle registration status.
- Compliance with state size and weight limitations.
- Other, state-specific requirements.

At present, the state and FMCSA inspection selection and clearance processes at virtually all sites are manual processes. Manual inspection processes are limited in terms of efficiency and "coverage." Verification of CDL, insurance, registration, Federal operating authority status, etc., can require parking a vehicle and bringing driver and paperwork into an office, and can take as much as 15 minutes of the officer's and driver's time. Even if handhelds are used (obviating the need to park the vehicle), these verifications can take several minutes to complete. At high-volume stations, where the lengths of the queues require processing a vehicle every few seconds, there is insufficient time to manually conduct these verifications on every vehicle. Even at low-volume stations, there is insufficient manpower to conduct these detailed verifications on every vehicle.

As a result, state and FMCSA inspection selection and clearance decisions are made based on a variety of factors, including:

- Officer/inspector knowledge of safety performance and history of specific carriers.
- Visual check of the CVSA decal and its currency.
- Walk-around/visual check of tire pressure, air brakes, and other obvious physical defects.
- Occasionally, limited conversation with the driver.
- Officer expertise.
- Random inspection.

The Santa Teresa RFID E-Screening Demonstration Project was designed to begin to address the inherent inefficiencies of manual inspection selection processes by using RFID technology to electronically identify the vehicle and driver, in conjunction with an electronic database and screening algorithm to verify compliance with safety and credential compliance requirements.

RFID technology was selected because 80–90 percent of the power units crossing into the United States from Mexico are already equipped with RFID transponders issued by CBP. These are either Free and Secure Trade Program (FAST) or user fee transponders, predominantly User Fee transponders at the Santa Teresa facility. CBP assesses a \$10 fee per trip each time a vehicle comes through one of its land ports. By purchasing a user fee transponder, a carrier pays a \$200

annual fee in lieu of any trip fees. As most of these drayage vehicles are crossing into the United States several times a day, the cost of the user fee transponder is far lower on an annual basis than the fee per trip. As a result, the user fee transponders are in widespread use.

Because it used the transponders that are already on 80–90 percent of the Mexican-domiciled trucks, the project did not require carriers to obtain a second identification device for their vehicles, and the project opened the doors for eventual interface of the e-screening system with the subset of the International Trade Data System (ITDS) data already being exchanged between CBP and FMCSA.

The project was funded through an Intelligent Transportation System (ITS) earmark provided to University of New Mexico's (UNM) American Transportation Research Institute (ATRI). The project concept of operations was developed in the fall of 2006, following discussions with New Mexico Motor Transportation Division (MTD) officers and New Mexico FMCSA Division Office personnel involved in commercial vehicle processing at the US-Mexican border.

The project concept of operations was designed to address as many of the current manual processing limitations as possible, within the limited timeframe (November 1, 2006 through May 31, 2007) and budget (<\$200,000) available. The demonstration project was not envisioned as a "full-service" e-screening solution. Rather, it was designed to test a set of basic hypotheses described below in Section 1.3, Project Purpose, to demonstrate the potential value of e-screening in improving the efficiency and effectiveness of the safety/compliance verification and inspection selection processes at state and FMCSA IBC facilities.

The Santa Teresa site provides an excellent and unique test site for e-screening and other ITS applications at the Southern border because it is a low-volume site (volume is approximately 120– 140 trips per day) which is routinely staffed 5.5 days a week with a full complement of FMCSA border inspectors and state MCSAP officers. Vehicles through the site are representative of vehicles/trips through any Southern border site: FAST and User Fee transponder-equipped as well as non-transponder-equipped vehicles; vehicles from the interior of Mexico as well as from border communities. The fact that both FMCSA and state inspectors operate out of the same facility makes possible the sharing of examination/evaluation of issues/processes among Federal and state inspectors, as well as issues unique to state clearance processes. The site sees the same safety and compliance issues as any other Southern state/FMCSA IBC, but it sees these issues on a smaller scale. New processes, systems, and technologies can be introduced, tested, and evaluated more quickly and with less potential for negative impact on site operations than at higher-volume sites.

1.3 PROJECT PURPOSE

The primary purpose of the Santa Teresa E-Screening Demonstration Project was to demonstrate the potential value of e-screening, using the same transponders used by CBP (transponders already installed on 80–90 percent of the trucks using the port) in improving the efficiency and effectiveness of the safety/compliance verification and inspection selection processes at state/FMCSA IBC facilities. The project team established six hypotheses to be tested in the limited deployment:

- RFID transponders are a reliable means of vehicle/driver ID for use in state IBC e-screening applications.
- In-station e-screening at state IBCs has the potential to reduce the time required to process enrolled vehicles/drivers for an inspection selection decision.
- In-station e-screening at state IBCs has the potential to enable enforcement officers to increase the number of vehicles/drivers subject to full compliance verification as part of inspection selection decision.
- In-station e-screening at state IBCs has the potential to enable enforcement officers to focus limited resources more directly on potentially higher-risk/noncompliant carriers/drivers.
- In-station e-screening at state IBCs has the potential to reduce the time required for enrolled safe and compliant vehicles/drivers to be processed through the site.
- In-station e-screening at IBCs has the potential to increase state IBC capacity/throughput.

1.4 PROJECT TEAM

The project team is comprised of the following organizations:

- **UNM's ATRI.** ATRI was responsible for project management and administration, project evaluation, and preparation of project reports.
- **Parker Young.** Parker Young developed the project concept of operations and assisted in development of screening system business rules and functional requirements, project evaluation, and preparation of final reports.
- **Heavy Vehicle License Plate, Inc. (HELP)/PrePass.** HELP, Inc./PrePass designed, developed, installed, and supported the project's e-screening software.
- **TransCore.** TransCore provided, installed, and calibrated the reader used in the e-screening system. (TransCore is providing the readers and installation/calibration/ongoing maintenance services for all CBP RFID installations.)

Project partners include the following:

- **New Mexico Border Authority,** an organization devoted to facilitating cross-border trade in New Mexico, assisted with enlistment of 14 carriers for participation in the demonstration; with ongoing outreach among participating carriers, including conduct of qualitative baseline and post-deployment carrier evaluations; and with translation of project documents into Spanish.
- **New Mexico Division Office of the Federal Motor Carrier Safety Administration** utilized the e-screening system during the 10-week pilot period, enrolling vehicles and drivers, integrating system use into its operations, and providing valuable feedback regarding desirable system enhancements.
- **New Mexico Department of Public Safety, MTD** also utilized the e-screening system during the 10-week pilot period, enrolling vehicles and drivers, integrating system use

into its operations, and providing valuable feedback regarding desirable system enhancements.



Figure 1. Santa Teresa Project Team Members

1.5 DOCUMENT ORGANIZATION

The document is organized in three sections following this Introduction as follows:

- **Section 2 Project Overview**—describes the project, the concept of operations, and the enrollment process.
- **Section 3 Project Evaluation**—discusses project results, including system performance, system transaction statistics, and carrier and FMCSA/MTD qualitative response to demonstration project.
- **Section 4 Limitations of the Initial Concept of Operations and Recommendations**—discusses operational limitations as they relate to the limited Santa Teresa context, suggested system enhancements for the near-term operational context, project limitations in the larger context of a “full-service” e-screening system suitable for deployment at any Southern or Northern secondary IBC facility, and recommendations.
- **Appendices**

2. SANTA TERESA RFID E-SCREENING DEMONSTRATION PROJECT OVERVIEW

2.1 PROJECT DESCRIPTION

New Mexico has two designated commercial vehicle crossings at the US-Mexican border, located at Columbus and Santa Teresa. Each crossing includes a facility operated by CBP, and a separate but proximate facility operated by the New Mexico Department of Public Safety's MTD, jointly staffed by FMCSA.

The state Santa Teresa Port is located approximately one-quarter mile north of the CBP Santa Teresa border crossing facility, as shown in Figure 2 below.

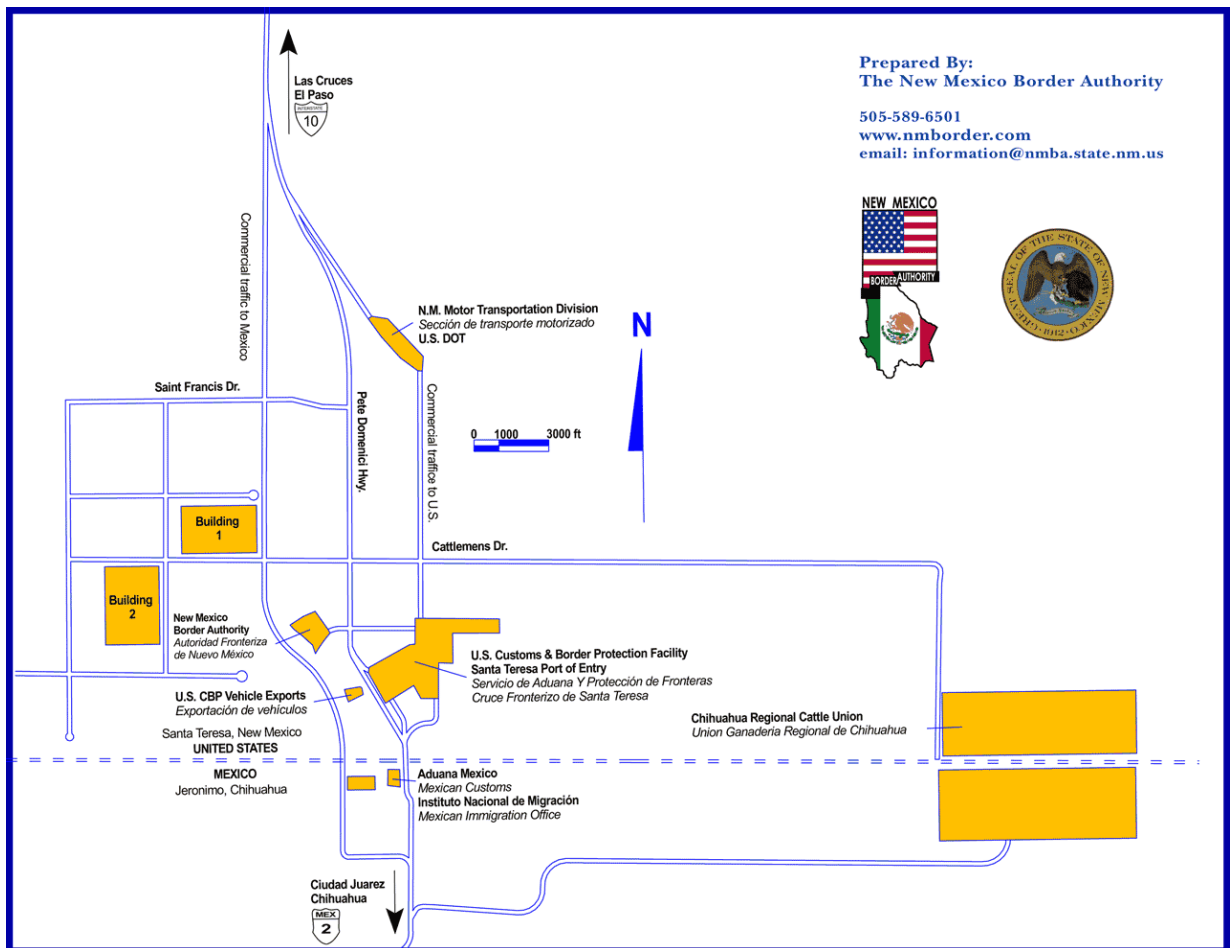


Figure 2. Santa Teresa Border Crossing Facilities

The Santa Teresa Port is jointly staffed by MTD and FMCSA. Trucks entering the United States at Santa Teresa are first processed by CBP at its site, and then proceed along a limited-access roadway directly to the state's Santa Teresa Port, where vehicles and drivers are subject to inspection for compliance with FMCSA and state regulatory requirements.

At the Santa Teresa Port, MTD officers and FMCSA inspectors validate:

- Driver credentials such as CDL status and restrictions.
- Federal operating authority status.
- Proof of insurance and insurance coverage.
- Vehicle registration status (state rather than Federal requirement).

Level 1 inspection within the last 90 days, as evidenced by the presence of current CVSA decals on both truck and trailer.

MTD and FMCSA may also review driver logs, trip manifests, and other relevant documents. Level 1 inspections are conducted in cases in which the CVSA decal has expired. Level 1 and other inspections may also be conducted as deemed warranted by the MTD officers and FMCSA inspectors at the site.

At the Santa Teresa Port, the manual process to fully verify all safety and regulatory requirements requires parking the truck, bringing the driver and associated paperwork into the office, querying multiple centralized databases, and physically examining paperwork. The full manual verification process requires 15 minutes or more of the inspector's and the driver's time.

Until recently, inspection selection decisions at the Santa Teresa Port, as at most state border inspection facilities, were based on a variety of factors, including:

- Officer/inspector knowledge of safety performance and history of specific carriers (Santa Teresa is a relatively low-volume facility, used primarily by drayage haulers, so officers tend to see many of the same carriers/trucks on a daily basis).
- Visual check of the CVSA decal.
- Quick walk-around to visually note tire pressure, condition of air brakes, other obvious defects.
- Officer expertise.
- Random inspection.

In March 2007, the ATRI Project Team (ATRI, Parker Young, HELP, Inc./PrePass, and TransCore) deployed an RFID e-screening demonstration project at MTD's Santa Teresa Port of Entry to assist MTD officers and FMCSA inspectors in making inspection selection decisions. The Phase I system uses the same transponder and reader technology as is used by CBP in its FAST and User Fee programs. Approximately 80–90 percent of the vehicles through the state Santa Teresa Port are equipped with FAST and/or user fee transponders.

2.1.1 Operational Scenario

A TransCore eGo 2101 RFID reader was installed on a temporary pole on the ramp approach to MTD's Santa Teresa Port (see Figure 3). The reader captures the transponder identification number (ID) or "tag number" from the CBP FAST or user fee tag on the vehicle windshield. Enrolled drivers with CBP-issued driver ID cards are instructed to display their driver ID cards,

and the reader also reads the transponder number from the driver ID card (see CBP Web site: http://www.cbp.gov/xp/cgov/trade/cargo_security/ctpat/fast/).

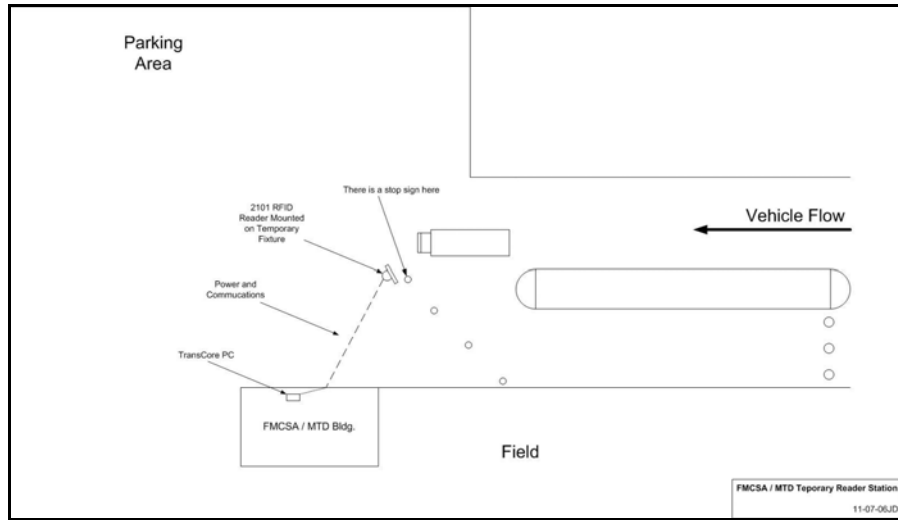


Figure 3. Santa Teresa RFID Location Schematic for RFID Reader

The transponder IDs are transmitted via an 8013/RS422 communications cable to the local screening system, developed for the project by HELP, Inc./PrePass. The screening system roadside operations computer (ROC) displays the transponder number, basic identifying information about the driver (if driver ID tag is present) and vehicle (if vehicle ID tag is present), and the results of the screening decision, as shown in Figure 4 below.

#	Date & Time	RFID #	RFID Type	Name/Plate No.	CVSA	Registrati...	License	OpAuthority	Insurance	Carrier Name
4	Feb 19, 2007 2:27:02 PM	01A3A28F80FDC019	Driver	James,Bill	N/A	N/A	Failed	N/A	N/A	N/A
3	Feb 19, 2007 2:26:59 PM	01A64890C0EB2002	Truck	P12345TX	Passed	Passed	N/A	Passed	Passed	New England Express
2	Feb 19, 2007 2:24:55 PM	01A3A28F80FDC019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	New Tag, Not In Database
1	Feb 19, 2007 2:24:44 PM	01A64890C0EB2002	Truck	P12345TX	Passed	Passed	N/A	Passed	Passed	New England Express

Figure 4. ROC Screen Displaying (Mock-up) E-Screening Results

If the screening results show the vehicle or driver are not enrolled in the program, an audible alarm sounds, and an MTD officer or FMCSA inspector parks the truck, notes the issue date of

the CVSA decal on the truck, and brings the driver and his paperwork into the office for enrollment and verification.

The enrollment process includes verification and data entry of the following:

Driver Enrollment:

- CBP-issued driver identification tag number (pre-populated by system read).
- Driver name and date of birth.
- CDL number.
- CDL date of issue/expire date.
- Mexico (MX)-only restriction.
- CDL status from the Mexican *Licencia Federal Information System* (LIFIS).

Vehicle Enrollment:

- FAST or user fee tag number (pre-populated by system read).
- Carrier name and address.
- Power unit vehicle identification number (VIN).
- Power unit plate number and country of issue.
- United States Department of Transportation (USDOT) number of carrier operating vehicle.
- Vehicle registration issue/expire dates.
- Insurance effective/expire dates.
- Federal operating authority status of carrier operating vehicle.
- CVSA decal issue/expire dates.

When that driver or truck next enters the Santa Teresa Port, the RFID reader reads the vehicle and driver ID tags, and transmits the tag numbers to the local screening system, triggering a screening query to the local database. Results of the screening decision are displayed on the ROC, along with identifying information.

Where results of the automated query result in a “pass” indicator (indicating that the vehicle/driver is compliant for all factors verified by the e-screening system), the MTD officer/FMCSA inspector has the option of waving the vehicle/driver through or pulling the vehicle out of the queue for a random inspection/compliance check.

Where results of the automated query result in a “fail” indicator (indicating that the vehicle/driver is noncompliant for one or more factors verified by the e-screening system), the ROC sounds an alarm (using a tone different from the “not enrolled” alarm) and displays a “fail” message, along with the factors generating the “fail” (for example, “check registration,” “check CDL,” or “check operating authority,” etc.). Actions taken based on the “fail” decision are at the discretion of the officer/inspector processing the vehicle.

In the Phase I demonstration system, the Federal operating authority status was updated weekly via an automated refresh from the PrePass Commercial Vehicle Information Exchange Window (CVIEW). The Federal operating authority status data in the PrePass CVIEW is updated nightly via an interface with the national Safety and Fitness Electronic Records (SAFER) database.

3. PROJECT EVALUATION

The demonstration project was not envisioned as a “full-service” e-screening solution. Rather, it was designed to demonstrate the potential value of e-screening, using the same transponders used by CBP (transponders already installed on 80–90 percent of the trucks using the port), in improving the efficiency and effectiveness of the safety/compliance verification and inspection selection processes at secondary IBC facilities. The project team established six hypotheses to be tested in the limited deployment, as outlined below:

- RFID transponders are a reliable method of vehicle/driver ID for use in state IBC e-screening applications.
- In-station e-screening at state IBCs has the potential to reduce the time required to process enrolled vehicles/drivers for an inspection selection decision.
- In-station e-screening at state IBCs has the potential to enable enforcement officers to increase the number of vehicles/drivers subject to full compliance verification as part of inspection selection decision.
- In-station e-screening at state IBCs has the potential to enable enforcement officers to focus limited resources more directly on potentially higher-risk/noncompliant carriers/drivers.
- In-station e-screening at state IBCs has the potential to reduce the time required for enrolled safe and compliant vehicles/drivers to be processed through the site.
- In-station e-screening at IBCs has the potential to increase state IBC capacity/throughput.

3.1 EVALUATION FRAMEWORK

Three evaluation time periods were established in testing these hypotheses:

- Baseline.
- Demonstration.
- Post-Demonstration.

Four evaluation methods were used:

- **Observation:** During the baseline and test evaluation periods, ATRI evaluators observed and documented various activities/events at the Santa Teresa site. Forms were developed for recording observed activities/events. The observations comprised a sample of data from which the team could extrapolate/draw conclusions regarding, for example, the percentage of vehicles/drivers subject to full compliance check prior to installation of the RFID e-screening system.
- **“Staged” Events:** During the baseline evaluation period, the team established certain parameters—for example, the time required to manually compliance-check all data elements included in the e-screening system. To establish these (and other similar data), the evaluators requested MTD officers/FMCSA inspectors to perform certain functions with MX vehicles/drivers while being observed/documented by the evaluator.

- **Interviews:** During each of the three evaluation periods, evaluators interviewed MTD officers/FMCSA inspectors and participating “test” carriers (three carriers who agreed to participate in pre-test and post-test interviews) regarding various aspects of Baseline and Test operations.
 - **System Data:** Daily transaction statistics data maintained in the e-screening system were downloaded every 14 days during the pilot test period (see Appendix A for daily transaction statistics).

The *Baseline Evaluation* established/characterized the pre-test operating environment and was used as the benchmark against which to evaluate the impact/results of the test. The Baseline evaluation was conducted in February 2007.

The *Demonstration Evaluation* established/characterized the test operational environment and was conducted between March 5 and May 12, 2007.

The *Post-Demonstration Evaluation* characterized MTD/FMCSA and test carrier perceptions of the strengths/limitations of the test, impact on their operations, and recommendations for future e-screening deployments.

3.2 EVALUATION FINDINGS

3.2.1 General Conditions

For purposes of the evaluation, the demonstration test ran from March 5, when vehicle enrollment was initiated, to May 12, when the last transaction statistics were downloaded from the system (the system continues to be operational beyond May 12, but the evaluation data are based on the period of March 5 to May 12, 2007).

Fourteen carriers were solicited for system participation by the New Mexico Border Authority, and all 14 enthusiastically agreed to participate. Among the participating carriers, 100 trucks and five drivers were enrolled in the system. Enrollment was deliberately restricted for two reasons:

- Because the project was introducing new concepts (processing/clearance via e-screening) and new requirements (pulling vehicle/driver out of queue for enrollment), the project team wanted to fully inform carriers of the process/requirements prior to implementation to ensure buy-in among carriers and drivers using the Santa Teresa facility.
- The primary focus of MTD and FMSCA personnel at the port is safety/compliance verification and enforcement, rather than e-screening system enrollment and system testing/evaluation. Each vehicle and driver enrollment and verification required approximately 30 minutes of officer and driver time. The goals of the project team and FMCSA/MTD were to enroll enough vehicles to validate the test, while not overburdening officers/inspectors with excessive time spent enrolling vehicles/drivers.

Explaining the project to potential carrier participants, outlining the potential short- and long-term advantages, as well as the potential for lost time in the one-time enrollment process, made it possible to bring carriers in as project partners, rather than as unknowing subjects of the test. By

restricting the enrollment requirement to 100 vehicles, FMCSA and MTD staff could accommodate the enrollment processing needs over a 4-week period without adversely affecting their enforcement operations.

More than 5,500 transponders were read by the system in the 10-week evaluation period. Over 2,400 of these reads were “enrolled” reads—reads of transponders enrolled in the system. By the end of April/early May, when FMCSA and MTD had completed vehicle enrollment, on a daily basis 56 percent of the reads were enrolled reads.

3.2.2 Baseline Evaluation

The baseline evaluation consisted of interviews with several participating carriers, interviews with MTD and FMCSA staff regarding strengths/limitations of the current manual processes, and observation/staged events related to vehicle processing through the Santa Teresa Port. Carrier interviews were conducted with three participating carriers in February 2007. MTD/FMCSA staff interviews were conducted in February and March 2007. Observations/staged events were conducted at the Santa Teresa Port during a six-hour period on February 27, 2007.

3.2.2.1 Carrier Interview Results

As mentioned above, 14 carriers were contacted by the New Mexico Border Authority to determine their interest in participating in the pilot project. All 14 carriers enthusiastically agreed to participate. These participating carriers operate more than 300 trucks; however, only some of these vehicles routinely operate through the Santa Teresa Port. In some cases, carriers may use IBCs in El Paso or elsewhere for some of their operations, depending on the loads’ points of origin/destinations.

In terms of strengths of the existing Santa Teresa operations, the three carriers selected for interview indicated the following:

- ***Faster access to clients:*** All three carriers interviewed indicated that they used the Santa Teresa Port for all or a portion of their operations because the port has less traffic, and hence shorter wait times, than other nearby border-crossing facilities, and thus provides for faster access to clients.
- ***Individualized attention:*** Carriers reported that they appreciated the “individualized attention” received at the Santa Teresa Port. MTD officers at the Santa Teresa facility have assisted some of these carriers with terminal inspections, outreach/education, and training efforts on US safety assurance requirements (including hours-of-service requirements, maintenance of log books, pre- and post-trip inspection processes, etc.). Carriers appreciate these efforts to help ensure their compliance. Some carriers will also bring power units in need of Level 1 inspection to the port on a proactive basis to obtain inspections and new CVSA decals.

In terms of limitations of the existing manual process, carriers described the following:

- ***Wide range of operating hours/limited operating hours:*** The operating hours at the state Santa Teresa facility are based on the operating hours of Mexican Customs. MTD and the New Mexico Border Authority are working with Mexican Customs to extend operating

hours through 10:00 p.m., Monday through Friday. However, operating hours are beyond the control of FMCSA or MTD, and outside the potential impact area of the demonstration project.

- ***Processing delays due to trailer inspection:*** At Southern border crossings, both the truck and the trailer are required to display current CVSA decals. Often, in drayage operations, the trailer being hauled is not owned by (or leased by) the carrier operating the power unit. Carriers expressed frustration that they work very hard to ensure the safety and compliance of their power units and drivers, but are pulled over for secondary inspection due to issues with the trailers. Carriers understand and appreciate the need for inspection of the trailers, but indicated that because the trailer citation is assessed to the carrier pulling the trailer, rather than to the owner of the trailer, there is little incentive for the trailer-owner to comply with the inspection requirement. Carriers suggested assessing the violation/citation against the owner of the trailer to provide a stronger incentive to owners of the trailers to comply with requirements.

Carriers interviewed indicated that they were willing to participate in the Santa Teresa E-Screening Demonstration Project for the following reasons:

- They expected to be able to minimize wait time for clearing vehicles through the station.
- Participation did not require adding another identification device to the truck (i.e., system used user fee or FAST tag already on the truck).
- Participation did not require any kind of fee paid on the part of the carrier.

Expected benefits among participating carriers included the following:

- Facilitation of the import/export process.
- Reduced inspection of safe and legal vehicles and drivers, resulting in productivity savings for the carrier.

3.2.2.2 MTD/FMCSA Interview Results

MTD and FMCSA border inspection staff working out of the Santa Teresa Port were interviewed on several occasions regarding the nature of the existing clearance process and its associated strengths and weaknesses, in the course of establishing the business requirements for the Santa Teresa e-screening system. Key findings of these interviews are highlighted below.

Existing Process Description

At the Santa Teresa Port, MTD officers and FMCSA inspectors are tasked with validating the following:

- Driver credentials such as commercial driver's license (CDL) status and restrictions.
- Federal operating authority status.
- Proof of insurance and insurance coverage.
- Vehicle registration status (state rather than Federal requirement).

MTD and FMCSA may also review driver logs, trip manifests, and other relevant documents. Level 1 inspections are conducted in cases in which the CVSA decal is expired. Level 1 and other inspections may also be conducted as deemed warranted by the MTD officers and FMCSA inspectors at the site. Size and weight inspection details are also periodically conducted by MTD, using portable scales.

Strengths of Existing Processes

FMCSA and MTD officers appreciate the value of the hands-on contact with drivers and observation of vehicles. A CVSA decal can be current, but six weeks old, and therefore might not reflect safety issues that had arisen since the decal was issued. A vehicle can still have a safety issue, even if the decal is current. Even limited conversation with drivers can be an important tool in making an inspection selection decision.

Limitations of the Existing Processes

Prior to initiation of the Santa Teresa E-Screening Demonstration Project, verification of all of the factors outlined above could be conducted only by parking the truck and bringing the driver and paperwork inside the office to run a series of queries against LIFIS, Motor Carrier Management Information System (MCMIS), safety and fitness electronic records (SAFER), and other centralized databases. FMCSA inspectors are equipped with handheld devices, but the handhelds are of somewhat limited utility at Santa Teresa because site communications are not reliable, a circumstance which results in frequent signal drops from the handhelds.

Bringing the driver and paperwork into an office, reviewing paper documents, and conducting the series of manual queries required to verify the factors outlined above can take as much as 15 minutes of the officer's and driver's time. Even if handhelds are in use (obviating the need to park the vehicle), these verifications can take several minutes to complete. There is insufficient manpower to conduct these detailed verifications on every vehicle/driver.

Anticipated Benefits/Limitations of the Demonstration Project

MTD and FMCSA inspectors saw potential value in the project as follows:

- ***Assist with inspection selection decisions:*** The e-screening system could assist in making inspection selection decisions based on a range of data available in the screening database—data not typically available to officers except by pulling a vehicle out of the queue.
- ***Increased productivity:*** By electronically distinguishing compliant and noncompliant vehicles, the e-screening system could focus limited enforcement resources on noncompliant vehicles and drivers, and vehicles/drivers about whom less is known (unenrolled vehicles/ drivers).

MTD and FMCSA inspectors identified several limitations to the e-screening concept of operations, as outlined below:

- ***Currency of CVSA trailer decal:*** Because trailers are not equipped with separate RFID transponders, the Santa Teresa E-Screening Demonstration Project was not able to electronically identify/enroll trailers and thus monitor the currency of their CVSA decals.

It was agreed the project and its potential benefits provide value in spite of this limitation, and that inspectors would operate the system understanding this limitation.

- **Limited insurance policies:** Some Mexican vehicles operate on 24-hour or 48-hour insurance policies. It was agreed where the screening decision included a “fail” status on insurance, the system would also display a “48-hour policy” message to indicate to officers that the vehicle in question was operating under a limited-duration insurance policy.
- **Driver logs:** The system was not designed to address verification related to driver hours-of-service. It was agreed currently, the only way to verify driver hours-of-service is through manual observation of the log books, and that the e-screening demonstration project would not change current processes as they relate to hours-of-service enforcement. Officers/inspectors could still observe vehicles/drivers as they approach the stop sign and reader at the Santa Teresa Port, and could still converse with drivers to make an inspection selection decision, regardless of the e-screening decision. The e-screening results would provide a more informed basis on which to make the inspection selection decision.

3.2.2.3 Results of Baseline Observations/“Staged” Events

Table 2 below details the findings of the baseline evaluation observation/staged events conducted on-site over a six-hour period on February 27, 2007. These observations/events established a series of benchmarks against which to evaluate the findings of the demonstration test.

Table 2. Baseline Evaluation Findings

Criteria	Measure	Comments
Average daily trip volume	120–140 trips/day	
Average full safety/compliance checks per month	237/month	Based on number of Level 1 inspections conducted January–March 2007 Observations indicate that generally, a full compliance check is conducted for all elements included in e-screening verification only when officers are conducting an inspection
Time required to manually verify all factors considered by e-screening system	15 minutes	Requires parking vehicle, bringing driver and paperwork into office, querying multiple databases to verify information on paper forms as well as Federal operating authority; CDL status
Vehicle processing	92 trucks processed in six-hour period 18 pulled out of queue for further inspection Five found fully compliant 13 found out-of-service (OOS) or violation	Average of 27 minutes out of productive service for fully compliant trucks Average of 1.8 minutes lost to inspection/review of compliant vehicles for all trucks in queue

3.2.3 Demonstration Test Evaluation

Fourteen carriers participated in the initial 10-week demonstration. Five drivers and 100 trucks were enrolled in the system. More than 5,500 transponder reads were recorded during the 10-week period, of which more than 2,400 were reads of enrolled transponders.

Results of the Phase 1 demonstration test indicate that the technology performed reliably and as expected, and the demonstration met the objectives defined in five of the six hypotheses, with results as related to the final hypothesis inconclusive. Table 3 summarizes the hypotheses and discusses related results.

Table 3. Hypotheses Underlying Demonstration and Related Results

Premise Tested in Demonstration Project	Results
RFID Technology can be used to reliably identify vehicles/drivers at ramp speeds	The RFID readers and tags used in the demonstration project performed reliably. All transponder-equipped vehicles observed during a 6-hour evaluation period in March registered a read, and each observed read matched the corresponding transponder number, which was also captured with a handheld reader and verified against the reader on the screening system for that truck.
In-station e-screening can reduce the time required to process vehicles for inspection selection, resulting in productivity improvements for both inspectors and carriers	Full electronic verification of enrolled vehicles was routinely accomplished via the e-screening system in less than one (1) second, vs. 15 minutes required to manually verify all items checked by the screening system. The 2,414 enrolled reads—each results in a “pass” or “fail” decision for inspection selection—represents a savings of more than 600 hours in officer time.
In-station e-screening has the potential to increase the number of vehicles/drivers routinely subject to full compliance verification.	The Baseline evaluation showed that, on average, 237 vehicles per month were subject to full safety/ compliance verifications of all criteria included in the e-screening system. Subsequent to e-screening system implementation, the number of vehicles screened for full compliance was increased to an average of 965 vehicles per month, an increase of 307%. The number of vehicles screened electronically at Santa Teresa was limited by the number of vehicles enrolled. If all transponder-equipped vehicles through the port had been enrolled, the increase in safety/compliance verifications would have been over 800%. There is potential for significantly higher increases at higher-volume facilities. The theoretical capacity of the e-screening system is approximately 9,600 vehicles per lane per eight-hour shift [assuming three (3) seconds processing time per vehicle], compared with a potential for one officer to manually verify safety/compliance on only 32 vehicles in an eight-hour shift (assuming 15 minutes per full manual compliance verification).
In-station e-screening focuses limited enforcement resources on noncompliant/ unknown vehicles/drivers	The system identified compliant/noncompliant vehicles more than 99% of the time, enabling officers to focus their efforts on vehicles with “fail” reads and those that are not transponder-equipped.

Premise Tested in Demonstration Project	Results
In-station e-screening has the potential to reduce processing time for compliant vehicles	On-site observations over a six-hour time period indicated that each vehicle pulled out of the queue for credentials verification, Level 1 inspection, and/or other form of review and found to be fully compliant upon completion of the review, spent an average of 27 minutes in the review/inspection process. Average time saved per vehicle when distributed among all vehicles in the queue was 1.8 minutes per vehicle.
In-station e-screening provides the potential to increase capacity/throughput	<p>The premise here was that physical lane capacity and inspection parking area capacity would be increased by officers' ability to identify and clear compliant vehicles more quickly. In theory, this would result in parking fewer compliant vehicles for inspection, and would increase hourly throughput, since less time would be spent in queue by all vehicles.</p> <p>However, the volumes at Santa Teresa were too low to draw significant conclusions—positive or negative—regarding this hypothesis. The project team will be considering other means to evaluate this premise within the limitations of the Santa Teresa site as the project moves forward.</p>

The tables below summarize transaction statistics downloaded from the e-screening system from the period March 5–May 12, 2007, (see Appendix A for full detail on daily transaction statistics). The Santa Teresa facilities' operating hours mirror those of Mexican and US Customs, so the port is closed on Sundays (which explains the “missing days” in the transaction statistics provided in Table 4, Table 5, and Table 6).

The text following each table describes the significance of the data included in the table. Data in the tables relate to vehicle transponders only. Because only five drivers were enrolled in the system, the project team did not attempt to analyze/draw conclusions relating to driver tag reads.

Table 4. Enrolled Reads During Test Period

Category	March 5–31	April 2–28	April 30–May 12	Total
Total Transponders Read	2,312	2,037	1,156	5,505
Enrolled Reads	722	1,050	642	2,414
Enrolled Reads as % of Total Reads	31%	52%	56%	44%

The eGo 2101 reader reads all vehicle-mounted transponders, regardless of whether or not they are enrolled in the system, and the screening system logs each read. If a vehicle has both a FAST tag and a user fee tag on the windshield, the reader reads both tags and the system logs each tag read. Only one tag per vehicle was enrolled, so where a vehicle had both a FAST and a user fee transponder, the number of reads exceeds the number of truck trips through the station. The system recorded a total of 5,505 transponder reads during the period March 5–May 12, 2007.

FMCSA and MTD staff began enrolling vehicles and drivers in the system on March 5, 2007. April 18, 2007 was the last date on which any vehicles were enrolled. The percentage of enrolled reads thus increases throughout March and April. By May, 56 percent of all transponders being read were enrolled in the system.

During enrollment process training on March 5, ATRI evaluation staff conducted limited observations over a six-hour period to verify that windshield tags on transponder-equipped vehicles were being read by the system, and were being read accurately. Results of those observations indicated that all tags were read, and that each read matched the transponder number of the tag on the windshield. To accomplish the match testing, windshield tags were read with a handheld reader, and the tag ID displayed on the handheld was matched against the tag ID displayed in the e-screening system. In all 30 cases in which this random check was done, the tag IDs matched.

Table 5. Pass Reads During Test Period

Category	March 5–31	April 3–28	April 30–May 12	Total
Pass Reads	517	401	114	1,032
Pass Rate	72%	38%	18%	43%

“Pass” reads indicate enrolled reads which result in a “pass” e-screening decision, where the screening algorithm shows the vehicle to be compliant on all safety/compliance criteria evaluated by the e-screening system. In March, the “pass” rate exceeded 70 percent. By May, the “pass” rate—the percentage of enrolled vehicles that complied with all screening criteria—was reduced to 18 percent.

This drop in “pass” rate is attributable to several factors:

- CVSA decals are valid for a limited period of time and the vehicle requires a new Level 1 inspection upon decal expiration.
- Mexican vehicle registrations expire in April (insurance policies generally run concurrently with the registration period).
- Lack of screening system interface to centralized data systems affects data currency.
- There are limitations inherent in a manual on-site enrollment and update process.

Each of these issues is discussed in greater detail following Table 6.

Table 6. Fail Reads During Test Period and Reason for Failure

Category	March 5–31	April 3–28	April 30–May 12	Total
Fail Reads	205	649	528	1,382
Expired CVSA decal as % of all enrolled reads	22%	50%	75%	48%
Expired registration as % of all enrolled reads	17%	23%	22%	21%
Expired insurance as % of all enrolled reads	1%	21%	23%	16%
Invalid Federal operating authority as % of all enrolled reads	0%	0%	0%	0%

Table 6 above shows the number of “fail” reads on a monthly basis and the reasons for failure. A “fail” read indicates a read which results in a “fail” e-screening decision, where the screening algorithm finds the vehicle to be noncompliant for one or more safety/compliance criteria evaluated by the e-screening system. (Note: vehicles may fail on more than one factor; as a result, failures as percentage of enrolled reads, plus pass rate, will not add up to 100 percent.)

Lack of currency of the Level 1 inspection was the factor most frequently responsible for a “fail” screening decision. With the beginning of each new month, approximately one-third of the CVSA decals expire (decals are valid through the end of the second month following the month of issue. For example, a decal issued any time in January is valid through the end of March).

Table 6 above shows a significant increase in “fail” decisions based on CVSA decal expiration with each new month. Appendix A shows daily transaction statistics throughout the demonstration period. Daily pass/fail counts from the end of March through early April show a very clear spike in “fail” decisions related to CVSA decal expiration during this time period, indicating that the vehicle’s CVSA decal is expired, and a new Level 1 inspection is required. “Fail” reads related to CVSA decal expiration provided an important indicator to officers regarding which vehicles were due for a new Level 1 inspection.

Because the project was originally designed as a six-week limited demonstration, officers did not necessarily update the database each time a new CVSA decal was issued. As a result, the enrollment data upon which the screening decisions were made remained static. While many of the “fail” reads related to CVSA decal expiration from March to April were valid “fails,” it is likely that the continued spike in CVSA “fail” reads from April to May was related at least in part to the fact that the enrollment database was not being manually updated as new Level 1 inspections were completed in April; hence, the data on which the e-screening decision was being made were no longer current. The demonstration period was extended to a 10-week period at the urging of both the participating motor carriers and the MTD.

Mexican vehicle registrations expire in April. Insurance, if an annual policy, typically runs concurrently with the registration, so the insurance and registration expiration failures also

spiked in April and remained high in May (because the screening database was not being updated by centralized databases to reflect registration renewals).

Some insurance “fail” reads are related to the fact that some drayage carriers operate on 48-hour policies. The insurance effective dates were entered upon enrollment, but within two to three days, the insurance which was in effect at the time of enrollment has already expired. The screening system displays a “48-hour insurance policy” message with these “fail” reads to provide officers additional information that can be used in deciding how to process the vehicle. For example, if there are three vehicles in the queue, and only two parking spaces left, if one reads “fail—CVSA decal,” the second reads “fail—Federal operating authority,” and the third reads “fail—48-hour insurance policy,” the officer is likely to focus on parking the first two, and dealing with the “48-hour insurance” warning the next time that vehicle comes through.

3.2.4 Qualitative Response to the Demonstration Project

3.2.4.1 Carrier Response to Demonstration Project

Three participating carriers were selected for pre- and post-test interviews. The pre-test interviews were conducted from February through early March 2007, and are summarized in section 3.2.2. The post-test interview instruments were disseminated to the three participating carriers. However, due to scheduling challenges with the carriers, the post-test interview instruments could not be collected by the project team as of the date of this report—May 2007. (See Appendix B for combined carrier baseline/post-demonstration evaluation forms.) Informal discussions with participating carriers indicate the following qualitative response to the project:

- The enrollment process, within the context of the Santa Teresa demonstration, was not viewed as overly cumbersome.
- Carriers agreed that interface with centralized data sources to maintain currency of the screening database would improve screening system performance (and better meet their expectations of reduced clearance time for safe and compliant vehicles).
- Carriers are interested in continuing participation in the project, and see potential for increased value, particularly if enhancements as described in section 4 are implemented.
- Some carriers continue to be interested in issues related to trailer compliance and assignment of violations/citations to trailer owners as an incentive to increase compliance with inspection requirements among owners of trailers.

Any additional findings resulting from completion of the carrier post-test evaluation forms will be provided to FMCSA as an addendum to this document.

3.2.4.2 Enforcement Agency Response to Project

Because the project was initially designed as a limited six-week demonstration, the FMCSA Santa Teresa Supervisor assigned two specific officers to the system. These officers enrolled vehicles and monitored the system: One officer inside relayed the screening results to the officer outside, who then waved “passed” vehicles through, and parked “failed” vehicles for further inspection.

During the enrollment process, MTD and FMCSA identified several enrollment process improvements which were immediately coded into the system (system auto-population of registration and CVSA decal and insurance expire dates, for example, based on issue-date data entered by the officer). These minor system enhancements saved time in the enrollment process and improved data accuracy.

Based on their operational experience using the system, MTD officers and FMCSA inspectors support the project and its continuation, with some enhancements to address operational limitations, described in section 4.0.

4. LIMITATIONS AND RECOMMENDATIONS

The project team and project partners recognize a number of limitations inherent in the initial demonstration project. Some of these limitations were clearly understood prior to initiation of the demonstration test, but were accommodated, to enable the test to move forward within the limited timeframe and budget available. Other limitations became known/better understood through conduct of the demonstration test. Section 4.1 outlines known limitations; section 4.2 describes proposed ways to address and overcome limitations in subsequent e-screening efforts.

4.1 KNOWN LIMITATIONS OF THE SANTA TERESA RFID E-SCREENING DEMONSTRATION PILOT AND RELATED RECOMMENDATIONS

Two categories of limitations are outlined below. The first involves operational limitations within the limited Santa Teresa deployment context. These are limitations which can be addressed with relatively minor modifications to the existing e-screening software and interfaces with display devices at the Santa Teresa site, as described in section 4.1.1. Recommended enhancements are discussed in section 4.1.2.

Other limitations involve factors which limit the e-screening system's portability/applicability as a full-service e-screening solution, suitable for implementation/use at a broad range of Northern and Southern state and FMCSA inspection sites. These are described in section 4.1.3. Section 4.1.4 describes the proposed high-level requirements to modify the software and interface it with centralized databases to address this larger set of limitations.

4.1.1 Operational Limitations of the Deployment Within the Limited Santa Teresa Deployment Context

Operational limitations of the deployment test as related to the limited Santa Teresa operating environment fall into three basic categories:

- On-site enrollment and manual update of the enrollment process.
- Need for display of screening results outside of the port office, where inspectors are stationed.
- Routine update of the enrollment database from centralized sources, where available.

Each of these factors is described in more detail below.

On-Site Enrollment/Manual Update of Enrollment Database

The Santa Teresa facility is a relatively-low-volume facility, with daily trip volumes averaging 120–140 truck trips. The facility is typically staffed with three to four FMCSA inspectors and an FMCSA inspector supervisor, and one or two MTD officers. The same trucks, operating on a drayage basis, often travel through the facility several times a day. Queues are typically very short, on the order of two to three trucks. Often, there will be 2–3, even 5–10, minutes between trucks, and in these circumstances, there is no queue at all.

Even within this low-volume operational context, the on-site enrollment process is undesirable as a long-term solution. The 20–30 minutes required to enroll a driver and truck takes officers away from hands-on enforcement activities. That said, within the Santa Teresa operational context, on-site enrollment, if phased in over several weeks and confined to a limited-duration operational test, can be accommodated without significant adverse effects to enforcement operations.

However, the manual update process as currently available is too cumbersome and needs to be improved, even for a limited 6–12-month continuation of the demonstration. Because the system was originally designed as a limited-duration six-week pilot, the screening software was not designed to accommodate routine updates to the enrollment database. Currently, officers must search through a list of transponder numbers to select the record they wish to modify, or key in the transponder ID number. This requires the officer to read the transponder with a handheld reader, bring the handheld inside and search for the corresponding number in the database (all the while holding down the display key on the handheld), or write the transponder ID number down outside, as the transponder ID is not on any of the vehicle/driver paperwork. It is a cumbersome process which serves to discourage update of enrollment records. Search capabilities are required to enable officers to key in a plate or CDL number to access the enrollment record they wish to update.

Display of Screening Results Outside the Port Office

For maximum efficiency, officers need to be stationed outside the port office. Typically, officers at Santa Teresa are inside only when they are using their computers to complete inquiries to centralized databases on a vehicle already pulled out of the queue for inspection or compliance check, or when they are data-entering an inspection report to ASPEN. Otherwise, they are outside, inspecting trucks, watching the queue, talking with drivers (as part of the inspection selection decision process), performing quick walk-arounds of trucks at the front of the queue, etc.

For the initial six-week demonstration project, budget and time limitations prevented interface with a dynamic message sign (DMS) or red light/green light system to notify officers who were outside of the screening decision. While assigning one officer to monitor the ROC and to relay screening decisions to another officer outside via walkie-talkie was acceptable for a six-week proof-of-concept demonstration, it is certainly not a model that is feasible for even a limited 6–12-month extension of the demonstration. The productivity savings made possible by the e-screening system are offset by the need to assign an officer to monitor the screen.

Need for Routine Update of the Enrollment Database from Centralized Sources

The transaction statistics examined in section 3 clearly point up the limitations of manual, on-site enrollments to the screening database. While making the update process easier for officers to perform will help to ensure currency of data, it is preferable that, where data are accessible from centralized sources, the e-screening system be interfaced with these data sources to enable routine, automated update of these screening criteria.

4.1.2 Proposed Enhancements to the Santa Teresa Operational Deployment to Meet Short-Term Needs of a 6–12-Month Continued Deployment

Implementation of the enhancements described below would provide greater value to MTD and FMCSA enforcement staff working out of the Santa Teresa facility, and would provide greater utility for carriers participating in the project:

- The screening software should be modified to provide search capabilities to enable officers to easily locate a specific record for update. Search capabilities should include:
 - Ability to search by USDOT number (officer keys in USDOT number, system displays list of plates associated with that number; officer selects desired plate, system presents editable enrollment record).
 - Ability to search by carrier name (officer keys in first few letters of carrier name, system displays list of carrier names; officer selects desired carrier name, system displays list of plates associated with that USDOT number; officer selects desired plate, system presents editable enrollment record).
 - Ability to search by plate (officer keys in plate number; system presents editable enrollment record).
- DMS should be installed at Santa Teresa and interfaced with the e-screening system. The DMS should display the screening results. The display could be simply red light/green light, could be used to direct the driver to park if the decision is a “fail,” or could be used to relay specific coded messages to the officers outside (indicating the nature of the “fail” decision, for example). Specifics of the message set would be defined through discussions with MTD and FMCSA port staff.
- The e-screening system should be interfaced with handheld devices, enabling officers to view detailed screening results on the handhelds, update enrollment records from the handhelds, and make additional queries from the handhelds.
 - Handhelds are not in frequent use at Santa Teresa at present, as site communication capabilities are such that the devices are frequently dropped from the signal. Communications capabilities may need to be modified/enhanced to support use of handhelds at the site.
- The e-screening system should be interfaced with centralized databases, which are the authoritative source for key screening criteria. Looking out 6–12 months, these interfaces could include the following:
 - Interface to CVIEW/SAFER for routine update of the Federal operating authority and insurance information. (The e-screening database is already interfaced with a CVIEW for weekly refresh of the Federal operating authority status, but these updates should be nightly or more frequent. The e-screening system should be modified to enable update of the insurance data through CVIEW/SAFER nightly. Note: License and insurance (L&I) does not include insurance information on 24- or 48-hour policies, so this enhancement will not address issues related to short-term insurance policies)

- Interface with MCMIS for routine update of the date of issue for the latest CVSA decal (or web service interface with the query central (QC) query to MCMIS for CVSA decal issue date)
- Interface with LIFIS for routine update of the Mexican CDL status, class and MX-only restriction (or web service interface with the QC query to LIFIS)

At present, there does not appear to be a centralized data source accessible to FMCSA which can be used for updates of the Mexican vehicle registration data.

4.1.3 Known Limitations of the Operational Concept for “Full-Service” E-Screening Solutions

Operational limitations of the deployment test as related to its applicability for a “full-service” e-screening solution can be categorized as follows:

- On-site enrollment and manual update of the enrollment process.
- Need for display of screening results outside the port office, where inspectors are stationed.
- Data currency.
- Trailer identification and verification of the currency of the trailer’s CVSA decal.
- Driver identification and verification.

Each of these factors is described in more detail below.

On-site Enrollment/Manual Update of Enrollment Database

On-site enrollment is time-consuming, a fact which potentially limits wide deployment, particularly when considering application in large, high-volume facilities. Whereas Santa Teresa sees 120–140 trucks trips on a daily basis, facilities such as Nogales, Otay Mesa, El Paso, and Laredo see 1,000–1,500 trips daily. Enrollment of 1,500 trucks would require more than 4.5 man-months to complete. On-site enrollment is not feasible at these high-volume sites.

Nor is manual update of an enrollment database feasible in a high-volume environment. High-volume locations are processing vehicles in multiple lanes every few seconds. Officers simply do not have sufficient time to examine the paperwork of a truck in the lane and to update enrollment data via a handheld before looking at the next truck in the queue, without significant adverse impact on overall processing time.

Display of Screening Results Outside the Port Office

For maximum efficiency, officers at any facility need to be stationed outside the port office when they are processing vehicles through the queue. Display of the screening decision at each lane would be required for a full-service solution.

Data Currency

Because of the added complexity/operational limitations associated with manual on-site updates of an enrollment database at a high-volume facility, routine update of the screening database from centralized sources to ensure data currency becomes even more important for a “full-service” solution.

Trailer Identification and Verification of the Currency of the Trailer’s CVSA Decal

At Southern border locations, both the truck and the trailer are required to display current CVSA decals. In all commercial vehicle (CV) operations, but particularly in drayage operations which are very common on the Southern border, the trailer is not “tied” to the truck. Each time a power unit comes through a Southern land port, it may be hauling a different trailer. Trailers are not equipped with separate RFID tags. Within the current Santa Teresa demonstration project parameters, there is no way to electronically identify the trailer, and as a result, no way to electronically verify the currency of the trailer’s CVSA decal.

Driver Identification and Verification

Driver identification/verification is not fully addressed by the initial Santa Teresa operational concept. Drivers of carriers participating in the FAST program tend to have driver ID cards. Only a small percentage of drivers participating only in the user fee transponder program (at least among carriers enrolled in the Santa Teresa demonstration project) had CBP-issued driver ID cards.

The read rate for windshield-mounted RFID tags exceeds 99 percent. The read rate for driver ID tags is variable, based on how a particular driver is physically holding the card and the angle at which he/she presents it to the reader.

Provision for Interface to Other Devices at State/FMCSA Border Facilities

A full-service e-screening system would need to accommodate results of “reads” from other screening devices already in use at a variety of border crossing facilities. These might include weigh-in-motion devices; radiation detection systems; infrared scanners used in brake-system-problem detection; and optical character recognition devices (OCRs) used to read plates and USDOT numbers to assist in the identification of non-transponder-equipped trucks and others.

4.1.4 Proposed Enhancements to the Santa Teresa Operational Concept to Address “Full-Service” E-Screening Needs

The Santa Teresa Project Team has identified a variety of potential means to address the limitations of the Phase I demonstration operational concept as outlined below. Central to these solutions is the potential to access/interface with the subset of the ITDS data set currently being shared by CBP with FMCSA.

Section 343(a) of the Trade Act of 2002 and subsequent implementing regulations require motor carriers and other eligible parties to file an electronic manifest with CBP prior to entering the United States through land ports. This requirement is being implemented in phases by groups of ports. To date, the requirement has been enacted for vehicles entering the United States through land ports in Washington, Arizona, California, Texas, and New Mexico, and some ports in North

Dakota. Effective May 24, 2007, CVs entering through land ports in Michigan and New York were required to file e-manifests prior to crossing into the United States. Remaining land ports in North Dakota and other Northern Border States are being phased in according to a schedule to be developed by CBP.

The e-manifest is filed via the CBP ACE Truck Manifest System at least 24 hours before a trip. Data from the manifest are “packaged” by CBP’s ITDS and electronically transmitted to each of the Federal government agencies which require documentation for clearing or licensing cargo. Packets of data are sent to FMCSA, the Department of Agriculture, and 20-odd other Federal agencies for electronic verification. The packets transmitted to each agency include only the data elements from the e-manifest for which that agency is the authoritative source, and/or data which the agency requires to meet or implement a statutory requirement of the agency. Each agency electronically verifies the data for which it is the authoritative source, flags data where there is an issue, and transmits the data packet back to CBP.

FMCSA receives a data packet related to truck, trailer, and driver from each e-manifest filed. FMCSA electronically verifies the data transmitted, and then transmits the verified data set (with check flags to indicate potential compliance issues) back to CBP.

The Santa Teresa Project Team has identified a need to interface the subset of ITDS data verified by FMCSA with e-screening systems at Southern and Northern state IBCs. Access to the ITDS data subset would address many of the limitations described above in Section 4.1.3, including the following:

On-Site Enrollment

Interface with the ITDS data set would eliminate the need for on-site enrollment. The RFID tag number on the power unit is linked via the ITDS data set to key vehicle/carrier identifiers such as VIN, plate number, and carrier USDOT number. Access to these identifiers provides the “keys” required to access attribute information in centralized Federal (and state) systems to electronically establish and verify the information currently established/verified via the enrollment process, including:

- Date of issue of CVSA decal associated with power unit (available via MCMIS).
- Insurance status/coverage (available via L&I).
- Carrier Federal operating authority status (available via MCMIS/SAFER).
- Carrier OOS status (available via MCMIS/SAFER).
- Carrier safety status (available via MCMIS/SAFER).
- CDL status and endorsements (available via LIFIS).
- Date of issue of CVSA decal associated with trailer (available via MCMIS).

Two of the e-screening criteria included in the current Santa Teresa e-screening algorithm—insurance status/coverage, and vehicle registration status—are not fully addressed by this proposed model. Limited-duration insurance coverage information (policies in effect for only 24

or 48 hours) is not included in the L&I database. Mexican vehicle registration status is not currently interfaced with Federal or state systems.

Trailer Identification and Verification of the Currency of the Trailer's CVSA Decal and Driver Identification/Verification

The ITDS data set ties the power unit, trailer, and driver together on a per-trip basis. If the power unit can be identified via the RFID tag, the driver and trailer can be identified and screened electronically, even in the absence of driver and trailer RFID tags. One of the CBP verification steps is to ensure that the driver, power unit, and trailer are the same entities as those shown on the e-manifest. If any of the three is different, CBP notes that difference in the “arrival data set” and transmits that arrival data set back to FMCSA. By linking the e-screening system to the arrival data set information, state and FMCSA inspectors can be assured that when the driver, trailer, and power unit reach the secondary facility, the three entities in front of them are the same three entities linked in the ITDS data set.

Data Currency

The QC web service queries developed by FMCSA for ITDS data set verification perform queries to the authoritative source (MCMIS, L&I, LIFIS, etc.) to verify the following criteria:

- Date of issue of the CVSA decal associated with power unit (available via MCMIS).
- Insurance status/coverage (available via L&I).
- Carrier Federal operating authority status (available via MCMIS/SAFER).
- Carrier OOS status (available via MCMIS/SAFER).
- Carrier safety status (available via MCMIS/SAFER).
- CDL status and endorsements (available via LIFIS).

The e-screening system could be interfaced with these web service query capabilities and reformat the response to the “pass/fail” type of response that the system currently provides, ensuring data currency in screening decisions.

Currency of the CVSA decal associated with the trailer can be addressed by developing an additional web service query similar to the query for power unit CVSA decal information.

Two of the requirements—insurance status/coverage and vehicle registration status—require further investigation to identify a universal/reliable means of electronic update. Limited-duration insurance coverage information (policies in effect for only 24 or 48 hours) is not included in the L&I database. Mexican vehicle registration status is not currently interfaced with Federal or state systems.

Other limitations could be addressed in ways similar to those proposed for the Santa Teresa limited-duration extension.

Display of Screening Results Outside the Port Office/Provision for Interface with Other Devices

- The e-screening system would require an interface with DMS in each lane where the system is installed. The DMS should display the screening results. The display could be simply red light/green light, could be used to direct the driver to park if the decision is a “fail,” or could be used to relay specific coded messages to the officers outside (indicating the nature of the “fail” decision, for example).
- The e-screening system should be interfaced with handheld devices, enabling officers to view detailed screening results on the handhelds, and to make additional queries from the handhelds.
- Any subsequent design/development efforts should make provision for interface with other screening devices in use/widely contemplated for use in Southern and Northern border-crossing environments.

**APPENDIX A—DAILY E-SCREENING SYSTEM
TRANSACTION STATISTICS
MARCH 5—MAY 12, 2007**

VEHICLE/DRIVER TRANSPONDERS READ: MARCH 5—MARCH 17, 2007

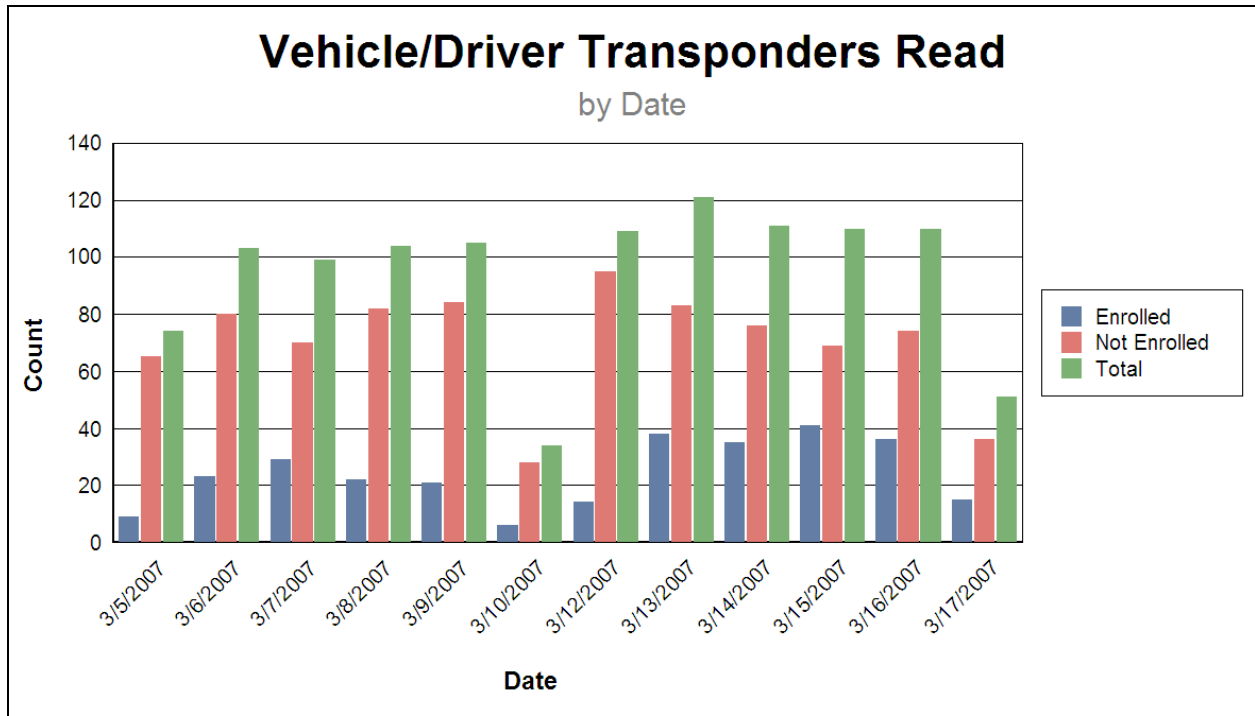


Figure 5. Transponders Read 3/05–3/17—Bar Graph

Table 7. Transponders Read 3/05–3/07—Data Table

Enrollment Status	3/5/2007	3/6/2007	3/7/2007	3/8/2007	3/9/2007	3/10/2007	3/12/2007	3/13/2007	3/14/2007	3/15/2007	3/16/2007	3/17/2007	Total for Period
Enrolled	9	23	29	22	21	6	14	38	35	41	36	15	289
Not Enrolled	65	80	70	82	84	28	95	83	76	69	74	36	842
Total	74	103	99	104	105	34	109	121	111	110	110	51	1,131

VEHICLE/DRIVER TRANSPONDERS READ: MARCH 19–MARCH 31, 2007

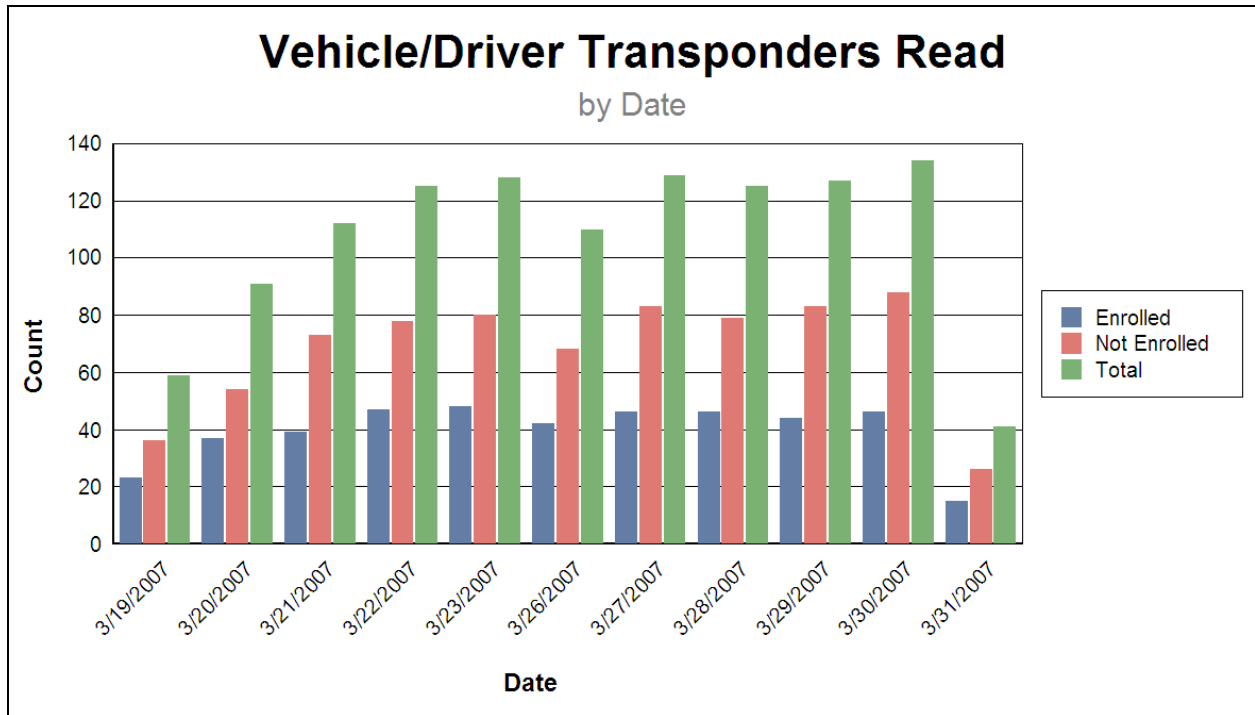


Figure 6. Transponders Read 3/19–3/31—Bar Graph

Table 8. Transponders Read 3/19–3/31—Data Table

Enrollment Status	3/19/2007	3/20/2007	3/21/2007	3/22/2007	3/23/2007	3/26/2007	3/27/2007	3/28/2007	3/29/2007	3/30/2007	3/31/2007	Total for Period
Enrolled	23	37	39	47	48	42	46	46	44	46	15	433
Not Enrolled	36	54	73	78	80	68	83	79	83	88	26	748
Total	59	91	112	125	128	110	129	125	127	124	41	1,181

VEHICLE/DRIVER TRANSPONDERS READ: APRIL 2–APRIL 14, 2007

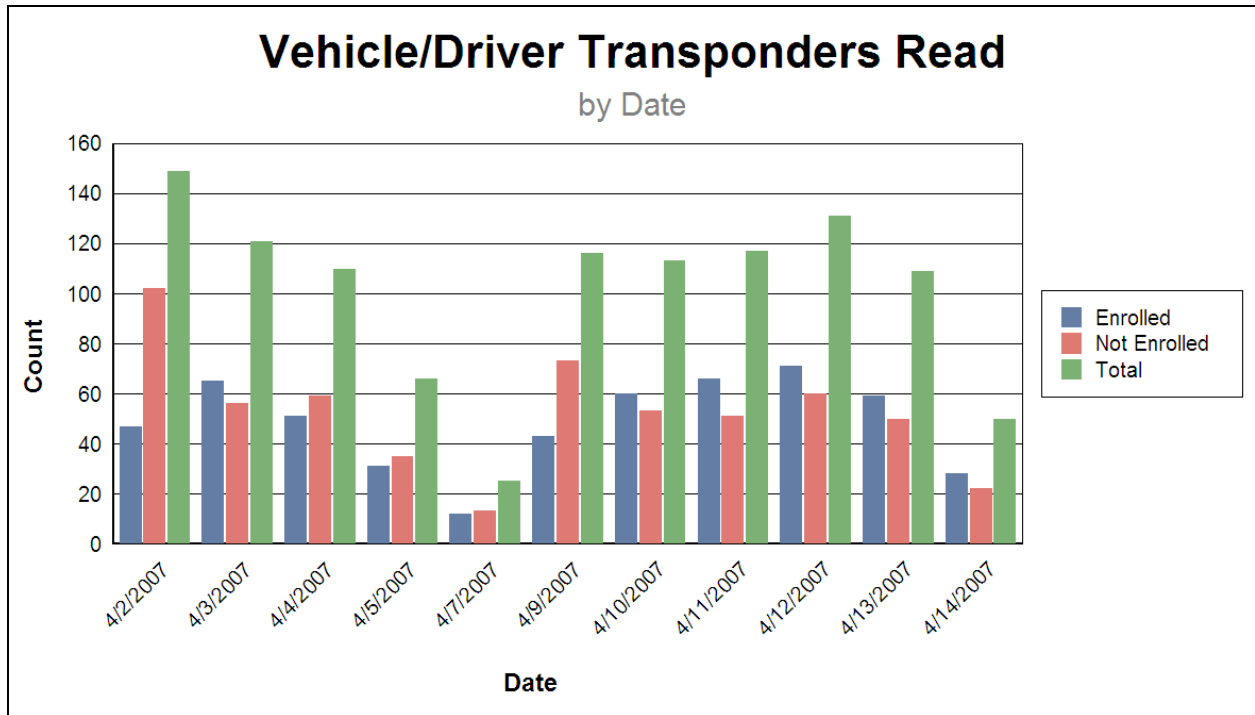


Figure 7. Transponders Read 4/02–4/14—Bar Graph

Table 9. Transponders Read 4/02–4/14—Data Table

Enrollment Status	4/2/2007	4/3/2007	4/4/2007	4/5/2007	4/7/2007	4/9/2007	4/10/2007	4/11/2007	4/12/2007	4/13/2007	4/14/2007	Total for Period
Enrolled	47	65	51	31	12	43	60	66	71	59	28	533
Not Enrolled	102	56	59	35	13	73	53	51	60	50	22	574
Total	149	121	110	66	25	116	113	117	131	109	50	1,107

VEHICLE/DRIVER TRANSPONDERS READ: APRIL 16–APRIL 28, 2007

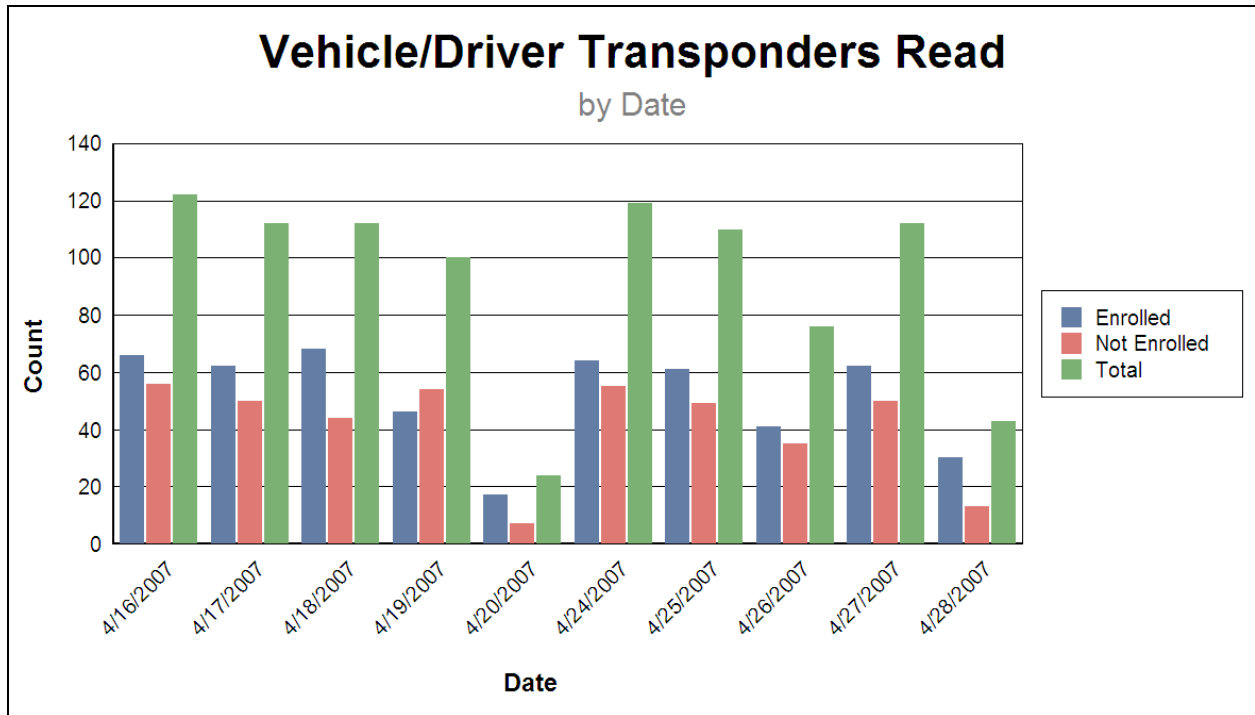


Figure 8. Transponders Read 4/16–4/28—Bar Graph

Table 10. Transponders Read 4/16–4/28—Data Table

Enrollment Status	4/16/2007	4/17/2007	4/18/2007	4/19/2007	4/20/2007	4/24/2007	4/25/2007	4/26/2007	4/27/2007	4/28/2007	Total for Period
Enrolled	66	62	68	46	17	64	61	41	62	30	517
Not Enrolled	56	50	44	54	7	55	49	35	50	13	413
Total	122	112	112	100	24	119	110	76	112	43	930

VEHICLE/DRIVER TRANSPONDERS READ: APRIL 30–MAY 12, 2007

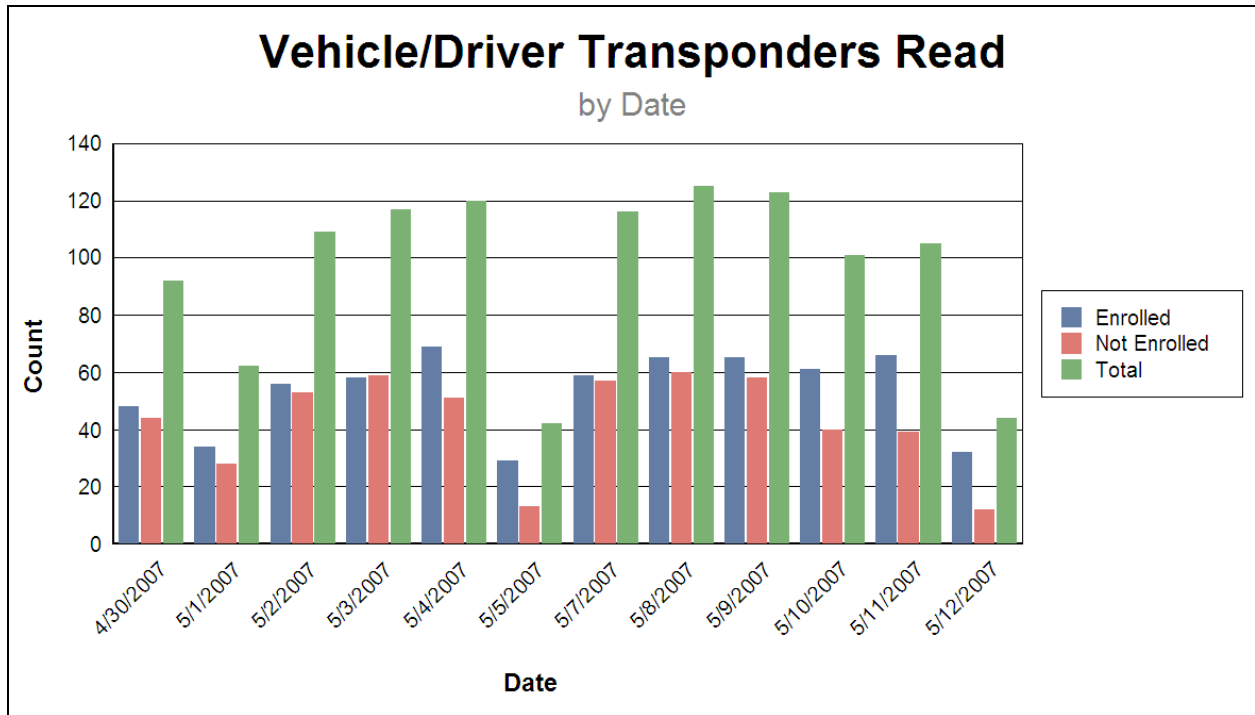


Figure 9. Transponders Read 4/30–5/12—Bar Graph

Table 11. Transponders Read 4/30–5/12—Data Table

Enrollment Status	4/30/2007	5/1/2007	5/2/2007	5/3/2007	5/4/2007	5/5/2007	5/7/2007	5/8/2007	5/9/2007	5/10/2007	5/11/2007	5/12/2007	Total for Period
Enrolled	48	34	56	58	69	29	59	65	65	61	66	32	642
Not Enrolled	44	28	53	59	51	13	57	60	58	40	39	12	514
Total	92	62	109	117	120	42	116	125	123	101	105	44	1,156

TRANSPONDER SCREENING RESULTS MARCH 5–MARCH 17, 2007

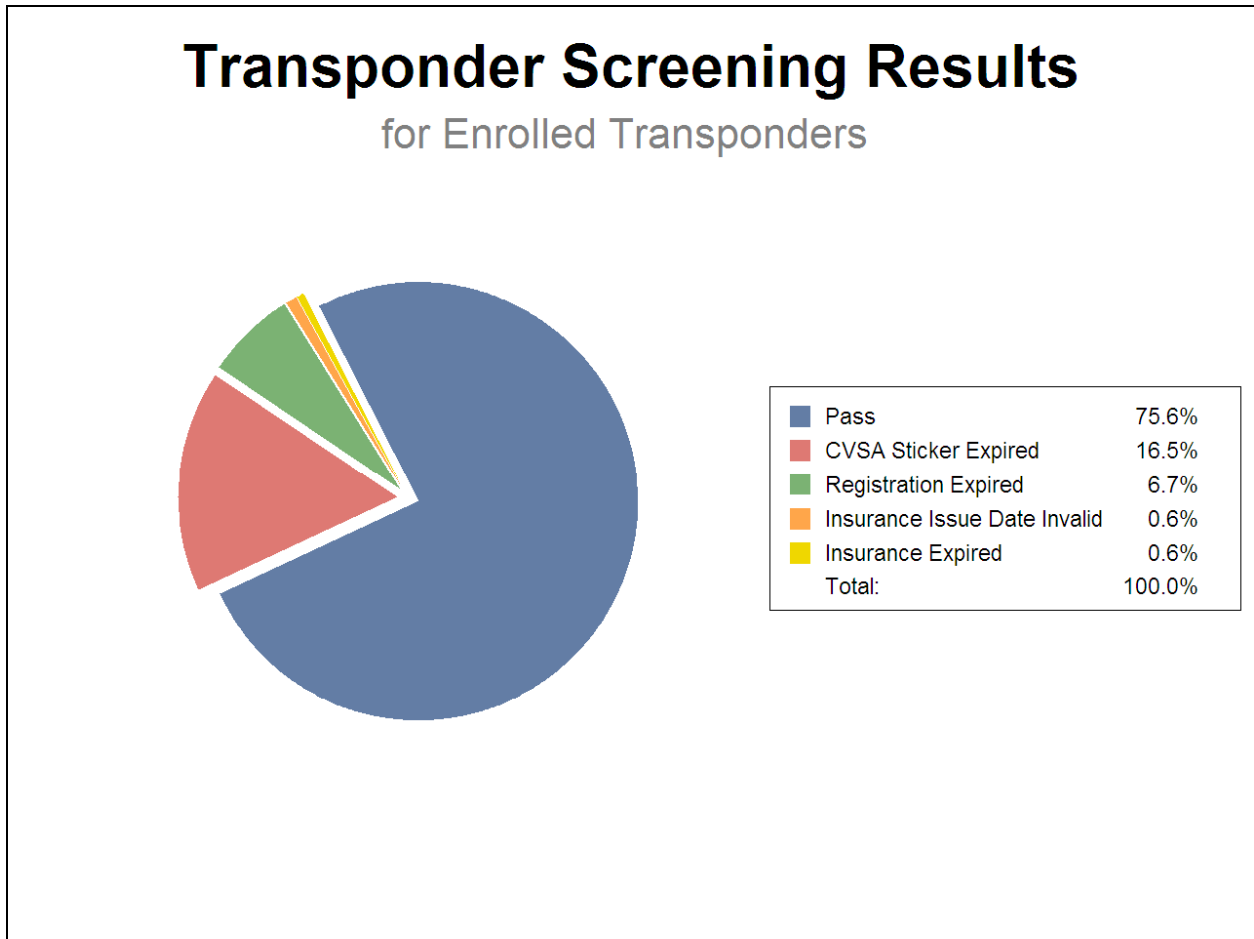


Figure 10. Transponder Screening Results 3/05–3/17—Pie Chart

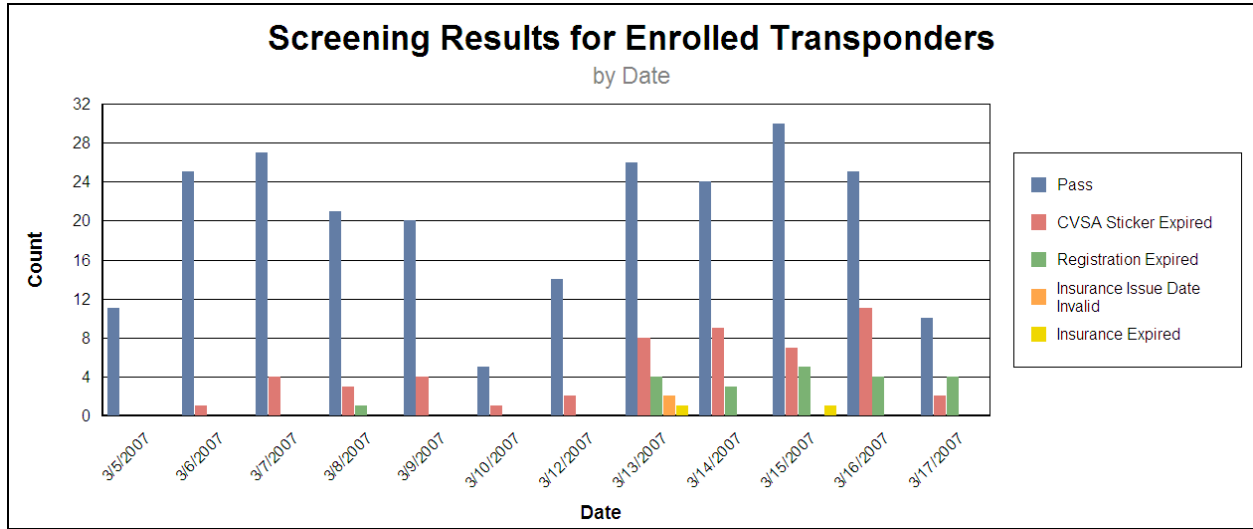


Figure 11. Transponder Screening Results 3/05–3/17—Bar Graph

Table 12. Transponder Screening Results 3/05–3/17—Data Table

Result	3/5/2007	3/6/2007	3/7/2007	3/8/2007	3/9/2007	3/10/2007	3/12/2007	3/13/2007	3/14/2007	3/15/2007	3/16/2007	3/17/2007	Total for Period
Pass	11	25	27	21	20	5	14	26	24	30	25	10	238
CVSA Sticker Expired	0	1	4	3	4	1	2	8	9	7	11	2	52
Registration Expired	0	0	0	1	0	0	0	4	3	5	4	4	21
Insurance Issue Date Invalid	0	0	0	0	0	0	0	2	0	0	0	0	2
Insurance Expired	0	0	0	0	0	0	0	1	0	1	0	0	2
Total	11	26	31	25	24	6	16	41	36	43	40	16	315

TRANSPONDER SCREENING RESULTS MARCH 19–MARCH 31, 2007

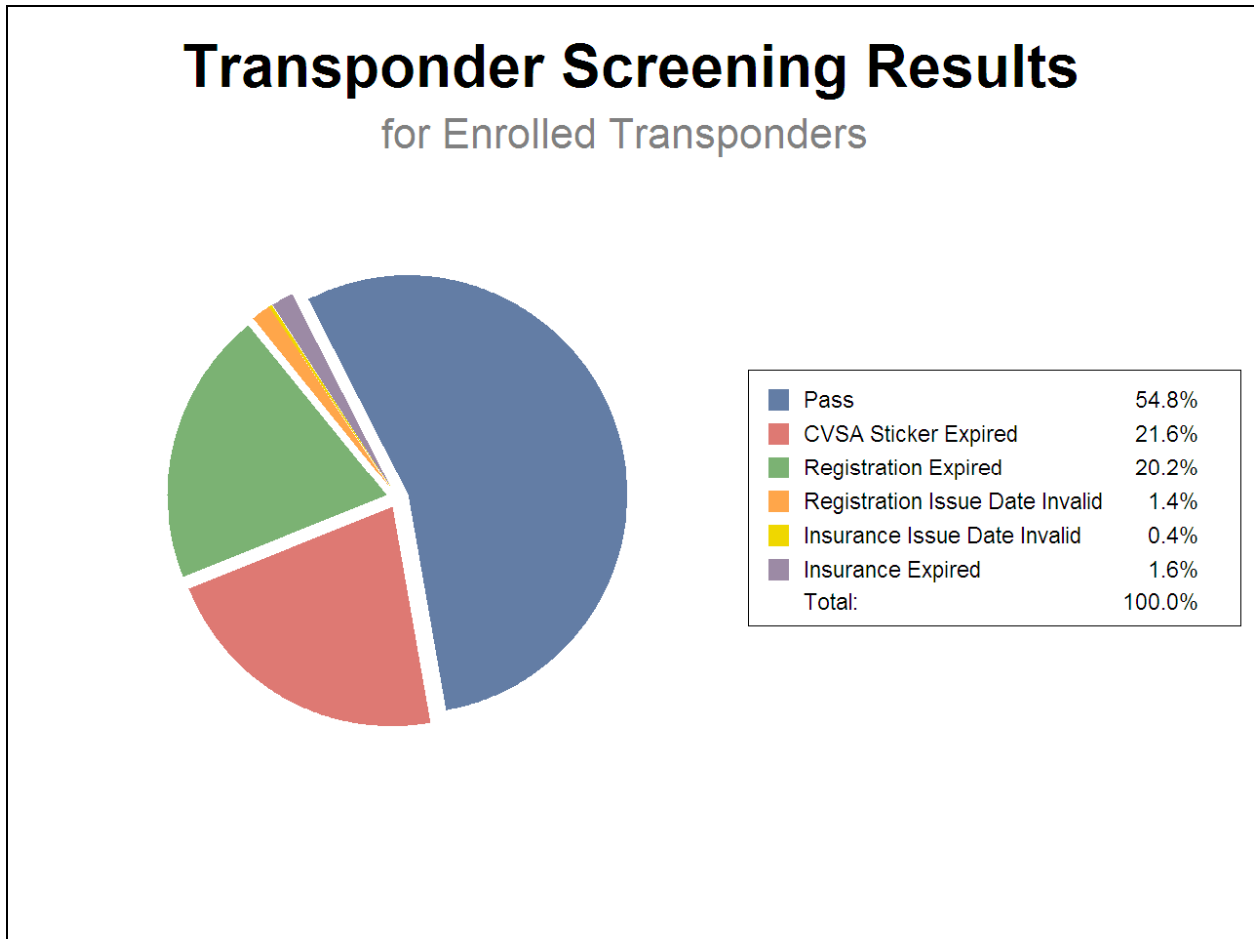


Figure 12. Transponder Screening Results 3/19–3/31—Pie Chart

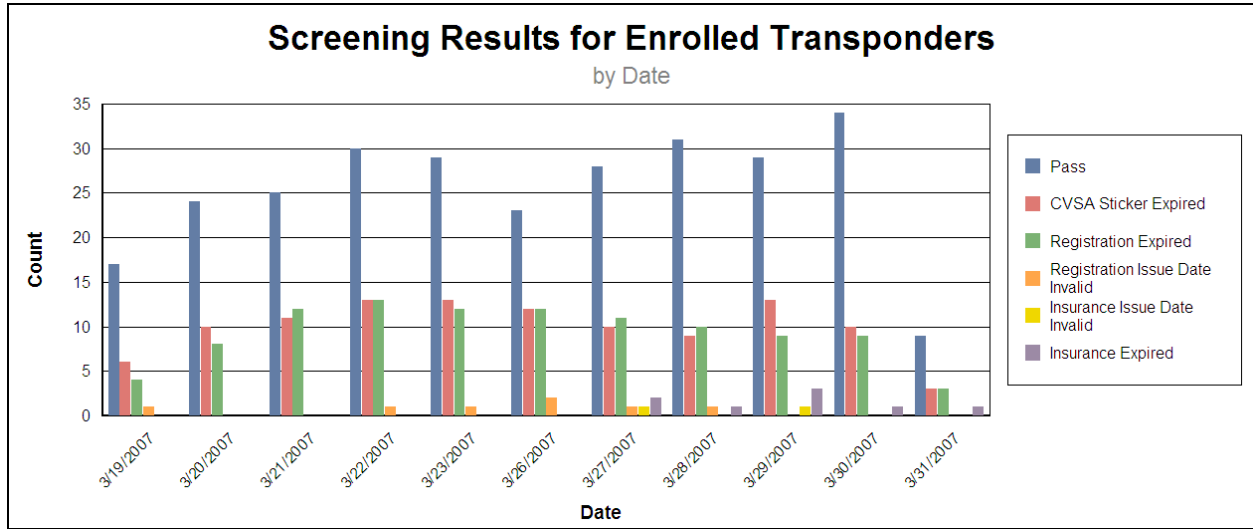


Figure 13. Transponder Screening Results 3/19–3/31—Bar Graph

Table 13. Transponder Screening Results 3/19–3/31—Data Table

Result	3/19/2007	3/20/2007	3/21/2007	3/22/2007	3/23/2007	3/26/2007	3/27/2007	3/28/2007	3/29/2007	3/30/2007	3/31/2007	Total for Period
Pass	17	24	25	30	29	23	28	31	29	34	9	279
CVSA Sticker Expired	6	10	11	13	13	12	10	9	13	10	3	110
Registration Expired	4	8	12	13	12	12	11	10	9	9	3	103
Insurance Issue Date Invalid	1	0	0	1	1	2	1	1	0	0	0	7
Insurance Expired	0	0	0	0	0	0	2	1	3	1	1	8
Total	28	42	48	57	55	49	53	52	55	54	16	509

TRANSPONDER SCREENING RESULTS APRIL 2–APRIL 14, 2007

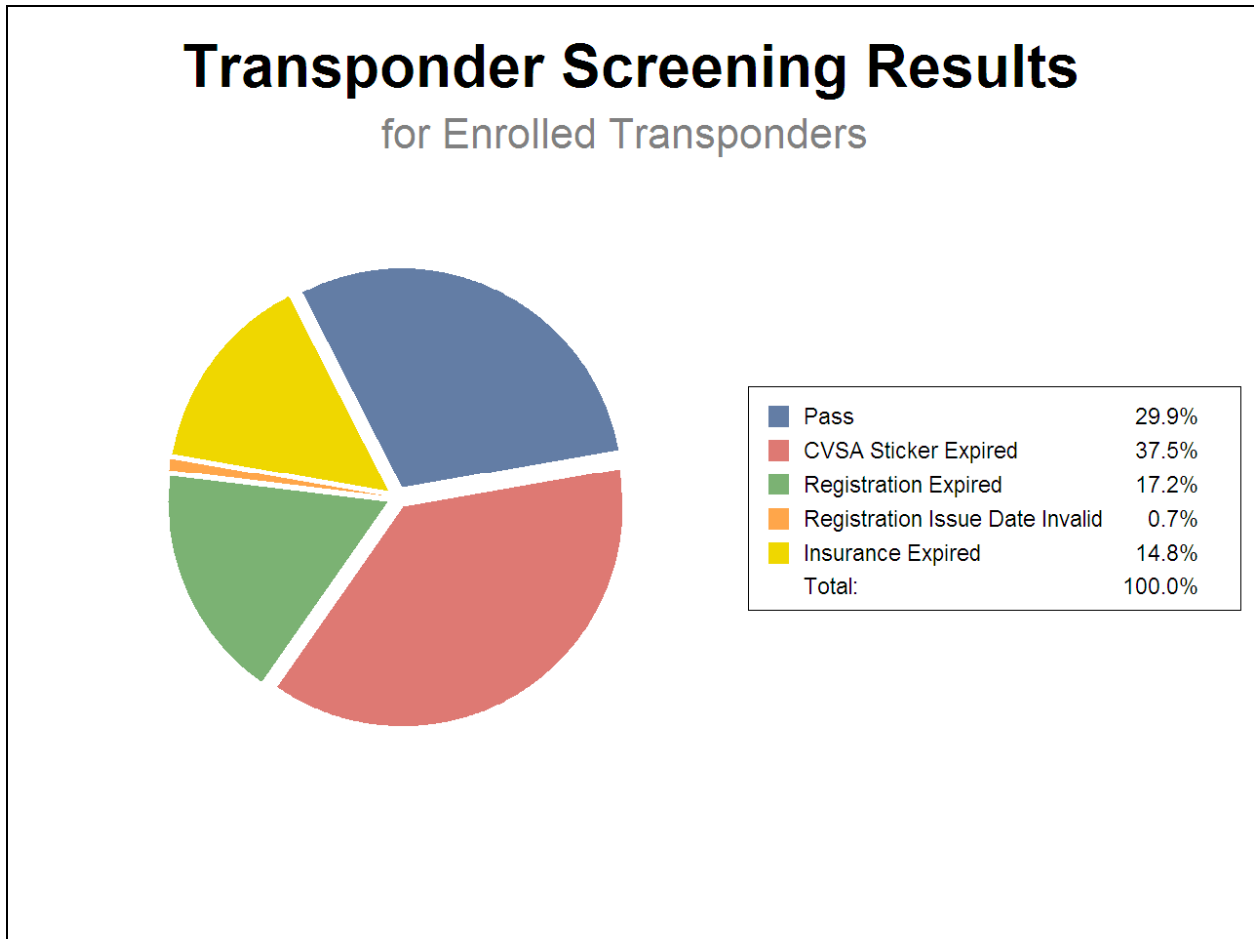


Figure 14. Transponder Screening Results 4/02–4/14—Pie Chart

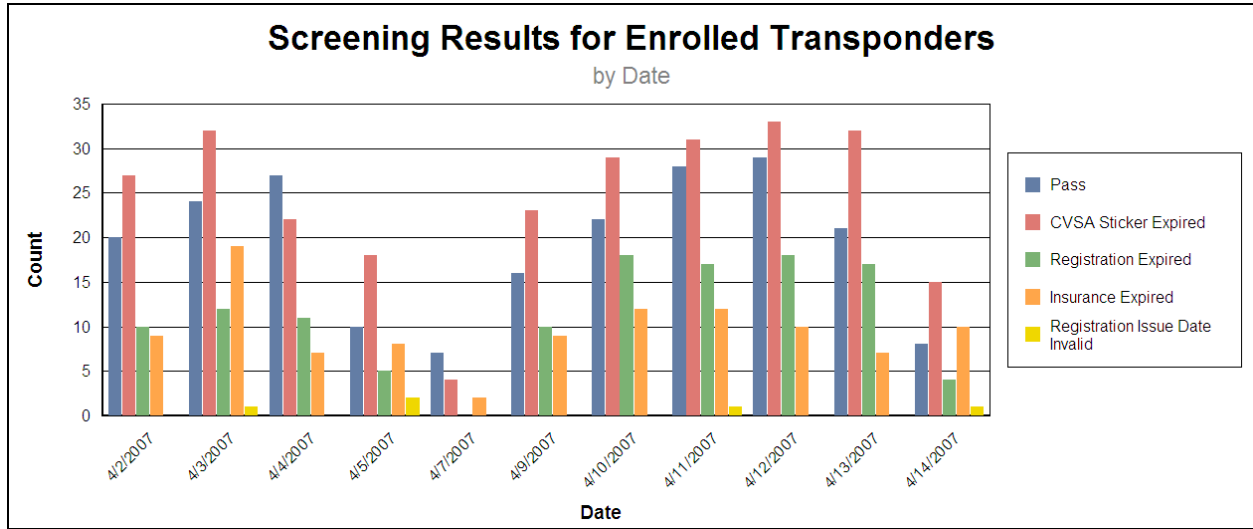


Figure 15. Transponder Screening Results 4/02–4/14—Bar Graph

Table 14. Transponder Screening Results 4/02–4/14—Data Table

Result	4/2/2007	4/3/2007	4/4/2007	4/5/2007	4/7/2007	4/9/2007	4/10/2007	4/11/2007	4/12/2007	4/13/2007	4/14/2007	Total for Period
Pass	20	24	27	10	7	16	22	28	29	21	8	212
CVSA Sticker Expired	27	32	22	18	4	23	29	31	33	32	15	266
Registration Expired	10	12	11	5	0	10	18	17	18	17	4	122
Insurance Issue Date Invalid	0	1	0	2	0	0	0	1	0	0	1	5
Insurance Expired	9	19	7	8	2	9	12	12	10	7	10	105
Total	66	88	67	43	13	58	81	89	90	77	38	710

TRANSPONDER SCREENING RESULTS APRIL 16–APRIL 28, 2007

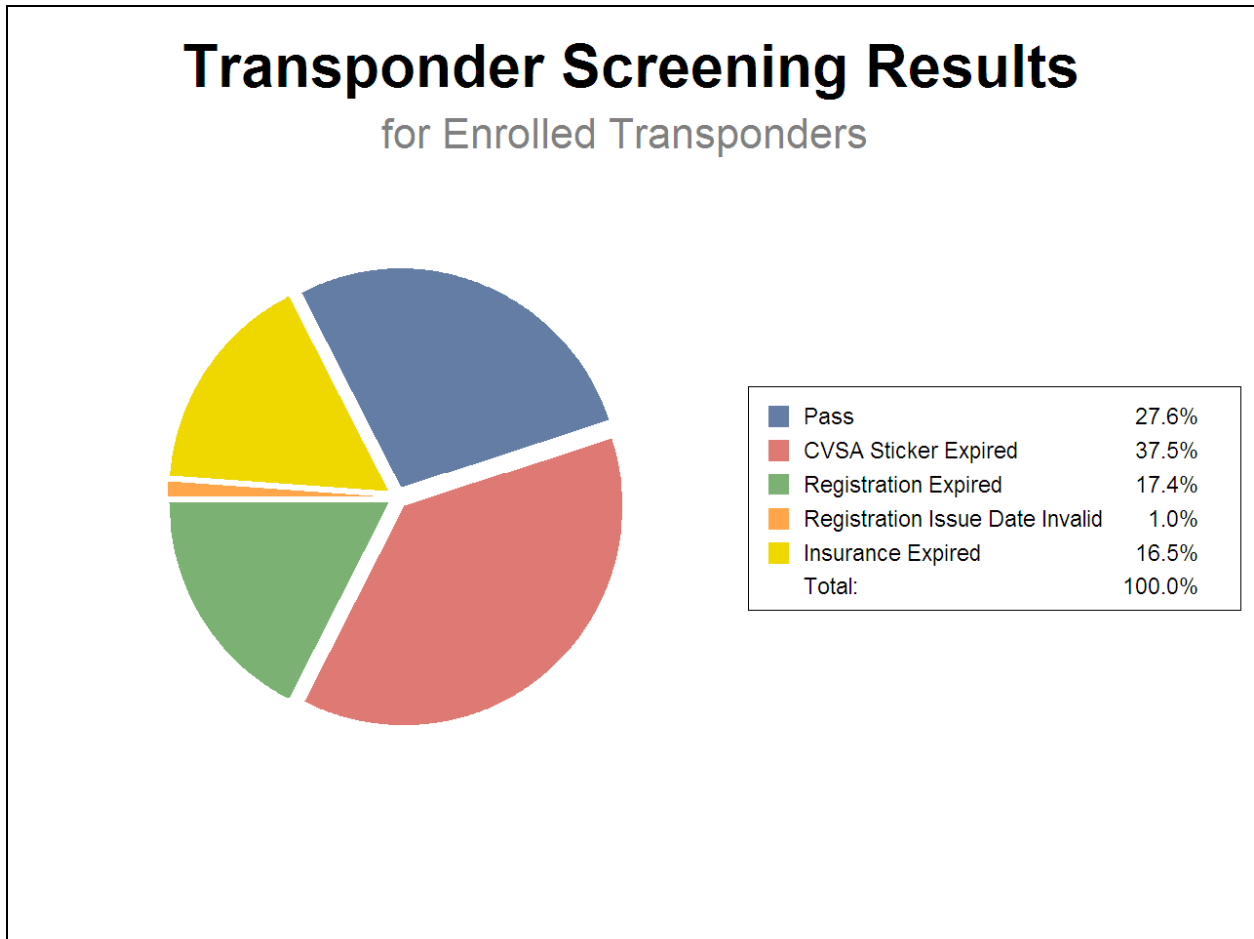


Figure 16. Transponder Screening Results 4/16–4/28—Pie Chart

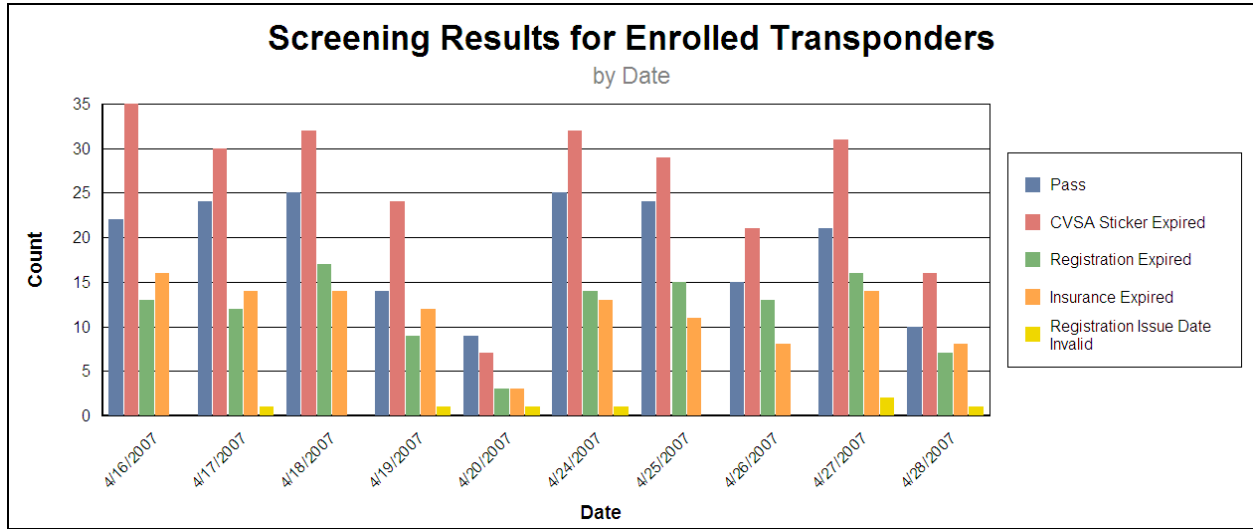


Figure 17. Transponder Screening Results 4/16–4/28—Bar Graph

Table 15. Transponder Screening Results 4/16–4/28—Data Table

Result	4/16/2007	4/17/2007	4/18/2007	4/19/2007	4/20/2007	4/24/2007	4/25/2007	4/26/2007	4/27/2007	4/28/2007	Total for Period
Pass	22	24	25	14	9	25	24	15	21	10	189
CVSA Sticker Expired	35	30	30	24	7	32	29	21	31	16	257
Registration Expired	13	12	17	9	3	14	15	13	16	7	119
Insurance Issue Date Invalid	0	1	0	1	1	1	0	0	2	1	7
Insurance Expired	16	14	14	13	9	13	11	8	12	8	113
Total	86	81	88	60	21	85	79	57	84	42	685

TRANSPONDER SCREENING RESULTS APRIL 30–MAY 12, 2007

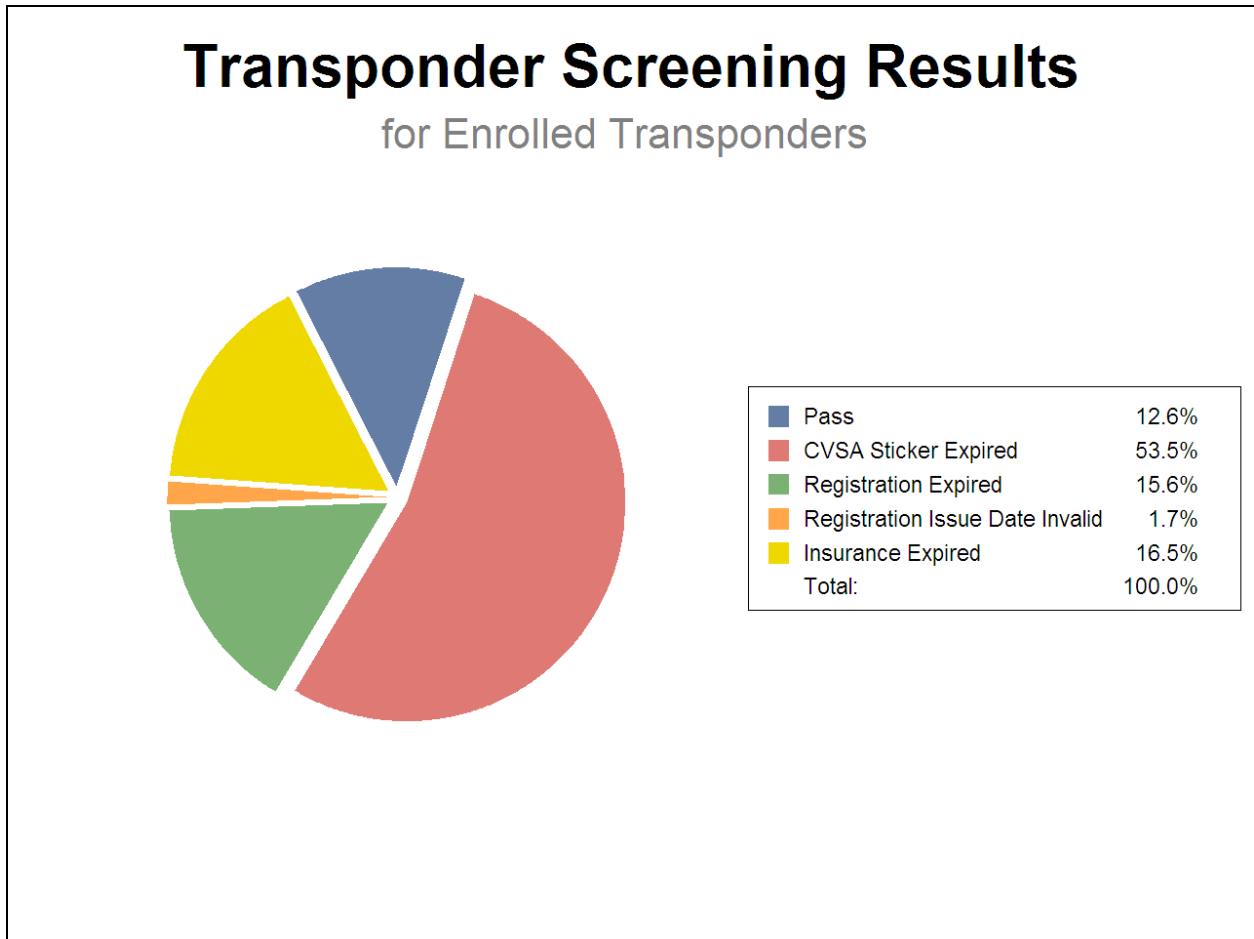


Figure 18. Transponder Screening Results 4/30–5/12—Pie Chart

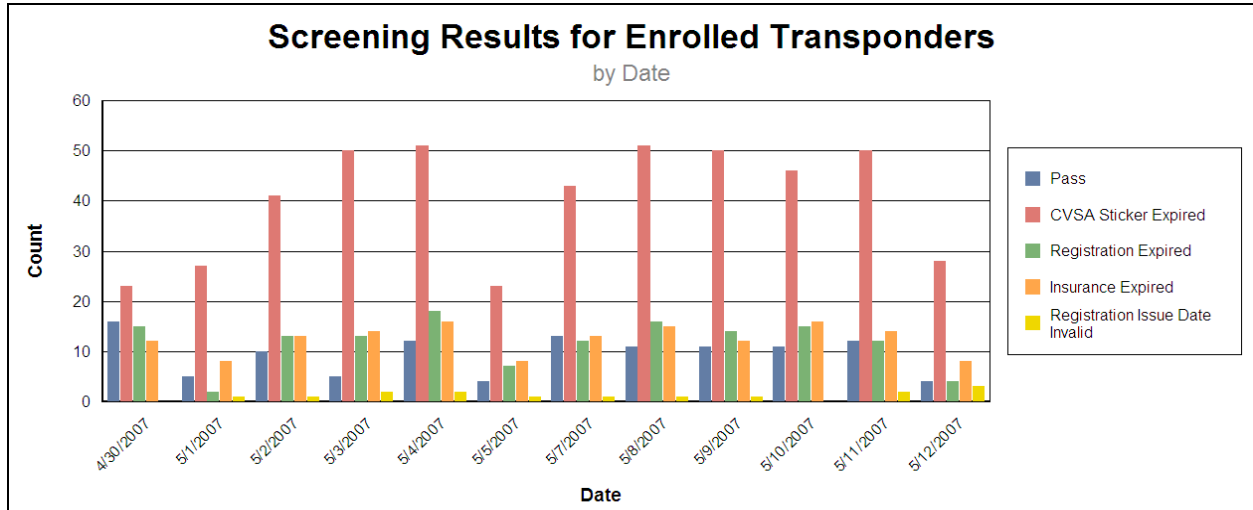


Figure 19. Transponder Screening Results 4/30–5/12—Bar Graph

Table 16. Transponder Screening Results 4/30–5/12—Data Table

Result	4/30/2007	5/1/2007	5/2/2007	5/3/2007	5/4/2007	5/5/2007	5/7/2007	5/8/2007	5/9/2007	5/10/2007	5/11/2007	5/12/2007	Total
Pass	16	5	10	5	12	4	13	11	11	11	12	4	114
CVSA Sticker Expired	23	27	41	50	51	23	43	51	50	46	50	28	483
Registration Expired	15	2	13	13	18	7	12	16	14	15	12	4	141
Registration Issue Date Invalid	0	1	1	2	2	1	1	1	1	0	2	3	15
Insurance Expired	12	8	13	14	16	8	13	15	12	16	14	8	149
Total	66	43	78	84	99	43	82	94	88	88	90	47	902

**APPENDIX B—SANTA TERESA CARRIER EVALUATION FORM
(COMPILATION OF BASELINE AND POST-DEMONSTRATION
TEST FORMS)**

Carrier Evaluation—Santa Teresa RFID E-Screening Project

The purpose of the carrier evaluation is to understand and characterize the types of operations participating in the Santa Teresa RFID E-Screening Project, the expectations of carriers participating in the pilot, and participating carriers’ perceptions of the project—how it impacted their operations, and suggestions for improvements, changes, and other factors to consider as the project moves into its next phase.

Responses from all participating carriers will be aggregated by UNM and Parker Young, the project’s Evaluation Team. Individual responses will not be shared with MTD, FMCSA, or any other entities outside of the Evaluation Team. Comments received from participating carriers will not be associated with individual carriers in any written reports, presentations, or other documents resulting from the project.

Date Completed:

Question		Response
General/Operational Questions		
1	Carrier name	
2	Carrier contact name	
3	Contact phone number	
4	Total number trucks operated by carrier	
5	Total number drivers employed by carrier	
6	Number trucks equipped with User Fee RFID tags	
7	Number trucks equipped with FAST RFID tags	
8	Number Drivers with CBP-issued driver ID tag	

Question		Response
9	Number trucks routinely crossing at Santa Teresa IBC (as opposed to BOTA Bridge or other IBC)	
10	Do you typically haul trailers owned/leased by your company, or trailers owned / leased by others?	
Baseline Evaluation		
11	Reasons why you use Santa Teresa rather than other crossing(s)?	
12	From your perspective, thinking about operations prior to implementation of the Santa Teresa RFID E-Screening Project, what works well in terms of vehicle processing at the <u>state</u> Santa Teresa Port?	
13	From your perspective, thinking about operations prior to implementation of the Santa Teresa RFID E-Screening Project, what does not work so well in terms of vehicle processing at the state Santa Teresa Port; what could be improved?	
14	Why did you choose to participate in the Santa Teresa RFID E-Screening Project?	
15	What benefit did you hope to see from your participation in the project?	

Question	Response
Post-implementation Evaluation	
16	What impact did implementation of the RFID E-Screening Project have on your operations?
17	Did it affect your decisions regarding use of the Santa Teresa crossing vs. another crossing?
18	Did you or your drivers notice any time savings related to project participation/the e-screening process?
19	Did you or your drivers feel as if your vehicles were stopped more frequently for inspection, stopped less frequently, or did you not notice a change?
20	In what ways did the RFID E-Screening Project meet your expectations?
21	In what ways did the project exceed your expectations?
22	In what ways did the project fall short of your expectations?
23	What suggestions do you have for improving the e-screening process as the project moves forward?
24	Any other input you would like to provide?
25	Any questions you have about the project?