VOLUME II: Appendices

Evaluation of the Commercial Vehicle Information Systems and Networks (CVISN) Model Deployment Initiative

U.S. Department of Transportation
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U.S. Department of Transportation
ITS Joint Program Office
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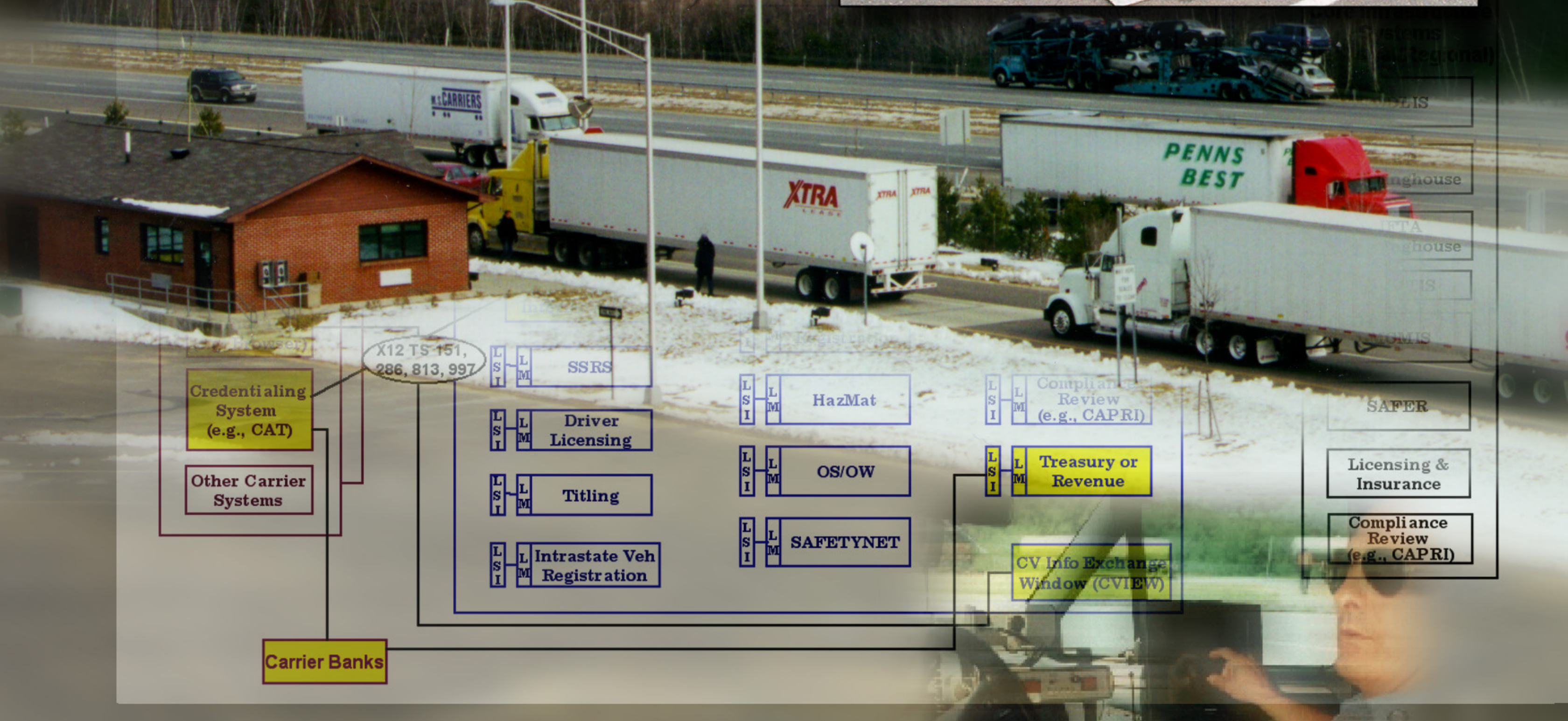

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EVALUATION OF THE COMMERCIAL VEHICLE INFORMATION SYSTEMS AND NETWORKS (CVISN) MODEL DEPLOYMENT INITIATIVE

Volume II. Appendices

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APPENDIX A.1: OREGON COMPLIANCE RATE AND INSPECTION SELECTION STUDIES

INTRODUCTION

Potential safety benefits associated with the deployment of CVISN technologies fall into two categories: direct effects and indirect effects. The direct effect of CVISN deployment is to improve the efficiency with which high-risk carriers are selected for inspection. Improved targeting of high-risk carriers will result in an increase in the number of vehicles that are found to be in violation of Federal Motor Carrier Safety Regulations (FMCSRs) and are put out of service as a consequence. Increasing the number of vehicles placed out of service will reduce the number of crashes involving large commercial motor vehicles, specifically reducing the number of such crashes where OOS conditions are a contributing factor. The indirect effect of CVISN deployment will be to increase the compliance rate of large commercial vehicles with FMCSR. An increased compliance rate means that there will be fewer vehicles on the road with OOS conditions, leading to fewer crashes.

The CVISN evaluation plan [1] required several studies to performed to collect data necessary for determining the effectiveness of CVISN deployment. Two of these studies were proposed for and conducted in Oregon. The first examined the effects of CVISN technologies on the rates of motor carrier compliance with the (FMCSRs). Specifically, the numbers of violations of Out-of-Service (OOS) criteria were measured across various inspection sites at different times to determine whether there were any decreases in the observed OOS rates over time. The second study examined the selection of vehicles for inspection, using data collected at the roadside to quantify how effectively roadside enforcement staff are able to target vehicles from carriers known to have high safety risks relative to the general population of carriers. Inspection effectiveness with and without CVISN technologies was compared. Data on truck counts, DOT and license plate numbers of the trucks, CVISN technologies available to inspection staff at each site, and other variables were analyzed.

These two studies are discussed in the sections that follow. The discussion includes background information about the studies, study designs, information on data collection methods, and results of the studies.

CVISN/GREEN LIGHT – COMPLIANCE RATE STUDY

Background

Oregon Green Light is an operational test of Intelligent Transportation Systems on Oregon’s highways. The purpose of the Green Light project is to develop and deploy advanced technology to improve the safety and efficiency of commercial vehicle operations, increase the performance of the highway system, and protect the public investment in infrastructure. The Oregon Green Light deployment focuses in large part on electronic screening. It is being carried out by the Oregon Department of Transportation and involves modernizing 21 Oregon weigh stations with a new system that allows safe and legal trucks equipped with transponders to be weighed and precleared past stations at highway speed. Oregon is one of the leaders in deploying Electronic Screening. At the time of the CVISN evaluation, for example, the state already had a contract with Oregon State University to perform an independent evaluation of the Green Light project at those stations where it was deployed.

The Oregon Green Light project involves installing weigh-in-motion (WIM) scales and pole-mounted automatic vehicle identification (AVI) readers that interface with computers capable of checking a truck's size, weight, and height, as well as the carrier's records related to vehicle registration, tax payments, and safety. This is all done in less than one second, at a distance of more than one mile before the weigh station. In addition, the project involves safety enhancements for truckers to use, such as advanced weather warning systems and downhill speed advisory systems.

The long-term success and impact of the project will be greatly affected by motor carrier enrollment, which has varied over time. Figure A.1-1 shows the history of enrollment in the Green Light project up through the time of the study. As of February 1999, at which time the compliance study was being conducted, about 3,000 trucks were enrolled in the Oregon Green Light project and had been issued transponders. After the study was performed, enrollment in the green Light project increased to 4,800 trucks by February 2000. Shortly after that time, the Oregon DOT eliminated the $45 annual fee, and enrollment increased to 12,000 by April 18, 2000, with 2,000 transponders distributed in the two weeks prior to that date.

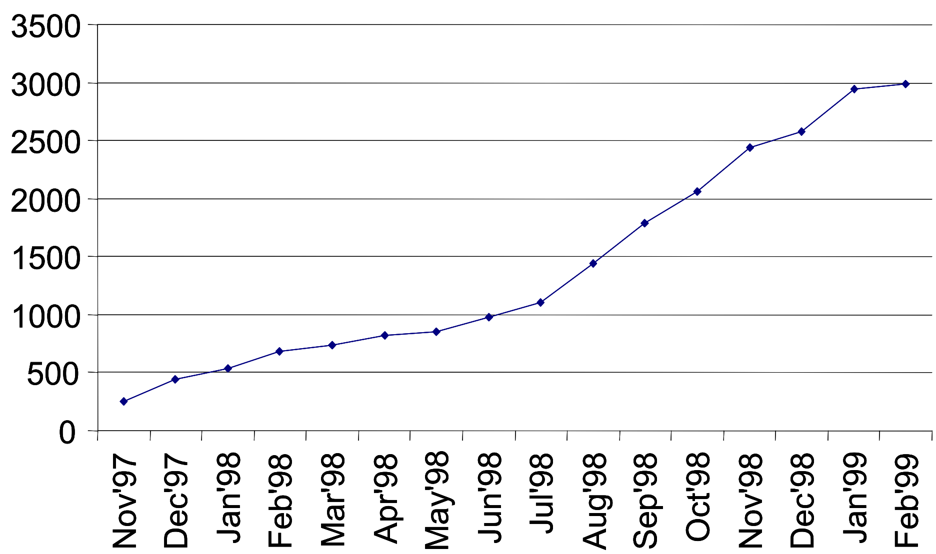


Figure A.1-1. Transponders Issued (Cumulative)

Table A.1-1 identifies the 22 sites that are being deployed with Green Light technology, indicating the average number of "green lights" transmitted to transponders per month from March through June of 1999 and the average daily truck volume where available. In the period from March through June of 1999, a total of 87,880 trucks received green lights to bypass the ten weigh station sites where Oregon Green Light project was operational. If bypassing a weigh station at highway speed saves a trucker just 5 minutes, the 87,880 green lights represent a savings of 7,323 hours of travel time. Table A.1-1 shows that the port of entry (POE) on Interstate Highway 5 (I-5) southbound at Woodburn is the most active, averaging over 11,000 green lights per month. The northbound site at Woodburn and the two POEs at Ashland and Umatilla follow the Woodburn POE in terms of transponder utilization; each of these three sites averages over 2,000 green lights per month. The Farewell Bend POE averages over 1,000 green lights per month. The remaining five operational sites average below 1,000 green lights per month. The data for Woodburn POE shows that only about 3.8 percent of the passing truck traffic (estimated by dividing the number of average daily bypasses – 11,371/30 – by the average monthly truck volume, which was obtained from data collected during the field study to be 9,716 trucks per day) is given a green light.

Table A.1-1. Oregon Green Light Electronic Screening Deployment Status

Highway	Site Name	Average Monthly Bypasses	Date Operational	Daily Volume
I-5 South	**Woodburn POE***	**11,371**	**Oct 97**	**9,716**
I-5 North	**Woodburn NB***	**2,651**	**Jan 99**	**9,716**
I-84 West	Farewell Bend POE	1,629	Jan 98	
I-84 East	Olds Ferry	295	Aug 98	
I-5 North	Ashland POE	2,615	Sept 98	
I-5 South	Ashland	814	Oct 98	
I-82 South	Umatilla POE	2,263	Nov 98	
I-84 East	La Grande	28	Nov 98	
I-5 South	Wilbur	276	Mar 99	
I-5 North	Booth Ranch	199	Apr 99	
I-84 West	Emigrant Hill		Aug 99	
US 97 North	Juniper Butte			
US 97 South	Juniper Butte			
US 97 North	Klamath Falls POE			
US 97 South	Klamath Falls			
OR 58 West	Lowell			2,075
I-84 East	**Cascade Locks POE***			**3,856**
I-84 West	Wyeth			4,034
US 26 West	Brightwood EB			774
US 26 East	Brightwood WB*			774
US 30 West	Rocky Point*			1,938

* These sites were included in the sample design, and random inspections were conducted at these sites.

Study Objective

One of the most important goals of CVISN, as for several other ITS deployments, is improved safety. Specifically, everyone would like to see fewer crashes involving trucks. A major challenge for the States' motor carrier enforcement and public safety staff is to identify and take action on the carriers on the highways most likely to be involved in crashes. Safety Information Exchange and electronic screening were developed as part of the CVISN program to enable enforcement staff to better target such *high-risk* carriers. The most direct way to measure whether this program, or any program, impacts safety would be to measure crash rates and injury and fatality rates before and after the program is put in place. Only a minor portion of the CVISN evaluation effort has been devoted to analysis of crash rates, because crashes are relatively rare events and because many other factors can influence crash rates (most notably weather). Therefore, there is great uncertainty involved in conclusions that can be drawn from these analyses. For this reason, much CVISN safety evaluation is focused on analysis of surrogates for crash rates and on changes in roadside processes that may improve the ability of enforcement staff to better target high-risk carriers during regular operations.

The Compliance Rate Study was performed to measure and document the impact of the CVISN deployment on rates of compliance with the Federal Motor Carrier Safety Regulations (FMCSRs). Violation rates are considered to be a surrogate for crash rates. Specifically, the analysis in this report focuses on violations of Out-of-Service (OOS) criteria, which are intended to define "an imminent hazard":

> *"Any condition of a vehicle, driver, or commercial vehicle operation which violates a federal or state safety regulation and is likely to cause an accident or a breakdown: contribute to the loss of control of the vehicle; and result in serious injury or death if not immediately discontinued."* [2]

It is assumed that rates of violation of OOS criteria are correlated with crash rates. If violation rates *for average motor carriers* are found to drop, then crash rates can reasonably be expected to drop, as long as other factors are held constant. In fact, this relationship is elusive. In a recent study by Oregon State University's Transportation Research Institute [3], based on a national random sample of accident reports, only 4.6 percent of crashes involving a commercial vehicle were reported to exhibit a *vehicle* violation that would have put the commercial vehicle out of service. In a different study, 5.9 percent of such crashes involve a *driver* violation that would put them out of service [4].

We distinguish here between violation rates on vehicles typically selected for inspection by trained staff and violation rates on average motor carriers or those in the general trucking population. To measure compliance rates, one might be tempted to simply extract records of inspections from the state's files and monitor trends in violation rates on inspected vehicles. However, our ultimate goal is to make a statement about changes in safety, and it is not evident how changes in inspection results obtained by standard procedures might be correlated with crash rates. Specifically, violation rates might increase simply because inspectors are getting better at selecting high-risk vehicles (due to experience or access to improved information at the roadside, e.g., from Safety Information Exchange). Random inspections, in contrast to inspections conducted under standard procedures, are required in part because standard practices are designed to target that subset of the general trucking population with the greatest problems.

Compliance rates can be inferred from data on violation rates. That is, the two rates are assumed to be inversely proportional; as violation rates go down, compliance rates necessarily go up. Because "violations" are more tangible and easily measured in the context of roadside inspections, the data collection and analysis are focused on violation rates.

The two hypotheses being tested in the Oregon compliance rate study were as follows:

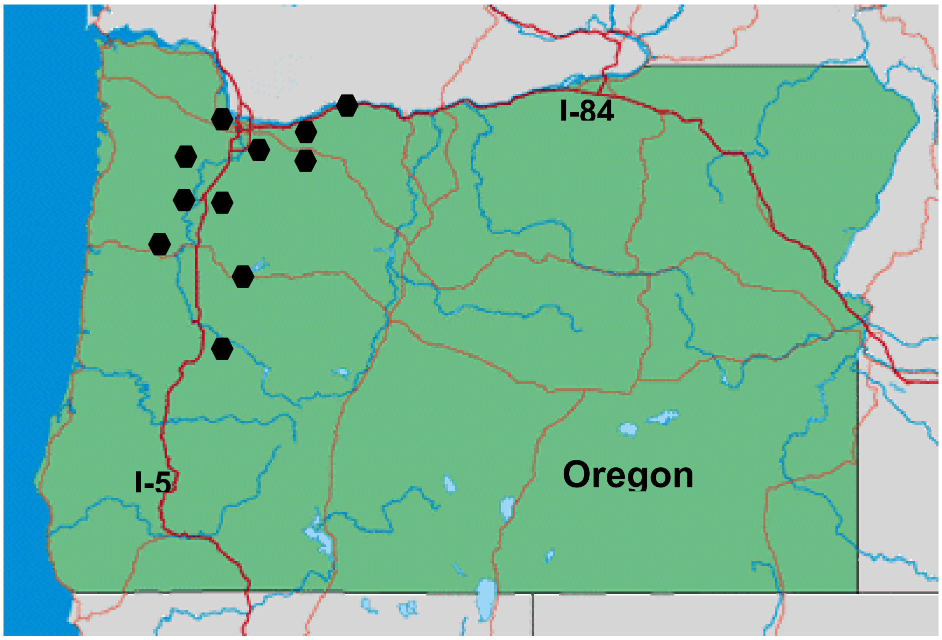
1. Violation rates decrease (i.e., compliance rates increase) when CVISN technologies (Safety Information Exchange and electronic screening) are deployed.

2. Changes in violation rates between 1998 and 1999 were the same across sites with and without CVISN technologies.

Study Design

Four inspection campaigns, each lasting one month, were conducted in January 1998, July 1998, January 1999, and July 1999. A survey design was used to select sites, dates, and times to conduct random inspections of trucks. The design took into account Oregon's historical operations to ensure feasibility.

Figure A.2 portrays the region monitored. Five agencies conduct inspections in the northern I-5 corridor in Oregon. In order to ensure consistency in the vehicle selection process and to reduce unnecessary communications, most of the random inspections for this test were done by ODOT Motor Carrier Transportation Division (MCTD) staff, specifically motor carrier enforcement officers and motor carrier safety specialists. Multnomah County patrol staff conducted some inspections at non-fixed sites (locations other than weigh stations).



= Inspection Site

Figure A.1-2. General locations of Oregon inspection sites along Interstate 5 North Corridor

Sites and times of day were randomly selected with the following constraints:

1. Past inspection history was taken into account in determining the selection probabilities at sites where inspections have been conducted, and truck traffic volume was used to determine probabilities at the remaining sites, where inspections can be conducted, but typically are not. (The primary supporting evidence used in study design was Oregon's past inspection data for the period October 1996 through September 1997.)

2. Eighty percent of the emphasis was given to sites where inspections are typically performed, and 20 percent was given to the remaining sites.

3. A stratified sample was selected, segregating ports of entry (POEs), sites with mainline screening (Green Light sites), fixed sites without mainline screening, and non-fixed sites.

To ensure valid inferences based on a random sample of inspection sites, it was necessary that all sites within the region have a positive, known probability of being selected. However, it was neither necessary nor practical to give each location the same probability of selection. Sites where several inspections are typically conducted were emphasized, and sites where inspections are typically conducted only rarely were included with only very low probability of selection.

Using appropriate analysis methods, this approach still allowed an unbiased estimate of the average compliance rate.

One of the safety constraints in Oregon was that night inspections can only be conducted at well-lighted locations. These were restricted to the ports of entry. In making inferences, it is necessary to assume that these locations have similar compliance properties as the other types of sites.

The following is a detailed description of the approach used to stratify the region and select sites, dates, and times of day for conducting inspections.

Selecting Sites

A total of 48 sites in the northern I-5 corridor were divided into the four strata noted above: Ports of Entry (POEs), Green Light sites (non-POEs), fixed non-GL sites, and non-fixed sites. The POEs are (or will be) equipped with Green Light technology, but they also have WIM sorter lanes and generally handle greater volumes of truck traffic. One of the two POEs included in this test, Woodburn, was the first site to become operational with Green Light technology. The other, Cascade Locks, was not to become operational until after conclusion of this test. Based on the historical allocation of inspections to these strata, Table A.1-2 illustrates the allocation of random inspections to these strata for each sampling campaign.

Table A.1-2. Allocation of Inspections to Strata

Stratum	Inspections conducted 10/1/96 thru 9/30/97	Inspections planned for each campaign
Ports of Entry	3381	138
Green Light Sites	793	48
Fixed Sites (non-GL)	897	60
Non-Fixed Sites	1833	60
Total	6904	306

Roughly six inspections were expected on each shift. Sixty shifts were selected with replacement from the pool of 48 candidate sites extending over 4 weeks of possible times for selection. Several sites were selected multiple times, and each of the selections was randomly assigned a date and time (day or night) for conducting inspections. Because sites and shifts were chosen with replacement, some sites were selected multiple times during the same shift. This resulted in 306 planned inspections during each of the four campaigns.

Table A.1-3 provides a list of all the sites included in the sampling frame for this survey, by stratum, along with each site's probability of selection. The following describes the algorithm for determining the probabilities of selecting each link.

Table A.1-3. List of Sites and Selection Probabilities

Stratum	Scale Number	Selection Probability
POE	1404	0.1393
	2409	0.8607
GL-Fixed	0307	0.0083
	0308	0.0083
	1402	0.0199
	2005	0.0271
	2408	0.4575
	2601	0.4788
nGL-Fixed	0201	0.1235
	0203	0.0358
	0204	0.0142
	0202	0.0275
	0303	0.0212
	0304	0.1052
	0310	0.0076
	2002	0.0522
	2003	0.0010
	2004	0.0465
	2006	0.0416
	2051	0.0113
	2054	0.0154
	2072	0.0005
	2075	0.0053
	2202	0.0431
	2205	0.0020
	2401	0.0006
	2402	0.0410
	2403	0.0377
	2407	0.0421
	2701	0.1104
	2704	0.0429
	3402	0.0710
	3602	0.1005
Non-Fixed-nI	0277	0.0035
	0377	0.0104
	2077	0.0190
	2277	0.0052
	2477	0.0060
	2677	0.6291
	2777	0.0009
	3477	0.1260
	3677	0.2000

No Level 1 inspections were conducted at some of the sites in the fixed, non-Green Light stratum in the past year. In this stratum, it was decided that 80 percent of the emphasis should be placed on sites where inspections are typically performed, and 20 percent devoted to sites available for inspection but not typically used. Within the group of sites at which Level 1 inspections were conducted in (fiscal) 1997, the probability of selection was chosen proportional to the number of inspections conducted in 1997. Within the group of sites at which Level 1 inspections were not conducted in 1997, the probability of selection was chosen proportional to the estimated truck traffic volume at those sites.

Inspections were conducted in 1997 at both of the Ports of Entry and every one of the Green Light sites, so the 80/20 rule needed to be applied only for the non-GL fixed sites and the non-fixed sites. The non-fixed sites are much less well-defined. Inspections at non-fixed locations are typically (but not necessarily) conducted at non-highway locations where vehicles can be waved in and safely inspected. For this study, specific sites (e.g., the corner of X and Y streets on Z date) were randomly assigned for the first and second campaign. However, in the third and fourth campaign, the inspectors conducting the non-fixed inspections were reluctant to go back to the same sites at the same times of the day. Because the nature of non-fixed inspections is different than the other types of sites, inspectors conducting the non-fixed inspections were assigned dates to conduct the random inspections, but allowed to choose the sites freely, with an attempt over the course of the campaign to get a representative sample. Vehicles were still selected randomly.

Assigning Dates and Times to Selected Shifts

After selecting a list of locations at which to conduct inspections, a date and time (day or night) needed to be selected on which to conduct the inspections. Inspections were scheduled for 4-week periods (28 days) during the 4 months in which the study was to take place. To select a particular date and time to conduct inspections at a particular selected location, the inspection history was used to develop a schedule that was feasible for the inspection staff. Table A.1-4 illustrates the approximate proportions of inspections conducted historically on weekdays versus weekends, and daytime versus nighttime at the four different categories of sites.

Table A.1-4. Historical Frequency of Oregon Inspections by Day of Week and Time of Day, %

Category	Weekday	Weekend	Day	Night
POE	85	15	90	10
Fixed Green Light	90	10	100	None
Fixed non-Green Light	90	10	100	None
Non-Fixed	90	10	100	None [1]

[1] Although a few inspections are conducted at night at non-fixed sites, random inspections could not be scheduled at night for safety reasons.

These relative frequencies were used to assign probabilities of selection to each of the 28 days (four weeks) in January (or July) on which inspections could be performed. For fixed Green Light sites, fixed non-Green Light sites, and non-fixed sites, inspections are not conducted at night, so assigning probabilities to specific shifts only depends on the historical weekday/weekend proportions. For example, having selected Walterville, a fixed non-Green Light site, the probability of assigning it to a weekday is 0.9. There were 20 weekdays during each campaign, and each was given equal probability of inspection. Thus, the probability of selecting Monday, January 19, 1998, for the particular shift of inspections (given that it had already been selected as a site for inspections), was 0.9/20 = 0.045.

For POEs, the historical allocation of inspections to night/day shifts was taken into account. For example, having already selected a particular POE at which to conduct inspections, the probability of selecting a weekday during the daytime was calculated as

$$(0.90)(0.85) = 0.765.$$

But there are 20 weekday/day shifts during each of the 28-day periods planned for this study. So, for example, the probability of selecting Cascade Locks for random inspections during the daytime on Monday, January 12, 1998 was calculated as

$$(0.90)(0.85)/20 = 0.765/20 = 0.03825.$$

In a similar manner, the probability of selecting the night shift on Saturday, January 10 for the same location was

$$(0.10)(0.15)/8 = 0.001875.$$

To ensure that valid comparisons could be made without biases due to day of week or time of day, general guidance was provided for rescheduling make-up shifts. For example, if a shift was cancelled (e.g., due to illness) on a Monday during the day at a particular site, then the inspectors were asked to reschedule inspections on another Monday during the day at that site. If it was not possible to reschedule the shift on the same day during the month, we asked that an attempt be made on another weekday. We did not want a weekday shift rescheduled for a weekend or vice versa. Night versus day shifts were treated likewise.

Inspection Schedule

Table A.1-5 shows the schedule of random inspections proposed for each of the four sampling campaigns (January 1998, July 1998, January 1999, July 1999) and the actual days on which the inspections were conducted. The schedule was developed based on the algorithm described above. The same design was used for each of the three sampling campaigns, but a shift in the date was made to align the days of the week, and ensure that a comparison would not be biased. There were slight departures from the proposed schedule resulting from weather and illness, but it was mostly adhered to.

Training

Management staff at the Oregon MCTD informed inspectors about the nature of the study and the types of data to collect. For each set of random inspections, inspectors were instructed to select the fifth passing vehicle after every inspection (or some arbitrary interval between vehicles) for the next inspection as a means of randomization. If a vehicle was not selected randomly but was pulled in for inspection due to an obvious defect, then the inspector was instructed to indicate this in a special field on the inspection form.

Table A.1-5. Schedule of Random Inspections for Compliance Rate Study, Proposed and Actual

Scale Number	Location Name	Day/ Night	1/98 Proposed	1/98 Actual	7/98 Proposed	7/98 Actual	1/99 Proposed	1/99 Actual	7/99 Proposed	7/99 Actual
1404	Cascade Locks	D	1/02/98	1/02/98	7/02/98	7/02/98	1/08/99	1/08/99	7/01/99	7/01/99
3602	Dayton	D	1/02/98	1/02/98	7/02/98	7/02/98	1/08/99	1/08/99	7/01/99	[3]
2677	Multnomah Co., Non-Fixed	D	1/06/98	1/06/98	7/07/98	7/14/98	1/12/99	1/26/99	7/06/99	7/27/99
1404	Cascade Locks	D	1/07/98	1/07/98	7/08/98	7/22/98	1/13/99	1/13/99	7/07/99	7/07/99
2409	Woodburn POE	D	1/07/98	1/07/98	7/08/98	7/08/98	1/13/99	1/13/99	7/07/99	7/07/99
2677	Multnomah Co, Non-fixed	D	1/07/98	1/07/98	7/08/98	7/15/98	1/13/99	1/13/99	7/07/99	7/07/99
203	Blodgett WB	D	1/08/98	1/08/98	7/09/98	7/09/98	1/14/99	1/14/99	7/08/99	7/08/99
1404	Cascade Locks	N	1/08/98	1/08/98	7/09/98	7/16/98	1/14/99	1/14/99	7/08/99	7/15/99
1404	Cascade Locks	D	1/09/98	1/09/98	7/10/98	7/10/98	1/15/99		7/09/99	7/09/99
2409	Woodburn POE	D	1/09/98	1/09/98	7/10/98	7/10/98	1/15/99	1/15/99	7/09/99	7/09/99
2677	Multnomah Co., Non-Fixed	D	1/09/98	1/19/98	7/20/98	7/20/98	1/15/99	1/15/99	7/19/99	7/19/99
2677	Multnomah Co., Non-Fixed	D	1/10/98	1/10/98	7/11/98	7/18/98	1/16/99	1/16/99	7/10/99	7/10/99
2409	Woodburn POE	D	1/11/98	1/11/98	7/12/98	7/26/98	1/17/99	1/17/99	7/11/99	7/18/99
1404	Cascade Locks	D	1/12/98	1/16/98	7/17/98	7/17/98	1/18/99		7/16/99	7/16/99
2408	Woodburn NB	D	1/13/98	1/13/98	7/14/98	7/15/98	1/19/99	1/27/99	7/14/99	7/14/99
2409	Woodburn POE	N	1/13/98	1/13/98	7/14/98	7/14/98	1/19/99	1/19/99	7/13/99	7/13/99
2409	Woodburn POE	D	1/13/98	1/13/98	7/14/98	7/14/98	1/19/99	1/19/99	7/13/99	7/13/99
2601	Rocky Point	D	1/13/98	1/20/98	7/21/98	7/21/98	1/19/99	1/19/99	7/20/99	7/20/99
2677	Multnomah Co., Non-Fixed	D	1/13/98	1/20/98	7/21/98	7/21/98	1/19/99	2/09/99	7/20/99	7/20/99
3677	Yamhill Co., Non-Fixed	D	1/13/98	1/13/98	7/14/98	7/14/98	1/19/99	1/19/99	7/13/99	7/13/99
202	Blodgett EB	D	1/14/98	1/14/98	7/15/98	7/15/98	1/20/99	1/27/99	7/14/99	7/14/99
2409	Woodburn POE	D	1/14/98	1/14/98	7/15/98	7/15/98	1/20/99	1/20/99	7/14/99	7/14/99
2409	Woodburn POE	N	1/14/98	1/14/98	7/15/98	7/15/98	1/20/99	1/20/99	7/14/99	7/14/99
307	Brightwood WB	D	1/15/98	1/15/98	7/16/98	7/16/98	1/21/99	1/21/99	7/15/99	7/15/99
2409	Woodburn POE	D	1/15/98	1/15/98	7/16/98	7/16/98	1/21/99	1/21/99	7/15/99	7/15/99
2601	Rocky Point	D	1/15/98	1/15/98	7/16/98	7/16/98	1/21/99	1/21/99	7/15/99	7/15/99
2677	Multnomah Co., Non-Fixed	D	1/15/98	1/22/98	7/23/98	7/23/98	1/21/99	1/21/99	7/22/99	7/22/99
304	Rock Creek	D	1/16/98	1/16/98	7/17/98	7/17/98	1/22/99	1/29/99	7/16/99	7/16/99
2409	Woodburn POE	D	1/16/98	1/16/98	7/17/98	7/17/98	1/22/99	1/22/99	7/16/99	7/16/99
2677	Multnomah Co., Non-Fixed	D	1/16/98	1/30/98	7/31/98	7/31/98	1/22/99		7/30/99	7/30/99
1404	Cascade Locks	D	1/18/98	1/18/98	7/19/98	7/19/98	1/24/99	1/24/99	7/18/99	8/01/99
2409	Woodburn POE	D	1/19/98	1/19/98	7/20/98	7/21/98	1/25/99	1/25/99	7/20/99	7/20/99
2601	Rocky Point	D	1/19/98	1/19/98	7/20/98	7/20/98	1/25/99	1/25/99	7/19/99	7/19/99

Scale Number	Location Name	Day/ Night	1/98 Proposed	1/98 Actual	7/98 Proposed	7/98 Actual	1/99 Proposed	1/99 Actual	7/99 Proposed	7/99 Actual
2002	Walterville	D	1/20/98	1/20/98	7/21/98	7/21/98	1/26/99	1/26/99	7/20/99	7/20/99
2002	Walterville	D	1/21/98	1/23/98	7/22/98	7/22/98	1/27/99	1/27/99	7/21/99	7/21/99
2205	Foster	D	1/21/98	1/21/98	7/22/98	7/22/98	1/27/99	1/27/99	7/21/99	7/21/99
2409	Woodburn POE	D	1/21/98	1/26/98	7/22/98	7/22/98	1/27/99	1/27/99	7/21/99	7/21/99
1404	Cascade Locks	N	1/22/98	2/05/98	7/23/98	7/30/98	1/28/99	1/28/99	7/22/99	7/22/99
2402	Hubbard	D	1/22/98	1/22/98	7/23/98	7/23/98	1/28/99		7/22/99	
2409	Woodburn POE	D	1/22/98	1/22/98	7/23/98	7/23/98	1/28/99	1/28/99	7/22/99	7/22/99
2409	Woodburn POE	N	1/22/98	1/22/98	7/23/98	7/23/98	1/28/99	1/28/99	7/22/99	7/22/99
2677	Multnomah Co., Non-Fixed	D	1/23/98	1/23/98	7/24/98	7/24/98	1/29/99	1/29/99	7/23/99	
2701	Eola	D	1/23/98	1/23/98	7/24/98	7/24/98	1/29/99	1/29/99	7/23/99	7/23/99
2409	Woodburn POE	D	1/25/98	1/26/98 [1]	7/26/98	7/27/98 [1]	1/31/99	1/31/99 [2]	7/26/99	7/26/99 [1]
2408	Woodburn NB	D	1/26/98	1/26/98	7/27/98	8/03/98	2/01/99	2/01/99	7/26/99	7/26/99
2601	Rocky Point	D	1/26/98	1/26/98	7/27/98	7/27/98	2/01/99		7/26/99	7/26/99
3677	Yamhill Co., Non-Fixed	D	1/26/98	1/26/98	7/27/98	7/27/98	2/01/99	2/01/99	7/26/99	7/26/99
2601	Rocky Point	D	1/27/98	1/27/98	7/28/98	7/28/98	2/02/99	2/09/99	7/27/99	7/27/99
2409	Woodburn POE	D	1/28/98	1/28/98	7/29/98	7/29/98	2/03/99	2/03/99	7/28/99	7/28/99
304	Rock Creek	D	1/29/98	1/29/98	7/30/98	7/30/98	2/04/99	2/04/99	7/29/99	7/29/99
2409	Woodburn POE	D	1/29/98	1/29/98	7/30/98	7/30/98	2/04/99	2/04/99	7/29/99	7/29/99

[1] This shift was scheduled on a weekend, but completed on a weekday in both January and July 1998; therefore, the data were not used in the analysis.

[2] In January 1999 this shift was completed as scheduled on the weekend, but the data were not used in the analysis. There were no previous data to compare the January 1999 data to because of the previous scheduling problems with this shift.

[3] The data from this shift were not used in the analysis because it was completed so long after all the other inspections. An inspection at the end of August may not be representative of inspections in July.

Inspections for this test were conducted using the standard Level 1 Inspection procedures. In Oregon, most inspections are recorded on pen-based computers and are electronically uploaded to the state databases daily. There were three primary types of information collected during this study: inspection results, an indicator of the method by which each vehicle was selected for inspection, and truck volume counts.

Vehicle Volume Counts

To appropriately weight the inspection results to reflect corridor-wide estimates of compliance rates, truck volume counts were collected at each site where inspections were conducted. To save money, counts were obtained during the first campaign and assumed constant throughout the study period, except where information was readily available. Counts were obtained to reflect the number of trucks that travel the section of the highway during the shift selected for the inspections. Partial counts were obtained in most cases and scaled to an 8-hour shift based on the actual shift duration.

These counts were obtained by various methods depending on the type of site and logistics. The ports of entry (POEs) have automatic vehicle classifiers built into the off-ramps. At these sites, volume counts were recorded by the inspectors on duty during the selected shifts. At other fixed sites, portable (e.g., pneumatic tube) classifiers were deployed. Finally, at non-fixed sites, where vehicles are selected from the traffic stream (sometimes) traveling in both directions, manual counts were obtained. Manual counts were also obtained at sites when a conflict prevented the use of a portable classifier.

Results

Only one port of entry (POE) had Green Light technology deployed during the random inspections. And only one other site had Green Light technology deployed. Therefore, for presentation, data from these two sites were combined to reflect observations at *all* Green Light sites. Table A.1-6 displays the division of the various sites where inspections were performed into three categories for presentation: Green Light sites, non-Green Light fixed sites, and non-Green Light non-fixed sites. At the top of each column is the number of inspections conducted. A total of 1,223 random inspections were conducted for this evaluation.

Table A.1-7 provides estimates of the violation rates for each of the three categories, estimated from each of the first three sampling campaigns. The table displays the number of shifts during which random inspections were conducted and the total number of random inspections performed. Five violation rates are displayed:

- Average number of violations per vehicle (any FMCSR);
- Average number of OOS violations per vehicle;
- Proportion of vehicles with at least one OOS violation;

- Average number of driver OOS violations; and
- Average number of vehicle OOS violations

Table A.1-6. Site Categories for Presentation of Results

Type of Site		
Green Light (408 Inspections)	**Non-Green Light Fixed (591 Inspections)**	**Non-Green Light Non-Fixed (224 Inspections)**
Woodburn POE (Oct. 1, 1997)	Blodgett EB	Hwy 18 McKibbon Rd, Yamhill Co.
Woodburn NB (Jan. 1, 1999)	Blodgett WB	Lombard and N Simmons, Multnomah Co.
	Brightwood	Lombard and Pier Park, Multnomah Co.
	Cascade Locks	McMinnville, Yamhill Co.
	Dayton	N. Lombard and Bruce Ave., Multnomah Co.
	Eola	NE 122nd and NE Inverness, Multnomah Co.
	Foster	NE 223rd and NE Glisan, Multnomah Co.
	Rocky Point	NE Marine Dr and NE 223rd, Multnomah Co.
	Rock Creek	Yamhill Co. (Not Specified)
	Walterville	

Each of these violation rates should be interpreted as "violations per vehicle" rather than "violations per inspection." In normal roadside operations, the term "inspection" implies that a trained inspector may be choosing which vehicles to inspect, and the numbers of violations per vehicle might be expected to be higher than the numbers seen in the general truck population. This is because inspectors can use their experience, training, and intuition to focus on certain characteristic vehicle attributes when choosing vehicles. In the compliance rate study, by contrast, the term "violations per vehicle" is used to emphasize that a statistical design, including a randomized study vehicle population, is being used to allow us to make better inferences to the general truck population.

Each violation rate estimate is listed with a +/- number, which can be used to calculate an approximate 95 percent confidence interval. The intervals were constructed with 95 percent confidence of containing the true violation rate. Figure A.1-3 illustrates these confidence intervals over time by site for the five violation categories presented in Table A.1-7. The dashed lines in each of the five component graphs in Figure A.1-3 represents the overall average number of violations combined over all three categories and all four time periods.

For the analysis, it was assumed that inspections conducted at different sites are independent and that inspections conducted in different campaigns are also independent (i.e., the choice of a vehicle in any of the sites or campaigns has no effect on the choice of vehicles at any of the other sites or in any of the other campaigns). Thus, we can treat the results obtained from separate sites and campaigns as if they were from different strata. This allows us to make comparisons between campaigns and between site types. Statistical tests were performed to determine if the violation rates were significantly different between sites or between campaigns from those observed in 1998. Footnotes in Table A.1-7 indicate whether differences in violation rates between 1998 and 1999 campaigns (within each site type) are statistically significant. Simple year-to-year comparisons were performed, in which aggregate rates from 1999 were compared with aggregate rates from 1998.

Table A.1-7. Violation Rate Estimates by Type of Site and Sampling Campaign

Stratum		# of Shifts	Total # Inspections	Average # Violations Per Vehicle (" 2 SD)	Average # OOS Violations Per Vehicle (" 2 SD)	Proportion of Vehicles with OOS Violations (" 2 SD)	Average # Driver OOS Violations Per Vehicle (" 2 SD)	Average # Vehicle OOS Violations Per Vehicle (" 2 SD)
GL	Jan 98	15	93	1.74 " 0.44	0.52 " 0.18	0.34 " 0.12	0.04 " 0.06	0.43 " 0.18
	July 98	15	90	1.17 " 0.40	0.22 " 0.12	0.16 " 0.08	0.02 " 0.04	0.19 " 0.10
	Jan 99	17	107	2.28 " 0.76	0.38 " 0.18	0.24 " 0.12	0.05 " 0.04	0.34 " 0.16
	July 99	17	118	1.65 " 0.66	0.46 " 0.18	0.31 " 0.12	0.04 " 0.04	0.41 " 0.18
NGL-Fixed	Jan 98	25	154	1.81 " 0.46	0.40 " 0.14	0.24 " 0.08	0.00	0.39 " 0.14
	July 98	25	170	1.61 " 0.32	0.31 " 0.12	0.22 " 0.06	0.00	0.83 " 0.86
	Jan 99	21	131	2.52 " 0.82 [1]	0.48 " 0.18	0.26 " 0.10	0.00	0.47 " 0.18
	July 99	21	148	2.25 " 0.38 [1]	0.40 " 0.14	0.23 " 0.08	0.05 " 0.06	0.35 " 0.12
NGL Non-Fixed	Jan 98	10	57	3.08 " 0.68	0.95 " 0.34	0.47 " 0.16	0.01 " 0.02	0.87 " 0.32
	July 98	10	60	3.01 " 0.72	0.92 " 0.36	0.51 " 0.16	0.09 " 0.12	3.09 " 1.28
	Jan 99	10	59	2.09 " 0.6 [2]	0.55 " 0.28 [2]	0.24 " 0.08	0.05 " 0.06	0.50 " 0.24 [2]
	July 99	9	54	1.91 " 0.54 [2]	0.55 " 0.16 [2]	0.54 " 0.16	0.01 " 0.02	0.53 " 0.16 [2]
Total	Jan 98	50	304	1.93 " 0.34	0.48 " 0.10	0.28 " 0.06	0.01 " 0.02	0.44 " 0.10
	July 98	50	320	1.69 " 0.26	0.36 " 0.10	0.24 " 0.06	0.01 " 0.02	0.98 " 0.64
	Jan 99	48	297	2.43 " 0.60 [1]	0.46 " 0.14	0.25 " 0.06	0.02 " 0.02	0.45 " 0.14
	July 99	47	320	2.08 " 0.30 [1]	0.43 " 0.10	0.28 " 0.08	0.05 " 0.04	0.38 " 0.10

1 Statistically significantly greater than 1998.

2 Statistically significantly less than 1998.

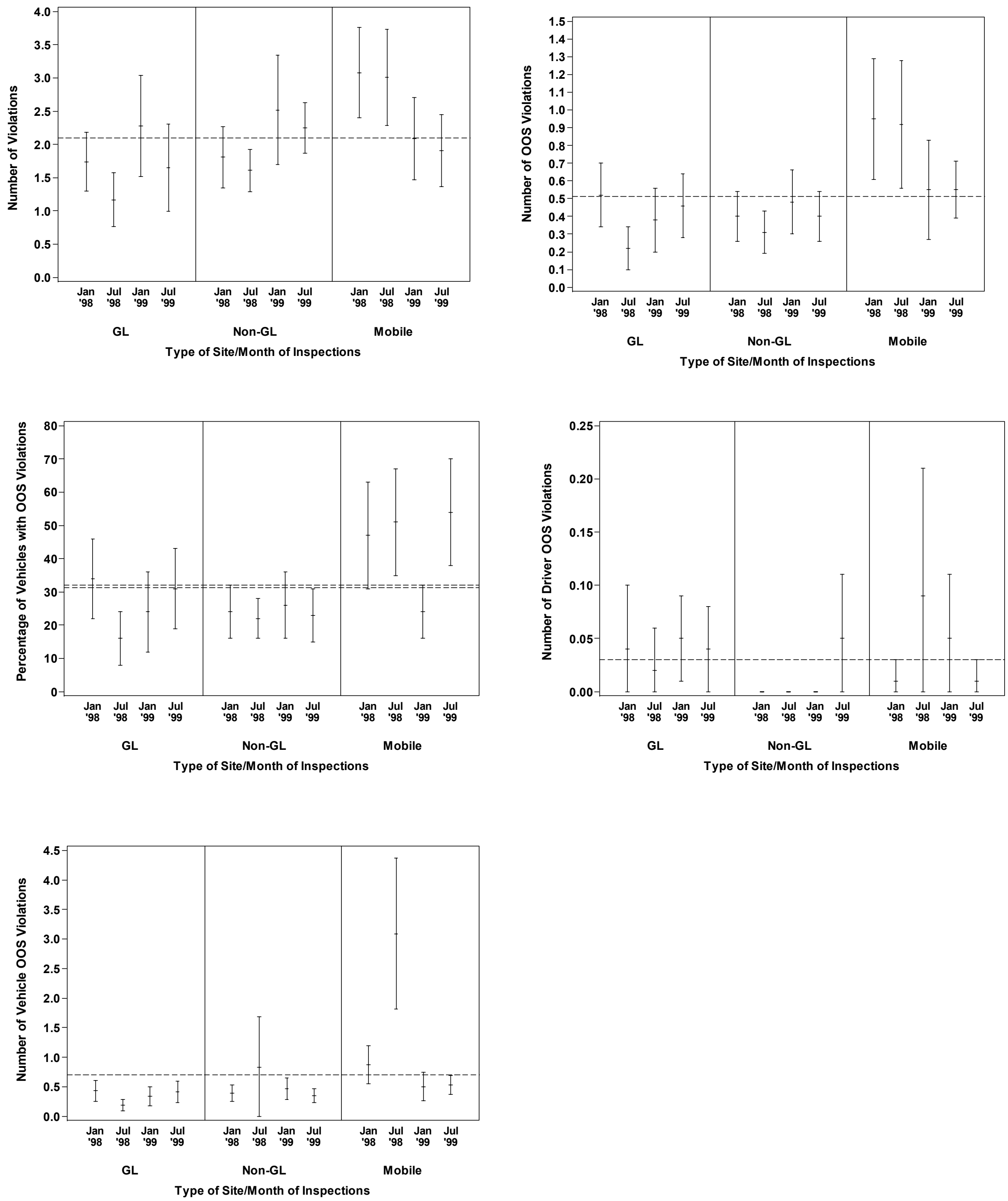


Figure A.1-3. Average violation rates for five categories by site and time

Table A.1-8 presents subsets of the information in Table A.1-7 with an emphasis on the contrasts between 1998 and 1999. Table A.1-8 provides for each stratum the estimated compliance rate averaged across January and July campaigns for 1998 and 1999 and the difference between the years, expressed as a percentage of the 1998 rate. In addition, Table A.1-8 shows which of the increases (or decreases) over time were statistically different from one stratum to another. This identifies site categories for which compliance behavior has changed in a different way from other site categories. Table A.1-7 also includes a stratum combining all non-Green Light sites into one class, labeled "Non-GL, combined". Table A.1-8 includes the results for all five of the categories of violation rates.

Table A.1-8 shows that the drop of 34 percent in the number of violations per vehicle observed at the non-fixed sites was statistically significantly different from the changes observed in both of the fixed types of sites. The other sites exhibited increases in this measure, though only for non-GL sites was the increase statistically significant. Similar results were observed for the number of OOS orders per vehicle and the number of vehicle OOS orders per vehicle, although the increases in these measures from 1998 to 1999 were not statistically significant for fixed non-Green Light sites. There were no significant changes from 1998 to 1999 in any of the strata for the percentage of vehicles with OOS orders and the number of driver OOS orders per vehicle, nor were there any statistically significant differences between the strata in these categories.

Conclusions

As Table A.1-8 shows, the only statistically significant decreases in violation rates over time occurred at non-fixed sites. Other sites generally showed an increase in violation rates over time. Based on these results, the effects of CVISN deployment on compliance with FMCSRs cannot be clearly determined. It should be noted, however, that at the time of the study deployment had just begun. Fewer than half of the sites where Green Light deployment had been planned had actually seen it implemented. As deployment increases over time, there may be a greater effect on compliance with FMCSRs.

Table A.1-8. Differences in Violation Rates by Stratum and Year

Violation Rate Type	Type of Site [1]	1998	1999	% Change
Number of Violations per Vehicle	Green Light	1.46	1.97	+ 35%
	Non-GL, fixed	1.71	2.39	+ 39% [2]
	Non-fixed	3.05	2.00	- 34% [2,3,4]
	Non-GL, combined	1.88	2.34	+ 24%
Number of OOS Orders per Vehicle	Green Light	0.37	0.42	+ 14%
	Non-GL, fixed	0.36	0.44	+ 24%
	Non-fixed	0.94	0.55	- 41% [2,3,4]
	Non-GL, combined	0.43	0.45	+ 5%
Percentage of Vehicles with OOS Orders	Green Light	25%	28%	+ 10%
	Non-GL, fixed	23%	25%	+ 7%
	Non-fixed	49%	39%	- 20%
	Non-GL, combined	27%	26%	- 2%
Number of Driver OOS Orders per Vehicle	Green Light	0.03	0.05	+ 50%
	Non-GL, fixed	0.00	0.03	NA
	Non-fixed	0.05	0.03	- 40%
	Non-GL, combined	0.01	0.03	+ 200%
Number of Vehicle OOS Orders per Vehicle	Green Light	0.31	0.38	+ 21%
	Non-GL, fixed	0.61	0.41	- 33%
	Non-fixed	1.98	0.52	- 74% [2,3,4]
	Non-GL, combined	0.79	0.43	- 45%

[1] Non-GL, combined stratum combines non-GL fixed and Non-fixed sites.
[2] Statistically significant change from 1998 to 1999.
[3] Statistically significant difference from Green Light sites.
[4] Statistically significant difference from non-fixed sites.

OREGON INSPECTION SELECTION STUDY

Although the roadside technologies deployed under CVISN are ultimately designed to improve safety, the uncertainty involved in estimating safety impacts directly is very large. To better understand how these technologies affect secondary but related factors, such as the efficiency with which enforcement staff conduct their jobs, we have conducted what we call "inspection selection studies." Inspection selection studies involve data collection at the roadside to quantify how effectively roadside enforcement staff are able to target vehicles from high-risk carriers. Specifically, inspection effectiveness is assessed by comparing the proportions of inspections across different risk groups with and without the CVISN technologies. Data needed for the inspection effectiveness evaluation include truck counts, data on the directions given to truck drivers entering the weigh station (when the site has branch points, such as a static scale lane and a bypass lane), DOT and license plate numbers of the trucks, and CVISN technologies available to inspection staff at that site. Truck identification information is used to determine the risk categorization for each vehicle using a safety ranking system.

In Oregon, to support the evaluation of the ISS system, the Motor Carrier Transportation Division management agreed to perform inspections with and without access to the ISS system. ODOT performed 508 inspections between June and September 1999 to support this study at various locations in the I-5 corridor in Oregon. The sections that follow provide a detailed description of the study design and results.

Study Design and Methods

The objective of the Oregon Inspection Selection Study was to determine whether the use of ISS improved the ability of inspectors to select higher-risk vehicles and drivers for inspection. The two hypotheses that were to be tested in this study were:

1. Inspection rates for high-risk vehicles increase when CVISN technologies are deployed; and

2. After high-risk vehicles, inspection priority is focused on carriers about which little is known.

The first hypothesis addresses the belief that the CVISN model deployments are expected to improve the ability of enforcement personnel to identify high-risk vehicles at the roadside. However, targeting "high-risk" carriers is not the only priority. The Office of Motor Carrier Safety has also made it a priority to obtain information on carriers for which very little data have been collected. Safety information exchange (SIE) technologies provide inspectors with more timely and accurate data at the roadside, which inspectors can then use to screen vehicles for inspection. Electronic screening enables carriers with good safety records (and satisfactory credentials) to bypass weigh stations, enabling staff to focus on carriers with poorer safety histories.

One way to measure the effectiveness of the roadside inspection process would be to compare the number of violations (or OOS orders) issued during inspections conducted before and after the technology is deployed. After all, if officers find more violations when they have access to the SIE, then it would appear that the technology is providing value to the inspection selection process. However, this approach has important limitations. First, if violation rates increase after deployment of CVISN, then we would not know whether the increase was due to an improvement in targeting efficiency by enforcement staff or due to a change in carrier behavior. Carriers could have many reasons for deciding that the economic benefits of violating the FMCSR outweigh the risks. In such a case, violation rates would be expected to increase—independent of the enforcement process. Second, whether an inspector finds a violation depends on the thoroughness of the inspection. Thus, differences among inspectors, their individual aptitudes and attitudes, and the inspection conditions may result in variability in the data, as do differences in weather conditions.

Rather than focus on OOS orders, we set out to determine whether inspectors could focus their efforts better on higher-risk trucks as a result of CVISN. Specifically, we compared the inspection rate for high-risk vehicles with and without the technologies. We decided to use carrier safety history, as measured by SafeStat [5], as our primary means of identifying high-risk carriers and quantifying inspection selection efficiency. The SafeStat ranking system, developed by the Volpe National Transportation Systems Center, is an automated, data-driven analysis system that is designed to incorporate current on-road safety performance information and enforcement history with on-site compliance review information in order to measure the relative safety fitness of interstate motor carriers. The system provides the Federal Highway Administration's (FHWA's) Office of Motor Carriers (OMC) with the capability to continuously quantify and monitor the safety status of motor carriers, especially unsafe carriers. This allows OMC enforcement and education programs to effectively allocate resources to carriers that pose a high risk of involvement in accidents.

Statistical Methods

The primary objective of the inspection selection study in Oregon was to determine whether the proportion of inspections that were of high-risk vehicles increased with the use of CVISN technologies. A secondary objective was to look at the population of vehicles other than high-risk vehicles and determine whether more attention was given to vehicles that had insufficient data to be assigned a risk classification. The secondary objective is important to consider because ISS gives high priority to inspecting carriers with a bad safety record, as well as carriers with little historical data.

To address these objectives, the analysis is based on dividing all vehicles into three risk categories: High Risk (HR), Insufficient Data (ID) and Medium/Low Risk (ML). The inspection rate for a high-risk vehicle may be expressed as P(I | HR), the probability of being inspected, given that the vehicle is from a high-risk carrier. Using Bayes Theorem, we may write

$$P(I \mid HR) = \frac{P(HR \mid I)P(I)}{P(HR)}$$

where P(HR | I) is the probability that a given inspection is of a high-risk carrier, P(I) is the proportion of all vehicles that are inspected and P(HR) is the proportion of all vehicles that are from high-risk carriers. We may safely assume that P(I) and P(HR) are constant during the study or, if they do change, change similarly with and without deployment of CVISN technology. The assumption that P(HR) is constant is supported by the results of the Oregon Green Light Study, which is discussed in Section A.2. Thus, when comparing P(I | HR) with and without CVISN, it is equivalently to compare P(HR | I) instead. This quantity is the measure that is directly estimable from the selection studies conducted and is referred to as "inspection selection efficiency," that is, how likely a particular inspection selection is to have resulted in an inspection of a high-risk carrier.

Figure A.1-4 illustrates the two-stage statistical model used to achieve the primary and secondary objectives. First, the proportion of all screenings that are high-risk vehicles is estimated, and then the probability of screening a vehicle with insufficient data given that it is not a high-risk vehicle is estimated. These proportions can be estimated for various combinations of agencies, sites, phases, and ISS usage. As a result, this approach allows us to compare the proportions of high-risk and insufficient data vehicles between sites and agencies.

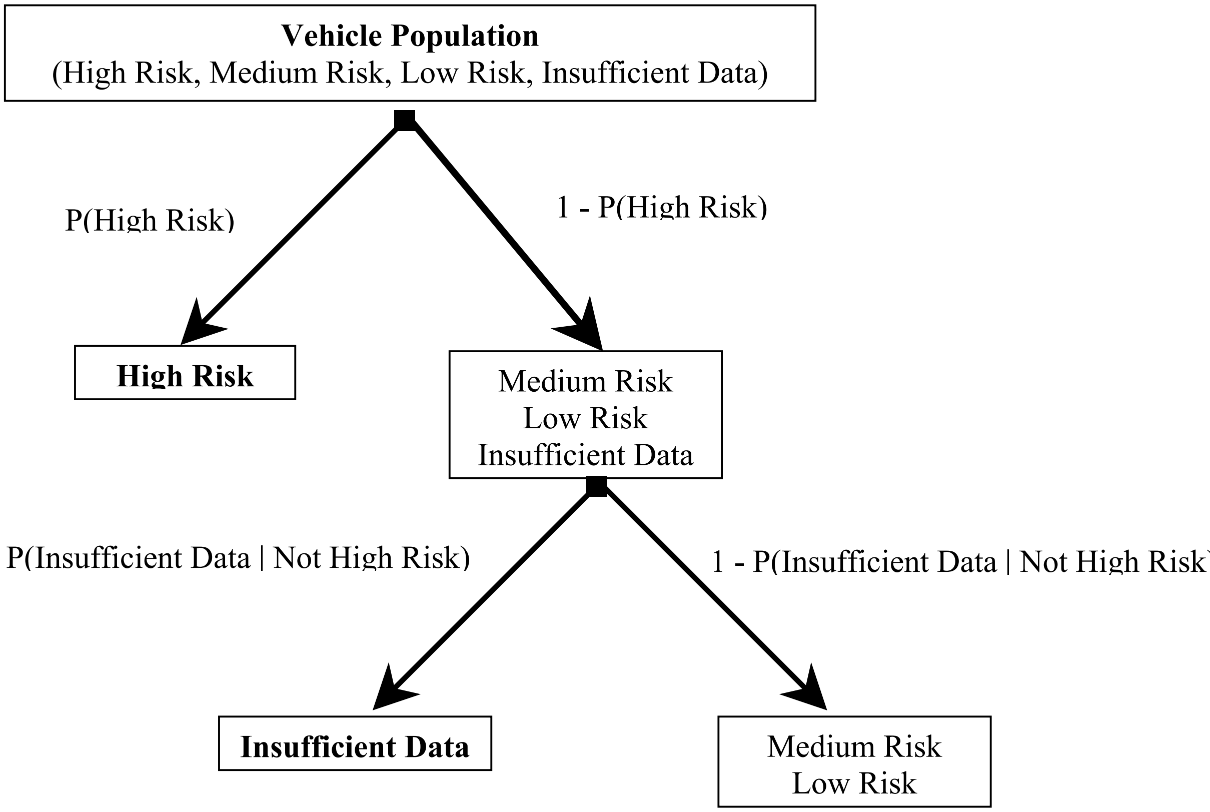


Figure A.1-4. Two-Stage Model for Vehicle Risk Distribution

Data Collection for Oregon Inspection Selection Study

Data were collected concerning operations at various inspection sites to characterize the efficiency of the inspection selection procedures. The standard approach for these studies was to record the DOT number of each vehicle entering a weigh station and to document the path and treatment of the vehicle as it went through the weigh station. We documented whether the vehicle was bypassed or was brought over the static scale and whether the vehicle was inspected.

After the data were collected, an off-line analysis was performed to determine, where possible, a safety rating of each truck. The safety rating was determined using SafeStat, a ranking system developed by the Volpe National Transportation Systems Center as an automated, data-driven analysis system to incorporate current on-road safety performance information and enforcement history with on-site compliance review information in order to measure the relative safety fitness of interstate motor carriers. The system was developed to provide the Federal Highway Administration's (FHWA's) Office of Motor Carriers (OMC) with the capability to continuously quantify and monitor the safety status of motor carriers, especially unsafe carriers. Using the SafeStat rating for each vehicle, it could be assigned to one of the three risk categories of interest for the analysis. Risk categories could be modified to determine how modifying the definition of high-risk vehicles (based on the SafeStat score) would affect the efficiency in inspecting high-risk vehicles.

Results of the Analysis of Data from Oregon Inspection Selection Study

Table A.1-9 shows the numbers of inspections conducted with and without the ISS system at each inspection location. Vehicles were to be selected for inspection if they had an ISS rating of 95 or greater (on a scale of 0 to 100 with 100 signifying the least safe). The choice of 95 was somewhat arbitrary. In reality, vehicles with a much wider range of ISS scores were selected. Table A.1-9 shows that although 274 vehicles were inspected without using the ISS system, only 230 could be classified using SafeStat. Similarly, only 150 of the 194 of the vehicles inspected using ISS could be classified using SafeStat.

Table A.1-10 shows the results of the ISS efficiency analysis for the Oregon. The Table A.1-10 breaks down the 150 inspections using ISS and the 230 inspections performed without ISS into high-risk, insufficient data, and medium- and low-risk carriers. Table A.1-10 shows that 5.7% of the inspections performed without ISS were of high-risk vehicles, while 10% of the inspections performed using ISS were of high-risk vehicles. The ISS efficiency is defined to be the ratio of the proportions of inspections that were high-risk vehicles for ISS versus non-ISS selection. Table A.1-10 shows that 1.77 times more inspections were of high-risk vehicles with ISS selection as without ISS selection. Similarly, after removing the high-risk vehicles, the conditional probability of selecting a vehicle with insufficient data was 1.06 times higher with ISS selection that without ISS selection.

The inspections in Oregon were conducted primarily in June and July of 1999. SafeStat ratings were available based on September 1998 data and March 1999 data. The analysis in Table A.1-10 is based on September 1998 SafeStat ratings. Using that score, there was not a significant difference between ratings of carriers given an ISS score of 80-89 and the carriers given an ISS score of 90-100. Thus, the high-risk category contains those vehicles whose ISS scores were greater than 80. However, using the March 1999 SafeStat information, there was a significant difference between these groups of carriers, with carriers in the 90-100 category tending to be rated worse by SafeStat. Thus the ISS efficiency analysis was repeated, using the March SafeStat information and ISS scores above 90 to indicate high-risk carriers. Table A.1-11 compares the results of the original analysis with the second analysis. Table A.1-11 shows that the inspection efficiency for high-risk carriers using ISS versus non-ISS is 2.83 and the conditional efficiency for carriers with insufficient data was 1.68. The high-risk efficiency is statistically significant, indicating that use of the ISS system does improve selection of high-risk vehicles. While not statistically significant, ISS also appears to improve the selection efficiency for vehicles with insufficient data.

Table A.1-9. Numbers of Non-ISS and ISS Inspections per Location in Oregon

INSPECTION LOCATION	Number of Inspections	
	Non-ISS	ISS
ADAIR NB	1	0
ASHLAND POE	45	7
BAKER	9	2
BOOTH RANCH	10	0
BRIGHTWOOD WB	0	9
BURNS	2	2
DAYTON	4	2
EMIGRANT HILL	5	0
EOLA	4	11
FORT HILL	0	3
FOSTER	4	0
GATES	7	2
HAUSER	7	8
HUBBARD NB	4	19
HUBBARD SB	15	25
HWY 22	1	0
JOHN DAY	5	2
LA GRANDE	34	29
LAKE CREEK	5	0
LANE COUNTY	0	1
LOWELL	35	34
MARCOLA SCALE	1	4
MINAM	11	0
MOLALLA PORTABLE	3	4
MORROW COUNTY	5	0
MULTNOMAH COUNTY	3	0
NOTI	13	12
OLDS FERRY	0	3
PHILOMATH	2	1
PILOT ROCK	1	1
ROCKY POINT	9	0
ROW RIVER SCALE	4	2
SALEM (KMART)	4	0
UMATILLA COUNTY	3	0
UNION COUNTY / ELGIN	7	0
VALE	0	3
WALTERVILLE	8	8
WASHINGTON COUNTY	8	0
TOTAL	**279**	**194**
TOTAL CATEGORIZED	**230**	**150**

Table A.1-10. Oregon ISS Efficiency

ISS	HR	ID	ML	Total	Total (Non-HR)	P(HR)	P(ID | Not HR)
ISS	15	29	106	150	135	10.00%	21.48%
Non-ISS	13	44	173	230	217	5.65%	20.28%
ISS ÷ Non-ISS						1.77	1.06

Table A.1-11. Oregon ISS Efficiency

Comparison		ISS Efficiency	P-value
ISS vs. Non-ISS	High Risk	1.77	0.1300
	Insufficient Data Given Not High Risk	1.06	0.7930
ISS ≥ 90 vs. Non-ISS	High Risk	2.83	0.0204
	Insufficient Data Given Not High Risk	1.64	0.0764

Conclusions

Tables A.1-10 and A.1-11 indicate that use of the ISS system improves the ability of inspectors to select high-risk vehicle for inspection, although the improvement is statistically significant only with using an ISS score of 90 or greater to select vehicles. There also appears to be an increase in the conditional probability of identifying vehicles with insufficient data given that they are not high-risk, although this is not statistically significant. Thus, use of the ISS does appear to improve the efficiency with which vehicles are being selected. The number of vehicles included in this study is fairly small, and inclusion of a larger number of vehicles would most likely result in a statistically significant result for high-risk vehicles, regardless of what ISS score was used to select vehicles for inspection.

As with the Green Light Study, use of the ISS system at the time of the study had just begun. As time passes and more organizations deploy ISS systems, the data in the system will improve. As a result, the effectiveness of the system should also improve.

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[5] John A. Volpe National Transportation Systems Center, "SafeStat: Motor Carrier Safety System Measurement System, Methodology: Version 7," Federal Highway Administration, Office of Motor Carrier and Highway Safety Report, October 1999.

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APPENDIX A.2:

CONNECTICUT SCREENING ASSESSMENT STUDY RESULTS

APPENDIX A.2: CONNECTICUT SCREENING ASSESSMENT STUDY RESULTS

INTRODUCTION

The CVISN Model Deployment Initiative (MDI) is designed to implement the primary CVISN user services in ten participating states to demonstrate their technical and institutional feasibility, costs, and benefits, and to encourage further deployment. Improved safety of commercial motor vehicles is one of the ultimate objectives of the CVISN MDI. However, measuring the direct impact of any technology or process change on safety (quantified by numbers of accidents, injuries, or fatalities) may not be possible for several reasons. For example, accidents are very rare events, and it is not likely that the change in the number of accidents observed during the period of the evaluation will be statistically significant, even if there is a real change in safety. Another reason is that any observed reduction in accidents, fatalities, or injuries might be attributed to other factors (e.g., anti-lock brakes, changes in traffic patterns, etc.).

Therefore, our primary approach to evaluating the safety impacts of CVISN is to measure its impact on the processes that it is expected to most directly affect. In particular, we plan to measure changes in screening effectiveness at sites where CVISN technologies are deployed. To that end, this study attempts to measure changes in screening effectiveness (defined below) at sites where new technologies and/or new information are made available to inspection and enforcement staff at the roadside. Specifically, we will compare the rate at which "high-risk" carriers are inspected at specific sites with the corresponding rate for non-high-risk carriers, and assess whether these rates change as a result of the deployment.

Efforts in Connecticut on the evaluation of CVISN are being coordinated with efforts on the evaluation of the SAFER Data Mailbox (SDM) and the safety-related field operational tests (FOTs) of the I-95 Corridor Coalition CVO Working Group. The SDM is one of the mechanisms by which Safety Information Exchange is achieved at the roadside. The reader is referred to the evaluation plans for the CVISN MDI (July 1998), SAFER Data Mailbox FOT (March 1999), and the I-95 Corridor Coalition Safety FOTs (March 1999) for detailed descriptions of the activities undertaken for each evaluation. The remainder of this appendix presents the screening assessment study results prepared as part of these three evaluations.

APPROACH

Three different tests were conducted to measure the value brought to the screening process by CVISN. The first was a retrospective analysis of screening performance. Screening performance was monitored and compared against major deployment milestones, such as the deployment of laptops and releases of upgrades to Aspen and ISS. The second was a comparison of the screening procedures conducted by the Connecticut Department of Motor Vehicles and the Connecticut Department of Public Safety (DPS). Both agencies use the ASPEN/ISS systems, but with different protocols and priorities. The goal of this second test was not to measure how well each agency conducts its respective duties. Instead, the test was conducted to establish the degree to which the two organizations use the CVISN and, by comparison, measure the value provided by CVISN. The third test was a comparison of the SAFER Data Mailbox configuration used in Connecticut with the configurations used in other states, with emphasis on the ability to target high-risk carriers at the roadside. A separate evaluation of the SAFER Data Mailbox system is also being conducted. However, the SDM is a component of CVISN, and the extent to which the SDM assists enforcement staff in targeting high-risk vehicles at the roadside will be documented as part of the CVISN evaluation.

Retrospective Analysis

The first test was a retrospective analysis of screening performance. Connecticut is well ahead of most states in the exchange of safety information at the roadside. In fact, they have been using ASPEN/ISS at the roadside for several years (to varying degrees). Connecticut already uses ISS to make screening decisions because they believe that it helps enforcement staff identify high-risk vehicles. To measure the value of the technology, it would have been ideal to run an experiment consisting of a side-by-side comparison of screening performance with and without the technology. However, because the users already recognize the technology as an integral part of their roadside operation, it was not reasonable to temporarily suspend its use – just for study purposes. For this reason, a retrospective analysis was used to measure the impact of ISS over time, noting changes in the system's functionality and level of deployment.

Inspection results from the past several years were extracted and traced against the ASPEN/ISS deployment history in the state. We identified the carrier (and possibly unit number) for each inspection conducted over this time period. The location was also identified, along with other information that could be used to identify the type of screening that was performed. Each vehicle inspected was assigned a safety rating that could be used to judge the effectiveness of the screening process. The goal was to focus inspections on the highest-risk carriers using the highways.

Specifically, we planned to use the SafeStat motor carrier measurement system, developed by the Volpe National Transportation Systems Center, to rate carrier safety performance. SafeStat (Safety Status Measurement System) is an automated, data-driven analysis system that is designed to incorporate current on-road safety performance information and enforcement history with on-site compliance review information in order to measure the relative safety fitness of interstate motor carriers. The system provides the Federal Highway Administration's (FHWA) Office of Motor Carriers (OMC) with the capability to continuously quantify and monitor the safety status of motor carriers, especially unsafe carriers. This allows OMC enforcement and education programs to efficiently allocate resources to carriers that pose a high risk of involvement in accidents.

Over time, the level of CVISN deployment has increased. Not only has the percentage of inspections conducted using ISS as a screening tool increased, but ISS is constantly being improved. In addition, the deployment of SDM has increased the access to safety data at the roadside through the PIQ (previous inspection query) tool, which is being used more and more in Connecticut during inspections to check for recent violations. The interfaces have improved and the information behind the interface has been made more complete and up-to-date. The deployment history in Connecticut was documented, identifying key milestones. Screening effectiveness, in this case measured as the proportion of inspections conducted on high-risk carriers, was monitored over time and compared against these milestones.

Comparison of Different Operating Scenarios

An important goal of the CVISN evaluation is to compare screening performance under different "configurations" of deployment. This is important because, in practice, no two scenarios are exactly alike – due to differences in layout, procedure, technology, or other factors. In Connecticut, we characterized and monitored screening operations at four weigh scales: Greenwich, Danbury, Middletown, and Union.

In Connecticut, two agencies conduct motor carrier safety inspections: the Department of Motor Vehicles (DMV) and the Department of Public Safety (DPS). The DMV is primarily responsible for enforcing motor carrier safety, and the DPS is responsible for ensuring that motor carriers obey legal weight limits. These objectives affect the approach these organizations take to the screening/inspection process. Differences in their processes, as well as differences in layout, equipment, and traffic composition were documented to determine whether they were related to differences in screening performance.

This was a prospective analysis. In addition to comparing inspection data, we could characterize the traffic stream at the sites selected. Where possible, we compared the safety ratings of trucks in the following subpopulations:

- mainline truck traffic,
- trucks entering scale,
- screened trucks, and
- inspected trucks.

The comparison is based first on the proportions of high-risk vehicles and drivers that are selected for inspection under the different screening processes employed in Connecticut. In addition, the analysis is extended to look at how selection of vehicles impacts the number of vehicles and drivers put out of service. For this extension, the OOS orders issued under the different screening processes are compared to "random" selection of vehicles and drivers for inspection.

Comparison of SAFER Data Mailbox Configurations

The SAFER Data Mailbox project consisted of developing a centralized database that would provide mobile enforcement units with access to real-time data that describes the safety rating of the motor carriers they are inspecting. A specific goal was to catch drivers that have violated out-of-service orders. This system includes two distinct components: adding data to the database, and conducting queries on the database. The participating states differ somewhat on how these components should be implemented.

This test documents the differences between the configuration being deployed by Connecticut and the configuration supported by FHWA for the Eastern States Coalition. This is mainly a qualitative discussion of the functionality differences. Several quantitative aspects of the SDM deployment in Connecticut were measured as part of this study and the SAFER Data Mailbox evaluation (such as timeliness, proportion of vehicles with previous inspections, and the impact of PIQ results on inspection outcomes). However, a quantitative comparison of performance measures was not yet possible given the status of the other participating states. Two key components that were evaluated are the ease of implementation/deployment and the functionality of the systems (e.g., interstate communications such as e-mail).

Because Connecticut enforcement leadership was convinced that the deployed SIE technologies helped their roadside staff conduct their jobs more efficiently, they wanted their inspection staff to use them whenever possible. Therefore, inspectors participating in the Connecticut study used the SIE technology throughout the study period. Alternatives to simple "with/without" test methods were used to measure the impact of the technologies in Connecticut.

RESULTS

To perform the three analyses presented in the previous section, data were collected in the field, historical data were obtained, and interviews were carried out with inspectors and agency personnel responsible for the management of inspection programs. Field data were collected by observing the inspection operations of two different agencies at four different sites in the winter and spring of 1999. The two agencies who conduct motor carrier safety inspections are the Department of Motor Vehicles (DMV) and the Department of Public Safety (DPS). The four facilities that were observed were Union, Greenwich, Middletown, and Danbury. Data included observation from over 10,000 vehicles entering these weigh stations, recording their DOT numbers and license plates where possible, and recording their path through the facility.

Historical data consisted of the results from over 58,000 inspections conducted in Connecticut between October 1995 and June 1999.

Data analysis consisted of comparison of screening results across the four facilities and two agencies over time, and taking into consideration the differences between facilities and agencies in ISS deployment over time. Figure A.2-1 shows the layout of each of the four facilities. Table A.2-1 compares the four facilities with regard to various characteristics, including truck traffic volume, the number of inspections, and screening methods.

Table A.2-1. Connecticut Inspection Station Characteristics

Station	Union	Greenwich	Danbury	Middletown
Location	POE, I-84 WB	POE, I-95 NB	POE, I-84 EB	I-91 NB (Central)
Volume	350 trucks/hour	485 trucks/hour	215 trucks/hour	350 trucks/hour
1998 Inspections	4100	1200	1300	1000
Traffic Management	All mainline traffic enters sorter WIM ramp	Continuously opened/closed to manage queue and staff resources		
WIM Screening	- Height, weight - Distant visual inspection from scale house	- Weight - Quick, up-close inspection from WIM booth	No WIM screening	
Static Scale Screening	ISS1/ISS2 on scale house computer	ISS1 on scale house computer	No computer screening (Sometimes laptops from cruisers are used)	

The sections that follow present the results of the three analyses presented in the previous section. Analyses for both the retrospective analysis and the comparison among different operating scenarios included an assessment of the proportion of inspections that were made of vehicles within different risk categories. Because the analysis of changes in screening effectiveness over time can be considered a comparison among different operating scenarios, the results of all analyses addressing screening effectiveness are presented in Section 3.2.

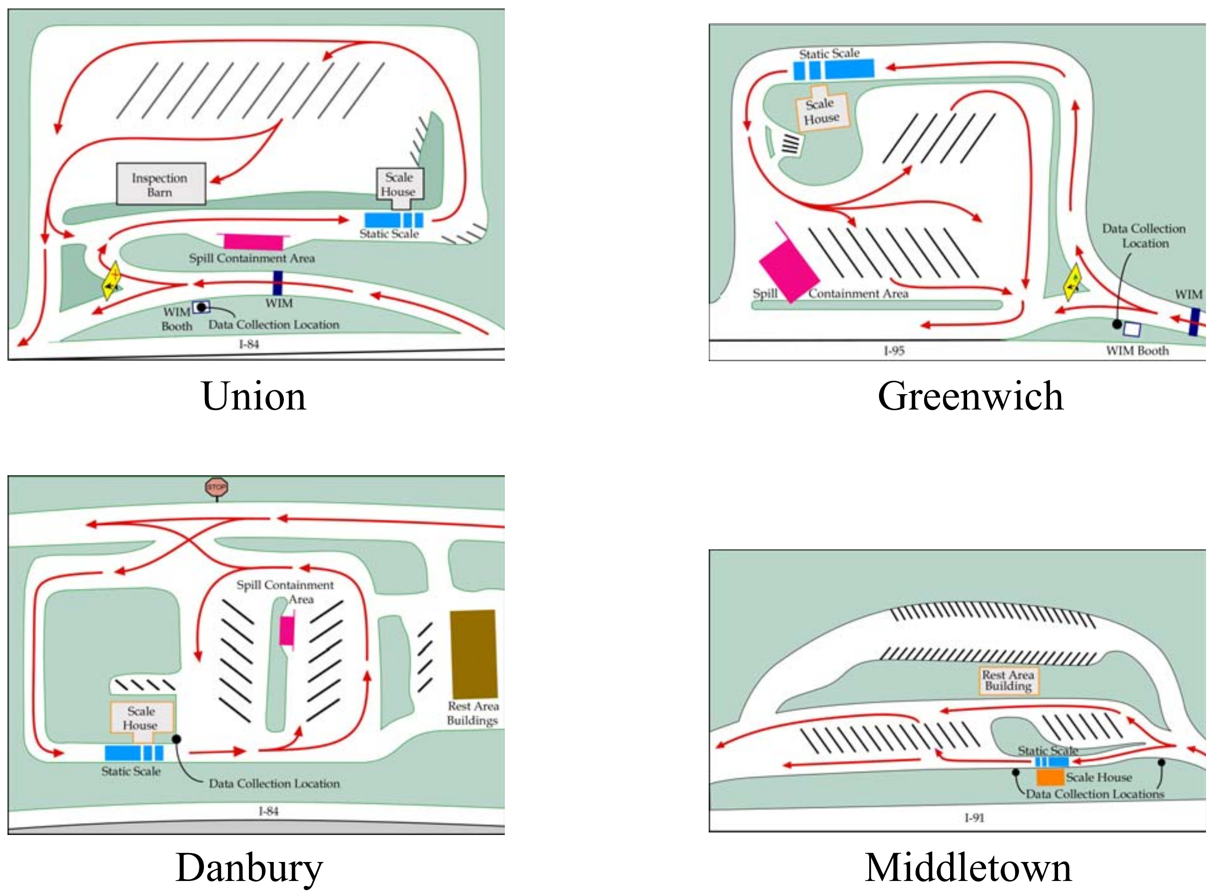

Figure A.2-1. Schematic Diagrams of the Four Connecticut Facilities

Retrospective Analysis

The historical inspection data collected from the state of Connecticut was divided into three phases based on the degree to which the inspection selection system (ISS) was deployed. The three phases considered in this analysis are:

- Phase 1: June 1996 to May 1997
- Phase 2: June 1997 to May 1998
- Phase 3: June 1998 to May 1999.

During Phase 1, the DMV utilized ISS while the DPS did not. During Phase 2, the DPS made the transition to the use of ISS. In Phase 3, both the DMV and the DPS had full access to ISS technology. During all three phases, only Greenwich and Union utilized ISS for screening, while Middletown and Danbury did not. ISS was incorporated into the ASPEN system for the processing of inspection data once a vehicle was selected for inspection, regardless of scale location, for all enforcement personnel equipped with a laptop computer. The DMV and DPS performed inspections at all four sites during all three phases, with one exception: there were no DPS inspections at Union during Phase 1. Table A.2-2 summarizes the pattern of ISS deployment over time in Connecticut.

Table A.2-2. Deployment of Inspection Selection Systems in Connecticut by Agency and Inspection Site, 1996 to 1999

		Did the Agency Use ISS?		Did the Site Have ISS?	
Phase	Dates	Department of Motor Vehicles	Department of Public Safety	Greenwich and Union	Middletown and Danbury
1	June 1996 to May 1997	Yes	No	Yes	No
2	June 1997 to May 1998	Yes	Transition	Yes	No
3	June 1998 to May 1999	Yes	Yes	Yes	No

In order to compare the screening performance of a site or agency with and without ISS, an experiment should be designed that has the agency select vehicles for inspection with ISS and then without ISS (or vice versa). Such an experiment was not performed in Connecticut for a specific agency in a specific time period. However, for specified periods of time, Table A.2-2 shows that we did have a basis for comparing sites with and without ISS by comparing sites and agencies within the three phases.

One of the objectives of the retrospective analysis was to compare the screening effectiveness, measured as the proportion of high-risk carriers inspected, by enforcement operation with the implementation of ISS to those high-risk carriers inspected without the implementation of ISS. Such a comparison also falls under the objectives of the analysis comparing the screening effectiveness under different operating scenarios. Thus, the comparison of the proportion of high-risk carrier vehicles inspected with and without ISS deployment is given in the subsequent section.

Comparison of Screening Effectiveness Among Different Operating Scenarios

The SafeStat motor carrier measurement system, developed by the Volpe National Transportation Systems Center, was used to rate carrier safety performance. SafeStat (Safety Status Measurement System) is an automated, data-driven analysis system that is designed to incorporate current on-road safety performance information and enforcement history with on-site compliance review information in order to measure the relative safety fitness of interstate motor carriers. The system provides the Federal Highway Administration's (FHWA) Office of Motor Carriers (OMC) with the capability to continuously quantify and monitor the safety status of motor carriers, especially unsafe carriers. For the screening analyses, the carriers were divided into three risk categories: high risk (HR), medium/low risk (ML), and insufficient data (ID).

The primary objective of the analysis was to compare the proportion of inspected vehicles that were high-risk with and without ISS deployment. A secondary objective was to look at the population of vehicles other than high-risk vehicles, giving attention to vehicles that could not be assigned to a risk classification due to insufficient data. The purpose of this second comparison was to compare the proportion of non-HR, inspected vehicles that had "insufficient data" with and without ISS deployment. The secondary objective is important to consider because ISS gives high priority to inspecting carriers with a bad safety record, as well as carriers with little historical data.

The purpose of evaluating the insufficient data selection efficiency on only non-HR vehicles is best illustrated with an example. Table A.2-3 illustrates a hypothetical scenario where 70 inspections are performed with and without ISS. Clearly, the HR efficiency has improved threefold with use of ISS (30 versus 10 vehicles). It would appear at first that no change has occurred in the ID efficiency, as in both cases 10 vehicles out of 70 inspections have insufficient data. If use of ISS really did not improve the chance of selecting ID vehicles, however, we would have expected the 20 extra HR inspections to have come proportionately from the MR/LR and ID categories, resulting in about 33 MR/LR and 7 ID vehicles. Since the additional HR inspections came entirely from the MR/LR group, we should conclude that CVISN is indeed successful at targeting ID vehicles more efficiently. The correct comparison is of the ratio of ID inspections to non-HR inspections with ISS (10/40 = 0.25) to the same ratio without ISS (10/60 = 0.17).

Table A.2-3. Hypothetical Inspection Data to Illustrate The Reason for Evaluating Insufficient Data Efficiency on Only Non-High Risk Vehicles

	HR	MR/LR	ID	Total
Without ISS	10	50	10	70
With ISS	30	30	10	70

Figure A.2-2 illustrates the two-stage statistical model used to achieve the primary and secondary objectives. First, the proportion of all screenings that are high-risk vehicles is estimated, and then the probability of screening a vehicle with insufficient data given that it is not a high-risk vehicle is estimated. These proportions can be estimated for various combinations of agencies, sites, phases, and ISS usage. As a result, this approach allows us to compare the proportions of high-risk and insufficient data vehicles between sites and agencies.

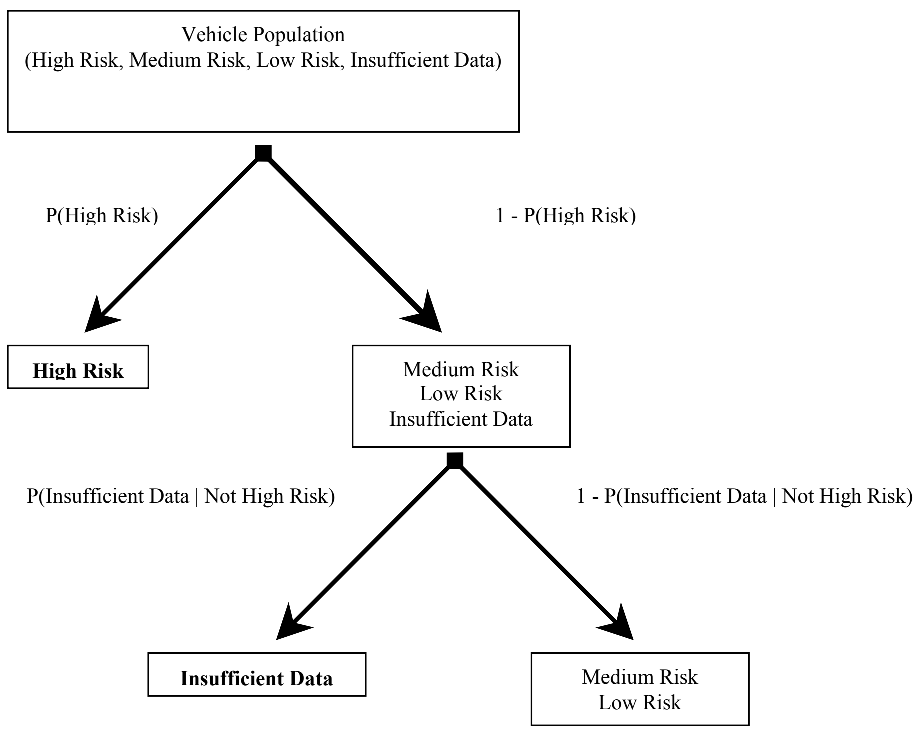

Figure A.2-2.   Two-Stage Model for Vehicle Risk Distribution

Two analyses were performed in order to assess, primarily, the efficiency of ISS in selecting high-risk vehicles and, secondarily, the efficiency of ISS in selecting vehicles with insufficient data. The first analysis compared the screening efficiency of sites with and without ISS during Phase 3 alone. Three subpopulations were considered in this analysis: pooled over DMV and DPS, DMV only, and DPS only. The second analysis compared the screening efficiencies of the two agencies within each of the three phases as a surrogate for a comparison of ISS usage versus non-ISS usage. This analysis was done within the ISS sites only. Again, three subpopulations were considered in this analysis: Greenwich, Union, and pooled over Greenwich and Union.

Comparison of Screening Effectiveness of ISS and Non-ISS During Phase 3

The first analysis compares Union and Greenwich (ISS sites) with Middletown and Danbury (Non-ISS sites) during Phase 3 only, with inspections performed by the DMV and the DPS pooled together. Phase 3 data were used because during this phase both agencies were able to make best use of ISS. Roadside data collection allowed us to characterize the SafeStat makeup of the vehicle populations passing by each site. Thus, all comparisons are controlled for the baseline composition of the trucks in the population.

The two-stage model in Figure A.2-2 was employed. The first stage estimated the proportion of HR vehicles in the inspected population and in the population in general. The second stage estimated the proportion of ID vehicles in the non-HR inspected population and in the non-HR population in general. Thus, we were able to estimate the probability that an inspected vehicle is high-risk relative to the population. The "high-risk inspection efficiency" is defined as

$$P(\text{HR} \mid \text{inspected}) \div P(\text{HR} \mid \text{population}).$$

For example, at Union, an estimated 5.09 percent of vehicles in the population were high-risk. However, 433 of the 4,082 (10.61%) inspections were of high-risk vehicles. Thus, Union's high-risk inspection efficiency was 10.61 percent ÷ 5.09 percent = 2.08. The inspection selection process at Union resulted in twice as many high-risk carriers than would be expected if the selection were purely random. Similarly, the "insufficient data inspection efficiency" is defined as

$$P(\text{ID} \mid \text{not HR and inspected}) \div P(\text{ID} \mid \text{non-HR population}).$$

For example, at Union, an estimated 16.24 percent of vehicles in the non-HR population had insufficient data to assign a risk classification. However, 713 of the 3,649 (19.54%) inspections of non-HR vehicles were of vehicles with insufficient data. Thus, Union's insufficient data inspection efficiency was 19.54 percent ÷ 16.24 percent = 1.20. The inspection selection process (among the non-HR vehicles) at Union resulted in 20 percent more insufficient data carriers than would be expected if selection were purely random.

Table A.2-4 illustrates the estimated risk distributions for the inspected sub-population and the whole population and the estimated inspection efficiencies for each site (inspected ÷ population). Table A.2-5 provides comparisons of efficiencies between ISS and non-ISS sites. The results of the same analysis for inspections performed by the DMV only may be found in Tables A.2-6 and A.2-7. Similarly, Tables A.2-8 and A.2-9 present results for the DPS only. The proportion of HR, ID, and ML vehicles were estimated by classifying all vehicles that entered the station during a three-day period, while the inspected proportions were obtained over the entirety of Phase 3, which accounts for a larger number of inspected vehicles than vehicles in the population. Note that the population data are identical for all analyses; only the inspected sub-populations change with the agency.

A consistently statistically significant result is that Union had a greater HR inspection efficiency than Danbury. While a greater proportion of Danbury inspections were of HR vehicles, these vehicles were drawn from a population with a greater proportion of HR vehicles. After adjusting for population differences, inspectors at Union had about twice the efficiency of inspectors at Danbury for selecting HR vehicles.

Looking at DMV inspections only, an additional significant result is that Danbury (a non-ISS site) had a greater ID inspection efficiency than Union (an ISS site). When a selected vehicle was not HR, Danbury did a better job of at least selecting a carrier with insufficient data in order to increase the amount of information for that carrier. For DPS inspections only, Greenwich (an ISS site) had a significantly higher ID inspection efficiency than Middletown (a non-ISS site).

Table A.2-4. Inspection Efficiency by Site and ISS Usage in Connecticut (Pooled over DMV and DPS)

<table>
<tr><th colspan="2">Site</th><th>HR</th><th>ID</th><th>ML</th><th>Total</th><th>Total (Non-HR)</th><th>P(HR)</th><th>P(ID | Not HR)</th></tr>
<tr><td rowspan="3">Union</td><td>Inspected</td><td>430</td><td>706</td><td>2900</td><td>4036</td><td>3606</td><td>10.65</td><td>19.58%</td></tr>
<tr><td>Population</td><td>181</td><td>546</td><td>2815</td><td>3542</td><td>3361</td><td>5.11%</td><td>16.25%</td></tr>
<tr><td colspan="6">Inspected ÷ Population</td><td>2.08 **</td><td>1.21 **</td></tr>
<tr><td rowspan="3">Greenwich</td><td>Inspected</td><td>108</td><td>363</td><td>731</td><td>1202</td><td>1094</td><td>8.99%</td><td>33.18%</td></tr>
<tr><td>Population</td><td>62</td><td>190</td><td>774</td><td>1026</td><td>964</td><td>6.04%</td><td>19.71%</td></tr>
<tr><td colspan="6">Inspected ÷ Population</td><td>1.49 **</td><td>1.68 **</td></tr>
<tr><td>ISS
(Union and Greenwich)</td><td colspan="6">Inspected ÷ Population
(Weighted Average[1] of Union and Greenwich Efficiencies)</td><td>1.94 [2]</td><td>1.32 [2]</td></tr>
<tr><td rowspan="3">Danbury</td><td>Inspected</td><td>158</td><td>219</td><td>879</td><td>1256</td><td>1098</td><td>12.58</td><td>19.95%</td></tr>
<tr><td>Population</td><td>37</td><td>45</td><td>297</td><td>379</td><td>342</td><td>9.76%</td><td>13.16%</td></tr>
<tr><td colspan="6">Inspected ÷ Population</td><td>1.29</td><td>1.52 **</td></tr>
<tr><td rowspan="3">Middletown</td><td>Inspected</td><td>83</td><td>178</td><td>705</td><td>966</td><td>883</td><td>8.59%</td><td>20.16%</td></tr>
<tr><td>Population</td><td>11</td><td>41</td><td>208</td><td>260</td><td>249</td><td>4.23%</td><td>16.47%</td></tr>
<tr><td colspan="6">Inspected ÷ Population</td><td>2.03 *</td><td>1.22</td></tr>
<tr><td>Non-ISS
(Danbury and Middletown)</td><td colspan="6">Inspected ÷ Population
(Weighted Average[1] of Danbury and Middletown Efficiencies)</td><td>1.61 [2]</td><td>1.39 [2]</td></tr>
</table>

1 Each site's efficiency is weighted by the proportion of the total inspections performed at that site. For the Insufficient Data Efficiency, the total is the total number of non-HR inspections.

2 No measure of statistical significance is associated with these figures as they are pooled across analyses.

* Significantly different from 1 at the 0.05 level.

** Significantly different from 1 at the 0.01 level.

Table A.2-5. Comparison of Inspection Efficiencies between ISS and Non-ISS Sites in Connecticut (Pooled over DMV and DPS)

Comparison (ISS vs. Non-ISS)		Ratio [1]	P-value
HR Inspection Efficiency	Union vs. Danbury	1.62 *	0.0126
	Union vs. Middletown	1.03	0.9355
	Greenwich vs. Danbury	1.15	0.5360
	Greenwich vs. Middletown	0.73	0.3714
	Union/Greenwich vs. Danbury/Middletown	1.21 [2]	N/A [2]
ID Inspection Efficiency	Union vs. Danbury	0.80	0.1520
	Union vs. Middletown	0.98	0.9246
	Greenwich vs. Danbury	1.11	0.5380
	Greenwich vs. Middletown	1.38	0.0701
	Union/Greenwich vs. Danbury/Middletown	0.95 [2]	N/A [2]

1 A ratio greater than one indicates that the site on the left has a greater observed efficiency. A ratio less than one indicates that the site on the right has a greater efficiency.
2 No measure of statistical significance is associated with these figures as they are pooled across analyses.
* Significantly different from 1 at the 0.05 level.
** Significantly different from 1 at the 0.01 level.

Table A.2-6. Inspection Efficiency by Site and ISS Usage in Connecticut (DMV Only)

Site		HR	ID	ML	Total	Total (Non-HR)	P(HR)	P(ID | Not HR)
Union	Inspected	372	625	2558	3555	3183	10.46%	19.64%
	Population	181	546	2815	3542	3361	5.11%	16.25%
	Inspected ÷ Population						2.05 **	1.21 **
Greenwich	Inspected	19	42	132	193	174	9.84%	24.14%
	Population	62	190	774	1026	964	6.04%	19.71%
	Inspected ÷ Population						1.63	1.22
ISS (Union and Greenwich)	Inspected ÷ Population (Weighted Average[1] of Union and Greenwich Efficiencies)						2.03 [2]	1.21 [2]
Danbury	Inspected	34	75	240	349	315	9.74%	23.81%
	Population	37	45	297	379	342	9.76%	13.16%
	Inspected ÷ Population						1.00	1.81 **
Middletown	Inspected	58	119	464	641	583	9.05%	20.41%
	Population	11	41	208	260	249	4.23%	16.47%
	Inspected ÷ Population						2.14 *	1.24
Non-ISS (Danbury and Middletown)	Inspected ÷ Population (Weighted Average[1] of Union and Greenwich Efficiencies)						1.74 [2]	1.44 [2]

[1] Each site's efficiency is weighted by the proportion of the total inspections performed at that site. For the Insufficient Data Efficiency, the total is the total number of non-HR inspections.

[2] No measure of statistical significance is associated with these figures as they are pooled across analyses.

* Significantly different from 1 at the 0.05 level.

** Significantly different from 1 at the 0.01 level.

Table A.2-7. Comparison of Inspection Efficiencies between ISS and Non-ISS Sites in Connecticut (DMV Only)

Comparison (ISS vs. Non-ISS)		Ratio [1]	P-value
HR Inspection Efficiency	Union vs. Danbury	2.05 **	0.0030
	Union vs. Middletown	0.96	0.8959
	Greenwich vs. Danbury	1.63	0.1458
	Greenwich vs. Middletown	0.76	0.5033
	Union/Greenwich vs. Danbury/Middletown	1.17 [2]	N/A [2]
ID Inspection Efficiency	Union vs. Danbury	0.67 *	0.0247
	Union vs. Middletown	0.98	0.8838
	Greenwich vs. Danbury	0.68	0.0861
	Greenwich vs. Middletown	0.99	0.9564
	Union/Greenwich vs. Danbury/Middletown	0.84 [2]	N/A [2]

[1] A ratio greater than one indicates that the site on the left has a greater observed efficiency. A ratio less than one indicates that the site on the right has a greater efficiency.7

[2] No measure of statistical significance is associated with these figures as they are pooled across analyses.

* Significantly different from 1 at the 0.05 level.

** Significantly different from 1 at the 0.01 level.

Table A.2-8. Inspection Efficiency by Site and ISS Usage in Connecticut (DPS Only)

Site		HR	ID	ML	Total	Total (Non-HR)	P(HR)	P(ID | Not HR)
Union (ISS)	Inspected	58	81	342	481	423	12.06%	19.15%
	Population	181	546	2815	3542	3361	5.11%	16.25%
	Inspected ÷ Population						2.36 **	1.18
Greenwich (ISS)	Inspected	89	321	599	1009	920	8.82%	34.89%
	Population	62	190	774	1026	964	6.04%	19.71%
	Inspected ÷ Population						1.46 *	1.77 **
ISS (Union and Greenwich)	Inspected ÷ Population (Weighted Average[1] of Union and Greenwich Efficiencies)						1.75 [2]	1.58 [2]
Danbury (Non-ISS)	Inspected	124	144	639	907	783	13.67%	18.39%
	Population	37	45	297	379	342	9.76%	13.16%
	Inspected ÷ Population						1.40	1.40 *
Middletown (Non-ISS)	Inspected	25	59	241	325	300	7.69%	19.67%
	Population	11	41	208	260	249	4.23%	16.47%
	Inspected ÷ Population						1.82	1.19
Non-ISS (Danbury and Middletown)	Inspected ÷ Population (Weighted Average[1] of Union and Greenwich Efficiencies)						1.51 [2]	1.34 [2]

1 Each site's efficiency is weighted by the proportion of the total inspections performed at that site. For the Insufficient Data Efficiency, the total is the total number of non-HR inspections.
2 No measure of statistical significance is associated with these figures as they are pooled across analyses.
* Significantly different from 1 at the 0.05 level.
** Significantly different from 1 at the 0.01 level.

Table A.2-9. Comparison of Inspection Efficiencies between ISS and Non-ISS Sites in Connecticut (DPS Only)

Comparison (ISS vs. Non-ISS)		Ratio [1]	P-value
HR Inspection Efficiency	Union vs. Danbury	1.69 *	0.0218
	Union vs. Middletown	1.30	0.4927
	Greenwich vs. Danbury	1.04	0.8619
	Greenwich vs. Middletown	0.80	0.5699
	Union/Greenwich vs. Danbury/Middletown	1.16 [2]	N/A [2]
ID Inspection Efficiency	Union vs. Danbury	0.84	0.3724
	Union vs. Middletown	0.99	0.9507
	Greenwich vs. Danbury	1.27	0.1811
	Greenwich vs. Middletown	1.48 *	0.0498
	Union/Greenwich vs. Danbury/Middletown	1.18 [2]	N/A [2]

1 A ratio greater than one indicates that the site on the left has a greater observed efficiency. A ratio less than one indicates that the site on the right has a greater efficiency.7

2 No measure of statistical significance is associated with these figures as they are pooled across analyses.

* Significantly different from 1 at the 0.05 level.

** Significantly different from 1 at the 0.01 level.

Another inference that may be drawn from Analysis 1 is an assessment of how well each agency made use of ISS. The ISS High Risk Efficiencies for the DMV and for the DPS were 1.17 and 1.16, respectively. Thus, the two agencies similarly improved their efficiency in selection of high-risk vehicles through use of ISS. The ISS Insufficient Data Efficiencies for the DMV and for the DPS were 0.84 and 1.18, respectively. It seems, therefore, that use of ISS has decreased the DMV's and increased the DPS's efficiency in choosing vehicles with insufficient data for a risk classification among the vehicles left over after selection of high risk vehicles. As footnoted in Tables A.2-6 and A.2-8, these efficiency estimates do not have associated levels of statistical significance. They are provided here as an additional qualitative comparison. They were obtained by taking weighted averages of within site efficiencies.

Comparison of Screening Effectiveness Within the Three Phases

The second analysis assessed the utility of ISS via comparisons of agencies within each of the three phases. A comparison of DMV versus DPS acts, in Phase 1, as a surrogate for an ISS versus non-ISS comparison, in Phase 2, as a surrogate for an ISS versus "Transitioning into

ISS" comparison, and in Phase 3, as a comparison of agencies that both use ISS. The Phase 3 comparison was a control comparison against which we may compare the results of Phases 1 and 2 to see if agency differences are related to ISS usage or to other unquantified differences between agencies.

Here, only inspections from Greenwich and Union (ISS sites) are used, because the ISS vs. Non-ISS comparison is made between agencies rather than between sites. Comparing agencies within Danbury and Middletown would be a Non-ISS versus Non-ISS comparison, which would not aid in the evaluation of ISS. As comparisons are made within sites, there is no need to control for population differences. Again, the two-stage model in Figure A.2-2 was employed. The first stage estimated the proportion of HR vehicles inspected by each agency. The second stage estimated the proportion of non-HR vehicles inspected by each agency that had insufficient data for assignment of a risk classification. The probability ratios of interest are

$$P(HR \mid DMV) \div P(HR \mid DPS)$$

and

$$P(ID \mid \text{not HR}, DMV) \div P(ID \mid \text{not HR}, DPS).$$

During Phases 1 and 2, we were unable to identify carriers with insufficient data. Thus, the second ratio is calculated for Phase 3 only. Table A.2-10 presents the results of Analysis 2.

Conclusions about ISS vs. Non-ISS are limited because screening efficiencies for trucks with insufficient data can only be determined in Phase 3. However, we may conclude that the DPS at Greenwich had a significantly higher ID inspection efficiency than did the DMV at Greenwich during Phase 3.

During Phase 1, the differences between inspections conducted by DMV and DPS were insignificant. (A limited number of inspections were reported for the DPS.) During Phase 2, the DMV performed significantly better at selecting HR vehicles than the DPS at Greenwich. (The two agencies performed similarly at Union.) Thus, when considering HR efficiency, the only significant result supports the hypothesis that ISS improves selection efficiency.

Table A.2-10. ISS Evaluation Via Agency Comparison: Phases 1 to 3, Connecticut

Site	Agency	HR	Not HR	Total	P(HR)
Phase 1 (June 1996 to May 1997)					
Union	DMV	3	30	33	9.09%
	DPS	0	0	0	--
	DMV ÷ DPS (ISS vs. Non-ISS)				--
Greenwich	DMV	126	716	842	14.96%
	DPS	12	52	64	18.75%
	DMV ÷ DPS (ISS vs. Non-ISS)				0.80
Phase 2 (June 1997 to May 1998)					
Union	DMV	208	2036	2244	9.27%
	DPS	33	319	352	9.38%
	DMV ÷ DPS (ISS vs. Non-ISS)				0.99
Greenwich	DMV	98	511	609	16.09%
	DPS	40	482	522	7.66%
	DMV ÷ DPS (ISS vs. Non-ISS)				2.10 **
Pooled over Sites (ISS vs. Transition into ISS)					1.33

Site	Agency	HR	ID	ML	Total	Total (Non-HR)	P(HR)	P(ID | Not HR)
Phase 3 (June 1998 to May 1999)								
Union	DMV	372	625	2784	3781	3409	9.84%	18.33%
	DPS	58	81	342	481	423	12.06%	19.15%
	DMV ÷ DPS (ISS vs. ISS) (control)						0.82	0.96
Greenwich	DMV	19	42	132	193	174	9.84%	24.14%
	DPS	89	321	611	1021	932	8.72%	34.44%
	DMV ÷ DPS (ISS vs. ISS) (control)						1.13	0.70 *
Pooled							0.89	0.90

* Significantly different from 1 at the 0.05 level.
** Significantly different from 1 at the 0.01 level.

ESTIMATION OF CVISN CRASH AVOIDANCE BENEFITS

The prediction of CVISN safety benefits presented in Chapter 5 relied on specific estimates of the improvement in inspection selection efficiency that are or could be directly attributable to CVISN deployment. The primary source of data for developing these estimates came from the Connecticut Screening Assessment Study. This section presents the analyses that support these key findings.

As discussed in Section 5.2, the Connecticut Screening Assessment Study was conducted at four commercial vehicle weigh stations in Connecticut to evaluate the effectiveness of ISS for improving the inspection selection efficiency of roadside operations. Inspection selection efficiency is measured by the number of OOS orders issued per 100 vehicles inspected. Increased efficiency means that more unsafe vehicles or drivers will be removed from the highway for the same number of inspections performed. During 13 days of data collection, approximately 10,000 vehicle identification numbers were recorded for all trucks entering the four weigh stations. At two of the stations (Danbury and Middletown), vehicles are selected for inspection without the aid of ISS. At the other sites (Union and Greenwich), vehicles are pre-screened using weigh-in-motion (WIM) and visual inspection. Vehicles sent to the fixed scale for weighing are then screened for inspection using ISS ratings. Figure A.2-3 shows the configuration of the Union facility.

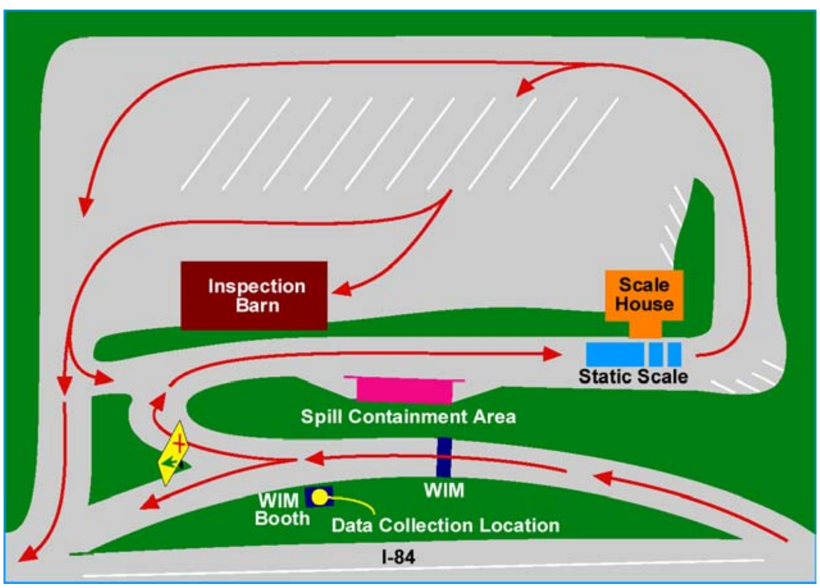

Figure A.2-3. Schematic of Connecticut's Union Facility with WIM Sorting

The vehicle identification numbers were used to characterize the distribution of trucks in terms of safety risk at each inspection site. This was achieved during the analysis phase by calculating the SafeStat score for each truck. SafeStat is an automated motor carrier safety status measurement system developed for FMCSA that combines current and historical safety data to measure the relative fitness of motor carriers (Volpe 1998). In addition to the inspection results obtained during the data collection phase, results of over 58,000 inspections performed over a four-year period at these sites were analyzed.

The analyses performed with these data are summarized in Table A.2-11. The SafeStat scores for the 10,000 trucks that visited the four sites were used to estimate the distribution of trucks that would be inspected if vehicles were selected at random. This serves as a baseline which allows us to make valid comparisons of inspection selection strategies at each site. For example, at the Danbury site, which does not use ISS for vehicle selection, the distribution of trucks includes 8.6% high-risk vehicles (according to SafeStat scores) and 47.2% low-risk vehicles. The actual inspection results show that inspectors are selecting more high-risk (12.0% versus 8.6%) and fewer low-risk (36.1% versus 47.2%) vehicles for inspection then they would if vehicles were selected at random. Multiplying these percentages by the statewide OOS rate gives the expected number of OOS orders per 100 vehicles inspected within each risk category. Notice that the statewide OOS rate for low-risk carriers is 38% compared to rates of 42% to 63% for the other risk categories. The totals represent the expected number of OOS order for a given inspection selection strategy. Notice that the inspectors at Danbury average 48.4 OOS orders per 100 inspections using their own judgment and experience to select vehicles for inspection. Random selection would produce only 46.76 OOS orders per 100 inspections. Combining the Danbury and Middletown results we see that inspector judgment and experience produce 3.5% more OOS orders than random selection. Even though Connecticut's OOS rates are much higher than the national average, the percent difference in these rates is consistent with similar findings from the National Fleet Safety Survey (1997).

Table A.2-11. Estimating the Improvements in OOS Rates Resulting from the Use of ISS and Electronic Screening in Roadside Enforcement

Station	Risk Category	CMV Inspection Selection Percentages			State OOS Rate (%)	No. OOS Orders per 100 Inspections[4]		
		Random Selection[1]	Actual Inspection Selections[2]	With Electronic Screening[3]		With Random Selection	Predicted from Actual Inspections	With Electronic Screening
Danbury (non-ISS)	High	8.6	12.0	18.8	63	5.42	7.56	11.83
	Medium	30.5	33.1	51.8	59	18.00	19.53	30.56
	Low	47.2	36.1	0.0	38	17.94	13.72	0.00
	Insuff. Data	10.7	13.7	21.4	42	4.49	5.75	9.00
	Unknown	3.0	5.1	8.0	53	1.59	2.70	4.23
	Total Expected OOS Orders per 100 Inspections					**47.43**	**49.26**	**55.63**
Middletown (non-ISS)	High	5.1	6.8	11.3	63	3.21	4.28	7.14
	Medium	26.1	27.4	45.7	59	15.40	16.17	26.94
	Low	49.8	40.0	0.0	38	18.92	15.20	0.00
	Insuff. Data	13.8	16.2	27.0	42	5.80	6.80	11.34
	Unknown	5.2	9.6	16.0	53	2.76	5.09	8.48
	Total Expected OOS Orders per 100 Inspections					**46.09**	**47.54**	**53.90**
Average for Non-ISS Sites						46.76	48.40	54.77
Percent increase in OOS orders compared to random inspections							3.5%	17.1%
Greenwich (with ISS)	High	5.1	7.8	10.8	63	3.21	4.91	6.81
	Medium	29.2	26.9	37.3	59	17.23	15.87	21.98
	Low	45.4	27.8	0.0	38	17.25	10.56	0.00
	Insuff. Data	16.2	25.9	29.7	42	6.80	10.88	15.07
	Unknown	4.1	11.6	7.5	53	2.17	6.15	8.52
	Total Expected OOS Orders per 100 Inspections					**46.67**	**48.38**	**52.37**
Union (with ISS)	High	4.6	11.1	18.3	63	2.90	6.99	11.50
	Medium	25.8	32.2	53.0	59	15.22	19.00	31.25
	Low	55.7	39.2	0.0	38	21.17	14.90	0.00
	Insuff. Data	11.9	13.8	22.7	42	5.00	5.80	9.53
	Unknown	2.0	3.7	6.1	53	1.06	1.96	3.23
	Total Expected OOS Orders per 100 Inspections					**45.34**	**48.64**	**55.51**

Average for ISS Sites	**46.01**	**48.51**	**53.94**
Percent increase in OOS orders compared to random inspections		**5.4%**	**17.1%**
Percent increase in OOS orders due to use of ISS – versus non-ISS		**1.9%**	
Percent increase in OOS orders with electronic screening of low-risk carriers – compared to ISS users without electronic screening			**11.2%**

1. Random selection percentages were determined from SafeStat scores of more than 10,000 vehicles that were observed at specified inspection stations during the Screening Assessment study (Spring 1999).
2. Actual selection percentages are based on more than more than 58,000 inspections performed at the specified inspection stations between October 1995 and June 1999.
3. Distribution was derived from actual selection percentages (note 2) and the assumption that electronic screening will eliminate low-risk carriers from the selection process. (e.g., for Danbury high-risk category 18.8% = 12.0%/(1-0.361)
4. Product of CMV selection percentage and state OOS rate.

The same calculations were performed with the data from the Greenwich and Union, which use ISS and manual pre-screening with WIM, in addition to judgment and experience, to make inspection selection decisions. This inspection selection process produces 5.4% more OOS orders than random selection. Using an odds ratio to adjust for differences in populations, we estimate that the net effect of using ISS with manual pre-screening produces 1.9% more OOS orders than would be achieved with inspector judgment and experience. This estimate was used in the model for crashes avoided under scenario RE-1.

To simulate the impact of electronic screening under full deployment, we assumed that all low-risk carriers would enroll and be permitted to bypass all inspection sites. Since no low-risk carriers will be inspected, we assumed that inspectors would proportionally allocate the inspections among the other risk categories. The predicted number of OOS orders with electronic screening was then calculated in the same manner. The relevant finding is that by using electronic screening to eliminate the low-risk carriers (and thereby target high-risk carriers) can increase OOS orders by 11.2%. This estimate was used in the model for crashes avoided under scenario RE-2.

Comparison of SAFER Data Mailbox Configurations

At present, Connecticut has two different SAFER Data Mailbox system configurations available for use. They currently use the CDPD configuration, although the Motorola 800 MHz system has been tested and will become more integrated given that the CT DPS currently is deploying the Motorola system to all State Police. Figures A.2-4 and A.2-5 illustrate the two configurations as they are used in Connecticut.

Figure A.2-4 shows the CDPD configuration. In this configuration:

- the inspector (mobile patrol or fixed site) completes an inspection using ASPEN and uploads the data via CDPD to the SCA server. Inspections are uploaded after each inspection is completed;
- the SCA server transmits the data to Blizzard-32;
- Blizzard-32 uploads inspection data to the SDMB on a two-minute interval where it becomes immediately available for queries conducted by roadside inspectors across the country;
- Blizzard-32 copies inspection data to the Avalanche Inspection Manager for upload to SAFETYNET;
- the data are uploaded from the inspection manager to the SAFETYNET database where they are cleaned and prepared for upload to MCMIS;
- the State uploads data to MCMIS daily;
- the roadside queries conducted as part of an inspection are sent directly to the SDMB via CDPD.

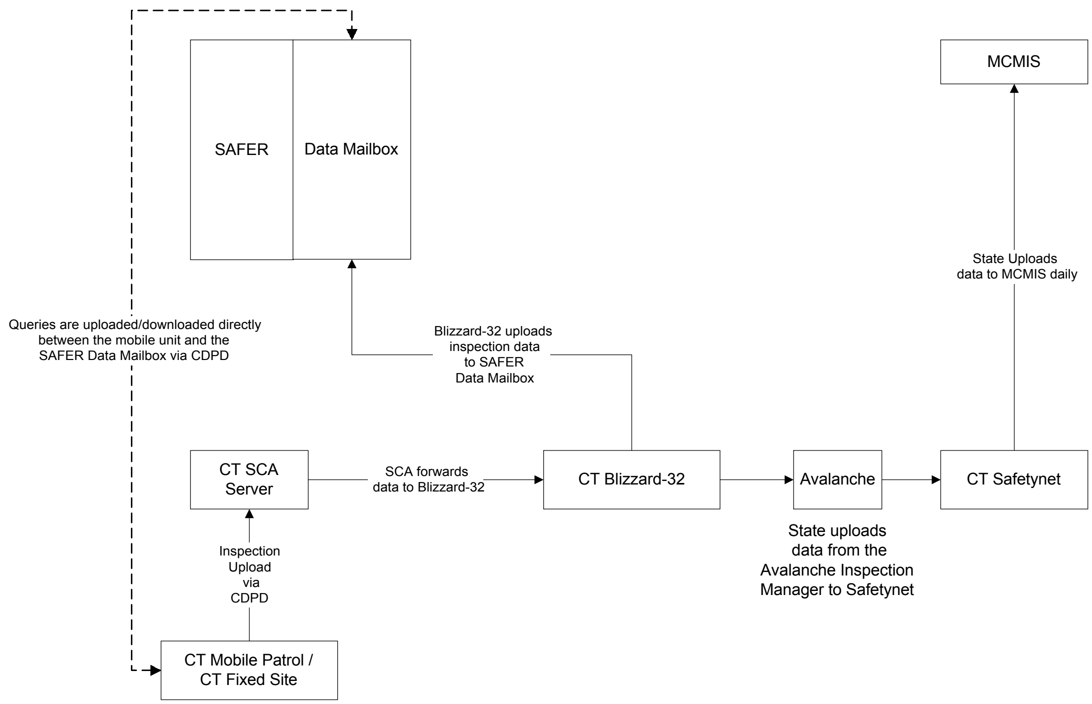

Figure A.2-4. Connecticut SAFER Configuration Using CDPD System

Figure A.2-5 shows the Motorola 800 MHz Configuration. In this configuration:

- the inspector (mobile patrol or fixed site) completes an inspection using ASPEN and uploads the data via Motorola 800 MHz to the SCA server. Inspections are uploaded after each inspection is completed;
- the SCA server transmits the data to Blizzard-32;
- Blizzard-32 uploads inspection data to the SDMB on a two-minute interval where it becomes immediately available for queries conducted by roadside inspectors across the country;
- Blizzard-32 copies inspection data to the Avalanche Inspection Manager for upload to SAFETYNET;
- the data are uploaded from the inspection manager to the SAFETYNET database where they are cleaned and prepared for upload to MCMIS;
- the State uploads data to MCMIS daily;

- the roadside queries conducted as part of an inspection are sent to the SDMB via the SCA server. The queries are transmitted to the server via the Motorola system and then sent to the SDMB via a TCP/IP redirector.

It should be noted that system changes with the deployment of SAFETYNET2000 should not affect the timeliness of data transmissions.

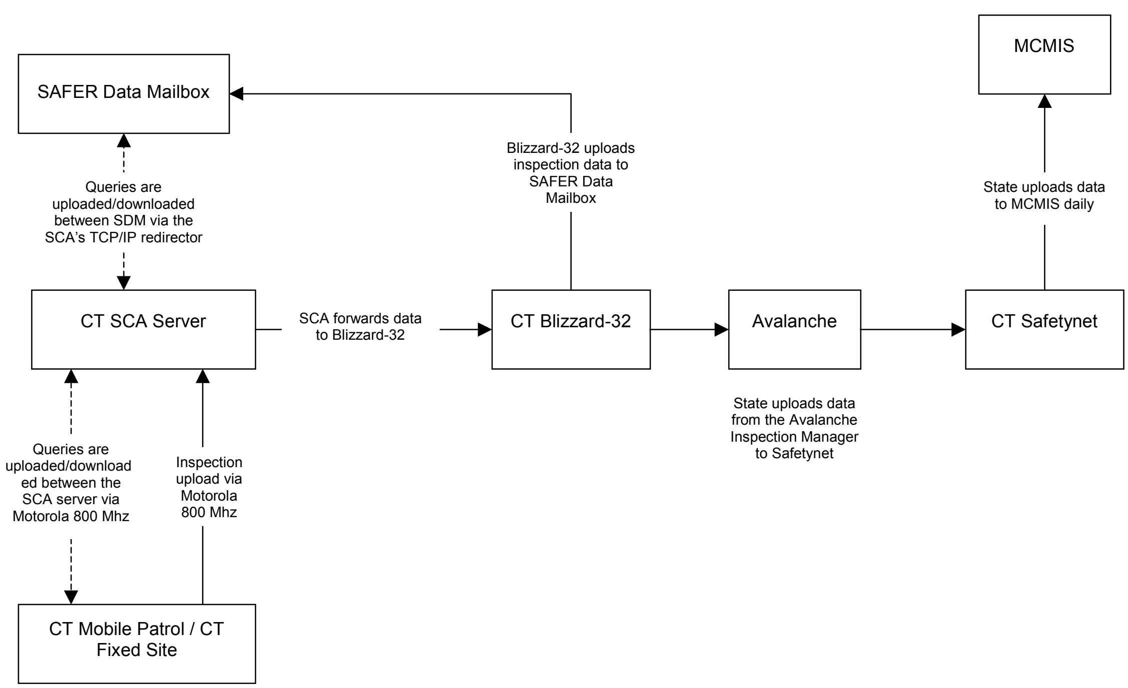

Figure A.2-5. Connecticut SAFER Configuration Using the Motorola 800 MHz System

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APPENDIX A.3:

KENTUCKY SCREENING ASSESSMENT STUDY RESULTS

APPENDIX A.3: KENTUCKY SCREENING ASSESSMENT STUDY RESULTS

INTRODUCTION

The CVISN Model Deployment Initiative (MDI) is designed to implement the primary CVISN user services in ten participating states to demonstrate their technical and institutional feasibility, costs, and benefits, and to encourage further deployment. Improved safety of commercial motor vehicles is one of the ultimate objectives of the CVISN MDI. This improved safety will come about as a direct effect of improved efficiency with which high-risk carriers are selected for inspection. Improved targeting of high-risk carriers will result in an increase in the number of vehicles that are found to be in violation of Federal Motor Carrier Safety Regulations (FMCSRs) and are put out of service as a consequence. Increasing the number of vehicles placed out of service will reduce the number of crashes involving large commercial motor vehicles, specifically reducing the number of such crashes where OOS conditions are a contributing factor. CVISN deployment may also have an indirect effect, which will be to increase the compliance rate of large commercial vehicles with FMCSR. An increased compliance rate means that there will be fewer vehicles on the road with OOS conditions, leading to fewer crashes.

In order to assess the impact of CVISN deployment on safety, it was necessary to conduct studies in several states to collect appropriate evaluation data. One of these studies was undertaken in Kentucky. The Kentucky Screening Assessment Study focuses on measuring changes in screening effectiveness at sites in Kentucky where CVISN's Electronic Screening technology was deployed. The goal of the Kentucky Screening Assessment Study is to measure screening effectiveness at several inspection sites and to compare those measures between sites that have Electronic Screening deployed and those that do not.

The sections that follow discuss the Kentucky Screening Assessment Study, describing the study design and approach, the study results, and study conclusions.

APPROACH

The objective of the Kentucky Screening Assessment Study was to determine whether the use of Electronic Screening had an impact on the safety. To address the objectives, two analyses were performed. The first focused on the ability of inspectors to select higher-risk vehicles, and the second focused on the number of OOS orders that would be expected as a result of improved inspection efficiency. A single study was conducted to collect data that could be used for analyses, although the second analyses also required some additional historical data.

The sections that follow describe the design of the Kentucky Screening Assessment Study, data collection, and statistical analysis methods.

Study Design and Methods

There are several ways one could measure the effectiveness of the roadside inspection process. The most direct way would be to measure the number of crashes, injuries, and fatalities that occur under different inspection scenarios. This way, however, has important limitations. First, deployment is not uniform even within a state, and vehicles travel across the entire state, so it would be impossible to determine "zones" that would represent any specific inspection scenario. As a result, a one-time study would not provide method-specific information. Second, if a study is done over time to provide a before-and-after comparison, other influences in addition to the inspection method may affect safety.

Rather than basing the safety evaluation on crashes, injuries, and fatalities, it could be based on a surrogate that is strongly related to the measures of greatest concern. One such surrogate is the number of violations (or OOS orders) issued during inspections conducted with and without the technology deployed. After all, if officers find more violations when they have access to the Electronic Screening, then it would appear that the technology is providing value to the inspection selection process. This approach also has an important limitation. Whether an inspector finds a violation depends on the thoroughness of the inspection. Thus, differences among inspectors, their individual aptitudes and attitudes, and the inspection conditions may result in variability in the data, as do differences in weather conditions. Nonetheless, one of the analyses will look at OOS orders as a surrogate measure of safety benefits.

An important variable affecting the number of OOS orders given is the ability of inspectors to focus their efforts on higher-risk trucks as a result of CVISN. CVISN model deployments are expected to improve the ability of enforcement personnel to identify high-risk vehicles at the roadside, leading to higher numbers of unsafe trucks being taken off the road, which will result in fewer crashes, injuries, and fatalities. However, targeting "high-risk" carriers is not the only priority. The Office of Motor Carrier Safety has also made it a priority to obtain information on carriers for which very little data have been collected. Electronic screening enables carriers with good safety records (and satisfactory credentials) to bypass weigh stations, enabling staff to focus on carriers with poorer safety histories and carriers for whom insufficient data are available.

For both OOS rates and high-risk inspection efficiency, it is necessary to have a safety rating for each vehicle. In this study, that safety rating is based on the carrier safety history, as measured by SafeStat [1]. The SafeStat ranking system, developed by the Volpe National Transportation Systems Center, is an automated, data-driven analysis system that is designed to incorporate current on-road safety performance information and enforcement history with on-site compliance review information in order to measure the relative safety fitness of interstate motor carriers. The system provides the Federal Highway Administration's (FHWA's) Office of Motor Carriers (OMC) with the capability to continuously quantify and monitor the safety status of motor carriers, especially unsafe carriers. This allows OMC enforcement and education programs to effectively allocate resources to carriers that pose a high risk of involvement in accidents.

Data Collection

The data that were needed to assess the impact of Electronic Screening on inspection selection efficiency and resulting OOS orders include the following:

- Risk classifications for trucks in the population at each inspection site;
- Risk classifications for trucks that were inspected; and
- OOS rates by risk classification.

In order to obtain this information, an observational study was conducted from September 28 to October 29, 1999 at five inspection sites: Boone, Kenton, Laurel (northbound), Shelby Eastbound, and Shelby Westbound. These sites were selected because each had an electronic reader that recorded the U.S. DOT number of each truck that passed the site. Of these sites, only Laurel had Electronic Screening in operation. The DOT numbers were inputted into SafeStat to obtain a risk rating for each truck that could be identified. Five risk categories were defined based on the SafeStat score: high risk, medium risk, low risk, insufficient data, or unknown. The U.S. DOT numbers for each of the trucks inspected at these sites were also obtained, with SafeStat again being used to provide risk classifications.

In order to obtain OOS rates by risk category, historical inspection data was obtained for the entire state for the year 1998. The U.S. DOT number of each inspected truck was used to obtain its risk classification, and the inspection records were used to determine whether an OOS order had been issued. OOS rates were calculated as the number of OOS orders given per 100 inspections.

Statistical Methods

The primary objective of inspection selection studies is to determine whether the proportion of inspections that were of high-risk vehicles increased with the use of CVISN technologies. A secondary objective is to look at the population of vehicles other than high-risk vehicles and determine whether more attention was given to vehicles that had insufficient data to be assigned a risk classification. The secondary objective is important to consider because ISS gives high priority to inspecting carriers with a bad safety record, as well as carriers with little historical data.

To address these objectives, the analysis is based on dividing all vehicles into three risk categories: High Risk (HR), Insufficient Data (ID) and Medium/Low Risk (ML). The inspection rate for a high-risk vehicle may be expressed as $P(I \mid HR)$, the probability of being inspected, given that the vehicle is from a high-risk carrier. Using Bayes Theorem, we may write

$$P(I \mid HR) = \frac{P(HR \mid I)P(I)}{P(HR)}$$

where P(HR | I) is the probability that a given inspection is of a high-risk carrier, P(I) is the proportion of all vehicles that are inspected and P(HR) is the proportion of all vehicles that are from high-risk carriers. We may safely assume that P(I) and P(HR) are constant during the study or, if they do change, change similarly with and without deployment of CVISN technology. The assumption that P(HR) is constant is supported by the results of the Oregon Green Light Study, which is discussed in Appendix A. Thus, when comparing P(I | HR) with and without CVISN, it is equivalently to compare P(HR | I) instead. This quantity is the measure that is directly estimable from the selection studies conducted and is referred to as "inspection selection efficiency," that is, how likely a particular inspection selection is to have resulted in an inspection of a high-risk carrier.

Figure A.3-1 illustrates the two-stage statistical model used to achieve the primary and secondary objectives. First, the proportion of all screenings that are high-risk vehicles is estimated, and then the probability of screening a vehicle with insufficient data given that it is not a high-risk vehicle is estimated. These proportions can be estimated for various combinations of agencies, sites, phases, and ISS usage. As a result, this approach allows us to compare the proportions of high-risk and insufficient data vehicles between sites and agencies.

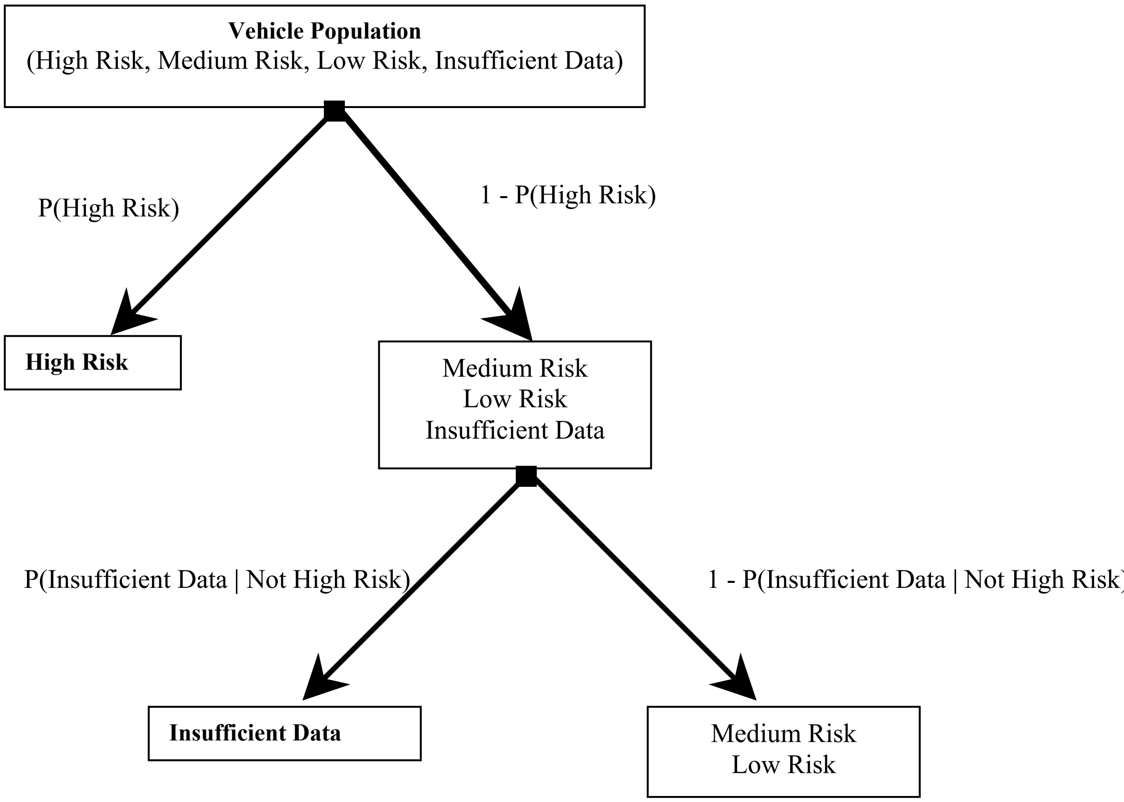

Figure A.3-1. Two-Stage Model for Vehicle Risk Distribution

The analysis of OOR rates differs from the inspection selection efficiency analysis. The expected number of OOS orders is calculated for two scenarios: if trucks were selected randomly for inspection, and if trucks were selected according to current practices. The expected number of OOS orders per 100 inspections under each of these scenarios is calculated by multiplying the proportion of trucks in each risk category by the OOS rate for that category. That is, the number of OOS orders per 100 inspections is equal to the proportion of those 100 inspections that would be expected to be in the risk category multiplied by the OOS rate for the risk category. The sum of those numbers over all five risk categories gives the total number of OOS orders expected per 100 inspections. The population proportions are used to calculate expected OOS orders for random selection while the inspected proportions are used to calculate expected OOS orders under current practices.

In order to compare results for sites with and without Electronic Screening in operation, the difference between expected OOS orders for current practices and random selection were compared. Average differences were calculated for each of the four non-ES sites.

In addition to this analysis, one additional analysis of OOS orders was performed. Electronic Screening implementation was still in its early stages. As a result, there were few participants at the time of the study. As implementation matures, more and more vehicles would be expected to enroll. On possible scenario for the future is that Electronic Screening becomes deployed to the extend that all low-risk vehicles participate. Under that scenario, if all low-risk vehicles are allowed to bypass inspection stations, no low-risk vehicles would be inspected. The numbers of inspections for the remaining four risk categories would increase proportionally. Comparing the number of OOS orders per 100 inspections for this scenario with current practices and random selection would provide an estimate of the full potential of Electronic Screening on safety.

RESULTS

Figures A.3-2 through A.3-4 summarize the truck count data that were collected at each of the five inspection sites. Figure A.3-2 shows the number of trucks observed at each inspection site during each week of the study. Of the five participating sites, Boone, had the highest truck volume, averaging over 9,000 trucks per week. The weekly truck volume at other four sites averaged between 4,500 and 6000. Figure A.3-3 shows the average number of trucks per hour observed at each site, with averages taken by day, and Figure A.3-4 plots the average hourly truck volume by the day of the week. Both figures show that truck volume was greatest between Tuesday and Thursday and least on Saturdays and Sundays. These figures also show that data were not collected on weekends at the Shelby and Kenton sites, nor were data collected on Sundays at Boone.

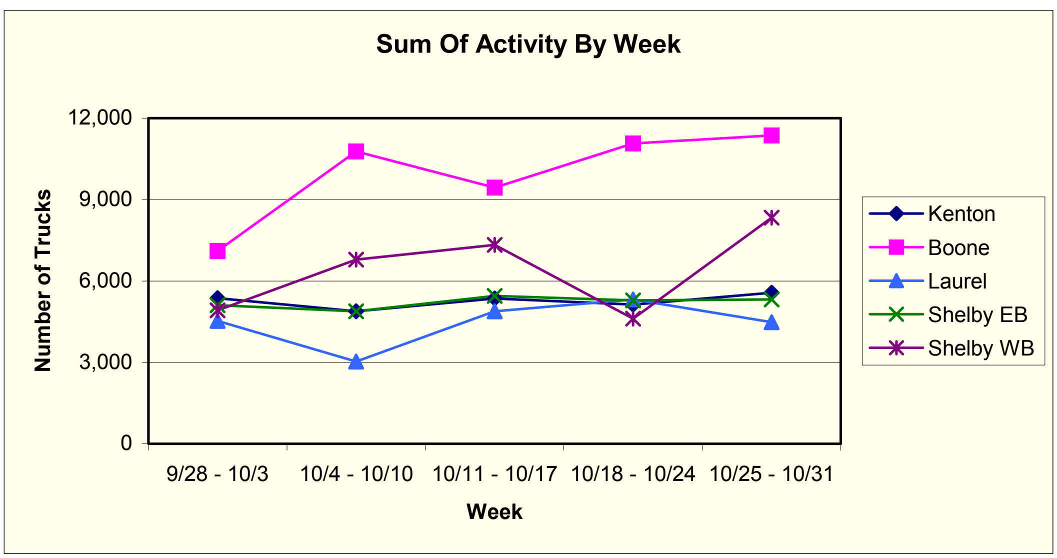

Figure A.3-2. Number of Trucks Observed by Week at Kentucky Inspection Sites

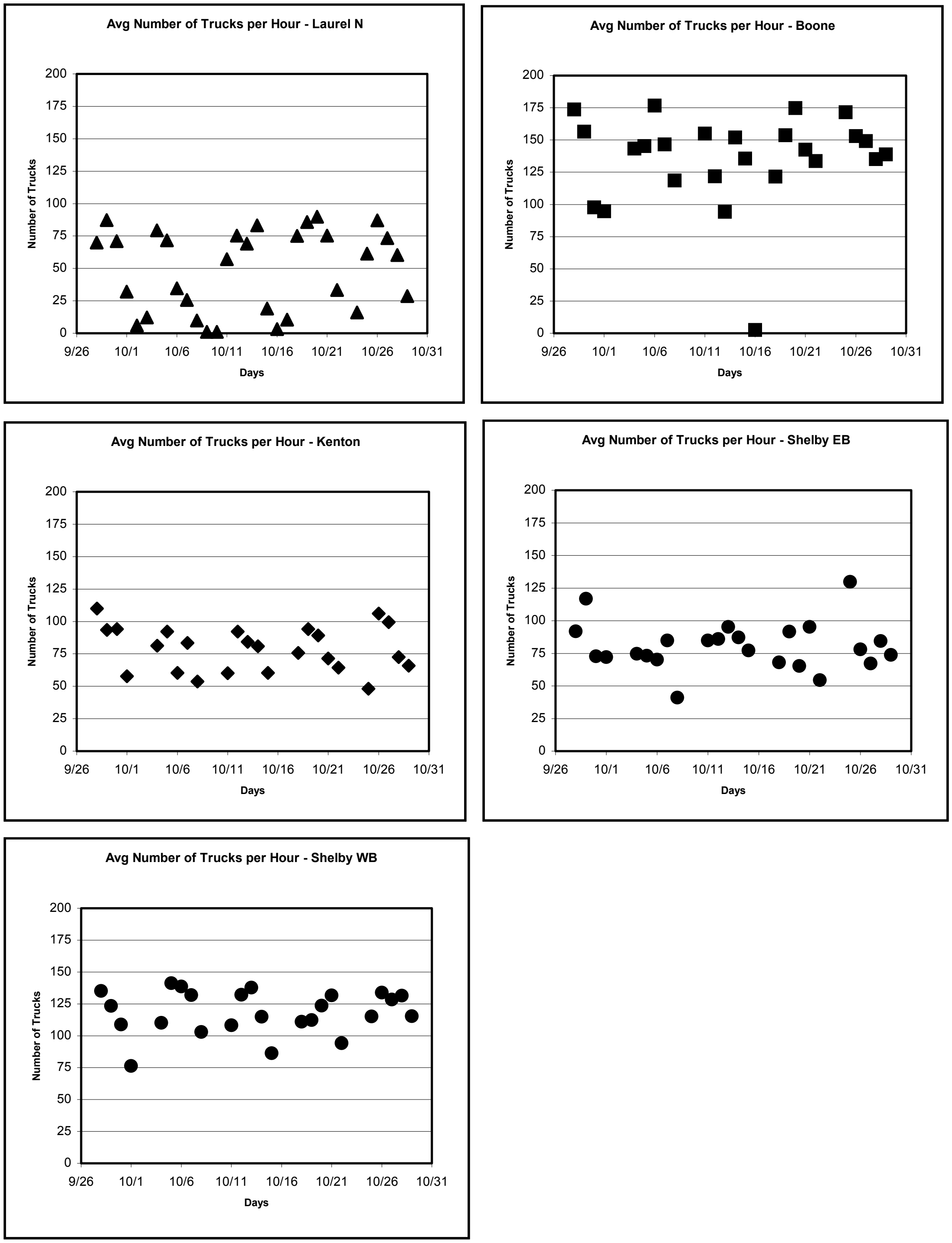

Figure A.3-3. Average Number of Trucks per Hours by Site in Kentucky Study

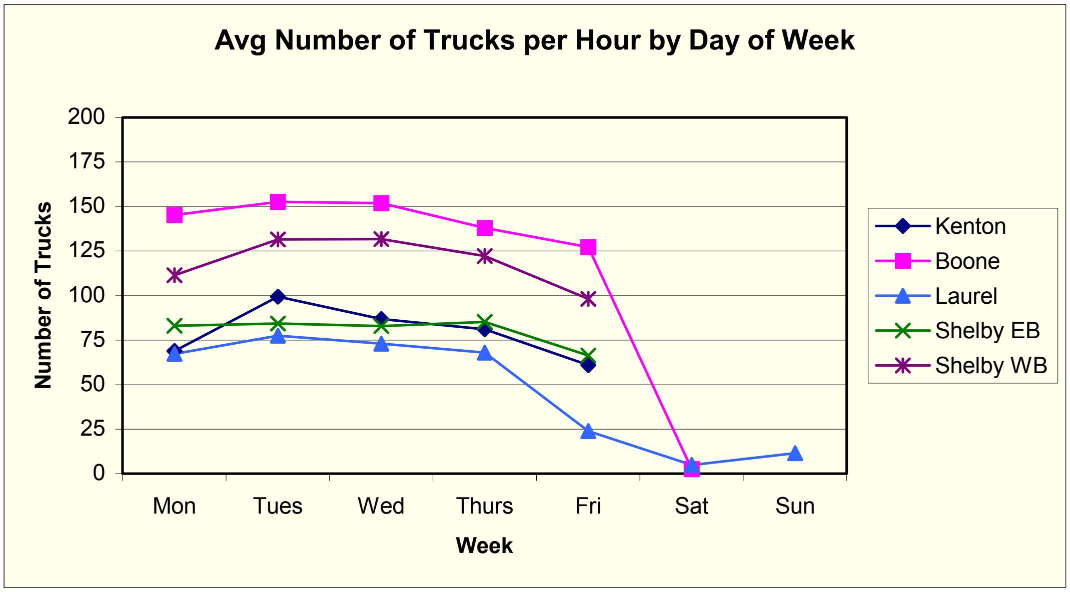

Figure A.3-4. Average Number of Trucks Observed per Hour by Day of Week

Table A.3-1 summarizes the ISS efficiency at each of the five sites in terms of probability of selecting high-risk trucks. The vehicles selected for inspection at each site were divided into high-risk, insufficient data, and medium- and low-risk carriers based on SafeStat scores. Table A.3-1 shows that the ratio of the proportion of high-risk vehicles inspected to the proportion in the population ranges from 1.78 to 2.11. All of these ratios are statistically significantly greater than 1 (the value expected if there was no difference between random inspections and current practices). Of interest is the fact that that ratio is smallest at the site with electronic screening in operation, which may indicate that electronic screening is not yet an effective tool in improving inspection efficiency. The ratio of the conditional probability of selecting a vehicle with insufficient data to the same value in the population ranges from 3.08 to 8.79. Here, the ratio for Laurel, where electronic screening is operating, is at the upper end of the range. Statistical comparisons between ES and individual non-ES sites for the ratio of high-risk vehicles inspected were not significant. Statistical comparisons of conditional inspection rates between ES and individual non-ES sites for vehicles with insufficient data were significant for Laurel versus Boone, Kenton, and Shelby EB. Statistical comparisons between Laurel and the four non-ES sites combined were also significant for vehicles with insufficient data but not for high-risk vehicles.

Table A.3-1. Kentucky ISS Efficiency

Site	ISS	HR	ID	ML	Total	Total (Non-HR)	P(HR)	P(ID | Not HR)
Laurel	Inspected	561	519	4162	5242	4681	10.70	11.09
	Population	1086	224	16803	18113	17027	6.00	1.32
	Inspected vs Population						**1.78**	**8.43**
Boone	Inspected	236	106	1732	2074	1838	11.38	5.77
	Population	2577	410	39143	42130	39553	6.12	1.04
	Inspected vs Population						**1.86**	**5.56**
Kenton	Inspected	398	200	2953	3551	3153	11.21	6.34
	Population	1214	402	19122	20738	19524	5.85	2.06
	Inspected vs Population						**1.91**	**3.08**
Shelby EB	Inspected	128	154	1213	1495	1367	8.56	11.27
	Population	857	334	19916	21107	20250	4.06	1.65
	Inspected vs Population						**2.11**	**6.80**
Shelby WB	Inspected	131	175	1145	1451	1320	9.03	13.26
	Population	1218	377	24625	26220	25002	4.65	1.51
	Inspected vs Population						**1.94**	**8.79**
Total Non-ES	Inspected	893	635	7043	8571	7678	10.42	8.27
	Population	5866	1523	102806	110195	104329	5.32	1.46
	Inspected vs Population						**1.95**	**5.67**

The analysis comparing OOS rates requires estimates of OOS rates across risk categories. Table A.3-2 shows statewide OOS rates by risk categories, which were calculated using all inspections in Kentucky in 1998. OOS rates ranged from 13.6 per 100 inspections for low-risk trucks to 26.6 per 100 inspections for high-risk trucks. OOS rates for trucks with insufficient data fell between low-risk and medium-risk trucks, and OOS rates for unknown trucks fell between medium- and high-risk trucks. The overall OOS violation rate was 18.6% over 1998.

Table A.3-2. Statewide OOS Violation Rates by Risk Category

Risk Class	Number of Trucks	Number of OOS Violations	OOS Rate (No. per 100 Inspections)
High-Risk	7,311	1,946	26.6
Medium-Risk	23,926	5,072	21.2
Low-Risk	35,794	4,850	13.6
Insufficient Data	7,793	1,503	19.3
Unknown	9,035	2,188	24.2
Total	83,859	15,559	18.6

Table A.3-3 presents the results of the analysis of OOS rates. The population of trucks is divided among the various risk categories in three ways:

- the observed population at each site;
- the proportion that are inspected; and
- the proportion that would be inspected if all low-risk trucks were allowed to bypass the site and if the numbers for the remaining risk categories were increased proportionally.

The three columns showing expected OOS orders per 100 inspections are calculated by multiplying the corresponding percentage in the risk category by the statewide OOS rate for that category.

Table A.3-3 shows that if trucks were selected for inspection at random, one would expect about 17 OOS orders per 100 inspections, regardless of which site. Using the current (1998) inspection selection procedure at each site, the number of OOS orders per 100 inspections would be expected to rise by 1.1 OOS orders per 100 inspections at non-ES sites and 1.38 OOS orders per 100 inspections at ES sites. However, it should be noted that the increase at Laurel is not much larger than those at the other sites. If electronic screening were implemented to the point that all low-risk trucks would be allowed to bypass the site, the number of OOS orders per 100 inspections would be expected to rise to about 22. The gain at non-ES sites, as expected, is slightly larger than at the ES site.

Table A.3-3. Comparisons of Expected Number of OOS Orders Per 100 Inspections Between Sites with Transponder and without Transponder

Station	Risk Category	CMV Percentages			State OOS Rate	No. OOS Orders per 100 Inspections		
		Population	Inspected	Full ES [1]		Random	Observed	Full ES [1]
Boone	High	6.1	11.0	20.7	26.6	1.62	2.94	5.50
	Medium	35.9	34.5	64.5	21.2	7.60	7.31	13.68
	Low	56.3	46.6	0.0	13.6	7.63	6.31	0.00
	Insufficient Data	1.0	5.0	9.3	19.3	0.19	0.96	1.79
	Unknown	0.8	3.0	5.5	24.2	0.18	0.71	1.34
	Total Expected OOS Orders per 100 Inspections					**17.22**	**18.23**	**22.31**
Kenton	High	5.7	10.7	20.0	26.6	1.53	2.86	5.32
	Medium	32.3	33.3	62.0	21.2	6.85	7.06	13.15
	Low	58.1	46.4	0.0	13.6	7.87	6.28	0.00
	Insufficient Data	1.9	5.4	10.0	19.3	0.37	1.04	1.94
	Unknown	2.0	4.2	7.9	24.2	0.48	1.02	1.91
	Total Expected OOS Orders per 100 Inspections					**17.09**	**18.26**	**22.32**
Shelby EB	High	4.0	8.1	14.8	26.6	1.06	2.15	3.95
	Medium	36.7	30.7	56.5	21.2	7.77	6.51	11.99
	Low	56.3	45.7	0.0	13.6	7.63	6.19	0.00
	Insufficient Data	1.6	9.7	17.8	19.3	0.30	1.97	3.44
	Unknown	1.5	5.9	10.8	24.2	0.35	1.42	2.61
	Total Expected OOS Orders per 100 Inspections					**17.12**	**18.14**	**21.99**
Shelby WB	High	4.6	8.5	15.4	26.6	1.22	2.26	3.95
	Medium	33.7	29.5	53.4	21.2	7.14	6.25	11.99
	Low	58.9	44.8	0.0	13.6	7.98	6.08	0.00
	Insufficient Data	1.4	11.4	20.6	19.3	0.27	2.19	3.44
	Unknown	1.5	5.8	10.6	24.2	0.35	1.41	2.56
	Total Expected OOS Orders per 100 Inspections					**16.96**	**18.19**	**21.96**
Average for Non-ES Sites						**17.10**	**18.20**	**22.14**
Laurel	High	5.5	10.2	18.3	26.6	1.47	2.71	4.87
	Medium	32.4	31.4	56.3	21.2	6.87	6.66	11.94
	Low	59.6	44.2	0.0	13.6	8.08	5.99	0.00
	Insufficient Data	1.2	9.4	16.9	19.3	0.23	1.82	3.26
	Unknown	1.3	4.7	8.5	24.2	0.31	1.15	2.05
	Total Expected OOS Orders per 100 Inspections					**16.95**	**18.33**	**22.12**
Average for ES Sites						**16.95**	**18.33**	**22.12**

1. Values in this column represent an estimate of the results that might be observed under full electronic screening, which would allow all low-risk vehicles to bypass the inspection stations.

CONCLUSIONS

On the basis of the data collected and analyzed in the Kentucky Screening Assessment study, it appears that the deployment of Electronic Screening had little effect on either the proportion of high-risk vehicles inspected or the number of OOS orders given per 100 inspections. It must be noted that these results are based on the data collected early in the deployment process. Only one Electronic Screening site was available for inclusion in the study. In addition, the number of carriers participating in Electronic Screening programs was fairly small. As time passes, more sites will have Electronic Screening deployed and more trucks will participate. As the number of sites and participating carriers increases, the effects of Electronic Screening should become more apparent than the results shown in this study.

REFERENCE

[1] John A. Volpe National Transportation Systems Center, "SafeStat: Motor Carrier Safety System Measurement System, Methodology: Version 7," Federal Highway Administration, Office of Motor Carrier and Highway Safety Report, October 1999.

APPENDIX B.1:

STATUS OF CVISN DEPLOYMENT

APPENDIX B.1: STATUS OF CVISN DEPLOYMENT

This section describes state systems for credentialing, safety information exchange, and roadside screening processes. The systems for the states from which cost data were obtained are described. First, the steps for IRP credentialing in Kentucky and Maryland are described. The only major difference is the use of a third party, such as Lockheed Martin VISTA, in some states (e.g., Maryland) for processing applications and issuing invoices. Other states (e.g., Kentucky) have in-house systems to calculate fees and generate invoices. The steps in these two states provide a good representations of the systems in all states. The cost evaluation is intended to determine the start-up costs as well as annual costs associated with operating electronic credentialing with either type of system.

Second, the safety information exchange systems in Kentucky and Connecticut are described. Third, the roadside screening system in Kentucky is described.

B.1.1 CREDENTIALING SYSTEMS

Kentucky

The steps involved in IRP credentialing in Kentucky are described in the following sections.

New Registrations

The Division of Motor Carriers regulates all for-hire transportation within Kentucky and administers the state's fuel (IFTA) and highway usage taxes. The division also provides credentials for adequate enforcement. The division issues all overweight/over dimensional permits to trucking companies in Kentucky. Kentucky maintains databases for both interstate and intrastate motor carriers to facilitate the registration process. Kentucky has developed and uses a PC client-server system using an Oracle relational database for the credentialing process. The Division of Motor Vehicle Licensing uses a statewide computer network that connects all administrative and operational units. This is an IRP-compliant system with capability for daily downloading from and to the Automatic Vehicle Identification System (AVIS).

A number of sequential steps are involved from the application to the issuance of an IRP credential to the carrier. On receipt of an application for registration, the vehicle title is verified, the fee determined and an invoice issued to the carrier. When payment is received the appropriate databases are updated and the credential issued to the carrier. Similarly, with the IFTA, when an application is received, checks are conducted to ensure that the carrier is not owing any taxes or fines. The carrier is then notified of approval and a decal is mailed. The following are the credentialing steps:

File application. A first step to obtain a new IRP credential is for the motor carrier to update vehicle title information of all new vehicles at the nearest county courthouse. The carrier then completes an application form and gathers all necessary information (e.g., insurance). The applications can be mailed or submitted in person (walk-in). About 70 to 75 percent of IRP applications are submitted by mail.

Process application and generate invoice. The Department of Motor Vehicles (DMV) reviews information provided on the completed application forms for accuracy, completeness, and verifies tax payments. Errors discovered are corrected by the carrier before the processing proceeds. For mail-in applications, the form may be sent back (by mail or fax) to the carrier for correction.

The next step is to enter information provided on the completed form into DMV's computer based legacy system. The legacy system is then used to determine the fee based on the registered weight of the vehicle and expected area of coverage in terms of mileage. Once the fee is determined, an invoice is generated and mailed to the carrier (for mail-in applications). No invoices are issued for walk-in applications.

Process Payment and Issue Credential. With walk-in applications, the applicant pays on the spot. For mail-in applications, the carrier mails the payment to the DMV. Kentucky accepts certified checks, cash, and company or personal checks as payment for credentials. Credit cards are not accepted unless through a third-party vendor. On receipt of proper payment, a receipt is printed and the database updated.

No temporary credentials are issued between application and payment. With walk-in applications, credentials are issued and handed to the applicant once the payment is processed and the files updated. With mail-in applications, credentials are issued and mailed to the carrier on receipt of payment.

Renewals

Each year, DMV prints out renewal packages from the IRP system. These packages are mailed to motor carriers registered in the state. The interstate motor carrier is requested to check and update all vehicle information contained in the notices. Carriers are required to make any necessary changes, including updating vehicle title information, adding and/or deleting vehicles, adding jurisdictions, increasing and/or decreasing weights, changing unit numbers, contact persons, telephone numbers, and name and address corrections. The corrected information and mileage computations are submitted by mail or in person to the DMV.

The DMV then makes all the necessary changes in a carrier's file in the IRP database. Based on the updated information, the fees are then calculated and an invoice is generated. The invoice is then given or mailed to the motor carrier. The payment process for renewals is the same as for new applications.

Supplements

Supplemental applications are treated as new applications. Therefore, in order to process a supplement, an initial or renewal application must have been processed first. The major types of supplemental information for an account are transfers, additions of vehicles, changes of weights, additions of jurisdiction, replacement/duplication of credentials, and fleet-to-fleet transfers. For the issuance of the duplicate/substitute, the application along with the payment is given to the cashier, who then processes the duplicate or substitute. Substitute tags or stickers are given to carriers who have lost their original credentials.

Maryland

The steps involved in IRP credentialing in Maryland are described in the following sections.

New Registration

File application. For a new registration, the motor carrier is required to complete Schedule A/C and Schedule B. If the completed application form is processed at a location other than the Glen Burnie Motor Vehicle Administration (MVA) office, i.e., the main office, then the motor carrier also completes a Temporary Apportioned (TA) application form. Applications may be submitted in person or by mail. With walk-in applications, motor carriers are given credentials when payment has been made.

Process application. The MVA verifies that the application has been completed correctly and that the motor carrier does not have a flag in the MVA database. If the vehicle was just titled, then a copy of the TARIS receipt, which shows the title information on the vehicle, is submitted with the application.

Given the fact that neither the branch offices nor the motor carrier offices have access to the Vehicle Information System for Tax Apportionment (VISTA) database, the main office faxes the invoice to these locations. For walk-in applications, the motor carrier may wait at the branch office while the temporary credential and invoice are issued from the main office to the branch office.

All necessary information is entered into the VISTA system including an insurance code. VISTA then calculates the fees and generates an invoice. If the application is processed at a location other than the main office, the invoice and the TA are faxed to the motor carrier. The carrier can only use the TA up to its expiration date, which is 45 days after the date of issuance. For new accounts processed at a branch office, a base plate must be purchased before receiving a TA. The motor carrier takes the invoice or mails the invoice along with an appropriate means of payment to the IRP's cashier's office, which issues the cabcard and sticker.

Process Payment and Issue Credential. The payment process for all applications is the same. A certified check, cash, credit voucher (MVA credit), or money order is accepted for payment. However, a motor carrier may pay the Maryland portion of the invoice by company or personal check. A company or personal check may also be accepted if a surety bond is on the carrier's file. The cashier receives the invoice along with the proper payment and enters the payment into the VISTA system, a receipt is printed, the check is validated, and credentials are issued. The receipt and credentials are handed to or mailed to the motor carrier.

Renewals

The VISTA system prints out all renewal notices (Schedule A/C) as a yearly one-time batch process. Notices are mailed to the motor carriers in January. It is requested that the completed renewals be returned by March 1. The interstate motor carrier is to complete the mileage and insurance information portion of the renewal, and make any necessary changes, including adding and/or deleting vehicles, adding jurisdictions, increasing and/or decreasing weights, changing unit numbers, contact person, telephone numbers, and name and address corrections. The motor carrier service representative then makes all the necessary changes in VISTA and enters their mileage (mileage requested is for the previous year; the carrier is allowed to estimate mileage for two years but by the third year the carrier should have actual mileage). Carriers may estimate their mileage for any new jurisdictions. If there are no changes to the renewal notice, only the mileage and insurance information has to be entered. The fees are then calculated based on the new mileage and an invoice is generated. The invoice is given to the motor carrier or mailed. The payment process for renewals is the same as for initial applications.

Supplements

In order to process a supplement, an initial or renewal application must have been processed first. The major types of supplemental information for an account are transfers, additions of vehicles, changes of weights, additions of jurisdiction, replacement/duplication of credentials, and fleet-to-fleet transfers. Depending on the transaction, either a Schedule A/C and/or Schedule B or a duplicate/substitute (VR-09) application is processed. For all the above transactions, except for duplicate/substitute (VR-09) application, the application process is similar to the initial application. For the issuance of the duplicate/substitute, the application along with the payment is given to the cashier, who then processes the duplicate or substitute. Substitute tags or stickers are given to carriers who have lost their original credentials.

Adjustments

If an application was processed incorrectly and was not caught until after payment was received, an adjustment would have to be processed to correct the error. The cashier would void the original invoice and the representative would then process the application correctly. VISTA then generates a new invoice. Based on the original application that was voided, the motor carrier is given credit for that amount. If a motor carrier is due a credit, a credit voucher is issued. If additional fees are due, the motor carrier pays the additional fees and the new credentials are issued. The necessary corrections are then made to the paperwork for accounting purposes.

B.1.2 Safety Information Exchange

Kentucky

Methods for delivering safety and credential information to the roadside for safety inspections and credential verifications include calling in to the state's department of motor vehicles, or requesting and having hard copies sent, or by dialing into the credentialing system via a modem. The direct connection via modem is only possible from fixed weigh scale sites.

Trucks are selected for safety inspections at random at mobile sites and at fixed sites for trucks without transponders. Pen-based computers loaded with Aspen software are used to track and record the results of safety inspections.

Standard safety inspections are performed both at the fixed sites and by mobile inspections at the roadside. The level of inspection conducted depends on the carrier profile or on the discretion of the inspector. The inspection results are recorded in Aspen and printed for the driver at the roadside. Citations are manually issued. Safety performance databases are updated daily on-line.

Connecticut

Connecticut currently uses the cellular digital packet data (CDPD) configuration for safety information exchange. However, the Motorola 800 MHz system was tested and will become more integrated given that the Connecticut Department of Public Safety (DPS) deploys the Motorola system to all State Police. The following are the processes and information flows associated with the Safer Data Mailbox (SDM) system:

CDPD Configuration

- Inspector (mobile patrol or fixed site) completes an inspection using Aspen and uploads the data via CDPD to the SCA server. Inspections are uploaded after each inspection is completed.
- SCA server transmits the data to Blizzard-32.
- Blizzard-32 uploads inspection data to the SDM on a 2-minute interval, where it becomes immediately available for queries conducted by roadside inspectors across the country.
- Blizzard-32 copies inspection data to the Avalanche Inspection Manager for upload to Safetynet.
- Data are uploaded from the inspection manager to the Safetynet database; data are cleaned and prepared for upload to MCMIS.
- State uploads data to MCMIS daily.
- Roadside queries are sent directly to the SDM via CDPD.

Motorola 800 MHz Configuration

- Inspector (mobile patrol or fixed site) completes an inspection using Aspen and uploads the data via Motorola 800 MHz to the SCA server. Inspections are uploaded after each inspection is completed.
- SCA server transmits the data to Blizzard-32.
- Blizzard-32 uploads inspection data to the SDMB on a 2-minute interval, where it becomes immediately available for queries conducted by roadside inspectors across the country.
- Blizzard-32 copies inspection data to the Avalanche Inspection Manager for upload to SAFETYNET.

- Data are uploaded from the inspection manager to the SAFETYNET database; data are cleaned and prepared for upload to MCMIS.
- State uploads data to MCMIS daily.
- Roadside queries are sent to the SDMB via the SCA server. The queries are transmitted to the server via the Motorola system and then sent to the SDM via a TCP/IP redirector.

Note: The systems are expected to change with the deployment of SAFETYNET2000, but the timeliness of data should not be affected.

B.1.3. Roadside Screening

Kentucky

Kentucky enforces vehicle size, weight, economic, and safety regulations at fixed scale sites and using mobile inspection teams employing WIM, static scales, transponders. Kentucky screens vehicles at mainline speeds at five locations on I-75 as part of the Advantage I-75 program. The mainline screening system used a mainline automated clearance systems (MACS) that was developed for the Advantage I-75 program. Mainline screening is limited to transponder-equipped vehicles and uses size and weight limits as the screening criteria. Information exchange occurs between the transponder, screening system, and MACS host computer. Information flags include ALTS, Intra/Inter Fuel Tax, WD tax, and OS/OW data.

At fixed weigh scale sites, slowdown lane or ramp screening is conducted where a vehicle's tax and credential status is verified by manually keying a vehicle's KYU number into the system. Citations for size and weight violations are manually issued. Weight data are not normally stored as part of the enforcement process.

APPENDIX B.2:

COST STUDY INTERVIEW GUIDES

APPENDIX B.2: COST STUDY INTERVIEW GUIDES

CVISN MODEL DEPLOYMENT INITIATIVE
COST DATA COLLECTION

INTERVIEW GUIDE FOR STATE AGENCIES

PURPOSE OF STUDY AND INTERVIEW OBJECTIVES

The cost analysis component of the CVISN evaluation effort is designed to provide states with a better understanding of the specific cost components, the drivers of these costs, and a methodology for developing cost estimates given the unique characteristics and policies of each state. The cost analysis considers two major cost-related questions: what are the current costs associated with CVO processes and what are the new costs of CVISN systems.

The current costs include costs currently borne by state CV regulatory and enforcement agencies. These costs include labor costs for processing and reprocessing credentials and permits, costs for inspections and safety monitoring, costs of operation and maintenance of existing equipment, and data collection and reporting costs. New costs associated with CVISN deployment include up-front investment costs, such as hardware and software costs, systems integration, planning and design-related expenditures, and outreach efforts. This category also includes operation and maintenance of the system and replacement capital costs.

The objectives of the interview are to collect:

- Information on costs associated with the current credentialing processes and roadside screening and inspection activities
- Information on costs associated with deploying various CVISN systems in your state
- Information on resources committed to CVISN deployment
- Sufficient information to allow analysis of the costs and benefits of CVISN deployment.

BACKGROUND

Questions in this section are designed to provide information on the types of CVO functions of the organization.

1. Which CVO functions are the responsibilities of your department?
2. What are your job responsibilities with respect to CVO?
3. What is your role in CVISN systems deployment in your state?

CREDENTIALING SYSTEMS

Pre-CVISN Deployment

Questions in this section focus on costs associated with credentialing and permitting by state agencies prior to CVISN deployment.

1 . Please provide the following information relating to the credentialing and permitting processes:
   - Type of credential (e.g., IRP, IFTA, OS/OW, SSRS, HAZMAT, etc.)
   - Number of staff required and labor classification (or job title) for each credential
   - Salaries and labor rates for staff involved in each credentialing process
   - Average time to process a credentialing application (new, supplemental, renewals)
   - Fee charged per transaction for each credential or permit
   - Number of applications processed (or credentials issued) monthly or annually
   - Average annual mailing and distribution costs such as postage, fax, and other communication media associated with each credentialing and permitting process
2. What are the equipment or systems costs associated with each type of credentialing activity (e.g., computers, etc.)?
3. What are the current costs of <u>operating and maintaining</u> systems for credentialing and permitting activities?
4. What other administrative and budget support costs are associated with the credentialing and permitting activities?

CREDENTIALING SYSTEMS

Post-CVISN Deployment

Questions in this section focus on costs associated with credentialing and permitting by state agencies following CVISN deployment.

<u>Start-up costs</u>

1. What CVISN systems are being deployed by your department for electronic credentialing?
2. What <u>new equipment</u> have been introduced as part of CVISN deployment for electronic credentialing?
3. What are the <u>costs</u> of the new equipment and systems (hardware and software)? <u>Name</u> specific hardware type and software and <u>the function</u> it is expected to perform. For example, computers, electronic sensors, communication systems, etc.

4. What are the in-house and contractor related costs for developing credentialing interfaces?
5. What are the legacy system modification costs associated with CVISN systems?
6. What new skills have been or need to be acquired purposely for the CVISN systems deployed?
7. What is the cost of training staff to use new equipment and systems?
8. What is the cost of new facilities or remolding to accommodate new equipment and systems (e.g., telecommunication) including staff time, construction, moving cost, etc.?
9. What other start-up or capital costs were incurred in deploying electronic credentialing systems (e.g., travel, administrative support)?

Operating and maintenance costs

10. What are the costs associated with operating dual systems (legacy and new systems) and other transition support costs?
11. What are the equipment servicing and maintenance costs (including parts)?
12. What additional operating costs are incurred resulting from CVISN deployment (e.g., greater use of telephone and computers)?
13. What costs have been incurred in increasing interactions with the motor industry?
14. What costs have been incurred due to changes in interagency coordination or interaction associated with CVISN systems deployment?

Effects

15. What are the changes in the number and salary levels of personnel required to operate the new systems?
16. What are the effects of the new equipment on credentialing processes (time savings, reduced labor, increased number of credentials processed, etc.)? Indicate the skill and salary level of staff affected.
17. What are the most important changes?
18. What are the increases in output described in $ value?

ROADSIDE SCREENING

Pre-CVISN Deployment

Questions in this section focus on current operation and maintenance costs of facilities and equipment prior to CVISN deployment.

1. How many fixed sites conduct mainline screening – weight, credential, and safety?
2. How many fixed sites conduct ramp screening – weight, credential, and safety?
3. How many fixed sites conduct mainline and ramp screening – weight, credential, and safety?
4. How many fixed sites that do not have weighing facilities conduct credential and safety screening?

5. How many mobile teams (vehicles) in your state perform commercial vehicle screening (weight, credential, and safety)?
6. How many remote screening sites (if any) does your state operate (weight, credential, and safety)?
7. What equipment are associated with current roadside screening and inspections (number and type of equipment, e.g., desktop and laptop computers, WIM, AVI, etc.)?
   - Fixed site with mainline screening
   - Fixed site with ramp screening (no mainline)
   - Fixed site with mainline and ramp sorting
   - Fixed site without weighing facility
   - Mobile screening
   - Remote screening
8. What <u>equipment and labor costs</u> are associated with operating current roadside screening and inspections – for each type of site listed in question 7?
   - Number of staff and job title
   - Salary levels and labor rates
   - Safety data acquisition (where used for screening)
   - Credential information acquisition
   - Tax and insurance data verification
   - Safety inspections
   - Etc.
9. What are the operation costs of existing systems (equipment) and facilities?
   - Fixed scales, WIM, AVI, height detectors, computers, etc., for mainline screening
   - Fixed scales, WIM, AVI, height detectors, computers, etc., for ramp sorting
   - Safety inspection infrastructure, equipment, hardware and software
   - Mobile screening equipment and infrastructure (e.g., portable scales, videos, etc.)
   - Remote screening equipment and infrastructure (WIM, AVI, video camera, etc.)
   - Etc.
10. What are the maintenance costs of existing systems and facilities?
    - Fixed scales, WIM, AVI, height detectors, etc., for mainline screening
    - Equipment servicing
    - System upgrades
    - Periodic and routine maintenance
    - Lease payment
    - Etc.
11. How many vehicles are processed per site daily or annually?
    - Fixed site with mainline screening
    - Fixed site with ramp screening (no mainline)
    - Fixed site with mainline and ramp screening
    - Fixed site without weigh scales
    - Mobile screening
    - Remote screening

12. How many CVSA inspections are conducted daily or annually under each inspection level (Levels I, II, III, and IV) per site?
    - Fixed site with mainline screening
    - Fixed site with ramp screening (no mainline)
    - Fixed site with mainline and ramp screening
    - Fixed site without weigh scales
    - Mobile screening
    - Remote screening
13. What is the average time spent on each type of safety inspection?
    - Level I
    - Level II
    - Level III
    - Level IV
14. What is the average time required to access credential or safety data from state US DOT databases under the existing systems?
15. What is the average time required for safety data upload to US DOT under existing systems?

ROADSIDE SCREENING

Post-CVISN Deployment

This section focuses on cost data relating to capital, operating, and maintenance costs associated with CVISN deployment.

1. What are the costs of new or modified facilities due to CVISN deployment?
    - Modifications to existing facilities (retrofits)
    - New scales
    - New facility construction
    - Communication infrastructure
    - Etc.
2. What are the costs of new equipment due to CVISN deployment?
    - Type and cost of equipment for each activity (electronic and auxiliary)
    - Hardware (e.g., computers)
    - Software development
    - Modifications to existing systems
    - New systems (e.g., communication technology)
    - Creation of new interfaces
3. What are the operating costs of the new systems?
    - Workstations, WIM/AVC, etc.
    - Portable scales
    - Remote screening sites
    - License plate readers (LPR)
    - Lease payment
    - Etc.

4. How many new staff are required to operate the new systems and at what salary levels?
   - Number of new staff
   - Salary levels of new staff
   - Staff training costs
   - Consultant fees
5. What are the non-labor costs associated with operating the new systems and installations?
   - Increased use of telephone
   - Internet connections
   - CDPD - wireless data transfer
   - Data acquisition
   - Access to SAFER and other databases
   - Other communication costs
   - Etc.
6. What are the estimated maintenance costs associated with these systems?
   - Routine and periodic maintenance
   - Equipment servicing
   - Hardware and software upgrades
   - Database maintenance fees
   - Etc.
7. What is the estimated number of vehicles screened per site daily with the new systems?
   - Fixed site with mainline screening
   - Fixed site without mainline (e.g., ramp) screening
   - Mobile screening
   - Remote screening
8. What is the estimated number of CVSA inspections conducted daily under each inspection level (Levels I, II, III, and IV) per site?
   - Fixed site with mainline screening
   - Fixed site without mainline (e.g., ramp) screening
   - Mobile screening
   - Remote screening
9. What is the average time spent on each type of inspection using ASPEN on laptops?
   - Level I
   - Level II
   - Level III
   - Level IV
10. What is the average time required for safety data upload to US DOT?

CVISN MODEL DEPLOYMENT INITIATIVE
COST DATA COLLECTION

INTERVIEW GUIDE FOR MOTOR CARRIERS

PURPOSE OF STUDY AND INTERVIEW OBJECTIVES

The cost analysis component of the CVISN evaluation effort is designed to provide states with a better understanding of the specific cost components, the drivers of theses costs, and a methodology for developing cost estimates given the unique characteristics and policies of each state. The cost analysis considers two major cost-related questions: what are the current costs associated with CVO processes and what are the new costs of CVISN systems.

The current costs include costs currently borne by state CV regulatory and enforcement agencies. These costs include, labor costs for processing and reprocessing credentials and permits, costs for inspections and safety monitoring, costs of operation and maintenance of existing equipment, data collection and reporting costs. New costs associated with CVISN deployment include, up-front investment costs such as hardware and software costs, systems integration, planning and design-related expenditures, and outreach efforts. This category will also include, operation and maintenance of the system, replacement capital costs

The objectives of the data collection effort are to:

- Gather information on the costs incurred by the motor carrier industry resulting from CVISN system deployment
- Learn about the cost impacts of CVISN systems on the efficiency and productivity of the motor carrier industry
- Gather sufficient information to allow analysis of the costs and benefits of CVISN deployment.

OVERVIEW OF COMPANY

Questions in this section are designed to provide information on the type and size of commercial vehicle operations.

1. Are you a for-hire carrier or private carrier?
2. How many trucks does your company operate?
3. Do you operate locally, regionally or nationally?
4. How time sensitive are your shipments?

CREDENTIALING SYSTEMS

Pre-CVISN Deployment

The section aims at gathering cost information associated with obtaining credentials from stage agencies prior to CVISN systems deployment.

1. How are credentials obtained from state agencies (e.g., walk-in, telephone, mail, fax, etc.)?
2. How many staff and their labor rates are involved in the credentialing process – new and renewals?
3. What is the average time spent to obtain different credentials – new and renewals?
4. What is the average number of credentials obtained in a month or year (new, renewals)?
5. What equipment are used for credentialing purposes (manual, computers, etc.)?
6. What are the operating and maintenance costs of equipment and systems for credentialing?
7. What other costs are incurred in the credentialing process (e.g., telephone, fax, vehicle mileage charges)?

Post-CVISN Deployment

This section focuses on cost data relating to capital, operating, and maintenance costs associated with CVISN deployment.

1. What new equipment and systems have been or need to be acquired because of CVISN systems deployment (e.g., computers, etc.)?
2. What are the costs of these new systems (hardware and software)?
3. How many staff and their labor rates are involved in the credentialing process – new and renewals?
4. What is the average time spent to obtain different credentials – new and renewals?
5. What changes occurred in the number and salary levels of staff resulting from CVISN deployment?
6. What is the average number of credentials obtained in a month or year (new, renewals)?
7. What non-labor costs are associated with the new systems, e.g., training?
8. What other costs are associated with changes to the new systems?
9. What are the equipment servicing and maintenance costs (including parts) of CVISN systems deployed?
10. What are the additional costs resulting from greater use of telephones and computers?
11. What costs have been incurred due to changes in interaction associated with state agencies?
12. What is the most important change resulting form CVISN systems deployment?

13. What are the quantifiable productivity gains resulting from the deployment of CVISN systems? Can you put a dollar value on increased output of your organization as a result of changes due to CVISN?

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APPENDIX B.3:

COST BACKGROUND AND DETAILS

APPENDIX B.3: COST BACKGROUND AND DETAILS

The worksheet-style tables below itemize the cost elements to the states and show the calculations used to determine the cost estimates in Table 6-3. Boldface cost values were carried into Table 6-3. Some values here may vary slightly from the information presented in Table 6-3 because of rounding differences. Unless otherwise indicated, all values are in U.S. dollars ($). Most cost values were reported by the states. For information on assumed values, see Chapter 6.

CREDENTIALING (ADMINISTRATIVE PROCESSES)

' **End-to-End IRP (Non-VISTA)**

Baseline Annual Operating Costs

Labor/Acct	Mail/Acct	O&M/Acct	Total/Acct
45.17	4.32	13.05	**62.54**

CVISN Deployment Costs

Cost Element	Cost
Hardware, server	65,000
Software development	420,000
Legacy system modification	225,000
In-house and contractor labor	169,640
Training, state	960
Travel	3,750
Administrative	11,250
Project management	26,250
Training, carriers	6,556
Showcase	7,500
TOTAL	**935,906**

Post-CVISN Annual Capital Costs

Cost Element	Purch. Cost	Life, Yrs	Annual Capital	No. of Accts	Annual Capital/Acct
Hardware, server	65,000	10	6,500	4,400	**1.48**

Post-CVISN Annual Operating Costs

[Determine allocation of effort between new & renewal credential applications]

Type of Credential	No. of Creds Issued	Minutes/Cred	Min/Year	Hr/Yr	% of Annual Effort
New & Supplemental	2,800	20	56,000	933	50
Renewal	3,800	15	57,000	950	50
TOTAL	6,600			1,883	

[Determine annual labor costs per credential issued; total labor cost/year = $198,755 = $45.17 (4,400]

Type of Credential	% of Annual Effort	$ Allocated/Yr	No. Creds/Yr	$/Cred Issued
New & Supplemental	50	99,378	2,800	35.49
Renewal	50	99,378	3,800	26.15

[Apply weighted time & cost factors to each process step for **new and supplemental** applications]

Baseline Labor	Labor) 12	Process Step	Time Weight Factor	$/Step Baseline	Post Time) Pre Time	$/Step Post-CVISN
35.49	2.96	Process Application	5	14.80	0.25	3.70
		Generate Invoice	1	2.96	0.25	0.74
		Receive Payment	3	8.88	1	8.88
		Issue Temp Credential	2	5.92	0	0.00
		Issue Perm Credential	1	2.96	1	2.96
		TOTAL	12			16.28

[Apply weighted time & cost factors to each process step for **renewal** applications]

Baseline Labor	Labor) 13	Process Step	Time Weight Factor	$/Step Baseline	Post Time) Pre Time	$/Step Post-CVISN
26.15	2.01	Proc. Renew. Notice	3	6.03	0	0.00
		Process Application	5	10.05	0.25	2.51
		Generate Invoice	1	2.01	0.25	0.50
		Receive Payment	3	6.03	1	6.03
		Issue Perm Credential	1	2.01	1	2.01
		TOTAL	13			11.05

[Convert labor cost from per-application to per-account basis]

Cred Type	$/Application	No. of Apps/Yr	Labor $/Yr Post	No. of Accts	Labor $/Acct Post
New & Supp	16.28	2,800	45,584.00		
Renewal	11.05	3,800	41,990.00		
			87,574.00	4,400	19.90

[Allocate annual database charge per carrier account]

Cost Element	Annual Cost	Accounts	$/Acct
Data backup	10,000	4,400	2.27

[Determine total annual operating cost per carrier account]

Labor/Acct	Mail/Acct	O&M/Acct	Data/Acct	Total/Acct
19.90	4.32	13.05	2.27	**39.54**

* *

Credentialing

' **End-to-End IRP with VISTA**

Baseline Annual Operating Costs

Labor/Acct	Mail/Acct	O&M/Acct	Total/Acct
82.45	11.22	44.54	**138.21**

CVISN Deployment Costs

Cost Element	Cost
Equipment	131,626
Contract	84,637
In-house labor	150,395
Communication	777
Administration/travel	97,367
TOTAL	**464,802**

Post-CVISN Annual Capital Costs

Cost Element	Purch Cost	Life, Yrs	Annual Capital	No. of Accts	Annual Capital/Acct
Equipment	131,626	10	13,163	6500	**2.03**

Post-CVISN Annual Operating Costs

[Determine allocation of effort between new & renewal credential applications]

Type of Credential	No. of Creds Issued	Minutes/Cred	Min/Year	Hr/Yr	% of Annual Effort
New & Supplemental	3,694	20	73,880	1,231	45
Renewal	6,061	15	90,915	1,515	55
TOTAL	9,755			2,746	

[Determine annual labor costs per credential issued; total labor cost/year = $535,930 = $82.45 (6,500]

Type of Credential	% of Annual Effort	$ Allocated/Yr	No. Creds/Yr	$/Cred Issued
New & Supplemental	45	241,169	3,694	65.29
Renewal	55	294,762	6,061	48.63

[Apply weighted time & cost factors to each process step for **new and supplemental** applications]

Baseline Labor	Labor) 12	Process Step	Time Weight Factor	$/Step Baseline	Post Time) Pre Time	$/Step Post-CVISN
65.29	5.44	Process Application	5	27.20	0.25	6.80
		Generate Invoice	1	5.44	0.25	1.36
		Receive Payment	3	16.32	1	16.32
		Issue Temp Credential	2	10.88	0	0.00
		Issue Perm Credential	1	5.44	1	5.44
		TOTAL	12			29.92

[Apply weighted time & cost factors to each process step for **renewal** applications]

Baseline Labor	Labor) 13	Process Step	Time Weight Factor	$/Step Baseline	Post Time) Pre Time	$/Step Post-CVISN
48.63	3.74	Proc. Renew. Notice	3	11.22	0	0.00
		Process Application	5	18.70	0.25	4.68
		Generate Invoice	1	3.74	0.25	0.94
		Receive Payment	3	11.22	1	11.22
		Issue Perm Credential	1	3.74	1	3.74
		TOTAL	13			20.58

[Convert labor cost from per-application to per-account basis]

Cred Type	$/Application	No. of Apps/Yr	Labor/Yr Post	No. of Accts	Labor/Acct Post
New & Supp	29.92	3,694	110,524		
Renewal	20.58	6,061	124,735		
			235,259	6,500	36.19

[Determine total annual operating cost per carrier account]

Labor/Acct	Mail/Acct	O&M/Acct	Total/Acct
36.19	11.22	44.54	**91.95**

* *

Credentialing

' **End-to-End IFTA**

Baseline Annual Operating Costs

State	Labor/Acct	Mail/Acct	O&M/Acct	Total $/Acct	No. of Accts
KY	27.90	1.00	40.03	68.93	4,000
MD	184.73	6.03	72.54	263.30	5,500
AVERAGE	106.32	3.52	56.29	**166.12**	4,750

CVISN Deployment Costs

[Kentucky]

Cost Element	Cost
Software development	80,000
In-house labor	1,600
Staff training, state	800
Travel	1,250
Administrative	3,750
Project management	8,750
Showcase	2,500
TOTAL	98,650

[Maryland]

Cost Element	Cost
Equipment	15,051
Contract	216
In-house labor	12,202
Administration/travel	1,072
TOTAL	28,541

[Average of Kentucky and Maryland]

Cost Element	Cost
Kentucky start-up	98,650
Maryland start-up	28,541
AVERAGE	**63,596**

Post-CVISN Annual Capital Costs

[Maryland]

Cost Element	Purch Cost	Life, Yrs	Annual Capital	No. of Accts	Annual Capital/Acct
Equipment	15,051	10	1,505	5500	0.27

[Average of Kentucky and Maryland. *NOTE: Kentucky reported no one-time capital costs for IFTA credentialing.*]

State	Annual Capital	No. of Accts	Annual Capital/Acct
Kentucky	0	4,000	0.00
Maryland	1,505	5,500	0.27
AVERAGE			**0.14**

Post-CVISN Annual Operating Costs

*[Assumed to be **$100** per carrier account, based on reported IRP cost reductions.]*

* *

Credentialing

' **IRP Clearinghouse** *[See Springer 1999]*

* *

ELECTRONIC SCREENING

' **One Static Weigh Scale Plus 3 FTEs**

Baseline Annual Capital Costs

[Average of scale purchase costs reported by Kentucky and Connecticut]

Cost Element	$/Site	State
Scale, static	142,000	CT
Scale, static	75,000	KY
AVERAGE	108,500	

[Determine annual capital cost. *NOTE: Applies to both baseline and post-CVISN phases.*]

Cost Element	Purch Cost	Life, Yrs	Annual Capital
Static scale	108,500	10	**10,850**

Baseline Annual Operating Costs

[Determine average labor cost (including fringe benefits) per FTE]

Cost Element	Cost	State	Site Type
Roadside DMV	54,233	CT	Fixed
Roadside DPS	53,000	CT	Fixed
Roadside	23,774	KY	Fixed
Roadside	33,675	KY	Mobile
AVERAGE	41,171		
ROUND TO	41,000		

[Determine annual operating cost. *NOTE: Applies to both baseline and post-CVISN phases.*]

Cost Element	Cost
Labor (3 FTEs)	123,000
Annual operating (phone, water, util., etc.)	5,580
TOTAL	**128,580**

One-Time Start-Up Costs (Non-CVISN; for information only)

Cost Element	$/Site	State
Scale, static	142,000	CT
Scale, static	75,000	KY
AVERAGE	**108,500**	

Post-CVISN Annual Capital and Annual Operating Costs

[Same as baseline costs.]

* *

Electronic Screening

' **Basic Screening Equipment (AVI and WIM)**

CVISN Deployment Costs

Cost Element	$/Site
AVI reader	15,000
Scale, WIM, mainline	125,000
Electronic signs/loop detectors	10,000
TOTAL	**150,000**

Post-CVISN Annual Capital Costs

Cost Element	Purch Cost	Life, Yrs	Annual Capital
AVI reader	15,000	10	1,500
Scale, WIM, mainline	125,000	10	12,500
Electronic signs/loop detectors	10,000	10	1,000
TOTAL			**15,000**

Post-CVISN Annual Operating Costs

Cost Element	$/Site
Annual maintenance, WIM	**6,500**

* *

Electronic Screening

' **Site upgrade to electronic snapshot capability**

CVISN Deployment Costs

Cost Element	$/Site
Administrative/other	27,000
Communication equipment	123,000
Consultant (software development)	166,712
Interfaces	25,000
Personal computer (3 desktop)	10,000
Retrofit fixed weigh scale	20,000
Training, PC (3 persons)	240
Training, info technology (3 persons)	300
TOTAL	**372,252**

Post-CVISN Annual Capital Costs

Cost Element	Purch Cost	Life, Yrs	Annual Capital
Communication equipment	123,000	10	12,300
Personal computer (3 desktop)	10,000	5	2,000
TOTAL			**14,300**

Post-CVISN Annual Operating Costs

Cost Element	$/Site
Communication, equip. O&M	400
Communication, internet access	2,016
Hardware/software upgrade, incl. database	30,000
Mainline screening equip O&M	10,000
TOTAL	**42,416**

* *

Electronic Screening

' **Mobile unit**

CVISN Deployment Costs

Cost Element	Cost
Operations van	70,000
CVISN mobile system components	335,000
TOTAL	**405,000**

Post-CVISN Annual Capital Costs

Cost Element	Purch Cost	Life, Yrs	Annual Capital
Operations van	70,000	10	7,000
CVISN mobile system components	335,000	10	33,500
TOTAL			**40,500**

Post-CVISN Annual Operating Costs (including labor)

Cost Element	Cost
Labor (2 FTEs)	82,000
Cables, loops, etc. for mobile unit	15,500
TOTAL	**97,500**

SAFETY INFORMATION EXCHANGE

' **Enforcement officer and 1 vehicle**

Baseline Annual Capital Costs

[Determine purchase cost of vehicle and portable scale]

Cost Element	Cost
Patrol vehicle	30,000
Portable scale	3,250
TOTAL	33,250

[Determine annual capital cost. *NOTE: Applies to both baseline and post-CVISN phases.*]

Cost Element	Purch Cost	Life, Yrs	Annual Capital
Patrol vehicle	30,000	3	10,000
Portable scale	3,250	10	325
TOTAL	33,250		**10,325**

Baseline Annual Operating Costs

[Applies to both baseline and post-CVISN phases.]

Cost Element	Cost
Average labor	41,000
Vehicle operation	4,320
TOTAL	**45,320**

One-Time Start-Up Costs (Non-CVISN; for information only)

Cost Element	Purch Cost
Patrol vehicle	30,000
Portable scale	3,250
TOTAL	**33,250**

Post-CVISN Annual Capital and Annual Operating Costs

[Same as baseline costs.]

* *

Safety Information Exchange

' **Upgrade statewide to Aspen capability**

CVISN Deployment Costs

[Per state]

Cost Element	Cost
LAN upgrade	20,000
Personal computer, desktop (4)	10,000
Printer, desktop (4)	1,000
TOTAL	**31,000**

[Per unit]

Cost Element	Cost
Personal computer, laptop	3,800
Printer, mobile	250
Staff training	772
TOTAL	**4,822**

Post-CVISN Annual Capital Costs

[Per state]

Cost Element	Purch Cost	Life, Yrs	Annual Capital
Personal computer, desktop (4)	10,000	5	2,000
Printer, desktop (4)	1,000	5	200
TOTAL			**2,200**

[Per unit]

Cost Element	Purch Cost	Life, Yrs	Annual Capital
Personal computer, laptop	3,800	5	760
Printer, mobile	250	5	50
TOTAL			**810**

Post-CVISN Annual Operating Costs

[Per state]

Cost Element	Cost
Server maintenance	**6,000**

[Per unit]

Cost Element	Cost
Software version control/upgrade	**74**

* *

Safety Information Exchange

' **Wireless and SAFER mailbox**

CVISN Deployment Costs per Unit

Cost Element	Cost
Modem, CDPD	**1,000**

Post-CVISN Annual Capital Costs per Unit

Cost Element	Purch Cost	Life, Yrs	Annual Capital
Modem, CDPD	1,000	10	**100**

Post-CVISN Annual Operating Costs per Unit

Cost Element	Cost/Month	Cost/Yr
CDPD modem coverage	39.05	**469**

* *

Safety Information Exchange

' **CVIEW or equivalent (statewide)**

CVISN Deployment Costs

Cost Element	Cost
Software development	310,000
Software, CVIEW work, in-house	15,000
TOTAL	**325,000**

Post-CVISN Annual Capital Costs

[Software only; capital equipment cost assumed to be zero.]

Post-CVISN Annual Operating Costs

Cost Element	Cost
Labor (2FTEs @ 40,000)	**80,000**

APPENDIX C.1:

MOTOR CARRIER SURVEY METHODOLOGY

APPENDIX C.1: MOTOR CARRIER SURVEY METHODOLOGY

SAMPLE DESIGN

A detailed discussion of survey design options and choices has been provided in an earlier document.[1] The presentation here provides only a brief summary.

We chose to use the MCMIS Census database as the sampling frame. The information available within the MCMIS database was believed to provide the most comprehensive and up-to-date picture available for the national commercial vehicle industry, albeit with incomplete coverage of some purely *intrastate* carriers that do not require federal government registration.

The MCMIS database includes a significant number of entries for which no indication of firm size is available. We excluded such firms from the study, along with firms with addresses outside the contiguous 48 states and those in certain specialist categories judged to be largely irrelevant to the credentialing and inspection initiatives.[2] We also excluded from consideration any records not classified as "active," or those with inadequate contact information. For the remainder, we assigned each to one of seven strata based on the reported number of power units operated and (for the smaller firms) on the location of the firm's home office address. Table C.1-1 summarizes the target number of responses in each stratum (to allow disaggregation of the results into key sample segments), and the issued sample size thought necessary (by analogy with the ATA Foundation survey experience) to achieve that sample size.

When this originally issued sample failed to generate the 150 target responses desired, specifically because of disappointing response rates from the larger firms, it was augmented with a second phase sample of 280 firms with 250 or more power units and 220 firms with between 100 and 249 power units.

Within each of the strata, sample firms were selected at random with equal probability.

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1 Battelle (1999), *Test Plan: Baseline National Motor Carrier Survey for Commercial Vehicle Information Systems & Networks Model Deployment Initiative*.

2 The excluded categories were registered car shippers; mail; federal, state, and local governments; Indian tribes; and "other" classes.

Table C.1-1. Structure of the originally issued sample

	Within 5 focus states	Outside the focus states
Target achieved sample sizes		
250 or more units	35 firms selected nationally	
100 to 249 units	35 firms selected nationally	
10 to 99 units	25 firms	25 firms
Fewer than 10 units	15 firms	15 firms
Estimated necessary issued sample sizes		
250 or more units	200 firms selected nationally	
100 to 249 units	200 firms selected nationally	
10 to 99 units	250 firms	250 firms
Fewer than 10 units	300 firms	300 firms
MCMIS Census universe of qualified firms, as of May, 1999		
250 or more units	76 firms	1,045 firms
100 to 249 units	149 firms	2,003 firms
10 to 99 units	4,085 firms	35,620 firms
Fewer than 10 units	55,055 firms	377,170 firms

FIELDWORK LOGISTICS

The fieldwork aspects of this study were all conducted by the Department of Civil, Construction, & Environmental Engineering at Oregon State University, under the direction of Paul E. Montagne. This survey team had previously been responsible for conducting a survey of Oregon-based trucking firms, as part of the evaluation of that state's *Green Light* initiative.[3]

A pilot survey of 100 issued firms was conducted in the Spring of 2000, and 28 of these proved to be "dead wood" – mail returned as undeliverable, firms that were no longer commercial carriers, or phone numbers that were no longer operable. Subsequent research was able to pinpoint new phone numbers for five of the 18 inoperable numbers, but no replacement addresses were traced for the bad addresses. Thus, the effective issued sample size was approximately three-quarters of the total issued sample.

Usable responses were received from 10 pilot survey firms, roughly in line with the expected number based on the response rate assumptions. The method used in the pilot was first to send out an explanatory letter to all sample firms, and to follow that up for firms with 5 or more power units with a phone call to ascertain the names and addresses of the appropriate respondents for each of the three segments of the questionnaire.

After reviewing the pilot survey experience, minor wording changes were made at a small number of points in the questionnaire. It was decided to eliminate the stage of telephoning the firms with five or more power units, as that had not proved fruitful. Instead, in the full-scale survey the initial mailing included a single questionnaire for firms classified in the MCMIS Census database as operating fewer than 100 power units, and three themed questionnaires for the larger firms. The MCMIS Census addresses for sample firms were first checked by Oregon State University for accuracy, using US address inventory software, and as far as possible the

[3] Paul Montagne & Chris A Bell (1998), *Oregon Green Light CVO Evaluation: Survey of Motor Carrier Acceptance, Part 1*, Corvallis (Oregon): Oregon State University Transportation Research Institute.

addresses of the sample units failing this test were corrected. If no correction could be established easily, another firm was substituted from a randomly-drawn list of replacement firms for each stratum.

The texts for the cover letters used in each of the two categories are shown as Tables C.1-2 and C.1-3.

A reminder letter (along with a duplicate copy of the questionnaire(s)) was mailed to those firms from whom no response had been received by two weeks after the original mailing. The main survey began in July, 2000, and the second phase mailing was made at the end of October, 2000.

SUMMARY OF RESPONSE

Table C.1-4 summarizes the response received to the main survey and the second phase mailing by the beginning of January 2001.[4] The "dead wood" was close to 9 percent of the issued sample, markedly less than had been experienced in the pilot survey. This is probably due to the added screening of addresses to filter out obviously bad ones.

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[4] As well as the 148 responses from the main survey, we also included the 10 responses from the pilot survey.

Table C.1-2. Cover letter (on Battelle stationery) to firms with 100 or more power units

Dear Sir or Madam,

I am writing to request the cooperation of your company in a survey project that is important to the trucking industry. It's about new computer-based methods now being used in some states for commercial vehicle credentialing processes and roadside weight and safety inspections.

This research will learn the *experience* of motor carriers with both existing and new methods of credentialing and roadside inspections, and very importantly, will *ensure that their opinions about these matters will be heard* by the state and federal governments. The study findings will be examined closely by state motor vehicle administration and enforcement agencies across the country, and by the Federal Motor Carrier Safety Administration (that has in part sponsored the research). Representatives of both the *American Trucking Associations* and the *National Private Truck Council* have reviewed and endorsed the study.

It is very important that the survey represent *all* segments of the motor carrier industry, from multi-billion dollar corporations to the owner/operators of single power units. Your company's name was selected at random from industry lists, to represent many other companies of similar size and type. I know that you probably get many calls on your time for information and assistance not in the direct path of your business, but I do hope that your company will cooperate in this very worthwhile project. Only if the selected firms give us their opinions can we be sure that the research findings are truly representative of the industry as a whole.

Battelle, an independent, non-profit research organization, is overseeing this project, and the survey is being carried out on our behalf by researchers at Oregon State University (OSU). Survey responses from individual companies will be treated as *strictly confidential*, and the resulting data will be reported in aggregate form only.

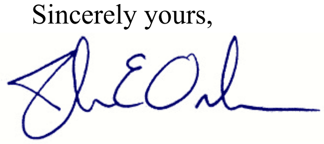
I am enclosing a copy of the questionnaire for this study, in the hope that the appropriate officials of your firm will agree to fill it out and return it (in the enclosed postage-paid envelope) to OSU. We appreciate that the information and opinions we are seeking may involve more than one member of your staff. Accordingly, the questionnaire has been printed in three different sections, and each should be completed by the most appropriate person to answer that particular section:

- The *yellow* section is about *obtaining vehicle credentials and permits*;
- The *buff* section is about *roadside weight and safety inspection procedures*; *and*
- The *white* section provides *general background information* for your firm.

Of course, if a particular person is the best qualified to answer more than one of the sections, he or she should do so.

If you have any questions or comments about this letter, please call the research office (toll-free) at (877) 404-3055. Thank you in advance for your very valuable assistance.

Sincerely yours,



John E. Orban
Project Director

Table C.1-3. Cover letter (on Battelle stationery) to firms with fewer than 100 power units

Dear Sir or Madam,

I am writing to request the cooperation of your company in a survey project that is important to the trucking industry. It's about new computer-based methods now being used in some states for commercial vehicle credentialing processes and roadside weight and safety inspections.

This research will learn the *experience* of motor carriers with both existing and new methods of credentialing and roadside inspections, and very importantly, will *ensure that their opinions about these matters will be heard* by the state and federal governments. The study findings will be examined closely by state motor vehicle administration and enforcement agencies across the country, and by the Federal Motor Carrier Safety Administration (that has in part sponsored the research). Representatives of both the *American Trucking Associations* and the *National Private Truck Council* have reviewed and endorsed the study.

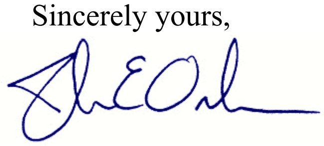
It is very important that the survey represent *all* segments of the motor carrier industry, from multi-billion dollar corporations to the owner/operators of single power units. Your company's name was selected at random from industry lists, to represent many other companies of similar size and type. I know that you probably get many calls on your time for information and assistance not in the direct path of your business, but I do hope that your company will cooperate in this very worthwhile project. Only if the selected firms give us their opinions can we be sure that the research findings are truly representative of the industry as a whole.

Battelle, an independent, non-profit research organization, is overseeing this project, and the survey is being carried out on our behalf by researchers at Oregon State University (OSU). Survey responses from individual companies will be treated as *strictly confidential*, and the resulting data will be reported in aggregate form only.

I am enclosing a copy of the questionnaire for this study, in the hope that the appropriate officials of your firm will agree to fill it out and return it (in the enclosed postage-paid envelope) to OSU. If the information and opinions we are seeking involve more than one senior member of your staff, please feel free to have different people complete the different parts of the questionnaire.

If you have any questions or comments about this letter, please call the research office (toll-free) at (877) 404-3055. Thank you in advance for your very valuable assistance.

Sincerely yours,



John E. Orban
Project Director

Table C.1-4. Final summary of response

Issued sample	2,000	100.0%	
Less mailings returned			
Firm not at that address	–95	–4.8%	
Bad address	–28	–1.4%	
Firm no longer a commercial carrier	–18	–0.9%	
Other reasons	–31	–1.6%	
Effective issued sample	1,828	91.4%	100.0%
Completed questionnaire(s) returned	148	7.4%	8.1%

For the firms with 250 or more power units, the responses constituted 7 percent of the issued sample and 7 percent of the effective issued sample (since the "dead wood" losses were relatively small in this category). For firms with between 100 and 249 power units, the statistics were 9 percent and 10 percent, respectively. These were the disappointing size categories, since the ATA Foundation study had experienced higher response rates for these size groups.

For the firms with 10 to 99 power units, responses were received from 11 percent of the total issued sample and 12 percent of the effective sample. However, for the firms with fewer than 10 power units, the statistics were 4 percent and 4 percent, respectively.

APPENDIX C.2:

MOTOR CARRIER SURVEY QUESTIONNAIRE

APPENDIX C.2: MOTOR CARRIER SURVEY QUESTIONNAIRE

The version of the questionnaire appearing in the following pages is that sent to firms believed (on the basis of the information in the MCMIS Census database) to operate fewer than 100 power units. For larger firms, the questionnaire was divided up into three separate components (dealing with, in turn, permits and credentials, roadside inspections, and general information about the company) for ease of completion when the authoritative person about each component was different. In this case, the three components differed from the text in the single questionnaire only in that they also contained questions about the identity and level of experience of the person completing each component.

−0

SURVEY OF MOTOR CARRIERS, 2000

This survey is being carried out by Oregon State University on behalf of Battelle, an independent research organization, to find out about the experiences of motor carriers in obtaining credentials and permits, and in undergoing roadside weight, safety, and compliance inspections. Your answers will help us learn what types of improvements would be most useful to the motor carrier industry. The statistical findings from the survey will be shared with commercial vehicle administrators at the Federal and State levels, but your individual responses will be kept completely confidential.

It is very important that the opinions of *smaller carriers* and *owner/operators* get represented in this survey. While we hope that everything in the questionnaire is easy for you to answer, there may be parts for which you have no information. If so, it is perfectly acceptable to write in "**DK**" (for "Don't know").

If you believe that you are *not* the most appropriate person in your organization to complete this questionnaire, or if there is any question for which you need further clarification or assistance, please call (toll-free)

Ms Corina Locklear, Oregon State University Transportation Research Institute
1 (877) 404-3055

Motor carrier firm:

Name of the person completing this questionnaire:

Your firm's current experience of obtaining permits and credentials

1a) Please think about all of the different types of permits, credentials, or stickers that you have needed to obtain for your company's vehicles over the most recent twelve-month period for which you have information. In the table below, please check the box in column **A** for each different type of credentials that your company needed to obtain.

1b) For each type of permit or credential you checked in column **A**, please check one box in column **B** to indicate whether your company . . .
- paid an outside firm (or firms) to obtain *all* of that type of operating credential, *or*
- paid an outside firm (or firms) to obtain *most* (more than 50 percent) of that type of operating credential, *or*
- paid an outside firm (or firms) to obtain *some* (but less than 50 percent) of that type of operating credential, *or*
- used your own staff *exclusively* to obtain that type of operating credential.

	A Obtained in 12-month period	**B. Outside firm(s) paid to obtain** all	most	some	none
Credentials obtained on ***an initial basis****, or when you make* ***fleet changes***:					
IRP or **IFTA** initial applications	❑	❑	❑	❑	❑
IRP or **IFTA** supplemental applications, for fleet changes	❑	❑	❑	❑	❑
Credentials obtained on an ***annual basis***:					
IRP or **IFTA** annual renewals	❑	❑	❑	❑	❑
Intrastate registrations, for intrastate only vehicles	❑	❑	❑	❑	❑
Single State Registration System (**SSRS**) registrations	❑	❑	❑	❑	❑
Credentials obtained on an ***individual vehicle trip basis***:					
IRP or **IFTA** "single trip" permits	❑	❑	❑	❑	❑
Oversize / Overweight (**OS/OW**) permits	❑	❑	❑	❑	❑
Hazardous materials (**HAZMAT**) permits	❑	❑	❑	❑	❑
Returns associated with ***tax payments***:					
IFTA quarterly tax	❑	❑	❑	❑	❑
Weight / Distance tax reports	❑	❑	❑	❑	❑

2) ***If, over the most recent twelve months for which you have information, you have not paid any outside firms to help obtain operating credentials for you, check here ❑ and skip to Question 3.***

For the most recent twelve-month period for which you have information, how much in total did your company pay to outside firms for credentialing services? Don't count the costs of the permits or credentials themselves, just the amount you paid for outside help to obtain them.

Amount paid for outside credentialing help: **$** __________

If this amount includes payment for other services as well as credentialing, please indicate below what other services were included in the amount *(Check all that apply)*:

❑ payroll administration
❑ income tax preparation
❑ other accounting or auditing services
❑ personnel services
❑ legal services
❑ other services ***[please describe: ______________________________]***

3) The next few questions are about your own firm's "*in-house*" staff and equipment that are involved in obtaining permits and credentials. ***If, over the most recent twelve months for which you have information, no employees of your firm have been involved in obtaining credentials, check here ❑ and skip to Question 6.***

For the most recent twelve-month period for which you have information, which of the following methods have your firm's staff used to file credentials paperwork? *(Check all that apply)*

❑ walk-in applications (in-person visits to a credentialing office)
❑ mail-in applications (submitted paperwork by mail)
❑ faxed applications
❑ submitted paperwork by Internet or E-mail, or filled out forms on a WWW website
❑ provided all necessary information by telephone
❑ some other method ***[please describe: ______________________________]***
❑ none of these

4) Is the time that your company's own staff spends on obtaining permits and credentials . . . *(Check one only)*
❑ spread out pretty evenly throughout the whole year, *or*
❑ concentrated into a particular time of the year?
If so, for how many weeks does this period of special activity typically last? ___________ weeks

5) Thinking again about the most recent twelve-month period for which you have information, how many of your own company's employees were involved in obtaining vehicle operating credentials (and assuring that they were placed on vehicles in a timely manner)?

For each staff category below, please count the number of staff positions (or "full time equivalents") involved in credentialing, and estimate the average percentage of a counted person's time that was spent on credentialing matters. If your credentialing work is concentrated into a particular time of year, put the numbers for this concentrated period in column **A** and those for the rest of the year in column **B**. If credentialing is spread out evenly over the year, just complete column **B.**

	A Most concentrated period		**B** Rest of year, or all year	
	number of people (or FTEs)	*average % of these people's time*	*number of people (or FTEs)*	*average %of these people's time*
managerial and supervisory staff	______	______%	______	______%
clerical staff	______	______%	______	______%
other staff ***[please specify: ______________________________]***	______	______%	______	______%

6) We're interested in the *in-house* costs to your company of obtaining vehicle operating credentials. These include

- the costs of your own employees' time to complete and submit applications, obtain the permits and credentials, and place them on the vehicles, *and*
- the costs of any special equipment or other charges involved in carrying out those functions.

These costs do ***not*** include

- any payments to an outside firm (or firms) to help you obtain the operating credentials, *or*
- the actual fees paid for the credentials or permits themselves.

For the most recent twelve-month period for which you have information, has your company made any calculation of these *in-house* costs of obtaining vehicle operating credentials?

❑ no, or not sure ***[skip to Question 7]***
❑ yes
Briefly give the estimate below, being sure to indicate whether it is a total annual companywide figure, or per power unit, or per some other unit of measure. (*If you are willing to share, on a confidential basis, any internal report, memo, or other document that shows how this estimate was derived, please enclose it with your reply*.)

____

____

7) Overall, how satisfied are you currently with the *process* your firm has to use (or has decided to use) for each of the following types of credentials or permits? We're not asking for your opinion about whether you should have to get that type of permit; rather, given that you need a particular type of credential, how satisfied are you with the *process* of obtaining it?

For each type of registration listed below, please circle a number between **0** and **10** to show your opinion. A **0** would mean that you are ***completely dissatisfied***, and a **10** would mean that you are ***completely satisfied***. A **5** means that you are ***neither satisfied nor dissatisfied***, or that you have no opinion. If your company hasn't needed that type of registration, circle **X**.

	completely dissatisfied					***neutral***					***completely satisfied***	***hasn't applied***
IRP/IFTA initial application	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**X**
IRP/IFTA supplemental application (fleet changes)	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**X**
IRP/IFTA annual renewals	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**X**
Intrastate registrations, for intrastate only vehicles	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**X**
Single State Registration System (**SSRS**)	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**X**
IRP/IFTA "single trip" application	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**X**
Oversize / Overweight (**OS/OW**) permits	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**X**
Hazardous materials (**HAZMAT**) permits	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**X**
IFTA quarterly tax	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**X**
Weight / Distance tax reports	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**X**

Your opinions about possible new methods of obtaining permits and credentials

8) Have you heard of using electronic (computer-to-computer) methods for obtaining credentials or permits *directly from any of the states* for which your company needs credentials? This "electronic credentialing" is the situation where you would send your information electronically direct to the state's registration agency, *not* to an outside company who would then file the application on your behalf. *(Check the one answer that best applies)*

❑ yes, I have heard of computer-to-computer credentialing
❑ no, I've not heard of that ***[Skip to Question 10]***
❑ I'm not sure whether or not I've heard of that ***[Skip to Question 10]***

9) Please check one or more of these answers to indicate your firm's current involvement with direct-to-state, computer-to-computer registration of vehicles or operations. *(Check all that apply)*

- ❑ we're already using electronic registration in one or more states ***[Which states? ________________________]***
- ❑ we could do that now for some (other) states, but we haven't done so yet ***[Which states? _________________]***
- ❑ I believe that some of the states we deal with plan to introduce that ***[Which states? ______________________]***
- ❑ we have definite plans to use that when it becomes available in the states we deal with
- ❑ I've heard of the idea in general, but I don't know where or when it will be possible

10) In some states, certain motor carriers do have the option of using electronic (computer-to-computer) methods for obtaining credentials or permits. Here are some opinions from other motor carriers about electronic credentialing methods. Please circle a number between **0** and **10** to show how much you personally agree or disagree with each statement below. A **0** would mean that you ***disagree completely***, and a **10** would mean that you ***agree completely***. A **5** means that you ***neither agree nor disagree***, or that you have no opinion.

	disagree completely					***neutral***					***agree completely***
"With electronic credentialing, I'd expect the turnaround time to be *much* quicker"	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
"Electronic credentialing is likely to cost my company more than we'd save"	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
"I expect we'd make significant time and cost savings from using electronic credentialing"	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
"We're too small to justify thinking about electronic credentialing"	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
"The only major beneficiaries of electronic credentialing will be the state agencies"	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
"Electronic credentialing would result in more accurate and fairer calculation of fees"	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
"Electronic credentialing would help me run a safer trucking operation"	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
"Training our existing staff to do electronic credentialing would be very difficult"	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
"I'm concerned that electronic credentialing will help the states to *expand* regulation and charges in new ways"	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
"Electronic credentialing would allow us to reorganize how we run the business, and help put more trucks on the road for more hours"	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
"If we let our computers talk directly to the state's computer, I'd be worried about privacy"	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
"Electronic credentialing would require us to use state-mandated standards, formats, or equipment"	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

11) ***If your company <u>currently</u> uses electronic (computer-to-computer) credentialing, please skip to Question 12; otherwise, continue:***

Suppose that within the next twelve months your company has the opportunity to start using electronic means to obtain credentials or permits from at least one of the states with which you must register. Please choose a number between **0** and **10** to indicate how likely your company would be to use that method. *(Circle one number)*

very <u>un</u>likely					***neutral, or can't say***					***very likely***
0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

In order of importance, what are the main reasons why you gave that particular answer?

Most important: ____

____

Second reason (if any): ____

____

12) Either from your own experience, from what you have heard from others, or just from your own expectations, are there any ways in which you expect adopting electronic credentialing might change the ways in which your firm does business, positively or negatively? List any possible changes that occur to you, in their order of importance.

Most important change: ____

____

Other changes (if any): ____

____

____

Your firm's current experience with roadside vehicle inspections

13) Does your company maintain records that allow you easily to know the number of roadside checks that your vehicles undergo? Which one of the following answers best describes your company's situation? *(Check one answer only)*

- ❑ we do *not* collect and analyze any data about roadside checks of our vehicles ***[Skip to Question 15]***
- ❑ we keep records of all (or almost all) roadside checks, and make statistical summaries of them
- ❑ we keep records of all (or almost all) roadside checks, but don't summarize the data routinely
- ❑ occasionally or every so often, we look at sample data about our roadside checks
- ❑ we do something else ***[please describe:*** ____
____***]***

14) For the most recent twelve-month period for which you have information, how many times in total did your company's vehicles have to stop for roadside checks for size & weight or safety compliance? For each type of inspection, what would you estimate to be the *average* amount of time spent per inspection (including time spent waiting)?

If you don't know any of these numbers but can make a reasonably good approximation or guess, please enter the number and circle the **G** after it. If the number is based on statistics that your company keeps, circle the **D** after it. If you don't know a number and can't estimate it, please enter "**DK**" for that number.

Type of inspection	*Number of checks in 12-month period*	*Based on **D**ata or **G**uess?*	*Average time spent per inspection*	*Based on **D**ata or **G**uess?*
size and weight check requiring a stop	______	**D G**	______ **minutes**	**D G**
safety inspection	______	**D G**	______ **minutes**	**D G**

15) Overall, how satisfied are you with each of the following aspects of roadside inspections, as your company experiences them in the states in which your vehicles operate most? We're not asking for your opinion about whether there should be roadside inspections at all; rather, given that the states decide to make roadside inspections, how satisfied are you with the ways in which the inspections are carried out?

For each aspect listed below, please circle a number between **0** and **10** to show your opinion. A **0** would mean that you are ***completely dissatisfied***, and a **10** would mean that you are ***completely satisfied***. A **5** means that you are ***neither satisfied nor dissatisfied***, or that you have no opinion. If for some reason a particular aspect hasn't applied to your company, circle **X**.

	completely dissatisfied					*neutral*					*completely satisfied*	*hasn't applied*
The **frequency** of inspections	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**X**
The **criteria** for deciding which vehicles to inspect	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**X**
The **types of checks** made	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**X**
The **fairness** of the inspection process	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**X**
The time spent in vehicle **inspection** itself	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**X**
The time spent **waiting** for inspection	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**X**

16) State motor vehicle agencies are charged with enforcing state and federal laws to ensure the safety and compliance of commercial vehicles operating on the highways. If you could suggest or make changes to the ways in which roadside inspections are typically organized and conducted, that wouldn't lead to more unsafe vehicles on the roads, what would be your highest priorities?

Most important change: ______________________________

Other changes (if any): ______________________________

Your opinions about new methods of roadside vehicle screening

17) Some places are beginning to use a new method of roadside screening that is sometimes called "***Mainline screening***" This is where an electronic transponder on board the vehicle allows enforcement officials to identify vehicles as they travel along the road at highway speeds. Vehicles operated by carriers with good safety records will not be signalled to pull in or stop for safety checks. Carriers may pay an annual fee per vehicle, allowing an unlimited number of uses over the year (as with the "*NORPASS* program"), or they may be charged each time an equipped vehicle passes an inspection site (as with the "*HELP PrePass* program").

Please check one or more of these answers to indicate your firm's current or expected use of mainline screening for *any* of your vehicle fleet. *(Check all that apply)*

- ❑ I've never heard of this new screening method before ***[Skip to Question 18]***
- ❑ we currently use this method on an "annual fee per truck" basis
- ❑ we currently use this method on a "charge per inspection site passed" basis
- ❑ we don't use this method now, and don't expect to do so within the next two years
- ❑ we don't use this method now, but expect to do so within the next two years

In your opinion, what are the most important reasons for or against your company participating in a program like this?

____

18) Other safety screening changes being introduced in some states increase the amount and timeliness of the information available to roadside enforcement staff. For example, in many states they can check quickly the safety history of a ***carrier***, so as to target only high-risk carriers for inspection. In some places, up-to-the-minute information on a ***specific vehicle*** is available (including recent inspection results), so that violations of out-of-service-orders can be identified quickly.

Before reading this question, were you aware that inspection and enforcement staff might have these types of information available to them when making decisions about roadside inspections? *(Check one box in each row)*

	yes, I did know that	***no, I didn't know that***	***I'm not sure***
Information about the ***carrier***'s safety history	❑	❑	❑
Information about the ***vehicle*** condition & compliance	❑	❑	❑

19) Here are some opinions from other motor carriers about these types of changes (mainline screening, and putting more information in the hands of the enforcement staff). Please circle a number between **0** and **10** to show how much you personally agree or disagree with each statement below. A **0** would mean that you ***disagree completely***, and a **10** would mean that you ***agree completely***. A **5** means that you ***neither agree nor disagree***, or that you have no opinion.

	disagree completely					***neutral***					***agree completely***
"Equipping all our units with transponders is likely to cost my company more than we'd save"	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
"If these new inspection methods were more widespread, I expect we'd make significant time and cost savings"	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
"We're too small to justify thinking about putting transponders in our units"	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
"Even if the time spent in safety and weight inspections were halved, there'd be very little impact on our costs"	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
"Even without equipping our vehicles, we'd probably benefit if the inspection officials had better information"	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
"I expect that our drivers would be pleased by these types of changes"	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
"These types of changes will make the roadside inspection system significantly more fair"	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
"I'm concerned that changes like these will help the states to *expand* regulation and charges in new ways"	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
"I worry about government agencies having so much information about our vehicles"	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

20) Either from your own experience, from what you have heard from others, or just from your own expectations, are there any ways in which you expect the types of roadside screening changes we've been discussing – mainline screening, and more information in the hands of the screening staff – might change the ways in which your firm does business, positively or negatively? List any possible changes that occur to you, in their order of importance.

Most important change: ____

____

Other changes (if any): ____

____

____

21) Have any recent changes in roadside inspection or enforcement policies in the states in which your trucks operate caused your company to spend additional dollars, either to take advantage of streamlined inspection procedures or to improve your compliance with the safety regulations? Which one of the following answers best describes your company's situation? *(Check one answer only)*

- ❑ yes, we are spending more than we otherwise would have spent this year, in part because of changes in inspection or enforcement practices
- ❑ no, our spending hasn't been increased because of changes in inspection or enforcement practices
- ❑ I'm not sure whether our spending has been increased or not

If you believe that your spending *has* increased in part because of changes in inspection or enforcement policies, how much extra per power unit do you estimate that you are spending this year as a result of the changes?

Estimated extra spending this year, per power unit: **$** __________

About your firm's business and size (for statistical purposes only)

22) Which one of the following types of carrier best describes your company?

- ❑ for-hire truckload carrier
- ❑ for-hire LTL carrier
- ❑ private carrier
- ❑ general freight carrier
- ❑ tank truck operator
- ❑ refrigerated truck operator
- ❑ automobile transporter
- ❑ bulk commodities carrier
- ❑ household goods mover
- ❑ owner / operator
- ❑ other ***[please describe: ______________________________]***

23) As of the beginning of the current month, how many vehicles does your company operate?

	Owned	*Leased*
Single-unit vehicles	_______	_______
Power units	_______	_______
Trailers	_______	_______

24) ***If you do not operate any leased vehicles, skip to Question 25.***

If you do operate leased vehicles, which of the following services does the leasing company (or companies) provide? *[Check all that apply]*

	For all leased vehicles	*For some leased vehicles*
drivers	❑	❑
fleet management services	❑	❑
vehicle maintenance	❑	❑
operating credentials	❑	❑
fuel tax reporting	❑	❑
other services ***[please specify: ______________________]***	❑	❑
none of these	❑	❑

25) As of the beginning of the current month, how many drivers did your company employ directly? *[Don't count drivers provided by leasing companies or other firms, who were not on your direct payroll]*

Number of drivers employed directly, in "Full time equivalents": _________ FTEs

If roadside inspections were made more efficient, whether or not your company's costs would be affected depends in part on how your drivers are paid. Please tell us which of these methods of reimbursement are used for the drivers that your company employs directly. Check one box in column **A** to show the method you use most. If you use more than one method, also check columns **B** and **C** to indicate the other methods that your company uses.

	A *Method used most (check one)*	**B** *Method used second (check one)*	**C** *Other methods used (check all)*
pay by the hour	❑	❑	❑
pay by the mile	❑	❑	❑
pay by the trip	❑	❑	❑
pay by the value of the shipment	❑	❑	❑
other payment methods ***[please specify: ________________________]***	❑	❑	❑

26) And as of the beginning of the current month, how many drivers were operating vehicles for your company who were not direct employees of your company?

Number of drivers not employed directly, in "Full time equivalents": _________ FTEs

Which of these methods of reimbursement are used for the drivers that your company does not employ directly? Check one box in column **A** to show the method you use most. If you use more than one method, also check columns **B** and **C** to indicate the other methods that your company uses.

	A *Method used most (check one)*	**B** *Method used second (check one)*	**C** *Other methods used (check all)*
pay by the hour	❑	❑	❑
pay by the mile	❑	❑	❑
pay by the trip	❑	❑	❑
pay by the value of the shipment	❑	❑	❑
other payment methods ***[please specify: ________________________]***	❑	❑	❑

27) For the most recent twelve-month period for which you have information, what were your total annual fleet miles as used for highway use tax reporting?

Total annual fleet miles: ___________

28) About what percentage of your loads require . . .

an oversize / overweight permit? _________ **%**

a HAZMAT placard? _________ **%**

29) Which of these **best** describes the furthest geographic range of your company's usual operations? *(Check one only)*

- ❑ local only (within a radius of ~75 miles)
- ❑ within state only
- ❑ regional (own state and nearby states)
- ❑ national, or nearly so (48 continental US states)
- ❑ international (using your own power units)
- ❑ other ***[please describe: ____]***

30) In the most recent twelve-month period for which you have information, in which of the following states did your company operate more than 2,500 annual fleet miles? *(Check all that apply)*

- ❑ California
- ❑ Colorado
- ❑ Connecticut
- ❑ Kentucky
- ❑ Maryland
- ❑ Michigan
- ❑ Minnesota
- ❑ Oregon
- ❑ Virginia
- ❑ Washington
- ❑ none of the above

31) Is your company . . . *(Check one only)*

- ❑ privately held, or the subsidiary of a privately held company
- ❑ publicly quoted on a stock exchange, in its own right ***[enter stock symbol: _________]***
- ❑ the subsidiary of a publicly quoted company ***[enter stock symbol: _________]***

About your own position in the company (for statistical purposes only)

32) For how long have you worked in your current job, at your current firm, and within the commercial vehicles industry?

	Time in current job	*Time in current firm*	*Time in CVO industry*
less than 1 year	❑	❑	❑
1 year to less than 2 years	❑	❑	❑
2 years to less than 5 years	❑	❑	❑
5 years to less than 10 years	❑	❑	❑
10 years to less than 20 years	❑	❑	❑
20 years to less than 30 years	❑	❑	❑
30 years or longer	❑	❑	❑
can't say	❑	❑	❑

33) In case we need to contact you to clarify any of your responses, please supply the following details.

Your name: ______________________________

Your job title: ______________________________

Your telephone number: (_____)______–____________ext.__________

Your address: ______________________________

____

Your email address: ______________________________

Thank you very much for your assistance. Your information and opinions will be very valuable to this study. Please return your completed questionnaire, in the enclosed envelope, to

Paul Montagne
Oregon State University
202 Apperson Hall
Corvallis, OR 97333-9967

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APPENDIX C.3:

MOTOR CARRIER SURVEY DETAILED DATA

APPENDIX C.3: MOTOR CARRIER SURVEY DETAILED DATA

This appendix presents a series of tables showing detailed responses to the questionnaire items, cross-tabulated by carrier type and other carrier features. Each questionnaire topic has been assigned an identifying letter, used to identify tables within this appendix. Every topic is then presented four times, across four sets of motor carrier types (e.g., for-hire truckload carriers versus private carriers versus all others) or other features (e.g., Does the carrier use an outside firm for credentialing?).

For reference, the following table shows the page numbers where each cross-tabulation of data appears in this appendix.

Contents of Cross-Tabulated Data Results by Questionnaire Topic and Carrier Type

APPENDIX C.3
Table A: Credentials obtained in last twelve months.
Base: All respondents.

	All firms		Type of carrier						Number of powered units						Total drivers					
			For-hire truckload carrier		Private carrier		All others		10 or fewer		Over 10 up to 50		Over 50		10 or fewer		Over 10 up to 70		Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	158		45		38		67		45		39		74		41		40		64	
Weighted number of observations	10000.0		440.2		3428.6		4959.0		8716.9		1171.7		111.5		7971.1		1141.6		65.2	
IRP/IFTA initial application	4729	47%	341	77%	2471	72%	1348	27%	4259	49%	418	36%	52	47%	4260	53%	423	37%	41	64%
Outside firm obtained all	154	2%	33	8%	116	3%	4	0%	83	1%	69	6%	3	2%	83	1%	70	6%	1	2%
Outside firm obtained most	1	0%			1	0%							1	1%					1	2%
Outside firm obtained some	117	1%	115	26%	1	0%			83	1%	33	3%	1	1%	83	1%	33	3%	1	2%
IRP/IFTA supplemental application	2232	22%	203	46%	720	21%	1307	26%	1262	14%	924	79%	46	41%	1233	15%	957	84%	39	60%
Outside firm obtained all	71	1%	33	8%	33	1%	4	0%			69	6%	3	2%			70	6%	1	2%
Outside firm obtained most	1	0%			1	0%							1	1%					1	2%
Outside firm obtained some	684	7%	83	19%	1	0%	600	12%	83	1%	600	51%	2	1%	83	1%	600	53%	2	2%
IRP/IFTA annual renewals	5727	57%	366	83%	2628	77%	2163	44%	4665	54%	1001	85%	62	55%	3935	49%	1003	88%	51	79%
Outside firm obtained all	723	7%	33	8%	683	20%	5	0%	650	7%	69	6%	4	4%	83	1%	70	6%	3	4%
Outside firm obtained most																				
Outside firm obtained some	651	7%	83	19%	1	0%	567	11%	83	1%	567	48%	1	1%	83	1%	567	50%	1	2%
Intrastate registrations	4042	40%	171	39%	1302	38%	2000	40%	3773	43%	221	19%	48	43%	3874	49%	126	11%	37	57%
Outside firm obtained all	36	0%	33	8%			3	0%			35	3%	1	1%			35	3%	1	1%
Outside firm obtained most	3	0%			1	0%	1	0%					3	3%					3	5%
Outside firm obtained some																				
SSRS registrations	4097	41%	312	71%	645	19%	2571	52%	3061	35%	954	81%	81	73%	3029	38%	1021	89%	43	66%
Outside firm obtained all	37	0%	33	8%	1	0%	3	0%			36	3%	1	1%			36	3%	1	2%
Outside firm obtained most	1	0%			1	0%							1	1%						
Outside firm obtained some	3	0%					3	0%			3	0%					3	0%		
IRP/IFTA single trip permits	973	10%	142	32%	674	20%	155	3%	725	8%	181	15%	67	60%	690	9%	250	22%	28	43%
Outside firm obtained all	80	1%	39	9%	33	1%	9	0%			68	6%	13	11%			69	6%	11	17%
Outside firm obtained most	5	0%	3	1%	1	0%	1	0%			4	0%	1	1%			4	0%		
Outside firm obtained some	41	0%	4	1%	1	0%	36	1%	3	0%	33	3%	5	5%	3	0%	36	3%	2	4%
OS/OW permits	387	4%	209	48%	114	3%	62	1%	129	1%	185	16%	73	65%	167	2%	184	16%	31	47%
Outside firm obtained all	50	1%	38	9%			11	0%	2	0%	38	3%	11	9%	3	0%	35	3%	11	16%
Outside firm obtained most	3	0%	2	0%	1	0%							3	2%					2	3%
Outside firm obtained some	42	0%	35	8%	3	0%	4	0%	3	0%	33	3%	6	5%	3	0%	33	3%	4	7%
HAZMAT permits	69	1%	12	3%	11	0%	44	1%	8	0%	41	4%	20	18%	5	0%	41	4%	18	28%
Outside firm obtained all	3	0%	1	0%			3	0%	1	0%			3	2%					3	5%
Outside firm obtained most																				
Outside firm obtained some	2	0%	1	0%	1	0%							2	2%					1	1%
IFTA quarterly tax	4689	47%	398	90%	2692	79%	1029	21%	3563	41%	1066	91%	60	54%	3483	44%	1068	94%	51	78%
Outside firm obtained all	162	2%	37	8%	119	3%	5	0%	83	1%	69	6%	9	8%	83	1%	69	6%	10	15%
Outside firm obtained most	33	0%	33	7%							33	3%					33	3%		
Outside firm obtained some	2	0%	1	0%	1	0%							2	2%					2	3%
Weight/distance tax reports	2949	29%	249	57%	1339	39%	791	16%	2031	23%	862	74%	56	50%	1983	25%	833	73%	46	71%
Outside firm obtained all	157	2%	68	15%	85	2%	4	0%	83	1%	69	6%	5	5%	115	1%	36	3%	6	9%
Outside firm obtained most	1	0%	1	0%									1	1%					1	2%
Outside firm obtained some	2	0%	1	0%	1	0%							2	2%					2	3%
Outside firm used, details unknown	1266	13%	6	1%			1228	25%	1220	14%	35	3%	11	10%	1249	16%	5	0%	11	16%
No permits obtained	2078	21%	4	1%	83	2%	1390	28%	2035	23%	35	3%	8	7%	1984	25%	3	0%	8	12%

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Table B: Payments to outside firms.
Base: All respondents.

	All firms		Type of carrier: For-hire truckload carrier		Type of carrier: Private carrier		Type of carrier: All others		Number of powered units: 10 or fewer		Number of powered units: Over 10 up to 50		Number of powered units: Over 50		Total drivers: 10 or fewer		Total drivers: Over 10 up to 70		Total drivers: Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	158		45		38		67		45		39		74		41		40		64	
Weighted number of observations	10000.0		440.2		3428.6		4959.0		8716.9		1171.7		111.5		7971.1		1141.6		65.2	
Up to $500	732	7%	41	9%			690	14%	651	7%	71	6%	10	9%	652	8%	71	6%	8	12%
$501 to $1,000	33	0%	33	7%			1	0%			33	3%	1	1%			33	3%	1	1%
$1,001 to $5,000	640	6%	34	8%			573	12%	1	0%	635	54%	5	4%	33	0%	602	53%	5	7%
Over $5,000	7	0%	2	0%			4	0%	3	0%			4	4%			3	0%	4	6%
Paid outside firm, but amount not known	1404	14%	130	29%	690	20%	584	12%	1303	15%	73	6%	28	25%	768	10%	42	4%	25	38%
No payments made	7184	72%	201	46%	2738	80%	3107	63%	6759	78%	361	31%	64	57%	6518	82%	392	34%	23	36%
Total	10000	100%	440	100%	3429	100%	4959	100%	8717	100%	1172	100%	111	100%	7971	100%	1142	100%	65	100%
Mean	1160.9		3962.0				829.6		244.7		1641.7		13520.1		398.5		1549.6		15623.8	
Std. Error of the Mean	1231.9		7046.8				241.4		380.6		372.4		13879.5		531.1		383.8		15377.7	

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Table C: Other services bundled with credentialing.
Base: All respondents reporting payments to outside firms.

	All firms		Type of carrier: For-hire truckload carrier		Type of carrier: Private carrier		Type of carrier: All others		Number of powered units: 10 or fewer		Number of powered units: Over 10 up to 50		Number of powered units: Over 50		Total drivers: 10 or fewer		Total drivers: Over 10 up to 70		Total drivers: Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	30		12				14		5		9		16		4		9		15	
Weighted number of observations	1412.1		109.5				1267.3		654.4		737.9		19.8		685.0		708.0		17.1	
Payroll administration	2	0%	1	1%			1	0%					2	10%					2	12%
Income tax preparation	121	9%	33	30%			87	7%	85	13%	33	4%	3	14%	83	12%	35	5%	3	16%
Other accounting/auditing	152	11%	66	60%			85	7%	85	13%	65	9%	1	7%	83	12%	68	10%	1	8%
Personnel services	3	0%					3	0%	3	0%			1	4%			3	0%	1	4%
Legal services	604	43%	33	30%			570	45%	570	87%	33	4%	1	7%	567	83%	35	5%	1	8%
Other	36	3%	2	2%			1	0%			33	4%	3	17%	33	5%			3	19%
No other services	657	46%	41	37%			614	48%	2	0%	640	87%	14	73%	3	0%	640	90%	12	68%

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Table D: Resources used for credentialing.
Base: All respondents.

	All firms		Type of carrier						Number of powered units						Total drivers					
			For-hire truckload carrier		Private carrier		All others		10 or fewer		Over 10 up to 50		Over 50		10 or fewer		Over 10 up to 70		Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	158		45		38		67		45		39		74		41		40		64	
Weighted number of observations	10000.0		440.2		3428.6		4959.0		8716.9		1171.7		111.5		7971.1		1141.6		65.2	
In-house resources only	3897	39%	198	45%	1356	40%	1773	36%	3508	40%	326	28%	64	57%	3433	43%	357	31%	23	36%
Outside firm only	835	8%	34	8%	116	3%	652	13%	732	8%	101	9%	1	1%	765	10%	69	6%	1	2%
Both in-house & outside firm	1982	20%	205	47%	574	17%	1199	24%	1225	14%	710	61%	47	42%	688	9%	681	60%	41	62%
None reported	3286	33%	3	1%	1382	40%	1335	27%	3251	37%	35	3%			3086	39%	35	3%		
Total	10000	100%	440	100%	3429	100%	4959	100%	8717	100%	1172	100%	111	100%	7971	100%	1142	100%	65	100%

APPENDIX C.3

Table E: Methods used to file paperwork.
Base: All respondents using in house resources.

	All firms		Type of carrier: For-hire truckload carrier		Type of carrier: Private carrier		Type of carrier: All others		Number of powered units: 10 or fewer		Number of powered units: Over 10 up to 50		Number of powered units: Over 50		Total drivers: 10 or fewer		Total drivers: Over 10 up to 70		Total drivers: Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	136		42		30		58		31		32		73		28		34		63	
Weighted number of observations	5878.7		403.7		1930.4		2972.0		4733.3		1035.2		110.2		4120.5		1037.8		63.9	
Walk-in applications	2330	40%	221	55%	677	35%	865	29%	2133	45%	153	15%	43	39%	1485	36%	160	15%	32	50%
Mail-in applications	3810	65%	294	73%	1261	65%	1682	57%	2851	60%	861	83%	98	89%	2741	67%	926	89%	55	86%
Faxed applications	1576	27%	209	52%	50	3%	1314	44%	777	16%	747	72%	52	47%	746	18%	785	76%	42	66%
Internet, email, Website	585	10%	11	3%	3	0%	571	19%	570	12%	3	0%	12	11%	572	14%	3	0%	9	15%
Telephone	872	15%	157	39%	37	2%	678	23%	152	3%	670	65%	50	46%	123	3%	735	71%	12	19%
Other	6	0%	5	1%			1	0%					6	5%					6	9%
None of these	33	1%			33	2%			33	1%					33	1%				
Not reported	1297	22%	35	9%	4	0%	1257	42%	1217	26%	73	7%	6	6%	1282	31%	8	1%	5	8%

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Table F: In-house managerial staff time.
Base: All respondents using in house resources.

	All firms		Type of carrier						Number of powered units						Total drivers					
			For-hire truckload carrier		Private carrier		All others		10 or fewer		Over 10 up to 50		Over 50		10 or fewer		Over 10 up to 70		Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	136		42		30		58		31		32		73		28		34		63	
Weighted number of observations	5878.7		403.7		1930.4		2972.0		4733.3		1035.2		110.2		4120.5		1037.8		63.9	
Up to 5 FTE days	781	13%	164	41%	181	9%	433	15%	472	10%	245	24%	64	58%	395	10%	278	27%	23	36%
Over 5 up to 10 FTE days	1172	20%	35	9%	571	30%	567	19%	567	12%	602	58%	3	3%	567	14%	602	58%	3	4%
Over 10 up to 20 FTE days	650	11%	41	10%	33	2%	576	19%	570	12%	73	7%	6	5%	572	14%	71	7%	7	10%
Over 20 up to 50 FTE days	788	13%	119	30%	5	0%	96	3%	735	16%	45	4%	8	7%	735	18%	46	4%	7	10%
Over 50 up to 100 FTE days	9	0%	4	1%	1	0%	2	0%	1	0%			8	7%					8	12%
Over 100 up to 250 FTE days	5	0%	2	0%	1	0%	2	0%					5	5%					3	5%
Over 250 FTE days	575	10%	1	0%	568	29%	4	0%	568	12%			7	7%	567	14%			7	12%
Not reported	1899	32%	37	9%	569	30%	1293	43%	1820	38%	71	7%	9	9%	1284	31%	41	4%	7	10%
Total	5879	100%	404	100%	1930	100%	2972	100%	4733	100%	1035	100%	110	100%	4121	100%	1038	100%	64	100%
Mean	56.5		25.8		128.2		13.4		69.1		9.5		115.9		69.5		9.3		118.1	
Std. Error of the Mean	10.7		13.6		32.5		3.2		26.1		1.1		32.2		27.9		1.2		34.9	

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Table G: In-house clerical staff time.
Base: All respondents using in house resources.

	All firms		Type of carrier: For-hire truckload carrier		Type of carrier: Private carrier		Type of carrier: All others		Number of powered units: 10 or fewer		Number of powered units: Over 10 up to 50		Number of powered units: Over 50		Total drivers: 10 or fewer		Total drivers: Over 10 up to 70		Total drivers: Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	136		42		30		58		31		32		73		28		34		63	
Weighted number of observations	5878.7		403.7		1930.4		2972.0		4733.3		1035.2		110.2		4120.5		1037.8		63.9	
Up to 5 FTE days	2605	44%	315	78%	774	40%	945	32%	2228	47%	350	34%	27	24%	2148	52%	345	33%	25	39%
Over 5 up to 10 FTE days	577	10%	3	1%	574	30%			567	12%	8	1%	2	2%	567	14%	9	1%	1	1%
Over 10 up to 20 FTE days	161	3%	1	0%	5	0%	155	5%	115	2%	5	1%	41	37%	118	3%	38	4%	5	8%
Over 20 up to 50 FTE days	40	1%	35	9%	2	0%	3	0%			33	3%	8	7%			33	3%	8	12%
Over 50 up to 100 FTE days	576	10%	5	1%	3	0%	569	19%	3	0%	567	55%	7	6%	3	0%	570	55%	4	6%
Over 100 up to 250 FTE days	11	0%	4	1%	1	0%	5	0%			1	0%	10	9%			3	0%	7	11%
Over 250 FTE days	9	0%	2	0%	2	0%	3	0%	1	0%			7	7%					7	12%
Not reported	1899	32%	37	9%	569	30%	1293	43%	1820	38%	71	7%	9	9%	1284	31%	41	4%	7	10%
Total	5879	100%	404	100%	1930	100%	2972	100%	4733	100%	1035	100%	110	100%	4121	100%	1038	100%	64	100%
Mean	30.4		51.0		6.9		45.9		6.5		55.2		69.0		6.1		53.4		122.4	
Std. Error of the Mean	5.0		19.5		5.8		7.2		4.2		5.9		18.1		1.6		5.6		25.9	

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Table H: In-house total staff time.
Base: All respondents using in house resources.

	All firms		Type of carrier						Number of powered units						Total drivers					
			For-hire truckload carrier		Private carrier		All others		10 or fewer		Over 10 up to 50		Over 50		10 or fewer		Over 10 up to 70		Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	136		42		30		58		31		32		73		28		34		63	
Weighted number of observations	5878.7		403.7		1930.4		2972.0		4733.3		1035.2		110.2		4120.5		1037.8		63.9	
Up to 5 FTE days	516	9%	154	38%	170	9%	190	6%	269	6%	242	23%	5	5%	191	5%	237	23%	5	7%
Over 5 up to 10 FTE days	120	2%	34	8%	1	0%	85	3%	85	2%	33	3%	2	2%	85	2%	33	3%	1	2%
Over 10 up to 20 FTE days	1372	23%	40	10%	608	31%	725	24%	1253	26%	73	7%	46	42%	1252	30%	109	10%	12	18%
Over 20 up to 50 FTE days	759	13%	90	22%	5	0%	97	3%	735	16%	13	1%	10	9%	738	18%	12	1%	9	14%
Over 50 up to 100 FTE days	612	10%	36	9%	7	0%	570	19%	3	0%	602	58%	8	7%	3	0%	602	58%	8	12%
Over 100 up to 250 FTE days	15	0%	8	2%	1	0%	5	0%					15	13%			4	0%	9	14%
Over 250 FTE days	585	10%	5	1%	570	30%	7	0%	569	12%	1	0%	14	13%	567	14%	1	0%	14	22%
Not reported	1899	32%	37	9%	569	30%	1293	43%	1820	38%	71	7%	9	9%	1284	31%	41	4%	7	10%
Total	5879	100%	404	100%	1930	100%	2972	100%	4733	100%	1035	100%	110	100%	4121	100%	1038	100%	64	100%
Mean	72.5		34.7		147.8		36.1		67.2		54.2		372.1		67.5		51.2		638.4	
Std. Error of the Mean	37.4		17.4		138.1		6.4		22.1		6.0		290.7		23.1		6.0		412.8	

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Table I: Satisfaction score with credentialing (scale: -5 to +5).
Base: All respondents.

	All firms	Type of carrier			Number of powered units			Total drivers		
		For-hire truckload carrier	Private carrier	All others	10 or fewer	Over 10 up to 50	Over 50	10 or fewer	Over 10 up to 70	Over 70
	No %	No %	No %	No %	No %	No %	No %	No %	No %	No %
Unweighted number of observations	158	45	38	67	45	39	74	41	40	64
Weighted number of observations	10000.0	440.2	3428.6	4959.0	8716.9	1171.7	111.5	7971.1	1141.6	65.2
IRP/IFTA initial application										
Mean	0.9	1.7	0.2	0.1	0.9	0.8	2.0	1.0	0.8	1.8
Std. Error of the Mean	0.3	0.5	0.5	0.2	0.6	0.5	0.3	0.6	0.5	0.4
IRP/IFTA supplemental application										
Mean	1.1	2.6	1.0	-0.7	1.6	-0.2	1.8	1.7	-0.3	1.8
Std. Error of the Mean	0.3	0.4	0.6	0.3	0.7	0.6	0.3	0.7	0.6	0.4
IRP/IFTA annual renewals										
Mean	0.2	1.7	-1.4	0.1	0.3	-0.4	1.8	0.3	-0.4	1.7
Std. Error of the Mean	0.3	0.5	0.5	0.3	0.6	0.6	0.3	0.7	0.5	0.4
Intrastate registrations										
Mean	0.4	1.8	-0.4	-0.4	0.4	1.6	1.4	0.3	1.8	1.1
Std. Error of the Mean	0.3	0.5	0.7	0.2	0.7	0.8	0.4	0.7	0.7	0.5
SSRS registrations										
Mean	1.4	1.8	-0.6	1.5	1.2	2.0	2.2	1.3	1.9	2.1
Std. Error of the Mean	0.3	0.4	1.1	0.4	0.8	0.5	0.4	0.9	0.5	0.4
IRP/IFTA single trip permits										
Mean	-0.8	2.6	-1.3	-1.5	-1.6	2.5	0.6	-1.5	1.6	0.7
Std. Error of the Mean	0.3	0.6	0.5	0.2	0.4	0.7	0.4	0.6	0.7	0.5
OS/OW permits										
Mean	-0.8	1.2	-3.5	0.8	-1.3	2.1	1.0	-1.2	1.7	1.2
Std. Error of the Mean	0.4	0.4	0.7	0.3	0.8	0.7	0.3	0.9	0.7	0.5
HAZMAT permits										
Mean	-1.9	0.4	1.4	-3.2	0.9	-2.9	1.7	4.8	-3.4	1.8
Std. Error of the Mean	0.5	0.4	0.9	0.5	0.7	1.2	0.4	0.4	1.0	0.5
IFTA quarterly tax										
Mean	1.0	1.7	0.9	1.2	1.1	0.6	1.1	1.1	0.5	1.6
Std. Error of the Mean	0.2	0.5	0.6	0.3	0.5	0.5	0.3	0.5	0.5	0.4
Weight/distance tax reports										
Mean	-0.1	1.0	-3.4	1.2	-0.2	0.2	1.5	-0.2	-0.1	1.5
Std. Error of the Mean	0.3	0.4	0.6	0.3	0.6	0.5	0.3	0.7	0.4	0.4

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Table J: Electronic credentialing awareness & use.
Base: All respondents.

	All firms		Type of carrier						Number of powered units						Total drivers					
			For-hire truckload carrier		Private carrier		All others		10 or fewer		Over 10 up to 50		Over 50		10 or fewer		Over 10 up to 70		Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	158		45		38		67		45		39		74		41		40		64	
Weighted number of observations	10000.0		440.2		3428.6		4959.0		8716.9		1171.7		111.5		7971.1		1141.6		65.2	
Hasn't heard of EC	7522	75%	265	60%	2628	77%	3461	70%	6526	75%	960	82%	36	32%	6365	80%	958	84%	32	50%
Not sure whether heard of EC	250	2%	6	1%	37	1%	204	4%	201	2%	38	3%	10	9%	201	3%	39	3%	7	10%
Already using EC	38	0%	36	8%			2	0%			33	3%	6	5%			33	3%	5	8%
Able to use, but hasn't yet	1	0%	1	0%									1	1%					1	2%
Some of our states plan to introduce	6	0%	2	0%	3	0%	1	0%			3	0%	3	3%			3	0%	3	5%
Definite plans to use when available	14	0%	6	1%	2	0%	5	0%	1	0%	3	0%	10	9%	3	0%	3	0%	7	10%
Heard of it, but don't know availability	282	3%	90	20%	155	5%	36	1%	205	2%	38	3%	39	35%	121	2%	71	6%	6	9%
Not reported	1890	19%	35	8%	603	18%	1251	25%	1784	20%	98	8%	9	8%	1282	16%	35	3%	6	9%

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Table K: Opinions about electronic credentialing (scale: -5 to +5).
Base: All respondents.

		Type of carrier			Number of powered units			Total drivers		
	All firms	For-hire truckload carrier	Private carrier	All others	10 or fewer	Over 10 up to 50	Over 50	10 or fewer	Over 10 up to 70	Over 70
	No %	No %	No %	No %	No %	No %	No %	No %	No %	No %
Unweighted number of observations	158	45	38	67	45	39	74	41	40	64
Weighted number of observations	10000.0	440.2	3428.6	4959.0	8716.9	1171.7	111.5	7971.1	1141.6	65.2
"With electronic credentialing, I'd expect the turnaround time to be much quicker."										
Mean	1.4	1.5	1.8	1.8	1.2	3.1	2.3	1.5	2.9	2.6
Std. Error of the Mean	0.3	0.5	0.5	0.4	0.5	0.2	0.2	0.6	0.2	0.3
"Electronic credentialing is likely to cost my company more than we'd save."										
Mean	0.8	-0.4	-0.7	1.5	1.0	-0.6	-1.6	0.9	-0.8	-1.1
Std. Error of the Mean	0.2	0.4	0.5	0.3	0.5	0.3	0.3	0.5	0.3	0.3
"I expect we'd make significant time and cost savings from using electronic credentialing."										
Mean	-0.2	0.8	0.5	-0.4	-0.5	1.4	1.3	-0.3	1.5	1.6
Std. Error of the Mean	0.2	0.3	0.5	0.4	0.5	0.3	0.2	0.5	0.3	0.3
"We're too small to justify thinking about electronic credentialing."										
Mean	1.2	0.4	-0.1	1.5	1.7	-2.0	-1.1	1.5	-2.1	-1.8
Std. Error of the Mean	0.3	0.5	0.6	0.6	0.6	0.6	0.3	0.7	0.6	0.3
"The only major beneficiaries of electronic credentialing will be the state agencies."										
Mean	-0.3	0.0	-1.9	0.0	0.1	-2.4	-0.9	0.1	-2.3	-1.3
Std. Error of the Mean	0.3	0.4	0.4	0.5	0.6	0.6	0.3	0.6	0.5	0.3
"Electronic credentialing would result in more accurate and fairer calculation of fees."										
Mean	-0.2	0.3	1.1	-1.1	-0.6	2.1	0.2	-0.7	2.4	0.3
Std. Error of the Mean	0.3	0.1	0.4	0.5	0.5	0.4	0.2	0.6	0.4	0.3
"Electronic credentialing would help me run a safer trucking operation."										
Mean	-0.7	-0.7	1.6	-1.8	-0.7	-0.9	-0.5	-1.1	-0.7	-0.6
Std. Error of the Mean	0.3	0.3	0.4	0.4	0.5	0.3	0.2	0.6	0.3	0.3
"Training our existing staff to do electronic credentialing will be very difficult."										
Mean	-0.2	0.4	-1.8	0.2	0.0	-1.9	-0.8	0.1	-2.1	-1.0
Std. Error of the Mean	0.3	0.4	0.4	0.5	0.5	0.5	0.2	0.6	0.5	0.3
"I'm concerned that electronic credentialing will help the states to expand regulations and charges in new ways."										
Mean	1.7	0.5	1.6	1.4	1.6	2.4	-0.1	1.6	2.2	0.1
Std. Error of the Mean	0.2	0.2	0.4	0.4	0.5	0.4	0.2	0.5	0.4	0.3
"Electronic credentialing would allow us to reorganize how we run the business, and help put more trucks on the road for more hours."										
Mean	-0.9	-1.7	-0.9	-0.9	-0.9	-0.7	-0.6	-0.6	-0.6	-1.0
Std. Error of the Mean	0.2	0.3	0.3	0.4	0.4	0.3	0.2	0.5	0.2	0.3
"If we let our computers talk directly to the state's computer, I'd be worried about privacy."										
Mean	-0.9	-0.3	0.1	-1.9	-0.6	-2.3	-0.1	-1.2	-2.2	-0.6
Std. Error of the Mean	0.2	0.3	0.4	0.3	0.5	0.4	0.2	0.4	0.4	0.3
"Electronic credentialing would require us to use state-mandated standards, formats, or eqipment."										
Mean	1.7	2.4	0.1	2.1	2.0	-0.4	0.2	1.8	-0.3	0.3
Std. Error of the Mean	0.2	0.4	0.4	0.3	0.4	0.5	0.2	0.5	0.4	0.2

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Table L: Likelihood of using electronic credentialing.
Base: All respondents.

	All firms		Type of carrier						Number of powered units						Total drivers					
			For-hire truckload carrier		Private carrier		All others		10 or fewer		Over 10 up to 50		Over 50		10 or fewer		Over 10 up to 70		Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	158		45		38		67		45		39		74		41		40		64	
Weighted number of observations	10000.0		440.2		3428.6		4959.0		8716.9		1171.7		111.5		7971.1		1141.6		65.2	
Company already uses	38	0%	36	8%			2	0%			33	3%	6	5%			33	3%	5	8%
10 (very likely to use)	1752	18%	4	1%	1170	34%	577	12%	1705	20%	35	3%	12	11%	1703	21%	38	3%	10	15%
9	607	6%	1	0%	3	0%	603	12%	33	0%	572	49%	2	2%	3	0%	602	53%	2	3%
8	20	0%	10	2%	1	0%	9	0%			12	1%	8	7%	5	0%	7	1%	8	12%
7	110	1%	37	8%	66	2%	8	0%			103	9%	7	6%	33	0%	71	6%	6	10%
6	106	1%			5	0%	101	2%			100	9%	5	5%	33	0%	68	6%	5	8%
5 (neutral, can't say)	1904	19%	115	26%	691	20%	1097	22%	1705	20%	145	12%	54	48%	1586	20%	217	19%	17	27%
4	650	6%			83	2%	567	11%	650	7%					650	8%				
3	83	1%	83	19%					83	1%					83	1%				
2	660	7%	1	0%			89	2%	655	8%			5	5%	655	8%	4	0%	1	2%
1	37	0%			37	1%	1	0%			35	3%	2	2%	3	0%	33	3%	1	1%
0 (very unlikely to use)	2712	27%	85	19%	689	20%	1904	38%	2670	31%	38	3%	4	3%	2619	33%	5	0%	4	6%
Not reported	1320	13%	69	16%	684	20%	1	0%	1217	14%	98	8%	6	5%	600	8%	65	6%	6	9%
Total	10000	100%	439	100%	3419	100%	4967	100%	8720	100%	1170	100%	110	100%	7971	100%	1140	100%	68	100%
Mean	4.5		4.2		5.8		4.0		4.0		7.5		6.0		4.0		7.6		6.7	
Std. Error of the Mean	0.3		0.5		0.7		0.5		0.6		0.4		0.3		0.6		0.4		0.4	

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Table M1: Reasons for likelihood scores >=6.
Base: All respondents not using EC who claim a positive likelihood of doing so.

	All firms		Type of carrier: For-hire truckload carrier		Type of carrier: Private carrier		Type of carrier: All others		Number of powered units: 10 or fewer		Number of powered units: Over 10 up to 50		Number of powered units: Over 50		Total drivers: 10 or fewer		Total drivers: Over 10 up to 70		Total drivers: Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	59		16		14		28		6		19		34		9		16		31	
Weighted number of observations	2595.5		50.7		1245.7		1297.8		1737.3		823.2		34.9		1776.7		785.2		31.2	
Saves time, faster	697	27%	43	85%	73	6%	581	45%	3	0%	679	83%	15	42%	41	2%	644	82%	12	37%
Saves money, more efficient	612	24%	10	19%	1	0%	602	46%	567	33%	38	5%	8	22%	570	32%	35	4%	8	24%
Reduces paperwork	3	0%	1	1%			1	0%	1	0%			1	4%					1	5%
Better tracking	1135	44%			1134	91%	1	0%	1134	65%			1	4%	1134	64%			1	4%
We have computerized systems	41	2%			35	3%	5	0%			38	5%	3	8%	3	0%	35	4%	3	9%
Available at any time	35	1%	3	5%			33	3%	33	2%	3	0%					35	4%		
Other reasons	75	3%	1	1%	2	0%	73	6%			68	8%	8	22%	33	2%	35	4%	8	24%

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Table M2: Reasons for likelihood scores < 6.
Base: All respondents not using EC who claim a negative likelihood of doing so.

	All firms		Type of carrier						Number of powered units						Total drivers					
			For-hire truckload carrier		Private carrier		All others		10 or fewer		Over 10 up to 50		Over 50		10 or fewer		Over 10 up to 70		Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	99		29		24		39		39		20		40		32		24		33	
Weighted number of observations	7404.5		389.5		2182.9		3661.2		6979.5		348.5		76.5		6194.4		356.4		34.0	
Will take more time	3	0%			1	0%	2	0%					3	4%			3	1%	0	1%
Unsure about cost	71	1%	4	1%			66	2%	35	1%	33	9%	3	4%	35	1%	33	9%	3	10%
Firm too small	325	4%			123	6%	201	5%	251	4%	73	21%			251	4%	73	21%		
Happy with current credentialing arrangements	42	1%	3	1%			39	1%	38	1%			4	5%	5	0%	35	10%	1	3%
Limited or no computer equipment, expertise	1303	18%	1	0%	570	26%	732	20%	1299	19%	3	1%	1	2%	1302	21%			1	4%
Possible staff resistance	35	0%	1	0%			1	0%	1	0%	33	9%	2	3%	33	1%			3	8%
Fear of tracking problems	567	8%							567	8%					567	9%				
Needs to know more about it	90	1%	3	1%			87	2%	83	1%	5	2%	1	2%	83	1%	5	2%	1	4%
Other reasons	374	5%	2	1%	201	9%	171	5%	367	5%	0	0%	7	9%	284	5%	0	0%	6	17%

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Table N1: Roadside check incidence.
Base: All respondents.

	All firms		Type of carrier: For-hire truckload carrier		Type of carrier: Private carrier		Type of carrier: All others		Number of powered units: 10 or fewer		Number of powered units: Over 10 up to 50		Number of powered units: Over 50		Total drivers: 10 or fewer		Total drivers: Over 10 up to 70		Total drivers: Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	158		45		38		67		45		39		74		41		40		64	
Weighted number of observations	10000.0		440.2		3428.6		4959.0		8716.9		1171.7		111.5		7971.1		1141.6		65.2	
We keep data & summarize them	1297	13%	50	11%	37	1%	1177	24%	1172	13%	66	6%	58	52%	1204	15%	66	6%	24	37%
Firms estimating safety inspections	1294	13%	49	11%	37	1%	1176	24%	1172	13%	65	6%	57	51%	1204	15%	65	6%	24	37%
based on data	1251	13%	45	10%	1	0%	1172	24%	1137	13%	65	6%	49	44%	1169	15%	65	6%	16	25%
based on guess	43	0%	4	1%	35	1%	3	0%	35	0%			8	7%	35	0%			8	12%
Firms estimating size/weight checks	1249	12%	10	2%	35	1%	1171	24%	1172	13%	33	3%	45	40%	1204	15%	33	3%	12	19%
based on data	605	6%	5	1%			601	12%	567	7%			39	35%	567	7%	33	3%	6	9%
based on guess	641	6%	5	1%	33	1%	571	12%	602	7%	33	3%	6	6%	635	8%			6	10%
Firms estimating safety inspection time	1292	13%	48	11%	37	1%	1174	24%	1172	13%	65	6%	55	49%	1204	15%	65	6%	22	33%
based on data	668	7%	36	8%			600	12%	567	7%	65	6%	36	32%	600	8%	65	6%	3	5%
based on guess	624	6%	13	3%	37	1%	574	12%	605	7%			19	17%	605	8%			19	28%
Firms estimating size/weight check time	1252	13%	11	2%	37	1%	1171	24%	1172	13%	33	3%	47	42%	1204	15%	33	3%	14	22%
based on data	603	6%	2	0%	1	0%	600	12%	567	7%			36	32%	567	7%	33	3%	3	5%
based on guess	646	6%	9	2%	33	1%	572	12%	602	7%	33	3%	12	10%	635	8%			11	17%
We keep data, don't summarize them	3107	31%	125	28%	816	24%	1595	32%	2275	26%	798	68%	33	30%	2166	27%	832	73%	25	38%
Firms estimating safety inspections	2981	30%	92	21%	811	24%	1507	30%	2192	25%	760	65%	29	26%	2081	26%	794	70%	23	35%
based on data	1629	16%	50	11%	120	3%	893	18%	1533	18%	84	7%	11	10%	1506	19%	112	10%	11	18%
based on guess	1349	13%	42	10%	692	20%	615	12%	656	8%	675	58%	17	16%	572	7%	682	60%	11	17%
Firms estimating size/weight checks	2403	24%	85	19%	811	24%	1506	30%	1623	19%	754	64%	26	23%	1511	19%	788	69%	20	30%
based on data	814	8%	35	8%	4	0%	775	16%	768	9%	43	4%	2	2%	740	9%	71	6%	2	3%
based on guess	1471	15%	50	11%	722	21%	699	14%	739	8%	708	60%	24	21%	688	9%	682	60%	18	27%
Firms estimating safety inspection time	2889	29%	90	20%	809	24%	1424	29%	2106	24%	760	65%	23	21%	1995	25%	791	69%	20	31%
based on data	1360	14%	45	10%	33	1%	716	14%	1282	15%	73	6%	5	4%	1252	16%	103	9%	5	8%
based on guess	1529	15%	45	10%	776	23%	708	14%	824	9%	687	59%	19	17%	743	9%	688	60%	15	24%
Firms estimating size/weight check time	2389	24%	79	18%	810	24%	1501	30%	1620	19%	749	64%	21	18%	1503	19%	785	69%	17	27%
based on data	100	1%	33	7%	3	0%	65	1%	65	1%	35	3%			3	0%	98	9%		
based on guess	2203	22%	46	10%	722	21%	1435	29%	1472	17%	711	61%	21	18%	1417	18%	685	60%	17	27%
We do samples occasionally	153	2%	83	19%	5	0%	66	1%	115	1%	35	3%	3	2%	115	1%	35	3%	3	4%
Firms estimating safety inspections	152	2%	83	19%	3	0%	66	1%	115	1%	35	3%	1	1%	115	1%	35	3%	1	2%
based on data	33	0%					33	1%			33	3%	1	1%			33	3%	1	1%
based on guess	119	1%	83	19%	3	0%	33	1%	115	1%	3	0%	1	1%	115	1%	3	0%	1	1%
Firms estimating size/weight checks	152	2%	83	19%	3	0%	66	1%	115	1%	35	3%	1	1%	115	1%	35	3%	1	2%
based on data																				
based on guess	152	2%	83	19%	3	0%	66	1%	115	1%	35	3%	1	1%	115	1%	35	3%	1	2%
Firms estimating safety inspection time	69	1%			3	0%	66	1%	33	0%	35	3%	1	1%	33	0%	35	3%	1	2%
based on data																				
based on guess	69	1%			3	0%	66	1%	33	0%	35	3%	1	1%	33	0%	35	3%	1	2%
Firms estimating size/weight check time	69	1%			3	0%	66	1%	33	0%	35	3%	1	1%	33	0%	35	3%	1	2%
based on data																				
based on guess	69	1%			3	0%	66	1%	33	0%	35	3%	1	1%	33	0%	35	3%	1	2%
We don't collect data	5336	53%	115	26%	2535	74%	2119	43%	5153	59%	174	15%	10	9%	4453	56%	142	12%	7	10%
Not reported	107	1%	67	15%	36	1%	2	0%	2	0%	98	8%	7	7%	33	0%	65	6%	7	10%

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Table N2: Roadside check means.
Base: All respondents.

	All firms		Type of carrier						Number of powered units						Total drivers					
			For-hire truckload carrier		Private carrier		All others		10 or fewer		Over 10 up to 50		Over 50		10 or fewer		Over 10 up to 70		Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	158		45		38		67		45		39		74		41		40		64	
Weighted number of observations	10000.0		440.2		3428.6		4959.0		8716.9		1171.7		111.5		7971.1		1141.6		65.2	
We keep data & summarize them																				
Firms estimating safety inspections	15		132		11		9		6		35		176		8		4		407	
based on data	14		122		42		9		6		35		177		8		4		519	
based on guess	39		234		9		91		9				172		9				172	
Firms estimating size/weight checks	38		92		28		11		12		1000		19		39		2		63	
based on data	3		89				2		2				15		2		2		84	
based on guess	71		95		30		20		21		1000		43		71				43	
Firms estimating safety inspection time	40		19		13		42		42		23		29		41		23		27	
based on data	42		17				44		45		23		30		44		23		32	
based on guess	38		26		13		40		38				27		38				26	
Firms estimating size/weight check time	24		15		15		25		25		15		27		24		30		17	
based on data	39		22		20		39		40				29		40		30		21	
based on guess	11		13		16		10		10		15		18		10				15	
We keep data, don't summarize them																				
Firms estimating safety inspections	26		147		2		41		2		82		414		2		79		518	
based on data	5		77		3		2		2		33		164		2		31		164	
based on guess	53		231		2		97		2		88		578		3		87		874	
Firms estimating size/weight checks	225		4395		8		106		6		198		14821		8		186		19242	
based on data	4		14		217		3		3		31		45		2		23		45	
based on guess	366		7480		8		225		10		209		16056		15		213		21379	
Firms estimating safety inspection time	48		29		23		69		46		53		28		46		53		31	
based on data	59		21		30		81		61		24		33		61		30		33	
based on guess	38		37		23		55		24		56		27		21		56		30	
Firms estimating size/weight check time	17		17		19		15		17		16		26		16		16		30	
based on data	23		30		1		20		20		28				1		23			
based on guess	17		8		21		15		18		15		26		17		15		30	
We do samples occasionally																				
Firms estimating safety inspections	45		20		3		78		28		94		152		28		94		152	
based on data	106						106				102		296				102		296	
based on guess	28		20		3		50		28		2		7		28		2		7	
Firms estimating size/weight checks	321		20		2		716		394		94		7		394		94		7	
based on data																				
based on guess	321		20		2		716		394		94		7		394		94		7	
Firms estimating safety inspection time	39				30		40		60		21		30		60		21		30	
based on data																				
based on guess	39				30		40		60		21		30		60		21		30	
Firms estimating size/weight check time	24				14		25		30		19		23		30		19		23	
based on data																				
based on guess	24				14		25		30		19		23		30		19		23	
We don't collect data																				
Not reported																				
All firms																				
Firms estimating safety inspections	24		97		3		28		4		79		254		5		74		452	
Firms estimating size/weight checks	168		2120		9		80		24		225		5308		37		175		11367	
Firms estimating safety inspection time	45		26		23		56		45		49		29		45		49		29	
Firms estimating size/weight check time	19		17		19		20		20		16		26		20		17		24	

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Table O: Annual safety inspection times.
Base: All respondents with inspedction data.

	All firms		Type of carrier						Number of powered units						Total drivers					
			For-hire truckload carrier		Private carrier		All others		10 or fewer		Over 10 up to 50		Over 50		10 or fewer		Over 10 up to 70		Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	122		43		26		46		27		30		65		25		31		58	
Weighted number of observations	4664.0		324.9		893.8		2840.1		3564.2		998.0		101.8		3518.3		999.2		58.5	
Up to 1 vehicle-hour / year	1584	34%	151	47%	692	77%	171	6%	1469	41%	106	11%	10	10%	1500	43%	76	8%	6	11%
Over 1 up to 2 vh / year	1441	31%	3	1%	154	17%	1284	45%	1370	38%	38	4%	33	32%	1257	36%	101	10%		
Over 2 up to 10 vh / year	654	14%	46	14%	6	1%	602	21%	605	17%	41	4%	8	8%	575	16%	73	7%	5	9%
Over 10 up to 40 vh / year	117	3%	37	11%	1	0%	46	2%	3	0%	106	11%	8	8%	33	1%	77	8%	7	12%
Over 40 up to 100 vh / year	647	14%	7	2%			640	23%	33	1%	600	60%	14	14%	33	1%	600	60%	15	25%
Over 100 vh / year	20	0%	13	4%	1	0%	6	0%			3	0%	17	17%	3	0%			17	29%
Not reported	202	4%	68	21%	40	4%	91	3%	85	2%	105	11%	12	12%	118	3%	73	7%	8	14%
Total	4664	100%	325	100%	894	100%	2840	100%	3564	100%	998	100%	102	100%	3518	100%	999	100%	58	100%
Mean	19.1		55.3		1.4		26.1		3.0		69.6		121.0		3.4		66.2		217.7	
Median	2.0		8.0		1.0		2.0		2.0		100.0		2.0		2.0		100.0		69.5	
Std. Error of the Mean	7.8		55.7		1.5		6.9		1.3		8.9		69.4		1.7		9.1		93.0	

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Table P: Annual size/weight inspection times.
Base: All respondents with inspedction data.

	All firms		Type of carrier						Number of powered units						Total drivers					
			For-hire truckload carrier		Private carrier		All others		10 or fewer		Over 10 up to 50		Over 50		10 or fewer		Over 10 up to 70		Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	122		43		26		46		27		30		65		25		31		58	
Weighted number of observations	4664.0		324.9		893.8		2840.1		3564.2		998.0		101.8		3518.3		999.2		58.5	
Up to 1 vehicle-hour / year	2901	62%	168	52%	781	87%	1382	49%	2723	76%	117	12%	61	60%	2612	74%	182	18%	22	38%
Over 1 up to 2 vh / year	37	1%	34	10%			3	0%			35	4%	1	1%			35	4%	1	2%
Over 2 up to 10 vh / year	768	16%	43	13%	38	4%	687	24%	685	19%	76	8%	7	7%	688	20%	73	7%	7	12%
Over 10 up to 40 vh / year	110	2%	5	2%	33	4%	72	3%	39	1%	65	7%	6	6%	35	1%	69	7%	5	9%
Over 40 up to 100 vh / year	572	12%	1	0%	2	0%	569	20%			567	57%	5	5%			567	57%	5	8%
Over 100 vh / year	75	2%	6	2%			36	1%	33	1%	33	3%	9	9%	65	2%			9	16%
Not reported	202	4%	68	21%	40	4%	91	3%	85	2%	105	11%	12	12%	118	3%	73	7%	8	14%
Total	4664	100%	325	100%	894	100%	2840	100%	3564	100%	998	100%	102	100%	3518	100%	999	100%	58	100%
Mean	58.1		1167.9		2.3		23.9		9.3		54.7		2147.0		12.6		42.9		4585.7	
Median	1.0		2.0		1.0		1.0		1.0		63.0		1.0		1.0		63.0		14.5	
Std. Error of the Mean	244.2		2511.2		1.7		14.9		16.9		11.5		2669.2		20.0		6.3		3988.6	

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Table Q: Annual inspection times for all checks.
Base: All respondents with inspedction data.

	All firms		Type of carrier						Number of powered units						Total drivers					
			For-hire truckload carrier		Private carrier		All others		10 or fewer		Over 10 up to 50		Over 50		10 or fewer		Over 10 up to 70		Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	122		43		26		46		27		30		65		25		31		58	
Weighted number of observations	4664.0		324.9		893.8		2840.1		3564.2		998.0		101.8		3518.3		999.2		58.5	
Up to 1 vehicle-hour / year	1462	31%	151	47%	656	73%	85	3%	1386	39%	68	7%	8	8%	1385	39%	71	7%	5	9%
Over 1 up to 5 vh / year	1464	31%	8	2%	119	13%	1337	47%	1390	39%	41	4%	33	33%	1310	37%	71	7%	1	1%
Over 5 up to 10 vh / year	681	15%	38	12%	43	5%	600	21%	632	18%	43	4%	5	5%	602	17%	76	8%	3	5%
Over 10 up to 50 vh / year	120	3%	41	13%	34	4%	46	2%	35	1%	73	7%	12	12%	35	1%	75	7%	10	18%
Over 40 up to 100 vh / year	76	2%	3	1%	1	0%	72	3%	3	0%	65	7%	8	8%			68	7%	9	15%
Over 100 up to 200 vh / year	578	12%	5	2%			573	20%			570	57%	9	9%	3	0%	567	57%	9	15%
Over 200 vh / year	79	2%	10	3%	1	0%	36	1%	33	1%	33	3%	14	14%	65	2%			14	24%
Not reported	202	4%	68	21%	40	4%	91	3%	85	2%	105	11%	12	12%	118	3%	73	7%	8	14%
Total	4664	100%	325	100%	894	100%	2840	100%	3564	100%	998	100%	102	100%	3518	100%	999	100%	58	100%
Mean	68.3		885.8		3.0		49.1		10.5		121.6		1898.2		13.5		107.3		3392.5	
Median	3.0		10.0		1.0		4.0		2.0		163.0		3.0		2.0		163.0		82.0	
Std. Error of the Mean	201.2		1663.3		2.5		17.2		15.7		15.7		2053.5		17.5		14.9		2788.2	

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Table R: Satisfaction score with inspections (scale: -5 to +5).
Base: All respondents.

	All firms		Type of carrier: For-hire truckload carrier		Type of carrier: Private carrier		Type of carrier: All others		Number of powered units: 10 or fewer		Number of powered units: Over 10 up to 50		Number of powered units: Over 50		Total drivers: 10 or fewer		Total drivers: Over 10 up to 70		Total drivers: Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	158		45		38		67		45		39		74		41		40		64	
Weighted number of observations	10000.0		440.2		3428.6		4959.0		8716.9		1171.7		111.5		7971.1		1141.6		65.2	
Frequency of inspections																				
Mean	-0.13		0.21		1.80		-1.91		-0.05		-0.74		0.44		-0.44		-0.92		0.51	
Std. Error of the Mean	0.28		0.49		0.60		0.29		0.58		0.45		0.21		0.57		0.41		0.28	
Criteria for selection																				
Mean	-1.15		-0.01		1.14		-3.33		-0.98		-2.31		0.12		-1.48		-2.56		-0.02	
Std. Error of the Mean	0.31		0.47		0.60		0.28		0.62		0.56		0.21		0.57		0.50		0.28	
Types of checks																				
Mean	1.03		0.54		1.16		0.71		0.85		2.18		0.47		0.67		2.22		0.49	
Std. Error of the Mean	0.28		0.38		0.51		0.49		0.59		0.29		0.22		0.63		0.28		0.26	
Fairness of the process																				
Mean	-0.21		0.14		0.97		-1.38		-0.21		-0.23		0.04		-0.42		-0.08		-0.11	
Std. Error of the Mean	0.30		0.49		0.51		0.46		0.63		0.33		0.23		0.66		0.31		0.30	
Time spent being inspected																				
Mean	-1.07		-0.46		1.00		-2.98		-0.89		-2.29		0.12		-1.40		-2.46		0.10	
Std. Error of the Mean	0.28		0.43		0.57		0.27		0.56		0.52		0.19		0.50		0.48		0.26	
Time waiting for inspection																				
Mean	-1.97		-0.17		-0.57		-3.67		-1.89		-2.62		-0.25		-2.37		-2.46		-0.43	
Std. Error of the Mean	0.28		0.32		0.59		0.27		0.56		0.47		0.20		0.54		0.48		0.27	

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Table S: Most important inspection improvement.
Base: All mentions.

	All firms		Type of carrier: For-hire truckload carrier		Type of carrier: Private carrier		Type of carrier: All others		Number of powered units: 10 or fewer		Number of powered units: Over 10 up to 50		Number of powered units: Over 50		Total drivers: 10 or fewer		Total drivers: Over 10 up to 70		Total drivers: Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	80		25		15		38		20		18		42		18		20		38	
Weighted number of observations	5544.1		235.4		781.8		3927.4		4621.7		847.5		74.9		4458.2		882.8		35.6	
Happy with current system	203	4%	1	1%	1	0%	201	5%	166	4%	1	0%	37	50%	166	4%	33	4%	4	12%
Need regular, terminal-based inspections	5	0%	3	2%	1	0%					3	0%	2	3%			3	0%	2	6%
Manage roadside to reduce evasion	690	13%			569	82%	121	3%	682	15%	0	0%	7	10%	650	15%	36	4%	5	14%
Better enforcement of regulations	685	13%	34	23%			651	17%	650	15%	33	4%	3	4%	650	15%	33	4%	3	8%
Better targeting of vehicles	1773	33%	2	1%	3	0%	1769	45%	1167	26%	600	71%	7	9%	1166	27%	600	68%	7	20%
More concern with safety of inspection arrangements	570	11%	3	2%			567	14%	567	13%			3	4%	567	13%			3	9%
Better information about vehicles	1	0%	1	0%									1	1%					1	2%
Better inspectors	609	11%	3	2%	1	0%	573	15%	570	13%	35	4%	5	6%	602	14%	3	0%	5	14%
More consistency, uniformity	705	13%	68	45%	33	5%	38	1%	570	13%	133	16%	3	4%	570	13%	133	15%	3	8%
Other changes	125	2%	35	23%	87	13%	3	0%	83	2%	35	4%	7	9%			38	4%	3	8%
Total mentions	5366	100%	149	100%	694	100%	3923	100%	4454	100%	839	100%	73	100%	4370	100%	877	100%	34	100%

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Table T: All inspection improvement suggestions.
Base: All mentions.

	All firms		Type of carrier: For-hire truckload carrier		Type of carrier: Private carrier		Type of carrier: All others		Number of powered units: 10 or fewer		Number of powered units: Over 10 up to 50		Number of powered units: Over 50		Total drivers: 10 or fewer		Total drivers: Over 10 up to 70		Total drivers: Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	80		25		15		38		20		18		42		18		20		38	
Weighted number of observations	5544.1		235.4		781.8		3927.4		4621.7		847.5		74.9		4458.2		882.8		35.6	
Happy with current system	203	3%	1	1%	1	0%	201	4%	166	4%	1	0%	37	41%	166	4%	33	2%	4	8%
Need regular, terminal-based inspections	6	0%	5	2%	1	0%					3	0%	3	4%			3	0%	3	6%
Manage roadside to reduce evasion	691	11%			569	82%	122	3%	682	15%	0	0%	8	9%	650	14%	36	2%	5	10%
Better enforcement of regulations	685	11%	34	18%			651	14%	650	14%	33	2%	3	3%	650	14%	33	2%	3	5%
Better targeting of vehicles	1806	29%	34	18%	3	0%	1769	38%	1167	25%	632	43%	7	7%	1166	26%	632	43%	7	13%
More concern with safety of inspection arrangements	570	9%	3	2%			567	12%	567	12%			3	3%	567	12%			3	6%
Better information about vehicles	2	0%	1	0%			1	0%					2	2%					2	4%
Better inspectors	613	10%	4	2%	3	0%	574	12%	570	12%	35	2%	7	8%	602	13%	3	0%	8	16%
More consistency, uniformity	711	12%	70	37%	34	5%	40	1%	570	12%	133	9%	9	10%	570	12%	133	9%	9	17%
Other changes	894	14%	38	20%	87	12%	737	16%	248	5%	635	43%	11	13%	198	4%	605	41%	7	15%
Total mentions	6181	100%	191	100%	696	100%	4662	100%	4620	100%	1472	100%	89	100%	4568	100%	1477	100%	5079%	100%

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Table U: Electronic screening awareness & use.
Base: All respondents.

	All firms		Type of carrier						Number of powered units						Total drivers					
	All firms		For-hire truckload carrier		Private carrier		All others		10 or fewer		Over 10 up to 50		Over 50		10 or fewer		Over 10 up to 70		Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	158		45		38		67		45		39		74		41		40		64	
Weighted number of observations	10000.0		440.2		3428.6		4959.0		8716.9		1171.7		111.5		7971.1		1141.6		65.2	
Hasn't heard of ES	6466	65%	243	55%	3382	99%	1706	34%	6153	71%	288	25%	26	23%	5309	67%	319	28%	22	34%
Already using SC (annual fee)	43	0%	39	9%	3	0%	1	0%	0	0%	38	3%	5	4%			41	4%	1	2%
Already using SC (per site)	609	6%	5	1%			571	12%	567	7%	33	3%	9	8%	600	8%			9	14%
Not using, expect to use within 2 years	613	6%	5	1%			607	12%			602	51%	11	10%			605	53%	8	12%
Not using, don't expect to use within 2 years	2044	20%	81	18%	9	0%	1954	39%	1907	22%	81	7%	56	50%	1910	24%	112	10%	21	32%
Not reported	227	2%	67	15%	35	1%	120	2%	90	1%	130	11%	6	6%	153	2%	65	6%	5	8%

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Table V: Reasons for or against ES participation.
Base: All mentions.

	All firms		Type of carrier: For-hire truckload carrier		Type of carrier: Private carrier		Type of carrier: All others		Number of powered units: 10 or fewer		Number of powered units: Over 10 up to 50		Number of powered units: Over 50		Total drivers: 10 or fewer		Total drivers: Over 10 up to 70		Total drivers: Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	56		23		5		26		10		11		35		11		11		31	
Weighted number of observations	2685.6		121.7		7.2		2523.8		1907.3		739.9		38.4		1972.1		680.1		31.0	
Hasn't reached critical mass yet	8	0%	4	4%			3	0%	3	0%			5	13%	3	0%	3	0%	2	8%
Time savings	1149	43%	9	7%	3	37%	1137	45%	567	30%	570	77%	12	32%	567	29%	572	84%	9	28%
Cost of participation	651	24%	40	33%	2	28%	609	24%	605	32%	37	5%	9	24%	602	31%	40	6%	8	26%
Possible bad impacts on safety	69	3%	34	28%			3	0%			65	9%	4	11%	33	2%	33	5%	4	14%
Big Brother concerns	652	24%					652	26%	650	34%			3	7%	650	33%			3	8%
Needs more information to judge	34	1%	0	0%			33	1%			33	4%	1	3%	33	2%			1	3%
Not applicable to us	122	5%	35	29%	3	35%	84	3%	83	4%	35	5%	4	10%	85	4%	33	5%	4	12%
Total mentions	2686	100%	123	100%	7	100%	2523	100%	1907	100%	740	100%	38	100%	1972	100%	680	100%	31	100%

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Table W1: Awareness of SAFER carrier information.
Base: All respondents.

	All firms		Type of carrier						Number of powered units						Total drivers					
			For-hire truckload carrier		Private carrier		All others		10 or fewer		Over 10 up to 50		Over 50		10 or fewer		Over 10 up to 70		Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	158		45		38		67		45		39		74		41		40		64	
Weighted number of observations	10000.0		440.2		3428.6		4959.0		8716.9		1171.7		111.5		7971.1		1141.6		65.2	
Respondent aware	3158	32%	170	39%	682	20%	2272	46%	2173	25%	889	76%	96	86%	2148	27%	954	84%	53	81%
Respondent not aware	6107	61%	150	34%	2707	79%	2115	43%	5889	68%	209	18%	8	7%	5135	64%	147	13%	9	13%
Not sure	8	0%			3	0%	3	0%	3	0%	5	0%			3	0%	5	0%		
Not reported	727	7%	119	27%	37	1%	569	11%	652	7%	68	6%	8	7%	685	9%	35	3%	4	6%
Total	10000	100%	440	100%	3429	100%	4959	100%	8717	100%	1172	100%	111	100%	7971	100%	1142	100%	65	100%

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Table W2: Awareness of SAFER vehicle information.
Base: All respondents.

	All firms		Type of carrier						Number of powered units						Total drivers					
			For-hire truckload carrier		Private carrier		All others		10 or fewer		Over 10 up to 50		Over 50		10 or fewer		Over 10 up to 70		Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	158		45		38		67		45		39		74		41		40		64	
Weighted number of observations	10000.0		440.2		3428.6		4959.0		8716.9		1171.7		111.5		7971.1		1141.6		65.2	
Respondent aware	1749	17%	130	29%	70	2%	1549	31%	1491	17%	179	15%	79	71%	1463	18%	243	21%	42	65%
Respondent not aware	6213	62%	107	24%	2184	64%	2755	56%	5272	60%	919	78%	22	20%	5170	65%	858	75%	17	27%
Not sure	94	1%	1	0%	5	0%	85	2%	85	1%	5	0%	3	3%	85	1%	5	0%	2	2%
Not reported	1944	19%	202	46%	1170	34%	569	11%	1868	21%	68	6%	8	7%	1252	16%	35	3%	4	6%
Total	10000	100%	440	100%	3429	100%	4959	100%	8717	100%	1172	100%	111	100%	7971	100%	1142	100%	65	100%

CBA

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Table X: Opinions about electronic screening (scale: -5 to +5).
Base: All respondents.

	All firms	Type of carrier: For-hire truckload carrier	Type of carrier: Private carrier	Type of carrier: All others	Number of powered units: 10 or fewer	Number of powered units: Over 10 up to 50	Number of powered units: Over 50	Total drivers: 10 or fewer	Total drivers: Over 10 up to 70	Total drivers: Over 70
	No %	No %	No %	No %	No %	No %	No %	No %	No %	No %
Unweighted number of observations	158	45	38	67	45	39	74	41	40	64
Weighted number of observations	10000.0	440.2	3428.6	4959.0	8716.9	1171.7	111.5	7971.1	1141.6	65.2
"Equipping all our units with transponders is likely to cost my company more than we'd save."										
Mean	2.71	0.76	2.34	2.62	2.99	0.92	1.48	2.97	0.92	1.68
Std. Error of the Mean	0.20	0.39	0.35	0.30	0.37	0.39	0.32	0.39	0.38	0.36
"If these new inspection methods were more widespread, I expect we'd make significant time and cost savings."										
Mean	-0.05	-0.52	-0.56	0.39	-0.46	2.59	1.17	-0.65	2.52	0.51
Std. Error of the Mean	0.21	0.39	0.39	0.39	0.36	0.55	0.24	0.37	0.53	0.29
"We're too small to justufy thinking about putting transponders in our units."										
Mean	2.79	1.51	2.59	2.57	3.43	-1.96	-0.02	3.37	-2.02	-0.86
Std. Error of the Mean	0.25	0.32	0.39	0.43	0.34	0.62	0.33	0.36	0.59	0.35
"Even if the time spent in safety and weight inspections were halved, there'd be very little impact on our costs."										
Mean	0.44	0.93	0.01	-0.41	0.80	-1.98	0.60	1.00	-2.09	0.33
Std. Error of the Mean	0.25	0.28	0.16	0.46	0.45	0.59	0.30	0.49	0.54	0.33
"Even without equipping our vehicles, we'd probably benefit if the inspection officials had better information."										
Mean	1.94	0.54	1.22	2.96	1.71	3.55	1.41	1.57	3.53	2.16
Std. Error of the Mean	0.24	0.48	0.48	0.28	0.48	0.41	0.22	0.50	0.40	0.24
"I expect that our drivers would be pleased by these types of changes."										
Mean	0.32	0.04	-1.31	1.09	-0.04	2.62	1.70	0.25	2.42	1.51
Std. Error of the Mean	0.24	0.36	0.31	0.37	0.43	0.52	0.22	0.45	0.51	0.29
"These type of changes will make the roadside inspection system significantly more fair."										
Mean	1.22	-0.57	-0.92	2.88	0.92	3.23	1.21	1.19	3.23	0.71
Std. Error of the Mean	0.25	0.45	0.30	0.33	0.48	0.45	0.24	0.50	0.43	0.31
"I'm concerned that changes like these will help the states to expand regulations and charges in new ways."										
Mean	2.32	-0.35	2.13	2.29	2.39	1.99	0.81	2.22	2.04	0.63
Std. Error of the Mean	0.19	0.32	0.39	0.27	0.38	0.33	0.26	0.38	0.32	0.29
"I worry about government agencies having so much information about our vehicles."										
Mean	1.70	0.50	2.26	1.42	1.80	1.19	0.16	2.07	1.02	-0.47
Std. Error of the Mean	0.26	0.41	0.51	0.46	0.53	0.42	0.30	0.55	0.45	0.33

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Table Y: Impact of inspection on firm's spending.
Base: All respondents.

	All firms		Type of carrier: For-hire truckload carrier		Type of carrier: Private carrier		Type of carrier: All others		Number of powered units: 10 or fewer		Number of powered units: Over 10 up to 50		Number of powered units: Over 50		Total drivers: 10 or fewer		Total drivers: Over 10 up to 70		Total drivers: Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	158		45		38		67		45		39		74		41		40		64	
Weighted number of observations	10000.0		440.2		3428.6		4959.0		8716.9		1171.7		111.5		7971.1		1141.6		65.2	
Spending increased this year	1300	13%	37	8%	35	1%	661	13%	1249	14%	42	4%	9	8%	1249	16%	42	4%	7	11%
No increase from last year	5645	56%	214	49%	2075	61%	2756	56%	5232	60%	362	31%	51	46%	5189	65%	332	29%	41	63%
Not sure	1724	17%	151	34%	603	18%	970	20%	1014	12%	670	57%	40	36%	931	12%	703	62%	6	10%
Not reported	1330	13%	38	9%	716	21%	572	12%	1221	14%	98	8%	11	10%	602	8%	65	6%	10	16%
Total	10000	100%	440	100%	3429	100%	4959	100%	8717	100%	1172	100%	111	100%	7971	100%	1142	100%	65	100%

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Table AA: Type of carrier.
Base: All respondents.

	All firms		Type of carrier						Number of powered units						Total drivers					
			For-hire truckload carrier		Private carrier		All others		10 or fewer		Over 10 up to 50		Over 50		10 or fewer		Over 10 up to 70		Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	158		45		38		67		45		39		74		41		40		64	
Weighted number of observations	10000.0		440.2		3428.6		4959.0		8716.9		1171.7		111.5		7971.1		1141.6		65.2	
For-hire truckload carrier	440	4%	440	100%					171	2%	239	20%	30	27%	123	2%	206	18%	26	40%
For-hire LTL carrier	73	1%					73	1%	3	0%	68	6%	2	2%			71	6%	2	3%
Private carrier	3429	34%			3429	100%			3234	37%	177	15%	18	16%	2536	32%	146	13%	12	18%
General freight carrier	638	6%					638	13%	600	7%	35	3%	3	3%	600	8%	35	3%	3	5%
Tank truck operator	568	6%					568	11%			567	48%	1	1%			567	50%	1	2%
Refrigerated truck carrier	88	1%					88	2%	83	1%	3	0%	3	2%	83	1%	3	0%	3	4%
Automobile transporter	3	0%					3	0%			3	0%					3	0%		
Bulk commodities carrier	1346	13%					1346	27%	1302	15%	35	3%	8	8%	1302	16%	38	3%	6	9%
Household goods mover	575	6%					575	12%	567	7%	1	0%	7	6%	567	7%	3	0%	5	8%
Owner/operator	1665	17%					1665	34%	1619	19%	11	1%	35	32%	1591	20%	71	6%	3	4%
Other type	3	0%					3	0%	1	0%			3	2%					3	5%
Not reported	1172	12%							1139	13%	33	3%	1	1%	1169	15%			1	1%
Total	10000	100%	440	100%	3429	100%	4959	100%	8717	100%	1172	100%	111	100%	7971	100%	1142	100%	65	100%

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Table AB: Total annual fleet miles.
Base: All respondents.

	All firms		Type of carrier: For-hire truckload carrier		Type of carrier: Private carrier		Type of carrier: All others		Number of powered units: 10 or fewer		Number of powered units: Over 10 up to 50		Number of powered units: Over 50		Total drivers: 10 or fewer		Total drivers: Over 10 up to 70		Total drivers: Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	158		45		38		67		45		39		74		41		40		64	
Weighted number of observations	10000.0		440.2		3428.6		4959.0		8716.9		1171.7		111.5		7971.1		1141.6		65.2	
10k or fewer	1583	16%			682	20%	901	18%	1583	18%					1583	20%				
Over 10k to 50k	2038	20%	83	19%	650	19%	1305	26%	2035	23%	3	0%			1952	24%	3	0%		
Over 50k to 100k	1867	19%			650	19%	83	2%	1866	21%			1	1%	1866	23%			1	1%
Over 100k to 200k	679	7%	35	8%	37	1%	605	12%	635	7%	43	4%	1	1%	605	8%	73	6%	1	2%
Over 200k to 500k	1211	12%	73	17%	1137	33%	2	0%	1139	13%	71	6%	2	1%	572	7%	72	6%	0	1%
Over 500k to 1 mn.	179	2%	3	1%	34	1%	110	2%	33	0%	145	12%	1	1%	71	1%	109	10%		
Over 1 mn. to 5 mn.	827	8%	137	31%	46	1%	645	13%	33	0%	771	66%	24	22%	33	0%	779	68%	15	23%
Over 5 mn. to 20 mn.	28	0%	14	3%	5	0%	9	0%	1	0%	1	0%	26	23%			1	0%	27	41%
Over 20 mn.	16	0%	9	2%			6	0%					16	14%					16	25%
Not reported	1571	16%	87	20%	188	5%	1294	26%	1393	16%	138	12%	40	36%	1290	16%	106	9%	5	8%
Total	10000	100%	440	100%	3429	100%	4959	100%	8717	100%	1172	100%	111	100%	7971	100%	1142	100%	65	100%
Mean (in thousands)	709		3016		242		1083		122		3252		24088		97		3218		28391	
Median (in thousands)	90		450		90		50		80		4536		5000		50		4536		6775	
Std. Error of the Mean (in thousands)	584		1847		131		1264		41		309		8460		40		304		9500	

CRA

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Table AC: Number of powered units operated.
Base: All respondents.

	All firms		Type of carrier						Number of powered units						Total drivers					
			For-hire truckload carrier		Private carrier		All others		10 or fewer		Over 10 up to 50		Over 50		10 or fewer		Over 10 up to 70		Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	158		45		38		67		45		39		74		41		40		64	
Weighted number of observations	10000.0		440.2		3428.6		4959.0		8716.9		1171.7		111.5		7971.1		1141.6		65.2	
One or fewer	2283	23%			732	21%	1551	31%	2283	26%					2200	28%			1	1%
2 to 5	4991	50%	88	20%	2383	70%	1386	28%	4991	57%					4257	53%				
6 to 10	239	2%	83	19%	85	2%	71	1%	239	3%					203	3%	35	3%		
11 to 15	84	1%	8	2%	0	0%	43	1%			84	7%			33	0%	52	5%		
16 to 20	106	1%	35	8%	5	0%	65	1%			106	9%			38	0%	68	6%		
21 to 25	206	2%	98	22%	100	3%	8	0%			206	18%			33	0%	174	15%		
26 to 50	775	8%	98	22%	71	2%	606	12%			775	66%			38	0%	737	65%		
51 to 100	51	1%	7	2%	4	0%	41	1%					51	46%			43	4%	8	12%
101 to 200	25	0%	13	3%	3	0%	10	0%					25	23%					25	39%
201 to 500	25	0%	8	2%	9	0%	7	0%					25	22%					22	34%
Over 500	11	0%	4	1%	2	0%	5	0%					11	9%					9	14%
Not reported	1204	12%			33	1%	1166	24%	1204	14%					1169	15%	33	3%		
Total	10000	100%	440	100%	3429	100%	4959	100%	8717	100%	1172	100%	111	100%	7971	100%	1142	100%	65	100%
Mean	10.4		38.4		6.1		13.1		2.5		30.1		336.2		2.8		32.1		486.3	
Median	3.0		20.0		3.0		2.0		2.0		35.0		75.0		2.0		35.0		155.0	
Std. Error of the Mean	9.0		19.0		9.3		19.1		0.2		1.4		106.5		0.6		1.9		145.3	

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Table AD: Total drivers employed directly or indirectly.
Base: All respondents.

	All firms		Type of carrier: For-hire truckload carrier		Type of carrier: Private carrier		Type of carrier: All others		Number of powered units: 10 or fewer		Number of powered units: Over 10 up to 50		Number of powered units: Over 50		Total drivers: 10 or fewer		Total drivers: Over 10 up to 70		Total drivers: Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	158		45		38		67		45		39		74		41		40		64	
Weighted number of observations	10000.0		440.2		3428.6		4959.0		8716.9		1171.7		111.5		7971.1		1141.6		65.2	
One or fewer	4716	47%	83	19%	1217	35%	2850	57%	4713	54%	3	0%			4716	59%				
2 to 5	2432	24%	5	1%	635	19%	1222	25%	2432	28%					2432	31%				
6 to 10	823	8%	35	8%	685	20%	71	1%	685	8%	138	12%			823	10%				
11 to 15	125	1%	5	1%	3	0%	117	2%	35	0%	90	8%					125	11%		
16 to 25	266	3%	133	30%	100	3%	33	1%			266	23%					266	23%		
26 to 50	679	7%	35	8%	39	1%	605	12%	33	0%	638	54%	8	7%			679	59%		
51 to 100	79	1%	37	8%	5	0%	37	1%			37	3%	42	38%			72	6%	7	11%
101 to 200	28	0%	12	3%	3	0%	13	0%	1	0%			27	24%					28	42%
201 to 1,000	23	0%	8	2%	8	0%	8	0%					23	21%					23	35%
Over 1,000	8	0%	3	1%			4	0%					8	7%					8	12%
Not reported	822	8%	84	19%	734	21%	1	0%	818	9%			4	3%						
Total	10000	100%	440	100%	3429	100%	4959	100%	8717	100%	1172	100%	111	100%	7971	100%	1142	100%	65	100%
Mean	9.7		42.7		5.7		11.0		2.3		28.1		357.1		2.2		31.8		548.4	
Median	1.0		20.0		3.0		1.0		1.0		35.0		70.0		1.0		35.0		173.0	
Std. Error of the Mean	10.6		20.4		4.7		20.9		0.6		1.9		135.2		0.3		1.9		176.4	

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Table AE: Geographic range of operations.
Base: All respondents.

	All firms		Type of carrier						Number of powered units						Total drivers					
			For-hire truckload carrier		Private carrier		All others		10 or fewer		Over 10 up to 50		Over 50		10 or fewer		Over 10 up to 70		Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	158		45		38		67		45		39		74		41		40		64	
Weighted number of observations	10000.0		440.2		3428.6		4959.0		8716.9		1171.7		111.5		7971.1		1141.6		65.2	
Local only (<75 miles)	1829	18%	83	19%	805	23%	941	19%	1714	20%	111	9%	4	3%	1630	20%	111	10%	4	6%
Within state only	891	9%	3	1%	233	7%	655	13%	850	10%	38	3%	3	2%	720	9%	5	0%		
Own state and nearby states	5831	58%	201	46%	2383	70%	2110	43%	5010	57%	757	65%	63	57%	4384	55%	853	75%	24	37%
National	832	8%	146	33%	6	0%	647	13%	570	7%	230	20%	31	28%	635	8%	169	15%	27	42%
International	15	0%	7	2%	1	0%	6	0%	3	0%	3	0%	9	8%	3	0%	3	0%	9	14%
Not reported	603	6%	1	0%			600	12%	569	7%	33	3%	1	1%	600	8%			1	1%
Total	10000	100%	440	100%	3429	100%	4959	100%	8717	100%	1172	100%	111	100%	7971	100%	1142	100%	65	100%

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Table AF: CVISN States with 2,500+ fleet miles / year.
Base: All respondents.

	All firms		Type of carrier: For-hire truckload carrier		Type of carrier: Private carrier		Type of carrier: All others		Number of powered units: 10 or fewer		Number of powered units: Over 10 up to 50		Number of powered units: Over 50		Total drivers: 10 or fewer		Total drivers: Over 10 up to 70		Total drivers: Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	158		45		38		67		45		39		74		41		40		64	
Weighted number of observations	10000.0		440.2		3428.6		4959.0		8716.9		1171.7		111.5		7971.1		1141.6		65.2	
California	1481	15%	87	20%	108	3%	718	14%	1235	14%	202	17%	44	39%	1237	16%	203	18%	39	60%
Colorado	232	2%	84	19%	36	1%	78	2%	36	0%	163	14%	33	29%	100	1%	98	9%	33	50%
Connecticut	271	3%	52	12%	4	0%	215	4%	168	2%	66	6%	36	32%	168	2%	66	6%	35	54%
Kentucky	1085	11%	137	31%	859	25%	85	2%	937	11%	105	9%	42	38%	690	9%	103	9%	42	64%
Maryland	282	3%	90	21%	160	5%	31	1%	92	1%	151	13%	40	35%	91	1%	151	13%	40	61%
Michigan	212	2%	53	12%	72	2%	86	2%	33	0%	135	12%	43	39%	33	0%	135	12%	42	64%
Minnesota	802	8%	84	19%	39	1%	647	13%	600	7%	164	14%	38	35%	665	8%	98	9%	38	59%
Oregon	451	5%	58	13%	43	1%	348	7%	320	4%	89	8%	42	37%	292	4%	122	11%	36	55%
Virginia	871	9%	62	14%	661	19%	147	3%	739	8%	86	7%	47	42%	738	9%	88	8%	44	67%
Washington	250	3%	54	12%	43	1%	119	2%	69	1%	145	12%	36	33%	103	1%	112	10%	33	51%
None of the above	6071	61%	67	15%	1802	53%	3067	62%	5334	61%	697	60%	40	36%	4766	60%	731	64%	5	7%
Not reported	85	1%	83	19%			0	0%	85	1%			0	0%	83	1%				

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Table AG: Percent of vehicle units leased.
Base: All respondents.

	All firms		Type of carrier: For-hire truckload carrier		Type of carrier: Private carrier		Type of carrier: All others		Number of powered units: 10 or fewer		Number of powered units: Over 10 up to 50		Number of powered units: Over 50		Total drivers: 10 or fewer		Total drivers: Over 10 up to 70		Total drivers: Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	158		45		38		67		45		39		74		41		40		64	
Weighted number of observations	10000.0		440.2		3428.6		4959.0		8716.9		1171.7		111.5		7971.1		1141.6		65.2	
Zero																				
Over zero to 25%	66	1%	15	3%	5	0%	14	0%	3	0%	42	4%	22	19%	35	0%	11	1%	18	28%
Over 25% to 50%	1261	13%	3	1%	84	2%	607	12%	650	7%	603	51%	9	8%	650	8%	603	53%	9	14%
Over 50% to 75%	72	1%	35	8%	33	1%	4	0%			65	6%	7	6%			68	6%	3	5%
Over 75% to less than 100%	5	0%	1	0%	1	0%	3	0%					5	5%					5	8%
100%	1238	12%	38	9%	633	18%	567	11%	1134	13%	98	8%	7	6%	600	8%	65	6%	7	10%
Not reported	7357	74%	348	79%	2672	78%	3764	76%	6931	80%	364	31%	62	56%	6687	84%	395	35%	22	34%
Total	10000	100%	440	100%	3429	100%	4959	100%	8717	100%	1172	100%	111	100%	7971	100%	1142	100%	65	100%
Mean	68.1		71.3		92.4		62.5		81.7		39.7		40.8		72.5		38.0		42.3	
Median	53.8		69.1		100.0		41.7		100.0		27.8		40.8		50.0		27.8		40.8	
Std. Error of the Mean	3.8		6.3		5.2		7.1		12.1		7.0		5.2		11.7		6.3		5.7	

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Table AH: Percent of drivers not employed directly.
Base: All respondents.

	All firms		Type of carrier						Number of powered units						Total drivers					
			For-hire truckload carrier		Private carrier		All others		10 or fewer		Over 10 up to 50		Over 50		10 or fewer		Over 10 up to 70		Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	158		45		38		67		45		39		74		41		40		64	
Weighted number of observations	10000.0		440.2		3428.6		4959.0		8716.9		1171.7		111.5		7971.1		1141.6		65.2	
Zero	2093	21%	73	17%	1258	37%	761	15%	1869	21%	213	18%	11	10%	1907	24%	175	15%	11	17%
Over zero to 25%	27	0%	13	3%	3	0%	11	0%	3	0%	3	0%	21	19%	3	0%	8	1%	16	25%
Over 25% to 50%	578	6%	4	1%			574	12%	3	0%	568	48%	7	6%			571	50%	7	11%
Over 50% to 75%	3	0%	3	1%									3	3%					3	5%
Over 75% to less than 100%	38	0%	33	7%	1	0%	4	0%			33	3%	5	5%			34	3%	4	6%
100%	39	0%	37	9%			1	0%			33	3%	6	6%			33	3%	6	10%
Not reported	7223	72%	276	63%	2167	63%	3608	73%	6843	78%	323	28%	57	51%	6062	76%	321	28%	18	27%
Total	10000	100%	440	100%	3429	100%	4959	100%	8717	100%	1172	100%	111	100%	7971	100%	1142	100%	65	100%
Mean	11.6		42.6		0.1		18.6		0.1		35.8		32.2		0.0		37.4		33.2	
Median	0.0		9.1		0.0		0.0		0.0		42.9		11.8		0.0		42.9		11.6	
Std. Error of the Mean	2.5		8.0		0.9		3.9		0.5		5.8		5.2		0.3		5.5		5.4	

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Table AI: Vehicle leasing arrangements.
Base: All respondents.

	All firms		Type of carrier: For-hire truckload carrier		Type of carrier: Private carrier		Type of carrier: All others		Number of powered units: 10 or fewer		Number of powered units: Over 10 up to 50		Number of powered units: Over 50		Total drivers: 10 or fewer		Total drivers: Over 10 up to 70		Total drivers: Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	158		45		38		67		45		39		74		41		40		64	
Weighted number of observations	10000.0		440.2		3428.6		4959.0		8716.9		1171.7		111.5		7971.1		1141.6		65.2	
Firm has no leased vehicles	1	0%					1	0%	1	0%									1	1%
Lessor provides drivers																				
for all leased vehicles	39	0%	5	1%			1	0%			33	3%	6	5%	33	0%			6	9%
for some leased vehicles	35	0%	33	7%			3	0%			33	3%	3	2%	33	0%			3	4%
Lessor provides fleet management																				
for all leased vehicles	41	0%	36	8%	1	0%	3	0%			33	3%	8	7%	33	0%			7	10%
for some leased vehicles	1	0%			1	0%							1	1%					1	2%
Lessor provides vehicle maintenance																				
for all leased vehicles	111	1%	71	16%	35	1%	4	0%			98	8%	13	12%	33	0%	66	6%	10	16%
for some leased vehicles	6	0%	1	0%	3	0%	2	0%			0	0%	6	5%			0	0%	6	9%
Lessor provides operating credentials																				
for all leased vehicles	140	1%	70	16%	34	1%	35	1%			133	11%	6	6%	33	0%	102	9%	5	8%
for some leased vehicles	6	0%	1	0%	3	0%	2	0%			0	0%	6	5%			0	0%	6	9%
Lessor provides fuel tax reporting																				
for all leased vehicles	138	1%	69	16%	34	1%	35	1%			131	11%	7	7%	33	0%	99	9%	6	9%
for some leased vehicles	4	0%	1	0%	1	0%	1	0%					4	4%					4	6%
Lessor provides none of these services	2455	25%	15	4%	717	21%	1156	23%	1787	20%	641	55%	27	24%	1219	15%	644	56%	23	36%
Not reported	7356	74%	348	79%	2672	78%	3764	76%	6930	80%	364	31%	62	56%	6687	84%	395	35%	22	33%

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Table AJ: Payment method used most for employed drivers.
Base: All respondents employing drivers directly.

	All firms		Type of carrier						Number of powered units						Total drivers					
			For-hire truckload carrier		Private carrier		All others		10 or fewer		Over 10 up to 50		Over 50		10 or fewer		Over 10 up to 70		Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	134		37		33		59		34		37		63		37		39		58	
Weighted number of observations	7919.8		318.6		2694.2		3737.2		6682.0		1136.4		101.4		6751.8		1109.0		59.0	
By the hour	3625	46%	75	23%	1886	70%	1663	44%	3304	49%	262	23%	59	58%	3312	49%	292	26%	21	35%
By the mile	261	3%	81	25%	70	3%	75	2%	39	1%	199	18%	23	22%	103	2%	135	12%	22	38%
By the trip	1229	16%	90	28%	568	21%	4	0%	1219	18%			10	10%	1217	18%	5	0%	7	12%
By shipment value	1296	16%	38	12%	83	3%	1175	31%	652	10%	637	56%	6	6%	652	10%	637	57%	6	10%
Other methods	173	2%	1	0%	87	3%	85	2%	168	3%	3	0%	3	3%	168	2%	4	0%	1	2%
Not reported	1336	17%	34	11%			735	20%	1299	19%	35	3%	1	1%	1299	19%	35	3%	1	2%
Total	7920	100%	319	100%	2694	100%	3737	100%	6682	100%	1136	100%	101	100%	6752	100%	1109	100%	59	100%

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Table AK: All payment methods used for employed drivers.
Base: All respondents employing drivers directly.

			Type of carrier						Number of powered units						Total drivers					
	All firms		For-hire truckload carrier		Private carrier		All others		10 or fewer		Over 10 up to 50		Over 50		10 or fewer		Over 10 up to 70		Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	134		37		33		59		34		37		63		37		39		58	
Weighted number of observations	7919.8		318.6		2694.2		3737.2		6682.0		1136.4		101.4		6751.8		1109.0		59.0	
By the hour	4306	49%	78	22%	1957	71%	2270	50%	3307	48%	926	50%	72	56%	3312	48%	960	51%	33	38%
By the mile	426	5%	116	32%	70	3%	205	5%	157	2%	240	13%	30	23%	189	3%	209	11%	29	34%
By the trip	1280	14%	95	26%	575	21%	41	1%	1255	18%	8	0%	17	13%	1222	18%	43	2%	14	17%
By shipment value	1302	15%	39	11%	83	3%	1180	26%	652	10%	643	35%	7	5%	655	10%	640	34%	7	8%
Other methods	178	2%	1	0%	87	3%	90	2%	168	2%	7	0%	3	3%	168	2%	8	0%	2	2%
Not reported	1336	15%	34	9%			735	16%	1299	19%	35	2%	1	1%	1299	19%	35	2%	1	1%
Total mentions	8828	100%	363	100%	2771	100%	4521	100%	6838	100%	1859	100%	130	100%	6845	100%	1896	100%	87	100%

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Table AL: Payment method used most for drivers not employed directly.
Base: All respondents employing contract drivers.

	All firms		Type of carrier						Number of powered units						Total drivers					
			For-hire truckload carrier		Private carrier		All others		10 or fewer		Over 10 up to 50		Over 50		10 or fewer		Over 10 up to 70		Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	49		26		3		20		2		5		42		1		9		39	
Weighted number of observations	684.9		91.1		3.8		590.0		5.4		636.1		43.5		2.7		645.4		36.8	
By the hour	7	1%	5	5%	1	33%	1	0%	3	50%			4	9%	3	100%			4	11%
By the mile	13	2%	12	13%			1	0%					13	30%					13	36%
By the trip	53	8%	39	43%	3	67%	11	2%	3	50%	33	5%	18	40%			42	6%	11	30%
By shipment value	610	89%	35	38%			575	97%			602	95%	7	17%			602	93%	7	20%
Other methods	3	0%	1	1%			2	0%			1	0%	1	3%			1	0%	1	4%
Not reported																				
Total	685	100%	91	100%	4	100%	590	100%	5	100%	636	100%	43	100%	3	100%	645	100%	37	100%

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Table AM: All payment methods used for drivers not employed directly.
Base: All respondents employing contract drivers.

	All firms		Type of carrier						Number of powered units						Total drivers					
			For-hire truckload carrier		Private carrier		All others		10 or fewer		Over 10 up to 50		Over 50		10 or fewer		Over 10 up to 70		Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	49		26		3		20		2		5		42		1		9		39	
Weighted number of observations	684.9		91.1		3.8		590.0		5.4		636.1		43.5		2.7		645.4		36.8	
By the hour	14	2%	6	6%	3	40%	5	1%	5	50%			9	14%	3	100%	3	0%	9	16%
By the mile	24	3%	16	16%	1	20%	6	1%	3	25%			21	34%			3	0%	21	38%
By the trip	58	8%	44	43%	3	40%	11	2%	3	25%	33	5%	22	36%			42	6%	16	29%
By shipment value	610	86%	35	34%			575	96%			602	95%	7	12%			602	93%	7	13%
Other methods	3	0%	1	1%			3	0%			1	0%	2	3%			1	0%	2	4%
Not reported																				
Total mentions	709	100%	102	100%	6	100%	600	100%	11	100%	636	100%	62	100%	3	100%	651	100%	55	100%

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Table AN: Percent of loads requiring OS/OW permit.
Base: All respondents.

	All firms		Type of carrier: For-hire truckload carrier		Type of carrier: Private carrier		Type of carrier: All others		Number of powered units: 10 or fewer		Number of powered units: Over 10 up to 50		Number of powered units: Over 50		Total drivers: 10 or fewer		Total drivers: Over 10 up to 70		Total drivers: Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	158		45		38		67		45		39		74		41		40		64	
Weighted number of observations	10000.0		440.2		3428.6		4959.0		8716.9		1171.7		111.5		7971.1		1141.6		65.2	
Zero	8118	81%	238	54%	3231	94%	3516	71%	7123	82%	953	81%	42	38%	6472	81%	955	84%	39	59%
Over zero to 25%	244	2%	85	19%	108	3%	51	1%	36	0%	150	13%	58	52%	76	1%	145	13%	22	33%
Over 25% to 50%	3	0%			3	0%							3	2%			3	0%		
Over 50% to 75%																				
Over 75% to less than 100%	71	1%	33	7%	3	0%	3	0%	3	0%	68	6%	0	0%	35	0%	35	3%	0	1%
100%	89	1%	3	1%	1	0%	85	2%	83	1%			7	6%	83	1%	3	0%	4	6%
Not reported	1475	15%	83	19%	83	2%	1303	26%	1473	17%			2	2%	1305	16%	1	0%	1	1%
Total	10000	100%	440	100%	3429	100%	4959	100%	8717	100%	1172	100%	111	100%	7971	100%	1142	100%	65	100%
Mean	2%		10%		0%		2%		1%		6%		10%		2%		3%		8%	
Median	0%		0%		0%		0%		0%		0%		2%		0%		0%		0%	
Std. Error of the Mean	1%		4%		1%		2%		2%		3%		3%		2%		2%		3%	

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Table AO: Percent of loads requiring HAZMAT placards.
Base: All respondents.

	All firms		Type of carrier						Number of powered units						Total drivers					
			For-hire truckload carrier		Private carrier		All others		10 or fewer		Over 10 up to 50		Over 50		10 or fewer		Over 10 up to 70		Over 70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	158		45		38		67		45		39		74		41		40		64	
Weighted number of observations	10000.0		440.2		3428.6		4959.0		8716.9		1171.7		111.5		7971.1		1141.6		65.2	
Zero	7214	72%	335	76%	2734	80%	3011	61%	6669	77%	466	40%	78	70%	6056	76%	465	41%	40	61%
Over zero to 25%	133	1%	22	5%	37	1%	73	1%	5	0%	103	9%	24	22%	8	0%	103	9%	20	31%
Over 25% to 50%	3	0%			3	0%					3	0%					3	0%		
Over 50% to 75%	1	0%	1	0%									1	1%					1	1%
Over 75% to less than 100%	4	0%			4	0%							4	4%			3	0%	1	2%
100%	1172	12%			568	17%	571	12%	570	7%	600	51%	3	2%	602	8%	567	50%	3	4%
Not reported	1475	15%	83	19%	83	2%	1303	26%	1473	17%			2	2%	1305	16%	1	0%	1	1%
Total	10000	100%	440	100%	3429	100%	4959	100%	8717	100%	1172	100%	111	100%	7971	100%	1142	100%	65	100%
Mean	14%		1%		17%		16%		8%		52%		7%		9%		51%		7%	
Median	0%		0%		0%		0%		0%		100%		0%		0%		100%		0%	
Std. Error of the Mean	3%		1%		6%		5%		5%		8%		3%		5%		8%		3%	

CRA

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Table A: Credentials obtained in last twelve months.
Base: All respondents.

	Total annual fleet miles						Geographic scope						Firm operates		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international		in CVISN states		5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	35		41		53		32		63		56		128		78		80	
Weighted number of observations	6167.2		1548.8		712.9		2719.8		5830.8		846.5		4410.7		8431.1		1568.9	
IRP/IFTA initial application	3122	51%	866	56%	97	14%	808	30%	3154	54%	765	90%	2275	52%	3241	38%	1489	95%
Outside firm obtained all	115	2%	4	0%	2	0%	83	3%	33	1%	39	5%	154	4%	116	1%	39	2%
Outside firm obtained most			1	0%							1	0%	1	0%			1	0%
Outside firm obtained some	83	1%	33	2%					117	2%			1	0%	33	0%	84	5%
IRP/IFTA supplemental application	691	11%	198	13%	694	97%	107	4%	1357	23%	766	91%	978	22%	1244	15%	988	63%
Outside firm obtained all	33	1%	4	0%	2	0%			33	1%	39	5%	71	2%	33	0%	39	2%
Outside firm obtained most			1	0%							1	0%	1	0%			1	0%
Outside firm obtained some	83	1%			600	84%			651	11%	33	4%	34	1%	567	7%	117	7%
IRP/IFTA annual renewals	2842	46%	1443	93%	705	99%	362	13%	4557	78%	806	95%	2621	59%	4158	49%	1569	100%
Outside firm obtained all	115	2%	571	37%	3	0%	83	3%	600	10%	40	5%	156	4%	684	8%	39	2%
Outside firm obtained most																		
Outside firm obtained some	83	1%			567	80%			651	11%			1	0%	567	7%	84	5%
Intrastate registrations	3208	52%	130	8%	28	4%	1412	52%	1936	33%	659	78%	1051	24%	2699	32%	1343	86%
Outside firm obtained all	33	1%	3	0%	1	0%					36	4%	36	1%			36	2%
Outside firm obtained most					2	0%	1	0%	1	0%	1	0%	3	0%			3	0%
Outside firm obtained some																		
SSRS registrations	2458	40%	296	19%	698	98%	640	24%	2658	46%	764	90%	1042	24%	2576	31%	1521	97%
Outside firm obtained all	33	1%	3	0%	2	0%					37	4%	37	1%			37	2%
Outside firm obtained most			1	0%					1	0%							1	0%
Outside firm obtained some							3	0%					3	0%			3	0%
IRP/IFTA single trip permits	754	12%	85	5%	57	8%	101	4%	777	13%	92	11%	821	19%	711	8%	262	17%
Outside firm obtained all	33	1%	4	0%	11	2%			39	1%	42	5%	80	2%	34	0%	47	3%
Outside firm obtained most			4	0%					4	0%	1	0%	5	0%	3	0%	2	0%
Outside firm obtained some			3	0%	36	5%			3	0%	38	5%	41	1%			41	3%
OS/OW permits	154	2%	129	8%	24	3%	111	4%	211	4%	62	7%	199	5%	179	2%	208	13%
Outside firm obtained all	33	1%	7	0%	9	1%	1	0%	6	0%	42	5%	48	1%	2	0%	48	3%
Outside firm obtained most					2	0%			2	0%	1	0%	3	0%			3	0%
Outside firm obtained some			35	2%	3	0%			37	1%	4	0%	7	0%	34	0%	8	0%
HAZMAT permits	5	0%	44	3%	14	2%	39	1%	11	0%	16	2%	65	1%	5	0%	64	4%
Outside firm obtained all					3	0%					3	0%	3	0%			3	0%
Outside firm obtained most																		
Outside firm obtained some			1	0%	1	0%			1	0%	1	0%	1	0%			2	0%
IFTA quarterly tax	2875	47%	909	59%	704	99%	994	37%	3485	60%	208	25%	2087	47%	3122	37%	1567	100%
Outside firm obtained all	115	2%	4	0%	9	1%	83	3%	34	1%	45	5%	162	4%	118	1%	43	3%
Outside firm obtained most			33	2%					33	1%					33	0%		
Outside firm obtained some					1	0%			1	0%	1	0%	2	0%			2	0%
Weight/distance tax reports	1380	22%	769	50%	700	98%	331	12%	2379	41%	236	28%	1243	28%	1502	18%	1446	92%
Outside firm obtained all	115	2%	37	2%	6	1%	83	3%	1	0%	73	9%	157	4%	117	1%	41	3%
Outside firm obtained most					1	0%					1	0%	1	0%			1	0%
Outside firm obtained some					1	0%			1	0%	1	0%	2	0%			2	0%
Outside firm used, details unknown	83	1%	35	2%	5	1%	83	3%	10	0%	605	71%	1264	29%	1261	15%	5	0%
No permits obtained	1303	21%	34	2%	7	1%	332	12%	1142	20%	38	4%	1428	32%	2078	25%		

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Table B: Payments to outside firms.
Base: All respondents.

	Total annual fleet miles						Geographic scope						Firm operates		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international		in CVISN states		5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	35		41		53		32		63		56		128		78		80	
Weighted number of observations	6167.2		1548.8		712.9		2719.8		5830.8		846.5		4410.7		8431.1		1568.9	
Up to $500	83	1%	45	3%	36	5%	83	3%	41	1%	606	72%	697	16%	685	8%	47	3%
$501 to $1,000			33	2%	1	0%			33	1%	1	0%	1	0%	33	0%	1	0%
$1,001 to $5,000	33	1%	35	2%	572	80%			570	10%	70	8%	73	2%	601	7%	39	3%
Over $5,000					3	0%	1	0%	3	0%	1	0%	6	0%	3	0%	3	0%
Paid outside firm, but amount not known	166	3%	606	39%	19	3%	86	3%	697	12%	54	6%	753	17%	1294	15%	111	7%
No payments made	5886	95%	830	54%	82	12%	2550	94%	4487	77%	114	13%	2882	65%	5816	69%	1368	87%
Total	6167	100%	1549	100%	713	100%	2720	100%	5831	100%	846	100%	4411	100%	8431	100%	1569	100%
Mean	1699.7		1625.3		1805.3		523.1		1729.3		657.5		943.8		916.3		4737.9	
Std. Error of the Mean	2071.1		676.9		2722.6		991.0		3188.8		379.1		1889.1		449.5		5838.2	

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Table C: Other services bundled with credentialing.
Base: All respondents reporting payments to outside firms.

	Total annual fleet miles						Geographic scope						Firm operates in CVISN states		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international				5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	2		9		14		2		10		15		23		10		20	
Weighted number of observations	115.3		112.5		612.0		84.0		647.0		678.4		776.0		1321.8		90.4	
Payroll administration					2	0%	1	2%	1	0%			2	0%			2	2%
Income tax preparation	83	72%	33	29%	3	0%	84	100%	36	6%	1	0%	88	11%	118	9%	3	3%
Other accounting/auditing	83	72%	65	58%	1	0%	83	98%	68	10%	1	0%	86	11%	151	11%	1	1%
Personnel services					1	0%			3	0%	1	0%	3	0%	3	0%	1	1%
Legal services			33	29%	1	0%			36	6%	568	84%	571	74%	602	46%	1	2%
Other			34	30%	2	0%	1	2%			35	5%	35	4%	33	2%	3	4%
No other services	33	28%	13	12%	609	99%			578	89%	76	11%	88	11%	571	43%	86	95%

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Table D: Resources used for credentialing.
Base: All respondents.

	Total annual fleet miles						Geographic scope						Firm operates in CVISN states		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international				5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	35		41		53		32		63		56		128		78		80	
Weighted number of observations	6167.2		1548.8		712.9		2719.8		5830.8		846.5		4410.7		8431.1		1568.9	
In-house resources only	3367	55%	228	15%	82	12%	1616	59%	2133	37%	114	13%	729	17%	2565	30%	1332	85%
Outside firm only	166	3%	68	4%	2	0%	166	6%	66	1%	603	71%	802	18%	831	10%	3	0%
Both in-house & outside firm	116	2%	651	42%	629	88%	5	0%	1278	22%	130	15%	726	16%	1784	21%	198	13%
None reported	2519	41%	602	39%			933	34%	2353	40%			2153	49%	3251	39%	35	2%
Total	6167	100%	1549	100%	713	100%	2720	100%	5831	100%	846	100%	4411	100%	8431	100%	1569	100%

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Table E: Methods used to file paperwork.
Base: All respondents using in house resources.

	Total annual fleet miles						Geographic scope						Firm operates in CVISN states		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international				5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	25		35		51		23		54		52		109		60		76	
Weighted number of observations	3483.1		878.7		710.9		1621.1		3411.2		243.6		1455.9		4348.5		1530.2	
Walk-in applications	1457	42%	692	79%	22	3%	842	52%	1435	42%	51	21%	362	25%	1604	37%	727	47%
Mail-in applications	2700	78%	237	27%	704	99%	1468	91%	2169	64%	170	70%	621	43%	2321	53%	1489	97%
Faxed applications	804	23%	127	14%	632	89%	655	40%	790	23%	129	53%	289	20%	1304	30%	272	18%
Internet, email, Website	570	16%	7	1%	7	1%	570	35%	4	0%	11	5%	18	1%	578	13%	7	0%
Telephone	181	5%	43	5%	611	86%	35	2%	758	22%	79	32%	155	11%	704	16%	168	11%
Other			1	0%	5	1%	1	0%	3	0%	2	1%	5	0%			6	0%
None of these	33	1%							33	1%					33	1%		
Not reported	653	19%	37	4%	4	1%	87	5%	574	17%	35	15%	729	50%	1293	30%	3	0%

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Table F: In-house managerial staff time.
Base: All respondents using in house resources.

	Total annual fleet miles						Geographic scope						Firm operates		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international		in CVISN states		5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	25		35		51		23		54		52		109		60		76	
Weighted number of observations	3483.1		878.7		710.9		1621.1		3411.2		243.6		1455.9		4348.5		1530.2	
Up to 5 FTE days	356	10%	183	21%	83	12%	272	17%	391	11%	117	48%	483	33%	580	13%	201	13%
Over 5 up to 10 FTE days	567	16%	35	4%	569	80%	570	35%	603	18%			39	3%	1170	27%	3	0%
Over 10 up to 20 FTE days	570	16%	9	1%	38	5%	600	37%	15	0%	35	14%	49	3%	603	14%	46	3%
Over 20 up to 50 FTE days	738	21%	39	4%	5	1%	89	6%	659	19%	39	16%	137	9%	91	2%	696	45%
Over 50 up to 100 FTE days			0	0%	6	1%	0	0%	2	0%	5	2%	8	1%	3	0%	6	0%
Over 100 up to 250 FTE days			3	0%	2	0%			2	0%	3	1%	2	0%	1	0%	4	0%
Over 250 FTE days	567	16%	3	0%	4	1%			568	17%	6	2%	7	0%	3	0%	572	37%
Not reported	686	20%	606	69%	4	1%	90	6%	1172	34%	38	16%	732	50%	1897	44%	2	0%
Total	3483	100%	879	100%	711	100%	1621	100%	3411	100%	244	100%	1456	100%	4349	100%	1530	100%
Mean	69.6		28.6		11.3		12.0		87.2		40.0		28.9		11.7		124.4	
Std. Error of the Mean	26.9		24.0		4.5		2.7		19.5		21.4		9.4		6.0		16.7	

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Table G: In-house clerical staff time.
Base: All respondents using in house resources.

	Total annual fleet miles						Geographic scope						Firm operates		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international		in CVISN states		5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	25		35		51		23		54		52		109		60		76	
Weighted number of observations	3483.1		878.7		710.9		1621.1		3411.2		243.6		1455.9		4348.5		1530.2	
Up to 5 FTE days	2147	62%	178	20%	117	16%	956	59%	1501	44%	146	60%	522	36%	1155	27%	1450	95%
Over 5 up to 10 FTE days	567	16%	9	1%	1	0%	570	35%	7	0%			9	1%	574	13%	3	0%
Over 10 up to 20 FTE days	83	2%	45	5%	1	0%	3	0%	157	5%	1	1%	127	9%	153	4%	8	1%
Over 20 up to 50 FTE days	1	0%	33	4%	7	1%	2	0%	2	0%	36	15%	40	3%			40	3%
Over 50 up to 100 FTE days			3	0%	570	80%			567	17%	9	4%	9	1%	567	13%	9	1%
Over 100 up to 250 FTE days			5	1%	4	1%			2	0%	9	4%	9	1%	2	0%	9	1%
Over 250 FTE days					7	1%			3	0%	4	2%	7	0%	1	0%	8	1%
Not reported	686	20%	606	69%	4	1%	90	6%	1172	34%	38	16%	732	50%	1897	44%	2	0%
Total	3483	100%	879	100%	711	100%	1621	100%	3411	100%	244	100%	1456	100%	4349	100%	1530	100%
Mean	5.6		25.1		61.1		5.3		44.4		48.6		30.5		28.5		54.3	
Std. Error of the Mean	1.2		8.0		7.6		0.8		6.3		17.5		9.9		6.5		15.7	

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Table H: In-house total staff time.
Base: All respondents using in house resources.

	Total annual fleet miles						Geographic scope						Firm operates		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international		in CVISN states		5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	25		35		51		23		54		52		109		60		76	
Weighted number of observations	3483.1		878.7		710.9		1621.1		3411.2		243.6		1455.9		4348.5		1530.2	
Up to 5 FTE days	187	5%	139	16%	69	10%	266	16%	149	4%	101	42%	334	23%	341	8%	175	11%
Over 5 up to 10 FTE days	85	2%	33	4%	1	0%	3	0%	116	3%	1	1%	37	3%	119	3%	1	0%
Over 10 up to 20 FTE days	1219	35%	46	5%	41	6%	1172	72%	164	5%	36	15%	173	12%	1321	30%	51	3%
Over 20 up to 50 FTE days	739	21%	9	1%	6	1%	89	5%	664	19%	6	2%	107	7%	95	2%	664	43%
Over 50 up to 100 FTE days			36	4%	572	80%	2	0%	572	17%	39	16%	46	3%	569	13%	43	3%
Over 100 up to 250 FTE days			5	1%	8	1%			4	0%	11	4%	14	1%	2	0%	13	1%
Over 250 FTE days	567	16%	5	1%	10	1%			570	17%	11	5%	13	1%	3	0%	581	38%
Not reported	686	20%	606	69%	4	1%	90	6%	1172	34%	38	16%	732	50%	1897	44%	2	0%
Total	3483	100%	879	100%	711	100%	1621	100%	3411	100%	244	100%	1456	100%	4349	100%	1530	100%
Mean	67.4		176.1		70.2		14.2		97.8		199.7		84.9		39.2		125.4	
Std. Error of the Mean	23.2		340.0		12.5		2.3		16.2		266.9		110.6		77.5		15.6	

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Table I: Satisfaction score with credentialing (scale: -5 to +5).
Base: All respondents.

	Total annual fleet miles			Geographic scope			Firm operates	Different permits types used	
	200k or less	Over 200k up to 3000k	Over 3000k	Within state	Regional	National, international	in CVISN states	5 or fewer	Over 5
	No %	No %	No %	No %	No %	No %	No %	No %	No %
Unweighted number of observations	35	41	53	32	63	56	128	78	80
Weighted number of observations	6167.2	1548.8	712.9	2719.8	5830.8	846.5	4410.7	8431.1	1568.9
IRP/IFTA initial application									
Mean	1.1	2.4	0.3	-0.9	1.7	0.6	1.7	0.6	1.5
Std. Error of the Mean	0.7	0.5	0.3	0.5	0.4	0.3	0.2	0.4	0.4
IRP/IFTA supplemental application									
Mean	2.0	3.5	-1.3	0.2	1.4	0.6	1.8	0.8	1.7
Std. Error of the Mean	0.9	0.4	0.4	0.7	0.5	0.3	0.3	0.4	0.4
IRP/IFTA annual renewals									
Mean	0.0	2.9	-1.5	-0.7	0.0	2.0	1.5	0.1	0.4
Std. Error of the Mean	0.8	0.5	0.3	0.6	0.5	0.3	0.2	0.3	0.5
Intrastate registrations									
Mean	0.6	2.2	3.1	0.7	0.5	-0.3	0.8	0.5	0.2
Std. Error of the Mean	0.7	0.7	0.5	0.4	0.7	0.3	0.3	0.3	0.6
SSRS registrations									
Mean	1.8	2.5	2.0	3.4	1.3	-0.8	1.0	1.9	0.4
Std. Error of the Mean	1.1	0.5	0.3	0.8	0.6	0.4	0.3	0.4	0.6
IRP/IFTA single trip permits									
Mean	-1.2	2.4	2.0	0.6	-1.4	-0.8	-1.0	-1.2	1.9
Std. Error of the Mean	0.8	0.6	0.6	0.7	0.4	0.4	0.3	0.4	0.4
OS/OW permits									
Mean	-2.7	3.1	1.6	1.2	-3.0	1.1	1.1	1.2	-3.6
Std. Error of the Mean	0.9	0.6	0.5	0.5	0.6	0.2	0.2	0.4	0.4
HAZMAT permits									
Mean	1.5	4.2	-3.6	1.3	-3.8	2.3	1.6	-2.4	2.0
Std. Error of the Mean	1.3	0.4	0.3	0.8	0.3	0.5	0.4	0.8	0.4
IFTA quarterly tax									
Mean	0.8	2.3	-0.1	0.0	0.9	2.7	3.1	1.6	-0.1
Std. Error of the Mean	0.6	0.5	0.3	0.8	0.3	0.3	0.2	0.4	0.2
Weight/distance tax reports									
Mean	-1.3	1.4	-0.1	0.7	-1.5	2.7	1.9	1.3	-1.7
Std. Error of the Mean	0.7	0.6	0.3	0.4	0.4	0.3	0.2	0.3	0.4

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Table J: Electronic credentialing awareness & use.
Base: All respondents.

	Total annual fleet miles						Geographic scope						Firm operates in CVISN states		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international				5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	35		41		53		32		63		56		128		78		80	
Weighted number of observations	6167.2		1548.8		712.9		2719.8		5830.8		846.5		4410.7		8431.1		1568.9	
Hasn't heard of EC	5165	84%	921	59%	625	88%	2342	86%	4458	76%	720	85%	3223	73%	6094	72%	1428	91%
Not sure whether heard of EC	202	3%	10	1%	36	5%	85	3%	127	2%	38	5%	212	5%	206	2%	44	3%
Already using EC	33	1%	1	0%	4	1%					38	5%	38	1%	3	0%	36	2%
Able to use, but hasn't yet					1	0%					1	0%	1	0%			1	0%
Some of our states plan to introduce			3	0%	3	0%			4	0%	1	0%	5	0%	1	0%	5	0%
Definite plans to use when available	3	0%	5	0%	4	1%	5	0%	2	0%	5	1%	12	0%	7	0%	7	0%
Heard of it, but don't know availability	115	2%	7	0%	37	5%	205	8%	69	1%	7	1%	248	6%	235	3%	47	3%
Not reported	650	11%	602	39%	5	1%	83	3%	1172	20%	36	4%	673	15%	1886	22%	4	0%

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Table K: Opinions about electronic credentialing (scale: -5 to +5).
Base: All respondents.

	Total annual fleet miles: 200k or less (No %)	Total annual fleet miles: Over 200k up to 3000k (No %)	Total annual fleet miles: Over 3000k (No %)	Geographic scope: Within state (No %)	Geographic scope: Regional (No %)	Geographic scope: National, international (No %)	Firm operates in CVISN states (No %)	Different permits types used: 5 or fewer (No %)	Different permits types used: Over 5 (No %)
Unweighted number of observations	35	41	53	32	63	56	128	78	80
Weighted number of observations	6167.2	1548.8	712.9	2719.8	5830.8	846.5	4410.7	8431.1	1568.9
"With electronic credentialing, I'd expect the turnaround time to be much quicker."									
Mean	1.6	-0.2	2.9	0.4	1.9	3.1	2.4	1.5	1.3
Std. Error of the Mean	0.7	0.4	0.1	0.7	0.4	0.1	0.2	0.4	0.4
"Electronic credentialing is likely to cost my company more than we'd save."									
Mean	1.0	2.0	-1.2	1.4	0.7	-0.2	-0.1	1.1	-0.7
Std. Error of the Mean	0.6	0.3	0.1	0.5	0.4	0.2	0.2	0.3	0.4
"I expect we'd make significant time and cost savings from using electronic credentialing."									
Mean	-0.5	-1.8	1.7	-0.5	-0.5	1.6	0.9	-0.5	1.0
Std. Error of the Mean	0.6	0.4	0.1	0.5	0.4	0.2	0.2	0.3	0.4
"We're too small to justify thinking about electronic credentialing."									
Mean	0.6	3.8	-4.0	0.2	0.7	4.0	2.1	1.4	0.2
Std. Error of the Mean	0.7	0.4	0.3	0.7	0.6	0.3	0.3	0.5	0.5
"The only major beneficiaries of electronic credentialing will be the state agencies."									
Mean	0.2	0.7	-4.1	-0.2	-0.3	-0.3	-0.7	-0.4	0.1
Std. Error of the Mean	0.7	0.3	0.3	0.7	0.5	0.2	0.2	0.4	0.5
"Electronic credentialing would result in more accurate and fairer calculation of fees."									
Mean	-1.0	-0.1	3.2	-2.1	0.7	1.3	0.4	-0.7	1.9
Std. Error of the Mean	0.6	0.3	0.2	0.6	0.4	0.2	0.2	0.4	0.3
"Electronic credentialing would help me run a safer trucking operation."									
Mean	-1.5	1.1	-0.1	-2.5	-0.1	1.4	0.1	-1.0	0.4
Std. Error of the Mean	0.6	0.5	0.1	0.5	0.4	0.4	0.2	0.4	0.4
"Training our existing staff to do electronic credentialing will be very difficult."									
Mean	0.0	0.1	-3.2	0.2	-0.6	0.1	-0.5	-0.1	-0.7
Std. Error of the Mean	0.7	0.3	0.3	0.7	0.5	0.2	0.2	0.4	0.4
"I'm concerned that electronic credentialing will help the states to expand regulations and charges in new ways."									
Mean	1.4	2.4	3.2	-0.6	3.1	3.0	2.0	1.7	1.8
Std. Error of the Mean	0.6	0.3	0.2	0.5	0.3	0.3	0.2	0.4	0.3
"Electronic credentialing would allow us to reorganize how we run the business, and help put more trucks on the road for more hours."									
Mean	-0.7	-3.5	-0.1	-0.2	-1.6	-0.4	-0.4	-1.0	-0.5
Std. Error of the Mean	0.6	0.3	0.1	0.7	0.3	0.2	0.1	0.3	0.2
"If we let our computers talk directly to the state's computer, I'd be worried about privacy."									
Mean	-1.6	2.7	-3.2	-1.9	-0.7	0.1	-0.8	-1.1	0.1
Std. Error of the Mean	0.4	0.4	0.3	0.5	0.4	0.2	0.2	0.4	0.1
"Electronic credentialing would require us to use state-mandated standards, formats, or eqipment."									
Mean	1.9	3.5	-1.6	2.1	1.5	2.8	1.0	1.7	1.4
Std. Error of the Mean	0.6	0.2	0.2	0.5	0.4	0.2	0.2	0.3	0.4

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Table L: Likelihood of using electronic credentialing.
Base: All respondents.

	Total annual fleet miles						Geographic scope						Firm operates in CVISN states		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international				5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	35		41		53		32		63		56		128		78		80	
Weighted number of observations	6167.2		1548.8		712.9		2719.8		5830.8		846.5		4410.7		8431.1		1568.9	
Company already uses	33	1%	1	0%	4	1%					38	5%	38	1%	3	0%	36	2%
10 (very likely to use)	1707	28%	3	0%	40	6%	570	21%	1178	20%	2	0%	615	14%	1141	14%	611	39%
9	1	0%	38	2%	568	80%	3	0%	603	10%	1	0%	40	1%	600	7%	8	0%
8	3	0%	9	1%	8	1%	3	0%	11	0%	6	1%	20	0%	7	0%	13	1%
7			3	0%	37	5%	69	3%	5	0%	35	4%	45	1%	69	1%	41	3%
6	3	0%	35	2%	34	5%	3	0%	5	0%	66	8%	106	2%	36	0%	70	4%
5 (neutral, can't say)	567	9%	716	46%	14	2%	285	10%	1000	17%	52	6%	1686	38%	1814	22%	90	6%
4	83	1%					83	3%			567	67%	650	15%	650	8%		
3	83	1%							83	1%							83	5%
2	652	11%	4	0%	1	0%	85	3%	572	10%	3	0%	11	0%	88	1%	572	36%
1			34	2%	1	0%	33	1%	5	0%			36	1%			37	2%
0 (very unlikely to use)	2469	40%	72	5%	2	0%	1504	55%	1170	20%	38	4%	443	10%	2704	32%	8	0%
Not reported	567	9%	633	41%	3	0%	83	3%	1199	21%	39	5%	721	16%	1320	16%		
Total	6167	100%	1549	100%	713	100%	2720	100%	5831	100%	846	100%	4411	100%	8431	100%	1569	100%
Mean	4.0		4.7		8.7		3.1		5.1		4.5		5.2		4.1		5.9	
Std. Error of the Mean	0.8		0.3		0.2		0.7		0.5		0.3		0.3		0.5		0.4	

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Table M1: Reasons for likelihood scores >=6.
Base: All respondents not using EC who claim a positive likelihood of doing so.

	Total annual fleet miles						Geographic scope						Firm operates		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international		in CVISN states		5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	9		12		27		11		26		18		50		18		41	
Weighted number of observations	1713.5		88.3		687.4		647.9		1802.1		110.6		825.9		1852.5		743.0	
Saves time, faster	13	1%	9	11%	609	89%	75	12%	583	32%	38	35%	63	8%	648	35%	49	7%
Saves money, more efficient	570	33%	35	40%	6	1%	570	88%	7	0%	35	32%	45	5%	572	31%	41	6%
Reduces paperwork					1	0%			1	0%	1	1%	1	0%			3	0%
Better tracking	1134	66%			1	0%			1134	63%	1	1%	568	69%	567	31%	568	76%
We have computerized systems			5	6%	35	5%	3	0%	38	2%			41	5%	3	0%	38	5%
Available at any time			35	40%					35	2%			35	4%	33	2%	3	0%
Other reasons			3	3%	36	5%	3	0%	5	0%	35	31%	75	9%	33	2%	42	6%

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Table M2: Reasons for likelihood scores < 6.
Base: All respondents not using EC who claim a negative likelihood of doing so.

	Total annual fleet miles						Geographic scope						Firm operates		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international		in CVISN states		5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	26		29		26		21		37		38		78		60		39	
Weighted number of observations	4453.7		1460.5		25.4		2071.9		4028.7		735.9		3584.8		6578.6		825.9	
Will take more time			3	0%	0	1%			1	0%	2	0%	2	0%	1	0%	2	0%
Unsure about cost			69	5%	2	8%	33	2%	33	1%	6	1%	70	2%	35	1%	36	4%
Firm too small	251	6%	71	5%			236	11%	85	2%	3	0%	324	9%	254	4%	71	9%
Happy with current credentialing arrangements	33	1%	5	0%	1	3%	3	0%	39	1%			9	0%	35	1%	6	1%
Limited or no computer equipment, expertise	1299	29%			1	5%	1217	59%	85	2%	1	0%	169	5%	1299	20%	4	0%
Possible staff resistance			33	2%	3	11%					35	5%	35	1%	33	0%	3	0%
Fear of tracking problems	567	13%							567	14%							567	69%
Needs to know more about it	85	2%	4	0%			83	4%	7	0%			88	2%	87	1%	3	0%
Other reasons	367	8%	2	0%	5	18%	286	14%	85	2%	3	0%	208	6%	371	6%	3	0%

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Table N1: Roadside check incidence.
Base: All respondents.

	Total annual fleet miles						Geographic scope						Firm operates		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international		in CVISN states		5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	35		41		53		32		63		56		128		78		80	
Weighted number of observations	6167.2		1548.8		712.9		2719.8		5830.8		846.5		4410.7		8431.1		1568.9	
We keep data & summarize them	600	10%	74	5%	17	2%	600	22%	77	1%	620	73%	663	15%	1271	15%	26	2%
Firms estimating safety inspections	600	10%	73	5%	17	2%	600	22%	76	1%	618	73%	661	15%	1271	15%	23	1%
based on data	567	9%	70	5%	13	2%	567	21%	71	1%	613	72%	617	14%	1237	15%	14	1%
based on guess	33	1%	3	0%	4	1%	33	1%	5	0%	5	1%	43	1%	34	0%	9	1%
Firms estimating size/weight checks	600	10%	39	3%	8	1%	600	22%	43	1%	607	72%	649	15%	1232	15%	18	1%
based on data	567	9%	1	0%	5	1%	567	21%	35	1%	4	0%	5	0%	600	7%	6	0%
based on guess	33	1%	38	2%	3	0%	33	1%	8	0%	601	71%	641	15%	632	7%	9	1%
Firms estimating safety inspection time	600	10%	73	5%	15	2%	600	22%	77	1%	616	73%	659	15%	1270	15%	22	1%
based on data	567	9%	66	4%	1	0%	567	21%	65	1%	36	4%	35	1%	666	8%	2	0%
based on guess	33	1%	7	0%	14	2%	33	1%	11	0%	580	69%	624	14%	604	7%	20	1%
Firms estimating size/weight check time	600	10%	41	3%	8	1%	600	22%	43	1%	609	72%	651	15%	1233	15%	19	1%
based on data	567	9%	3	0%	1	0%	567	21%	33	1%	3	0%	2	0%	601	7%	2	0%
based on guess	33	1%	38	2%	7	1%	33	1%	11	0%	603	71%	646	15%	632	7%	14	1%
We keep data, don't summarize them	2245	36%	202	13%	620	87%	1060	39%	1957	34%	89	10%	656	15%	2398	28%	709	45%
Firms estimating safety inspections	2163	35%	194	13%	585	82%	972	36%	1955	34%	53	6%	613	14%	2307	27%	674	43%
based on data	1509	24%	76	5%	9	1%	287	11%	1333	23%	9	1%	429	10%	1044	12%	585	37%
based on guess	651	11%	118	8%	577	81%	685	25%	619	11%	44	5%	181	4%	1260	15%	89	6%
Firms estimating size/weight checks	1593	26%	187	12%	584	82%	972	36%	1379	24%	51	6%	602	14%	2297	27%	105	7%
based on data	776	13%	34	2%	1	0%	89	3%	724	12%	1	0%	214	5%	804	10%	10	1%
based on guess	734	12%	118	8%	583	82%	801	29%	620	11%	50	6%	270	6%	1378	16%	93	6%
Firms estimating safety inspection time	2075	34%	190	12%	585	82%	889	33%	1951	33%	49	6%	524	12%	2219	26%	670	43%
based on data	1252	20%	71	5%	5	1%	118	4%	1237	21%	5	1%	161	4%	788	9%	572	36%
based on guess	823	13%	120	8%	581	81%	771	28%	713	12%	45	5%	363	8%	1431	17%	98	6%
Firms estimating size/weight check time	1586	26%	182	12%	583	82%	970	36%	1372	24%	47	6%	590	13%	2293	27%	96	6%
based on data	33	1%	65	4%					100	2%			68	2%	98	1%	3	0%
based on guess	1471	24%	114	7%	583	82%	887	33%	1269	22%	47	6%	436	10%	2112	25%	91	6%
We do samples occasionally	86	1%	33	2%	35	5%	3	0%	117	2%	33	4%	71	2%	37	0%	116	7%
Firms estimating safety inspections	86	1%	33	2%	33	5%	3	0%	115	2%	33	4%	69	2%	36	0%	116	7%
based on data					33	5%					33	4%	33	1%	1	0%	33	2%
based on guess	86	1%	33	2%			3	0%	115	2%			36	1%	35	0%	83	5%
Firms estimating size/weight checks	86	1%	33	2%	33	5%	3	0%	115	2%	33	4%	69	2%	36	0%	116	7%
based on data																		
based on guess	86	1%	33	2%	33	5%	3	0%	115	2%	33	4%	69	2%	36	0%	116	7%
Firms estimating safety inspection time	3	0%	33	2%	33	5%	3	0%	33	1%	33	4%	69	2%	36	0%	33	2%
based on data																		
based on guess	3	0%	33	2%	33	5%	3	0%	33	1%	33	4%	69	2%	36	0%	33	2%
Firms estimating size/weight check time	3	0%	33	2%	33	5%	3	0%	33	1%	33	4%	69	2%	36	0%	33	2%
based on data																		
based on guess	3	0%	33	2%	33	5%	3	0%	33	1%	33	4%	69	2%	36	0%	33	2%
We don't collect data	3236	52%	1173	76%	38	5%	1055	39%	3644	62%	37	4%	2916	66%	4657	55%	679	43%
Not reported			66	4%	3	0%	1	0%	36	1%	67	8%	104	2%	68	1%	39	3%

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Table N2: Roadside check means.
Base: All respondents.

	Total annual fleet miles						Geographic scope						Firm operates in CVISN states		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international				5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	35		41		53		32		63		56		128		78		80	
Weighted number of observations	6167.2		1548.8		712.9		2719.8		5830.8		846.5		4410.7		8431.1		1568.9	
We keep data & summarize them																		
Firms estimating safety inspections	2		35		519		2		19		27		27		9		334	
based on data	2		35		620		2		19		25		26		8		527	
based on guess	10		35		234		10		24		239		39		39		41	
Firms estimating size/weight checks	4		842		77		4		17		73		71		37		66	
based on data	2		8		104		2		6		94		104		2		84	
based on guess	30		870		36		30		67		73		71		71		75	
Firms estimating safety inspection time	43		23		27		43		23		39		38		40		28	
based on data	45		23		40		45		23		30		30		42		34	
based on guess	10		28		26		10		29		40		38		38		27	
Firms estimating size/weight check time	39		14		18		39		26		10		11		25		13	
based on data	40		25		8		40		30		21		16		39		22	
based on guess	15		13		19		15		13		10		11		11		15	
We keep data, don't summarize them																		
Firms estimating safety inspections	2		33		117		2		33		227		31		28		22	
based on data	2		45		201		2		4		180		13		5		5	
based on guess	2		26		115		2		96		236		72		47		141	
Firms estimating size/weight checks	5		27		898		10		112		7401		652		68		3656	
based on data	3		16		53		2		4		41		8		3		92	
based on guess	7		39		899		12		245		7590		1447		111		4148	
Firms estimating safety inspection time	47		32		59		26		58		49		36		52		35	
based on data	62		23		33		51		60		33		42		76		35	
based on guess	24		38		59		23		54		50		33		38		37	
Firms estimating size/weight check time	17		19		15		18		15		25		20		16		21	
based on data	20		25						23				24		23		1	
based on guess	18		17		15		20		14		25		23		17		22	
We do samples occasionally																		
Firms estimating safety inspections	19		50		106		3		28		106		75		51		43	
based on data					106						106		106		296		102	
based on guess	19		50				3		28				46		46		20	
Firms estimating size/weight checks	19		1345		100		2		394		100		681		1218		43	
based on data																		
based on guess	19		1345		100		2		394		100		681		1218		43	
Firms estimating safety inspection time	30		60		20		30		60		20		39		57		20	
based on data																		
based on guess	30		60		20		30		60		20		39		57		20	
Firms estimating size/weight check time	14		30		20		14		30		20		24		28		20	
based on data																		
based on guess	14		30		20		14		30		20		24		28		20	
We don't collect data																		
Not reported																		
All firms																		
Firms estimating safety inspections	2		35		127		2		32		46		31		21		34	
Firms estimating size/weight checks	5		316		845		8		131		613		368		69		1636	
Firms estimating safety inspection time	46		33		56		33		57		39		37		48		34	
Firms estimating size/weight check time	23		20		15		26		16		12		15		19		20	

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Table O: Annual safety inspection times.
Base: All respondents with inspedction data.

	Total annual fleet miles						Geographic scope						Firm operates		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international		in CVISN states		5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	22		34		47		20		46		52		103		55		67	
Weighted number of observations	2931.0		375.8		674.8		1664.6		2186.8		809.6		1494.5		3773.7		890.3	
Up to 1 vehicle-hour / year	1475	50%	73	19%	2	0%	775	47%	770	35%	39	5%	300	20%	893	24%	691	78%
Over 1 up to 2 vh / year	1367	47%	36	9%			798	48%	641	29%	3	0%	242	16%	1400	37%	41	5%
Over 2 up to 10 vh / year	3	0%	79	21%	5	1%	3	0%	79	4%	571	71%	621	42%	644	17%	9	1%
Over 10 up to 40 vh / year	3	0%	77	21%	34	5%	0	0%	47	2%	69	9%	117	8%	70	2%	47	5%
Over 40 up to 100 vh / year			66	18%	579	86%			603	28%	43	5%	79	5%	602	16%	45	5%
Over 100 vh / year			3	1%	16	2%			7	0%	12	2%	20	1%	5	0%	14	2%
Not reported	83	3%	42	11%	39	6%	88	5%	39	2%	72	9%	117	8%	159	4%	43	5%
Total	2931	100%	376	100%	675	100%	1665	100%	2187	100%	810	100%	1495	100%	3774	100%	890	100%
Mean	1.5		19.4		105.6		1.5		30.9		21.8		16.6		19.8		15.9	
Median	2.0		9.0		100.0		2.0		2.0		7.0		7.0		2.0		1.0	
Std. Error of the Mean	0.2		4.3		27.5		0.2		7.5		26.0		13.7		6.0		22.4	

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Table P: Annual size/weight inspection times.
Base: All respondents with inspedction data.

	Total annual fleet miles						Geographic scope						Firm operates		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international		in CVISN states		5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	22		34		47		20		46		52		103		55		67	
Weighted number of observations	2931.0		375.8		674.8		1664.6		2186.8		809.6		1494.5		3773.7		890.3	
Up to 1 vehicle-hour / year	2698	92%	153	41%	12	2%	1425	86%	1422	65%	53	7%	483	32%	2160	57%	741	83%
Over 1 up to 2 vh / year	3	0%	33	9%	1	0%			37	2%			4	0%	33	1%	4	0%
Over 2 up to 10 vh / year	115	4%	77	21%	6	1%	118	7%	47	2%	603	74%	767	51%	718	19%	50	6%
Over 10 up to 40 vh / year	33	1%	4	1%	38	6%	33	2%	36	2%	41	5%	45	3%	72	2%	38	4%
Over 40 up to 100 vh / year			1	0%	570	84%			569	26%	3	0%	5	0%	567	15%	5	1%
Over 100 vh / year			65	17%	9	1%			37	2%	38	5%	75	5%	65	2%	9	1%
Not reported	83	3%	42	11%	39	6%	88	5%	39	2%	72	9%	117	8%	159	4%	43	5%
Total	2931	100%	376	100%	675	100%	1665	100%	2187	100%	810	100%	1495	100%	3774	100%	890	100%
Mean	1.1		108.2		290.5		1.7		42.6		212.4		133.6		20.0		810.9	
Median	1.0		4.0		63.0		1.0		1.0		3.0		3.0		1.0		4.0	
Std. Error of the Mean	0.5		49.7		989.4		1.0		21.3		921.9		442.6		13.3		1479.8	

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Table Q: Annual inspection times for all checks.
Base: All respondents with inspedction data.

	Total annual fleet miles						Geographic scope						Firm operates		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international		in CVISN states		5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	22		34		47		20		46		52		103		55		67	
Weighted number of observations	2931.0		375.8		674.8		1664.6		2186.8		809.6		1494.5		3773.7		890.3	
Up to 1 vehicle-hour / year	1389	47%	69	18%	2	0%	654	39%	770	35%	38	5%	211	14%	775	21%	687	77%
Over 1 up to 5 vh / year	1391	47%	38	10%			854	51%	608	28%	3	0%	298	20%	1423	38%	41	5%
Over 5 up to 10 vh / year	33	1%	76	20%	3	0%	35	2%	79	4%	567	70%	648	43%	670	18%	11	1%
Over 10 up to 50 vh / year	35	1%	48	13%	5	1%	33	2%	78	4%	9	1%	55	4%	104	3%	16	2%
Over 40 up to 100 vh / year			35	9%	38	6%			4	0%	73	9%	75	5%	4	0%	72	8%
Over 100 up to 200 vh / year			3	1%	575	85%			572	26%	7	1%	12	1%	572	15%	7	1%
Over 200 vh / year			65	17%	13	2%			38	2%	41	5%	79	5%	67	2%	12	1%
Not reported	83	3%	42	11%	39	6%	88	5%	39	2%	72	9%	117	8%	159	4%	43	5%
Total	2931	100%	376	100%	675	100%	1665	100%	2187	100%	810	100%	1495	100%	3774	100%	890	100%
Mean	2.1		113.1		391.6		2.8		60.8		230.5		146.4		38.9		208.2	
Median	2.0		10.0		163.0		3.0		2.0		10.0		10.0		3.0		1.0	
Std. Error of the Mean	0.4		42.7		839.6		1.0		19.8		760.6		386.2		14.3		656.2	

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Table R: Satisfaction score with inspections (scale: -5 to +5).
Base: All respondents.

	Total annual fleet miles			Geographic scope			Firm operates	Different permits types used	
	200k or less	Over 200k up to 3000k	Over 3000k	Within state	Regional	National, international	in CVISN states	5 or fewer	Over 5
	No %	No %	No %	No %	No %	No %	No %	No %	No %
Unweighted number of observations	35	41	53	32	63	56	128	78	80
Weighted number of observations	6167.2	1548.8	712.9	2719.8	5830.8	846.5	4410.7	8431.1	1568.9
Frequency of inspections									
Mean	0.75	0.78	-2.28	0.78	0.08	-0.19	-0.81	-0.46	2.16
Std. Error of the Mean	0.57	0.66	0.22	0.47	0.49	0.25	0.31	0.42	0.19
Criteria for selection									
Mean	-0.47	0.52	-4.17	-1.81	-0.31	-1.73	-1.42	-1.54	1.65
Std. Error of the Mean	0.65	0.67	0.26	0.54	0.53	0.34	0.32	0.45	0.26
Types of checks									
Mean	1.79	0.11	2.34	1.83	1.15	2.65	-0.12	0.89	1.99
Std. Error of the Mean	0.57	0.55	0.22	0.33	0.48	0.19	0.32	0.43	0.21
Fairness of the process									
Mean	0.56	-0.54	-1.03	-0.63	0.37	0.74	-0.81	-0.50	1.81
Std. Error of the Mean	0.73	0.48	0.15	0.70	0.46	0.21	0.30	0.44	0.25
Time spent being inspected									
Mean	-0.63	0.54	-4.13	-0.09	-1.11	-0.59	-1.54	-1.47	1.79
Std. Error of the Mean	0.56	0.66	0.27	0.56	0.48	0.15	0.23	0.41	0.22
Time waiting for inspection									
Mean	-1.83	-0.50	-4.04	-1.14	-2.06	-1.51	-2.60	-2.48	1.67
Std. Error of the Mean	0.66	0.53	0.28	0.64	0.46	0.19	0.20	0.38	0.22

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Table S: Most important inspection improvement.
Base: All mentions.

	Total annual fleet miles						Geographic scope						Firm operates in CVISN states		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international				5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	16		21		37		13		30		35		66		39		41	
Weighted number of observations	3967.3		196.5		662.1		2208.1		2575.0		161.6		1875.4		5372.4		171.8	
Happy with current system	166	4%			5	1%	83	4%	115	4%	5	3%	88	5%	199	4%	4	2%
Need regular, terminal-based inspections			3	1%	2	0%			3	0%	2	1%	5	0%			5	3%
Manage roadside to reduce evasion	684	18%	3	2%	3	0%	652	32%	34	1%	3	2%	89	5%	687	13%	3	2%
Better enforcement of regulations	650	17%	33	18%	3	0%	650	32%	35	1%	1	0%	3	0%	683	13%	2	1%
Better targeting of vehicles	1134	29%	35	19%	571	87%	567	28%	1168	46%	5	3%	73	4%	1767	34%	6	4%
More concern with safety of inspection arrangements	567	15%			3	0%			567	22%	3	2%	3	0%	567	11%	3	2%
Better information about vehicles					1	0%					1	0%	1	0%			1	0%
Better inspectors	3	0%	38	20%	2	0%	3	0%	1	0%	39	24%	608	36%	608	12%	1	1%
More consistency, uniformity	600	15%	35	19%	68	10%			606	24%	99	61%	705	42%	571	11%	134	81%
Other changes	83	2%	39	21%	3	0%	83	4%	38	1%	4	2%	123	7%	118	2%	7	4%
Total mentions	3884	100%	186	100%	660	100%	2037	100%	2568	100%	162	100%	1697	100%	5200	100%	166	100%

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Table T: All inspection improvement suggestions.
Base: All mentions.

	Total annual fleet miles						Geographic scope						Firm operates		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international		in CVISN states		5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	16		21		37		13		30		35		66		39		41	
Weighted number of observations	3967.3		196.5		662.1		2208.1		2575.0		161.6		1875.4		5372.4		171.8	
Happy with current system	166	4%			5	0%	83	4%	115	4%	5	2%	88	5%	199	3%	4	2%
Need regular, terminal-based inspections			3	1%	3	0%			3	0%	3	1%	6	0%			6	3%
Manage roadside to reduce evasion	684	17%	3	1%	4	0%	652	30%	35	1%	3	1%	90	5%	687	12%	4	2%
Better enforcement of regulations	650	16%	33	15%	3	0%	650	29%	35	1%	1	0%	3	0%	683	11%	2	1%
Better targeting of vehicles	1166	29%	35	16%	571	46%	567	26%	1168	37%	38	16%	105	5%	1767	30%	39	18%
More concern with safety of inspection arrangements	567	14%			3	0%			567	18%	3	1%	3	0%	567	9%	3	1%
Better information about vehicles					2	0%					2	1%	2	0%	1	0%	1	1%
Better inspectors	3	0%	39	18%	4	0%	3	0%	1	0%	42	17%	612	31%	608	10%	5	2%
More consistency, uniformity	600	15%	38	17%	71	6%			608	19%	103	43%	711	37%	573	10%	138	65%
Other changes	248	6%	72	32%	574	46%	248	11%	606	19%	40	17%	326	17%	883	15%	11	5%
Total mentions	4083	100%	222	100%	1240	100%	2203	100%	3139	100%	240	100%	1945	100%	5969	100%	212	100%

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Table U: Electronic screening awareness & use.
Base: All respondents.

	Total annual fleet miles						Geographic scope						Firm operates		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international		in CVISN states		5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	35		41		53		32		63		56		128		78		80	
Weighted number of observations	6167.2		1548.8		712.9		2719.8		5830.8		846.5		4410.7		8431.1		1568.9	
Hasn't heard of ES	4856	79%	1259	81%	115	16%	1860	68%	4457	76%	149	18%	2683	61%	5018	60%	1449	92%
Already using SC (annual fee)			41	3%	1	0%			41	1%	2	0%	43	1%	38	0%	5	0%
Already using SC (per site)			33	2%	9	1%			2	0%	606	72%	609	14%	602	7%	7	0%
Not using, expect to use within 2 years			38	2%	574	81%	35	1%	571	10%	7	1%	46	1%	572	7%	40	3%
Not using, don't expect to use within 2 years	1309	21%	113	7%	14	2%	740	27%	720	12%	17	2%	809	18%	2015	24%	29	2%
Not reported	3	0%	66	4%	1	0%	84	3%	40	1%	67	8%	224	5%	186	2%	41	3%

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Table V: Reasons for or against ES participation.
Base: All mentions.

	Total annual fleet miles						Geographic scope						Firm operates		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international		in CVISN states		5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	6		15		28		6		20		28		48		25		31	
Weighted number of observations	1303.3		184.2		591.8		740.5		1287.4		624.8		916.7		2650.4		35.2	
Hasn't reached critical mass yet			5	3%	2	0%	3	0%	1	0%	4	1%	8	1%	5	0%	2	8%
Time savings			5	3%	576	97%			575	45%	574	92%	582	64%	1139	43%	10	33%
Cost of participation	567	44%	73	39%	6	1%	570	77%	76	6%	6	0%	51	5%	635	24%	17	35%
Possible bad impacts on safety			65	36%	4	1%			35	3%	34	5%	69	7%	66	2%	3	8%
Big Brother concerns	650	50%	1		1	0%	83	11%	567	44%	3	0%	85	9%	651	25%	1	8%
Needs more information to judge					1				0	0%	1		34	4%	33	1%	0	1%
Not applicable to us	87	7%	34	18%	1	0%	85	12%	34	3%	3	0%	88	10%	121	4%	1	8%
Total mentions	1303	100%	184	100%	592	100%	740	100%	1289	100%	624	100%	917	100%	2650	100%	35	100%

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Table W1: Awareness of SAFER carrier information.
Base: All respondents.

	Total annual fleet miles						Geographic scope						Firm operates		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international		in CVISN states		5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	35		41		53		32		63		56		128		78		80	
Weighted number of observations	6167.2		1548.8		712.9		2719.8		5830.8		846.5		4410.7		8431.1		1568.9	
Respondent aware	1459	24%	336	22%	643	90%	472	17%	1950	33%	736	87%	1774	40%	2928	35%	230	15%
Respondent not aware	4623	75%	1173	76%	70	10%	2245	83%	3754	64%	74	9%	1988	45%	4863	58%	1243	79%
Not sure	3	0%	3	0%			3	0%	5	0%			8	0%	5	0%	3	0%
Not reported	83	1%	37	2%					121	2%	36	4%	640	15%	635	8%	92	6%
Total	6167	100%	1549	100%	713	100%	2720	100%	5831	100%	846	100%	4411	100%	8431	100%	1569	100%

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Table W2: Awareness of SAFER vehicle information.
Base: All respondents.

	Total annual fleet miles						Geographic scope						Firm operates in CVISN states		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international				5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	35		41		53		32		63		56		128		78		80	
Weighted number of observations	6167.2		1548.8		712.9		2719.8		5830.8		846.5		4410.7		8431.1		1568.9	
Respondent aware	776	13%	188	12%	66	9%	356	13%	731	13%	662	78%	1083	25%	1601	19%	147	9%
Respondent not aware	4656	75%	755	49%	645	91%	2195	81%	3837	66%	148	17%	2594	59%	5456	65%	758	48%
Not sure	85	1%	3	0%	1	0%	85	3%	8	0%	1	0%	11	0%	89	1%	4	0%
Not reported	650	11%	603	39%			83	3%	1255	22%	36	4%	723	16%	1285	15%	659	42%
Total	6167	100%	1549	100%	713	100%	2720	100%	5831	100%	846	100%	4411	100%	8431	100%	1569	100%

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Table X: Opinions about electronic screening (scale: -5 to +5).
Base: All respondents.

	Total annual fleet miles: 200k or less	Total annual fleet miles: Over 200k up to 3000k	Total annual fleet miles: Over 3000k	Geographic scope: Within state	Geographic scope: Regional	Geographic scope: National, international	Firm operates in CVISN states	Different permits types used: 5 or fewer	Different permits types used: Over 5
	No %	No %	No %	No %	No %	No %	No %	No %	No %
Unweighted number of observations	35	41	53	32	63	56	128	78	80
Weighted number of observations	6167.2	1548.8	712.9	2719.8	5830.8	846.5	4410.7	8431.1	1568.9
"Equipping all our units with transponders is likely to cost my company more than we'd save."									
Mean	2.93	3.71	0.22	2.38	3.05	3.14	2.83	2.79	2.33
Std. Error of the Mean	0.41	0.36	0.23	0.43	0.30	0.34	0.22	0.27	0.31
"If these new inspection methods were more widespread, I expect we'd make significant time and cost savings."									
Mean	-1.17	0.86	3.84	-0.12	-0.29	1.49	0.31	0.34	-1.81
Std. Error of the Mean	0.41	0.31	0.35	0.23	0.40	0.27	0.14	0.28	0.33
"We're too small to justufy thinking about putting transponders in our units."									
Mean	3.78	1.95	-3.74	2.51	3.07	3.56	2.41	2.60	3.78
Std. Error of the Mean	0.33	0.47	0.39	0.41	0.43	0.38	0.24	0.36	0.28
"Even if the time spent in safety and weight inspections were halved, there'd be very little impact on our costs."									
Mean	1.68	-0.02	-4.09	0.65	0.95	-2.98	0.29	0.19	1.60
Std. Error of the Mean	0.47	0.28	0.27	0.35	0.43	0.28	0.26	0.37	0.24
"Even without equipping our vehicles, we'd probably benefit if the inspection officials had better information."									
Mean	2.32	0.77	3.93	2.73	1.83	1.96	1.19	2.50	-0.64
Std. Error of the Mean	0.49	0.63	0.33	0.39	0.45	0.24	0.26	0.33	0.28
"I expect that our drivers would be pleased by these types of changes."									
Mean	1.05	-2.65	3.63	1.17	0.25	-1.20	-0.29	0.39	-0.01
Std. Error of the Mean	0.43	0.33	0.43	0.52	0.39	0.30	0.26	0.37	0.17
"These type of changes will make the roadside inspection system significantly more fair."									
Mean	1.72	-1.91	4.20	1.26	1.12	2.50	0.67	1.46	0.11
Std. Error of the Mean	0.50	0.40	0.31	0.53	0.43	0.26	0.27	0.38	0.22
"I'm concerned that changes like these will help the states to expand regulations and charges in new ways."									
Mean	2.51	2.39	2.33	0.56	3.14	3.08	1.93	2.15	3.13
Std. Error of the Mean	0.41	0.39	0.25	0.28	0.27	0.27	0.20	0.27	0.26
"I worry about government agencies having so much information about our vehicles."									
Mean	1.49	1.29	2.56	-1.13	2.70	3.48	2.13	1.49	2.66
Std. Error of the Mean	0.62	0.51	0.21	0.59	0.33	0.39	0.26	0.38	0.32

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Table Y: Impact of inspection on firm's spending.
Base: All respondents.

	Total annual fleet miles						Geographic scope						Firm operates in CVISN states		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international				5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	35		41		53		32		63		56		128		78		80	
Weighted number of observations	6167.2		1548.8		712.9		2719.8		5830.8		846.5		4410.7		8431.1		1568.9	
Spending increased this year	686	11%	41	3%	7	1%	116	4%	610	10%	574	68%	1266	29%	1284	15%	15	1%
No increase from last year	4630	75%	804	52%	95	13%	2157	79%	3296	57%	160	19%	1943	44%	4774	57%	871	56%
Not sure	848	14%	72	5%	605	85%	332	12%	1319	23%	74	9%	442	10%	1082	13%	642	41%
Not reported	3	0%	632	41%	6	1%	115	4%	606	10%	39	5%	760	17%	1290	15%	41	3%
Total	6167	100%	1549	100%	713	100%	2720	100%	5831	100%	846	100%	4411	100%	8431	100%	1569	100%

APPENDIX C.3

Table AA: Type of carrier.
Base: All respondents.

	Total annual fleet miles						Geographic scope						Firm operates		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international		in CVISN states		5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	35		41		53		32		63		56		128		78		80	
Weighted number of observations	6167.2		1548.8		712.9		2719.8		5830.8		846.5		4410.7		8431.1		1568.9	
For-hire truckload carrier	118	2%	180	12%	55	8%	85	3%	201	3%	153	18%	290	7%	232	3%	208	13%
For-hire LTL carrier			68	4%	2	0%	33	1%	3	0%	37	4%	73	2%	3	0%	70	4%
Private carrier	2019	33%	1184	76%	38	5%	1038	38%	2383	41%	7	1%	1626	37%	2776	33%	652	42%
General freight carrier	33	1%			3	0%			35	1%	570	67%	606	14%	636	8%	3	0%
Tank truck operator					568	80%			567	10%	1	0%	1	0%	567	7%	1	0%
Refrigerated truck carrier	85	1%	3	0%			3	0%	85	1%			88	2%	85	1%	3	0%
Automobile transporter							3	0%					3	0%			3	0%
Bulk commodities carrier	1299	21%	6	0%	38	5%	654	24%	658	11%	33	4%	212	5%	1303	15%	43	3%
Household goods mover	567	9%	4	0%	3	0%			567	10%	8	1%	8	0%	569	7%	6	0%
Owner/operator	909	15%	71	5%	3	0%	904	33%	193	3%	1	0%	899	20%	1655	20%	10	1%
Other type			1	0%	2	0%			1	0%	2	0%	2	0%	3	0%	1	0%
Not reported	1137	18%	33	2%	1	0%			1137	19%	33	4%	603	14%	603	7%	570	36%
Total	6167	100%	1549	100%	713	100%	2720	100%	5831	100%	846	100%	4411	100%	8431	100%	1569	100%

APPENDIX C.3

Table AB: Total annual fleet miles.
Base: All respondents.

	Total annual fleet miles						Geographic scope						Firm operates in CVISN states		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international				5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	35		41		53		32		63		56		128		78		80	
Weighted number of observations	6167.2		1548.8		712.9		2719.8		5830.8		846.5		4410.7		8431.1		1568.9	
10k or fewer	1583	26%					1417	52%	166	3%			284	6%	1583	19%		
Over 10k to 50k	2038	33%					166	6%	1872	32%			254	6%	1383	16%	655	42%
Over 50k to 100k	1867	30%					166	6%	1701	29%			1300	29%	1299	15%	568	36%
Over 100k to 200k	679	11%					578	21%	69	1%	33	4%	46	1%	647	8%	33	2%
Over 200k to 500k			1211	78%			3	0%	1204	21%	4	0%	612	14%	1207	14%	4	0%
Over 500k to 1 mn.			179	12%			65	2%	45	1%	69	8%	178	4%	69	1%	110	7%
Over 1 mn. to 5 mn.			158	10%	669	94%	7	0%	681	12%	140	17%	224	5%	679	8%	148	9%
Over 5 mn. to 20 mn.					28	4%	1	0%	11	0%	16	2%	28	1%	7	0%	21	1%
Over 20 mn.					16	2%			4	0%	12	1%	16	0%	3	0%	13	1%
Not reported							316	12%	79	1%	573	68%	1470	33%	1554	18%	18	1%
Total	6167	100%	1549	100%	713	100%	2720	100%	5831	100%	846	100%	4411	100%	8431	100%	1569	100%
Mean (in thousands)	59		615		6528		85		701		6346		953		579		1285	
Median (in thousands)	50		500		4536		6		90		2162		90		80		94	
Std. Error of the Mean (in thousands)	9		96		3032		66		383		4845		1071		315		1784	

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Table AC: Number of powered units operated.
Base: All respondents.

	Total annual fleet miles						Geographic scope						Firm operates		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international		in CVISN states		5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	35		41		53		32		63		56		128		78		80	
Weighted number of observations	6167.2		1548.8		712.9		2719.8		5830.8		846.5		4410.7		8431.1		1568.9	
One or fewer	1633	26%			1	0%	416	15%	1299	22%	568	67%	1551	35%	2283	27%	1	0%
2 to 5	3683	60%	1139	74%			1498	55%	3490	60%	3	0%	1588	36%	3851	46%	1139	73%
6 to 10	201	3%	33	2%			83	3%	153	3%	3	0%	123	3%	151	2%	88	6%
11 to 15	5	0%	76	5%			5	0%	14	0%	65	8%	84	2%	46	1%	38	2%
16 to 20	38	1%	33	2%			38	1%	3	0%	33	4%	106	2%	38	0%	68	4%
21 to 25	3	0%	136	9%			71	3%	68	1%	68	8%	141	3%	133	2%	73	5%
26 to 50			77	5%	665	93%	35	1%	673	12%	67	8%	143	3%	667	8%	108	7%
51 to 100			13	1%	5	1%	3	0%	43	1%	5	1%	17	0%	39	0%	12	1%
101 to 200	1	0%	3	0%	19	3%	3	0%	8	0%	14	2%	23	1%	10	0%	15	1%
201 to 500			5	0%	16	2%			8	0%	16	2%	23	1%	8	0%	16	1%
Over 500	1	0%	1	0%	6	1%	1	0%	4	0%	5	1%	9	0%	2	0%	9	1%
Not reported	602	10%	33	2%			567	21%	68	1%			602	14%	1202	14%	2	0%
Total	6167	100%	1549	100%	713	100%	2720	100%	5831	100%	846	100%	4411	100%	8431	100%	1569	100%
Mean	3.0		12.0		63.1		5.4		9.0		31.3		13.0		7.5		23.5	
Median	2.0		4.0		35.0		3.0		3.0		1.0		3.0		3.0		2.0	
Std. Error of the Mean	7.1		13.0		46.5		11.7		6.3		41.9		14.1		4.8		27.8	

APPENDIX C.3

Table AD: Total drivers employed directly or indirectly.
Base: All respondents.

	Total annual fleet miles						Geographic scope						Firm operates in CVISN states		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international				5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	35		41		53		32		63		56		128		78		80	
Weighted number of observations	6167.2		1548.8		712.9		2719.8		5830.8		846.5		4410.7		8431.1		1568.9	
One or fewer	3497	57%	3	0%			981	36%	2601	45%	567	67%	2767	63%	4064	48%	652	42%
2 to 5	2421	39%	5	0%			1252	46%	1175	20%	5	1%	131	3%	1857	22%	575	37%
6 to 10	88	1%	667	43%			118	4%	608	10%	65	8%	791	18%	818	10%	5	0%
11 to 15	38	1%	79	5%			43	2%	46	1%	35	4%	92	2%	49	1%	76	5%
16 to 25	35	1%	133	9%	33	5%	68	2%	100	2%	98	12%	168	4%	136	2%	130	8%
26 to 50	3	0%	43	3%	633	89%	3	0%	640	11%	36	4%	112	3%	605	7%	74	5%
51 to 100			41	3%	6	1%	4	0%	70	1%	4	0%	45	1%	68	1%	11	1%
101 to 200	1	0%	4	0%	22	3%	1	0%	13	0%	13	2%	25	1%	10	0%	18	1%
201 to 1,000	1	0%	4	0%	14	2%	1	0%	5	0%	17	2%	23	1%	7	0%	16	1%
Over 1,000			1	0%	6	1%			2	0%	5	1%	6	0%	2	0%	6	0%
Not reported	83	1%	568	37%			249	9%	570	10%	1	0%	250	6%	817	10%	5	0%
Total	6167	100%	1549	100%	713	100%	2720	100%	5831	100%	846	100%	4411	100%	8431	100%	1569	100%
Mean	2.2		18.7		70.1		2.9		9.7		35.6		12.0		6.7		24.3	
Median	1.0		6.0		35.0		2.0		2.0		1.0		1.0		1.0		5.0	
Std. Error of the Mean	0.8		18.5		59.3		1.5		6.9		53.7		16.4		5.1		34.2	

APPENDIX C.3

Table AE: Geographic range of operations.
Base: All respondents.

	Total annual fleet miles						Geographic scope						Firm operates in CVISN states		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international				5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	35		41		53		32		63		56		128		78		80	
Weighted number of observations	6167.2		1548.8		712.9		2719.8		5830.8		846.5		4410.7		8431.1		1568.9	
Local only (<75 miles)	1557	25%	69	4%	1	0%	1829	67%					579	13%	1758	21%	70	4%
Within state only	770	12%	5	0%			891	33%					292	7%	888	11%	3	0%
Own state and nearby states	3807	62%	1328	86%	617	87%			5831	100%			2096	48%	4538	54%	1293	82%
National	33	1%	139	9%	87	12%					832	98%	830	19%	640	8%	192	12%
International			7	0%	8	1%					15	2%	15	0%	6	0%	9	1%
Not reported													600	14%	601	7%	2	0%
Total	6167	100%	1549	100%	713	100%	2720	100%	5831	100%	846	100%	4411	100%	8431	100%	1569	100%

APPENDIX C.3

Table AF: CVISN States with 2,500+ fleet miles / year.
Base: All respondents.

	Total annual fleet miles						Geographic scope						Firm operates in CVISN states		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international				5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	35		41		53		32		63		56		128		78		80	
Weighted number of observations	6167.2		1548.8		712.9		2719.8		5830.8		846.5		4410.7		8431.1		1568.9	
California	632	10%	145	9%	98	14%	34	1%	713	12%	734	87%	1481	34%	1313	16%	167	11%
Colorado	33	1%	103	7%	93	13%	1	0%	68	1%	162	19%	232	5%	108	1%	124	8%
Connecticut	168	3%	36	2%	63	9%	115	4%	92	2%	63	7%	271	6%	176	2%	95	6%
Kentucky	201	3%	609	39%	69	10%	334	12%	649	11%	102	12%	1085	25%	982	12%	102	7%
Maryland	115	2%	54	3%	67	9%	121	4%	60	1%	102	12%	282	6%	137	2%	145	9%
Michigan			70	5%	102	14%			110	2%	101	12%	212	5%	78	1%	134	9%
Minnesota	1	0%	133	9%	99	14%	1	0%	72	1%	162	19%	802	18%	678	8%	124	8%
Oregon	182	3%	118	8%	62	9%	266	10%	156	3%	29	3%	451	10%	379	4%	72	5%
Virginia	732	12%	23	2%	102	14%	88	3%	678	12%	105	12%	871	20%	755	9%	116	7%
Washington	3	0%	150	10%	58	8%	3	0%	152	3%	63	7%	250	6%	180	2%	70	4%
None of the above	4768	77%	637	41%	567	80%	1849	68%	4219	72%	1	0%	567	13%	4934	59%	1136	72%
Not reported	83	1%							83	1%					0	0%	85	5%

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Table AG: Percent of vehicle units leased.
Base: All respondents.

	Total annual fleet miles						Geographic scope						Firm operates in CVISN states		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international				5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	35		41		53		32		63		56		128		78		80	
Weighted number of observations	6167.2		1548.8		712.9		2719.8		5830.8		846.5		4410.7		8431.1		1568.9	
Zero																		
Over zero to 25%			46	3%	15	2%	3	0%	14	0%	50	6%	62	1%	45	1%	21	1%
Over 25% to 50%	650	11%	3	0%	607	85%	83	3%	1137	19%	42	5%	695	16%	1218	14%	44	3%
Over 50% to 75%			35	2%	3	0%	35	1%	34	1%	3	0%	7	0%	69	1%	3	0%
Over 75% to less than 100%			1	0%	4	1%			1	0%	4	0%	5	0%	3	0%	2	0%
100%	567	9%	602	39%	36	5%	568	21%	635	11%	35	4%	102	2%	1201	14%	37	2%
Not reported	4951	80%	861	56%	47	7%	2031	75%	4010	69%	714	84%	3539	80%	5895	70%	1462	93%
Total	6167	100%	1549	100%	713	100%	2720	100%	5831	100%	846	100%	4411	100%	8431	100%	1569	100%
Mean	73.3		92.5		32.5		91.9		60.5		48.4		53.1		68.6		56.3	
Median	50.0		100.0		27.8		100.0		50.0		41.7		50.0		66.7		41.7	
Std. Error of the Mean	17.6		5.5		2.9		8.1		6.4		5.7		2.6		6.0		5.6	

APPENDIX C.3

Table AH: Percent of drivers not employed directly.
Base: All respondents.

	Total annual fleet miles						Geographic scope						Firm operates		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international		in CVISN states		5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	35		41		53		32		63		56		128		78		80	
Weighted number of observations	6167.2		1548.8		712.9		2719.8		5830.8		846.5		4410.7		8431.1		1568.9	
Zero	1792	29%	140	9%	38	5%	244	9%	1747	30%	69	8%	957	22%	1379	16%	713	45%
Over zero to 25%	1	0%	11	1%	13	2%	3	0%	8	0%	16	2%	26	1%	11	0%	16	1%
Over 25% to 50%			3	0%	573	80%			570	10%	9	1%	11	0%	572	7%	6	0%
Over 50% to 75%					3	0%					3	0%	3	0%			3	0%
Over 75% to less than 100%			35	2%	3	0%			33	1%	5	1%	5	0%	35	0%	3	0%
100%	33	1%			6	1%			3	0%	35	4%	38	1%	2	0%	37	2%
Not reported	4342	70%	1360	88%	77	11%	2473	91%	3471	60%	709	84%	3370	76%	6432	76%	790	50%
Total	6167	100%	1549	100%	713	100%	2720	100%	5831	100%	846	100%	4411	100%	8431	100%	1569	100%
Mean	1.8		17.3		40.3		0.1		11.6		34.6		5.0		13.9		5.9	
Median	0.0		0.0		42.9		0.0		0.0		0.0		0.0		0.0		0.0	
Std. Error of the Mean	4.7		8.0		2.0		0.4		4.2		6.9		2.4		3.9		3.3	

APPENDIX C.3

Table AI: Vehicle leasing arrangements.
Base: All respondents.

	Total annual fleet miles						Geographic scope						Firm operates		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international		in CVISN states		5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	35		41		53		32		63		56		128		78		80	
Weighted number of observations	6167.2		1548.8		712.9		2719.8		5830.8		846.5		4410.7		8431.1		1568.9	
Firm has no leased vehicles					1	0%					1	0%	1	0%			1	0%
Lessor provides drivers																		
for all leased vehicles			33	2%	6	1%			1	0%	38	4%	39	1%	33	0%	5	0%
for some leased vehicles			33	2%	3	0%					35	4%	35	1%	33	0%	3	0%
Lessor provides fleet management																		
for all leased vehicles			34	2%	7	1%			4	0%	37	4%	39	1%	34	0%	7	0%
for some leased vehicles					1	0%					1	0%	1	0%			1	0%
Lessor provides vehicle maintenance																		
for all leased vehicles			68	4%	9	1%			71	1%	40	5%	76	2%	100	1%	10	1%
for some leased vehicles			0	0%	4	1%			2	0%	4	0%	6	0%	0	0%	6	0%
Lessor provides operating credentials																		
for all leased vehicles			69	4%	37	5%			70	1%	70	8%	106	2%	102	1%	38	2%
for some leased vehicles			2	0%	3	0%	1	0%	3	0%	2	0%	6	0%	2	0%	5	0%
Lessor provides fuel tax reporting																		
for all leased vehicles			67	4%	38	5%			68	1%	71	8%	104	2%	99	1%	39	2%
for some leased vehicles			1	0%	3	0%	1	0%	1	0%	1	0%	4	0%	1	0%	3	0%
Lessor provides none of these services	1217	20%	583	38%	618	87%	688	25%	1745	30%	22	3%	719	16%	2398	28%	57	4%
Not reported	4951	80%	861	56%	46	6%	2031	75%	4010	69%	713	84%	3539	80%	5895	70%	1461	93%

APPENDIX C.3

Table AJ: Payment method used most for employed drivers.
Base: All respondents employing drivers directly.

	Total annual fleet miles						Geographic scope						Firm operates		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international		in CVISN states		5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	30		38		48		26		57		50		114		65		69	
Weighted number of observations	5401.5		977.9		707.3		1821.1		5255.8		810.3		3552.6		6395.4		1524.4	
By the hour	3279	61%	194	20%	11	2%	1481	81%	2102	40%	9	1%	1076	30%	2955	46%	670	44%
By the mile	3	0%	139	14%	83	12%			105	2%	156	19%	261	7%	142	2%	119	8%
By the trip	650	12%	570	58%	7	1%			1222	23%	7	1%	580	16%	572	9%	657	43%
By shipment value	650	12%	38	4%	605	86%	84	5%	1175	22%	37	5%	129	4%	1252	20%	44	3%
Other methods	168	3%	5	1%			88	5%	84	2%	1	0%	171	5%	172	3%	1	0%
Not reported	652	12%	33	3%	1	0%	168	9%	568	11%	600	74%	1336	38%	1302	20%	34	2%
Total	5401	100%	978	100%	707	100%	1821	100%	5256	100%	810	100%	3553	100%	6395	100%	1524	100%

APPENDIX C.3

Table AK: All payment methods used for employed drivers.
Base: All respondents employing drivers directly.

	Total annual fleet miles						Geographic scope						Firm operates		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international		in CVISN states		5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	30		38		48		26		57		50		114		65		69	
Weighted number of observations	5401.5		977.9		707.3		1821.1		5255.8		810.3		3552.6		6395.4		1524.4	
By the hour	3279	59%	229	21%	620	47%	1481	81%	2742	45%	50	6%	1189	31%	3561	49%	744	46%
By the mile	85	2%	210	19%	88	7%	3	0%	262	4%	162	19%	425	11%	297	4%	130	8%
By the trip	685	12%	579	53%	12	1%	3	0%	1266	21%	11	1%	597	15%	618	9%	662	41%
By shipment value	650	12%	43	4%	606	46%	84	5%	1180	19%	38	4%	135	4%	1255	17%	47	3%
Other methods	168	3%	7	1%	1	0%	91	5%	84	1%	3	0%	176	5%	172	2%	6	0%
Not reported	652	12%	33	3%	1	0%	168	9%	568	9%	600	69%	1336	35%	1302	18%	34	2%
Total mentions	5520	100%	1101	100%	1328	100%	1829	100%	6103	100%	863	100%	3858	100%	7205	100%	1623	100%

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Table AL: Payment method used most for drivers not employed directly.
Base: All respondents employing contract drivers.

	Total annual fleet miles						Geographic scope						Firm operates in CVISN states		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international				5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	2		9		34		1		13		34		45		17		32	
Weighted number of observations	33.9		48.4		597.6		2.7		612.6		68.9		83.4		619.5		65.4	
By the hour			3	6%	3	0%			4	1%	3	4%	7	8%	4	1%	3	4%
By the mile					13	2%			3	0%	10	15%	13	16%	5	1%	8	13%
By the trip	1	4%	41	84%	8	1%	3	100%	37	6%	13	19%	19	23%	41	7%	12	19%
By shipment value	33	96%	4	8%	572	96%			568	93%	41	59%	42	50%	570	92%	40	61%
Other methods			1	3%	1	0%					3	4%	3	3%	1	0%	2	3%
Not reported																		
Total	34	100%	48	100%	598	100%	3	100%	613	100%	69	100%	83	100%	620	100%	65	100%

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Table AM: All payment methods used for drivers not employed directly.
Base: All respondents employing contract drivers.

	Total annual fleet miles						Geographic scope						Firm operates in CVISN states		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international				5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	2		9		34		1		13		34		45		17		32	
Weighted number of observations	33.9		48.4		597.6		2.7		612.6		68.9		83.4		619.5		65.4	
By the hour			4	8%	6	1%			9	1%	5	7%	14	13%	7	1%	7	9%
By the mile			1	3%	19	3%			8	1%	15	19%	23	22%	10	2%	14	17%
By the trip	1	4%	41	79%	12	2%	3	100%	40	6%	14	18%	23	22%	41	7%	16	20%
By shipment value	33	96%	4	8%	572	94%			568	91%	41	51%	42	40%	570	91%	40	50%
Other methods			1	3%	2	0%					3	4%	3	3%	1	0%	3	3%
Not reported																		
Total mentions	34	100%	51	100%	612	100%	3	100%	625	100%	79	100%	106	100%	628	100%	80	100%

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Table AN: Percent of loads requiring OS/OW permit.
Base: All respondents.

	Total annual fleet miles						Geographic scope						Firm operates in CVISN states		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international				5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	35		41		53		32		63		56		128		78		80	
Weighted number of observations	6167.2		1548.8		712.9		2719.8		5830.8		846.5		4410.7		8431.1		1568.9	
Zero	5931	96%	1381	89%	694	97%	2283	84%	5611	96%	191	23%	2632	60%	6667	79%	1452	93%
Over zero to 25%	68	1%	92	6%	15	2%	106	4%	91	2%	47	6%	144	3%	144	2%	100	6%
Over 25% to 50%			3	0%					3	0%			3	0%	3	0%		
Over 50% to 75%																		
Over 75% to less than 100%			68	4%			0	0%	35	1%	35	4%	71	2%	65	1%	6	0%
100%	83	1%	4	0%	3	0%	83	3%	3	0%	4	0%	89	2%	84	1%	5	0%
Not reported	85	1%	1	0%	1	0%	248	9%	88	2%	569	67%	1472	33%	1468	17%	7	0%
Total	6167	100%	1549	100%	713	100%	2720	100%	5831	100%	846	100%	4411	100%	8431	100%	1569	100%
Mean	1%		4%		0%		4%		1%		14%		5%		2%		1%	
Median	0%		0%		0%		0%		0%		0%		0%		0%		0%	
Std. Error of the Mean	2%		3%		1%		3%		1%		4%		2%		2%		1%	

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Table AO: Percent of loads requiring HAZMAT placards.
Base: All respondents.

	Total annual fleet miles						Geographic scope						Firm operates		Different permits types used			
	200k or less		Over 200k up to 3000k		Over 3000k		Within state		Regional		National, international		in CVISN states		5 or fewer		Over 5	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	35		41		53		32		63		56		128		78		80	
Weighted number of observations	6167.2		1548.8		712.9		2719.8		5830.8		846.5		4410.7		8431.1		1568.9	
Zero	6079	99%	859	55%	94	13%	2399	88%	4590	79%	190	22%	2196	50%	5779	69%	1435	91%
Over zero to 25%			83	5%	48	7%	67	2%	15	0%	51	6%	130	3%	13	0%	120	8%
Over 25% to 50%			3	0%			3	0%					3	0%			3	0%
Over 50% to 75%					1	0%			1	0%			1	0%			1	0%
Over 75% to less than 100%			4	0%					3	0%	1	0%	4	0%	3	0%	1	0%
100%	3	0%	600	39%	569	80%	3	0%	1134	19%	35	4%	605	14%	1169	14%	3	0%
Not reported	85	1%	1	0%	1	0%	248	9%	88	2%	569	67%	1472	33%	1468	17%	7	0%
Total	6167	100%	1549	100%	713	100%	2720	100%	5831	100%	846	100%	4411	100%	8431	100%	1569	100%
Mean	0%		40%		81%		0%		20%		15%		21%		17%		1%	
Median	0%		0%		100%		0%		0%		0%		0%		0%		0%	
Std. Error of the Mean	0%		8%		6%		1%		5%		5%		4%		5%		1%	

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Table A. Credentials Obtained in the Last Twelve Months

Base: All respondents.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	72		69		42		47		45		37		58	
Weighted number of observations	2816.5		6537.0		2251.0		1211.9		3232.1		1516.4		1545.8	
IRP/IFTA initial application	941	33%	2744	42%	1350	60%	635	52%	1415	44%	1341	88%	775	50%
Outside firm obtained all	154	5%	152	2%			3	0%	85	3%	2	0%	34	2%
Outside firm obtained most	1	0%			1	0%							1	0%
Outside firm obtained some	117	4%	34	1%	83	4%			115	4%	1	0%		
IRP/IFTA supplemental application	1358	48%	851	13%	178	8%	1203	99%	1330	41%	693	46%	139	9%
Outside firm obtained all	71	3%	69	1%			3	0%	3	0%	2	0%	34	2%
Outside firm obtained most	1	0%			1	0%							1	0%
Outside firm obtained some	684	24%	34	1%	83	4%	567	47%	682	21%	1	0%	0	0%
IRP/IFTA annual renewals	2091	74%	3560	54%	960	43%	1207	100%	1792	55%	1348	89%	786	51%
Outside firm obtained all	723	26%	719	11%	1	0%	3	0%	87	3%	2	0%	34	2%
Outside firm obtained most														
Outside firm obtained some	651	23%	1	0%	83	4%	567	47%	650	20%	1	0%		
Intrastate registrations	758	27%	1404	21%	2041	91%	597	49%	2040	63%	618	41%	746	48%
Outside firm obtained all	36	1%	35	1%			1	0%	3	0%	1	0%	33	2%
Outside firm obtained most	3	0%	1	0%			2	0%			1	0%	2	0%
Outside firm obtained some														
SSRS registrations	1398	50%	2080	32%	817	36%	1201	99%	1400	43%	689	45%	1406	91%
Outside firm obtained all	37	1%	36	1%			1	0%	3	0%	1	0%	34	2%
Outside firm obtained most	1	0%					1	0%			1	0%		
Outside firm obtained some	3	0%			3	0%							3	0%
IRP/IFTA single trip permits	217	8%	814	12%	136	6%	22	2%	202	6%	612	40%	94	6%
Outside firm obtained all	80	3%	69	1%	9	0%	3	0%	8	0%	3	0%	37	2%
Outside firm obtained most	5	0%			3	0%	2	0%			2	0%	3	0%
Outside firm obtained some	41	1%	36	1%	1	0%	4	0%	36	1%	1	0%	4	0%
OS/OW permits	188	7%	189	3%	171	8%	28	2%	170	5%	23	2%	159	10%
Outside firm obtained all	50	2%	35	1%	9	0%	7	1%	9	0%	4	0%	37	2%
Outside firm obtained most	3	0%			1	0%	2	0%					3	0%
Outside firm obtained some	42	1%	36	1%	1	0%	5	0%	4	0%	3	0%	35	2%
HAZMAT permits	18	1%	40	1%	15	1%	14	1%	1	0%	43	3%	22	1%
Outside firm obtained all	3	0%			2	0%	1	0%			1	0%	2	0%
Outside firm obtained most														
Outside firm obtained some	2	0%			1	0%	1	0%			1	0%	1	0%
IFTA quarterly tax	957	34%	1924	29%	1560	69%	1206	99%	2425	75%	697	46%	932	60%
Outside firm obtained all	162	6%	152	2%	2	0%	7	1%	88	3%	4	0%	37	2%
Outside firm obtained most	33	1%	33	0%					33	1%				
Outside firm obtained some	2	0%	1	0%			1	0%			1	0%	1	0%
Weight/distance tax reports	797	28%	1076	16%	671	30%	1202	99%	1392	43%	176	12%	743	48%
Outside firm obtained all	157	6%	152	2%	1	0%	5	0%	87	3%	1	0%	37	2%
Outside firm obtained most	1	0%					1	0%			1	0%		
Outside firm obtained some	2	0%	1	0%			1	0%			1	0%	1	0%
Outside firm used, details unknown	1266	45%	1256	19%	5	0%	4	0%	4	0%	652	43%	40	3%
No permits obtained	689	24%	2075	32%	1	0%	2	0%	88	3%	83	6%	38	2%

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Table B: Payments to outside firms.
Base: All respondents.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	72		69		42		47		45		37		58	
Weighted number of observations	2816.5		6537.0		2251.0		1211.9		3232.1		1516.4		1545.8	
Up to $500	732	26%	716	11%	11	0%	5	0%	37	1%	651	43%	44	3%
$501 to $1,000	33	1%	33	0%			1	0%	33	1%			1	0%
$1,001 to $5,000	640	23%	68	1%	4	0%	568	47%	572	18%	2	0%	66	4%
Over $5,000	7	0%			3	0%	4	0%	1	0%	3	0%	3	0%
Paid outside firm, but amount not known	1404	50%	1294	20%	93	4%	17	1%	177	5%	12	1%	14	1%
No payments made			4426	68%	2141	95%	616	51%	2413	75%	849	56%	1418	92%
Total	2816	100%	6537	100%	2251	100%	1212	100%	3232	100%	1516	100%	1546	100%
Mean	1160.9		596.6		2242.9		1924.9		1728.4		245.9		3220.6	
Std. Error of the Mean	1231.9		415.7		1597.2		3069.6		3619.1		340.0		981.6	

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Table C: Other services bundled with credentialing.
Base: All respondents reporting payments to outside firms.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	30		10		8		12		8		6		16	
Weighted number of observations	1412.1		816.4		17.3		578.5		642.2		655.6		114.3	
Payroll administration	2	0%					2	0%	1	0%			1	1%
Income tax preparation	121	9%	115	14%	3	16%	3	0%	33	5%	85	13%	2	2%
Other accounting/auditing	152	11%	148	18%	3	16%	1	0%	33	5%	85	13%	34	30%
Personnel services	3	0%			3	16%	1	0%			3	0%	1	1%
Legal services	604	43%	600	73%	3	16%	1	0%	33	5%	570	87%	1	1%
Other	36	3%	33	4%			3	1%	1	0%			35	30%
No other services	657	46%	69	8%	15	84%	573	99%	608	95%	3	0%	46	40%

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Table D: Resources used for credentialing.
Base: All respondents.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	72		69		42		47		45		37		58	
Weighted number of observations	2816.5		6537.0		2251.0		1211.9		3232.1		1516.4		1545.8	
In-house resources only			1140	17%	2141	95%	616	51%	2330	72%	167	11%	765	50%
Outside firm only	835	30%	835	13%					119	4%	650	43%	33	2%
Both in-house & outside firm	1982	70%	1276	20%	110	5%	596	49%	700	22%	18	1%	95	6%
None reported			3286	50%					83	3%	682	45%	652	42%
Total	2816	100%	6537	100%	2251	100%	1212	100%	3232	100%	1516	100%	1546	100%

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Table E: Methods used to file paperwork.
Base: All respondents using in house resources.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	63		47		42		47		40		32		53	
Weighted number of observations	1981.6		2415.8		2251.0		1211.9		3030.0		184.5		860.1	
Walk-in applications	687	35%	880	36%	1430	64%	20	2%	1053	35%	17	9%	693	81%
Mail-in applications	769	39%	389	16%	2218	99%	1202	99%	2928	97%	98	53%	751	87%
Faxed applications	755	38%	185	8%	762	34%	629	52%	1383	46%	94	51%	99	11%
Internet, email, Website	6	0%	4	0%	575	26%	6	0%	570	19%	5	3%	10	1%
Telephone	729	37%	140	6%	157	7%	576	48%	754	25%	8	4%	111	13%
Other	6	0%	1	0%	3	0%	3	0%	4	0%			2	0%
None of these			33	1%					33	1%				
Not reported	606	31%	1293	54%			4	0%	4	0%	84	46%	4	0%

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Table F: In-house managerial staff time.
Base: All respondents using in house resources.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	63		47		42		47		40		32		53	
Weighted number of observations	1981.6		2415.8		2251.0		1211.9		3030.0		184.5		860.1	
Up to 5 FTE days	122	6%	516	21%	251	11%	13	1%	507	17%	51	27%	190	22%
Over 5 up to 10 FTE days	568	29%			603	27%	569	47%	1136	38%	1	0%	35	4%
Over 10 up to 20 FTE days	9	0%			649	29%	0	0%	607	20%	3	1%	39	5%
Over 20 up to 50 FTE days	95	5%			747	33%	41	3%	169	6%	39	21%	576	67%
Over 50 up to 100 FTE days	5	0%					9	1%	2	0%	4	2%	3	0%
Over 100 up to 250 FTE days	4	0%					5	0%	2	0%	3	2%		
Over 250 FTE days	5	0%					575	47%	569	19%			6	1%
Not reported	1173	59%	1899	79%					37	1%	84	46%	10	1%
Total	1982	100%	2416	100%	2251	100%	1212	100%	3030	100%	184	100%	860	100%
Mean	16.5		1.1		17.2		132.8		64.2		30.8		29.1	
Std. Error of the Mean	10.4		0.3		1.9		22.1		20.0		7.3		9.0	

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Table G: In-house clerical staff time.
Base: All respondents using in house resources.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	63		47		42		47		40		32		53	
Weighted number of observations	1981.6		2415.8		2251.0		1211.9		3030.0		184.5		860.1	
Up to 5 FTE days	206	10%	516	21%	1511	67%	578	48%	1732	57%	47	25%	794	92%
Over 5 up to 10 FTE days	3	0%			574	25%	3	0%	568	19%			7	1%
Over 10 up to 20 FTE days	7	0%			161	7%			119	4%	7	4%	35	4%
Over 20 up to 50 FTE days	5	0%			5	0%	35	3%	2	0%	33	18%	5	1%
Over 50 up to 100 FTE days	574	29%					576	48%	568	19%	3	1%	6	1%
Over 100 up to 250 FTE days	8	0%					11	1%	4	0%	6	3%	1	0%
Over 250 FTE days	6	0%					9	1%	1	0%	5	3%	3	0%
Not reported	1173	59%	1899	79%					37	1%	84	46%	10	1%
Total	1982	100%	2416	100%	2251	100%	1212	100%	3030	100%	184	100%	860	100%
Mean	60.4		1.4		6.6		64.8		28.8		68.2		35.1	
Std. Error of the Mean	5.9		0.4		0.8		7.5		7.3		21.4		17.9	

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Table H: In-house total staff time.
Base: All respondents using in house resources.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	63		47		42		47		40		32		53	
Weighted number of observations	1981.6		2415.8		2251.0		1211.9		3030.0		184.5		860.1	
Up to 5 FTE days	103	5%	516	21%					305	10%	39	21%	140	16%
Over 5 up to 10 FTE days	1	0%			120	5%			83	3%			37	4%
Over 10 up to 20 FTE days	10	1%			1372	61%			1288	43%	9	5%	74	9%
Over 20 up to 50 FTE days	99	5%			759	34%			175	6%	3	2%	581	68%
Over 50 up to 100 FTE days	572	29%					612	51%	570	19%	33	18%	8	1%
Over 100 up to 250 FTE days	11	1%					15	1%	2	0%	10	5%	3	0%
Over 250 FTE days	13	1%					585	48%	571	19%	6	3%	8	1%
Not reported	1173	59%	1899	79%					37	1%	84	46%	10	1%
Total	1982	100%	2416	100%	2251	100%	1212	100%	3030	100%	184	100%	860	100%
Mean	97.1		1.6		18.4		186.3		83.6		97.4		29.6	
Std. Error of the Mean	115.1		0.3		1.4		95.5		76.0		38.4		10.0	

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Table I: Satisfaction score with credentialing (scale: -5 to +5).
Base: All respondents.

	Outside firm used for credentialing	Total staff credentialing time (FTE days)			Mean credentialing satisfaction score		
		5 or fewer	Over 5 up to 50	Over 50	0 (neutral) or lower	Over 0 less than +2.5	+2.5 or higher
	No %	No %	No %	No %	No %	No %	No %
Unweighted number of observations	72	69	42	47	45	37	58
Weighted number of observations	2816.5	6537.0	2251.0	1211.9	3232.1	1516.4	1545.8
IRP/IFTA initial application							
Mean	0.2	1.7	1.3	-0.8	-1.2	2.0	4.9
Std. Error of the Mean	0.2	0.4	0.6	0.2	0.2	0.3	0.0
IRP/IFTA supplemental application							
Mean	-0.6	1.9	3.8	-1.8	-1.8	2.0	4.9
Std. Error of the Mean	0.3	0.4	0.5	0.2	0.2	0.3	0.0
IRP/IFTA annual renewals							
Mean	0.2	1.5	1.2	-3.1	-2.3	1.7	4.9
Std. Error of the Mean	0.3	0.3	0.5	0.3	0.3	0.2	0.0
Intrastate registrations							
Mean	-0.4	0.7	1.7	-4.7	-1.2	0.3	5.0
Std. Error of the Mean	0.2	0.4	0.4	0.3	0.4	0.3	0.1
SSRS registrations							
Mean	0.2	1.8	4.3	-1.3	-1.4	0.6	4.9
Std. Error of the Mean	0.3	0.5	0.4	0.5	0.6	0.5	0.1
IRP/IFTA single trip permits							
Mean	-0.8	-1.0	2.0	1.4	-0.3	-1.8	4.8
Std. Error of the Mean	0.4	0.4	0.7	0.6	0.2	0.2	0.2
OS/OW permits							
Mean	1.3	1.0	1.1	-4.7	-3.3	1.1	3.7
Std. Error of the Mean	0.2	0.3	0.5	0.3	0.5	0.2	0.4
HAZMAT permits							
Mean	-3.1	1.6	3.0	-3.8	-3.3	1.1	4.8
Std. Error of the Mean	0.4	0.6	0.8	0.2	0.5	0.5	0.2
IFTA quarterly tax							
Mean	1.3	3.0	-0.5	-0.3	-0.9	3.7	1.8
Std. Error of the Mean	0.3	0.4	0.3	0.1	0.2	0.3	0.3
Weight/distance tax reports							
Mean	1.3	1.4	0.5	-2.2	-2.0	2.0	1.3
Std. Error of the Mean	0.3	0.4	0.3	0.4	0.5	0.3	0.3

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Table J: Electronic credentialing awareness & use.
Base: All respondents.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	72		69		42		47		45		37		58	
Weighted number of observations	2816.5		6537.0		2251.0		1211.9		3232.1		1516.4		1545.8	
Hasn't heard of EC	1438	51%	4224	65%	2113	94%	1184	98%	2786	86%	1382	91%	1452	94%
Not sure whether heard of EC	40	1%	155	2%	90	4%	4	0%	155	5%	89	6%	5	0%
Already using EC	36	1%	34	1%	1	0%	3	0%			2	0%	36	2%
Able to use, but hasn't yet			1	0%									1	0%
Some of our states plan to introduce	1	0%					6	1%	2	0%			1	0%
Definite plans to use when available	7	0%	3	0%	3	0%	7	1%	6	0%	1	0%	7	0%
Heard of it, but don't know availability	91	3%	235	4%	41	2%	6	1%	201	6%	37	2%	44	3%
Not reported	1204	43%	1885	29%	3	0%	3	0%	83	3%	5	0%	1	0%

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Table K: Opinions about electronic credentialing (scale: -5 to +5).
Base: All respondents.

	Outside firm used for credentialing	Total staff credentialing time (FTE days)			Mean credentialing satisfaction score		
		5 or fewer	Over 5 up to 50	Over 50	0 (neutral) or lower	Over 0 less than +2.5	+2.5 or higher
	No %	No %	No %	No %	No %	No %	No %
Unweighted number of observations	72	69	42	47	45	37	58
Weighted number of observations	2816.5	6537.0	2251.0	1211.9	3232.1	1516.4	1545.8
"With electronic credentialing, I'd expect the turnaround time to be much quicker."							
Mean	1.2	1.3	0.4	3.9	2.7	3.4	-2.4
Std. Error of the Mean	0.3	0.5	0.4	0.2	0.3	0.2	0.4
"Electronic credentialing is likely to cost my company more than we'd save."							
Mean	0.3	1.5	1.2	-2.8	-1.0	0.1	2.9
Std. Error of the Mean	0.2	0.4	0.3	0.3	0.4	0.1	0.4
"I expect we'd make significant time and cost savings from using electronic credentialing."							
Mean	0.4	-1.0	-0.6	3.4	1.6	1.3	-2.9
Std. Error of the Mean	0.3	0.4	0.3	0.2	0.3	0.2	0.4
"We're too small to justify thinking about electronic credentialing."							
Mean	2.1	3.2	0.2	-4.7	-3.0	2.2	4.2
Std. Error of the Mean	0.5	0.4	0.6	0.2	0.4	0.4	0.3
"The only major beneficiaries of electronic credentialing will be the state agencies."							
Mean	-1.2	0.8	0.0	-4.7	-2.9	-1.5	4.0
Std. Error of the Mean	0.3	0.4	0.6	0.2	0.4	0.2	0.3
"Electronic credentialing would result in more accurate and fairer calculation of fees."							
Mean	1.4	-0.8	-1.3	4.3	0.8	1.1	-1.9
Std. Error of the Mean	0.2	0.4	0.4	0.2	0.5	0.2	0.4
"Electronic credentialing would help me run a safer trucking operation."							
Mean	1.2	-0.7	-2.3	2.3	-0.3	1.4	-3.3
Std. Error of the Mean	0.2	0.4	0.3	0.4	0.5	0.3	0.3
"Training our existing staff to do electronic credentialing will be very difficult."							
Mean	-0.7	1.0	-0.5	-4.4	-2.7	-1.0	3.2
Std. Error of the Mean	0.3	0.4	0.5	0.1	0.4	0.4	0.3
"I'm concerned that electronic credentialing will help the states to expand regulations and charges in new ways."							
Mean	2.5	1.6	1.8	1.9	1.0	3.7	0.2
Std. Error of the Mean	0.2	0.4	0.4	0.3	0.3	0.3	0.6
"Electronic credentialing would allow us to reorganize how we run the business, and help put more trucks on the road for more hours."							
Mean	-1.1	-0.7	-1.7	0.0	-1.3	0.0	1.5
Std. Error of the Mean	0.2	0.4	0.4	0.1	0.3	0.1	0.4
"If we let our computers talk directly to the state's computer, I'd be worried about privacy."							
Mean	-0.1	0.0	-1.8	-1.9	-1.9	-1.2	0.4
Std. Error of the Mean	0.4	0.3	0.4	0.3	0.4	0.3	0.3
"Electronic credentialing would require us to use state-mandated standards, formats, or eqipment."							
Mean	1.3	2.3	2.5	-2.3	-0.1	1.3	4.2
Std. Error of the Mean	0.3	0.3	0.4	0.2	0.4	0.3	0.3

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Table L: Likelihood of using electronic credentialing.
Base: All respondents.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	72		69		42		47		45		37		58	
Weighted number of observations	2816.5		6537.0		2251.0		1211.9		3232.1		1516.4		1545.8	
Company already uses	36	1%	34	1%	1	0%	3	0%			2	0%	36	2%
10 (very likely to use)	8	0%	604	9%	575	26%	574	47%	1140	35%	603	40%	6	0%
9	570	20%	33	0%	6	0%	568	47%	570	18%	4	0%	33	2%
8	6	0%	7	0%	7	0%	6	0%	5	0%	11	1%	4	0%
7	11	0%	33	1%	73	3%	4	0%	69	2%	1	0%	41	3%
6	37	1%	102	2%	3	0%	1	0%	68	2%	3	0%	3	0%
5 (neutral, can't say)	706	25%	1527	23%	332	15%	45	4%	438	14%	236	16%	93	6%
4	567	20%	650	10%							567	37%	83	5%
3	83	3%			83	4%			83	3%				
2	4	0%	92	1%	567	25%	1	0%	88	3%	1	0%	571	37%
1	1	0%	35	1%			2	0%			5	0%		
0 (very unlikely to use)	118	4%	2105	32%	603	27%	4	0%	737	23%	83	5%	675	44%
Not reported	669	24%	1317	20%	1	0%	3	0%	35	1%			1	0%
Total	2816	100%	6537	100%	2251	100%	1212	100%	3232	100%	1516	100%	1546	100%
Mean	5.6		3.5		4.2		9.3		6.3		6.4		1.9	
Std. Error of the Mean	0.3		0.4		0.6		0.2		0.6		0.5		0.3	

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Table M1: Reasons for likelihood scores >=6.
Base: All respondents not using EC who claim a positive likelihood of doing so.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	28		16		18		25		20		19		18	
Weighted number of observations	631.7		778.1		663.7		1153.7		1851.3		622.0		86.9	
Saves time, faster	579	92%	41	5%	79	12%	577	50%	646	35%	8	1%	40	46%
Saves money, more efficient	3	0%	34	4%	574	86%	5	0%	608	33%	3	0%	2	2%
Reduces paperwork	2	0%					3	0%			2	0%	1	1%
Better tracking			567	73%			568	49%	568	31%	567	91%		
We have computerized systems	3	0%	35	5%	5	1%			3	0%	35	6%	3	3%
Available at any time			33	4%	3	0%					3	0%	33	38%
Other reasons	41	7%	67	9%	6	1%	2	0%	33	2%	3	0%	8	9%

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Table M2: Reasons for likelihood scores < 6.
Base: All respondents not using EC who claim a negative likelihood of doing so.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	44		53		24		22		25		18		40	
Weighted number of observations	2184.8		5758.9		1587.4		58.2		1380.8		894.4		1458.9	
Will take more time	2	0%			1	0%	2	3%	0	0%	1	0%	1	0%
Unsure about cost	2	0%	35	1%	34	2%	2	3%	3	0%	33	4%	36	2%
Firm too small			316	5%	3	0%	5	9%	85	6%	115	13%	88	6%
Happy with current credentialing arrangements	3	0%	41	1%	0	0%	1	1%	35	3%	1	0%	6	0%
Limited or no computer equipment, expertise	84	4%	735	13%	567	36%	1	2%	650	47%	85	10%	568	39%
Possible staff resistance	35	2%	33	1%	2	0%	1	1%					35	2%
Fear of tracking problems					567	36%							567	39%
Needs to know more about it	1	0%	3	0%	87	5%	1	1%	84	6%			6	0%
Other reasons	86	4%	286	5%	85	5%	3	5%	250	18%	86	10%	38	3%

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Table N1: Roadside check incidence.
Base: All respondents.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	72		69		42		47		45		37		58	
Weighted number of observations	2816.5		6537.0		2251.0		1211.9		3232.1		1516.4		1545.8	
We keep data & summarize them	652	23%	672	10%	607	27%	17	1%	642	20%	574	38%	79	5%
Firms estimating safety inspections	650	23%	672	10%	606	27%	16	1%	642	20%	573	38%	77	5%
based on data	642	23%	637	10%	601	27%	13	1%	639	20%	572	38%	39	3%
based on guess	8	0%	34	1%	5	0%	3	0%	3	0%	1	0%	38	2%
Firms estimating size/weight checks	608	22%	636	10%	605	27%	9	1%	605	19%	569	38%	75	5%
based on data	2	0%	1	0%	600	27%	5	0%	602	19%	1	0%	2	0%
based on guess	606	22%	635	10%	5	0%	1	0%	3	0%	568	37%	71	5%
Firms estimating safety inspection time	649	23%	671	10%	607	27%	15	1%	642	20%	572	38%	77	5%
based on data	68	2%	66	1%	600	27%	3	0%	635	20%			33	2%
based on guess	581	21%	605	9%	7	0%	12	1%	7	0%	572	38%	44	3%
Firms estimating size/weight check time	610	22%	636	10%	606	27%	10	1%	606	19%	569	38%	77	5%
based on data	3	0%	1	0%	600	27%	3	0%	602	19%			1	0%
based on guess	608	22%	636	10%	6	0%	5	0%	4	0%	569	38%	73	5%
We keep data, don't summarize them	797	28%	1204	18%	1318	59%	584	48%	1580	49%	188	12%	736	48%
Firms estimating safety inspections	794	28%	1116	17%	1283	57%	582	48%	1498	46%	187	12%	694	45%
based on data	178	6%	924	14%	700	31%	5	0%	320	10%	90	6%	651	42%
based on guess	617	22%	189	3%	583	26%	577	48%	1175	36%	96	6%	43	3%
Firms estimating size/weight checks	790	28%	1110	17%	713	32%	580	48%	1495	46%	185	12%	120	8%
based on data	3	0%	689	11%	125	6%			203	6%	3	0%	40	3%
based on guess	705	25%	305	5%	588	26%	577	48%	1209	37%	182	12%	47	3%
Firms estimating safety inspection time	707	25%	1028	16%	1282	57%	580	48%	1494	46%	104	7%	689	45%
based on data	6	0%	669	10%	689	31%	2	0%	151	5%	1	0%	642	42%
based on guess	701	25%	359	5%	592	26%	578	48%	1343	42%	103	7%	48	3%
Firms estimating size/weight check time	783	28%	1108	17%	704	31%	577	48%	1488	46%	185	12%	113	7%
based on data			68	1%	33	1%			33	1%	3	0%	65	4%
based on guess	701	25%	958	15%	671	30%	574	47%	1373	42%	182	12%	48	3%
We do samples occasionally	115	4%	35	1%	116	5%	2	0%	118	4%	1	0%	34	2%
Firms estimating safety inspections	115	4%	35	1%	116	5%	1	0%	118	4%	1	0%	33	2%
based on data	33	1%	33	0%			1	0%	33	1%	1	0%		
based on guess	83	3%	3	0%	116	5%			85	3%	1	0%	33	2%
Firms estimating size/weight checks	115	4%	35	1%	116	5%	1	0%	118	4%	1	0%	33	2%
based on data														
based on guess	115	4%	35	1%	116	5%	1	0%	118	4%	1	0%	33	2%
Firms estimating safety inspection time	33	1%	35	1%	33	1%	1	0%	35	1%	1	0%	33	2%
based on data														
based on guess	33	1%	35	1%	33	1%	1	0%	35	1%	1	0%	33	2%
Firms estimating size/weight check time	33	1%	35	1%	33	1%	1	0%	35	1%	1	0%	33	2%
based on data														
based on guess	33	1%	35	1%	33	1%	1	0%	35	1%	1	0%	33	2%
We don't collect data	1180	42%	4557	70%	209	9%	570	47%	891	28%	716	47%	693	45%
Not reported	72	3%	68	1%	1	0%	38	3%	1	0%	37	2%	5	0%

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Table N2: Roadside check means.
Base: All respondents.

	Outside firm used for credentialing	Total staff credentialing time (FTE days)			Mean credentialing satisfaction score		
		5 or fewer	Over 5 up to 50	Over 50	0 (neutral) or lower	Over 0 less than +2.5	+2.5 or higher
	No %	No %	No %	No %	No %	No %	No %
Unweighted number of observations	72	69	42	47	45	37	58
Weighted number of observations	2816.5	6537.0	2251.0	1211.9	3232.1	1516.4	1545.8
We keep data & summarize them							
Firms estimating safety inspections	25	15	3	479	5	17	67
based on data	23	14	2	590	5	17	122
based on guess	172	39	24	65	12	300	12
Firms estimating size/weight checks	73	72	2	54	2	20	456
based on data	57	250	2	61	2	64	189
based on guess	73	71	25	200	40	20	482
Firms estimating safety inspection time	38	37	44	27	42	40	22
based on data	23	23	44	30	43		30
based on guess	40	38	29	26	20	40	15
Firms estimating size/weight check time	10	10	39	19	39	10	14
based on data	25	8	39	25	39		8
based on guess	10	10	12	27	14	10	15
We keep data, don't summarize them							
Firms estimating safety inspections	77	11	6	101	41	8	22
based on data	10	2	6	223	2	8	8
based on guess	97	56	5	100	52	8	225
Firms estimating size/weight checks	254	308	74	252	105	50	3132
based on data	34	4	6		7	300	15
based on guess	284	1111	88	254	128	47	7934
Firms estimating safety inspection time	53	65	29	59	40	41	34
based on data	28	81	37	36	50	20	34
based on guess	54	34	20	59	39	41	37
Firms estimating size/weight check time	12	14	22	15	18	17	19
based on data		19	30		20	1	25
based on guess	14	15	21	15	19	17	11
We do samples occasionally							
Firms estimating safety inspections	43	94	28	296	42	152	50
based on data	102	102		296	102	296	
based on guess	20	2	28		19	7	50
Firms estimating size/weight checks	43	94	392	12	42	7	1345
based on data							
based on guess	43	94	392	12	42	7	1345
Firms estimating safety inspection time	20	21	59	30	21	30	60
based on data							
based on guess	20	21	59	30	21	30	60
Firms estimating size/weight check time	20	19	30	15	19	23	30
based on data							
based on guess	20	19	30	15	19	23	30
We don't collect data							
Not reported							
All firms							
Firms estimating safety inspections	53	14	6	111	31	15	27
Firms estimating size/weight checks	165	219	69	249	73	28	1990
Firms estimating safety inspection time	45	53	35	58	40	40	34
Firms estimating size/weight check time	12	13	30	15	24	12	19

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Table O: Annual safety inspection times.
Base: All respondents with inspedction data.

	Outside firm used for credentialing		Total staff credentialing time (FTE days): 5 or fewer		Over 5 up to 50		Over 50		Mean credentialing satisfaction score: 0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	62		47		33		42		32		31		50	
Weighted number of observations	1636.4		1979.8		2042.5		641.7		2340.9		799.9		852.9	
Up to 1 vehicle-hour / year	288	18%	326	16%	1221	60%	37	6%	890	38%	119	15%	574	67%
Over 1 up to 2 vh / year	3	0%	750	38%	688	34%	3	0%	715	31%	86	11%	41	5%
Over 2 up to 10 vh / year	603	37%	640	32%	10	0%	3	1%	7	0%	571	71%	73	9%
Over 10 up to 40 vh / year	73	4%	68	3%	43	2%	5	1%	35	2%	9	1%	72	8%
Over 40 up to 100 vh / year	577	35%	33	2%	41	2%	573	89%	605	26%	4	0%	38	4%
Over 100 vh / year	15	1%	5	0%	3	0%	12	2%	6	0%	5	1%	7	1%
Not reported	76	5%	156	8%	37	2%	9	1%	83	4%	6	1%	47	6%
Total	1636	100%	1980	100%	2042	100%	642	100%	2341	100%	800	100%	853	100%
Mean	48.7		8.9		3.3		95.7		29.0		8.5		14.1	
Median	7.0		2.0		1.0		100.0		2.0		7.0		1.0	
Std. Error of the Mean	8.4		18.1		2.0		7.9		8.6		6.7		26.3	

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Table P: Annual size/weight inspection times.
Base: All respondents with inspedction data.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	62		47		33		42		32		31		50	
Weighted number of observations	1636.4		1979.8		2042.5		641.7		2340.9		799.9		852.9	
Up to 1 vehicle-hour / year	223	14%	931	47%	1919	94%	51	8%	1549	66%	124	16%	623	73%
Over 1 up to 2 vh / year	33	2%	33	2%	3	0%	1	0%	1	0%			35	4%
Over 2 up to 10 vh / year	656	40%	724	37%	42	2%	2	0%	39	2%	661	83%	68	8%
Over 10 up to 40 vh / year	38	2%	102	5%	5	0%	3	1%	98	4%	5	1%	6	1%
Over 40 up to 100 vh / year	570	35%			1	0%	571	89%	567	24%	2	0%	3	0%
Over 100 vh / year	41	2%	34	2%	36	2%	5	1%	3	0%	1	0%	70	8%
Not reported	76	5%	156	8%	37	2%	9	1%	83	4%	6	1%	47	6%
Total	1636	100%	1980	100%	2042	100%	642	100%	2341	100%	800	100%	853	100%
Mean	38.3		84.5		22.2		59.8		19.9		3.7		779.3	
Median	4.0		2.0		1.0		63.0		1.0		3.0		8.0	
Std. Error of the Mean	23.6		574.5		35.9		5.1		10.1		3.6		1695.4	

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Table Q: Annual inspection times for all checks.
Base: All respondents with inspedction data.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	62		47		33		42		32		31		50	
Weighted number of observations	1636.4		1979.8		2042.5		641.7		2340.9		799.9		852.9	
Up to 1 vehicle-hour / year	204	12%	208	11%	1217	60%	37	6%	854	37%	34	4%	573	67%
Over 1 up to 5 vh / year	86	5%	771	39%	691	34%	3	0%	688	29%	167	21%	11	1%
Over 5 up to 10 vh / year	602	37%	670	34%	8	0%	3	0%	3	0%	575	72%	100	12%
Over 10 up to 50 vh / year	8	0%	71	4%	43	2%	6	1%	69	3%	7	1%	44	5%
Over 40 up to 100 vh / year	41	2%	66	3%	6	0%	4	1%	68	3%	5	1%	3	0%
Over 100 up to 200 vh / year	576	35%	3	0%	4	0%	572	89%	572	24%	3	0%	3	0%
Over 200 vh / year	43	3%	35	2%	36	2%	8	1%	4	0%	3	0%	72	8%
Not reported	76	5%	156	8%	37	2%	9	1%	83	4%	6	1%	47	6%
Total	1636	100%	1980	100%	2042	100%	642	100%	2341	100%	800	100%	853	100%
Mean	82.9		91.2		18.5		154.7		48.2		11.3		229.1	
Median	10.0		4.0		1.0		163.0		3.0		10.0		1.0	
Std. Error of the Mean	21.9		519.4		26.5		10.5		15.6		7.4		783.1	

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Table R: Satisfaction score with inspections (scale: -5 to +5).
Base: All respondents.

	Outside firm used for credentialing	Total staff credentialing time (FTE days)			Mean credentialing satisfaction score		
		5 or fewer	Over 5 up to 50	Over 50	0 (neutral) or lower	Over 0 less than +2.5	+2.5 or higher
	No %	No %	No %	No %	No %	No %	No %
Unweighted number of observations	72	69	42	47	45	37	58
Weighted number of observations	2816.5	6537.0	2251.0	1211.9	3232.1	1516.4	1545.8
Frequency of inspections							
Mean	-0.77	-0.54	1.48	-2.52	-0.30	1.55	2.74
Std. Error of the Mean	0.48	0.50	0.27	0.24	0.39	0.42	0.22
Criteria for selection							
Mean	-1.56	-0.92	-0.75	-4.33	-2.73	0.49	2.32
Std. Error of the Mean	0.54	0.50	0.49	0.33	0.40	0.59	0.21
Types of checks							
Mean	1.02	0.24	2.33	2.83	2.14	2.48	2.54
Std. Error of the Mean	0.42	0.52	0.20	0.11	0.28	0.23	0.20
Fairness of the process							
Mean	-0.68	-0.32	0.20	-0.78	-0.98	1.62	2.33
Std. Error of the Mean	0.35	0.50	0.53	0.13	0.47	0.35	0.24
Time spent being inspected							
Mean	-1.21	-1.42	0.64	-4.32	-1.51	-0.15	2.30
Std. Error of the Mean	0.50	0.43	0.43	0.33	0.50	0.21	0.17
Time waiting for inspection							
Mean	-2.02	-2.56	0.05	-4.35	-2.01	-2.26	1.78
Std. Error of the Mean	0.41	0.37	0.54	0.32	0.55	0.29	0.26

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Table S: Most important inspection improvement.
Base: All mentions.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	34		34		22		24		24		18		33	
Weighted number of observations	1343.3		3533.4		1423.6		587.1		2181.5		218.0		844.3	
Happy with current system	87	6%	84	3%	117	8%	1	0%	117	6%	83	39%	3	0%
Need regular, terminal-based inspections	2	0%			3	0%	2	0%			5	2%		
Manage roadside to reduce evasion	2	0%	37	1%	651	46%	2	0%	684	33%	2	1%	5	1%
Better enforcement of regulations	33	2%	682	20%			3	0%	117	6%	1	1%	567	75%
Better targeting of vehicles	570	42%	633	19%	570	40%	570	97%	1135	54%	1	0%	38	5%
More concern with safety of inspection arrangements	2	0%	569	17%			1	0%					3	0%
Better information about vehicles	1	0%					1	0%			1	0%		
Better inspectors	601	45%	605	18%	1	0%	3	1%	7	0%	1	0%	35	5%
More consistency, uniformity	39	3%	665	20%	39	3%	1	0%	35	2%	35	16%	68	9%
Other changes	6	0%	86	3%	37	3%	2	0%	3	0%	87	40%	35	5%
Total mentions	1343	100%	3361	100%	1418	100%	586	100%	2097	100%	215	100%	753	100%

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Table T: All inspection improvement suggestions.
Base: All mentions.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	34		34		22		24		24		18		33	
Weighted number of observations	1343.3		3533.4		1423.6		587.1		2181.5		218.0		844.3	
Happy with current system	87	4%	84	2%	117	8%	1	0%	117	4%	83	28%	3	0%
Need regular, terminal-based inspections	3	0%			4	0%	2	0%			5	2%	1	0%
Manage roadside to reduce evasion	3	0%	38	1%	651	43%	2	0%	684	25%	2	1%	5	1%
Better enforcement of regulations	33	2%	682	19%			3	0%	117	4%	1	0%	567	68%
Better targeting of vehicles	603	29%	666	19%	570	38%	570	49%	1135	41%	1	0%	70	8%
More concern with safety of inspection arrangements	2	0%	569	16%			1	0%					3	0%
Better information about vehicles	1	0%					2	0%	0	0%	1	0%		
Better inspectors	604	29%	606	17%	3	0%	4	0%	7	0%	1	0%	38	5%
More consistency, uniformity	42	2%	665	19%	39	3%	7	1%	38	1%	36	12%	70	8%
Other changes	692	33%	203	6%	119	8%	572	49%	652	24%	170	57%	72	9%
Total mentions	2069	100%	3513	100%	1504	100%	1164	100%	2749	100%	301	100%	830	100%

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Table U: Electronic screening awareness & use.
Base: All respondents.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	72		69		42		47		45		37		58	
Weighted number of observations	2816.5		6537.0		2251.0		1211.9		3232.1		1516.4		1545.8	
Hasn't heard of ES	825	29%	4328	66%	1553	69%	585	48%	2010	62%	690	45%	1377	89%
Already using SC (annual fee)	4	0%	1	0%	42	2%					5	0%	38	2%
Already using SC (per site)	606	22%	602	9%	1	0%	6	0%			570	38%	37	2%
Not using, expect to use within 2 years	572	20%	40	1%	2	0%	571	47%	567	18%	38	3%	7	0%
Not using, don't expect to use within 2 years	738	26%	1378	21%	654	29%	12	1%	648	20%	177	12%	85	6%
Not reported	73	3%	188	3%			38	3%	7	0%	36	2%	3	0%

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Table V: Reasons for or against ES participation.
Base: All mentions.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	28		18		17		21		12		17		25	
Weighted number of observations	1340.8		1442.3		658.4		585.0		1179.3		750.2		156.6	
Hasn't reached critical mass yet	2	0%	5	0%			2	1%	1	0%	1	0%	6	4%
Time savings	1137	85%	569	39%	7	1%	574	99%	568	48%	576	77%	4	3%
Cost of participation	48	3%	36	2%	610	93%	5	1%	601	51%	5	0%	45	29%
Possible bad impacts on safety	37	3%	33	2%	37	5%			3	0%	2	0%	65	42%
Big Brother concerns	83	6%	650	45%	1	0%	1		1	0%	83	11%	1	1%
Needs more information to judge			33	2%	0	0%	1				1		0	0%
Not applicable to us	34	2%	117	8%	3	0%	3	0%	7	0%	83	11%	33	21%
Total mentions	1340	100%	1442	100%	657	100%	586	100%	1181	100%	750	100%	155	100%

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Table W1: Awareness of SAFER carrier information.
Base: All respondents.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	72		69		42		47		45		37		58	
Weighted number of observations	2816.5		6537.0		2251.0		1211.9		3232.1		1516.4		1545.8	
Respondent aware	1361	48%	2356	36%	170	8%	632	52%	839	26%	1389	92%	243	16%
Respondent not aware	730	26%	3540	54%	1994	89%	573	47%	2306	71%	118	8%	1296	84%
Not sure	3	0%	5	0%	3	0%			3	0%	3	0%	3	0%
Not reported	723	26%	636	10%	84	4%	7	1%	85	3%	6	0%	4	0%
Total	2816	100%	6537	100%	2251	100%	1212	100%	3232	100%	1516	100%	1546	100%

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Table W2: Awareness of SAFER vehicle information.
Base: All respondents.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	72		69		42		47		45		37		58	
Weighted number of observations	2816.5		6537.0		2251.0		1211.9		3232.1		1516.4		1545.8	
Respondent aware	716	25%	1538	24%	157	7%	53	4%	86	3%	813	54%	197	13%
Respondent not aware	807	29%	3624	55%	2006	89%	583	48%	2326	72%	694	46%	1338	87%
Not sure	3	0%	89	1%	4	0%	1	0%	85	3%	3	0%	6	0%
Not reported	1290	46%	1286	20%	84	4%	574	47%	734	23%	6	0%	4	0%
Total	2816	100%	6537	100%	2251	100%	1212	100%	3232	100%	1516	100%	1546	100%

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Table X: Opinions about electronic screening (scale: -5 to +5).
Base: All respondents.

	Outside firm used for credentialing	Total staff credentialing time (FTE days)			Mean credentialing satisfaction score		
		5 or fewer	Over 5 up to 50	Over 50	0 (neutral) or lower	Over 0 less than +2.5	+2.5 or higher
	No %	No %	No %	No %	No %	No %	No %
Unweighted number of observations	72	69	42	47	45	37	58
Weighted number of observations	2816.5	6537.0	2251.0	1211.9	3232.1	1516.4	1545.8
"Equipping all our units with transponders is likely to cost my company more than we'd save."							
Mean	2.01	3.28	2.74	0.13	1.35	3.09	3.10
Std. Error of the Mean	0.27	0.27	0.40	0.12	0.32	0.26	0.44
"If these new inspection methods were more widespread, I expect we'd make significant time and cost savings."							
Mean	1.90	0.00	-0.16	-0.03	-0.18	0.85	0.58
Std. Error of the Mean	0.26	0.28	0.16	0.79	0.48	0.22	0.28
"We're too small to justufy thinking about putting transponders in our units."							
Mean	1.21	3.38	2.58	0.05	1.21	3.61	3.97
Std. Error of the Mean	0.50	0.29	0.34	0.78	0.53	0.38	0.33
"Even if the time spent in safety and weight inspections were halved, there'd be very little impact on our costs."							
Mean	-1.95	0.73	1.27	-2.30	-0.79	-1.12	2.48
Std. Error of the Mean	0.31	0.39	0.34	0.42	0.39	0.45	0.36
"Even without equipping our vehicles, we'd probably benefit if the inspection officials had better information."							
Mean	2.46	1.91	1.68	2.55	2.66	2.12	-0.86
Std. Error of the Mean	0.27	0.36	0.50	0.40	0.35	0.22	0.44
"I expect that our drivers would be pleased by these types of changes."							
Mean	-0.06	-0.54	1.19	2.41	1.80	-1.04	-0.28
Std. Error of the Mean	0.39	0.34	0.38	0.40	0.38	0.29	0.31
"These type of changes will make the roadside inspection system significantly more fair."							
Mean	1.17	0.97	1.12	2.45	1.87	1.14	0.51
Std. Error of the Mean	0.37	0.39	0.43	0.40	0.42	0.38	0.28
"I'm concerned that changes like these will help the states to expand regulations and charges in new ways."							
Mean	2.71	2.61	0.85	3.85	1.79	2.67	1.78
Std. Error of the Mean	0.27	0.29	0.27	0.20	0.33	0.28	0.28
"I worry about government agencies having so much information about our vehicles."							
Mean	1.55	2.11	-0.31	3.72	0.64	3.87	1.51
Std. Error of the Mean	0.31	0.37	0.49	0.25	0.51	0.42	0.38

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Table Y: Impact of inspection on firm's spending.
Base: All respondents.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	72		69		42		47		45		37		58	
Weighted number of observations	2816.5		6537.0		2251.0		1211.9		3232.1		1516.4		1545.8	
Spending increased this year	608	22%	1204	18%	91	4%	4	0%	117	4%	574	38%	43	3%
No increase from last year	344	12%	3529	54%	2058	91%	59	5%	1624	50%	853	56%	1430	93%
Not sure	656	23%	485	7%	99	4%	1140	94%	1485	46%	83	6%	69	4%
Not reported	1208	43%	1319	20%	3	0%	9	1%	6	0%	6	0%	4	0%
Total	2816	100%	6537	100%	2251	100%	1212	100%	3232	100%	1516	100%	1546	100%

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Table AA: Type of carrier.
Base: All respondents.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	72		69		42		47		45		37		58	
Weighted number of observations	2816.5		6537.0		2251.0		1211.9		3232.1		1516.4		1545.8	
For-hire truckload carrier	239	8%	228	3%	164	7%	49	4%	209	6%	40	3%	157	10%
For-hire LTL carrier	7	0%	68	1%	3	0%	2	0%	35	1%	37	2%	1	0%
Private carrier	690	25%	2238	34%	613	27%	578	48%	1321	41%	696	46%	127	8%
General freight carrier	571	20%	635	10%	1	0%	2	0%	34	1%	569	38%	3	0%
Tank truck operator	568	20%			1	0%	567	47%	567	18%			1	0%
Refrigerated truck carrier	3	0%	3	0%	85	4%			85	3%			3	0%
Automobile transporter	3	0%			3	0%							3	0%
Bulk commodities carrier	41	1%	692	11%	652	29%	2	0%	771	24%	3	0%	5	0%
Household goods mover	4	0%	567	9%			8	1%	1	0%	5	0%	2	0%
Owner/operator	653	23%	1505	23%	159	7%	2	0%	203	6%	166	11%	643	42%
Other type	2	0%			3	0%			3	0%			1	0%
Not reported	35	1%	603	9%	567	25%	3	0%	3	0%	1	0%	601	39%
Total	2816	100%	6537	100%	2251	100%	1212	100%	3232	100%	1516	100%	1546	100%

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Table AB: Total annual fleet miles.
Base: All respondents.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	72		69		42		47		45		37		58	
Weighted number of observations	2816.5		6537.0		2251.0		1211.9		3232.1		1516.4		1545.8	
10k or fewer			848	13%	735	33%			898	28%			685	44%
Over 10k to 50k	83	3%	1300	20%	171	8%	567	47%	732	23%	166	11%	5	0%
Over 50k to 100k	166	6%	1299	20%	568	25%			83	3%	650	43%	567	37%
Over 100k to 200k	33	1%	110	2%	570	25%			644	20%			33	2%
Over 200k to 500k	603	21%	1172	18%	38	2%	2	0%	33	1%	1	0%	43	3%
Over 500k to 1 mn.	40	1%	139	2%	39	2%	1	0%	38	1%	40	3%	69	4%
Over 1 mn. to 5 mn.	679	24%	170	3%	47	2%	610	50%	608	19%	72	5%	112	7%
Over 5 mn. to 20 mn.	17	1%	4	0%	10	0%	14	1%	9	0%	7	0%	11	1%
Over 20 mn.	10	0%	5	0%	2	0%	9	1%	2	0%	4	0%	8	1%
Not reported	1185	42%	1490	23%	72	3%	9	1%	185	6%	577	38%	12	1%
Total	2816	100%	6537	100%	2251	100%	1212	100%	3232	100%	1516	100%	1546	100%
Mean (in thousands)	2719		333		235		3144		1063		1128		619	
Median (in thousands)	500		80		94		2162		40		90		94	
Std. Error of the Mean (in thousands)	1896		372		225		2675		592		3341		639	

APPENDIX C.3

Table AC: Number of powered units operated.
Base: All respondents.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	72		69		42		47		45		37		58	
Weighted number of observations	2816.5		6537.0		2251.0		1211.9		3232.1		1516.4		1545.8	
One or fewer	650	23%	2197	34%	86	4%			248	8%	1299	86%	86	6%
2 to 5	570	20%	2557	39%	1866	83%	567	47%	1952	60%	83	5%	605	39%
6 to 10	168	6%	115	2%	121	5%	3	0%	198	6%	3	0%	38	2%
11 to 15	38	1%	79	1%	5	0%			35	1%	6	0%	41	3%
16 to 20	33	1%	103	2%	3	0%			5	0%	35	2%	33	2%
21 to 25	103	4%	133	2%	41	2%	33	3%	68	2%	33	2%	8	1%
26 to 50	637	23%	134	2%	71	3%	571	47%	635	20%	37	2%	101	7%
51 to 100	9	0%	3	0%	42	2%	7	1%	37	1%	5	0%	9	1%
101 to 200	17	1%	6	0%	9	0%	10	1%	14	0%	3	0%	9	1%
201 to 500	16	1%	7	0%	5	0%	13	1%	3	0%	8	1%	11	1%
Over 500	6	0%	1	0%	3	0%	7	1%	2	0%	4	0%	4	0%
Not reported	569	20%	1202	18%			2	0%	35	1%	1	0%	601	39%
Total	2816	100%	6537	100%	2251	100%	1212	100%	3232	100%	1516	100%	1546	100%
Mean	22.5		5.0		9.5		35.5		12.7		13.5		18.3	
Median	3.0		3.0		2.0		22.0		3.0		1.0		2.0	
Std. Error of the Mean	23.1		2.9		14.3		39.4		9.0		40.2		12.8	

APPENDIX C.3

Table AD: Total drivers employed directly or indirectly.
Base: All respondents.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	72		69		42		47		45		37		58	
Weighted number of observations	2816.5		6537.0		2251.0		1211.9		3232.1		1516.4		1545.8	
One or fewer	1302	46%	3898	60%	251	11%	567	47%	983	30%	1299	86%	650	42%
2 to 5	3	0%	643	10%	1786	79%	3	0%	1255	39%			610	39%
6 to 10	148	5%	785	12%	38	2%			118	4%	3	0%	71	5%
11 to 15	14	0%	112	2%	13	1%			71	2%	41	3%	11	1%
16 to 25	163	6%	201	3%	33	1%	33	3%	100	3%	33	2%	68	4%
26 to 50	570	20%	69	1%	38	2%	572	47%	567	18%	35	2%	74	5%
51 to 100	5	0%	2	0%	72	3%	5	0%	37	1%	7	0%	35	2%
101 to 200	21	1%	6	0%	13	1%	9	1%	11	0%	3	0%	13	1%
201 to 1,000	13	0%	5	0%	5	0%	12	1%	5	0%	8	0%	9	1%
Over 1,000	5	0%			1	0%	6	1%	3	0%	1	0%	3	0%
Not reported	572	20%	817	12%	1	0%	4	0%	83	3%	86	6%	2	0%
Total	2816	100%	6537	100%	2251	100%	1212	100%	3232	100%	1516	100%	1546	100%
Mean	22.6		3.9		9.5		38.0		12.6		12.7		14.2	
Median	1.0		1.0		3.0		19.0		2.0		1.0		5.0	
Std. Error of the Mean	30.2		1.7		12.3		51.7		10.8		51.5		13.3	

APPENDIX C.3

Table AE: Geographic range of operations.
Base: All respondents.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	72		69		42		47		45		37		58	
Weighted number of observations	2816.5		6537.0		2251.0		1211.9		3232.1		1516.4		1545.8	
Local only (<75 miles)	87	3%	1139	17%	688	31%	2	0%	936	29%	116	8%	658	43%
Within state only	83	3%	316	5%	575	26%			602	19%	168	11%	38	2%
Own state and nearby states	1344	48%	3740	57%	945	42%	1146	95%	1617	50%	618	41%	726	47%
National	724	26%	734	11%	43	2%	55	5%	71	2%	610	40%	117	8%
International	9	0%	8	0%			7	1%	5	0%	2	0%	6	0%
Not reported	570	20%	600	9%			3	0%			2	0%	2	0%
Total	2816	100%	6537	100%	2251	100%	1212	100%	3232	100%	1516	100%	1546	100%

APPENDIX C.3

Table AF: CVISN States with 2,500+ fleet miles / year.
Base: All respondents.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	72		69		42		47		45		37		58	
Weighted number of observations	2816.5		6537.0		2251.0		1211.9		3232.1		1516.4		1545.8	
California	729	26%	1407	22%	49	2%	24	2%	77	2%	619	41%	151	10%
Colorado	152	5%	172	3%	40	2%	19	2%	37	1%	40	3%	119	8%
Connecticut	25	1%	121	2%	129	6%	21	2%	175	5%	43	3%	52	3%
Kentucky	128	5%	1012	15%	46	2%	27	2%	126	4%	99	7%	175	11%
Maryland	192	7%	201	3%	55	2%	26	2%	101	3%	14	1%	98	6%
Michigan	97	3%	110	2%	42	2%	59	5%	46	1%	80	5%	52	3%
Minnesota	689	24%	707	11%	40	2%	56	5%	41	1%	77	5%	83	5%
Oregon	112	4%	340	5%	93	4%	18	2%	17	1%	216	14%	130	8%
Virginia	163	6%	702	11%	139	6%	30	2%	214	7%	584	39%	68	4%
Washington	60	2%	146	2%	85	4%	19	2%	6	0%	52	3%	157	10%
None of the above	1203	43%	3082	47%	1851	82%	1137	94%	2633	81%	1	0%	1168	76%
Not reported	85	3%	0	0%	83	4%	2	0%	83	3%	2	0%	1	0%

APPENDIX C.3

Table AG: Percent of vehicle units leased.
Base: All respondents.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	72		69		42		47		45		37		58	
Weighted number of observations	2816.5		6537.0		2251.0		1211.9		3232.1		1516.4		1545.8	
Zero														
Over zero to 25%	53	2%	43	1%	10	0%	13	1%	5	0%	13	1%	46	3%
Over 25% to 50%	691	25%	689	11%	1	0%	572	47%	685	21%	5	0%	5	0%
Over 50% to 75%	35	1%	35	1%	34	2%	3	0%	34	1%	1	0%	37	2%
Over 75% to less than 100%	5	0%	1	0%	3	0%	1	0%	3	0%	1	0%	2	0%
100%	637	23%	667	10%	570	25%	2	0%	571	18%	33	2%	3	0%
Not reported	1397	50%	5102	78%	1633	73%	621	51%	1935	60%	1464	97%	1453	94%
Total	2816	100%	6537	100%	2251	100%	1212	100%	3232	100%	1516	100%	1546	100%
Mean	62.5		72.5		96.5		27.9		62.4		70.2		41.8	
Median	50.0		50.0		100.0		27.8		50.0		100.0		27.4	
Std. Error of the Mean	5.3		5.2		3.9		1.2		8.9		9.1		5.8	

APPENDIX C.3

Table AH: Percent of drivers not employed directly.
Base: All respondents.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	72		69		42		47		45		37		58	
Weighted number of observations	2816.5		6537.0		2251.0		1211.9		3232.1		1516.4		1545.8	
Zero	126	4%	1439	22%	49	2%	605	50%	693	21%	638	42%	47	3%
Over zero to 25%	16	1%	14	0%	4	0%	9	1%	7	0%	5	0%	14	1%
Over 25% to 50%	573	20%	2	0%	4	0%	572	47%	567	18%	6	0%	5	0%
Over 50% to 75%	3	0%	1	0%	1	0%	1	0%					3	0%
Over 75% to less than 100%	37	1%	33	0%	3	0%	3	0%	1	0%	3	0%	34	2%
100%	37	1%	34	1%	3	0%	2	0%	3	0%	1	0%	35	2%
Not reported	2023	72%	5015	77%	2188	97%	19	2%	1961	61%	864	57%	1408	91%
Total	2816	100%	6537	100%	2251	100%	1212	100%	3232	100%	1516	100%	1546	100%
Mean	40.1		4.2		11.4		21.1		19.5		0.9		49.9	
Median	42.9		0.0		0.0		0.0		0.0		0.0		84.0	
Std. Error of the Mean	3.6		3.5		6.6		4.1		5.3		1.8		7.7	

CRA

APPENDIX C.3

Table AI: Vehicle leasing arrangements.
Base: All respondents.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	72		69		42		47		45		37		58	
Weighted number of observations	2816.5		6537.0		2251.0		1211.9		3232.1		1516.4		1545.8	
Firm has no leased vehicles	1	0%			1	0%							1	0%
Lessor provides drivers														
for all leased vehicles	38	1%	34	1%	0	0%	4	0%			2	0%	36	2%
for some leased vehicles	34	1%	33	0%	1	0%	1	0%			1	0%	1	0%
Lessor provides fleet management														
for all leased vehicles	38	1%	35	1%			5	0%	1	0%	3	0%	4	0%
for some leased vehicles	1	0%					1	0%			1	0%		
Lessor provides vehicle maintenance														
for all leased vehicles	107	4%	100	2%	3	0%	8	1%	2	0%	3	0%	40	3%
for some leased vehicles	5	0%	2	0%	1	0%	3	0%			4	0%	2	0%
Lessor provides operating credentials														
for all leased vehicles	137	5%	132	2%	5	0%	2	0%	33	1%	1	0%	40	3%
for some leased vehicles	2	0%	3	0%			3	0%			3	0%	3	0%
Lessor provides fuel tax reporting														
for all leased vehicles	136	5%	133	2%	3	0%	3	0%	33	1%	1	0%	39	3%
for some leased vehicles			1	0%			3	0%			1	0%	3	0%
Lessor provides none of these services	1238	44%	1265	19%	611	27%	579	48%	1262	39%	44	3%	14	1%
Not reported	1396	50%	5102	78%	1633	73%	621	51%	1935	60%	1464	97%	1452	94%

APPENDIX C.3

Table AJ: Payment method used most for employed drivers.
Base: All respondents employing drivers directly.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	58		56		39		39		41		31		49	
Weighted number of observations	1637.1		4469.4		2244.9		1205.4		3061.2		1429.3		941.6	
By the hour	52	3%	1537	34%	1507	67%	580	48%	2164	71%	698	49%	126	13%
By the mile	116	7%	174	4%	75	3%	11	1%	41	1%	44	3%	109	12%
By the trip	93	6%	567	13%	656	29%	7	1%	83	3%	4	0%	576	61%
By shipment value	724	44%	724	16%			572	47%	687	22%	2	0%	40	4%
Other methods	1	0%	166	4%	7	0%	1	0%	84	3%			89	9%
Not reported	651	40%	1302	29%			34	3%	3	0%	682	48%	1	0%
Total	1637	100%	4469	100%	2245	100%	1205	100%	3061	100%	1429	100%	942	100%

APPENDIX C.3

Table AK: All payment methods used for employed drivers.
Base: All respondents employing drivers directly.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	58		56		39		39		41		31		49	
Weighted number of observations	1637.1		4469.4		2244.9		1205.4		3061.2		1429.3		941.6	
By the hour	663	29%	1635	35%	1515	64%	1155	65%	2766	73%	736	50%	134	13%
By the mile	128	6%	212	5%	199	8%	15	1%	128	3%	48	3%	184	18%
By the trip	98	4%	610	13%	662	28%	7	0%	122	3%	6	0%	585	56%
By shipment value	724	32%	729	16%			573	32%	687	18%	5	0%	43	4%
Other methods	6	0%	166	4%	9	0%	3	0%	84	2%	2	0%	92	9%
Not reported	651	29%	1302	28%			34	2%	3	0%	682	46%	1	0%
Total mentions	2270	100%	4654	100%	2386	100%	1787	100%	3789	100%	1479	100%	1039	100%

APPENDIX C.3

Table AL: Payment method used most for drivers not employed directly.
Base: All respondents employing contract drivers.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	33		17		10		22		8		13		25	
Weighted number of observations	666.9		83.3		14.1		587.5		578.1		14.3		90.4	
By the hour	3	0%	5	6%			1	0%	1	0%	2	14%	3	4%
By the mile	9	1%	4	5%	6	40%	4	1%	3	0%	5	33%	4	5%
By the trip	48	7%	37	44%	9	60%	7	1%	3	0%	4	30%	46	51%
By shipment value	606	91%	37	44%			573	98%	572	99%	1	9%	36	40%
Other methods	2	0%	1	1%			2	0%			2	14%	1	1%
Not reported														
Total	667	100%	83	100%	14	100%	587	100%	578	100%	14	100%	90	100%

APPENDIX C.3

Table AM: All payment methods used for drivers not employed directly.
Base: All respondents employing contract drivers.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	33		17		10		22		8		13		25	
Weighted number of observations	666.9		83.3		14.1		587.5		578.1		14.3		90.4	
By the hour	9	1%	6	7%	5	18%	3	0%	2	0%	5	21%	7	7%
By the mile	18	3%	5	6%	12	42%	7	1%	4	1%	8	37%	10	10%
By the trip	52	8%	38	44%	11	39%	9	1%	5	1%	5	23%	47	47%
By shipment value	606	88%	37	43%			573	96%	572	98%	1	6%	36	35%
Other methods	3	0%	1	1%			3	0%			3	12%	1	1%
Not reported														
Total mentions	688	100%	86	100%	29	100%	594	100%	583	100%	22	100%	102	100%

APPENDIX C.3

Table AN: Percent of loads requiring OS/OW permit.
Base: All respondents.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	72		69		42		47		45		37		58	
Weighted number of observations	2816.5		6537.0		2251.0		1211.9		3232.1		1516.4		1545.8	
Zero	1464	52%	4853	74%	2076	92%	1189	98%	2984	92%	844	56%	1350	87%
Over zero to 25%	90	3%	178	3%	54	2%	12	1%	73	2%	15	1%	123	8%
Over 25% to 50%					3	0%					3	0%		
Over 50% to 75%														
Over 75% to less than 100%	33	1%	35	1%	33	1%	3	0%	0	0%	3	0%	68	4%
100%	89	3%	83	1%	3	0%	4	0%	4	0%	83	5%	3	0%
Not reported	1141	40%	1388	21%	83	4%	4	0%	171	5%	569	38%	2	0%
Total	2816	100%	6537	100%	2251	100%	1212	100%	3232	100%	1516	100%	1546	100%
Mean	7%		2%		2%		1%		0%		9%		4%	
Median	0%		0%		0%		0%		0%		0%		0%	
Std. Error of the Mean	3%		2%		2%		1%		1%		5%		2%	

APPENDIX C.3

Table AO: Percent of loads requiring HAZMAT placards.
Base: All respondents.

	Outside firm used for credentialing		Total staff credentialing time (FTE days)						Mean credentialing satisfaction score					
			5 or fewer		Over 5 up to 50		Over 50		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	72		69		42		47		45		37		58	
Weighted number of observations	2816.5		6537.0		2251.0		1211.9		3232.1		1516.4		1545.8	
Zero	1024	36%	4440	68%	2153	96%	621	51%	2458	76%	900	59%	1485	96%
Over zero to 25%	49	2%	110	2%	5	0%	18	2%	37	1%	40	3%	20	1%
Over 25% to 50%					3	0%					3	0%		
Over 50% to 75%							1	0%					1	0%
Over 75% to less than 100%	1	0%			4	0%					3	0%	1	0%
100%	602	21%	600	9%	4	0%	568	47%	567	18%	1	0%	37	2%
Not reported	1141	40%	1388	21%	83	4%	4	0%	171	5%	569	38%	2	0%
Total	2816	100%	6537	100%	2251	100%	1212	100%	3232	100%	1516	100%	1546	100%
Mean	36%		12%		0%		47%		19%		1%		3%	
Median	0%		0%		0%		0%		0%		0%		0%	
Std. Error of the Mean	6%		4%		1%		8%		6%		1%		2%	

APPENDIX C.3
Table A: Credentials obtained in last twelve months.
Base: All respondents.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	27		17		114		41		55		68		50		18	
Weighted number of observations	93.8		334.3		9571.9		3753.3		819.2		4540.7		1692.9		1864.7	
IRP/IFTA initial application	87	93%	93	28%	4549	48%	2621	70%	102	12%	1439	32%	1446	85%	1205	65%
Outside firm obtained all	33	36%	83	25%	38	0%	83	2%	2	0%	86	2%	2	0%	33	2%
Outside firm obtained most					1	0%			1	0%	1	0%				
Outside firm obtained some	1	1%			115	1%	33	1%			83	2%	33	2%		
IRP/IFTA supplemental application	85	91%	11	3%	2136	22%	721	19%	670	82%	1416	31%	164	10%	42	2%
Outside firm obtained all	33	36%			38	0%			2	0%	3	0%	2	0%	33	2%
Outside firm obtained most					1	0%			1	0%	1	0%				
Outside firm obtained some	2	2%			682	7%			600	73%	683	15%				
IRP/IFTA annual renewals	88	94%	181	54%	5458	57%	2151	57%	714	87%	2367	52%	1425	84%	1260	68%
Outside firm obtained all	33	36%	83	25%	606	6%	83	2%	3	0%	87	2%	2	0%	600	32%
Outside firm obtained most																
Outside firm obtained some	1	1%			650	7%			567	69%	650	14%				
Intrastate registrations	55	58%	9	3%	3979	42%	2969	79%	91	11%	1473	32%	783	46%	1174	63%
Outside firm obtained all	33	36%			3	0%			1	0%	3	0%	1	0%	33	2%
Outside firm obtained most	1	1%			2	0%					1	0%				
Outside firm obtained some																
SSRS registrations	81	86%	76	23%	3940	41%	1990	53%	737	90%	1515	33%	801	47%	641	34%
Outside firm obtained all	33	36%			4	0%			1	0%	3	0%	1	0%	33	2%
Outside firm obtained most					1	0%							1	0%		
Outside firm obtained some	3	3%					3	0%					3	0%		
IRP/IFTA single trip permits	43	46%	73	22%	857	9%	182	5%	55	7%	274	6%	619	37%	39	2%
Outside firm obtained all	35	37%	3	1%	43	0%	3	0%	9	1%	9	0%	7	0%	33	2%
Outside firm obtained most	1	1%			5	0%	3	0%			1	0%			3	0%
Outside firm obtained some	1	2%			40	0%			34	4%	34	1%	2	0%		
OS/OW permits	50	53%	78	23%	259	3%	146	4%	98	12%	247	5%	57	3%	70	4%
Outside firm obtained all	35	37%	3	1%	13	0%			11	1%	11	0%	5	0%	33	2%
Outside firm obtained most	3	3%							2	0%	1	0%	1	0%	1	0%
Outside firm obtained some			2	1%	40	0%	34	1%	3	0%	0	0%	37	2%	1	0%
HAZMAT permits	8	9%	6	2%	55	1%	46	1%	13	2%	14	0%	48	3%	3	0%
Outside firm obtained all	1	1%			3	0%			2	0%			3	0%		
Outside firm obtained most																
Outside firm obtained some					2	0%			1	0%			2	0%		
IFTA quarterly tax	88	94%	215	64%	4387	46%	1567	42%	779	95%	1863	41%	972	57%	1212	65%
Outside firm obtained all	35	37%	84	25%	43	0%	84	2%	7	1%	90	2%	4	0%	34	2%
Outside firm obtained most					33	0%	33	1%					33	2%		
Outside firm obtained some	2	2%							1	0%			1	0%		
Weight/distance tax reports	90	96%	217	65%	2641	28%	867	23%	706	86%	1567	35%	161	9%	608	33%
Outside firm obtained all	35	37%	84	25%	39	0%	84	2%	4	1%	87	2%	3	0%	34	2%
Outside firm obtained most					1	0%			1	0%			1	0%		
Outside firm obtained some	2	2%							1	0%			1	0%		
Outside firm used, details unknown	2	2%			1264	13%	650	17%	43	5%	1224	27%	37	2%	3	0%
No permits obtained	1	1%	83	25%	1994	21%	166	4%	39	5%	1387	31%	33	2%	3	0%

APPENDIX C.3
Table B: Payments to outside firms.
Base: All respondents.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	27		17		114		41		55		68		50		18	
Weighted number of observations	93.8		334.3		9571.9		3753.3		819.2		4540.7		1692.9		1864.7	
Up to $500	2	2%	1	0%	729	8%	685	18%	42	5%	687	15%	39	2%	3	0%
$501 to $1,000	1	1%			33	0%	33	1%			1	0%	33	2%		
$1,001 to $5,000	35	37%	1	0%	605	6%			603	74%	572	13%	35	2%	33	2%
Over $5,000	2	2%			5	0%			4	1%	4	0%	1	0%		
Paid outside firm, but amount not known	7	8%	88	26%	1309	14%	90	2%	18	2%	748	16%	14	1%	572	31%
No payments made	47	50%	244	73%	6892	72%	2945	78%	152	19%	2529	56%	1572	93%	1257	67%
Total	94	100%	334	100%	9572	100%	3753	100%	819	100%	4541	100%	1693	100%	1865	100%
Mean	10465.3		1038.3		895.9		211.3		1950.7		831.7		3629.3		4623.1	
Std. Error of the Mean	13530.6		719.5		242.5		66.3		2653.1		262.4		7408.1		1312.9	

APPENDIX C.3
Table C: Other services bundled with credentialing.
Base: All respondents reporting payments to outside firms.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	9		2		19		5		14		12		11		2	
Weighted number of observations	39.1		2.0		1371.0		717.6		649.2		1263.6		107.1		35.3	
Payroll administration	1	2%			1	0%			1	0%	1	0%	1	1%		
Income tax preparation	1	2%			120	9%	115	16%	3	1%	87	7%	33	31%		
Other accounting/auditing	1	2%			151	11%	148	21%	3	0%	85	7%	65	61%		
Personnel services					3	0%			3	0%	3	0%				
Legal services	1	2%			603	44%	600	84%	3	1%	570	45%	33	31%		
Other	1	2%	1	64%	34	2%			35	5%	3	0%	33	31%		
No other services	37	95%	1	36%	619	45%	3	0%	611	94%	609	48%	8	7%	35	100%

APPENDIX C.3
Table D: Resources used for credentialing.
Base: All respondents.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	27		17		114		41		55		68		50		18	
Weighted number of observations	93.8		334.3		9571.9		3753.3		819.2		4540.7		1692.9		1864.7	
In-house resources only	47	50%	244	73%	3606	38%	2662	71%	152	19%	1230	27%	807	48%	1172	63%
Outside firm only			83	25%	752	8%	765	20%	34	4%	737	16%	65	4%		
Both in-house & outside firm	46	50%	8	2%	1928	20%	43	1%	633	77%	1274	28%	55	3%	607	33%
None reported					3286	34%	284	8%			1299	29%	765	45%	85	5%
Total	94	100%	334	100%	9572	100%	3753	100%	819	100%	4541	100%	1693	100%	1865	100%

APPENDIX C.3
Table E: Methods used to file paperwork.
Base: All respondents using in house resources.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	27		16		93		32		53		58		44		16	
Weighted number of observations	93.8		251.6		5533.4		2704.7		785.4		2504.2		862.6		1779.2	
Walk-in applications	17	18%	208	83%	2104	38%	1222	45%	160	20%	1011	40%	58	7%	1173	66%
Mail-in applications	60	64%	215	85%	3536	64%	1981	73%	715	91%	1832	73%	174	20%	1144	64%
Faxed applications	79	84%	17	7%	1480	27%	766	28%	643	82%	1437	57%	97	11%	35	2%
Internet, email, Website	12	13%	3	1%	571	10%	572	21%	11	1%	572	23%	12	1%	1	0%
Telephone	37	40%	73	29%	763	14%	100	4%	649	83%	794	32%	11	1%	66	4%
Other			4	2%	2	0%	3	0%	2	0%	5	0%	1	0%		
None of these					33	1%										
Not reported			4	2%	1293	23%	656	24%	2	0%	572	23%	686	79%	3	0%

APPENDIX C.3

Table F: In-house managerial staff time.

Base: All respondents using in house resources.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	27		16		93		32		53		58		44		16	
Weighted number of observations	93.8		251.6		5533.4		2704.7		785.4		2504.2		862.6		1779.2	
Up to 5 FTE days	77	82%	235	93%	469	8%	183	7%	151	19%	532	21%	87	10%	38	2%
Over 5 up to 10 FTE days					1172	21%	567	21%	601	76%	572	23%			600	34%
Over 10 up to 20 FTE days			3	1%	647	12%	575	21%	8	1%	608	24%	39	5%	3	0%
Over 20 up to 50 FTE days	5	6%	3	1%	779	14%	693	26%	8	1%	176	7%	45	5%	567	32%
Over 50 up to 100 FTE days	3	3%	1	1%	4	0%			6	1%	4	0%	4	0%		
Over 100 up to 250 FTE days	2	2%	1	1%	2	0%			3	0%	1	0%	3	0%	1	0%
Over 250 FTE days	5	6%	2	1%	568	10%	1	0%	4	1%	2	0%	3	0%	1	0%
Not reported	1	1%	7	3%	1892	34%	686	25%	5	1%	609	24%	683	79%	570	32%
Total	94	100%	252	100%	5533	100%	2705	100%	785	100%	2504	100%	863	100%	1779	100%
Mean	137.2		24.8		56.9		18.3		11.4		14.6		24.2		17.8	
Std. Error of the Mean	50.3		55.5		12.5		6.6		4.7		2.9		8.0		11.3	

APPENDIX C.3
Table G: In-house clerical staff time.
Base: All respondents using in house resources.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	27		16		93		32		53		58		44		16	
Weighted number of observations	93.8		251.6		5533.4		2704.7		785.4		2504.2		862.6		1779.2	
Up to 5 FTE days	76	81%	204	81%	2324	42%	1372	51%	156	20%	1157	46%	122	14%	637	36%
Over 5 up to 10 FTE days	1	1%	3	1%	574	10%	572	21%	1	0%	3	0%	5	1%	570	32%
Over 10 up to 20 FTE days	7	7%	33	13%	122	2%	38	1%	39	5%	155	6%	7	1%		
Over 20 up to 50 FTE days	1	1%			39	1%	33	1%	3	0%	3	0%	37	4%		
Over 50 up to 100 FTE days			3	1%	574	10%	3	0%	570	73%	571	23%	2	0%		
Over 100 up to 250 FTE days	2	2%	3	1%	6	0%	1	0%	7	1%	4	0%	4	0%	1	0%
Over 250 FTE days	6	6%			3	0%			5	1%	3	0%	3	0%	1	0%
Not reported	1	1%	7	3%	1892	34%	686	25%	5	1%	609	24%	683	79%	570	32%
Total	94	100%	252	100%	5533	100%	2705	100%	785	100%	2504	100%	863	100%	1779	100%
Mean	166.8		24.1		29.0		7.2		58.0		45.6		52.1		5.8	
Std. Error of the Mean	50.4		15.0		4.8		2.6		7.3		6.9		21.4		4.1	

APPENDIX C.3
Table H: In-house total staff time.
Base: All respondents using in house resources.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	27		16		93		32		53		58		44		16	
Weighted number of observations	93.8		251.6		5533.4		2704.7		785.4		2504.2		862.6		1779.2	
Up to 5 FTE days	67	71%	200	79%	250	5%	139	5%	104	13%	286	11%	73	8%	36	2%
Over 5 up to 10 FTE days	1	1%			119	2%	3	0%	34	4%	87	3%			33	2%
Over 10 up to 20 FTE days	7	7%	35	14%	1330	24%	1177	44%	44	6%	759	30%	46	5%	567	32%
Over 20 up to 50 FTE days	5	6%			754	14%	661	24%	10	1%	179	7%	11	1%	570	32%
Over 50 up to 100 FTE days	1	1%	7	3%	605	11%	38	1%	570	73%	574	23%	37	4%		
Over 100 up to 250 FTE days	3	3%			12	0%			10	1%	2	0%	9	1%	1	0%
Over 250 FTE days	10	10%	3	1%	572	10%	1	0%	9	1%	8	0%	4	0%	2	0%
Not reported	1	1%	7	3%	1892	34%	686	25%	5	1%	609	24%	683	79%	570	32%
Total	94	100%	252	100%	5533	100%	2705	100%	785	100%	2504	100%	863	100%	1779	100%
Mean	104.0		212.5		66.8		32.9		66.4		37.7		46.2		39.9	
Std. Error of the Mean	50.6		656.0		11.0		108.9		11.8		7.9		16.9		185.8	

APPENDIX C.3
Table I: Satisfaction score with credentialing (scale: -5 to +5).
Base: All respondents.

	Electronic credentialing status			Total vehicle-hours in checks		Mean inspection satisfaction score		
	Using, or likely to do so	Not using, unlikely to do so	Not aware, or unsure	less than 15	Over 15	0 (neutral) or lower	Over 0 less than +2.5	+2.5 or higher
	No %	No %	No %	No %	No %	No %	No %	No %
Unweighted number of observations	27	17	114	41	55	68	50	18
Weighted number of observations	93.8	334.3	9571.9	3753.3	819.2	4540.7	1692.9	1864.7
IRP/IFTA initial application								
Mean	4.3	0.9	0.8	0.9	0.5	0.2	3.0	1.6
Std. Error of the Mean	0.4	0.6	0.3	0.5	0.3	0.3	0.3	0.9
IRP/IFTA supplemental application								
Mean	4.1	0.9	1.0	2.1	-0.9	-0.5	3.7	4.4
Std. Error of the Mean	0.4	0.6	0.4	0.6	0.4	0.3	0.2	0.4
IRP/IFTA annual renewals								
Mean	2.4	0.9	0.1	1.6	-0.9	0.1	1.3	1.9
Std. Error of the Mean	0.5	0.6	0.4	0.6	0.4	0.3	0.3	0.9
Intrastate registrations								
Mean	3.8	1.3	0.4	1.2	2.7	-0.2	1.2	3.2
Std. Error of the Mean	0.5	0.9	0.4	0.6	0.5	0.2	0.3	0.6
SSRS registrations								
Mean	4.3	1.5	1.3	1.4	2.0	0.3	2.8	4.4
Std. Error of the Mean	0.5	0.8	0.4	0.7	0.3	0.4	0.3	0.5
IRP/IFTA single trip permits								
Mean	4.3	1.0	-1.2	-1.0	1.3	-0.9	-1.1	1.5
Std. Error of the Mean	0.6	0.8	0.3	0.6	0.5	0.4	0.5	0.9
OS/OW permits								
Mean	0.2	1.2	-1.0	1.0	2.5	1.1	0.9	1.0
Std. Error of the Mean	0.5	0.7	0.5	0.4	0.5	0.2	0.6	0.8
HAZMAT permits								
Mean	0.8	1.5	-2.4	2.1	-3.2	-2.8	3.9	0.3
Std. Error of the Mean	1.0	1.0	0.5	1.1	0.5	0.6	0.4	0.7
IFTA quarterly tax								
Mean	0.7	0.8	1.0	0.7	0.3	1.0	3.8	-0.3
Std. Error of the Mean	0.9	0.5	0.3	0.4	0.3	0.3	0.4	0.6
Weight/distance tax reports								
Mean	0.4	0.7	-0.2	1.3	0.3	1.2	0.6	0.3
Std. Error of the Mean	0.9	0.5	0.3	0.4	0.3	0.3	0.4	0.3

APPENDIX C.3

Table J: Electronic credentialing awareness & use.

Base: All respondents.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	27		17		114		41		55		68		50		18	
Weighted number of observations	93.8		334.3		9571.9		3753.3		819.2		4540.7		1692.9		1864.7	
Hasn't heard of EC					7522	79%	2934	78%	762	93%	3568	79%	981	58%	1262	68%
Not sure whether heard of EC					250	3%	84	2%	39	5%	122	3%	91	5%	1	0%
Already using EC	38	41%							5	1%	2	0%	3	0%	33	2%
Able to use, but hasn't yet			1	0%					1	0%	1	0%				
Some of our states plan to introduce	3	4%	3	1%			3	0%	2	0%			5	0%		
Definite plans to use when available	8	8%	6	2%			4	0%	3	0%	5	0%	6	0%	2	0%
Heard of it, but don't know availability	40	43%	242	72%			159	4%	5	1%	274	6%	5	0%	0	0%
Not reported	7	7%	83	25%	1801	19%	570	15%	4	0%	569	13%	604	36%	567	30%

APPENDIX C.3

Table K: Opinions about electronic credentialing (scale: -5 to +5).
Base: All respondents.

	Electronic credentialing status			Total vehicle-hours in checks		Mean inspection satisfaction score		
	Using, or likely to do so	Not using, unlikely to do so	Not aware, or unsure	less than 15	Over 15	0 (neutral) or lower	Over 0 less than +2.5	+2.5 or higher
	No %	No %	No %	No %	No %	No %	No %	No %
Unweighted number of observations	27	17	114	41	55	68	50	18
Weighted number of observations	93.8	334.3	9571.9	3753.3	819.2	4540.7	1692.9	1864.7
"With electronic credentialing, I'd expect the turnaround time to be much quicker."								
Mean	2.9	3.0	1.4	2.0	2.8	2.1	4.2	-1.4
Std. Error of the Mean	0.5	0.5	0.3	0.5	0.2	0.3	0.2	0.4
"Electronic credentialing is likely to cost my company more than we'd save."								
Mean	1.1	-2.7	0.9	1.4	-0.8	0.0	1.5	1.9
Std. Error of the Mean	0.7	0.5	0.3	0.4	0.2	0.2	0.4	0.4
"I expect we'd make significant time and cost savings from using electronic credentialing."								
Mean	2.4	0.8	-0.3	-0.5	1.1	0.9	-1.1	-1.7
Std. Error of the Mean	0.5	0.5	0.3	0.5	0.3	0.2	0.5	0.4
"We're too small to justify thinking about electronic credentialing."								
Mean	1.0	-2.6	1.3	1.6	-2.9	0.1	1.8	3.2
Std. Error of the Mean	0.7	0.6	0.4	0.7	0.5	0.6	0.5	0.6
"The only major beneficiaries of electronic credentialing will be the state agencies."								
Mean	1.2	-2.1	-0.2	0.6	-3.2	-1.9	0.6	1.6
Std. Error of the Mean	0.7	0.4	0.4	0.6	0.4	0.3	0.5	0.6
"Electronic credentialing would result in more accurate and fairer calculation of fees."								
Mean	0.2	0.3	-0.2	-1.2	2.4	0.3	-1.5	0.0
Std. Error of the Mean	0.2	0.2	0.3	0.5	0.4	0.4	0.4	0.1
"Electronic credentialing would help me run a safer trucking operation."								
Mean	-1.8	-0.1	-0.7	-1.6	-0.8	-0.7	-1.9	-0.1
Std. Error of the Mean	0.5	0.2	0.3	0.5	0.2	0.4	0.4	0.6
"Training our existing staff to do electronic credentialing will be very difficult."								
Mean	1.4	-1.4	-0.2	0.3	-2.5	-1.3	0.3	1.0
Std. Error of the Mean	0.6	0.5	0.3	0.6	0.4	0.3	0.6	0.4
"I'm concerned that electronic credentialing will help the states to expand regulations and charges in new ways."								
Mean	-0.2	-0.3	1.8	2.6	3.2	1.8	3.6	2.4
Std. Error of the Mean	0.2	0.2	0.3	0.4	0.2	0.3	0.3	0.5
"Electronic credentialing would allow us to reorganize how we run the business, and help put more trucks on the road for more hours."								
Mean	-0.4	-0.7	-0.9	-1.7	-0.7	-1.3	-2.1	-1.2
Std. Error of the Mean	0.2	0.3	0.3	0.4	0.2	0.3	0.4	0.5
"If we let our computers talk directly to the state's computer, I'd be worried about privacy."								
Mean	1.3	-1.9	-0.9	-1.4	-3.1	-1.8	-2.1	1.9
Std. Error of the Mean	0.5	0.5	0.3	0.4	0.3	0.3	0.2	0.6
"Electronic credentialing would require us to use state-mandated standards, formats, or eqipment."								
Mean	2.0	-1.3	1.8	2.7	-0.9	1.1	1.9	2.8
Std. Error of the Mean	0.5	0.5	0.3	0.4	0.3	0.3	0.4	0.6

APPENDIX C.3
Table L: Likelihood of using electronic credentialing.
Base: All respondents.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	27		17		114		41		55		68		50		18	
Weighted number of observations	93.8		334.3		9571.9		3753.3		819.2		4540.7		1692.9		1864.7	
Company already uses	38	41%							5	1%	2	0%	3	0%	33	2%
10 (very likely to use)	42	45%			1710	18%	572	15%	6	1%	605	13%	576	34%		
9	4	4%			603	6%	36	1%	570	70%	572	13%	35	2%		
8	4	5%			16	0%	3	0%	12	1%	5	0%	12	1%	3	0%
7	3	4%			107	1%	5	0%	37	5%	69	2%	37	2%	3	0%
6	1	1%			105	1%	3	0%	69	8%	66	1%	38	2%	1	0%
5 (neutral, can't say)			46	14%	1858	19%	508	14%	46	6%	1556	34%	191	11%	119	6%
4					650	7%	567	15%			567	12%	83	5%		
3					83	1%					83	2%				
2			87	26%	574	6%	567	15%	3	0%	4	0%	1	0%	567	30%
1					37	0%	35	1%	1	0%	35	1%	1	0%	1	0%
0 (very unlikely to use)			201	60%	2511	26%	1341	36%	66	8%	891	20%	682	40%	570	31%
Not reported			1	0%	1319	14%	117	3%	4	0%	86	2%	33	2%	568	30%
Total	94	100%	334	100%	9572	100%	3753	100%	819	100%	4541	100%	1693	100%	1865	100%
Mean	9.7		1.2		4.5		3.3		7.7		5.0		4.8		1.6	
Std. Error of the Mean	0.2		0.4		0.4		0.6		0.4		0.4		0.6		0.5	

APPENDIX C.3

Table M1: Reasons for likelihood scores >=6.

Base: All respondents not using EC who claim a positive likelihood of doing so.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	19				40		10		28		23		25		4	
Weighted number of observations	55.4				2540.1		619.0		694.6		1317.0		697.7		6.8	
Saves time, faster	10	18%			687	27%	14	2%	611	88%	641	49%	50	7%	3	39%
Saves money, more efficient	6	10%			607	24%	570	92%	39	6%	604	46%	7	1%		
Reduces paperwork	3	5%											1	0%		
Better tracking	1	2%			1134	45%			1	0%			568	81%		
We have computerized systems	35	64%			5	0%	3	0%	3	0%	38	3%			3	39%
Available at any time					35	1%	33	5%	3	0%			35	5%		
Other reasons	5	8%			71	3%	3	0%	38	5%	34	3%	39	6%	1	11%

APPENDIX C.3

Table M2: Reasons for likelihood scores < 6.

Base: All respondents not using EC who claim a negative likelihood of doing so.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	8		17		74		31		27		45		25		14	
Weighted number of observations	38.4		334.3		7031.8		3134.2		124.7		3223.7		995.1		1857.9	
Will take more time					3	0%			1	1%	0	0%	3	0%		
Unsure about cost			4	1%	67	1%	33	1%	38	30%	38	1%	33	3%		
Firm too small			5	2%	319	5%	239	8%			41	1%	284	28%	0	0%
Happy with current credentialing arrangements			3	1%	39	1%	35	1%	1	1%	35	1%	0	0%	3	0%
Limited or no computer equipment, expertise			1	0%	1302	19%	735	23%	1	1%	85	3%	84	8%	567	31%
Possible staff resistance					35	1%			35	28%			35	3%		
Fear of tracking problems					567	8%	567	18%							567	31%
Needs to know more about it			1	0%	89	1%	88	3%			89	3%				
Other reasons			201	60%	173	2%	202	6%	2	2%	204	6%	1	0%	83	4%

APPENDIX C.3
Table N1: Roadside check incidence.
Base: All respondents.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	27		17		114		41		55		68		50		18	
Weighted number of observations	93.8		334.3		9571.9		3753.3		819.2		4540.7		1692.9		1864.7	
We keep data & summarize them	10	11%	73	22%	1213	13%	1241	33%	50	6%	1212	27%	78	5%	6	0%
Firms estimating safety inspections	9	9%	73	22%	1212	13%	1241	33%	50	6%	1210	27%	78	5%	5	0%
based on data	8	9%	35	11%	1207	13%	1203	32%	46	6%	1171	26%	74	4%	5	0%
based on guess	0	0%	38	11%	5	0%	38	1%	4	1%	39	1%	4	0%		
Firms estimating size/weight checks	3	3%	72	21%	1175	12%	1207	32%	42	5%	1207	27%	39	2%	4	0%
based on data	3	3%	34	10%	569	6%	600	16%	6	1%	602	13%	3	0%	1	0%
based on guess	0	0%	35	11%	606	6%	605	16%	36	4%	602	13%	36	2%	3	0%
Firms estimating safety inspection time	8	8%	73	22%	1211	13%	1241	33%	50	6%	1209	27%	77	5%	5	0%
based on data			34	10%	634	7%	632	17%	36	4%	602	13%	65	4%	1	0%
based on guess	8	8%	39	12%	577	6%	609	16%	15	2%	607	13%	12	1%	5	0%
Firms estimating size/weight check time	3	4%	73	22%	1175	12%	1208	32%	43	5%	1207	27%	39	2%	5	0%
based on data			35	11%	568	6%	601	16%	2	0%	601	13%			2	0%
based on guess	3	4%	35	11%	608	6%	605	16%	41	5%	603	13%	39	2%	3	0%
We keep data, don't summarize them	11	12%	176	53%	2919	30%	2273	61%	701	86%	1021	22%	741	44%	1256	67%
Firms estimating safety inspections	11	12%	91	27%	2878	30%	2273	61%	701	86%	981	22%	741	44%	1253	67%
based on data	5	5%	84	25%	1540	16%	1550	41%	79	10%	330	7%	697	41%	603	32%
based on guess	7	7%	7	2%	1336	14%	723	19%	622	76%	651	14%	45	3%	651	35%
Firms estimating size/weight checks	10	11%	91	27%	2302	24%	1700	45%	698	85%	977	22%	740	44%	683	37%
based on data	3	3%			811	8%	779	21%	35	4%	125	3%	656	39%	33	2%
based on guess	7	8%	5	2%	1458	15%	803	21%	663	81%	769	17%	49	3%	651	35%
Firms estimating safety inspection time	11	12%	91	27%	2787	29%	2189	58%	700	85%	896	20%	740	44%	1253	67%
based on data	3	3%	3	1%	1355	14%	1290	34%	70	9%	152	3%	606	36%	602	32%
based on guess	9	9%	88	26%	1432	15%	900	24%	630	77%	744	16%	134	8%	651	35%
Firms estimating size/weight check time	7	8%	91	27%	2291	24%	1695	45%	694	85%	974	21%	732	43%	683	37%
based on data					100	1%	68	2%	33	4%	35	1%	33	2%	33	2%
based on guess	7	8%	5	2%	2190	23%	1542	41%	661	81%	856	19%	696	41%	650	35%
We do samples occasionally					153	2%	3	0%	66	8%	149	3%	3	0%	1	0%
Firms estimating safety inspections					152	2%	3	0%	66	8%	148	3%	3	0%	1	0%
based on data					33	0%			33	4%	33	1%			1	0%
based on guess					119	1%	3	0%	33	4%	115	3%	3	0%		
Firms estimating size/weight checks					152	2%	3	0%	66	8%	148	3%	3	0%	1	0%
based on data																
based on guess					152	2%	3	0%	66	8%	148	3%	3	0%	1	0%
Firms estimating safety inspection time					69	1%	3	0%	66	8%	65	1%	3	0%	1	0%
based on data																
based on guess					69	1%	3	0%	66	8%	65	1%	3	0%	1	0%
Firms estimating size/weight check time					69	1%	3	0%	66	8%	65	1%	3	0%	1	0%
based on data																
based on guess					69	1%	3	0%	66	8%	65	1%	3	0%	1	0%
We don't collect data	68	73%	83	25%	5185	54%	203	5%	1	0%	2158	48%	835	49%	602	32%
Not reported	4	4%	2	1%	101	1%	33	1%	1	0%	1	0%	35	2%		

APPENDIX C.3
Table N2: Roadside check means.
Base: All respondents.

	Electronic credentialing status			Total vehicle-hours in checks		Mean inspection satisfaction score		
	Using, or likely to do so	Not using, unlikely to do so	Not aware, or unsure	less than 15	Over 15	0 (neutral) or lower	Over 0 less than +2.5	+2.5 or higher
	No %	No %	No %	No %	No %	No %	No %	No %
Unweighted number of observations	27	17	114	41	55	68	50	18
Weighted number of observations	93.8	334.3	9571.9	3753.3	819.2	4540.7	1692.9	1864.7
We keep data & summarize them								
Firms estimating safety inspections	767	9	10	6	186	7	126	72
based on data	796	9	9	6	184	7	123	72
based on guess	60	10	269	10	204	25	174	
Firms estimating size/weight checks	101	16	39	12	793	11	855	155
based on data	114	2	2	2	84	2	114	250
based on guess	2	31	73	21	910	21	910	133
Firms estimating safety inspection time	28	21	41	40	29	41	23	33
based on data		30	43	43	30	44	23	40
based on guess	28	12	40	38	27	38	26	32
Firms estimating size/weight check time	36	21	25	25	16	25	15	14
based on data		30	40	39	22	39		16
based on guess	36	14	10	10	16	10	15	13
We keep data, don't summarize them								
Firms estimating safety inspections	82	98	24	2	105	72	5	4
based on data	76	5	4	2	56	4	4	6
based on guess	86	1273	47	3	111	106	17	2
Firms estimating size/weight checks	163	3661	90	6	761	504	63	3
based on data	0		4	4	17	17	1	15
based on guess	222	63344	140	9	799	638	939	3
Firms estimating safety inspection time	22	21	49	46	55	52	76	28
based on data	27	39	59	61	26	49	86	34
based on guess	20	20	39	24	59	52	33	23
Firms estimating size/weight check time	12	1	17	17	16	15	14	22
based on data			23	19	30	19	20	30
based on guess	12	10	17	17	16	16	14	21
We do samples occasionally								
Firms estimating safety inspections			45	3	78	45	3	296
based on data			106		106	102		296
based on guess			28	3	50	28	3	
Firms estimating size/weight checks			321	2	716	330	2	12
based on data								
based on guess			321	2	716	330	2	12
Firms estimating safety inspection time			39	30	40	40	30	30
based on data								
based on guess			39	30	40	40	30	30
Firms estimating size/weight check time			24	14	25	25	14	15
based on data								
based on guess			24	14	25	25	14	15
We don't collect data								
Not reported								
All firms								
Firms estimating safety inspections	382	58	21	4	108	37	16	4
Firms estimating size/weight checks	148	2050	83	8	759	238	102	4
Firms estimating safety inspection time	24	21	47	44	52	46	71	28
Firms estimating size/weight check time	20	10	20	20	17	21	14	22

APPENDIX C.3

Table O: Annual safety inspection times.
Base: All respondents with inspedction data.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	23		16		83		36		54		52		41		15	
Weighted number of observations	25.6		251.6		4386.8		3549.8		818.0		2382.7		857.4		1262.4	
Up to 1 vehicle-hour / year	5	20%	84	33%	1495	34%	1456	41%	34	4%	289	12%	153	18%	1135	90%
Over 1 up to 2 vh / year			68	27%	1373	31%	1441	41%			785	33%	570	66%	86	7%
Over 2 up to 10 vh / year	5	21%	8	3%	640	15%	649	18%	5	1%	576	24%	74	9%	3	0%
Over 10 up to 40 vh / year	2	6%	1	1%	114	3%	4	0%	113	14%	41	2%	42	5%	34	3%
Over 40 up to 100 vh / year	4	15%	1	1%	642	15%			647	79%	638	27%	9	1%		
Over 100 vh / year	5	19%	3	1%	12	0%			20	2%	10	0%	8	1%	1	0%
Not reported	5	18%	86	34%	111	3%					43	2%	2	0%	3	0%
Total	26	100%	252	100%	4387	100%	3550	100%	818	100%	2383	100%	857	100%	1262	100%
Mean	115.3		31.1		18.2		2.6		89.4		33.8		6.9		1.9	
Median	6.0		1.0		2.0		2.0		100.0		7.0		2.0		1.0	
Std. Error of the Mean	55.6		95.7		4.6		0.4		20.4		15.8		6.0		2.5	

APPENDIX C.3
Table P: Annual size/weight inspection times.
Base: All respondents with inspedction data.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	23		16		83		36		54		52		41		15	
Weighted number of observations	25.6		251.6		4386.8		3549.8		818.0		2382.7		857.4		1262.4	
Up to 1 vehicle-hour / year	13	53%	124	49%	2764	63%	2789	79%	18	2%	896	38%	775	90%	1222	97%
Over 1 up to 2 vh / year					37	1%	35	1%	1	0%	4	0%	33	4%		
Over 2 up to 10 vh / year	3	11%	37	15%	729	17%	693	20%	75	9%	727	31%	5	1%	36	3%
Over 10 up to 40 vh / year	1	5%	3	1%	106	2%	33	1%	77	9%	105	4%	4	0%	1	0%
Over 40 up to 100 vh / year	1	6%			570	13%			572	70%	569	24%	2	0%	1	0%
Over 100 vh / year	2	8%	3	1%	70	2%			75	9%	39	2%	36	4%		
Not reported	5	18%	86	34%	111	3%					43	2%	2	0%	3	0%
Total	26	100%	252	100%	4387	100%	3550	100%	818	100%	2383	100%	857	100%	1262	100%
Mean	43.1		847.0		22.2		1.4		265.4		90.6		15.6		1.4	
Median	7.0		0.0		1.0		1.0		63.0		3.0		0.0		1.0	
Std. Error of the Mean	23.1		3156.8		14.4		0.3		693.6		432.2		31.3		0.9	

APPENDIX C.3

Table Q: Annual inspection times for all checks.
Base: All respondents with inspedction data.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	23		16		83		36		54		52		41		15	
Weighted number of observations	25.6		251.6		4386.8		3549.8		818.0		2382.7		857.4		1262.4	
Up to 1 vehicle-hour / year	2	10%	84	33%	1376	31%	1368	39%			167	7%	153	18%	1135	90%
Over 1 up to 5 vh / year	3	11%	36	14%	1426	33%	1464	41%			803	34%	573	67%	88	7%
Over 5 up to 10 vh / year	5	21%	38	15%	637	15%	681	19%			610	26%	71	8%		
Over 10 up to 50 vh / year	2	6%	4	2%	115	3%	37	1%	84	10%	75	3%	11	1%	35	3%
Over 40 up to 100 vh / year	4	15%	1	1%	71	2%			76	9%	71	3%	6	1%		
Over 100 up to 200 vh / year	1	6%			577	13%			578	71%	572	24%	5	1%	1	0%
Over 200 vh / year	3	13%	3	1%	73	2%			79	10%	41	2%	37	4%	1	0%
Not reported	5	18%	86	34%	111	3%					43	2%	2	0%	3	0%
Total	26	100%	252	100%	4387	100%	3550	100%	818	100%	2383	100%	857	100%	1262	100%
Mean	139.0		869.5		36.6		3.5		349.7		122.8		21.6		2.3	
Median	8.0		1.0		3.0		2.0		163.0		10.0		2.0		1.0	
Std. Error of the Mean	61.4		2937.1		13.8		0.6		600.9		412.0		26.2		2.9	

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Table R: Satisfaction score with inspections (scale: -5 to +5).

Base: All respondents.

	Electronic credentialing status			Total vehicle-hours in checks		Mean inspection satisfaction score		
	Using, or likely to do so	Not using, unlikely to do so	Not aware, or unsure	less than 15	Over 15	0 (neutral) or lower	Over 0 less than +2.5	+2.5 or higher
	No %	No %	No %	No %	No %	No %	No %	No %
Unweighted number of observations	27	17	114	41	55	68	50	18
Weighted number of observations	93.8	334.3	9571.9	3753.3	819.2	4540.7	1692.9	1864.7
Frequency of inspections								
Mean	2.95	-2.67	-0.09	0.78	-1.68	-2.50	1.92	3.65
Std. Error of the Mean	0.38	0.59	0.33	0.29	0.31	0.26	0.29	0.23
Criteria for selection								
Mean	0.80	-1.69	-1.15	-0.86	-3.32	-3.84	1.54	2.73
Std. Error of the Mean	0.78	0.67	0.36	0.44	0.39	0.21	0.29	0.48
Types of checks								
Mean	1.19	-0.99	1.09	2.95	2.45	-0.71	3.40	3.04
Std. Error of the Mean	0.75	0.44	0.34	0.22	0.19	0.42	0.23	0.08
Fairness of the process								
Mean	0.15	-1.69	-0.17	1.12	-0.82	-2.71	3.13	2.73
Std. Error of the Mean	0.93	0.66	0.35	0.53	0.17	0.29	0.28	0.14
Time spent being inspected								
Mean	-0.12	-1.68	-1.06	-0.17	-3.34	-3.17	-0.68	3.60
Std. Error of the Mean	0.50	0.66	0.33	0.41	0.36	0.24	0.27	0.23
Time waiting for inspection								
Mean	0.65	-2.34	-1.99	-1.11	-3.74	-3.56	-3.10	2.85
Std. Error of the Mean	0.25	0.49	0.33	0.53	0.30	0.24	0.32	0.16

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Table S: Most important inspection improvement.
Base: All mentions.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	18		8		54		16		35		38		27		11	
Weighted number of observations	82.4		206.4		5255.3		2091.8		699.6		2799.9		802.4		724.0	
Happy with current system	1	2%	33	26%	169	3%	115	6%	3	0%	201	7%	1	0%	1	0%
Need regular, terminal-based inspections					5	0%			3	0%	2	0%	3	0%		
Manage roadside to reduce evasion	2	3%	3	2%	685	13%	683	33%	2	0%	118	4%	5	1%	567	79%
Better enforcement of regulations			83	67%	602	12%	33	2%	3	0%	1	0%	33	5%	1	0%
Better targeting of vehicles	3	4%			1770	34%	600	29%	571	82%	1706	63%	67	9%		
More concern with safety of inspection arrangements	1	1%	1	1%	568	11%	567	27%	3	0%	2	0%	568	79%		
Better information about vehicles	1	1%							1	0%			1	0%		
Better inspectors	1	2%	4	3%	604	12%	4	0%	37	5%	574	21%	35	5%	1	0%
More consistency, uniformity	66	84%			639	12%			41	6%	106	4%			33	5%
Other changes	3	4%			121	2%	85	4%	35	5%	3	0%	7	1%	115	16%
Total mentions	79	100%	124	100%	5163	100%	2086	100%	699	100%	2712	100%	719	100%	719	100%

APPENDIX C.3
Table T: All inspection improvement suggestions.
Base: All mentions.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	18		8		54		16		35		38		27		11	
Weighted number of observations	82.4		206.4		5255.3		2091.8		699.6		2799.9		802.4		724.0	
Happy with current system	1	1%	33	26%	169	3%	115	5%	3	0%	201	6%	1	0%	1	0%
Need regular, terminal-based inspections					6	0%			5	0%	2	0%	4	1%		
Manage roadside to reduce evasion	2	2%	3	2%	686	12%	683	30%	3	0%	118	3%	5	1%	567	75%
Better enforcement of regulations			83	66%	602	10%	33	1%	3	0%	1	0%	33	4%	1	0%
Better targeting of vehicles	36	30%			1770	30%	600	27%	571	43%	1706	49%	67	9%	33	4%
More concern with safety of inspection arrangements	1	1%	1	1%	568	10%	567	25%	3	0%	2	0%	568	75%		
Better information about vehicles	1	1%			1	0%			1	0%	0	0%	1	0%	1	0%
Better inspectors	1	1%	4	3%	608	10%	4	0%	41	3%	576	17%	36	5%	1	0%
More consistency, uniformity	68	58%	1	1%	641	11%	1	0%	45	3%	108	3%	2	0%	34	4%
Other changes	7	6%	1	1%	886	15%	251	11%	639	49%	738	21%	41	5%	115	15%
Total mentions	117	100%	126	100%	5937	100%	2253	100%	1313	100%	3452	100%	759	100%	753	100%

APPENDIX C.3
Table U: Electronic screening awareness & use.
Base: All respondents.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	27		17		114		41		55		68		50		18	
Weighted number of observations	93.8		334.3		9571.9		3753.3		819.2		4540.7		1692.9		1864.7	
Hasn't heard of ES	69	74%	291	87%	6105	64%	1701	45%	111	14%	2011	44%	809	48%	1822	98%
Already using SC (annual fee)	3	4%			40	0%	5	0%	35	4%	1	0%	7	0%	36	2%
Already using SC (per site)	3	3%			606	6%	567	15%	40	5%	568	13%	39	2%	1	0%
Not using, expect to use within 2 years	3	3%	3	1%	607	6%	33	1%	576	70%	572	13%	40	2%	1	0%
Not using, don't expect to use within 2 years	10	11%	38	11%	1996	21%	1415	38%	56	7%	1306	29%	734	43%	4	0%
Not reported	5	5%	2	1%	220	2%	33	1%	1	0%	83	2%	66	4%		

APPENDIX C.3
Table V: Reasons for or against ES participation.
Base: All mentions.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	16		4		36		12		31		19		30		7	
Weighted number of observations	18.9		7.9		2658.8		1943.5		697.8		1835.7		811.2		38.7	
Hasn't reached critical mass yet	2	13%	5	100%	0	0%			4	1%	6	0%	2	0%		
Time savings	7	41%			1142	43%	570	29%	578	83%	1137	62%	10	1%	2	4%
Cost of participation	3	15%	1		647	24%	605	31%	43	6%	606	33%	43	5%	3	7%
Possible bad impacts on safety	2	2%			68	3%			69	10%	3	0%	34	4%	33	88%
Big Brother concerns	1				651	25%	650	33%	3	0%	85	5%	567	70%		
Needs more information to judge					34	1%			1	0%			34	4%		
Not applicable to us	4	28%	1		117	4%	119	6%	1	0%			121	324%	1	
Total mentions	19	100%	8	100%	2659	100%	1944	100%	699	100%	1837	100%	810	409%	39	100%

APPENDIX C.3
Table W1: Awareness of SAFER carrier information.
Base: All respondents.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	27		17		114		41		55		68		50		18	
Weighted number of observations	93.8		334.3		9571.9		3753.3		819.2		4540.7		1692.9		1864.7	
Respondent aware	20	21%	165	49%	2973	31%	1622	43%	714	87%	1570	35%	1487	88%	13	1%
Respondent not aware	68	72%	169	50%	5870	61%	2126	57%	105	13%	2315	51%	205	12%	1849	99%
Not sure	3	3%			5	0%	3	0%			3	0%			3	0%
Not reported	4	4%	1	0%	723	8%	3	0%			654	14%				
Total	94	100%	334	100%	9572	100%	3753	100%	819	100%	4541	100%	1693	100%	1865	100%

APPENDIX C.3
Table W2: Awareness of SAFER vehicle information.
Base: All respondents.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	27		17		114		41		55		68		50		18	
Weighted number of observations	93.8		334.3		9571.9		3753.3		819.2		4540.7		1692.9		1864.7	
Respondent aware	13	14%	80	24%	1656	17%	1513	40%	73	9%	890	20%	844	50%	9	1%
Respondent not aware	73	78%	88	26%	6052	63%	2235	60%	746	91%	2909	64%	849	50%	1285	69%
Not sure	4	4%	83	25%	7	0%	3	0%	0	0%	5	0%	0	0%	3	0%
Not reported	4	4%	83	25%	1857	19%	3	0%			736	16%			567	30%
Total	94	100%	334	100%	9572	100%	3753	100%	819	100%	4541	100%	1693	100%	1865	100%

APPENDIX C.3
Table X: Opinions about electronic screening (scale: -5 to +5).
Base: All respondents.

	Electronic credentialing status			Total vehicle-hours in checks		Mean inspection satisfaction score		
	Using, or likely to do so	Not using, unlikely to do so	Not aware, or unsure	less than 15	Over 15	0 (neutral) or lower	Over 0 less than +2.5	+2.5 or higher
	No %	No %	No %	No %	No %	No %	No %	No %
Unweighted number of observations	27	17	114	41	55	68	50	18
Weighted number of observations	93.8	334.3	9571.9	3753.3	819.2	4540.7	1692.9	1864.7
"Equipping all our units with transponders is likely to cost my company more than we'd save."								
Mean	3.93	1.73	2.73	3.33	0.47	2.64	2.90	2.83
Std. Error of the Mean	0.54	0.42	0.23	0.36	0.27	0.30	0.33	0.54
"If these new inspection methods were more widespread, I expect we'd make significant time and cost savings."								
Mean	2.02	-0.37	-0.06	-0.54	3.59	0.88	-1.30	0.65
Std. Error of the Mean	0.58	0.40	0.25	0.37	0.36	0.26	0.43	0.31
"We're too small to justufy thinking about putting transponders in our units."								
Mean	0.72	1.45	2.85	3.22	-3.31	1.63	3.37	3.05
Std. Error of the Mean	0.45	0.36	0.29	0.37	0.43	0.41	0.36	0.59
"Even if the time spent in safety and weight inspections were halved, there'd be very little impact on our costs."								
Mean	-0.14	1.29	0.43	0.89	-3.20	-1.00	1.79	0.98
Std. Error of the Mean	0.31	0.42	0.29	0.53	0.46	0.34	0.44	0.51
"Even without equipping our vehicles, we'd probably benefit if the inspection officials had better information."								
Mean	2.26	0.30	2.00	2.15	4.24	1.43	3.32	1.38
Std. Error of the Mean	0.52	0.50	0.29	0.46	0.22	0.40	0.26	0.73
"I expect that our drivers would be pleased by these types of changes."								
Mean	0.27	0.34	0.32	0.36	3.44	0.37	0.00	-0.81
Std. Error of the Mean	0.98	0.25	0.27	0.38	0.40	0.43	0.18	0.39
"These type of changes will make the roadside inspection system significantly more fair."								
Mean	3.89	0.31	1.21	2.06	3.61	1.20	2.39	-0.56
Std. Error of the Mean	0.48	0.23	0.29	0.42	0.35	0.43	0.33	0.31
"I'm concerned that changes like these will help the states to expand regulations and charges in new ways."								
Mean	-0.12	0.95	2.39	2.34	2.64	1.32	2.76	2.44
Std. Error of the Mean	0.37	0.33	0.22	0.34	0.18	0.24	0.30	0.51
"I worry about government agencies having so much information about our vehicles."								
Mean	-2.26	1.23	1.76	1.23	2.31	1.50	2.98	0.52
Std. Error of the Mean	0.54	0.47	0.30	0.59	0.21	0.44	0.43	0.44

APPENDIX C.3
Table Y: Impact of inspection on firm's spending.
Base: All respondents.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	27		17		114		41		55		68		50		18	
Weighted number of observations	93.8		334.3		9571.9		3753.3		819.2		4540.7		1692.9		1864.7	
Spending increased this year	1	1%	34	10%	1265	13%	721	19%	7	1%	690	15%	40	2%	3	0%
No increase from last year	82	87%	99	30%	5465	57%	2715	72%	168	21%	2245	49%	1563	92%	1260	68%
Not sure	5	5%	201	60%	1519	16%	201	5%	636	78%	919	20%	89	5%	33	2%
Not reported	7	7%	1	0%	1323	14%	115	3%	7	1%	687	15%	1	0%	568	30%
Total	94	100%	334	100%	9572	100%	3753	100%	819	100%	4541	100%	1693	100%	1865	100%

APPENDIX C.3
Table AA: Type of carrier.
Base: All respondents.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	27		17		114		41		55		68		50		18	
Weighted number of observations	93.8		334.3		9571.9		3753.3		819.2		4540.7		1692.9		1864.7	
For-hire truckload carrier	43	46%	92	28%	305	3%	111	3%	59	7%	218	5%	114	7%	71	4%
For-hire LTL carrier	1	1%			72	1%	33	1%	37	4%	39	1%	33	2%	1	0%
Private carrier	40	43%	124	37%	3265	34%	899	24%	35	4%	880	19%	695	41%	1219	65%
General freight carrier	1	1%			638	7%	600	16%	3	0%	601	13%	34	2%	3	0%
Tank truck operator					568	6%			567	69%	567	12%	1	0%		
Refrigerated truck carrier					88	1%	3	0%	3	0%	85	2%	3	0%		
Automobile transporter	3	3%					3	0%					3	0%		
Bulk commodities carrier			3	1%	1343	14%	732	20%	40	5%	1256	28%	86	5%		
Household goods mover	4	4%			571	6%	567	15%	5	1%	3	0%	571	34%	0	0%
Owner/operator	2	2%	115	35%	1548	16%	239	6%	37	4%	889	20%	119	7%	3	0%
Other type					3	0%			2	0%	3	0%	1	0%		
Not reported	1	1%	1	0%	1170	12%	567	15%	33	4%			33	2%	567	30%
Total	94	100%	334	100%	9572	100%	3753	100%	819	100%	4541	100%	1693	100%	1865	100%

APPENDIX C.3
Table AB: Total annual fleet miles.
Base: All respondents.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	27		17		114		41		55		68		50		18	
Weighted number of observations	93.8		334.3		9571.9		3753.3		819.2		4540.7		1692.9		1864.7	
10k or fewer			115	35%	1468	15%	768	20%			201	4%	166	10%	567	30%
Over 10k to 50k					2038	21%	739	20%			736	16%	652	39%	83	4%
Over 50k to 100k			83	25%	1784	19%	733	20%			166	4%	568	34%	567	30%
Over 100k to 200k	35	38%			644	7%	608	16%			602	13%	7	0%	33	2%
Over 200k to 500k			3	1%	1209	13%	38	1%	37	5%	573	13%	34	2%	605	32%
Over 500k to 1 mn.			0	0%	179	2%	66	2%	106	13%	104	2%	72	4%	3	0%
Over 1 mn. to 5 mn.	40	42%	9	3%	779	8%	110	3%	610	74%	682	15%	107	6%	2	0%
Over 5 mn. to 20 mn.	6	7%	4	1%	17	0%	3	0%	19	2%	16	0%	11	1%		
Over 20 mn.	5	5%	1	0%	10	0%			10	1%	3	0%	8	0%	2	0%
Not reported	8	8%	119	36%	1445	15%	690	18%	38	5%	1457	32%	69	4%	4	0%
Total	94	100%	334	100%	9572	100%	3753	100%	819	100%	4541	100%	1693	100%	1865	100%
Mean (in thousands)	12254		579		590		173		4609		1206		873		233	
Median (in thousands)	2000		7		80		90		4536		180		50		94	
Std. Error of the Mean (in thousands)	13570		1342		257		76		1076		350		2102		278	

APPENDIX C.3
Table AC: Number of powered units operated.
Base: All respondents.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	27		17		114		41		55		68		50		18	
Weighted number of observations	93.8		334.3		9571.9		3753.3		819.2		4540.7		1692.9		1864.7	
One or fewer			83	25%	2201	23%	818	22%	1	0%	1385	30%	733	43%	83	4%
2 to 5			118	35%	4873	51%	2552	68%	3	0%	1501	33%	650	38%	1703	91%
6 to 10			85	26%	153	2%	121	3%	35	4%	236	5%	3	0%		
11 to 15			0	0%	84	1%	8	0%	71	9%	38	1%	38	2%	6	0%
16 to 20	35	38%			71	1%	41	1%			3	0%	71	4%	33	2%
21 to 25	3	3%			204	2%	103	3%			41	1%	100	6%		
26 to 50	35	38%	3	1%	737	8%	38	1%	667	81%	705	16%	35	2%	35	2%
51 to 100	4	4%	38	11%	9	0%	38	1%	7	1%	39	1%	9	1%		
101 to 200	5	5%	4	1%	17	0%			19	2%	14	0%	8	0%	0	0%
201 to 500	4	5%	3	1%	18	0%	1	0%	12	1%	9	0%	8	0%	3	0%
Over 500	6	7%			4	0%	1	0%	5	1%	3	0%	5	0%	1	0%
Not reported	1	1%	1	0%	1202	13%	33	1%			567	12%	33	2%	0	0%
Total	94	100%	334	100%	9572	100%	3753	100%	819	100%	4541	100%	1693	100%	1865	100%
Mean	202.3		16.2		8.0		5.1		44.9		12.1		15.9		5.0	
Median	43.0		3.0		3.0		2.0		35.0		2.0		4.0		3.0	
Std. Error of the Mean	184.1		11.4		5.0		8.0		12.4		7.6		32.9		8.6	

APPENDIX C.3
Table AD: Total drivers employed directly or indirectly.
Base: All respondents.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	27		17		114		41		55		68		50		18	
Weighted number of observations	93.8		334.3		9571.9		3753.3		819.2		4540.7		1692.9		1864.7	
One or fewer			83	25%	4633	48%	815	22%	3	0%	2117	47%	815	48%		
2 to 5			38	11%	2394	25%	2391	64%	3	0%	690	15%	567	33%	1137	61%
6 to 10	3	3%	83	25%	738	8%	91	2%	98	12%	718	16%	71	4%	3	0%
11 to 15	3	3%	0	0%	122	1%	74	2%	41	5%	76	2%	41	2%	6	0%
16 to 25	33	35%			234	2%	136	4%	33	4%	68	1%	133	8%	33	2%
26 to 50	35	38%	5	2%	638	7%	41	1%	567	69%	638	14%	38	2%		
51 to 100	4	5%	37	11%	38	0%	38	1%	37	4%	41	1%	4	0%	33	2%
101 to 200	3	3%	3	1%	22	0%			22	3%	15	0%	11	1%		
201 to 1,000	5	5%	3	1%	16	0%	2	0%	14	2%	9	0%	8	0%	3	0%
Over 1,000	6	6%			2	0%			3	0%	2	0%	4	0%		
Not reported	3	3%	83	25%	735	8%	166	4%			167	4%	1	0%	651	35%
Total	94	100%	334	100%	9572	100%	3753	100%	819	100%	4541	100%	1693	100%	1865	100%
Mean	246.7		17.8		7.1		5.1		46.2		10.8		17.1		6.7	
Median	50.0		6.0		1.0		3.0		35.0		2.0		4.0		5.0	
Std. Error of the Mean	250.7		10.5		4.3		1.7		14.4		8.9		39.0		5.2	

APPENDIX C.3
Table AE: Geographic range of operations.
Base: All respondents.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	27		17		114		41		55		68		50		18	
Weighted number of observations	93.8		334.3		9571.9		3753.3		819.2		4540.7		1692.9		1864.7	
Local only (<75 miles)	3	3%	250	75%	1576	16%	890	24%	0	0%	371	8%	237	14%	567	30%
Within state only	5	6%	35	11%	850	9%	856	23%	33	4%	806	18%	3	0%	83	4%
Own state and nearby states	41	43%	38	11%	5752	60%	1404	37%	656	80%	2107	46%	1338	79%	1179	63%
National	41	43%	4	1%	787	8%	602	16%	120	15%	683	15%	78	5%	34	2%
International	2	2%	7	2%	6	0%	1	0%	10	1%	7	0%	5	0%	1	0%
Not reported	2	2%	1	0%	600	6%					567	12%	33	2%	0	0%
Total	94	100%	334	100%	9572	100%	3753	100%	819	100%	4541	100%	1693	100%	1865	100%

APPENDIX C.3
Table AF: CVISN States with 2,500+ fleet miles / year.
Base: All respondents.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	27		17		114		41		55		68		50		18	
Weighted number of observations	93.8		334.3		9571.9		3753.3		819.2		4540.7		1692.9		1864.7	
California	78	83%	39	12%	1364	14%	639	17%	134	16%	757	17%	54	3%	37	2%
Colorado	75	80%	5	2%	151	2%			125	15%	114	3%	49	3%	34	2%
Connecticut	11	12%	5	2%	254	3%	203	5%	24	3%	134	3%	134	8%	1	0%
Kentucky	50	53%	88	26%	946	10%	171	5%	98	12%	824	18%	101	6%	121	6%
Maryland	47	50%	92	28%	143	1%	130	3%	33	4%	182	4%	23	1%	40	2%
Michigan	47	51%	3	1%	162	2%	33	1%	96	12%	121	3%	50	3%	3	0%
Minnesota	45	48%	4	1%	753	8%	35	1%	126	15%	681	15%	83	5%	3	0%
Oregon	47	50%	8	2%	396	4%	220	6%	101	12%	264	6%	145	9%	38	2%
Virginia	16	17%	91	27%	764	8%	97	3%	70	9%	267	6%	590	35%	8	0%
Washington	43	46%	8	2%	199	2%	45	1%	128	16%	86	2%	122	7%	39	2%
None of the above	1	1%	117	35%	5953	62%	2399	64%	601	73%	1885	42%	669	39%	1701	91%
Not reported	2	2%	1	0%	83	1%					83	2%			0	0%

APPENDIX C.3
Table AG: Percent of vehicle units leased.
Base: All respondents.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	27		17		114		41		55		68		50		18	
Weighted number of observations	93.8		334.3		9571.9		3753.3		819.2		4540.7		1692.9		1864.7	
Zero																
Over zero to 25%	9	10%	3	1%	55	1%	5	0%	49	6%	11	0%	49	3%	3	0%
Over 25% to 50%	3	3%	86	26%	1173	12%	83	2%	606	74%	687	15%	5	0%	2	0%
Over 50% to 75%	2	2%	3	1%	67	1%	33	1%	3	0%	3	0%	68	4%		
Over 75% to less than 100%	1	1%			5	0%			5	1%	4	0%	1	0%		
100%	33	36%	5	2%	1200	13%	570	15%	2	0%	603	13%			568	30%
Not reported	46	49%	238	71%	7073	74%	3063	82%	154	19%	3232	71%	1569	93%	1292	69%
Total	94	100%	334	100%	9572	100%	3753	100%	819	100%	4541	100%	1693	100%	1865	100%
Mean	77.4		51.8		68.6		91.8		28.5		63.0		45.5		99.3	
Median	100.0		50.0		66.7		100.0		27.8		50.0		66.7		100.0	
Std. Error of the Mean	9.3		4.4		4.9		7.6		1.5		7.1		5.2		3.2	

APPENDIX C.3
Table AH: Percent of drivers not employed directly.
Base: All respondents.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	27		17		114		41		55		68		50		18	
Weighted number of observations	93.8		334.3		9571.9		3753.3		819.2		4540.7		1692.9		1864.7	
Zero	9	10%	83	25%	2000	21%	767	20%	70	9%	252	6%	1240	73%	33	2%
Over zero to 25%	7	7%	5	2%	15	0%			13	2%	10	0%	11	1%	1	0%
Over 25% to 50%	5	5%	1	0%	572	6%			577	70%	575	13%	3	0%	0	0%
Over 50% to 75%			1	0%	2	0%			3	0%			3	0%		
Over 75% to less than 100%					38	0%	33	1%	5	1%	3	0%	35	2%	1	0%
100%	34	36%	3	1%	2	0%	3	0%	3	0%	3	0%	1	0%	33	2%
Not reported	39	42%	241	72%	6943	73%	2951	79%	148	18%	3698	81%	400	24%	1797	96%
Total	94	100%	334	100%	9572	100%	3753	100%	819	100%	4541	100%	1693	100%	1865	100%
Mean	66.4		5.2		10.7		3.7		38.4		30.0		2.7		50.1	
Median	100.0		0.0		0.0		0.0		42.9		42.9		0.0		50.0	
Std. Error of the Mean	10.2		7.7		2.8		4.7		2.4		3.6		2.6		20.3	

APPENDIX C.3
Table AI: Vehicle leasing arrangements.
Base: All respondents.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	27		17		114		41		55		68		50		18	
Weighted number of observations	93.8		334.3		9571.9		3753.3		819.2		4540.7		1692.9		1864.7	
Firm has no leased vehicles					1	0%			1	0%			1	0%		
Lessor provides drivers																
for all leased vehicles	2	2%	1	0%	36	0%			39	5%	1	0%	38	2%		
for some leased vehicles	1	1%			34	0%			1	0%			3	0%		
Lessor provides fleet management																
for all leased vehicles	3	4%	1	0%	36	0%			6	1%	2	0%	5	0%	0	0%
for some leased vehicles					1	0%					1	0%				
Lessor provides vehicle maintenance																
for all leased vehicles	4	5%	1	0%	105	1%	33	1%	8	1%	3	0%	42	2%		
for some leased vehicles	2	2%	0	0%	3	0%	0	0%	1	0%	1	0%	3	0%	1	0%
Lessor provides operating credentials																
for all leased vehicles	1	2%			138	1%	35	1%	36	4%	34	1%	37	2%	4	0%
for some leased vehicles	5	5%	2	0%			0	0%	3	0%			3	0%	0	0%
Lessor provides fuel tax reporting																
for all leased vehicles	1	2%	2	0%	135	1%	33	1%	38	5%	34	1%	38	2%	1	0%
for some leased vehicles	3	3%	1	0%					2	0%			3	0%		
Lessor provides none of these services	41	43%	93	28%	2321	24%	655	17%	588	72%	1271	28%	46	3%	568	30%
Not reported	46	49%	238	71%	7072	74%	3063	82%	154	19%	3232	71%	1569	93%	1292	69%

APPENDIX C.3

Table AJ: Payment method used most for employed drivers.
Base: All respondents employing drivers directly.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	20		13		101		37		50		60		47		12	
Weighted number of observations	56.7		165.4		7697.7		3584.4		813.7		3800.7		1690.2		1180.6	
By the hour	14	24%	76	46%	3535	46%	2129	59%	78	10%	1005	26%	1404	83%	607	51%
By the mile	37	65%	4	3%	220	3%	0	0%	123	15%	143	4%	46	3%	1	0%
By the trip	3	5%	1	1%	1225	16%	567	16%	7	1%	654	17%	6	0%	567	48%
By shipment value	2	4%	83	50%	1211	16%	118	3%	604	74%	1255	33%	35	2%	5	0%
Other methods			1	1%	172	2%	85	2%	1	0%	7	0%	167	10%		
Not reported	1	2%			1335	17%	685	19%	1	0%	736	19%	33	2%		
Total	57	100%	165	100%	7698	100%	3584	100%	814	100%	3801	100%	1690	100%	1181	100%

APPENDIX C.3
Table AK: All payment methods used for employed drivers.
Base: All respondents employing drivers directly.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	20		13		101		37		50		60		47		12	
Weighted number of observations	56.7		165.4		7697.7		3584.4		813.7		3800.7		1690.2		1180.6	
By the hour	51	49%	76	46%	4179	49%	2129	58%	687	47%	1644	36%	1413	81%	607	50%
By the mile	42	40%	4	3%	380	4%	36	1%	160	11%	234	5%	85	5%	37	3%
By the trip	5	4%	1	1%	1274	15%	602	16%	11	1%	697	15%	7	0%	570	47%
By shipment value	3	3%	83	50%	1216	14%	118	3%	608	41%	1255	27%	39	2%	8	1%
Other methods	3	3%	1	1%	174	2%	88	2%	2	0%	8	0%	170	10%		
Not reported	1	1%			1335	16%	685	19%	1	0%	736	16%	33	2%		
Total mentions	105	100%	165	100%	8557	100%	3658	100%	1469	100%	4574	100%	1746	100%	1222	100%

APPENDIX C.3

Table AL: Payment method used most for drivers not employed directly.
Base: All respondents employing contract drivers.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	16		5		28		2		34		17		23		5	
Weighted number of observations	45.4		10.6		628.9		35.3		600.7		591.4		53.0		35.1	
By the hour	2	4%	3	25%	2	0%			5	1%	4	1%	1	1%	1	2%
By the mile	2	5%	4	37%	7	1%	3	8%	10	2%	7	1%	5	10%	1	4%
By the trip	2	5%	4	37%	46	7%	33	92%	11	2%	9	1%	41	78%	0	1%
By shipment value	39	85%			571	91%			574	95%	571	97%	5	9%	33	93%
Other methods					3	0%			1	0%	1	0%	1	3%		
Not reported																
Total	45	100%	11	100%	629	100%	35	100%	601	100%	591	100%	53	100%	35	100%

APPENDIX C.3

Table AM: All payment methods used for drivers not employed directly.
Base: All respondents employing contract drivers.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	16		5		28		2		34		17		23		5	
Weighted number of observations	45.4		10.6		628.9		35.3		600.7		591.4		53.0		35.1	
By the hour	3	7%	3	20%	8	1%			11	2%	8	1%	4	7%	1	2%
By the mile	4	9%	4	30%	15	2%	3	7%	18	3%	12	2%	10	16%	1	4%
By the trip	4	8%	7	50%	47	7%	35	93%	13	2%	11	2%	42	67%	1	3%
By shipment value	39	77%			571	89%			574	93%	571	95%	5	8%	33	91%
Other methods					3	1%			2	0%	1	0%	2	3%		
Not reported																
Total mentions	50	100%	13	100%	645	100%	38	100%	618	100%	603	100%	63	100%	36	100%

APPENDIX C.3
Table AN: Percent of loads requiring OS/OW permit.
Base: All respondents.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	27		17		114		41		55		68		50		18	
Weighted number of observations	93.8		334.3		9571.9		3753.3		819.2		4540.7		1692.9		1864.7	
Zero	49	52%	173	52%	7897	83%	2873	77%	691	84%	2834	62%	1604	95%	1792	96%
Over zero to 25%	41	43%	74	22%	129	1%	141	4%	56	7%	153	3%	50	3%	39	2%
Over 25% to 50%	3	3%					3	0%					3	0%		
Over 50% to 75%																
Over 75% to less than 100%			3	1%	68	1%	3	0%	68	8%	3	0%	35	2%	33	2%
100%			1	0%	88	1%	84	2%	3	0%	85	2%			1	0%
Not reported	1	1%	83	25%	1390	15%	650	17%	1	0%	1465	32%	1	0%	0	0%
Total	94	100%	334	100%	9572	100%	3753	100%	819	100%	4541	100%	1693	100%	1865	100%
Mean	6%		2%		2%		3%		8%		3%		2%		2%	
Median	0%		0%		0%		0%		0%		0%		0%		0%	
Std. Error of the Mean	2%		3%		1%		3%		3%		2%		2%		3%	

APPENDIX C.3
Table AO: Percent of loads requiring HAZMAT placards.
Base: All respondents.

	Electronic credentialing status						Total vehicle-hours in checks				Mean inspection satisfaction score					
	Using, or likely to do so		Not using, unlikely to do so		Not aware, or unsure		less than 15		Over 15		0 (neutral) or lower		Over 0 less than +2.5		+2.5 or higher	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Unweighted number of observations	27		17		114		41		55		68		50		18	
Weighted number of observations	93.8		334.3		9571.9		3753.3		819.2		4540.7		1692.9		1864.7	
Zero	80	85%	242	72%	6892	72%	3025	81%	165	20%	1858	41%	1610	95%	1858	100%
Over zero to 25%	6	7%	9	3%	117	1%	71	2%	52	6%	76	2%	44	3%	7	0%
Over 25% to 50%	3	3%					3	0%			3	0%				
Over 50% to 75%	1	1%							1	0%			1	0%		
Over 75% to less than 100%	3	3%			1	0%	3	0%	1	0%	1	0%	3	0%		
100%					1172	12%	3	0%	600	73%	1138	25%	34	2%		
Not reported	1	1%	83	25%	1390	15%	650	17%	1	0%	1465	32%	1	0%	0	0%
Total	94	100%	334	100%	9572	100%	3753	100%	819	100%	4541	100%	1693	100%	1865	100%
Mean	36%		12%		0%		47%		19%		1%		3%		4%	
Median	0%		0%		0%		0%		0%		0%		0%		0%	
Std. Error of the Mean	6%		4%		1%		8%		6%		1%		2%		3%	

APPENDIX C.4:

MOTOR CARRIER OPEN-ENDED RESPONSES

APPENDIX C.4: MOTOR CARRIER OPEN-ENDED RESPONSES

Q: Suppose that within the next twelve months your company has the opportunity to start using electronic means to obtain credentials or permits from at least one of the states with which you must register. Please choose a number between **0** and **10** to indicate how likely your company would be to use that method. In order of importance, what are the main reasons why you gave that particular answer?

Score 10

"We generate most reports in our computer system"

"We are looking for the most efficient and cost effective method for ordering permits"

"To see if there would be much time savings."

"Time, cut the overall time frame"

"Time"

"Speed, improved efficiency, improved tracking of credentials."

"Reduce the cost of outside permit agency ordering"

"Paperwork reduction"

"I've used the computer to acquire credentials. My company would like to go in that direction."

"IFTA lost my renewal last year."

"I have had several "Lost Applications" I think it would eliminate that."

"I am already talking to the state."

"Expense"

"Less time consuming"

"Reduce paperflow, increase accuracy"

"Electronic credentialing is fast, less time consuming"

Score 7 to 9

"To reduce paperwork"

"Time savings related to staff."

"Time saving"

"Seems that the internet is quick and real time"

"Quick turnaround time"

"Our company is already doing some electronic reporting. Payroll for example"

"With electronic processing, we should be able to get permits that are accurate any time of day."

"We are a progressive company."

"Time to prepare"

"Speed"

"Quicker turnaround, more accurate"

"I have heard of this and think it could speed up the process greatly"

"I believe this would allow us to obtain the credentials faster and keep monies in house."

"Because we are a computer literate company that already accesses use of computer to computer communication w/ other reporting agencies that we work with"

"Would probably start using it, but would be concerned about information being lost or not received"

"Time savings"

"Time factor"

"Saving time in the big picture is important"

"Save time, cut costs."

"Save time"

"It sounds interesting but VA does a good job of helping me acquiring the credentials I need. I might try it if offered."

"Fill out form on paper, go online, fill it out again. Takes more time"

"Save time"

"We have other similar systems that work well"

"Faster response from states. We could be assured of the information being received by the states."

"Anything to speed up permitting to get the trucks rolling faster."

"I believe it would speed up the process."

"Efficiency"

Score 4 to 6

"We know we'll eventually be conduction credentializing in this manner, so we might as well start now to become acclimated sooner."

"We are moving soon Another change will just add more opportunity for confusion"

"Size of company, we have capabilities but have not checked into computer filing."

"Immediate verification"

"Currently have a good internal method."

"Convenience"

"We are very small and do not see significant cost savings either way."

"We are phasing our company and have no need."

"Unsure of how the e-system works, in real time?"

"This does not represent a major portion of our operation."

"The cost of electric equip. in all locations for our Co."

"Small fleet."

"Satisfied with present method"

"Owned by ***xxxxx*** and theses issues are handled by corporate people"

"Our transport of HAZMAT is for our use only"

"No information about the process or equipment."

"New equipment requirements and cost"

"Just not sure how it would operate."

"It's fairly easy to go to the walk in and obtain permits etc."

"If it was uniform throughout the US it would be a good thing, but if it is an isolated affair it would only contribute to create more time consuming clerical functions."

"I will have to research more first"

"I do not have a computer at this time, nor do I have even the basic skills to operate one."

"I deal with 6 managers throughout the US. Some would be for it, others probably not."

"I am a one man show. I don't know enough about computers and everything is always done last minute."

"Depends on the capability of the software"

"Since our fleet is domiciled in many states we may try this procedure with one state."

"Unsure how titling of new vehicles would be done."

"I would have to see the program before I could answer this question"

"Not sure of improvement from state as to what permits needed"

"We do not have complete control over that decision"

"NA to our business"

"We are not equipped to handle this type of transaction."

"Work is done at corporate office and they are slow to change methods sometimes."

"It is not an issue which is under discussion"

"Employees view any change as bad"

"I doubt our company would because we're so small."

Score 1 to 3

"Wouldn't move that quickly"

"We don't find it necessary"

"Privacy"

"Oregon DOT is extremely efficient and particularly well managed. The service they give now is hard to beat."

"I need to be on the internet."

"Don't like computers."

"At present just don't want to. Can already with KY but don't – use fax"

"I feel that our current method works just fine. We have a large fleet and 1.5 people doing it."

"Because of the size of our fleet."

Score 0

"Wouldn't use it"

"We only operate in Oregon."

"We have one interstate vehicle- It would be too much trouble for one vehicle"

"We are not interested in computers in any way."

"We are not a trucking company."

"Too small of a company to benefit from this"

"Size of fleet, and number of states we operate in."

"Shutting mill down, going out of business. Thanks to Bill Clinton."

"Our vehicles requiring permits are leased and the lessor provides permits"

"Not necessary for one truck"

"New procedure would initially require more time"

"It would cost our company too much money."

"Have no problem now."

"Do not have time to train office help to do this type of work."

"Cost of hiring input operators and making room for them, training costs"

"Computer not hooked up to phone line."

Q: Either from your own experience, from what you have heard from others, or just from your own expectations, are there any ways in which you expect adopting electronic credentialing might change the ways in which your firm does business, positively or negatively?

"Would be more trouble than necessary."

"Would be a positive change mostly due to our customers and prospective customers requiring it."

"We would probably wait until closer to the expiration date to submit the applications and fees."

"We would expect to obtain credentials (permits) faster"

"We will never use it."

"We are too small to consider – in size and size of trucks."

"Timely processing"

"Time"

"The change could be positive, with a 24 hour 7 day/wk availability, + holidays. Every time I need something it is after hours, a weekend, or a holiday. Only because my usual time is tied up during normal work hours trying to make at least a little money!"

"Speed of overall cycle. The dollar cost is the same."

"Small percent less time involved. Hopefully less paperwork and quicker last minute changes in fleet motion."

"Should be able to confirm receipt"

"Quicker"

"Probably more accurate reporting. Maybe more efficiency"

"Probably not"

"Presently, the types of permits needed are obtained instantly thru outside firm. Or annual permits (IFTA and SSR) are pretty timely"

"Positively, your credentials would get to us in a timely manner instead of the mail."

"Not having to make trips to party entry. Getting them more quickly"

"No significant change, simply electronic with less paper."

"No change in the way we do business."

"More efficient renewal process. Cut costs"

"Make things simpler. Make credentialing less redundant"

"Less reliance on mail"

"It took more time. Very disappointed. Form hard to follow. Had to do twice. Forms should be simple. Response should be quicker. I had to call to see if they were processing. No verification of receipt of info."

"It is still important to talk to someone for help, not just get a machine."

"Improved productivity."

"I would expect a minor time savings in a very small part of our business."

"I look forward to a quicker, cheaper, more effective way to deal with state agencies for credentials"

"I have not heard of this until I had seen this survey form."

"I don't expect any "changes" as far as the way we do business. It will save clerical time and paper."

"Heavy truck licensing and registration in NM is a joke. Anything will help."

"Faster, maybe. If it is faster, I might not license units until needed, instead of licensing for full year."

"Electronic files, not paper"

"***xxxxxx*** from ODOT tells me I will be able to access services outside of 8-5 business hours and save money from my employee time sated *(sic.)* . . . less standing in line too."

"Can provide and print our own temporary operating permits."

"Better time efficiency. More reliable than mail."

"Would be helpful in titling, permitting and leasing. Enabling us to lease and operate trucks faster."

"Turnaround time in receiving permits"

"Timely notifications and accuracy of state maintained data."

"Speed the process, save postage."

"No change. However, this may allow us to put new trucks into service quicker. This would have value"

"Improves turn around time"

"Improve turn around time to receive credentials. Lower postage costs/copying cost/employee time spent on credentials"

"I would say that it would speed up the issue process of over dimensional permits. Maybe we could electronic recognition of issued permits so as not to mandate the carrying of actual hard copies."

"Faster, less paper."

"Electronic filing have deadlines. Computers go down, and can't get online. This would require training on state levels and company levels. Owner operators would have a hard time getting access to computers."

"Cost savings and time efficient"

"Accessibility + speed"

Q: State motor vehicle agencies are charged with enforcing state and federal laws to ensure the safety and compliance of commercial vehicles operating on the highways. If you could suggest or make changes to the ways in which roadside inspections are typically organized and conducted, that wouldn't lead to more unsafe vehicles on the roads, what would be your highest priorities?

"Make sure all inspectors have proper training of the federal regulations if they are to be inspecting commercial equipment and drivers."

"Have stickers issued with date of inspection."

"Rest times for drivers."

"If vehicle has a current COSA sticker it should get a pass."

"We do away with roadside and go to 3 or 6 month fed inspection by state approved inspection station. At best if a problem is found, it could be repaired on the spot and not @ premium on the road."

"No change suggested."

"Make inspectors more aware of what drivers go thru everyday on the road. Get rid of inspectors who continually harass drivers and have complaints against (them)."

"Need a better way of gathering information from all states. Information on our profile is incomplete."

"None"

"The criteria for deciding which vehicles to stop. DMV officers need additional training regarding "driveaway" US freight moves."

"Consistency"

"No opinion, we only travel in Maryland and Virginia"

"To see the sites moved around. Not always at the same location at the same time."

"More officers inspecting and less pulling carriers over on the road. Advertise, publish, and mail regulation changes. Also include a copy of the fed. Motor carriers Reg booklet to all carriers to make the regulations known."

"Probable cause for a vehicle stop. When backlog of trucks is present, close down inspection until vehicle traffic thins out, rather than requiring drivers to sit and wait for their time to be inspected."

"Nothing at this time"

"Terminal inspections: this would increase the number of safe trucks on the road and give roadside inspectors more time for random inspections."

"Check drivers" hours of service. We are in the process of changing this and I don't feel we are enforcing the ones we have. Check out of service items on vehicle."

"If I am inspected, please place a sticker on my truck so that I will not have to be inspected four times during the same day."

"Do not let scale houses back trucks up on interstates – safety hazard."

"Many times, it is the attitude of the state employee – they should be there to help rather than sometimes seem to be punitive in their work. Sometimes I feel they are unreasonable at demanding repairs"

"Type of people that are used are poor. They are very poor on knowledge of laws. Stricter ways of knowing the laws, send them to school once every six months for training and updating the laws."

"Check more vehicles with no names, DOT numbers, and home (city) identifications."

"No suggestions. I think the systems implemented at this time are appropriate."

"To have it conducted the same for out of state trucks as it is conducted on in state trucks. I.e., (California) I think and feel that all Cal. Instate trucks are not looked at the same."

"Current criteria appears to be effective."

"Enforcement of allowing drivers to catch up logbook in 15 min.s. DOT allows 15 min.s but state agencies ignore this for the money they get from the driver. Enforcement on equal basis by state."

"Ensure all states inspect to the same standard."

"Listen to CB radios and find the ones that pull off or divert to another road to by-pass inspections."

"Set up inspection stations (mobile) on smaller state highways used to avoid stations."

"Use performance based standards to determine which vehicles to inspect. Target carriers with unsafe histories. Speed up process"

"Make process uniform – each state should recognize an inspection done by another state. Currently we have cases of the same truck being stopped by each state on the same trip."

"Train the inspectors better, most are OK but some are downright pathetic."

"Accurate carrier info, they keep using old or incorrect ICC #'s addresses, etc. Accurate vehicle info – they often fail to fully or correctly identify which vehicles were inspected."

"Open inspection stations for longer hours and inspect work vehicles"

"Current system is fine."

"Start enforcing the speed laws on the highways: Truckers do not get stopped"

"Have a better way to check drivers for drugs so you can take them out of trucks right away."

"I'd like (electronic or other) photos/example of any violation"

"Inspections made at locations where there is enough room to have vehicles in a safe place to do an inspection."

"All states agree on and stick to the DOT rules and regulations for commercial vehicles. In one state I'm told one thing and one state over I'm told something totally different."

"Do away with By-pass system because some things could be caught at the inspection stations."

"Make certain they're done at a safe inspection station, not on the side of the highway - Unsafe!! Inspections and penalties should be uniform – many inspectors know the regulations and are objective and yet fair. However there are quite a few who misunderstand regulations (especially hours of service)"

"None"

"Not applicable to our company"

"Consistency across country. Inspectors have the ability to check and see how many times a vehicle has been stopped and how often as the outcome of those inspections so as not to do the same one over and over unless there are pro. . ."

"The inspection process is OK and improving. Progress is needed in consistent application and interpretation of FMCSR. Improved vehicle knowledge is needed by inspectors. CVSA is addressing these issues. The inspection violation correction procedure needs improvement – too slow and the agency that issues the violation must admit error to make correction."

"Just the way it is presently being done at this time is fine. I was stopped 4 yrs ago at a Medford scale, and inspected. The inspector said I had a air can leaking on a trailer axle. I could not hear it and had two mechanics listen to it and spray it with soap. . ."

"More portable activities"

"When they don't find a problem with a truck send him on his way! They spend extra time looking for things that don't affect safety in any way."

"Provide adequate training in order to insure that regulations are interpreted consistently in all jurisdictions."

"Once a vehicle has passed an inspection it should not be re-inspected by another state the very same day. The first inspection should be accepted by the second state."

"Officers be consistent in who they are relaxing to driver regarding regulations."

"None"

"No changes needed"

"More mobile inspectors. Electronic transmission of inspection results to operating carrier instead of delaying on driver to send form to carrier."

"Make more inspections on secondary and inter city roads where many poorly maintained vehicles operate."

"It's about 85 percent only to generate revenue, and 15 percent for safety."

"Issue tickets to vehicle owner rather than carrier or driver. Do level 1 inspections even on vehicles that are likely to have no defects."

"Increasing inspections for those operators with historically poor inspections (drivers and vehicles). Make uniform the bridge laws throughout the US"

"Fines and enforcement predicated on repeat offences to get the bad actors off the road. More repeats, higher fines."

"Enforcement of current laws."

"Eliminate conducting inspections on side of roadway. Move to secure/safe area away from traffic to protect officer and driver. Eliminate waking a driver at rest stop to conduct an inspection, or making an inspection while driver is in sleeper berth."

"Educating state enforcement personnel as to regulatory compliance along with interpretation of the regs. Many issue unwarranted citations or warnings. State enforcement is more often than not inconsistent with federal regs."

"Do the inspection and paperwork even if you find nothing wrong with the vehicle. I would make sure all officers know the rules and regulations and know what they are looking at during the inspections."

"Consistency between all states in violations, fines, and amounts of fines."

"Conduct inspection on equipment with highest O/S violation."

"An annual training publication to remind drivers of their requirements."

"All states should require state inspection at least twice a year."

"A mandatory yearly inspection at a setup inspection center this would save a lot of time."

"The line in a rural area & roadside checks, plus roadside checks can be easily circumvented by unsafe vehicles. I would think if the laws could be streamlined and simplified for small fleets there would . . ."

Q: Some places are beginning to use a new method of roadside screening that is sometimes called "***Mainline screening***." . . . In your opinion, what are the most important reasons for or against your company participating in a program like this?

"I don't see how this program would apply to our firm, the drive away tow away operations."

"We don't have any information on this type of program. What costs are involved?"

"Wear and tear on equipment, better driver attitude."

"Expense and frequency of use. System is set up to make money for the state and let the bigger operators with cash off the hook so the state can concentrate on hammering the small operator who can't d . . ."

"Broad-range coverage"

"We don't have money to do this"

"It would cut down on lost time for drivers as long as we maintained our proper maintenance program"

"We feel like it will not be effective until all states are participating."

"With traffic backed up at weigh scales, the transponders save drivers a lot of time by continuing at highway speeds."

"Drivers save time on the road. If the scale has Prepass set up, they are given the green light to go through the scale without stopping."

"Needs to be one system instead of two"

"Expenses"

"For those of us who are safe carriers it probably would be beneficial. However, we are all concerned about too much big brother."

"Costs is a reason against. If the cost was lower, it would benefit us, not only in the time spent at inspection station but in lack of paperwork."

"Cost for transponders and inspection, as screening doesn't check current driver logs or status"

"We know some of these programs exist but do not have enough specific information to comment."

"Safety is #1 in our company. Why should we have to pay for this program at all? The poor carriers should be required to pay. Where is the incentive for being proactive in safety!!"

"Time savings"

"Cost"

"Less time sitting in inspection stations"

"It is still experimental, it is only good in Oregon, CA & OR will not accept each other's transponders. Our trucks are close enough to the weight limits that they have to weigh anyhow. We also don't . . ."

"Cost of transponders"

"None"

"Recognition of good record saves time"

"Drivers may feel that they can put off repairs until a later time."

"Eliminates needless, duplicate, inspections. Random system is still in place to make certain a representative group is samples."

"Cost"

"It doesn't really affect us since we haul basically locally and don't cross scales that often."

"We haven't determined a benefit. The systems need to be expanded and more states need increased participation. We continue to monitor progress."

"I don't need big brother watching me."

"I haul gravel locally, I seldom cross scales"

"HELP charges a fee per pass and you can't use their transponder in other states. Norpass doesn't work anywhere."

"Money talks . . ."

"Time spent with inspections doesn't warrant the expense for the transponder, we have a good safety record."

"We are 85 percent owner operators."

"Just because a Co. has a "good" rating and enough money for the program does not make them safe."

"Allows us to save time and avoid extensive stops. The incentive is for the driver not to go around the scales"

"Currently using EZ pass for tolls. NY is now starting to use EZ pass times to mail speeding tickets. Our drivers are given plenty of time to work, but I feel this is a "big brother" type of thing."

"Time savings"

"Don't think I should be charged on any basis for having a good safety record. That would allow our trucks to pass."

"We transport over-dimensional loads as a private carrier because of permit issues. I would imagine we will always be singled out for inspections. Otherwise I would openly accept the program."

"Time saving advantages to the driver."

"We don't operate that many over-the-road trucks"

"This has the feel of states trying to pry more money out of the industry without having to take the trouble to dispatch an auditor."

"The cost of inspecting all our vehicles plus I can see that certain vehicles could be charged several times during a year which would amount to additional cost to that vehicle."

"Saves aggravation and waiting by drivers who have to waste a lot of time. And already waste a lot of time at shippers" and receivers" docks."

"Less time waiting for the driver, increased fuel economy, driver satisfaction. The down side is the "clear" DOT inspection that may have been obtained impacts the company ratios for overall compliance."

"Just another government control."

"Cost"

"Cost"

"Cost"

"As we have a very good inspection record, this system allows us to save substantial time otherwise spent on inspections. The time savings appear to be greater than the cost to us of the program."

"Make vehicles safe"

APPENDIX C.5:

DRIVER SURVEY METHODOLOGY

APPENDIX C.5: DRIVER SURVEY METHODOLOGY

Intercept Locations and Times

The fieldwork aspects of this survey were handled by the specialist survey staff of Battelle's Centers for Public Health Research & Evaluation, under the direction of Ms. Louise Glezen.

The intercept locations and times were selected primarily to provide a relatively large number of potentially eligible respondents. We focused on two states that have made significant CVISN roadside inspection and enforcement innovations, and have been the focus of complementary evaluation activities: Connecticut and Kentucky.

We chose to concentrate on some of the largest commercial truck stops (or public rest areas used extensively by truckers) in the two states. After investigating the appropriateness of a number of candidate sites and contacting their management staff to request permissions, the four sites selected were:

- State-operated *Welcome Center* (westbound) & *Rest Area* (eastbound) near Willington, Connecticut, I-84, near exit 70

- *New Haven 95 East Truck Stop*, Branford, Connecticut, I-95, exit 56

- *Flying J Travel Plaza #05400*, Walton, Kentucky ,I-75, exit 171

- *Clays Ferry Travel Center*, Richmond, Kentucky, I-75, exit 97 (South Clays Ferry Road)

The fieldwork in Connecticut was carried out on November 28-29, 2000, and that in Kentucky on December 5-6, 2000 (a Tuesday and Wednesday of two successive weeks).

Respondent Quotas

We determined that for the purposes of this qualitative study, a total of 50 to 60 completed interviews would suffice; that is the equivalent in respondent numbers of between five and seven focus groups, the most familiar form of qualitative research. Respondent quotas were set so as to represent drivers from firms of different sizes, using the UMTIP Midwestern data as a rough guide in setting the targets. The quotas were:

- owner-operators responsible for their own credentialing – 20 respondents;
- firms with 39 or fewer drivers – 13 respondents;
- firms with 40 to 499 drivers – 15 respondents;
- firms with 500 or more drivers – 12 respondents.

These quotas were to be split approximately equally across the two states.

Based on the UMTIP survey experience, we offered a $20 incentive payment for completed interviews. Following UMTIP, we were also prepared to make appointments for fallback telephone interviews at a more convenient time, in case the quotas proved difficult to achieve. This gave us an opportunity, at least in theory, to speak with drivers who have relatively high values for time savings and are unwilling to participate in an interview at the time of interception. *A priori*, we would expect such drivers to have a higher than average interest in reducing the time spent in roadside inspections and weight checks also.

In practice, it did not prove difficult to make the quotas. When initially intercepted, the refusal rate of drivers unwilling to participate in the screener questionnaire was quite low.

APPENDIX C.6:

DRIVER SURVEY INSTRUMENT

APPENDIX C.6: DRIVER SURVEY INSTRUMENT

The following pages set out the semi-structured questionnaire used in the rest stop interviews. It is in two parts: first, the "screener" instrument used in intercepting drivers and qualifying them for interview, and secondly, the interview itself.

CVISN
Commercial Vehicle Information Systems and Network
Truck Driver Questionnaire

INTERVIEWER ....

STATE: KY CT SITE: 1 2

INTERCEPT POINT: ________________

TYPE: OWNER FIRM -39 40+ 500+

1. First, I want to ask you about the roadside weight and safety inspection stops you've made in the last *six* months. In which states have you been weighed or inspected during the *last six* months? CODE ALL THAT APPLY. PROBE: Any other states?

AL	AZ	AR	CA	CO	CT	DE	FL	GA	ID	IL	IN	IA	KS	KY	LA
ME	MD	MA	MI	MN	MS	MO	MT	NE	NV	NH	NJ	NM	NY	NC	ND
OH	OK	OR	PA	RI	SC	SD	TN	TX	UT	VT	VA	WA	WV	WI	WY

2. From your point of view, are there any states where weight and safety inspections are handled significantly better than others? CODE GOOD STATES.

3. And are there any states where you think weight and safety inspections are handled poorly? CODE POOR STATES.

   A. What types of differences between the states makes a state particularly good or bad? PROBE: Any other reasons? _____

4. State motor vehicle agencies are required to enforce state and federal laws to ensure the safety and compliance of commercial vehicles operating on the highways. If you could suggest or change the ways in which roadside inspections are typically organized and conducted, that wouldn't result in more unsafe vehicles on the roads, what would they be?

   A. Which of your suggestions would you rank as most important? PROBE: 2nd? 3rd? ________________

5. Some places are beginning to use a new method of screening trucks for weight, safety, and proper credentials sometimes called "mainline screening" or "electronic screening." This is where an electronic transponder on board your truck allows the enforcement officials to identify your vehicle as you travel along the road at highway speeds. Vehicles operated by carriers with good records are less likely to be signaled to pull in or stop for safety checks. The programs like this that are best known are the NORPASS program, the HELP PrePass program, and the Oregon Green light program.

SHOW CARD A. Please look at this card and tell me which one of the statements best fits your personal experience of mainline screening. CODE ONLY ONE.

NEVER HEARD OF MAINLINE SCREENING..(SKIP TO 8)1

HEARD OF IT, BUT PERSONALLY USED IT OR TALKED WITH ANY DRIVER WHO HAS ....(SKIP TO 8)2

HEARD OF IT AND TALKED WITH DRIVERS WHO HAVE USED IT................(SKIP TO 7)3

R HAS PERSONAL EXPERIENCE USING MAINLINE SCREENING.............. (CONTINUE)4

DK/CAN'T SAY ....(SKIP TO 8)8

6. Since you've had experience using mainline screening, can you please tell me about your experiences? For instance, can you tell me on how long you've used it, in which states, has it been with your current company or past companies, etc.? PROBE : Which states. How long? With current company? Past company names. If in the past, how long ago was it? Was it the NORPASS program (one payment per year), or the help PrePass program (charge per inspection site passed) or some other program?

____

____

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____

____

7. From what you have heard from other drivers, how well does mainline screening work? What are the good things about it? What about any bad things?

____

____

____

____

____

GOOD: ____

____

BAD: ____

____

SKIP TO 9.

8. From your viewpoint as a driver, what do you think about mainline screening? PROBE: Do you think it is a good idea or a bad idea? Why? What things would like most about it? What things would you like least? Why?

____

____

____

LIKE MOST: ____

____

LIKE LEAST: ____

9. Other safety screening changes being introduced in some states increase the amount and timeliness of the information available to roadside enforcement staff. For example, in many states they can quickly check the safety history of a particular carrier, so as to target most inspections on the highest-risk carriers. In some places, current information on a specific vehicle is available (including recent inspection results), so that violations of out-of-service-orders can be identified quickly.

Before I told you just now about the computerized information that is available to some roadside inspectors, were you aware that some inspection sites had current information about each **trucking company's** safety history?	YES........1 NO........2 DK/NOT SURE........8

A. And before I mentioned it, were you aware that some inspection sites had current information about the condition and compliance of individual vehicles?

YES	1
NO	2
DK/NOT SURE	8

IF R IS AN OWNER-OPERATOR (SCREENER QUESTION 7=2), SKIP TO 11. OTHERS CONTINUE.

10. I'd like to understand whether it's *you*, the truck driver, or *your company* that benefits most if the time you spend in roadside inspections gets reduced. Are you paid by the hour or paid the same amount no matter how long the trip takes you?

BY THE HOUR	1
BY THE TRIP	2
DK/CAN'T SAY	8

SKIP TO 18

OWNER-OPERATORS ONLY WHO HAVE NOT HAD PERSONAL EXPERIENCE WITH ELECTRONIC SCREENING:

IF SCREENER QUESTION 7=1 AND QUESTION 5=4 SKIP TO 13.

11. Suppose that within the next twelve months you had the opportunity to start using mainline screening in at least one of the states through which you travel regularly. How likely would you be to do that? Do you think that you would be very likely, somewhat likely, somewhat unlikely, or very unlikely to participate in mainline screening?

VERY LIKELY	1
SOMEWHAT LIKELY	2
SOMEWHAT UNLIKELY	3
VERY UNLIKELY (SKIP TO 13)	4
IT WOULD DEPEND ON THE COSTS, ETC.	5
DK/CAN'T SAY	6

12. If you were to decide to participate in a mainline screening program, would you prefer to pay a fixed amount per truck per year for an unlimited number of uses in each state for which you are covered, like the NORPASS program, or to pay each time your truck passes a participating inspection station, like the HELP PrePass program? CODE ONLY ONE.

PREFERS ANNUAL FEE PER TRUCK BASIS	1
PREFERS FEE PER INSPECTION SITE PASSED BASIS	2
IT WOULD DEPEND ON THE COSTS, ETC.	3
DK/CAN'T SAY	8

13. I've got a few more questions about a different subject —the time you spend in getting the necessary permits, credentials, or stickers to be allowed to operate your vehicle in various different states. I'm talking about things like IRP or IFTA credentials, oversize/overweight permits, and so on. In an *average year*, what would you estimate to be the total number of staff hours your firm spends in obtaining credentials and stickers, including any time spent traveling to or from registry offices?

EST TOTAL ANNUAL LABOR HOURS ..... |__|__|__|__|__|

14. And if we disregard the money and fees you pay for the permits themselves, do you have any other out-of-pocket costs for obtaining permits, credentials, or stickers? For example, some owner-operators hire other companies to handle the paperwork for them, or there may be costs from sending or faxing the forms or going to registry offices. Do you have any costs like that? If so, about how much do you have to spend in the average year? PROBE: You're sure that doesn't include the costs of the permits themselves, just the extra costs you incur to obtain them?

ESTIMATED TOTAL ANNUAL OUT-OF-POCKET COSTS... |__|__|__|__|__|__|

15. Some states are now using electronic, computer-to-computer, methods for obtaining credentials or permits. This electronic credentialling is the situation where you would send your information electronically direct to the state's registration agency, not to an outside company who would then file the application on your behalf.

HAND CARD B. Please look at this card and tell me which of these statements best fits your own experience of electronic credentialling. CODE ONLY ONE.

NEVER HEARD OF ELECTRONIC CREDENTIALLING BEFORE	(SKIP TO 18)	1
HAVE HEARD OF THIS, BUT NOT PERSONALLY USED IT NOR TALKED WITH ANY DRIVER WHO HAS	(SKIP TO 18)	2
HAVE HEARD OF THIS, AND **HAVE** TALKED WITH OTHER DRIVERS WHO HAVE USED IT	(SKIP TO 17)	3
HAS PERSONAL EXPERIENCE WITH USING ELECTRONIC CREDENTIALLING	(CONTINUE WITH 16)	4
DK/CAN'T SAY	(SKIP TO 18)	8

16. What was your personal experience using electronic credentialling? PROBE: In what states? Which types of permits or credentials?

17. From what you have heard from other drivers, how well does electronic credentialling work? What are the good things and the bad things about it?

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____

GOOD THINGS: ____

____

BAD THINGS: ____

____

____ **SKIP TO 19.**

18. From your viewpoint as an owner-operator, how interested would you be in finding out about electronic credentialling if it became available for you to use to get permits? Do you think it would be a good idea or a bad idea? Why? What things do you think you would like most about it? What things would you like least? Why?

____

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19. That's my last question. Your answers have been very helpful; thank you very much. Here's the $20 I promised you; I just need to get you to sign my form to show that you have received it.

HAVE R ENTER HIS/HER NAME AND PHONE NUMBER ON THE NEXT LINE OF THE RECEIPT FORM, AND SIGN FOR THE MONEY.

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APPENDIX D.1:

LITERATURE SEARCH ON VALUATION OF CVISN BENEFIT MEASURES

APPENDIX D.1: LITERATURE SEARCH ON VALUATION OF CVISN BENEFIT MEASURES

D.1.1 INTRODUCTION

This chapter describes the monetary values of various measures of CVISN's possible benefits to the operation of trucks on highway facilities. Many of these benefits are in natural units other than dollars (e.g., reduction in the number of accidents). Therefore, we need to monetize these measures so that a comprehensive benefit-cost analysis of the CVISN program can be undertaken. Other chapters in this report have examined the effect CVISN has on costs to state administrators and to motor carriers.

CVISN involves improvements to the process of obtaining permits and selecting and processing trucks for inspections through electronic screening, weigh-in-motion (WIM) devices, and checking for compliance with permits issued. Therefore, it can be expected that CVISN will lead to a reduction in the number of truck-related *crashes* and to a reduction in the number of *vehicle hours* traveled as eligible trucks are allowed to by-pass various types of inspections. Savings in vehicle hours traveled affects the cost of operating the trucks, the time value of the goods being transported, and the *air* and *noise pollution* emitted by the trucks. Information on these unit costs is a necessary input to valuing the benefits of the CVISN program. Therefore, the following is a list of the measures for which unit values have been found in this literature review:

- Truck Crash (total value)
- Truck Value of Time
- Air and Greenhouse Gas Emissions
- Noise Pollution.

In addition to providing information on unit costs, we have also been able to research the times associated with various aspects of truck inspections that CVISN is expected to avoid or shorten (e.g., inspection times, out-of-service times, etc.). By applying our unit values of time and pollution (emissions) to these activities, we also value the savings associated with various CVISN activities.

We begin by reporting the results of a detailed review of the literature on the unit dollar value of a reduction in truck crashes (or accidents).

D.1.2 LITERATURE REVIEW

Value of Truck Crashes[1]

Early work undertaken by the National Public Services Research Institute (NPSRI) estimated the cost of crashes[2] of "large trucks" as $3.258 million *per incident* if it involved a fatality; $51,881 *per incident* involving a personal injury, and $3,295 *per incident* for a large truck crash involving property damage sufficient to require a towaway situation (all expressed in 1993 dollars; italics added).[3] After accounting for peculiarities in the data, and weighting by the frequencies of different types of crashes from the *Truck and Bus Accident Fact Book for 1994* produced by the Office of Motor Carriers (OMC),[4] the Volpe Center derived a weighted average (large) truck crash cost of $130,833 (in 1993 dollars). In arriving at this figure, the distribution of crashes used (based on data from the 1994 Accident Fact Book) were:

- Truck crashes with fatalities – 4,795
- Truck crashes with a personal injury – 56,000
- Truck crashes involving a towaway – 90,000.

Note that this source provides no information for truck crashes involving "property damage only" that did *not* involve a towaway. It can be expected that there were many "fender-benders" for which the property damage was small. Consequently, in comparing the total accidents used in this study with other sources, we conclude that the value used for property damage-only accidents appears not to include many such minor accidents. Accounting for this factor implies that this figure represents an upper limit to the average value of a truck crash. It also highlights the importance of using a consistent definition of a crash.

Although the definition of a "large truck" is not stated in this study, it is likely to be similar to the type of truck that would benefit the most from the CVISN program. The National Highway Traffic Safety Administration (NHTSA) defines a large truck as a vehicle with a gross

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1 At the outset, it is useful to note that a key finding of the literature search is that the amount of research on the value of crashes involving *trucks* (although increasing) has been limited. Much more literature is devoted to crashes involving automobiles than trucks. Nevertheless, an average truck crash value that *includes* all the significant benefit measures has been obtained (except for property damage to highway infrastructure, which, in any event, is relatively very small and can be ignored as "in the noise").

2 For consistency purposes, a few basic definitions are useful. Unless stated to the contrary, an *incident* or a *crash* is defined as an accident of any type or severity that involves any number of vehicles. A *crashed-vehicle* is defined as that amount of the total value of a crash (incident) that has been assigned or allocated to each vehicle involved in the crash. Thus, an accident involving two trucks (say) would imply 1 accident (or crash) and 2 crashed-vehicles.

3 Ted R. Miller, R.S. Spicer, D.T. Levy, and D.C. Lestina, "The Costs of Motor Vehicle Crashes: Cars, Trucks, Buses, Pedacycles, and Pedestrians," Working Paper, National Public Services Research Institute, October 1996, as cited in Volpe National Transportation Systems Center "OMC Safety Program Performance Measures", (Draft) 12/18/98.

4 Office of Motor Carriers, *Truck and Bus Accident Factbook 1994*, prepared by the Center for National Truck Statistics (University of Michigan Transportation Research Institute), October 1996.

weight rating of over 10,000 pounds, including single unit trucks and truck tractors.[5] Rates for fatalities, injuries, and property-damage only crashes were based on the Fatality Analysis Reporting System (FARS) and the National Automotive Sampling System General Estimates System (GES).

For completeness, the weighting from the 1994 edition of the *Truck and Bus Accident Fact Book* is based on a frequency distribution in which trucks are defined as "a motor vehicle equipped for carrying property and having at least two axles and six tires or a vehicle displaying a hazardous materials placard." This definition of a truck may be broader than what would be considered a "large truck". In any event, it is useful to note that the Federal Motor Carrier Safety Administration (FMCSA) has discontinued publication of the Factbook and relies strictly on statistics reported annually in its Large Truck Profile series.

Moses and Savage[6] derived a value of $118,211 (in 1992 dollars) for an average truck crash. Their estimate was based on a 1991 study by Miller[7], and also appears to be on a per incident rate with unit costs that are calculated on something other than a per incident basis. The unit costs for a typical truck accident reported by Moses and Savage are given in Table D.1-1.

Table D.1-1. Costs Associated with Truck Crashes

Type of Cost	Unit Cost (in 1992 dollars)
Fatality	$2,835,693
Incapacitation injury	$200,885
Non-incapacitating injury	$39,378
Possible injury	$20,181
Persons not injured	$2,055
Property damage	$11,960
Delays to other traffic	$758

Source: Leon N. Moses and Ian Savage, "A Cost-Benefit Analysis of US Motor Carrier Safety Programmes", Journal of Transport Economics and Policy, *January 1997.*

Based on the amounts shown in Table D.1-1, it is clear that "delays to other traffic", at only $758 per incident (in 1992 dollars) is quite small. Subsequent discussions on this subject[8] confirmed that this cost component of a truck crash is relatively inconsequential. Nevertheless, whenever possible, it should be included in the cost of a crash involving a large truck. Property damage associated with truck crashes is not small, and was estimated at $11,960 per incident. It

5 National Highway Traffic Safety Administration, "Traffic Safety Facts 1998: A Compilation of Motor Vehicle Crash Data from the Fatality Analysis Reporting System and the General Estimates System", October 1999.

6 Leon N. Moses and Ian Savage, "A Cost-Benefit Analysis of US Motor Carrier Safety Programmes", *Journal of Transport Economics and Policy*, January 1997.

7 Ted Miller, et al. (The Urban Institute), *The Costs of Highway Crashes*, Report No. FHWA-RD-91-055, October 1991.

8 Telephone conversation with Ted Miller by Tom Parody, CRA, 11/23/99.

is difficult to determine whether this value includes damage to highway infrastructure—one of the initial measures for which we sought disaggregate information.

Although encumbered by transferability concerns, an Australian study on the cost of truck accidents involving casualties recommended the use of values shown in Table D.1-2. This study reported an average truck crash value of $84,500 (in 1990 U.S. dollars), but was also able to disaggregate the information on truck crashes by truck type and location[9]:

Table D.1-2. Costs Associated with Truck Accidents (by Location and Type)

Type of Truck Accident	Australian Dollars	Unit Amount (in 1990 U.S. dollars)
All types	$130,000	$84,500
Rigid truck, metropolitan accident	$90,000	$58,500
Rigid truck, rural accident	$130,000	$84,500
Semi-trailer, metropolitan accident	$130,000	$84,500
Semi-trailer, rural accident	$200,000	$130,000

Conversion Rate: 1$ AU = 0.65$ US

Source: P.T. Cairney, "The Cost of Truck Accidents in Australia: Australian Truck Safety Study: Task 4," Australian Road Research Board, *Research Report ARR No. 204, June 1991.*

Losses to cargo were included in the unit values shown in Table D.1-2 and averaged about $13,000 (AU) or $8,500 (US). This is higher than the results of a study of the value of cargo loss in Canada that determined a very approximate value of CN $8,000[10] (or approximately $5,600 in U.S. dollars[11]). The Canadian value is similar to the loss of cargo value of $5,000 per truck accident included in Moses and Savage's $118,211 average cost per crash (in 1992 dollars).

A more recent analysis[12] of the cost of crashes by vehicle type along the lines of the work described by Miller, and by Moses and Savage above, developed an overall estimate of $72,000 per crash (in September 1995 dollars) for "other single trucks" (defined as "other single medium and heavy trucks …. (with) gross vehicle weight exceeding 10,000 pounds)". This average value is substantially less than the average value of a large truck crash cited above and appears to reflect differences in definitions of what constitutes a crash. That is, the universe of truck crashes in the database used in this later study is reported to be four times as large as other

9 P.T. Cairney, "The Cost of Truck Accidents in Australia: Australian Truck Safety Study: Task 4", *Australian Road Research Board*, Research Report ARR No. 204, June 1991.

10 D. Andreassen, "Trucks, Semi-trailers, and Motorcycles: Accident Costs", *Australian Road Research Board*, Research Report ARR No. 232, 1992.

11 Although the year was not reported, it is likely to be 1990 or 1991.

12 Ted R. Miller, Rebecca S. Spicer, Diane C. Lestina, and David T. Levy, "Is It Safest to Travel by Bicycle, Car, or Big Truck?", *Journal of Prevention and Injury Control*, Vol. 1(1), 1999.

truck-related crash databases. This suggests that it includes many more minor accidents. This later study with the lower crash costs does not breakdown costs by the categories used in earlier studies (e.g., property damage, personal injury, etc.), which then could be used to develop independent cost estimates or to undertake a benefit-cost analysis at a more disaggregate level.

The $72,000 truck crash value reported by Miller, et al., conveniently falls between a value of $66,370 for crashes involving single unit trucks and $89,400 for crashes involving combination unit trucks (both in 1997 dollars) reported by Wang, Knipling, and Blincoe.[13] Using average truck crash statistics that they report as being an average for the 1989-1993 period, the weighted average value for these two categories of truck crashes is $79,762. As with most other studies reported here, these estimates were derived using a 4 percent annual discount rate to reflect the decreased value of future economic loses (e.g., lost wages).

A continuation and further refinement of the Miller, at al., (1999) work is reported in a very recent study for the FMCSA.[14] In particular, based on what they describe as "comprehensive, economically sophisticated estimates of the costs of highway crashes involving large trucks…", *police-reported* crashes involving trucks with a gross weight of more than 10,000 pounds were computed to be $75,637 (in 1999 dollars). Great care was taken in this study to adjust the various input databases for known anomalies. Unfortunately, since cost categories were defined as medical cost, emergency services, property damage (defined to include "the cost to repair damaged vehicles, cargo, and other property…"), lost productivity from delays and other factors, and monetized "Quality-Adjusted Life Years (QALYS)", it is not possible to make a direct comparison to truck accident figures reported in the Truck and Bus Factbook or by the FMCSA.[15] However, as approximately 320,000 annual truck accidents are implied in the calculations reported, the database is more consistent with the latest FMCSA data, which has been used in this evaluation to calculate numbers of truck accidents avoided by CVISN. Thus, as long as consistency is maintained in the definitions used in this CVISN evaluation, this most recent Miller study appears to be the most reliable and useful source of the value of an average truck crash.

While it is not possible from their report (or subsequent phone conversations with both Miller and Zaloshnja) to develop a distribution of truck crash *types*, Table D.1-3 shows the categories of costs associated with truck accidents and their estimated values. Comparing Tables D.1-1 and D.1-3, the unit costs associated with injuries (both incapacitating and non-incapacitating) increased at a faster rate than the average change when compared to the values reported earlier for 1992. Conversely, there was a significant decrease in the unit value associated with property damage from truck crashes.

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13 Jing-Shiarn Wang, Ronald R. Knipling, and Lawrence J. Blincoe, "The Dimensions of Motor Vehicle Crash Risk", *Journal of Transportation and Statistics*, Vol. 2, Number 1, May 1999.

14 Eduard Zaloshnja, Ted Miller, and Rebecca Spicer (Pacific Institute for Research and Evaluation), "Costs of Large Truck- and Bus-Involved Crashes", prepared for the Federal Motor Carrier Safety Administration, November 30, 2000.

15 Federal Motor Carrier Safety Administration, "Large Truck Crash Profile: The 1998 National Picture", January 2000.

Table D.1-3. Value of Factors Associated with Truck Crashes

Type of Cost	Unit Cost (in 1999 dollars)
Fatality	$3,358,240
Incapacitation injury	$298,927
Non-incapacitating injury	$69,407
Possible injury	$26,527
Persons not injured	$1,596
Property damage	$3,913
Delays to other traffic	$10,993*
Unknown severity	$52,606
Unknown if injured	$12,278

* See text concerning an alternative scenario that was examined in this study in which travel delay costs were constrained to the values reported in Miller, et al., (1991).

Source: *Eduard Zaloshnja, Ted Miller, and Rebecca Spicer (Pacific Institute for Research and Evaluation), "Costs of Large Truck- and Bus-Involved Crashes", prepared for the Federal Motor Carrier Safety Administration, November 30, 2000, with calculations by Charles River Associates*

Most striking, however, is the increase in the value of "delays to other traffic" from the earlier 1992 result. As an alternative hypothesis, therefore, the authors elected to constrain the values for the delay component of truck crashes to those reported in Miller, at al., (1991). After doing so, the average value of a large truck crash was reported to be $64,985 (in 1999 dollars). Additional phone conversations with the study authors revealed that the authors favor this value, even though it can only be found in the appendix to the study and is not reported or referred to on the abstract page for this work. Therefore, based on the study authors' preferences, it is being adopted for use in the current study.

As reported in Table D.1-2 and Table D.1-3, the largest component of truck crash costs by far involves the value of a life for accidents involving a fatality. Based on a review and analysis of 50 reasonably credible studies that examined the value that people place on survival, Miller arrived at a $3 million figure for lifetime work and quality of life combined (in 1995 dollars).[16] This value appears to have been used in both the Miller and the Moses and Savage studies cited above.

In summary, both the total value and the components of crash costs involving trucks can vary in the literature based on a number of factors, including basic definitional issues. However, the overall value of $64,985 (in 1999 dollars) per truck crash appears to be the most consistent with the definitions being used in this study; is based on the latest study; and its lower value makes its use in this evaluation a conservative choice.

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16 Miller, Ted R., The plausible range for the value of life: red herrings among the mackerel., *Journal of Forensic Economics*, Vol. 3, 1990.

Note that the recommended average crash cost of $64,985 includes all the costs associated with a truck crash, with the possible exception of "property damage to highway infrastructure from an accident involving a CV." It should be clear by now that the most recent literature will not support separate cost estimates for this impact, nor will it support more precise (but not more accurate) crash cost estimates that vary by state, calculated assuming that the distribution of CVs involved in crashes varies with the state specific CV fleet composition.[17]

Value of CV transit time by type/size of CV

There is a small but growing body of literature on the value of time (VOT) associated with intercity auto trips, much of it written by CRA.[18] However, there is very little published on the VOT of trucks, perhaps because these are private costs in a competitive market. Truck VOT should include driver wages, truck operating and maintenance costs (including depreciation), and the time value of the freight being transported. Typically, the values of truck travel time in the CVISN literature are limited to the cost of the driver of the truck. For example, the benefit-cost study of the Maryland CVISN program[19] used a driver wage value of $23 per hour (year not stated, but likely in 1996 dollars) obtained from a TRB report.[20]. This is more than the average driver wage of $14.49 per hour (in 1993 dollars) used in the ATA Foundation study of the dollar value of benefits for electronic clearance.[21]

In addition, a study by Titus[22] gives the VOT for truckload (TL) trips as being either (1) the simple driver wage rate of $13.00 per hour (year not stated) or (2) the distance equivalent charge of $0.23 per mile (in 1991 dollars). This latter figure reflects the more common practice of using distance-based costs methods for TL travel. Titus states that less-than-truckload (LTL) wages are higher at $24.60 per hour (in 1991 dollars), although a different source is cited for this statistic. [No corresponding distance-based charge is used for LTL as he states that travel typically takes place between fixed terminals.] Restated in 1999 dollars, this time based value is $30 per hour – very similar to the $30.38 (in 1995 dollars) used for combination truck VOT in an ITS program evaluation in Indiana.[23]

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17 Also, the CVISN *Evaluation Strategy and Plan* dated August 27, 1997, called for reducing accident costs by the amount covered by insurance. Upon further reflection, this subtraction is not appropriate since reduced accident rates can reduce insurance premiums to everyone. BCA is a public sector evaluation tool, and subtracting insurance payments would not reflect the value of safety benefits to the *public* (i.e., to all carriers, with the savings passed on to shareholders, shippers and the costs to the public of the shipped goods).

18 Brand, Daniel, "The Values of Time Savings for Intercity Air and Auto Travelers for Trips Under 500 miles in the U.S.," Prepared for U.S. DOT, Office of the Secretary, Panel on the Value of Time for Use in Transportation Investment Valuation, June 1, 1996.

19 Bapna, Sanjay, Jigish Zaveri, and Z. Andrew Farkas (Morgan State University), "Benefit-Cost Assessment of the Commercial Vehicle Information Systems and Networks (CVISN) in Maryland", November 1998.

20 Transportation Research Board, "Assessing the Economic Impact of Transportation Projects: How to Choose the Appropriate Technique for Your Project", *Transportation Research Circular No. 477*, October 1997.

21 The ATA Foundation, "Assessment of Intelligent Transportation Systems/Commercial Vehicle Operations (ITS/CVO) User Services Qualitative Benefit/Cost Analysis", Report No. FHWA-MC-96-028, August 1996.

22 Titus, Matthew J., "Benefits of Electronic Clearance for Enforcement of Motor Carrier Regulations", *Transportation Research Record* 1522, 1996.

23 Latoski, Stephen, Raktim Pal, and Kumares Sinha, "A Cost-Effectiveness Evaluation of the Hoosier Helper Freeway Service Patrol", Purdue University, February 1998.

As noted above, a *total* truck VOT should include truck operating and maintenance (O + M) costs (including depreciation) along with the time value of the freight being carried. In a recent study[24], truck O + M costs (including depreciation) for TL carriers were given as $1.25 per vehicle-mile or 8.42 cents per ton mile (in 1994 dollars) based on operating and financial data compiled by the American Trucking Associations (ATA).[25] At an average speed of 50 mph, this implies a variable cost of $62.50 per hour (in 1994 dollars) or $70 (in 1999 dollars). Inventory costs are available from a study that presented an innovative method of estimating the effects of carrier transit-time performance on logistics cost and service.[26] That study estimated that for just-in-time service delivery, an average shipper is willing to expend $310 to reduce transit time by 24 hours (i.e., from 3 to 2 days). This implies an average unit cost of $12.90 per hour.

It is well known that just-in-time service implies a higher VOT, and that higher value goods are more likely to be transported by air.[27] Still, over all modes (i.e., but not including local package carriers and multiple mode goods), trucks represent the overwhelming majority (87%) of the value of all goods shipped,[28] with about 63 percent of the value of trucking and courier service being truckload shipments.[29] Thus, it is reasonable to use $10 per hour to represent the time value of goods shipped by truck. This is the same as Brand's 1994 time value for goods in large trucks of $10 per hour.[30] Adding this to the $70 presented above yields a value of $80 per hour for the *total* value of time savings of a truck. This is larger than the value of $50 per hour (year and components not explicitly stated, but the year is likely 1997) for commercial vehicles used in an evaluation of the CVISN pilot project in Washington State.[31] In any event, the $80 per hour VOT derived here (in 1999 dollars) appears to be reasonable and is the value we recommend for use in the current CVISN evaluation.

Value of air pollutants

With regard to the air pollution costs that are to be applied to the time savings per truck, it is important to note that the *amount* of air pollutants emitted from trucks is dependent on a variety of factors such as engine size and design, vehicle condition, speed, frequency of acceleration and deceleration, temperature, etc. In addition, the (dollar) *values* in the literature for truck emission rates are highly site specific and vary by significant amounts from study to

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24 Forkenbrock, David, "External Costs of Intercity Truck Freight Transportation", *Transportation Research Part A*, Vol. 33, No. 7/8, Sept./Nov. 1999.

25 American Trucking Associations, *1994 Motor Carrier Annual Report: Financial and Operating Statistics*, (Alexandria, Virginia), 1995.

26 Tyworth, John and Amy Zeng, "Estimating the Effects of Carrier Transit-Time Performance on Logistics Cost and Service", *Transportation Research Part A*, Vol. 32, No. 2, February 1998.

27 For example, see Federal Highway Administration, "U.S. Freight: Economy in Motion", FHWA-PL-98-034, May 1998.

28 U.S. Department of Transportation and the U.S. Department of Commerce, "1997 Commodity Flow Survey", December 1999.

29 U.S. Department of Commerce, "Motor Freight Transportation and Warehousing Survey: 1995", issued February 1997.

30 Brand, Daniel, "Criteria and Methods for Evaluating Intelligent Transportation System Plans and Operational Tests", *Transportation Research Record No. 1453*, 1994.

31 Washington Department of Transportation, "Information Technology Feasibility Study for the Washington State Commercial Vehicle Information Systems and Networks (CVISN) Pilot Project, January 8, 1998.

study. In almost all instances, unit costs in the literature for amounts of air pollution are expressed either as a function of (1) vehicle miles traveled or (2) weight times distance traveled.

With regard to the *rate* at which different types of air pollutants are emitted, a recent TRB study[32] used EPA's Mobile 5 model to develop emission rates for a diesel heavy truck. The resulting values are shown in Table D.1-5.

Table D.1-5. Pollutant Emission Rates from Heavy Diesel Trucks (grams/mile)

Truck Speed (MPH)	PM10	NO_x	CO	VOC	SO_x
10	1.43	18.96	22.26	2.36	0.58
20	1.43	14.52	12.13	2.36	0.58
30	1.43	12.81	7.93	2.36	0.58
40	1.43	13.03	6.22	2.36	0.58
50	1.43	15.28	5.85	2.36	0.58
60	1.43	20.64	6.61	2.36	0.58

PM10 = Particulate matter less than 10 microns in diameter
NO_x = Nitrogen oxides
CO = Hydrocarbons/carbon monoxide
VOC = Volatile organic compounds
SO_x = Sulfur oxides

Source: Transportation Research Board, Paying Our Way: Estimating Marginal Social Costs of Freight Transportation, Special Report 246, 1996.

These emission rates are based on a heavy truck in motion. However, for heavy-duty diesel trucks that are idling (e.g., waiting for an inspection), EPA[33] has estimated the following average values (i.e., over summer and winter conditions) in *grams per hour* for a heavy-duty diesel vehicle: NO_x = 55.8, CO = 94.3, VOC = 12.6, and PM10 = 2.57. Fuel consumption for a typical truck that is idling has been estimated at 0.5 gallons per hour.[34]

Others have calculated emission *rates* for heavy-duty diesel trucks that are comparable to those above, but they add carbon dioxide (CO_2) in a separate category – "greenhouse gas (GHG) emissions" -- since some do not view CO_2 as air pollution. Recognizing the great uncertainty of the cost to society of GHG emissions, Forkenbrock[35] has estimated a GHG (only) emissions value due to truck operations of 0.15 cents per ton-mile based on the amount of CO_2 discharged

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32 Transportation Research Board, *Paying Our Way: Estimating Marginal Social Costs of Freight Transportation*, Special Report 246, 1996.
33 Environmental Protection Agency (http://www.epa.gov/oms/consumer/f98014.htm).
34 "Electronic Diesels and Other Ways to Improve Fuel Economy", *Commercial Carrier Journal*, April 1993, as cited in Office of Technology Assessment, *Saving Energy in U.S. Transportation*, OTA-ETI-589, July 1994.
35 Forkenbrock, David, "External Costs of Intercity Truck Freight Transportation", *Transportation Research Part A*, Vol. 33, No. 7/8, Sept./Nov. 1999.

for each gallon of diesel fuel used (22.8 pounds), the fuel economy of an average truck (5.2 mpg), and the GHG value of CO_2 ($10 per ton).

In order to develop a dollar value for the non-GHG emissions shown in Table D.1-5, it is necessary to determine the dollar cost per unit weight for different pollutants. This has been done in a number of studies, but they typically deal with urban area values since "nonattainment" is mostly an urban or metropolitan area concern. Inspection stations, however, are in rural areas. To highlight the differences, Table D.1-6 summarizes "damage value" estimates for various air pollution emissions in 9 U.S. *urban* areas[36] along with values that have been averaged over 2,233 *rural* counties derived by Forkenbrock based on data from Haling and Cohen.[37]

Table D.1-6. Estimated Average Emission Values (in dollars per ton)

Emission Type	Urban Areas* (1989 dollars)	Rural Areas (1994 dollars)
NO_x	$4,700	$218
ROG	$2,400	$385
PM10	$5,600	$3,943
SO_x	$2,800	$263
CO	N/A	N/A

* Simple average over 9 US urban areas
ROG = Reactive organic gases (mainly differs from VOC in that it includes ethane[38])

Source: Michael Q. Wang and Danilo J. Santini, "Monetary Values of Air Pollutant Emissions in Various U.S. Regions", Transportation Research Record, 1475 (1995).

Given the earlier data on emission rates, we can combine these with the air pollution values and the separate estimate of the value of CO_2 emissions. Using the emission values for rural areas, a heavy duty diesel truck traveling at 60 mph emits air pollutants (including GHG) at a rate of 0.262 cents per ton mile or $2.33 per hour (in 1999 dollars) assuming an average truck load of 14.8 tons.[39] Conversely, an idling heavy-duty diesel truck emits air pollutants with a value of $0.099 per hour (in 1999 dollars). This idling value, while not zero, is much less than the $2.33 figure since no energy is being expended to move the truck and its freight.

Value of Noise

There is general agreement in the literature that transportation is a major cause of noise pollution. Similarly, there is agreement that the value of noise pollution is greatly influenced by

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36 Michael Q. Wang and Danilo J. Santini, "Monetary Values of Air Pollutant Emissions in Various U.S. Regions", *Transportation Research Record* 1475 (1995).
37 Haling, D., and H. Cohen, "Air quality cost analysis spreadsheet", 1995.
38 Ethane is solely a product of combustion. According to the January 17, 1997 issue of the *Federal Register*, VOC accounts for 98.5 percent of combustion.
39 ATA, 1995, op. cit.

factors such as traffic characteristics, roadway geometry, vehicle type, speed, and land use/density. It has been noted that trucks have significantly different noise patterns compared to automobiles because of engine size, number of axles, and vehicle weight. There is less agreement, however, on the cost that should be attributable to noise levels produced by truck travel.

A study by Haling and Cohen found that noise damage costs can vary from 0 to 11.48 cents per mile (in 1993 dollars) for different truck configuration, operating weights, and land use conditions.[40] Based on a consideration of the types of trucks providing intercity freight service, Forkenbrock has estimated a value of 0.045 cents per ton-mile (in 1994 dollars).[41] This value falls within this range, and given the uncertainty associated with this estimate, it is recommended that this value be used in the CVISN evaluation without a further adjustment for CPI changes.

D.1.3 SUMMARY OF UNIT COST VALUES TO BE USED IN CVISN BCA

Table D.1-7 presents the unit cost values that have been recommended in this chapter for use in the CVISN evaluation. They are consistently reported in 1999 dollars. The reader should refer to the relevant section(s) of the preceding text for further information on each item along with the relevant citations.

Table D.1-7. Summary Values of Truck-related Items

Item	Unit Amount (in 1999 dollars)
Truck crash (total)	$64,985 per incident
Truck VOT (total)	$80 per hour
Air and greenhouse gas (in motion)	$2.33 per hour
Air and greenhouse gas (idling)	$0.099 per hour
Noise	$0.00045 per ton-mile

Times and Costs of Truck Inspection Activities

This section calculates various trucking costs (or costs avoided) associated with specific CVISN-related inspection activities using the unit costs given in Table D.1-7.

Table D.1-8 lists the times involved in various truck inspection activities along with their sources. The definition of each of the activities is shown in the Glossary that follows the table. The dollar cost associated with each activity is shown in the far right column of Table D.1-8. The procedure for calculating the cost of each activity is to multiply the time savings (or time differential) involved in an activity by the appropriate value per hour. For certain items, this is

40 Haling, David and Harry Cohen, "Residential Noise Damage Costs Caused by Motor Vehicles", *Transportation Research Record 1559*, 1996.

41 Forkenbrock, David, "External Costs of Intercity Truck Freight Transportation", *Transportation Research Part A*, Vol. 33, No. 7/8, Sept./Nov. 1999.

straightforward. For example, if 1.23 minutes is the time associated with avoiding a WIM station, the value of this benefit is simply the VOT of $80.00 per hour times 1.23 minutes or $1.64.

Estimating the costs of air pollution and noise are more complex. For example, a truck using a weigh station must decelerate from its normal cruising speed, stop and idle, and then accelerate and resume its normal cruising speed. It can be expected that the act of decelerating and accelerating will result in air pollution/noise values that are larger than the "in motion" average reported previously. Conversely, idling costs are much smaller than the average value associated with traveling. Without information on the exact times associated with these three events, we can use the traveling unit value as the average of these three events (i.e., deceleration, idling, and accelerating). Thus, the value of the *air pollution avoided* by bypassing a WIM station would be calculated as 1.23 minutes x $2.33/hour x 1-hour/60 minutes or $0.048. Similarly, the value of *noise pollution* avoided would be $0.00045/ton-mile x 50 miles/hour x 1 hour/60 minutes x 14.8 tons x 1.23 minutes or $0.007 (assuming that a truck travels at an average of 50 mph and carried 14.80 tons: ATA data cited by David J. Forkenbrock, "External costs of intercity truck freight transportation", *Transportation Research Part A*, 1999). Thus, the *total cost* (i.e., VOT, air pollution, noise pollution) associated with bypassing an average WIM station would be $1.64 + $0.048 + $0.007 or $1.69.

Given these examples, and the unit values that have been developed for truck travel time, air and greenhouse gas for trucks in motion and idling, and for truck noise when in motion, the remaining cost values in Table D.1-8 can be calculated based on whether a truck is in motion, and whether, when stopped, its engine is running (i.e., idling) or not (i.e., it is turned off). For the purpose of this study, it is assumed that trucks are idling for *all* inspections, but that they are not when they are placed OOS. Definitions of the terms used in the table are presented following the table.

Table D.1-8. Times and Costs of Various Truck Inspection Activities

Factor (Item) [a]	Natural Units	Value ($1999)
Roadside Inspection Time[1]	31.5 Min.	$42.05
Safety Review Time[2]	2-3 Hours	NA
Compliance Review Time[2]	28 Hours	NA
Roadside Safety Inspection[3]	40 Min.	$53.40
Roadside Size/Weight Inspection[3]	22 Min.	$29.37
Level I Inspection[4]	34 Min.	$45.39
Level II Inspection[4]	29 Min.	$38.71
Level III Inspection[4]	20 Min.	$26.70
Time Savings per station bypassed (Static)[5]	2.81 Min.	$3.75
Total Cost Savings (time, air, noise) per station bypassed (Static)	2.81 Min.	$3.87
Time Savings per station bypassed (WIM)[6]	1.23 Min.	$1.64
Total Cost Savings (time, air, noise) per station bypassed (WIM)	1.23 Min.	$1.69
Vehicle OOS[7] Time	1.5 Hours	$120.00
Driver OOS[7] Time	4 Hours	$320.00

[a] A definition of these factors is shown on the following page.

Sources:

1 = Federal Highway Administration, Office of Motor Carriers, *Relative Effectiveness of Level I, II, and III Roadside Inspections*, Report FHWA-MC-93-005 (1992) as cited in Leon Moses and Ian Savage, "A Cost-Benefit Analysis of US Motor Carrier Safety Programmes", *Journal of Transport Economics and Policy*, January 1997, p57.

2 = Office of Technology Assessment, *Gearing up for Safety: Motor Carrier Safety in a Competitive Environment*, Report OTA-SET-382, (1988) as cited in Leon Moses and Ian Savage, "A Cost-Benefit Analysis of US Motor Carrier Safety Programmes", *Journal of Transport Economics and Policy*, January 1997, p57.

3 = The ATA Foundation, "Assessment of Intelligent Transportation Systems/Commercial Vehicle Operations (ITS/CVO) User Services Qualitative Benefit/Cost Analysis", prepared for FHWA, August 1996, p18.

4 = Federal Highway Administration, Office of Motor Carrier Field Operations, *Annual Report on Program Quality and Effectiveness, Fiscal Year 1992*, 1993 as cited in Matthew Titus, "Benefits of Electronic Clearance for Enforcement of Motor Carrier Regulations", *Transportation Research Record* 1522, 1996, p66.

5 = Iowa State University, Center for Transportation Research and Education, "Advantage I-75 Mainline Automated Clearance System: Final Evaluation Report", August 1998, p3-26, with calculations by Charles River Associates.

6 = Iowa State University, Center for Transportation Research and Education, "Advantage I-75 Mainline Automated Clearance System: Final Evaluation Report", August 1998, pp3-26 - 3-27, with calculations by Charles River Associates assuming a simple average of standard and high speed WIM stations.

7 = Bapna, Sanjay, Jigish Zaveri, Z., and Farkas, Andrew, (Morgan State University), "Benefit-Cost Assessment of the Commercial Vehicle Information Systems and Networks (CVISN) in Maryland", November 1998, p60.

Glossary of Terms used in Table D.1-8

Roadside Inspection Time is the average time associated with all types of roadway inspections, which would include Level I through Level V. Conducted as per the Motor Carrier Safety Assistance Program (MCSAP).

Safety Review Time is the time associated with a visit to the operating base of a firm.

Compliance Review Time is the time associated with a second visit to the base office of a firm. A compliance review is made if a firm does not achieve a satisfactory rating.

Roadside Safety Inspection is likely the same as Roadside Inspection Time above.

Roadside Size/Weight Inspection is the time (including wait time) associated with a stop for size/weight inspection. The authors state that it is considered by others to be high, but they feel that it likely includes additional safety enforcement activities (i.e., driver hours of service, vehicle inspection, writing up of citations, etc.)

Level I Inspection is likely defined as the North American Standard Inspection.

Level II Inspection is likely defined as a walk-around-driver/vehicle inspection.

Level III Inspection is likely defined to be a driver-only inspection.

Static weigh stations – average of facilities located in OH, TN, and ON.

WIM (Weigh-in-Motion) weigh stations – average of facilities located in ON, MI, KY, GA, and FL.

Vehicle OOS Time is the average delay in hours for vehicles placed out-of-service.

Driver OOS Time is the average delay in hours for drivers placed out-of-service.

D.1.4 Additional Bibliography

In addition to the extensive footnoted references in the main body of the text, presented below is a list the most relevant of the considerable literature that was reviewed to arrive at the recommended unit values shown in Table D.1-7.

Miller, Ted R., et al., "Allocating the Costs of Motor Vehicle Crashes Between Vehicle Types", *Transportation Research Record* 1635, 1998.

Miller, Ted R., et al., "Highway Crash Costs in the United States by Driver Age, Blood Alcohol Level, Victim Age, and Restraint Use", *Accident Analysis and Prevention*, Vol. 30, No. 2, 1998.

Network of Employers for Traffic Safety, "What do Traffic Crashes Cost?", December 1996.

Blincoe, Lawrence J., (NHTSA) The Economic Cost of Motor Vehicle Crashes, 1994.

Iowa State University, "Advantage I-75 Mainline Automated Clearance System", Final Evaluation Report, August 1998.

Monsere, Christopher M., and Maze, T. H., "A Summary of the Economic Analysis Concerning the Application of Intelligent Transportation Systems/Commercial Vehicle Operations (ITS/CVO) to the Mid-Continent Corridor", Transportation Conference Proceedings, 1998.

Litman, Todd (Victoria Transport Policy Institute), "Transportation Cost Analysis", July 26, 1999.

National Safety Council, "Costs of Motor-Vehicle Crashes", September 28, 1998.

Turner, S., et al., "ITS Benefits: Review of Evaluation Methods and Reported Benefits", Prepared for the Texas Department of Transportation, October 1998.

NHTSA, "Trends in Large Truck Crashes", c.1996.

Volpe National Transportation Systems Center, "Electronic Credentialing for Commercial Vehicle Operations: A Cross-cutting Analysis", Final Draft, June 10, 1999.

Rechnitzer, G., and Foong, C., "Truck Crash Study – Report on fatal and injury crashes of cars into the real of trucks", Monash University Accident Research Centre Report No. 26, 1997.

Federal Highway Administration, "Highway Cost Allocation Study", August 1997.

Federal Highway Administration, "Comprehensive Truck Size and Weight Study", March 1995.

Mejza, Michael M., and Corsi, Thomas M., "Assessing Motor Carrier Potential for Improving Safety Processes", *Transportation Journal*, Summer 1999.

Volpe National Transportation Systems Center, "OMCHS Safety Program Performance Measures: Assessment of Initial Models and Plans for Second Generation Models", draft, May 28, 1999.

Evanco, William M. (Mitretek Systems), "The Impact on Fatal Involvements of Commercial Vehicle Operation ITS User Services", undated.

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APPENDIX D.2:

BENEFIT/COST ANALYSIS ANNUAL TABLES

APPENDIX D.2: BENEFIT/COST ANALYSIS ANNUAL TABLES

Tables D.2-1 through D.2-3 show the detailed year-by-year forecasts for all the benefits and costs included in the BCA for the three roadside enforcement scenarios described in Chapter 8, including the present value for each benefit or cost at each future year, discounted at both 4 percent and 7 percent (real). Tables D.2-4 and D.2-5 show the same information for electronic credentialing. Examination of these tables can be very helpful in understanding the relative importance of each category of project benefits and costs, how these are projected to increase over time, and how the arithmetic of discounting decreases the present value of a benefit or cost, the farther into the future it occurs.[1]

Table D.2-1. Benefit/Cost Comparison for Roadside Enforcement (Present Value in $1999)

Scenario RE 1

		Discounted at 4%	Discounted at 7%
Benefits	Crashes avoided	$90,739,934	$69,075,911
	Transit time savings (including O&M and air and noise pollution)	$0	$0
	Total benefits	$90,739,934	$69,075,911
Costs	One time startup cost to states	$30,980,000	$30,980,000
	Replacement capital costs to states	$72,885,238	$51,208,383
	Increased operating costs to states	$12,494,817	$9,511,698
	Increased operating costs to carriers	$0	$0
	Increased OOS costs to carriers	$26,129,910	$19,891,433
	Total costs	$142,489,965	$111,591,514
	Total (Net Present Value)	-$51,750,031	-$42,515,604
	Benefit/Cost Ratio	0.6	0.6

1 The present value of a benefit or cost that occurs n years into the future using discount rate *i* is simply the future value divided by $1+i)^n$.

Table D.2-1A. Crashes Avoided Benefit of RE ($1999)

Scenario RE 1

Year	Amount	Discounted at 4%	Discounted at 7%
2000	$5,459,000	$5,459,000	$5,459,000
2001	$5,459,000	$5,249,038	$5,101,869
2002	$5,459,000	$5,047,152	$4,768,102
2003	$5,459,000	$4,853,031	$4,456,170
2004	$5,459,000	$4,666,376	$4,164,645
2005	$5,459,000	$4,486,900	$3,892,192
2006	$5,459,000	$4,314,327	$3,637,562
2007	$5,459,000	$4,148,391	$3,399,591
2008	$5,459,000	$3,988,838	$3,177,188
2009	$5,459,000	$3,835,421	$2,969,334
2010	$5,459,000	$3,687,905	$2,775,079
2011	$5,459,000	$3,546,062	$2,593,532
2012	$5,459,000	$3,409,675	$2,423,861
2013	$5,459,000	$3,278,534	$2,265,291
2014	$5,459,000	$3,152,436	$2,117,094
2015	$5,459,000	$3,031,189	$1,978,593
2016	$5,459,000	$2,914,605	$1,849,152
2017	$5,459,000	$2,802,505	$1,728,180
2018	$5,459,000	$2,694,716	$1,615,121
2019	$5,459,000	$2,591,073	$1,509,459
2020	$5,459,000	$2,491,416	$1,410,709
2021	$5,459,000	$2,395,593	$1,318,420
2022	$5,459,000	$2,303,454	$1,232,168
2023	$5,459,000	$2,214,860	$1,151,559
2024	$5,459,000	$2,129,673	$1,076,223
2025	$5,459,000	$2,047,763	$1,005,816
Total	$141,934,000	$90,739,934	$69,075,911

Source: Charles River Associates, 2000.

Table D.2-1B. Transit Time Savings Benefit to Carriers of RE (including O&M and air and noise pollution) ($1999)

Scenario RE 1

Year	Amount	Discounted at 4%	Discounted at 7%
2000	$0	$0	$0
2001	$0	$0	$0
2002	$0	$0	$0
2003	$0	$0	$0
2004	$0	$0	$0
2005	$0	$0	$0
2006	$0	$0	$0
2007	$0	$0	$0
2008	$0	$0	$0
2009	$0	$0	$0
2010	$0	$0	$0
2011	$0	$0	$0
2012	$0	$0	$0
2013	$0	$0	$0
2014	$0	$0	$0
2015	$0	$0	$0
2016	$0	$0	$0
2017	$0	$0	$0
2018	$0	$0	$0
2019	$0	$0	$0
2020	$0	$0	$0
2021	$0	$0	$0
2022	$0	$0	$0
2023	$0	$0	$0
2024	$0	$0	$0
2025	$0	$0	$0
Total	$0	$0	$0

Source: Charles River Associates, 2000.

Table D.2-1C. One-Time Startup Cost to States of RE ($1999)
Scenario RE 1

Year	Amount	Discounted at 4%	Discounted at 7%
2000	$30,980,000	$30,980,000	$30,980,000
2001	$0	$0	$0
2002	$0	$0	$0
2003	$0	$0	$0
2004	$0	$0	$0
2005	$0	$0	$0
2006	$0	$0	$0
2007	$0	$0	$0
2008	$0	$0	$0
2009	$0	$0	$0
2010	$0	$0	$0
2011	$0	$0	$0
2012	$0	$0	$0
2013	$0	$0	$0
2014	$0	$0	$0
2015	$0	$0	$0
2016	$0	$0	$0
2017	$0	$0	$0
2018	$0	$0	$0
2019	$0	$0	$0
2020	$0	$0	$0
2021	$0	$0	$0
2022	$0	$0	$0
2023	$0	$0	$0
2024	$0	$0	$0
2025	$0	$0	$0
Total	$30,980,000	$30,980,000	$30,980,000

Source: Charles River Associates, 2000.

Table D.2-1D. Replacement Capital Costs to States of RE ($1999)
Scenario RE 1

Year	Amount	Discounted at 4%	Discounted at 7%
2000	$0	$0	$0
2001	$0	$0	$0
2002	$0	$0	$0
2003	$0	$0	$0
2004	$0	$0	$0
2005	$25,270,000	$20,770,098	$18,017,161
2006	$0	$0	$0
2007	$0	$0	$0
2008	$0	$0	$0
2009	$0	$0	$0
2010	$25,270,000	$17,071,507	$12,845,987
2011	$0	$0	$0
2012	$0	$0	$0
2013	$0	$0	$0
2014	$0	$0	$0
2015	$25,270,000	$14,031,534	$9,159,011
2016	$0	$0	$0
2017	$0	$0	$0
2018	$0	$0	$0
2019	$0	$0	$0
2020	$25,270,000	$11,532,898	$6,530,248
2021	$0	$0	$0
2022	$0	$0	$0
2023	$0	$0	$0
2024	$0	$0	$0
2025	$25,270,000	$9,479,202	$4,655,977
Total	$126,350,000	$72,885,238	$51,208,383

Source: Charles River Associates, 2000.

Table D.2-1E. Increased Operating Costs to States of RE ($1999)
Scenario RE 1

Year	Amount	Discounted at 4%	Discounted at 7%
2000	$751,700	$751,700	$751,700
2001	$751,700	$722,788	$702,523
2002	$751,700	$694,989	$656,564
2003	$751,700	$668,259	$613,611
2004	$751,700	$642,556	$573,468
2005	$751,700	$617,843	$535,952
2006	$751,700	$594,079	$500,889
2007	$751,700	$571,230	$468,121
2008	$751,700	$549,260	$437,496
2009	$751,700	$528,134	$408,875
2010	$751,700	$507,822	$382,126
2011	$751,700	$488,290	$357,127
2012	$751,700	$469,510	$333,764
2013	$751,700	$451,452	$311,929
2014	$751,700	$434,088	$291,522
2015	$751,700	$417,392	$272,451
2016	$751,700	$401,339	$254,627
2017	$751,700	$385,903	$237,969
2018	$751,700	$371,060	$222,401
2019	$751,700	$356,789	$207,851
2020	$751,700	$343,066	$194,254
2021	$751,700	$329,871	$181,545
2022	$751,700	$317,184	$169,669
2023	$751,700	$304,984	$158,569
2024	$751,700	$293,254	$148,195
2025	$751,700	$281,975	$138,500
Total	$19,544,200	$12,494,817	$9,511,698

Source: Charles River Associates, 2000.

Table D.2-1F. Increased Operating Costs to Carriers of RE ($1999)
Scenario RE 1

Year	Amount	Discounted at 4%	Discounted at 7%
2000	$0	$0	$0
2001	$0	$0	$0
2002	$0	$0	$0
2003	$0	$0	$0
2004	$0	$0	$0
2005	$0	$0	$0
2006	$0	$0	$0
2007	$0	$0	$0
2008	$0	$0	$0
2009	$0	$0	$0
2010	$0	$0	$0
2011	$0	$0	$0
2012	$0	$0	$0
2013	$0	$0	$0
2014	$0	$0	$0
2015	$0	$0	$0
2016	$0	$0	$0
2017	$0	$0	$0
2018	$0	$0	$0
2019	$0	$0	$0
2020	$0	$0	$0
2021	$0	$0	$0
2022	$0	$0	$0
2023	$0	$0	$0
2024	$0	$0	$0
2025	$0	$0	$0
Total	$0	$0	$0

Source: Charles River Associates, 2000.

Table D.2-1G. Increased OOS Costs to Carriers of RE ($1999)
Scenario RE 1

Year	Amount	Discounted at 4%	Discounted at 7%
2000	$1,572,000	$1,572,000	$1,572,000
2001	$1,572,000	$1,511,538	$1,469,159
2002	$1,572,000	$1,453,402	$1,373,046
2003	$1,572,000	$1,397,502	$1,283,220
2004	$1,572,000	$1,343,752	$1,199,271
2005	$1,572,000	$1,292,069	$1,120,814
2006	$1,572,000	$1,242,374	$1,047,490
2007	$1,572,000	$1,194,591	$978,963
2008	$1,572,000	$1,148,645	$914,918
2009	$1,572,000	$1,104,466	$855,064
2010	$1,572,000	$1,061,987	$799,125
2011	$1,572,000	$1,021,141	$746,846
2012	$1,572,000	$981,867	$697,987
2013	$1,572,000	$944,102	$652,324
2014	$1,572,000	$907,791	$609,649
2015	$1,572,000	$872,876	$569,765
2016	$1,572,000	$839,304	$532,491
2017	$1,572,000	$807,023	$497,655
2018	$1,572,000	$775,983	$465,098
2019	$1,572,000	$746,138	$434,671
2020	$1,572,000	$717,440	$406,235
2021	$1,572,000	$689,846	$379,659
2022	$1,572,000	$663,314	$354,821
2023	$1,572,000	$637,802	$331,609
2024	$1,572,000	$613,271	$309,914
2025	$1,572,000	$589,684	$289,640
Total	$40,872,000	$26,129,910	$19,891,433

Source: Charles River Associates, 2000.

Table D.2-2. Benefit/Cost Comparison for Roadside Enforcement (Present Value in $1999) Scenario RE 2

		Discounted at 4%	Discounted at 7%
Benefits	Crashes avoided	$636,226,732	$484,328,550
	Transit time savings (including O&M and air and noise pollution)	$6,327,826,370	$4,817,067,273
	Total benefits	$6,964,053,102	$5,301,395,823
Costs	One time startup cost to states	$99,540,500	$99,540,500
	Replacement capital costs to states	$124,745,461	$86,434,473
	Increased operating costs to states	$234,737,013	$178,693,902
	Increased operating costs to carriers	$2,800,488,029	$2,131,875,694
	Increased OOS costs to carriers	$183,058,966	$139,353,912
	Total costs	$3,442,569,970	$2,635,898,480
	Total (Net Present Value)	$3,521,483,132	$2,665,497,343
	Benefit/Cost Ratio	2.0	2.0

Table D.2-2A. Crashes Avoided Benefit of RE ($1999) Scenario RE 2

Year	Amount	Discounted at 4%	Discounted at 7%
2000	$38,276,000	$38,276,000	$38,276,000
2001	$38,276,000	$36,803,846	$35,771,963
2002	$38,276,000	$35,388,314	$33,431,741
2003	$38,276,000	$34,027,225	$31,244,618
2004	$38,276,000	$32,718,485	$29,200,577
2005	$38,276,000	$31,460,082	$27,290,259
2006	$38,276,000	$30,250,079	$25,504,915
2007	$38,276,000	$29,086,614	$23,836,369
2008	$38,276,000	$27,967,898	$22,276,980
2009	$38,276,000	$26,892,210	$20,819,608
2010	$38,276,000	$25,857,894	$19,457,578
2011	$38,276,000	$24,863,360	$18,184,652
2012	$38,276,000	$23,907,077	$16,995,002
2013	$38,276,000	$22,987,574	$15,883,179
2014	$38,276,000	$22,103,436	$14,844,093
2015	$38,276,000	$21,253,304	$13,872,984
2016	$38,276,000	$20,435,869	$12,965,405
2017	$38,276,000	$19,649,874	$12,117,201
2018	$38,276,000	$18,894,110	$11,324,487
2019	$38,276,000	$18,167,413	$10,583,633
2020	$38,276,000	$17,468,667	$9,891,246
2021	$38,276,000	$16,796,795	$9,244,155
2022	$38,276,000	$16,150,764	$8,639,397
2023	$38,276,000	$15,529,581	$8,074,203
2024	$38,276,000	$14,932,290	$7,545,984
2025	$38,276,000	$14,357,971	$7,052,322
Total	$995,176,000	$636,226,732	$484,328,550

Source: Charles River Associates, 2000.

Table D.2-2B. Transit Time Savings Benefit to Carriers of RE (including O&M and air and noise pollution) ($1999)
Scenario RE 2

Year	Amount	Discounted at 4%	Discounted at 7%
2000	$380,688,000	$380,688,000	$380,688,000
2001	$380,688,000	$366,046,154	$355,783,178
2002	$380,688,000	$351,967,456	$332,507,643
2003	$380,688,000	$338,430,246	$310,754,806
2004	$380,688,000	$325,413,698	$290,425,052
2005	$380,688,000	$312,897,786	$271,425,283
2006	$380,688,000	$300,863,256	$253,668,489
2007	$380,688,000	$289,291,592	$237,073,354
2008	$380,688,000	$278,164,993	$221,563,882
2009	$380,688,000	$267,466,339	$207,069,049
2010	$380,688,000	$257,179,172	$193,522,475
2011	$380,688,000	$247,287,666	$180,862,126
2012	$380,688,000	$237,776,602	$169,030,025
2013	$380,688,000	$228,631,348	$157,971,986
2014	$380,688,000	$219,837,834	$147,637,370
2015	$380,688,000	$211,382,533	$137,978,850
2016	$380,688,000	$203,252,436	$128,952,197
2017	$380,688,000	$195,435,034	$120,516,072
2018	$380,688,000	$187,918,302	$112,631,843
2019	$380,688,000	$180,690,675	$105,263,404
2020	$380,688,000	$173,741,034	$98,377,013
2021	$380,688,000	$167,058,686	$91,941,134
2022	$380,688,000	$160,633,352	$85,926,293
2023	$380,688,000	$154,455,146	$80,304,947
2024	$380,688,000	$148,514,564	$75,051,352
2025	$380,688,000	$142,802,465	$70,141,451
Total	$9,897,888,000	$6,327,826,370	$4,817,067,273

Source: Charles River Associates, 2000.

Table D.2-2C. One-Time Startup Cost to States of RE ($1999)
Scenario RE 2

Year	Amount	Discounted at 4%	Discounted at 7%
2000	$99,540,500	$99,540,500	$99,540,500
2001	$0	$0	$0
2002	$0	$0	$0
2003	$0	$0	$0
2004	$0	$0	$0
2005	$0	$0	$0
2006	$0	$0	$0
2007	$0	$0	$0
2008	$0	$0	$0
2009	$0	$0	$0
2010	$0	$0	$0
2011	$0	$0	$0
2012	$0	$0	$0
2013	$0	$0	$0
2014	$0	$0	$0
2015	$0	$0	$0
2016	$0	$0	$0
2017	$0	$0	$0
2018	$0	$0	$0
2019	$0	$0	$0
2020	$0	$0	$0
2021	$0	$0	$0
2022	$0	$0	$0
2023	$0	$0	$0
2024	$0	$0	$0
2025	$0	$0	$0
Total	$99,540,500	$99,540,500	$99,540,500

Source: Charles River Associates, 2000.

Table D.2-2D. Replacement Capital Costs to States of RE ($1999)
Scenario RE 2

Year	Amount	Discounted at 4%	Discounted at 7%
2000	$0	$0	$0
2001	$0	$0	$0
2002	$0	$0	$0
2003	$0	$0	$0
2004	$0	$0	$0
2005	$26,600,000	$21,863,261	$18,965,432
2006	$0	$0	$0
2007	$0	$0	$0
2008	$0	$0	$0
2009	$0	$0	$0
2010	$69,026,000	$46,631,492	$35,089,318
2011	$0	$0	$0
2012	$0	$0	$0
2013	$0	$0	$0
2014	$0	$0	$0
2015	$26,600,000	$14,770,036	$9,641,064
2016	$0	$0	$0
2017	$0	$0	$0
2018	$0	$0	$0
2019	$0	$0	$0
2020	$69,026,000	$31,502,565	$17,837,630
2021	$0	$0	$0
2022	$0	$0	$0
2023	$0	$0	$0
2024	$0	$0	$0
2025	$26,600,000	$9,978,107	$4,901,028
Total	$217,852,000	$124,745,461	$86,434,473

Source: Charles River Associates, 2000.

Table D.2-2E. Increased Operating Costs to States of RE ($1999)
Scenario RE 2

Year	Amount	Discounted at 4%	Discounted at 7%
2000	$14,122,000	$14,122,000	$14,122,000
2001	$14,122,000	$13,578,846	$13,198,131
2002	$14,122,000	$13,056,583	$12,334,702
2003	$14,122,000	$12,554,407	$11,527,759
2004	$14,122,000	$12,071,545	$10,773,606
2005	$14,122,000	$11,607,255	$10,068,791
2006	$14,122,000	$11,160,822	$9,410,085
2007	$14,122,000	$10,731,559	$8,794,472
2008	$14,122,000	$10,318,807	$8,219,133
2009	$14,122,000	$9,921,930	$7,681,432
2010	$14,122,000	$9,540,317	$7,178,909
2011	$14,122,000	$9,173,382	$6,709,260
2012	$14,122,000	$8,820,560	$6,270,337
2013	$14,122,000	$8,481,307	$5,860,128
2014	$14,122,000	$8,155,103	$5,476,755
2015	$14,122,000	$7,841,445	$5,118,463
2016	$14,122,000	$7,539,851	$4,783,610
2017	$14,122,000	$7,249,857	$4,470,664
2018	$14,122,000	$6,971,016	$4,178,190
2019	$14,122,000	$6,702,900	$3,904,851
2020	$14,122,000	$6,445,096	$3,649,393
2021	$14,122,000	$6,197,208	$3,410,648
2022	$14,122,000	$5,958,854	$3,187,521
2023	$14,122,000	$5,729,667	$2,978,992
2024	$14,122,000	$5,509,295	$2,784,105
2025	$14,122,000	$5,297,399	$2,601,967
Total	$367,172,000	$234,737,013	$178,693,902

Source: Charles River Associates, 2000.

Table D.2-2F. Increased Operating Costs to Carriers of RE ($1999)
Scenario RE 2

Year	Amount	Discounted at 4%	Discounted at 7%
2000	$168,480,000	$168,480,000	$168,480,000
2001	$168,480,000	$162,000,000	$157,457,944
2002	$168,480,000	$155,769,231	$147,156,957
2003	$168,480,000	$149,778,107	$137,529,866
2004	$168,480,000	$144,017,410	$128,532,585
2005	$168,480,000	$138,478,279	$120,123,912
2006	$168,480,000	$133,152,191	$112,265,338
2007	$168,480,000	$128,030,953	$104,920,877
2008	$168,480,000	$123,106,686	$98,056,894
2009	$168,480,000	$118,371,813	$91,641,957
2010	$168,480,000	$113,819,051	$85,646,689
2011	$168,480,000	$109,441,395	$80,043,634
2012	$168,480,000	$105,232,111	$74,807,135
2013	$168,480,000	$101,184,722	$69,913,210
2014	$168,480,000	$97,293,002	$65,339,449
2015	$168,480,000	$93,550,963	$61,064,905
2016	$168,480,000	$89,952,849	$57,070,005
2017	$168,480,000	$86,493,124	$53,336,453
2018	$168,480,000	$83,166,466	$49,847,153
2019	$168,480,000	$79,967,756	$46,586,124
2020	$168,480,000	$76,892,073	$43,538,434
2021	$168,480,000	$73,934,685	$40,690,125
2022	$168,480,000	$71,091,044	$38,028,154
2023	$168,480,000	$68,356,773	$35,540,331
2024	$168,480,000	$65,727,666	$33,215,263
2025	$168,480,000	$63,199,679	$31,042,301
Total	$4,380,480,000	$2,800,488,029	$2,131,875,694

Source: Charles River Associates, 2000.

Table D.2-2G. Increased OOS Costs to Carriers of RE ($1999)
Scenario RE 2

Year	Amount	Discounted at 4%	Discounted at 7%
2000	$11,013,000	$11,013,000	$11,013,000
2001	$11,013,000	$10,589,423	$10,292,523
2002	$11,013,000	$10,182,138	$9,619,181
2003	$11,013,000	$9,790,517	$8,989,889
2004	$11,013,000	$9,413,959	$8,401,765
2005	$11,013,000	$9,051,883	$7,852,117
2006	$11,013,000	$8,703,734	$7,338,427
2007	$11,013,000	$8,368,975	$6,858,343
2008	$11,013,000	$8,047,091	$6,409,666
2009	$11,013,000	$7,737,588	$5,990,342
2010	$11,013,000	$7,439,988	$5,598,451
2011	$11,013,000	$7,153,835	$5,232,197
2012	$11,013,000	$6,878,687	$4,889,904
2013	$11,013,000	$6,614,122	$4,570,003
2014	$11,013,000	$6,359,733	$4,271,031
2015	$11,013,000	$6,115,128	$3,991,618
2016	$11,013,000	$5,879,931	$3,730,484
2017	$11,013,000	$5,653,780	$3,486,434
2018	$11,013,000	$5,436,326	$3,258,349
2019	$11,013,000	$5,227,237	$3,045,186
2020	$11,013,000	$5,026,189	$2,845,968
2021	$11,013,000	$4,832,874	$2,659,784
2022	$11,013,000	$4,646,995	$2,485,779
2023	$11,013,000	$4,468,264	$2,323,158
2024	$11,013,000	$4,296,408	$2,171,176
2025	$11,013,000	$4,131,161	$2,029,136
Total	$286,338,000	$183,058,966	$139,353,912

Source: Charles River Associates, 2000.

Table D.2-3. Benefit/Cost Comparison for Roadside Enforcement (Present Value in $1999)
Scenario RE 3

		Discounted at 4%	Discounted at 7%
Benefits	Crashes avoided	$10,742,448,429	$8,177,704,908
	Transit time savings (including O&M and air and noise pollution)	$6,327,826,370	$4,817,067,273
	Total benefits	$17,070,274,798	$12,994,772,181
Costs	One time startup cost to states	$99,540,500	$99,540,500
	Replacement capital costs to states	$124,745,461	$86,434,473
	Increased operating costs to states	$234,737,013	$178,693,902
	Increased operating costs to carriers	$2,800,488,029	$2,131,875,694
	Increased OOS costs to carriers	$137,298,380	$104,518,597
	Total costs	$3,396,809,384	$2,601,063,166
	Total (Net Present Value)	$13,673,465,415	$10,393,709,015
	Benefit/Cost Ratio	5.0	5.0

Table D.2-3A. Crashes Avoided Benefit of RE ($1999)
Scenario RE 3

Year	Amount	Discounted at 4%	Discounted at 7%
2000	$646,275,825	$646,275,825	$646,275,825
2001	$646,275,825	$621,419,063	$603,996,098
2002	$646,275,825	$597,518,329	$564,482,335
2003	$646,275,825	$574,536,855	$527,553,584
2004	$646,275,825	$552,439,284	$493,040,733
2005	$646,275,825	$531,191,619	$460,785,731
2006	$646,275,825	$510,761,172	$430,640,870
2007	$646,275,825	$491,116,512	$402,468,103
2008	$646,275,825	$472,227,415	$376,138,414
2009	$646,275,825	$454,064,822	$351,531,228
2010	$646,275,825	$436,600,791	$328,533,858
2011	$646,275,825	$419,808,452	$307,040,989
2012	$646,275,825	$403,661,974	$286,954,195
2013	$646,275,825	$388,136,513	$268,181,491
2014	$646,275,825	$373,208,186	$250,636,907
2015	$646,275,825	$358,854,025	$234,240,100
2016	$646,275,825	$345,051,947	$218,915,982
2017	$646,275,825	$331,780,718	$204,594,375
2018	$646,275,825	$319,019,921	$191,209,697
2019	$646,275,825	$306,749,924	$178,700,651
2020	$646,275,825	$294,951,850	$167,009,954
2021	$646,275,825	$283,607,548	$156,084,069
2022	$646,275,825	$272,699,566	$145,872,962
2023	$646,275,825	$262,211,121	$136,329,871
2024	$646,275,825	$252,126,078	$127,411,094
2025	$646,275,825	$242,428,921	$119,075,789
Total	$16,803,171,450	$10,742,448,429	$8,177,704,908

Source: Charles River Associates, 2000.

Table D.2-3B. Transit Time Savings Benefit to Carriers of RE (including O&M and air and noise pollution) ($1999)
Scenario RE 3

Year	Amount	Discounted at 4%	Discounted at 7%
2000	$380,688,000	$380,688,000	$380,688,000
2001	$380,688,000	$366,046,154	$355,783,178
2002	$380,688,000	$351,967,456	$332,507,643
2003	$380,688,000	$338,430,246	$310,754,806
2004	$380,688,000	$325,413,698	$290,425,052
2005	$380,688,000	$312,897,786	$271,425,283
2006	$380,688,000	$300,863,256	$253,668,489
2007	$380,688,000	$289,291,592	$237,073,354
2008	$380,688,000	$278,164,993	$221,563,882
2009	$380,688,000	$267,466,339	$207,069,049
2010	$380,688,000	$257,179,172	$193,522,475
2011	$380,688,000	$247,287,666	$180,862,126
2012	$380,688,000	$237,776,602	$169,030,025
2013	$380,688,000	$228,631,348	$157,971,986
2014	$380,688,000	$219,837,834	$147,637,370
2015	$380,688,000	$211,382,533	$137,978,850
2016	$380,688,000	$203,252,436	$128,952,197
2017	$380,688,000	$195,435,034	$120,516,072
2018	$380,688,000	$187,918,302	$112,631,843
2019	$380,688,000	$180,690,675	$105,263,404
2020	$380,688,000	$173,741,034	$98,377,013
2021	$380,688,000	$167,058,686	$91,941,134
2022	$380,688,000	$160,633,352	$85,926,293
2023	$380,688,000	$154,455,146	$80,304,947
2024	$380,688,000	$148,514,564	$75,051,352
2025	$380,688,000	$142,802,465	$70,141,451
Total	$9,897,888,000	$6,327,826,370	$4,817,067,273

Source: Charles River Associates, 2000.

Table D.2-3C. One-Time Startup Cost to States of RE ($1999)
Scenario RE 3

Year	Amount	Discounted at 4%	Discounted at 7%
2000	$99,540,500	$99,540,500	$99,540,500
2001	$0	$0	$0
2002	$0	$0	$0
2003	$0	$0	$0
2004	$0	$0	$0
2005	$0	$0	$0
2006	$0	$0	$0
2007	$0	$0	$0
2008	$0	$0	$0
2009	$0	$0	$0
2010	$0	$0	$0
2011	$0	$0	$0
2012	$0	$0	$0
2013	$0	$0	$0
2014	$0	$0	$0
2015	$0	$0	$0
2016	$0	$0	$0
2017	$0	$0	$0
2018	$0	$0	$0
2019	$0	$0	$0
2020	$0	$0	$0
2021	$0	$0	$0
2022	$0	$0	$0
2023	$0	$0	$0
2024	$0	$0	$0
2025	$0	$0	$0
Total	$99,540,500	$99,540,500	$99,540,500

Source: Charles River Associates, 2000.

Table D.2-3D. Replacement Capital Costs to States of RE ($1999)
Scenario RE 3

Year	Amount	Discounted at 4%	Discounted at 7%
2000	$0	$0	$0
2001	$0	$0	$0
2002	$0	$0	$0
2003	$0	$0	$0
2004	$0	$0	$0
2005	$26,600,000	$21,863,261	$18,965,432
2006	$0	$0	$0
2007	$0	$0	$0
2008	$0	$0	$0
2009	$0	$0	$0
2010	$69,026,000	$46,631,492	$35,089,318
2011	$0	$0	$0
2012	$0	$0	$0
2013	$0	$0	$0
2014	$0	$0	$0
2015	$26,600,000	$14,770,036	$9,641,064
2016	$0	$0	$0
2017	$0	$0	$0
2018	$0	$0	$0
2019	$0	$0	$0
2020	$69,026,000	$31,502,565	$17,837,630
2021	$0	$0	$0
2022	$0	$0	$0
2023	$0	$0	$0
2024	$0	$0	$0
2025	$26,600,000	$9,978,107	$4,901,028
Total	$217,852,000	$124,745,461	$86,434,473

Source: Charles River Associates, 2000.

**Table D.2-3E. Increased Operating Costs to States of RE ($1999)
Scenario RE 3**

Year	Amount	Discounted at 4%	Discounted at 7%
2000	$14,122,000	$14,122,000	$14,122,000
2001	$14,122,000	$13,578,846	$13,198,131
2002	$14,122,000	$13,056,583	$12,334,702
2003	$14,122,000	$12,554,407	$11,527,759
2004	$14,122,000	$12,071,545	$10,773,606
2005	$14,122,000	$11,607,255	$10,068,791
2006	$14,122,000	$11,160,822	$9,410,085
2007	$14,122,000	$10,731,559	$8,794,472
2008	$14,122,000	$10,318,807	$8,219,133
2009	$14,122,000	$9,921,930	$7,681,432
2010	$14,122,000	$9,540,317	$7,178,909
2011	$14,122,000	$9,173,382	$6,709,260
2012	$14,122,000	$8,820,560	$6,270,337
2013	$14,122,000	$8,481,307	$5,860,128
2014	$14,122,000	$8,155,103	$5,476,755
2015	$14,122,000	$7,841,445	$5,118,463
2016	$14,122,000	$7,539,851	$4,783,610
2017	$14,122,000	$7,249,857	$4,470,664
2018	$14,122,000	$6,971,016	$4,178,190
2019	$14,122,000	$6,702,900	$3,904,851
2020	$14,122,000	$6,445,096	$3,649,393
2021	$14,122,000	$6,197,208	$3,410,648
2022	$14,122,000	$5,958,854	$3,187,521
2023	$14,122,000	$5,729,667	$2,978,992
2024	$14,122,000	$5,509,295	$2,784,105
2025	$14,122,000	$5,297,399	$2,601,967
Total	$367,172,000	$234,737,013	$178,693,902

Source: Charles River Associates, 2000.

Table D.2-3F. Increased Operating Costs to Carriers of RE ($1999)
Scenario RE 3

Year	Amount	Discounted at 4%	Discounted at 7%
2000	$168,480,000	$168,480,000	$168,480,000
2001	$168,480,000	$162,000,000	$157,457,944
2002	$168,480,000	$155,769,231	$147,156,957
2003	$168,480,000	$149,778,107	$137,529,866
2004	$168,480,000	$144,017,410	$128,532,585
2005	$168,480,000	$138,478,279	$120,123,912
2006	$168,480,000	$133,152,191	$112,265,338
2007	$168,480,000	$128,030,953	$104,920,877
2008	$168,480,000	$123,106,686	$98,056,894
2009	$168,480,000	$118,371,813	$91,641,957
2010	$168,480,000	$113,819,051	$85,646,689
2011	$168,480,000	$109,441,395	$80,043,634
2012	$168,480,000	$105,232,111	$74,807,135
2013	$168,480,000	$101,184,722	$69,913,210
2014	$168,480,000	$97,293,002	$65,339,449
2015	$168,480,000	$93,550,963	$61,064,905
2016	$168,480,000	$89,952,849	$57,070,005
2017	$168,480,000	$86,493,124	$53,336,453
2018	$168,480,000	$83,166,466	$49,847,153
2019	$168,480,000	$79,967,756	$46,586,124
2020	$168,480,000	$76,892,073	$43,538,434
2021	$168,480,000	$73,934,685	$40,690,125
2022	$168,480,000	$71,091,044	$38,028,154
2023	$168,480,000	$68,356,773	$35,540,331
2024	$168,480,000	$65,727,666	$33,215,263
2025	$168,480,000	$63,199,679	$31,042,301
Total	$4,380,480,000	$2,800,488,029	$2,131,875,694

Source: Charles River Associates, 2000.

Table D.2-3G. Increased OOS Costs to Carriers of RE ($1999)
Scenario RE 3

Year	Amount	Discounted at 4%	Discounted at 7%
2000	$8,260,000	$8,260,000	$8,260,000
2001	$8,260,000	$7,942,308	$7,719,626
2002	$8,260,000	$7,636,834	$7,214,604
2003	$8,260,000	$7,343,110	$6,742,620
2004	$8,260,000	$7,060,683	$6,301,514
2005	$8,260,000	$6,789,118	$5,889,266
2006	$8,260,000	$6,527,998	$5,503,987
2007	$8,260,000	$6,276,921	$5,143,913
2008	$8,260,000	$6,035,501	$4,807,395
2009	$8,260,000	$5,803,366	$4,492,893
2010	$8,260,000	$5,580,160	$4,198,965
2011	$8,260,000	$5,365,538	$3,924,266
2012	$8,260,000	$5,159,172	$3,667,539
2013	$8,260,000	$4,960,742	$3,427,606
2014	$8,260,000	$4,769,944	$3,203,370
2015	$8,260,000	$4,586,485	$2,993,804
2016	$8,260,000	$4,410,082	$2,797,948
2017	$8,260,000	$4,240,463	$2,614,904
2018	$8,260,000	$4,077,368	$2,443,836
2019	$8,260,000	$3,920,546	$2,283,959
2020	$8,260,000	$3,769,756	$2,134,541
2021	$8,260,000	$3,624,766	$1,994,898
2022	$8,260,000	$3,485,351	$1,864,391
2023	$8,260,000	$3,351,300	$1,742,421
2024	$8,260,000	$3,222,403	$1,628,431
2025	$8,260,000	$3,098,465	$1,521,898
Total	$214,760,000	$137,298,380	$104,518,597

Source: Charles River Associates, 2000.

Table D.2-4. Benefit/Cost Comparison for Electronic Credentialing without VISTA
(Present Value in $1999)
Scenario EC 1

			Discounted at 4%	**Discounted at 7%**
Benefits	Operating cost savings to states		$338,757,989	$257,880,025
	Operating cost savings to carriers		$74,516,784	$56,726,013
	Inventory cost savings to carriers		$319,310,156	$243,075,333
		Total benefits	$732,584,929	$557,681,371
Costs	One time startup cost to states		$42,144,000	$42,144,000
	Replacement capital costs to states		$3,461,552	$2,344,808
		Total costs	$45,605,552	$44,488,808
	Total (Net Present Value)		$686,979,378	$513,192,563
	Benefit/Cost Ratio		16.1	12.5

Table D.2-4A. Operating Cost Saving Benefit to States from EC ($1999)
Scenario EC 1

Year	Amount	Discounted at 4%	Discounted at 7%
2000	$20,380,000	$20,380,000	$20,380,000
2001	$20,380,000	$19,596,154	$19,046,729
2002	$20,380,000	$18,842,456	$17,800,681
2003	$20,380,000	$18,117,746	$16,636,151
2004	$20,380,000	$17,420,909	$15,547,804
2005	$20,380,000	$16,750,874	$14,530,658
2006	$20,380,000	$16,106,610	$13,580,055
2007	$20,380,000	$15,487,125	$12,691,640
2008	$20,380,000	$14,891,466	$11,861,346
2009	$20,380,000	$14,318,718	$11,085,370
2010	$20,380,000	$13,767,998	$10,360,159
2011	$20,380,000	$13,238,459	$9,682,391
2012	$20,380,000	$12,729,288	$9,048,964
2013	$20,380,000	$12,239,700	$8,456,975
2014	$20,380,000	$11,768,942	$7,903,715
2015	$20,380,000	$11,316,291	$7,386,650
2016	$20,380,000	$10,881,049	$6,903,411
2017	$20,380,000	$10,462,547	$6,451,786
2018	$20,380,000	$10,060,141	$6,029,707
2019	$20,380,000	$9,673,213	$5,635,240
2020	$20,380,000	$9,301,166	$5,266,579
2021	$20,380,000	$8,943,429	$4,922,037
2022	$20,380,000	$8,599,451	$4,600,034
2023	$20,380,000	$8,268,703	$4,299,097
2024	$20,380,000	$7,950,676	$4,017,848
2025	$20,380,000	$7,644,880	$3,754,998
Total	$529,880,000	$338,757,989	$257,880,025

Source: Charles River Associates, 2000.

Table D.2-4B. Operating Cost Saving Benefit to Carriers from EC ($1999)
Scenario EC 1

Year	Amount	Discounted at 4%	Discounted at 7%
2000	$4,483,000	$4,483,000	$4,483,000
2001	$4,483,000	$4,310,577	$4,189,720
2002	$4,483,000	$4,144,786	$3,915,626
2003	$4,483,000	$3,985,371	$3,659,463
2004	$4,483,000	$3,832,087	$3,420,059
2005	$4,483,000	$3,684,699	$3,196,317
2006	$4,483,000	$3,542,980	$2,987,212
2007	$4,483,000	$3,406,712	$2,791,787
2008	$4,483,000	$3,275,684	$2,609,147
2009	$4,483,000	$3,149,696	$2,438,455
2010	$4,483,000	$3,028,554	$2,278,930
2011	$4,483,000	$2,912,071	$2,129,841
2012	$4,483,000	$2,800,069	$1,990,506
2013	$4,483,000	$2,692,374	$1,860,286
2014	$4,483,000	$2,588,821	$1,738,585
2015	$4,483,000	$2,489,251	$1,624,846
2016	$4,483,000	$2,393,510	$1,518,547
2017	$4,483,000	$2,301,452	$1,419,203
2018	$4,483,000	$2,212,935	$1,326,358
2019	$4,483,000	$2,127,822	$1,239,587
2020	$4,483,000	$2,045,983	$1,158,492
2021	$4,483,000	$1,967,291	$1,082,703
2022	$4,483,000	$1,891,626	$1,011,872
2023	$4,483,000	$1,818,871	$945,675
2024	$4,483,000	$1,748,915	$883,808
2025	$4,483,000	$1,681,649	$825,989
Total	$116,558,000	$74,516,784	$56,726,013

Source: Charles River Associates, 2000.

Table D.2-4C. Inventory Cost Saving Benefit to Carriers from EC ($1999)
Scenario EC 1

Year	Amount	Discounted at 4%	Discounted at 7%
2000	$19,210,000	$19,210,000	$19,210,000
2001	$19,210,000	$18,471,154	$17,953,271
2002	$19,210,000	$17,760,725	$16,778,758
2003	$19,210,000	$17,077,620	$15,681,082
2004	$19,210,000	$16,420,789	$14,655,217
2005	$19,210,000	$15,789,220	$13,696,465
2006	$19,210,000	$15,181,942	$12,800,434
2007	$19,210,000	$14,598,021	$11,963,023
2008	$19,210,000	$14,036,559	$11,180,395
2009	$19,210,000	$13,496,691	$10,448,967
2010	$19,210,000	$12,977,588	$9,765,390
2011	$19,210,000	$12,478,450	$9,126,533
2012	$19,210,000	$11,998,509	$8,529,470
2013	$19,210,000	$11,537,028	$7,971,467
2014	$19,210,000	$11,093,296	$7,449,969
2015	$19,210,000	$10,666,631	$6,962,588
2016	$19,210,000	$10,256,376	$6,507,092
2017	$19,210,000	$9,861,900	$6,081,394
2018	$19,210,000	$9,482,596	$5,683,546
2019	$19,210,000	$9,117,881	$5,311,725
2020	$19,210,000	$8,767,193	$4,964,229
2021	$19,210,000	$8,429,993	$4,639,466
2022	$19,210,000	$8,105,763	$4,335,950
2023	$19,210,000	$7,794,003	$4,052,290
2024	$19,210,000	$7,494,234	$3,787,187
2025	$19,210,000	$7,205,994	$3,539,427
Total	$499,460,000	$319,310,156	$243,075,333

Source: Charles River Associates, 2000.

Table D.2-4D. One-Time Startup Cost to States of EC ($1999)
Scenario EC 1

Year	Amount	Discounted at 4%	Discounted at 7%
2000	$42,144,000	$42,144,000	$42,144,000
2001	$0	$0	$0
2002	$0	$0	$0
2003	$0	$0	$0
2004	$0	$0	$0
2005	$0	$0	$0
2006	$0	$0	$0
2007	$0	$0	$0
2008	$0	$0	$0
2009	$0	$0	$0
2010	$0	$0	$0
2011	$0	$0	$0
2012	$0	$0	$0
2013	$0	$0	$0
2014	$0	$0	$0
2015	$0	$0	$0
2016	$0	$0	$0
2017	$0	$0	$0
2018	$0	$0	$0
2019	$0	$0	$0
2020	$0	$0	$0
2021	$0	$0	$0
2022	$0	$0	$0
2023	$0	$0	$0
2024	$0	$0	$0
2025	$0	$0	$0
Total	$42,144,000	$42,144,000	$42,144,000

Source: Charles River Associates, 2000.

Table D.2-4E. Replacement Capital Costs to States of EC ($1999)
Scenario EC 1

Year	Amount	Discounted at 4%	Discounted at 7%
2000	$0	$0	$0
2001	$0	$0	$0
2002	$0	$0	$0
2003	$0	$0	$0
2004	$0	$0	$0
2005	$0	$0	$0
2006	$0	$0	$0
2007	$0	$0	$0
2008	$0	$0	$0
2009	$0	$0	$0
2010	$3,058,040	$2,065,902	$1,554,552
2011	$0	$0	$0
2012	$0	$0	$0
2013	$0	$0	$0
2014	$0	$0	$0
2015	$0	$0	$0
2016	$0	$0	$0
2017	$0	$0	$0
2018	$0	$0	$0
2019	$0	$0	$0
2020	$3,058,040	$1,395,650	$790,256
2021	$0	$0	$0
2022	$0	$0	$0
2023	$0	$0	$0
2024	$0	$0	$0
2025	$0	$0	$0
Total	$6,116,080	$3,461,552	$2,344,808

Source: Charles River Associates, 2000.

Table D.2-5. Benefit/Cost Comparison for Electronic Credentialing with VISTA
(Present Value in $1999)
Scenario EC 2

			Discounted at 4%	Discounted at 7%
Benefits	Operating cost savings to states		$316,284,937	$240,772,381
	Operating cost savings to carriers		$24,484,324	$18,638,728
	Inventory cost savings to carriers		$104,885,324	$79,844,110
		Total benefits	$445,654,585	$339,255,219
Costs	One time startup cost to states		$7,200,000	$7,200,000
	Replacement capital costs to states		$1,805,462	$1,222,995
		Total costs	$9,005,462	$8,422,995
	Total (Net Present Value)		$436,649,123	$330,832,223
	Benefit/Cost Ratio		49.5	40.3

Table D.2-5A. Operating Cost Saving Benefit to States from EC ($1999)
Scenario EC 2

Year	Amount	Discounted at 4%	Discounted at 7%
2000	$19,028,000	$19,028,000	$19,028,000
2001	$19,028,000	$18,296,154	$17,783,178
2002	$19,028,000	$17,592,456	$16,619,792
2003	$19,028,000	$16,915,823	$15,532,516
2004	$19,028,000	$16,265,214	$14,516,370
2005	$19,028,000	$15,639,629	$13,566,701
2006	$19,028,000	$15,038,105	$12,679,160
2007	$19,028,000	$14,459,716	$11,849,682
2008	$19,028,000	$13,903,573	$11,074,469
2009	$19,028,000	$13,368,820	$10,349,971
2010	$19,028,000	$12,854,635	$9,672,870
2011	$19,028,000	$12,360,226	$9,040,066
2012	$19,028,000	$11,884,833	$8,448,660
2013	$19,028,000	$11,427,724	$7,895,944
2014	$19,028,000	$10,988,196	$7,379,386
2015	$19,028,000	$10,565,573	$6,896,623
2016	$19,028,000	$10,159,205	$6,445,442
2017	$19,028,000	$9,768,466	$6,023,778
2018	$19,028,000	$9,392,756	$5,629,699
2019	$19,028,000	$9,031,496	$5,261,401
2020	$19,028,000	$8,684,131	$4,917,197
2021	$19,028,000	$8,350,126	$4,595,511
2022	$19,028,000	$8,028,967	$4,294,870
2023	$19,028,000	$7,720,161	$4,013,897
2024	$19,028,000	$7,423,231	$3,751,306
2025	$19,028,000	$7,137,723	$3,505,893
Total	$494,728,000	$316,284,937	$240,772,381

Source: Charles River Associates, 2000.

**Table D.2-5B. Operating Cost Saving Benefit to Carriers from EC ($1999)
Scenario EC 2**

Year	Amount	Discounted at 4%	Discounted at 7%
2000	$1,473,000	$1,473,000	$1,473,000
2001	$1,473,000	$1,416,346	$1,376,636
2002	$1,473,000	$1,361,871	$1,286,575
2003	$1,473,000	$1,309,492	$1,202,407
2004	$1,473,000	$1,259,127	$1,123,745
2005	$1,473,000	$1,210,699	$1,050,229
2006	$1,473,000	$1,164,133	$981,522
2007	$1,473,000	$1,119,359	$917,310
2008	$1,473,000	$1,076,307	$857,299
2009	$1,473,000	$1,034,910	$801,214
2010	$1,473,000	$995,106	$748,799
2011	$1,473,000	$956,833	$699,812
2012	$1,473,000	$920,031	$654,030
2013	$1,473,000	$884,646	$611,243
2014	$1,473,000	$850,621	$571,255
2015	$1,473,000	$817,905	$533,883
2016	$1,473,000	$786,447	$498,956
2017	$1,473,000	$756,199	$466,314
2018	$1,473,000	$727,114	$435,808
2019	$1,473,000	$699,148	$407,297
2020	$1,473,000	$672,258	$380,651
2021	$1,473,000	$646,402	$355,749
2022	$1,473,000	$621,540	$332,475
2023	$1,473,000	$597,635	$310,725
2024	$1,473,000	$574,649	$290,397
2025	$1,473,000	$552,547	$271,399
Total	$38,298,000	$24,484,324	$18,638,728

Source: Charles River Associates, 2000.

Table D.2-5C. Inventory Cost Saving Benefit to Carriers from EC ($1999)
Scenario EC 2

Year	Amount	Discounted at 4%	Discounted at 7%
2000	$6,310,000	$6,310,000	$6,310,000
2001	$6,310,000	$6,067,308	$5,897,196
2002	$6,310,000	$5,833,950	$5,511,398
2003	$6,310,000	$5,609,567	$5,150,840
2004	$6,310,000	$5,393,814	$4,813,869
2005	$6,310,000	$5,186,360	$4,498,943
2006	$6,310,000	$4,986,885	$4,204,619
2007	$6,310,000	$4,795,081	$3,929,551
2008	$6,310,000	$4,610,655	$3,672,477
2009	$6,310,000	$4,433,322	$3,432,222
2010	$6,310,000	$4,262,810	$3,207,684
2011	$6,310,000	$4,098,856	$2,997,836
2012	$6,310,000	$3,941,207	$2,801,715
2013	$6,310,000	$3,789,622	$2,618,426
2014	$6,310,000	$3,643,868	$2,447,127
2015	$6,310,000	$3,503,719	$2,287,034
2016	$6,310,000	$3,368,961	$2,137,415
2017	$6,310,000	$3,239,385	$1,997,584
2018	$6,310,000	$3,114,793	$1,866,901
2019	$6,310,000	$2,994,994	$1,744,768
2020	$6,310,000	$2,879,802	$1,630,624
2021	$6,310,000	$2,769,040	$1,523,948
2022	$6,310,000	$2,662,538	$1,424,250
2023	$6,310,000	$2,560,133	$1,331,075
2024	$6,310,000	$2,461,667	$1,243,995
2025	$6,310,000	$2,366,987	$1,162,612
Total	$164,060,000	$104,885,324	$79,844,110

Source: Charles River Associates, 2000.

Table D.2-5D. One-Time Startup Cost to States of EC ($1999)
Scenario EC 2

Year	Amount	Discounted at 4%	Discounted at 7%
2000	$7,200,000	$7,200,000	$7,200,000
2001	$0	$0	$0
2002	$0	$0	$0
2003	$0	$0	$0
2004	$0	$0	$0
2005	$0	$0	$0
2006	$0	$0	$0
2007	$0	$0	$0
2008	$0	$0	$0
2009	$0	$0	$0
2010	$0	$0	$0
2011	$0	$0	$0
2012	$0	$0	$0
2013	$0	$0	$0
2014	$0	$0	$0
2015	$0	$0	$0
2016	$0	$0	$0
2017	$0	$0	$0
2018	$0	$0	$0
2019	$0	$0	$0
2020	$0	$0	$0
2021	$0	$0	$0
2022	$0	$0	$0
2023	$0	$0	$0
2024	$0	$0	$0
2025	$0	$0	$0
Total	$7,200,000	$7,200,000	$7,200,000

Source: Charles River Associates, 2000.

Table D.2-5E. Replacement Capital Costs to States of EC ($1999)
Scenario EC 2

Year	Amount	Discounted at 4%	Discounted at 7%
2000	$0	$0	$0
2001	$0	$0	$0
2002	$0	$0	$0
2003	$0	$0	$0
2004	$0	$0	$0
2005	$0	$0	$0
2006	$0	$0	$0
2007	$0	$0	$0
2008	$0	$0	$0
2009	$0	$0	$0
2010	$1,595,000	$1,077,525	$810,817
2011	$0	$0	$0
2012	$0	$0	$0
2013	$0	$0	$0
2014	$0	$0	$0
2015	$0	$0	$0
2016	$0	$0	$0
2017	$0	$0	$0
2018	$0	$0	$0
2019	$0	$0	$0
2020	$1,595,000	$727,937	$412,178
2021	$0	$0	$0
2022	$0	$0	$0
2023	$0	$0	$0
2024	$0	$0	$0
2025	$0	$0	$0
Total	$3,190,000	$1,805,462	$1,222,995

Source: Charles River Associates, 2000.

APPENDIX D.3:

DATA SOURCES AND PROCEDURES FOR ESTIMATING ANNUAL CVISN BENEFITS AND COSTS

APPENDIX D.3: DATA SOURCES AND PROCEDURES FOR ESTIMATING ANNUAL CVISN BENEFITS AND COSTS

This appendix provides the data sources and procedures for estimating the annual benefits and costs in Appendix D.2 for the CVISN scenarios in the benefit/cost analysis in Chapter 8. Table D.3-1 provides this information for the CVISN benefits. Table D.3-2 provides the information for the CVISN costs.

Table D.3-1. Sources of Estimates of CVISN's Benefit Measures

Roadside Enforcement

Benefit Measure	Customer(s) Impacted	Data Source(s)	Estimation Procedures
Number of crashes before and after the deployment of CVISN Roadside Enforcement	Carriers, public.	Safety study (Chapter 5)	Use estimates in Table 5-1 for each RE scenario
Value of truck crashes: dollars	Carriers, public.	Literature review (Appendix D.1). Unit values in Table D.1-7 include value of personal injuries, fatalities, and property damage to all vehicles involved in each crash, plus delays to other vehicles	Multiply unit values in Table D.1-7 by number of crashes avoided.
Cost savings: transit time savings	Carriers.	Literature review (Appendix D.1)	Multiply number of low risk trucks allowed to bypass inspection stations (equals 0.52 of the 1999 US safety inspections of trucks from MCSAP + 1999 US weight checks from FHWA) by the unit time saved from Table D.1-8.
Value of transit time savings: dollars	Carriers.	Literature review (Appendix D.1)	Multiply transit time savings by unit values in Table D.1-8. Unit values include all truck costs (O&M including fuel, plus depreciation) and inventory cost of loads.
Value of reduced fuel use: dollars	Carriers, public.	Literature review (Appendix D.1)	Included in truck transit time value in Table D.1-8.
Value of reduced air and noise pollution: dollars	Public.	Literature review (Appendix D.1)	Included in truck transit time value in Table D.1-8.

Table D.3-1. Sources of Estimates of CVISN's Benefit Measures (continued)

Electronic Credentialing

Benefit Measure	Customer(s) Impacted	Data Source(s)	Estimation Procedures
Electronic Credentialing operating cost savings: dollars	State.	Cost study (Chapter 6)	Multiply IRP unit costs per account in Table 6-3 (Post CVISN minus Baseline) for KY and/or MD (nonVISTA and VISTA states, respectively) by the number of carrier accounts in Table 6-3. Expand to national by multiplying total US IRP registrants (accounts) in 1999-2000 Annual IRP Audit Results table divided by number of KY or MD IRP registrants in table. Multiply "statewide" costs (IRP Clearinghouse) by 50. Membership fee for IRP Clearinghouse assumes linear graduated fee scale—see text, Chapter 6, page 6-21.
Credentialing operating cost savings: dollars.	Carriers.	Cost study (Chapter 6)	Multiply overall average new and renewal credentialing cost savings (Table 6-15) by the total number of trucks registered in US in each of the VISTA and nonVISTA systems from 1999-2000 Annual IRP Audit Results table. Assume 15% of credentials are for new trucks.
Inventory cost savings from faster credentialing of new trucks.	Carriers.	Cost study (Chapter 6) and 1999-2000 Annual IRP Audit Results table for total trucks registered in VISTA and nonVISTA IRP systems	Multiply average 1.5 day time savings for registering new trucks (Table 6-15, notes) by 15 percent cost of capital, $100,000 value of new truck, and 15 percent of IRP system 1999-2000 trucks registered annually in US.

Table D.3-2. Sources of Estimates of CVISN's Cost Measures

Benefit Measure	Customer(s) Impacted	Data Source(s)	Estimation Procedures
CVISN Roadside Enforcement startup, replacement capital costs, and O&M costs	States.	Cost study (Chapter 6)	RE 1: Multiply CT costs per unit in Table 6-3 by 50 units and expand to national by multiplying total 1999 US safety inspections from MCSAP divided by 1999 CT safety inspections. Multiply costs "per state" in Table 6-3 by 50. RE 2,3: RE 1 + multiply KY or CT costs in Table 6-3 per site by 5 sites (startup ES costs in Tables 6-7 and 6-8) and unit costs by 50 units. Expand by total 1999 US safety inspections from MCSAP divided by 1999 CT or KY safety inspections. Multiply costs "per state" in Table 6-3 by 50.
CVISN Roadside Enforcement O&M costs	Carriers.	Cost study (Chapter 6)	RE 2, 3: Multiply 7.2 million trucks (1998 FHWA highway statistics) by 52 percent (low-risk trucks) by $45 per year (NORPASS) annual fee per truck.
Increased OOS costs	Carriers.	Literature Review (Appendix D.1), Safety study (Chapter 5)	Multiply increased OOS placements for each RE scenario (Chapter 5) times weighted average cost of vehicle and driver OOS placements (Table D.1-8). 1998 MCSAP data used to calculate weights for weighted OOS average cost.
CVISN electronic credentialing startup and replacement capital costs	States.	Cost study (Chapter 6)	Multiply IRP per account costs in Table 6-3 for KY and/or MD (nonVISTA and VISTA states, respectively) by number of carrier accounts in Table 6-3. Expand to national by multiplying total US IRP registrants (accounts) in 1999-2000 Annual IRP Audit Results table divided by number of KY or MD IRP registrants in table. "Statewide" startup costs for KY and/or MD expanded to national total in same way.

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