IMPROVING COMMERCIAL MOTOR VEHICLE SAFETY IN OREGON

Final Report

SPR 688

Oregon Department of Transportation

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by

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16. Abstract

This study addressed the primary functions of the Oregon Department of Transportation's (ODOT's) Motor Carrier Safety Assistance Program (MCSAP), which is administered by the Motor Carrier Transportation Division (MCTD). The study first documented Oregon's MCSAP enforcement performance in relation to its counterparts in other states. Cluster analysis was then employed to identify Oregon's peer states with respect to MCSAP enforcement performance and a variety of other factors related to the motor carrier travel and safety environments. Structured interviews of peer state MCSAP personnel were then conducted to identify performance-improving strategies and practices that could potentially be implemented in Oregon. The feasibility of implementing these strategies and practices was then assessed against selected criteria.

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APPROXIMATE CONVERSIONS TO SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
in	inches	25.4	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
		AREA		
in^2	square inches	645.2	millimeters squared	mm^2
ft^2	square feet	0.093	meters squared	m^2
yd^2	square yards	0.836	meters squared	m^2
ac	acres	0.405	hectares	ha
mi^2	square miles	2.59	kilometers squared	km^2
		VOLUME		
fl oz	fluid ounces	29.57	milliliters	ml
gal	gallons	3.785	liters	L
ft^3	cubic feet	0.028	meters cubed	m^3
yd^3	cubic yards	0.765	meters cubed	m^3
NOTE: Volumes greater than 1000 L shall be shown in m^3.				
		MASS		
oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2000 lb)	0.907	megagrams	Mg
		TEMPERATURE (exact)		
°F	Fahrenheit	(F-32)/1.8	Celsius	°C

APPROXIMATE CONVERSIONS FROM SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
mm	millimeters	0.039	inches	in
m	meters	3.28	feet	ft
m	meters	1.09	yards	yd
km	kilometers	0.621	miles	mi
		AREA		
mm^2	millimeters squared	0.0016	square inches	in^2
m^2	meters squared	10.764	square feet	ft^2
m^2	meters squared	1.196	square yards	yd^2
ha	hectares	2.47	acres	ac
km^2	kilometers squared	0.386	square miles	mi^2
		VOLUME		
ml	milliliters	0.034	fluid ounces	fl oz
L	liters	0.264	gallons	gal
m^3	meters cubed	35.315	cubic feet	ft^3
m^3	meters cubed	1.308	cubic yards	yd^3
		MASS		
g	grams	0.035	ounces	oz
kg	kilograms	2.205	pounds	lb
Mg	megagrams	1.102	short tons (2000 lb)	T
		TEMPERATURE (exact)		
°C	Celsius	1.8C+32	Fahrenheit	°F

*SI is the symbol for the International System of Measurement

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Sally Ridenhour, Public Information Officer, ODOT Communications Division;
John "Mike" Nolan, State Program Specialist, Federal Motor Carrier Safety Administration, Oregon Division; and
Nick Fortey, Traffic Safety Engineer, Federal Highway Administration, Oregon Division.

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The authors also express their appreciation to June Ross, Research Coordinator, ODOT Research Section, for her management of this project. Lastly, the authors thank persons affiliated with MCSAPs in Oregon's peer states, who were interviewed as part of this project.

DISCLAIMER

IMPROVING COMMERCIAL MOTOR VEHICLE SAFETY IN OREGON

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1.0 INTRODUCTION

Oregon's commercial motor vehicle (CMV) safety record compares favorably to other states. For example, Federal Motor Carrier Safety Administration (FMCSA) statistics show that the CMV fatal crash rate in Oregon was 1.89 per 100 million truck and bus miles traveled in 2007, 13.3% below the national rate. Also, Oregon's CMV fatal crash rate has declined more rapidly than the national rate in recent years (-14.5% between 2003 and 2007, compared to -8.4% nationally). Considering all CMV crashes, Oregon's record remains favorable, although somewhat mixed. Its 2007 CMV crash rate of 47.9 per 100 million truck and bus miles was 22.2% below the national rate, but it had also trended upward between 2003 and 2007 at more than three times the national trend increase (30.9% v. 8.3%). Thus with respect to CMV crash incidence, Oregon's comparative safety advantage over other states has been narrowing.[1]

Administration of CMV safety programs in Oregon is the responsibility of the Motor Carrier Transportation Division (MCTD) of the Oregon Department of Transportation (ODOT). MCTD has made a priority of maintaining a downward trend in Oregon's CMV crash rate. This serves as the motivation for the research reported here.

The Motor Carrier Safety Assistance Program (MCSAP) serves as a focal point of MCTD's safety enforcement activity. MCSAP is a federal-aid program administered by the Federal Motor Carrier Safety Administration (FMCSA). To obtain federal funds, MCTD must submit a plan to FMCSA annually, detailing objectives, strategies, and actions intended to improve CMV safety in Oregon. The plan must address five national program elements: 1) driver and vehicle inspections; 2) traffic enforcement; 3) compliance reviews; 4) public education and awareness; and 5) data collection.

In addition to the national program elements, MCTD's 2008 plan addresses four Oregon-specific objectives: 1) reducing speed-related truck-at-fault crashes on the state's major freight routes; 2) conducting a relatively higher rate of inspections of passenger-carrying CMVs; 3) achieving a higher rate of seat belt use among CMV drivers; and 4) reducing the number of weather-related truck-at-fault crashes along the Siskiyou Summit corridor of I-5 and the Emigrant Hill, Ladd Canyon, and Nelson Point-Weatherby corridors of I-84 (*ODOT 2008a; ODOT 2007*).

The enforcement practices implemented through Oregon's MCSAP have generally been shown to be successful in reducing CMV crashes (*Cambridge Systematics and MaineWay Services 2006; FMCSA 2008; FMCSA 2007b; TRB 2007*). Future improvement, however, depends on identifying and adopting more effective approaches or altering current practices. Thus an investigation of the enforcement approaches of other states provides an opportunity to improve CMV safety and further protect Oregon's motoring public.

[1] Oregon's fatal crash rate and total crash rate for 2008 were 1.25 and 46.49, respectively. The analysis in this report is organized around 2007 data, which were the most recent available when the work was undertaken.

1.1 ORGANIZATION OF THE REPORT

This study was guided by two general objectives: 1) to document and assess the effectiveness of Oregon's MCSAP activities relative to other states; and 2) to identify program strategies and practices that contribute to success in other states, and are potentially transferable to Oregon's MCSAP.

The first objective is addressed in Chapter 2, which draws on enforcement data that state MCSAPs report to FMCSA. These data cover enforcement functions such as driver and vehicle inspections, compliance reviews, and traffic enforcement activity. The FMCSA data are standardized (by truck miles), allowing more direct comparison of Oregon's enforcement performance with that of other states. Chapter 2 also explores the literature related to commercial vehicle safety enforcement, including analyses of the cost effectiveness of MCSAP's primary enforcement functions and the general focus of enforcement on safety behavior.

The second objective is covered in the remainder of the report. To better focus the project's interviewing efforts to identify strategies and practices that would potentially benefit Oregon's MCSAP, a cluster analysis was performed to locate a set of peer states with geographic, development, travel and safety enforcement conditions similar to those found in Oregon. This analysis is presented in Chapter 3.

Having identified Oregon's peer states, structured interviews of MCSAP personnel were then undertaken to obtain information about issues and challenges, as well as innovative strategies and practices related to MCSAP performance. The interview responses were then distilled and screened to identify a set of potential opportunities for further consideration. The interview findings and selection of candidate opportunities are reported in Chapter 4.

In Chapter 5, in an effort to gauge the relative ease and likely consequences of implementation in Oregon, the candidate opportunities were assessed against a set of feasibility criteria.

Lastly, Chapter 6 presents the study's conclusions.

2.0 LITERATURE REVIEW

This chapter is organized around four main subjects. First, the primary MCSAP enforcement functions are described. Second, MCSAP enforcement data maintained by FMSCA are tapped to document Oregon's enforcement performance relative to other states. Third, research on the cost effectiveness of MCSAP's primary enforcement functions is reviewed. Lastly, literature related to the behavioral orientation of MCSAP's enforcement functions is reviewed.

2.1 CMV SAFETY ENFORCEMENT PROGRAMS

Compared with crashes involving only light vehicles, crashes involving trucks are more likely to result in fatalities. Thus while large trucks are involved in only 4 percent of all crashes nationally, they are involved in 12 percent of all fatality crashes (*GAO 2006*). The disproportionate contribution of heavy trucks to the severity of crash outcomes underscores the motivations of federal and state interests in ensuring the safe operation of commercial motor vehicles.

The Federal Motor Carrier Safety Administration (FMCSA) was established in 2000 in response to concerns over the increased demand for truck freight and the need for improving the effectiveness of truck safety enforcement. FMCSA is committed to increase both the level and effectiveness of safety enforcement to reduce crashes, injuries, and fatalities involving large trucks and buses. A variety of programs has been developed and implemented by FMCSA in pursuit of its safety goals.

In the context of FMCSA's overall approach to improving CMV safety, enforcement is considered to hold the greatest importance (*GAO 2006*). Most of FMCSA's enforcement programs are focused on two parties that greatly influence CMV safety: motor carriers and drivers. This orientation is an outgrowth of research showing drivers to be the critical reason for 87% of large truck crashes (*FMCSA 2007a*), as well as a desire to achieve safety improvements through more systematic preventive maintenance programs (*Knipling, et al. 2004*). Programs focused on commercial carriers include compliance reviews, new carrier safety audits, and border safety audits. Programs focused on commercial vehicles and drivers include roadside inspections and traffic enforcement. This study pays particular attention to three enforcement activities administered through MCSAP: compliance reviews, roadside inspections, and traffic enforcement. The three programs are described further below. State level information is also provided on safety enforcement activity and enforcement outcomes of the programs. Information on the programs was obtained from FMCSA's A&I Online system.[2]

[2] The Analysis and Information (A&I) Online system was developed by the FMCSA Analysis Division and the U.S. DOT's Volpe National Transportation Systems Center. The URL for the A&I online citations in this section is: http://ai.volpe.dot.gov/Help/Help.asp#cr1.

2.1.1 Compliance reviews

A compliance review is an on-site examination of a motor carrier's records and operations to determine whether the carrier meets the FMCSA safety fitness standards in terms of: alcohol and controlled substance testing; commercial driver's license requirements; financial responsibility; the use of unqualified drivers; improper use and driving of motor vehicles; unsafe vehicles; crash registers and copies of crash reports maintenance; the use of fatigued drivers; inadequate inspection, repair, and maintenance of vehicles; transportation of hazardous materials; driving and parking rule violations; violation of hazardous materials regulations; motor vehicle crashes; and hazardous materials incidents (*A&I Online*).

The purpose of a compliance review is to improve the safety of a motor carrier's commercial vehicle operation through education, heightened safety regulation awareness, and enforcement-driven adherence to FMCSA safety regulations. One of three safety ratings is assigned to a carrier after a compliance review is completed: satisfactory, conditional, or unsatisfactory. Corrective actions are required within 30 days for a carrier who receives a conditional or unsatisfactory rating. If corrective actions are not taken, driver or vehicle out-of-service (OOS) orders are issued.

On-site compliance reviews are FMCSA's single greatest resource-consuming activity (*FMCSA 2008*). According to Volpe Center data, state and federal personnel conducted 15,730 compliance reviews in 2007. Both federal and state safety inspectors conduct compliance reviews. For some states, such as New York and California, federal personnel conduct all compliance reviews.

Figure 2.1 shows the number of compliance reviews completed per million truck vehicle miles traveled (TVMT) by state and federal personnel in each of the 48 continental states in 2007. The figure shows that Oregon ranked 8th among the states. Figures 2.2 and 2.3 show the share of conditional and unsatisfactory ratings in 2007 for each state following compliance reviews. These figures show that the conditional rate in Oregon is higher than for most states (ranked 13th), and its share of unsatisfactory ratings is also higher than average (ranked 20th).

2.1.2 Roadside inspections

FMCSA defines a roadside inspection as an event where "… a MCSAP inspector conducts an examination of individual commercial motor vehicles and drivers to determine if they are in compliance with the Federal Motor Carrier Safety Regulations and/or Hazardous Materials Regulations" (*A&I Online*). Most roadside inspections are conducted by states under MCSAP and follow criteria developed jointly by FMCSA and the Commercial Vehicle Safety Alliance (CVSA). Appendix A describes the six types or levels of inspection and presents the criteria that define vehicles subject to inspection. The inspections referred to in this report are Level I, which is a very comprehensive inspection of both vehicle and driver; Level II, which is a "walk around" inspection of the vehicle and a complete inspection of the driver; and Level III, which is an inspection of the driver only. Serious violations result in the issuance of driver out of service (DOS) or vehicle out of service (VOS) orders. FMCSA's Motor Carrier Management

Information System (MCMIS) data show that there were 3,416,942 roadside inspections conducted by state and federal personnel in 2007.

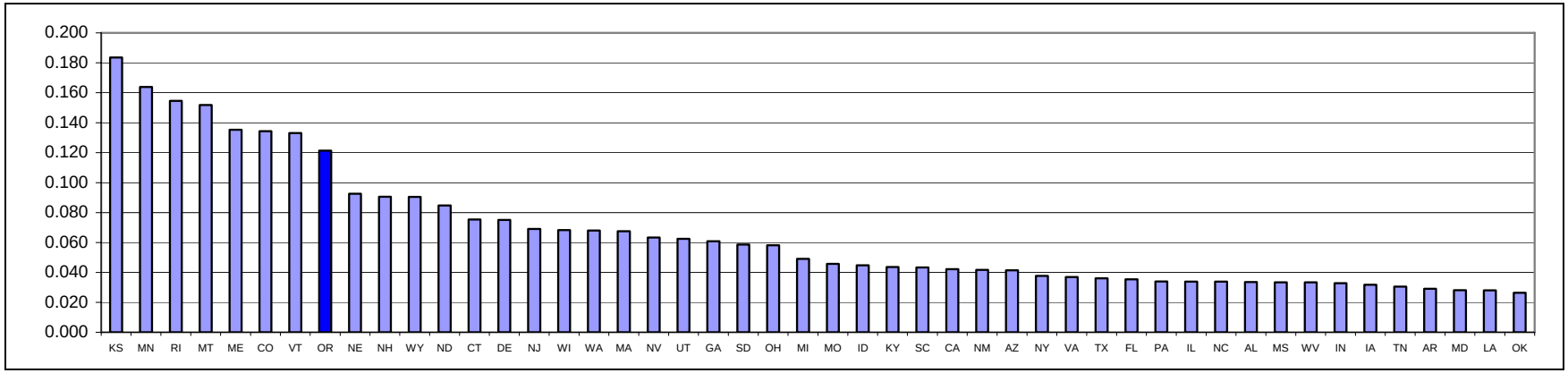

Figure 2.1: Compliance reviews conducted per million TVMT, 2007

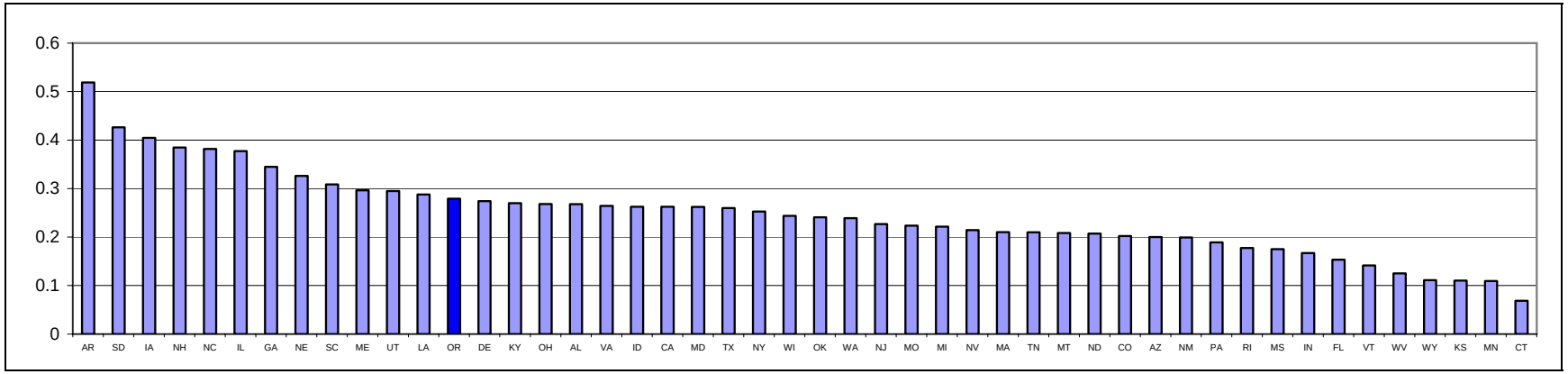

Figure 2.2: Proportion of "conditional" compliance review outcomes, 2007

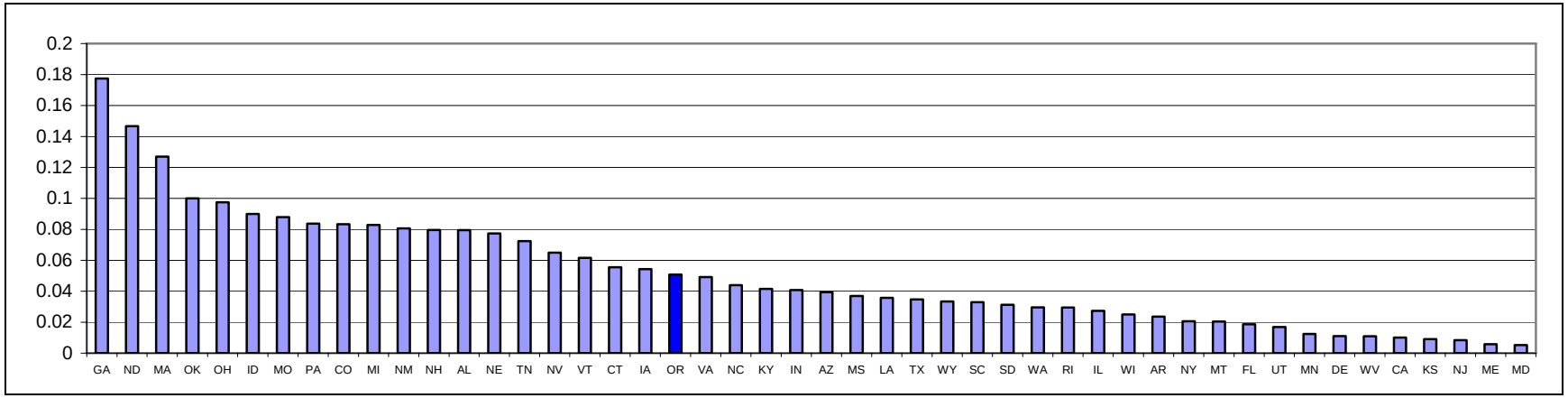

Figure 2.3: Proportion of "unsatisfactory" compliance review outcomes, 2007

Figure 2.4 shows the number of roadside inspections per million TVMT by state in 2007. Oregon ranked 11th in terms of number of roadside inspections per million TVMT. Figures 2.5 and 2.6 show the DOS rate and VOS rate in roadside inspections in 48 continental states in 2007. Oregon's DOS rate ranked 2nd, while its VOS rate ranked 13th. Thus while the state's VOS ranking corresponds to its roadside inspection effort, its high DOS ranking is noteworthy. This pattern is not reflected in the states that border Oregon, and may indicate a difference in Oregon's inspection tactics. For example, Oregon inspectors have access to time stamped in-state weighing and pre-clearance data, and can also access similar data from selected neighboring states. Log book entries can be cross checked against these data to identify discrepancies that can place a driver out of service.

2.1.3 Traffic enforcement

There are two distinct activities in the traffic enforcement program: a traffic stop as a result of a moving violation and a roadside inspection (*FMCSA 2007b*). A roadside inspection is identified as a traffic enforcement event when at least one traffic violation occurs. Only those traffic enforcement events that initiate a subsequent roadside inspection are included in the MCSAP program statistics (*A&I Online*). If a roadside inspection results in only alcohol or drug related violations, it is not considered a traffic enforcement inspection. MCMIS data indicate that in CY 2007, among the total of 3,416,942 roadside inspections, 756,100 (22.1%) were identified as traffic enforcement events.

Figure 2.7 shows the number of traffic enforcement events per million TVMT by state in 2007. Oregon ranked 19th in terms of the rate of traffic enforcement events. Figures 2.8 and 2.9 show the DOS and VOS rates resulting from traffic enforcement events in 48 continental states in 2007. Oregon ranked 9th in terms of DOS rate and 46th in terms of VOS rate. As with roadside inspections, Oregon CMV drivers were relatively more likely to be placed out of service. In contrast to roadside inspections, however, their vehicles were much less likely to be placed out of service following a traffic enforcement event. This to be expected since traffic enforcement focuses on the driver and not the vehicle.

2.1.4 Truck-involved crashes

Figure 2.10 shows the rate of truck-involved crashes (fatal and non-fatal) per million TVMT by state in 2007. As the figure shows, Oregon's crash rate is lower than most states, which gives Oregon a ranking of 36th among the 48 states. Figure 2.11 illustrates the change in the truck-involved crash rate by state over the 2003-2007 period. In Figure 2.11, negative values mean the truck involved crash rate decreased over the period, while positive values represent increases. As the figure shows, the crash rate declined in 18 and increased in 30 states. Oregon's crash rate increase over the period places it in the middle of the latter group. Figure 2.12 shows the annual truck-involved crash rates for Oregon from 2003 to 2007, indicating that the rate increased from 2003 to 2005, decreased in 2006, and then increased again in 2007. The rate in 2007 was about 30% higher than it was in 2003, which serves as a catalyst for this study as well as underscoring the objective of strengthening motor carrier safety programs in Oregon.

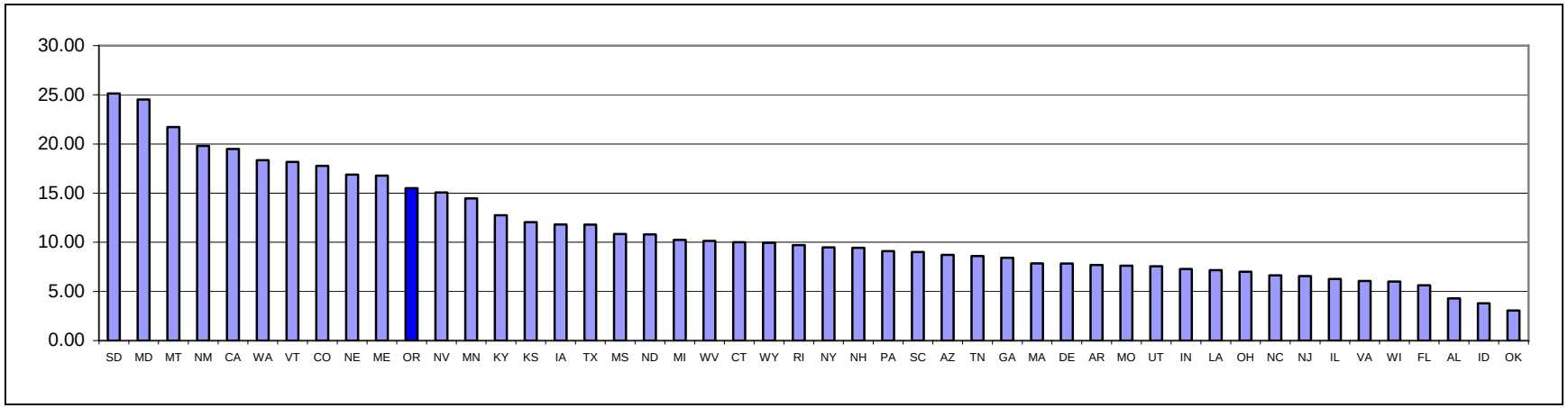

Figure 2.4: Roadside inspections conducted per million TVMT, 2007

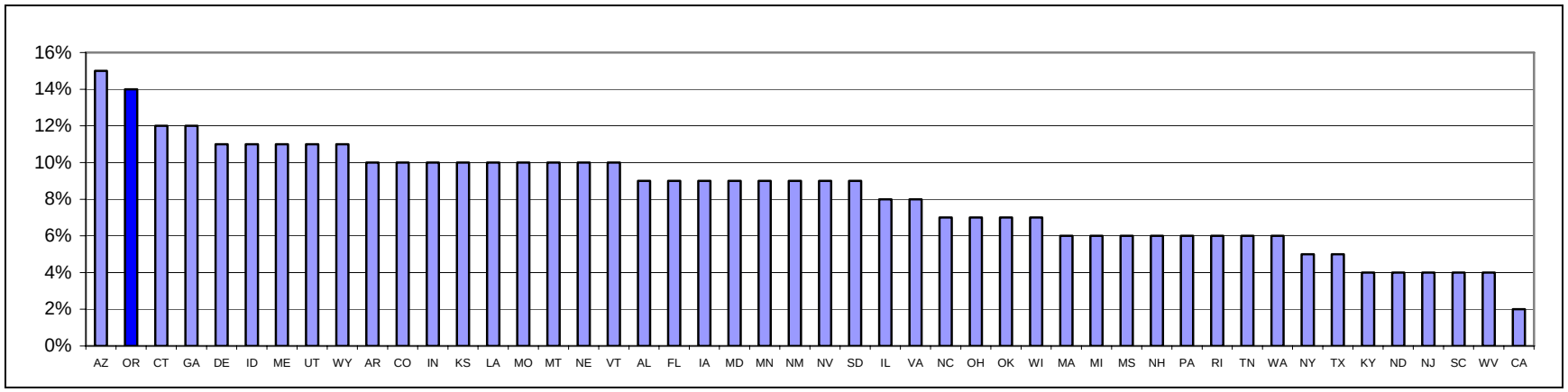

Figure 2.5: Percentage of drivers placed out of service in roadside inspections, 2007

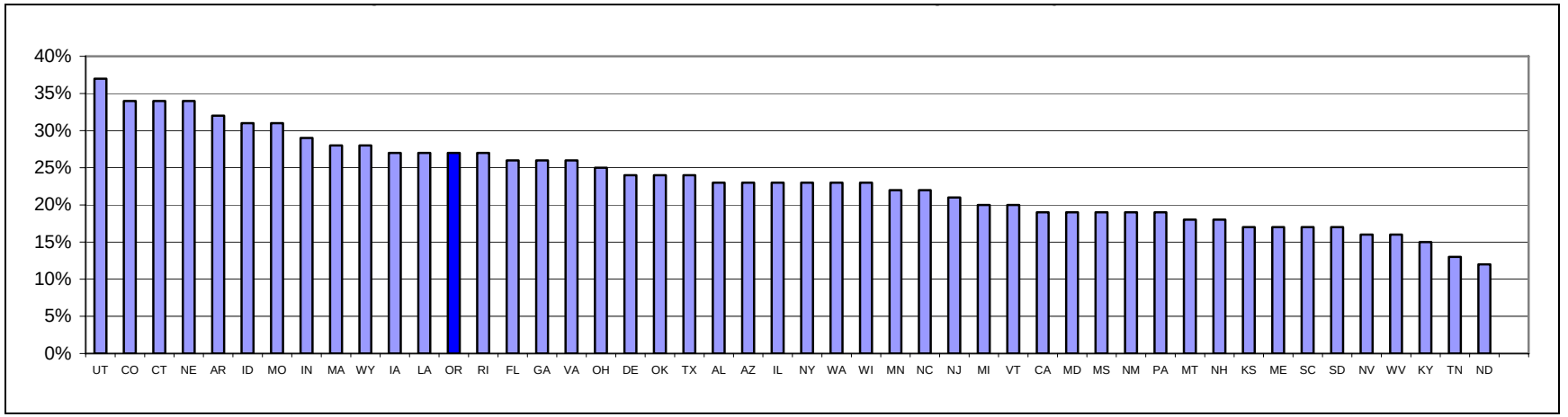

Figure 2.6: Percentage of vehicles placed out of service in roadside inspections, 2007

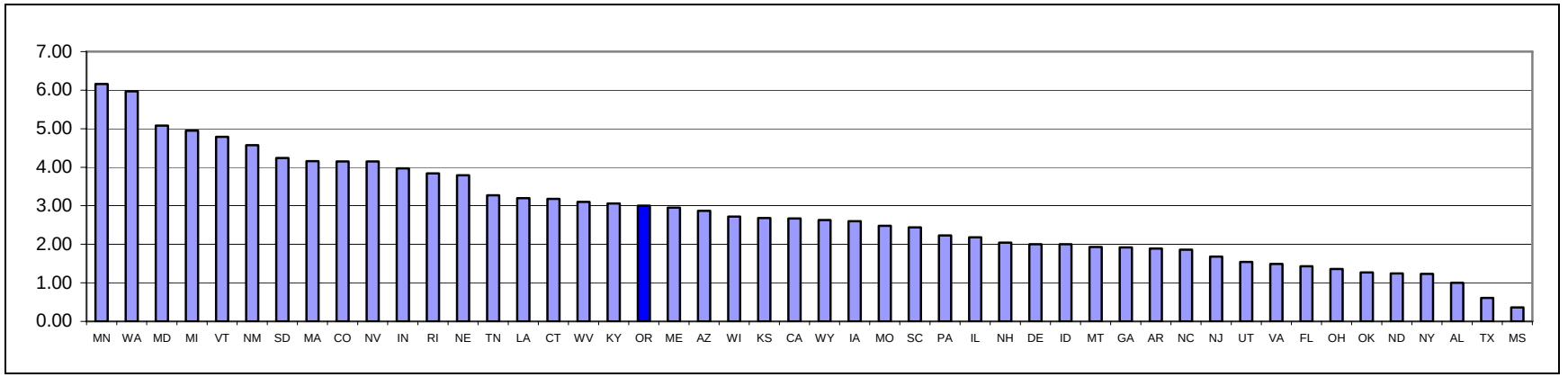

Figure 2.7: Traffic enforcement events per million TVMT, 2007

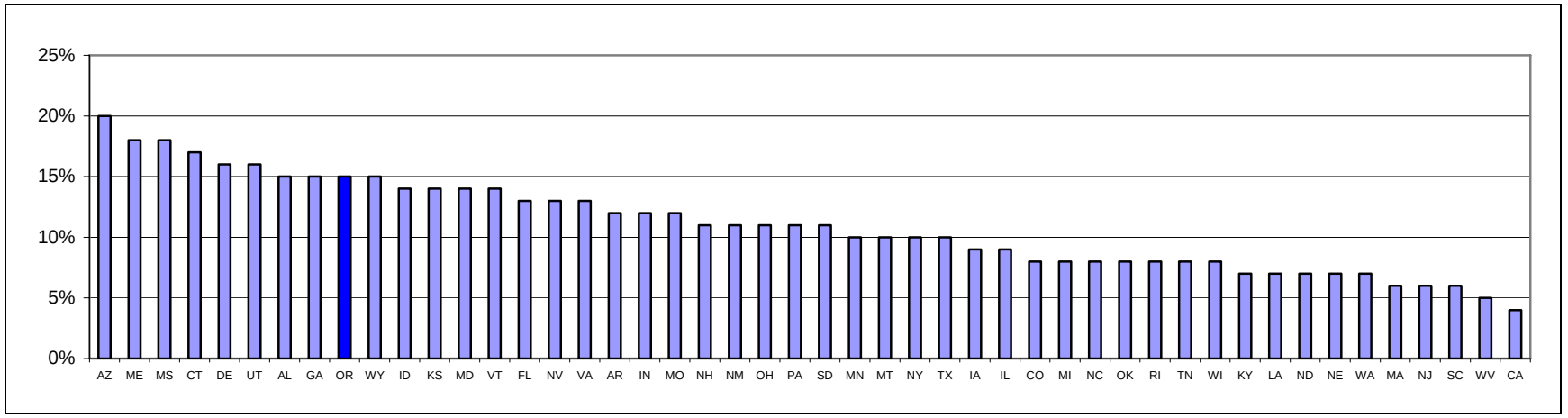

Figure 2.8: Percentage of drivers placed out of service in traffic enforcement events, 2007

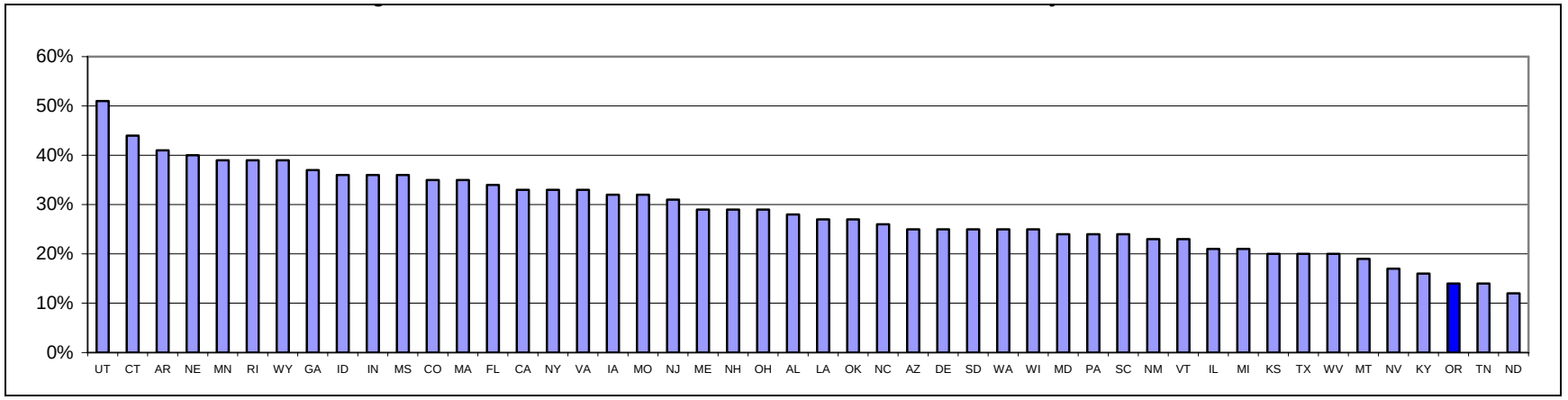

Figure 2.9: Percentage of vehicles placed out of service in traffic enforcement events, 2007

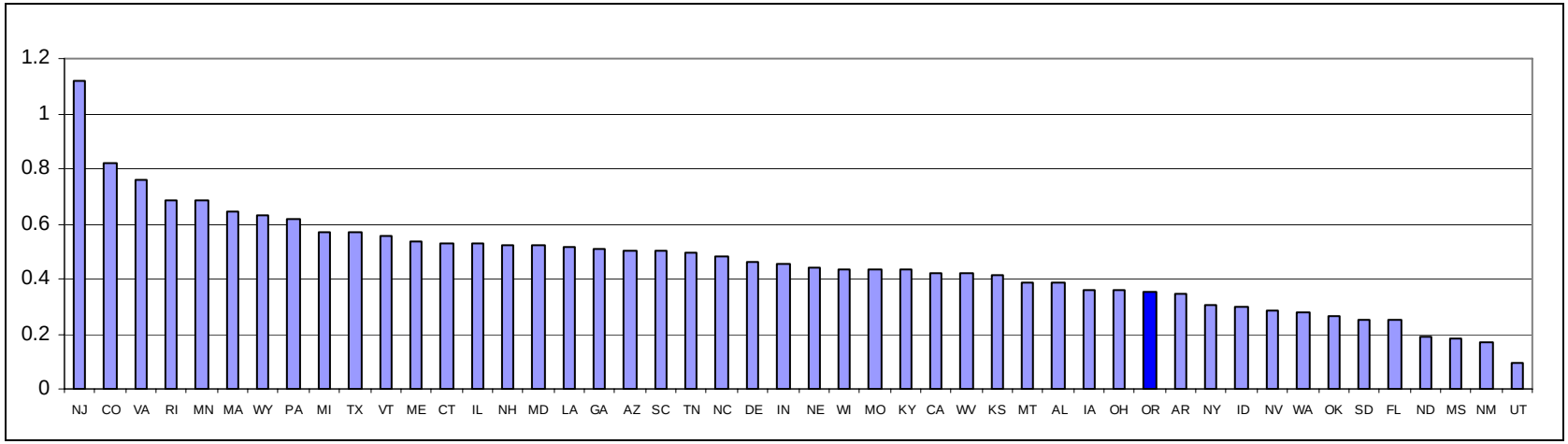

Figure 2.10: Truck-involved crashes per million TVMT, 2007

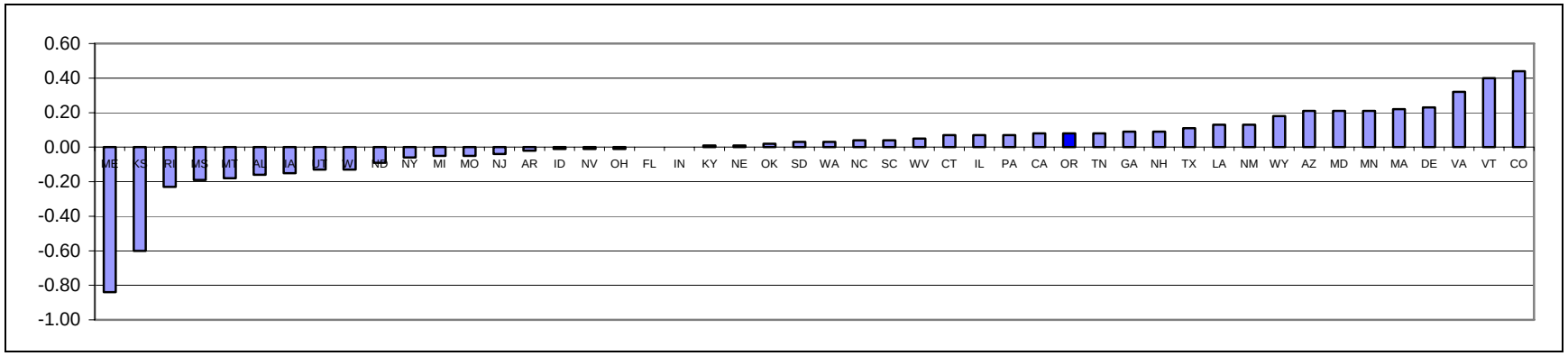

Figure 2.11: Proportionate change in truck-involved crashes per million TVMT, 2003-2007

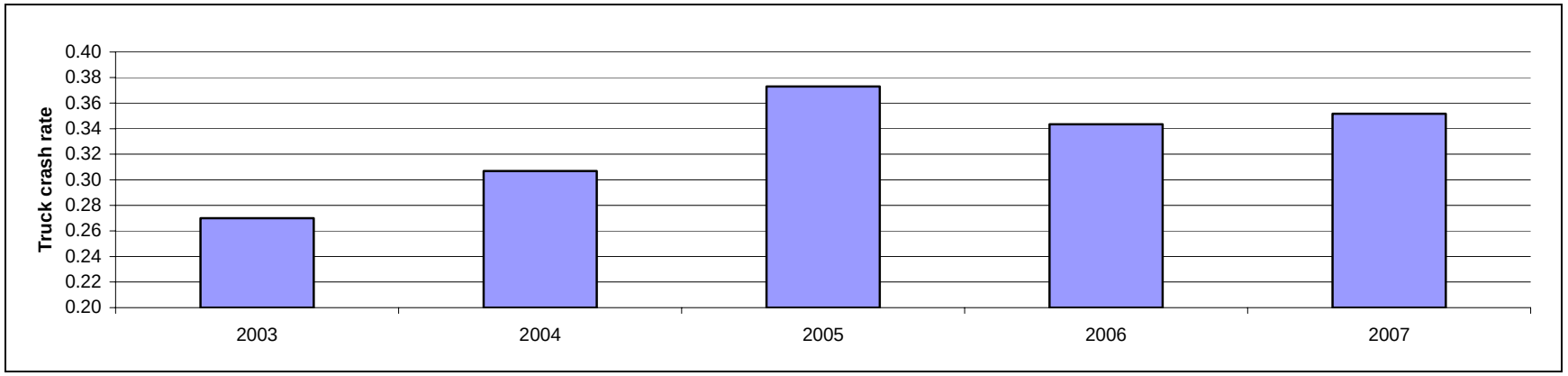

Figure 2.12: Truck-involved crashes in Oregon per million TVMT, 2003-2007

2.1.5 Summary

FMCSA designed MCSAP to be data-driven and results-oriented. States thus have considerable flexibility in directing resources and effort within their programs to achieve the greatest improvement in safety. Oregon's MCSAP is distinguished by its greater emphasis on drivers, reflecting the state's CMV safety experience and research identifying drivers as the critical reason for 87% of large truck crashes (*FMCSA 2007a*). As this section has shown, Oregon dedicates comparatively greater effort to commercial vehicle safety enforcement activity than is typical. Considering the outcomes of the enforcement activities in these three areas, as represented by DOS and VOS orders and conditional/unsatisfactory compliance review ratings, the investment of enforcement effort in Oregon appears to be relatively effective when compared to the outcomes achieved in other states.

2.2 MCSAP EFFECTIVENESS: REVIEW

In cooperation with the Volpe National Transportation Systems Center, FMCSA has developed two analytical models to estimate the benefits of MCSAP in terms of crashes avoided, lives saved, and injuries avoided. One model addresses compliance reviews (*FMCSA 2008*), and a second addresses both roadside inspections and traffic enforcements (*FMCSA 2007b*). Beyond these assessments, the academic and professional literature offers a limited amount of evidence specifically addressing MCSAP safety enforcement functions.

According to a report prepared by Volpe National Transportation Systems Center for FMCSA (*2008*), the compliance review effectiveness model is based on the observed reduction in motor carriers' crashes during the 12-month period after a compliance review compared to crashes that occurred during the 12-month period prior to compliance review. Data used in the model to make "before and after" comparisons include crashes reported by states and carriers' power units reported during compliance reviews.

Analysis using the Volpe Center model estimates that for the immediate 12 months following compliance reviews in FY 2005, 2,306 crashes, 1,561 injuries, and 92 fatalities were avoided nationally as a consequence of the compliance review program. The average crash rate of motor carriers receiving compliance reviews in FY 2005 decreased by 16.3%. Carriers with 1 to 5 power units experienced the largest crash rate reduction. The analysis indicated that Arizona and Texas had the most crashes avoided in FY 2005.

FMCSA (*2007b*) also reported the results of another intervention model developed by the Volpe Center. The second intervention model consists of two sub-models estimating the direct and indirect crashes avoided from the roadside inspection and traffic enforcement programs. Direct effects are estimated based on the assumption that the program intervention reduces a driver's/vehicle's probability of being involved in a crash through discovering and correcting their safety defects. The sub-model for indirect effects assumes that crashes can also be prevented by carriers' increased awareness of FMCSA programs as a consequence of the law enforcement activities. The two sub-models share the same three basic steps as the compliance review effectiveness model to calculate the program effects: input data selection, assignment of crash risk probabilities, and calculation of direct results.

The Volpe Center enforcement intervention model estimated that 9,256 crashes, 6,417 injuries, and 344 fatalities were avoided nationally as a result of roadside inspections in FY 2005. Texas and California led the states in terms of the total number of crashes, injuries, and fatalities avoided due to the roadside inspection program.

Lastly, the Volpe Center model estimated that 9,215 crashes, 6,390 injuries, and 343 fatalities were avoided as a result of traffic enforcements in FY 2005. Missouri and Texas experienced the largest number of estimated crashes, injuries, and fatalities avoided as a result of the traffic enforcement program.

FMCSA has also estimated the costs associated with performing compliance reviews and roadside inspections (*Econometrica 2007a; 2007b*). The costs of compliance reviews were based on reviews performed by federal safety investigators, while the costs of roadside inspections were based on inspections performed by state personnel. In both cases, the assessment covered both enforcement agency and motor carrier costs in 2006.

The summary findings of the compliance review and roadside inspection cost assessments are presented in Table 2.1. A compliance review is considerably more expensive than a roadside inspection, with a cost that is about twenty times greater. Also, about 75% of compliance review costs are borne by the enforcement agency, while over 60% of roadside inspection costs are borne by motor carriers. Motor carriers' larger share of roadside inspection costs is attributable to the inclusion of revenue service losses that occur while a vehicle is inspected. Such losses do not occur in a compliance review.

Table 2.1: Estimated average costs of compliance reviews and roadside inspections

Source of Costs	Cost Per Review	Cost Per Inspection
Enforcement Agency	$1,133.00	$30.52
Motor Carrier	374.00	47.76
Total	1,507.00	78.28

Combining FMCSA's cost information with its estimates of avoided crashes, injuries, and fatalities provides a measure of the cost effectiveness of the compliance review and roadside inspection programs. This information is shown in Table 2.2. Although a compliance review is more costly, the safety benefit that it yields per dollar expended is more than twice the benefit yielded per dollar spent on a roadside inspection.

Table 2.2: Cost effectiveness of compliance reviews and roadside inspections

Activity & Source of Costs	Cost Per Crash Avoided	Cost Per Injury Avoided	Cost Per Life Saved
Compliance Reviews			
Enforcement Agency	$5,616	$8,297	$140,775
Motor Carrier	1,854	2,739	46,470
Total	7,470	11,036	187,245
Roadside Inspections			
Enforcement Agency	$7,236	$10,438	$194,704
Motor Carrier	11,324	16,334	304,688
Total	18,560	26,771	499,392

For analysis and evaluation purposes, the U.S. Department of Transportation has adopted a monetary value of the benefit from preventing a fatality or an injury. In 2008, the Department amended the value of an avoided fatality from $3.0 to $5.8 million (*USDOT 2008*). The Department also observed that empirical research on this subject had yielded varied estimates, and it thus recommended that evaluations consider estimates ranging from $3.2 to $8.4 million per avoided fatality.

The USDOT benchmark values per avoided fatality are substantially greater that the cost effectiveness estimates for avoided fatalities from both the compliance review and roadside inspection programs. For example, the mid-point benefit value is 31 times greater than cost effectiveness estimate for compliance reviews, while the low-end benefit value is more than 11 times greater. For roadside inspections, the corresponding benefit values are 17 and 6 times greater, respectively. Thus, with respect to fatalities averted both safety enforcement programs appear to yield substantial net benefits to society.

FMCSA research estimates that of the savings obtained per avoided truck crash is approximated $91,000 (*Zaloshnja and Miller 2007*). At this value, the ratio of mid-point benefits to costs per avoided crash for compliance reviews and roadside inspections is 12.2:1 and 4.9:1, respectively.

The USDOT has also adopted benefit values for avoided injuries. These values are differentiated according to a six-category injury severity scale. The FMCSA program effectiveness model does not differentiate avoided injuries by severity level, and thus an assessment of injury-related benefits and costs is not possible.

There is a potential research design problem associated with the FMCSA's crash, injury and fatality avoidance model estimates. Using compliance reviews as an example, it is known that carriers are not randomly selected for compliance review. Rather, screening tools are used to identify carriers with a history of safety violations. A research design phenomenon known as "regression-to-the-mean" (*Campbell and Stanley 1963*) posits that there is a non-trivial statistical likelihood that these carriers, as a group, would experience a subsequent reduction in crashes without a compliance review intervention. To properly control for this phenomenon, it would be necessary to apply the following design: 1) screen carriers to identify candidates with problematic safety records; 2) randomly assign the identified candidates to treatment (receiving

compliance reviews) and control (no compliance review) groups; and 3) determine the compliance review effect by comparing the change in crashes of the treatment group to the change in crashes of the control group.

Given the research designs employed in the FMCSA enforcement effectiveness models, which do not control for regression-to-the-mean effects, it can be posited that the models' estimates of the number of crashes avoided as a result of enforcement interventions are overstated. The extent of the bias is unknown, but it could be substantial. For example, Jones (*1991*) found that over 80% of the observed reduction in traffic violations following treatment of Oregon problem drivers was attributable to regression-to-the-mean effects.

Likely regression-to-the-mean effects prevent definitive conclusions from being drawn about the net benefits of compliance review and roadside inspection activity. However, the net benefit of both activities remains positive under very conservative assumptions about the value of an avoided fatality and the magnitude of regression-to-the-mean effects. To the extent that the regression-to-the-mean effect is similar for both compliance reviews and roadside inspections, it can also be concluded that the net benefit of resources invested in compliance reviews is greater than the net benefit of resources invested in roadside inspections. If this conclusion is valid, it implies that society would benefit from allocating relatively more enforcement resources to compliance reviews.

Beyond the cost effectiveness assessment discussed above, Moses and Savage (*1997*) conducted a full cost-benefit analysis of compliance review and roadside inspection activity using program and crash data from the early 1990s. Their analysis accounted for deadweight losses, demand shifts, deterrence effects, and long term crash trends in assessing these safety enforcement activities. With respect to benefit measures, they also monetized savings associated with avoided cargo and property damage losses in addition to avoided injuries and fatalities. In addition to time losses directly related to inspections, their cost measures also accounted for additional expenditures borne by carriers when drivers or vehicles were placed out of service after failing roadside inspections. Moses and Savage (*1997*) estimated that the ratio of benefits to costs for compliance reviews was 4.24, while the ratio for roadside inspections was 1.27. Thus, they found that the net social benefit of compliance reviews substantially exceeded that of roadside inspections. Lastly, Moses and Savage (*1997*) acknowledged that regression-to-the-mean represented a threat to the validity of their analysis, but they were unable to take steps to mitigate its effects.

Elsewhere in the literature, Chen (*2008*), using MCMIS data, conducted a study to examine whether the compliance review program was effective in terms of reducing crashes, whether the program was effective across motor carrier sub-groups, and whether the impact of the program was sustained over time. Chen selected companies formed during the 1990-1995 period with at least one truck that remained active until 2004. Truck crash data for those companies from 1996 to 2003 were examined. Chen found that the compliance review program had a strong impact (in reducing truck crashes) soon after the review and the initial impact was sustained through the end of the study period. The program was also found to be effective regardless of carrier size, operation classification, type of organization, or safety rating.

Although current inspection strategies are generally having a positive effect on commercial vehicle safety, a study prepared by Cambridge Systematics and MaineWay Service (*2006*) for FMCSA shows that the nation's roadside inspection programs are on the verge of being overwhelmed by growing commercial vehicle traffic volumes, decreasing enforcement resources, and the addition of security-related responsibilities. Their interviews found that stakeholders from both state CMV safety programs and the motor carrier industry agree that alternative inspection strategies should be employed. The stakeholders also agreed that many of the current inspection strategies were not performing at their optimal level due to data quality issues. The study highlights the importance of developing and maintaining more productive inspection and screening tools and technologies, such as the wireless communication networks, that can support mobile enforcement and data exchange.

Seatbelt use is effective in preventing injuries and fatalities from motor vehicle crashes; and improving seatbelt use is an important component of MCSAP roadside inspection and traffic enforcement programs. National seatbelt usage surveys have shown that commercial vehicle drivers' seatbelt usage rate is below that of passenger vehicle drivers (*Cook, et al. 2008*). Survey data from Utah also has shown that the seatbelt usage rate for heavy commercial vehicle drivers in that state is only 64%, much lower than the national rate (84%) for drivers of passenger vehicles (*Cook, et al. 2008*). This illustrates the need to strengthen seatbelt use enforcement among heavy commercial vehicle drivers to reduce injuries and death.

In 2004 the state of Washington demonstrated an FMCSA-sponsored program called Ticketing Aggressive Cars and Trucks (TACT)[3], which employed a high-visibility enforcement (HVE) strategy to reduce unsafe driving behaviors around commercial motor vehicles (*Thomas, et al. 2008*). To test the effectiveness of TACT, they selected four high-crash interstate highway corridors. Two of the corridors received media messages and increased traffic enforcement over an 18-month period, while the other two corridors did not. Interviews among drivers found that the media messages were received and understood, that the media messages were being shared among drivers, and that driver behaviors improved. Statistical analysis also showed that violation rates fell significantly among the intervention corridors while remaining unchanged among the control corridors.

The findings by Thomas, et al. (*2008*) highlight the important role of communication and public information in raising public awareness of the safety risks involving heavy trucks and passenger vehicles. The coordination of enforcement and media communication has been identified as a "best practice" by Wundersitz, et al. (*2010*) in their review of research on road safety media campaigns. Research has also found that passenger vehicle drivers are at fault in about two thirds of collisions involving light vehicles and heavy trucks (*Knipling, et al. 2004*). Thus, improving safety in the motor carrier operating environment depends in no small way on promoting safer driving practices among light vehicle drivers.

[3] The TACT program is designed around three principal components: communication, targeted enforcement, and evaluation. Presently, FMCSA is moving TACT into implementation and has certified the following eight states as having fully met all implementation requirements: Georgia, Indiana, Kentucky, Nevada, North Carolina, Oregon, Pennsylvania, and Washington (*FMCSA 2010b*).

Generally, the shift in safety enforcement orientation from vehicles to drivers has been accompanied by media campaigns that are less than fully informed by behavioral psychology research (*Wundersitz, et al. 2010*). In the extreme, this shortcoming can limit the impact of enforcement programs to those who are directly subjected to enforcement actions. Alternatively, media and communication campaigns that are fully informed by research can leverage the effects of enforcement throughout the driving population by raising safety awareness and motivating behavioral change. In this respect, it should also be recognized that the contribution of research to informing media and communication strategies does not ensure success. Evaluations are necessary to determine the extent to which an implemented campaign has achieved its objectives. Such evaluations, in turn, serve to both inform the underlying research and redirect the strategy toward greater effectiveness.

2.3 SAFETY ASSESSMENT IN CONTEXT

There is a well-documented history of success in reducing U.S. traffic fatalities through safety treatments in the areas of highway and vehicle design. Evans (*2004*) considers safety improvements in these two areas to be important contributors to the 90% decline in U.S. traffic fatality rates since the 1920s. Experience with specific types of highway design treatments is extensive, with numerous evaluations providing fairly rigorous evidence of expected crash reductions. For example, the Federal Highway Administration (FHWA) maintains a Crash Modification Factors Clearinghouse, summarizing research on the expected change in crashes for a large inventory of design and operational safety countermeasures (*FHWA, no date*). Similarly, there is extensive knowledge of the safety benefits associated with various National Highway Traffic Safety Administration (NHTSA)-mandated vehicle design improvements that followed passage of the National Motor Vehicle Safety Act of 1966 (see, for example, *Vahidnia and Walsh 2002*). In combination, highway and vehicle safety improvements have contributed to both reductions in crash risk and gains in crash survivability. However, the marginal safety benefits of vehicle and highway treatments have diminished over time. Having already addressed the most hazardous highway and vehicle safety conditions, contemporary treatments, although still cost effective, are not yielding safety improvements comparable to previous applications (*Evans 2004; 2006*).

Thanks in part to the legacy of road and vehicle design improvements, the predominant source of safety risk in today's transportation environment is driver behavior. For example, research summarized by Evans (*2004*) finds that driver behavior is now a principal or contributing cause in over 90% of crashes. The Large Truck Crash Causation Study (*FMCSA 2007a*) has reached similar conclusions with respect to the roles of truck operator and passenger vehicle driver behavior.

In contrast with the road/vehicle safety experience, which is deeply rooted in the engineering sciences, knowledge of the effects of behavioral countermeasures on crash incidence and severity is more limited (*Evans 2004; Preusser, et al. 2008; Vahidnia and Walsh 2002*). Driver sanctions, involving traffic enforcement and sometimes followed by license actions, provide the best evidence of countermeasures intending to produce behavior change (*DeYoung 1999; Masten and Peck 2004; Preusser, et al. 2008; Zaidel 2002*). This evidence indicates that enforcement

and license suspensions have generally modest and temporary effects. Evans (*2004*), for example, states that the reduction in crash incidence following traffic enforcement activity is limited to a three-month period, and DeYoung (*1999*) reports that 75% of Californians continue to drive while their licenses are suspended.

Evans (*2004*) contends that conventional traffic enforcement is of limited effectiveness because it cannot, by itself, overcome social norms that encourage risk-taking behavior. He also contends that the media, through content, programming and advertising, systematically promotes unsafe driving behavior. Thus, in his view, lasting improvements in driver behavior will depend on a serious commitment by the transportation policy community to traffic safety marketing campaigns that effectively recast social norms.

Successful efforts to recast social norms depend on engaging diverse sources of social capital in support of desired behavior changes (*Wallack 2000*). In its efforts to promote a culture of safe driving, the transportation safety community is learning from successful efforts in other fields, including the anti-smoking campaigns of public health and the recycling initiatives of the environmental movement (*McNeely and Gifford 2007*).

To date, the best evidence of progress in promoting safe driving behavior is represented in the campaigns against drunk driving and in support of seat belt use (*NHTSA 2009*). For instance, the number of traffic fatalities involving alcohol-impaired drivers has declined 44% since 1982, while seat belt use among motorists has increased from 15% in 1983 to 83% in 2008. Although legislative changes and active enforcement have contributed importantly, changes of this magnitude would not have been achieved without coordinated marketing, communication, public information, and education campaigns (*NHTSA 2009*).

The success initially achieved in reducing drunk-driving fatalities also offers lessons on current challenges facing efforts to recast social norms. For example, since the early 1990s, progress toward further reducing alcohol-related traffic fatalities has substantially slowed. One reason for this lack of continuing progress is that the alcoholic beverage industry has invested heavily in marketing and advertising – approximately $4 billion in 2005 (*FTC 2008*) – in an effort to sustain social norms promoting consumption. Drunk driving campaigns thus must also engage in costly counter marketing and advertising to offset the effects of the alcoholic beverage industry's promotional efforts (*Agostinelli and Grube 2002; Saffer 1997*).

The alcoholic beverage industry takes evaluation of its marketing and advertising investments very seriously. Evaluation studies relating marketing and advertising expenditures to sales (i.e., brand/product response analysis) are regularly undertaken (*Saffer 1997*). The same cannot be said of counter marketing and advertising campaigns. For example, the federal Government Accountability Office (GAO) (*2008*) has reviewed NHTSA's HVE program, which is primarily focused on seat belt use and alcohol-impaired driving. HVE involves intensified enforcement combined with a coordinated national-state level marketing and public information campaign. While state safety officials interviewed by GAO consistently observed that HVE was contributing to safety improvements, GAO nevertheless found that inconsistent and incomplete information hampered efforts to evaluate the effectiveness of the associated marketing and public information campaign.

In summary, there is a paradox within the transportation community's current approach to traffic safety. Knowledge is fairly deep with respect to the safety consequences of vehicle design, highway design, and traffic operations treatments. However, the predominant contemporary safety risks are associated with driver behavior, and knowledge of treatment effects in this area is fairly uncertain.

Within this general context, MCSAP is a very behavior-oriented program. Compliance reviews and safety audits essentially address organizational behavior as it relates to safety. Traffic enforcement activity addresses the negligent behavior of motorists and motor carrier operators. Roadside inspections that place drivers out of service are responding to negligent behavior in relation to hours of service and other operating regulations. And inspections that place vehicles out of service are addressing the negligent behavior of owners as it relates to proper maintenance.

Given its behavioral orientation, evaluation of MCSAP's activities has generally been more challenging than traditional evaluations of highway and vehicle design changes. For example, the effect of an implemented highway design countermeasure can be assessed against similar untreated (control) locations. Establishing comparable control in an evaluation of the effect of vehicle inspections would require allowing vehicles with identified safety deficiencies to remain in service, which is ethically unacceptable.

3.0 IDENTIFYING OREGON'S PEER STATES

One of the subsequent tasks in this study involved conducting structured interviews of MCSAP staff from other states. The objective of the interviews was to gather information on motor carrier safety enforcement strategies and practices that were being used elsewhere that offered promise for implementation in Oregon. One way of approaching the interview task was to contact Oregon's neighbor states, which share a common experience with interstate carriers operating in the region. Another approach was to contact states with the lowest CMV crash and fatality rates, under the assumption that these states were doing something that states with higher crash and fatality rates should know about.

However, as the earlier review of state level MCSAP activities has shown, there was considerable variation among states in the orientation of enforcement activities and outcomes achieved. In addition, motor carrier operating environments, represented by state highway system capacities and traffic volumes, extent of urbanization, weather and climate, and other factors can influence the motor carrier safety risk environment and the choices that motor carrier safety officials make in pursuing their missions. Thus, it was important to recognize that information and insights on dealing with motor carrier safety issues could be context sensitive.

This concern has been discussed more generally with respect to analyzing the performance of state transportation departments (*Hartgen and Neumann 2002*). In short, safety enforcement strategies and practices that are appropriate and yield desired results in one state may not effectively transfer to another. Thus, some effort needed to be devoted at the outset to identifying peer states, or states that shared the basic characteristics of Oregon's motor carrier operating and safety enforcement environments.

Cluster analysis was employed to identify peer states for the structured interviews. Cluster analysis is a statistical tool that assigns states into groups (called clusters) so that states within a given cluster are more similar to each other than states assigned to other clusters (*Aldenderfer and Blashfield 1984*). The analysis in this study was done using the hierarchical cluster routine in the SPSS statistical package, and similarity was assessed according to a Euclidean distance measure that partitioned the variance among the assignment variables so that within-cluster variance was minimized and between-cluster variance was maximized. Hendren and Niemeier (*2008*) used a variant of this approach to identify peer states for state transportation department policy and performance evaluation.

Variables used to characterize states with respect to commercial vehicle operations and safety were selected to represent four contextual dimensions: 1) the general travel environment; 2) the composition of MCSAP safety enforcement activities (i.e., relative effort dedicated to compliance reviews, roadside inspections, and traffic enforcement); 3) the direct consequences of MCSAP enforcement activities (i.e., compliance ratings, VOS and DOS rates); and 4) commercial vehicle safety outcomes (i.e., the change in truck crash rates from 2003 to 2007).

The variables and data sources are presented in Table 3.1. As the table shows, the variables are organized into a 4-group hierarchy consistent with the breakdown described above. The general travel environment is represented by variables describing the state highway system and its usage, the economy, topography, severe weather, and urbanization. "Severe weather" is an interaction variable created by multiplying the number of months with average temperature lower than 35 degrees (Fahrenheit) by state average precipitation in January, November, and December 2007. The MCSAP enforcement environment is represented by the number of compliance reviews, roadside inspections, and traffic enforcements per million truck miles traveled (TVMT) in 2007. The consequences of MCSAP enforcement are represented by DOS and VOS rates related to roadside inspections and traffic enforcements, and conditional and unsatisfactory rates related to compliance reviews. Safety outcome is represented by the change in truck crash rate between 2003 and 2007.

The cluster analysis was conducted progressively through the 4-group hierarchy of variables. Thus, first level state clusters were obtained using only travel environment variables; second level clusters were obtained using travel environment and MCSAP enforcement variables; third level clusters were obtained using travel environment, enforcement, and enforcement outcome variables; and fourth level clusters were obtained using travel environment, enforcement, enforcement outcome, and safety outcome variables.

Results of the cluster analysis are presented in Figure 3.1. At the first level of analysis, Oregon is assigned to the largest cluster with 18 other states. At the second level, where MCSAP enforcement variables were added, Oregon joins a much smaller cluster with 5 other states: Minnesota, Washington, Michigan, Nevada, and Colorado. At the third level, where enforcement outcome variables were added, Oregon joins an even smaller cluster with New Mexico, Arizona, and Nevada. At the fourth level, Oregon's cluster location remains unchanged from the third level.

3.1 SELECTION OF STATES FOR STRUCTURED INTERVIEWS

The second level cluster results provided a logical basis for identifying peer states for the structured interviews. At this level, the states identified shared generally similar travel and MCSAP enforcement characteristics with Oregon. Also, beyond this level, the reduction in within-cluster variance was limited.

Distinguishing characteristics of the second level Oregon cluster are presented in Table 3.2. The rows in the table are organized in descending order to show the variables that most distinguish the six states in this cluster from the 42 states assigned to the other clusters. Differentiation is represented by the cluster and state-specific Z-score values of the variables, which are measured in standard deviation units.

Table 3.1: Variables used in identifying peer state clusters

Cluster Levels				Variables	Data Source
Cluster level 4	Cluster level 3	Cluster level 2	Cluster level 1	Interstate lane miles / total public road lane miles in 2007	Highway Statistics 2007
				Truck VMT / Total VMT in 2007	Highway Statistics 2007
				Total VMT / total public road lane miles in 2007	Highway Statistics 2007
				Interstate VMT / interstate lane miles in 2007	Highway Statistics 2007
				Truck VMT / Total public road lane miles in 2007	Highway Statistics 2007
				GDP per capita in 2007	BEA 2007
				Mean Elevation	Census 2000
				Severe weather in 2007	U.S. Dept. of Commerce 2009
				Urban land percent in 2007	Highway Statistics 2007
				Urban lane miles percent in 2007	Highway Statistics 2007
				No. of roadside inspection / Truck VMT in 2007	FMCSA A&I Online system
				No. of traffic enforcement / Truck VMT in 2007	FMCSA A&I Online system
				No. of compliance review / Truck VMTby Fed and states in 2007	FMCSA A&I Online system
				Driver out of service rate in roadside inspection in 2007	FMCSA A&I Online system
				Vehicle out of service rate in roadside inspection in 2007	FMCSA A&I Online system
				Driver out of service rate in traffic enforcement in 2007	FMCSA A&I Online system
				Vehicle out of service rate in traffic enforcement in 2007	FMCSA A&I Online system
				Conditional Satisfactory rate in compliance review in 2007	FMCSA A&I Online system
				Unsatisfactory rate in compliance review in 2007	FMCSA A&I Online system
				Crash rate change from 2003 to 2007	FMCSA A&I Online system

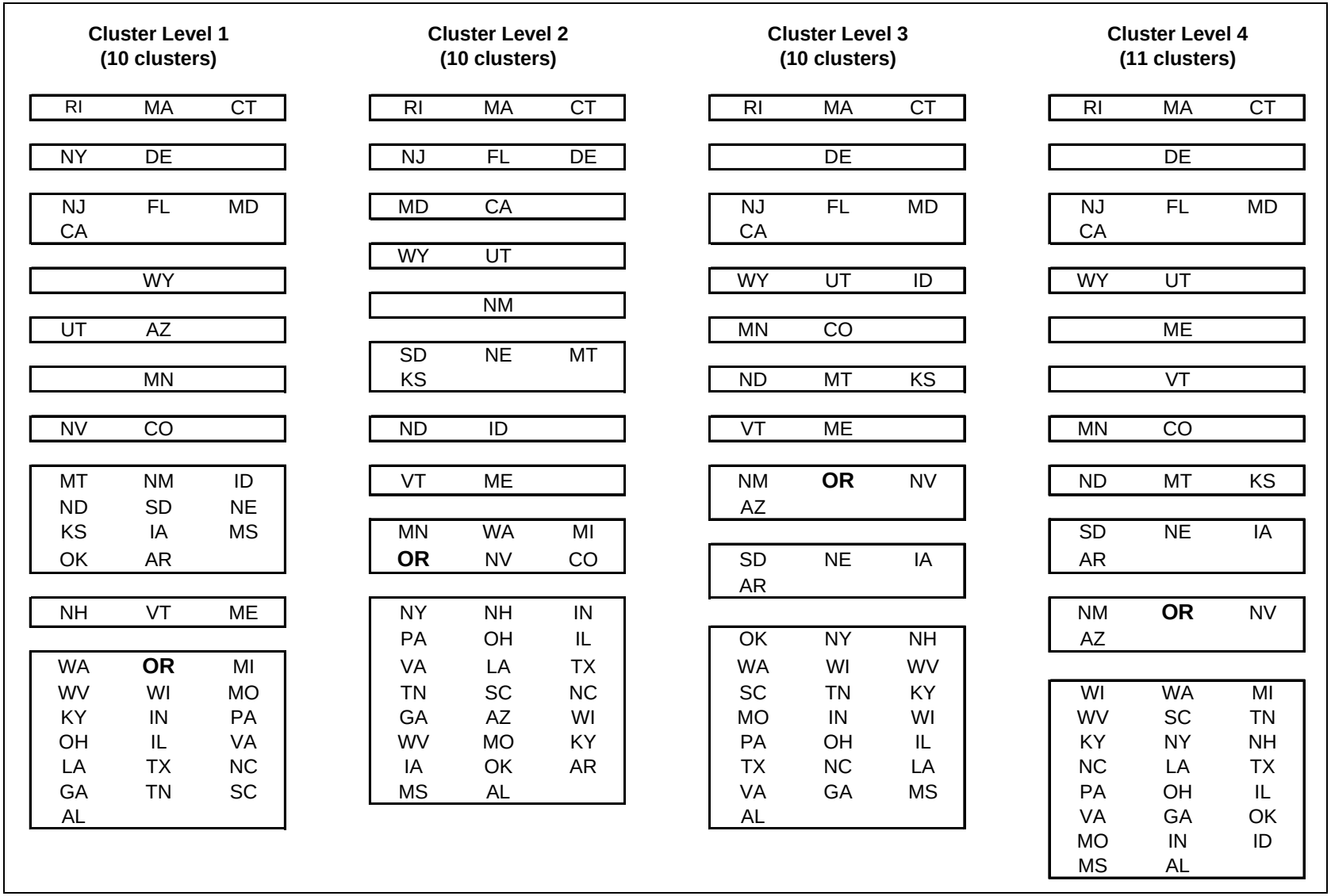

Figure 3.1: Peer state groups by cluster level

Table 3.2: Peer state cluster Z-scores*

Variables	Cluster	Cluster State Z-Score								
	Mean Z-Score	OR	CO	MI	MN	NV	WA	KY	AZ	FL
Traffic Enforcement / TVMT in 2007	1.43	0.16	1.01	1.60	2.49	1.01	2.35	0.20	0.06	-1.01
Compliance Review / TVMT in 2007	0.82	1.33	1.64	-0.41	2.35	-0.07	0.05	-0.63	-0.63	-0.63
Mean Elevation Feet 1983	0.80	0.84	2.72	-0.46	-0.30	2.02	-0.03	-0.54	1.27	-0.89
Truck VMT / Total VMT	-0.79	-0.13	-1.36	-0.87	-1.36	-0.62	-0.38	0.61	-0.13	-0.62
Roadside Inspections / TVMT in 2007	0.76	0.81	1.24	-0.17	0.62	0.73	1.34	0.30	-0.45	-1.03
Truck VMT / Total Public Road Lane Miles	-0.75	-0.44	-1.06	-0.44	-1.69	-0.44	-0.44	0.19	0.81	2.06
Interstate Lale Miles / Total Public Road Lane Miles	-0.55	0.26	-0.71	-0.71	-1.68	0.26	-0.71	-0.71	1.23	0.26
Urbanized Land Area / Total State Land Area	-0.50	-0.66	-0.59	-0.15	-0.51	-0.66	-0.44	-0.44	-0.59	0.57
GDP per capita, 2007 (in 2000 dollars)	0.43	0.33	0.71	-0.51	0.80	0.62	0.64	-0.89	-0.39	-0.42
Total VMT / Total Public Road Lane Miles	-0.32	-0.41	-0.46	0.18	-0.78	-0.28	-0.18	-0.37	0.51	1.84
Urban Lane Miles / Total Public Road Lane Miles	-0.26	-0.35	-0.26	0.13	-0.74	-0.31	-0.02	-0.60	0.52	1.87
Temp*Precipitation	0.12	0.31	-0.27	0.50	-0.08	-0.84	1.08	-0.08	-1.04	-1.04
Interstate VMT / interstate lane miles	-0.09	-0.29	-0.24	0.27	-0.05	-0.67	0.45	0.17	-0.40	1.06

* Values in the table are state values measured in standard deviation form in relation to the sample means.

The traffic enforcement variable provides the greatest differentiation of the Oregon six-state cluster from the remaining states, with a cluster level mean enforcement value that is 1.43 standard deviations above the overall sample mean level of traffic enforcement. Hence, given a standard normal distribution, the Oregon cluster's collective traffic enforcement activity ranks at about the 90th percentile among the states included in the cluster analysis. Traffic enforcement activity within the Oregon cluster is greatest in Minnesota (2.49 standard deviations above the sample mean) and least intense in Oregon (.16 standard deviation above the overall sample mean).

Compliance reviews, at .82 standard deviations above the overall sample mean, are the second most distinguishing characteristic of the Oregon cluster. Topography, represented by mean elevation, is the third most distinguishing characteristic of the Oregon cluster, with a collective average value that is .80 standard deviations above the overall sample mean elevation. In subsequent order, the Oregon cluster can be characterized as follows:

- truck traffic representing a relatively smaller share of state VMT
- relatively higher rates of roadside inspections
- relatively lower density of truck traffic on the state road system
- relatively smaller share of Interstate capacity on the state road system
- relatively low level of urbanization of the state's total land area
- relatively high levels of gross domestic product per capita
- relatively low density of total traffic on the state road system
- relatively smaller urban share of the state's road system
- near-typical incidence of inclement cold weather conditions
- near-typical Interstate traffic density

Overall, the Oregon cluster was primarily characterized by relative high levels of motor carrier safety enforcement activity, covering traffic enforcement, compliance reviews and roadside inspections. Thus, the states within this cluster offered an opportunity for structured interviews to probe for strategies that were based on a greater than typical commitment to enforcement with the intent to achieve the greatest possible improvement in motor carrier safety.

The states identified in the cluster analysis were reviewed by the project's technical advisory committee (TAC). The TAC generally agreed with the list of candidate interview states but also made suggestions based on their knowledge of motor carrier safety conditions and enforcement practices. First, the TAC suggested that Arizona be added to the interview group, given its inclusion with Oregon in subsequent stages of the cluster analysis, when enforcement outcomes are included. Second, the TAC suggested that Kentucky be included as a result of its utilization of intelligent transportation system (ITS) technologies in enforcement practice, making it similar to Oregon in that regard. Third, the TAC suggested that Florida be included because its MCSAP is, like Oregon's, administered within the state department of transportation.

The cluster variable Z-scores for Kentucky, Arizona, and Florida are presented in the right hand columns of Table 3.2. Comparing the Z-scores of these states with the overall cluster mean scores, Kentucky appears to be more similar to the Oregon cluster states than is Arizona or Florida. For example, Kentucky corresponds fairly well to the Oregon cluster in the rate of

roadside inspections, the interstate share of total lane miles, urbanization, and traffic density. Arizona's correspondence is limited to elevation and urbanization, while Florida's correspondence is limited to the commercial vehicle share of total VMT.

4.0 PEER STATE INTERVIEWS

This chapter presents findings from structured interviews of key MCSAP staff from Oregon's peer states. The intent of the interviews was to recover information about motor carrier safety enforcement issues, strategies, and practices. Information from the interviews was then screened for common themes to identify potential actions that MCTD could take to improve the effectiveness of Oregon's MCSAP.

The research approach in the interviews was qualitative in several respects. First, given that a cluster analysis was employed to identify peer states for the interviews, the selection of states was not random. Thus the interview responses were not necessarily representative of MCSAP as it is administered across all states and territories. Second, although the interviews followed a pre-designed protocol, the information recovered was, by definition, informal and did not correspond to established objective measurement criteria (*Moser and Kalton 1972*). Offsetting these considerations, the main benefit of the structured interview approach was that it allowed deeper insights to be gained on subjects that were central to the objectives of this study.

4.1 METHODOLOGY

Preliminary interviews were conducted with two MCTD commercial vehicle safety program staff to develop the interview protocol. These interviews covered the full range of program activities and helped to clarify topics and issues of specific interest to the present study. An interview protocol was then drafted and reviewed by the project's technical advisory committee (TAC). Following TAC review, the final protocol (presented in Appendix B) was completed. The interview questions covered the following five topical areas:

- Organizational structure;
- General concerns about commercial vehicle safety;
- Strategies and tactics;
- New ideas and innovations; and
- Relationship with FMCSA and other stakeholders.

An initial roster of interviewees was compiled from a contact list prepared by the Commercial Vehicle Safety Alliance (CVSA). The CVSA contact list generally included each state's MCSAP manager. Selection of interviewees other than state MCSAP managers was based on their involvement in MCSAP activities. For example, the Oregon State Police (OSP) has shared Oregon's MCSAP resources. Thus, the OSP field officer responsible for coordinating commercial vehicle safety enforcement activities was interviewed. Likewise, two additional interviews were conducted in Minnesota because the Minnesota State Patrol and the Minnesota Department of Transportation divide MCSAP administration and implementation responsibilities. In Colorado, staff from the Department of Revenue, Port of Entry Division were interviewed because they divide MCSAP functions with the Colorado State Patrol. Colorado

also emphasizes regional planning to improve commercial vehicle safety, and the officer responsible for coordinating this activity was thus interviewed.

Interviews were conducted by telephone between September and December 2009, with each interview taking between an hour and an hour and a half to complete. Interviews were sometimes supplemented by information drawn from a state's Commercial Vehicle Safety Plan or from its program website (*Colorado State Patrol 2007; Michigan State Police 2007; Minnesota State Patrol 2007; Nevada Department of Public Safety 2007; Washington State Patrol 2007*). Callbacks were sometimes needed to clarify interpretation of interview responses or to obtain additional information. To ensure accuracy, a draft of the information obtained in the interviews was sent to the subjects for review and confirmation.

With the exception of Arizona, commercial vehicle safety staff from all of the peer states agreed to be interviewed. Twelve persons from eight states were interviewed.

4.2 INTERVIEW RESULTS

This section presents findings from the peer state interviews. The section begins with a brief profile of the general structural characteristics of each state MCSAP. The presentation then turns to interview findings and observations related to each of the topical areas listed in the previous section.

4.2.1 Peer state MCSAP profiles

Although FMCSA funding of state MCSAPs is formula driven (see Appendix C), federal guidelines do not specify how states should organize their programs beyond identifying a lead agency responsible for administration. As is evident in the following general profiles, there were notable differences among the peer states with respect to MCSAP administration, personnel dedicated to commercial vehicle safety activities, and other commitments supplementing MCSAP activities.

4.2.1.1 Oregon

ODOT MCTD has been the lead MCSAP agency for Oregon since the mid-1980s. In a 2003 budget note, the Oregon State Legislature directed MCTD to partner with the Oregon State Police (OSP) in carrying out traffic enforcement and vehicle inspection activities under MCSAP. The budget note also directed MCTD to allocate about two-thirds of its MCSAP funds to the OSP (*Oregon State Legislature 2003*).[4] MCSAP funding allocations from MCTD to OSP are subject to an Interagency Agreement (IA). Terms of the FFY 2009 IA between MCTD and OSP cover 1) matching and maintenance of effort funding commitments required of OSP; 2) the number of inspections to be

[4] As this report was being completed, OSP decided to continue its commercial motor vehicle safety enforcement activity without MCSAP funding. Thus, approximately $1.6 million in MCSAP funds will be transferred to other MCSAP activities including the hiring of 16 limited duration positions.

completed by OSP (amounting to about 30% of MCTD's program-wide target number); 3) participation in special enforcement operations (e.g., TACT); 4) rates of reimbursement for inspections, inspections/actions resulting in drug or DUII arrests, and participation in special enforcement operations; and 5) scheduling, reporting and other program compliance requirements (*ODOT 2009*). In addition to its IA with OSP, MCTD has implemented similarly structured agreements with local law enforcement agencies in Oregon.

MCTD employs approximately 100 Enforcement Officers charged with size and weight enforcement and inspections, and approximately 30 Compliance Specialists assigned to compliance reviews and inspections. During 2010 it will add 16 limited duration inspectors to increase the number of mechanical and driver inspections. There is also a staff responsible for commercial vehicle registration, and a staff responsible for weight-mile tax compliance audits. Program offices are located throughout the state. Facilities include 50 permanent weigh stations and six ports of entry. MCTD's commercial vehicle safety budget is approximately $7 million, of which $2.9 million is dedicated to MCSAP.

OSP employs 375 troopers, with eight officers carrying primary MCSAP safety enforcement responsibilities. These officers maintain up to Level II inspection training. OSP troopers generally receive a week of training for commercial vehicle inspection upon joining the force. Troopers do not work the weigh stations but rather patrol, enforce, and inspect using probable cause stops.

4.2.1.2 Colorado

The Colorado State Patrol (CSP), Motor Carrier Safety Section (MCSS), has been the lead agency for MCSAP since 1984. In 1987, the Colorado Department of Revenue, Port of Entry (POE) Division became a sub-contractor and shares approximately 25-30% of the MCSAP funds. Both agencies enforce FMCSA regulations. POE has concentrated its activities at 10 fixed and 10 mobile locations. However, only the CSP has the authority to conduct compliance reviews and safety audits. The CSP has Memorandums of Understanding (MOUs) for enforcement with over 20 local police departments, but it does not share federal dollars with these entities. The overall budget for MCSS is $4 million, of which $2.9 million is dedicated to MCSAP.

POE employs seven full time inspectors and approximately 50 part-time inspectors. POE inspectors have responsibility for enforcement of state and federal size, weight and safety regulations. They are certified in basic motor carrier safety inspection, bulk-packaging and hazardous material.

MCSS employs 17 troopers and nine supervisory and clerical staff. Overall, CSP employs approximately 700 uniformed members, of which 350 are troopers. All CSP troopers are trained to conduct at least a Level III inspection. CSP troopers must have two years of regular patrol experience before assignment to MCSS for which, in turn, they receive a small pay increase.

MCSS troopers are located throughout the state. They conduct compliance reviews and new carrier safety audits, as well as engaging in roadside enforcement activities and compliance investigations. The state is divided into nine regions, each comprised of four to six counties. Each region is responsible for developing its own commercial vehicle safety plan and performance measures.

4.2.1.3 Michigan

The Michigan State Police (MSP), Traffic Division (TD), is the lead agency for commercial vehicle enforcement. Within TD, the Commercial Vehicle Safety (CVS) unit has primary responsibility for implementation of program activities related to commercial vehicle safety. Four years ago, TD/CVS partnered with the Michigan State Department of Transportation (MDOT), which is responsible for maintaining inspection stations and weighing equipment around the state to coordinate MCSAP and size and weight enforcement. The budget for CVS is $7.0 million, of which MCSAP accounts for $5.2 million.

CVS enforces size and weight regulations; does inspections, compliance reviews, and new carrier safety audits; conducts investigations; provides training; and is responsible for general enforcement of state and federal commercial vehicle safety regulations. CVS works closely with the Michigan Public Service Commission and the Michigan Department of State. These agencies collect fees, issue licenses, and collect data.

Another resource available to TD is the Michigan Truck Safety Commission (MTSC). This 11-member body monitors safety and issues grants to support education among the general public and within the trucking industry. Under state law, every truck over 10,000 pounds must pay $10.00 annually to MTSC. MTSC funds the Michigan Center for Truck Safety, which delivers education and training programs to truck drivers (e.g., spin out classes using a driving simulator).

CVS employs 124 Motor Carrier Officers (MCOs), 11 Motor Carrier Investigators (MCIs), and four Safety Auditors (SAs), with additional supervisory and administrative personnel. To ensure that commercial vehicle safety enforcement responsibilities are "not diluted with other law enforcement duties" (*Michigan Commercial Vehicle Safety Plan, 2008*), MCOs are restricted in their enforcement authority to laws pertaining only to commercial vehicles and certain other general criminal statutes.

MCOs are located across eight enforcement districts and divide their time between weight enforcement, inspections, and traffic safety enforcement activities. Officers are certified to Level I and are trained for cargo and hazardous material inspections. MCIs primarily perform compliance reviews, while the SAs conduct new carrier safety audits.

4.2.1.4 Minnesota

The Commercial Vehicle Section (CVS) of the Minnesota State Patrol (MSP) in the Department of Public Safety (DPS) is the lead agency for MCSAP. Approximately 30% of the MCSAP budget is allocated to the Minnesota Department of Transportation

(MnDOT) as a sub-grantee. MnDOT's Office of Freight and Commercial Vehicle Operations (OFCVO) performs compliance reviews, provides hazardous material response, and offers some education. CVS has also signed Memorandums of Cooperation with several local agencies for enforcement. As part of these agreements, local officers come one day a month to headquarters for planning and to work with CVS personnel on the road. The program budget for CVS is $6.2 million, of which MCSAP accounts for $3.7 million.

CVS employs eight Lieutenants, 30 troopers, 85 inspectors, and seven support staff. CVS has the primary responsibility for commercial vehicle inspections in Minnesota. The state is divided into seven regions, each managed by a Lieutenant in charge of commercial vehicle safety. Although CVS troopers have full authority to enforce all laws, their primary focus is on enforcement of commercial vehicle regulations through probable cause stops. Troopers who come to CVS are reclassified as technical sergeants and receive a 10% pay raise. Troopers are cross-trained to handle what they encounter without having to call in an inspector. Inspectors work the weigh stations and are joined by troopers at mobile weigh station sites.

OFCVO employs between 17-29 Commercial Vehicle Operations (CVO) officers. The primary responsibility of CVOs is to conduct compliance reviews. The office is currently a participant in FMCSA's Comprehensive Safety Analysis 2010 (CSA 2010) pilot initiative, which is designed to improve the performance of the compliance review process.

4.2.1.5 Nevada

In 2001 the Highway Patrol Division (HPD) was moved from the Nevada Department of Motor Vehicles to the Department of Public Safety (DPS). Following the move, DPS has served as the lead agency for MCSAP. The Motor Carrier Enforcement Division (MCED) of DPS is responsible for administering the program. MCSAP funding accounts for $1.5 million of MCED's $4.0 million budget.

Administratively, MCED is comprised of a central headquarters and three command regions (Northern, Southern and Central). MCED headquarters creates an overall commercial vehicle safety plan with both statewide goals and specific goals for each command region. MCED is staffed with approximately 60 sworn officers (with 20 assigned to each command region) and 12 Commercial Vehicle inspectors.

MCED is responsible for inspections, size and weight enforcement, compliance reviews, new carrier safety audits, and training of state patrol officers and officers in allied agencies. Officers have Inspection Level I-V training, with selected officers receiving training in HAZMAT, nuclear, and cargo tank packaging and bulk packaging. MCED's goal is to maximize opportunities for cross-training in order to achieve flexibility. As there are no fixed-location inspection facilities within the state, mobile enforcement and temporary inspection sites are used to meet state and federal goals. Efforts are being made to provide local inspection training to officers in rural law enforcement agencies.

4.2.1.6 Washington

In 2001 MCSAP and other commercial vehicle enforcement responsibilities were centralized in the Commercial Vehicle Safety Division (CVSD) of the Washington State Patrol (WSP). CVSD has MOUs with 19 city and county agencies to perform inspections and to enforce commercial vehicle regulations. MCSAP funds are also shared with the Utilities and Transportation Commission, which performs safety inspections on motor coaches, solid waste carriers, and movers. CVSD has a number of additional responsibilities beyond enforcement of commercial vehicle safety regulations. Thus, MCSAP funds account for just $3.3 million of CVSD's $32.0 million budget.

CVSD employs 270 people, including 70 sworn patrol officers and 180 Commercial Vehicle Enforcement Officers (CVOs), and 20 persons carrying out supervisory and support responsibilities. Patrol officer responsibilities include traffic enforcement and inspections related to probable cause stops. CVOs have more limited authority. They can stop and inspect a commercial vehicle without probable cause, but cannot issue traffic citations or make arrests. CVOs are also responsible for compliance reviews, new carrier safety audits, and size and weight enforcement.

There are 53 fixed location scales in the state and five ports of entry. CVSD assigns detachments of 5-7 patrol officers to the ports of entry and to specific geographical regions within the state. CVOs have an opportunity to become patrol officers. CVSD's goal is to have everyone classified as both a sworn patrol officer and CVO.

4.2.1.7 Kentucky

MCSAP lead agency responsibility is vested in the Kentucky State Police (KSP), Commercial Vehicle Enforcement Division (CVED). CVED is KSP's newest division, having been a stand-alone entity prior to 2008. CVED partners with the Kentucky Department of Transportation, Motor Carrier Division, which owns the weigh stations. CVED also has sub-grants with the Lexington, Louisville and Boone County sheriffs' offices for traffic enforcement activities. MCSAP funds account for $3 million of CVED's $21.5 million budget.

Administratively, CVED is divided into two regions (East and West Troop) with three posts in each region. Safety enforcement strategies and tactics are determined at the division level in consultation with post personnel. CVED employs 146 sworn troopers, 25 Commercial Vehicle Safety (CVS) officers, and 25 staff. CVS officers must successfully complete the North American Standard Driver/Vehicle Inspection Program and General Hazardous Materials training. Additional training is provided on state laws and regulations appropriate to commercial vehicle enforcement. Troopers patrol the highways and stop vehicles with probable cause. In addition, they can operate weigh stations, conduct compliance reviews and vehicle accident investigations, impound vehicles, and make arrests. CVS officer responsibilities are limited to operating weigh stations, inspecting vehicles, and undertaking compliance reviews and new carrier safety audits.

4.2.1.8 Florida

The Florida Department of Transportation (FDOT), Law Enforcement Division, Office of Motor Carrier Compliance (MCC) is the lead agency for MCSAP in Florida. The State is divided into two regions, the north and the south, with a Chief of Law Enforcement for each region. Regions are responsible for developing enforcement priorities under the guidance of the Commercial Vehicle Safety Plan and the State Enforcement plan. MCC does traffic enforcement for commercial vehicles and follows up with investigative assistance when a commercial vehicle is involved in a crash. Additional relationships are covered in MOUs with the Federal Drug Enforcement Administration, Federal Bureau of Investigation, the Department of Agriculture, and several local law enforcement agencies. MCSAP funds account for $8 million of MCC's $39.7 million budget.

FDOT directly employs 265 sworn officers, of which 256 are assigned to MCC. MCC officers' vehicles are clearly marked as patrol for FDOT. MCC officers are certified (i.e., police academy trained), armed, and have full statewide law enforcement authority, including powers of arrest. Their primary duties include commercial traffic enforcement, driver and vehicle compliance inspections, and providing supplemental support to state and local law enforcement agencies in emergencies. Although their primary focus is on commercial vehicles, MCC officers will stop non-commercial drivers when serious infractions are observed.

There are also 156 inspectors employed by MCC. Their primary responsibility is to work the weigh stations, enforcing size and weight regulations. FDOT has 22 inspection facilities throughout the state connected with weigh stations. Inspectors are assigned daily, and scales are open around the clock.

4.2.2 Organizational structure and performance

Organizational placement of MCSAP mainly reflects the legacy of commercial vehicle safety responsibilities in the peer states. Lead responsibility for administration resides within a highway patrol organization in six states (Colorado, Kentucky, Michigan, Minnesota, Nevada, and Washington), and within a department of transportation in the remaining two states (Florida and Oregon). However, with the exception of Florida, no state vests MCSAP implementation responsibility entirely within a single organization. Coordination of effort and resources among state agencies is commonplace. Moreover, extensive coordination of activities and resources generally occurs between state and local agencies. From an administrative standpoint, these arrangements are managerially complex, considering the budgetary scale of the program.

It is also worth noting that MCSAP's organizational placement is somewhat dynamic, considering the changes that have occurred in Kentucky and Oregon over the past decade. Moreover, additional organizational changes were being considered at the time of the interviews. In Colorado, for example, the legislature was considering a bill that would place the MCSAP activities of the Department of Revenue's Port of Entry Division under the administration of the

Colorado State Patrol.[5] Oregon also was addressing its partnership between MCTD-MCSAP and OSP.

Given FMCSA's funding formula, the scale of budgeted MCSAP activities varies with state population, the capacity of the state highway system, and the volume of commercial vehicle travel. However, considering expenditures from all sources dedicated to commercial vehicle regulatory activities, the relative importance of MCSAP funding varies considerably. Collectively among the peer states, MCSAP funds account for 25% of budgeted commercial vehicle regulatory expenditures. However, in Washington and Kentucky MCSAP's share is 10.3% and 14.0%, respectively; while in Michigan and Colorado its share is 74.3% and 72.5%. In Oregon, MCSAP accounts for 41% of MCTD's CMV safety budget.

The operational consequences of differences in the scale of safety enforcement activities were noted by an interviewee from a smaller state, who observed: "Look at other states … they have sheer numbers. Quite often, I'm the only one (in the State Patrol) working." Michigan and Minnesota specifically raised the issue of resource limitations in their 2008 Commercial Vehicle Safety Plans, while Oregon's Plan noted that the transfer of MCSAP funds to OSP was partially in response to OSP budget shortfalls.

Although there was no common organizational model of MCSAP administration among the peer states, the importance of organizational issues to MCSAP managers in implementing enforcement strategies emerged in the interviews. Michigan and Washington attributed the "success" of their enforcement activities to recent changes in organizational structure. Washington's manager concluded: "… now there is a common message, policies, procedures … this provided the ground work that set things in motion."

Through the process of describing their organizations, the interviewees commonly identified challenges to maintaining a coordinated and productive safety enforcement program. These challenges included:

- Officers being "called off" commercial vehicle enforcement to do other activities;
- Lack of commercial vehicle safety training and experience among regular patrol officers;
- Lack of resources for all enforcement activities, including commercial vehicle safety; and lack of "buy-in" on the part of supervisory and line staff;
- A perception that inspectors are more knowledgeable about commercial vehicle safety regulations than sworn officers, but get paid less;
- Trouble attracting and keeping inspectors because of lower pay;
- A perception that appointment to a commercial vehicle safety enforcement unit was like "putting an officer out to pasture;" and

[5] Subsequent to the interviews, the Colorado Legislature enacted HB 1113, which will shift MCSAP activities of the Ports of Entry to the Colorado State Patrol on August 15, 2010.

- Lack of confidence among regular patrol officers in their ability to effectively enforce commercial vehicle safety regulations.

Efforts to deal with these challenges varied. To improve the focus on commercial vehicle safety enforcement, Michigan's Motor Carrier Officers are sworn officers with authority restricted to laws that pertain only to commercial vehicles and certain other criminal statutes. The restricted authority is intended to ensure predictable enforcement. However, an officer with this authority receives less pay and has little monetary incentive to stay in the unit. As a consequence, turnover is high. As the interviewee noted: "We are competing against ourselves."

Another approach, taken by Minnesota and Colorado, is to upgrade the position of a commercial vehicle safety officer within the police force. In these states, officers receive a pay increase when they come into the commercial vehicle safety unit and, in the case of Minnesota, an increase in rank. Colorado also requires two years of regular patrol experience before coming into the unit.

Coordinated regional enforcement planning is an organizational strategy employed in two states. This approach is intended to promote buy-in and enhance consistency. In Colorado, for example, MCSS officers are assigned to specific regions. Each region develops its own commercial vehicle safety plan, based on statistical analysis of regional safety and enforcement data. Each region's plan is reviewed, discussed, and then integrated into Colorado's statewide commercial vehicle safety plan.

In Nevada, the Motor Carrier Division's commander works "laterally" with commanders in each of the state's three enforcement regions to implement the "goals and objectives" decided by headquarters: "We create the plan which is signed off by me. Then we meet with the regional commanders and generate objectives for each region."

Minnesota signs Memorandums of Cooperation with local jurisdictions. In exchange for training, the "local folks agree to come one day a month and work with our personnel out on the road. … we are concerned about consistency."

The importance of training is emphasized among nearly all of the states and is identified as lacking, particularly among regular patrol officers and within local jurisdictions. States vary in their training threshold goals, but the norm is to train for Level I-III inspections. Two states (Washington and Minnesota) emphasize cross-training for their commercial vehicle patrol officers so that they can deal "with whatever they meet up with."

Training not only a means of informing officers of safety regulations and inspection practice, it gives them the tools and experience necessary to overcome any personal timidity about enforcement. For example, Michigan views training of local officers as an element of their education and outreach effort: "We are trying to get across that this is everybody's job" [and] "… training makes them comfortable to stop a truck."

The emphasis on training extends beyond patrol officers. In Colorado and Oregon the importance of training inspectors is also recognized and emphasized. Both states have committed resources to ensuring that inspectors are well trained and current on regulations.

Another concern with organizational performance expressed by several interviewees was the difference between patrol officers and inspectors in both status and salary. This issue was a particular concern in units where officers and inspectors worked together. Interviewees observed that inspectors often have more knowledge and experience with FMCSA regulations, yet they are "not respected" by patrol officers and are paid less. In response to this perception, Washington formed strike teams of high performing troopers and inspectors in an effort to bring them together. Washington's ultimate goal was to eliminate the distinct roles of troopers and inspectors by ensuring that all troopers have the same training as inspectors. Part of this goal involved providing an opportunity for inspectors to become patrol officers. Minnesota's effort to enhance the status of inspectors was to both promote an organizational climate of respect and to provide inspectors with vehicles that look like patrol cars, with an insignia indicating state patrol inspector.

4.2.3 General concerns about commercial vehicle safety

Interviewees were asked to describe major commercial vehicle safety concerns in their state and to identify major enforcement issues. Responses consistently indicated that the focus of attention in commercial vehicle safety was shifting from equipment to drivers, including passenger vehicle drivers. In part, this was occurring in response to the direction coming from FMCSA, but it also reflected state level analysis of safety data.

With respect to commercial vehicle drivers, interviewees drew attention to concerns with driver fatigue, distracted drivers (e.g., cell phone use and texting), drug and alcohol use, and unskilled drivers (including both commercial and passenger vehicles). States were grappling with how to best "focus on the driver" in their enforcement and inspection processes. State efforts to promote driver-focused safety enforcement included the following:

- Developing better real time information systems for ensuring that a driver's actual time on the road corresponds to the logbook;
- Promoting commercial driver education and training (beyond the CDL) through specialized schools or classes;
- Developing interview protocols for troopers and inspectors, allowing them to better identify fatigue or drug/alcohol use.

One of the persons interviewed noted that the focus may need to shift back somewhat to the vehicle, given the recession. Beyond the incentive for drivers to work longer hours, the recession may be contributing to cutbacks on vehicle maintenance. Another person, however, contended that the negative safety fallout of the recession was more evident among drivers than among vehicles.

4.2.4 Strategies and practices

Interviewees were asked about innovative strategies or practices they have developed to enhance MCSAP effectiveness. More generally, they were also asked to describe how they cultivate new ideas for improving program performance. Their responses consistently emphasized the importance of networking and learning about other states' practices. With respect to formal networking mechanisms, several persons noted that the Commercial Vehicle Safety Alliance annual conference provided an excellent opportunity to learn about new ideas and "pick up best practices." Also, Kentucky reported that it participates in a formal working group with surrounding states in regionally coordinating MCSAP enforcement activities.

In addition to regional and national scale networking arrangements, states work internally to develop new ideas. For Nevada: "it is a group effort … [we] … schedule meetings with regional lieutenants and sergeants and review FMCSA memoranda and … state specific statistics … to come up with enforcement strategies." Michigan "reaches out to people on the road who are doing the work," as do Nevada and Florida, who hold regular field meetings with officers and commanders to identify issues and discuss possible solutions. Oregon holds periodic meetings, inviting anyone involved in enforcement to "brain storm" ideas. Minnesota focuses on the analyzing data monthly: "We look at crash data in a number of different ways … each month we are pumping out the data on crashes to help us determine if we need to change strategies."

Interviewees were also asked to describe new strategies that have followed from their efforts to innovate. Their responses included the following:

- Minnesota identified its "rural initiative," which came from an analysis of crash data showing a need for focused enforcement in rural areas at certain times of the year.
- Michigan implemented TACT and was looking for ways to get more and better data to officers in the field.
- Both Oregon and Nevada proposed changes in enforcement regulations.
- Florida was looking for a better method for collecting fines.
- Kentucky was focusing on "greater" enforcement.
- Colorado mentioned an interactive web-based tool providing information about compliance reviews and new carrier safety audits.

The following sections present other strategies and practices organized around the primary MCSAP functions.

4.2.4.1 Driver and vehicle inspections

Although the protocols for conducting NAS Levels I-V inspections are fixed, interviewees observed that the productivity of their inspection efforts depended on strategies and practices that improved their ability to target drivers and vehicles with

safety problems. In this respect, the truck size and weight enforcement function has long provided a productive means of screening for driver and vehicle inspections. The advantages of such coordination are supported by research indicating that size and weight violations are highly correlated with driver and vehicle safety violations (*Battelle 1995*).

Both Florida and Oregon are known for their effective size and weight enforcement programs (*Cunagin, et al. 1997; Strathman and Theisen 2002*), and their MCSAP status with respect to placing a greater-than-normal share of drivers and vehicles out of service likely reflects the advantages of such coordination. Oregon takes coordination a step further by sharing data in real time with other states. For example, weighmasters and inspectors in Oregon and Idaho can check for correspondence between logbook entries and a vehicle's actual time-stamped scale records from their counterpart state.

Coordination of size, weight, and safety enforcement is generally more effective when field operations employ both fixed location and portable scales. Although portables tend to yield a higher rate of citations than fixed scales, their costs per weighing are greater, and siting constraints are increasingly limiting feasible locations for deployment (*ODOT 2008b*). These constraints contribute to an increased likelihood of evasion, limiting the gains from coordination between size and weight enforcement and driver/vehicle inspections.

Pre-clearance programs also allow states to sharpen the focus of their driver and vehicle safety enforcement efforts (*Titus 1996*). Through automated size and weight screening (using weigh-in-motion devices and height sensors), pre-clearance participants (who qualify by demonstrating a history of compliance with registration, tax, and safety regulations) are allowed to bypass weigh stations, thereby freeing up weighmasters' and inspectors' time to focus on more likely safety violators. As of December 2009, pre-clearance systems had been deployed in 38 states and the District of Columbia (*FMCSA 2010a*). Oregon's popular Green Light pre-clearance program currently covers about 4,600 carriers and 38,000 vehicles. At I-5 Woodburn, the largest of Oregon's six ports of entry, more than 50% of the vehicles processed are Green Light participants.

Interviewees identified the following strategies and tactics as being beneficial to the effectiveness of MCSAP inspection activities:

- Using FMCSA data tools to identify unsafe drivers and carriers;
- Having troopers prepare their own regional safety plans;
- Sending special teams to places where there are no inspection/weigh stations;
- Increasing the effective number of inspectors by tapping the private sector (e.g., truck repair businesses);
- Using aircraft to spot trucks attempting to bypass weigh stations;
- Having roving inspections with portable scales;
- Coordinating TACT traffic enforcement with inspections;

4.2.4.2 Traffic enforcement

Traffic enforcement involves patrol officers using observed violations as probable cause for a stop. An officer can then perform an inspection. Patrol officers are in a unique position to observe equipment problems or unsafe behavior that may indicate driver fatigue or a drug/alcohol-related impairment. They are also well positioned (specifically within the TACT program and more generally through their patrol responsibilities) to observe unsafe behaviors involving motorists interacting with trucks.

As previously discussed, MCSAP traffic enforcement activity is typically the responsibility of a distinct state highway patrol unit. In Oregon, the OSP CMV unit's enforcement capability is somewhat limited by its in-vehicle communication system. OSP troopers must communicate with dispatchers by radio to access driver and vehicle data provided by FMCSA information tools, while in other states these data can be accessed by troopers directly.

Interviewees identified the following strategies and tactics for achieving more effective performance in traffic enforcement activity:

- Using roving enforcement;
- Creating a strike force joining top performing troopers with inspectors;
- Targeting high-risk highway segments for probable cause stops;
- Using data tools to identify drivers who may warrant attention;
- Patrolling in unmarked SUVs to identify unsafe automobile drivers around commercial vehicles;
- Using "ride-alongs" in commercial vehicles to better detect unsafe motorist behavior;
- Enforcement blitzes in select safety corridors or areas, coordinated with media communication;

4.2.4.3 Compliance reviews

Compliance reviews involve a detailed review of carrier records and vehicles, resulting in fines or operational suspensions if warranted. Compliance reviews can be triggered by safety incidents, complaints, or information provided by FMCSA about an "at risk" carrier. Although compliance reviews are time-intensive and costly, they represent a very cost effective means of reducing crashes, injuries and fatalities involving commercial vehicles. The interviewees identified the following strategies for improving the effectiveness of compliance reviews:

- Extending compliance reviews to intra-state carriers;
- Maintaining the training of inspectors;
- Relying on complaints to trigger reviews;
- Focusing on "at risk" carriers identified by FMCSA;
- Notifying state of record when carrier crashes involve a DUI citation;
- Performing an immediate compliance review when a new entrant fails to attend a required Safety Seminar;

Minnesota is a pilot state for FMCSA's Comprehensive Safety Analysis (CSA 2010) program, which is designed to identify "at risk" carriers and provide information to state MCSAPs for follow-up enforcement action. Depending on the problem identified, subsequent enforcement actions can include a full compliance review, an on-site review focusing on one or several issues, a limited telephone or FAX-based review, or a warning letter. The idea behind CSA 2010 is to focus more directly on specific safety problems, allowing more carriers to be covered overall than the number that could be covered by full compliance reviews. CSA 2010 will rely on a new algorithm – the Carrier Safety Measurement System (CSMS) – to identify at-risk carriers and more specific safety issues. CSMS draws on a wide array of safety data maintained by FMCSA, including the crash, citation, and MCSAP enforcement data recorded by states.

4.2.4.4 Education and outreach

Education and outreach involves communicating with MCSAP stakeholders about commercial vehicle safety in order to improve the effectiveness of the program or promote safety awareness. Interview responses identified a number of education and outreach activities focused on relevant stakeholder populations, including the general public. These included the following:

- Ongoing training of inspectors, troopers, and local law enforcement officers;
- Newsletters providing the latest program and safety information to MCSAP personnel;
- Educational outreach to judges and prosecutors;
- Presentations and special events intended to inform and engage trucking associations;
- Reaching out to specific industries (e.g., agriculture and timber);
- Educating the general public through mixed media campaigns;
- Developing materials to educate drivers on crash avoidance.

Among the examples listed above, training, disseminating information to inspectors and officers, and education of judges and prosecutors were most commonly mentioned. As has been the case with size and weight enforcement (*TRB 1990*), judges and prosecutors sometimes downgrade MCSAP-related citations, diluting their deterrent effect. Two states also mentioned the use of DVDs for disseminating MCSAP education and training information. Lastly, there was a general interest expressed in further developing strategies to communicate safety information and messages to the general public.

4.2.4.5 Safety data collection

The data function includes collecting data to meet FMCSA reporting requirements, using data to review or document state MCSAP performance, and providing data to those engaged in safety enforcement so that they can do their jobs better. Analysis of safety data was a common activity among the peer states, and it generally facilitated more effective targeting of their resources. A number of the strategies identified across the other primary MCSAP functions were linked to the collection or analysis of data.

Interviewees acknowledged that their principle responsibility is to ensure that the data are clean and are reliably reported to FMCSA. All of the states relied on data to inform their Commercial Vehicle Safety Plan, while ongoing data analysis was generally employed to "fine tune" implementation. Consistent with FMCSA's goal of making MCSAP a data-driven program, Oregon attributed the successful implementation of its safety plan to its ability to "track data" and to make data available to inspectors in the field. All of the peer states applied their safety data programmatically in evaluating MCSAP performance. Beyond this, the interviews revealed varied success in efforts to get data to personnel in the field dealing with a specific incident.

4.2.5 Relationship with FMCSA and other MCSAP stakeholders

Interviewees were asked to characterize their relationship with the local FMCSA office. Their responses ranged from "ok" to "excellent." Most positively acknowledged the support received from FMCSA in terms of money and direction. Four states indicated that they communicate and/or collaborate with the local office on a regular basis. One person noted that over the years the FMCSA has provided "a lot of innovations as well as equipment to improve data quality."

While comments about FMCSA were generally positive, there was some criticism. One person characterized his state's relationship as "frustrating" due to the length of time the agency took in approving requests to do certain activities or to make program changes. Another person expressed the desire that the agency focus "less on implementation of the regulations" and more on promoting safety. This view was somewhat consistent with GAO's (*2006*) finding that FMCSA was not fully evaluating whether the goals in state CMV plans were being achieved.

Interviewees identified a variety of MCSAP stakeholders, including trucking associations, trucking firms, the state legislature, the general public, and various state and federal agencies with which they work (e.g., Departments of Transportation, Department of Revenue, etc.). Collaboration with agencies that had direct MCSAP responsibilities (e.g., the Department of Revenue, Port of Entry in Colorado, or the State Police in Oregon) was characterized as very important. With one exception, these relationships were described as "good."

With respect to the trucking industry, most of the interviewees indicated that they collaborate more with specific trucking firms than with the trucking associations. However, relationships with firms were not uniformly positive and reported that "some are more open" than others. Two persons observed that there is a tension between the economic pressures to keep the trucks on the road and the need to regulate for safety, and that this tension affects cooperation and collaboration.

While the general public was given some attention as stakeholders, it did not appear to be a high priority. Michigan conducted "town meetings," and some states had "billboards." Florida observed that its program is relatively unknown to the public and it is exploring ways to "brand" itself through a partnership with the University of South Florida.

With respect to interactions with the state legislature, responses ranged from "… don't have much direct contact, but work with the executive" to "I try to keep an open dialog."

All of the interviewees were members of the Commercial Vehicle Safety Alliance (CVSA), and all had positive perceptions of the organization. Attendance at the CVSA conference was seen as a "good place to get ideas" and "to compare" programs. One person went further and said "[we] couldn't get along without it. ... provides technical support. ... otherwise we would be stabbing the dark." One person expressed a concern about CVSA. He observed that the conference is "dominated by technical people" who tend to make the decisions. He would like to see more "policy people" attending the conference. Lastly, one person observed that "it was difficult to send people out of state" to attend the CVSA annual conference.

4.3 OPPORTUNITIES FOR FURTHER CONSIDERATION

The intent of the structured interviews was to gather information from states similar to Oregon about issues, experiences, and innovations in their commercial vehicle safety programs. More specifically, the purpose of the interviews was to identify opportunities for Oregon to consider in its efforts to improve commercial vehicle safety through its MCSAP activities. With this in mind, a list of opportunities drawn from the interview findings is presented below. The opportunities were selected by giving consideration to 1) the current performance and existing practices of Oregon's MCSAP; 2) challenges that were commonly experienced among Oregon's peer states; 3) innovations of peer states that appeared to offer the potential to improve performance among states, including Oregon; and 4) the potential to address a need or challenge identified in the commercial vehicle safety literature.

Generally, Oregon's MCSAP is outperforming most other states, as represented in the enforcement and safety information presented in Figures 2.1 through 2.10. In particular, given the increasing focus on drivers in the safety policy arena, Oregon's second place ranking among states in the percentage of drivers placed out of service through roadside inspections is a very noteworthy achievement. Among the 10 commercial vehicle safety performance indicators presented in Chapter 2, the only instance where Oregon lags a majority of states is in the percentage of vehicles it places out of service through traffic enforcement events (where it ranks 46th).[6] In sum, the context for considering performance improving options for Oregon's MCSAP is one that attempts to leverage a comparatively successful program to an even higher level of performance.

4.3.1 Program organization and training

With respect to common challenges, most (if not all) of the states interviewed had faced or were facing administrative issues involving lateral coordination across state agencies. In several instances, the state legislature had become directly involved in defining the organizational structure of MCSAP. Coordination with local agencies was also extensive and considered important in administering MCSAP, but concerns were much less likely to be expressed in the interviews about this organizational dimension. Even in states where MCSAP administration was fully centralized in a single entity, such as a state highway patrol agency, coordination of responsibilities (for example, between motor carrier safety enforcement and other enforcement

[6] MCSAP staff observed that this outcome reflects the strong attention that Oregon's program places on drivers rather than vehicles in traffic enforcement activities.

activities) remained an issue. The most evident overall message in this regard was that a variety of organizational structures had been tried or were in place, and none had proved sufficiently effective to where it could be characterized as preferable over the others.

With chronic staffing shortages in OSP's Patrol Division, ensuring that troopers receive sufficient inspection training has been problematic in Oregon. Beyond training issues, Oregon's main organizational challenge involves coordination between ODOT MCTD, which administers MCSAP, and OSP, which is responsible for select traffic enforcement and driver/vehicle inspection activities within the program. The following two opportunities address actions that have the potential to improve MCSAP performance as it relates to training and MCTD-OSP coordination.

Opportunity 1: Ensure that all OSP staff in the Patrol Division complete NAS Level II training, with annual refreshers. Identify select OSP Patrol Division staff for NAS Level I training, with annual refreshers.

Opportunity 2: Establish a law enforcement unit in MCTD with commercial vehicle traffic enforcement authority that is equivalent to the authority of OSP patrol officers.

Opportunity 1 seeks to achieve consistent and effective CMV safety enforcement by ensuring that OSP troopers learn and remain knowledgeable of inspection practices. Opportunity 2 follows the "Florida model." While acknowledging the importance of the training addressed in Opportunity 1, Opportunity 2 goes a step further to ensure that commercial vehicle safety enforcement effectively becomes the primary focus of patrol officers who are directly charged with that responsibility. In this respect, placing such an enforcement unit within MCTD would likely lessen the competing demands identified by Oregon's peer state interview respondents. It may also help to ensure uniformity in safety inspections. Implementation of this option would require legislative action.

4.3.2 Networking

The interviews revealed that networking, both formal and informal, provided the most fertile opportunity for identifying innovative strategies and practices. Regular attendance at professional meetings addressing commercial vehicle safety, such as the Commercial Vehicle Safety Alliance (CVSA) and the Transportation Research Board (TRB) annual meetings, provide an excellent opportunity for MCSAP managers to learn about innovations elsewhere that can be implemented in Oregon. However, as the interviews also revealed, budget-conscious state agencies are increasingly reluctant to support conference travel. This logic would be difficult to justify if it were applied to training for inspectors. By extension, there are also important benefits from information exchange and professional development among MCSAP managers and senior staff.

Documenting the monetary benefits of formal networking activity is difficult. However, such an effort was undertaken by the Utah Department of Transportation (UDOT), focusing on staff attendance at TRB annual meetings between 2003 and 2009 (*Lindsey 2009*). UDOT documented monetary savings – totaling $189 million - from 136 initiatives that its TRB attendees learned about at the meetings, sold to senior management, and implemented. In turn, UDOT's TRB

meeting attendance costs over the period totaled $150,000. UDOT thus obtained $1,260 in savings for each dollar spent to support TRB meeting attendance. Such evidence prompts the following opportunity:

Opportunity 3: Support regular attendance of MCSAP personnel at professional meetings addressing commercial vehicle safety.

More localized networking and communications were also found to be important to MCSAP performance. Staff newsletters kept MCSAP personnel current on regulatory and program developments, and information dissemination to stakeholders helped to raise awareness of commercial vehicle regulations and other traffic safety issues. MCTD publishes a quarterly newsletter, Motor Carrier News, that sometimes reports on MCSAP activities, among many other subjects associated with the Division's responsibilities. This publication provides a useful means for communicating information about MCSAP to select external stakeholders, but is less appropriate for internal communications. For internal communications, MCSAP circulates a newsletter among its staff and law enforcement partners. To date, the main focus of the newsletter has been on inspector education.

4.3.3 Marketing

Beyond communications with MCSAP staff and immediate stakeholders, there are two more general communications issues that deserve further consideration. First, an important element in raising general awareness of commercial vehicle safety risks and MCSAP's enforcement role relates to establishing the program's identity among the traveling public. Although MCSAP's identity within the commercial motor vehicle industry appears to be well established, the traveling public's perceptions are largely filtered through their general awareness of general state and local traffic enforcement activities. In short, the organizational complexity of MCSAP may be clouding its identity among selected stakeholders. This has potentially important implications for efforts to improve the effectiveness of the program's traffic enforcement activities, considering, for example, that auto motorist errors are the principal contributor in a substantial majority of car-truck crashes. For this reason, the following opportunity is intended to promote MCSAP's identity:

Opportunity 4: Design, implement, and evaluate a marketing strategy to clarify MCSAP's identity and promote its safety enforcement role.

4.3.4 Stakeholder communications

Although communication with MCSAP stakeholders is generally differentiated to achieve greatest impact, little follow-up evaluation of the effects of communications on safety has occurred. By contrast, in another traffic safety context, a great deal of effort has been dedicated to crafting the content of warning letters sent by state DMVs to negligent drivers, with follow-up evaluation assessing the letters' effects on the incidence of crashes and convictions (*Masten and Peck 2004*). Findings from follow-up evaluations, in turn, have been used to revise warning letter messages to improve their effectiveness. More generally, lessons learned from the treatment of negligent drivers indicate that the safety consequences of MCSAP's focus on driver and operator behavior will depend on effective communications. In turn, ensuring maximum

effectiveness of communications depends on evaluation. This discussion leads to the following communications opportunity:

Opportunity 5: Evaluate the effects of communications with MCSAP's public stakeholders.

In summary, this chapter has covered issues that Oregon and its peer states have commonly faced in managing MCSAP and performing its primary functions. These issues relate to operating within varied organizational frameworks, identifying effective approaches to enforcement, promoting innovation, and communicating with stakeholders. The peer state interviews themselves represent a means of information exchange among the subject states. Within the interview findings are opportunities for these states, and possibly others, to learn and benefit from others' experiences. In Oregon's case, a specific set of opportunities has been identified. In the following chapter each of these opportunities is assessed against criteria associated with implementation feasibility and expected consequences.

5.0 ASSESSMENT OF OPPORTUNITIES TO IMPROVE CMV SAFETY IN OREGON

In this chapter five opportunities for improving commercial vehicle safety in Oregon are assessed. These opportunities, identified through the structured interviews and the literature review, are assessed in relation to seven criteria associated with both the feasibility and expected consequences of implementation. The assessment is not intended to produce a ranking, nor will it result in specific implementation recommendations. The criteria employed in assessing the opportunities are presented in the next section. The presentation then turns to assessing the options.

5.1 ASSESSMENT CRITERIA

Seven criteria have been selected for assessing the selected opportunities to improve CMV safety in Oregon. The first, **cost effectiveness**, addresses the expected safety consequences from implementation with respect to associated monetary costs. The discussion of compliance review and roadside inspection costs per avoided crash, injury, or fatality in Chapter 2 is an example of a cost effectiveness appraisal of those enforcement practices.

The second criterion, **scale feasibility**, considers whether the size of Oregon's program has any bearing on an opportunity's prospects for successful implementation. For example, given that the size of Florida's MCSAP budget is three times that of Oregon's, innovations or practices that are feasible for Florida may be impractical for Oregon.

The third criterion, **organizational feasibility**, considers the extent to which an opportunity's prospects for successful implementation would require changes in organizational processes, structures, or responsibilities. Also relevant for this criterion would be the effects of an opportunity on coordination and administration of program functions.

The fourth criterion, **political and legal feasibility**, considers the extent to which implementation of an opportunity would require statutory changes, or could be expected to encounter institutional, administrative, or stakeholder resistance.

The fifth criterion, **stakeholder effects**, considers the consequences of an opportunity for relevant MCSAP stakeholders, including the general public and the motor carrier industry.

The sixth criterion, **risk and uncertainty**, considers the extent to which an opportunity's expected benefits can be supported by hard evidence. For example, the uncertainty and opportunity risks of committing MCSAP resources to compliance reviews are very low, given the cost effectiveness evidence that has been reported in multiple FMCSA-sponsored and peer reviewed national studies. Uncertainty and risk are somewhat greater for traffic enforcement activities (e.g., TACT) because the documented evidence is more limited and localized.

The final assessment criterion, **synergistic effects**, considers whether the direct benefits of implementing an opportunity are supplemented by indirect benefits. For example, the direct benefit of Oregon's Green Light Program – the savings from virtually instantaneous processing of qualifying trucks at weigh stations – has also led to an indirect benefit – freeing up weighmasters' and inspectors' time to focus on more likely safety violators.

5.2 OPPORTUNITY ASSESSMENT

A summary of the assessment of the five opportunities across the seven criteria is presented in Table 5.1. Opportunity 1, **Training**, seeks to ensure that OSP patrol staff receive training that provides basic and refresher knowledge covering NAS inspections and pertinent FMCSA regulations. The general cost effectiveness of this opportunity is grounded in the substantial literature on human capital. Human capital research has established that there are positive productivity and income returns to investments in education and training, with the returns to training being somewhat greater than the returns to education (*Mincer 1994*). Within the training sphere, returns tend to be greater for employer-sponsored training than for general occupational training. In MCSAP the benefits of training are manifested in more productive safety enforcement, which, as discussed in the literature review chapter, is moderately cost effective. There do not appear to be any specific concerns related to scale effects. Generally, training efficiencies can be reached at fairly small scales.

Maintaining uniformity in training across Oregon MCSAP's enforcement partners has been problematic at times and will likely continue to remain so unless training expectations are clearly established. For enforcement partners operating under an interagency funding agreement, terms related to training expectations can be included in the agreement. A memorandum of understanding including training terms can be prepared for enforcement partners who are not supported by MCSAP funds. With or without such conditions, uniformity of training will likely result in improved enforcement uniformity, which is an important issue among the program's motor carrier stakeholders (*Colorado Motor Carriers Association 2010*).

There is no direct evidence relating inspection training to enforcement performance, which introduces some uncertainty with implementing this opportunity. Synergistic benefits are also expected to be fairly limited given the tightly-focused orientation of the training.

Opportunity 2, **Reorganization**, establishes a law enforcement unit within MCTD, where the Oregon MCSAP is administered. Greater uniformity in training and enforcement practice are thus expected through organizational consolidation of MCSAP personnel and functions. Costs of administering MCSAP are likely to decline with this opportunity. While there is no direct evidence that this will occur, the organizational performance literature indicates that unit administrative costs tend to be lower in more centralized, less differentiated, and larger scale operations (*Miner 2007*). The cost effectiveness of MCSAP enforcement activities may also improve if, when assigned within MCTD, traffic enforcement officers become less prone to being diverted from their primary responsibilities (as was reported by several of Oregon's peers).

Table 5.1 Summary assessment of Oregon MCSAP opportunities

	Opportunities for Improving Commercial Vehicle Safety				
Assessment Criteria	**Training**	**Reorganization**	**Formal Networking**	**Marketing**	**Communications Evaluation**
Cost Effectiveness	Training improves the cost effectiveness of enforcement.	Claims of lower administrative costs provide a rationale for consolidation.	Conference attendance has been found to be highly cost effective.	Marketing is cost effective when investments exceed threshold levels.	These improve the cost effectiveness of enforcement.
Scale Feasibility	There are no reported scale effects.	Coordination benefits are likely to grow with program scale.	There are no reported scale effects.	Marketing may be more feasible for larger programs.	The capacity to evaluate may be greater at larger scales.
Organizational Feasibility	Ensuring consistent training is more difficult in a multi-agency setting.	Coordination may improve with less differentiation.	New processes may be needed to transform innovations into practice.	FMCSA & NHTSA marketing efforts & material resources can leverage state efforts.	NHTSA & FMCSA encourage & provide guidance on evaluation.
Political & Legal Feasibility	There is a history of institutional resistance to additional training.	Reorganization would require legislative approval.	Senior management & policy makers may need to be persuaded.	There are no apparent institutional resistance or legal issues.	Management may need to be persuaded.
Stakeholder Effects	Motor carriers expect inspectors & officers to be able, consistent and professional.	Uniformity and consistency are key issues for motor carriers.	All stakeholders potentially benefit from innovations.	Marketing must engage stakeholders through multiple channels.	Evaluation helps to refine communication with MCSAP stakeholders.
Risk & Uncertainty	Enforcement has well documented safety benefits.	There is no direct evidence on the performance of alternative MCSAP structures.	Networking is a primary source of innovation identified by MCSAP interview respondents.	The best evidence of effectiveness comes from fields other than transportation.	Rigorous evaluation is difficult, and direct evidence is limited.
Synergistic Effects	Limited benefits may spill over to other safety enforcement areas.	Benefits may be gained from joint size, weight, and safety enforcement.	Innovation benefits may spill over to other safety programs.	Benefits will spill over among traffic safety marketing campaigns.	Evaluations may contribute insights that benefit other MCTD and traffic safety communications.

Changing the existing organizational structure and enforcement authority within Oregon's MCSAP would require approval of the Oregon Legislature. If Oregon's motor carrier stakeholders share the views of their Colorado counterparts, legislation to consolidate MCSAP functions within MCTD would be seen as a beneficial change in terms of improving enforcement uniformity and consistency.

As there have been no direct studies of MCSAP administrative or enforcement performance in relation to alternative organizational structures, the expected consequences of implementing this opportunity are somewhat uncertain. One synergistic performance benefit that could follow from consolidation is improved coordination of MCSAP and size and weight enforcement within MCTD.

Opportunity 3, **Formal Networking**, promotes innovation through information exchange. Networking appears to be particularly important at this time, given the emphasis that FMCSA has put behind CSA 2010, new carrier safety audits, development of new enforcement tools, and revision of hours of service regulations (*Ferro 2010*). Thus, similar to Lindsey's (*2009*) findings, the cost effectiveness of this activity would likely be high.

As Lindsey (*2009*) reported, UDOT maximized the prospects of a successful payoff from conference attendance by instituting a fairly formal process for routing innovations to implementation. Being considerably smaller than a state department of transportation, Oregon's MCSAP may not warrant such formalization, but instituting some type of debriefing process would help to reinforce an expectation that the intended purpose of information exchange activities is to improve the program's performance. This process could also be broadened to encourage input from field staff to tap ideas drawn from enforcement experiences.

Resistance to this opportunity from budget-conscious administrators and policy makers would not be surprising. Thus, it is important to document the benefits that follow from information exchange so that this source of innovation is identified. Considering effects on MCSAP stakeholders, innovations that lead to safety improvements benefit everyone.

With respect to risk and uncertainty, this opportunity reflects the peer state interview findings, in which virtually all respondents cited conferences and other formal exchange activities as their principal source of innovative ideas. In terms of synergistic effects, information exchange activity sometimes produces insights that benefit areas that are not directly related to the subject of the exchange (*Mendonca, et al. 2008*). In the present context, for example, information exchanges focusing on MCSAP activity may yield useful ideas for other motor carrier or transportation safety programs.

Opportunity 4, **Marketing**, addresses the need for marketing to raise general awareness of Oregon's MCSAP and to promote its motor carrier safety responsibilities and objectives. Motorists are unlikely to be aware of the existence of a state program dedicated to reducing the safety risks of truck travel. Moreover, motorists are also unlikely to be aware of their own involvement in truck safety risk, what MCSAP is doing to address this risk, and what they should be doing on their part.

Generally, traffic safety marketing has been found to be cost effective. Preusser, et al. (*2008*) report that traffic safety marketing's cost effectiveness is usually realized at fairly high expenditure levels. Also, to be most effective, safety marketing campaigns need to be sustained over time and should engage intended audiences through multiple channels (*McNeely and Gifford 2007*). Although Evans (*2004*) contends that transportation safety marketing is essential in changing society's safety norms, he also acknowledges that there is still much uncertainty about the effectiveness of safety marketing campaigns. Taken together, these observations suggest that there are substantial scale effects and considerable risk and uncertainty associated with transportation safety marketing efforts. The domain of traffic safety marketing is relatively immature, and continues to rely on lessons drawn from other fields (*McNeeley and Gifford 2007*).

FMCSA and NHTSA have addressed the marketing scale limitations faced by smaller states with multiple national marketing campaigns. They are also providing states with marketing materials and information that help to link the national campaigns to local initiatives and circumstances. NHTSA maintains a web site, trafficsafetymarketing.gov, which provides information on its national safety marketing campaigns, as well as "toolkits" to assist states in their marketing efforts. FMCSA maintains a TACT e-Toolkit web site that provides marketing and public information materials for the 16 states (including Oregon) enrolled in this high-visibility enforcement program. NHTSA and FMCSA (*2007*) have also collaborated in producing a TACT guidebook to assist states in developing their marketing, public information, and education programs.

The peer state interview respondents were familiar with NHTSA and FMCSA safety marketing efforts. They also noted that state MCSAP and other safety marketing was intended to link to such national campaigns as "Leave More Space," "Click It or Ticket," "Safety Belts – A Way of Life," "Be Ready. Be Buckled," "Buckle Up America," "Share the Road," "Over the Limit, Under Arrest," and "Buzzed Driving is Drunk Driving." Although the national "Leave More Space" campaign is aligned with the TACT program, and the "Safety Belts – A Way of Life" campaign focuses on motor carrier operators, MCSAP is not identified in the marketing materials.

MCSAP and TACT grants include resources to support marketing, communication, and public information activities. Peer state interview respondents generally saw value in these activities. There was no indication of institutional resistance to marketing activity focused on the program's identity. Coordinating with NHTSA, ODOT's Transportation Safety Division (TSD) has engaged in safety marketing for many years. Thus one would expect spillover benefits between MCSAP and TSD safety marketing initiatives. These benefits would likely expand if the initiatives were coordinated.

The final opportunity, **Communications Evaluation,** addresses the need for evaluation of Oregon MCSAP's formal communications with the public. NHTSA and FMCSA (*2007*) emphasize the importance of such evaluation in their guidebook on implementing high-visibility enforcement programs. NHTSA and FMCSA also provide communications materials that can be tailored for state conditions and audiences. Oregon MCSAP draws on these materials and an

experienced communications staff to prepare media releases in coordination with TACT and other high visibility enforcement exercises (see the examples in Appendix D).

Coordination of communication and traffic enforcement is reported to result in greater safety improvements (*Wundersitz, et al. 2010*). However, the relationship between communication itself and safety performance is less certain. Tison and Williams' (*2010*) evaluation of the initial years of the Click It or Ticket campaign found that, controlling for variations in enforcement intensity, states with higher advertising and communications expenditures did not experience greater increases in seat belt use than states with lower expenditures. General awareness of the Click It or Ticket campaign, however, was greater in the higher expenditure states. Taken together, these findings indicated that while the initial advertising and communication campaign was reaching a general audience, it was not directly effective in leveraging behavior change, particularly among low-seat-belt-use segments of the population (i.e., night time, rural, and pickup drivers). NHTSA and FMCSA are now refining the public education and outreach efforts of their seat belt and high-visibility enforcement programs to better focus on these low-use segments (*FMCSA 2010b*).

Two general observations have been made with respect to cost effectiveness. First, the cost effectiveness of advertising and communications is uncertain, because rigorous evaluation of safety outcomes is both challenging and infrequently undertaken (*Wundersitz, et al. 2010*). Second, despite the challenges, evaluation is nevertheless considered essential to leveraging the effectiveness of enforcement and, more broadly, to successfully recasting the social norms that underlie driver behavior (*Evans 2004; Preusser, et al. 2008*).

The general lack of evaluation of communications functions may be a consequence of several factors. First, a rigorous evaluation can be expensive relative to the usually modest commitment of program resources to communications. Thus, evaluation may be more feasible in states with larger budgets and staff. Second, institutional support for evaluation may be weak if it is perceived that evaluation would divert resources from enforcement activities. Here, a case needs to be made that the principal objective of communications and enforcement is the same in that they both seek to achieve behavior changes. Both communications and enforcement need periodic evaluation to ensure that they achieve this objective.

MCSAP communications must reach a diverse set of program stakeholders, including an extensively segmented driving population. Evaluation helps to refine and differentiate communications among stakeholder groups, ensuring that relevant information is provided to each audience and that all stakeholders become fully engaged. Insights gained from the evaluation process will likely benefit the communications efforts associated with other MCTD and traffic safety programs in ODOT.

5.3 SUMMARY OBSERVATIONS

Collectively, the opportunities considered in this chapter represent actions with the potential to improve CMV safety in Oregon. It is noteworthy that the opportunity set does not address enforcement strategies or tactics. Their absence is a consequence of two related insights gained in the course of the research. First, examination of enforcement performance measures clearly

revealed that Oregon MCSAP's effectiveness is consistently very high compared to other states. Second, the structured interview findings on enforcement strategies and tactics essentially reinforced the performance measures appraisal. The peer states did not identify enforcement practices that were not already in place in Oregon. In turn, the opportunity set considered for Oregon's MCSAP addresses common issues facing peer states.

The objective of MCSAP enforcement activities, as well as the opportunities considered in this chapter, is to improve CMV and traffic safety. The program's basic orientation is toward drivers, reflecting the predominant role that driver behavior plays in crash causation. As with other safety programs focused on driver behavior, evaluation of the safety consequences of interventions and other promotional efforts is challenging. Generally, there is less understanding of the safety consequences of behavioral countermeasures than there is of engineering countermeasures. Compared to other fields, transportation safety's experience with marketing, advertising and communication is limited, although it is learning from experiences elsewhere.

The assessment of opportunities for Oregon's MCSAP against selected criteria provides a fairly general appraisal of expected implementation issues and consequences. As with other traffic safety behavior research, direct evidence is limited. Thus, the appraisal often relies on analogous research findings.

6.0 CONCLUSIONS

This report has examined ODOT's Motor Carrier Safety Assistance Program (MCSAP) with the intent of identifying opportunities to improve CMV safety. The examination has included documentation of the program's safety enforcement performance, a literature review focused on the program's primary functions, and structured interviews of persons involved with MCSAPs in peer states. A set of opportunities was identified from the literature review and peer state interviews. These opportunities were then assessed against criteria representing economic, organizational, institutional, stakeholder, and uncertainty considerations.

Collectively, the safety performance indicators reveal a very positive picture. Oregon's truck crash rate is among those in the lowest quartile of states, and indicators of enforcement intensity show that Oregon's MCSAP is aggressively pursuing its safety mission. Indicators covering enforcement effectiveness are also very positive. Here again, Oregon's MCSAP generally ranks among those in the top quartile of states in placing drivers and vehicles out of service through inspections, and in identifying safety deficiencies through compliance reviews. Thus, MCSAP compares well with other ODOT MCTD programs as an effective contributor to motor carrier safety in Oregon.

The literature evaluating compliance reviews, roadside inspections, and traffic enforcement finds these activities to be cost effective with respect to their safety outcomes. However, these evaluations are also subject to research design challenges that qualify the confidence that can be placed in their findings. In recent years, high-visibility traffic enforcement (HVE) initiatives have joined longer-standing MCSAP inspection and review activities. HVE is clearly aimed at the social norms that underlie the principal cause of crashes - negligent driving behavior. HVE is currently attracting the most critical scrutiny among MCSAP activities, especially with respect to the effectiveness of its marketing, advertising, public information, and outreach components.

The peer state interviews addressed MCSAP's organizational structure, enforcement strategies and tactics, innovation, and relationships with stakeholders. The interviews revealed fairly complex organizational structures with extensive state and local agency linkages. Possibly related to the complexity of these linkages, there was also evidence of change in MCSAP organizational structure over time.

The most challenging operational issue reported by Oregon's peer states involved the differentiated responsibilities of patrol officers and the perception that motor carrier safety enforcement was not afforded sufficient status or priority. Networking with peers was consistently seen to be important. In selected instances, enforcement was being regionally coordinated through formal and informal alliances.

Conferences provided important networking opportunities for learning about innovations and exchanging program information. Internal and external communications were consistently viewed as vital elements of both program administration and stakeholder relations. Also, with

respect to HVE, communications was considered centrally important to the initiative's effectiveness.

Five opportunities offering the potential to improve Oregon MCSAP's performance were drawn from the literature review and the structured interviews. The opportunities addressed training, reorganization, networking, marketing, and communications evaluation. For each opportunity, available evidence was appraised on criteria covering cost effectiveness, scale effects, organizational feasibility, political and legal considerations, stakeholder implications, uncertainty, and synergistic effects with other motor carrier and safety programs.

Several overall conclusions about Oregon's MCSAP can be drawn from this study. First, Oregon's MCSAP is presently very effective in pursuing its safety mission. Safety performance measures show this program's enforcement activities to be both intensive and effective compared to other states. Second, Oregon MCSAP's placement within ODOT MCTD is very appropriate. Its safety mission reinforces the mission of MCTD's size and weight enforcement program. Its use of advanced technology enforcement tools also complements the preclearance technology applications of the size and weight enforcement program. Third, through the course of this study it became very apparent to the research team that MCSAP and MCTD's leadership is strongly committed to program improvement. This commitment will clearly contribute to the prospects of successful implementation of this study's findings.

More generally, safety has always been a central concern in U.S. transportation policy and practice. Very substantial reductions in fatality rates over decades have been achieved as a result of highway design improvements, vehicle design improvements, more extensive enforcement, and more comprehensive regulation and treatment of drivers. MCSAP has contributed to these safety gains, and its evolving functions are well positioned to shape the safety cultures of the motor carrier industry and the traveling public.

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APPENDICES

APPENDIX A

NORTH AMERICAN STANDARD INSPECTIONS OF DRIVERS AND COMMERCIAL MOTOR VEHICLES

Roadside inspections of commercial motor vehicles (CMVs) are performed by qualified safety inspectors following the guidelines of the North American Standard, developed by the Commercial Vehicle Safety Alliance (CVSA) in cooperation with the Federal Motor Carrier Safety Administration (FMCSA). Most roadside inspections by the states are conducted under the Motor Carrier Safety Assistance Program (MCSAP). CMVs subject to roadside inspection under MCSAP include those having any of the following characteristics:

- Vehicles with a gross vehicle weight, gross vehicle rating, gross combination weight, or gross combination weight rating of 10,001 pounds or more.
- Vehicles designed or used to transport 16 or more passengers, including the driver.
- Vehicles used in the transportation of hazardous materials.

Roadside inspections can include a vehicle component, a driver component or both. A roadside inspection occurs when a safety inspector conducts an examination of an individual commercial motor vehicle and driver to determine if they are in compliance with the Federal Motor Carrier Safety Regulations and/or Hazardous Materials Regulations. Serious violations result in the issuance of driver or vehicle Out of Service orders. These violations must be corrected before the affected driver or vehicle can return to service. Moving violations may also be recorded in conjunction with a roadside inspection.

The North American Standard Truck Inspection procedures developed by CVSA and FMCSA cover six alternative levels of inspection, as defined below.

LEVEL I North American Standard Inspection
An inspection that includes examination of driver's license; medical examiner's certificate and Skill Performance Evaluation (SPE) Certificate (if applicable); alcohol and drugs; driver's record of duty status as required; hours of service; seat belt; vehicle inspection report(s) (if applicable); brake systems; coupling devices; exhaust systems; frames; fuel systems; lighting devises (turn signals, stop lamps, tail lamps, head lamps, lamps/flags on projecting loads); securement of cargo; steering mechanisms; suspensions; tires; van and open-top trailer bodies; wheels, rims and hubs; windshield wipers; emergency exits and/or electrical cables and systems in engine and battery compartments (buses); and hazardous material/dangerous goods (HM/DG) requirements, as applicable. HM/DG required inspection items will be inspected by certified HM/DG inspectors.

LEVEL II Walk-Around Driver/Vehicle Inspection
At a minimum, Level II inspections must include examination of driver's license; medical examiner's certificate and Skill Performance Evaluation (SPE) Certificate (if applicable); alcohol

and drugs; driver's record of duty status as required; hours of service; seat belt; vehicle inspection report(s) (if applicable); brake systems; coupling devices; exhaust systems; frames; fuel systems; lighting devises (turn signals, stop lamps, tail lamps, head lamps, lamps/flags on projecting loads); securement of cargo; steering mechanisms; suspensions; tires; van and open-top trailer bodies; wheels, rims and hubs; windshield wipers; emergency exits and/or electrical cables and systems in engine and battery compartments (buses); and hazardous material/dangerous goods (HM/DG) requirements, as applicable. HM/DG required inspection items will be inspected by certified HM/DG inspectors. It is contemplated that the walk-around driver/vehicle inspection will include only those items that can be inspected without physically getting under the vehicle.

LEVEL III Driver/Credential Inspection
A roadside inspection that includes examination of the driver's license; medical examiners certificate and Skill Performance Evaluation (SPE) Certificate; driver's record of duty status; hours of service; seat belt condition; vehicle inspection report(s); and HM/DG requirements.

LEVEL IV Special Inspections
Inspections under this heading typically include a one-time examination of a particular item. These examinations are normally made in support of a study or to verify or refute a suspected trend.

LEVEL V Vehicle-Only Inspection
An inspection that includes each of the vehicle inspection items specified under the North American Standard Inspection (Level I), without a driver present, conducted at any location.

LEVEL VI Enhanced North American Standard Inspection for Radioactive Shipments
An inspection for select radiological shipments, which include inspection procedures, enhancements to the Level I inspection, radiological requirements, and the enhanced out-of-service criteria. Select radiological shipments include only highway route controlled quantities as defined by title 49 section 173.403 and all transuranics.

The table below provides summary information on the number of CMV inspections completed in the United States during calendar year 2008. The number of completed Level I, II, and III inspections were roughly equivalent, and collectively accounted for nearly 96% of all inspections.

Table A-1 CMV Roadside Inspections by Level of Inspection, CY2008

Level	Number of Inspections	Percent of Total
I	1,113,945	32.0
II	1,138,412	32.7
III	1,080,032	31.0
IV	16,768	0.5
V	128,867	3.7
VI	1,924	0.1
Total	3,479,948	100.0

Source: FMCSA MCMIS

APPENDIX B

STRUCTURED INTERVIEW PROTOCOL

My name is Lois Bronfman and I am calling on behalf of the Oregon Department of Transportation, Research Section and Motor Carrier Transportation Division. The Department has contracted with Portland State University, my employer, to explore the best practices used by other states to promote commercial vehicle safety. Your state has been identified as a state comparable to Oregon and with an interesting and effective commercial vehicle safety plan. We would like to have some time to speak with you about the strategies that you pursue to promote commercial vehicle safety. Are you the person with whom I should be speaking?

Yes…….. Is there a good time that I can call in order to ask a few questions? The interview will take about 30 minutes, depending on the length of your responses.

Proposed date for interview_____ Phone_____

No……. Who would you suggest that I can speak to and why?

Alternative names and numbers

_____

_____

Introduction to Main Interview

As I indicated in our previous phone conversation the purpose of this study is to explore best practices in the implementation of the Commercial Vehicle Safety Plan.

I.1. Are you aware that your state compares well with other states in terms of results?

Yes_____

I.2. To what do you attribute the success of your implementation strategy?

Let's get specific.

Section 1 Organizational structure

1.1. Let's discuss organizational structure for implementing the Commercial Vehicle Safety Plan

1.2. You are employed by ____State Police_____.

Yes_____ No_____ Letter of agreement….

1.3 Please explain who else is involved and their role?

List agencies……..

_____ Role _____
_____ _____
_____ _____

1.4. Do you have formal written agreements or contracts with these other agencies?

1.4.1 (If yes) Approximately how many contracts and agreements are there?

1.4.2 Of these, which are the most important? Be specific, please.

1.5. Do you share Federal truck safety dollars with these other agencies?

(If yes) Please explain, specifically, are you mandated to share?

(If no) What is the basis of the collaboration?

1.6. How well do these collaborations work in your opinion?

1.7. What are the sources of funding for the implementation of your CVSP?

Section 2 Defining the Problem

2.1. Briefly what are the major trends/issues in Commercial Vehicle Safety in your State?

2.2. How do you track these issues or trends?

2.3. From your perspective what is the major safety enforcement problem that needs to be addressed?

2.4 Is this the focus of your Commercial Vehicle Safety Plan?

Yes, explain.

No, explain.

2.5. Are there any recent trends/issues in commercial vehicle safety that are making you rethink the focus of your Commercial Vehicle Safety Plan? If yes, what are they?

Section 3 Implementation

3.1 The Federal Motor Carrier Safety Regulations identify five national commercial motor vehicle program activities:

	Allocations of Resources	Effectiveness
a. Driver/Vehicle Inspections	_____	_____
b. Traffic Enforcement with Inspection	_____	_____
c. Compliance and Enforcement	_____	_____
d. Education and Outreach	_____	_____
e. Safety Data Collection	_____	_____

3.2. On which activities do you spend the most money? Now please rank the other activities in terms of financial support.

3.3. Are there any limitations on your ability to move resources across enforcement activities?

3.4. Leaving aside the actual allocation of dollars, how would you rank order these activities in terms of effectiveness in reducing commercial vehicle crashes?

3.5. Are there other program activities that have been mandated by the State? If yes, what are they? How are they financed?

3.6. In terms of commercial safety how effective are these additional activities relative to the main activities of the program?

3.7 Let's focus on each of the federally mandated activity areas briefly. Are there any specific safety enforcement tactics you use that you think are innovative or different from the norm and which may not be done by other States? Let's begin with

Traffic Enforcement with Inspection:

□ Officers use observed traffic violations (i.e., speeding, no turn signal, etc) as *probable cause* for stops
□ Officer performs truck inspection after stop
□ Strategically deployed; i.e., officers target highway stretches that experience high crash rates
□ Inspection blitzes/or targeting activities

□ Use "sorting tools to find drivers most likely to warrant attention (i.e., access to safety records)

Compliance and Enforcement:

□ Compliance Reviews

□ Penalties

Education and Outreach:

□ To the general public (e.g., signage on highway for motorists)

□ Driver education

□ Industry

Safety Data Collection:

□ Use of data to develop strategies

□ Analyze crash information and assign fault

□ Use of performance measures

3.8. Have you evaluated any of these strategies?

Section 4 Approaches for Innovation

4.1. Do you think your program could benefit from some new strategies for improving or promoting truck safety?

No_____ Yes _____If yes, why?

4.2. When you are looking for new ways to address the question of preventing crashes how do you get new ideas (i.e., what is your process for innovating within the agency's program?)

4.3. At this point, what "new strategies" have you identified?

4.4. Why do you think they will be helpful?

Section 5 Relationship with Stakeholders and FMCSA

5.1. In addition to the agencies mentioned above, who are the other stakeholders in your program?

Day to day with trucking firms, alliance….

□ Other

5.1. Which stakeholders are most involved?

5.1.1. How are they involved?

5.2. Which are least involved?

5.2. Please characterize the relationship your agency has with the local Federal Motor Carrier Safety Administration office.

5.3. How involved is the FMCSA local office with the implementation of your program?

5.4. Do you participate in the Commercial Vehicle Safety Alliance?

Finally, thanks for your time and the information you have provided. Before we sign off is there anyone else I should speak with in order to fully understand how the commercial vehicle safety plan is implemented?

If yes, why?

Name _____ Number _____

Again, thanks for your time. Before we hang up, let me be sure I have the correct address for you. ODOT would like to send you a copy of the final report for this project.

Address: _____

APPENDIX C

STATE MCSAP FUNDING

Funding of MCSAPs by FMCSA is governed by Sections 4101 and 4107 of PL 109-59 (SAFETEA-LU), implemented through 49 CFR 350.201, 49 CFR 350.205, and 49 CFR 350.207. Each recipient state or territory must designate a lead MCSAP agency, which becomes eligible for receipt of federal funds following federal approval of a submitted Commercial Vehicle Safety Plan (CVSP). To qualify for federal funds, the lead MCSAP agency must commit to a 20% local funding match.

Federal funds are divided into basic and incentive components. The amount of basic funding is determined by a formula comprised of the following four measures (each weighted equally):

1. Highway miles, as defined by FMCSA;
2. Vehicle miles traveled (all vehicles), as defined by FMCSA;
3. Population, as defined by U.S. Census Bureau estimates;
4. Special fuel consumption, net after reciprocity adjustment, as defined by FMCSA.

To qualify for incentive funds, the lead MCSAP agency must demonstrate that its commercial vehicle safety program has shown improvement consistent with any of the following criteria:

1. Reduction in the number of large truck-involved fatal crashes;
2. Reduction in the rate of large truck-involved fatal crashes;
3. A large truck-involved fatal crash rate that is among the lowest 10% of MCSAP recipients, and is not higher than the rate most recently experienced;
4. Uploading of CMV crash reports in accordance with FMCSA policy guidelines;
5. Uploading of CMV inspection data in accordance with FMCSA policy guidelines;
6. Verification of Commercial Driver's Licenses during roadside inspections.

MCSAP funding in FY 2009, totaling $161.3 million, is shown for states and territories in Table C-1. FMCSA refers to the funding amounts in the table as estimates, given that funding may be withheld from Alabama due to regulatory incompatibilities. Also, the basic funding figures for Maine and South Dakota reflect a 50% withholding due to regulatory incompatibilities.

Table C-1 FY 2009 MCSAP Funding Estimates ($000s)

State	Basic Funds	Incentive Funds	Total Funds
Alabama	$3,218.0	$239.1	$3,457.0
Alaska	678.1	47.1	725.2
American Samoa	350.0	0.0	350.0
Arizona	3,147.9	191.7	3,339.5
Arkansas	2,448.3	165.8	2,614.1
California	7,534.2	571.0	8,105.2
Colorado	2,760.9	186.6	2,947.5
Connecticut	1,408.9	105.1	1,514.0
Delaware	678.1	27.8	705.8
District of Columbia	678.1	6.6	684.7
Florida	7,534.2	330.6	7,864.8
Georgia	5,523.3	223.9	5,747.3
Guam	350.0	0.0	350.0
Hawaii	678.1	30.2	708.3
Idaho	1,291.6	131.7	1,423.3
Illinois	6,108.8	330.2	6,439.4
Indiana	4,129.7	250.9	4,380.7
Iowa	2,589.8	193.2	2,783.0
Kansas	2,586.9	261.8	2,848.7
Kentucky	2,853.2	115.9	2,969.1
Louisiana	2,596.8	140.5	2,737.3
Maine	399.9	59.2	459.1
Maryland	2,376.6	208.3	2,584.9
Massachusetts	2,355.5	206.9	2,562.4
Michigan	4,901.6	497.3	5,398.9
Minnesota	3,476.2	352.4	3,828.6
Mississippi	2,346.6	238.8	2,585.4
Missouri	4,055.3	164.7	4,220.0
Montana	1,257.5	50.7	1,308.2
Nebraska	1,867.7	189.4	2,057.0
Nevada	1,502.1	61.3	1,563.3
New Hampshire	678.1	54.2	732.3
New Jersey	3,511.4	189.7	3,701.1
New Mexico	1,745.5	47.4	1,792.9
New York	7,002.2	520.4	7,522.6
North Carolina	4,707.2	254.7	4,961.9
North Dakota	1,255.2	93.0	1,348.2
Northern Marianas	350.0	0.0	350.0
Ohio	5,813.9	510.9	6,324.8
Oklahoma	3,080.7	125.1	3,205.8
Oregon	2,386.2	96.8	2,483.1
Pennsylvania	5,948.2	441.9	6,390.2
Puerto Rico	678.1	0.0	678.1
Rhode Island	678.1	27.8	705.8
South Carolina	2,639.4	178.9	2,818.3
South Dakota	640.2	95.4	735.6
Tennessee	3,700.9	150.2	3,851.1
Texas	7,534.2	548.6	8,082.8
Utah	1,650.3	100.8	1,751.0
Vermont	678.1	30.2	708.3
Virgin Islands	350.0	0.0	350.0
Virginia	3,943.4	213.4	4,156.8
Washington	3,147.4	234.3	3,381.7
West Virginia	1,181.6	120.2	1,301.8
Wisconsin	3,460.2	350.7	3,810.9
Wyoming	902.6	36.9	939.5
Total	$151,346.8	10,000.0	161,346.8

Lastly, to ensure that MCSAP funding does not supplant state and local funding of commercial vehicle safety programs, FMCSA requires (under 49 CFR 350.301) that MCSAP recipients document *Maintenance of Effort*. Under maintenance of effort, a state must document that current expenditures for commercial vehicle safety programs are at least equal to the average expenditures of the state and its political subdivisions over a 3-year period, beginning five years prior to the FMCSA award. Maintenance of effort expenditures cannot include the following:

1. Federal funds used for motor carrier and hazardous materials safety enforcement;
2. State matching funds;
3. State funds used for federally-sponsored CMV demonstration or pilot safety programs.

APPENDIX D

SELECTED PRESS RELEASES

Trucking Industry, OSP, Local Law Enforcement and ODOT Partner on Safety Campaign

09/25/2008

Sally Ridenour
Public Affairs Specialist
Oregon Department of Transportation
Communications Division
Office: (503) 986-3359

Lieutenant Mark Cotter
Oregon State Police - Albany
Office: (541) 967-2026

Aggressive car and truck drivers in the Salem area beware! Oregon is continuing its new safety campaign targeting unsafe driving. **The Ticket Aggressive Cars and Trucks campaign, or TACT,** is designed to reduce truck crashes through education and enforcement. Specifically, **TACT focuses on aggressive driving near the vicinity of large trucks.**

Next week, the **Oregon Department of Transportation's Motor Carrier Division, in cooperation with Oregon State Police, Marion County Sheriff's Office, Salem Police Department and the Oregon trucking industry will begin a TACT enforcement exercise on Interstate 5 in the Willamette Valley.** Law enforcement officers will be riding in commercial trucks looking for car and truck drivers who engage in risky driving behavior such as speeding, tailgating, and changing lanes unsafely. Haney Truck Line, Charlie's Produce, Pepsi Northwest Beverages and Cascade Express are the participating trucking companies and are generously providing commercial vehicles and drivers.

"It is more than just an enforcement effort, TACT also involves educating drivers about how to stay out of trouble," said **Lt. Mark Cotter with Oregon State Police**, who is coordinating law enforcement participation in the campaign. "Of course the bottom line objective is to reduce truck crashes, particularly those in which the car driver is at-fault, and reduce the number of people injured or killed on Oregon highways."

People in the Salem and north Jefferson area will start seeing public service announcements, posters, highway signs, brochures and more with **TACT** messages beginning next week.

“One key **TACT** campaign message motorists will see over and over again is, **LEAVE MORE SPACE.** Bad things happen when vehicles get too close to each other. When cars and trucks collide, cars get the brunt of it no matter which vehicle is at-fault,” said **ODOT Motor Carrier Safety and Federal Programs Manager David McKane.**

In the last 10 years, 3 out of 4 people who died in these collisions were riding in the cars. In fact, in crashes involving a car and truck, the car occupants are 15 times more likely to be killed than truck occupants. Here are the **key messages that the TACT campaign will emphasize:**

- **Don't cut off trucks. For safety sake, it's recommended that car drivers maintain one car length for every 10 miles per hour of speed.**
- **Don't tailgate. Unlike cars, trucks have large blind spots behind them. Also, car drivers who tailgate trucks can't see traffic ahead. If the truck brakes suddenly, the car driver has no time to react and no place to go.**
- **Allow trucks plenty of room. Both car and truck drivers must be especially careful when entering a highway or merging with traffic.**
- **Don't speed. Speed is the leading cause of all crashes in Oregon.**

“Research shows that most truck vs. car crashes could be avoided if drivers knew how to steer clear of unsafe situations,” said **McKane**. “With this campaign, we hope to increase awareness, encourage safer driving practices, and make a positive change in the risky driving behaviors of motorists. All of which will lead to fewer crashes, fatalities and injuries on Oregon’s roadways.”

The **Oregon TACT campaign** is modeled after a successful operation conducted in Washington. For more information, visit the ODOT Motor Carrier Transportation Division Web site, at http://www.oregon.gov/ODOT/MCT/SAFETY.shtml.

Update: Trucking Industry, ODOT and Police Wrap Up Two Day TACT Safety Campaign

10/01/2008

Sally Ridenour
Public Affairs Specialist
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Lieutenant Mark Cotter
Oregon State Police - Albany
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A new safety campaign wrapped up today following two days of focused enforcement on **Interstate 5 in the Willamette Valley** aimed at aggressive driving near the vicinity of large trucks. The **Ticket Aggressive Cars and Trucks campaign, or TACT**, is designed to reduce truck crashes through education and enforcement in a partnership involving Oregon Department of Transportation's Motor Carrier Division, the Oregon trucking industry, and law enforcement.

On **September 30th and October 1st,** law enforcement officers from Oregon State Police (OSP), Marion County Sheriff's Office, and Salem Police Department worked together as police officers rode in commercial trucks looking for car and truck drivers who engaged in risky driving behavior such as speeding, tailgating, and changing lanes unsafely. Officers in trucks were also helped above by the OSP patrol aircraft and on the road by unmarked ADEP (Aggressive Driving Enforcement Plan) vehicles. Haney Truck Line, Charlie's Produce, Pepsi Northwest Beverages and Cascade Express were participating trucking companies that generously provided commercial vehicles and drivers.

According to **OSP Lieutenant Mark Cotter** from the Albany Area Command office, twelve OSP troopers, three Marion County deputies, and one Salem police officer were involved in TACT over the two-day run. Officers issued citations to 34 passenger car drivers and four truck drivers for violations including speed (14), following too close (9), unsafe/improper lane change (6), and safety restraint violations (5). Twenty-one warnings were also issued. One driver was cited Tuesday evening for going 103 mph on Interstate 5 in a 65 mph speed zone.

"This operation provided another great chance to partner with ODOT, area police agencies and the trucking industry," said **Cotter**. "Officers who rode in the trucks gained a new perspective as seen by commercial truck drivers and the time they spent together will pay off down the road."

During the week, people in the Salem and north Jefferson area started seeing public service announcements, posters, highway signs, brochures and more with TACT messages. One key TACT campaign message motorists will see over and over again is – **LEAVE MORE SPACE.**

In the last 10 years, 3 out of 4 people who died in these collisions were riding in the cars. In fact, in crashes involving a car and truck, the car occupants are 15 times more likely to be killed than truck occupants. **Key messages emphasized by the TACT campaign are:**

- **Don't cut off trucks. For safety sake, it's recommended that car drivers maintain one car length for every 10 miles per hour of speed.**
- **Don't tailgate. Unlike cars, trucks have large blind spots behind them. Also, car drivers who tailgate trucks can't see traffic ahead. If the truck brakes suddenly, the car driver has no time to react and no place to go.**
- **Allow trucks plenty of room. Both car and truck drivers must be especially careful when entering a highway or merging with traffic.**
- **Don't speed. Speed is the leading cause of all crashes in Oregon.**

"Research shows that most truck vs. car crashes could be avoided if drivers knew how to steer clear of unsafe situations," said ODOT Motor Carrier Safety and Federal Programs Manager David McKane. "With this campaign, we hope to increase awareness, encourage safer driving practices, and make a positive change in the risky driving behaviors of motorists. All of which will lead to fewer crashes, fatalities and injuries on Oregon's roadways."

Unsafe Commercial Vehicles and Drivers Target of "Operation Trucker Check 17"

09/23/2009

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The 17th interagency operation focusing on removing impaired truck drivers and unsafe commercial vehicles from Oregon's roads is currently underway at the Interstate 5 Ashland Port of Entry. "***Operation Trucker Check***", a 48-hour interagency operation, **began at 12:01 a.m., September 22, and ends at 11:59 p.m., September 23,** with police officers and truck inspectors working with Drug Recognition Evaluators (DRE) and K9 officers targeting operator impairment, vehicle safety, and potential criminal activity related to commercial vehicle operations.

First held in 1998 at the Ashland Port of Entry, "Operation Trucker Check" is a successful enforcement and inspection program that provides an ongoing look into commercial vehicle and driver safety. The around-the-clock operation involves a team of police officers and Oregon Department of Transportation (ODOT) commercial vehicle inspectors looking for driver impairment related to alcohol, drugs, or fatigue, and vehicle equipment safety. Trucker check operations have also previously been held at the Woodburn Port of Entry and in Klamath Falls, Ontario, and Cascade Locks.

The last "Operation Trucker Check" was held during a 72-hour period April 7 – 9, 2009 at the Interstate 5 Woodburn Port of Entry. A total of 463 commercial vehicles were inspected of which 53 (11.4%) were placed out-service for critical safety violations. Ninety-three (93) drivers were also placed out-of-service for assorted safety violations including excessive driving hours, log book deficiencies, and driver qualification issues. Officers and inspectors issued 42 motor carrier-related citations and 367 warnings. Five arrests were made for Driving Under the Influence of Intoxicants and four drivers were cited for Driving While Suspended.

"This program continues to be successful and is a blueprint for how others have developed similar trucker inspection programs in other parts of the country," said **Sergeant Dave MacKenzie, who oversees the OSP Motor Carrier Enforcement Unit.** "With the support of the Oregon Trucking Association, ODOT and participating police agencies, these unannounced safety inspections help get dangerous impaired drivers and unsafe vehicles off the road before something bad happens."

Sergeant MacKenzie pointed out the program's **four goals** for "Operation Trucker Check 17":

1) Identifying commercial vehicle driver and equipment violations, with an emphasis on out-of-service violations;
2) Detecting operator impairment by alcohol and/or substance abuse;
3) Detecting operator impairment by fatigue; and,
4) Detecting any criminal activity occurring in conjunction with commercial motor vehicle operations.

Oregon State Police (OSP) and ODOT will work toward these goals by conducting Level I, Level II, and Level III truck inspections to identify drivers impaired by fatigue or substances, compliance with federal hours of service regulations, and federal requirement for commercial motor vehicle safety equipment. Trained Drug Recognition Evaluators (DREs) from OSP and the following agencies will evaluate and identify drug or alcohol impaired drivers:

Ashland Police Department
Eugene Police Department
Corvallis Police Department
Medford Police Department

According to 2008 statistics provided by ODOT's Motor Carrier Transportation Division:

- 60,550 truck safety inspections were conducted in Oregon, down from 61,349 in 2007
- During inspections, critical safety violations were found in 28% of the vehicles and 19% of drivers
- Most common mechanical violation found during inspections continues to be brake-related
- Over 9,900 truck drivers were found during inspections falsifying or keeping inaccurate log books, a sharp rise from the more than 7,000 drivers caught in 2007 and more than 5,000 in 2006

Additional motor carrier related information and statistics is available on ODOT's Web site at www.oregon.gov/ODOT/MCT/SAFETY/shtml.

Questions regarding ODOT MCTD statistics and information should be directed to Ms. Sally Ridenour at (503) 986-3359.