

THE MOTOR CARRIER SAFETY ASSISTANCE PROGRAM 2009 ANNUAL REPORT TO CONGRESS

A Report Pursuant to Section 31102(e) of Title 49 United States Code
September 2013

The Federal Motor Carrier Safety Administration's (FMCSA) Motor Carrier Safety Assistance Program (MCSAP) provides financial assistance to State and local government agencies to reduce the number and severity of crashes and hazardous material (HM) incidents involving commercial motor vehicles (CMV). Section 31102(e) of Title 49 United States Code (USC) requires the Secretary of the U.S. Department of Transportation (DOT) to submit an annual report on MCSAP that (1) analyzes CMV safety trends among States, (2) documents the most effective CMV safety programs implemented with MCSAP grants, and (3) describes the effects on CMV safety activities carried out with these grants. In addressing these requirements, this report provides an update to the Fiscal Year (FY) 2008 annual report and reflects activities and outcomes in FY 2009.

Overview of MCSAP

In FY 2009, Congress appropriated \$209 million for MCSAP. The FMCSA awards grants under Section 31102 of Title 49 USC through two grant programs:

- The **Basic** funding program is the core MCSAP grant program. It distributes funds proportionally to the States and the District of Columbia (States), Puerto Rico, and the U.S. Territories of Guam, American Samoa, the U. S. Virgin Islands, and the Commonwealth of Northern Mariana Islands, using four equally weighted factors: 1997 road miles, vehicle miles traveled (VMT), population, and special fuel consumption. In FY 2009, FMCSA distributed approximately \$152.4 million in Basic MCSAP grants.
- FMCSA provides **Incentive** funds to those States and Puerto Rico that demonstrate improvement in CMV safety programs by achieving reductions in CMV involved fatal crashes or the CMV fatal crash rate, or that meet other specified CMV safety performance criteria, such as the timely uploading of CMV inspection data to FMCSA data systems. States may use these funds for any MCSAP-eligible safety purpose. The FMCSA provided \$10 million in MCSAP Incentive grants in FY 2009.

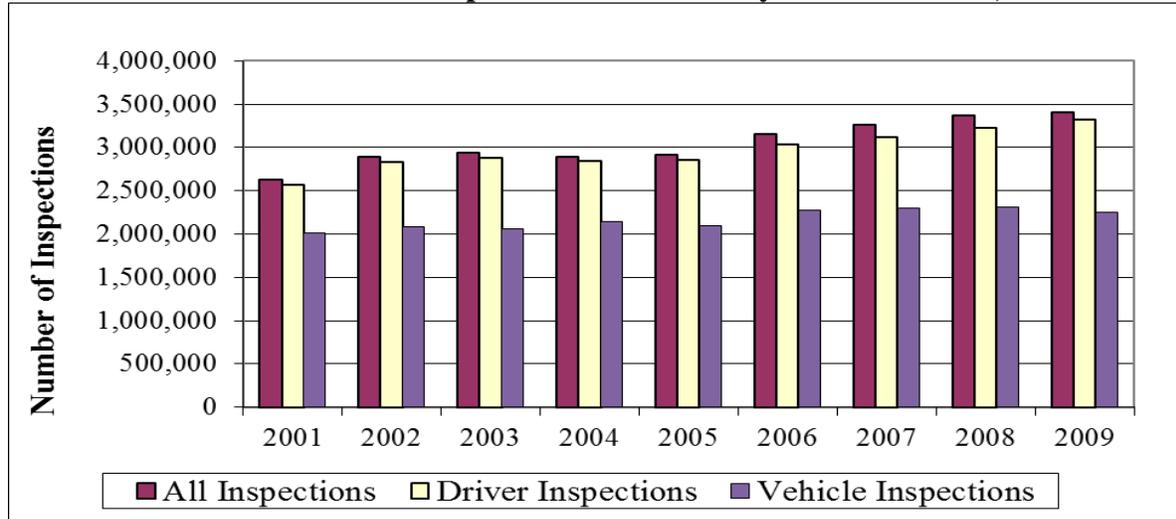
MCSAP Activities and Outcomes

Roadside Inspections

Roadside inspections are one method for determining carrier and driver compliance with Federal and compatible State regulations. As shown in Exhibit 1, between FY 2001 through FY 2009, the number of annual roadside inspections conducted by State personnel increased by 778,382, or 30 percent. Driver inspections increased by 29 percent during this period, while vehicle

inspections increased by 12 percent.¹ In FY 2009, approximately 6 percent of driver inspections and 22 percent of vehicle inspections resulted in out-of-service (OOS) orders, which is consistent with inspection results from FYs 2001-2008. Bus inspections numbered 84,372, an increase of over 100 percent since 2001.² This included a spike of school bus inspections by States during FYs 2006-2008, resulting in inspections for those years ranging from 103,000-133,000.³

Exhibit: 1. Driver and Vehicle Inspections Conducted by State Personnel, FYs 2001-2009



Source: FMCSA Inspection Archive, June 2012.

In FY 1998, FMCSA developed an Intervention Model to measure the effectiveness of roadside inspections and traffic enforcements, in terms of crashes and injuries avoided and lives saved.⁴ The Intervention Model is based on the premise that the Roadside Inspection and Traffic Enforcement programs directly and indirectly contribute to the reduction of truck and bus crashes. As a result, the model includes two submodels to measure these different effects. Direct effects are based on the assumption that vehicle and/or driver violations discovered and then corrected as the result of interventions (roadside inspections and traffic enforcements)

reduce the probability that these vehicles/drivers will be involved in subsequent crashes. Indirect effects are considered to be the by-products of the carriers' increased awareness of FMCSA programs and the potential consequences that these programs impose, if steps are not taken to ensure and/or maintain high levels of safety. The model assumes that observed deficiencies

(i.e., violations) discovered at the time of the intervention can be converted into crash risk probabilities. This assumption is based on the premise that detected violations represent varying degrees of mechanical or judgmental faults, and, further, that some are more likely than others to play a contributory role in motor carrier crashes. The assumption is that these deficiencies can be noted and ranked into discrete risk categories, each with a probability that quantifies the potential for a crash for all deficiencies in that category.

¹ The sum of driver and vehicle inspections is greater than that shown for all inspections because Level I and II inspections contain both a driver and a vehicle component.

² A spike of school bus inspections ranging from 103,000-133,000 inspections took place during FYs 2006-2008.

³ Motor Carrier Management Information System (MCMIS), March 23, 2012. Data include inspections of motorcoaches, school buses, buses, vans, and limousines.

⁴ A description of the Intervention Model is found at <http://ai.fmcsa.dot.gov/pe/home.aspx>

The Direct Effects submodel evaluates the likelihood of an inspection preventing a crash by using the crash reduction probabilities of each violation cited during the inspection. An inspection with multiple violations will have a greater likelihood of an avoided crash than will an inspection with a single violation, assuming all the violations are in the same risk category. This result reflects the belief that multiple violations compound the safety hazard posed from driver and/or vehicle deficiencies.

Once the number of crashes avoided for each inspection has been calculated, the next step is to compute the number of lives saved and injuries avoided as a result of those crashes avoided. This is done by first utilizing national historical data to determine the percentage of crashes that result in fatalities and injuries. The average number of fatalities per fatal crash, injuries per fatal crash, and injuries per injury crash are computed using MCMIS data. These averages are then multiplied by the number of fatal crashes avoided and injury crashes avoided, resulting in the number of lives saved and injuries avoided. The Indirect Effects Submodel compares carrier performance in a base year to the year after in order to measure the effects of exposure to interventions in the base year on compliance. The estimate of crashes avoided is based on the number of interventions that record violations, so fewer violations recorded indicate reduced likelihood of a crash. The model uses changes in the number of violations recorded during inspections to identify and evaluate the indirect effects. Estimates of indirect effect crashes avoided are allocated to the program initiating the intervention, either the Roadside Inspection or Traffic Enforcement program.

FMCSA enhanced the Intervention Model in FY 2001 and FY 2008.

Exhibit: 2 Exhibit 2. Effectiveness of Roadside Inspection and Traffic Enforcement Programs, FY 20095

Intervention Benefits	FY 2009
Roadside Inspections	2,788,728
Traffic Enforcement Inspections	730,916
<i>Total Inspections</i>	<i>3,519,644</i>
Crashes Avoided due to Roadside Inspections	8,149
Crashes Avoided due to Traffic Enforcement Inspections	8,789
<i>Total Estimated Crashes Avoided</i>	<i>16,938</i>
Injuries Avoided due to Roadside Inspections	5,206
Injuries Avoided due to Traffic Enforcement Inspections	5,615
<i>Total Estimated Injuries Avoided</i>	<i>10,821</i>
Lives Saved due to Roadside Inspections	276
Lives Saved due to Traffic Enforcement Inspections	297
<i>Total Estimated Lives Saved</i>	<i>573</i>

Source: FMCSA Intervention Model.

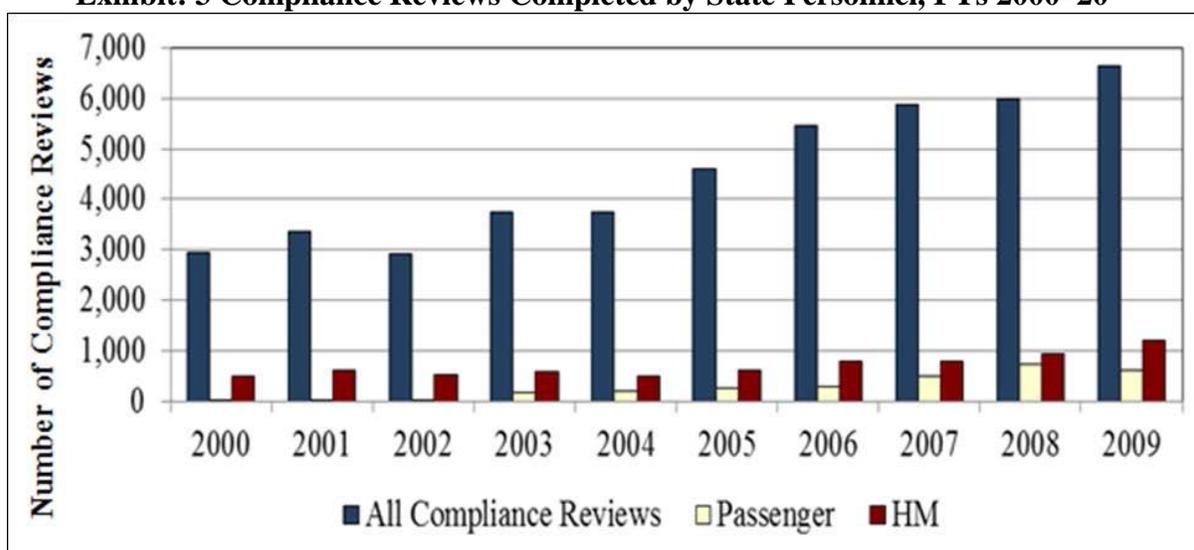
⁵ The Intervention Effectiveness Model methodology was revised in 2008. The results presented in Exhibit 2 reflect that change as applied to the 2009 preliminary data (the latest year for which FMCSA has updated the analysis).

Exhibit 2 shows that MCSAP-supported enforcement actions contributed to preventing an estimated 16,938 crashes and 10,821 injuries, and saved an estimated 573 lives.⁶

Compliance Reviews

State enforcement personnel conduct compliance reviews (CR) to assess a carrier's level of compliance with the Federal Motor Carrier Safety Regulations and Hazardous Materials Regulations. Through education, heightened safety-regulation awareness, and enforcement, the CR is intended to improve a motor carrier's compliance with Federal and comparable State regulations and ultimately improve its safety performance. The CRs may result in enforcement action against the carrier. As shown in Exhibit 3, the total number of CRs performed by State personnel more than doubled from 2,943 in FY 2000 to 6,638 in FY 2009. The number of CRs conducted for HM carriers increased from 507 in FY 2000 to 1,218 in FY 2009, and for passenger carriers increased from 5 to 614 during this period.

Exhibit: 3 Compliance Reviews Completed by State Personnel, FYs 2000–20



Source: MCMIS Snapshot, March 23, 2012.

The CR is the most resource-intensive enforcement tool in FMCSA's compliance and enforcement program. In FY 2002, FMCSA developed the CR Effectiveness Model to measure the crashes and injuries avoided and lives saved. The model is based on the individual and cumulative "before and after" changes in the safety performance of carriers that received CRs in a given year. The model compares a motor carrier's crash rate in the 12 months following an onsite compliance review to its crash rate in the 12 months prior to that review. The model uses crash data reported by the States and power unit data reported by carriers or obtained during CRs to calculate both the before-CR and after-CR crash rates. To eliminate the effects of changes in the average crash rate of the general carrier population and changes in crash reporting and possibly other unknown factors, a control group of carriers was used. Any change in the average crash rate of the control group must be due to factors other than the effects of the CRs. Thus, the

⁶ The number of crashes, injuries, and fatalities prevented decreased in FY 2009 from FY 2008, even as the total number of inspections increased because the proportion of inspections resulting in no violations actually increased. While this suggests that MCSAP-supported efforts are helping to improve carrier compliance, it results in variations in the calculations of the intervention effectiveness models.

change in the average crash rate of the control group is calculated and then subtracted from the change in the average crash rate of the carriers that received CRs in the year in question (i.e., the CR group). The difference resulting from this calculation represents the change in the average crash rate of the carriers that received CRs in the year in question that could be attributed to the CRs. The model estimates the benefits derived from performing CRs on motor carriers in terms of crashes avoided, as well as lives saved and injuries prevented. Minor modifications to the control group were made in FY 2008. Exhibit 4 shows the results for CRs conducted in 2008, the most recent year that results are available.⁷ In FY 2008, CRs prevented an estimated 2,886 crashes, 1,853 injuries, and saved 101 lives.⁸

Exhibit: 4. Results of the Compliance Review Effectiveness Model, FY 2008

Compliance Review Benefits	FY 2008
Compliance Reviews Conducted	11,032
Crashes Avoided	2,886
Fatal Crashes	87
Injury Crashes	1,157
Towaway Crashes	1,642
Injuries Avoided	1,853
Lives Saved	101

Source: FMCSA Compliance Review Effectiveness Model.

State Safety Trends

The MCSAP provides financial assistance to State and local agencies with the goal of reducing the number and severity of CMV-related crashes, fatalities, injuries, and HM incidents through consistent, uniform, and effective safety programs. This investment is working, as evidenced by Exhibit 5. Despite a relatively static period from 2002 to 2006, the overall trend shows a decline in fatalities with the total in 2009 36 percent lower than in 2000. The fatality rate, expressed as the number of fatalities per 100 million truck VMT, has consistently declined since FY 2005. Between FYs 2000 and 2009, the rate decreased from 2.57 to 1.17.

Exhibit: 5. Large-Truck Fatal Crash Statistics, 2000–2009

Year	Fatal Crashes	Fatalities	Total VMT(Millions)	Fatalities per 100 Million TruckVMT
2000	4,573	5,282	205,520	2.57
2001	4,451	5,111	209,032	2.45
2002	4,224	4,939	214,603	2.30
2003	4,335	5,036	217,917	2.31
2004	4,478	5,235	220,811	2.37
2005	4,551	5,240	222,523	2.35
2006	4,350	5,027	222,513	2.26
2007	4,204	4,822	304,178	1.59

⁷ The CR Effectiveness Model does not distinguish between reviews conducted by Federal and State personnel.

⁸ The 2009 results from the Compliance Review Effectiveness Model were not available at the time of print.

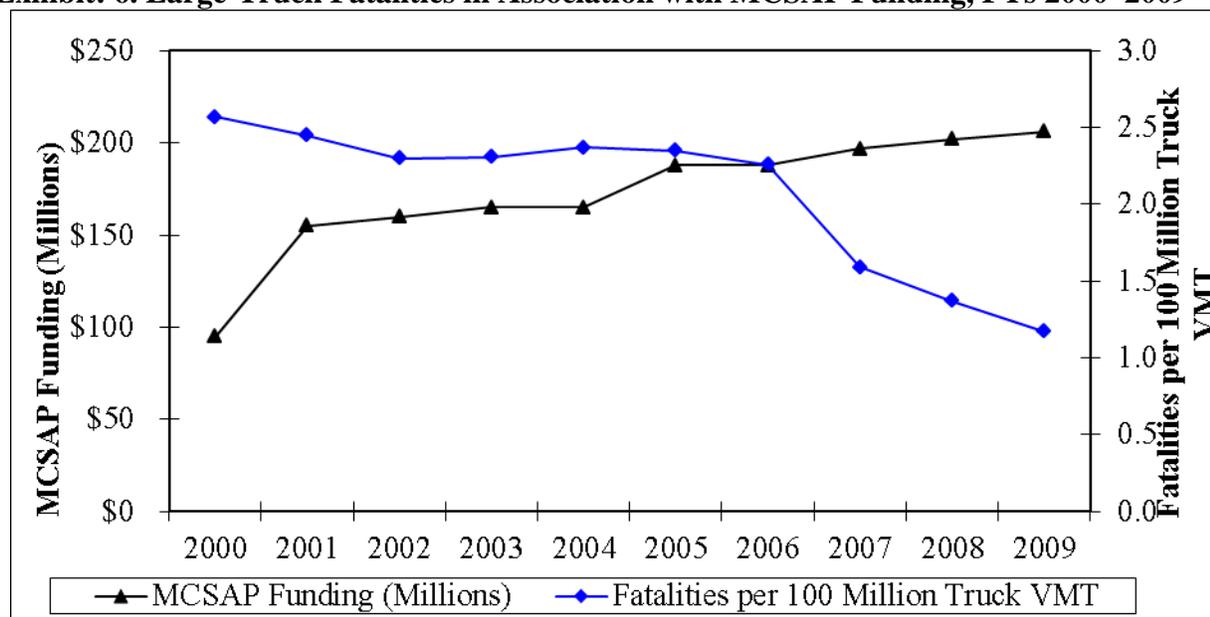
⁹ The FHWA implemented an enhanced methodology for estimating registered vehicles and VMT by vehicle type for the years 2007-2009. As a result, involvement rates may differ, and in some cases significantly, from previously published rates. For more information, see <http://www.fhwa.dot.gov/policyinformation/statistics/2009/vml.cfm> and <http://www.fhwa.dot.gov/pressroom/fhwa1155.htm>

Year	Fatal Crashes	Fatalities	Total VMT(Millions)	Fatalities per 100 Million Truck VMT
2008	3,754	4,245	310,680	1.37
2009	2,987	3,380	288,005	1.17

Sources: *VMT and Registered Vehicles*: Federal Highway Administration (FHWA).
Fatal Crashes, Vehicles Involved, and Fatalities: National Highway Traffic Safety Administration (NHTSA), Fatality Analysis Reporting System (FARS).

Exhibit 6 suggests that this reduction in large-truck fatal crash rates is associated with the increase in MCSAP funding since FY 2000, notably since FY 2005.

Exhibit: 6. Large-Truck Fatalities in Association with MCSAP Funding, FYs 2000–2009



Sources: *VMT*: FHWA. *Fatal Crashes, Vehicles Involved, and Fatalities*: NHTSA, FARS. *MCSAP Funding*: FMCSA.

Safety Trends for Individual States

Exhibit 7 shows the trends in fatalities resulting from large-truck-related crashes in each State. Twenty-nine States had fewer large-truck-related fatalities between CY 1996 and CY 2006; 27 had fewer fatalities between CY 2001 and CY 2006; 35 had fewer fatalities between CY 2007 and CY 2008, and 34 had fewer fatalities between CY 2008 and CY 2009.

Exhibit: 7 Fatalities in Crashes Involving Large Trucks, by State (CYs 1996, 2001, 2006-2009)

State	Fatalities						Percent Change From			
	1996	2001	2006	2007	2008	2009	1996 - 2006	2001 - 2006	2007 - 2008	2008 - 2009
Alabama	152	145	137	134	131	80	-10%	-6%	-2%	-39%
Alaska	6	10	4	4	5	3	-33%	-60%	25%	-40%
Arizona	98	85	136	98	98	66	39%	60%	0%	-33%

State	Fatalities						Percent Change From			
	1996	2001	2006	2007	2008	2009	1996 - 2006	2001 - 2006	2007 - 2008	2008-2009
Arkansas	104	98	91	114	76	78	-13%	-7%	-33%	3%
California	390	378	394	366	318	274	1%	4%	-13%	-14%
Colorado	63	95	67	82	68	40	6%	-29%	-17%	-41%
Connecticut	34	29	29	28	24	13	-15%	0%	-14%	-46%
Delaware	14	15	17	6	7	11	21%	13%	17%	57%
District of Columbia	4	1	2	2	1	1	-50%	100%	-50%	0%
Florida	305	365	350	301	264	181	15%	-4%	-12%	-31%
Georgia	220	255	232	229	180	151	5%	-9%	-21%	-16%
Hawaii	13	8	12	3	6	5	-8%	50%	100%	-17%
Idaho	40	34	29	27	30	20	-28%	-15%	11%	-33%
Illinois	152	200	159	154	146	88	5%	-21%	-5%	-40%
Indiana	166	135	140	147	137	96	-16%	4%	-7%	-30%
Iowa	84	83	75	71	73	66	-11%	-10%	3%	-10%
Kansas	64	80	69	77	63	59	8%	-14%	-18%	-6%
Kentucky	100	107	105	104	113	112	5%	-2%	9%	-1%
Louisiana	107	123	104	121	111	83	-3%	-15%	-8%	-25%
Maine	15	28	21	21	23	22	40%	-25%	10%	-4%
Maryland	70	78	61	69	52	48	-13%	-22%	-25%	-8%
Massachusetts	39	30	34	28	23	22	-13%	13%	-18%	-4%
Michigan	162	122	116	124	88	67	-28%	-5%	-29%	-24%
Minnesota	77	64	62	86	70	59	-19%	-3%	-19%	-16%
Mississippi	99	98	90	75	70	61	-9%	-8%	-7%	-13%
Missouri	167	139	155	136	124	86	-7%	12%	-9%	-31%
Montana	21	27	34	31	25	24	62%	26%	-19%	-4%
Nebraska	63	68	34	43	43	43	-46%	-50%	0%	0%

State	Fatalities						Percent Change From			
	1996	2001	2006	2007	2008	2009	1996 - 2006	2001 - 2006	2007 - 2008	2008-2009
Nevada	44	46	51	29	22	19	16%	11%	-24%	-14%
New Hampshire	12	14	7	12	13	8	-42%	-50%	8%	-38%
New Jersey	86	77	74	64	47	69	-14%	-4%	-27%	47%
New Mexico	56	59	80	57	45	36	43%	36%	-21%	-20%
New York	161	139	174	155	119	108	8%	25%	-23%	-9%
North Carolina	183	201	152	168	162	124	-17%	-24%	-4%	-23%
North Dakota	12	12	19	12	20	31	58%	58%	67%	55%
Ohio	224	168	158	134	143	114	-29%	-6%	7%	-20%
Oklahoma	99	94	140	112	115	98	41%	49%	3%	-15%
Oregon	64	64	62	53	37	30	-3%	-3%	-30%	-19%
Pennsylvania	185	185	193	194	192	134	4%	4%	-1%	-30%
Rhode Island	6	6	8	7	2	6	33%	33%	-71%	200%
South Carolina	111	108	95	91	85	82	-14%	-12%	-7%	-4%
South Dakota	24	21	19	14	14	16	-21%	-10%	0%	14%
Tennessee	175	138	148	149	95	94	-15%	7%	-36%	-1%
Texas	450	486	500	502	453	315	11%	3%	-10%	-30%
Utah	36	34	39	39	29	21	8%	15%	-26%	-28%
Vermont	10	7	11	5	7	6	10%	57%	40%	-14%
Virginia	121	110	107	108	81	77	-12%	-3%	-25%	-5%
Washington	73	63	65	79	55	31	-11%	3%	-30%	-44%
West Virginia	60	48	48	48	47	34	-20%	0%	-2%	-28%
Wisconsin	105	108	76	85	63	57	-28%	-30%	-26%	-10%
Wyoming	16	23	42	24	30	11	163%	83%	25%	-63%
U.S. Total	5,142	5,111	5,027	4,822	4,245	3,380	-2%	-2%	-12%	-20%

Source: NHTSA, FARS. FMCSA, Analysis Division.

Conclusion

The activities supported by MCSAP grant funds are saving lives and reducing injuries by preventing and minimizing the severity of large truck and bus crashes through consistent, uniform, and effective safety programs among FMCSA's State, local, and non-profit partners. Roadside inspections and traffic enforcements conducted in FY 2009 avoided an estimated 16,938 crashes, 10,821 injuries, and 573 fatalities. Moreover, CRs conducted in FY 2008 resulted in an estimated 2,886 fewer crashes, 1,853 fewer injuries, and 101 saved lives.¹⁰ It is expected that the increased number of CRs conducted in FY 2009 led to more crashes and injuries avoided, and lives saved than in FY 2008. Finally, the continuing reduction in large-truck fatal crash rates, particularly since 2004, suggests a relationship with the increase in MCSAP funding in recent years. In total, FMCSA's MCSAP program saved an estimated 573 lives in FY 2009.

¹⁰ FY 2009 results from the Compliance Review Effectiveness Model not available at time of print.