

THE MOTOR CARRIER SAFETY ASSISTANCE PROGRAM

2008 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) 2007 annual report and reflects activities and outcomes in FY 2008.

Overview of MCSAP

In FY 2008, Congress appropriated \$202 million for MCSAP. 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 2008, FMCSA distributed approximately \$148.5 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. FMCSA awarded \$10 million in MCSAP Incentive grants in FY 2008.

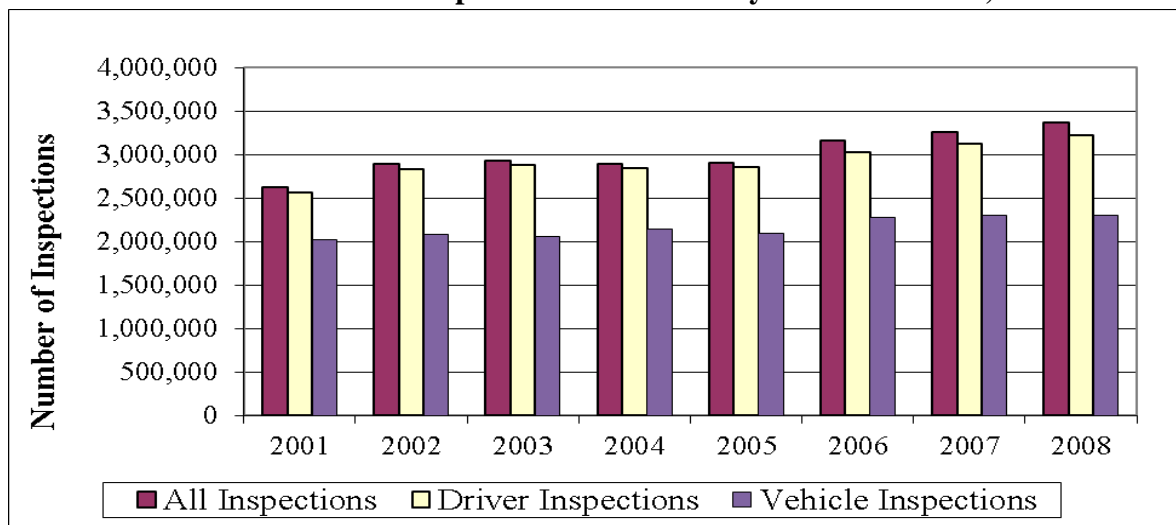
MCSAP Activities and Outcomes

Roadside Inspections

Roadside inspections are one method for determining carrier and driver compliance with Federal and compatible State regulations. As shown in Exhibit 1, from FY 2001 through FY 2008, the number of annual roadside inspections conducted by State personnel increased by 740,524, or nearly 28 percent. Driver inspections increased by approximately 26 percent during this period,

while vehicle inspections increased by 14 percent.¹ In FY 2008, approximately 7 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 2001-2007.

Exhibit 1. Driver and Vehicle Inspections Conducted by State Personnel, FYs 2001–2008



Source: FMCSA Inspection Archive, June 2012.

FMCSA's FY 2008 MCSAP planning memorandum required that States maintain or increase the number of passenger carrier inspections. As a result, States conducted 133,359 bus inspections in FY 2008, representing a 5 percent increase over the 126,510 inspections conducted in FY 2007.²

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.³ 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

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

³ A description of the Intervention Model is found at <http://ai.fmcsa.dot.gov/pe/home.aspx>. The methodology was revised in 2008. The results presented in Exhibit 2 reflect that change.

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.

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. Effectiveness of Roadside Inspection and Traffic Enforcement Programs, FY 2008

| Intervention Benefits | FY 2008 |
|---|-------------------------|
| Roadside Inspections | 2,723,576 |
| Traffic Enforcement Inspections | 756,169 |
| <i>Total Inspections</i> | <i>3,479,745</i> |
| Crashes Avoided due to Roadside Inspections | 8,464 |
| Crashes Avoided due to Traffic Enforcement Inspections | 9,053 |
| <i>Total Estimated Crashes Avoided</i> | <i>17,517</i> |
| Injuries Avoided due to Roadside Inspections | 5,381 |
| Injuries Avoided due to Traffic Enforcement Inspections | 5,755 |
| <i>Total Estimated Injuries Avoided</i> | <i>11,136</i> |
| Lives Saved due to Roadside Inspections | 304 |
| Lives Saved due to Traffic Enforcement Inspections | 325 |
| <i>Total Estimated Lives Saved</i> | <i>629</i> |

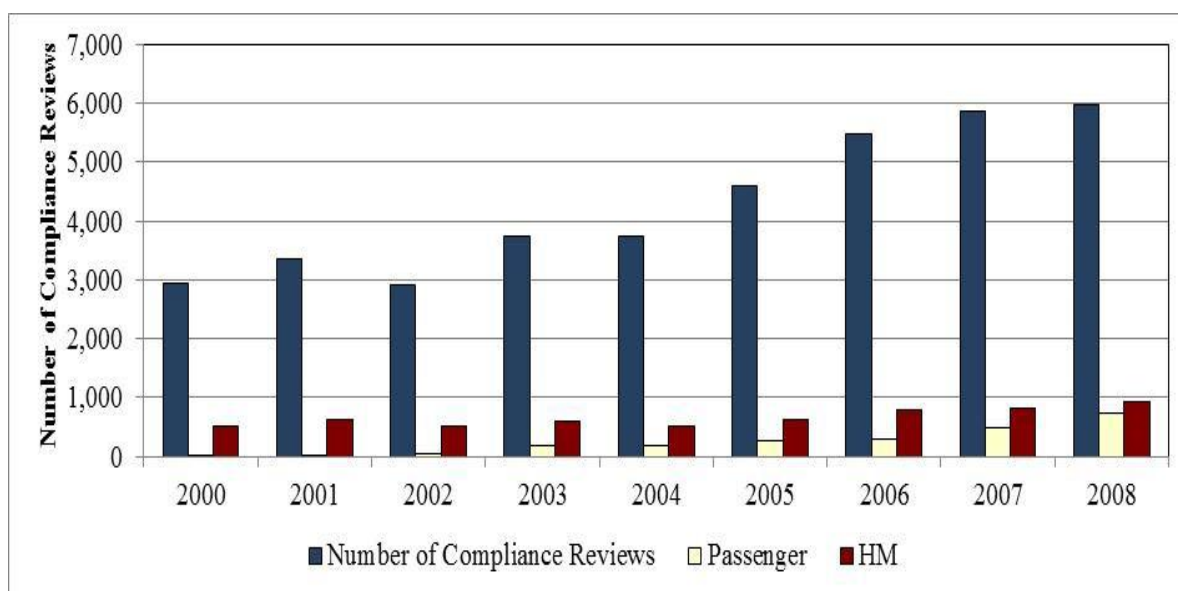
Source: FMCSA Intervention Model.

Exhibit 2 shows that MCSAP-supported enforcement actions contributed to preventing an estimated 17,517 crashes and 11,136 injuries, and saved an estimated 629 lives.

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 almost doubled from 2,943 in FY 2000 to 5,980 in FY 2008. The number of CRs conducted for HM carriers increased from 507 in FY 2000 to 938 in FY 2008, and for passenger carriers increased from 5 to 731.

Exhibit 3. Compliance Reviews Completed by State Personnel, FYs 2000–2008



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 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 2008.⁴ Exhibit 4 shows the results for CRs conducted in FY 2008.⁵ In FY 2008, CRs prevented an estimated 2,886 crashes, 1,853 injuries, and saved 101 lives.

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.⁶ 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 2008 20 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 2008, the rate decreased from 2.57 to 1.37.

Exhibit 5. Large-Truck Fatal Crash Statistics, FYs 2000–2008⁷

| Fiscal Year | Fatal Crashes | Fatalities | Total VMT(Millions) | Fatalities per 100 Million Truck VMT |
|-------------|---------------|------------|---------------------|--------------------------------------|
| 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 |
| 2008 | 3,754 | 4,245 | 310,680 | 1.37 |

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).

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

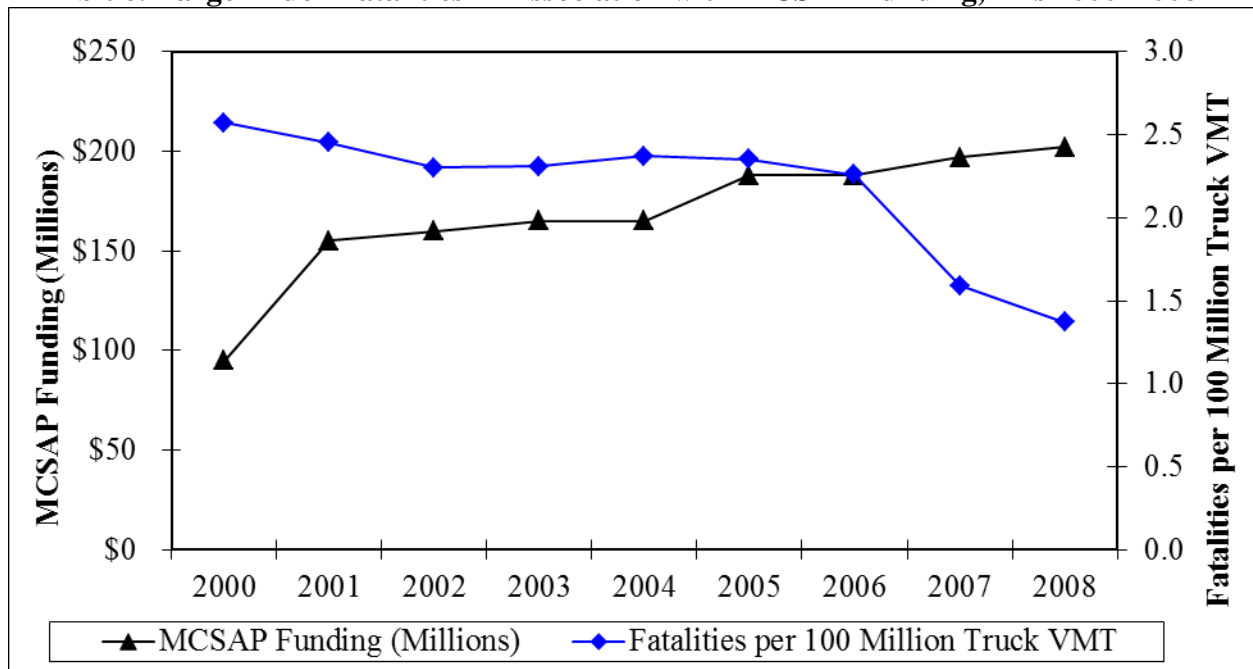
⁵ The CR Effectiveness Model does not distinguish between reviews conducted by Federal and State personnel.

⁶ FY 2008 MCSAP funding allocations by State and grant type can be found at <http://www.fmcsa.dot.gov/safety-security/safety-initiatives/mcsap/mcsap-fy08.htm>.

⁷ 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>.

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 2000–2008



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; 29 had fewer fatalities between CY 2006 and CY 2007, and 35 had fewer fatalities between CY 2007 and CY 2008.

Exhibit 7. Fatalities in Crashes Involving Large Trucks, by State (CY)

| State | Fatalities | | | | | Percent Change From | | | |
|----------------------|------------|------|------|------|------|---------------------|-----------|-----------|-----------|
| | 1996 | 2001 | 2006 | 2007 | 2008 | 1996-2006 | 2001-2006 | 2006-2007 | 2007-2008 |
| Alabama | 152 | 145 | 137 | 134 | 131 | -10% | -6% | -2% | -2% |
| Alaska | 6 | 10 | 4 | 4 | 5 | -33% | -60% | 0% | 25% |
| Arizona | 98 | 85 | 136 | 98 | 98 | 39% | 60% | -28% | 0% |
| Arkansas | 104 | 98 | 91 | 114 | 76 | -13% | -7% | 25% | -33% |
| California | 390 | 378 | 394 | 366 | 318 | 1% | 4% | -7% | -13% |
| Colorado | 63 | 95 | 67 | 82 | 68 | 6% | -29% | 22% | -17% |
| Connecticut | 34 | 29 | 29 | 28 | 24 | -15% | 0% | -3% | -14% |
| Delaware | 14 | 15 | 17 | 6 | 7 | 21% | 13% | -65% | 17% |
| District of Columbia | 4 | 1 | 2 | 2 | 1 | -50% | 100% | 0% | -50% |

| State | Fatalities | | | | | Percent Change From | | | |
|----------------|------------|-------|-------|-------|-------|---------------------|-----------|-----------|-----------|
| | 1996 | 2001 | 2006 | 2007 | 2008 | 1996-2006 | 2001-2006 | 2006-2007 | 2007-2008 |
| Florida | 305 | 365 | 350 | 301 | 264 | 15% | -4% | -14% | -12% |
| Georgia | 220 | 255 | 232 | 229 | 180 | 5% | -9% | -1% | -21% |
| Hawaii | 13 | 8 | 12 | 3 | 6 | -8% | 50% | -75% | 100% |
| Idaho | 40 | 34 | 29 | 27 | 30 | -28% | -15% | -7% | 11% |
| Illinois | 152 | 200 | 159 | 154 | 146 | 5% | -21% | -3% | -5% |
| Indiana | 166 | 135 | 140 | 147 | 137 | -16% | 4% | 5% | -7% |
| Iowa | 84 | 83 | 75 | 71 | 73 | -11% | -10% | -5% | 3% |
| Kansas | 64 | 80 | 69 | 77 | 63 | 8% | -14% | 12% | -18% |
| Kentucky | 100 | 107 | 105 | 104 | 113 | 5% | -2% | -1% | 9% |
| Louisiana | 107 | 123 | 104 | 121 | 111 | -3% | -15% | 16% | -8% |
| Maine | 15 | 28 | 21 | 21 | 23 | 40% | -25% | 0% | 10% |
| Maryland | 70 | 78 | 61 | 69 | 52 | -13% | -22% | 13% | -25% |
| Massachusetts | 39 | 30 | 34 | 28 | 23 | -13% | 13% | -18% | -18% |
| Michigan | 162 | 122 | 116 | 124 | 88 | -28% | -5% | 7% | -29% |
| Minnesota | 77 | 64 | 62 | 86 | 70 | -19% | -3% | 39% | -19% |
| Mississippi | 99 | 98 | 90 | 75 | 70 | -9% | -8% | -17% | -7% |
| Missouri | 167 | 139 | 155 | 136 | 124 | -7% | 12% | -12% | -9% |
| Montana | 21 | 27 | 34 | 31 | 25 | 62% | 26% | -9% | -19% |
| Nebraska | 63 | 68 | 34 | 43 | 43 | -46% | -50% | 26% | 0% |
| Nevada | 44 | 46 | 51 | 29 | 22 | 16% | 11% | -43% | -24% |
| New Hampshire | 12 | 14 | 7 | 12 | 13 | -42% | -50% | 71% | 8% |
| New Jersey | 86 | 77 | 74 | 64 | 47 | -14% | -4% | -14% | -27% |
| New Mexico | 56 | 59 | 80 | 57 | 45 | 43% | 36% | -29% | -21% |
| New York | 161 | 139 | 174 | 155 | 119 | 8% | 25% | -11% | -23% |
| North Carolina | 183 | 201 | 152 | 168 | 162 | -17% | -24% | 11% | -4% |
| North Dakota | 12 | 12 | 19 | 12 | 20 | 58% | 58% | -37% | 67% |
| Ohio | 224 | 168 | 158 | 134 | 143 | -29% | -6% | -15% | 7% |
| Oklahoma | 99 | 94 | 140 | 112 | 115 | 41% | 49% | -20% | 3% |
| Oregon | 64 | 64 | 62 | 53 | 37 | -3% | -3% | -15% | -30% |
| Pennsylvania | 185 | 185 | 193 | 194 | 192 | 4% | 4% | 1% | -1% |
| Rhode Island | 6 | 6 | 8 | 7 | 2 | 33% | 33% | -13% | -71% |
| South Carolina | 111 | 108 | 95 | 91 | 85 | -14% | -12% | -4% | -7% |
| South Dakota | 24 | 21 | 19 | 14 | 14 | -21% | -10% | -26% | 0% |
| Tennessee | 175 | 138 | 148 | 149 | 95 | -15% | 7% | 1% | -36% |
| Texas | 450 | 486 | 500 | 502 | 453 | 11% | 3% | 0% | -10% |
| Utah | 36 | 34 | 39 | 39 | 29 | 8% | 15% | 0% | -26% |
| Vermont | 10 | 7 | 11 | 5 | 7 | 10% | 57% | -55% | 40% |
| Virginia | 121 | 110 | 107 | 108 | 81 | -12% | -3% | 1% | -25% |
| Washington | 73 | 63 | 65 | 79 | 55 | -11% | 3% | 22% | -30% |
| West Virginia | 60 | 48 | 48 | 48 | 47 | -20% | 0% | 0% | -2% |
| Wisconsin | 105 | 108 | 76 | 85 | 63 | -28% | -30% | 12% | -26% |
| Wyoming | 16 | 23 | 42 | 24 | 30 | 163% | 83% | -43% | 25% |
| U.S. Total | 5,142 | 5,111 | 5,027 | 4,822 | 4,245 | -2% | -2% | -4% | -12% |

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 2008 avoided an estimated 17,517 crashes, 11,136 injuries, and 629 fatalities. Moreover, CRs conducted in FY 2008 resulted in an estimated 2,886 fewer crashes, 1,853 fewer injuries, and 101 saved lives. 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 730 lives in FY 2008.