FMCSA Safety Program Effectiveness Measurement Compliance Review Effectiveness Model Results for Carriers With Compliance Reviews in Fiscal Year 2009

This Analysis Brief documents the methodology and results from the Compliance Review Effectiveness Model (CREM) for carriers receiving CRs in fiscal year (FY) 2009. The model measures the effectiveness of the compliance review (CR) program, one of the key safety programs of the Federal Motor Carrier Safety Administration (FMCSA). This work addresses the requirements of the Government Performance and Results Act (GPRA) of 1993, which obligates Federal agencies to measure the results of their programs as part of the budget cycle process. The benefits of the CR program are calculated in terms of crashes avoided, lives saved, and injuries avoided.

METHODOLOGY

In FY 2009, Federal and State enforcement personnel conducted more than 15,000 CRs on individual motor carriers. It is intended that through education, heightened safety regulation awareness, and the enforcement effects of the CR, carriers will improve the safety of their commercial vehicle operations and, ultimately, reduce the number and severity of crashes in which they are involved.

The CR Effectiveness Model was developed to determine the effectiveness of the CR program. The model measures the direct impact of CRs on carriers that received CRs, but not the "deterrent" effects (i.e., the "threat" of having a CR) on carriers that did not actually receive CRs. The model is based on the individual and cumulative "before and after" changes in the safety performance of carriers that received CRs in a givenyear. The model compares motor carriers' crash rates (crashes per power unit) in the 12 months following an onsite CR 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, changes in crash reporting, and possibly other unknown factors, an adjustment procedure is used, based on a control group of carriers that did not receive CRs was used. 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 may be attributed to the CRs.

The first three implementations of the model were on a calendar year (CY) basis. That is, the model was used to estimate benefits for carriers with CRs conducted in CY 2002, 2003, and 2004. Beginning with the report on carriers with CRs in FY 2005, the model has been implemented on a FY basis to align the activities of the CR program with the program's funding cycle. It is now possible to link the results of the CRs conducted during a given FY with the funding for the CR program for that FY.

The CR Effectiveness Model succeeded the CR Impact Analysis Model, which was used to estimate the benefits for carriers with CRs from CY 1998 to 2001. The results from the two models are not directly comparable because the models use different methodologies and different data sources.

IMPLEMENTATION OF MODEL FOR CARRIERS WITH CRS IN FY 2009

The CR Effectiveness Model was implemented for carriers with CRs in FY 2009 to estimate the number of crashes (and associated fatalities and injuries) avoided in the first year following their reviews (i.e., FY 2009–10). These results are shown in Table 1, along with benefits that were estimated to have occurred in:

• FY 2005–06 for carriers with CRs in FY 2005.

• FY 2006–07 for carriers with CRs in FY 2006.

• FY 2007–08 for carriers with CRs in FY 2007

• FY 2008–09 for carriers with CRs in FY 2008.

The estimates from the model implementation for carriers with CRs in FY 2007, FY 2008, and FY 2009 were made using a control group adjustment that takes into account carrier size, which is a change from previous models. To allow for comparisons, the model was rerun for carriers with CRs in CY 2002–04 and FY2005–06 using this modified control group procedure. Estimates of crashes avoided produced with this new control group adjustment procedure were within 4 percent of the earlier estimates produced by the original control group adjustment. For this reason, previous final estimates from the model for CYs 2002–04 and FYs 2005–06 have not been changed.

ADDITIONAL ANALYSIS

To further assess the effectiveness of the CR program, the results of the implementation of the model were broken down by carrier size (i.e., number of power units) and by the planned course of action (i.e., enforcement or no enforcement) for the carrier following its CR.

• A breakdown of the results of the model by carrier size showed that carriers with 1 to 5 power units had the largest reduction in their average crash rates in the 12 months following their CRs.

• The results of the model broken down by planned course of action showed that the carriers slated for an enforcement action as a result of the CR had a reduction in their average crash rate similar to those for which no enforcement actions were planned.

For more information, please visit:
http://www.fmcsa.dot.gov/safety/research-and-analysis/publications?keywords=&title=&author=&year=&to=&page=0.

**Table 1. Estimated results of implementation of
CR Effectiveness Model for carriers with CRs FY 2005–09.**

Model Results (i.e., Benefits) Estimated for:	FY 2005–06	FY 2006–07	FY 2007–08	FY 2008–09	FY 2009–10
Crashes Avoided	2,306	2,860	2,175	2,886	2,430
Fatal Crashes	79	93	68	87	70
Injury Crashes	982	1,185	879	1,157	970
Towaway Crashes	1,245	1,582	1,228	1,642	1,390
Lives Saved	92	109	79	101	81
Injuries Avoided	1,561	1,866	1,399	1,853	1,544