How Effective are Roadside Inspections and Traffic Enforcements?

FMCSA Federal Motor Carrier Safety Administration

Analysis Division

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The Roadside Inspection and Traffic Enforcement programs are two of the Federal Motor Carrier Safety Administration's (FMCSA) key safety programs. The Roadside Inspection program consists of roadside inspections performed by qualified safety inspectors following the guidelines of the North American Standard, which were developed by FMCSA and the Commercial Vehicle Safety Alliance. Most roadside inspections are conducted by the States under the Motor Carrier Safety Assistance Program (MCSAP). There are five levels of inspections that include a vehicle component, a driver component, or both. The Traffic Enforcement program is composed of two distinct activities: a traffic stop as a result of a moving violation and a roadside inspection.

FMCSA, in cooperation with the Volpe National Transportation Systems Center, has developed an analytic model to measure the effectiveness of roadside inspections and traffic enforcements in terms of crashes avoided, injuries avoided, and lives saved. This model provides FMCSA management with information to address the requirements of the Government Performance and Results Act of 1993 (GPRA), which obligates Federal agencies to measure the effectiveness of their programs as part of the budget cycle process. It also provides FMCSA and State safety program managers with a quantitative basis for optimizing the allocation of safety resources in the field. This analytic model is known as the Intervention Model.

The Intervention Model is based on the premise that the two programs—Roadside Inspection and Traffic Enforcement—directly and indirectly contribute to a reduction in crashes. The model includes two submodels that are used for measuring these different effects:

- Direct effects are based on the assumption that vehicle and/or driver defects discovered and then corrected as the result of interventions reduce the probability that these vehicles/drivers will be involved in subsequent crashes. The model calculates direct-effect-prevented crashes according to the number and type of violations detected and corrected during an intervention.
- Indirect effects are the by-products of the carriers' increased awareness of FMCSA programs and the potential consequences that the programs could impose if steps are not taken to ensure and/or maintain higher levels of safety. In order to measure indirect effects, which are essentially changes in behavior involving driver preparation, practices and vehicle maintenance, the model calculates responses to exposure to the programs and the resulting reduction in potentially crash-causing violations.

How Can FMCSA Use the Model?

By using motor carrier categories, or classes, such as those developed in the Analysis Division's Motor Carrier Industry Profile research, the Analysis Division can assist FMCSA managers in using the model to study program effectiveness among carrier classes. Differences in fleet size, SafeStat score, etc., may contribute to differences in direct-effect and indirect-effect program impacts. A better understanding of carrier classes and how they react to interventions will aid in the application and development of the Roadside Inspection and Traffic Enforcement programs.

What are the Results of the Model?

Most recently, the model was implemented to measure program effectiveness during the 2005 calendar year using March 31, 2006 data extracted from the Motor Carrier Management Information System (MCMIS). The number of inspections as well as the model results are shown below for 2005 and the previous year.

Program Exposure 2004 - 2005

	2004	2005
Roadside Inspections	2,211,875	2,194,567
Traffic Enforcements	803,032	827,719
Total Interventions	*3,014,907*	*3,022,286*

Program Effectiveness 2004 - 2005

	2004	2005
Crashes Avoided		
Roadside Inspection	9,606	9,256
Traffic Enforcement	9,067	9,215
Total	*18,673*	*18,471*
Injuries Avoided		
Roadside Inspection	7,004	6,417
Traffic Enforcement	6,611	6,390
Total	*13,615*	*12,807*
Lives Saved		
Roadside Inspection	371	344
Traffic Enforcement	351	343
Total	*722*	*687*

The Traffic Enforcement program benefits are broken out between the traffic enforcement activity, roadside inspection activity, and a combined activity, which quantifies the benefits of performing both activities during the same intervention.

2005 Traffic Enforcement Activity Level Results

	Crashes Avoided	Injuries Avoided	Lives Saved
Traffic Enforcement Activity	3,416	2,369	127
Roadside Inspection Activity	3,216	2,230	120
Combined Activity	2,583	1,791	96
Total	*9,215*	*6,390*	*343*

For questions or comments please contact Mr. Tom Keane of FMCSA's Analysis Division at 202-366-4025 or via e-mail at tom.keane@fmcsa.dot.gov. A full discussion of the model results as well as a description of the model methodology can be obtained at: http://ai.fmcsa.dot.gov/ProgramMeasures/PM/PM.asp