



Analysis of the Railroad-Highway Grade Crossing Rules

BACKGROUND

The primary mission of the Federal Motor Carrier Safety Administration (FMCSA) is to reduce crashes, injuries, and fatalities involving large trucks and buses. In carrying out this safety mission, FMCSA develops and enforces data-driven Federal Motor Carrier Safety Regulations (FMCSRs) that balance motor carrier safety with efficiency. Several FMCSRs address commercial motor vehicle (CMV) driver requirements at railroad highway-grade (RRHG) crossings.

One of these FMCSRs—49 CFR 392.10—requires drivers of buses and hazardous materials vehicles (HMVs) to stop at all RRHG crossings. An exception to this rule, under 49 CFR 392.10(b)(3), allows these drivers to proceed without slowing or stopping if the crossing has an active traffic control device that transmits a green indication when safe to cross. However, the vast majority of railroad-highway active traffic control devices do not use green indications.

STUDY PURPOSE

Stopping at RRHG crossings, especially on high-speed divided highways, has been identified as a potential crash hazard, since CMVs can be rear-

ended while stopped. The regulation cited above was formulated in the mid-twentieth century at a time when most RRHG crossings were un-gated. Since then, strides have been made to identify and control RRHG crossings with sophisticated arm and light systems.

The goal of this study was to estimate the costs and benefits associated with modifying 49 CFR 392.10, to allow drivers of buses and HMVs to obey active traffic control devices (not just those that transmit a green indication) and supporting highway signage at actively controlled RRHG crossings, rather than stopping in every instance. Table 1 summarizes key study findings.

STUDY APPROACH

The study employed the following approach:

- Examine the history and development of the RRHG crossing rules.

- Analyze data on crashes at RRHG crossings to estimate the potential costs and benefits of amending 49 CFR 392.10.

- Examine supporting documentation, such as RRHG crossing violation rates and State RRHG crossing regulations.

Table 1. Estimated yearly impact of amending 49 CFR 392.10 as proposed.

Crash Type	Estimate of Crashes Prevented	Estimate of New Crashes	Estimated Net Change in Crashes	Estimated Cost per Crash	Value of Net Change in Crashes
Fatal bus crashes	0.57	0.60	0.04	\$11,496,000	\$ -433,434
Injury bus crashes	119.77	5.18	-114.59	\$472,000	\$ 54,088,360
Property damage only bus crashes	386.99	39.98	-347.01	\$75,000	\$ 26,025,913
Fatal HMV crashes	0.75	0.25	-0.50	\$11,496,000	\$ 5,798,866
Injury HMV crashes	44.70	0.49	-44.22	\$472,000	\$ 20,870,092
Property-damage-only HMV crashes	66.54	2.03	-64.51	\$75,000	\$ 4,838,314
Total	619.32	48.52	-570.80	n/a	\$111,188,110



The potential costs of amending 49 CFR 392.10 as proposed include increased train-bus or train-HMV crashes (attributable to malfunctioning active traffic control devices) that would have been prevented if buses and HMTVs were still required to stop at RRHG crossings. Potential benefits include decreased fatalities, injuries, and property damage resulting from rear-end crashes involving HMTVs and buses at RRHG crossings.

RESULTS

Findings indicate that the potential benefits of modifying 49 CFR 392.10 as proposed significantly outweigh the potential new costs. As shown in Table 1 (page 1), potential benefits include decreased fatalities, injuries, and property damage resulting from rear-end crashes involving HMTVs and buses at RRHG crossings. Potential costs would result from increased train-HMV or train-bus crashes attributable to malfunctioning railroad-highway active traffic control devices.

Based on the analysis, if FMCSA were to amend 49 CFR 392.10 as proposed, an estimated 619 crashes would be prevented each year, while an estimated 49 new crashes would occur each year, attributable to malfunctioning active traffic control devices. This amounts to an estimated net decrease of approximately 570 crashes.

LIMITATIONS

This study examines data on some very specific crash types which often cannot be accurately determined using the existing national crash databases. For example, rear-ended buses and HMTVs at RRHG crossings can only be reliably identified in one annual national dataset (FARS), which only includes fatal crashes. This report utilizes complex methods, incorporating data from many sources, to estimate injury and towaway crashes of this type. The results of this analysis depend heavily on some specific statistics, and it is possible that a different method would produce significantly different rates.

Further, there are many different types of RRHG crossings; some have only passive signage, while others have various types of active signage. State regulations sometimes make distinctions between how non-commercial and commercial drivers

should proceed across the different types of RRHG crossings, in addition to the Federal Regulations examined in this report. Most of the crash data does not distinguish between the different types of RRHG crossings or different rules applying to drivers in different States.

To estimate many of the costs and benefits of 49 CFR 392.10, it is necessary to assume a hypothetical state of the world in which buses and HMTVs do not have to stop before proceeding across RRHG crossings. There are many ways this analysis could be performed. This report provided three different methods for estimating the costs and four different methods for estimating the benefits, each of which had differing results. To account for these limitations, the final analysis used the most conservative results from the different methods used (i.e., the least predicted benefits and the highest predicted costs).

CONCLUSION

Study findings suggest that the safety benefits of modifying 49 CFR 392.10 as proposed would significantly outweigh the costs, resulting in approximately 570 fewer crashes per year. This translates to an annual net reduction of approximately \$110 million in crash costs.

To read the complete report, please visit:
<https://rosap.ntl.bts.gov/view/dot/49618>

