

crossing collisions are infrequent events at individual crossings, the nationwide study, and the experience in Florida, showed they were much less infrequent when train horns were not sounded.

FRA conducted an outreach program in order to promptly share this information with all communities where bans were in effect. In addition to issuing press releases and sending informational letters to various parties, FRA met with community officials and participated in town meetings. Along with the study's findings, information about the upcoming rule requiring the sounding of train horns was presented, including provisions for Supplemental Safety Measures (SSMs) that could be implemented by communities to compensate for silenced train horns and allow bans to remain in effect.

From the outreach effort, FRA gained a clearer understanding of local concerns and issues. Many of those concerns were expressed in person and others were submitted in writing to FRA's train horn docket. Another result of the outreach effort was the identification by communities and State and local governmental agencies of 664 additional crossings that were purportedly subject to whistle bans, but not included in the nationwide study. About 95 percent of these were located in the city and suburbs of Chicago, Illinois. Many carry a high volume of commuter rail traffic.

Prior to issuing the NPRM, FRA updated its analysis of safety at whistle ban crossings, expanding it to include data for all the Chicago Region crossings as well as for a few other newly identified locations.

FRA also refined its procedure by conducting separate analyses for three different categories of warning devices in place at the crossings (*e.g.*, automatic gates with flashing lights; flashing lights or other active devices without gates; and passive devices only, such as "crossbucks" or other signs). By separating crossings according to the different categories of warning devices installed, FRA was better able to identify the level at which locomotive horns increase safety at crossings with different types of warning devices and thus the level at which substitutes for the horn must be effective in order to fully compensate for the lack of a horn at those crossings. In addition, FRA excluded from the analysis certain collisions where the sounding of the train horn would not have been a deterrent to the collisions. These included cases where there was no driver in the vehicle and collisions where the vehicle struck the side of the train beyond the fourth locomotive unit

(or railcar). FRA also excluded events where pedestrians were struck. Pedestrians, compared to vehicle operators, have a greater opportunity to see and recognize an approaching train because they can look both ways from the edge of the crossing, closer than the motorist sitting at least a car hood length or more back from the edge. They can also stop or reverse their direction more quickly than a motorist if they have second thoughts about crossing safely.

Data for the five-year time period from 1992 through 1996 were used for the updated analysis in place of the older data of the 1995 Nationwide Study. For the updated analysis, the collision rate for whistle ban crossings in each device category was compared to similar crossings in the national inventory using the ten-range risk level method used in the original study.

The analysis showed that an average of 62 percent more collisions occurred at whistle ban crossings equipped with automatic gates and flashing lights than at similarly equipped crossings across the nation without bans. For purposes of the NPRM, FRA used this value as the increased risk associated with whistle bans instead of the 84 percent cited in the Nationwide Study of Train Whistle Bans released in April 1995. FRA determined that 62 percent was appropriate because it represents the elevated risk associated with crossings with automatic gates and flashing lights, which is the only category of crossings that will be eligible under this rule for new "quiet zones" (except for certain crossings where train speeds do not exceed 15 miles per hour).

The updated analysis also indicated that whistle ban crossings without gates, but equipped with flashing light signals and/or other types of active warning devices, on average, experienced 119 percent more collisions than similarly equipped crossings without whistle bans. This finding made clear that the train horn was highly effective in deterring collisions at non-gated crossings equipped only with flashing lights. The only exception to this finding was in the Chicago Region where collisions appeared from available data to be 16 percent less frequent. This will be discussed in greater detail below.

In comparing the collision differences at crossings with gates and those without gates, FRA found that about 55 percent of the collisions at crossings with gates occurred when motorists deliberately drove around lowered gates. These collisions occurred 128 percent more often at crossings with whistle bans than at other crossings.

Another 18 percent of the collisions occurred while motorists were stopped on the crossings, probably waiting for vehicles ahead to move forward. There were smaller percentages of collisions involving stalled and abandoned vehicles. Suicides are not included in the collision counts. At crossings equipped with flashing signal lights and/or other active warning devices, but not gates, collisions occurred 119 percent more often at crossings subject to bans. A distinction should be made between the two circumstances. In the case of lowered gates, it is the motorist's decision to circumvent a physical barrier to take a clearly unsafe and unlawful action that can result in a collision. However, in the case of crossings with flashing light signals and/or other active devices, collisions may be more the result of a motorist's error in judgment rather than a deliberate violation of the State's motor vehicle laws. The ambiguity of flashing lights at crossings, which in other traffic control situations indicate that the motorist may proceed after stopping, when safe to do so, coupled with the difficulty of correctly judging the rate of approach of a large object such as a locomotive, may contribute to this phenomenon. FRA's collision data suggested that the added warning provided by the train horn is most critical at crossings without gates but which are equipped with other types of active warning devices.

By separating crossings according to the different categories of warning devices installed, FRA was better able to identify the level at which locomotive horns increase safety at gated crossings and thus the level at which substitutes for the horn must be effective in order to fully compensate for the lack of a horn at those crossings.

For crossings with passive signs as the only type of warning device, the updated study indicated an average of 27 percent more collisions for crossings subject to whistle bans. This is the smallest difference identified between crossings with and without whistle bans. These crossings account for about one fourth of the crossings with whistle bans. Typically, they are the crossings with the lowest aggregate risk of collision because the installation of active warning devices usually follows a sequence where the highest risk crossings are equipped first. Two determinants of crossing risk are the amount of train traffic and highway traffic at a crossing. Often, crossings with only passive warning devices are located on seldom used sidings and industrial tracks and/or on roadways with relatively low traffic levels. FRA