

transportation from Iowa, Nevada, Missouri and Florida all supported the inclusion of wayside horns as substitutes for train horns. The Brotherhood of Railway Signalmen (BRS) cited design flaws as an impediment to the effectiveness of wayside horns. The BRS also stated that if wayside horns were permitted by FRA, it would be imperative that the track circuits be used to detect the train's approach. The BLE stated that it felt that additional testing should be required before acceptance of the wayside horn.

Generally, commenters voiced strong support for the inclusion of wayside horns as a supplementary safety measure under the rule. States and local governments in particular, with the exception of the California Public Utilities Commission (CPUC), were in favor of including wayside horns as a supplementary safety measure. In support of their positions, these commenters cited the Volpe Center study and an Iowa Department of Transportation study, both of which have shown reductions in gate violation frequency with use of wayside horns. The cities of Gering, Ames, and Wichita all supported inclusion of wayside horns as a substitute for locomotive horns. They expressed the view that there was great community support for wayside horns and felt that safety was improved. Ames, Iowa wrote " * * * it [wayside horn] has tremendously improved the quality of life and safety for our residents." It is noted that Ames has installed wayside horn systems at three additional crossings. The city administrator for Gering, Nebraska also wrote that he had never received so many unsolicited "thank you" calls and letters from citizens as he had over the installation of wayside horns. These same commenters, along with at least one representative of the railroad industry, also indicated that they believed that wayside horns provide a more cost-effective alternative to train horns, than some of the other supplementary safety measures included in the NPRM. The Florida Department of Transportation ("DOT") suggested that wayside horns be used in instances where it is impossible or impractical to install the supplemental safety measures articulated in the NPRM. The Florida DOT, however, did not elaborate on the rationale for limiting the use of wayside horns to situations where the installation of the identified supplemental safety measures is impractical or impossible.

The AAR suggested that there is more certainty regarding the effectiveness of the wayside horn than there is for the

non-engineering measures included in the NPRM as alternative safety measures. In support of its assertion, the AAR submitted a copy of its report entitled *Wayside Horn Sound Radiation and Motorist Audibility Evaluation* that found that the latest model of wayside horn was louder than previous versions and concluded that wayside horns are a viable alternative to locomotive horns for audible warnings at highway-rail grade crossings. However, recognizing FRA's misgivings about the wayside horn noted in the NPRM, the AAR suggested that if FRA could not definitively determine the effectiveness of the wayside horn prior to issuance of the final rule, FRA should permit use of the horns as supplementary safety measures at grade crossings subject to two conditions: (1) Concurrence of the railroads operating at the crossings, and (2) demonstration of the efficacy of the horns at each crossing at which they would be installed.

The CPUC, however, asserted that there is currently insufficient evidence that the wayside horn can provide protection comparable to locomotive horns and opposed the use of wayside horns as a supplementary safety measure until further data on the effectiveness of the horns is collected. Other commenters voicing opposition to the use of wayside horns for the same reason included the BLE and the BRS.

In response to FRA's first specific question posed in the NPRM—whether wayside horns provide the same quality of warning within the motor vehicle as a locomotive horn while a train is approaching the motorist's decision point—a few commenters suggested that the wayside horn gives equal or greater audible warning. For example, the City of Wichita, Kansas, suggested that a wayside horn provides a uniform quality of warning within a motor vehicle because while wind, neighboring buildings, houses, fences and trees all affect the quality of warning of the locomotive horn on a motorist at a crossing, only wind would have an effect on the quality and uniformity of the warning of a wayside horn. Other commenters suggested that wayside horns provide consistent decibel levels directed exactly where motorists are driving (*i.e.*, at the crossings, not down the tracks). The City of Roseville, California, cited a local wayside horn test that showed consistently higher audible warnings directed at the crossing, while reducing the noise impact to the surrounding communities.

In response to FRA's second question—whether the lack of directionality from a wayside horn

detracts from the effectiveness of the warning—commenters supporting the use of wayside horns generally agreed that the apparent lack of directionality does not detract from the effectiveness of these audible warnings. Wichita pointed out that as motorists approach rail crossings they often hear train horns from nearby crossings on different rail lines so it is not clear from which direction the train is coming anyway. The Kansas DOT suggested that the issue of direction is moot since wayside horns are used in combination with other automated warning devices (*i.e.*, gates, flashing lights) and that when crossing gates are down, motorists are supposed to stop and wait for the train to pass, regardless of the direction in which the train is traveling. The Missouri Department of Economic Development suggested that wayside horns would encourage motorists' compliance because drivers cannot tell how far away from the crossing the train is by the sound of the wayside horn.

Only one commenter responded directly to FRA's third question—whether the wayside horn would suffer from the lack of credibility sometimes associated with automated warning devices due to false activations of the signal system. Wichita suggested that the annoyance associated with a wayside horn sounding in connection with an active warning system's false activation may cause earlier public reporting, and thus quicker railroad response to the problem location.

Several additional studies have been conducted on the wayside horn since the initial study in Gering, NE. Ames, Iowa. One study (*Evaluation of an Automated Horn Warning System at Three Highway-Railroad Grade Crossings in Ames, Iowa*, by Gent, Logan and Evans, 2003) documented the reduced noise impact to the community, public acceptance of the horn system through surveys of residents and motorist, and locomotive engineer opinions that the system was safe or safer than the locomotive horn (obtained through surveys). No data on actual driver behavior at the crossings were collected in this study. This study did not analytically address any of the three questions posed by the Volpe study.

The *Wayside Horn Sound Radiation and Approaching Motorists Audibility Evaluation* (Mike Fann and Associates, May 2000) examined the sound levels and frequencies emitted by the wayside horn. This research collected data that showed that system that was tested provided a sound level of 98 dB at 100 feet from the wayside horn. The sound level that was produced met FRA's regulation for a locomotive horn that