Train Whistle Noise Reduction Systems

PROJECT FACTS

Background

Federal regulations and Alaska Railroad rules require trains to sound their horns when approaching an at-grade road crossing (road and rail are at the same level) and to continue sounding the horn until the crossing is reached. In June 2005, the Federal Railroad Administration (FRA) began enforcing a new rule requiring train locomotive engineers to sound the horn at least 15-20 seconds before the crossing and to continue sounding the horn until the train reaches the crossing. Given significant consequences for not complying (monetary fines to the railroad and suspension of train crews), train engineers have no choice but to blow the horn as required — day and night.

Anticipating potentially greater noise disruption to railbelt communities, ARRC began testing whistle noise reduction systems at two crossings in Anchorage in 2004. This technology, which is used in other locations in the United States, is designed to reduce noise from the train horn/whistle.

At one test site a stationary automated horn system was installed. When this system senses an approaching train, it sounds a whistle-like warning that is aimed perpendicular to the track, down the road toward oncoming highway traffic. The system uses two stationary horns mounted at the crossing, instead of on the train. By directing the noise into the street, instead of the surrounding area, noise is more focused and less disruptive to the surrounding community.

At the other test site, median barriers were erected down the middle of the street for about 100 feet on either side of the track. Crossing gates close against the median, thereby preventing vehicles from getting around the gates and onto the track. This system eliminates the need for trains to sound their horns for the crossing, making it a good choice for residential areas.

With either of these systems in place, train engineers do not need to sound the train horn/whistle

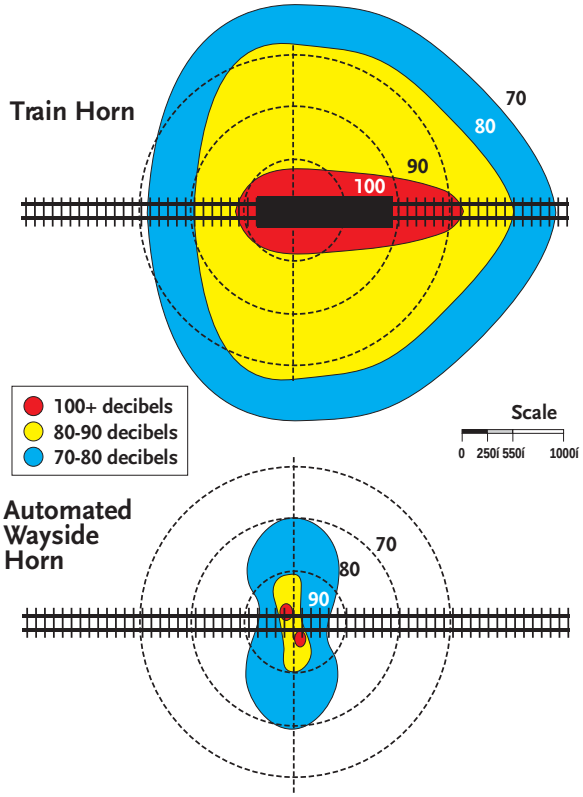


Figure 1. Wayside Horn Comparison. *Federal regulations and ARRC rules require horns to generate at least 96 decibels at 100 feet. A study conducted in Mundelein, Illinois, by the Northwestern University Center for Public Safety, showed the automated horn reduced noise by 85% compared to train-mounted horns.*

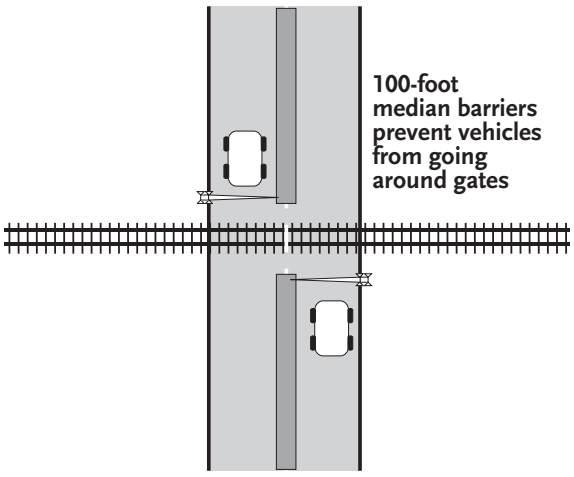


Figure 2. Median Barrier. *Eliminates horn requirement.*

when approaching the crossing. However, an engineer may need to blow the whistle when in the area for other reasons. For example, if the engineer sees a person or animal on the track, he/she would sound the horn as a warning to clear the tracks.

Status

- The system tests and installation in Anchorage proved that at least two of the whistle reduction "Quiet Zone" systems and technology can operate reliably in the Alaska environment.
- Communities statewide may determine that there are local crossings that warrant installation of whistle noise reduction systems. Nationwide, these projects are typically pursued at the request of the community, with funding coming from municipal, borough, state and federal sources. Citizens interested in creating a Quiet Zone should first contact their local government transportation and community planning agencies with a request that they fund, or seek funding for, train whistle noise reduction systems.

Costs of Noise Reduction Options

For communities considering whistle noise reduction systems, the Railroad researched cost ranges for three main options. These 2005 estimates are based on railroad experience with purchasing system equipment and materials, shipping charges, installation costs, and common construction-related contingencies.

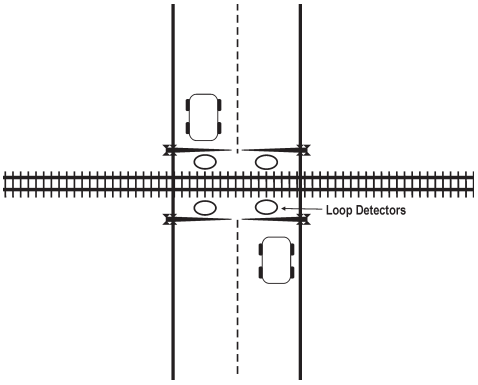
Automated Horn: Equipment includes two stationary horns mounted at the crossing, sensors on the track, and signals that notify the train engineer that system is working. Cost to install ranges from $50,000 to $140,000. Higher end costs relate to upgraded signal and gate equipment, if necessary.

Automated wayside horns at Klatt Rd crossing.

Median Barrier: Materials include a non-mountable curb that creates a barrier 60 to 100 feet long. Jersey barrier segments have been used to reduce cost in installation, maintenance, and for ease of installation. Traffic engineers determined that the roadway lanes and shoulder on either side of the median must be at least 30 feet in order to accommodate for shy distance from median, snow removal, and lane width for a vehicle. Configuration of surrounding roads also impact the feasability of this system. Cost to install is $45,000 to $180,000 depending on roadway improvements, if necessary.


Median barriers at Oceanview Rd crossing.

Other Systems: No other systems have been tested in Alaska. The "four quadrant gate" system installs two gates on either side of the track. Four gates come down, closing off access to the track on both sides of the road and on both sides of the track. This system installs loop detectors (sensors) buried beneath the pavement on each side of the crossing. Detectors sense vehicles that may be stalled or caught between the gates. If the system detects a trapped vehicle, the gates open so the vehicle can escape. Equipment and installation are expensive. This system is not feasible for many crossings due to high cost, roadway impact and potential traffic and rail operation delays if the system fails. Cost to install is $200,000 to $360,000, depending on existing gate equipment, and extent of road construction.



Four quadrant gate concept.