

Requirements:

a. Subject to audit, a statistically valid baseline violation rate must be established through automated or systematic manual monitoring or sampling at the subject crossing(s).

b. A sustainable public education and awareness program must be defined, established and continued concurrent with continued monitoring. This program shall be provided and supported primarily through local resources. It is critical that programs proposed under this appendix represent valid new increments of effort generated from the local level where quiet zone benefits will accrue.

3. *Photo Enforcement:* This alternative entails automated means of gathering valid photographic or video evidence of traffic law violations at a public highway-rail grade crossing together with follow-through by law enforcement and the judiciary.

Required:

a. State law authorizing use of photographic or video evidence both to bring charges and sustain the burden of proof that a violation of traffic laws concerning public highway-rail grade crossings has occurred, accompanied by commitment of administrative, law enforcement and judicial officers to enforce the law.

b. Sanction includes sufficient minimum fine (e.g., \$100 for a first offense, "points" toward license suspension or revocation) to deter violations.

c. Means to reliably detect violations (e.g., loop detectors, video imaging technology).

d. Photographic or video equipment deployed to capture images sufficient to document the violation (including the face of the driver, if required to charge or convict under state law).

Note to d.: This does not require that each crossing be continually monitored. The objective of this option is deterrence, which may be accomplished by moving photo/video equipment among several crossing locations, as long as the motorist perceives the strong possibility that a violation will lead to sanctions. Each location must appear identical to the motorist, whether or not surveillance equipment is actually placed there at the particular time. Surveillance equipment should be in place and operating at each crossing at least 25 percent of each calendar quarter.

e. Appropriate integration, testing and maintenance of the system to provide evidence supporting enforcement.

f. Public awareness efforts designed to reinforce photo enforcement and alert motorists to the absence of train horns.

g. Subject to audit, a statistically valid baseline violation rate must be

established through automated or systematic manual monitoring or sampling at the subject crossing(s).

h. A law enforcement effort must be defined, established and continued along with continual or regular monitoring.

The effectiveness of non-engineering ASMs will be determined as follows:

1. The first step in assessing the effectiveness of an ASM is to establish quarterly (3 months) baseline violation rates for each of the crossings. A violation in this context refers to a motorist not complying with the automatic warning devices at the crossing (not stopping for the flashing lights and driving over the crossing after the gate arms have started to descend, or driving around the lowered gate arms). A violation does not have to result in a traffic citation for the violation to be considered. Violation data may be obtained by any method that can be shown to provide a statistically valid sample. This may include the use of video cameras, other technologies (e.g. inductive loops), or manual observations that capture driver behavior when the automatic warning devices are operating. In the event that data is not collected continuously during the quarter, sufficient detail must be provided in the application in order to validate that the methodology used results in a statistically valid sample. FRA recommends that at least a minimum of 600 samples (one sample equals one gate activation) be collected during the baseline and subsequent quarterly sample periods. The sampling methodology must take measures to avoid biases in their sampling technique. Potential sampling biases could include: sampling on certain days of the week but not others, sampling during certain times of the day but not others, sampling immediately after implementation of an ASM while the public is still going through an adjustment period, or applying one sample method for the baseline rate and another for the new rate. One possible approach to avoid sampling bias would be to break a three-month observation period into many time slots and then randomly selecting these slots for sampling. The baseline violation rate should be expressed as the number of violations per gate activations in order to normalize for unequal gate activations during subsequent data collection periods. The application should include enough detail on the method used to collect and assess the data to insure that the results will provide a statistically valid result. While not it is not mandatory, public authorities are encouraged to provide

FRA with its sampling methodology for comment prior to actually collecting the data. This will enable FRA to provide comments to ensure that the sampling methodology is adequate.

2. The ASM should then be initiated for each crossing in the proposed quiet zone that is to be treated with programmed enforcement or education. During this time frame, train horns are still being sounded. Train horns will not be silenced until the application has been formally approved by FRA.

3. In the calendar quarter following initiation, a new violation rate should be determined (using the same methodology as in paragraph a) and compared to the baseline violation rate for each crossing treated with an ASM. The violation rate reduction for each crossing should then be determined by the following formula:

$$\text{Violation rate reduction} = (\text{new rate} - \text{baseline rate}) / \text{baseline rate}$$

Example: The baseline rate for a crossing was 60 violations per 100 gate activations. After implementation of the ASM, the new violation rate for the next quarter was 20 violations per 100 gate activations. The violation rate reduction would be 66 percent (.66).

4. The effectiveness rate for each crossing is then determined by multiplying the violation rate reduction by .78. This converts the violation rate reduction to the collision reduction rate which is the effectiveness rate. The effectiveness rate of the ASM would then be used in the calculation of the Quiet Zone Risk Index.

Example: In the above example, the violation rate reduction of .66 would be multiplied by .78 which results in an effectiveness rate of .51.

5. Using the effectiveness rates for each crossing treated by an ASM, determine the Quiet Zone Risk Index. If and when the Quiet Zone Risk Index for the proposed the quiet zone has been reduced to either the risk level which would exist if locomotive horns sounded at all crossings in the quiet zone or to a risk level below the Nationwide Significant Risk Threshold, the public authority may apply to FRA for approval of the quiet zone. Upon receiving written approval of the quiet zone application, the public authority may then proceed with notifications and implementation of the quiet zone.

6. Violation rates must be monitored for the next two calendar quarters and every second quarter thereafter. If after five years from the implementation of the quiet zone, the violation rate for any quarter has never exceeded the violation rate used to determine the effectiveness rate that was approved by FRA,