Draft Environmental Impact Statement

U.S. Department of Transportation

Federal Railroad Administration

Proposed Rule for the Use of Locomotive Horns at Highway-Rail Grade Crossings

December 1999

Office of Railroad Development
Washington, D.C. 20590

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Date

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Full implementation of the proposed rule, would require that locomotive horns be sounded at virtually all public highway-rail at-grade crossings in the United States. The proposed rule contains additional provisions that would set a maximum sound level for locomotive horns, limit sound directed to the side, prescribe when and how to sound the horn, and provide an opportunity to any community in the nation to establish a quiet zone.

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EXECUTIVE SUMMARY

ES-1 INTRODUCTION

The railroad transportation system is an essential component of the nation's vital transportation infrastructure. This system incorporates over 159,000 public and 103,000 private highway-rail at-grade crossings throughout the country. The Federal Railroad Administration (FRA) is responsible for promoting the safety of America's railroads for both railroad employees and the public and is committed to improving the safety of highway-rail crossings.

Collisions at highway-rail crossings are second only to trespassing as the leading cause of death and serious injury associated with railroad operations. Train horns provide an audible warning of approaching trains with an indication of their speed, direction, and proximity. A number of communities across the nation have regulated or attempted to regulate the use of locomotive horns in their jurisdictions in order to lessen the noise impacts associated with the blowing of train whistles at grade crossings. Following the large-scale imposition of train whistle bans in Florida, FRA became aware that there was a strong relationship between the use of locomotive horns and collision rates at highway-rail crossings. In April 1995, FRA prepared its *Nationwide Study on Train Whistle Bans* (Nationwide Study), to examine the nationwide safety implications of whistle bans. The study showed that, absent compensatory safety measures, whistle bans substantially increase the risk of deaths and injuries at highway-rail crossings.

In 1994, Congress passed the Swift Rail Development Act, Public Law 103-440 (Swift Act), which added Section 20153, *Audible Warnings at Highway-Rail Crossings*, to Title 49 of the United States Code. (See Appendix B.) §20153 directed FRA to issue a rule requiring the use of train horns at all public highway-rail crossings. FRA also was given the authority to make reasonable exceptions to the use of train horns in certain qualified circumstances.

FRA has prepared a Notice of Proposed Rulemaking (NPRM) to address the use of locomotive horns at public highway-rail grade crossings, as directed by 49 U.S.C. §20153. In preparing the NPRM, FRA determined that the implementation of the proposed rule constitutes a "major federal action" within the meaning of §102 (c) of the National Environmental Policy Act (NEPA) (42 U.S.C. 4321 et seq.). Accordingly, FRA is undertaking this effort to develop pertinent documentation required by §102 (c) of NEPA.

As defined by the Council on Environmental Quality, a Programmatic EIS is prepared to address the effects of "broad federal actions such as the adoption of new agency programs or regulations," 40 CFR 1502.5 (b). This EIS addresses issues appropriate for a decision on a rule of national applicability.

ES-2 PURPOSE AND NEED FOR THE PROPOSED RULE

Train horns are an important element of highway-rail grade crossing safety. The train horn is an effective means to alert motorists to the presence of a train, and also provides some indication of train speed, direction, and proximity. If a horn is not sounded at a particular location, the public lacks an important source of information as to when a train is approaching and approximately how soon the train will reach the crossing. This can be

crucial life-saving information, especially when only passive warnings, such as crossbucks, are present at the crossing.

Some communities, especially those with multiple crossings and high train volumes, have enacted whistle bans affecting crossings within their jurisdictions in the belief that the sounding of train horns at every crossing poses an excessive burden to the quality of life of its residents. Studies have demonstrated that, without the benefit of train horns or other substitute warnings, there is an increased rate of collision at highway-rail crossings leading to injury and death.

Overall, the results of the FRA Nationwide Study indicate that there is a pervasive safety risk associated with whistle bans. The Nationwide Study showed, in twelve cases involving 831 crossings in eight states other than Florida, an overall decline of 38 percent in the accident rate after whistle bans were repealed. Furthermore, the Nationwide Study indicated that accident rates were reduced by 53 percent and 59 percent when whistle bans were canceled on 288 Conrail and 293 CSX crossings, respectively.

FRA is faced with the task of balancing the need for an effective warning to motorists and other highway users while minimizing the horn's intrusion into the surrounding community. The proposed rule details when and how locomotive horns must be sounded and when and how a quiet zone, in which horns are not sounded, may be designated. FRA proposes to limit the maximum sound level of locomotive horns to provide some relief to the surrounding population while still ensuring that the sound level is high enough to provide the required warning to the motorist.

ES-3 ALTERNATIVES CONSIDERED

Proposed Action Alternative

Full implementation of the proposed rule would require that horns be sounded at virtually all public at-grade crossings in the United States. The proposed rule includes additional provisions that would set a maximum sound level for locomotive horns, limit sound directed to the side, prescribe when and how to sound the horn, and provide an opportunity to any community in the nation to establish a quiet zone. These provisions would apply to the use of locomotive horns at all public highway-rail grade crossings, including those currently subject to whistle bans established by local or state authorities.

No-Action Alternative

The No-Action Alternative would preserve the *status quo*: states and municipalities could try to regulate the sounding of train horns and railroads could continue to resist such regulation through litigation and other means. FRA lacks the authority to implement the No-Action alternative, and adoption of the No-Action alternative would require congressional action to reverse its mandate to regulate the use of locomotive horns at highway-rail grade crossings as set forth in 49 U.S.C. §20153.

ES-4 THE AFFECTED ENVIRONMENT

There are more than 159,000 public grade crossings in the United States that would be subject to provisions of the proposed rule. In addition, all locomotives operating on the general railroad system of the United States would be subject to provisions of the proposed rule. Overall, the crossings over which these locomotives operate and surrounding areas are considered by FRA to represent the affected environment for the purposes of preparing this DEIS.

ES-5 ENVIRONMENTAL CONSEQUENCES

Potential positive and negative impacts of the proposed rule are identified and discussed in this DEIS with the focus on the principal areas of concern: safety and noise. At the 1,978 highway-railroad at-grade crossings identified as potentially affected, FRA estimated the potential for direct negative impacts to the human environment using the modeling techniques illustrated in Chapter 3, "Affected Environment." Potential beneficial impacts are also analyzed using the same techniques.

FRA has determined that the environmental resources potentially affected by undertaking the proposed action are the human environment with respect to noise exposure and the safety of the transportation network. FRA has studied these issues and the potential for community disruption, impacts on commerce, and impacts on local government. FRA has not found any direct or indirect effects of the proposed rule on the following areas: air quality; water quality; solid waste disposal; ecological systems; impacts on wetlands areas; impacts on endangered species or wildlife: flood hazards and floodplain management; coastal zone management; use of energy resources; use of other natural resources, such as water, minerals, or timber; aesthetic and design quality impacts; possible barriers to the elderly and handicapped; land use, existing and planned; other impacts on the socioeconomic environment, including the number and kinds of available jobs, and the need for and availability of relocation housing; public health; human health impacts due to hazardous materials; recreational opportunities; locations of historic, archeological, architectural, or cultural significance; use of 4(f)-protected properties.

ES 5.1 Effects on Safety

FRA prepared the 1995 Nationwide Study using information about whistle bans from a broad-based survey, in addition to accident data from FRA's crossing accident/incident file[1]. This study made direct comparisons between accident occurrences for twelve groups of crossings and for all non-whistle ban crossings versus whistle ban crossings. FRA collected crossing information for the entire nation, for the five-year period from January 1989 through December 1993, for a more generalized indication of the impact of train whistle bans. An analytical model was used to predict the expected frequency of accidents within the two groups on a national basis and the results were compared with actual accident information.

FRA used the Accident Prediction Formula (APF) to estimate the five-year accident rates for all public at-grade crossings in the US DOT/AAR National Highway-Rail Crossing Inventory that did **not** have whistle bans in effect from 1989 through 1993. The FRA then compared the actual accident rates for crossings known to have had whistle bans during the five-year period with similar crossings drawn from the National Inventory.

The results of this analysis were dramatic. For nine out of ten groups of crossings arranged by risk level, the whistle ban crossings had significantly higher accident rates over the five-year period compared to the non-ban crossings. The average difference was an increase in the accident rate per crossing of 84 percent. These comparisons indicate that whistle bans substantially increase the risk of accidents at crossings. The increase is present in cases of

[1] Pursuant to 49 U.S.C. 20901, railroads are required to file accident/incident reports with the FRA. Any automobile, bus, truck, motorcycle, bicycle, farm vehicle, pedestrian, or other highway user collision at a highway-rail at-grade crossing must be reported to the FRA on the "Rail-Highway Grade Crossing Accident/Incident Report," Form FRA F 6180.57. The FRA has maintained a computer-based file of these reports since 1975.

both 24-hour bans and, as was the case in Florida, nighttime-only bans. For all crossings except those in Florida the crossing collision rate decreased by 38 percent when whistle bans were canceled, and in Florida the crossing collision rate fell 68.6 percent. These trends support the conclusion of both studies that whistle bans increase the risk of collisions at crossings, whether they are effective 24 hours or nighttime-only.

FRA updated its analysis by adding certain crossings in the Chicago region not previously known to have whistle bans. This analysis indicated that whistle ban crossings without gates, but equipped with flashing light signals and/or other types of active warning devices, on average, experienced 130 percent more collisions than similar crossings with whistles. This finding made it clear that the train horn was highly effective in deterring collisions at crossings equipped with active devices but without gates. The analysis showed that an average of 62 percent more collisions occurred at whistle ban crossings equipped with gates than at similar crossings across the nation without bans. FRA will use this value as the increased risk associated with whistle bans instead of the 84 percent cited in the Nationwide Study released in April 1995. FRA believes that 62 percent is appropriate because it represents the elevated risk associated with crossings with gates, which are the only category of crossings that will be eligible for “quiet zones” (except certain special cases).

These figures suggest that the proposed action would provide a public safety benefit in terms of lives saved as well as injuries and accidents averted. With the resumption of horn blowing, FRA expects at least 3 fatalities, 17 injuries, and 39 collisions to be avoided per year. The use of median barriers with gates and lights to establish quiet zones in all communities with current whistle bans would prevent more than 6 fatalities, 33 injuries, and 78 collisions per year. Since interest in silencing train horns extends to many more communities throughout the nation than those with current whistle bans, much greater safety benefits may accrue as a result of the proposed rule as more crossings are made safer so as to qualify for the establishment of quiet zones.

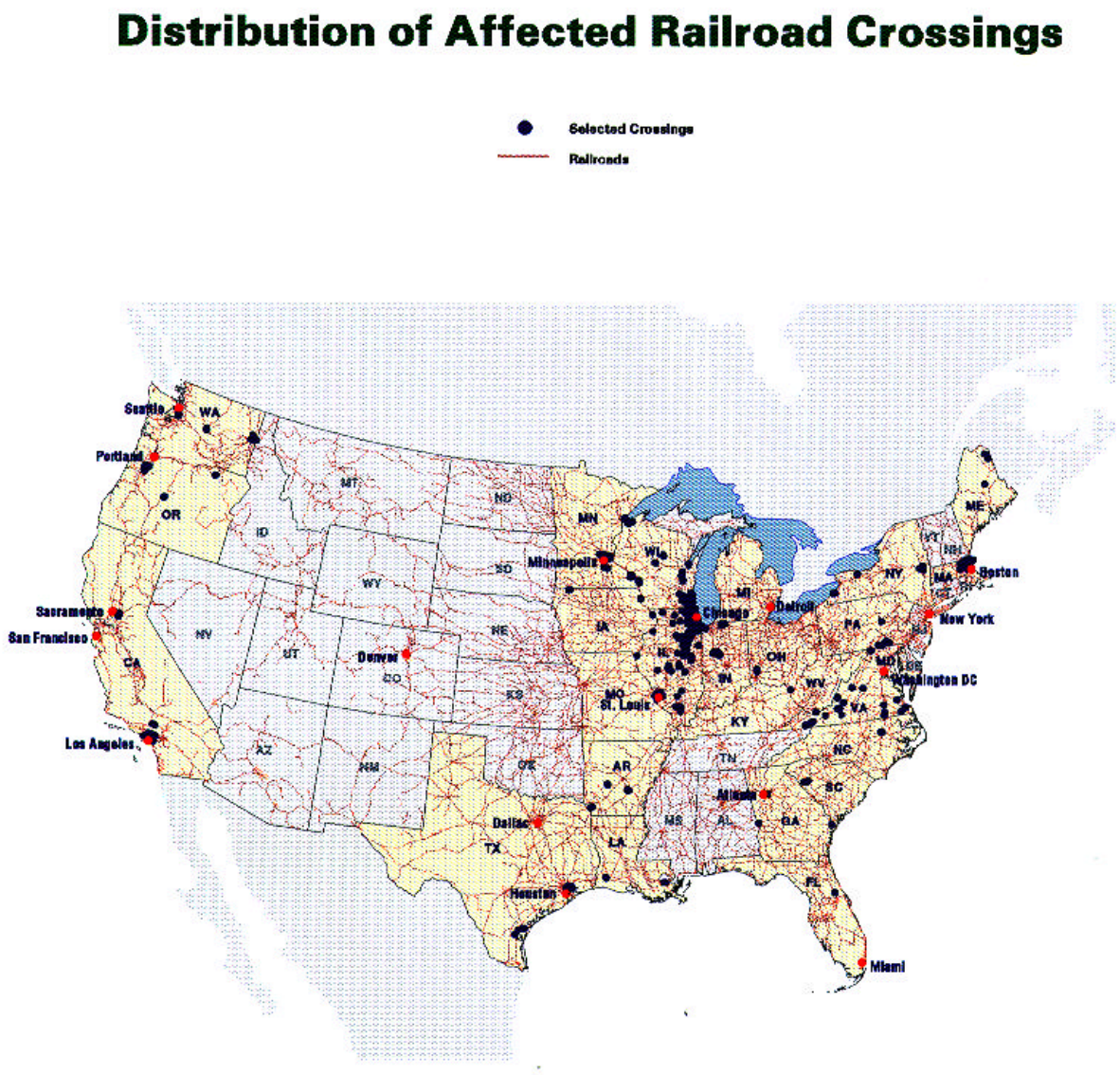
The No-Action Alternative would continue the 62 percent greater frequency of collisions at whistle ban crossings where they exist today, and would lead to more frequent collisions at every location where a ban is instituted in the future. Additionally, it is possible that in the absence of a mandate to regulate the use of locomotive horns at highway-rail grade crossings, whistle bans could proliferate and result in more injuries, collisions, and a greater loss of life.

ES 5.2 Effects on Noise

In the absence of decisions by others to apply proposed mitigation measures, the rule would cause the sounding of train horns at whistle ban locations. Potential noise impacts were modeled for this EIS to estimate the maximum number of people potentially affected. Figure ES-1 presents a map of all states containing existing whistle bans.

The modeling of potential impacts at the 1,978 locations identified by FRA assumed that none of the mitigation strategies (e.g., the establishment of a quiet zone) would be used to reduce the proposed rule's impact. The model also does not take into account the mitigating influence of a maximum horn sound level, a horn sounding distance requirement, nor a directionality requirement (all of which are under consideration as part of the proposed rule). The train horn source level was taken from actual measurements. The model assumed that population is uniformly distributed in the census blocks adjacent to the crossings. However, it is reasonable to expect that the number of persons adversely affected by train horn noise as a result of the proposed rule would ultimately be lower than the number of persons estimated as potentially impacted in this DEIS.

FIGURE ES-1



Number of Persons Potentially Impacted and Severely Impacted by State

The model estimated that approximately 365,010 persons are potentially impacted by train horn noise in the affected areas. Of this number, approximately 151,400 are in the severely impacted category. The state of Illinois contains the greatest number of potentially impacted persons (177,110) and 49 percent of all persons potentially impacted nationally. States with a significant number of potentially impacted persons include:

1. Illinois (177,110)
2. Massachusetts (38,300)
3. Wisconsin (28,770)
4. Indiana (26,400)
5. Minnesota (24,940)

The same five states also have the greatest number of persons within the severely impacted subset. These states are:

1. Illinois (74,230)
2. Massachusetts (13,000)
3. Wisconsin (12,300)
4. Indiana (10,640)
5. Minnesota (10,890)

Number of Persons Potentially Impacted by County
The counties with the largest total number of impacted persons are:

1. Cook County, IL (103,190 persons)
2. DuPage County, IL (33,110)
3. Middlesex County, MA (24,810)
4. Lake County, IL (23,280)
5. St. Joseph County, IN (15,340)

Number of Persons Potentially Impacted by City
The cities with the largest total number of impacted persons include:

1. Chicago, Illinois (76,890)
2. Minneapolis, Minnesota (10,720)
3. York, Indiana (8,730)
4. Anaheim-Santa Ana, California (8,190)
5. S. Portage, Indiana (8,000)

Nine of the top 20 cities affected by the proposed rule are located within the Chicago metropolitan area.

ES 5.3 Cumulative Effects

Cumulative effects are those resulting from the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time [40 C.F.R. 1508.7]

In addition to requiring the sounding of locomotive horns, the proposed rule contains provisions that set a horn sounding distance, establish a maximum horn sound level, mandate a directional signal, and authorize the designation of quiet zones. These mitigating provisions reduce noise exposure and impact from locomotive horns and apply to the entire nation, whereas the impact of the mandate to blow horns at all crossings affects a discrete number of locations. Because the mitigating provisions of the proposed rule would be applied much more broadly, their cumulative effects can reasonably be expected to be large. The effects of these measures are seen as cumulative because while some measures will be implemented initially, others will be adopted over time. All public highway-rail at-grade crossings would receive cumulative benefits from provisions of the rule, including current whistle ban crossings once the horn sounding provision take effect. Therefore, cumulative effects are examined for 159,000 crossings as a group.

The horn noise model was applied to an average or typical crossing and potential impacts estimated using an average surrounding population density of 658 persons per square mile as described in Chapter 3, "Affected Environment." For those crossings, there would be

approximately 5.8 million persons impacted and of these, 2.9 million persons severely impacted by train horn noise at grade crossings who might benefit from certain provisions of the proposed rule.

The proposed rule contains a provision that would set the required distance for horn sounding in advance of the crossing to be the distance traveled in 20 seconds while operating at maximum track speed. FRA's analysis estimated that for the 20-second provision, on average 10 people per crossing would be brought below the criteria threshold for train horn noise annoyance, if it were implemented at all locations. Alternatively, 17 people on average would likewise benefit from a 15-second provision. It is expected that the actual number of persons benefiting would be less than this estimate because relocating whistle posts and boards would occur over a long time period as maximum authorized speeds are changed by railroads. The proposed rule requires moving the whistle post or board **only** when the track speed at the crossing is adjusted, which may not ever occur. However, even if only a quarter of these benefits actually accrue, a significant number of persons, approximately 652,000 people, may be relieved of train horn noise impacts from a 20-second provision.

A maximum horn sound level of L_{max} 104 dBA was found to reduce community horn noise exposure by approximately 25 percent compared to current exposure levels on average. A day/night variable sound level of 111 dBA during the day and 104 dBA during the night was found to be effective in reducing community noise impacts by approximately 15 percent. The directionality provision was also found to have significant beneficial effects in reducing community horn noise exposure when combined with quieter horns. It is also estimated that moving all locomotive horns to the front could reduce the selected maximum sound level noise exposure as much as a 35 percent.

The proposed action allows for any local jurisdiction to establish a quiet zone by implementing a combination of supplementary safety measures and alternative safety at chosen highway-rail grade crossings. Since locations that used to have whistle bans clearly favored having trains run without horn blowing at highway-rail grade crossings, former whistle ban crossings are assumed by FRA to provide some indication of future demand from local communities to designate quiet zones. Upon adding locations of former whistle bans to the existing whistle bans, a minimum estimate of the number of persons showing willingness to actively reduce their exposure to train horn noise is approximately 501,210 persons. Due to the variations in local decision-making, it is not possible to predict which jurisdictions will seek to establish a quiet zone, nor the number of grade crossings that might be included in a particular jurisdiction's quiet zone. It is, however, reasonable to expect that the direct noise impacts of the proposed rule would be substantially mitigated and offset by the establishment of quiet zones.

ES 5.4 OTHER

Environmental Justice

Council on Environmental Quality (CEQ) Guidelines state that minority populations should be identified where either (a) "the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis." FRA developed the following thresholds for determining whether the persons within the noise impact areas constitute a minority population:

- the percent of the minority people in a noise impact area equaled or exceeded 50 percent of the total population within that impact zone, or

- the percent of the minority people in a noise impact area was at least 10 percent greater than the percentage of minority population of the county in which the impact zone is located.

In addition, the following threshold was developed for determining whether the population within the noise impact area constituted a low-income population:

- the percent of the low-income population in a noise impact area equaled or exceeded 50 percent of the total population within that impact zone.

After establishing the representation of minority and low-income populations in noise impact areas, FRA compared noise impacts in the areas to the county representation. This analysis shows a prevalence of proportionally greater impacts to minority populations at many locations. The number of minority and low-income persons represented as either impacted or severely impacted by train horn noise was not reduced to account for the cumulative benefits of the proposed rule. It is likely that many communities would choose to designate a quiet zone. Therefore, the number of minority and low-income persons likely to impacted by train horn noise as a result of this proposed rule would be less than the estimates presented here. Minority and low-income communities would have equal opportunity to designate a quiet zone under the proposed rule. Of minority populations, approximately 97,810 people were found to be potentially impacted (27 percent of those impacted), of whom 43,930 were severely impacted (29 percent of those severely impacted).

Health and Human Welfare Impacts

Sound exposure from locomotive horns in the community does not reach the cumulative levels that would exceed risk criteria for hearing damage. The horn noise model established by measurements for the Federal Railroad Administration is based on a sound exposure level of 107 dBA at 100 feet from the tracks for locations not closer than 1/8 mile from a grade crossing. In order to risk the onset of hearing damage, a person at that distance would have to hear more than 180 horn events during each 8-hour period for five days a week and continuously for 40 years. These conditions would yield an 8-hour Leq of 85 dBA. In fact, the risk of hearing damage may be even less because the sound is not actually continuous and the ear has time to recover between horn soundings.

Other noise effects on health have been researched with ambiguous results. Stress related syndromes, especially relevant to mental health, are the result of a complex interaction of many factors. Noise exposure can be a contributor when an emotional factor, such as an attitude toward the source of noise, comes into play. Several airport noise surveys have indicated stress-related disorders result from continuous exposure to high noise levels, but it has not been conclusively shown that the actual physical stimulus of noise is the cause of the health effect.

Economics

FRA studied the issue of economic impacts resulting from the proposed rule in the *Regulatory Evaluation and Initial Regulatory Flexibility Assessment for Use of Locomotive Horns at Highway-Rail Grade Crossings*, FRA, (Washington, DC) 1999. Using an initial base of 2,122 public at-grade crossings with whistle bans, FRA calculated the costs and benefits associated with the proposed rule.

The safety benefits alone, excluding any benefit to railroads, exceed the most costly yet realistic scenario for community safety enhancements. The analysis found that fully implementing other safety measures to designate quiet zones at all current whistle ban crossings is less costly than the collisions attributable to not blowing the horn at those

locations. The external environmental benefits of the various mitigating provisions of the proposed rule would likely add to its favorable economic effect.

A scenario assuming median barriers are installed at each crossing, signs are installed at each crossing and crossing upgrades to a minimum of gates and lights for all passive crossings would be justified on the basis of casualties prevented alone with net benefits of at least $255.2 million. Even if accident rates diminish over time the safety benefits alone, excluding any benefit to railroads, exceed the most costly yet realistic scenario for community safety enhancements. A study of the housing market showed that it is influenced by the proximity of rail lines and rail crossings, but there does not appear to be a permanent impact resulting from a resumption of horn blowing where there was a whistle ban.

ES 5.5 Impact Conclusions and Mitigation

With the proposed action, a number of communities could experience an increase in horn noise exposure and also would benefit from enhanced public safety. Analysis showed that an average of 62 percent more collisions occurred at whistle ban crossings equipped with gates than at gated crossings across the nation without bans. With the resumption of horn blowing, FRA expects a reduction of least 3 fatalities, 17 injuries, and 39 collisions per year. If median barriers with gates and lights were employed to designate quiet zones in all communities with current whistle bans, then more than 6 fatalities, 33 injuries, and 78 collisions would be prevented per year and noise impacts would be eliminated. Because interest in silencing train horns extends to many more communities throughout the nation than those with current whistle bans, much greater safety benefits may accrue as more crossings are made safer to designate quiet zones as a result of the proposed rule.

The No-Action Alternative would perpetuate the 62 percent greater frequency of collisions at whistle ban crossings where they exist today and would lead to more frequent collisions at every location where a ban is instituted in the future. Additionally, it is possible that in the absence of a mandate to regulate the use of locomotive horns at highway-rail grade crossings, whistle bans could proliferate and result in more injuries, collisions, and a greater loss of life.

Horn noise resulting from the proposed action may impact approximately 365,010 persons of whom 151,400 persons may be severely impacted within 24 states across the country at the 1,978 highway-railroad grade crossings FRA determined to be subject to current whistle bans. The proposed action would also likely benefit many people with less horn noise due to its other, mitigating provisions. Many people may benefit from the 20-second horn sounding distance provision, the maximum horn sound level, and the directionality provision. For example of the combined potential noise exposure reduction if the horn sounding duration is the current 1/4 mile, and the 104 dBA sound level option is selected and combined with the directionality provision, the community horn noise exposure reduction would be approximately 60 percent on average. This could result in reducing the locomotive horn noise exposure to acceptable levels of an estimated 3.5 million persons nationwide of whom 2.4 million are severely impacted. It is possible that the maximum horn sound level and the directionality provision would have potentially significant long-term impacts that would reduce community horn noise exposure of more people than the number people potentially receiving more noise through the resumption of horn blowing at crossings currently subject to whistle bans.

After consideration of the mitigation opportunities offered by the quiet zone provisions, FRA is confident that the adoption of quiet zones by local jurisdictions would be widespread. In principle, quiet zones could be adopted by all localities that currently have whistle bans in

effect. In addition to communities with current whistle bans, there are many more localities in the country that may opt to implement quiet zones. The effect of these new quiet zones, coupled with the quiet zones that are formed within jurisdictions with current whistle bans, would very likely be enough to fully compensate for the direct environmental impacts of the rule where whistle bans now exist.

The No-Action Alternative would not incur the potential impacts of more noise exposure at current whistle ban locations, but neither would it result in the benefits of the proposed rule. On balance, it is likely that a No-Action Alternative would result in more noise exposure over time to communities throughout the nation, and a greater loss of life and injuries.

ES-6 PUBLIC COMMENT

The DEIS and the NPRM are being issued jointly. An official comment period commences following the issuance of this DEIS. Interested parties may comment on the DEIS, the NPRM, or both. Because FRA is soliciting comments on both the DEIS and the NPRM, separate public dockets have been established for each. Interested parties wishing to comment on the DEIS should include the docket number for the environmental docket, "Docket Number FRA-1999-6440" on the first page of their comments. Those persons wishing to comment on the NPRM should include the docket number for the rulemaking, "Docket Number FRA-1999-6439" on their comments. Please include your full name and mailing address if you wish to receive further communications from FRA.

Comments must be submitted with the docket number to the Docket Clerk, DOT Central Docket Management Facility, 400 Seventh Street, S.W., Plaza-401, Washington, DC 20590-0001, on or before May 26, 2000. All written comments are placed in the appropriate docket, which is stored in the Department of Transportation's electronic Docket Management System. This system makes electronic submission and viewing of comments available on the Internet at http://dms.dot.gov. The public is free to inspect dockets using the Internet or by going to the dockets office during regular business hours at the above address.

Public hearings on the rulemaking and on the DEIS will be held in the following cities: Washington, DC; Boston, MA; Chicago, IL; South Bend, IN; Berea, OH; Ft. Lauderdale, FL; Los Angeles, CA; and Pendleton, OR. The hearings will provide interested parties an opportunity to make oral presentations. The specific locations, dates and times for each public hearing will be announced in the Federal Register and posted on the FRA web site.

CHAPTER 1

PURPOSE AND NEED FOR THE PROPOSED ACTION

1.0 INTRODUCTION

Collisions at highway-rail crossings are second only to trespassing as the greatest cause of death and serious injury associated with railroad operations. Train horns provide an audible warning of approaching trains with an indication of their speed, direction, and proximity. A number of communities across the nation have regulated or attempted to regulate the use of locomotive horns in their jurisdictions. Following large-scale imposition of train whistle bans in Florida, it became apparent to FRA that there was a strong relationship between collision rates at highway-rail crossings and the use of locomotive horns.

FRA prepared a *Nationwide Study on Train Whistle Bans* (Nationwide Study), in April 1995 to study the national safety implications of whistle bans. The Nationwide Study showed a much greater rate of collisions occurring at crossings with whistle bans as compared to crossings where train horns are sounded.

In 1994, Congress passed the Swift Rail Development Act, Public Law 103-440 (Swift Act), which added §20153, *Audible Warnings at Highway-Rail Crossings*, to Title 49 of the United States Code. (See Appendix B.) In §20153, Congress directed FRA to issue a rule requiring the use of train horns at all public highway-rail crossings. FRA also was given the authority to make reasonable exceptions to the use of train horns in certain qualified circumstances. In enacting §20153, Congress has made a determination that locomotive whistles provide a measure of safety at highway-rail crossings beyond that provided by other warning systems.

As directed by §20153, FRA has prepared a Notice of Proposed Rulemaking (NPRM) to address the use of locomotive horns at highway-rail grade crossings. In preparing the NPRM, FRA has determined that the implementation of the proposed rule constitutes a "major federal action" within the meaning of §102 (c) of the National Environmental Policy Act (42 U. S. C. 4321, et seq.) (NEPA). Accordingly, FRA is undertaking this effort to develop pertinent documentation required by §102 (c) of NEPA.

1.1 PURPOSE AND NEED

The railroad system is a vital component of the nation's transportation infrastructure. This system incorporates over 264,000 highway-rail at-grade crossings throughout the country. Of those crossings, more than 159,000 are public grade crossings -- those crossings in which a public road crosses railroad tracks at grade. Safe operation of highway-rail grade crossings is one of the more enduring challenges facing highway authorities, railroads, and the public. Approximately 4,000 times per year a train and a highway vehicle collide at one of this country's highway-rail grade crossings, causing many deaths and serious injuries.

During the years 1989 through 1994, there were 32,405 collisions at highway-rail crossings in the United States. These collisions are the second greatest cause of death, after trespassing, associated with railroading, resulting in roughly 600 deaths each year. For example, in the 1989 to 1994 period, 3,927 people died in these collisions. Another 13,142 people were injured. Approximately 50 percent of collisions at highway-rail intersections

occur at those intersections equipped with active warning devices such as bells, flashing lights, or gates (approximately 60,000 crossings).

Train horns are an important element of highway-rail grade crossing safety. The train horn is effective at alerting the motorist to the presence of a train, and also provides some indication of train speed, direction and proximity. If a horn is not sounded at a particular location, the public is deprived of an important source of information as to when a train is approaching and approximately how soon the train will reach the crossing. This can be crucial life-saving information, especially when only passive warnings, such as crossbucks, are present at the crossing.

Some communities, especially those with multiple crossings and high train volumes, have enacted whistle bans affecting crossings within their jurisdictions in the belief that the sounding of train horns at every crossing poses an excessive burden to the quality of life to its residents. Studies have demonstrated that, without the benefit of train horns or other substitute warnings, there is an increased rate of collisions at highway-rail crossings leading to injury and death.

Overall, the results of the Nationwide Study indicate that there is a pervasive safety risk associated with whistle bans. Twelve case studies, involving 831 crossings in eight states other than Florida, showed an overall 38 percent decline in the accident rate after whistle bans were repealed. Furthermore, a separate study indicated that there were 53 percent and 59 percent reductions in accident rates when whistle bans were canceled on 288 Conrail and 293 CSX crossings, respectively. The Nationwide Study was preceded by a study (1984 to 1989 study period) of the nighttime accident rate at the crossings in Florida that formerly had nighttime whistle bans.[1] In this study, FRA found that the rate increased 195 percent following the imposition of whistle bans, while daytime accident rates at the same crossings remained virtually unchanged.

FRA is faced with the task of balancing the need for an effective warning to the motorist while minimizing the horn's intrusion into the surrounding community. The proposed rule details when and how locomotive horns must be sounded and when and how a quiet zone, in which horns are not sounded, may be designated. FRA proposes to limit the maximum sound level of locomotive horns to provide some relief to the surrounding population while still ensuring that the sound level is high enough to provide the required warning to the motorist.

1.2 THE PROPOSED ACTION

With the passing of the Swift Act, the Secretary of Transportation (delegated to the Federal Railroad Administration) was directed to prescribe regulations requiring locomotive horns be sounded at all public highway-rail at-grade crossings in the country. FRA has reviewed information obtained through its outreach efforts and comments submitted to the agency by concerned citizens, communities, and legislators. FRA has considered that information and has attempted, within the statutory framework established by Congress, to accommodate all of the legitimate concerns expressed.

In drafting the proposed rule, FRA has attempted to reconcile Congress' two, somewhat conflicting, directives. The first directive, which is unambiguous, is that "the Secretary of Transportation shall prescribe regulations requiring that a locomotive horn shall be sounded while each train is approaching and entering upon each public highway-rail grade crossing." This directive does not allow any discretion as to issuance of the regulation requiring the

[1] *Florida's Train Whistle Ban*, Federal Railroad Administration, Office of Safety, FRA, July 1990.

sounding of horns. The Secretary, and by delegation, the Federal Railroad Administrator, must require that horns be sounded at every public grade crossing.

The second directive, however, is entirely discretionary. The Secretary may "exempt from the requirement to sound the locomotive horn certain categories of rail operations or categories of crossings." While exceptions may be crafted, they are not required. The proposed rule, which does contain provisions for such exceptions, is essentially a rule that reduces the environmental impact of the congressional locomotive horn mandate. It provides communities with the ability to reduce the impact of locomotive horns within their jurisdictions while assuring that safety reflected in the congressional mandate is maintained.

Full implementation of the proposed rule would require that horns be sounded at virtually all public at-grade crossings in the United States. The proposed rule also contains provisions that set a maximum sound level for locomotive horns, limit sound directed to the side, prescribe when and how to sound the horn, and provide an opportunity to any community in the nation to establish a quiet zone. These provisions would apply to the use of locomotive horns at all public highway-rail grade crossings, including those currently subject to whistle bans established by local or state authorities.

1.2.1 The Locations Affected

The proposed rule would apply to all locomotives operating on the general rail system of the United States and to all public highway-rail at-grade crossings. Some provisions would potentially affect approximately 159,000 public highway-rail crossings subject to the proposed rule. Provisions of the proposed rule requiring the use of locomotive horns would potentially affect those public highway-rail grade crossings with current whistle bans. In 1992, to support the FRA in preparing the Nationwide Study, the Association of American Railroads (AAR) surveyed member railroads for the locations of highway-rail grade crossings subject to whistle bans. The survey asked for information on all crossings at which whistle bans were imposed at any time from 1984 to the time of the request. Subsequent to the Nationwide Study, a record of whistle ban crossings has been maintained to reflect any change in the status of whistle bans to the extent FRA knew of the changes. Of all the 2,057 crossings believed to have had whistle bans as of the beginning of this environmental study, 1,978 were deemed to be subject to the provisions of the proposed regulation while 79 crossings were exempt due to low speed and the presence of flagging personnel. Potential impacts at these 1,978 crossings with current whistle bans and their surrounding areas are analyzed in Chapter 4, as are potential impacts to all highway-rail crossings.

1.3 PUBLIC PARTICIPATION

FRA has prepared this DEIS to analyze the potential environmental impacts of the proposed rule. This DEIS is being issued concurrently with the NPRM. This DEIS is being distributed to organizations and individuals that participated in the environmental scoping process and the pre-rulemaking stage of this proceeding. This DEIS as well as the NPRM are available on FRA's Internet site, http://www.fra.dot.gov or from FRA at the following address:

Office of Railroad Development
Federal Railroad Administration
1120 Vermont Avenue, Mail Stop 20
Washington, DC 20590
Attn. Locomotive Horns DEIS

In 1995, a public docket was established for the purpose of providing interested parties access to all the relevant documents and materials pertaining to the preparation of the NPRM. This information covers a period from June 1995 to 1998. The docket contents include comments, petitions, recommendations, resolutions, documents, information requests from individual citizens, public officials, community organizations, and city and regional entities. The docket contains over 95 comments concerning the legislation and the proposed rulemaking. The docket remains open.

The scoping process for this DEIS began with a series of public meetings in the Chicago area and in Massachusetts between the fall of 1997 and spring of 1998 that helped to shape the initial direction of the NPRM and DEIS.

The FRA published in the Federal Register its Notice of Intent to prepare an EIS (63 FR 28549) on May 26, 1998, and a subsequent Extension of Comment Period (63 FR 40151) on July 27, 1998. FRA also published a web page describing the scoping process and making it possible for the public to submit comments by e-mail. The formal comment period on the scoping process for this environmental document closed on August 7, 1998. At that date, a total of 214 separate comments had been recorded and entered into a comment table. This table makes up the main portion of the Scoping Report, which can be found in Appendix D.

1.3.1 Current Opportunity To Participate The DEIS and the NPRM are being issued jointly. An official comment period commences following the issuance of this DEIS. Interested parties may comment on the DEIS, the NPRM, or both. Because FRA is soliciting comments on both the DEIS and the NPRM, separate public dockets have been established for each. Interested parties wishing to comment on the DEIS should include the docket number for the environmental docket, "Docket Number FRA-1999-6440" on the first page of their comments. Those persons wishing to comment on the NPRM should include the docket number for the rulemaking, "Docket Number FRA-1999-6439" on their comments. Please include your full name and mailing address if you wish to receive further communications from FRA.

Comments must be submitted with the docket number to the Docket Clerk, DOT Central Docket Management Facility, 400 Seventh Street, S.W., Plaza-401, Washington, DC 20590-0001, on or before May 26, 2000. All written comments are placed in the appropriate docket, which is stored in the Department of Transportation's electronic Docket Management System. This system makes electronic submission and viewing of comments available on the Internet at http://dms.dot.gov. The public is free to inspect dockets using the Internet or by going to the dockets office during regular business hours at the above address.

Public hearings on the rulemaking and on the DEIS will be held in the following cities: Washington, DC; Boston, MA; Chicago, IL; South Bend, IN; Berea, OH; Ft. Lauderdale, FL; Los Angeles, CA; and Pendleton, OR. The hearings will provide interested parties an opportunity to make oral presentations. The specific locations, dates and times for each public hearing will be announced in the Federal Register and posted on the FRA web site.

CHAPTER 2

ALTERNATIVES CONSIDERED

2.0 INTRODUCTION

To implement the Swift Act (§20153), the FRA proposes a rule requiring that a locomotive horn be sounded while a train approaches a public highway-rail grade crossing. As an alternative to requiring locomotive engineers to sound the train horns, the proposed rule provides other safety measures that can be used by local jurisdictions to establish a quiet zone. A quiet zone would constitute mitigation for potential impacts of the proposed rule and substitute for the need to sound train horns.

This DEIS being prepared on a "broad federal action," in this case, the proposed rule described in the NPRM. The Draft EIS includes a broad environmental analysis of the proposed rule on use of locomotive horns at highway-rail grade crossings. A Final EIS will be prepared following the public comment period.

2.1 NO-ACTION ALTERNATIVE

This alternative would preserve the status quo: states and municipalities could try to regulate the sounding of train horns while railroads could continue to resist such regulation through litigation and other means. FRA lacks the authority to implement the No-Action Alternative, and adoption of the No-Action Alternative would require congressional action to reverse its mandate to regulate the use of locomotive horns at highway-rail grade crossings as set forth in 49 U.S.C. §20153. The No-Action Alternative serves as an environmental baseline against which the impacts of the other alternatives can be compared.

2.2 PROPOSED ACTION

FRA's proposed rule: 1) requires that horns be sounded at all public at-grade highway-rail crossings in the United States; 2) sets a maximum sound level for locomotive horns; 3) prescribes a directionality to the sound from locomotive horns; 4) prescribes how and when locomotive horns are to be sounded; and 5) provides an opportunity to any community in the nation to establish a quiet zone. These provisions have potential positive or negative effects and would apply to all public highway-rail grade crossings, including those currently subject to whistle bans promulgated by local or state authorities.

The proposed rule also incorporates many mitigation opportunities, which address direct impacts in communities that are now subject to whistle bans or that may want to adopt whistle bans in the future. The proposed rule delineates and describes a series of supplementary and alternative safety measures that can be employed through two methods to establish a quiet zone. These provisions constitute a means of substituting other safety measures for train horns. (See Chapter 4, "Environmental Consequences," for a full description of what constitutes a quiet zone and the process for establishing a quiet zone). Designation of a quiet zone could fully mitigate any potential direct impacts of the proposed rule.

As required by 49 U.S.C. §20153, FRA has taken into account the interest of communities that have whistle bans in effect or have not been to this point subject to the routine sounding

of locomotive horns. FRA has also worked in partnership with affected communities to provide technical assistance, allowed a reasonable amount of time for the communities to install added safety measures, and included local safety initiatives such as public awareness efforts to protect public safety.

The key substantive elements of the Proposed Action are summarized in Item 1 through 10. Further detailed discussion and additional procedural and administrative elements of the proposed rule are contained in the NPRM, which is available in the *Federal Register* and on the FRA website at: http://www.fra.dot.gov.

1. Requirement for sounding horn. Locomotive horns shall be sounded while each train is approaching and entering upon each public highway-rail grade crossing.

2. Options for Maximum Horn Sound Level. The NPRM contains three maximum sound level options for public comment. The Option that is placed in the final rule will be based on information developed during the comment period.

   Option 1. Limit the maximum permissible train horn sound level so that it would not exceed 104 dBA. This sound level is believed to be sufficient in most circumstances to provide adequate warning at crossings using automated warning devices but is less effective at crossings with only passive protection.

   Option 2. Limit the maximum permissible train horn sound level so that it would not exceed 111 dBA. This sound level is believed to be effective under many circumstances at passively signed crossings.

   Option 3. Variable Level Option. Under this approach, train horns would be required to be capable of sounding within a low range (96 to 104 dBA) approaching any crossing with active warning devices and within a higher range (104 to 111 dBA) at any crossing not equipped with automated warning systems.

3. Directionality requirement. The proposed rule would require that sound levels at 90 degrees and 100 feet from the center of the locomotive not exceed the value 100 feet in front of the locomotive. FRA requests comment to the NPRM on whether community exposure should be measured at 90 degrees from the horn placement location, rather than from the center of the locomotive. Some locomotive horns are placed near the center of the locomotive in order to reduce crew sound exposure. Sometimes this placement can lead to higher sound levels at right angles to the locomotive than to the front or rear. This is believed to result from obstructions such as diesel exhaust stacks and air conditioning units causing the horn sound to disperse.

4. Application of Use of Locomotive Horn Rule:

a) Applies to all railroads, both freight and passenger, that operate on the general system of standard gage railroads throughout the country.

b) The locomotive horn shall be sounded while each train is approaching and entering upon each public highway-rail grade crossing. All trains would be required to sound their horns with the standard signal sequence of two longs, a short, and a long starting at the whistle post and continuing until the lead engine has cleared the crossing. [Section 222.21 of the NPRM]

Use of locomotive horn rule applies to every railroad except:

a) Rapid transit systems within urban areas that are not connected to the general railroad transportation system.

b) Plant and freight railroads that are not part of the general transportation system. FRA recognizes that additional public grade crossings may be found on plant and freight railroads that are not part of the general transportation system. However, FRA proposes not to exercise its regulatory jurisdiction in applying this rule to such railroads. This is due to the fact that these operations are typically low-speed with small numbers of rail cars permitting relatively short stopping distances. In addition, these operations also often involve low-speed vehicular traffic. FRA reserves the right to assert jurisdiction in this area in the future if circumstances require.

c) Railroads with only private highway-rail crossings.

d) Railroads with highway-rail grade crossings where the maximum authorized operating speed (as established by the railroad) for that segment of track is 15 miles per hour or less AND properly equipped flaggers (as defined by 49 CFR 234.5) provide warning to motorists. [Subpart C, Section 222.31]. This exclusion will primarily occur at crossings located in industrial areas where substantial switching occurs.

5. Location(s) where locomotive horns are to be sounded. [Subpart B Section 222.21]

a) Increases or Decreases in Maximum Authorized Speed of Trains. Each railroad must properly adjust the location of the whistle board to reflect changes in maximum authorized track speeds (except where all trains and their horn systems operating over that crossing are equipped to be responsive to a positive train control system). The railroads must place whistle boards or posts at a distance from the crossing equal to the distance traveled by a train in 20 seconds while operating at the maximum speed allowed for any train operating on the track in that direction of movement. Because a fixed location for sounding the horn results in differing periods of warning depending on the speed of the train or locomotive, the location of the whistle board must therefore be dependent on the fastest train operating over that track. If a railroad decreases the maximum authorized speed of trains operating over a crossing, the whistle board must be moved closer to the crossing in order to provide 20 seconds of warning. Conversely, if the maximum authorized speed is increased, then the whistle board must be placed further from the crossing to maintain the 20-second warning time.

b) Use of Methods or Systems Other Than Whistle Boards Such As Positive Train Control Systems. Horns must be sounded not less than 20, nor more than 24 seconds before the locomotive enters the grade crossing.

c) Distance Train Horn to be Sounded. In no event may train horns be sounded more than 1/4 mile in advance of a crossing regardless of train speed.

6. Train Operations Which Do Not Require Sounding Of Horns: Locomotive horns need not be sounded at individual public highway-rail grade crossings if the maximum authorized operating speed (as established by the railroads) for that segment of track is 15 miles per hour or less AND properly equipped flaggers (as defined in 49 CFR 234.5) provide warning of approaching trains to motorists, except where active warning devices have malfunctioned and the use of the horn is required by 49 CFR §234.105, §234.106, or §234.107.

7. Creation of a Quiet Zone in Lieu of Sounding Horns:

a) Definition and Purpose of a Quiet Zone. A *Quiet Zone* means a segment of rail line containing one or more consecutive highway rail crossings at which locomotive horns are not routinely sounded because acceptable alternative safety measures are in place. The purpose of a quiet zone is to ensure that a whistle ban would have the greatest impact in terms of noise reduction; ease the added burden on locomotive crews of the necessity of determining on a crossing-by-crossing basis whether or not to sound the horn; maintain a comparable level of safety; and enable grade crossing safety initiatives to be focused on specific areas within the quiet zone.

b) Two Methods For Establishing Quiet Zones:

Method 1. *Community Designation* is applicable when every public grade crossing within the proposed quiet zone would have a supplementary safety measure (SSM) applied to a crossing. (Refer to Chapter 4, "Environmental Consequences," for a complete description of SSMs). This method may be applied at the sole discretion of the local community, if in compliance with state authority.

Method 2. *FRA Acceptance* is a flexible method that uses supplementary safety measures or other types of safety measures to deal with problem crossings. Risk is considered in terms of the quiet zone as a whole rather than at each individual grade crossing. SSMs are not needed at every crossing as long as implementation of the proposed SSMs and alternative safety measures on the quiet zone as a whole will compensate for the lack of a locomotive horn. If the aggregate reduction in predicted collision risk for the quiet zone as a whole is sufficient to compensate for the lack of a horn, a quiet zone may be established.

If Method 2 is selected by the state or local jurisdiction, they must demonstrate, in an application to FRA, through data and analysis that implementation of the proposed measures will reduce the risk at public highway-rail crossings within the quiet zone sufficient to equal the reduction in risk that would have been achieved through the use of the locomotive horn.

a) Minimum Length of Quiet Zone. The minimum length of a quiet zone shall be one-half mile (2,640 feet or 805 meters) along the length of railroad right-of-way. [Section 222.33 (d)]

b) Requirement For Active Grade Crossing Warning Devices. Save for exceptions defined in the proposed rule, each public highway-rail grade crossing in a quiet zone established or accepted must be equipped with active grade crossing warning devices comprising both flashing lights and gates that control traffic over the crossing and that conform to the standards contained in the Manual on Uniform Traffic Control Devices (MUTCD). [Section 222.33 (e)]

c) Quiet Zone Where SSMs or Alternative Safety Measures [ASMs] are not Required. A state or local government may create a quiet zone without the need for SSM's or ASM's if the following requirements are met:

- Train speed does not exceed 15 miles per hour;
- Train travels between traffic lanes of a public street or on an essentially parallel course within 30 feet of the street;

- Signs are posted at every grade crossing indicating that locomotive horns do not sound;

- Unless the railroad is actually situated on the surface of a public street, traffic on all crossing streets is controlled by STOP signs or traffic lights which are interconnected with automatic crossing warning devices; and

- The locomotive bell will ring when approaching and traveling through the crossing.

d) Requirement For Advance Warning Signs. Each highway approach to each public highway-rail crossing at which locomotive horns are not routinely sounded shall be equipped with an advanced warning sign advising the motorist that train horns are not sounded at the crossing. [Section 222.33 (f)]

8. Supplementary and Alternative Safety Measures. Section 222.41 discusses those measures that can be employed by states or local jurisdictions to designate a quiet zone. Appendix A and Appendix B, Supplementary Safety Measures (SSM's) and Alternative Safety Measures (ASM's), respectively, are included as appendices to 49 CFR Part 222 Subpart C, Section 222.41. The SSMs and ASMs are considered as mitigation strategies and are fully described in Section 4.5 of this DEIS. Implementation of these measures in accordance with the procedures outlined in the NPRM would constitute mitigation of potential impacts from the proposed rule.

9. Communities With Pre-Existing Restrictions On Use Of Locomotive Horns. §20153(i)(1) requires that FRA takes into account the interests of communities that "have in effect restrictions on the sounding of a locomotive horn at highway-rail grade crossings, or have not been subject to routine sounding of a locomotive horn at highway-rail grade crossings." FRA proposes the following measures to address the interests of these communities:

   a) Communities that as of October 9, 1996 had enacted ordinances restricting the sounding of locomotive horns, or communities that as of the same date had not been subject to the sounding of locomotive horns, due to formal or informal agreements with the railroad, may continue those restrictions for a period of up to three years from the date the final rule is issued.

   b) If a community with pre-existing restrictions on locomotive horns has not designated a quiet zone or had a quiet zone accepted by FRA within two years after the date of issuance of the final rule, the community must, within those two years, initiate or increase highway-rail grade crossing public safety awareness initiatives and grade crossing law enforcement programs in an effort to offset the lack of supplementary safety measures at the affected crossings.

   c) If the community does not take these actions, locomotive horns must be sounded in accordance with Section 222.21. The three-year grace period is reduced to two years if the community does not meet the above requirements.

2.2.1 Implementation Flexibility FRA would play the following specific roles in implementing the proposed rule:

1. FRA will take action in response to a state or local government application for the establishment of a Quiet Zone under Option 2 that uses measures identified in Appendicies A and B of the proposed rule. Based on the requirements of the rule, FRA will accept a proposed Quiet Zone, accept a proposed Quiet Zone with conditions, or reject a proposed Quiet Zone.

2. Upon receipt of an application, FRA will review and comment on a community's data, methodologies and supporting analysis to determine the effectiveness of strategies and countermeasures that would be used within a Quiet Zone.

3. FRA may at any time review the status of any Quiet Zone and determine whether the safety measures in place fully compensate for the absence of the warning provided by the locomotive horn under the conditions then present at the public highway-rail grade crossings within a Quiet Zone.

4. FRA will add new listings to SSMs or ASMs when it is determined that such measures or standards are effective substitutes for the locomotive horn in the prevention of highway-rail grade crossing casualties.

5. FRA may order a railroad to cease sounding of horns at public highway grade crossings to demonstrate and test proposed new supplementary safety measures.

6. FRA will not fund the construction or operation of SSMs or ASMs or other mitigation techniques or countermeasures used in the establishment of Quiet Zones. Local jurisdictions and states have the option to fund mitigation measures pursuant to the optional strategies allowed under the requirements of the proposed rule. Federal surface transportation funds are available for the construction of SSM's or ASM's and are allocated to specific projects by state agencies.

7. FRA may grant a waiver from its regulations as prescribed in 49 CFR Part 211. Additionally, §20153 (i)(3) gives the Federal Railroad Administrator the authority to waive in whole or in part any requirement of §20153 if it is determined not to contribute significantly to public safety.

2.2.1.1 Waivers The process for requesting a waiver from a provision of this regulation is explained in this section. FRA has historically entertained waiver petitions from parties affected by an FRA regulation. In many instances, a regulation or specific section of a regulation, while appropriate for the general regulated community, may be inappropriate when applied to a specific entity. Circumstances may make application of the regulation to the entity counter-productive. An extension of time to comply with a regulatory provision may be needed, or technological advancements may result in a portion of a regulation being inappropriate in a certain situation. FRA may grant a waiver from its regulations in such instances. The rules governing FRA's waiver process are found in 49 CFR Part 211. In summary, the waiver process is set in motion:

- After a petition for a waiver is received by FRA;
- A notice of the waiver request is published in the Federal Register;
- An opportunity for public comment is provided; and
- An opportunity for a hearing is afforded the petitioning or other interested party.

FRA, after reviewing information from the petitioning party and others, will grant or deny the petition. In certain circumstances, if FRA concludes that the conditions are necessary to assure safety or if they are in the public interest, conditions may be imposed on the grant of a waiver. Because this regulation's affected constituency is broader than most of FRA's rail safety regulations, FRA proposes a somewhat different process. Section 222.11 (a) and (b) of the proposed rule address the aspects that are different than FRA's customary waiver process. However, as paragraph (c) of §222.11 makes clear, once an application is made pursuant to either paragraph (a) or (b), FRA's normal waiver process applies, as specified in 49 CFR Part 211.

Section 222.11(a) of the proposed rule addresses jointly submitted waiver petitions as specified by 49 U.S.C. 20153 (d). Such a petition must be submitted by the railroad whose tracks cross the highway and either the appropriate traffic control authority or law enforcement authority that has jurisdiction over the roadway in question. Although 49 U.S.C. 20153 (d) requires that a joint application be made before a waiver of a provision of this regulation is granted, in §222.11(b), FRA addresses the situation that may occur if the two parties can not reach agreement to file a joint petition. Authority is given to the Secretary (and the Federal Railroad Administrator) in §20l53(i)(3) to waive in whole or part any requirement of §20153 (with certain limited exceptions) if it is determined not to contribute significantly to public safety.

FRA thus proposes to accept individually-filed waiver applications (under certain conditions) as well as jointly filed applications. In an effort to encourage the traffic control authority and the railroad to agree on the substance of the waiver request, FRA proposes to require that the filing party specify the steps it has taken in an attempt to reach agreement with the other party. Additionally, the filing party also must provide the other party with a copy of the petition filed with the FRA.

FRA prefers that petitions for waiver reflect the agreement of both entities controlling the two transportation modes at the crossing. If agreement is not possible, however, FRA will entertain a petition for waiver, but only after the two parties have attempted to reach an agreement on the petition. Section 222.11(c) of the proposed rule, provides that each petition for a waiver must be filed in the manner required by 49 CFR part 211.

Section 222.11(d) of the proposed rule, provides that the Administrator may grant the waiver if the Administrator finds that it is in the public interest and that safety of highway and railroad uses will not be diminished. The Administrator may grant the waiver subject to any necessary conditions required to maintain public safety.

CHAPTER 3

AFFECTED ENVIRONMENT

3.0 INTRODUCTION

As defined by the Council on Environmental Quality, a Programmatic EIS is designed to address the effects of a "broad federal action." This EIS addresses issues appropriate for a decision on a rule of national applicability.

3.1 THE LOCATIONS AFFECTED

All locomotives operating on the general railroad system of the United States would be subject to provisions of the proposed rule. According to the DOT/AAR Grade Crossing Inventory, more than 159,000 public grade crossings in the United States would therefore be subject to provisions of the proposed rule. Private highway-rail at-grade crossings would not be subject to the proposed rule. Overall, these crossings over which these locomotives operate and surrounding areas are considered by FRA to represent the affected environment for the purposes of preparing this DEIS.

Some jurisdictions have enforced whistle bans on a subset of those public crossings. These crossings would potentially be impacted by certain provisions of the proposed rule. At FRA's request, the Association of American Railroads (AAR) surveyed member railroads for the locations of highway-rail grade crossings subject to whistle bans concluding in 1992. The survey asked for information on all crossings at which whistle bans were imposed at any time from 1984 to the time of the request. FRA used this information to complete its Nationwide Study on whistle bans. Subsequent to the Nationwide Study, FRA has kept a record of whistle ban crossings to reflect any change in the status of whistle bans (to the extent FRA knew of the changes). Of the 2,057 crossings believed to have had whistle bans in effect as of the beginning of this environmental study, 1,978 would be subject to the provisions of the proposed regulation requiring that train horns be sounded. These 1,978 crossings are considered to be potentially impacted. Potential impacts to those persons within current whistle ban areas will be analyzed and the results reported in Chapter 4, "Environmental Consequences."

3.1.1 Methodology for Identifying Crossings For Study The list of 2,057 crossings resulted from screening the AAR survey to eliminate all private crossings, pedestrian-only crossings, crossings not at-grade (railroad over or under roadway), and closed crossings. The crossings eliminated would not be subject to the whistle ban portions of the proposed rule and therefore are not potentially affected by this particular portion of the proposed rule.

In addition, a subsequent screening excluded from the final listing of 1,978 whistle ban crossings to be analyzed (Table 3-1), those crossings that satisfied the following criteria:

- No train has a maximum authorized speed (as established by the railroad) of 15 miles per hour or more for that segment of track **and** properly equipped flaggers (as defined in 49 CFR 234.5) provide warning of approaching trains to motorists.

TABLE 3-1
HIGHWAY-RAILROAD CROSSINGS STUDIED

Ban Type	Number of Crossings
Current Bans	
24 Hour Bans	1,898
Nighttime-Only Bans	80
Total	**1,978**

3.1.2 Grade Crossings with Current Bans Table 3-2 shows the types of highway-user warning devices installed at the 1,978 crossings with current whistle bans and all public highway-rail at-grade crossings within the United States. Crossings with whistle bans are more likely to be gated as compared to the proportion of all public crossings in the United States that are gated. For example, as reported in the FRA Nationwide Study, only 17 percent of crossings are equipped with gates compared to 56% of the whistle ban crossings under study in this EIS.

TABLE 3-2
COMPARISON OF TYPES OF WARNING DEVICES
CROSSINGS WITH WHISTLE BANS VS. TOTAL PUBLIC CROSSINGS IN U.S.

Crossings with Whistle Bans

Warning Device	Number of Crossings	Percentage of Total Crossings
Gates	1,106	55.9
Flashers	341	17.2
Crossbucks	340	17.2
Other	27	1.4
None	164	8.3
TOTAL	**1,978**	**100.0**

Public Crossings in U.S. (prior to 1995)

Warning Device	Number of Crossings	Percentage of Total Crossings
Gates	28,139	16.7
Flashers	29,645	17.6
Crossbucks	85,440	50.8
None/Other	24,999	14.9
TOTAL	**168,223**	**100.0**

The 1,978 crossings subject to whistle bans are located in 24 states, as shown in Figure 3-1. The state with the most locations with current whistle bans is Illinois, with 840. Other states with significant numbers of crossings subject to current whistle bans include: Wisconsin (195), Minnesota (164), Virginia (106), and Missouri (103).

Four percent, or 80 of the current bans, are effective only during nighttime hours, usually between 6:30 P.M. and 6:30 A.M. Figure 3-2 shows the locations in eight states and 18 cities of the crossings with nighttime-only bans. The types of warning devices installed at these 80 crossings include 29 with gates and lights, 29 with flashing lights, and 22 with passive devices.

FIGURE 3-1
NUMBER OF CROSSINGS BY STATE SUBJECT TO CURRENT WHISTLE BANS

Number of Crossings: 1978
Number of States: 24

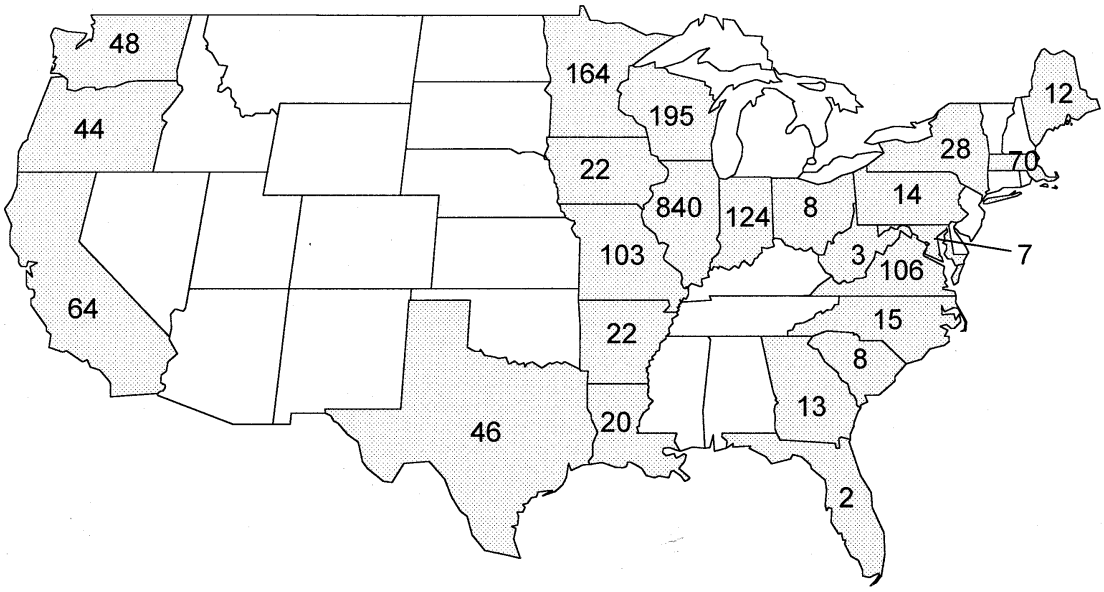


FIGURE 3-2
NUMBER OF CROSSINGS WITH NIGHTTIME-ONLY WHISTLE BANS

Number of Crossings: 80
Number of States: 8

3.1.3 Former Locations of Whistle Bans In conducting the Nationwide Study, FRA learned that, during the study period, cancellations of whistle bans occurred at 1,194 highway-rail crossings throughout the United States. A significant number of these cancellations are due to FRA Emergency Order No. 15 (July 26, 1991). For the purpose of this DEIS, crossings that had whistle bans will be considered for cumulative effects as an indication of the latent demand for quiet zones in the nation.

3.2 SAFETY OF HIGHWAY-RAIL GRADE CROSSINGS

The Florida State Legislature enacted a statute that permitted communities to establish nighttime train whistle bans beginning in 1984. This statute applied only to the Florida East Coast Railway Company (FEC), an intra-state railroad, from10:00 P.M. to 6:00 A.M. Eventually, 511 of 600 public grade crossings on the FEC carried bans. Unfortunately, the nighttime accident rate increased at the crossings covered by whistle bans. During hearings held in 1990 by the U.S. House of Representatives Committee on Appropriations, FRA was requested to determine if there was a correlation between the rise in accident rates with whistle bans in Florida. FRA studied the nighttime accident rate at the 511 affected crossings using a 1984-to-1989 study period and found that the rate increased 195 percent following the imposition of whistle bans, while daytime accident rates at the same crossings remained virtually unchanged.[1] Based on its investigation and the lack of any response to correct the safety hazard, FRA issued Emergency Order No. 15 on July 26, 1991. This order requires the FEC to sound train whistles when approaching public highway-rail grade crossings, which essentially requires the FEC to follow the operating procedures in place for the use of whistles before the whistle bans were passed. The effect on accident rates following Emergency Order No. 15 was significant. Daytime (6:01 A.M. - 9:59 P.M.) accidents declined by 8.8 percent and nighttime accidents (10:00 P.M. - 6:00 A.M.) declined by 68.8 percent to equal pre-whistle ban levels.

FRA's 1995 Nationwide Study followed two analytical approaches: the first analyzed empirical data using a case study approach; the second examined the entire crossing database. The Nationwide Study used an established analytical model to predict the likelihood of collisions at highway-rail crossings based on certain physical (e.g., the type of roadway traveling over the tracks) and operational (e.g., the speed of the train) characteristics. The predicted collision rates were compared with the actual collision histories for crossings with whistle bans. As an independent control group, collision predictions for all other 167,000 crossings in the US DOT/AAR Highway-Rail Crossing Inventory were computed and compared to their actual collision histories. FRA then examined the variance between the predicted and actual collisions for whistle ban and non-whistle ban groups. Of special interest was any difference in how well each group conformed (or did not conform) to its predicted frequency of collisions. The variance between the whistle ban groups and non-whistle bans groups was of interest because significant variances suggest that the sounding of train horns has an effect on the rate of collisions at public highway-railway grade crossings. The following description of the condition of public safety at affected crossings is drawn from the Nationwide Study.

3.2.1 Data Description The primary data source for the proposed rule is the US DOT/AAR Highway-Rail Crossing Inventory database of all highway-rail crossings in the United States. This database, created by states, railroads, and the US DOT, is voluntarily kept current by states and railroads providing information to the FRA on new crossings and changes to

[1] *Florida's Train Whistle Ban*, Federal Railroad Administration, Office of Safety, FRA, July 1990.

crossings by using U.S. DOT-AAR Crossing Inventory Form, Form FRA F 6180.71 and/or electronic equivalents.
In 1991, FRA asked the AAR to provide information on all crossings subject to whistle bans. AAR's survey identified 2,705 crossings reported to be subject to either 24 hour or nighttime-only bans as of the time of the survey. In the survey, 25 railroads responded, 17 of which reported operating over crossings subject to whistle bans. The respondents operate over a total of 102,737 public grade crossings. This number represents about 61 percent of the national total of approximately 168,000 crossings at the time. Crossings not included in the survey are on the properties of approximately 603 other railroads, all of which are smaller railroads.

FRA believes that nearly all Class I railroad crossings were covered by the survey. Because Class I railroads, as a group, accounted for about 91 percent of the total annual train miles operated in 1993, the crossings listed in the AAR survey experience a very large share of the total interactions between highway-users and trains that occur at crossings subject to whistle bans. Therefore, the survey was deemed an adequate basis for this analysis.

3.2.2 Before and After Case Studies Using information about whistle ban cancellations and implementations from the AAR survey, in addition to collision data from FRA's crossing accident/incident file[2], the Nationwide Study makes direct comparisons of collision occurrences for twelve groups of crossings. A comparison of collisions is shown in Table 3-3 for each crossing for equal periods of time when the crossings were and were not subject to whistle bans. This type of "before and after" comparison is similar to the technique used to study the impact of whistle bans in Florida.

Each crossing was studied for equivalent time periods before and after the date a whistle ban was terminated (or in a few cases, implemented). Since the time periods were not equal for all cases, a normalizing procedure was required.

For the twelve case studies, a total of 130 collisions occurred during whistle bans while 80 collisions occurred when horns were sounded, indicating a 38 percent reduction in the overall rate of collisions after whistle bans were canceled. 41 injuries and 11 fatalities occurred during the whistle bans, compared to 28 injuries and 4 fatalities for periods without whistle bans.

In conducting these case studies, FRA noted that several crossings had more than one collision. One crossing had five collisions during the 33 months and 2 weeks of the non-ban period reviewed. Three crossings had 4 collisions, 5 crossings had 3 collisions, and 13 crossings had 2 collisions during the periods when horns were not sounded.

The case studies reflect a very diverse group of crossing configurations, warning devices, traffic mixes, and locations. Unlike the Florida crossings, which were relatively homogeneous especially with regard to the number of trains, the crossings in these case studies embody such a variety of situations that the results should be free from significant bias. In addition, the eight state geographical distribution represented in the case studies contributes to a more credible portrayal of the national safety implication of train whistle bans.

[2] Pursuant to 49 U.S.C. §20901, railroads are required to file accident/incident reports with the FRA. Any contact involving on-track equipment and an automobile, bus, truck, motorcycle, bicycle, farm vehicle, pedestrian, or other highway user at a highway rail crossing must be reported to the FRA on the "Highway-rail Grade Crossing Accident/Incident Report," Form FRA F 6180.57. The FRA has maintained a computer-based file of these reports since 1975.

National Comparison

For a more generalized indication of the impact of train whistle bans, FRA collected crossing information for the entire nation for the five-year period from January 1989 through December 1993. Without regard to state borders or railroad identities, national information and information about the crossings with whistle bans were compared as two large groups. FRA used an analytical model to predict the expected frequency of collisions within the two groups and compare the results with actual collision information.

Table 3-3
COLLISION COMPARISONS FOR EQUAL TIME INTERVALS WITH AND WITHOUT WHISTLE BANS

Public Crossings - Excludes Private and Pedestrian Crossings

Case Study	Railroad And Location	Number Of Crossings	Time Interval	Ban Status	Number of Collisions	Number of Fatalities	Number of Injuries	Number of Crossings with Multiple Collisions, Number Of Collisions			
								2	3	4	5
1	Conrail		32mo-3wks	Ban	32	2	10	4	1	-	-
	Sys-Wide Except S. Bend	288	32mo-3wks	No-Ban	15	1	0	1	-	-	-
2	Conrail S. Bend & Mishawaka	62	19mo-1wk	Ban	10	3	0	2	-	-	-
			19mo-1wk	No-Ban	8	1	3	2	-	-	-
3	CSX Kentucky	158	23mo-2wks	Ban	18	0	7	2	1	-	-
			23Mo-2Wks	No-Ban	12	1	8	2	-	-	-
4	CSX Michigan	135	38mo-2wks	Ban	38	1	10	3	2	1	-
			38Mo-2Wks	No-Ban	11	0	9	1	-	-	-
5	KCS System Wide	82	33mo	Ban	11	1	9	1	-	-	-
			33mo	No-Ban	18	1	5	4	-	-	-
6	UP Camden, Ar	11	22mo	Ban	2	0	0	-	-	-	-
			22Mo	No-Ban	2	0	2	-	-	-	-
7	UP Dalles, Or	4	22mo	Ban	0	0	0	-	-	-	-
			22Mo	No-Ban	0	0	0	-	-	-	-
8	CSX Georgia Except Garden City	35	31mo-3wks	Ban	3	0	1	-	-	-	-
			31mo-3wks	No-Ban	0	0	0	-	-	-	-
9	CSX Georgia Garden City	5	21mo-1wk	Ban	0	0	0	-	-	-	-
			21mo-1wk	No-Ban	2	0	0	1	-	-	-
10	SR & NS Hapeville Georgia	5	33mo-2wks	Ban	13	0	4	1	1	2	-
			33mo-2wks	No-Ban	5	0	0	-	-	-	1
11	BAR Maine	12	32mo	Ban	1	0	0	-	-	-	-
			32Mo	No-Ban	2	0	0	-	1	-	-
12	SOO Winona, Mn	34	38mo-2wks	Ban	2	0	0	-	-	-	-
			38Mo-2Wks	No-Ban	5	0	1	-	-	-	-
TOTALS DURING BANS:					**130**	**11**	**41**	**13**	**5**	**3**	**0**
TOTALS WITHOUT BANS:					**80**	**4**	**28**	**11**	**1**	**0**	**1**

This procedure applied FRA's crossing accident prediction model developed in the early 1980s. This model, referred to as the "Accident Prediction Formula" (APF), is routinely used to determine those crossings at which warning devices should be given priority for upgrading. The formula was developed using data from thousands of collisions and incidents spanning many years. It does not consider whether a crossing has a whistle ban.

The model uses information about the physical characteristics of a crossing, such as the number of tracks, the number of highway lanes, types of existing warning devices (gates, flashing lights, and signs), whether its location is urban or rural, and whether the roadway is paved. The formula also considers operational information about the number of highway vehicles using the crossing per day and the number and maximum speed of trains in order to predict the frequency of collisions at a particular crossing.

For this comparison, the formula was used without a supplemental factor normally used to adjust its output for recent collision occurrences at a specific crossing. As a result, the analysis considered only the essential crossing characteristics, and was not skewed by local, collision-causing anomalies.

For this comparison, the "Study Group" of 2,122 crossings was purged of 900 crossings that either had a change in the status of its whistle ban or had a change to the type of motorist warning device installed between 1989 and 1993. Either change would have invalidated the results of the APF for the crossings. The resulting collision estimates were based solely on each crossing's physical and operational parameters. FRA applied the APF to estimate the five-year collision rates for the remaining 1,222 crossings reported to be subject to whistle bans. The 1,222 crossings with whistle bans were sorted in order of increasing risk according to their APF ratings, divided into ten groups of nearly equal size, and labeled A through J as shown in Table 3-4. Based on the APF ratings, Group "A" had the least risk and Group "J" had the highest risk.

The FRA used the APF to estimate the five-year collision rates for crossings in the 167,000 crossings in the US DOT/AAR National Highway-Rail Crossing Inventory, that did **not** have whistle bans in effect for the period 1989 through 1993. As with the whistle ban crossings, the inventory crossings were sorted and divided into corresponding risk groups A through J according to their APF ratings.

TABLE 3-4
STUDY PERIOD CROSSING COLLISIONS (WITH AND WITHOUT WHISTLE BANS)

	WITHOUT WHISTLE BANS			**5-YEAR WHISTLE BANS**			
APF Group	**Number of Crossings**	**5-Year Collisions**	**Collision Rate**	**Number of Crossings**	**5-Year Collisions**	**Collision Rate**	**Percent Increase with Ban**
A	35,056	954	0.02721360	123	9	0.07317073	168.88
B	38,460	1,786	0.04643786	121	8	0.06611570	42.37
C	25,059	2,199	0.08775290	122	20	0.16393443	86.81
D	19,761	2,443	0.12362735	122	46	0.37704918	204.99
E	18,552	3,232	0.17421302	126	43	0.34126984	95.89
F	9,478	2,207	0.23285503	119	58	0.48739496	109.31
G	7,205	2,219	0.30798057	122	31	0.25409836	- 17.50
H	6,291	2,543	0.40422826	121	74	0.61157025	51.29
I	4,556	2,230	0.48946444	122	66	0.54098361	10.53
J	2,582	1,707	0.66111541	124	156	1.25806452	90.29
Total	167,000			1,222			**84.00**

For each group, "with" and "without" whistle bans[3], the number of collisions for the five-year period for the group was divided by the number of crossings. This calculation produced an collision rate per crossing risk group, independent of group size. These data are shown in Table 3-4 and Figure 3-3. Finally, subtracting the non-ban rate from the whistle ban rate, and then dividing by the non-ban rate determined the percentage difference in the collision rates between whistle ban and non-ban crossings. This produced the percentage by which the whistle ban rate exceeded the non-ban rate. These percentage increases are shown in Table 3-4 and Figure 3-4.

FIGURE 3-3

Collision History: 1989 through 1993

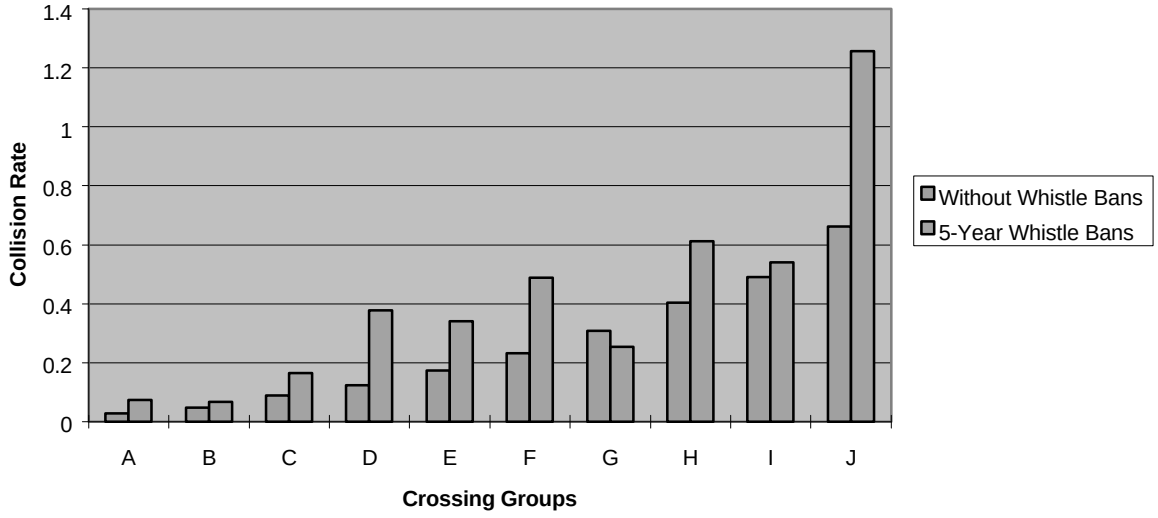
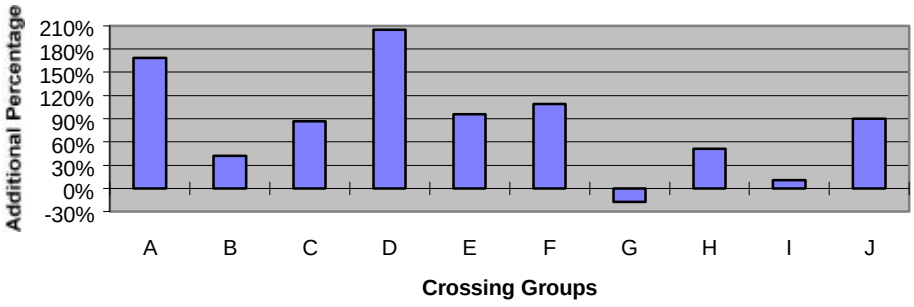


FIGURE 3-4

Percentage Increase in Collisions: Whistle Ban vs. Non-Whistle Ban



[3] Crossings, which had a ban for part of the period, were included in the "non-ban" group. This inclusion caused the differences between the two groups to be understated. The ten groups, "A" (least risk) through "J" (highest risk) vary in size. Since the subsequent analysis is based on collision rate per crossing, the variance in group size did not affect the validity of the analysis. The technique of stratification is normally used to prevent a preponderance of a certain characteristic, or a large number of low or high risk values from masking differences or skewing a comparison based on fully aggregated groups.

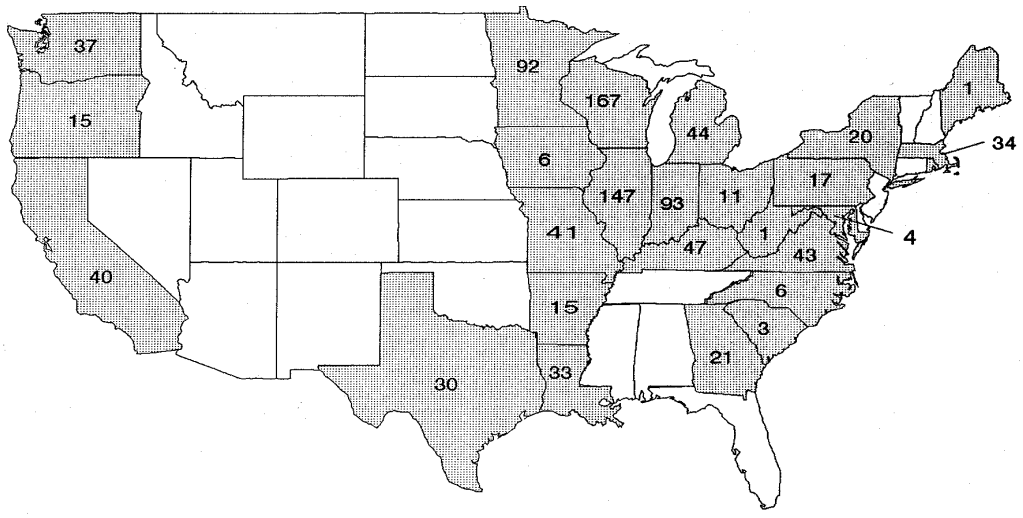
The results of this collision rate per crossing analysis were dramatic. For nine out of ten theoretically similar risk groups, the whistle ban crossings had significantly higher collision rates over the five-year period than did the non-ban crossings. While one group showed whistle ban crossings with 17.5 percent fewer collisions per crossing, the other nine groups clearly showed that crossings with five-year whistle bans were less safe than similarly grouped non-ban crossings. The average difference for all ten groups, including the group with the 17.5 percent reduction, was an 84 percent increase in the collision rate per crossing.

3.2.3 Initial Whistle Ban Collision Summary A review of the collisions at crossings with whistle bans indicated a total of 948 collisions between January 1, 1988 and June 30, 1994. These collisions resulted in 62 fatalities and 308 injuries. All seventeen railroads that reported operating over crossings with whistle bans experienced at least one collision at a crossing subject to a ban during the time period. The numbers of collisions, and the resulting fatalities and injuries by reporting railroad are shown Table 3-5. Geographically, 24 of the 27 states with crossings subject to whistle bans experienced collisions at one or more of their crossings during the study time period. A tabulation of the locations of the collisions is provided in the Table 3-6 and on the maps in Figure 3-5 and Figure 3-6.

TABLE 3-5COLLISIONS EXPERIENCED BY RAILROADS AT CROSSINGS DURING WHISTLE BANS: JANUARY 1, 1988 THROUGH JUNE 30, 1994

Railroad	Number of Collisions	Number of Fatalities	Number of Injuries
ATK	54	5	19
ATSF	20	2	6
BA	1	0	0
BN	80	13	20
CNW	49	8	19
CR	81	11	26
CSX	113	4	31
DH	4	0	5
GTW	3	0	1
KCS	11	1	9
NS	10	0	4
NW	89	5	31
SOO	157	2	33
WP	28	2	7
SR	5	0	0
UP	101	7	36
WC	142	2	61
TOTALS	**948**	**62**	**308**

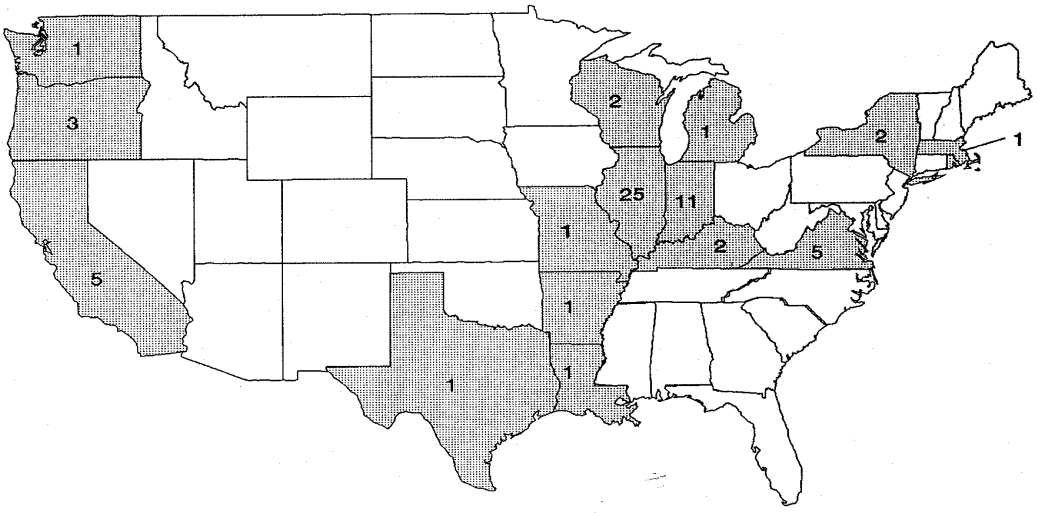
FIGURE 3-5



NUMBER OF ACCIDENTS AT CROSSINGS DURING WHISTLE BANS
JANUARY 1988 THROUGH JUNE 1994
EXCLUDES PRIVATE AND PEDESTRIAN CROSSINGS

NUMBER OF ACCIDENTS 948
NUMBER OF FATALITIES 62
NUMBER OF INJURIES 308
NUMBER OF STATES 25

Figure 3-6



NUMBER OF FATALITIES AT CROSSINGS DURING WHISTLE BANS
JANUARY 1988 THROUGH JUNE 1994
EXCLUDES PRIVATE AND PEDESTRIAN CROSSINGS

NUMBER OF FATALITIES 62
NUMBER OF STATES 15

TABLE 3-6
COLLISIONS IN STATES AT CROSSINGS DURING WHISTLE BANS: JANUARY 1, 1988 THROUGH JUNE 30, 1994

State	Number of Collisions	Number of Fatalities	Number of Injuries
AR	15	1	4
CA	40	5	17
GA	21	0	5
IA	6	0	1
IL	144	25	41
IN	93	11	34
KY	47	2	15
LA	33	1	12
MA	34	1	15
ME	1	0	0
MI	41	1	10
MN	92	0	15
MO	41	1	13
NC	6	0	1
NY	20	2	10
OH	11	0	2
OR	15	3	8
PA	17	0	2
SC	3	0	0
TX	30	1	10
VA	38	5	16
WA	37	1	5
WI	162	2	72
WV	1	0	0
TOTALS	**948**	**62**	**308**

Collision Conditions

The circumstances of collisions occurring during periods of whistle bans were compared with those of collisions during non-ban periods to determine whether the sounding of train horns reduced or prevented collisions under certain conditions. Collisions at the crossings where whistle bans were canceled or enacted were grouped according to whether they occurred during the ban or non-ban periods. The conditions for the ban and non-ban groups are shown in Table 3-7.

Almost two thirds of the collisions occurred in clear weather (65 and 62 percent). Collisions during bad weather, including rain, fog, sleet, and snow, showed a negligible difference when horns were sounded (14 percent compared to 13 percent). Night collisions accounted for 48 percent of the total during the ban period, compared to 43 percent when horns were permitted. Collisions at dawn and dusk were about the same during the ban and non-ban periods (7 percent compared to 5 percent).

However, collisions that occurred when motorists drove around lowered gates accounted for 28 percent of the cases when horns were banned and only 15 percent when horns were sounded. Motorists were struck by a second train with the same frequency during both ban and non-ban periods (about 2 percent of the cases).

TABLE 3-7
COLLISION CONDITIONS

	Horns Banned		Horns Sounded	
Total Collisions	**948**		**100**	
CONDITIONS	**NUMBER**	**Percent***	**NUMBER**	**Percent***
Clear Weather	617	65	62	62
Cloudy	195	21	25	25
Rain	98	10	6	6
Fog	8	1	0	0
Sleet	2	0	1	1
Snow	28	3	6	6
Daylight	421	44	52	52
Dusk or Dawn	69	7	5	5
Night	458	48	43	43
View Obstructed	56	6	6	6
Signal Failure	1	0	0	0
Hit by 2nd Train	17	2	2	2
Struck Side of Train	206	22	21	21
Drove Around Gates	270	28	15	15

*Percent of total. Multiple conditions are possible.

Similarly, collisions where motorists struck the side of the train occurred with about equal frequency during both ban and non-ban periods (22 percent compared to 21 percent). In the combined total of 1,048 collisions, there was only one instance where the crossing warning device had failed to operate. That one collision was at a crossing with a whistle ban in effect.

Collisions at night or involving motorists who drove around lowered gates showed a reduced frequency when train horns were sounded and suggest that train horns reduce collisions in instances of darkness and motorist impatience.

Nighttime-Only Collisions

When FRA examined the collision histories of the 118 crossings subject to nighttime-only whistle bans, the data were found to be insufficient to support statistically meaningful conclusions. Low highway and/or train traffic volumes after midnight are probably responsible for the relatively small number of collisions that occurred during the nighttime whistle ban hours between midnight and 6:30 a.m. Only 2 of the 17 collisions (approximately 12 percent) occurred during those hours.

3.3 NOISE AT HIGHWAY-RAIL GRADE CROSSINGS

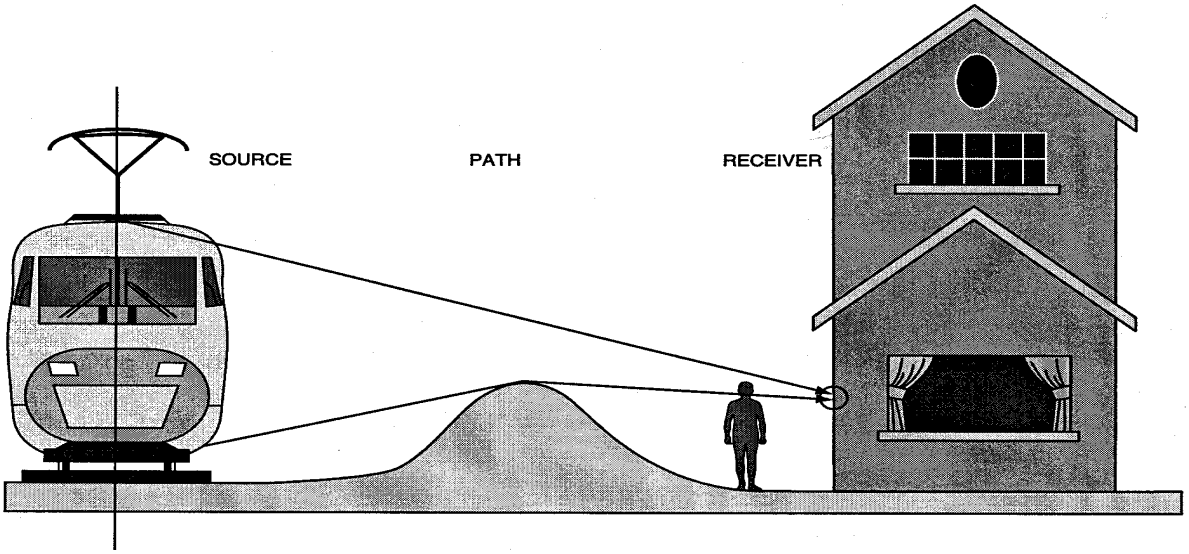
FRA recognizes that railroad noise and locomotive horn noise in particular can exceed desirable sound levels near railroad tracks. While significant horn sound levels are necessary to meet the intent of this safety device, sound generated by railroad vehicles (exclusive of sound from safety devices, which are exempt from EPA regulation) must not exceed a maximum acceptable standard set by EPA.[4] FRA enforces this standard through its Railroad Noise Emission Compliance Regulation, 49 CFR 210. The provisions of the Swift Act and the proposed rule both recognize the significant annoyance that train horn noise can cause. The

[4] U.S. Environmental Protection Agency, "Noise Emission Standards for Transportation Equipment: Interstate Rail Carriers," 40 CFR 201.

proposed rule is substantially devoted to making provisions for mitigation of horn noise available to the nation. (See Chapter 4, "Environmental Consequences," for more information on mitigation.)

3.3.1 Noise and Acoustics Concepts Noise generated by ground transportation is commonly expressed by the conceptual framework of source - path - receiver. (See Figure 3-7.) A noise generating transportation **source** creates sound that propagates along a **path** to a **receiver.** Sound levels from the source are reduced (attenuated) by distance, intervening obstacle, and other factors. Finally, the receiver perceives the sound in the context of all other sounds understood as a background sound level. The degree of impact a particular noise event causes, depends principally upon the sensitivity of the receiver and the relative increase in cumulative noise exposure (event + background noise vs. background noise).

FIGURE 3-7
SOURCE-PATH-RECEIVER FRAMEWORK



Source: *High Speed Ground Transportation Noise and Vibration Impact Assessment* (FRA, Final Draft, December, 1998, Washington, DC).

The universal descriptor used for environmental noise is the A-weighted sound level.[5] It describes the level of noise measured at a receiver at any moment in time and is read directly from noise-monitoring equipment, with the weighting switch set on "A." Typical A-weighted sound levels range from the 40s to the 90s, where 40 is very quiet and 90 is very loud. The scale notation "**dBA**" indicates A-weighted sound levels. The letters "dB" signify "decibels" and refer to the general strength of the noise. The letter "A" indicates that the sound has been filtered to reduce the strength of very low and very high frequency sounds, much as the human ear does. Without this A-weighting, sound-monitoring equipment would respond to events people cannot hear, such as high-frequency dog whistles and low-frequency seismic disturbances. On the average, each A-weighted sound level increase of 10 decibels corresponds to an approximate doubling of subjective loudness.

[5] Detailed definitions and mathematical representations of these noise descriptors can be found in *the FRA High Speed Ground Transportation Noise and Vibration Impact Assessment Manual,* Final Draft, December 1998.

The **Maximum Sound Level (L_{max})** describes the highest exponential-time-average sound level in A-weighted decibels that occurs during a certain measurement period. It is a descriptor of the maximum sound energy level from a source, such as a train horn.

The **Sound Exposure Level (SEL)** describes a receiver's cumulative sound exposure from a single sound event. It represents the total A-weighted sound energy during an event, normalized to a one-second interval. It is the primary descriptor of rail vehicle noise emissions and an intermediate value in the calculation of both L_{eq} and L_{dn} (defined below).

The **Hourly Equivalent Sound Level [L_{eq} (h)]** describes a receiver's cumulative sound exposure L_{eq} from all events over a one-hour period. The underlying metric for calculating L_{eq} (h) is SEL. L_{eq} (h) is used to assess noise for non-residential land uses. For assessment, L_{eq} is computed for the loudest operating hour during the hours of noise-sensitive activity.

The **Day-Night Sound Level (L_{dn} or DNL)** describes a receiver's cumulative sound exposure from all events over a 24-hour period. The basic unit used in calculating L_{dn} is the L_{eq} (h) for each one hour period. It may be thought of as a sound exposure, totaled after increasing all nighttime A-Levels (between 10 p.m. and 7 a.m.) by 10 decibels. Every sound event during the 24-hour period increases this exposure, louder events more than quieter events, and events that are of longer duration more than briefer events. L_{dn} is used to assess noise for residential land uses. Typical community L_{dn}'s range from about 50 to 70 dBA, where 50 dBA represents a quiet environment and 70 dBA is a noisy one.

3.3.2 Noise Impact Criteria Noise can interrupt ongoing activities and can result in community annoyance, especially in residential areas. In general, most residents become highly annoyed when noise interferes significantly with activities such as sleeping, talking, noise-sensitive work, and listening to radio, TV, or music. In addition, some land uses, such as outdoor concert pavilions, are inherently incompatible with high background noise levels.

Annoyance from noise has been investigated and approximate exposure-response relationships have been quantified by the Environmental Protection Agency (EPA).[6,7] The selection of noise descriptors used in this document is largely based upon this EPA work. Beginning in the 1970s, EPA undertook a number of research and synthesis studies relating to community noise of all types. Results of these studies have been widely published. Basic conclusions of these studies have been adopted by the Federal Interagency Committee on Noise[8], the Department of Housing and Urban Development (HUD)[9], the American National

[6] Environmental Protection Agency, "Impact Characterization of Noise Including Implications of Identifying and Achieving Levels of Cumulative Noise Exposure," Task group 3, Henning von Gierke, Chairman, Report NTID 73.4, Washington, DC, 27 July 1973.

[7] Environmental Protection Agency, "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety," Report No. 550/9-74-004, Washington, DC, March 1974.

[8] Federal Interagency Committee on Urban Noise, "Guidelines for Considering Noise in Land Use Planning and Control," a joint publication of the Environmental Protection Agency, the Department of Transportation, the Department of Housing and Urban Development, the Department of Defense, and the Veterans Administration, Washington, DC, June 1980.

[9] Department of Housing and Urban Development, "Environmental Criteria and Standards of the Department of Housing and Urban Development," 24 Code of Federal Regulations Part 5 1; 44 Federal Register 40861, Washington, DC, 12 July 1979.

Standards Institute[10], and even internationally.[11] Conclusions from EPA's seminal work remain scientifically valid to this day.

In a large number of community attitudinal surveys, transportation noise has been ranked among the most significant causes of community dissatisfaction. A synthesis by Schultz of many such surveys on annoyance appears in Figure 3-8.[12,13] Different neighborhood noise exposures are plotted horizontally. The percentage of people who are *highly annoyed* by their particular level of neighborhood noise is plotted vertically. As shown in the figure, the percentage of high annoyance is approximately 0 percent at 45 decibels, 10 percent around 60 decibels and increases quite rapidly to approximately 70 percent around 85 decibels. The scatter about the synthesis line is due to variation from community to community and to some wording differences in the various surveys. A recent update of the original research, containing several additional railroad, transit and street traffic noise surveys, confirmed the shape of the original Schultz curve.[14]

This research and study is incorporated into the noise criteria used in this EIS. Both absolute thresholds, which consider activity interference caused by the transportation noise source alone, and relative thresholds, which consider annoyance due to the change in the noise environment caused by the transportation noise source are represented. The criteria used were developed to apply to a wide variety of surface transportation modes, to recognize the heightened community annoyance caused by late-night or early-morning operations, and to respond to the varying sensitivities of communities to projects under different background noise conditions. The noise criteria and descriptors for human annoyance depend on land use designated Category 1, Category 2, or Category 3 as shown in Table 3-8.

These categories consider such functions as residences and buildings where people normally sleep and institutional land uses with primarily daytime and evening use. The criteria do not apply to most commercial or industrial uses because the activities within these buildings are generally compatible with higher noise levels. They do apply, however, to business uses that depend on quiet as an important part of operations, such as sound and motion picture recording studios.

The noise impact criteria are represented by two curves in Figure 3-9 relating source noise levels to existing noise. The complex shapes of the curves represent a scale of cumulative noise exposure and are used to compare existing outdoor noise levels with future outdoor noise levels including a transportation noise source. A transportation source that generates noise below the lower curve is considered to have no noise impact since on average the increase in the number of people highly annoyed by the added noise source has been shown to be insignificant.

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[10] American National Standards Institute, "American National Standard: Compatible Land Use With Respect to Noise," Standard S3.23-1980, New York, NY, May 1980.

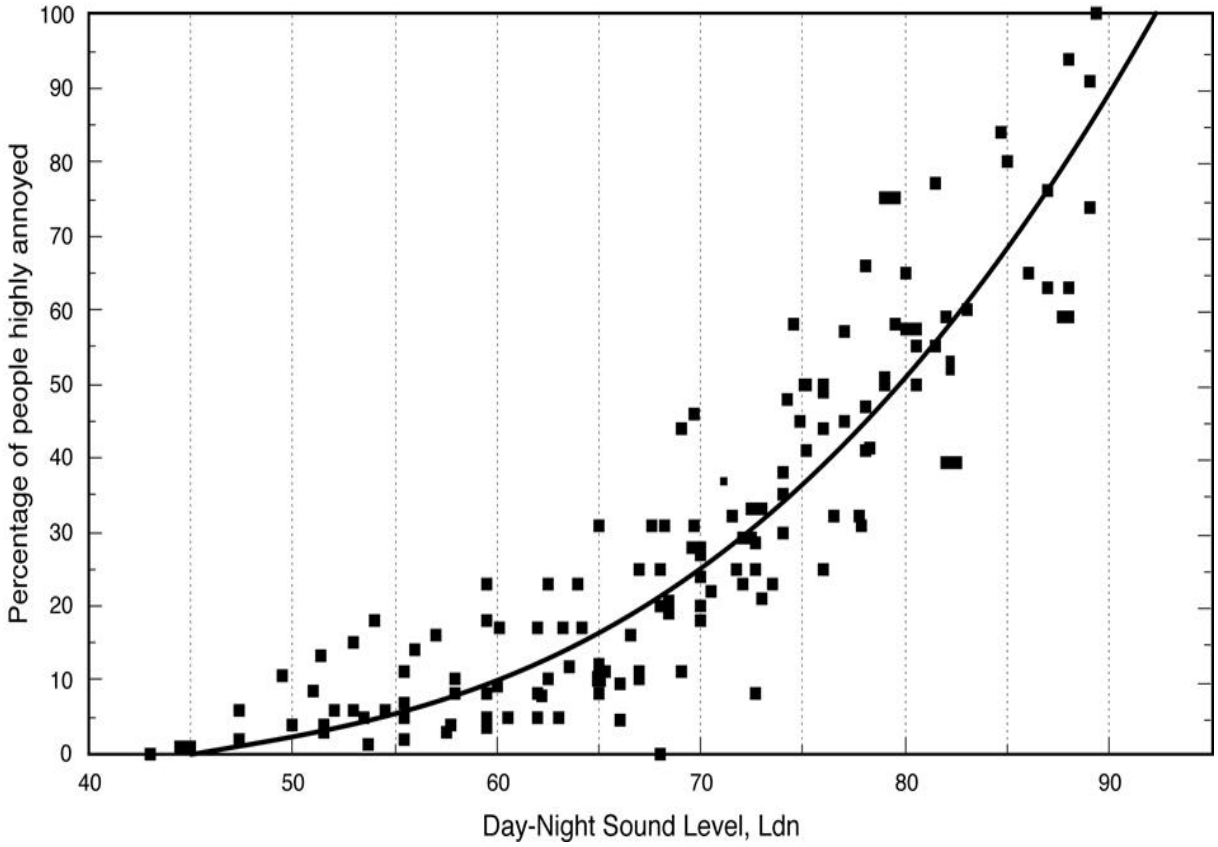
[11] International Standards Organization, "Assessment of Noise with Respect to Community Response," Recommendation R- 1996, Geneva, 1971.

[12] T.J. Schultz, "Noise Rating Criteria for Elevated Rapid Transit Structures," U.S. Department of Transportation Report No. UMTA-MA-06-0099-79-3, Washington DC, May 1979.

[13] T.J. Schultz, "Synthesis of Social Surveys on Noise Annoyance," Journal of the Acoustical Society of America, Vol. 63, No. 8, August 1978.

[14] S. Fidell, D.S. Barber, and T.J. Schultz, "Updating a Dosage-Effect Relationship for the Prevalence of Annoyance Due to General Transportation Noise," Journal of the Acoustical Society of America, Vol. 89, No. 1, January 1991.

FIGURE 3-8
NOISE ANNOYANCE CURVE



Source: *T. J. Schultz, "Synthesis of Social Surveys on Noise Annoyance," Journal of the Acoustical Society of America, Vol. 63, No. 8, August 1978.*

A noise source that falls between these two curves is judged to have some impact, although not severe. The change in the cumulative sound level here is noticeable to most people, but it may not be sufficient to cause strong, adverse reactions from the community. In this transitional area, other source specific factors must be considered to determine the magnitude of the impact and the need for mitigation, such as the predicted level of increase over existing sound levels and the types and numbers of noise-sensitive land uses affected. The curve defining the onset of noise impact stops increasing at 65 dB for Category 1 and 2 land use, a standard limit for an acceptable living environment as defined by a number of federal agencies.

Transportation noise above the upper curve is considered to cause a severe impact because a significant percentage of people would be highly annoyed by the new noise. This curve flattens out at 75 dB for Category 1 and 2 land uses, a level associated with an unfavorable living environment. As indicated by the right-hand scale on Figure 3-9, the project noise criteria are 5 decibels higher for Category 3 land uses since these types of land use are considered to be slightly less sensitive to noise than the types of land use in categories 1 and 2.

TABLE 3-8
LAND USE CATEGORIES AND METRICS FOR HIGH SPEED RAIL NOISE IMPACT CRITERIA

Land Use Category	Noise Metric* (dBA)	Description of Land Use Category
1	Outdoor $L_{eq}(h)$**	Tracts of land where quiet is an essential element of their intended purpose. This category includes lands set aside for serenity and quiet such as outdoor amphitheaters, concert pavilions, as well as National Historic Landmarks with significant outdoor use.
2	Outdoor L_{dn}	Residences and buildings where people normally sleep. This category includes homes, hospitals, and hotels where a nighttime sensitivity to noise is assumed to be of utmost importance.
3	Outdoor $L_{eq}(h)$**	Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, churches, and other places where it is important to avoid interference with such activities as speech, meditation, and concentration on reading material. Buildings with interior spaces where quiet is important, such as medical offices, conference rooms, recording studios and concert halls fall into this category, as well as places for meditation or study associated with cemeteries, monuments, and museums. Certain historical sites, parks and recreational facilities are also included.

* Onset-rate adjusted sound levels (L_{eq}, L_{dn}) are to be used where applicable.
** L_{eq} for the noisiest hour of transit-related activity during hours of noise sensitivity.

Source: *High Speed Ground Transportation Noise and Vibration Impact Assessment* (Final Draft, FRA, December, 1998, Washington, DC)

The lower curve represents the impact area, and is based on the following considerations:

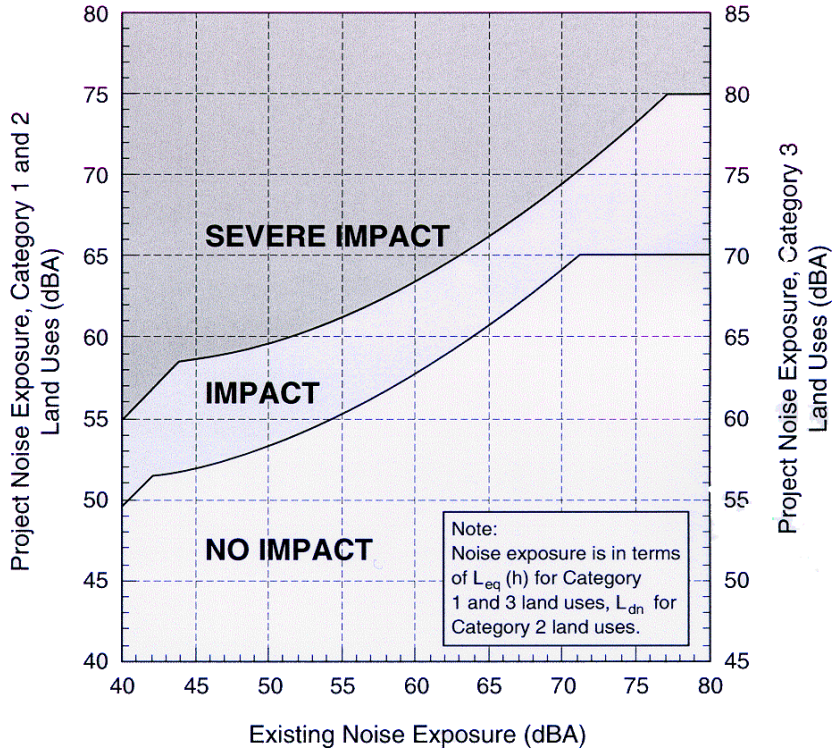
- The EPA finding that a community noise level of L_{dn} less than or equal to 55 dBA is requisite to protect public health and welfare with an adequate margin of safety.
- The conclusion by EPA and others that a 5-dB increase in L_{dn} or L_{eq} is the minimum required for a change in community reaction.
- The research finding that there are very few people highly annoyed when the L_{dn} is 50 dBA, and that an increase in L_{dn} from 50 dBA to 55 dBA results in an average of 2 percent more people highly annoyed.

The severe impact curve is based on the following considerations:

- The Department of Housing and Urban Development's environmental noise standards define an L_{dn} of 65 as the onset of a normally unacceptable noise zone. Moreover, the Federal Aviation Administration (FAA) considers that residential land uses are not compatible with noise environments where L_{dn} is greater than 65 dBA.

- The common use of a 5-dBA increase in L_{dn} or L_{eq} as the minimum required for a change in community reaction.

FIGURE 3-9
NOISE IMPACT CRITERIA BY LAND USE



Source: *High Speed Ground Transportation Noise and Vibration Impact Assessment* (FRA, December 1998, Washington, D.C.)

The introduction of horn noise into a community where a whistle ban is in effect may have two undesirable effects. First, it may significantly increase existing sound levels in the community, beyond levels residents have become accustomed to. This effect is called "relative" noise impact. Evaluation of this effect is "relative" to existing sound levels; relative criteria are based upon noise increases above existing levels. Second, newly introduced sound may interfere with community activities, independent of existing sound levels; it may be simply too loud to converse or to sleep. This effect is called “absolute" noise impact, because it is expressed as a fixed level not to be exceeded and is independent of existing sound levels. Both of these effects, relative and absolute, enter into the assessment of noise impact.

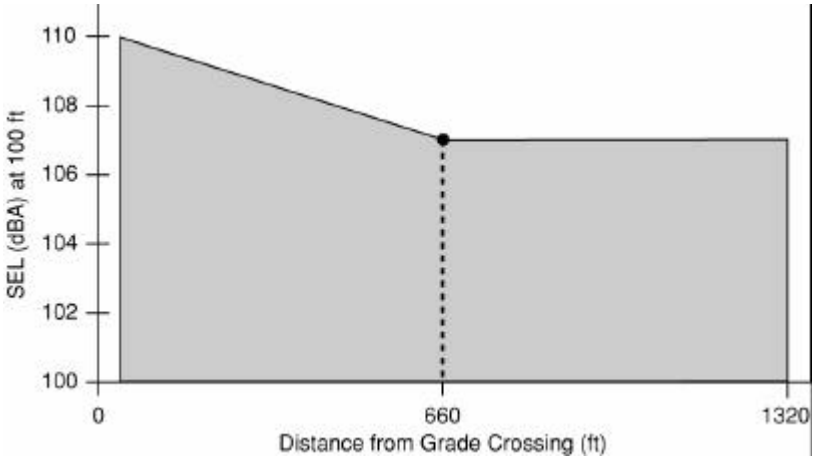
3.3.3 Development of a Predictive Train Horn Noise Model The noise concepts and criteria described in the previous section were used to assess the noise impacts of the proposed rule. A computer model was developed that uses a reference SEL for a typical train horn event at a highway-rail grade crossing to estimate the noise exposure contours for impact and severe impact areas near to and along a typical railroad line. The model assumed suburban residential development in the vicinity of the typical grade crossing and used the residential criteria, the most stringent, to assess impacts. A second integration procedure was developed using other computer software and data to apply the horn noise model to the 1,978 locations known to FRA to be potentially impacted by the proposed rule. This

integration adds to the accuracy of the modeling procedure to reflect the expected characteristics of the impacted population and to account for the varying density of affected populations across the nation. The model was also applied to locations previously known to have had whistle bans in order to assess the significance of potential cumulative and secondary effects that may contribute to the potential for mitigation. Field measurements were taken to arrive at a scientifically valid train horn reference SEL as part of the effort to complete this analysis. This effort and technical details of the development of the computer model and its application are described in detail in a Technical Supplement to this DEIS available upon request.

3.3.3.1 Reference SEL Although the maximum sound output of a horn can be determined in a laboratory, it is how the horn is used in the real world that determines its effect on the environment. For this reason and because there are a wide variety of actual horn blowing practices, an empirical reference SEL was developed using field measurements at grade crossings in numerous states. Although not all engineers commence blowing horns 1/4 mile in advance of a grade crossing, this starting point was noted as the average starting location on recent field observations. The proposed rule also includes a maximum distance of 1/4 mile where the horn blowing sequence may begin. While 1/4 mile was the empirical assumption, further analysis using other starting locations related to the 20 second provision and the 15 second option for consideration was also performed and will be discussed in Chapter 4.

FRA found that a reference level that varies from the beginning of the horn sequence to the grade crossing accurately represents the noise reference level. Recently collected data[15] show an average reference SEL of 107 dBA at 100 feet perpendicularly away from the nearest track represents the horn noise in the stretch from 1/4 mile to 1/8 mile in advance of a crossing. Starting at the 1/8-mile point, the data show that the horn is sounded more continuously in the last part of the blowing sequence as the train approaches the crossing. Consequently, the SEL is assumed to increase linearly to 110 dBA at the edge of the crossing. These assumptions result in the five-sided polygon shown shaded in Figure 3-10. This figure is the basis for the horn-noise model and the impact and severe impact areas at each grade crossing. The reference SEL and the number of train passes during day and night are used as the basis for calculating the L_{dn} for use with the noise impact criteria.

FIGURE 3-10
SOURCE LEVEL MODEL



[15] See the *Technical Supplement* for more information about the data gathered and derivation of the horn reference SEL.

3.3.3.2 Propagation Sound propagation depends on a great number of factors discussed in much greater detail in the Technical Supplement to this DEIS**.** The key effects of geometric spreading (divergence), ground effects, atmospheric effects, and shielding are built into the horn noise model as described in the following subsections. The assumed propagation effects are shown in Figure 3-11.

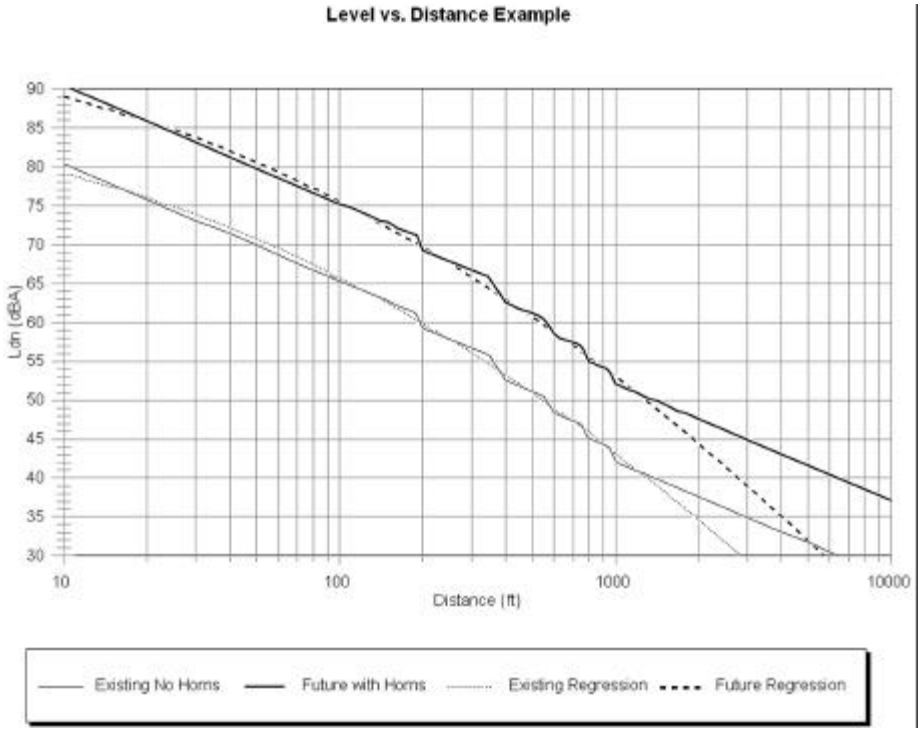
Each of the following effects are important in determining the distance to impact and severe impact, which in turn determine the size of the impact polygons.

Divergence
The sound from a horn is assumed to act as if it were emitting from a moving point source that acts like a line source with a 3-dB reduction for every distance doubling, when averaged over the length of track.

Ground effect
The model takes into account a generalized soft ground condition, assuming that most grade crossings with whistle bans are located in residential areas with grass and vegetation. This assumption results in an additional 1.5-dB reduction per distance doubling, so that when combined with the divergence relationship, a total of a 4.5-dB reduction per distance doubling applies.

Atmospheric effects
The model does not take into account atmospheric effects, assuming that if averaged over an entire year, the average condition is a uniform, quiescent atmosphere.

FIGURE 3-11
ASSUMED PROPAGATION EFFECTS OF LEVEL VS DISTANCE OF SOUND



Shielding
The model also accounts for shielding from rows of buildings. A general model for a national average of shielding at grade crossings was assumed. The general model was based on observations of urban and suburban grade crossings combined with field verification of the FRA noise prediction method with shielding. The generalized finding is that the first row of buildings occurs at 200 feet from the tracks, with succeeding rows of buildings at 200 foot intervals, with gaps between buildings constituting between 35 and 65 percent of the length of the row. Given this assumption, the model attributes a 3-dB reduction at the first row of buildings at 200 feet from the tracks, and a 1.5-dB reduction for each succeeding row of buildings at 400, 600, 800, and 1,000 feet. This assumption is relatively conservative, as denser development would result in more shielding.

3.3.3.3 Impact Zones Noise impact criteria used by the FRA are based on an increase in noise exposure. Consequently, the existing sound exposure with the whistle ban in place and the future sound levels with horn blowing must be estimated and compared for every grade crossing. Trains dominate the existing levels in the immediate vicinity of the tracks. The train noise L_{dn} depends on the number of trains passing during the day and night. At some distance from the track, however, a general ambient sound level is attained that is characteristic of the general ambient environment away from the influence of the railroad. According to the U.S. Environmental Protection Agency, the typical ambient level in a suburban residential area is L_{dn} = 55 dBA.[16] This level represents the noise "floor" in the noise impact calculation method.

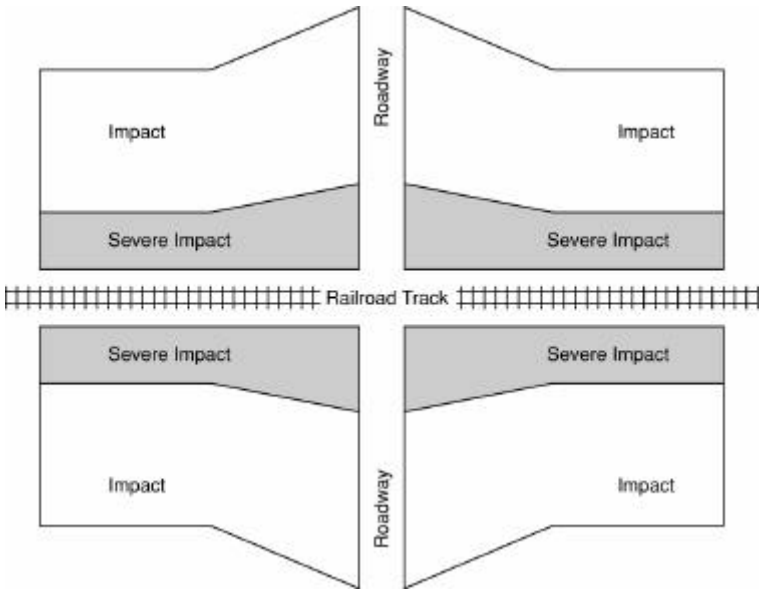
The horn noise model computes the horn noise in terms of L_{dn} as a function of distance from the tracks, and the train noise without horns as a function of distance from the track down to a noise floor, established by the ambient sound level. These calculations form two curves that were compared in the model at each distance from the railroad until the noise impact criteria ratings of impact and severe impact are reached for land use Category 2, residential land use. Since the original source model, shown shaded in Figure 3-10, is a polygon with five sides, the impact areas were similar polygons.

Typical impact and severe impact polygons are shown in Figure 3-12. The entire impact area is made up of two sets of four identical polygons for each grade crossing, each set representing either the Impact and Severe Impact areas. Each of the polygons are mirror images reflected around the axis represented by the road and the axis represented by the tracks. Consequently, the horn noise model calculates the vertices of the impact polygon in one quadrant only. The other three quadrants are determined by symmetry.

3.3.4 Application of the Model Horn Noise Model The horn noise model discussed in the preceding sections was designed to use data from the US DOT/AAR Highway-Rail Crossing Inventory, a database containing information about individual grade crossings. A C++ computer program was used as the basis of the model. A supplemental spreadsheet program was developed to generate noise impact polygons and then to convert x-y coordinates to latitude and longitude for use with GIS and census block data. The following sections detail the steps the computer model, the spreadsheet, and a GIS system played in estimating impacts at each of the grade crossings under analysis. Further application of these computer programs was used to assess the effects of mitigating provisions of the proposed rule at the crossings under study and at all public highway-rail grade crossings.

[16] U.S. Environmental Protection Agency, "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety," EPA Report No. 550/9-74-004, March 1974.

FIGURE 3-12
TYPICAL IMPACT POLYGONS



3.3.4.1 Horn Noise Prediction The horn noise computer model is used to develop the Impact and Severe Impact distances for each grade crossing under study. The calculation of these distances involves complex functions of sound level versus distance, and is much easier to model with a computer program. Each of the steps taken in the computer program and the input and output of the program are detailed in the following section.

Each grade crossing is identified with an alphanumeric code unique to the grade crossing. The US DOT/AAR Highway-Rail Crossing Inventory contains a large amount of information related to each grade crossing. The database contains information on the railroad using the tracks, the type of signaling at the crossing, the location, and a host of other fields of information. The program selects the following specific data fields: train traffic by daytime and nighttime split; speed; number of tracks; number of roadway lanes, and the latitude and longitude of the center point of the grade crossing. This unique information, from the grade crossings under analysis was combined with generalized information used for every crossing.

The next set of inputs is the assumed background L_{dn} and the propagation characteristics due to residences and terrain at the grade crossings. To analyze the proposed rule, the background L_{dn} is set at 55 dBA--the standard suburban L_{dn} as discussed in Section 3.2.2. Propagation characteristics discussed in Section 3.2.4.2, such as distances to rows of houses and the amount of shielding attributed to each row, are inputs into the program.

Calculating the sound levels without horn blowing is the first step in determining the impact from horn blowing at a grade crossing. The existing sound level when a train is passing is dominated by sound generated by the train. Existing sound level in the vicinity of the grade crossing is calculated at 100 feet perpendicular to the tracks using a reference SEL from a single train. The reference train SEL obtained from measurement data is 100 dBA at 40 mph. This reference SEL is adjusted for the speed at the crossing (unless the default speed of 40 mph is assumed) and the number of trains using the grade crossing in a single day. These data are drawn from the crossing inventory. L_{dn} from the reference SEL is calculated

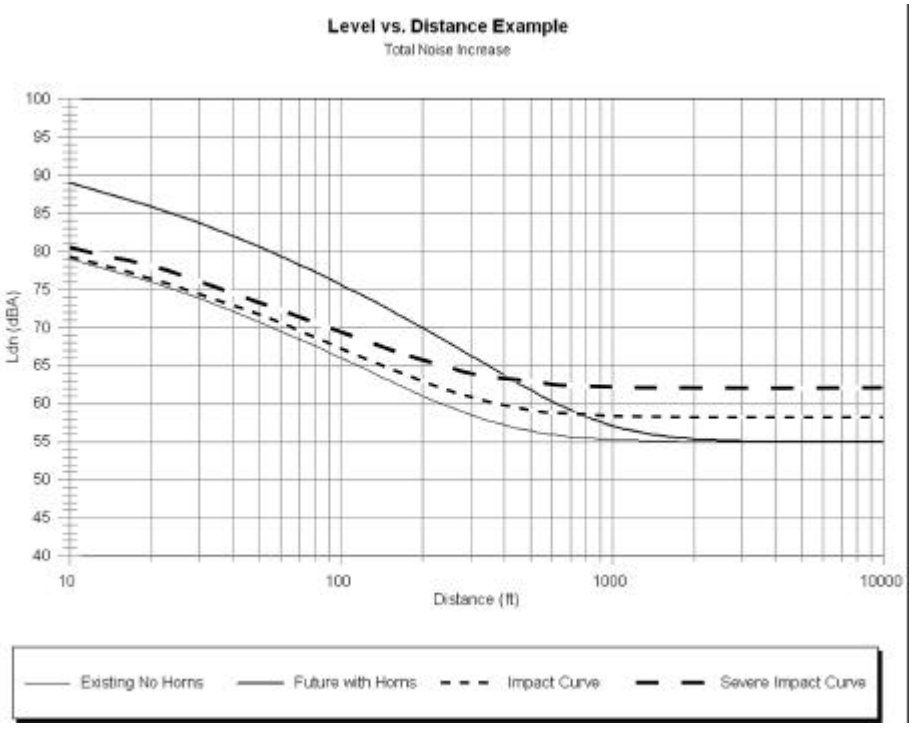
where first the L_{eq} (day) and L_{eq} (night) are derived and then combined to develop the day-night descriptor (L_{dn}).

Sound exposure levels from trains with horn blowing are calculated similarly to the procedure described above, with some exceptions. The first exception is that the horn sound is not dependent on speed. The next exception is that instead of one reference SELs, two reference SELs are used. These levels are shown in Figure 3-10. The two reference SELs are 110 dBA and 107 dBA. The numbers of day trains and night trains are used to calculate L_{dn}. The sound levels from the horns decrease as a function of distance until the horn sound is equal to the background L_{dn} (55 dBA in the default setting), at which point the existing sound level is assumed to be uniform and any further effect of the train horn is negligible.

The final calculations performed by the computer program determine the distances to impact and severe impact areas. Sound levels without horn blowing are applied to noise impact criteria (Figure 3-9) to arrive at two curves of impact and severe impact level versus distance. The two points at which these curves intersect the curve of noise with horn blowing versus distance are the threshold distances for impact and severe impact. Example curves are shown in Figure 3-13. The computer program generates two sets of these points. The first set is for the train horn SEL of 110 dBA (at the grade crossing) and the second set is for the train horn SEL of 107 dBA (for distances greater than $^1/_8$ mile from the grade crossing).

After completing all the above calculations for each of the grade crossings under analysis, the computer program generates an output file that records the distances to impact and severe impacts for use in creating impact polygons.

FIGURE 3-13
IMPACT AND SEVERE IMPACT NOISE CURVES



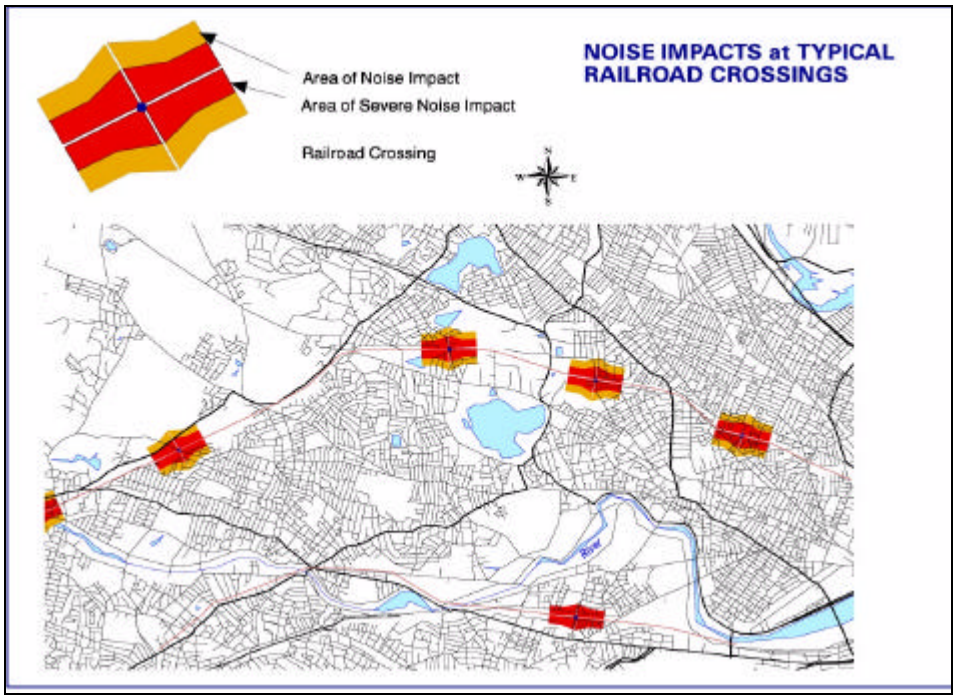
3.3.4.2 Population Exposure Prediction For the noise impact polygons to be used in the impact inventory, it is necessary to overlay them on census blocks. The tool for performing the overlay function is a Geographical Information System (GIS) program. The information from the horn noise model had to be converted in a supplementary spreadsheet program into geographic impact polygons that the GIS system can use and understand.

A spreadsheet was developed to calculate the impact polygons at each grade crossing. The polygons have five sides and five vertices in each quadrant of the track/road intersection. See Figures 3-10 and 3-12.) The five vertices of a polygon are generated in Cartesian (X-Y) coordinates. The spreadsheet takes into account the width of the road and the railroad tracks in calculating the impact polygons by using the number of tracks and the number of roadway lanes at each grade crossing. The vertices of the impact polygons were calculated accounting for this information and the Impact and Severe Impact polygon distances at the grade crossing and at 1/8 mile from the grade crossing. The output of the spreadsheet was a series of five X-Y coordinates for each polygon (both Impact and Severe Impact) in each of the four identical quadrants of each grade crossing. However, for these points to be used in the GIS program, two steps were taken. First, the angle of railroad tracks at each crossing with respect to a reference direction from GIS databases was entered. The second step was to determine the latitude and longitude of every set of points on the vertices for each of the polygons at the grade crossings.

This resulted in a representation of the vertices of all the impact polygons in a form used by the GIS program to determine the location of every set of Impact and Severe Impact polygons at each grade crossing. The GIS program was then used to append polygons that overlapped as occurs when crossings are close together. This was done to avoid counting impact zones and their populations more than one time. The GIS program was then used to overlay the census block data on the polygons and tabulate the estimated number of people “Impacted” and “Severely Impacted” at grade crossings under study. It was necessary to automate this computer routine to complete these steps for all of the crossings under analysis. A generic example of the GIS overlay output is shown in Figure 3-14.

Subsequent to the above analysis, the horn noise model was used to assess noise exposure conditions at all 159,000 public at-grade highway-rail crossings. The DOT/AAR highway-rail crossing inventory was used to derive an average public at-grade highway-rail crossing using some 147,653 database records with geographic location codes. Noise impact polygons were then modeled for the average public grade crossing. Finally, an average population density in proximity to public highway-rail crossings was derived. A density of approximately 658 people per square mile was estimated for coded public at-grade crossings using 1990 data of census tracts located within a 5-mile radius of those crossings. Tracts were found for some 122,173 crossings while the 25,480 remaining crossings were located in less densely settled areas with large tract sizes. An average population density was calculated, assuming zero population for the crossings that had no data. The population currently affected by train horn noise was estimated using this typical population density and the typical noise polygons and then applied to the approximate 159,000 public at-grade highway-rail crossings where horns are sounded as a group. A reduction factor of 0.656 was applied to account for the overlap of noise polygons that occurs when crossings are close together. This was derived by comparing the appended total polygon area for the set of individual crossings studied with the total area of all those polygons without merging overlapping areas. At 157,000 public highway-rail grade crossings (excluding whistle ban crossings) thought to be currently impacted by train horns, approximately 5,469,000 persons would be “impacted” and of that group, 2,732,000 persons would be “severely impacted.”

FIGURE 3-14
SAMPLE OF NOISE IMPACT



3.4 OTHER CONSIDERATIONS

3.4.1 Environmental Justice This section describes how environmental justice impacts were identified and evaluated in connection with the proposed rule. The environmental justice definitions, methodology, and results of the analysis are summarized below. Executive Order No. 12898 directs federal agencies to examine the effects of their actions on minority and low-income communities in order to ensure that all communities and persons live in a safe and healthful environment.[17]

3.4.1.1 Definitions

Minority Population: According to Council on Environmental Quality (CEQ) Guidelines, minority populations should be identified where either (a) "the minority population of the affected area exceeds 50% or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis."[18] The appropriate unit of geographic analysis could be a governing body's jurisdiction, a neighborhood, census tract, or other similar unit as long as it does not artificially dilute or inflate the affected minority population.

[17] The Order requires executive branch agencies, and requests independent agencies, to comply. See Order dated February 11, 1994 and accompanying "Memorandum for the Heads of All Departments and Agencies."

[18] "Guidance for Considering Environmental Justice Under the National Environmental Policy Act," CEQ, Dec 10, 1997.

Minority Individuals: *Minority* individuals are classified by the U.S. Bureau of the Census into the following: American Indian or Alaskan Native, Asian or Pacific Islander, Black (not of Hispanic Origin), and Hispanic.

Low-Income Population: A *low-income* person is someone whose median household income is below the Department of Health and Human Services poverty guidelines which vary according to household size. The poverty thresholds for a population in an affected area are identified in the annual statistical poverty thresholds from the Bureau of the Census (Current Population Reports, Series P-60 on Income and Poverty).[19]

3.4.1.2 Noise Impacts In Minority Or Low-Income Communities To determine whether any potential environmental effects might occur in minority or low-income communities, the following were studied:

- the locations where potential effects are likely to occur; and
- the minority and low-income population within each area.

The geographic locations considered where potential noise effects could occur were the crossings thought by FRA to be subject to whistle bans. The area of potential direct noise effect was further defined by the "impact" and "severe impact" areas represented by the noise impact polygons used in the noise impact analysis. (See Figure 3-10, Source Level Model.)

Next, the minority and low-income characteristics of the population within each of the noise impact area were determined. Using the definitions above, detailed U.S. Census data was collected for the counties potentially affected by the proposed rule. These data included:

- total population;
- total minority population; and
- total low-income population

Within the noise impact areas, similar census data at the "block" level was collected. Blocks are small, statistical subdivisions of census tracts. Block level information allowed environmental justice analysis to be performed using comparable data from the noise analysis.

FRA utilized the computerized geographic information system (GIS) base map used in the noise impact analysis to integrate the block level census data with the areas of impact in order to obtain population estimates.

3.4.1.3 Establishment of Criteria Neither the Executive Order nor the DOT order on Environmental Justice defines what constitutes a minority or low-income population. Therefore, using CEQ's[20] and EPA's[21] draft guidance, FRA developed the following thresholds

[19] Source: Bureau of the Census (Current Population Reports, Series P-60 on Income and Poverty), 1989. FRA used 1989 data, the most recent year for which there are actual population counts (rather than statistical estimates) available. The 1990 Census data were also used to determine impacts. The U.S. Bureau of the Census will issue new data in the year 2000.

[20] "Draft Guidance for Considering Environmental Justice Under the National Environmental Policy Act," CEQ, May 7, 1997.

[21] Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analysis: EPA, July 12, 1996.

for determining whether the persons within the noise impact area constituted a minority population:

- The percent of the minority people in a noise impact area equaled or exceeded 50 percent of the total population within that impact zone, or

- The percent of the minority people in a noise impact area was at least 10 percent greater than the percentage of minority population of the county where the impact zone is located.

In addition, the following threshold was developed for determining whether the population within the noise impact area constituted a low-income population:

- The percent of the low-income population in a noise impact area equaled or exceeded 50 percent of the total population within that impact zone.

3.4.2 Health and Human Welfare Impacts A general literature search and discussion regarding noise impacts on the health and human welfare of the population exposed to noise from train horns sounded at highway–rail grade crossings is included in chapter 4.

3.4.3 Economic Impacts FRA studied the issue of economic impacts resulting from the proposed rule in the *Regulatory Evaluation and Initial Regulatory Flexibility Assessment for Use of Locomotive Horns at Highway-Rail Grade Crossings*, FRA, (Washington, DC) 1999. The estimated benefits of this proposed rule are derived from the prevention of collisions and the resulting fatalities and injuries. Costs are analyzed as those born by local communities in designating quiet zones and any potential economic externalities incurred by those communities due to noise exposure.

CHAPTER 4

ENVIRONMENTAL CONSEQUENCES

4.0 INTRODUCTION

To the best of FRA's knowledge, the environmental resources potentially affected by undertaking the proposed action are the human environment with respect to noise exposure and the safety of the transportation network. FRA has studied these issues and the potential for community disruption, impacts on commerce, and impacts on local government. FRA is not aware of any direct or indirect effects of the proposed rule on: air quality; water quality; solid waste disposal; ecological systems; impacts on wetlands areas; impacts on endangered species or wildlife: flood hazards and floodplain management; coastal zone management; use of energy resources; use of other natural resources, such as water, minerals, or timber; aesthetic and design quality impacts; possible barriers to the elderly and handicapped; land use, existing and planned; other impacts on the socioeconomic environment, including the number and kinds of available jobs, and the need for and availability of relocation housing; public health; human health impacts due to hazardous materials; recreational opportunities; locations of historic, archeological, architectural, or cultural significance; or use of 4(f)-protected properties.

The potential positive and negative impacts of the proposed rule are identified and discussed in this chapter. This discussion focuses on the principal areas of concern, safety and noise. The potential for direct impacts to the human environment at the 1,978 highway-rail at-grade crossings identified as potentially directly impacted are estimated using the modeling techniques illustrated in Chapter 3, "Affected Environment." The potential beneficial impacts at 159,000 public at-grade highway-rail crossings are also analyzed using this approach.

4.1 EFFECTS ON SAFETY AT HIGHWAY-RAIL GRADE CROSSINGS

The proposed rule's effect on public safety was assessed using the FRA's Nationwide Study. This 1995 study is an analytical comparison of 1,222 crossings subject to whistle bans at some time from 1989 through 1993, against the remaining 167,000 public at-grade crossings in the US DOT/AAR National Highway-Rail Inventory. The study found that the crossings with whistle bans had a significantly higher average collision frequency than the non-ban crossings. In performing this analysis, 1,222 whistle ban crossings were divided into 10 groups of nearly equal size; based on similar estimated collision frequencies, as calculated by an established collision prediction formula. Within each risk level, which ranged from low to high, the collision histories of the crossings were tabulated. A similar procedure was followed for the other 167,000 crossings in the national inventory at that time. In nine of the ten risk levels, the group of crossings with whistle bans had collision frequencies significantly higher than the national population. Overall, this analysis indicated that the whistle ban crossings experienced an average 84 percent greater frequency of collisions than the crossings without bans.

The crossings in the Nationwide Study reflected a very diverse population with respect to physical configurations, motorist warning devices, and highway and rail traffic mixes. Their geographical dispersion contributed to a credible indication of the national safety implication of train whistle bans. More recently, FRA made a substantial effort to collect information on additional whistle ban locations with the City of Chicago, the Chicago Area Transportation Study (CATS), the Chicago Operating Rules Association (CORA), the Association of American

Railroads (AAR), the Association of Short Line Railroads of America (ASLRA) and FRA Grade Crossings Managers. FRA updated its records of whistle ban locations and its analysis of the safety at whistle ban crossings, adding some 700 Chicago area crossings as well as adding and removing some other locations.

FRA also refined the analysis procedures 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 for passive devices, such as "crossbucks" and other signs). 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 rail car). 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. They can also stop or reverse their direction more quickly than a motorist if they have second thoughts about crossing safely.

FRA updated the Nationwide Study analysis of the 1989 through 1993 time period with data for a five-year time period from 1992 through 1996 instead. 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. By separating crossings according to the different categories of warning devices installed, FRA has better identified and, in effect, lowered the risk compensation that must be implemented for crossings with gates in order to allow whistle bans.

The updated analysis indicated that whistle ban crossings without gates, but equipped with flashing light signals and/or other types of active warning devices, on average, experienced 130 percent more collisions than similar crossings without whistle bans. This finding made it clear that the train horn was highly effective in deterring collisions at crossings equipped with active devices, but without gates. The only exception was in the Chicago area where collisions were 11 percent less frequent. FRA does not have an explanation for this anomaly. One possibility is that approximately one third of the crossings in the city of Chicago are rumored to have been closed, but many continue to be included in FRA's inventory because they have not been reported as closed by local officials nor as abandoned by railroads and thus cannot be identified. FRA believes this could contribute to the low collision count for Chicago area crossings without gates.

The updated analysis also showed that an average of 62 percent more collisions occurred at whistle ban crossings equipped with gates than at similar crossings across the nation without bans. FRA will use this value as the increased risk associated with whistle bans instead of the 84 percent cited in the Nationwide Study. FRA believes that 62 percent is appropriate because it represents the elevated risk associated with crossings with gates, which are the only category of crossings that would be eligible for "quiet zones" (except for certain crossings where train speeds do not exceed 15 miles per hour).

In order to make highway-rail crossings where whistles are not sounded as safe as crossings where horns are used, the probability of collision must be reduced by .38 standard effectiveness rate. This applies to all states except Florida, where a 1990 FRA study showed that in Florida the whistle had an effectiveness rate of .68.[1] FRA is assuming that a similar effectiveness rate will be gained by Florida in 1997 as in 1989, although effectiveness rates for train whistles seem to have fallen somewhat over time in the rest of the United States.

[1] For more information, please see the Florida Whistle Ban Study.

Using these figures, the Proposed Action is expected to have a public safety benefit in terms of lives saved as well as injuries and accidents averted. With the resumption of horn blowing, FRA expects at least 3 fatalities, 17 injuries, and 39 collisions to be avoided per year. If median barriers with gates and lights are employed to designate quiet zones in all communities with current whistle bans, then more than 6 fatalities, 33 injuries, and 78 collisions would be prevented per year. Since interest in silencing train horns extends to many more communities throughout the nation than those with current whistle bans, much greater safety benefits may accrue as a result of the proposed rule as more crossings are made safer so as to qualify for the establishment of quiet zones.

The No Action Alternative would continue the 62 percent greater frequency of collisions at whistle ban crossings where they exist today and would lead to more frequent collisions at every location where a ban is instituted in the future. Additionally, it is possible that in the absence of a mandate to regulate the use of locomotive horns at highway-rail grade crossings, whistle bans could proliferate and result in more injuries, collisions, and a greater loss of life.

4.2 EFFECTS ON NOISE AT HIGHWAY-RAIL GRADE CROSSINGS

The effects of the proposed rule related to noise and noise impacts were analyzed using empirical information about train horn sound and computer models described in Chapter 3, "Affected Environment." The summary tables that follow provide estimates of the number of persons impacted and of those, the number of persons severely impacted by train horn noise. These impact estimates assume the typical 1/4-mile sounding distance commonly found on the nation's railroads. These results do not incorporate the cumulative benefits of the proposed rule, nor the likely application of mitigation strategies (e.g., the establishment of a quiet zone) identified later in this Chapter. It is reasonable to expect that the number of persons adversely affected by train horn noise as a result of the proposed rule would ultimately be significantly lower than the number of persons estimated here. The mitigating influence of the horn sounding distance, the maximum horn sound level, and the directionality requirement are discussed in Section 4.2.2, "Cumulative Effects." The No-Action Alternative would not have any of these potential impacts, but neither would it provide the cumulative benefits of the proposed rule. Figures 4-1 through 4-4 show the locations of existing whistle ban crossings by region, and indicate the estimated number of persons that are potentially impacted by the proposed rule.

Number of Persons Potentially Adversely Impacted by State

FRA has estimated the number of persons potentially impacted and the subset of those people severely impacted by train horn noise for each of the 24 states across the country with highway-rail grade crossings subject to current whistle bans (Table 4-1). There would be approximately 365,010 persons potentially impacted by horn noise nationally, and approximately 151,400 of those would be severely impacted. The state of Illinois contains the greatest number of potentially impacted persons (177,110), that represent 49 percent of all persons potentially impacted nationally. Other states with large numbers of potentially impacted persons include Massachusetts (38,300), Wisconsin (28,770), Indiana (26,400), and Minnesota (24,940). The same states have the greatest number of persons within the severely impacted subset noise category: Illinois (74,230); Massachusetts (13,000), Wisconsin (12,300), Indiana (10,640), and Minnesota (10,890).

Figure 4-1


Selected Railroad Crossings
North East Region
Selected Crossings
Railroads
ME
Bango
MI
VT
NH
NY
Albany
Buffalo
Boston
MA
PA
OH
New York
Pittsburgh
Philadelphia
NJ
MD
Baltimore
Washington DC
WV
KY
Roanoke
Richmond
VA

Figure 4-2

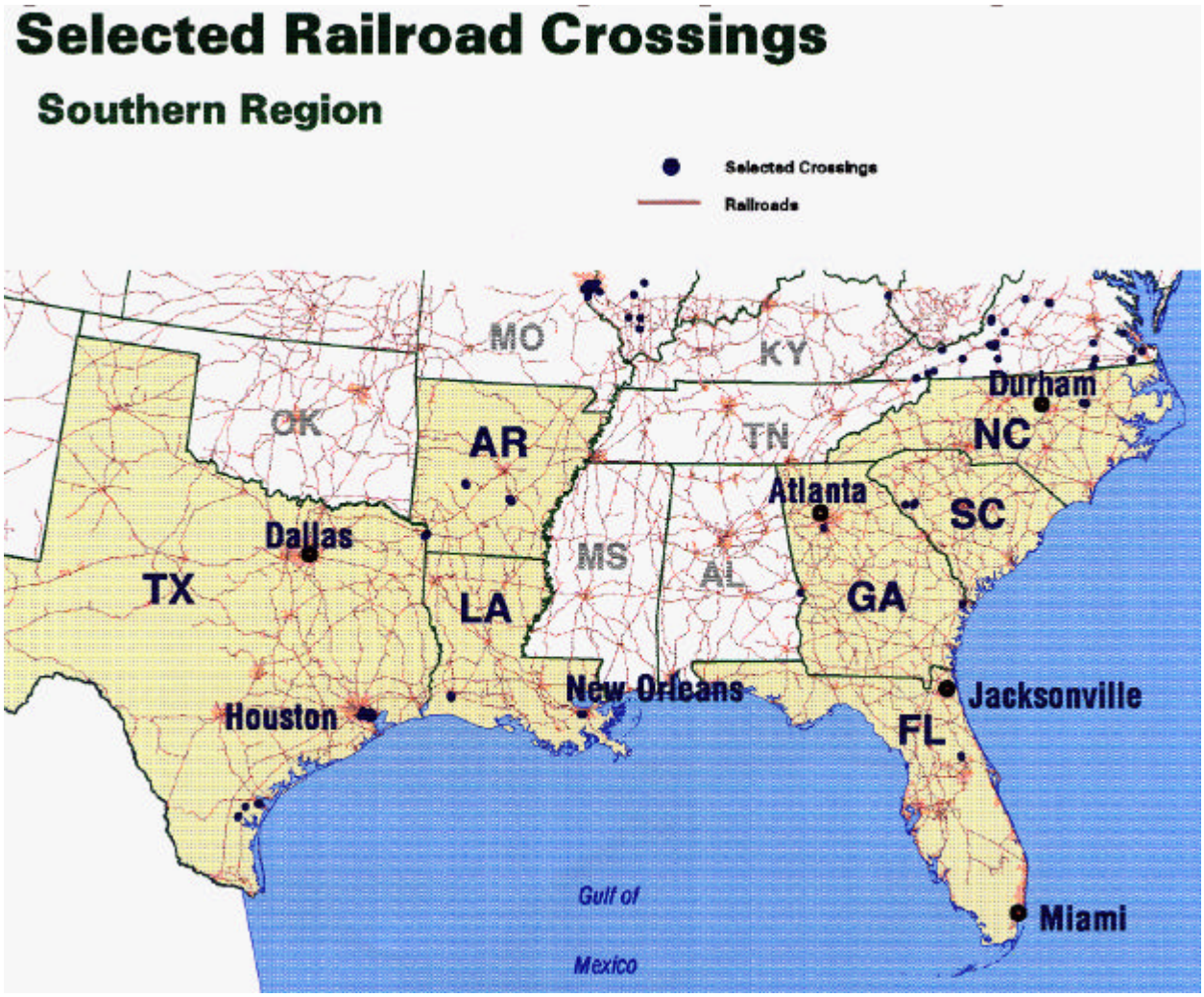

Selected Railroad Crossings
Southern Region
Selected Crossings
Railroads
MO
KY
OK
AR
TN
NC
Durham
Atlanta
SC
Dallas
MS
AL
GA
TX
LA
New Orleans
Jacksonville
Houston
FL
Gulf of
Mexico
Miami

Figure 4-3


Selected Railroad Crossings
Central Region
Selected Crossings
Railroads
MN
WI
Minneapolis
MI
Detroit
IA
Chicago
Cleveland
IL
OH
Indianapolis
MO
Cincinnati
IN
St. Louis
Lexington
KY
AR
TN

Figure 4-4


Selected Railroad Crossings
Western Region
Selected Crossings
Railroads
WA
Seattle
Tacoma
Portland
OR
ID
NV
Sacramento
San Francisco
CA
AZ
Los Angeles
San Diego

TABLE 4-1
CURRENT WHISTLE BANS - TOTAL PERSONS IMPACTED AND SEVERELY IMPACTED, BY STATE

State	Population	
	Impacted	Severely Impacted
IL	177,110	74,230
MA	38,300	13,000
WI	28,770	12,300
IN	26,400	10,640
MN	24,940	10,890
CA	19,140	9,890
MO	9,700	4,030
VA	9,270	3,200
OR	7,030	3,600
NY	6,610	2,250
LA	4,150	1,780
TX	3,580	1,590
WA	2,590	1,350
AR	1,230	540
PA	1,190	410
SC	1,180	400
NC	940	310
ME	690	210
GA	550	190
MD	510	180
WV	510	190
IA	360	150
OH	250	70
FL	10	-
Total	365,010	151,400

Number of Persons Potentially Adversely Impacted by County

A complete listing of the number of persons estimated to be potentially impacted and the subset severely impacted by train horn noise under the proposed rule for each county within the 24 impacted states with current whistle bans is provided in Appendix E. The counties (and their respective states) with the 20 greatest number of impacted and severely impacted persons are shown in Table 4-2. The counties with the largest total number of impacted or severely impacted persons are Cook County, IL (103,190 persons); DuPage County, IL (33,110); Middlesex County, MA (24,810); Lake County, IL (23,280); and St. Joseph, IN (15,340). Five of the top 20 counties shown on Table 4-2 are located within the Chicago metropolitan region.

Number of Persons Potentially Adversely Impacted by City

A complete listing of the number of persons potentially impacted and the subset severely impacted by train horn noise for each city within the 26 impacted states with current whistle bans is provided in Appendix F. The cities (and their respective states) with the 20 greatest number of impacted and severely impacted persons are shown in Table 4-3. Each of these cities contains approximately 3,700 or more persons that would be impacted by train horn noise assuming implementation of the proposed rule. The cities with the largest total number of impacted and severely impacted persons include: Chicago, Illinois (76,890); Minneapolis, Minnesota (10,720); York, Illinois (8,730); and Anaheim-Santa Ana, California (8,190). Seven

TABLE 4-2
CURRENT WHISTLE BANS - NUMBER OF PERSONS IMPACTED AND SEVERELY IMPACTED BY RULE-MAKING, BY COUNTY

COUNTY	STATE	Population	
		Impacted	Severely Impacted
Cook County	IL	103,190	44,920
DuPage County	IL	33,110	13,380
Middlesex County	MA	24,810	8,510
Lake County	IL	23,280	9,130
St. Joseph County	IN	15,340	6,000
Hennepin County	MN	11,390	5,030
Milwaukee County	WI	10,050	4,150
Essex County	MA	9,670	3,180
Orange County	CA	8,190	4,230
Ramsey County	MN	7,510	3,470
Winona County	MN	5,900	2,340
Sacramento County	CA	5,600	3,020
Tippecanoe County	IN	5,530	2,370
McHenry County	IL	5,420	2,190
Los Angeles County	CA	5,340	2,650
St. Louis County	MO	4,880	2,020
St. Louis City	MO	4,820	2,010
Marion County	OR	4,070	2,050
Waukesha County	WI	3,870	1,740
Suffolk County	MA	3,820	1,300

TABLE 4-3
CURRENT WHISTLE BANS - TOTAL PERSONS IN 20 CITIES WITH GREATEST NUMBER OF IMPACTED AND SEVERELY IMPACTED, BY CITY

City	County	State	Population	
			Impacted	Severely Impacted
Chicago	Cook County	IL	76,890	33,850
Minneapolis	Hennepin County	MN	10,720	4,740
York	DuPage County	IL	8,730	3,660
Anaheim-Santa Ana	Orange County	CA	8,190	4,230
Portage	St. Joseph County	IN	8,000	3,260
Penn	St. Joseph County	IN	7,340	2,740
St. Paul	Ramsey County	MN	7,280	3,380
Milton	DuPage County	IL	7,130	2,910
Downers Grove	DuPage County	IL	6,730	2,670
Deerfield	Lake County	IL	6,560	2,570
West Allis	Milwaukee County	WI	6,340	2,740
Winona	Winona County	MN	5,730	2,260
Sacramento	Sacramento County	CA	5,600	3,020
Shields	Lake County	IL	5,320	2,050
Fairfield	Tippecanoe County	IN	5,000	2,160
St. Louis	St. Louis City	MO	4,820	2,010
Beverly	Essex County	MA	4,570	1,510
Melrose	Middlesex County	MA	4,370	1,490
Worth	Cook County	IL	3,810	1,650
Salem	Marion County	OR	3,690	1,850

of the top 20 cities shown on Table 4-3 are located within the Chicago metropolitan region. The cities with nighttime-only train whistle bans (and their respective impacted and severely impacted populations) are shown in Table 4-4 as well as in Appendix F. All other populations shown in Table 4-3 and Appendix F are subject to 24-hour train whistle bans.

TABLE 4-4
CURRENT WHISTLE BANS - TOTAL PERSONS SEVERELY IMPACTED AND IMPACTED, BY CITY & NIGHTTIME BANS

City	County	State	Population	
			Impacted	Severely Impacted
Wausau	Marathon County	WI	1,890	800
Dunkirk	Chautauqua County	NY	1,020	380
Prairie du Chien	Crawford County	WI	990	430
Marshfield	Wood County	WI	600	270
Addison	DuPage County	IL	530	200
Madison	Washington County	VA	450	160
Vernon	Lake County	IL	290	120
Rocky Mount	Franklin County	VA	150	50
Robinson	Pulaski County	VA	120	40
York	DuPage County	IL	80	20
Caribou	Aroostook County	ME	70	20
Draper	Pulaski County	VA	40	10
Van Buren	Aroostook County	ME	30	10
Fountain City	Buffalo County	WI	20	10
Columbus	Muscogee County	GA	10	10
Brule	Douglas County	WI	10	-
De Land	Volusia County	FL	10	-
Sheridan	Chautauqua County	NY	10	-
Hawthorne	Douglas County	WI	-	-
Woodland	Aroostook County	ME	-	-
Baltimore	Baltimore City	MD	-	-
Bennett	Douglas County	WI	-	-
Bridgeport	Crawford County	WI	-	-
Superior	Douglas County	WI	-	-

4.2.1 Cumulative Effects Cumulative effects are those resulting from the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time [40 C.F.R. 1508.7]

In addition to mandating the sounding of locomotive horns, the proposed rule contains provisions that set a horn sounding distance, establish a maximum horn sound level, mandate a directional signal, and authorize the designation of quiet zones. These mitigating provisions reduce noise exposure and impact from locomotive horns and apply to the entire nation, whereas the impact of the mandate to blow horns at all crossings affects a discrete number of locations. Given the much broader applicability of the mitigating provisions of the proposed rule, their cumulative effects can reasonably be expected to be large. The effects of these measures are seen as cumulative because while some measures will be implemented initially, others will be adopted over time. All public highway-rail at-grade crossings would receive cumulative benefits from provisions of the rule, including current whistle ban crossings once

the horn sounding provision take effect. Therefore, cumulative effects are examined for 159,000 crossings as a group.

The potential effects of these provisions on 159,000 public at-grade highway-rail crossings were estimated using the horn noise model. Estimates of population potentially impacted by different combinations of rule provisions are described in this section. The horn noise model was applied to an average crossing derived from the roughly 3,000 crossings modeled. An estimate of potential impacts was made using an average surrounding population density of 658 persons per square mile as described in Chapter 3. An overlap reduction factor of 0.65 was applied to account for closely spaced crossings. The number of persons at 159,000 public highway-rail grade crossings that would be potentially benefited are shown in the top left entry in Table 4-5. For those crossings, there are conservatively estimated to be approximately 5,834,000 persons impacted and of them 2,883,000 persons severely impacted by train horn noise at grade crossings who might benefit from certain provisions of the proposed rule.

4.2.1.1 Horn Sounding Distance The proposed rule contains a provision that would set a duration of horn sounding. Potential benefits from reducing the horn blowing distance were estimated, although this provision would take effect over a very long time. As shown in the top row of Table 4-5, the first case shown represents the current practice of sounding for 1/4 mile before reaching the crossing. The second case shows the exposure using the rule provision to set the starting point for horn sounding at 20 seconds from the crossing running at maximum track speed. The third and final case shows the exposure assuming adoption of a 15-second provision, suggested for public comment in the NPRM.

The analysis estimated that universal application of the 20-second provision would bring an average of 10 people per crossing below the criteria threshold for train horn noise annoyance. Alternatively, 17 people per crossing on average would be likewise benefited by a 15-second provision. If implemented everywhere in the nation, some 1,579,000 could benefit from a 20-second provision or some 2,676,000 people could benefit from a 15-second (a 27-percent and 46-percent reduction in currently impacted persons, respectively). These estimates assume that the horn sounding distance provisions of the proposed rule are implemented at all locations, and that any state regulations, to which the proposed rule would defer, would correspond with the final rule. The proposed rule requires moving the whistle post or board **only** when the track speed of the particular section of track at a crossing is adjusted, which may or may not occur. Because relocating whistle posts and boards would occur over a long time period, it is expected that the actual number of persons benefiting would be limited. However, even if only quarter of these benefits actually accrue over time, a significant number of persons, approximately 652,000 people, may be relieved of train horn noise impacts from a 20-second provision.

4.2.1.2 Horn Sound Level and Directionality The proposed rule contains a provision that sets a maximum sound level to the front and to the side of the locomotive. The side sound limit has a directional effect referred to in this EIS as a directionality provision. The results of modeling shown in Table 4-5 indicate significant beneficial effects for some of these provisions. They are presented for the three horn sounding distance options: at the current 1/4 mile, at 20 seconds, and at 15 seconds.

Maximum Sound Level

The original modeling used a reference wayside SEL of 110 dBA at the grade crossing 100 feet from the tracks. This SEL was based on an extensive number of measurements throughout the country. Besides SEL, many measurements of the L_{max} of horns were available for moving trains at the wayside and a relationship between them was determined.

TABLE 4-5
CUMULATIVE EFFECT OF MITIGATING PROVISIONS ON 159,000 CROSSINGS NATIONALLY

National Impact & Severe Impact Population Using a Single National Average Grade Crossing

Individual Crossing Data	1/4 Mile Length		20 Second Length		15 Second Length	
Condition & National Population Estimates	Impact	Severe Impact	Impact	Severe Impact	Impact	Severe Impact
Original Condition, horns mixed						
square feet (million)	2.36	1.16	1.719	0.844	1.278	0.627
square miles	0.085	0.042	0.062	0.03	0.046	0.023
% of Original, (1/4 mile length)	--	--	72.8	72.8	54.2	54.1
Affected Population per Crossing	37	18	14	13	10	10
National Affected Population	5,834,000	2,883,000	4,256,000	2,059,000	3,157,000	1,579,000
National Population Relieved			*1,578,000*	*824,000*	*2,677,000*	*1,304,000*
Percent Population Exposure Reduction	***0%***	***0%***	***27%***	***29%***	***46%***	***45%***
Combined Population Exposure Reduction			***28%***		***46%***	
Cap Horn Lmax at 111,						
horns mixed square feet (million)		No Change from the Original Condition				
square miles						
% of Original, (1/4 mile length)						
Cap Horn Lmax at 111,						
horns at front square feet (million)		No Change from the Original Condition				
square miles						
% of Original, (1/4 mile length)						
Cap Horn Lmax at 104,						
horns mixed square feet (million)	1.795	0.769	1.307	0.56	0.971	0.415
square miles	0.064	0.028	0.047	0.02	0.035	0.015
% of Original, (1/4 mile length)	76	66.3	55.4	48.3	41.2	35.9
Affected Population per Crossing	16	12	12	9	9	6
National Affected Population	4,393,000	1,922,000	3,226,000	1,373,000	2,402,000	1,030,000
National Population Relieved	*1,441,000*	*961,000*	*2,608,000*	*1,510,000*	*3,432,000*	*1,853,000*
Percent Population Exposure Reduction	***25%***	***33%***	***45%***	***52%***	***59%***	***64%***
Combined Population Exposure Reduction	***28%***		***47%***		***61%***	
Cap Horn Lmax at 104, horns at front						
square feet (million)	0.943	0.188	0.686	0.136	0.51	0.1
square miles	0.034	0.007	0.025	0.005	0.018	0.004
% of Original, (1/4 mile length)	40	16.2	29.1	11.7	21.6	8.7
Affected Population per Crossing	12	3	9	2	6	2
National Affected Population	2,334,000	480,000	1,716,000	343,000	1,235,000	275,000
National Population Relieved	*3,500,000*	*2,403,000*	*4,118,000*	*2,540,000*	*4,599,000*	*2,608,000*
Percent Population Exposure Reduction	***60%***	***83%***	***71%***	***88%***	***79%***	***90%***
Combined Population Exposure Reduction	***68%***		***76%***		***83%***	
Cap night Lmax at 104, day Lmax at 111, horns mixed						
square feet (million)	2.012	0.958	1.466	0.698	1.09	0.519
square miles	0.072	0.034	0.053	0.025	0.039	0.019
% of Original, (1/4 mile length)	85.3	82.7	62.1	60.2	46.2	44.8
Affected Population per Crossing	16	15	12	11	9	8
National Affected Population	4,942,000	2,334,000	3,638,000	1,716,000	2,677,000	1,304,000
National Population Relieved	*892,000*	*549,000*	*2,196,000*	*1,167,000*	*3,157,000*	*1,579,000*
Percent Population Exposure Reduction	***15%***	***19%***	***38%***	***40%***	***54%***	***55%***
Combined Population Exposure Reduction	***17%***		***39%***		***54%***	
Cap night Lmax at 104, day Lmax at 111, horns at front						
square feet (million)	1.512	0.65	1.101	0.473	0.819	0.352
square miles	0.054	0.023	0.039	0.017	0.029	0.013
% of Original, (1/4 mile length)	64	56.1	46.6	40.8	34.7	30.3
Affected Population per Crossing	13	10	9	7	7	6
National Affected Population	3,706,000	1,579,000	2,677,000	1,167,000	1,991,000	892,000
National Population Relieved	*2,128,000*	*1,304,000*	*3,157,000*	*1,716,000*	*3,843,000*	*1,991,000*
Percent Population Exposure Reduction	***36%***	***45%***	***54%***	***60%***	***66%***	***69%***
Combined Population Exposure Reduction	***39%***		***56%***		***67%***	

In order to estimate the SEL at the wayside from the L_{max} in front of the locomotive, a model was developed based on horn sounding characteristics measured by the Volpe Center.[2]

Their measurements of horns were taken 100 feet in front and around the sides of several stationary locomotives. Detailed information was obtained about the length of the long and short horn blasts, and the amount of time between each horn blast. These data were used to determine the relationship between L_{max} and SEL, taking account of the following parameters:

- L_{max} for both the long and short horn blasts.
- Speed of the train.
- Time associated with the sounding sequence.
- Duration of the four horn blasts (long, long, short, long), and the time between each blast.
- Rise time of the horn blasts.

Using this model, a difference was estimated between the L_{max} at 100 ft in front of a locomotive and the SEL measured at 100 feet at the wayside, near the grade crossing. This relationship was then used with the horn noise data previously collected to estimate a reference SEL based on capping the maximum horn sound at 104 dBA and 111 dBA at 100 feet in front of the locomotive.

Very few existing horns were found to exceed the possible limit of L_{max} 111 dBA. Therefore, the provision for a maximum horn sound level at L_{max} 111 dBA was predicted to affect very few horns and would be expected to have no measurable effect on existing sound levels. Similarly, it was found that the directionality provision would likely have no effect with this sound level limit because current sound levels are estimated to be lower than 111 dBA. However, this sound limit would limit horn sound levels to a level lower than the loudest horns that are generally among the newest.

A maximum horn sound level of L_{max} 104 dBA was predicted to reduce community horn noise exposure by approximately 25 percent compared to current exposure levels on average. Because many existing horns were found to exceed this level today, many horns would need to be dampened to meet this sound limit. When combined with other provisions of the proposed rule, much greater cumulative reductions are possible with this sound limit.

While the proposed rule asks for comment on a horn sound level that would vary by type of warning device, the proposed rule also requests comment on variable treatments by day versus night. A day/night variable sound level was analyzed to respond to concerns that noise sensitivity is generally found to be greater at night. A variable sound level of 111 dBA during the day and 104 dBA during the night was predicted to be effective in reducing community noise impacts by approximately 15 percent. Greater reductions are found when this sound limit is combined with directionality or with other provisions.

Directionality

The directional pattern of sound from both a front mounted and center mounted locomotive horn was obtained from measurements taken by the Volpe Center.[3] The center mounted pattern showed a higher sound level to the side relative to the sound level to the front, while the front mounted horn showed a lower sound level to the side relative to the sound level to the front. To estimate the effect of the directionality provision, an analysis was performed comparing horns mounted at the center with horns mounted at the front of locomotives.

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[2] Keller, A., and Rickley, E. The Safety of Highway-Railroad Grade Crossings: Study of the Acoustic Characteristics of Railroad Horn Systems. Report No. DOT/FRA/ORD-93/25, June 1993

[3] *Ibid.*

To estimate the effect on the average SEL from moving all the horns to the front of the locomotives, an estimate of the mix of front- and center- mounted horns in the current locomotive fleet was required. The locomotive rosters for two of the largest Class I railroads representing about 40 percent of the total locomotive fleet in the country were reviewed along with photographs of typical locomotives of each type. Assuming the horn positions in the photographs were typical, it was found that there are roughly an equal number of front mounted and middle mounted horns in their fleets (48 percent front, 52 percent middle). For modeling purposes, a split of 50 percent front-mounted and 50 percent middle-mounted horns was used to represent the current locomotive fleet. Using this information, and the difference in SEL based on horn location, an estimate was made of the change in SEL due to moving all the horns to the front of the locomotives. Shifting all locomotive horns to the front of the vehicles is estimated to produce as much as a 35 percent reduction in noise exposure or as little as no noise reduction depending upon its interrelationship with other provisions.

If the horn sounding duration is the current 1/4 mile, and the 104 dBA sound level option is selected and combined with the directionality provision, the potential community horn noise exposure reduction would be approximately 60 percent on average. This would result in reducing the locomotive horn noise exposure of an estimated 3,501,000 persons nationwide to acceptable levels.

4.2.1.3 Quiet Zones Since locations that formerly had whistle bans clearly favored having trains run without horn blowing at highway-rail grade crossings, former whistle ban crossings are seen by FRA to represent some indication of future demand from local communities to designate quiet zones. These locations are those known by FRA to have had whistle bans after 1988 but were discontinued at some later date. Bans were discontinued due to various factors including state or local legislation, FRA Emergency Order #15 in Florida, or anticipation of FRA's proposed rule.

Table 4-6 provides some indication of the number of persons who may pursue quiet zones, derived by combining locations of former whistle bans to the existing whistle bans. A total of 26 states across the country have either current or former whistle ban crossings and include approximately 501,210 persons potentially impacted by horn noise. Of this number, approximately 196,610 are severely impacted.

The state of Illinois contains the greatest number of persons (177,260). Other states with a significant number of persons are Florida (84,480), Massachusetts (39,750), Wisconsin (29,030), Indiana (26,400), and Minnesota (25,510).

A cumulative effect analysis seeks to account for "reasonably foreseeable future actions," and it is reasonable to assume that many communities beyond those with existing whistle bans would desire to designate a quiet zone.[4] The number of communities and local jurisdictions (and persons living in proximity to highway-rail grade crossings) that may opt for the establishment of quiet zones is unknown and therefore, not quantifiable. However, the opportunity for creating quiet zones would be open and available to all communities nationwide. Consequently, it is possible that more people would be relieved of train horns in the future, simply through the designation of quiet zones, than the number of people who are potentially impacted negatively by the proposed rule. The effects of a maximum horn sound level and horn directionality requirement would likely reduce horn noise exposure to many

[4] Refer to Section 4.5 for a complete description of what constitutes a quiet zone.

TABLE 4-6
MINIMUM ESTIMATED POPULATION CONCERNED ABOUT TRAIN HORN NOISE AND LIKLEY TO SEEK RELIEF THROUGH MITIGATION
A CUMULATIVE ANALYSIS OF CURRENT + FORMER WHISTLE BANS

STATE	POPULATION					
	Current Ban		Former Ban		Cumulative	
	Impacted	Severely Impacted	Impacted	Severely Impacted	Impacted	Severely Impacted
AR	1,230	540	430	170	**1,660**	**710**
CA	19,140	9,890	40	10	**19,180**	**9,900**
FL	10	-	84,470	26,400	**84,480**	**26,400**
GA	550	190	3,850	1,430	**4,400**	**1,620**
IA	360	150	-	-	**360**	**150**
IL	177,110	74,230	150	40	**177,260**	**74,270**
IN	26,400	10,640	-	-	**26,400**	**10,640**
KY	-	-	9,440	3,450	**9,400**	**3,450**
LA	4,150	1,780	1,910	820	**6,060**	**2,600**
MA	38,300	13,000	1,450	450	**39,750**	**13,450**
MD	510	180	-	-	**510**	**180**
ME	690	210	-	-	**690**	**210**
MI	-	-	13,930	5,470	**13,930**	**5,470**
MN	24,940	10,890	570	250	**25,510**	**11,140**
MO	9,700	4,030	1,170	490	**10,870**	**4,520**
NC	940	310	-	-	**940**	**310**
NY	6,610	2,250	5,630	1,660	**12,240**	**3,910**
OH	250	70	460	100	**710**	**170**
OR	7,030	3,600	330	180	**7,360**	**3,780**
PA	1,190	410	10,890	3,730	**12,080**	**4,140**
SC	1,180	400	90	20	**1,270**	**420**
TX	3,580	1,590	1,020	410	**4,600**	**2,000**
VA	9,270	3,200	-	-	**9,270**	**3,200**
WA	2,590	1,350	110	40	**2,700**	**1,390**
WI	28,770	12,300	260	90	**29,030**	**12,390**
WV	510	190	-	-	**510**	**190**
	365,010	151,400	136,200	45,210	**501,210**	**196,610**

people on a national basis in excess of the number of people negatively impacted. FRA believes that these are reasonable and foreseeable future consequences of the proposed rule.

4.3 OTHER CONSIDERATIONS

4.3.1 Environmental Justice An analysis was performed when the thresholds for environmental justice analysis described in Chapter 3 were reached for any particular county. For those evaluated, the population characteristics of persons within the noise impact areas were analyzed according to the following steps.

Step 1: Determination of Minority and Low-income Populations. Assuming an even population distribution throughout each noise impact area, FRA analyzed the census blocks included within the noise impact area to determine the total population (including minority and low-income subgroups within each total population) of each block located in the noise

impact area. From these totals, FRA determined the percentage of the population in each noise impact area that is minority and low-income.

Step 2: Comparison with County Representation. Having established the number of minority and low-income populations in noise impact areas, a comparison to the relevant larger units of analysis, the county, was made.

4.3.1.1 Estimation of Environmental Justice Impacts The environmental justice summary presented in Table 4-7 below provides the number of minority and/or low-income persons impacted and severely impacted by train horn noise. This analysis shows a prevalence of proportionally greater impacts to minority populations at many grade-crossing locations. The number of minority and low-income persons represented as either impacted or severely impacted by train horn noise is not reduced to account for the cumulative benefits of the proposed rule. It is likely that many communities would choose to designate a quiet zone. Therefore, the number of minority and low-income persons who are likely to impacted by train horn noise as a result of this proposed rule would be less than the estimates presented here. Minority and low-income communities would have equal opportunity to designate a quiet zone under the proposed rule.

4.3.1.2 Number of Minority and Low-Income People Potentially Affected by Noise
The number of minority and low-income persons estimated to be impacted and severely impacted by train horn noise for each county with potentially impacted highway-rail grade crossings is shown in Table 4-7. A total of 18 states have impacts for noise on environmental justice populations. Out of a total of 104 counties impacted or severely impacted by noise for the country as a whole (see Appendix F), this environmental justice analysis shows that a total of 52 counties (or 50 percent) have environmental justice populations. There are approximately 97,810 minority and low-income persons impacted by train horn noise out of a total of approximately 365,020 impacted persons for the nation as a whole. As a result, approximately 27 percent of all impacted persons nationwide are considered environmental justice populations due to their high proportional representation in noise impact zones. Approximately 43,930 minority and/or low-income persons are severely impacted by train horn noise out of a total of 151,430 severely impacted persons nationally. Therefore, approximately 29 percent of all severely impacted persons nationwide are considered environmental justice populations due to their high proportional representation in noise impact zones.

A complete listing of the number of minority and low-income persons impacted and severely impacted by train horn noise for each county within the 18 environmental justice impacted states with current whistle bans is provided in Table 4-7. As shown, the state of Illinois contains the greatest total environmental justice population (72,720). Other states with substantial environmental justice populations (approximately 2,000 or more persons) include California, Massachusetts, Indiana, Virginia, Minnesota, and Texas.

Table 4-7 also presents two ratios to consider the potential disproportionate impacts of the proposed action. The first ratio considers the percentage of impacted environmental justice minority populations to the minority population for each county as a whole. The second ratio considers the percentage of severely impacted environmental justice minority populations to the minority population for each county as a whole. These ratios are shown to provide a basis for comparing the relative minority segment in impacted (and severely impacted) areas to their representation in the relevant counties in which these areas are located. The counties with the largest ratios for either impacted or severely impacted environmental justice populations are

TABLE 4-7
NATIONWIDE SUMMARY OF ALL COUNTIES WITH ENVIRONMENTAL JUSTICE IMPACTS

STATE	COUNTY	# EJ Persons Impacted	EJ as percent Persons Impacted	EJ Persons Severely Impacted	EJ as percent Persons Severely Impacted	Percent Minority County Popul.	Ratio of Minority Impacted to County Minority	Ratio of Minority Severely Impacted to County Minority
AR								
	Jefferson County	910	78.4	400	78.4	44.2	**1.77**	**1.77**
	Miller County	30	50.0	10	33.3	24.3	**2.06**	**1.37**
	State Total	**940**	**77.0**	**410**	**75.9**			
CA								
	Los Angeles County	1,840	34.5	920	34.7	59.7	**0.58**	**0.58**
	Orange County	2,990	36.5	1,760	41.6	35.7	**1.02**	**1.16**
	Sacramento County	210	3.8	160	5.3	31.2	**0.12**	**0.17**
	State Total	**5,040**	**26.3**	**2,840**	**28.4**			
IL								
	Champaign County	540	87.1	180	85.7	16.4	**5.32**	**5.24**
	Cook County	66,150	64.1	30,430	67.7	42.9	**1.49**	**1.58**
	DuPage County	970	2.9	420	3.1	11.4	**0.26**	**0.28**
	Kane County	1,450	48.5	580	50.9	20.8	**2.33**	**2.44**
	Lake County	3,290	14.1	1,380	15.1	16.5	**0.86**	**0.91**
	Macon County	50	31.3	20	33.3	13.2	**2.37**	**2.52**
	McHenry County	40	0.7	10	0.5	4.3	**0.17**	**0.11**
	McLean County	30	16.7	10	14.3	6.8	**2.46**	**2.11**
	Will County	200	7.2	50	5.6	17.7	**0.41**	**0.31**
	State Total	**72,720**	**42.4**	**33,080**	**45.9**			
IN								
	Lake County	930	26.0	370	25.0	34.4	**0.76**	**0.73**
	St. Joseph County	1,110	7.2	440	7.3	13.0	**0.56**	**0.56**
	State Total	**2,040**	**10.8**	**810**	**10.8**			
LA								
	Calcasieu Parish	630	39.9	270	40.3	24.6	**1.62**	**1.64**
	Jefferson Parish	400	15.6	170	15.5	26.1	**0.60**	**0.59**
	State Total	**1,030**	**24.8**	**440**	**24.9**			
MA								
	Middlesex County	3,470	14.0	1,410	16.6	9.8	**1.43**	**1.69**
	Suffolk County	970	25.4	370	28.5	38.4	**0.66**	**0.74**
	State Total	**4,440**	**15.5**	**1,780**	**18.1**			
MD								
	Washington County	70	13.7	20	11.1	7.4	**1.85**	**1.50**
	State Total	**70**	**14**	**20**	**11**			
MN								
	Hennepin County	1,940	17.0	650	12.9	11.3	**1.51**	**1.14**
	Ramsey County	50	0.7	20	0.6	13.2	**0.05**	**0.04**
	State Total	**1,990**	**10.5**	**670**	**7.9**			

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NATIONWIDE SUMMARY OF ALL COUNTIES WITH ENVIRONMENTAL JUSTICE IMPACTS

STATE	COUNTY	# EJ Persons Impacted	EJ as percent Persons Impacted	EJ Persons Severely Impacted	EJ as percent Persons Severely Impacted	Percent Minority County Popul.	Ratio of Minority Impacted to County Minority	Ratio of Minority Severely Impacted to County Minority
MO								
	St. Louis City	530	11.0	190	9.5	49.8	**0.22**	**0.19**
	St. Louis County	390	8.0	150	7.4	16.5	**0.48**	**0.45**
	State Total	**920**	**9.5**	**340**	**8.4**			
NC								
	Nash County	330	35.1	110	35.5	32.6	**1.08**	**1.09**
	State Total	**330**	**35**	**110**	**35**			
NY								
	Chautauqua County	280	14.9	100	14.3	5.4	**2.76**	**2.65**
	Monroe County	130	28.3	40	28.6	17.2	**1.64**	**1.66**
	State Total	**410**	**17.5**	**140**	**16.7**			
OH								
	Butler County	80	32.0	20	28.6	5.9	**5.41**	**4.83**
	State Total	**80**	**32.0**	**20**	**28.6**			
OR								
	Marion County	130	3.2	90	4.4	11.8	**0.27**	**0.37**
	State Total	**130**	**3.2**	**90**	**4.4**			
SC								
	Abbeville County	40	100.0	10	50.0	32.2	**3.11**	**1.55**
	Greenwood County	650	57.0	220	56.4	31.1	**1.83**	**1.81**
	State Total	**690**	**58.5**	**230**	**56.1**			
TX								
	Bowie County	70	50.0	30	50.0	24.6	**2.03**	**2.03**
	Harris County	1,280	64.0	550	63.2	45.9	**1.40**	**1.38**
	Kleberg County	250	67.6	100	66.7	66.3	**1.02**	**1.01**
	Nueces County	1,050	98.1	500	98.0	57.4	**1.71**	**1.71**
	State Total	**2,650**	**74.0**	**1,180**	**74.2**			
VA								
	Charlottesville City	700	49.6	250	50.0	24.8	**2.01**	**2.02**
	Emporia City	160	29.1	40	26.7	46.8	**0.62**	**0.57**
	Norfolk City	260	86.7	90	90.0	45.0	**1.93**	**2.00**
	Pulaski County	20	12.5	10	16.7	6.6	**1.91**	**2.54**
	Smyth County	10	3.2	-	-	2.5	**1.31**	**-**
	Staunton City	120	46.2	40	50.0	13.9	**3.32**	**3.59**
	Suffolk City	1,780	72.7	590	72.8	45.6	**1.59**	**1.60**
	Tazewell County	160	31.4	60	30.0	3.2	**9.68**	**9.25**
	Washington County	50	11.1	20	12.5	1.8	**6.13**	**6.89**
	Williamsburg City	20	50.0	10	100.0	19.5	**2.57**	**5.14**
	State Total	**3,280**	**50.9**	**1,110**	**50.9**			

TABLE 4-7
NATIONWIDE SUMMARY OF ALL COUNTIES WITH ENVIRONMENTAL JUSTICE IMPACTS

STATE	COUNTY	# EJ Persons Impacted	EJ as percent Persons Impacted	EJ Persons Severely Impacted	EJ as percent Persons Severely Impacted	Percent Minority County Popul.	Ratio of Minority Impacted to County Minority	Ratio of Minority Severely Impacted to County Minority
WA								
	King County	40	2.2	40	3.9	16.9	**0.13**	**0.23**
	State Total	**40**	**2.2**	**40**	**3.9**			
WI								
	Brown County	20	0.9	10	1.1	4.5	**0.21**	**0.25**
	La Crosse County	360	14.2	260	25.5	4.4	**3.20**	**5.75**
	Marathon County	250	13.2	190	23.8	2.8	**4.64**	**8.34**
	Milwaukee County	150	1.5	50	1.2	27.1	**0.06**	**0.04**
	Waukesha County	230	5.9	110	6.3	3.3	**1.82**	**1.94**
	State Total	**1,010**	**4.9**	**620**	**7.2**			
	COUNTRY TOTAL	**97,810**		**43,930**				

Champaign County, IL, Butler County, OH, Abbeville County, SC, Staunton City, Tazwell County, Washington County, and Williamsburg City, VA; and LaCrosse County and Marathon County, WI.

4.3.2 Health Effects of Noise Many laboratory and field tests have been conducted to determine the effects of noise on people. The U.S. Environmental Protection Agency (EPA) summarizes the results of these testing programs in their "Levels Document".[5] In their summary, EPA adopts the term "health" to include physiological and psychological well being in addition to absence of disease. Consequently, noise effects on people are considered in two categories: (1) behavioral indicators of well being, and (2) physiological and medical indicators of disease.

The first category includes the subjective indicators, activity interference and annoyance, which can change as people become familiar with the noise source. Environmental noise impact assessment uses noise annoyance as the key indication of behavioral well being. Among the contributors to annoyance are noise interference with speech communication, learning process, mental activity, and sleep. Research has lead to quantitative relationships between noise and annoyance for these factors. Other contributors to noise annoyance, such as emotional attitude toward the noise source, are less well defined.

The second category includes the objective indicator hearing loss, which is the only proven physiological effect of noise. It is important to emphasize that noise is not the only cause of hearing loss. A natural diminution of hearing acuity with age, called "presbycusis," is one of several other medical causes of hearing loss. The onset of hearing damage can occur from exposure to either high sound levels for a short period, or lower sound levels for a longer time. The person exposed suffers what is termed, "temporary threshold shift" (TTS), reduced hearing ability for some period of time after exposure, usually lasting for a period up to a day. If allowed to recover by a period of quiet time, the person's hearing returns to normal.

[5] U.S. Environmental Protection Agency, *"Information on levels of environmental noise requisite to protect public health and welfare with an adequate margin of safety,"* EPA 550/9-74-004, March 1974.

However, if such exposure continues to be repeated again before the ear is allowed to recover, the TTS can become permanent hearing loss.

After extensive research on noise-induced hearing loss, researchers have established general relationships between noise exposure and hearing loss. At the upper end of noise exposure, the US Occupational Safety and Health Administration (OSHA) published limits on the levels of noise exposure in the industrial workplace to avoid permanent hearing loss over a working life.[6] The limit is a maximum permissible A-weighted exposure level (L_{eq}) of 90 dBA for an 8-hour workday. For each halving of exposure time, the level is allowed to increase by 5 dB, up to a maximum of 115 dBA for 15 minutes. Hearing conservation programs are required when the 8-hour equivalent exposure exceeds 85 dBA. At the lower end, a conservative criterion was recommended by EPA to protect hearing with an adequate margin of safety; a continuous 24-hour L_{eq} of 70 dB should protect the general population when exposed to such a level over a 40-year period. Between these extremes, the International Organization for Standards (ISO) has established a standard and a procedure for calculating potential hearing damage from exposures during 8-hour workdays over periods ranging from 0 to 40 years.[7]

Sound exposure from locomotive horns in the community does not reach the cumulative levels that would exceed risk criteria for hearing damage. The horn noise model established by measurements for the Federal Railroad Administration is based on a sound exposure level of 107 dBA at 100 feet from the tracks for locations not closer than 1/8 mile from a grade crossing. In order to risk the onset of hearing damage, a person at that distance would have to hear more than 180 horn events during each 8-hour period for five days a week and continuously for 40 years. These conditions would yield an 8-hour L_{eq} of 85 dBA. In fact, the risk of hearing damage may be even less because the sound is not actually continuous and the ear has time to recover between horn soundings.

Other noise effects on health have been researched with ambiguous results. Stress related syndromes, especially relevant to mental health, are the result of a complex interaction of many factors. Noise exposure can be a contributor when an emotional factor, such as an attitude toward the source of noise, comes into play. Several airport noise surveys have indicated stress-related disorders result from continuous exposure to high noise levels, but it has not been conclusively shown that the actual physical stimulus of noise is the cause of the health effect. Quoting the World Health Organization, “research on this subject has not yielded any positive evidence, so far, that disease is caused or aggravated by noise exposure, insufficient to cause hearing impairment.” [8]

4.3.3 Economic Impacts FRA studied the issue of economic impacts resulting from the proposed rule in the Regulatory Evaluation and Initial Regulatory Flexibility Assessment for Use of Locomotive Horns at Highway-Rail Grade Crossings, FRA, (Washington, DC) 1999. Using an initial base of 2,122 public at-grade crossings with whistle bans, FRA calculated the costs and benefits associated with the proposed rule.

The safety benefits alone, excluding any benefit to railroads, exceed the most costly yet realistic scenario for community safety enhancements. The analysis found that fully implementing

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6 U.S. Department of Labor, “Department of Labor Occupational Noise Exposure Standard,” Amended Code of Federal Regulations, Title 29, XVII, Part 1910, 1983.

7 International Organization for Standards, “Acoustics – Determination of occupational noise exposure and estimation of noise-induced hearing impairment,” International Standard ISO 1999.2, Geneva, Switzerland, 1989.

8 World Health Organization, “Environmental health criteria 12:noise,” Geneva, 1980.

other safety measures to designate quiet zones at all current whistle ban crossings is less costly than the collisions attributable to not blowing the horn at those locations. The external environmental benefits of the various mitigating provisions of the proposed rule would likely add to its favorable economic effect.

The estimated benefits of this proposed rule are derived from the prevention of collisions and the resulting fatalities and injuries. Benefits also exist for railroads in terms of reduced train delay, debris removal, and track and signal repairs. The estimated benefits of this proposed rule were found to exceed the estimated costs over a 20-year period at a 7 percent discount rate. The benefits resulting from casualties prevented are shown in Table 4-8. The first benefit scenario (Casualties Prevented – 1) assumes that the collision rate remains constant over time accruing $258,641,800 in benefits over 20 years. However, it is more likely that grade crossing collisions will continue to decline as safety initiatives by FRA and state and local governments take effect. Therefore, the second scenario (Casualties Prevented – 2) assumes that the collision rate declines by about 4 percent per year to accrue benefits of $188,273,400 over 20 years.

TABLE 4-8
ESTIMATED BENEFITS

Category	Effectiveness ~ .38[9]	Effectiveness ~ .75[10]
Casualties Prevented – 1	$258,641,800	$510,477,200
Casualties Prevented – 2	$188,273,400	$371,592,200

Source: *Regulatory Evaluation and Initial Regulatory Flexibility Assessment for Use of Locomotive Horns at Highway-Rail Grade Crossings*, FRA, (Washington, DC) 1999.

Because FRA cannot predict the eventual combination of improvements and their costs, the costs of applying each safety measure to each crossing studied are summarized in Table 4-9. These measures would never all be used together.

For the economic analysis, FRA assumed that affected communities would choose to take actions that have the least cost (i.e., a cost that would not exceed the costs of supplementary or alternative safety measures). Various benefit and cost scenarios are established in Tables 4-10 and 4-11 on the following page. Table 4-10 summarizes the costs and benefits of alternative scenarios. Table 4-11 lists the assumptions for each scenario. In these scenarios non-monetized costs and benefits are those factors, including noise exposure, for which a clear value can not be assigned. Because noise is not a good or service generally traded in the open market place, it is difficult to directly assign a value to noise or the avoidance of noise. The value of noise, and its avoidance, is arguably best reflected in the value people place on the noise environment when selling or purchasing homes. FRA conducted the residential price analysis described later in this section to address these issues.

[9] Equivalent to effectiveness of train horns used at crossings with gates and lights.

[10] Equivalent to effectiveness of median barriers with frangible delineators placed at crossings and with gates and lights.

TABLE 4-9
ESTIMATED COSTS[11]

Item	Amount
Whistle Boards	$20,250
Installation of Gates & Lights(878 crossings)	$67,109,706
Increased Maintenance Gates/Lights (878)	$11,201,974
Signs	$375,500
Community Planning	$134,000
Government Costs	$134,000
Medians (mountable at 878 crossings)	$11,060,183
Medians (mountable at all crossings)	$26,453,740
Police Enforcement	$24,805,600
Photo Enforcement	$124,955,453

Source: *Regulatory Evaluation and Initial Regulatory Flexibility Assessment for Use of Locomotive Horns at Highway-Rail Grade Crossings*, FRA, (Washington, DC) 1999.

A scenario that assumes installation of median barriers and signs at each crossing and upgrades to a minimum of gates and lights for all passive crossings would be justified on the basis of casualties prevented alone. This scenario would result in net benefits of at least $255.2 million. The estimated costs for this scenario, including maintenance and other costs of the proposed rule as well as installation of median barriers, signs, and passive crossing upgrades with gates and lights for 2,100 impacted crossings, would be $116.4 million. These findings are somewhat preliminary, as FRA does not have detailed data for the effectiveness or costs for some of the Supplementary Safety Measures. FRA does not have adequate information on what choices a given community will make regarding either blowing the train whistle or installing or implementing alternatives to the train whistle. In the NPRM, FRA is seeking comment and additional information from communities regarding choices they would make so that a more complete estimate of the costs and benefits of this rule may be made prior to the issuance of the final rule.

If a community with a current whistle ban decides that it would rather reduce risk at highway-rail grade crossings by means other than having trains sound horns in the community, it would incur some costs under the proposed rule. If the community chooses to designate a quiet zone, it would need to notify relevant railroads, traffic and law enforcement control authorities, state agencies, and FRA. The community would need to implement supplementary or alternative safety measures, and certain costs would be born by the railroads. While FRA cannot predict with certainty how many communities would select these exceptions, it is reasonable to assume that many communities would, particularly those with longstanding whistle bans.

[11] This table cannot be summed for a total cost of the rule, much of the cost depends on community choice. Numbers for Police and Photo Enforcement are shown, however, they are also contained in the benefits section.

TABLE 4-10
COSTS AND BENEFITS OF ALTERNATIVE IMPLEMENTATION SCENARIOS
NET PRESENT VALUE 1999-2029[12]

Implementation Scenario	Costs Monetized/ Non-Monetized	Benefits		Net Monetized Benefits
		Injury/Fatality Reduction	Monetized Injury/Fatality	
Train whistles at crossing with gates and lights, collision rate constant [13]	$89,313,931 Indeterminate level of noise costs.	(68 Fatalities) (342 Injuries)	$258,641,800	$169,327,869
Train whistles at crossing with gates and lights, collision rate decline [14]	$89,313,931 Indeterminate level of noise costs	(47 Fatalities) (235 Injuries)	$188,273,400	$98,959,469
Median barrier with frangible delineators at crossings with lights and gates, collision rate constant [15]	$116,395,343	(135 Fatalities) (675 Injuries)	$510,477,200	$394,081,857
Median barrier with frangible delineators at crossings with lights and gates, collision rate decline [16]	$116,395,343	(97 Fatalities) (463 Injuries)	$371,592,200	$255,196,857

Source: *Regulatory Evaluation and Initial Regulatory Flexibility Assessment for Use of Locomotive Horns at Highway-Rail Grade Crossings*, FRA, (Washington, DC) 1999.

12 All figures assume 7% discount rate. The baseline to which these scenarios are compared is the continuation of the whistle-bans in the communities that now have them. See table below for categories of costs and benefits included in these monetized estimates.

13 Assumes a 38% reduction in fatalities and injuries and an accident rate that is constant over time. Reduction in fatalities and injuries is the same 38%, the equivalent effectiveness of a train horn whether the horn is sounded or not. Costs include installation and maintenance of gates and lights at 878 passive crossings.

14 Assumes a 38% reduction in fatalities and injuries and an accident rate that declines by about 4% per year. Reduction in fatalities and injuries is the same 38%, the equivalent effectiveness of a train horn whether the horn is sounded or not. Costs include installation and maintenance of gates and lights at 878 passive crossings.

15 Assumes a 75% reduction (effectiveness rate of median barrier) in fatalities and injuries and an accident rate that is constant over time.

16 Assumes a 75% reduction (effectiveness rate of median barrier) in fatalities and injuries and an accident rate that declines by about 4% per year.

TABLE 4-11
CATEGORIES OF COSTS AND BENEFITS INCLUDED IN SCENERIOS

Category		Monetized	Non-monetized
Costs	train whistles at crossings with gates and lights	-whistle boards -directionality provision -upgrades to gates and lights at passive crossings	-indeterminate level of noise costs
	supplementary safety measures	- upgrades to gates and lights at passive crossings -community costs -government Costs -whistle boards -directionality -Supplementary Safety Measures and Alternative Safety Measures.	-none
Benefits	train whistles at crossings with gates and lights	-reduction in injuries and fatalities.	-community noise reduction through whistle boards and the directionality provision
	supplementary safety measures	-reduction in injuries and fatalities (greater reduction than train horn is likely as all SSMs have higher effectiveness rate than train horn)	-reduced train delay, debris removal and repairs -collisions/incidents involving pedestrians and bicyclists -incidents where car struck train at behind the first five cars -community noise reduction through quiet zones in communities where state law currently requires the use of the train horn

Source: *Regulatory Evaluation and Initial Regulatory Flexibility Assessment for Use of Locomotive Horns at Highway-Rail Grade Crossings*, FRA, (Washington, DC) 1999.

The rule contains provisions that would make it possible for many communities, currently exposed to train horn noise, to establish quiet zones and thus relieve themselves of noise exposure. Any potential benefit from these new quiet zones is indeterminate, as it is impossible to estimate how many would be implemented and when; however, FRA has noted the interest of many communities impacted by recent railroad mergers in abating the train horn impacts of recent changes in traffic flows.

Housing Study

FRA conducted a study to assess the potential for external effects to homeowners or businesses adjacent to railroad tracks, where an existing whistle-ban exists, should the community elect not to pursue a qualifying quiet zone. Data for more than 12,000 single-family residential home sales in two Ohio communities (Middletown and Niles) over the period

1988-1997 was analyzed by FRA for this study[17]. A statistical model was used to determine the independent influence of proximity to Conrail crossings where whistle bans were ignored. The Conrail line is of interest because it represents a rail line where some communities had whistle bans, while others did not. In addition, over the time period in question, Conrail ignored the whistle ban in some communities. After accounting for the influence of numerous characteristics of the property (such as bedrooms, bathrooms, size of garage, lot size, etc.) as well as neighborhood attributes (such as air quality, school district, proximity to local hazards, proximity to sound, etc.), the model generated the following findings:

- **Proximity to rail lines depresses property values**. The addition of one active railroad track (main, siding, or spur) within 1/4 mile of a property, lowers its sale price by approximately 2.1 percent in Middletown and 2.8 percent in Niles.

- **Proximity to rail crossings lowers property values**. Being within approximately 1/2 mile of a Conrail crossing lowers property values by approximately 6.2 percent in the Middletown area and by 17.4 percent in the Niles area. In contrast, being within 1/2 mile of a rail crossing for another rail company that is not sounding horns, lowers sale prices 7.8 percent and 8.4 percent for Middletown and Niles respectively.

- **Conrail's action of ignoring the whistle ban generated temporary but not permanent housing price impacts.** There is evidence of a temporary increase in home values (increased sale prices) with greater distance from the crossing (i.e., a so-called housing price gradient). For the Middletown area, this price gradient at Conrail crossings results after the whistle ban is ignored (i.e., housing prices rise by about 4.5 percent over the distance from the crossing to the edge of the audible range for train horns). However, the impact in Middletown does not appear to remain statistically important once temporary versus permanent impacts are distinguished. In the Niles region, the price impact of proximity rises temporarily after ignoring the ban, but the detrimental effect of the action taken by Conrail subsides after 4.5 years.

These findings suggest that, although the housing market is influenced by the proximity of rail lines and rail crossings, there is not a significant long-run impact on residential housing markets impacted by the resumed use of locomotive horns at highway-rail grade crossings. The implications of the study make it difficult to assign a value to noise exposure and thus noise costs and benefits are indeterminate.

Some studies of airplane noise impacts, however, have shown some degree of property value effects. A 1998 working paper cited studies performed in the 1980's which purportedly estimated a range of 0.10 to 1.60 percent housing value reduction per increased decibel level near airports.[18] While the differences in the subjects of these studies cast doubt on their applicability to property abutting railroads, they are perhaps helpful for comparison purposes. Significant differences between airplane noise and train horn noise in terms of the geographical size of the area affected (and population size), the frequency and duration of the noise, and other factors caution against the use of airplane noise study conclusions to determine the impact of train horns. Some of the lessons learned in airplane noise studies may, however, have value for further investigation of the possible impacts of train horn noise.

[17] David E. Clark, "Ignoring Whistle Bans and Residential Property Values: An Hedonic Housing Price Analysis," (FRA, Argonne National Laboratory, March 1999)

[18] Morrison, et al., "Fundamental Flaws of Social Regulation; The Case of Airplane Noise", (American Enterprise Institute and Brookings Institution, 1998)

4.4 IMPACT CONCLUSIONS

The estimated benefits of the Proposed Action were found to exceed the estimated costs over a 20-year period at a 7 percent discount rate. A scenario assuming median barriers are installed at each crossing, signs are installed at each crossing and crossing upgrades to a minimum of gates and lights for all passive crossings would be justified on the basis of casualties prevented alone with net benefits of at least $255.2 million. A housing price analysis found that although the housing market is influenced by the proximity of rail lines and rail crossings, there does not appear to be a permanent impact resulting from the instances where Conrail resumed horn blowing.

The No-Action alternative may not incur the potential impacts of more noise exposure at current whistle ban locations, but neither may it result in the benefits of the proposed rule. On balance, it is likely that a No-Action alternative **may** result in more noise exposure over time to communities throughout the nation as well as greater loss of life and more injuries.

4.5 MITIGATION

Mitigation of direct noise impacts is a prominent feature of the proposed rule in the provisions that permit the creation of quiet zones. In addition, the proposed rule contains mitigating provisions for a maximum horn sound level and forward directionality that would reduce community noise impacts nationally. These provisions reflect the intent of Congress and meet the requirements for an integral opportunity for mitigation set forth in the 49 U.S.C. §20153 (See Appendix B). FRA views the provisions for quiet zones as an ample and unlimited measure to address direct impacts that would be available to all localities, including those communities that do not currently have whistle bans.

To make quiet zones both effective and available, the proposed rule details a list of Supplemental and Alternative Safety Measures (SSMs and ASMs) that would be available to local jurisdictions that wish to avoid the noise impacts in their communities. These measures are shown in NPRM Appendices A and B, Section 222.41, for the establishment of quiet zones. As proposed, communities would have sole discretion to designate a quiet zone, if those supplementary safety measures in Appendix A are used as prescribed in the proposed rule. Otherwise, a community may pursue a corridor wide strategy to implement a quiet zone using differing treatments at individual crossings upon demonstrating the total effectiveness of the strategy to FRA. FRA is prepared to provide technical assistance to communities seeking to implement quiet zones, including information regarding public education and awareness resources.

FRA has concluded that all SSMs in the NPRM Appendix A fully compensate for the lack of a locomotive horn. ASMs that may partially compensate for the lack of a locomotive horn depending on the extent of their implementation are listed in Appendix B of the NPRM. Each SSM and ASM is discussed in Section 4.5.3, Mitigation Toolbox, of this DEIS and summarized in Table 4-12.

4.5.1 Effectiveness of Supplementary And Alternative Safety Measures FRA has calculated an effectiveness rate for each SSM. This rate indicates the effectiveness of the SSM in reducing the probability of a collision at a highway-rail grade crossing. Effectiveness rates are based on available empirical data and experience with similar approaches. The effectiveness rates shown for each SSM are subject to adjustment as research and demonstration projects are completed and data are gathered and refined. FRA proposes to

use these estimates as benchmark values to determine the effectiveness of all SSMs along a proposed quiet zone.

TABLE 4-12
MITIGATION TOOLBOX

List A: Supplementary Safety Measure	**Effectiveness**	**Other Information**
Temporary closure of a public highway-rail grade crossing	1.0 (for periods closed)	Nighttime or other time-of-day whistle bans; hours at the discretion of the community.
Four-quadrant gates only, no vehicle presence detection	0.82	Gates and circuitry only are estimated to cost $244,000 to $318,000. Annual maintenance costs are estimated at $3,750.
Four-quadrant gates only, with vehicle presence detection	0.77	Costs same as above; costs for presence detection unknown.
Four-quadrant gates only, with medians of at least 60 feet, with or without presence detection	0.92	Costs same as above; costs for medians as below; costs for presence detection not known.
Mountable curb medians with channelization devices	0.75	Estimated cost: $11,100. This cost assumes 60 feet of mountable median barriers with high intensity yellow reflective sheeting and reflective arcs.
Barrier curb medians with or without channelization devices	0.80	None.
One-way streets with gates	0.82	None.
Photo enforcement	0.78	Capital cost is estimated at $55,000 to $75,000 per grade crossing. Annual Operating Costs = $20,000 to $30,000 per grade crossing. All crossings may total capital and operating costs given that "dummy" equipment could be used at some crossings. Costs may be offset by revenue generated by citation collection.
List B: Alternative Safety Measure	**Conversion Rate**	**Other Information**
Programmed Enforcement	.78	Average cost per crossing is $3,000 per year. Average revenue per crossing is $10,600 per year.
Public Education and Awareness	N/A	None.
Other Mitigation Required To Implement A Quiet Zone		**Other Information**
Advance Warning Signs		Cost of sign, pole, and installation is estimated at $200 each.
Installation of activated gates and flashing lights		Cost is estimated at $100,000 per crossing.

FRA's nationwide study indicated that collision probabilities increase an average of 62 percent when horns are silenced. As such, the supplementary safety measure should have an effectiveness of at least .38 (reducing the probability of a collision by at least 38 percent) to compensate for this 62 percent increase. For example, if a select group of 1,000 crossings are expected to have 100 collisions per year with train horns being sounded, this same group of crossings would be expected to have 162 collisions per year once the sounding of the train horns is banned if no other safety measures are implemented and other factors remain unchanged. Conversely, if these same crossings were experiencing 162 collisions per year while the horn was banned, it would be expected that this number would decrease to 100 once use of the horn is reinstated.

4.5.2 Procedures Required To Implement Quiet Zones Communities may apply SSMs from NPRM Appendix A according to requirements of the proposed rule at every crossing within a zone and may then designate the quiet zone upon notification of FRA and the railroad. Otherwise, communities would be required to perform analyses of a proposed quiet zone for submittal to FRA. The following procedures and guidelines are provided to help state and local governments through the decision making process (as proposed) in their considerations of the establishment and designations of quiet zones. The procedures detailed below are considered recommended practices and are not meant to supersede or amend regulatory requirements. FRA would require the use of its DOT Highway-Rail Crossing Accident Prediction Formula to determine the "mitigation goal."

Analysis of a proposed quiet zone can be completed using the following steps:

1. Define the subject corridor and the involved crossings;

2. Obtain the U.S. DOT/AAR Crossing Inventory Number of each crossing within the proposed quiet zone. The corridor must be at least one-half mile in length (805 meters) measured along the rail right-of-way, and all highway-rail crossings within the entire length of the quiet zone corridor must be included;

3. Ensure that current data, especially public or private status, highway and rail traffic counts, and at least five years of collision history, are available;

4. Current highway and rail traffic counts must be submitted to the FRA for inclusion in the U.S. DOT/AAR National Highway-Rail Crossing Inventory. A record of collisions can be obtained on the FRA web-site (HTTP://www.fra.dot.gov) or from the FRA Office of Safety Analysis (RRS-21), Mail Stop 25, 400 Seventh Street, SW, Washington, DC 20590.

5. Specify the type of safety devices at each public highway-rail grade crossing.

6. Determine the presence of minimum requirements. The applicant will specify the type of automatic warning devices (flashing lights, automatic gates, and bell) and special advanced warning signs (if available) on each highway approach.

7. Account for private and pedestrian crossings. Specify the traffic control elements for each private highway-rail grade crossing and pedestrian grade crossing within a quiet zone. The minimum traffic control requirement for these crossings is a special warning sign on each approach that advises users of the crossing that the train horn will not be sounded. Private highway-rail grade crossings and pedestrian crossings should not be included in the calculations of violation rates and collision rates.

8. In the event that the proposed quiet zone includes private crossings, the jurisdiction establishing the quiet zone must notify all landowners using the crossing that train horns will not be routinely sounded at crossings within the quiet zone.

9. Determine the crossings that can be addressed by the engineering-based SSMs. If all crossings can be addressed without changing any requirements of the SSMs, the jurisdiction and the railroad(s) should proceed to implement the appropriate measures and make the applicable notifications.

10. If any of the crossings will be addressed with non-engineering based supplementary safety measures (from Appendix A of the NPRM), a baseline violation rate for each crossing to be addressed must be determined for subsequent assessment purposes. Currently, only Photo Enforcement is included in this category. Two methods are available for determining baseline violation rates as described below:

Method 1: Train Horns Are Routinely Sounded Within the Proposed Quiet Zone

Determine baseline violation rates prior to implementation of Photo Enforcement.

Determine new violation rates and compare to baseline rates in the calendar quarter following initiation of Photo Enforcement.

If and when the new violation rates at all crossings in the quiet zone at which Photo Enforcement is to be used are at least 49 percent below the baseline rates, and all other crossings in the quiet zone have been addressed with Appendix A options of the NPRM, the community and the railroad may proceed with notifications and implementation of the quiet zone.

Violation rates must be monitored for the next two calendar quarters and every other quarter thereafter. If the violation rate is ever greater than the baseline violation rate, the procedures for dealing with unacceptable effectiveness after establishment of a quiet zone should be followed.

Method 2: Train Horns Within the Proposed Quiet Zone are Already Prohibited

Determine baseline violation rates prior to implementation of Photo Enforcement.

Ensure that all other crossings in the quiet zone have been addressed with Appendix A options of the NPRM.

Initiate Photo Enforcement and notification and implementation of the quiet zone.

Violation rates must be monitored for the next two calendar quarters and every other quarter thereafter. If the violation rate is ever greater than the baseline violation rate, the procedures for dealing with unacceptable effectiveness after establishment of a quiet zone should be followed.

11. When one or more crossings in the proposed quiet zone corridor cannot be addressed with a SSM from Appendix A, the applicant must use the DOT Highway-Rail Crossing Accident Prediction Formula to determine the total of predicted collisions at all of the public crossings within the quiet zone assuming that each crossing is equipped with flashing lights, automatic gates, and a warning bell. This total becomes the mitigation goal

for the corridor (i.e., the predicted collision total that the community's proposal must show will not be exceeded once the quiet zone is implemented).

12. The mitigation goal must be multiplied by 1.62 (communities subject to FRA's EO15 should multiply by 3.125) to establish the expected collision total without horns (i.e., the expected collision total once horns are banned if no supplementary safety measures are applied).

13. The collision prediction for any crossing(s) to be closed prior to implementation of the quiet zone should be subtracted from the expected collision total without horns. The highway traffic counts for crossings to be closed must be added to the traffic counts of the crossings that will be used by the displaced vehicles and the collision prediction for these impacted crossings must be recalculated and multiplied by 1.62 (3.125 for EO15 communities) to establish a new expected collision total without horns.

14. For each crossing to be addressed the effectiveness of the SSMs to be applied should be multiplied by that crossing's collision prediction rate and the product should be subtracted from the expected collision total without horns. For the non-engineering based measures, an effectiveness of 0.38 may be assumed until analysis of the specific crossing and applied mitigation measure has been assessed.

15. Once it can be shown that the expected collision total without horns will be reduced to or below the mitigation goal, the quiet zone proposal may be submitted for approval to FRA's Associate Administrator for Safety.

4.5.3 Mitigation Tool Box For quiet zone designation by local jurisdictions, FRA has set forth five supplementary safety measures (SSMs) in the proposed rule, any one of which can be applied to a crossing. At least one SSM is required for each highway-rail grade crossings in the corridor under the first optional method for quiet zone designation. These safety measures have been determined by FRA to have a certain effectiveness rate that would effectively compensate for the absence of sound from the locomotive horn.

4.5.3.1 Supplemental Safety Measures The next sections describe the five SSMs designated by FRA as mitigation tools available to local jurisdictions and railroads.

1. Temporary Closure of a Public Highway-Rail Grade Crossing. The temporary closure of a public highway-rail grade crossing has the advantage of obvious safety and thus would more than compensate for the lack of a locomotive horn during the periods of crossing closure. The required conditions for closure are intended to ensure that vehicles are not able to enter the crossing. To avoid driver confusion and uncertainty, the crossing must be closed during the same hours every day and may only be closed during one period each 24 hours. The consistency of closure periods would avoid unnecessary automobile to automobile collisions in addition to avoiding collisions with trains. Activation and deactivation of the system is the responsibility of the local traffic control authority or the entity responsible for maintenance of the street or highway that crosses the railroad. Responsibility for activation and deactivation of the system may be contracted to another party. However, the appropriate governmental entity shall remain fully responsible for compliance with the requirements of this section. In addition, the system must be tamper-proof and vandal resistant to the same extent as other traffic control devices.

The Manual on Uniform Traffic Control Devices (MUTCD) standards should be met for any barricades and signs used in the closure of the facility. Signs for alternate highway routes should be erected in accordance with MUTCD and state and local standards and should

inform pedestrians and motorists that the streets are closed, the period for which they are closed, and that alternative routes must be used.

Effectiveness. The probability of a collision with a train at the crossing is zero during the period the crossing is closed. Effectiveness would equal 1.0. For the purpose of estimating risk following imposition of a whistle ban (unless the particular closure was accomplished by a grade separation), traffic would need to be redistributed among adjacent crossings or grade separations.[19]

Application. Communities may desire to implement a nighttime whistle ban (e.g., from 10 PM to 6 AM) closing one or more grade crossings within a proposed quiet zone. This mitigation measure assumes that train horns would be sounded at all other times of the day with the exception of the closure period. In any flexible program (i.e., when any of the Section 222.33, Appendix B mitigation measures or Appendix A non-engineering based measures are used) in combination with Section A engineering-based measures, the applicant for a quiet zone would be required to calculate collision risk in accordance with the required FRA procedures. The local jurisdiction or state would be required to factor 24-hour rail and highway volume data to reflect the period of time when the public highway-rail grade crossing is closed.

2. Four-Quadrant Gate System. A four-quadrant gate system involves the installation of gates at a public highway-rail grade crossing to fully block highway traffic from entering the crossing when the gates are lowered. This system includes at least one gate for each direction of traffic on each approach. A four-quadrant gate system is meant to prevent a motorist from entering the oncoming lane of traffic to avoid a fully lowered gate in the motorist's lane of traffic. Because an additional gate also would be fully lowered in the other lane of the road, the motorist would be fully blocked from entering the crossing.

FRA proposes that the following be required for all four-quadrant gate systems:

1. When a train is approaching the crossing, gates must span all highway approach and exit lanes on both sides of the grade crossing. This would deny the highway user the option of circumventing the conventional approach lane gates by switching into the opposing (oncoming) traffic lane to cross the tracks.

2. Constant warning time devices will be required to activate the gates.[20] This will ensure that the gates are activated for the same amount of time prior to the arrival of a train, irrespective of its speed. This will minimize the time spent waiting at crossings being approached by very slow moving trains.

3. When the gates are fully lowered or down, the gap between the ends of the entrance and exit gates (on the same side of the railroad tracks) must be less than two feet if no median between lanes is present. If there is a median or if channelization devices are installed, the lowered gates must reach within one foot of the median or channelization device, measured horizontally across the road from the end of the lowered gate to the median or channelization device or to a point over the edge of the median or channelization device.

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[19] It is assumed that trips would still be made, therefore, the vacant crossing that facilitated the trip is assumed to be used.

[20] Not all warning time devices in use today are of the modern type such that the time the gate stays open adjusts to the speed of the approaching train. However, FRA's position with regard to four-quadrant gates is that the gates, when installed as part of a quiet zone, must be of the modern type such that the time the gate stays open adjusts to the speed of the approaching train.

The gate and the median top or channelization device do not have to be at the same elevation.

4. Breakaway channelization devices must be frequently monitored to replace broken elements.

5. Signs must be posted alerting motorists that the train horn does not sound.

6. For new installations, FRA strongly recommends that the following conditions apply:

a. Qualified traffic engineers should establish gate timing based on site-specific determinations. Such determinations should consider the need for and timing of a delay in the descent of the exit gates (following the descent of the entrance gates). Factors to be considered include available storage space between the gates that is outside the fouling limits of the tracks (beyond the width of trains) and the possibility that traffic flows may be interrupted as a result of nearby intersections.

b. When operating in the fail-safe mode, exit gates should remain in the raised or "up" position.

c. A determination should be made whether to provide vehicle presence detectors (VPDs) to open or keep open the exit gates until all vehicles are clear of the crossing. VPD should be installed on one or both sides of the crossing and/or in the surface between the rails closest to the field. Among the factors to consider are the presence of the intersecting roadways near the crossing, the priority that the traffic crossing is given at such intersections, the types of traffic control devices at those intersections, and the presence and timing of traffic signal preemption.

7. Highway approaches on one or both sides of the highway-rail crossing may be provided with medians or channelization devices between the opposing lanes. Medians should be defined by a barrier or mountable curb, with or without reflectorized devices.

8. Remote monitoring of the status of these crossing systems is preferable.

Effectiveness. The installation of four-quadrant gates would provide a safe alternative to the locomotive horn. There have been no highway-rail crossing collisions documented at any of the five four-quadrant gate installations in the United States. There were also no collisions documented at a demonstration site in Knoxville, Tennessee from 1985 to 1986. The oldest of the permanent installations dates from 1952. Recognizing the limited number of installations, however, FRA proposes very conservative estimates for effectiveness of this countermeasure.

The estimate of .82 for freestanding four-quadrant gates (no medians and no presence detection) is a highly conservative figure involving a discount from documented experience. A recent four-quadrant gate installation in North Carolina, without medians, reduced violations by 86 percent compared to previous experience at the same crossing, which was previously equipped with standard gates. This North Carolina test ran for a period of five months, including base and test periods. However, it should be noted that the North Carolina observations involved simultaneous use of the train horn (both during the base period and the evaluation period). It is not known whether there is a significant synergistic effect between the train horn and the engineering improvements, but the short duration of the study and possibility of such effects suggest the need for the modest discount to the effectiveness rate.

Four-quadrant gate installations undertaken thus far in the United States generally have not employed Vehicle Presence Detection (VPD). However, some future installations would incorporate this feature to ensure coordination with other traffic signals and for other purposes. For instance, tight geometry may not allow for any storage space between the gates should queuing of traffic at a STOP sign on one side of the crossing prevent prompt clearance of the crossing by a motor vehicle. In such cases, leaving the exit gates in the raised position may be elected. Installing VPD would cause exit gates to remain up indefinitely as one or more vehicles pass over the crossing. Although providing VPD avoids the scenario of entrapment of cars on the crossing (long feared by some in the railroad community as a liability risk), it also leaves open the possibility that some motorists would follow violators through the crossing in a steady stream, defeating the intent of the warning device. Accordingly, where medians are not provided to prevent a steady stream of violators, a lower effectiveness rate is assumed. FRA estimates that a four-quadrant gate with presence detection, but without median barriers, would have an effectiveness rate of approximately .77.

By contrast, where lengthy median barriers to discourage the violation-minded driver supplement four-quadrant gates, the use of presence detection would make only a minor difference in the safety effectiveness of the arrangement. The North Carolina demonstration showed that when the four-quadrant gate installation was supplemented by medians (channelization devices) of at least 50 feet on each highway approach, the crossing experienced a 97 percent drop in violations. Also, in the North Carolina observations, as the number of violations decreased, the average number of seconds prior to arrival of the train also significantly increased (predicting that collisions might fall off at a faster rate than violations). The effectiveness of four-quadrant gates may thus be higher than the range stated above, both with and without medians and with presence detection. FRA estimates an effectiveness rate of .92 for four-quadrant gates with median barriers.

3. Gates with Medians or Channelization Devices. Keeping highway traffic on both highway approaches to a public highway-rail grade crossing in the proper lane denies the highway user the option of circumventing gates in the approach lanes by switching into the opposing (oncoming) traffic lane in order to drive around a lowered gate to cross the tracks. FRA therefore proposes to require that gates with medians or channelization devices be considered supplementary safety measures if the following conditions are met:

1. Opposing traffic lanes on both highway approaches to the crossing must be separated by either:

   a. medians bounded by barrier curbs, or

   b. medians bounded by mountable curbs if equipped with channelization devices.

2. Such medians must extend at least 100 feet from the gate, unless there is an intersection within that distance. Where an intersection is located within 100 feet of the gate, the median or channelization device must extend at least 60 feet from the gate. Intersections within 60 feet of the gate must be closed or moved.

3. The crossing warning system must be equipped with a constant warning time system.

4. The horizontal gap between the lowered gate and the median or channelization device must be one foot or less in length, measured horizontally across the road from the end of the lowered gate to the median or channelization device or to a point over the curb edge of the median or channelization device. The gate and the median top or channelization device do not have to be at the same elevation.

5. Breakaway channelization devices must be monitored frequently to replace broken elements.

6. Signs must be posted alerting motorists to the fact that the train horns are not sounded.

Effectiveness. FRA estimates that mountable curbs with channelization devices have an effectiveness of .75 and barrier curbs with or without channelization devices have an effectiveness of .80. FRA has found that a gate installation in North Carolina with channelization devices 60 feet long and longer reduced violations by 77 percent, during the 22-month period when data was collected.

A gate installation in the State of Washington equipped with barrier curbs (with channelization devices), 99 feet long on one approach and 30 feet long on the other, experienced reductions in violations of 97.5 and 95.6 percent respectively during a 4-month test period while train horns continued to sound. Given the short period of observation, the novelty effect of the installation would be expected to result in somewhat superior performance to that which would be expected over the long term, particularly on the approach with the 30-foot median.

Further, the particular application involved allowed for a clearly channelized two-lane, tangent roadway on level ground with median separation between two main tracks. In this setting, expectations concerning motorist behavior were exceptionally clear. As noted, the train horn continued to blow, reinforcing the engineering improvements. Accordingly, these data are not taken as indicative of the average or typical installation in a whistle ban environment.

4. One-Way Streets with Gates. This installation consists of one way streets with gates installed so that all approaching highway lanes are completely blocked. FRA would require that the gate arms on the approach side of the highway-rail grade crossing extend across the road to within one-foot of the far edge of the pavement. If no median is present and two gates are used, with one on each side of the road, the gap between the ends of the gates when they are in the down position should be no more than two feet. If the highway approach is equipped with a median, the lowered gates should reach to within one foot of the median. The measurement should be horizontal across the road from the end of the lowered gate to the median or to a point over the median edge. The gate and the median top do not have to be at the same elevation.

In situations where only one gate is used, the edge of the road opposite the gate mechanism must have a barrier curb extending to and around the nearest intersection for at least 100 feet, so that the motorist cannot veer onto the shoulder of the road and drive around the gate tip. Crossing warning systems must be equipped with constant warning time devices.

Signs must be posted alerting motorists that the train horn does not sound.

Effectiveness. FRA estimates an effectiveness rate of .82. This effectiveness rate is the same rate used for four-quadrant gates without medians.

5. Photo Enforcement. An automated means of gathering valid photographic or video evidence of violations of traffic laws relating to highway-rail grade crossings can be an effective supplementary safety measure, if there is sufficient support and follow-through by the law enforcement and judicial community. FRA would require that state law authorize use of photographic evidence both to bring charges against the vehicle owner and sustain the burden of proof that a traffic law violation has occurred.

This would need to be accompanied by the commitment of the law enforcement and judicial communities to enforce vigorously the traffic laws relative to photo enforcement. Evidence of sufficient commitment would be traffic law violation penalties (and collection) sufficiently large to deter violations. FRA suggests that a fine of at least $100 be assessed against the violator. Some states have substantially higher penalties, such as Illinois and Florida with $500 fines. Other possible measures of sufficient deterrence could include one or more points posted against a violator's drivers license.

The proposed rule also would require that the photo enforcement system have a means to detect violations (such as loop detectors and video imaging technology) and photo or video equipment deployed to capture images sufficient to convict violators under state law. Every public highway-rail grade crossing would not need to be equipped with cameras for continual monitoring. The goal of deterrence may be accomplished by moving the surveillance equipment among several crossing locations, as long as the motorist perceives the strong possibility that a violation of the law would lead to sanctions. Therefore, each location should appear identical to the motorist, whether or not the camera or video equipment is actually within the housing or equivalent equipment.

Implementation of Photo Enforcement as a SSM would require appropriate integration, testing, and maintenance of the system to provide evidence-supporting enforcement. Periodic data analysis would be performed to verify that violation rates remain below a baseline level (level with train horns sounding). Also, signs would be required that alert motorists that train horns are not sounded and that the crossings are monitored for compliance with the law.

Public awareness efforts are critical to the success of this program. The public must be informed that the horns are not being sounded and that violation of crossing laws would result in fines and penalties.

Effectiveness. The Los Angeles photo enforcement demonstration project showed that a carefully administered and well-publicized program of photo enforcement reduced violation rates by 92 percent, while collisions were reduced only 72 percent. This ratio, 72/92 or .78, is proposed to be used to estimate the reduction in collision rates (effectiveness) for law enforcement and education/awareness options.

It is reasonable to infer that education and legal sanctions may lack effectiveness for several segments of the population. These persons, while a small portion of the overall population, may be over-represented in the population of those involved in violations and thus in collisions. As such, for law enforcement and education/awareness mitigation options violations must be reduced at least 49 percent to realize a 38 percent reduction in the risk of collision.

The following qualifications with regard to the effectiveness of photo enforcement are noted:

a. Where train horns routinely sound prior to the evaluation. Effectiveness would be determined by comparison of a violation/train count ratio, based on the number of violations divided by the number of train movements in any calendar quarter to the violation/train count ratio during a baseline monitoring period (a minimum of four weeks if conducted without public notice or media coverage, 16 weeks if conducted with public notice or media coverage). The reduction in violations should be at least 49 percent prior to implementation of the quiet zone. Effectiveness would be considered unacceptable if violations are greater than the original baseline level following establishment of the quiet zone.

b. Where communities already have a whistle ban in place. Effectiveness would be determined by comparison of a violation/train count ratio based on the number of violations divided by the number of train movements in any calendar quarter to the violation/train count ratio during a baseline monitoring period (minimum of four weeks if conducted without public notice or media coverage, 16 weeks if conducted with public notice or media coverage). The violation rate should be at least 49 percent lower than the baseline rate. Effectiveness would be considered unacceptable if, at any time following establishment of the quiet zone, the rate of violations is greater than a value less than 49 percent below the baseline level.

c. Unacceptable effectiveness after establishment of Quiet Zone. Initial effectiveness of the photo enforcement program would be determined by calculating violation rates for at least two consecutive calendar quarters following establishment of the quiet zone. The railroad would be notified to resume sounding of the train horn if results are not acceptable. FRA and all parties required to be informed in 222.35(b) would be informed of such notification. If, in a subsequent calendar quarter the violation rate sinks below the acceptable level, the quiet zone may be continued temporarily provided the state or municipality takes reasonable steps to increase the effectiveness of the Supplementary Safety Measure. If, in the second calendar quarter following the quarter for which results were not acceptable, the rate is still unacceptable, the quiet zone would be terminated until re-qualified.

4.5.3.2 Alternative Safety Measures Alternative Safety Measures (ASM's) are eligible interventions for use in designating a quiet zone under the second optional method. This method requires the completion of studies for submission to FRA. The description of the approved ASMs is given below.

1. Programmed Enforcement. This measure involves community and law enforcement officials committed to a systematic and measurable crossing monitoring and traffic law enforcement program at the public highway-rail grade crossings in question. This may be accomplished alone or in conjunction with the subsequently described public education and awareness program. Programmed enforcement requires a sustainable law enforcement effort combined with continued crossing monitoring.

Requirements for the use of this mitigation technique include:

1. A statistically valid baseline violation rate (subject to audit) must be established through automated or systematic manual monitoring or sampling at the subject crossing(s). Determination of violation rates should be completed in accordance with the procedures outlined for the treatment of effectiveness, with and without prior whistle bans, under the photo enforcement mitigation SSM (See Section 5.4.1.5) strategy.

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

3. Following implementation of the quiet zone, results of monitoring for not less than two full calendar quarters must show that the violation rate has been reduced sufficiently to compensate for the lack of train horns (e.g., a reduction of at least 49 percent with statistical confidence of 0.95) and the railroad shall be notified to resume sounding of the train horn if results are not acceptable.

4. Subsequent semi-annual sampling must indicate that this reduction is being sustained. If the reduction is not sustained, the state or municipality may continue the quiet zone for

a maximum of one calendar quarter and shall increase the frequency of sampling to verify improved effectiveness. If, in the second calendar quarter following the quarter for which results were not acceptable, the rate is not acceptable, the quiet zone shall be terminated until requalified and accepted by FRA.

5. Signs must be posted alerting motorists that the train horn does not sound.

Effectiveness: FRA requires that effectiveness for programmed enforcement be demonstrated and converted to an effectiveness rate using a 0.78 reduction factor. FRA assumes that effectiveness would be similar to that of the photo enforcement measures.

2. Public Education and Awareness. This alternative safety measure alone, or in conjunction with Programmed Enforcement is a program of public education and awareness directed at motor vehicle drivers, pedestrians, and residents near the railroad to emphasize the risks associated with highway-rail crossings and emphasize applicable requirements of state and local traffic laws at those crossings.

FRA recognizes the importance of public education and awareness efforts to safety at public highway-rail grade crossings. FRA and other modal administrations and offices within the U.S. Department of Transportation have promoted the Always Expect a Train campaign, Operation Lifesaver, Inc., safe communities, and other public outreach efforts. However, FRA is concerned that the desire of communities to implement quiet zones could lead to redirection of scarce safety resources from safe community initiatives. This redirection of safety resources could seriously tax the capacity of crossing safety programs provided by railroads and supported by the Federal government, leading to a net reduction in crossing safety. Accordingly, it is critical that public education and awareness programs represent valid new increments of effort by the localities where quiet zone benefits would accrue.

The public education and awareness option must have a sustained level of effort. Public safety campaigns generally have temporary value when conducted over a short period or during widely separated periods of emphasis. Campaigns, such as those promoting seat belt use or child safety seat use, have long-term and sustained impact only to the extent the message is delivered repeatedly and with varied or innovative techniques. FRA is concerned that government entities wishing to utilize the public education and awareness option would need to find effective means of targeting the relevant audience (concentrating the impact where it will have utility) and ensuring that the message is reinforced over time.

Requirements for the use Public Education and Awareness of this mitigation technique include:

1. A statistically valid baseline violation rate (subject to audit) must be established through automated or systematic manual monitoring or sampling at the subject crossing(s). Determination of violation rates should be completed in accordance with the procedures outlined for the treatment of effectiveness, with and without prior whistle bans, under the photo enforcement mitigation strategy. (See Section 5.4.1.5.)

2. A sustainable public education and awareness program must be defined, established and continued along with continual or regular monitoring. The program shall be provided and supported primarily through local resources.

3. Following implementation of the quiet zone, results of monitoring for not less than two full calendar quarters must show that the violation rate has been reduced sufficiently to compensate for the lack of train horns (e.g., a reduction of at least 49 percent with

statistical confidence of 0.95) and the railroad shall be notified to resume sounding of the train horn if results are not acceptable.

4. Subsequent semi-annual sampling must indicate that this reduction is being sustained. If the reduction is not sustained, the state or municipality may continue the quiet zone for a maximum of one calendar quarter and shall increase the frequency of sampling to verify improved effectiveness. If, in the second calendar quarter following the quarter for which results were not acceptable, the rate is not acceptable, the quiet zone shall be terminated until requalified and accepted by FRA.

5. Signs must be posted alerting motorists that the train horn does not sound.

Effectiveness: FRA requires that effectiveness for public education and awareness be demonstrated and converted to an effectiveness rate using a 0.78 reduction factor. FRA assumes that effectiveness would be similar to that of the photo enforcement measures.

3. Other Measures. Three additional measures have been mentioned by the general public during the preparation of the proposed rule and the DEIS. These measures are presently considered under development and therefore, cannot be used as an SSM or ASM within quiet zones. FRA will continue to investigate these three mitigation options, as well as other options under its Research and Development authority and responsibility. The three research and development options currently being investigated include:

a. Wayside Horns. Wayside horns are instruments that would be placed at a crossing and directed at oncoming motorists. Such a device would typically be activated by the same track circuits used to detect the train's approach for purposes of other automated warning devices at the crossing. The Volpe Center, at FRA's request, is currently evaluating the opportunities and issues related to wayside horns. At least three questions must be answered in this regard:

- Can wayside horns provide the same quality of warning, determined by loudness at appropriate frequencies, within the motor vehicle while it is approaching the motorist's decision point?

- As currently conceived, a single stationary horn cannot give the motorist a cue as to the direction of approach of the train or trains. To what extent does this lack of directionality detract from the effectiveness of the warning? Can wayside installation design be altered to compensate?

- To what extent will the stationary horn suffer from the lack of credibility sometimes associated with automated warning devices, due to the fact that it is activated by the same means? Over what period of time may this problem arise, if at all?

b. Articulated Gates. Concepts have been presented for articulated gates that would descend from a single apparatus to block the approach to the crossing in the normal direction of travel and continue down to block the exit lanes from the crossing (on one or both sides). The State of North Carolina, as part of an FRA-funded Sealed Corridor, will be evaluating articulated gates as a low-cost safety measure in the context of the Next-Generation High Speed Ground Transportation Program. Articulated gates appear to be particularly attractive for two-lane roads where the public highway-rail grade crossing is at a sufficient distance from other intersections or obstructions that could cause traffic to back up on the crossing. In principle, such gates should have the same effectiveness as

other four-quadrant gate arrangements. FRA may approve use of articulated gates as four-quadrant gate arrangements pending the results of further research.

c. Daylight/Nighttime Variable Treatment. It has been suggested that variable level horns could be used at higher range during daylight hours with lower range used at night when vehicle traffic is lower and train traffic is often higher. Also, it is has been argued, lower level horns are more appropriate at night when the ambient sound level is lower than during daylight hours.

d. In-Vehicle Warning Systems. In-vehicle warning systems are electronic devices installed on motor vehicles to warn of approaching trains. Over the long-term, systems may be deployed that permit broadcast notifications to motorists warning of the passage of trains over highway-rail crossings. This type of warning may be achieved through integration of Intelligent Transportation Systems (ITS) deployed for highway use, together with elements of Positive Train Control (PTC) systems that would govern train movements and provide accurate data concerning location, direction of movement and velocity. Clearly, before train horns could be silenced, essentially all trains and motor vehicles would need to be equipped with compatible in-vehicle warning system.

FRA is making progress toward in-vehicle warning for priority vehicles such as school buses and emergency vehicles. Concepts for proximity warning have been evaluated with Department of Transportation funding at the Transportation Technology Center. Field operational tests of priority warning systems took place in 1998. The State of Illinois is demonstrating a priority vehicle system in the Chicago metropolitan area. A commercial vendor is offering a radar system for private motor vehicles that is designed to detect a train's approach, assuming the lead locomotive is equipped with a radar unit. FRA will continue to work with the Federal Highway Administration and other transportation bodies to identify promising strategies for priority vehicle warning systems.

Successful in-vehicle systems would need to meet several criteria to be candidates for wide-scale application to all passenger motor vehicles: (1) systems must be fail-safe or they must be shown to be so highly reliable that their utility as a warning system exceeds the loss of safety associated with inappropriate reliance on the system when in the failure mode; (2) systems must be affordable for the vehicle owner, as well as the railroad charged with equipping locomotives; and (3) false alarms must be infrequent, or the system will lack credibility and may be subject to being defeated (if false alarms produce annoyance).

4.5.3.3 Applying the FRA Mitigation Tool Box in the Form of a Quiet Zone The procedures outlined above on how to apply the SSMs and ASMs to a quiet zone are designed by FRA to be used by localities as a kind of community guidebook on how to create an acceptable quiet zone. FRA emphasizes that communities that desire to avoid the sounding of train horns have a means of mitigating the negative noise impacts of the proposed rule through the quiet zone.

4.5.4 Mitigation Conclusions After consideration of the mitigation tools offered in the form of a quiet zone, FRA is confident that the adoption of quiet zones by local jurisdictions would be widespread. In principle, quiet zones could be adopted by all localities that currently have whistle bans in effect. In addition to communities with current whistle bans, there are many more localities in the country that may opt to implement quiet zones. The effect of these new quiet zones, coupled with the quiet zones that are formed within jurisdictions with current whistle bans, would very likely be enough to fully compensate for the direct environmental impacts of the rule.

4.6 UNAVOIDABLE ADVERSE EFFECTS

The proposed rule may unavoidably impact a number of locations currently having whistle bans with added sound from the regular use of the locomotive horn by trains traversing highway-rail grade crossings. The actual number of locations and the actual number of people impacted will depend upon future decisions by communities to implement quiet zones as provided for in the proposed rule.

4.7 RELATIONSHIP OF SHORT TERM USES AND LONG-TERM PRODUCTIVITY

The proposed rule would, in the short term, produce the desired public safety improvement at the cost of some increase in noise from train horns at certain highway-rail grade crossings across the nation at which there presently are whistle bans. In the long term, the proposed rule would maintain the public safety benefit achieved initially and would allow community impacts from train horns to be decreased at many additional locations with the potential to designate new quiet zones. Additionally, every community in the nation with a public highway-rail grade crossing would be relieved over time of some noise impact through the relocation of whistle post and the change to directional, sound limited train horns.

4.8 IRREVERSABLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

FRA is not aware of any use or commitment of environmental resources as part of the proposed rule that are irreversible or irretrievable. The effect of the proposed rule, sounding of train horns where they are not presently sounded, could be reversed at some time in the future. Indeed the proposed rule provides specific opportunities to accomplish this through the quiet zone provisions. Railroads and government at the local, state, and Federal levels may incur certain costs that would not be otherwise required if the proposed rule was not implemented. However, these expenditures would serve to enhance public safety and would continue to avert some number of future collisions involving loss of life, injury, and property damage, even if the proposed rule were repealed in the future.

CHAPTER 5

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Mr. & Mrs. Robert L. Phillips	
Mr. & Mrs. Richard Utt	
Mr. Arthur & Ms. Zoe Bartlett	
Mr. Bob Adams, General Manager	Red Apple Motel
Mr. Bob Head & Mrs. Roberta Head	Clyatt Insurance Services
Mrs. Bonnie Harris	
Ms. Bonnie E. Bonnell	
Mr. C. Scott & Mrs. Kathryn P. Bresnahan	
Mr. Carl M. Medlicott	
Ms. Carol Mitchell	
Ms. Cathy Myers	
Ms. Clare Siska	
Mr. Dan G. King	
Mr. David J. Leighon	
Ms. Dorothy M. Anderson	
Mr. E. M. Martinez	

Person	Affiliation
Ms. Ellen Crane	
Ms. Elly Ward	Hawthorne Condominiums
Mrs. Fay and Mr. John Senner	
Mrs. Fern E. Watts	
Mrs. Frances K. Clark	
Mr. Harry Shanley	
Ms. Ilya Lionznyansky	
Mr. Jack C. Binks	
Mr. Jack W. Lasher	POI MSI USNR Retired
Ms. Jacquelyn Magill	
Mr. James Yaffee	
Mr. James A. Pelley	
Mr. James G. Duggan	
Mr. James Corwin	
Mr. James G. Duggan	
Ms. Janet S. Finchum	
Ms. Jean E. Rockwell	
Mr. John M. McTighe	
Mr. John A. Marino	
Mr. John and Mrs. Edith Newberry	
Mr. Jonathan B. Novak	
Ms. Karen S. Heckman	
Mr. Leo Doherty	
Ms. Marcia Dorey	
Ms. Margaret Petitjean	
Ms. Margaret Miley	
Mr. Mark T. Nys	
Mr. Mark R. Lawson	Attorney and Counselor at Law
Mr. Mathew Handelman	
Ms. Meryl A. Heller	
Mr. Michael Jon Kell	
Mr. Paul S. Paatsch	
Ms. Paula N. Lesley	
Mr. Richard and Lauraine Lombara	
Mr. Richard Yukins	
Mr. Richard Udseth	
Mr. Richard D. Hagerty, Esq.	
Mr. Robert L. Michal, PE	
Mr. Robert Sladack	
Mr. Robert G. Riley, Locomotive Engineer	
Mr. Robert B. Simpson	
Mr. Robert J. Schindler	
Mr. Robert Almblad	
Mr. Roger J. Schiera	MTA Long Island Rail Road
Mr. Roger W. Granlund	
Mr. Roger W. Livingston	
Mr. Ronald J. Fortunato	
Mr. Russell R. French	
Mr. S. J. Tuminello	
Mr. Scott Long	
Mr. Scott & Mrs. Lisa Steiner	Home Owner Vinings Community
Dr. Scott A. Bowser, OD	Peachtree City Eye Center
Mr. Shane A. Winn	West Central Municipal Conference
Mr. Stephen Holmes	
Mr. Steven Szarmack	
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Person	Affiliation
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Mrs. Theresa L. Brown	
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Mr. W. John Pohl	
Mr. William F. French	
Mr. William and Mrs. Maureen Kennon	
Mr. Kenneth Jernigan	
Mr. Frank Weinstein	
Mr. Mel Vernon	

APPENDIX A

APPENDIX A

GLOSSARY

A-weighting: A method used to alter the sensitivity of a sound level meter with respect to frequency so that the instrument is less sensitive at frequencies where the human ear is less sensitive. Also written as dBA.

"Absolute" noise impact: Newly introduced noise may interfere with community activities, independent of existing noise levels; it may be too loud to converse or sleep. This effect is called "absolute" noise impact, because it is expressed as a fixed level not to be exceeded and is independent of existing noise levels. This factor enters into the assessment of a noise impact.

Active warning devices: Traffic control devices that give positive notice to highway users of the approach or presence of a train. These devices may include a flashing red light signal (a device that, when activated, displays red lights flashing alternately), a bell (a device which, when activated, provides an audible warning, usually used with a flashing red light signal), automatic gates (a mechanism added to flashing red light signals to provide an arm that can lower across the lanes of the roadway), and a cantilever (a structure equipped with flashing red light signals and extending over one or more lanes of traffic).

Administrator: The Administrator of the Federal Railroad Administration or the Administrator's delegate.

Adverse environmental impact: A negative effect, resulting from the implementation of a proposed action, that serves to degrade or diminish an aspect of human or natural resources.

Ambient: The pre-project background noise or vibration level.

ASM or Alternative Safety Measure: Alternative Safety Measures as prescribed in the proposed rule. Useable in designating Quiet Zones under Method 2, *FRA Acceptance*. ASMs may not be used for Quiet Zones designated under Method 1, *Community Designation*.

Barrier curb: A highway curb designed to discourage a motor vehicle from leaving the roadway. Such a curb is more that six inches but not more than nine inches high with a rounded top edge and is used where highway speeds do not exceed 40 miles per hour. The barrier curb in highly visible and provided with sloped end treatments. Additional design specifications are determined by the standard traffic design specifications used by the governmental entity constructing the barrier curb.

Block group: A small population area that the U.S. Census Bureau uses to measure and record demographic characteristics. The population of a block group typically ranges from 600 to 3,000 people and is designed to reflect homogeneous living conditions, economic status, and population characteristics. Block group boundaries follow visible and identifiable features, such as roads, canals, railroads, and aboveground high-tension power lines.

Centralized traffic control system: A signal system that allows for the movement of trains in either direction on designated tracks at the maximum authorized speed, in accordance with wayside or cab signals or both.

Census tract: Small, relatively permanent statistical subdivisions of a county containing between 2,500 and 8,000 persons. The U.S. Bureau of Census designs census tracts to reflect homogeneous living conditions, economic status, and population characteristics.

Channelization device: One of a continuous series of highly visible obstacles placed between opposing highway lanes designed to alert or guide traffic around an obstacle or to direct traffic in a particular direction. Channelization devices must be at least 2.5 feet high and placed at least every seven feet. End treatments, in the case of rigid channelization devices, should be determined by reference to the governmental entity's own standard traffic design specifications.

Chimes: In a locomotive horn, chime refers to the individual horns in a cluster of horns, each sounding a distinct frequency.

Constant warning time: A train detection system with the capability of measuring train speed and providing a relatively uniform warning time by warning signal devices to highway traffic at highway-rail grade crossings.

Council on Environmental Quality (CEQ): Federal agency responsible for developing regulations and guidance for agencies implementing the National Environmental Policy Act.

Cumulative effects: Effects resulting from the incremental impacts of the proposed Use of Locomotive Horns At Highway-Rail Grade Crossings Rule when added to other past, present, and reasonably foreseeable future actions, regardless of which agency (Federal or non-Federal) or person undertakes such actions, as described in 40 CFR 1508.7. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

Decibel (dB): A unit of noise measured on a logarithmic scale that compresses the range of sound pressures audible to the human ear over a range from 0 to 140, where 0 decibels represents sound pressure corresponding to the threshold of human hearing, and 120 decibels corresponds to a sound pressure at which pain occurs. Noise analysts measure sound pressure levels that people hear in decibels, much like other analysts measure linear distances in yards or meters. A-weighted decibel (dBA) refers to A-weighting that accounts for the various frequency components in a way that corresponds to human hearing.

Directivity: The variation in sound level around the source. The distribution of sound around a horn depends on the orientation of the individual horns in a cluster and the position of the cluster on the locomotive.

Effectiveness rate: The effectiveness of a supplementary safety measure in reducing the probability of a collision at the public highway-rail grade crossing. Effectiveness is indicated by a number between zero and one which represents the safety measure when compared to the same crossing equipped with conventional automated warning systems of flashing lights, gates and bells. Zero effectiveness means that the supplementary safety measure provides no reduction in the probability of a collision (there is no effectiveness) while an effectiveness rating of one means that the supplementary safety measure is totally effective in reducing collisions. Measurements between zero and one reflect the percentage by which the supplementary safety measure reduces the probability of a collision. (Thus, a supplementary safety measure with an effectiveness of .38 reduces the probability of a collision by 38 percent.)

FRA has determined that collision probabilities increase an average of 62 percent when locomotive horns are silenced. Thus, generally, a supplementary safety measure should have an effectiveness of at least .38 (reducing the probability of a collision by at least 38 percent) to compensate for this 62 percent increase.

Engineer (railroad): Employee responsible for operating a railroad locomotive in accordance with train-handling practices, signal indications, operating rules, speed limits, and the technical requirements of the particular locomotive.

Environmental Impact Statement (EIS): A document that the National Environmental Policy Act requires Federal agencies to prepare for major projects or legislative proposals having the potential to significantly affect the environment. A tool for decision-making, it describes the positive and negative environmental effects of the undertaking, and alternative actions and measures to reduce or eliminate potentially significant environmental impacts.

Environmental Justice (EJ): For purposes of this document, FRA defines environmental justice as the mission discussed in Executive Order (EO) 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" (59 FR 7629, February 11, 1994). This EO directs Federal agencies to identify and address "disproportionately high and adverse human health or environmental effects" of their programs, policies, and activities on minority and low-income populations in the United States.

Environmental Justice (EJ) population: Population within a noise impact area whose minority and low-income composition meets at least one of the following criteria: (1) The percentage of minority and low-income population in the impact area is greater than 50 percent of the total population in the impact area; or (2) The percentage of minority and low-income population in the impact area is at least ten percentage points greater than the percentage of minority or low-income population in the county of which the noise impact area is a part.

Executive Order (EO) 12898: Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority and Low-Income Populations," issued in February of 1994; directs Federal agencies to identify and address as appropriate "disproportionately high and adverse human health or environmental effects," including interrelated social and economic effects, of their programs, policies, and activities on minority populations and low-income populations in the United States.

Frequency spectrum: The distribution of sound frequency. The human hearing spectrum is generally expressed over a range from 20 to 20,000 Hz, with maximum sensitivity between 1000 and 5000 Hz. The horn system must emit considerable sound energy at frequencies in which the human hearing system is most sensitive to warn people.

FRA: The Federal Railroad Administration.

Geographic Information System (GIS): A computer system for storing, retrieving, manipulating, analyzing, and displaying geographic data. GIS combines mapping and databases.

Geometric spreading: When sound waves radiate in all directions from the horn. The horn acts as a stationary point source, as opposed to the line source represented by the train. A stationary point source sends sound energy in all directions, thereby resulting in a spherical spreading of sound energy. Mathematically, this is a $1/R^2$ type of spreading where R is the

radial distance traveled by the sound, similar to the so-called "inverse square law" in the radiation of light waves from a light bulb.

Grade crossing: See *highway-rail grade crossing.*
Grade separation: See *separated grade crossing.*

Highway-rail grade crossing: The general area of an intersection of a public or private road and a railroad where the intersecting rail and highway traffic are at the same level.

Historic property: Any prehistoric or historic district, site, building, structure, or object included in or eligible for inclusion in the National Register of Historic Places (NRHP). The term "eligible for inclusion in the NRHP" pertains to both properties that the Secretary of the Interior has formally determined to be eligible and to all other properties that meet NRHP listing criteria.

Horn noise (train): Noise that occurs when locomotives sound warning horns in the vicinity of highway-rail grade crossings. Used interchangably in this report with 'whistle noise.'

Impact zone: A zone where the change in the noise level is expected to be noticeable to most people, but may not be sufficient to cause strong, adverse reactions from the community.

Indian tribe: According to Indian Self-Determination and Education Assistance Act (25 U.S.C. 450-458; P.L. 93-638), any Indian tribe, band, nation, or other organized group or community recognized as eligible for the special programs and services that the United States provides to Indians because of their status as Indians.

Interlocking: An arrangement of switch, lock, and signal devices that is located where rail tracks cross, join, or separate. The devices are interconnected in such a way that their movements must succeed each other in a predetermined order, thereby preventing opposing or conflicting movements.

L_{dn}: The day-night average noise sound level, which is the receptor's cumulative noise exposure from all noise events over a full 24 hours. This is adjusted to account for the perception that noise at night is more bothersome than the same noise during the day.

$L_{eq(h)}$: The hourly (energy-averaged) equivalent sound level.

Locomotive: A self-propelled, non-revenue rail vehicle designed to convert electrical or mechanical energy into transactive effort to move railway cars.

Locomotive horn: A locomotive air horn, steam whistle, or similar audible warning device mounted on a locomotive or control cab car. The terms "locomotive horn", "train whistle", and "train horn" are used interchangeably in the railroad industry.

Low-income population: A population composed of persons whose median household income is below the US Department of Health and Human Services poverty guidelines.

Maximum authorized speed: Maximum permitted speed for a specific train at a specific location, taking into account the track and signal conditions.

Maximum Sound Level: The highest exponential-time-average sound level, in decibels, that occurs during a stated time period. Also written as L_{max}.

Median: A center divider in a highway that separates the travel ways for traffic moving in opposite directions. A median for use in implementing a Quiet Zone is bounded by mountable or barrier curbs.

Minority individuals: Minority individuals are classified by the Bureau of Census into the following: American Indian or Alaskan Native; Asian or Pacific Islander; Black (not of Hispanic Origin); and Hispanic.

Minority population: A population composed of persons who are Black (non-Hispanic), Hispanic, Asian American, American Indian (Native American), or Alaskan Native.

Mitigation: An action taken to prevent, reduce, or eliminate adverse environmental effects.

Mountable curb: A highway curb designed to permit motor vehicles to leave a roadway when required. It is a curb not more than six inches high, with a well-rounded top edge. Additional design specifications are determined by the standard traffic design specifications used by the governmental entity constructing the mountable curb.

National Environmental Policy Act (NEPA): The National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321-4347; P.L. 91-190) is the basic national charter for the protection of the environment. It establishes policy, sets goals, and provides means for carrying out the policy. Its purpose is to provide for the establishment of a Council on Environmental Quality and to instruct Federal agencies on what they must do to comply with the procedures and achieve the goals of NEPA.

National Historic Preservation Act (NHPA): The National Historic Preservation Act of 1966, as amended (16 U.S.C. 470-470t *et seq.*; P.L. 89-665), is the basic legislation of the Nation's historic preservation program that established the Advisory Council on Historic Preservation and the Section 106 review process. Section 106 of the NHPA requires every Federal agency to "take into account" the effects of its undertakings on historic properties.

National Register of Historic Places (NRHP): Administered by the National Park Service, the Nation's master inventory of known historic properties, including buildings, structures, sites, objects, and districts that possess historic, architectural, engineering, archaeological, or cultural significance at the Federal, state, and local levels.

Native American: According to the Native American Graves Protection and Repatriation Act of 1990, as amended (25 U.S.C. 3001 *et seq.*; P.L. 101-601), of, or relating to, a tribe, people, or culture that is indigenous to the United States.

No-Action Alternative: Under this alternative, the proposed Use of Locomotive Horns At Highway-Rail Grade Crossings Rule is not implemented and other legislative action is sought.

Noise: A disturbance or annoyance of an intruding or unwanted sound. Noise impacts essentially depend on the amount and nature of the intruding sound, the amount of background sound already present before the intruding or unwanted sound occurred, and the nature of working or living activity of the people occupying the area where the sound occurs.

Noise contour: Lines plotted on maps or drawings connecting points of equal sound levels.

Noise-sensitive receptor: Location where noise can interrupt ongoing activities and can result in community annoyance, especially in residential areas. These areas may include

schools, libraries, hospitals, residences, retirement communities, and nursing homes as examples of noise-sensitive receptors.

Noise model: A generalized noise model is developed to apply to all grade crossings with current whistle bans listed in the data base. The model includes noise source levels based on measurements and previous studies, noise exposure calculations based on train speeds and the number of trains passing during day and night at each crossing, propagation of sound to nearby neighborhoods based on typical suburban terrain and building configurations, and community reaction estimation based on EPA and FRA noise research. A computer program takes relevant data such as number of trains per day and night, speed, and number of tracks for grade crossings being modeled and generates noise impacted areas at each location.

Passive warning devices: Traffic control devices that do not give positive notice to highway users of the approach or presence of a train. These devices may include signs and pavement markings, located at, or in advance of, railroad crossings to indicate the presence of a crossing and the potential presence of a train. These signs are either regulatory or non-regulatory and may include crossbucks, stop signs, yield signs, and constantly flashing lights.

Positive train control territory: A line of railroad on which railroad operations are governed by a train control system capable of determining the position of the train in relation to a public highway-rail at-grade crossing and capable of computing the time of arrival of the train at the crossing, resulting in the automatic operation of the locomotive horn (or automatic prompting of the locomotive engineer) such that the horn in sounded at a predetermined time prior to the locomotive's arrival at the crossing.

Positive train separation: Mechanism included in positive train control, an experimental, automated safety system, using Global Positioning System (GPS) technology, onboard computers and wayside information inputs to control train movement. In the event of failure on the primary safety system, positive train control reduces the risk of single-point failure (that is, human error).

Private highway-rail grade crossing: A location where a private road or street, including associated sidewalks or pathways, crosses one or more active railroad tracks at-grade.

Public highway-rail grade crossing: A location where a public highway, road, or street, including associated sidewalks or pathways, crosses one or more active railroad tracks at-grade.

Quiet zone: A segment of a rail line within which is situated one or a number of consecutive public highway-rail crossings at which locomotive horns may not be routinely sounded because supplementary safety measures have been implemented.

Railroad: Any form of non-highway ground transportation that runs on rails or electromagnetic guideways and any entity providing such transportation, including (1) commuter or other short-haul railroad passenger service in a metropolitan or suburban area and (2) high speed ground transportation systems that connect metropolitan areas, without regard to whether those systems use new technologies not associated with traditional railroads; but does not include rapid transit operations in an urban area that are not connected to the general railroad system of transportation.

Rail line segment: Portions of rail lines that extend between two terminals or junction points.

Rail spur: A railroad track that typically connects to the main line at only one end and provides rail service to one or more railroad freight customers. A rail spur also could parallel the main line.

Rail yard: A location or facility with multiple tracks where rail operators switch and store rail cars.

Receptor: See *noise-sensitive receptor.*

Reflected path: When sound energy that radiates in all directions from a horn "reflects" off the ground between source and receiver.

"Relative" noise impact: Evaluation of newly introduced noise effects "relative" to existing noise levels. "Relative" noise criteria are based upon noise increases above existing noise levels and is a basis for the assessment of noise impact.

Separated grade crossing: The place where a railroad intersects with a roadway or another railway at different elevations such that the railroad goes under or over the intersecting roadway.

Severe impact zone: A zone where a significant percentage of people are likely to be highly annoyed by horn blowing.

Siding:A track parallel to a main track that is connected to the main track at each end. A siding is used for the passing and/or storage of trains.

Sound exposure level (SEL): For a transient noise event such as a passing train, equivalent to the maximum A-weighted sound level that would occur if all of the noise energy associated with the event were restricted to a time period of 1 second. The SEL accounts for the sound sweeping along a section of track near an grade crossing, the sound energy received at a single point as a train passes. The SEL accounts for both the magnitude and the duration of the noise event; noise analysts use SEL to calculate the day-night average noise level.

Sound level: Sounds from train horns are intended to warn people at relatively large distances from the leading vehicle of a train so that they can take evasive action if in danger of being struck by the train. As a result, horn systems are very loud. Federal Railroad Administration regulations mandate a minimum sound pressure level of 96 dBA at a distance of 100 feet (30.5m) in front of the locomotive, or leading car.

Sound path: The path with which sound passes through the air between the source and the receiver. The path includes the direct line of site from the horn to nearby buildings, but also several potential reflected and refracted paths over the ground, terrain features, vegetation, fences, walls, and buildings.

SSM or supplementary safety measure: A safety system or procedure established in accordance with the proposed Rule which is provided by the appropriate traffic control authority or law enforcement authority and that is determined by the Administrator to be an effective substitute for the locomotive horn in the prevention of highway-rail casualties.

Switching: The activity of moving cars from one track to another in a yard or where tracks go into a railroad customer's facility.

Temporal train separation: The time separation of trains that share rail lines, in order to reduce the possibility of train collisions.

Time variation: Time variation affects the SEL in proportion to the time that the signal is on compared to the total time of the pattern. Horns are used as warning devices at grade crossings and are supposed to be sounded in a “long-long-short-long” sequence with the last “long” blast lasting until the leading equipment has traversed the grade crossing.

Traffic volume (highway): The number of highway vehicles that pass over a given point during a given period of time, often expressed on an annual, daily, hourly, and sub-hourly basis.

Traffic volume (rail): The total volume of rail traffic that passes over a given rail line segment, typically expressed in either trains per day or annual million gross tons per year.

Whistle board: A post or sign directed toward oncoming trains and bearing the letter “W” or equivalent symbol erected at a distance from the next public highway-rail grade crossing which indicates to the locomotive engineer that the locomotive horn should be sounded beginning at that point.

APPENDIX B

§ 20153. Audible warnings at highway-rail grade crossings

(a) DEFINITIONS.—As used in this section—

(1) the term "highway-rail grade crossing" includes any street or highway crossing over a line of railroad at grade;

(2) the term "locomotive horn" refers to a train-borne audible warning device meeting standards specified by the Secretary of Transportation; and

(3) the term "supplementary safety measure" refers to a safety system or procedure, provided by the appropriate traffic control authority or law enforcement authority responsible for safety at the highway-rail grade crossing, that is determined by the Secretary to be an effective substitute for the locomotive horn in the prevention of highway-rail casualties. A traffic control arrangement that prevents careless movement over the crossing (e.g., as where adequate median barriers prevent movement around crossing gates extending over the full width of the lanes in the particular direction of travel), and that conforms to standards prescribed by the Secretary under this subsection, shall be deemed to constitute a supplementary safety measure. The following do not, individually or in combination, constitute supplementary safety measures within the meaning of this subsection: standard traffic control devices or arrangements such as reflectorized crossbucks, stop signs, flashing lights, flashing lights with gates that do not completely block travel over the line of railroad, or traffic signals.

(b) REQUIREMENT.—The Secretary of Transportation shall prescribe regulations requiring that a locomotive horn shall be sounded while each train is approaching and entering upon each public highway-rail grade crossing.

(c) EXCEPTION.—(1) In issuing such regulations, the Secretary may except from the requirement to sound the locomotive horn any categories of rail operations or categories of highway-rail grade crossings (by train speed or other factors specified by regulation)—

(A) that the Secretary determines not to present a significant risk with respect to loss of life or serious personal injury;

(B) for which use of the locomotive horn as a warning measure is impractical; or

(C) for which, in the judgment of the Secretary, supplementary safety measures fully compensate for the absence of the warning provided by the locomotive horn.

(2) In order to provide for safety and the quiet of communities affected by train operations, the Secretary may specify in such regulations that any supplementary safety measures must be applied to all highway-rail grade crossings within a specified distance along the railroad in order to be excepted from the requirement of this section.

(d) APPLICATION FOR WAIVER OR EXEMPTION.—Notwithstanding any other provision of this subchapter, the Secretary may not entertain an application for waiver or exemption of the regulations issued under this section unless such application shall have been submitted jointly by the railroad carrier owning, or controlling operations over, the crossing and by the appropriate traffic control authority or law enforcement authority. The Secretary shall not grant any such application unless, in the judgment of the Secretary, the application demonstrates that the safety of highway users will not be diminished.

(e) DEVELOPMENT OF SUPPLEMENTARY SAFETY MEASURES.—(1) In order to promote the quiet of communities affected by rail operations and the development of innovative safety measures at highway-rail grade crossings, the Secretary may, in connection with demonstration of proposed new supplementary safety measures, order railroad carriers operating over one or more crossings to cease temporarily the sounding of locomotive horns at such crossings. Any such measures shall have been subject to testing and evaluation and deemed necessary by the Secretary prior to actual use in lieu of the locomotive horn.

(2) The Secretary may include in regulations issued under this subsection special procedures for approval of new supplementary safety measures meeting the requirements of subsection (c)(1) of this section following successful demonstration of those measures.

(f) SPECIFIC RULES.—The Secretary may, by regulation, provide that the following crossings over railroad lines shall be subject, in whole or in part, to the regulations required under this section:

(1) Private highway-rail grade crossings.

(2) Pedestrian crossings.

(3) Crossings utilized primarily by nonmotorized vehicles and other special vehicles.

Regulations issued under this subsection shall not apply to any location where persons are not authorized to cross the railroad.

(g) ISSUANCE.—The Secretary shall issue regulations required by this section pertaining to categories of highway-rail grade crossings that in the judgment of the Secretary pose the greatest safety hazard to rail and highway users not later than 24 months following November 2, 1994. The Secretary shall issue regulations pertaining to any other categories of crossings not later than 48 months following November 2, 1994.

(h) IMPACT OF REGULATIONS.—The Secretary shall include in regulations prescribed under this section a concise statement of the impact of such regulations with respect to the operation of section 20106 of this title (national uniformity of regulation).

(i) REGULATIONS.—In issuing regulations under this section, the Secretary—

(1) shall take into account the interest of communities that—

(A) have in effect restrictions on the sounding of a locomotive horn at highway-rail grade crossings; or

(B) have not been subject to the routine (as defined by the Secretary) sounding of a locomotive horn at highway-rail grade crossings;

(2) shall work in partnership with affected communities to provide technical assistance and shall provide a reasonable amount of time for local communities to install supplementary safety measures, taking into account local safety initiatives (such as public awareness initiatives and highway-rail grade crossing traffic law enforcement programs) subject to such terms and conditions as the Secretary deems necessary, to protect public safety; and

(3) may waive (in whole or in part) any requirement of this section (other than a requirement of this subsection or subsection (j)) that the Secretary determines is not likely to contribute significantly to public safety.

(j) EFFECTIVE DATE OF REGULATIONS.—Any regulations under this section shall not take effect before the 365th day following the date of publication of the final rule.

APPENDIX C

filed only once when a carrier seeks approval to self-insure its BI&PD and/or cargo liability.

Public Comments Invited

Interested parties are invited to send comments regarding any aspect of this information collection, including but not limited to: (1) the necessity and utility of the information collection for the proper performance of the functions of the FHWA; (2) the accuracy of the estimated burden; (3) ways to enhance the quality, utility, and clarity of the collected information; and (4) ways to minimize the collection burden without reducing the quality of the collected information. Comments submitted in response to this notice will be summarized and/or included in the request for OMB's clearance for a renewal of this information collection.

Electronic Availability

An electronic copy of this document may be downloaded using a modem and suitable communications software from the **Federal Register** electronic bulletin board service (telephone number: 202–512–1661). Internet users may reach the **Federal Register**'s WWW site at: http://www.access.gpo.gov/su__ docs.

Authority: 23 U.S.C. 315 and 49 CFR 1.48.
Issued on: May 13, 1998.

George S. Moore, Jr.,

Associate Administrator for Administration.

[FR Doc. 98–13906 Filed 5–22–98; 8:45 am]
BILLING CODE 4910–22–P

DEPARTMENT OF TRANSPORTATION

Federal Railroad Administration

[FRA Docket No. RSGC–7]

Environmental Impact Statement: FRA Regulation of the Use of Locomotive Horns at Highway-Rail Grade Crossings Nationwide

AGENCY: Federal Railroad Administration (FRA), Department of Transportation (DOT).

ACTION: Notice of intent.

SUMMARY: FRA is issuing this notice to advise the public that an environmental impact statement (EIS) will be prepared for the proposed regulation covering the sounding of locomotive horns at highway-rail grade crossings and to solicit input into the development of the scope of that EIS.

FOR FURTHER INFORMATION CONTACT: Regarding the environmental review contact David Valenstein, Environmental Specialist, Office of Railroad Development, Federal Railroad Administration (RDV 13), 400 Seventh Street, SW (Mail Stop 20), Washington, D.C. 20590, (telephone 202 632–3268). For information regarding the rule making process contact Bruce F. George, Staff Director, Highway Rail Crossing and Trespasser Programs, Office of Safety, FRA, 400 Seventh Street, SW (Mail Stop 25), Washington, D.C. 20590 (telephone 202 632–3312), or Mark H. Tessler, Office of Chief Counsel, FRA, 400 Seventh Street, SW (Mail Stop 10), Washington, D.C. 20590 (telephone 202 632–3171).

SUPPLEMENTARY INFORMATION:

Background 0

The Swift Rail Development Act (Pub. L. 103–440, November 2, 1994) added Section 20153 to title 49, United States Code. That section directs the Secretary of Transportation (delegated to the Federal Railroad Administrator) to prescribe regulations requiring that a locomotive horn be sounded while each train is approaching and entering upon each public highway-rail grade crossing. In addition, 49 U.S.C. 20153 provides FRA the authority to except from this requirement, categories of rail operations or categories of grade crossings that: (1) Are determined not to present significant risk with respect to loss of life or serious personal injury; (2) for which the use of a locomotive horn is impractical; or (3) for which supplementary safety measures fully compensate for the absence of the warning provided by the locomotive horn.

The sounding of locomotive horns at highway-rail grade crossings is recognized by FRA and the railroad industry as contributing to railroad and highway safety. Studies conducted by FRA of circumstances where the sounding of horns had been restricted in eastern Florida (so-called ''whistle bans'') have indicated an increased incidence of collisions involving trains and highway users where locomotive horns were not sounded. Although the sounding of locomotive horns at highway-rail grade crossings is the normal practice at most of the 162,000 public grade crossings in the U.S., FRA is aware of approximately 2,200 crossings in 200 communities where locomotive horns are not routinely sounded.

In preparing for the rulemaking process required by 49 U.S.C. 20153, FRA established a public docket to enable local officials and citizens to offer their insight into the issues surrounding whistle bans and to comment on how FRA might best implement 49 U.S.C. 20153. FRA also undertook extensive research into locomotive horns and their relationship to grade crossing safety through the Department of Transportation's John A. Volpe National Transportation Systems Center. Some of the comments offered by the public expressed concerns that any regulation requiring the sounding of locomotive horns could create adverse environmental impacts in the form of significantly higher community noise levels in the vicinity of those highway-rail grade crossings where horns are presently not sounded. Based upon a review of these comments, and ongoing research, FRA has concluded that the promulgation of the regulation required by 49 U.S.C. 20153 is a major Federal action as this term is used in section 102(c) of the National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. 4321 *et seq.*) As a consequence, FRA is initiating the preparation of an EIS as required under NEPA and the regulations of the President's Council on Environmental Quality implementing NEPA (40 CFR S 1502).

Alternatives

FRA currently plans to analyze two alternatives in this environmental review, the proposed action and the ''no-action'' alternative. The proposed action is to comply with the statutory mandate and issue a regulation requiring the sounding of locomotive horns at every public highway-rail grade crossing in the U.S., including those where locomotive horns are presently not sounded. Such a rule would effectively preempt any State or local law or regulation to the contrary. The regulation encompassed in the proposed action would also identify a number of measures which the States and communities can undertake to provide improved safety at public highway-rail grade crossings. In such situations regular sounding of railroad horns would then become unnecessary from a safety perspective and could cease. The regulation would also establish a procedure for consideration by FRA of proposals by States, communities or other interested persons for approval of new supplementary safety measures that would permit designation of a quiet zone. The environmental impacts of requiring the sounding of locomotive horns at public highway-rail crossings where the horns are not presently sounded and a consideration of the environmental impacts associated with the implementation of supplementary safety measures would be a part of the proposed action analysis.

The no-action alternative would involve maintenance of the status quo with respect to the sounding of locomotive horns. This would require

alternative amendments to existing legislation.

Areas of Significant Environmental Concern

FRA's review of the current practice of sounding locomotive horns at highway-rail grade crossings and the comments received thus far in the public docket of this rulemaking have identified two primary areas of environmental concern associated with the proposed regulation, noise (and related impacts) and safety.

Scoping and Comments

FRA encourages broad participation in the EIS process during scoping and review of the resulting environmental documentation. Comments and suggestions are invited from all interested agencies and the public at large to insure the full range of issues related to the proposed action and all reasonable alternatives are addressed and all significant issues are identified. In particular, FRA is interested in determining whether there are any other reasonable alternatives consistent with the provisions of 49 U.S.C. 20153 and whether there are other areas of environmental concern where there might be the potential for significant impacts, either adverse or favorable, as a result of promulgating the proposed rule.

Due to the national scope of the proposed regulation, FRA does not plan to hold public scoping meetings. Notices soliciting comments have been and will be sent to appropriate Federal, State, and local agencies, private organizations and citizens who have expressed an interest in this rulemaking and made available to the media in areas that have been identified to date as currently subject to whistle bans or where whistle bans have been preempted by FRA order. Persons interested in providing comments on the scope of this environmental document should do so by June 19, 1998. Comments can be sent in writing to Mr. David Valenstein at the address identified above. Comments can also be sent via the Internet at: FRAEIS@fra.dot.gov.

The Remaining Environmental Review Process

Comments received on the scope and methodology to be used in preparation of the EIS will be reviewed by FRA to develop the final scope of the environmental review. A summary of the comments received will be provided to agencies and members of the public expressing an interest in this environmental review. FRA and its consultants will then undertake preparation of a draft EIS which will be made available to the public for comment. This is presently scheduled for the late fall 1998. It is FRA's intention that the comment period for the draft EIS will occur during the comment period associated with the proposed rule so that interested agencies and the public can combine their comments and that the environmental issues can be fully considered as FRA develops the final rule. After reviewing comments on the draft EIS, FRA will prepare a final EIS that addresses these comments and incorporates any additional analyses and material deemed necessary. The final EIS will be made available for public review for not less than 30 days before FRA takes any final action on the proposed rule.

Internet

This notice and all subsequent documents prepared as part of this environmental review will be available in the environmental pages of the FRA Internet website, located at: *http://www.fra.dot.gov*

Issued in Washington, D.C. on: May 19, 1998.

Donald M. Itzkoff,

Deputy Administrator.

[FR Doc. 98–13804 Filed 5–22–98; 8:45 am]

BILLING CODE 4910–06–P

DEPARTMENT OF TRANSPORTATION

Federal Railroad Administration

Application for Approval of Discontinuance or Modification of a Railroad Signal System or Relief from the Requirements of Title 49 Code of Federal Regulations Part 236

Pursuant to Title 49 Code of Federal Regulations (CFR) Part 235 and 49 U.S.C. App. 26, the following railroads have petitioned the Federal Railroad Administration (FRA) seeking approval for the discontinuance or modification of the signal system or relief from the requirements of 49 CFR Part 236 as detailed below.

Block Signal Application (BS–AP)-No. 3463

Applicants: Houston Belt and Terminal Railway Company, Mr. J. B. Mathis, General Manager, 501 Crawford, Room 515, Houston, Texas 77002–2192.

Burlington Northern and Santa Fe Railway Company, Mr. William G. Peterson, Director Signal Engineering, 4515 Kansas Avenue, Kansas City, Kansas 66106.

Union Pacific Railroad Company, Mr. Bruce E. Williams, Director Signal Design, 1416 Dodge Street, Room 1000, Omaha, Nebraska 68179–1000.

The Houston Belt and Terminal Railway Company, Burlington Northern and Santa Fe Railway Company, and Union Pacific Railroad Company, jointly seek approval of the proposed discontinuance and removal of the traffic control system, on the East Main Track, between Control Point 169, milepost 9.6 and Control Point 183, milepost 10.9, on the West Belt Subdivision, in Houston, Texas, including removal of Control Points 175 and 178, and associated signals, power-operated switch machines, and track circuits.

The reasons given for the proposed changes are that the track serves yards and the signal system is no longer required.

BS–AP–No. 3464

Applicants: Southern California Regional Rail Authority, Mr. David Solow, Deputy Executive Director, 700 South Flower Street, Suite 2600, Los Angeles, California 90017–4101.

Santa Clarita Railroad, Mr. James Clark, Manager of Operations, 25135 Anza, Santa Clarita, California 91355.

Union Pacific Railroad Company, Mr. Bruce E. Williams, Director Signal Design, 1416 Dodge Street, Room 1000, Omaha, Nebraska 68179–1000.

The Southern California Regional Rail Authority, Santa Clarita Railroad, and Union Pacific Railroad Company jointly seek approval of the proposed reduction to the interlocking limits of CP Saugus, milepost 32.4, Saugus, California, Valley Subdivision, consisting of the conversion of the No. 3 power-operated switch to hand operation, conversion of interlocked signal ''2WC'' to absolute signal ''3240,'' in lieu of an electric lock, removal of signal ''2WA,'' and installation of a new interlocked signal ''W,'' 642 feet west of the 2WA location.

The reason given for the proposed changes is to modify the interlocking to reflect change in operating practices.

BS–AP–No. 3465

Applicant: Long Island Rail Road, Mr. Frederick E. Smith, P.E., Chief Engineer, Hillside Maintenance Complex, 93–59 183 Street, Hollis, New York 11423.

The Long Island Rail Road seeks approval of the proposed temporary discontinuance of Cabin ''M'' Interlocking, on the Montauk Branch, in Queens County, New York, until June 1999, and govern train movements through the interlocking by issuance of a Clearance Card Form C, Rule 331 of

processes. Generally, they are reserved for consideration as part of any overall review of the lowest court's or arbitrator's decision. This reservation occurs in part because interlocutory appeals are frequently employed by parties simply to gain tactical advantage in the dispute. In addition, a substantive resolution of the conflict will often moot the procedural issues.

Inasmuch as this review by the Board of staff action is in the nature of an interlocutory appeal, the arbitrators and the courts may subsequently review the Board's decision. This may result in an unnecessary delay in the final resolution of an arbitration claim.

The Exchange notes that as a matter of statutory interpretation, when two statutes speak to the same subject matter, and one is general and the other is specific, the specific is usually interpreted to qualify or control the general. In this case, the Exchange Constitution and Rules, as well as the statutory framework within which alternative dispute resolution processes operate, create a specific scheme for review of administrative decisions of the Director of Arbitration.[7] The Exchange believes that this specific scheme obviates the need for review of the Director's decisions under the Exchange Constitution's general scheme for Board review of staff actions. Accordingly, the Exchange believes it is well within the norms of statutory construction for the Board to interpret the specific scheme for the review of the decisions of the Director to displace the general scheme.

2. Statutory Basis

The Exchange believes that the proposed change is consistent with Section 6(b)(5) of the Act[8] in that it promotes just and equitable principles of trade by insuring that members and member organizations and the public have a fair and impartial forum for the resolution of their disputes.

B. Self-Regulatory Organization's Statement on Burden on Competition

The Exchange does not believe that the proposed rule change will impose any inappropriate burden on competition.

C. Self-Regulatory Organization's Statement on Comments on the Proposed Rule Change Received From Members, Participants, or Others

No written comments were either solicited or received.

[7] *See* NYSE Rule 621; see also Federal Arbitration Act, 9 U.S.C. 1 et seq.

[8] 15 U.S.C. 78f(b)(5).

III. Date of Effectiveness of the Proposed Rule Change and Timing for Commission Action

Within 35 days of the publication of this notice is **Federal Register** or within such longer period (i) as the Commission may designate up to 90 days of such date if it finds such longer period to be appropriate and publishes its reasons for so finding or (ii) as to which the self-regulatory organization consents, the Commission will:

(A) By order approve the proposed rule change, or

(B) Institute proceedings to determine whether the proposed rule change should be disapproved.

IV. Solicitation of Comments

Interested persons are invited to submit written data, views, and arguments concerning the foregoing, including whether the proposed rule change is consistent with the Act. Persons making written submissions should file six copies thereof with the Secretary, Securities and Exchange Commission, 450 Fifth Street, NW., Washington, DC 20549. Copies of the submission, all subsequent amendments, all written statements with respect to the proposed rule change that are filed with the Commission, and all written communications relating to the proposed rule change between the Commission and any person, other than those that may be withheld from the public in accordance with the provisions of 5 U.S.C. 552, will be available for inspection and copying at the Commission's Public Reference Room. Copies of such filing will also be available for inspection and copying at the principal office of the Exchange. All submissions should refer to File No. SR–NYSE–98–20 and should be submitted by August 17, 1998.

For the Commission, by the Division of Market Regulation, pursuant to delegated authority.[9]

Jonathan G. Katz,

Secretary.

[FR Doc. 98–19984 Filed 7–24–98; 8:45 am]

BILLING CODE 8010–01–M

[9] 17 CFR 200.30–3(a)(12).

DEPARTMENT OF TRANSPORTATION

Federal Railroad Administration

Environmental Impact Statement: FRA Regulation of the Use of Locomotive Horns at Highway-Rail Grade Crossings Nationwide (FRA Docket No. RSGC–7)

AGENCY: Federal Railroad Administration (FRA), Department of Transportation (DOT).

ACTION: Notice of Extension of Comment Period.

SUMMARY: FRA is issuing this notice to advise the public that the comment period for identifying the scope of FRA's planned environmental impact statement (EIS) on a proposed regulation related to the use of locomotive horns at highway-rail grade crossings is extended to August 7, 1998.

FOR FURTHER INFORMATION CONTACT: David Valenstein, Environmental Specialist, Office of Railroad Development, Federal Railroad Administration (RDV 13), 400 Seventh Street, SW (Mail Stop 20), Washington, D.C. 20590, (telephone 202–493–6368).

SUPPLEMENTAL INFORMATION:

Background

On May 26, 1998, the Federal Railroad Administration (FRA) published a notice of intent to prepare an environmental impact statement for the proposed regulation of the use of locomotive horns at rail-highway grade crossings, as required by Section 20153 to title 49 United States Code, (63 Fed. Reg. 28549). Comments on the scope of the environmental document were requested by June 19, 1998. The FRA is extending the period in which comments will be accepted to August 7, 1998.

Scoping and Comments

Comments and suggestions are invited from all interested agencies and the public at large to insure the full range of issues related to the proposed action and all reasonable alternatives are addressed and all significant issues are identified. In particular, FRA is interested in determining whether there are any other reasonable alternatives consistent with the provisions of 49 U.S.C. 20153 and whether there are other areas of environmental concern where there might be the potential for significant impacts, either adverse or favorable, as a result of promulgating the proposed rule. Persons interested in providing comments on the scope of this environmental document should do so by August 7, 1998. Comments can be

sent in writing to Mr. David Valenstein at the address identified above. Comments can also be sent via the Internet at: FRAEIS@fra.dot.gov

The Remaining Environmental Review Process

Comments received on the scope and methodology to be used in preparation of the EIS will be reviewed by FRA to develop the final scope of the environmental review. A draft EIS will be made available to the public for comment, presently scheduled for the late fall 1998. It is FRA's intention that the comment period for the draft EIS will occur during the comment period associated with the proposed rule so that interested agencies and the public can combine their comments and that the environmental issues can be fully considered as FRA develops the final rule. After reviewing comments on the draft EIS, FRA will prepare a final EIS that addresses these comments and incorporates any additional analyses and material deemed necessary. The final EIS will be made available for public review for not less than 30 days before FRA takes any final action on the proposed rule.

Internet

This notice and all subsequent documents prepared as part of this environmental review will be available in the environmental pages of the FRA internet website, located at: *http://www.fra.dot.gov*

Issued in Washington, D.C. on: July 21, 1998.

James T. McQueen,

Assistant Administrator for Railroad Development.

[FR Doc. 98–19915 Filed 7–24–98; 8:45 am]

BILLING CODE 4910–06–P

DEPARTMENT OF TRANSPORTATION

Federal Railroad Administration

Notice of Application for Approval of Discontinuance or Modification of a Railroad Signal System or Relief From the Requirements of Title 49 Code of Federal Regulations Part 236

Pursuant to Title 49 Code of Federal Regulations (CFR) Part 235 and 49 U.S.C. App. 26, the following railroads have petitioned the Federal Railroad Administration (FRA) seeking approval for the discontinuance or modification of the signal system or relief from the requirements of 49 CFR Part 236 as detailed below.

Block Signal Application (BS–AP)–No. 3480

Applicant: Burlington Northern and Santa Fe Railway Company, Mr. William G. Peterson, Director Signal Engineering 4515 Kansas Avenue, Kansas City, Kansas 66106

Burlington Northern and Santa Fe Railway Company seeks approval of the proposed discontinuance and removal of the traffic control system, on the single main track, between North River, Missouri, milepost 8.6 and Maxwell, Missouri, milepost 177.7, on the Illinois Division, Brookfield Subdivision, a distance of approximately 169 miles. The proposal includes the implementation of Track Warrant Control Rules as the method of operation, and conversion of the ''Bevier Control Point'' to a remote controlled interlocking.

The reason given for the proposed changes is that the severe reductions in train traffic can no longer justify the ongoing maintenance and operation of the signals.

BS–AP–No. 3481

Applicant: Union Pacific Railroad Company, Mr. Phil Abaray, Chief Engineer—Signal/Quality, 1416 Dodge Street, Room 1000, Omaha, Nebraska 68179–1000

Union Pacific Railroad Company seeks approval of the proposed discontinuance and removal of the single direction automatic block signal (ABS) system, on the No. 1 single yard track, between Brooklyn, milepost 767.9 and East Portland, milepost 770.3, on the Brooklyn Subdivision, near Portland Oregon. The proposal includes removal of six automatic block signals and the installation of a new ''D'' signal at milepost 765.4.

The reason given for the proposed changes is the installation of a bi-directional signal system, on the No. 2 main track between Brooklyn and East Portland, has eliminated the need for the single direction ABS system on the No. 1 yard track.

BS–AP–No. 3482

Applicant: CSX Transportation, Incorporated, Mr. R. M. Kadlick, Chief Engineer Train Control, 500 Water Street (S/C J–350), Jacksonville, Florida 32202

CSX Transportation, Incorporated seeks approval of the proposed modification of the traffic control system, on the two main tracks, at Beech Street, milepost BA–280.5, near Grafton, West Virginia, on the Mountain Subdivision, Cumberland Business Unit, consisting of the conversion of the power-operated switch to hand operation, and removal of absolute controlled signals 29, 31, 33, 37, and 39.

The reason given for the proposed changes is to increase operating efficiency.

BS–AP–No. 3483

Applicants:

CSX Transportation, Incorporated, Mr. R. M. Kadlick, Chief Engineer Train Control, 500 Water Street (S/C J–350), Jacksonville, Florida 32202

Consolidated Rail Corporation, Mr. J. F. Noffsinger, Chief Engineer—C&S Assets, 2001 Market Street, Philadelphia, Pennsylvania 19101–1410

CSX Transportation, Incorporated and Consolidated Rail Corporation, jointly seek approval of the proposed discontinuance and removal of the automatic block signal system and interlocking, on the two main tracks, between milepost BIA–251.9 and milepost BIA–257.6, near Hammond, Indiana, on the Lake Subdivision, Chicago Service Lane. The method of operation will be by a Direct Traffic Control Block System. The proposal includes conversion of the power-operated switches at Whiting Interlocking to hand operation; removal of all existing associated signals; and installation of two eastward inoperative approach signals to ''Hick.''

The reason given for the proposed changes is to eliminate facilities no longer needed for present day operation.

Rules, Standards, and Instructions Application (RS&I–AP)–No. 1104

Applicants:

CSX Transportation, Incorporated, Mr. R. M. Kadlick, Chief Engineer Train Control, 500 Water Street (S/C J–350), Jacksonville, Florida 32202

National Railroad Passenger Corporation, Mr. Ron Scolaro, Vice President Operations, 60 Massachusetts Avenue, N.E., Washington, D.C. 20002

CSX Transportation, Incorporated (CSXT) and the National Railroad Passenger Corporation (AMTRAK), jointly seek temporary relief from Section 236.566 of the Rules, Standards, and Instructions (49 CFR, Part 236), during the period of September 1, through October 1, 1998, to the extent that the CSXT and AMTRAK, as operating railroads for Virginia Railway Express (VRE), be permitted to operate VRE Manassas trains, without cab signals, in automatic cab signal territory, between Alexandria and ''RO,'' Virginia,

APPENDIX D

SCOPING REPORT

I. INTRODUCTION

FRA published a Notice of Intent to prepare an Environmental Impact Statement on the proposed rule regarding the Use of Locomotive Horns at Highway-Rail At-Grade Crossings in the Federal Register on May 26, 1998. A subsequent Notice of Extension of Comment Period appeared in the Federal Register on July 27, 1998, extending the comment period to August 7, 1998. FRA has encouraged broad participation in the EIS process during scoping and review of the resulting environmental documentation for the proposed action. Comments and suggestions were invited from all interested agencies and the public at large to ensure the full range of related issues are considered, that all reasonable alternatives are addressed, and that all significant issues are identified. In particular, FRA was interested in determining whether there are other areas of environmental concern for which there might be the potential for significant impacts, either adverse or favorable, as a result of the proposed action. This scoping report documents the scoping process and records comments with FRA's responses.

Background Information:
Activities Preceding the Issuance of the Notice of Intent
Because of the great interest in this subject throughout various areas of the country, FRA conducted an extensive outreach program directed toward those communities that presently have whistle bans in effect. FRA staff attended a large number of meetings with local officials and citizens. FRA has also held a number of public meetings to discuss the issues and to receive information from the public. FRA broke from tradition and established a public docket before formal initiation of rulemaking proceedings in order to enable citizens and local officials to provide insight to FRA and to comment on how FRA might implement 49 U.S.C. §20153. Establishment of the docket also enabled members of the public to learn what other interested parties thought about this subject.

Significant comments received by FRA during the Pre-Notice of Intent period are summarized below:

- State and localities may be best suited to make decisions regarding exemptions from the requirement that trains sound horns at crossings.

- Examples of exemptions to the Rule could include locations:

    - where crossings are adequately protected,
    - where train speeds are no more than 30 miles per hour,
    - where vehicle speeds are no more than 35 miles per hour,
    - where crossings are flagged by the train crews,
    - where train crews activate the crossing signal

- Costs associated with alternative safety measures should be borne by parties other than the local or state government. Citizens and state and local officials are concerned about any imposition of funding mandates related to 49 U.S.C. §20153.

- The rule should not be implemented globally. Instead, the rule should be applied based on:

  - urban/rural population areas,
  - proximity to residential areas,
  - accident history

- There is support for aggressive enforcement, education programs, and less costly physical barriers rather than implementing the rule globally in urban areas.

- There are concerns regarding the identification of crossings impacted by informal bans on train horns.

- There is basic incompatibility between train horn noise and quality of life in adjacent communities.

- There should be an evaluation of the public health effects of loud train horns.

II. SUMMARY OF SCOPING COMMENTS RECEIVED

FRA received a total of 214 comments on the scope of the FRA Whistle Ban DEIS by the close of the comment period (August 7, 1998). From that date until October 1, 1998, FRA received 24 additional comments, which brings the total number of comments to 238. Exhibit #1 "Scoping Comments and Responses" provides a summary of comments received in tabular form. The 238 comments were received from 21 separate states and 62 separate communities across the country, including 34 comments from organizations.

A large number of the total comments originate from only 4 of 21 states represented by respondents. The four states represented most heavily are Illinois (38.2%), Massachusetts (18.1%), New Jersey (5.0%), and Kentucky (5.0%). Comments originating from organizations account for 14.3 percent of all comments. Tabulation of the comments lead to the conclusion that citizens in Illinois and Massachusetts, and to a lesser extent New Jersey and Kentucky, are sensitive to issues about the use of locomotive horns at highway-rail at-grade crossings.

III. INCORPORATION OF SCOPING COMMENTS INTO THE SUBSTANCE OF THE DEIS

Upon reviewing the comments received, FRA, where appropriate, amended and expanded the scope of the DEIS to reflect substantive issues raised in scoping comments.

EXHIBIT 1: FRA Use of Locomotive Horns DEIS: Scoping Comments and Responses

Issue	Comment Description	Response	State	City
Community Impacts	The town has 140 trains per day; therefore it is essential for the quality of life to use modern technology to eliminate the need for train horns.	A variety of alternative measures are available in the Quiet zone provisions of the Proposed Rule.	NJ	Denville
Community Impacts	Examples of impacts to communities include delays in emergency vehicle response time if crossings are closed.	This issue is important in quiet zone proposals that include temporary grade crossing closure. Permanent grade crossing closures are not considered in the proposed Rule but may be undertaken by communities to address safety and noise concerns.	IL Org.	Chicago Des Plaines
Community Impacts	FRA should consider the impacts of the Rule on air quality caused by increased congestion, delay, and auto emissions due to the closing of a crossing which adds vehicle miles traveled.	The closing of a railroad grade crossing is a site-specific mitigation measure that could potentially be considered in a package of supplementary safety measures that would be implemented by a local jurisdiction. When a grade crossing is closed, it is likely the amount of vehicle miles of travel (VMT) and concomitant vehicular emissions would increase. This situation could be analyzed by the community on a site-specific basis as part of the local jurisdiction's decision to either temporarily or fully close a grade crossing.	IL OR Org.	Chicago Pendleton Des Plaines
Community Impacts	Changing streets to one-way at rail crossings would cause increased traffic congestion, since people would be forced to drive greater distances.	A variety of alternative measures are available in the Quiet zone provisions of the Proposed Rule. The choice of those measures is up to the local community.	IL OR	Des Plaines Pendleton
Community Impacts	In communities where whistle bans have been in effect for more that five years, residences have been built within 50-100 feet of grade crossings.	In issuing the Use of Locomotive Horns Rule, FRA is responding to Congressional direction to protect public safety across the nation. In communities with whistle bans, the community may prefer to adopt a Quiet Zone.	MA	Beverly
Community Impacts	It is assumed that this EIS process will take into account Executive Order #12898 on Environmental Justice.	Environmental Justice will be considered in the DEIS.	IL	Chicago
Community Impacts	In the Chicago region, almost all commuter rail lines into the city pass through grade crossings; requiring horn sounding on all these trains would create unbearable living conditions for hundreds of thousands of families.	The proposed Rule has clear provisions allowing localities, if they so desire, to adopt a Quiet Zone to mitigate the effects of the train horns.	IL	Wilmette
Community Impacts	One never gets used to the sound of train horns like one does to the sound of the trains; the horns are a nuisance during the day and totally interruptive at night.	Noted.	KY	Louisville
Community Impacts	There are approximately 150-200 units of elderly and disabled housing located along both sides of the rail right-of-way.	The EIS will analyze the national effects of horn noise on residential population using generally accepted noise impact criteria.	MA	Ashland
Community Impacts	Noise from horns will discourage people from moving closer to train stations and thus runs counter to Clean Air Act goals to promote transit oriented development.	Noted.	IL	Chicago
Community Impacts	The negative effect on schools, businesses and other facilities due to noise runs counter to the Clean Air Act measures to promote transit oriented development.	The proposed Rule has clear provisions allowing localities, if they so desire, to adopt a Quiet Zone to mitigate the effects of the train horns.	Org. MA	Westchester Acton
Community Impacts	The amount of train traffic (and horn noise) from Canada thru Michigan and on to Chicago has doubled recently; this is a major nuisance.	Noted.	MI	Lansing

Issue	Comment Description	Response	State	City
Community Impacts	Residents consider train horns a nuisance because it diminishes quality of life.	Noted.	IL IL	Wood Dale North Riverside
Community Impacts	Recreation areas, school environments, and community facilities will be negatively impacted by the horns.	The proposed Rule has clear provisions allowing localities, if they so desire, to adopt a Quiet Zone to mitigate the effects of the train horns.	IL KY IL	Des Plaines Anchorage Chicago (2)
Community impacts	Horn noise should be stopped in places with a high density of residents.	The proposed Rule has clear provisions allowing localities, if they so desire, to adopt a Quiet Zone to mitigate the effects of the train horns.	KY	Anchorage
Community Impacts	Many of the communities house elderly populations near rail crossings.	The EIS will analyze the national effects of horn noise on residential population using generally accepted noise impact criteria. The proposed Rule has clear provisions allowing localities, if they so desire, to adopt a Quiet Zone to mitigate the effects of the train horns.	IL	DuPage County
Economic Impacts	The Rule may lead to a decline in neighborhoods located adjacent to grade crossings as people move away due to the intolerable noise pollution.	FRA studies have shown that for housing, the most noise sensitive general land use category, price effects from horn blowing normalize over time.	IL	Chicago
Economic Impacts	What social impacts may befall a community facing an exodus of residents who decide to move away from train horn noise?	FRA studies have shown that for housing, the most noise sensitive general land use category, price effects from horn blowing normalize over time.	MA	Beverly
Economic Impacts	The EIS should consider and weigh equally the benefits to the errant driver versus the impact to residents living near the railroad.	Noted.	MA	Hamilton
Economic Impact	Various costs will fall to the local governments, including the costs of complying with the Rule, sound proofing public institutions, relocation of those institutions which are severely impacted, and diminished property values.	FRA has shown that the costs of complying with the Quiet Zone provisions of the rule to maintain existing horn blowing patterns are exceeded by the value of averted incidents in its document entitled, "Initial Regulatory Evaluation and Initial Regulatory Flexibility Assessment for Use of Locomotive Horns at Highway-Rail Grade Crossings" (FRA, Office of Safety, 1998, Washington, DC).	Org.	Des Plaines
Economic Impacts	FRA's EIS needs to look at the effects of the proposed Rule on businesses and on people traveling and shopping.	The FRA will analyze the impacts of the proposed Rule on residential land use. Commercial land use is generally less sensitive to environmental noise outside of specific sensitive activities. Any site specific concerns can be addressed through the Quiet Zone provisions of the proposed Rule.	IL	Chicago
Economic Impacts	Residents have sold their homes, and won tax appeals because of the impact of the train noise.	FRA studies have shown that for housing, the most noise sensitive general land use category, price effects from resuming horn blowing at highway-rail at-grade crossings are not evident after several years.	NJ	Denville
Economic Impacts	In a downtown area with large numbers of businesses, including pedestrian tourists, train horns are very disruptive.	FRA notes that the effects raised by the commentator will be mitigated through commitments related to the Union Pacific/Southern Pacific merger.	NV	Reno
Economic Impact	The silencing of horns where no adequate alternative safety measures exist is a too high a price to pay in terms of train-automotive collisions at crossings.	Noted.	IL	Hoffman Estates
Economic Impacts	The proposed Rule should identify the direct pecuniary cost (and fiscal implications of such "unfunded mandates" on local governments).	The direct costs to any particular jurisdiction depends upon the local decision wether to designate a Quiet Zone and the choice of supplemental or alternative safety measures to employ.	IL	Oak Brook
Economic Impacts	The area within approximately one-half mile of any crossing will become undesirable for residential, educational, institutional, and commercial use.	FRA studies have shown that for housing, the most noise sensitive general land use category, price effects from horn blowing normalize over time.	IL	Des Plaines
Economic Impacts	The impact of increased freight traffic and horn noise has negatively affected business in the entire region.	Noted.	CO	Winter Park

Issue	Comment Description	Response	State	City
Economic Impacts	The EIS should include the costs involved to implement the alternative safety measures, and clarify how these costs would be assigned to local and federal bodies.	Estimated costs for other safety measures will be included in the EIS. The direct costs to any particular jurisdiction depends upon the local decision wether to designate a Quiet Zone and the choice of supplemental or alternative safety measures to employ.	IL	Chicago
Economic Impacts	The Rule would have unintended consequences. Any rational analysis would conclude that more people would die as a result of increased automobile accidents (due to sleep deprivation) as compared to deaths due to unprotected grade crossings.	FRA has thoroughly documented the reduction in automobile-train collisions from the regular use of the train horn at rail-highway grade crossings.	IL	Springfield
Economic Impacts	The disruption to the many hundreds of homes in the area clearly outweighs any imagined public safety "benefit" from the sounding of train horns; there must be a balance between public safety and peace and quiet sought by the public.	The proposed Rule has clear provisions allowing localities, if they so desire, to adopt a Quiet Zone to mitigate the effects of the train horns.	MN	Inner Grove
Economic Impacts	Businesses located at or near crossings may suffer multiple adverse impacts from the sounding of train horns.	FRA studies have shown that for housing, the most noise sensitive general land use category, price effects from horn blowing normalize over time.	MA	Beverly
Economic Impacts	Homes located within ¼ mile from grade crossings may find their properties devalued, and owners may consider this a "taking" by the Federal government; the potential for multiple lawsuits may cost taxpayers millions of dollars in court time and/or settlement costs.	FRA studies have shown that for housing, the most noise sensitive general land use category, price effects from horn blowing normalize over time.	MA	Beverly
Economic Impacts	It is clear that there are alternatives to horn blowing; while these alternatives are also costly, they should be considered for implementation.	Alternatives to horn blowing are available to local communities in the Quiet Zone provisions of the proposed Rule.	IL	Maple Park
Economic Impacts	The cost to all persons living in communities subject to train horns greatly outweighs the speculative and marginal effect on crossing safety statistics the proposed Rule might have.	FRA has shown in studies that train horns are an effective means of reducing collision rates at grade crossings and that the costs of complying with the Quiet Zone provisions of the rule to maintain existing horn blowing patterns are exceeded by the value of averted incidents.	IL	Wilmette
Economic Impacts	How would a hospital nearby train horns be able to compete with hospitals in non-rail/quiet communities?	Communities have the option of designating a Quiet Zone in the proposed Rule for any reason they chose.	MA	Beverly
Economic Impacts	A more efficient use of public funding would be to improve the most dangerous crossings first in order to achieve the greatest safety impact.	The proposed Rule is in addition to targeted funding directed at crossings based on safety need and is mandated by law. The Method 2 Quiet Zone provision of the proposed Rule allows for flexible application of safety measures that will permit improvements to be focused on priority crossings.	Org.	Westchester
Economic Impacts	The effects of the Rule, if applied without recourse to the alternative safety measures, would jeopardize the tourist industry in downtown locations with several hotels located near busy train lines.	Communities have the option of designating a Quiet Zone in the proposed Rule for any reason they chose. FRA notes that the effects raised by the commentator will be mitigated through commitments related to the Union Pacific/Southern Pacific merger.	NV	Reno
Economic Impacts	Train horns diminish the value of many types of property, including businesses and residences.	FRA studies have shown that for housing, the most noise sensitive general land use category, price effects from horn blowing normalize over time.	IL IL IL KY	Des Plaines Maple Park North Riverside Anchorage
Economic Impacts	If federal funding programs are identified related to the implementation of the Rule, FRA should be up-front about the true availability of these monies in light of other funding priorities.	Available Federal funds are controlled by State agencies receiving surface transportation appropriations.	IL	Chicago

Issue	Comment Description	Response	State	City
Economic Impacts	The proposed Rule would punish hundreds of thousands of law-abiding citizens who would never cross the tracks and is a case of federal "over-kill." According to FRA statistics, the effect of the Rule would be to save 4.36 lives per year versus affecting the peace and quiet of millions around the entire country.	FRA has shown that the costs of complying with the Quiet Zone provisions of the rule to maintain existing horn blowing patterns are exceeded by the value of averted incidents in its document entitled, "Initial Regulatory Evaluation and Initial Regulatory Flexibility Assessment for Use of Locomotive Horns at Highway-Rail Grade Crossings" (FRA, Office of Safety, 1998, Washington, DC).	MA	Acton
Economic Impacts	The U.S. Supreme Court decision (CSX v. Eastwood), which ruled that railroads are responsible for the costs of installing and maintaining warning devices at grade crossings, should be supported.	The case cited does not stand for the stated proposition. The statutory mandate specifies responsible parties.	Org.	Denver
Economic Impacts	The cost of four quadrant gates (up to $200,000 per crossing) and barrier medians (up to $50,000) will be difficult for communities to manage.	Noted.	MA	Acton
Economic Impacts	Federal funding from Sec. 130 program should be increased to compensate states for implementing grade crossings warning devices.	Available Federal funds are controlled by State agencies receiving surface transportation appropriations.	Org.	Denver
Environmental Process	The alternative to refraining from issuing the Rule would be in direct conflict with the 1994 Congressional mandate to take action on whistle bans.	The no action alternative would involve seeking legislative relief from Congress.	Org.	Washington
Environmental Process	How and when might one obtain a copy of the scoping portion of the proposed EIS document?	The Scoping Report will be included in the DEIS as an appendix.	MN	Inner Grove
Environmental Process	Other species besides humans may be negatively impacted by the Rule.	FRA has surveyed literature on noise effects on animals and finds that there is no conclusive evidence that there are any lasting impacts on animals from noise events of the type being studied.	MA IL	Beverly Des Plaines
Environmental Process	It is assumed that this EIS process will take into account consideration of the human environment (direct, indirect and cumulative impacts).	The DEIS will consider direct, indirect, and cumulative impacts of noise impacts on the human environment.	IL	Chicago
Environmental Process	Please consider the No-Action Alternative.	Noted.	NJ IL	Mt Tabor Buffalo Grove
Environmental Process	The proposed Rule should be delayed to allow additional alternatives to be researched and developed.	The proposed Rule is being issued by FRA in accordance with the intent of Congress and the Swift Act (Public Law 103-440) of 1994.	Org.	Westchester
Environmental Process	Please provide opportunity to comment on the proposed scope of work for the EIS.	Comments were solicited and received between May 26, 1998 and August 7, 1998.	IL	Chicago
Environmental Process	It is conceivable that the number of crossings subject to horn blowing may not increase significantly with the new Rule; thus, preparing an EIS before comments have been received on the exceptions to the Rule seems misguided.	The EIS is being prepared because FRA has determined that the proposed Rule represents a "Major Federal Action" under the National Environmental Policy Act. The Draft EIS will take into account all scoping comments.	Org.	Washington
FRA Database	FRA needs to be clear whether the safety statistics supplied are actual empirical data or FRA projections from computer models.	Noted.	IL	Chicago
FRA Database	FRA's database on train movements is inaccurate to a degree which causes the accident prediction rate to be falsely calculated.	The US DOT/AAR grade crossing inventory is the best available source of data on grade crossings for the country as a whole, even with its inherent inaccuracies. Submission of updated information is voluntary and is provided to FRA by states and railroads except in the case of collisions for which reporting is mandatory.	IL	Des Plaines

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FRA Database	The Chicago Metropolitan area contains approximately 1800 crossings in 110 separate municipalities; the FRA database is surely missing crossings in this area.	FRA has made every attempt to account for all the crossings subject to whistle bans in the country.	IL	Chicago
Governmental Role	Although there are substantially numbers of people affected by this rule, elected officials at the local level are unaware of the proposed changes.	FRA has conducted extensive outreach to potentially affected localities and their elected officials. FRA expects to further this outreach through our Regional Managers, public hearings, and information available through the Internet and other sources.	CO	Fountain
Governmental Role	The Federal Government should conduct research, facilitate public awareness of danger and the illegality of trespassing under State law.	Inasmuch as the proposed Rule addresses use of locomotive horns at highway-rail grade crossings, neither the DEIS nor the proposed Rule will address trespasser issues. FRA has addressed trespasser issues in other contexts.	Org.	Denver
Governmental Role	UP is reported to be ignoring local ordinances citing their belief that there is a Federal requirement to sound horns today.	Until a final rule on locomotive horns use is issued by FRA, local ordinances and state laws remain fully in force.	VA	Roanoke
Governmental Role	It is troubling and disconcerting to have states and localities lose the ability to impose whistle bans based on residential complaints and to have all state and local laws pertaining to whistle bans preempted.	The Congress mandated that FRA issue a rule requiring that locomotive horns be sounded at all public grade crossings, with exceptions as noted in the statute. While this law does preempt all state and local ordinances, the rule does have provisions for state and local involvement. Quiet zones will not be established if opposed by the state or local government, conversely, quiet zones can only by established with state and local government involvement.	Org.WI	Denver Milwaukee
Governmental Role	NJ Transit has been unresponsive to request for cooperation with towns along its commuter lines.	The Proposed rule would require that railroads comply with properly established quiet zones.	NJ	Denville
Governmental Role	States having a long-tradition in regulation of train horns should be allowed to retain their regulatory authority in this area, in accordance with USC 49 Section (c) (1) (A-B) of Section 20153.	The Congress mandated that FRA issue a rule requiring that locomotive horns be sounded at all public grade crossings, with exceptions as noted in the statute. While this law does preempt all state and local ordinances, the rule does have provisions for state and local involvement. Quiet zones will not be established if opposed by the state or local government, conversely, quiet zones can only by established with state and local government involvement.	ME	Augusta
Governmental Role	Can a municipality regulate locomotive horns at grade crossings or impose speed limits on trains?	The Congress mandated that FRA issue a rule requiring that locomotive horns be sounded at all public grade crossings, with exceptions as noted in the statute. While this law does preempt all state and local ordinances, the rule does have provisions for state and local involvement. Quiet zones will not be established if opposed by the state or local government, conversely, quiet zones can only by established with state and local government involvement. The Supreme Court has held that local speed restrictions are preempted by Federal rail safety regulations.	MN	Mankato
Governmental Role	FRA should revise its proposed Rule to allow states to devise their own regulations for train horns.	The Congress mandated that FRA issue a rule requiring that locomotive horns be sounded at all public grade crossings, with exceptions as noted in the statute. While this law does preempt all state and local ordinances, the rule does have provisions for state and local involvement. Quiet zones will not be established if opposed by the state or local government, conversely, quiet zones can only by established with state and local government involvement.	IL MA Org.	Buffalo Grove Acton Denver
Governmental Role	The ability of citizens to have their concerns addressed by state and federal officials is a major issue.	The Congress mandated that FRA issue a rule requiring that locomotive horns be sounded at all public grade crossings, with exceptions as noted in the statute. While this law does preempt all state and local ordinances, the rule does have provisions for state and local involvement. Quiet zones will not be established if opposed by the state or local government, conversely, quiet zones can only by established with state and local government involvement.	NJ	Morristown

Issue	Comment Description	Response	State	City
Grade Crossing Safety	OPERATION LIFESAVER should be promoted to foster safety and public awareness.	FRA supports the use of public awareness programs to increase safety at grade crossings.	IA MA Org. Org.	Nevada Acton Denver Westchester
Grade Crossing Safety	Most collisions at grade crossings are due to motorists or pedestrians ignoring or circumventing existing safety devices; horns will not further deter anyone set on crossing the tracks.	Approximately 50% of crossing collisions occur at crossings equipped with automatic warning devices. The remainder occur at crossings with passive warning devices (e.g. signs). The *Nationwide Study on Train Whistle Bans* (FRA, Office of Safety, 1995) showed that train horns are an effective means of reducing accident rates at grade crossings.	IL	Wilmette
Grade Crossing Safety	Mandating horn sounding will not prevent persons from crossing the tracks if they are determined to do so. Only further educational efforts on railroad safety will help achieve this goal.	FRA supports the use of public awareness programs to increase safety at grade crossings, but the effectiveness of those programs must be demonstrated as having the effectiveness of train horns. FRA supports the use of public awareness programs such as Operation Lifesaver to increase safety at grade crossings.	IL	Downers Grove
Grade Crossing Safety	FRA has not done enough comprehensive research to support its broad generalizations about the improvement in safety due to train horns.	The *Nationwide Study on Train Whistle Bans* (FRA, Office of Safety, 1995) showed that train horns are an effective means of reducing collision rates at grade crossings.	IL	Maple Park
Grade Crossing Safety	Because there is an increase in casualties and deaths due to automobile - train collisions, there is probably a need for increased safety and warning systems.	Noted.		
Grade Crossing Safety	While train horns may make sense for unprotected crossings in rural areas, they make no sense for a fully developed residential area.	Both rural and urban jurisdictions have reduced collision rates when train horns are used.	IL	Wilmette
Grade Crossing Safety	Appropriate responsible agencies should be required to monitor periodically wait times at crossings.	Local authorities are responsible for the traffic operations and roadway maintenance at grade crossings.	Org.	Westchester
Grade Crossing Safety	There is no evidence based on the City's collision data that a change in the horn policy will improve Grade Crossing Safety.	The *Nationwide Study on Train Whistle Bans* (FRA, Office of Safety, 1995) showed that train horns are an effective means of reducing collision rates at grade crossings.	KY	Anchorage
Grade Crossing Safety	Enhanced enforcement of existing rail safety laws and public education programs are needed.	FRA supports the use of public awareness and enhanced enforcement at grade crossings.	MA	Andover
Health Impacts	Train horn disrupt sleep patterns daily and contribute to this health problem. Recent research reports that sleep-deprived persons score 80% lower on a scale for overall functioning.	This issue may be appropriate for consideration by communities in determining wether to establish a quiet zone.	IL KY	Maple Park Anchorage
Health Impacts	Would children attending a school located near a grade crossing with horns be more susceptible to nervous disorders and what impact would train horns have on young children requiring periodic naps?	Research on the health effects of noise will be gathered and analyzed in the DEIS.	MA	Beverly
Health Impacts	What are the long term effects on the human nervous system after being subjected to sudden long sound blasts?	Research on the health effects of noise will be gathered and analyzed in the DEIS.	MA	Beverly
Health Effects	Since Locomotive Engineers have very little control over behavior of trespassers or motorists, Trauma and Post Traumatic Stress Disorder are to be expected to increase if the whistle ban alternative measures do not function properly.	This is not a differential effect. Failure to blow the train horn in the absence of compensating safety measures would produce the same effect.	NV Org.	Reno Cleveland
Health Impacts	What is the impact of repeated sleep interruptions caused by nighttime horn noise?	Research on the health effects of noise will be gathered and analyzed in the DEIS.	MA	Beverly

Issue	Comment Description	Response	State	City
Health Impacts	The intense noise from horns will increase the rate at which train engineers lose their hearing.	The issue of occupational noise exposure is addressed in existing FRA regulations and a pending rule-making. Potential exposure due to the proposed Rule is a very small fraction of the total occupational exposure to train horn noise.	IL	Des Plaines
Health Impacts	The health of persons living near crossings would be affected due to intense decibel level of the horns, which is measured at 100 dB, or is louder than a heavy metal rock concert.	Train passes are of shorter duration than concerts. Research on the health effects of noise will be gathered and analyzed in the DEIS.	MA	Acton
Health Impacts	Recent research reports that infants exposed to high noise, including train horns, have a greater chance of experiencing improper speech development.	No research was found as cited in this comment.	IL	Maple Park (3)
Health Impacts	Does repeated exposure to loud noise such as train horns have a cumulative effect on hearing loss?	Research on the health effects of noise will be gathered and analyzed in the DEIS.	MA	Beverly
Health Impacts	The elderly may be more severely impacted by noise since they may be more easily confused by the noise; collisions among this population may increase as well. How would horn noise affect recuperating patients and/or the elderly suffering from medical conditions including insomnia?	Research on the health effects of noise will be gathered and analyzed in the DEIS.	IL MA	Des Plaines Beverly (2)
Health Impacts	FRA's EIS needs to look at the effects of the proposed Rule on passengers (parked and boarded) and other passers by.	Train passengers are not significantly exposed to noise from train horns.	IL	Chicago
Legal Issues	Laws need to be passed to protect home-owners who live near the railroads and some authority regarding railroad should be returned to the EPA.	The proposed Rule has provisions which enable communities to create Quiet Zones which would prevent sounding of locomotive horns. Questions regarding "returning" authority to EPA is beyond the scope of this DEIS or proposed Rule.	IL	Antioch
Legal Issues	It is assumed FRA will abide by Public Law 104-264, Section 1218 which amended the requirements of the Swift Rail Act to take into account the interests of communities that have whistle bans in place or have not historically been subject to the use of train horns.	The proposed Rule addresses these issues.	IL	Oak Brook
Legal Issues	The Rule should be delayed until the year 2000 to allow time to address unanswered questions regarding the effectiveness and impact of the Rule.	49 USC 20153 directs that the rule can not be effective until one year after issuance.	MA	Acton
Legal Issues	Some railroads currently ignore whistle bans in certain locations, while adhering to them in others.	Until a final rule on locomotive horns use is issued by FRA, local ordinances and state laws remain fully in effect.	IL	Maple Park
Legal Issues	FRA's delay in issuing the Rule is a hindrance to decisions whether to sound horns and which alternative warning devices to use, such as directional horns mounted at crossings.	Although the delay did cause some uncertainty, it was occasioned by extensive outreach to communities required by amendments to the Swift Rail Act. Additionally, FRA has worked with communities to address those concerns.	Org.	Washington
Legal Issues	Train operators should have liability protection from people who clearly ignore train warning signals and devices.	The proposed Rule addresses the issue.	IL	Aurora
Legal Issues	FRA should establish a publicly accessible grievance process to resolve a conflict with a railroad.	Provisions for establishment of a Quiet Zone do not require permission from the railroad. FRA does not anticipate such conflict circumstances.	IA	Nevada
Legal Issues	By couching the Rule as an environmental issue, victims of train collisions will have less ability to have railroads take accountability.	The EIS process, by definition, is an analysis of a proposed Rule that is supplementary to the rule. This process does not have any effect on a railroad's accountability, if any, under the proposed Rule.		
Legal Issues	The Locomotive Engineer should not be held accountable for actions of persons injured at a crossing or in the railroad Right-of-Way.	The proposed Rule addresses the issue.	Org.	Cleveland

Issue	Comment Description	Response	State	City
Legal Issues	The village herewith exempts itself from train horn restrictions.	Until a final rule on locomotive horns use is issued by FRA, local ordinances and state laws remain fully in effect. Federal law requires that after the final rule is effective, state and local laws be preempted by the final rule.	IL	Elmwood Park
Legal Issues	Illinois Public Act 85-1144 from 1988 required many of the same horn blowing regulations as this proposed Rule, and was met with such intense public outcry that it was ordered by the court to be stopped.	Noted.	Org.	Westchester
Legal Issues	The Rule as written will cause intense public backlash which could result in a court order to stop the horns.	The proposed Rule is being released for comment. This rulemaking is required by Congress to address public safety concerns.	MA	Acton
Noise Analysis	FRA's EIS needs to look at the noise effects of the proposed Rule on train crews.	The issue of occupational noise exposure is addressed in existing FRA regulations and a pending rule-making. Potential exposure due to the proposed Rule is a very small fraction of the total occupational exposure to train horn noise.	IL	Chicago
Noise Analysis	FRA's noise model needs to consider how the noise impact changes under windy conditions.	Windy conditions are site specific temporal factors. This EIS will evaluate noise impacts on a national basis. Wind effects are not significant over time and across broad geographic variations that occur on a macro-scale.	IL IL	Chicago Des Plaines
Noise Analysis	Even under a current whistle ban, the number of trains is very obtrusive. Please keep the impacts of noise in mind when issuing this Rule.	The EIS will analyze the national effects of horn noise on residential population using generally accepted noise impact criteria.	KY	Anchorage
Noise Analysis	Noise effects on residents, businesses, schools, hospitals and recreational areas should be considered within ½ mile of the crossing.	The EIS will analyze the national effects of horn noise on residential population using generally accepted noise impact criteria.	Org.	Des Plaines
Noise Analysis	What were EPA's findings with regard to airport noise and its subsequent restrictions on airports and are they relevant to the Rule on train horns?	EPA's guidelines on noise levels will be incorporated into the development of the noise model used in the analysis for the DEIS.	MA	Beverly
Noise Analysis	Noise due to horns would become a very large problem in a small, densely populated town.	The proposed Rule has clear provisions allowing localities, if they so desire, to adopt a Quiet Zone to mitigate the effects of the train horns.	KY	Anchorage
Noise Analysis	Residents consider train horns a nuisance because it diminishes quality of life.	Noted.	CA CO IL IL	San Leandro Denver Aurora Burr Ridge
Noise Analysis	In particular, nighttime train horns cause much discomfort for residents.	The EIS will analyze the national effects of horn noise on residential population using generally accepted noise impact criteria that overweight nighttime noise.	IL	Buffalo Grove
Noise Analysis	The horn is so loud that it is impractical to be outdoors when trains pass by.	The EIS will analyze the national effects of horn noise on residential population using generally accepted noise impact criteria.	IL	Burr Ridge
Noise Analysis	Residents will be subjected to noise levels well above the decibel standard set by EPA.	Current EPA noise regulations exempt train horns as a safety device.	Org.	Westchester
Noise Analysis	Horns will be blown adjacent to a state prison, a hospital, and elementary school and at least five churches.	The EIS will analyze the national effects of horn noise on residential population using generally accepted noise impact criteria. Site specific issues can be addressed locally with the designation of a Quiet Zone.	OR	Pendleton
Noise Analysis	FRA must take into consideration the effect the impacts of excessive noise have on communities and account for this in the new Rule.	The proposed Rule has clear provisions allowing localities, if they so desire, to adopt a Quiet Zone to mitigate the effects of the train horns.	IL	Chicago

Issue	Comment Description	Response	State	City
Noise Analysis	How would train horns sounded in close proximity to schools, nurseries, and other day care facilities affect the educational environment?	The EIS will analyze the national effects of horn noise on residential population using generally accepted noise impact criteria. Site specific issues can be addressed locally with the designation of a Quiet Zone.	MA	Beverly
Noise Analysis	FRA's EIS needs to look at the effects of the proposed Rule on hospitals (day and night).	The EIS will analyze the national effects of horn noise on residential population using generally accepted noise impact criteria that overweight nighttime noise. Site specific issues can be addressed locally with the designation of a Quiet Zone.	IL	Chicago
Noise Analysis	FRA's EIS needs to look at the effects of the proposed Rule on people inside and outside of residences within ½ mile in the daytime.	The EIS will analyze the national effects of horn noise on residential population using generally accepted noise impact criteria that overweight nighttime noise.	IL	Chicago
Rule Provisions	Since the existing law does not regulate the duration of horn blowing, the community is subject to a continuous blast of noise from the first crossing to the last.	The proposed Rule would require train engineers to blow the train horns for no more than ¼ mile.	OH	Olmstead Falls
Rule Provisions	Train horns operate at around 144 decibels, which is unsafe and annoying up to one-half mile away.	The proposed Rule has provisions for a maximum horn noise level.	IL	Wilmette
Rule Provisions	In a town where crossings are close together, the train horn sounds continuously for long distances through the entire town.	The proposed Rule has provisions that would allow the designation of a quiet zone encompassing several adjacent crossings.	IL MN	Des Plaines Inner Grove
Rule Provisions	The Rule should not be implemented because to do so would unduly compromise the quality of life.	The proposed Rule has clear provisions allowing localities, if they so desire, to adopt a Quiet Zone to mitigate the effects of the train horns.	CO IL IL	Sterling Wilmette (2) Downers Grove
Rule Provisions	At 100 feet from the tracks, the typical horn is 114 decibels (as defined by the Chicago Council of Mayors) which is equivalent to 794 residential smoke alarms ringing simultaneously. This is unacceptable.	The train horn is a safety device and as such is exempt from EPA regulation. The proposed rule offers for consideration a possible maximum horn noise level. The EIS will analyze the national effects of horn noise on residential population using generally accepted noise impact criteria.	IL	Des Plaines
Rule Provisions	With 5 crossings within one mile of each other, there is no need to blow horns at each one of them.	The proposed Rule has provisions that would enable communities to designate Quiet Zones of multiple crossings. The proposed Rule calls for the horn to be sounded up to 20 seconds but not more than ¼ mile.	KY MA	Louisville Hamilton
Rule Provisions	Horns, especially late at night, are very disturbing to residents; at night, the sounding of horns should be limited to a few short blasts.	The proposed Rule has clear provisions allowing localities, if they so desire, to adopt a Quiet Zone to mitigate the effects of the train horns. Also, the proposed Rule has provisions for setting a maximum horn noise level.	IL	Franklin Park
Rule Provisions	The Rule should incorporate the use of strobe lights, more visible paint schemes on locomotives and cab car fronts, and reflective delineators on the sides of rail cars.	FRA has adopted a new Rule on train conspicuity, issued in 1996, entitled Locomotive Visibility; Minimum Standards for Auxiliary Lights (FRA Docket No.. RSGC–22, Notice No. 10). Reflective material on the sides of railroad cars would not be effective as compensation for train horns but is being studied for other purposes.	MA	Andover
Rule Provisions	Please consider adopting regulations which would allow a downtown area with a large number of hotels serving tourists to establish a quiet zone.	The proposed Rule has clear provisions allowing localities, if they so desire, to adopt a Quiet Zone to mitigate the effects of the train horns.	NV	Reno
Rule Provisions	A downtown area with large number of hotels serving tourists is the type of area which would benefit greatly from the establishment of a quiet zone.	The proposed Rule has clear provisions allowing localities, if they so desire, to adopt a Quiet Zone to mitigate the effects of the train horns.	NV	Reno
Rule Provisions	The sounding of train horns in a densely populated area is detrimental to the quality of life; the ability to enact a quiet zone under the Rule would be much appreciated.	The proposed Rule has clear provisions allowing localities, if they so desire, to adopt a Quiet Zone to mitigate the effects of the train horns.	NJ	Burlington Township

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Rule Provisions	The ability to designate quiet zones through a simple procedure is welcome.	The proposed Rule has clear provisions allowing localities, if they so desire, to adopt a Quiet Zone to mitigate the effects of the train horns.	Org.	Denver
Rule Provisions	A quiet zone is needed here, just as FRA has allowed in Palm Beach, FL.	The proposed Rule has clear provisions allowing localities, if they so desire, to adopt a Quiet Zone to mitigate the effects of the train horns.	KY	Anchorage
Rule Provisions	OSHA sets its safety standard for noise at 85 decibels, and EPA sets its standard at 70 decibels. Should not the FRA standard be in line with these numbers?	OSHA standards deal with a time-weighted average noise exposure over the work period. EPA has regulations governing noise emissions from railroad equipment and exempts train horns as safety devices. FRA's standards for noise assessments incorporate EPA and other agency guidance for noise annoyance.	IL	Maple Park
Rule Provisions	Incentive programs for state and local governments to review safety improvements on a corridor basis could be established.	The proposed Rule includes the possibility of adopting a Quiet Zone, which, by definition, would allow localities to improve safety for a series of crossings found within their jurisdictions. Supporting Federal programs are available.	MA	Acton
Rule Provisions	An automated horn system, four-quadrant gates, or a median channelization system provides enough adequate safety at a crossing so that horns do not need to be sounded.	A variety of alternative measures are available in the Quiet zone provisions of the Proposed Rule. Automated directional horns have not yet been demonstrated to be effective substitutes for the train horn; however, this option may be considered further as the rule-making progresses.	IL TX	Downers Grove Richardson
Rule Provisions	The proposed Rule should recognize the diversity of land use, development density, and demographics when considering how to implement the rule.	The EIS will analyze the national effects of horn noise on residential population using generally accepted noise impact criteria. Many options are available to local communities to implement a Quiet Zone.	IL	DuPage County
Rule Provisions	The organization HORN has pushed through legislation allowing bells to be substituted for train horns and to eliminate all soundings at crossings with upgraded gates.	Noted. A variety of alternative measures are available in the Quiet zone provisions of the Proposed Rule. Bells have not yet been demonstrated to be effective substitutes for the train horn.	NJ	Mt Tabor
Rule Provisions	Some railroad engineers prefer to sound their horns 30-45 seconds; the limit for horn sounding should be set as a standard and be for a shorter duration.	The proposed Rule would create a standard sounding time of 20 seconds at all crossings.	IL	Franklin Park
Rule Provisions	The behavior of the locomotive engineer varies greatly in reference to how long the horn sounds.	The proposed Rule would create a standard sounding time of 20 seconds at all crossings.	CO	Denver
Rule Provisions	With reduced speeds, trains bells, and automatic crossing arms that eliminate the ability of cars to go around them provide sufficient public safety.	Noted. A variety of alternative measures are available in the Quiet zone provisions of the Proposed Rule. Bells have not yet been demonstrated to be effective substitutes for the train horn.	KY	Anchorage
Rule Provisions	Collision reduction programs should be tailored to the magnitude and type of collision experience at individual crossings.	The proposed Rule seeks to provide a flexible framework for reduction of the risk of collisions.	IL IL MA	Aurora Chicago Andover (2)
Rule Provisions	The Rule should further explore the use of supplemental safety measures as a substitute for horns.	The proposed Rule details other safety measures that allow localities, if they so desire, to adopt a Quiet Zone to mitigate the effects of the train horns. It also provides a means for the development and approval of new supplementary safety measures	CA	San Leandro
Rule Provisions	A combination of gates with flashers, public awareness, policing and strong enforcement, and liability protection for the railroads provides enough safety protection to the public.	These measures alone may not suffice to substitute for train horns. The proposed Rule provides for the option to adopt a Quiet Zone by using approved safety measures. Public awareness, policing and enforcement programs that can document being an effective substitute for train horns are included as approved mitigation methods.	IL	Aurora

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Rule Provisions	Each of the alternative measures will have different impacts. FRA cannot presumably know which of these measures would be operationally and economically feasible in any given community, so it is necessary to evaluate all of the measures as to the feasibility of their implementation.	The DEIS will identify the options made eligible in the proposed Rule as a "Mitigation Toolbox." It will be up to the local community to decide the appropriateness and acceptability of a specific measure.	IL	Chicago
Rule Provisions	A November, 1995 report from the DuPage mayors and Managers Conference showed that over 90% of grade crossings could not qualify for the implementation of four quadrant gates and 100' median barriers as a supplemental safety measures.	FRA has considered this constraint and has adapted its technical specifications for four-quadrant gates and median barriers ,which now must extend at last 60 feet from the gates if there is an intersection within the 100 foot initial minimum distance. In addition, FRA has proposed a corridor level risk abatement strategy based on comments from DuPage County communities.	IL	Chicago
Rule Provisions	Safety devices at grade crossings might include innovative techniques, including more reliable active warning devices and Intelligent Transportation System applications.	A variety of alternative measures are available in the Quiet zone provisions of the Proposed Rule. ITS applications are not presently available but FRA advocates establishment of ITS architecture for future application. The Proposed Rule also provides a means for the development and approval of new supplementary safety measures.	IA	Nevada Wood Dale
Rule Provisions	FRA is urged to consider the actual safety hazard at a given crossing before requiring any costly changes to that crossing.	Site specific factors including propensity for collisions are considered in the procedures for Quiet Zone designation. The proposed Rule seeks to provide a flexible framework for reduction of the risk of collisions.	Org.	Des Plaines
Rule Provisions	Particularly at crossings with low-volume vehicular traffic, traditional stop signs are sufficient safety protection.	In the Swift Act, Congress specifically noted that STOP signs are not to be considered an adequate supplementary safety measure to compensate for the absence of train horns.	MN	Inner Grove
Rule Provisions	Defining only two alternatives is an "all or nothing" approach. Is it not possible to devise a third alternative which would allow horns to sound with two short "toots" during nighttime hour?	The proposed Rule would create a standard sounding time of 20 seconds at all crossings, would provide clear means to institute Quiet Zones, and has provisions for a maximum horn noise limit.	MA	Ipswich
Rule Provisions	Photo-enforcement at gate crossings is a promising safety measure; if pilot project prove cost-effective, FRA should consider including this in its list of supplemental safety measures and help in the funding of their implementation.	The proposed Rule has provisions for photo-enforcement as a supplementary safety measure	IL	Oak Brook
Rule Provisions	A combination of train bells that ring continuously as trains approach the crossing and crossing gates are sufficient safety measures already in place.	These measure alone do not suffice to substitute for train horns. The proposed Rule provides for the option to adopt a Quiet Zone by using safety devices of known effectiveness.	IL	Highland Park
Rule Provisions	All grade crossings which meet safety standards such as possessing automatic flashers and descending gates should be exempted from the Rule.	In the Swift Act, Congress specifically noted that conventional gate and flashing light installations are not to be considered an adequate supplementary safety measure to compensate for the absence of train horns.	IL	Lake Forest
Rule Provisions	The Rule needs to incorporate alternatives which will protect the public safety as well as the peace and tranquility of the affected residential environment.	Alternative measures are available in the Quiet zone provisions of the Proposed Rule.	MA	Ashland
Rule Provisions	People drive around bells and gates and are therefore not an effective deterrent. Therefore, train horns are also pointless.	The *Nationwide Study of Train Whistle Bans* (FRA, Office of Safety, 1995) showed that train horns are an effective means of reducing collision rates at grade crossings, even at crossings with lights and gates.	NY	Bayport
Rule Provisions	If safety is the main concern, then the logic of the Rule would require all motorists to blow their horns as they approach intersections just in case another motorist is planning to run the red light.	The potential for a fatality resulting from a vehicle-locomotive train collision is far higher than a vehicle-vehicle collision. Unlike automobiles, trains often cannot stop within the range of vision.	IL	Burr Ridge

Issue	Comment Description	Response	State	City
Rule Provisions	Trains operating at low speeds in residential areas, particularly at night, should be granted an exception to the Rule.	The proposed Rule has clear provisions allowing localities, if they so desire, to adopt a Quiet Zone to mitigate the effects of the train horns. Low train speed has not been shown to be an effective deterrent to car-train crashes and would not be an acceptable supplemental safety measure.	MI	East Tawas
Rule Provisions	At least three alternatives should be considered: 1) No-Action; 2) Full Implementation; and 3) Implementation of Supplemental Safety Measures, including public education and enforcement, closing of grade crossings, grade separation, installation of physical restraints at crossings, and other measures as FRA rules indicate.	The proposed Rule has clear provisions allowing localities, if they so desire, to adopt a Quiet Zone to mitigate the effects of the train horns.	IL	Chicago
Rule Provisions	The decibel level of the horns, 110 dB, will have a serious impact on residents, and is much higher than the EPA standards of 55-67 dB.	The train horn is a safety device and as such is exempt from EPA regulation. The proposed rule offers for consideration a possible maximum horn noise level.	MA	Acton
Rule Provisions	FRA should enact horn standards which would balance public safety with prevention of noise pollution.	Noted.	IA	Nevada
Rule Provisions	FRA should seriously consider a Rule which enforces the Swift Act's horn blowing provision on a selective basis keyed to the level of safety hazard at a given crossing; while costly and time consuming, this is the only way to ensure the minimum of public cost and disruption with a maximum safety benefit.	The proposed Rule seeks to provide a flexible framework for reduction of the risk of collisions.	IL	Chicago
Rule Provisions	FRA should include in the Rule a national horn blowing pattern at grade crossings; this standard would prohibit "social" whistling between units, and include FRA enforcement through both equipment and operation inspections.	The proposed Rule is being issued to set a standard operating procedure for railroads at grade crossings in the nation. When implemented, the final Rule would be enforced by FRA inspectors.	IA	Nevada
Rule Provisions	FRA should require the sounding of horns at all grade crossings in the country; even with lights, bells, gates, and horns, collisions still happen to inattentive drivers and train engineers. The horn is one of the most important safety devices.	Noted.	Org.	Miami
Rule Provisions	Citizens all over the country are waiting for FRA to make the right decision to grant cities the choice to implement alternative safety measures; one real option is a four quadrant gate.	The proposed Rule allows localities, if they so desire, to adopt a Quiet Zone to mitigate the effects of the train horns. Four-quadrant gates are one of the proposed supplemental safety measures.	FL	Boca Raton
Rule Provisions	FRA should consider the collision history and physical circumstances associated with each crossing.	Site specific conditions are considered in the procedures for Quiet Zone designations.	MA	Hamilton
Rule Provisions	Gates should cover the entire length of the roadway (instead of the typical halfway coverage) so that people cannot make a choice to try to beat the train.	A variety of alternative measures are available in the Quiet zone provisions of the Proposed Rule.	IL	Maple Park
Rule Provisions	FRA should consider the differences in various types of crossings based on differences in existing conditions, so that a distinct and separate analysis should be given to currently unprotected crossings, crossings with warning bells, those with gates and audible warning systems, etc.	Different conditions at individual highway-rail crossings are accounted for in the accident prediction formula. FRA has considered these factors in preparing the proposed Rule. The proposed Rule seeks to provide a flexible framework for reduction of the risk of collisions.	IL	Chicago
Rule Provisions	Railroads should be forced to install gates and lights at every grade crossing in the country so they will not have to rely on horns.	Statute specifies responsibility for supplementary safety measures. The proposed Rule provides for the option to adopt a Quiet Zone by using safety devices of known effectiveness.	IL	Antioch

Issue	Comment Description	Response	State	City
Rule Provisions	Research shows that gates are the number one safety measure to reduce collisions at grade crossings.	A variety of alternative measures are available in the Quiet zone provisions of the Proposed Rule.	IL	Maple Park
Rule Provisions	The automated horn system in place for several years has proven to be effective and has greatly increased the quality of life in the town.	Automated directional horns have not yet been demonstrated to be effective substitutes for the train horn; however, this option may be considered further as the rule-making progresses.	NE NE	Gering (2) Scottsbluff
Rule Provisions	An alert sounded at the city limits as a train approaches a small town would be satisfactory in giving notice and safety to the town's residents.	This undefined warning would not suffice as a substitute for the requirement to sound train horns. The proposed Rule has clear provisions allowing localities, if they so desire, to adopt a Quiet Zone by employing warning devices and barriers of known effectiveness.	KY	Louisville
Rule Provisions	For crossings which are located on private land where there is no car traffic, will the Rule still be applied?	Not at this time.	OR	Portland
Rule Provisions	The Illinois Commerce Commission's requirements on horn blowing should be considered as a model for this proposed Rule.	FRA will consider all pertinent legislation in drafting the Final Rule.	Org.	Westchester
Rule Provisions	A more efficient use of public funds would be to focus on the most dangerous grade crossings in a state to correct situations that have the greatest safety improvement impact.	Such a program has been ongoing in the US since 1973. More than $3.2 billion of Federal funds have been expended improving more than 30,000 sites and in saving more than 10,000 casualties.	MA	Acton
Rule Provisions	From the beginning, Sec. 20153 to Title 49 has been wrong-minded; instead of being known as the "Whistle" law, it should be known as the "Gate Crossing" law. As such, Congress, FRA and the States and communities would be focusing not on horns but on the design, construction and funding of modern signal gates throughout the country.	The proposed Rule concerns the blowing of train horns at all grade crossings first and foremost in accordance with the public law as passed by Congress. A variety of alternative measures are available in the Quiet Zone provisions of the Proposed Rule.	MA IL	Hamilton (2) Oak Brook
Rule Provisions	When a crossing already has flashers and gates, there is no need for horns to be sounded.	In the Swift Act, Congress specifically noted that conventional gate and flashing light installations are not to be considered an adequate supplementary safety measure to compensate for the absence of train horns.	IL KY	Evanston Anchorage
Rule Provisions	Flexible median delineator tubes and articulated railroad crossing gates are encouraged.	A variety of alternative measures are available in the Quiet zone provisions of the Proposed Rule.	MA	Andover
Rule Provisions	Where there are gates at crossings, there is less of a need for train horns.	In the Swift Act, Congress specifically noted that conventional gate and flashing light installations are not to be considered an adequate supplementary safety measure to compensate for the absence of train horns.	KY	Anchorage
Rule Provisions	The issue is not whether or not to implement a Rule on train horns, it is how to craft the Rule Provisions (alternative safety measures) to the rule requiring train horns.	A variety of alternative measures are available in the Quiet zone provisions of the Proposed Rule. The proposed Rule has clear provisions allowing localities, if they so desire, to adopt a Quiet Zone to mitigate the effects of the train horns.	Org.	Washington
Rule Provisions	In exempting a crossing from the Rule, FRA should consider the life and safety of the Locomotive Engineer as well as the public.	Noted.	Org.	Cleveland
Rule Provisions	A third alternative, besides the No Action and Full Implementation Alternatives, should be considered. This should include the implementation of supplementary safety measures such as public education and enforcement programs, grade crossing closings, grade separation, installation of physical restraints, and others as FRA indicates.	The proposed Rule has provisions for these safety devices as part of a Quiet Zone application.	Org.	Des Plaines

Issue	Comment Description	Response	State	City
Rule Provisions	Prior to implementing any new rules on horn blowing, metropolitan areas should be required to research the collision history of the area, and to present a plan detailing the most practical methods of decreasing collisions at grade crossings.	The proposed Rule specifies Supplementary Safety Measures that have a known effectiveness and establishes a procedure for assessing the local conditions.	Org.	Westchester
Rule Provisions	An optimum safety measure package, as defined by the Massachusetts Bay Transit Authority, is provided by the use of flashing lights, bells, and automatic gates covering at least half the road.	In the Swift Act, Congress specifically noted that conventional gate and flashing light installations are not to be considered an adequate supplementary safety measure to compensate for the absence of train horns. Accordingly, the MBTA is exploring the use of 4-quadrant gates.	MA	Acton
Rule Provisions	Every town has different crossing situations; a "blanket" Rule would be insufficient and devastating to communities.	The Quiet Zone provisions of the Rule offer many alternative means of achieving equivalent incident avoidance.	NJ NJ	Denville Mt Tabor
Rule Provisions	Closing grade crossings and building grade separation are measures which will help reduce horn conflicts.	Building a grade separation will be a local/state decision based upon collision history, physical and geometric constraints and financial considerations. A grade separation would close the crossing and could be part of a Quiet Zone designation.	IA	Nevada
Rule Provisions	A train horn at 100 feet is estimated to equal 110 decibels; for this reason, alternatives to train horns is a necessary part of any forthcoming Rule.	A variety of alternative measures are available in the Quiet zone provisions of the Proposed Rule.	NJ	Cinnaminson
Rule Provisions	A reduction in train speed may be able to replace the sounding of a horn at some crossings, since slower trains can stop quicker.	Trains can't stop quickly regardless of the train speed. It should be noted that slower trains block crossings for longer periods of time and would normally sound the horn beginning at the whistle post or board.	IL	Maple Park
Rule Provisions	It is important that the Rule be flexible enough to allow states to use the alternative safety measures to substitute for railroad horns.	A variety of alternative measures are available in the Quiet zone provisions of the Proposed Rule.	Org.	Denver
Rule Provisions	More research should be conducted about driver response to warning devices, improved devices, off-track train detection systems, train conspicuity (reflectorization), locomotive conspicuity (lights), and on horns.	A variety of alternative measures are available in the Quiet zone provisions of the Proposed Rule. FRA has adopted a new Rule on train conspicuity, issued in 1996, entitled Locomotive Visibility; Minimum Standards for Auxiliary Lights (FRA Docket No.. RSGC–22, Notice No. 10). Reflective material on the sides of railroad cars would not be effective as compensation for train horns but is being studied for other purposes.	Org.	Denver
Rule Provisions	Discretionary use of horn should not be an alternative protection measure under 49 USC 20153.	Noted.	Org.	
Rule Provisions	An automated horn system is a possible substitute for train horns; it is both beneficial to those living near tracks, and those living between ¼ mile and 3 miles from the crossing.	Automated directional horns have not yet been demonstrated to be effective substitutes for the train horn; however, this option may be considered further as the rule-making progresses.	KS	Parsons
Rule Provisions	Any horn blowing regulation should allow for exemptions where public safety can be protected by other means.	The Rule allows for Quiet Zones when public safety can be achieved by other means. FRA will seek data on the appropriateness of additional exceptions to the proposed Rule.	MA	Andover
Rule Provisions	Four quadrant gates with a center median divider is an adequate substitute for horns and could be applied in the rest of New Jersey.	The proposed Rule has provisions for the use of four quadrant gates in a Quiet Zone.	NJ	Denville
Rule Provisions	Four quadrant gates within an established quiet zone are a plausible alternative to train horns for all communities located close to busy grade crossings.	Such a warning device is described in the Quiet Zone portion in the proposed Rule. The proposed Rule has clear provisions allowing localities, if they so desire, to adopt a Quiet Zone to mitigate the effects of the train horns.	KY NJ ND	Anchorage Cinnaminson Fargo

Issue	Comment Description	Response	State	City
Rule Provisions	A “targeted” collision reduction program could be established by each state or subregion on the particular set of collision experience for that area.	The proposed Rule is in addition to targeted funding directed at crossings based on safety need and is mandated by law.	MA	Acton
Rule Provisions	The list of alternative safety measures should be expanded to include: enhanced public education, heightened enforcement of scoff-laws, surveillance cameras at grade crossings, additional safety measures such as better locomotive conspicuity with strobe lights and paint schemes, additional lighting, flexible median delineator tubes, articulated crossing gates, and sensors to warn trains of objects on the track.	Noted. A variety of alternative measures are available in the Quiet zone provisions of the Proposed Rule. FRA has adopted a new Rule on train conspicuity, issued in 1996, entitled Locomotive Visibility; Minimum Standards for Auxiliary Lights (FRA Docket No.. RSGC--22, Notice No. 10). Reflective material on the sides of railroad cars would not be effective as compensation for train horns but is being studied for other purposes.	MA Org.	Acton Denver

APPENDIX E

APPENDIX E

CURRENT WHISTLE BANS, BY COUNTY

COUNTY	STATE	PERSONS IMPACTED	PERSONS SEVERELY IMPACTED[1]
Cook County	IL	103,190	44,920
DuPage County	IL	33,110	13,380
Middlesex County	MA	24,810	8,510
Lake County	IL	23,280	9,130
St. Joseph County	IN	15,340	6,000
Hennepin County	MN	11,390	5,030
Milwaukee County	WI	10,050	4,150
Essex County	MA	9,670	3,180
Orange County	CA	8,190	4,230
Ramsey County	MN	7,510	3,470
Winona County	MN	5,900	2,340
Sacramento County	CA	5,600	3,020
Tippecanoe County	IN	5,530	2,370
McHenry County	IL	5,420	2,190
Los Angeles County	CA	5,340	2,650
St. Louis County	MO	4,880	2,020
St. Louis City	MO	4,820	2,010
Marion County	OR	4,070	2,050
Waukesha County	WI	3,870	1,740
Suffolk County	MA	3,820	1,300
Lake County	IN	3,580	1,480
Kane County	IL	2,990	1,140
Will County	IL	2,760	900
Umatilla County	OR	2,650	1,420
Jefferson Parish	LA	2,570	1,100
Albany County	NY	2,540	820
La Crosse County	WI	2,540	1,020
Suffolk City	VA	2,450	810
Fond du Lac County	WI	2,320	1,060
DeKalb County	IL	2,210	970
Brown County	WI	2,170	910
Harris County	TX	2,000	870
Winnebago County	WI	1,980	900
Clinton County	IN	1,950	800
Marathon County	WI	1,890	800
Chautauqua County	NY	1,880	700
King County	WA	1,860	1,020
Calcasieu Parish	LA	1,580	670
Roanoke City	VA	1,460	550

[1] The group of persons "severely impacted" is a subset of the group of persons "impacted".

Charlottesville City	VA	1,410	500
Douglas County	WI	1,370	620
Jefferson County	AR	1,160	510
Greenwood County	SC	1,140	390
Sangamon County	IL	1,110	440
Adams County	PA	1,100	380
Saratoga County	NY	1,080	370
Nueces County	TX	1,070	510
Crawford County	WI	990	430
Nash County	NC	940	310
Spokane County	WA	700	310
Schenectady County	NY	650	220
Champaign County	IL	620	210
Wood County	WI	600	270
St. Clair County	IL	580	230
Lee County	IL	560	220
Emporia City	VA	550	150
Chatham County	GA	530	180
Washington County	MD	510	180
Penobscot County	ME	510	160
Tazewell County	VA	510	200
Wayne County	WV	510	190
Racine County	WI	480	220
Monroe County	NY	460	140
Washington County	VA	450	160
Jefferson County	WI	440	150
Wise County	VA	390	150
Kleberg County	TX	370	150
Salem City	VA	370	130
Morgan County	IL	340	140
Iroquois County	IL	330	130
Jackson County	IA	310	130
Smyth County	VA	310	110
Deschutes County	OR	300	130
Norfolk City	VA	300	100
Staunton City	VA	260	80
Butler County	OH	250	70
Stephenson County	IL	220	80
Botetourt County	VA	220	70
Montgomery County	VA	200	70
McLean County	IL	180	70
Aroostook County	ME	180	50
Macon County	IL	160	60
Pulaski County	VA	160	60
Franklin County	VA	150	50
Bowie County	TX	140	60
Anoka County	MN	90	40
Northumberland County	PA	80	30
Kenosha County	WI	80	30

Miller County	AR	60	30
Osceola County	IA	40	20
Abbeville County	SC	40	20
James City County	VA	40	10
Williamsburg city	VA	40	10
Perry County	IL	30	10
Rice County	MN	30	10
Chelan County	WA	30	10
Winnebago County	IL	20	10
Dakota County	MN	20	10
Greensville County	VA	20	-
Buffalo County	WI	20	10
Volusia County	FL	10	-
Muscogee County	GA	10	10
Marion County	IL	10	-
York County	PA	10	-
TOTAL		**365,020**	**151,430**

APPENDIX F

APPENDIX F

CURRENT WHISTLE BANS, BY CITY

CITY	COUNTY	STATE	PERSONS IMPACTED	PERSONS SEVERELY IMPACTED[1]
Chicago	Cook County	IL	76,890	33,850
Minneapolis	Hennepin County	MN	10,720	4,740
York	DuPage County	IL	8,730	3,660
Anaheim-Santa Ana	Orange County	CA	8,190	4,230
Portage	St. Joseph County	IN	8,000	3,260
Penn	St. Joseph County	IN	7,340	2,740
St._Paul	Ramsey County	MN	7,280	3,380
Milton	DuPage County	IL	7,130	2,910
Downers_Grove	DuPage County	IL	6,730	2,670
Deerfield	Lake County	IL	6,560	2,570
West_Allis	Milwaukee County	WI	6,340	2,740
Winona	Winona County	MN	5,730	2,260
Sacramento	Sacramento County	CA	5,600	3,020
Shields	Lake County	IL	5,320	2,050
Fairfield	Tippecanoe County	IN	5,000	2,160
St._Louis	St. Louis City	MO	4,820	2,010
Beverly	Essex County	MA	4,570	1,510
Melrose	Middlesex County	MA	4,370	1,490
Worth	Cook County	IL	3,810	1,650
Salem	Marion County	OR	3,690	1,850
Waukesha	Waukesha County	WI	3,640	1,640
Addison	DuPage County	IL	3,490	1,320
North	Lake County	IN	3,260	1,360
Northfield	Cook County	IL	3,240	1,250
Lyons	Cook County	IL	3,230	1,410
Calumet	Cook County	IL	3,230	1,430
Lisle	DuPage County	IL	3,170	1,290
Waltham	Middlesex County	MA	3,150	1,090
Cambridge	Middlesex County	MA	3,020	1,040
Somerville	Middlesex County	MA	2,990	1,060
Proviso	Cook County	IL	2,680	1,170
Pendleton	Umatilla County	OR	2,650	1,420
Suffolk	Suffolk City	VA	2,450	810
Winfield	DuPage County	IL	2,430	970
Medford	Middlesex County	MA	2,420	840
Milwaukee	Milwaukee County	WI	2,410	940
Avon	Lake County	IL	2,380	930
Fond_du Lac	Fond du Lac County	WI	2,320	1,060

[1] The group of persons "severely impacted" is a subset of the group of persons "impacted".

CITY	COUNTY	STATE	PERSONS IMPACTED	PERSONS SEVERELY IMPACTED[1]
District 1	Jefferson Parish	LA	2,270	970
La_Crosse	La Crosse County	WI	2,260	910
De_Kalb	DeKalb County	IL	2,210	970
Concord	Middlesex County	MA	2,190	740
Boston	Suffolk County	MA	2,170	740
Green_Bay	Brown County	WI	2,120	890
Elgin	Kane County	IL	2,080	780
Wakefield	Middlesex County	MA	2,070	700
West_Deerfield	Lake County	IL	1,980	760
Lawrence	Essex County	MA	1,910	610
Palatine	Cook County	IL	1,900	800
Wausau	Marathon County	WI	1,890	800
Dunkirk	Chautauqua County	NY	1,870	700
Seattle	King County	WA	1,860	1,020
Neenah	Winnebago County	WI	1,850	870
East San Gabriel Valley	Los Angeles County	CA	1,820	920
Libertyville	Lake County	IL	1,810	720
Pasadena	Los Angeles County	CA	1,790	900
Newton	Middlesex County	MA	1,790	610
Center	Clinton County	IN	1,750	710
Cohoes	Albany County	NY	1,740	550
Leyden	Cook County	IL	1,670	700
Chelsea	Suffolk County	MA	1,650	560
Lake Charles	Calcasieu Parish	LA	1,580	670
Maine	Cook County	IL	1,570	600
Algonquin	McHenry County	IL	1,540	620
Dorr	McHenry County	IL	1,540	640
Bonhomme	St. Louis County	MO	1,510	610
Baytown	Harris County	TX	1,480	640
Roanoke	Roanoke City	VA	1,460	550
Gravois	St. Louis County	MO	1,450	610
Charlottesville	Charlottesville City	VA	1,410	500
Thornton	Cook County	IL	1,380	650
Superior	Douglas County	WI	1,350	610
Niles	Cook County	IL	1,330	500
Nunda	McHenry County	IL	1,320	510
New_Lenox	Will County	IL	1,270	440
Jefferson	St. Louis County	MO	1,230	530
Wauwatosa	Milwaukee County	WI	1,170	430
Pine Bluff	Jefferson County	AR	1,160	510
Greenwood	Greenwood County	SC	1,140	390
Gloucester	Essex County	MA	1,130	400
Gettysburg	Adams County	PA	1,090	380
Mechanicville	Saratoga County	NY	1,080	370
Corpus Christi	Nueces County	TX	1,070	510
Los Angeles	Los Angeles County	CA	1,030	510

CITY	COUNTY	STATE	PERSONS IMPACTED	PERSONS SEVERELY IMPACTED[1]
Vernon	Lake County	IL	1,010	400
Capital	Sangamon County	IL	1,000	400
Prairie_du Chien	Crawford County	WI	990	430
Belmont	Middlesex County	MA	960	330
Elk_Grove	Cook County	IL	950	400
Rocky Mount	Nash County	NC	920	300
Wheeling	Cook County	IL	880	350
Frankfort	Will County	IL	800	270
Watervliet	Albany County	NY	800	260
Naperville	DuPage County	IL	790	320
Waukegan	Lake County	IL	730	310
Grant	Lake County	IL	710	280
Spokane	Spokane County	WA	700	310
Chemung	McHenry County	IL	690	300
Schenectady	Schenectady County	NY	650	220
Bloomingdale	DuPage County	IL	650	240
Champaign_City	Champaign County	IL	610	210
Cuba	Lake County	IL	600	250
Marshfield	Wood County	WI	600	270
Belleville	St. Clair County	IL	580	230
Antioch	Lake County	IL	570	230
Ashton	Lee County	IL	560	220
Plymouth	Hennepin County	MN	560	240
Ipswich	Essex County	MA	550	180
Zion	Lake County	IL	550	220
Emporia	Emporia city	VA	550	150
St._Charles	Kane County	IL	530	210
Wea	Tippecanoe County	IN	530	210
Savannah	Chatham County	GA	530	180
Ceredo	Wayne County	WV	510	190
Eastern	Tazewell County	VA	510	200
Hagerstown	Washington County	MD	510	180
Millinocket	Penobscot County	ME	510	160
Swampscott	Essex County	MA	510	160
Inglewood	Los Angeles County	CA	500	250
Burlington	Racine County	WI	470	220
Hudson	Middlesex County	MA	460	160
Weston	Middlesex County	MA	460	160
Madison	Washington County	VA	450	160
Richmond	Wise County	VA	390	150
Northeast Harris	Harris County	TX	380	160
Kingsville	Kleberg County	TX	370	150
Salem	Salem City	VA	370	130
Silverton	Marion County	OR	360	190
Jacksonville	Morgan County	IL	340	140
Manchester	Essex County	MA	340	110

CITY	COUNTY	STATE	PERSONS IMPACTED	PERSONS SEVERELY IMPACTED[1]
North Andover	Essex County	MA	330	100
Belmont	Iroquois County	IL	330	130
Watertown	Jefferson County	WI	320	110
Hobart	Lake County	IN	320	130
Bellevue	Jackson County	IA	310	130
Rochester	Monroe County	NY	310	90
Bend	Deschutes County	OR	300	130
District 4	Jefferson Parish	LA	300	130
Norfolk	Norfolk City	VA	300	100
Onalaska	La Crosse County	WI	280	110
McHenry	McHenry County	IL	280	110
Lake_Villa	Lake County	IL	270	110
Lexington	Middlesex County	MA	270	80
Lockport	Will County	IL	260	60
Staunton	Staunton City	VA	260	80
Warren	Lake County	IL	260	100
Joliet	Will County	IL	260	60
Geneva	Kane County	IL	260	110
Concord	St. Louis County	MO	250	100
Park	Smyth County	VA	240	90
Hanover	Cook County	IL	240	90
Normandy	St. Louis County	MO	230	90
Middletown	Butler County	OH	230	70
Fremont	Lake County	IL	230	90
Ela	Lake County	IL	230	90
Buchanan	Botetourt County	VA	220	70
West_Point	Stephenson County	IL	220	80
Lemay	St. Louis County	MO	210	80
Reading	Middlesex County	MA	200	70
Shawsville	Montgomery County	VA	200	70
River_Forest	Cook County	IL	200	70
Ross	Clinton County	IN	200	80
Hamilton	Essex County	MA	200	70
Pewaukee	Waukesha County	WI	180	80
Chelmsford	Middlesex County	MA	160	50
Decatur	Macon County	IL	160	60
Gates	Monroe County	NY	150	50
Manhattan	Will County	IL	150	60
Rocky Mount	Franklin County	VA	150	50
Houston	Harris County	TX	140	60
Texarkana	Bowie County	TX	140	60
Maplewood	Ramsey County	MN	140	50
Oshkosh	Winnebago County	WI	130	30
Brown_Deer	Milwaukee County	WI	130	50
Aurora	Kane County	IL	120	50
Robinson	Pulaski County	VA	120	40

CITY	COUNTY	STATE	PERSONS IMPACTED	PERSONS SEVERELY IMPACTED[1]
Lincoln	Middlesex County	MA	120	40
Upper San Gabrie	Los Angeles County	CA	120	30
Springfield	Sangamon County	IL	120	30
Bloomington_City	McLean County	IL	120	50
Palmyra	Jefferson County	WI	120	40
Goodview	Winona County	MN	110	50
Acton	Middlesex County	MA	100	30
Columbia_Heights	Anoka County	MN	90	40
St._Anthony	Ramsey County	MN	90	40
Northfield	Lake County	IL	90	30
Presque Isle	Aroostook County	ME	90	20
Sunbury	Northumberland County	PA	80	30
South Antelope Valley	Los Angeles County	CA	80	40
Pleasant_Prairie	Kenosha County	WI	80	30
Westford	Middlesex County	MA	70	20
Caribou	Aroostook County	ME	70	20
Wenham	Essex County	MA	70	20
Stockton	Winona County	MN	60	30
Cropsey	McLean County	IL	60	20
Texarcana	Miller County	AR	60	30
Andover	Essex County	MA	60	20
Hartland	McHenry County	IL	50	20
Elm_Grove	Waukesha County	WI	50	20
Brooklyn_Center	Hennepin County	MN	50	20
Allouez	Brown County	WI	50	20
Abbeville	Abbeville County	SC	40	20
Atkins	Smyth County	VA	40	20
Williamsburg	Williamsburg city	VA	40	10
Ocheyedan	Osceola County	IA	40	20
Draper	Pulaski County	VA	40	10
Roberts	James City County	VA	40	10
Chilhowie	Smyth County	VA	30	10
Du_Quoin No. 9	Perry County	IL	30	10
Van Buren	Aroostook County	ME	30	10
Wenatchee	Chelan County	WA	30	10
Everett	Middlesex County	MA	30	10
Dundas	Rice County	MN	30	10
Jefferson	Marion County	OR	30	10
New_Hope	Hennepin County	MN	20	10
Liberty	Butler County	OH	20	10
Oak Level	Nash County	NC	20	10
South_St. Paul	Dakota County	MN	20	10
Rockford	Winnebago County	IL	20	10
Fountain_City	Buffalo County	WI	20	10
Nottoway	Greensville County	VA	20	-
Columbus	Muscogee County	GA	10	10

CITY	COUNTY	STATE	PERSONS IMPACTED	PERSONS SEVERELY IMPACTED[1]
Medina	Hennepin County	MN	10	10
Caledonia	Racine County	WI	10	10
Rantoul	Champaign County	IL	10	10
Straban	Adams County	PA	10	-
Brule	Douglas County	WI	10	-
Bloomington	Hennepin County	MN	10	-
Washington	Clinton County	IN	10	-
Lonsdale	Rice County	MN	10	-
Monee	Will County	IL	10	-
Centralia	Marion County	IL	10	-
Greenfield	Hennepin County	MN	10	-
De Land	Volusia County	FL	10	-
Golden_Valley	Hennepin County	MN	10	-
Conewago	York County	PA	10	-
Independence	Hennepin County	MN	10	-
Sheridan	Chautauqua County	NY	10	-
Southeast Harris	Harris County	TX	10	-

APPENDIX G

Federal Railroad Administration

United States Department of Transportation

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Regulatory Topics

Environmental Impact Statements

Overview

The FRA begins the process of considering the environmental impacts of a proposed major action at the earliest practical time in the planning process for the proposed action preferably when technical and economic studies are being conducted. To the fullest extent possible, steps to comply with all environmental review laws and regulations are undertaken concurrently.

In the process of considering environmental impacts all reasonable alternatives to the proposed action are identified, including "no action," and mitigation measures not incorporated into the design of the proposed action are included. It is entirely proper that the number of alternatives being considered should decrease as the environmental consideration process proceeds and as analysis reveals that certain alternatives would in fact be unreasonable. The relevant environmental impacts of all alternatives are identified and discussed, including both beneficial and adverse impacts; impacts which are direct, indirect, and cumulative; and impacts of both long and short-term duration; and mitigation measures that would be included for each alternative. Consultation with appropriate Federal, State, and local authorities, and to the extent necessary, with the public, is initiated at the earliest practicable time.

The FRA encourages broad participation during scoping and review of draft environmental documents. In addition to publication in the Federal Register, FRA makes efforts to advertise and notify the public affected. For each action in question, FRA maintains a contact list of persons and organizations who have expressed an interest. FRA provides notices and documents as they are released to those persons and organizations as well as in response to individual queries. FRA also places available information on this web site where comments may also be submitted.

Locomotive Horns at Grade Crossings - Impact Assessment

Overview

Notice

Background

Considering Environmental Impacts

Federal Railroad Administration
United States Department of Transportation

Environmental Impact Assessment of the Proposed National Regulation for the Use of Locomotive Horns at Grade Crossings

Search Contact Us

Environmental Impact Statements

- Procedures for Considering Environmental Impacts
- Locomotive Horns Overview

Overview

The Swift Rail Development Act (Pub. L. 103-440, November 2, 1994) added Section 20153 to title 49, United States Code. That section directs the Secretary of Transportation (delegated to the Federal Railroad Administrator) to prescribe regulations requiring that a locomotive horn be sounded while each train is approaching and entering upon each public highway-rail grade crossing. In addition, 49 U.S.C. 20153 provides FRA the authority to except from this requirement, categories of rail operations or categories of grade crossings that: 1) are determined not to present significant risk with respect to loss of life or serious personal injury; 2) for which the use of a locomotive horn is impractical; or 3) for which supplementary safety measures fully compensate for the absence of the warning provided by the locomotive horn. FRA has concluded that the promulgation of the regulation required is a major Federal action under the National Environmental Policy Act. Therefor, the FRA is undertaking the environmental review to which this page is devoted.

Notice of Intent

The FRA has published a Notice of Intent in the Federal Register to advise the public that an environmental impact statement (EIS) will be prepared for the proposed regulation covering the sounding of locomotive horns at highway-rail grade crossings and to solicit input into the development of the scope of that EIS. All comments on the proposed scope of the environmental assessment are due by August 7, 1998, and may be submitted by mail or E-mail. The FRA encourages broad participation during scoping and review of draft environmental documents. While, due to the national impact of the proposed regulation the FRA is not planning to conduct public scoping meetings, the FRA is using other available means of communicating, including this web page. In preparing the final scope of the environmental documentation, FRA will consider all environmental comments.

Process

Comments received on the scope and methodology for the environmental review will be reviewed by FRA to develop the final scope. A summary of the comments received will be provided to agencies and members of the public expressing an interest in this environmental review. FRA and its consultants will then undertake preparation of a draft EIS which will be made available to the public for comment. This is presently scheduled for the late fall 1998.