

***Use of Locomotive Horns at  
Highway-Rail Grade Crossings***

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## Train Horns And Alternatives

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An Explanation of the Proposed Rule

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## Purpose

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To Ensure Understanding:

- What is contained in the Notice of Proposed Rulemaking (NPRM) and Draft Environmental Impact Statement (DEIS).
- How you can make comments on the NPRM and DEIS. Let us know if you:
  - Agree
  - Disagree
  - Do not understand

2

## Guidelines

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- I can explain what the NPRM says.
- I cannot discuss the merits.
- Your comments on the NPRM today are **NOT** made part of the record. Comments must be:
  - To written docket.
  - Oral testimony at a formal hearing.

3

## Highlights of Proposed Rule

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- Maximum sound level established.
- Directionality requirements.
- Limits time horn is sounded.
- Means to establish "Quiet Zones" (QZ).
- Train must sound horn approaching crossing unless in QZ.

4

## Outline

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- History
- Notice of Proposed Rulemaking (NPRM)
- Draft Environmental Impact Statement (DEIS)
- Regulatory Impact Analysis (RIA)
- How to make comments

5

## History

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Current FRA Regulations  
Florida East Coast Study  
Nationwide Study of Train Whistle Bans  
Swift Rail Development Act

6

## Current FRA Horn Regulations

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- Locomotive equipped with a audible warning device - 96 dB, 100 feet in front of locomotive
- No Federal rule requiring sounding at public crossings - State law, railroad rule or both
- Must use horn when:
  - Approaching malfunctioning automatic warning device
  - Approaching roadway workers

7

## Florida Study of Whistle Bans

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Florida East Coast Railroad (FEC)

- 7/1/84 - Florida communities can create night-time whistle bans at crossings equipped with flashing lights, gates and special signs.
- 511 crossings eventually had bans by 12/31/89.
- 195% increase in collision rate during ban hours.
- Emergency Order No. 15 - 7/26/91.
- Collision rate returned to pre-ban level.

8

## Nationwide Study of Train Whistle Bans

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April 1995

- AAR poll found 2,122 crossings with bans for some period of time between 1/88 and 7/94.
- Before/after case studies - 38% decrease.
- 84% higher collision rate than at similar crossings.
- Decrease in whistle ban crossings from over 2,100 to about 1,400.

9

## Swift Rail Development Act

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Public Law 103-440 - Nov. 1994

- Requires that train horns must be sounded approaching public highway-rail crossings *except* where:
  - No significant risk to persons
  - Not practical (certain backing movements)
  - Supplemental safety measures fully compensate for absence of audible warning

10

## Activity After Swift Act

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- Outreach to over 160 communities and other interested parties
- Informed, gathered information, reviewed corridors and worked with communities
- Chicago-area data gap
- 62% higher collision rate at gated crossings
- Swift Act amended in Oct. 1996 - flexibility and delayed effective date

11

## Notice of Proposed Rulemaking (NPRM)

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Key Elements

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## Requirement for Sounding Horn

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Public Law 103-440; U.S.C. Title 49 §20153

Locomotive horns shall be sounded while each train is approaching and entering each public highway-rail grade crossing.

13

## Maximum Horn Sound Level

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Request Comments On Three Options

- #1 - Maximum 104 dBA. Sufficient for crossings with signals but is less effective for passive crossings.
- #2 - Maximum 111 dBA. Effective for passive crossings.
- #3 - Variable Level Option - Limit horns to 104 dBA when approaching a crossing with signals and to 111 dBA when approaching a passive crossing.

14

## Directionality Requirement

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Sound level at 90 degrees and 100 feet from the center of the locomotive not exceed the level 100 feet in front of the locomotive

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## Application of Rule

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- Applies to all railroads, both freight and passenger, that operate on the general system of standard gauge railroads.
- Does not apply to:
  - ▶ Rapid transit systems that are not connected to the general railroad system.
  - ▶ Plant and freight railroads that are not part of the general railroad system.
  - ▶ Railroads with only private crossings.

16

## Horn Sounding Pattern

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Horn Shall Be Sound While Each Train Is Approaching and Entering Upon Each Public Highway-Rail Grade Crossing

- Standard signal sequence of two longs, one short, and a long.
- Starts at the whistle post.
- Continues until lead engine has cleared the crossing.

17

## Starting Locations For Horn Use

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Whistle Boards

- Whistle boards must be placed at a distance from the crossing equal to the distance traveled by a train in 20 seconds while operating at the maximum speed for any train on that track.
- Existing boards need not be adjusted if placed in accordance with existing State law until railroad changes maximum speed.
- Horns may not be sounded more than 1/4 mile in advance of a crossing regardless of speed.

18

## Starting Locations (cont'd)

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Other Methods Such As Positive Train Control

- Horns must be sounded not less than 20 seconds nor more than 24 seconds prior to the crossing.
- Horns may not be sounded more than 1/4 mile in advance of a crossing regardless of speed.

19

## Operations Not Requiring Horn

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- Maximum authorized speed is 15 mph or less and properly equipped flagmen provide warning to motorists.
- Horns must be used if automatic warning devices have malfunctioned.

20

## Quiet Zones (QZ)

### Definition

- “A segment of track with one or more consecutive highway-rail grade crossings at which train horns not routinely sounded because acceptable alternative safety measures are in place.”
- At least ½ mile in length.
- Flashing lights and gates at all public crossings.
- Must have warning signs on each approach to every crossing advising train horns are not sounded.

21

## Purpose of Quiet Zones

### QZs Will:

- Ensure greatest impact in terms of noise reduction.
- Ease burden on locomotive crews.
- Maintain a comparable level of safety.
- Focus safety initiatives on specific areas.

22

## Creation of Quiet Zones

### Community Designation

- Every public crossing is treated with a Supplementary Safety Measure (SSM).
- May be at the sole discretion of the community.
- SSMs are listed in Appendix A.
- Must comply with state law.
- Affirmation to FRA every 5 years.

23

## Creation of Quiet Zones

### FRA Acceptance

- Flexible method using SSMs or Alternative Safety Measures (ASM) to maintain safety.
- Predicted collision risk is considered for the whole QZ. Not every crossing need be treated.
- Must demonstrate through data and analysis that treatments will compensate for the lack of horns.
- Must comply with state law.
- Affirmation to FRA every 3 years.

24

## Alternative Safety Measures

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- Appendix B
- Outcomes must be measurable
- Periodic verification of continuing effectiveness.

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## QZ Without SSM Or ASM

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When All Of The Following Are Met:

- Train speed does not exceed 15 mph
- Train travel between traffic lanes of a street or on a parallel course within 30 feet of the street.
- Signs are posted indicating no horns.
- Traffic controlled by STOP signs or traffic lights interconnected with crossing signals, unless tracks are actually on the surface of the street.
- Locomotive bell will ring while approaching and traveling through the crossing.

26

## Appendix A Treatments

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SSM

- Temporary closure of crossing during ban hours.
- Four-quadrant gates.
- Gates with medians or channelization devices.
- One way street with gates.
- Photo enforcement.

27

## Appendix B Treatments

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Appendix A Plus These ASMs

- Programmatic enforcement.
- Public education and awareness.
- Note: Enforcement and education efforts must include
  - Statistically valid baseline violation rate established.
  - Effort must be defined, established, and continued concurrent with continued monitoring.
  - Monitoring for 2 full quarters must show that the violation rate has been reduced to compensate for loss of horn.
  - Semi-annual sampling shows reduction being sustained.

28



## **Pre-Existing Bans**

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If A Ban Was In Place As Of October 9, 1996:

- May continue ban for a period of up to 3 years from the date the final rule is issued.
- If a QZ is not created in accordance with the rule within 2 years of the issuance of the final rule, public safety and law enforcement programs must be started.
- If these programs are not started, the grace period is reduced to 2 years and horns must then be sounded.

29

## **Draft Environmental Impact Statement**

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30

## **Why A DEIS?**

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- FRA determined proposed rule constitutes a "major federal action" under the National Environmental Policy Act (NEPA).
- A draft EIS has been prepared to generically evaluate the broad action contained in the proposed rule per NEPA §1502.4.

31

## **Purpose & Need For Rule**

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- Horns are an important element in crossing safety.
- Increased collision rates without horns.
- FRA must balance the need for an effective warning while minimizing the horn's intrusion.

32

## Alternatives Considered

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- Proposed Action Alternative - Horns sounded at almost all public crossings, maximum horn level, directionality, when and how to sound, and "QZs."
- No-Action Alternative - Preserve the *status quo*. Requires congressional action.

33

## Affected Environment

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- More than 159,000 public crossings.
- All locomotives on general railroad system.
- Overall, the crossings over which these locomotives operate and the surrounding areas is the affected environment.

34

## Environmental Consequences

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- Environmental resources potentially affected are noise exposure and safety of the human environment.
- Potential positive and negative impacts are principally related to safety and noise.
- Potential for direct negative impact at 1,978 crossings with whistle bans was analyzed.
- Potential positive impacts were analyzed using the same methodology.

35

## Effects On Safety

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- 521 potentially preventable collisions at about 2100 crossings over a 5 year period.
- 44 fatalities (all motorists) over a 5 year period.
- 229 Injuries (220 Motorist, 9 train crew over a 5 year period.
- On an annual basis 9 fatalities, 45 injuries, and 104 collisions.
- Potential for greater safety as more "QZs" begin.
- "No Action" would perpetuate higher crash rates.

36

## Effects On Noise

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### Assumptions Used In The Model

- No "QZs" are established.
- Actual train horn level measurements are used.
- Uniform population distribution in census block.
- Number of people affected would probably be less.

37

## People Impacted

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- 357,190 people either "impacted" (193,810) or "severely impacted" (163,380).
- "Impact" means noise is noticeable.
- "Severely Impact" means noise is highly annoying.

38

## Indirect And Cumulative Effects

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- Incremental impacts of the proposed rule over the foreseeable future.
- Maximum horn level, directionality, time limits and pattern may have positive impact at 159,000 crossings.
- A possible 5,834,000 people could benefit from these provisions.
- Example - A maximum sound limit with directionality provisions could relieve about 3 million persons of horn noise exposure.

39

## Other Considerations

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- Environmental Justice - Impact to minority and low income communities are disclosed and their proportionality assessed.
- Health and Human Welfare
  - Typical train horn noise exposure would not likely cause hearing loss.
  - Not clear from data that noise exposure alone places persons at higher risk of psychiatric or other health problems.
- Economic Impacts and Benefits - Value of lives saved exceed costs on society.
  - No apparent long term impact on housing market.

40

## **Regulatory Impact Analysis**

41

## **Risk Analysis**

### Potential Benefits

- 521 potentially preventable collisions at about 2100 crossings over a 5 year period.
- 44 fatalities (all motorists) over a 5 year period.
- 229 Injuries (220 Motorist, 9 train crew over a 5 year period.
- On an annual basis 9 fatalities, 45 injuries, and 104 collisions.

42

## **RIA Does Not Take Credit For:**

- Pedestrians, Bicyclists.
- Incidents where car struck train at behind the first five cars.
- Driver not in vehicle.

43

## **Benefits**

- Prevention of accidents and the resulting fatalities and injuries.
- Also for railroads in terms of reduced train delay, debris removal and repairs.
- Two benefit scenarios were estimated:
  - Accident rate remains constant over time.
  - Accident rate declines by about 4% per year.

44

### **Initial RIA is Cost Justified**

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A scenario where 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 (At 2,100 crossings total costs for all required improvements, including changes in direction of horn sound, and maintenance equal \$116,395,343)

45

### **Cost of whistle blowing**

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The costs of sounding a train horn where none has been previously sounded are difficult to measure. An attempt to quantify possible economic impacts on residential property values has been undertaken, residential land use is considered a more noise sensitive land use than either mixed or industrial purposes.

46

### **Conrail Study**

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- Evaluates homes that sold within 1 mile of a Conrail line over the period 1988 to 1996.
- Conrail represents a line where some communities had whistle bans, while others did not.

47

### **Conrail Study Found:**

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- Proximity to rail lines depresses property values.
- Proximity to rail crossings lowers property values.
- Conrail's action of ignoring the whistle ban generated temporary but not permanent housing price impacts.

48

## **How To Comment**

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## **NPRM In Writing**

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Written comments in triplicate sent to:

Docket Clerk, Office of Chief Counsel  
Federal Railroad Administration  
400 Seventh Street S.W., Room 8201  
Washington, DC 20590 [address will be changed]

FRA Docket and Notice Number:  
RSCG-7, Notice No. 2 [to be changed]

50

## **DEIS In Writing**

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Written comments in triplicate sent to:

Docket Clerk, Office of Chief Counsel (?????)  
Federal Railroad Administration  
400 Seventh Street S.W., Room 8201  
Washington, DC 20590

FRA Docket and Notice Number:  
?????????

51

## **NPRM And DEIS Orally**

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Public Hearings Will Be Held

- Washington, DC
- Boston, MA
- Chicago, IL
- Pendleton, OR
- Cleveland, OH
- Note: Written and oral comments carry equal weight in the rulemaking process.

52