FRA Quiet Zones:

Analysis of Existing Quiet Zones and Implementation Guidance

An American Association of Port Authorities (AAPA) Professional Port Manager (PPM) Program Capstone Paper

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Port of Grays Harbor

On Washington's Pacific Coast

Abstract

Railroads provide critical freight service to ports, connecting marine terminals to key business partners across the nation and world. Moving freight by rail provides for cost efficiency and lower impacts to the environment compared to other modes of transport, such as trucking. However, there are unique impacts to communities that arise from train activity, including the noise that train horns create at railroad crossings. In populated areas, this noise has the potential to impact people and create conflict between rail traffic and communities. To mitigate the effects of train horn noise, the Federal Railroad Administration (FRA) created Quiet Zones to provide for safe crossings that do not require train horns to sound. However, understanding Quiet Zones, including the feasibility of their applications and the process to implement them, can be difficult, especially for smaller communities with limited staff and resources. The ability for agencies, particularly ports or communities with ports, to implement Quiet Zones, allows for mitigation of train horn noise impacts, supporting growth of rail traffic serving ports and their customers. This paper proposes to be a resource to agencies interested in exploring the feasibility and implementation of Quiet Zones, with an emphasis on applications that provide value to ports and supply chains through the movement of cargo.

Author Biography



Kris Koski, PE

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Kris Koski was appointed Director of Planning and Engineering at the Port of Grays Harbor in October, 2025 after serving as Port Engineer since 2021. Prior to that he served as City Engineer at the City of Aberdeen since 2016, where he developed and managed major infrastructure projects such as the North Shore Levee and the Aberdeen US12 Highway-Rail Separation Project. Prior to his time with the City, Kris worked as both a Design and Project Engineer for KPFF Consulting Engineers for 10 years. A graduate of the University of Washington, Kris holds a BS in Civil Engineering, as well as a Washington State Professional Engineering License with a Civil Endorsement.

In his current leadership role at the Port of Grays Harbor, Kris is responsible for planning, permitting, environmental, engineering, and construction activities at all of the Port's facilities. As the Director of Planning and Engineering, he oversees capital project development, budgeting, regulatory compliance, contract administration, dredging coordination, and stakeholder collaboration. He is the Project Manager for the Port's largest infrastructure project in its history, the Terminal 4 Expansion & Redevelopment Project.

Kris and his wife, Alexa Amarok, reside in Aberdeen, Washington, where they enjoy participating in community music and arts programs, and experiencing the rich culture, history, and natural environment of the Pacific Northwest.

Acknowledgements

I am grateful for those who have supported, encouraged, and even challenged me during my two and half years in the PPM program. Thank you to the team at AAPA, and especially Shannon McLeod and Julie Barelas, who ensured that my time in the program was rich and memorable. I appreciate the support of my Port of Grays Harbor family, including former CEO Gary Nelson for encouraging me to join the program, current CEO Leonard Barnes for working with me as I saw it through, and my Planning & Engineering Department team for the dedication and talent they bring to the job every day. Extra special thank you and appreciation for my wife, Alexa Amarok, for her patience and cool headedness when things got hectic.

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Glossary

AI	Artificial Intelligence
ASM	Alternative Safety Measures
At-grade crossing	Location where a roadway or path crosses a railroad at the same elevation
CSV	An electronic file that stores data in a table format
CFR	Code of Federal Regulations
CRISI	Consolidated Rail Infrastructure and Safety Improvements
Crossing	Location where a road or path crosses a railroad
DOT	Department of Transportation
EPA	Environmental Protection Agency
FRA	Federal Railroad Administration
HUD	Housing and Urban Development
LID	Local Improvement District
MUTCD	Manual on Uniform Traffic Control Devices
Quiet Zone	Designated segment of a rail line where train horns are not required
RCE	Railroad Crossing Elimination
Roll-on/roll-off	Type of cargo that moves onto and off vessels on wheels such as cars
SSM	Supplemental Safety Measure
Train Horn Rule	Requirements for locomotive engineers to sound train horns at crossings
USDOT	United States Department of Transportation



A Puget Sound & Pacific Railroad locomotive at the Port of Grays Harbor in Aberdeen, Washington, where rail provides critical freight service to customers. [Photo by Author]

Part 1 – Introduction

The topic of Quiet Zones has roots in railroads, at-grade crossings, vehicle traffic, pedestrian traffic, crossing safety measures, train horn rules, train horn noise, noise impacts to communities, and noise mitigation strategies–quite a complex and nebulous topic! This paper will break down these components into digestible parts, show how they are related, and ultimately leave the reader with a better understanding of what Quiet Zones are and how to implement them, with an emphasis on ports and port applications. The goal is to do this in a simple manner with ease of comprehension in mind, with references to more detailed information for those wishing to take a deeper dive.

Objective

This paper strives to be a valuable tool for any agency, but particularly smaller local agencies with limited staff and resources, wishing to understand Quiet Zones and their implementation. This objective will be met by comprehensively providing the following in a simple, easy to follow format:

1. Overview of the purpose of FRA Quiet Zones and the process of implementing them

2. Review of data about Quiet Zones from publicly available databases with identification of key insights and trends in the data

3. Guidelines and recommendations for how agencies can successfully plan for and implement Quiet Zones, including examples of agencies that have already done so

Intended Audience

This paper is intended for a range of readers from someone seeking a basic understanding of FRA Quiet Zones to local agencies interested in implementation of Quiet Zones with a focus on applications that provide value to ports and supply chains through the movement of cargo. For agencies interested in pursuing a Quiet Zone, there is a focus on nuances to the program.

Approach

This paper approaches the topic of Quiet Zones through nine stages to meet its objective, which in turn supports the ultimate goal of aiding agencies in understanding Quiet Zones and supporting their successful implementation:

1. Describe the role that railroads play in success at ports and in support of supply chains
2. Review railroad crossings and train horn rules
3. Explore the noise impacts of train horns on surrounding communities
4. Summarize the FRA Quiet Zone Program, including its goals and objectives
5. Analyze data for existing Quiet Zones
6. Show trends in the data
7. Break down the Quiet Zone process to support understanding from an agency perspective

8. Identify specific cases of implementation of Quiet Zones
9. Provide recommendations for successful implementation

Use of AI

The author utilized AI tools in the creation of this paper, including Google Gemini to locate and summarize source material and Microsoft Copilot to analyze and generate reports from large amounts of data from publicly available databases. All root sources are cited as necessary.

Engagement and Feedback

Readers are asked to fill out a brief, voluntary poll designed to assess the efficacy of the paper in increasing a reader's understanding of Quiet Zones, including whether reading the paper affected the reader's interest in pursuing a Quiet Zone. This data will also be used by the author to inform future areas of study and outreach. A link to the poll is provided here and the reader will be kindly reminded with another link at the end of the paper.

Poll: https://forms.gle/6i2PL2cMQGTXqfzFA

Part 2 – Background

The story of Quiet Zones begins with a foundational understanding of the movement of cargo and freight by railroads; railroad and roadway infrastructure; and railroad safety systems. Before diving into the details of Quiet Zones, the following background is important for overall context and understanding. As mentioned in the introduction, this paper includes a focus on the role of ports in rail traffic.

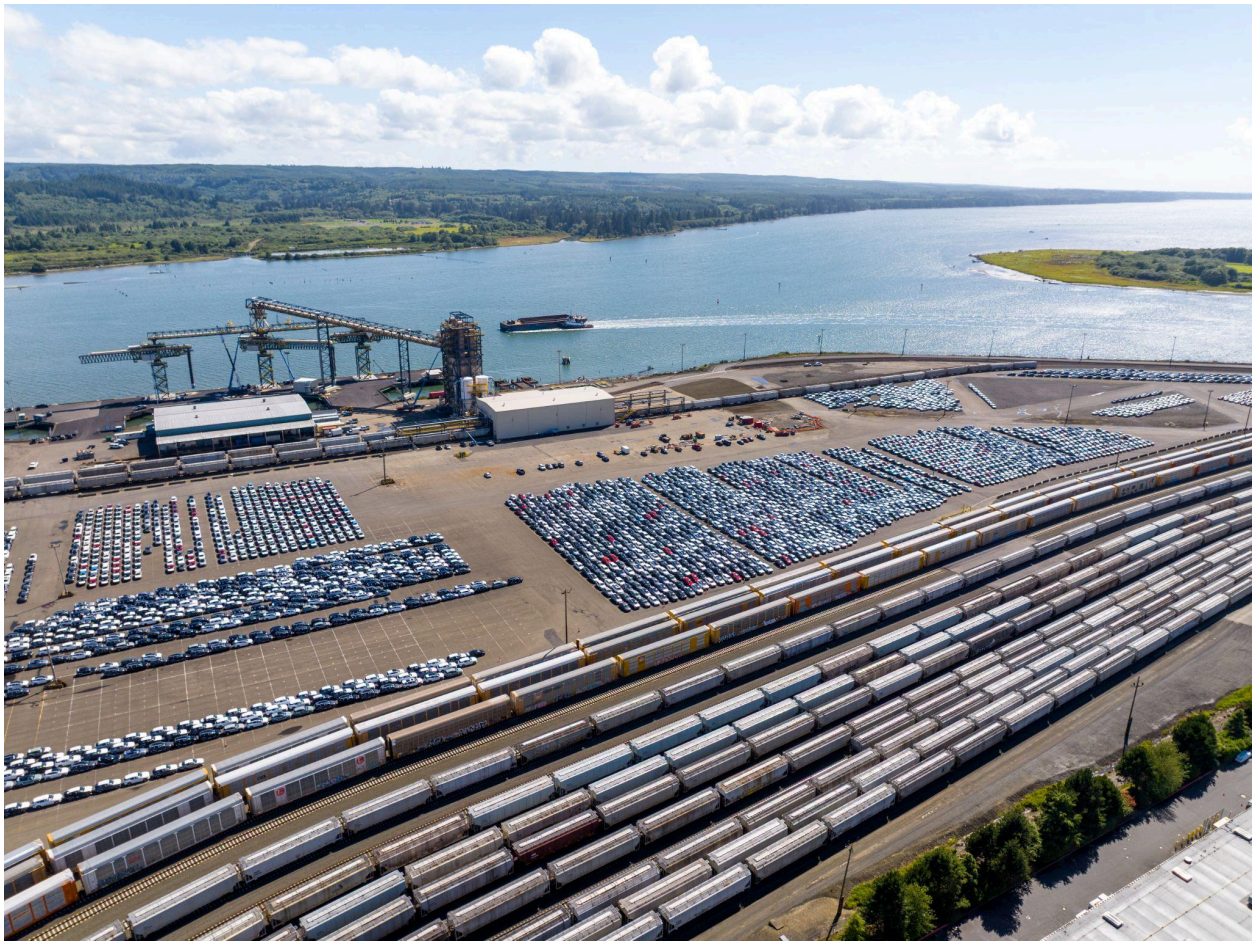
Railroads and Ports

Railroads serve ports by moving bulk goods, shipping containers, roll-on/roll-off cargo, and other cargos between marine terminals and inland markets via on-dock rail, near-dock intermodal facilities, and short-line switching networks. This transfer of freight bypasses highway congestion and links oceangoing vessels to transcontinental rail corridors. Major Class I railroads link coastal and inland harbors to major consumer and industrial markets, serving as the backbone for the economy and employment in the United States. In 2023, the top 150 U.S. ports handled 2.6 billion short tons of cargo [U.S. Department of Transportation, n.d.]. In a typical

year, freight railroads in the U.S. haul around 1.5 billion tons of raw materials and finished goods [Association of American Railroads, n.d.].

Example Cargo Handled

- Intermodal Containers: Single- and double-stack container trains move primarily manufactured goods rapidly between ports and destinations nationwide.
- Bulk and Breakbulk Commodities: Dedicated unit trains transport large volumes of uniform commodities like grain, coal, and minerals directly between port terminals and production sites or end consumers.
- Automobiles and Roll-On/Roll-Off Cargos: Autos and other vehicles and equipment move between docks and vessels via ramps with on-dock and near-dock rail for loading and unloading of rail cars.



Port of Grays Harbor Terminal 4 in Aberdeen, Washington showing bulk commodity and auto cargo facilities with near-dock rail systems.

Typical Port-Rail Integrations

- On-Dock Rail: Tracks run directly onto marine terminal docks, wharves, and piers, allowing cargo to be moved directly from rail to vessel via shipside cranes, dockside cranes, or as roll-on/roll-off cargo.
- Near-Dock Rail: Tracks run to marine terminal cargo yards and landside facilities where cargo is then conveyed between rail and vessel. Examples include bulk product transfer facilities that move bulk product between rail and vessel; roll-on/roll-off auto facilities where vehicles are moved between vessels and rail auto racks; and intermodal container transfer facilities that serve as centralized hubs where containers transferred via local drayage trucks are assembled into long-distance trains.
- Class I Access: Major rail networks such as Union Pacific, CSX, and BNSF connect ports to inland distribution nodes hundreds or thousands of miles away, either directly or through connecting shortline railroads.

At-Grade Crossings and Traffic

The freight rail network in the United States spans 140,000 route miles, connecting customers and users to ports throughout the country [U.S. Department of Transportation Federal Railroad Administration, February 24, 2025]. As of August 15, 2026, there are 386,017 at-grade crossings of railroads in the United States according to the publicly accessible United States Department of Transportation's Crossing Inventory Data database. (A deeper dive into this database can be found in the "Available Data on Quiet Zones" section of "Part 3 – FRA Quiet Zones" chapter of this paper.) These crossings range from small pedestrian crossings to major highway crossings, and include both public and private crossings. In 2020, an estimated 300 million vehicles passed over public crossings alone [Purdue University, July, 2020]. Nationally, more than 2,000 incidents and 200 fatalities at grade crossings occur each year, highlighting the importance of crossing safety [U.S. Department of Transportation Federal Railroad Administration, June 24, 2025].

The FRA ensures at-grade crossing safety through a shared federal, state, and local responsibility framework. Its program includes federal regulations, safety inspections, data collection, public education, and state-specific action plans. This is a very broad topic, and this paper focuses more specifically on crossing safety measures with respect to train horn rules and Quiet Zones.



Crossing signage and lights along the Puget Sound & Pacific Railroad at Division Street in Aberdeen, Washington. [Photo by Author]

Crossing Safety Measures and Train Horn Rules

Railroad crossings have safety measures regulated by the FRA, including signage, lights, and gates. In addition to these safety measures, and in the absence of an established Quiet Zone, locomotive engineers are required to sound the train's horn at all crossings. Railroads use train horns as a critical safety measure. These horns are activated prior to a train's arrival at a public

grade crossing and also in emergency situations, such as when a person, vehicle, or animal is on the tracks and at risk of being struck. While train horns can be disruptive to local communities, they play an essential role in ensuring safety for those who live and work along railroads. The FRA lays out the requirements for locomotive engineers to sound horns at rail crossings:

> Under the Train Horn Rule (49 CFR Part 222, effective August 17, 2006), locomotive engineers are required to sound train horns at least 15 seconds and no more than 20 seconds before reaching a public highway-rail grade crossing. For trains traveling over 60 mph, the horn must not be sounded more than one-quarter mile in advance of the nearest crossing, even if this results in an advance warning of less than 15 seconds. A "good faith" exception allows engineers to begin sounding the horn up to 25 seconds prior to arriving at a crossing when precise arrival times cannot be estimated. Train horns must follow a standardized pattern of two long blasts, one short blast, and one long blast. This pattern should be repeated or prolonged until the lead locomotive or cab car occupies the crossing. Although the rule does not specify the duration of long and short blasts, 49 CFR 229.129, Locomotive Horn, requires that train horns operate at a maximum volume of 110 decibels and a minimum volume of 96 decibels. [U.S. Department of Transportation Federal Railroad Administration, April 4, 2025]

Train Horn Noise and Impacts to Communities

Train horn noise has the potential to reduce quality of life in nearby neighborhoods by interrupting communication and thought, and also by causing distraction and sleep deprivation. While vital for safety at grade crossings, the resulting noise pollution can negatively impact the well-being of residents living near railroads.

High noise levels such as those coming from train horns can interfere with routine activities and diminish overall quality of life, particularly in residential areas. Residents are generally more likely to experience significant irritation or annoyance when noise disrupts activities such as sleeping, interpersonal or telephone conversations, work requiring concentration, watching television, or listening to the radio or music. Additionally, certain land uses, including outdoor concert venues, pavilions, and recreational sports facilities, are inherently sensitive to high noise levels and may be incompatible with excessive noise. The FRA

has documented and discussed train horn noise and impacts to humans based on work going back 50 years:

> Human annoyance to noise in the environment has been investigated and approximate exposure-response relationships have been quantified by the Environmental Protection Agency (EPA). The selection of noise descriptors by FRA 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 and discussed, and are regularly cited by many professionals in the acoustics field. The basic conclusions of these studies have been adopted by the Federal Interagency Committee on Noise, the Department of Housing and Urban Development (HUD), the American National Standards Institute, and in some cases by international organizations and entities. Conclusions from this seminal EPA work remain scientifically valid to this day. [U.S. Department of Transportation Federal Railroad Administration, February 14, 2020]

Transportation noise can be a major source of community dissatisfaction. Surveys show that higher noise levels lead to sharply higher annoyance: about 0% of people are highly annoyed at 45 Ldn, 10% at 60 Ldn, and roughly 70% at 85 Ldn, where Ldn is the Day-Night Sound Level measured in decibels [U.S. Department of Transportation Federal Railroad Administration, February 14, 2020]. This annoyance and impact can be due to the relative difference between existing background noise and train horns or due to the train horn alone being too loud regardless of the difference relative to background noise levels.

Part 3 – FRA Quiet Zone Program

Noise Mitigation Through FRA Quiet Zones

The FRA Train Horn Rule, established in 2005, requires locomotive horns to be routinely sounded when approaching public highway-rail grade crossings as an important safety measure. At the same time, the rule established a process allowing communities to designate certain segments of a rail line, consisting of one or more consecutive public crossings, as “Quiet Zones”

if specific safety requirements are met. In these designated areas, train horns are not routinely sounded.

Only a public authority—the entity responsible for traffic control or law enforcement at the public crossings, such as a city or county—may establish a Quiet Zone. Before doing so, the public authority must implement measures to address the increased safety risks associated with eliminating the routine use of train horns.

It is important to note that Quiet Zones do not prohibit the use of train horns in all circumstances. Horns may still be sounded in emergencies or when required by Federal regulations or railroad operating rules. For example, locomotive engineers may use the horn to warn animals, motorists, pedestrians, trespassers, railroad employees, or crews on other trains, as well as when necessary for other railroad operations. In addition, certain "no horn" restrictions that were established before the Train Horn Rule may qualify as "pre-rule quiet zones."

Railroad safety and noise reduction remain important concerns for both communities and the railroad industry. The FRA's Train Horn Rule balances these interests by maintaining routine horn use at public crossings as a critical safety precaution while providing communities with a structured process for establishing Quiet Zones when appropriate safety measures are in place. While the majority of rail crossings continue to not be within Quiet Zones, the number of Quiet Zones is increasing:

> Today there are 1,016 quiet zones across the nation according to James Payne of the Federal Railroad Administration, up from roughly 700 five years ago. These quiet zones cover over 5,500 grade crossings. [Cantwell, Betsy, April 10, 2025]

FRA Quiet Zone Process

The process to establish a quiet zone is described in Title 49, Subtitle B, Chapter II, Part 222, Subpart C, Section 222.39 of the Code of Federal Regulations (CFR). This title alone could be complicated enough to frighten some readers, so the following simplified explanation is provided. There are two main pathways to establishing a Quiet Zone. The first is by a public authority designating one, and the second is by a public authority submitting an application to the

FRA. The two pathways are summarized as follows for ease of learning. More detailed information is provided in the appendices and also in the CFR.

Method 1 – Public Authority Designation

Public authorities may designate a Quiet Zone without the need for formal application to, and approval by, FRA by complying with at least one of the following requirements:

1. Implementing, at every public highway-rail grade crossing within the Quiet Zone, one or more Supplementary Safety Measures (SSMs) as described in Appendix A to Part 222, which is included as Appendix B to the paper for ease of reference:
    a. Temporary Closure of a Public Highway-Rail Crossing–Close the crossing to highway traffic during designated quiet periods. (Partial Quiet Zones only.)
    b. Four-Quadrant Gate System–Install gates at a crossing sufficient to fully block highway traffic from entering the crossing when the gates are lowered, including at least one gate for each direction of traffic on each approach.
    c. Gates With Medians or Channelization Devices–Install medians or channelization devices on both highway approaches to a public highway-rail grade crossing denying to the highway user the option of circumventing the approach lane gates by switching into the opposing (oncoming) traffic lane and driving around the lowered gates to cross the tracks.
    d. One Way Street with Gate(s)--Gate(s) must be installed such that all approaching highway lanes to the public highway-rail grade crossing are completely blocked.
    e. Permanent Closure of a Public Highway-Rail Crossing–Permanently close the crossing to highway traffic.
2. Show that the Quiet Zone Risk Index is at, or below, the Nationwide Significant Risk Threshold, with or without implementation of new SSMs.
3. Implement SSMs which are sufficient to reduce the Quiet Zone Risk Index to a level at or below the Risk Index With Horns.

Method 2 – Public Authority Application to FRA

Public authorities may apply to the FRA Associate Administrator for approval of a Quiet Zone that does not meet the standards for public authority designation (Method 1). This method

requires assembling a comprehensive set of information and data for the proposed Quiet Zone including:

1. Grade Crossing Inventory Forms for each public, private, and pedestrian grade crossing
2. Detailed descriptions of existing safety measures at each public, private, and pedestrian crossing
3. Diagnostic team reviews of any crossing within the Quiet Zone
4. Statements by operating railroads; the state agency responsible for highway and road safety; and the state agency responsible for grade crossing safety
5. Detailed descriptions of proposed safety measures at each public, private, and pedestrian crossing
6. Commitment to implement the proposed safety measures
7. Data and analysis showing that proposed measures will reduce the Quiet Zone Risk Index to a level at, or below, either the Risk Index With Horns or the Nationwide Significant Risk Threshold

Method 2 includes a broader stakeholder feedback element. The application for FRA approval must also be sent to all operating railroads; the highway or traffic control or law enforcement authority having jurisdiction over vehicular traffic at grade crossings; any landowner having control over a private highway-rail crossing; the state agency responsible for highway and road safety; and the state agency responsible for grade crossing safety.

Next we will dive into review of data on Quiet Zones and case studies of successful implementations. For those wishing to learn more about the implementation process without further delay, now would be a good time to skip ahead to “Part 4 – Conclusions.”

Available Data on Quiet Zones

Understanding more about existing Quiet Zones is valuable for understanding their nature and lessons for implementation. The FRA maintains an inventory of all railroad crossings in the United States through the use of USDOT Form 71, officially known as Form FRA F 6180.71 or the U.S. DOT Crossing Inventory Form. This form is used by railroads and state and local governments to report, establish, and update data for highway-rail and pathway grade crossings. FRA uses this information to maintain a uniform national Crossing Inventory Data database for

safety management and accident analysis. The Crossing Inventory Data database is available online and has over 438,000 individual entries of Form 71 for crossings throughout the United States as of August 2026. Before moving on to analysis and trends, let's take a closer look at the information collection on Form 71 to better understand what the database has to offer.

Information Collected on Form 71

- Location & Classification: State, county, rail line name, milepost, and whether the crossing is public or private.
- Traffic Control Devices: Presence of crossbucks, stop signs, yield signs, signals, gates, and advance warning signs.
- Physical Characteristics: Number of traffic lanes, roadway surface type (e.g., concrete, timber, asphalt), angle of the crossing, and presence of illumination.
- Operational Data: Maximum timetable train speeds and volume estimates for train and highway traffic.

Core Uses of Form 71

- Reporting New Crossings: Submitting data when a new highway-rail or pedestrian grade crossing is constructed.
- Updating Existing Data: Recording physical or operational changes at a crossing, such as modified traffic control devices, changes in train speeds, or new surface materials.
- Closing Crossings: Notifying the federal database when a crossing is abandoned or permanently closed.
- Assigning Identification Numbers: Helping link specific physical characteristics to a unique U.S. DOT Grade Crossing Identification Number (crossing ID).

Relevance to Quiet Zone Research

Key data fields Form 71 and the Crossing Inventory Data database include "Whistleban Code," "Whistle Ban," "Whistle Date," and "Quiet Zone ID." (In this context, "whistle" simply means "horn.") These data fields indicate whether a crossing is within a Quiet Zone, the type of Quiet Zone, the date the Quiet Zone was established, and the FRA identification number of the Quiet Zone, which may include multiple individual crossings. The data can be filtered to single

out only crossings located within Quiet Zones, allowing for analysis of all other data fields within the Quiet Zone dataset to uncover trends and insights.

Analysis of Existing Quiet Zones and Trends

For the basis of this analysis, the entire Crossing Inventory Data database, including 438,747 records, was downloaded in a Microsoft Excel CSV file format [U.S. Department of Transportation, n.d.]. The data was then sorted and filtered to only include crossings within Quiet Zones. More specifically, only Quiet Zones marked as "24-hour" were analyzed, as this is the most typical type of Quiet Zone for agencies seeking to establish new Quiet Zones. (Other types include "partial" and "Chicago excused" which would only apply to very limited audiences. For this analysis, "Quiet Zone" will mean "24-hour" zones.) Review and analysis of the data revealed the following data sets pointing to the most interesting broad trends and characteristics of Quiet Zones.

1. **Number of 24-hr Quiet Zones and Crossings**

   This figure shows the number of unique Quiet Zone IDs for 24-hr zones and the number of individual crossings within all 24-hour zones. This provides insight into the number of 24-hr Quiet Zones and the number of 24-hr Quiet Zone crossings in the United States.

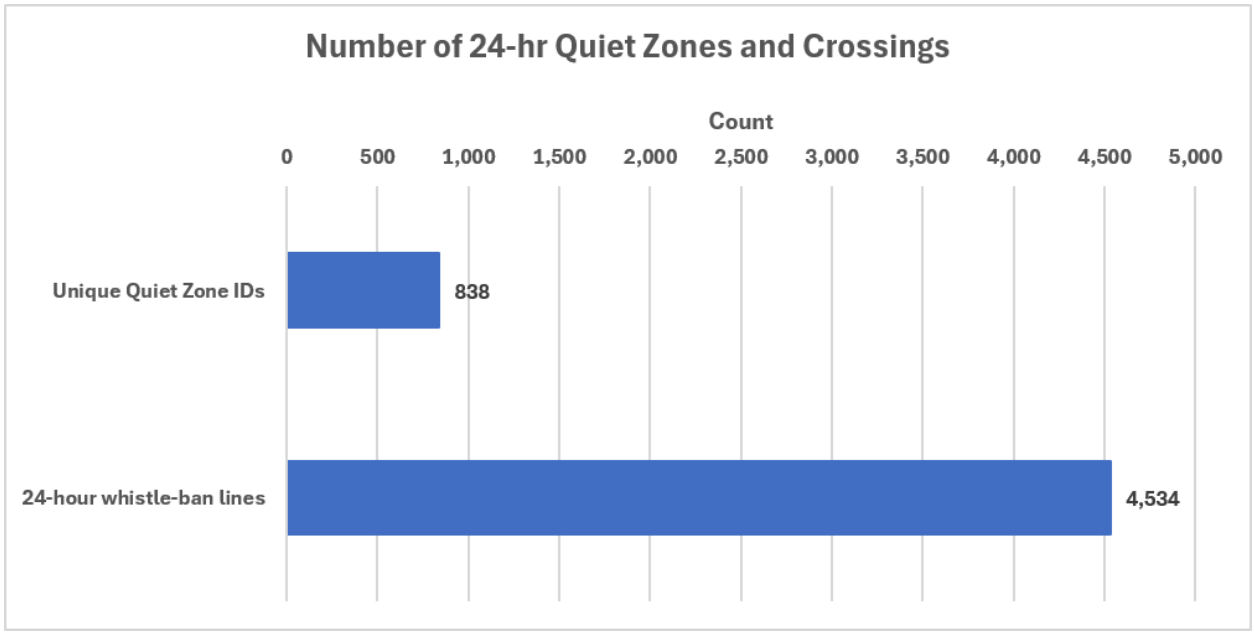


Figure 1: Number of 24-hr Quiet Zones and Crossings [Figure by Author]

2. Number of Crossings in 24-hr Quiet Zones

The first figure showed that there are far more individual crossings within 24-hr Quiet Zones than there are unique 24-hr Quiet Zone IDs. Therefore, many Quiet Zones contain multiple crossings. The next figure shows the number of crossings in each unique Quiet Zone. Quiet Zones containing 1-5 crossings are the most common, with the number of Quiet Zones with over 20 crossings dropping substantially. Quiet Zones with over 20 crossings are less common

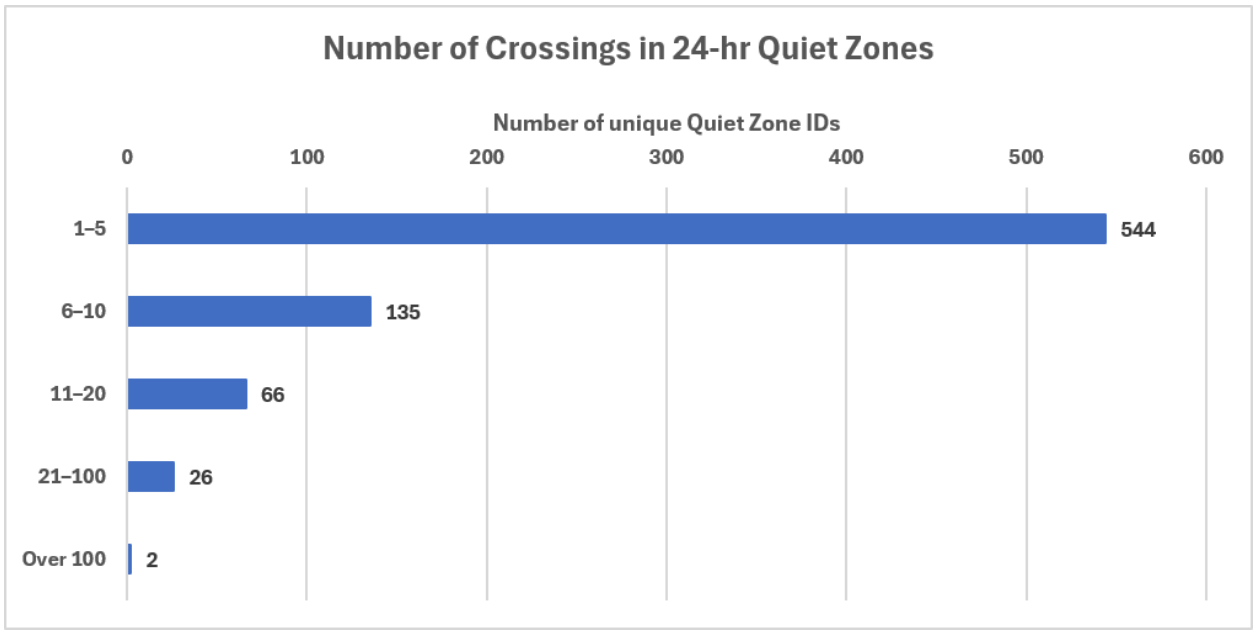


Figure 2: Number of Crossings in 24-hr Quiet Zones [Figure by Author]

3. Number of Quiet Zones by State

The data was sorted by number of unique 24-hr Quiet Zones per state, showing Texas as the strong leader in number of Quiet Zones, with Wisconsin, Illinois, Minnesota, and California showing fewer than Texas but more than many other states. Further analysis beyond the scope of the database and this paper would be required to better understand why these states stand out compared to others.

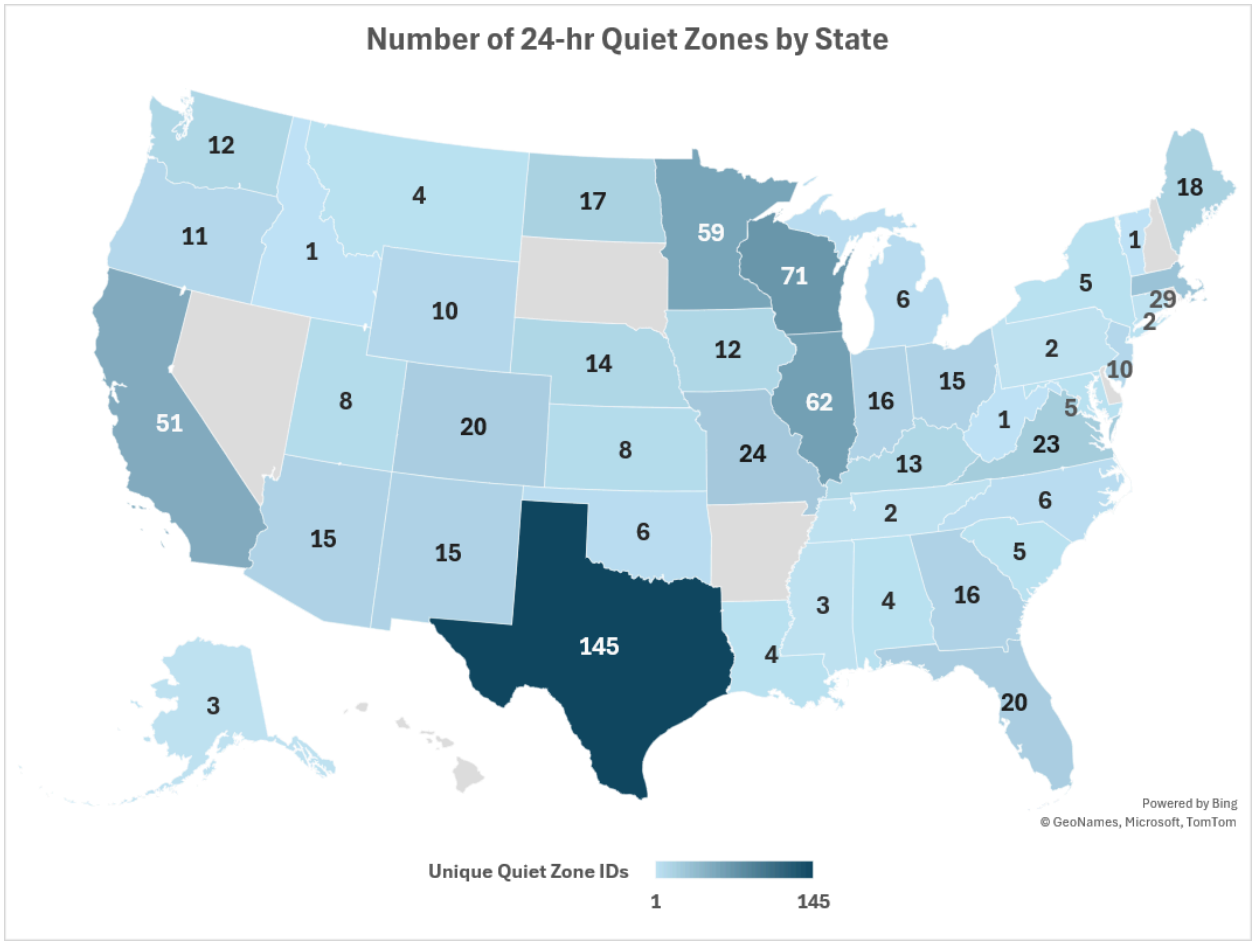


Figure 3: Number of 24-hr Quiet Zones by State [Figure by Author]

4. Number of Quiet Zone Crossings by State

When the data is sorted by number of individual 24-hr Quiet Zone crossings per state, the states standing out with a relatively high number of crossings include the Figure 3 states plus Missouri, Utah, Massachusetts, and Florida. As in the discussion of Figure 3, more analysis would be required to understand why these states stand out.

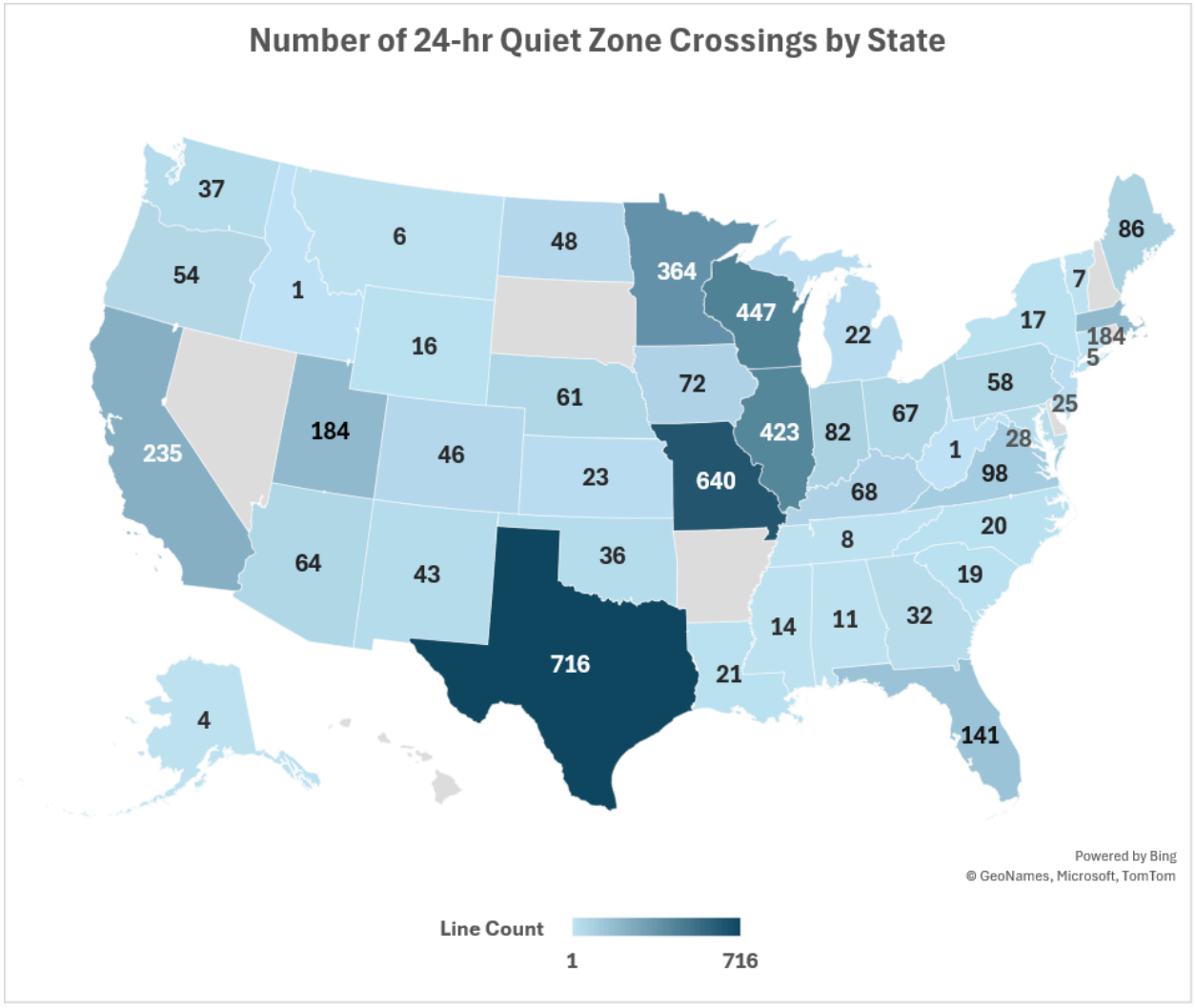


Figure 4: Number of 24-hr Quiet Zone Crossings by State [Figure by Author]

5. **Unique 24-hr Quiet Zone IDs by Year Established**

When the data is sorted by the year that each unique 24-hr Quiet Zone was established, the data shows a large number for 2005 when the Train Horn Rule was established, followed by a wave from 2006 to 2016, then a large drop in the number of new zones from 2017 onward. The data does not suggest a reason for the sharp drop off, but it could represent an initial wave of Quiet Zones for higher priority areas or agencies with better resources, followed by a decline as the focus moves to Quiet Zones that are more difficult to establish for technical or financial reasons.

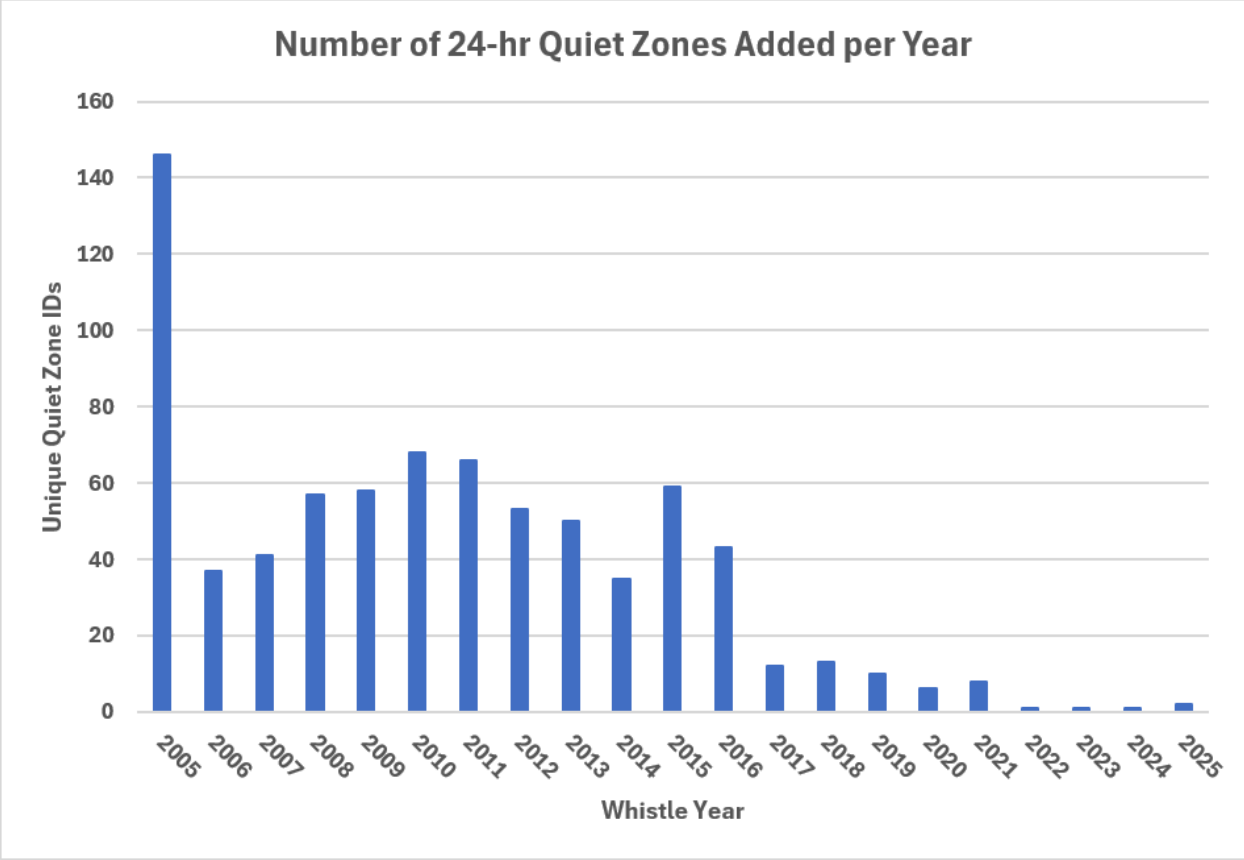


Figure 5: Number of 24-hr Quiet Zones Added per Year

6. **Quiet Zone Crossings by Crossing Type**

For 24-hr Quiet Zone crossings, the majority are public crossings, meaning a publicly accessible highway, street, or pedestrian crossings.

Crossing Type	Line Count	Share
Public	4,139	91.3%
Private	347	7.7%
Not Indicated	48	1.1%

Table 1: Number of 24-hr Quiet Zone Crossings by Crossing Type

7. **Quiet Zone Crossings by Functional Classification of Road at Crossing**

When the data is sorted by Roadway Functional Class, there is no clear trend, and roads with "Local" classification are the most common. This likely points to the impacts of train horn noise not being related to the size or amount of traffic on a roadway, rather where that roadway is located relative to residents in the community.

Roadway Functional Class	Line Count	Share
Local	1,674	36.9%
Major Collector	844	18.6%
Minor Arterial	799	17.6%
Not Listed	661	14.6%
Other Principal Arterial	371	8.2%
Minor Collector	88	1.9%
Interstate	85	1.9%
Other Freeways and Expressways	12	0.3%

Table 2: Number of 24-hr Quiet Zone Crossings by Roadway Functional Class

Next we will look at specific examples of successfully implemented Quiet Zones, with an emphasis on cities with ports in the Pacific Northwest.

Example Case Studies

Cities with ports in the Pacific Northwest that have successfully implemented Quiet Zones include Seattle, Bellingham, and Vancouver. In all three cases, the city was the public authority developing and implementing the Quiet Zones in conjunction with partners. The Cities of Aberdeen and Hoquiam in Grays Harbor County, Washington, are also considering the pursuit of Quiet Zones, and are included in the discussion.

City of Seattle

The Terminal 5 Quiet Zone was a safety and noise-mitigation project in West Seattle managed by the Seattle Department of Transportation alongside the Port of Seattle and The Northwest Seaport Alliance [Seattle Department of Transportation, n.d.]. The project eliminated the routine sounding of locomotive horns by upgrading warning devices, signals, and infrastructure to meet FRA safety standards. Key implementation details include:

- Location: The project was located at the south end of the Port of Seattle's Terminal 5 near the Duwamish Waterway and Elliot Bay. Terminal 5 is a major container terminal located near residential areas.
- Scope of Project: The project included closing some driveways near Terminal 5 so that trains wouldn't need to use their horns as often, building new traffic signals to improve traffic flow, and upgrading safety equipment at railroad crossings, including adding crossing gates and fencing.
- Crossing Closures: Railroad crossing safety improvements and a new traffic signal were installed at the Terminal 5 entrance off West Marginal Way SW. Additionally, three driveway crossings were closed and another entrance to Terminal 5 off West Marginal Way SW was closed.
- Active Components: The project included new crossing gates, driveway closures, specialized signalization, and updated signage.

- Multimodal Updates: Pedestrian and bicycle improvements were incorporated into the project for a multiple benefits approach. The project added new and improved pedestrian and bicycle connections, linking paths like the Alki Trail.
- Timeline: Construction began in April 2023 following design finalization, physical infrastructure wrapped up through 2024, and the formal Quiet Zone officially achieved FRA notice and completion in January 2025.

City of Bellingham

The City of Bellingham and Port of Bellingham are located along the Salish Sea in Washington south of the Canadian border [City of Bellingham, n.d.]. A BNSF mainline runs along the community's waterfront, separating the city from port areas. The City split its rail corridor into two segments to reduce train horn noise under FRA rules. There are 11 total at-grade crossings in the corridor – six in the Waterfront Quiet Zone area and five in the Fairhaven Quiet Zone area. Some of these crossings are on City of Bellingham property and others are on Port of Bellingham property. Key implementation details include:

- Fairhaven Quiet Zone (Active): Launched on March 10, 2025, the zone covers 1.25 miles of rail across five crossings. Upgrades completed include enhanced signs, flashing signals, automated crossing control gates, and pedestrian exit gates.
- Waterfront Quiet Zone (In Progress): This zone will span the central downtown and waterfront area covering six public crossings. Individual crossing improvements are underway or finished, but the full Quiet Zone requires all remaining crossings to meet federal standards before final FRA approval.

City of Vancouver

The City of Vancouver, Washington established two FRA Quiet Zones to stop the routine blowing of locomotive horns at public grade crossings. Vancouver is located along the Columbia River and is home to the Port of Vancouver. Its website lists a population of 205,100 residents and it is across the river from Portland, Oregon. Key implementation details include:

- East Vancouver Quiet Zone: Launched in October 2013 after years of advocacy by the East Vancouver Train Horn Noise Advisory Committee, this zone includes public crossings at SE 139th Avenue, SE 147th Avenue, and SE 164th Avenue, plus multiple private crossings.

- Chelsea Avenue Quiet Zone: This zone includes only one public crossing at Chelsea Avenue.
- Surrounding Environment: Both Quiet Zones are along the BNSF mainline running along the north side of the Columbia River. The area is marked by high-value residences due to waterfront and mountain views, plus proximity to Portland, Oregon.
- Funding Mechanism: The East Vancouver Quiet Zone was funded via a Local Improvement District (LID) where 467 nearby property owners paid for required crossing upgrades through a special property tax assessment [Rice, Stephanie, October 16, 2013].
- Required Upgrades: Safety features were added such as on-street medians, crossing gates, striping, and extra lighting to offset the lack of audible train horn warnings.

Cities of Aberdeen and Hoquiam

The Cities of Aberdeen and Hoquiam are located on Grays Harbor along Washington's Pacific Coast. The Port of Grays Harbor spans both cities with marine terminals located on the waterfront. The cities and Port are served by the Puget Sound & Pacific Railroad shortline with connections to Class I carriers BNSF and Union Pacific in Centralia, Washington. The City of Aberdeen is acting as lead agency in partnership with Hoquiam to utilize a $300,000 RCE grant to analyze a 1.25-mile corridor adjacent to the Port of Grays Harbor as a first step for a potential future railroad Quiet Zone. The corridor includes five crossings and the corridor study is anticipated to begin in the second half of 2026.



Port Industrial Road crossing of the Puget Sound & Pacific Railroad in Aberdeen, Washington, one of five crossings included in a corridor study by the City of Aberdeen. [Photo by Author]

Part 4 – Conclusions

Creating a Quiet Zone requires balancing safety, regulations, and community needs. By leveraging best practices, securing funding and maintaining open communication with stakeholders, communities can reduce noise pollution while upholding strong safety standards.

Implementation Guidance

While the creation of a Quiet Zone may be a daunting and expensive proposition, there are many potential benefits to quality of life while maintaining safe and reliable railroad crossings. For any public agency seeking a Quiet Zone, but especially smaller agencies with

limited staff time, a clear understanding of the effort required and the formation of a competent and effective team are critical. GoRail's February 14, 2025 webinar, "Creating Safe Quiet Zones," provides an excellent set of eight recommendations. These basic recommendations have been augmented with additional information and details based on this paper's research and findings and developed into implementation focus areas for anyone interested in establishing a Quiet Zone. Due to the complexity of the topic and the wide range in possible details depending on jurisdiction and crossing specifics, these are presented as overarching principles for any project.

Implementation Focus 1 – Obtain Professional Resources

Obtaining professional resources and expert guidance is critical for FRA Quiet Zones because establishing them requires navigating complex federal rules, designing precise engineered safety systems, mitigating high accident risks, and coordinating multi-year approvals.

Regulatory and Technical Compliance

- Federal Rules: Specialty consultants can navigate strict FRA standards requiring knowledge of rule-making steps and documentation.
- Safety Design: Professionals can ensure proper application of technical SSMs such as median barriers or four-quadrant gates for critical safety systems.
- Accident Mitigation: Experts can accurately evaluate and mitigate for increased collision and trespassing risks caused by silenced horns.

Project Execution and Funding

- Industry Credibility: Utilize experienced and qualified consultants to build trust and effective communication with railroad operators and federal officials.
- Securing Grants: Professionals can assist in locating and applying for competitive state and federal funding programs to reduce agency financial burdens.
- Ongoing Compliance: Experts help set up accurate periodic reporting and maintenance schedules required to maintain long-term Quiet Zone compliance.

Implementation Focus 2 – Take a Comprehensive Approach to Safety Improvements

To take a comprehensive approach to safety improvements in FRA Quiet Zones, a public authority must offset the loss of the train horn by combining pre-approved engineering solutions, risk calculations, diagnostic reviews, and stakeholder coordination to meet federal safety thresholds.

Diagnostic Reviews and Risk Assessment

- Diagnostic Team Review: Consult with an on-site diagnostic team consisting of representatives from the public authority, the operating railroad, state safety agencies, and FRA grade crossing managers.
- Risk Index Calculation: Use FRA risk calculators to evaluate the Quiet Zone Risk Index against federal risk thresholds to ensure the corridor remains as safe as if horns were sounding.

Engineering and Supplemental Safety Measures

- Crossing Closures: Permanently or temporarily close high-risk or redundant at-grade crossings. This is a critical first step to avoid costly planning and implementation of SSMs at a crossing that isn't needed in the first place.
- Physical Channelization: Install non-mountable raised median curbs or traffic separators on roadway approaches to deter people from driving around lowered gates.
- Advanced Gate Systems: Implement four-quadrant gate systems or convert multi-lane streets into one-way configurations with full gate coverage where applicable.
- Wayside Horns: Use fixed, directional wayside horns at the crossing as an alternative method to direct warning sounds specifically at oncoming roadway traffic instead of using locomotive horns. (This may be more difficult for smaller railroads and shortlines.)
- Active Infrastructure Improvements: Consider upgrading standard active warning systems to include constant warning time devices, clear power-out indicators, and updated MUTCD advance warning signage.

Regulatory and Community Coordination

- Notice of Intent: File official notices to operating railroads and relevant state DOT and safety agencies to open required comment windows.
- Public Education: Inform local residents and motorists about rules where locomotive engineers must still sound horns, such as during active track emergencies or roadway maintenance.
- Funding Strategy: Pursue federal and state funding programs (such as RCE or CRISI grants) to manage infrastructure investment burdens.

Implementation Focus 3 – Evaluate Opportunities for Crossing Eliminations

Evaluating opportunities for railroad crossing eliminations (closures or grade separations) within FRA Quiet Zones involves analyzing safety risk indices, assessing traffic and community impacts via diagnostic teams, and aligning project's scope with federal grant criteria. Permanent closure serves as the primary and most cost-effective SSM to offset the loss of train horns.

Risk and Safety Evaluation

- Quiet Zone Risk Index: Use the FRA Quiet Zone Calculator to compare corridor risk scores against pre-horn ban risk thresholds.
- Diagnostic Team Reviews: Conduct on-site evaluations alongside state rail authorities and railroads to inspect individual crossings, recommend closures or physical modifications, and update the Grade Crossing Inventory System (GCIS).
- Accident Prediction & Traffic Data: Evaluate train volume, vehicle counts, and speed to measure relative collision probabilities and determine if a physical closure or grade separation provides the necessary risk reduction.

Community and Operational Impact Analysis

- Traffic Circulation: Perform an engineering review to assess how closing a specific crossing impacts local detour lengths, grid connectivity, and neighborhood traffic patterns.

- Emergency Response: Check access speed and reliability for fire, police, and medical services to ensure a closure does not unacceptably delay emergency response times.
- Blocked Crossings: Obtain data regarding frequent train blockages to help prioritize which specific intersections benefit most from total elimination versus active warning upgrades.

Funding and Lifecycle Cost Considerations

- Grant Programs: Target federal support via the RCE Program, which will fund up to 80% of eligible project costs.
- Lifecycle Costs: Consider the long-term costs and savings of crossing removal, including lifecycle maintenance and replacement savings.

Implementation Focus 4 – Understand the Financial Responsibilities for Safety Upgrades

Federal statute and FRA regulations do not provide direct federal funding to establish Quiet Zones. Funding and financial obligations rest primarily with local public authorities and taxpayers rather than the operating railroad companies.

Local Public Authority and Taxpayer Responsibilities

- Installation and Engineering: Public authorities must pay for preliminary engineering, diagnostic reviews, and construction of any required SSMs and ASMs.
- Reimbursement Agreements: Localities must execute preliminary engineering and construction/maintenance agreements with the railroad to reimburse for costs incurred by the railroad.
- Maintenance and Replacement: Local governments carry the ongoing financial responsibility to maintain, inspect, and replace SSMs and ASMs such as active warning devices, medians, and wayside horn systems.
- Funding Mechanisms: Local governments often fund these projects through general municipal funds, LIDs, or other tax assessments on direct beneficiaries.

External Funding and Assistance

- Federal and State Grants: Communities can pursue external financial help via competitive federal programs such as the RCE program or the CRISI program, along with state transportation department programs that vary by state.
- Railroad Contribution Limitations: Railroads generally have no obligation to contribute financially to Quiet Zone enhancements but may elect to do so if a project aligns with a high-priority crossing closure or independent safety mandate of their own.

Implementation Focus 5 – Prepare a Comprehensive Plan Before the Diagnostic Meeting

Preparing a comprehensive plan or concept layout before a FRA Quiet Zone diagnostic meeting ensures that stakeholders—including the public authority, railroads, state safety agencies, and FRA personnel—can efficiently evaluate site-specific risks, align on required SSMs, and prevent costly project delays.

Why Advance Planning Matters

- Efficient Field Reviews: A well-defined baseline plan lets the diagnostic team immediately dive into specifics such as engineering treatments, traffic volumes, and speeds rather than wasting time on basic tasks such as establishing geographic layouts.
- Accurate Risk Calculations: Pre-identifying data like USDOT crossing inventory numbers, train speeds, and highway traffic volumes feeds directly into the FRA Quiet Zone Calculator to test risk index thresholds ahead of time.
- Stakeholder Consensus: Share concept layouts during pre-diagnostic calls to give railroads and state authorities time to review constraints, narrow in on applicable SSMs and ASMs, and have the group in better alignment during the site visit.
- Cost and Resource Management: Mapping out project footprint early exposes potential utility conflicts and geometric limitations, helping municipalities budget accurately and avoid unexpected redesign expenses later on in the process.

Implementation Focus 6 – Understand the Railroad Lead Times for Crossing Upgrades

Understanding railroad lead times for crossing upgrades is vital because infrastructure and signal circuitry changes must be physically completed and operational before train horns can legally fall silent. Misjudging the timelines to bring upgrades online can cause budget overruns, unmet public expectations, and delayed projects.

Budgeting and Cost Control

- Escalating Expenses: Construction estimates change over long schedules. Account for long lead time tasks and price escalation over time in cost estimates.
- Grant Management: Federal grants like CRISI or RCE grants have performance schedules and deadlines. Assuming unrealistically short lead times and durations in schedules can compromise critical grant funding.

Managing Community Expectations

- Extended Process: Establishing a Quiet Zone can take many years depending on the specific proposal due to funding, design, diagnostics, and construction.
- Public Frustration: Communities may expect immediate relief once a proposed project is announced. Be clear about the duration of the overall process to help manage public expectations.

Regulatory Compliance and Safety

- Legal Mandates: Railroads must keep sounding horns until every required SSM and ASM is fully installed and active.
- Operational Coordination: Only the designated railroad can perform or oversee circuitry or track-side signal work. Coordinating around railroad scheduling and other projects the railroad may have as priorities is important.

Implementation Focus 7 – Allow Time for Railroad's Plan Review and Permit Process

Allowing for a railroad's plan review and permit process is vital in FRA Quiet Zones to ensure that any SSMs and ASMs are correctly engineered, do not interfere with active train signals or track integrity, and adequately maintain public safety when horns are silenced.

Safety and Operational Integrity

- Signal and Equipment Coordination: New installations such as medians, channelization devices, or four-quadrant gates must integrate with other systems such as active warning and constant-warning-time circuitry. Ensure thorough railroad reviews to prevent equipment conflicts.
- Track Clearance and Sightlines: Improper placement of physical barriers can obstruct train crew sightlines or maintenance-of-way equipment clearance.
- Regulatory Compliance: The FRA requires risk mitigation when silencing horns. Involving operating railroads in diagnostic teams ensures that proposed engineering treatments will meet safety standards before horns stop sounding.

Risk Management and Liability

- Verify Installation: Railroads must verify that public infrastructure changes do not inadvertently increase grade-crossing collision risks.
- Immediate Recourse: If safety devices are compromised or fail, railroads retain the legal right to resume routine horn sounding until repairs are completed. Robust communication and coordination will help minimize jurisdictional and operational disputes during breakdowns and maintenance.

Implementation Focus 8 – Ensure Contractors Understand Railroad Safety Requirements while Performing Roadway Improvements

Ensuring contractors understand railroad safety requirements during roadway improvements is critical to prevent fatal strikes by moving trains, avoid catastrophic train derailments, protect valuable infrastructure, and maintain legal compliance with FRA and other oversight agencies.

Preventing Injuries and Fatalities

- Moving Trains: Workers on or near active tracks face severe risks from moving trains and heavy equipment. Lay out construction plans and sequencing to prioritize health and safety.

- On-Track Safety Rules: Clear and robust training and emphasis on safety requirements ensures proper use of flag persons, designated crossing zones, and safe distances from live tracks.
- Job Briefings: Mandatory safety talks help crews recognize and mitigate hazards during work.

Protecting Infrastructure and Preventing Derailments

- Track Integrity: Debris, improper excavation, or unapproved shoring near the right-of-way can destabilize tracks and warp precise rail alignment, potentially leading to derailments.
- Utility Strikes: Follow excavation protocols understanding that railroads may have unmarked underground utility lines on railroad property.
- Clear Communication: Coordinated work zones prevent miscommunication between heavy construction equipment operators and train engineers.

Regulatory Compliance and Accountability

- Federal Standards: Roadway workers and contractors must adhere to strict guidelines, such as FRA Roadway Worker Protection rules. Emphasize these requirements in construction documents and construction meetings.
- Liability Reduction: Emphasize contractor safety education to ensure proper safety documentation, reduce potential violation penalties, and minimize the risk of injury, death, and property damage.

Key Challenges

As this paper wraps up, the following key challenges are summarized and emphasized, and readers are encouraged to keep these in mind while considering the above guiding principles and recommendations.

- Keeping Safety in Mind: While less noise has many positives, even robust SSMs at crossings may not fully mitigate the benefits lost when train horns go silent. “Fifty-nine percent of all grade-crossing collisions and 78% of all fatalities are at gated crossings,” according to Jeff Moller, AVP of Transportation Systems & Practices at the Association

of American Railroads. “You can see that just putting a gate up is not the total solution.” [Cantwell, Betsy, April 10, 2025].

- Navigating Federal Requirements: The CFR sections detailing the Quiet Zone process, and the resulting work within FRA guidelines and requirements, is complicated and often more than even very capable staff can accomplish without an experienced and specially trained team, and the resulting infrastructure upgrades required can be substantial.
- Funding: The cost to implement a Quiet Zone is not consistent between locations due to the wide variation in details such as the number of crossings, necessary infrastructure modifications, and local environmental and physical conditions. Developing a project to align with state and federal grants can alleviate financial burdens.
- Managing Public Expectations: The road to establishing a Quiet Zone can be long with unexpected turns along the way. Be clear about the process, the timelines, and the unknowns that need to be addressed along the way so that the community can understand and plan accordingly. This includes robust community engagement and understanding that while some may want Quiet Zones, others such as railroads are prioritizing operations and safety. Keeping local elected officials and public agency managers updated is key.

Reflections on Learning

My overall goal for this paper as outlined in the “Objective” section was to gain an in-depth understanding of FRA Quiet Zones including:

1. Overview of the purpose of FRA Quiet Zones and the process of implementing them
    - *The basics: what they are, why they exist, how they work, and where they are located*

2. Review of data about Quiet Zones from publicly available databases with identification of key insights and trends in the data
    - *Data and insights: review of FRA databases, identification of trends in the data, and examples of specific Quiet Zone applications in the Pacific Northwest*

3. Guidlines and recommendations for how agencies can successfully plan for and implement Quiet Zones, including examples of agencies that have already done so
    - *Beyond the basics: insights into the program, what has worked well for agencies pursuing Quiet Zones, and guidance for successful implementation*

I am very pleased with the amount I learned in meeting all three of these goals, but I also believe I have only scratched the surface on a topic that will take many years to fully learn and understand through direct involvement in a Quiet Zone process. First, let's focus on what was learned through developing this paper, then I'd like to provide thoughts on the future.

- **Goal 1 – Overview of Purpose and Process of Implementing Quiet Zones**
    - The entirety of "Part 2 – Background" and the first portion of "Part 3 – FRA Quiet Zone Program" were dedicated to this goal, including:
        - Railroads and Ports – Description and explanation of freight and cargo movements on railroads and at ports, and how the two integrate.
        - At-Grade Crossings and Traffic – Overview of at-grade crossings including statistics on the number of crossings, amount of traffic that crosses over them, and number of accidents.
        - Crossing Safety Measures and Train Horn Rules – Review of the FRA's jurisdiction over crossings and safety requirements, including how trains are required to sound horns at crossings.
        - Train Horn Noise and Impacts to Communities – Explanation of noise impacts from train horns including research performed and data on the topic.
        - Noise Mitigation Through FRA Quiet Zones – Introduction to Quiet Zones including why they were created and what they are intended to accomplish.
        - FRA Quiet Zone Process – Detailed interpretation of the relevant CFR sections explaining how Quiet Zones are established.

- **Goal 2 – Review of Data and Identification of Trends and Insights for Quiet Zones**
    - "Part 3 – FRA Quiet Zone Program" included review of data and analysis of the FRA's crossing inventory with respect to Quiet Zones:
        - Available Data on Quiet Zones – Introduction to the FRA's crossing inventory including how Form 71 is used and its relevance to Quiet Zone research.
        - Analysis of Existing Quiet Zones and Trends - Download of the entire Crossing Inventory Data database and analysis of the data to create figures and tables showing trends in the data with discussion.

- **Goal 3 – Guidelines and Recommendations for Planning and Implementing Quiet Zones, Examples of Existing Quiet Zones**
    - These goals were covered in the latter part of "Part 3 – FRA Quiet Zone Program" and "Part 4 – Conclusions" was primarily dedicated to this goal, including:
        - Example Case Studies – Identification of three instances of successful Quiet Zone implementation and summary information on those examples, plus discussion of a potential future Quiet Zone in early stages of development in Aberdeen and Hoquiam.
        - Implementation Guide – Robust synthesis of this paper's research and findings to provide guidance for those pursuing Quiet Zones.
        - Key Challenges – A final reminder of the difficulties and pitfalls along the process of establishing Quiet Zones.

While I have met and exceeded my learning goals for this paper, my eyes have also been opened to the scale and complexity of this topic. As I move forward in my career as a Professional Port Manager, I look forward to building upon the research initiated in this paper by establishing relationships, communication channels, and information sharing with cities and ports that have implemented or are interested in implementing Quiet Zones in order to become authority on the topic and to help fellow port professionals. This next step will begin by working closely with the Cities of Aberdeen and Hoquiam as they begin their process towards establishing new Quiet Zones, and building relationships with colleagues discovered through research for this paper.

Survey

Thank you for reading! You are invited to fill out a brief, voluntary poll designed to assess the efficacy of the paper in increasing a reader's understanding of Quiet Zones, including whether reading the paper affected the reader's interest in pursuing a Quiet Zone. This data will also be used by the author to inform future areas of study and outreach.

Poll: https://forms.gle/6i2PL2cMQGTXqfzFA

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Appendix A

49 CFR 222.39 How is a quiet zone established?

This content is from the eCFR and is authoritative but unofficial.

Title 49 —Transportation
Subtitle B —Other Regulations Relating to Transportation
Chapter II —Federal Railroad Administration, Department of Transportation
Part 222 —Use of Locomotive Horns at Public Highway-Rail Grade Crossings
Subpart C —Exceptions to the Use of the Locomotive Horn
Silenced Horns at Groups of Crossings—Quiet Zones

Authority: 49 U.S.C. 20103, 20107, 20153, 21301, 21304; 28 U.S.C. 2461 note; and 49 CFR 1.89.
Source: 71 FR 47634, Aug. 17, 2006, unless otherwise noted.

§ 222.39 How is a quiet zone established?

(a) ***Public authority designation.*** This paragraph (a) describes how a quiet zone may be designated by a public authority without the need for formal application to, and approval by, FRA. If a public authority complies with either paragraph (a)(1), (a)(2), or (a)(3) of this section, and complies with the information and notification provisions of § 222.43 of this part, a public authority may designate a quiet zone without the necessity for FRA review and approval.

(1) A quiet zone may be established by implementing, at every public highway-rail grade crossing within the quiet zone, one or more SSMs identified in appendix A of this part.

(2) A quiet zone may be established if the Quiet Zone Risk Index is at, or below, the Nationwide Significant Risk Threshold, as follows:

(i) If the Quiet Zone Risk Index is already at, or below, the Nationwide Significant Risk Threshold without being reduced by implementation of SSMs; or

(ii) If SSMs are implemented which are sufficient to reduce the Quiet Zone Risk Index to a level at, or below, the Nationwide Significant Risk Threshold.

(3) A quiet zone may be established if SSMs are implemented which are sufficient to reduce the Quiet Zone Risk Index to a level at or below the Risk Index With Horns.

(b) ***Public authority application to FRA.***

(1) A public authority may apply to the Associate Administrator for approval of a quiet zone that does not meet the standards for public authority designation under paragraph (a) of this section, but in which it is proposed that one or more safety measures be implemented. Such proposed quiet zone may include only ASMs, or a combination of ASMs and SSMs at various crossings within the quiet zone. Note that an engineering improvement which does not fully comply with the requirements for an SSM under appendix A of this part, is considered to be an ASM. The public authority's application must:

(i) Contain an accurate, complete and current Grade Crossing Inventory Form for each public, private and pedestrian grade crossing within the proposed quiet zone;

(ii) Contain sufficient detail concerning the present safety measures at each public, private and pedestrian grade crossing proposed to be included in the quiet zone to enable the Associate Administrator to evaluate their effectiveness;

(iii) Contain detailed information about diagnostic team reviews of any crossing within the proposed quiet zone, including a membership list and a list of recommendations made by the diagnostic team;

(iv) Contain a statement describing efforts taken by the public authority to address comments submitted by each railroad operating the public highway-rail grade crossings within the quiet zone, the State agency responsible for highway and road safety, and the State agency responsible for grade crossing safety in response to the Notice of Intent. This statement shall also list any objections to the proposed quiet zone that were raised by the railroad(s) and State agencies;

(v) Contain detailed information as to which safety improvements are proposed to be implemented at each public, private, or pedestrian grade crossing within the proposed quiet zone;

(vi) Contain a commitment to implement the proposed safety improvements within the proposed quiet zone; and

(vii) Demonstrate through data and analysis that the proposed implementation of these measures will reduce the Quiet Zone Risk Index to a level at, or below, either the Risk Index With Horns or the Nationwide Significant Risk Threshold.

(2) If the proposed quiet zone contains newly established public or private highway-rail grade crossings, the public authority's application for approval must also include five-year projected vehicle and rail traffic counts for each newly established grade crossing;

(3)

(i) The public authority application for FRA approval of the proposed quiet zone shall be provided to: all railroads operating over the public highway-rail grade crossings within the quiet zone; the highway or traffic control or law enforcement authority having jurisdiction over vehicular traffic at grade crossings within the quiet zone; the landowner having control over any private highway-rail grade crossings within the quiet zone; the State agency responsible for highway and road safety; and the State agency responsible for grade crossing safety. A copy of the public authority application shall also be submitted electronically to the Grade Crossing and Trespasser Outreach Division of FRA's Office of Railroad Safety (FRA Grade Crossing and Trespasser Outreach Division).

(ii) Except as provided in paragraph (b)(3)(iii) of this section, any party that receives a copy of the public authority application may submit comments on the public authority application to the FRA Grade Crossing and Trespasser Outreach Division electronically during the 60-day period after the date on which the public authority application was sent.

(iii) If the public authority application for FRA approval contains written statements from each railroad operating over the public highway-rail grade crossings within the quiet zone, the highway or traffic control authority or law enforcement authority having jurisdiction over vehicular traffic at grade crossings within the quiet zone, the State agency responsible for grade crossing safety, and the State agency responsible for highway and road safety stating that the railroad, vehicular traffic authority and State agencies have waived their rights to provide comments on the public authority application, the 60-day comment period under paragraph (b)(3)(ii) of this section shall be waived.

(4)

(i) After reviewing any comments submitted under paragraph (b)(3)(ii) of this section, the Associate Administrator will approve the quiet zone if, in the Associate Administrator's judgment, the public authority is in compliance with paragraphs (b)(1) and (b)(2) of this section and has satisfactorily demonstrated that the SSMs and ASMs proposed by the public authority result in a Quiet Zone Risk Index that is either:

(A) At or below the Risk Index With Horns or

(B) At or below the Nationwide Significant Risk Threshold.

(ii) The Associate Administrator may include in any decision of approval such conditions as may be necessary to ensure that the proposed safety improvements are effective. If the Associate Administrator does not approve the quiet zone, the Associate Administrator will describe, in the decision, the basis upon which the decision was made. Decisions issued by the Associate Administrator on quiet zone applications shall be provided to all parties listed in paragraph (b)(3)(i) of this section and may be reviewed as provided in §§ 222.57(b) and (d) of this part.

(c) Appendix C of this part contains guidance on how to create a quiet zone.

[71 FR 47634, Aug. 17, 2006, as amended at 90 FR 28152, July 1, 2025]

Appendix B

49 CFR 222 Appendix A

Approved Supplementary Safety Measures

This content is from the eCFR and is authoritative but unofficial.

Title 49 —Transportation
Subtitle B —Other Regulations Relating to Transportation
Chapter II —Federal Railroad Administration, Department of Transportation
Part 222 —Use of Locomotive Horns at Public Highway-Rail Grade Crossings

Authority: 49 U.S.C. 20103, 20107, 20153, 21301, 21304; 28 U.S.C. 2461 note; and 49 CFR 1.89.
Source: 71 FR 47634, Aug. 17, 2006, unless otherwise noted.

Appendix A to Part 222—Approved Supplementary Safety Measures

A. Requirements and Effectiveness Rates for Supplementary Safety Measures

This section provides a list of approved supplementary safety measures (SSMs) that may be installed at highway-rail grade crossings within quiet zones for risk reduction credit. Each SSM has been assigned an effectiveness rate, which may be subject to adjustment as research and demonstration projects are completed and data is gathered and refined. Sections B and C govern the process through which risk reduction credit for pre-existing SSMs can be determined.

1. ***Temporary Closure of a Public Highway-Rail Grade Crossing:*** Close the crossing to highway traffic during designated quiet periods. (This SSM can only be implemented within Partial Quiet Zones.)

Effectiveness: 1.0.

Because an effective closure system prevents vehicle entrance onto the crossing, the probability of a collision with a train at the crossing is zero during the period the crossing is closed. Effectiveness would therefore equal 1. However, analysis should take into consideration that traffic would need to be redistributed among adjacent crossings or grade separations for the purpose of estimating risk following the silencing of train horns, unless the particular "closure" was accomplished by a grade separation.

Required:

a. The closure system must completely block highway traffic on all approach lanes to the crossing.

b. The closure system must completely block adjacent pedestrian crossings.

c. Public highway-rail grade crossings located within New Partial Quiet Zones shall be closed from 10 p.m. until 7 a.m. every day. Public highway-rail grade crossings located within Pre-Rule Partial Quiet Zones may only be closed during one period each 24 hours.

d. Barricades and signs used for closure of the roadway shall conform to the standards contained in the MUTCD.

e. Daily activation and deactivation of the system is the responsibility of the public authority responsible for maintenance of the street or highway crossing the railroad tracks. The public authority may provide for third party activation and deactivation; however, the public authority shall remain fully responsible for compliance with the requirements of this part.

f. The system must be tamper and vandal resistant to the same extent as other traffic control devices.

g. The closure system shall be equipped with a monitoring device that contains an indicator which is visible to the train crew prior to entering the crossing. The indicator shall illuminate whenever the closure device is deployed.

Recommended:

Signs for alternate highway traffic 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 alternate routes must be used.

2. ***Four-Quadrant Gate System:*** Install gates at a crossing sufficient to fully block highway traffic from entering the crossing when the gates are lowered, including at least one gate for each direction of traffic on each approach.

Effectiveness:

Four-quadrant gates only, no presence detection: .82.

Four-quadrant gates only, with presence detection: .77.

Four-quadrant gates with traffic of at least 60 feet (with or without presence detection): .92.

Note: The higher effectiveness rate for four-quadrant gates without presence detection does not mean that they are inherently safer than four-quadrant gates with presence detection. Four-quadrant gates with presence detection have been assigned a lower effectiveness rate because motorists may learn to delay the lowering of the exit gates by driving onto the opposing lane of traffic immediately after an opposing car has driven over the grade crossing. Since the presence detection will keep the exit gate raised, other motorists at the crossing who observe this scenario may also be tempted to take advantage of the raised exit gate by driving around the lowered entrance gates, thus increasing the potential for a crossing collision.
It should, however, be noted that there are site-specific circumstances (such as nearby highway intersections that could cause traffic to back up and stop on the grade crossing), under which the use of presence detection would be advisable. For this reason, the various effectiveness rates assigned to four-quadrant gate systems should not be the sole determining factor as to whether presence detection would be advisable. A site-specific study should be performed to determine the best application for each proposed installation. Please refer to paragraphs (f) and (g) for more information.

Required:

Four-quadrant gate systems shall conform to the standards for four-quadrant gates contained in the MUTCD and shall, in addition, comply with the following:

a. When a train is approaching, all highway approach and exit lanes on both sides of the highway-rail crossing must be spanned by gates, thus denying to the highway user the option of circumventing the conventional approach lane gates by switching into the opposing (oncoming) traffic lane in order to enter the crossing and cross the tracks.

b. Crossing warning systems must be activated by use of constant warning time devices unless existing conditions at the crossing would prevent the proper operation of the constant warning time devices.

c. Crossing warning systems must be equipped with power-out indicators.

Note: Requirements b and c apply only to New Quiet Zones or New Partial Quiet Zones. Constant warning time devices and power-out indicators are not required to be added to existing warning systems in Pre-Rule Quiet Zones and Pre-Rule Partial Quiet Zones. However, if existing automatic warning device systems in Pre-Rule Quiet Zones and Pre-Rule Partial Quiet Zones are renewed, or new automatic warning device systems are installed, power-out indicators and constant warning time devices are required, unless existing conditions at the crossing would prevent the proper operation of the constant warning devices.

d. The gap between the ends of the entrance and exit gates (on the same side of the railroad tracks) when both are in the fully lowered, or down, position must be less than two feet if no median is present. If the highway approach is equipped with a median or a channelization device between the approach and exit lanes, the lowered gates must reach to 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. The gate and the median top or channelization device do not have to be at the same elevation.

e. ***"Break-away"*** channelization devices must be frequently monitored to replace broken elements.

Recommendations for new installations only:

f. Gate timing should be established by a qualified traffic engineer based on site specific determinations. Such determination should consider the need for and timing of a delay in the descent of the exit gates (following descent of the conventional entrance gates). Factors to be considered may include available storage space between the gates that is outside the fouling limits of the track(s) and the possibility that traffic flows may be interrupted as a result of nearby intersections.

g. A determination should be made as to whether it is necessary 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 that should be considered are the presence of intersecting roadways near the crossing, the priority that the traffic crossing the railroad is given at such intersections, the types of traffic control devices at those intersections, and the presence and timing of traffic signal preemption.

h. 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 non-traversable curb or traversable curb, or by reflectorized channelization devices, or by both.

i. Remote monitoring (in addition to power-out indicators, which are required) of the status of these crossing systems is preferable. This is especially important in those areas in which qualified railroad signal department personnel are not readily available.

3. ***Gates With Medians or Channelization Devices:*** Install medians or channelization devices on both highway approaches to a public highway-rail grade crossing denying to the highway user the option of circumventing the approach lane gates by switching into the opposing (oncoming) traffic lane and driving around the lowered gates to cross the tracks.

Effectiveness:

Channelization devices—.75.

Non-traversable curbs with or without channelization devices— .80.

Required:

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

(1) medians bounded by non-traversable curbs or

(2) channelization devices.

b. Medians or channelization devices must extend at least 100 feet from the gate arm, or if there is an intersection within 100 feet of the gate, the median or channelization device must extend at least 60 feet from the gate arm.

c. Intersections of two or more streets, or a street and an alley, that are within 60 feet of the gate arm must be closed or relocated. Driveways for private, residential properties (up to four units) within 60 feet of the gate arm are not considered to be intersections under this part and need not be closed. However, consideration should be given to taking steps to ensure that motorists exiting the driveways are not able to move against the flow of traffic to circumvent the purpose of the median and drive around lowered gates. This may be accomplished by the posting of “no left turn” signs or other means of notification. For the purpose of this part, driveways accessing commercial properties are considered to be intersections and are not allowed. It should be noted that if a public authority can not comply with the 60 feet or 100 feet requirement, it may apply to FRA for a quiet zone under § 222.39(b), “Public authority application to FRA.” Such arrangement may qualify for a risk reduction credit in calculation of the Quiet Zone Risk Index. Similarly, if a public authority finds that it is feasible to only provide channelization on one approach to the crossing, it may also apply to FRA for approval under § 222.39(b). Such an arrangement may also qualify for a risk reduction credit in calculation of the Quiet Zone Risk Index.

d. Crossing warning systems must be activated by use of constant warning time devices unless existing conditions at the crossing would prevent the proper operation of the constant warning time devices.

e. Crossing warning systems must be equipped with power-out indicators. Note: Requirements d and e apply only to New Quiet Zones and New Partial Quiet Zones. Constant warning time devices and power-out indicators are not required to be added to existing warning systems in Pre-Rule Quiet Zones or Pre-Rule Partial Quiet Zones. However, if existing automatic warning device systems in Pre-Rule Quiet Zones and Pre-Rule Partial Quiet Zones are renewed, or new automatic warning device systems are installed, power-out indicators and constant warning time devices are required, unless existing conditions at the crossing would prevent the proper operation of the constant warning devices.

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

g. ***"Break-away"*** channelization devices must be frequently monitored to replace broken elements.

Recommended:

a. The use of non-traversable curbs at speeds up to 45 mph should incorporate appropriate engineering controls such as those recommended by organizations such as the American Association of State Highway and Transportation Officials.

4. ***One Way Street with Gate(s):*** Gate(s) must be installed such that all approaching highway lanes to the public highway-rail grade crossing are completely blocked.

Effectiveness: .82.

Required:

a. Gate arms on the approach side of the crossing should extend across the road to within one foot of the far edge of the pavement. If a gate is used on each side of the road, the gap between the ends of the gates when both are in the lowered, or down, position must be no more than two feet.

b. If only one gate is used, the edge of the road opposite the gate mechanism must be configured with a non-traversable curb extending at least 100 feet.

c. Crossing warning systems must be activated by use of constant warning time devices unless existing conditions at the crossing would prevent the proper operation of the constant warning time devices.

d. Crossing warning systems must be equipped with power-out indicators.

Note: Requirements c and d apply only to New Quiet Zones and New Partial Quiet Zones. Constant warning time devices and power-out indicators are not required to be added to existing warning systems in Pre-Rule Quiet Zones or Pre-Rule Partial Quiet Zones. If automatic warning systems are, however, installed or renewed in a Pre-Rule Quiet or Pre-Rule Partial Quiet Zone, power-out indicators and constant warning time devices shall be installed, unless existing conditions at the

crossing would prevent the proper operation of the constant warning time devices.

5. ***Permanent Closure of a Public Highway-Rail Grade Crossing:*** Permanently close the crossing to highway traffic.

   Effectiveness: 1.0.

   Required:

   a. The closure system must completely block highway traffic from entering the grade crossing.

   b. Barricades and signs used for closure of the roadway shall conform to the standards contained in the MUTCD.

   c. The closure system must be tamper and vandal resistant to the same extent as other traffic control devices.

   d. Since traffic will be redistributed among adjacent crossings, the traffic counts for adjacent crossings shall be increased to reflect the diversion of traffic from the closed crossing.

B. Credit for Pre-Existing SSMs in New Quiet Zones and New Partial Quiet Zones

A community that has implemented a pre-existing SSM at a public grade crossing can receive risk reduction credit by inflating the Risk Index With Horns as follows:

1. Calculate the current risk index for the grade crossing that is equipped with a qualifying, pre-existing SSM. (See appendix D. FRA's web-based Quiet Zone Calculator may be used to complete this calculation.)
2. Adjust the risk index by accounting for the increased risk that was avoided by implementing the pre-existing SSM at the public grade crossing. This adjustment can be made by dividing the risk index by one minus the SSM effectiveness rate. (For example, the risk index for a crossing equipped with pre-existing channelization devices would be divided by .25.)
3. Add the current risk indices for the other public grade crossings located within the proposed quiet zone and divide by the number of crossings. The resulting risk index will be the new Risk Index With Horns for the proposed quiet zone.

C. Credit for Pre-Existing SSMs in Pre-Rule Quiet Zones and Pre-Rule Partial Quiet Zones

A community that has implemented a pre-existing SSM at a public grade crossing can receive risk reduction credit by inflating the Risk Index With Horns as follows:

1. Calculate the current risk index for the grade crossing that is equipped with a qualifying, pre-existing SSM. (See appendix D. FRA's web-based Quiet Zone Calculator may be used to complete this calculation.)
2. Reduce the current risk index for the grade crossing to reflect the risk reduction that would have been achieved if the locomotive horn was routinely sounded at the crossing. The following list sets forth the estimated risk reduction for certain types of crossings:

a. Risk indices for passive crossings shall be reduced by 43%;

b. Risk indices for grade crossings equipped with automatic flashing lights shall be reduced by 27%; and

c. Risk indices for gated crossings shall be reduced by 40%.

3. Adjust the risk index by accounting for the increased risk that was avoided by implementing the pre-existing SSM at the public grade crossing. This adjustment can be made by dividing the risk index by one minus the SSM effectiveness rate. (For example, the risk index for a crossing equipped with pre-existing channelization devices would be divided by .25.)

4. Adjust the risk indices for the other crossings that are included in the Pre-Rule Quiet Zone or Pre-Rule Partial Quiet Zone by reducing the current risk index to reflect the risk reduction that would have been achieved if the locomotive horn was routinely sounded at each crossing. Please refer to step two for the list of approved risk reduction percentages by crossing type.

5. Add the new risk indices for each crossing located within the proposed quiet zone and divide by the number of crossings. The resulting risk index will be the new Risk Index With Horns for the quiet zone.

[71 FR 47634, Aug. 17, 2006, as amended at 91 FR 22740, Apr. 28, 2026]

Appendix C

USDOT Form 71 Crossing Inventory Data

U. S. DOT CROSSING INVENTORY FORM

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

OMB No. 2130-0017

Instructions for the initial reporting of the following types of new or previously unreported crossings: For public highway-rail grade crossings, complete the entire inventory Form. For private highway-rail grade crossings, complete the Header, Parts I and II, and the Submission Information section. For public pathway grade crossings (including pedestrian station grade crossings), complete the Header, Parts I and II, and the Submission Information section. For Private pathway grade crossings, complete the Header, Parts I and II, and the Submission Information section. For grade-separated highway-rail or pathway crossings (including pedestrian station crossings), complete the Header, Part I, and the Submission Information section. For changes to existing data, complete the Header, Part I Items 1-3, and the Submission Information section, in addition to the updated data fields. Note: For private crossings only, Part I Item 20 and Part III Item 2.K. are required unless otherwise noted. An asterisk * denotes an optional field.

A. Revision Date *(MM/DD/YYYY)* _____/_____/_____	**B. Reporting Agency** ☐ Railroad ☐ Transit ☐ State ☐ Other	**C. Reason for Update** *(Select only one)* ☐ Change in Data ☐ New Crossing ☐ Closed ☐ No Train Traffic ☐ Quiet Zone Update ☐ Re-Open ☐ Date Change Only ☐ Change in Primary Operating RR ☐ Admin. Correction	**D. DOT Crossing Inventory Number**

Part I: Location and Classification Information

1. Primary Operating Railroad	**2. State**	**3. County**

4. City / Municipality ☐ In ☐ Near	**5. Street/Road Name & Block Number** *(Street/Road Name)* | *(Block Number)*	**6. Highway Type & No.**

7. Do Other Railroads Operate a Separate Track at Crossing? ☐ Yes ☐ No If Yes, Specify RR	**8. Do Other Railroads Operate Over Your Track at Crossing?** ☐ Yes ☐ No If Yes, Specify RR

9. Railroad Division or Region ☐ None	**10. Railroad Subdivision or District** ☐ None	**11. Branch or Line Name** ☐ None	**12. RR Milepost** *(prefix)* | *(nnnn.nnn)* | *(suffix)*

13. Line Segment *	**14. Nearest RR Timetable Station** *	**15. Parent RR** *(if applicable)* ☐ N/A	**16. Crossing Owner** *(if applicable)* ☐ N/A

17. Crossing Type ☐ Public ☐ Private	**18. Crossing Purpose** ☐ Highway ☐ Pathway, Ped. ☐ Station, Ped.	**19. Crossing Position** ☐ At Grade ☐ RR Under ☐ RR Over	**20. Public Access** *(if Private Crossing)* ☐ Yes ☐ No	**21. Type of Train** ☐ Freight ☐ Intercity Passenger ☐ Commuter ☐ Transit ☐ Shared Use Transit ☐ Tourist/Other	**22. Average Passenger Train Count Per Day** ☐ Less Than One Per Day ☐ Number Per Day_____

23. Type of Land Use
☐ Open Space ☐ Farm ☐ Residential ☐ Commercial ☐ Industrial ☐ Institutional ☐ Recreational ☐ RR Yard

24. Is there an Adjacent Crossing with a Separate Number? ☐ Yes ☐ No If Yes, Provide Crossing Number _____	**25. Quiet Zone** *(FRA provided)* ☐ No ☐ 24 Hr ☐ Partial ☐ Chicago Excused Date Established _____

26. HSR Corridor ID ☐ N/A	**27. Latitude in decimal degrees** *(WGS84 std: nn.nnnnnnn)*	**28. Longitude in decimal degrees** *(WGS84 std: -nnn.nnnnnnn)*	**29. Lat/Long Source** ☐ Actual ☐ Estimated

30.A. Railroad Use *	**31.A. State Use** *
30.B. Railroad Use *	**31.B. State Use** *
30.C. Railroad Use *	**31.C. State Use** *
30.D. Railroad Use *	**31.D. State Use** *
32.A. Narrative *(Railroad Use)* *	**32.B. Narrative** *(State Use)* *

33. Emergency Notification Telephone No. *(posted)*	**34. Railroad Contact** *(Telephone No.)*	**35. State Contact** *(Telephone No.)*

Part II: Railroad Information

1. Estimated Number of Daily Train Movements

1.A. Total Day Thru Trains *(6 AM to 6 PM)*	1.B. Total Night Thru Trains *(6 PM to 6 AM)*	1.C. Total Switching Trains	1.D. Total Transit Trains	1.E. Check if Less Than One Movement Per Day ☐ How many trains per week? _____

2. Year of Train Count Data *(YYYY)*	3. Speed of Train at Crossing 3.A. Maximum Timetable Speed *(mph)* _____ 3.B. Typical Speed Range Over Crossing *(mph)* From _____ to _____

4. Type and Count of Tracks

Main _____ Siding _____ Yard _____ Transit _____ Industry _____

5. Train Detection *(Main Track only)*
☐ Constant Warning Time ☐ Motion Detection ☐AFO ☐ PTC ☐ DC ☐ Other ☐ None

6. Is Track Signaled? ☐ Yes ☐ No	7.A. Event Recorder ☐ Yes ☐ No	7.B. Remote Health Monitoring ☐ Yes ☐ No

U. S. DOT CROSSING INVENTORY FORM

A. Revision Date *(MM/DD/YYYY)*	PAGE 2	D. Crossing Inventory Number *(7 char.)*

Part III: Highway or Pathway Traffic Control Device Information

1. Are there Signs or Signals? ☐ Yes ☐ No

2. Types of Passive Traffic Control Devices associated with the Crossing

2.A. Crossbuck Assemblies *(count)*	2.B. STOP Signs *(R1-1)* *(count)*	2.C. YIELD Signs *(R1-2)* *(count)*	2.D. Advance Warning Signs *(Check all that apply; include count)* ☐ None ☐ W10-1 _____ ☐ W10-3 _____ ☐ W10-11 _____ ☐ W10-2 _____ ☐ W10-4 _____ ☐ W10-12 _____

2.E. Low Ground Clearance Sign *(W10-5)*	2.F. Pavement Markings	2.G. Channelization Devices/Medians	2.H. EXEMPT Sign *(R15-3)*	2.I. ENS Sign *(I-13)* Displayed
☐ Yes *(count_____)* ☐ No	☐ Stop Lines ☐Dynamic Envelope ☐ RR Xing Symbols ☐ None	☐ All Approaches ☐ Median ☐ One Approach ☐ None	☐ Yes ☐ No	☐ Yes ☐ No

2.J. Other MUTCD Signs ☐ Yes ☐ No	2.K. Private Crossing Signs *(if private)*	2.L. LED Enhanced Signs *(List types)*
Specify Type _____ Count _____ Specify Type _____ Count _____ Specify Type _____ Count _____	☐ Yes ☐ No	

3. Types of Train Activated Warning Devices at the Grade Crossing *(specify count of each device for all that apply)*

3.A. Gate Arms *(count)*	3.B. Gate Configuration	3.C. Cantilevered *(or Bridged)* Flashing Light Structures *(count)*	3.D. Mast Mounted Flashing Lights *(count of masts)* _____	3.E. Total Count of Flashing Light Pairs
Roadway _____ Pedestrian _____	☐ 2 Quad ☐ Full *(Barrier)* Resistance ☐ 3 Quad ☐ 4 Quad ☐ Median Gates	Over Traffic Lane _____ ☐ Incandescent Not Over Traffic Lane _____ ☐ LED	☐ Incandescent ☐ LED ☐ Back Lights Included ☐ Side Lights Included	

3.F. Installation Date of Current Active Warning Devices: *(MM/YYYY)*	3.G. Wayside Horn	3.H. Highway Traffic Signals Controlling Crossing	3.I. Bells *(count)*
_____/_____ ☐ Not Required	☐ Yes Installed on *(MM/YYYY)* _____/_____ ☐ No	☐ Yes ☐ No	

3.J. Non-Train Active Warning	3.K. Other Flashing Lights or Warning Devices
☐ Flagging/Flagman ☐Manually Operated Signals ☐ Watchman ☐ Floodlighting ☐ None	Count _____ Specify type _____

4.A. Does nearby Hwy Intersection have Traffic Signals?	4.B. Hwy Traffic Signal Interconnection	4.C. Hwy Traffic Signal Preemption	5. Highway Traffic Pre-Signals	6. Highway Monitoring Devices *(Check all that apply)*
☐ Yes ☐ No	☐ Not Interconnected ☐ For Traffic Signals ☐ For Warning Signs	☐ Simultaneous ☐ Advance	☐ Yes ☐ No Storage Distance * _____ Stop Line Distance * _____	☐ Yes - Photo/Video Recording ☐ Yes – Vehicle Presence Detection ☐ None

Part IV: Physical Characteristics

1. Traffic Lanes Crossing Railroad	2. Is Roadway/Pathway Paved?	3. Does Track Run Down a Street?	4. Is Crossing Illuminated? *(Street lights within approx. 50 feet from nearest rail)*
☐ One-way Traffic ☐ Two-way Traffic Number of Lanes _____ ☐ Divided Traffic	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No

5. Crossing Surface *(on Main Track, multiple types allowed)* Installation Date * *(MM/YYYY)* _____/_____ Width * _____ Length * _____
☐ 1 Timber ☐ 2 Asphalt ☐ 3 Asphalt and Timber ☐ 4 Concrete ☐ 5 Concrete and Rubber ☐ 6 Rubber ☐ 7 Metal
☐ 8 Unconsolidated ☐ 9 Composite ☐ 10 Other *(specify)* _____

6. Intersecting Roadway within 500 feet?	7. Smallest Crossing Angle	8. Is Commercial Power Available? *
☐ Yes ☐ No If Yes, Approximate Distance *(feet)* _____	☐ 0° – 29° ☐ 30° – 59° ☐ 60° - 90°	☐ Yes ☐ No

Part V: Public Highway Information

1. Highway System	2. Functional Classification of Road at Crossing	3. Is Crossing on State Highway System?	4. Highway Speed Limit
☐ (01) Interstate Highway System ☐ (02) Other Nat Hwy System (NHS) ☐ (03) Federal AID, Not NHS ☐ (08) Non-Federal Aid	☐ (0) Rural ☐ (1) Urban ☐ (1) Interstate ☐ (5) Major Collector ☐ (2) Other Freeways and Expressways ☐ (3) Other Principal Arterial ☐ (6) Minor Collector ☐ (4) Minor Arterial ☐ (7) Local	☐ Yes ☐ No	_____ MPH ☐ Posted ☐ Statutory

5. Linear Referencing System *(LRS Route ID)* *

6. LRS Milepost *

7. Annual Average Daily Traffic *(AADT)*	8. Estimated Percent Trucks	9. Regularly Used by School Buses?	10. Emergency Services Route
Year _____ AADT _____	_____ %	☐ Yes ☐ No Average Number per Day _____	☐ Yes ☐ No

Submission Information - *This information is used for administrative purposes and is not available on the public website.*

Submitted by _____ Organization _____ Phone _____ Date _____

Public reporting burden for this information collection is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed and completing and reviewing the collection of information. According to the Paperwork Reduction Act of 1995, a federal agency may not conduct or sponsor, and a person is not required to, nor shall a person be subject to a penalty for failure to comply with, a collection of information unless it displays a currently valid OMB control number. The valid OMB control number for information collection is 2130-0017. Send comments regarding this burden estimate or any other aspect of this collection, including for reducing this burden to: Information Collection Officer, Federal Railroad Administration, 1200 New Jersey Ave. SE, MS-25 Washington, DC 20590.