

# Wyoming Quiet Zone Study



## Phase 2

A Report Prepared For

**Wyoming Department of Transportation**

Submitted By

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Economics • Engineering • Service Planning

Arlington, VA

October 27, 2009

# Wyoming Quiet Zone Study

## Phase 2

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# Wyoming Quiet Zone Study

## Phase 2

### Introduction

The Swift Rail Development Act, Public Law 103-440, enacted by Congress in 1994, requires the use of locomotive horns at public grade crossings, but gives the Federal Railroad Administration (FRA) the authority to make reasonable exceptions. The Final Rule, “49 CFR Parts 222 and 229, Use of Locomotive Horns at Highway-Rail Grade Crossings”, published in the Federal Register on August 17, 2006, is employed in this study to guide methodology and recommendations, and is referred to as the 2006 Final Rule.

#### Phase 1 Study

In the Phase 1 Study, R.L. Banks & Associates, Inc., (RLBA) performed a field assessment of 84 grade crossings in the State of Wyoming in order to determine what improvements may be appropriate to qualify quiet zones on an individual crossing-by-crossing basis, and to estimate both the costs of these improvements, and also the costs of installing requisite equipment, in order to comply with the minimum requirements for quiet zones, for example, presence of active warning devices (flashing lights and gates, and compliance with the U.S. Department of Transportation *Manual on Uniform Traffic Control Devices*).<sup>1</sup>

The Phase 1 portion of this study assumes qualification of a quiet zone by implementing, at every public grade crossing within the proposed quiet zone, a supplementary safety measure (SSM) as identified in the Federal Railroad Administration (FRA) 2006 Final Rule. This is one method of quiet zone qualification, and it requires no risk calculations because the SSM is presumed to reduce the quiet zone risk at a given crossing to a level equal to or below the risk level with horns. Thus where a SSM is installed at every crossing within a proposed quiet zone, no risk calculation is necessary.

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<sup>1</sup> FRA 2006 Final Rule, Use of Locomotive Horns at Highway-Rail Grade Crossings, 49 CFR Parts 222 and 229, as published in the Federal Register, August 17, 2006, Section 222.35, page 47639.

## Phase 2 Study

The FRA 2006 Final Rule authorizes an alternative method for qualification of a quiet zone by Public Authority Designation<sup>2</sup>, that is, implementation of SSMs sufficient to reduce the Quiet Zone Risk Index (QZRI) to a level at or below the Risk Index With Horns (RIWH).<sup>3</sup> This alternative method of quiet zone qualification may be considerably less expensive than installing a SSM at each crossing. That is, a group two or more crossings on the same railroad line may constitute a quiet zone if SSMs are applied to the extent that the overall QZRI for the multiple crossings is equal to or less than the RIWH. SSMs are not required at every crossing, but only to the extent that they are needed to reduce the risk index sufficiently.

FRA recommends utilization of its web-based Quiet Zone Calculator to aid the decision-making process, and the Calculator may be found at <http://www.fra.dot.gov/us/content/1337>.<sup>4</sup> The Calculator allows the public authority desiring to establish a quiet zone to consider options in determining which SSMs make the most sense.<sup>5</sup>

## Terminology

A review of terminology used in the 2006 Final Rule may be helpful. Highway-rail grade crossings, also referred to as “grade crossings” or “crossings”, are places where the road, street or highway crosses railroad tracks at the same level, or grade. A public grade crossing is a location where a public highway, road or street, including associated sidewalks or pathways, crosses one or more railroad tracks at grade. If a public authority maintains the roadway on both sides of the crossing, the crossing is considered a public crossing. The focus of this study is on public crossings. Public authority means the public entity responsible for traffic control or law enforcement at the public highway-rail grade or pedestrian crossing. A pedestrian grade crossing, or pedestrian crossing, is a separate designated sidewalk or pathway where pedestrians, but not vehicles, cross railroad tracks. A private crossing, sometimes referred to as a private highway-rail grade crossing, is a highway-rail grade crossing which is not a public highway-rail grade crossing. A supplementary safety measure (SSM) is a safety system or procedure established in accordance with this 2006 Final Rule which is provided by the appropriate traffic control authority or law enforcement authority responsible for safety at the highway-rail grade crossing. The SSMs most recommended in this study are non-surmountable medians and four-quadrant gates. Median means the portion of a divided highway separating the travel ways for traffic in opposite directions. Four-quadrant gates are a system of gates

<sup>2</sup> FRA 2006 Final Rule, Appendix C to Part 222—Guide to Establishing Quiet Zones, Section I, B.1., page 47652-47653.

<sup>3</sup> FRA 2006 Final Rule, Section 222.39 (a) (3), page 47640.

<sup>4</sup> FRA 2006 Final Rule, Appendix C, Section I, A (5), page 47652.

<sup>5</sup> *Ibid.*

at a crossing sufficient to fully block highway traffic from entering the crossings when the gates are lowered, including at least one gate for each direction of traffic on each approach.

## Scope of Services

The following Scope of Services constitute Phase 2 of this study.

This R.L. Banks & Associates, Inc., (RLBA) Proposal is based upon discussion with Dan Kline of Wyoming Department of Transportation, and examination of the Description of Change provided by Dan Kline, which states that Phase 2 will include utilization of the Federal Railroad Administration's Quiet Zone Calculator for rail crossings within the 34 communities in the original (Phase 1) scope of work.

Cheyenne has two rail corridors which will necessitate two different sets of calculations.

RLBA will provide revised cost estimates based upon findings of the Quiet Zone Calculator. Revised cost estimates will show the estimated costs of the two options available: SSMs at every crossing (as suggested by the format of Phase 1 of this study), or just enough SSMs, in a grouping of sequential crossings in a community, to qualify one or more quiet zones in that community.

Support documentation will include Quiet Zone calculator printouts and subsequent cost estimates.

RLBA will perform this work and provide the results in a study report by October 16, 2009.

## Discussion

### Qualification of Quiet Zones

The Wyoming Department of Transportation has stated that alternative safety measures (ASMs) shall not be considered in quiet zone evaluations, and RLBA strongly agrees with this decision. Briefly, ASMs are modified SSMs and other measures, such as programmed enforcement, public education and awareness, and photo enforcement programs, that may be used to reduce risk within a quiet zone.<sup>6</sup> If ASMs are utilized in the establishment of quiet zones, the public

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<sup>6</sup> FRA 2006 Final Rule, Appendix B to Part 222—Alternative Safety Measures, page 47649.

authority<sup>7</sup> proposing those quiet zone(s) must provide a Notice of Intent and then apply to FRA for approval of the quiet zone(s). Even if FRA approves the quiet zone(s), an ASM-qualified quiet zone is subject to annual review, and it may become dis-qualified depending upon annual recalculation of the Nationwide Significant Risk Threshold (NSRT). In addition, the use of non-engineering ASMs to establish a quiet zone would require continued monitoring and analysis throughout the existence of the quiet zone to ensure that risk continues to be reduced.

On the other hand, if supplementary safety measures (SSMs) are used, either at every crossing or at a sufficient number of crossings to reduce the Quiet Zone Risk Index (QZRI) to a level at or below the Risk Index With Horns (RIWH), the public authority may designate a quiet zone without FRA approval, and after making the required notifications to the appropriate officials (railroad, state agency responsible for highway and road safety, state agency responsible for grade crossing safety)<sup>8</sup>, the quiet zone may be implemented.<sup>9</sup> Furthermore, and deemed very important, a quiet zone thus qualified is not subject to dis-qualification owing to annual changes in the Nationwide Significant Risk Threshold (NSRT).

Thus, and as pointed out by FRA in its 2006 Final Rule, the use of SSMs at every crossing, or at least sufficient SSMs at a group of crossings to reduce the QZRI to a level at or below the RIWH, “may have higher initial costs” but “there are several benefits”, for example “the public authority will never need to be concerned about the Nationwide Significant Risk Threshold, annual reviews of the Quiet Zone Risk Index, or failing to be qualified because the Quiet Zone Risk Index is higher than the Nationwide Significant Risk Threshold.”<sup>10</sup>

## **Utilization of Phase 1 Results in Phase 2**

In Phase 1 of this study, RLBA inspected each of 84 grade crossings throughout Wyoming, and determined at each crossing the SSM deemed most feasible (assuming that a SSM would be implemented at that crossing). In making this determination, the results of which are displayed in Appendix A of the Phase 1 Study Report, RLBA considered crossing intersection geometry and other pertinent characteristics of the site, including proximity of residences and offices, and selected what it considered the least expensive but feasible SSM, or, alternatively, wayside horns. This is a stationery horn located at a highway rail

<sup>7</sup> *Public authority* means the public entity responsible for traffic control or law enforcement at the public highway-rail grade or pedestrian crossing. FRA 2006 Final Rule, Section 222.9 Definitions, page 47636.

<sup>8</sup> FRA 2006 Final Rule, Appendix C Section II A.1., page 47654.

<sup>9</sup> FRA 2006 Final Rule, Appendix C to Part 222—Guide to Establishing Quiet Zones, pages 47652-47653.

<sup>10</sup> FRA 2006 Final Rule, Appendix C to Part 222, Section I, A (3), page 47652.

grade crossing, designed to provide, upon approach of a locomotive or train, audible warning to oncoming motorists of a train's approach.<sup>11</sup>

As stated in the Phase 1 Study Report on page 3, approximate capital costs of SSMs vary from \$60,000, for non-traversable medians/curbs, to \$500,000 for four-quadrant gates. Wayside horns, which may be treated as a one-for-one substitute for the train horn<sup>12</sup>, cost approximately \$115,000. Addition of gates to an existing one-way street would cost approximately \$150,000. (Other SSMs were not considered feasible in this study.)

Given the lowest capital cost of non-traversable medians/curbs, RLBA first determined whether these are practicable at each intersection. Use of the medians SSM requires that the medians extend at least 100 feet from the gate arm, or if there is an intersection within 100 feet of the gate, the median must extend at least 60 feet from the gate arm.<sup>13</sup> RLBA recommended medians where these intersection geometry criteria are met. Where they are not, RLBA went on to the next least expensive alternative, the wayside horn. Since the wayside horn is stationary and directional, the sound emitted affects but a small area, as contrasted with the relatively much larger area over which a locomotive horn is heard. Where the wayside horn is not deemed practicable because of extent of nearby community development, the one-way street SSM, where there is an existing one-way street grade crossing, or four-quadrant gates, are considered.

Using the above-described method, the lowest-cost SSM (or alternatively, the wayside horn) deemed most practicable at the 84 locations in the Phase 1 Study Report was the wayside horn in 50 cases, medians at 28 locations, and four-quadrant gates in four instances. At two sites (one in Gillette and one in Cheyenne), four-quadrant gates exist today, and risk reduction credit may be taken by a public authority for a SSM that was previously implemented and is currently in place.<sup>14</sup>

Another important Phase 1 result utilized in Phase 2 are the RLBA notes made at each of the 84 crossings, both on individual Crossing Assessment working papers and on U.S. DOT Crossing Inventory Information forms, downloaded from the FRA website for this purpose. At most crossings, RLBA sketched the crossing on the individual Crossing Assessment working papers so as to have a record of intersection geometry considerations, and other features of the crossing. Where data on the U.S. DOT Crossing Inventory Information forms was found to be incorrect, corrections are entered. (This was not a comprehensive updating of the forms, since this is not a study requirement and since only data most directly pertinent to the qualification of quiet zones is of

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<sup>11</sup> FRA 2006 Final Rule, Section 222.9 Definitions, page 47637.

<sup>12</sup> FRA 2006 Final Rule, Appendix C to Part 222, Section I, B.3, page 47653.

<sup>13</sup> FRA 2006 Final Rule, Appendix A to Part 222—Approved Supplementary Safety Measures, A.3., page 47648.

<sup>14</sup> FRA 2006 Final Rule, Appendix C to Part 222, Section I, B.3., page 47653.



interest, and also since some data, such as annual average daily traffic (AADT), are not available in a brief visit to a crossing site.)

As is stated in the Phase 1 Study Report, it should be understood that all cost estimates are preliminary and approximate; more precise cost estimates must be based upon decisions with regard to the quiet zone make-up, and with regard to design of improvements.

### **Use of the FRA Quiet Zone Calculator**

In this Phase 2 Study, RLBA utilizes the FRA web-based Quiet Zone Calculator to assist in the determination of least-cost, feasible quiet zones within communities and along rail lines. Use of the Calculator is relatively straightforward, and, as stated earlier, applies to the case of a multi-crossing quiet zone qualified by SSMs. The following paragraph describes what is done where an alternative to the SSM, the wayside horn, is planned.

### **Wayside Horn Consideration**

Where the wayside horn is considered, it is not included in calculating the Crossing Corridor Risk Index (a number reflecting a measure of risk to the motoring public at public grade crossings along a rail corridor<sup>15</sup>), the Risk Index with Horns (RIWH) or the Quiet Zone Risk Index.<sup>16</sup> Thus the wayside horn is not a factor in use of the FRA Quiet Zone Calculator.

Where the wayside horn is planned, the grade crossing must be equipped with an active warning system including, as a minimum, flashing lights and gates.<sup>17</sup>

### **Example, Using the Four Crossings at Basin (Big Horn County)**

Using the FRA Quiet Zone Calculator, (see printout of proposed quiet zone crossings on next page), one sees that the Risk Index with Horns (RIWH) is 6644.75, and that the Quiet Zone Risk Index (QZRI), with no SSMs added, is 11,083.45. In order to qualify this prospective quiet zone, one must reduce the QZRI to a level at or below the RIWH.

The individual Basin crossings have risk indices as follows:

<b>Crossing</b>	<b>Street</b>	<b>Risk</b>
090830Y	North Street	14,247.84
090831F	B Street	13,316.47
090832M	Wyoming Avenue	10,238.02
090833U	Bighorn Avenue	6,531.47

<sup>15</sup> FRA 2006 Final Rule, Section 222.9 Definitions, page 47635.

<sup>16</sup> FRA 2006 Final Rule, Appendix C to Part 222, Section I, B.3., page 47653.

<sup>17</sup> FRA 2006 Final Rule, Section 222.59, page 47647.

Federal Railroad Administration

# QUIET ZONE CALCULATOR

Home | Help | Contact | logoff [transport@rbadfc.com](mailto:transport@rbadfc.com)

- [Cancel](#)
  - [Change Scenario: BASIN2\\_30234](#)
  - [Continue](#)
- [Create New Zone](#)
  - [Manage Existing Zones](#)
  - [Log Off](#)

Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
090830Y	NORTH ST	168	Gates	0	0	14,247.84	<a href="#">MODIFY</a>
090831F	"B" STREET	131	Gates	0	0	13,316.47	<a href="#">MODIFY</a>
090832M	WYOMING AVE	98	Gates	0	0	10,238.02	<a href="#">MODIFY</a>
090833U	BIGHORN AVE	32	Gates	0	0	6,531.47	<a href="#">MODIFY</a>

**Step by Step Instructions:**

**Step 1:** To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

**Step 2:** Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

**Step 3:** Repeat Step (2) until the [SELECT](#) button is shown at the bottom right side of this page. Note that the [SELECT](#) button is shown **ONLY** when the Quiet Zone Risk Index falls below the NSRT or the Risk Index with Horn.

**Step 4:** To save the scenario and continue, click the [SELECT](#) button

\* Only Public At Grade Crossings are listed.  
 Click for [Supplementary Safety Measures \[SSM\]](#)  
 Click for ASM spreadsheet: [ASM](#) \* Note: The use of ASMs requires an application to and approval from the FRA.

Summary	
<b>Proposed Quiet Zone:</b>	BASIN2
<b>Type:</b>	New 24-hour QZ
<b>Scenario:</b>	BASIN2_30234
<b>Estimated Total Cost:</b>	\$0.00
<b>Nationwide Significant Risk Threshold:</b>	18775 .00
<b>Risk Index with Horns:</b>	6644.75
<b>Quiet Zone Risk Index:</b>	<b>11083.45</b>
<a href="#">Select</a>	

Installing wayside horns at the four crossings on the above listing is an alternative to use of SSMs, inasmuch as the wayside horn is considered a one-for-one substitute for the train horn.

Installation of four sets of wayside horns at Basin would result in a capital cost estimated approximately at \$460,000. This figure should be compared with SSM options. Appendix A of the Phase 1 Study Report indicates that medians are not deemed feasible at any of the four Basin crossings. All crossings involve two-way streets, so the one-way street SSM is not feasible. That leaves four-quadrant gates. Even if the FRA Calculator shows that installation of four-quadrant gates at one intersection would reduce the QZRI to equal or less than the RIWH, this would be more expensive than installation of wayside horns at the four crossings.

As it turns out, application of four-quadrant gates to one Basin crossing is not sufficient to reduce the QZRI to a level equal or less than the RIWH. The FRA Calculator shows that two crossings would have to be fitted with four-quadrant gates. The FRA Calculator print-out showing this result is included in Appendix A of this Phase 2 Study Report; see Appendix A, page A-2. (The reader is warned to ignore the estimated costs shown on Appendix A print-outs, as these are believed to be out of date, and on the low side.)

Thus the Town of Basin has three options:

- (1) Install SSMs at every crossing. This option would require installation of four-quadrant gates at each of four crossings, for a total estimated cost of \$2,000,000. This option provides the most grade crossing protection.
- (2) Upgrade two-quadrant gates to four-quadrant gates at North Street and B Street, at an approximate cost of \$1,000,000.
- (3) Install wayside horns at all four crossings, at an approximate cost of \$460,000.

To all of those options must be added certain additional costs. For example, the installation of wayside horns requires flashing lights and gates, and constant warning time circuitry. Likewise these three items are required at each crossing in a quiet zone qualified by the addition of SSMs, whether the SSMs are installed at every crossing, or in the case where enough SSMs are added to reduce the Quiet Zone Risk Index. SSM-option quiet zones also require, at time of implementation, advance warning signs telling the motorist that the locomotive horn will not be sounded. Pavement markings are recommended at all grade crossings where practicable.

With regard to the four Basin crossings, Appendix A of the Phase 1 Study Report shows that pavement markings are required, at an estimated cost of \$1,000 per crossing. Each SSM crossing included in the quiet zone also will require, at time of implementation, an advance warning sign stating that no locomotive horn will be sounded, at an approximate cost of \$1,000. Thus an estimated \$8,000 must be added to Option (1) above (SSMs at every crossing), \$8,000 to Option (2), and \$4,000 to Option (3), wayside horns.

Basin summary: SSMs every crossing, \$2,008,000; or SSMs sufficient to reduce QZRI to level of RIWH, \$1,008,000; or wayside horns, \$464,000.

### **Application of Above-Described Methodology to Remaining Communities**

This Phase 2 Study applies the above methodology, summarized below, to the 34 communities designated by Wyoming Department of Transportation:

1. Review of Phase 1 data and field notes. In particular, Appendix A of the Phase 1 report provides, with regard to each crossing, the requisite equipment requirements and their costs, feasibility of quiet zone options (on an individual crossing basis), and a range of costs of options. Appendix B of the Phase 1 report provides a summary of estimated costs. (As is mentioned below at the appropriate places, a few corrections are made to data the appendices A and B of the Phase 1 report.)
2. Assemble crossings into a potential quiet zone with the aid of the FRA Quiet Zone Calculator.
3. Consider feasible low-cost solutions. Through an iterative process, apply SSMs to crossings until the QZRI is reduced to a level equal to or below the RIWH.
4. Assess the use of wayside horns as an option.
5. Describe feasible options and their estimated costs. Feasible options include the least cost option, whether SSM or wayside horns; the least cost SSM option; and the option which places a SSM at each grade crossing (if there is more than one public grade crossing).

### **Considerations**

It is important to understand the following, with regard to this Phase 2 Study.

The FRA Quiet Zone Calculator is based upon factors used to predict collisions, such as average annual daily traffic, number of trains per day, etc.<sup>18</sup> These factors are taken from the U.S. Department of Transportation Crossing Inventory

<sup>18</sup> FRA 2006 Final Rule, Appendix D to Part 222—Determining Risk Levels, page 47663.

File. The updating of this information, with regard to all grade crossings within a prospective quiet zone, is required by the 2006 FRA Final Rule<sup>19</sup> prior to qualification of a quiet zone. It is possible that the updating of this information could result in changes to Quiet Zone Calculator results.

As stated in the Scope of Services on page 2, Cheyenne has two rail corridors, which fact necessitates two different sets of calculations. This situation exists also in Laramie, where crossings 810427N and 810434Y are located on separate UP main line tracks. Thus RLBA necessarily recommends two quiet zones in each community.

There are two locations where four-quadrant gates are already in place, 245684D in Cheyenne, and 064975S in Gillette. The public authority may take risk reduction credit for a SSM that was previously implemented and is currently in place.<sup>20</sup> In using the FRA Quiet Zone Calculator in these instances, RLBA found that the existing four-quadrant gates are of significant help in reducing quiet zone implementation costs.

By federal regulation, the minimum length of a quiet zone is one-half mile, measured along the railroad right of way.<sup>21</sup> This will require, in many communities, that adjacent or consecutive public crossings be grouped into one quiet zone.

This Phase 2 Study does not resolve the issue of private crossings, defined as highway-rail grade crossings which are not public crossings. Public crossings are defined as crossings where a public highway, road or street crosses one or more railroad tracks at grade.<sup>22</sup> There are communities in which private crossings exist in the middle of prospective quiet zones, for example in Moorcroft and Torrington. Where there are private crossings in a prospective new quiet zone, they must be included in the quiet zone, and must be inspected by a diagnostic team and then equipped or treated in accordance with the team's recommendations, if the private crossings allow access to active industrial or commercial sites.<sup>23</sup> The point is that there may be other grade crossing improvements required, if private crossings are included in the quiet zone. The existence of private crossings has no effect on FRA Quiet Zone Calculator results.

Furthermore, this study does not consider pedestrian grade crossings (defined as a separate and designed sidewalk or pathway where pedestrians, but not vehicles, cross railroad tracks) that are located within quiet zones, which must be

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<sup>19</sup> FRA 2006 Final Rule, Appendix C to Part 222, Section II A.4., page 47654. (Also, the Rail Safety Improvement Act of 2008 (Public Law 110-432, enacted October 16, 2008), requires the updating of grade crossing data nationwide.)

<sup>20</sup> FRA 2006 Final Rule, Appendix C to Part 222, Section I B.3., page 47653.

<sup>21</sup> FRA 2006 Final Rule, Section 222.35 (a), page 47639.

<sup>22</sup> FRA 2006 Final Rule, Section 222.9 Definitions, page 47636.

<sup>23</sup> FRA 2006 Final Rule, Section 222.25, page 47638.

evaluated by a diagnostic team and equipped or treated in accordance with the team's recommendations.<sup>24</sup> (RLBA did not happen to see any pedestrian crossings during the course of its inspecting 84 grade crossings.)

The communities of Casper and Evansville are so close together that they might consider cooperating, and perhaps qualifying one single quiet zone, perhaps at less cost compared with separate quiet zones. As it turns out, there is a reduction in cost if the two communities put their crossings together and qualify one quiet zone for both communities.

The community of Lusk may wish to consider deleting the Airport Access crossing, 188627H, from its prospective quiet zone, since deleting that crossing would result in a considerably less expensive quiet zone.

## **Study Results by Community**

The following study results by community are shown in the same order in which the 84 quiet zone candidate crossings were provided to RLBA by Wyoming Department of Transportation, and this is the same order in which the Crossing Assessments are presented in Appendix A of the Phase 1 Study Report.

Where the FRA Quiet Zone Calculator was utilized, a printout of the results is included in Appendix A of this Phase 2 Study Report. These printouts are listed in the same order as the community results are presented below.

As stated above, the following study results by community will describe three options, where there are three feasible options: (1) the all-SSMs option, (2) the addition of SSMs to a multiple-crossing quiet zone until the QZRI is less than the RIWH, and (3) use of wayside horns where feasible.

### **Laramie (Albany County)**

The two Laramie crossings in this study, as mentioned above, are on different UP main line tracks, and therefore cannot be included in the same quiet zone. Inasmuch as each quiet zone has only one crossing, the options are straightforward.

Crossing 810434Y is at the entrance to Mountain Creek Cement Company. The Phase 1 assessment recommends wayside horns, and the only feasible SSM is four-quadrant gates. Thus those are the quiet zone options, with estimated costs of \$115,000 (wayside horns) and \$500,000 (four-quadrant gates). The

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<sup>24</sup> FRA 2006 Final Rule, Section 222.27, page 47638.

requirement for pavement markings adds approximately \$1,000 to each option. Advance warnings signs (\$1,000) would be required in the case of the SSM option only. Inasmuch as this is a one-crossing quiet zone, and a SSM is the improvement chosen, there is no need to use the FRA Quiet Zone Risk calculator because the SSM by definition reduces the risk at one crossing sufficiently to qualify the quiet zone. (Nor is the FRA Calculator's use appropriate for the wayside horn solution, since the wayside horn is not an installation that the Calculator recognizes.)

Crossing 810427N (County Road 22 (CR-218 on signal cabinet)) has a crossing configuration which allows medians. Thus the estimated quiet zone cost is \$60,000, plus \$1,000 for addition of pavement markings, and another \$1,000 for advance warning signs. There is no reason to select the four-quadrant gates option, since medians constitute a SSM. And again, there is no need to utilize the FRA Calculator where the solution is a SSM on a one-crossing quiet zone, or on a quiet zone where SSMs are installed at every crossing.

Laramie summary: The Mountain Creek Cement Company quiet zone has the options of four-quadrant gates, \$502,000, or wayside horns, \$116,000. The County Road 22 (or 218) quiet zone has one least cost and feasible option, the medians SSM, \$62,000.

### **Basin (Big Horn County)**

Basin quiet zone results are shown above under "Example, Using the Four Crossings at Basin (Big Horn County)".

Basin summary: SSMs at every crossing, \$2,008,000; or four-quadrant gates at North Street and B Street, \$1,008,000; or Wayside horns at all four crossings, \$464,000.

### **Deaver (Big Horn County)**

The two Deaver crossings, 091482B (State Highway 114) and 091483H (Central Avenue) are 0.15 mile apart, and should be included in the same quiet zone. Both crossings are amenable to the lowest-cost SSM, medians.

The option of installing SSMs at every crossing would therefore cost \$120,000, for medians at both crossings.

The FRA Quiet Zone Calculator shows that the QZRI can be reduced to a value below the RIWH by installation of medians at 091482B (State Highway 114). See Calculator print-out at page A-3, Appendix A. (Again, the reader is warned to ignore the estimated costs shown on Appendix A print-outs, as these are believed to be out of date, and on the low side.) Thus the least cost of a Deaver

quiet zone including both Deaver crossings is approximately \$60,000 for the SSM.

Wayside horns are not considered because less expensive medians are feasible at both crossings.

Both Deaver crossings, however, lack requisite equipment. At 091482B, gates and pavement markings are not present. At 091483H (Central Avenue), gates, constant warning time circuitry and pavement markings are not present. Thus requisite equipment will add an estimated \$654,000, including the requirement for advance warning signs. (\$654,000 is the sum of \$251,000 requisite equipment costs at State Highway 114 plus \$401,000 requisite equipment costs at Central Avenue, plus an additional \$2,000 total to cover advance warnings signs at the two crossings.)

Deaver summary: SSMs (medians) at both crossings, \$774,000; or medians at one crossing, \$714,000.

### **Frannie (Big Horn County)**

The recommendation for the single Frannie crossing, 091476X (4<sup>th</sup> Street), is wayside horns, at an estimated cost of \$115,000. Pavement markings are not required, given that 4<sup>th</sup> Street is not paved. Other requisite equipment exists. If the public authority desires to install a SSM at this crossing, four-quadrant gates is the only feasible SSM, at an estimated cost of \$500,000, plus the \$1,000 for advance warning signs.

Frannie summary: Four-quadrant gates, \$501,000; or wayside horns, \$115,000.

### **Greybull (Big Horn County)**

Phase 1 recommends, on an individual crossing basis (not on a multi-crossing quiet zone basis), installation of wayside horns at the two Greybull crossings, 091020K (13<sup>th</sup> Avenue) and 086338Y (5<sup>th</sup> Street). Installation of wayside horns at both crossings would cost an estimated \$230,000, to which should be added \$2,000 for pavement markings.

The only feasible SSM at either crossing is four-quadrant gates. Installation of four-quadrant gates at both crossings would cost an estimated \$1,000,000 for the four-quadrant gates. Adding \$4,000 for pavement markings and advance warning signs, the total for the all-SSM option is \$1,004,000.

Installation of four-quadrant gates at one of the two crossings, which should be sufficient to reduce the QZRI to a level below the RIWH, would cost approximately \$500,000, to which should be added \$4,000 for pavement markings and advance warning signs.



The FRA Quiet Zone Calculator verifies the supposition that four-quadrant gates at one crossing will reduce the QZRI to a level below the RIWH (see printout of Calculator results in Appendix A, page A-4). The four-quadrant gates would be placed at the crossing with the higher risk number, 086338Y (5<sup>th</sup> Street).

Greybull summary: Four-quadrant gates at both crossings, \$1,004,000; or four-quadrant gates at one crossing, \$504,000; or wayside horns at both crossings, \$232,000.

### **Lovell (Big Horn County)**

Phase 1 recommends, on an individual crossing basis (not on a multi-crossing quiet zone basis), wayside horns at the two Lovell crossings, 091498X (Hampshire Avenue) and 091500W (Shoshone Avenue).

Installation of wayside horns would cost approximately \$230,000 total for the two crossings. Inasmuch as the streets are not paved, pavement markings would not be required (this represents a change from the information provided, with regard to these two crossings, in Appendix A of the Phase 1 Study). However, crossing 091498X lacks flashing lights, gates, and multiple track constant warning time circuitry. This requisite equipment would require an additional \$500,000. Total, \$730,000.

The only feasible SSM, in the case of both crossings, is four-quadrant gates. Installation of SSMs at both crossings would cost \$1,000,000, to which \$500,000 would be added for requisite equipment, and another \$2,000 for advance warning signs. Total, \$1,502,000. Pavement markings are not required inasmuch as Hampshire Avenue and Shoshone Avenue are not paved at the crossing site.

Installation of SSMs sufficient to reduce the QZRI would mean four-quadrant gates at Shoshone Avenue (the higher risk crossing). Four-quadrant gates at Shoshone Avenue would bring the QZRI to a value below the RIWH (see printout in Appendix A, page A-5). Installation of this SSM would require approximately \$500,000, to which must be added an estimated \$2,000 for advance warning signs, and another \$500,000 for flashing lights, gates, and constant warning time circuitry at the Hampshire Avenue crossing. Total, \$1,002,000.

Lovell summary: SSMs at both crossings, \$1,502,000; or four-quadrant gates at Shoshone Avenue, \$1,002,000; or wayside horns at both crossings, \$730,000.

### **Manderson (Big Horn County)**

Crossing 090842T (Sherman Street) is the single crossing in Manderson which is considered. The recommendation for this crossing is medians, at an estimated

cost of \$60,000. There is no reason to consider other options, as this is an SSM and is the least expensive option. No requisite equipment is needed; one need add only \$1,000 for advance warning signs at time of quiet zone implementation. There is no need to use the FRA Quiet Zone Calculator, since there is but one crossing and one quiet zone, and the recommendation is an SSM.

Manderson summary: Medians, \$61,000.

### **Gillette (Campbell County)**

The six Gillette public crossings designated in this study lie on one eight-mile stretch of BNSF corridor. The Phase 1 Study Report's Appendix A, Crossing Assessments, shows medians "feasible and recommended" at four of the crossings, four-quadrant gates currently in place at one crossing (064975S, Brooks Avenue) and wayside horns at one crossing (064976Y, Burma Avenue). Given that the FRA 2006 Final Rule allows the public authority to take risk reduction credit for a SSM that was previously implemented and is currently in place, the starting point is the FRA web-based Quiet Zone Calculator, to determine whether the currently-installed four-quadrant gates at Brooks Avenue provide sufficient risk reduction to qualify a six-crossing quiet zone.

Use of the Calculator shows that the existing four-quadrant gates at 064975S (Brooks Avenue) plus installation of medians at 064969N (Potter Avenue) and 064970H (Garner Lake Road) will bring the QZRI down to a level below the RIWH, thus qualifying the quiet zone for the cost of two sets of medians, or approximately \$120,000. See page A-6, Appendix A. To this amount would be added requisite equipment costs of \$305,000, plus \$6,000 for advance warning signs. Total, \$431,000. This would be the least cost quiet zone option for Gillette.

Installation of SSMs at every Gillette public crossing could be done for an estimated \$746,000 for SSMs (four sets of medians, one set of four-quadrant gates at Burma Avenue) and advance warning signs, to which must be added the requisite equipment costs of \$305,000, for a total of \$1,051,000. This estimate includes no cost for the existing four-quadrant gates at Brooks Avenue.

Excluding the crossing at Brooks Avenue where four-quadrant gates are presently installed, it is feasible to install wayside horns at the other five Gillette intersections. This would cost \$575,000 for the wayside horn sets, to which \$300,000 would be added for constant warning time circuitry at 064969N (Potter Avenue) and 064976Y (Burma Avenue). Total: \$875,000.

Gillette summary: SSMs at every crossing, \$1,051,000; or SSMs added to reduce QZRI to at or below RIWH, \$431,000; or wayside horns at five crossings, \$875,000.

### **Medicine Bow (Carbon County)**

The Phase 1 Study recommendation for public grade crossing 810437U (County Road 1) in Medicine Bow is wayside horns. Estimated cost is \$115,000, plus the requisite equipment cost of \$1,000.

Should the public authority decide to install a SSM, four-quadrant gates is the only SSM deemed feasible. Cost is approximately \$500,000, to which would be added \$1,000 for pavement markings and an additional \$1,000 for advance warning signs at time of implementation.

Medicine Bow summary: Four-quadrant gates, \$502,000; or wayside horns, \$116,000.

### **Rawlins (Carbon County)**

The single public crossing examined in Rawlins is 810468T (County Road 605). The recommendation is medians, which would cost \$60,000, to which another \$1,000 would be added for advance warning signs. Inasmuch as this SSM would be the lowest cost solution, no other option is investigated.

Rawlins summary: Medians, \$60,000.

### **Douglas (Converse County)**

Three Douglas public grade crossings are examined: 089291R (Brownfield Road), 094931Y (Richards Street), and 089293E (Center Street). These three crossings lie within a 1.5 mile stretch of BNSF rail corridor through Douglas. The quiet zone improvements recommended (on a crossing-by-crossing basis) in Phase 1 are medians, in the case of the first two crossings, and wayside horns in the case of Center Street.

Douglas has the following options:

(1) SSMs at every crossing. This is the most expensive option, requiring medians at 089291R (Brownfield Road) and 094931Y (Richards Street), and four-quadrant gates at 089293E (Center Street). Estimated SSM costs are \$620,000, to which another \$302,000 must be added to provide constant warning time circuitry and pavement markings (requisite equipment), plus another \$3,000 for advance warning signs. Total, \$925,000.

(2) Using the FRA Calculator, addition of medians at Brownfield Road and Richards Street qualifies the three-crossing quiet zone at a cost of approximately \$120,000 for the two SSMs, plus \$302,000 for requisite equipment, plus another \$3,000 for advance warning signs. See Appendix A, page A-7. Total, \$425,000.

(3) Wayside horns are feasible at all three Douglas crossings. Three sets would cost \$345,000, to which \$302,000 would be added for requisite equipment. Total, \$647,000.

Douglas summary: SSMs at every crossing, \$925,000; or \$425,000 if SSMs are added enough to reduce the QZRI to a level at or below the RIWH; or wayside horns, \$647,000.

### **Moorcroft (Crook County)**

In the case of Moorcroft, Phase 1 recommends, on an individual crossing basis and not on a multi-crossing quiet zone basis, medians at 064950W (Shipwheel Road), and wayside horns at two crossings, 927512F (Yellowstone Avenue) and 064947N (Warbonnet Road).

Medians would cost approximately \$60,000, and two sets of wayside horns would cost an estimated total of \$230,000. Approximately half way between Shipwheel Road and Yellowstone Avenue, at Belle Fourche River Road, there exists a private crossing on this BNSF line. Therefore if there is to be one quiet zone (which is usually lower cost, compared with two), this private crossing, as mentioned earlier in this paper, must be inspected by a diagnostic team and then equipped or treated in accordance with the team's recommendations, if the private crossing allows access to active industrial or commercial sites. (The reader is reminded that RLBA did not look for private crossings in the assignment, but where one was seen, it was reported to Wyoming Department of Transportation.) The only requisite equipment requirement is pavement markings at 927512F (Yellowstone Avenue); estimated cost is \$1,000. Total cost of this wayside horns option, \$291,000.

Installation of SSMs at every crossing would require four-quadrant gates at Yellowstone Avenue and Warbonnet Road, and medians at Shipwheel Road. Total cost of this option would be approximately \$1,060,000 for installation of SSMs, plus approximately \$1,000 for pavement markings and another \$3,000 for advance warning signs. Total, \$1,064,000.

The FRA Quiet Zone Calculator shows that installation of medians at 064950W (Shipwheel Road) will reduce the QZRI to a level below the RIWH. See page A-8, Appendix A. Inasmuch as medians would cost an estimated \$60,000, plus requisite equipment and advance warning signs (additional \$4,000), this appears to be the low-cost solution to Moorcroft quiet zone qualification, at a total of \$64,000.

Moorcroft summary: SSMs at every crossing, \$1,064,000; or medians at Shipwheel Road, \$64,000; or wayside horns, \$291,000. In the first two cases, it should be understood that the private crossing mentioned above would have to be dealt with in accordance with the 2006 FRA Final Rule.

### **Fort Laramie (Goshen County)**

Three Fort Laramie public crossings are located on the same BNSF rail line, within a one-mile stretch. Phase 1 recommends, on an individual crossing basis (not on a multi-crossing quiet zone basis), medians at two crossings, 089243B (State Highway 160) and 089241M (Oil Storage Plant), and wayside horns at 089242U (South Laramie Avenue).

The option of SSMs at every crossing would require medians at the two crossings mentioned above, and four-quadrant gates instead of wayside horns at South Laramie Avenue, at a total estimated cost of \$620,000 for the SSMs. To this would be added requisite equipment costs of \$302,000, plus, at time of implementation advance warning signs for an estimated \$3,000. Overall total, \$925,000.

Another option, utilizing the FRA Quiet Zone Calculator, is a Fort Laramie quiet zone embracing the three public crossings, qualified by addition of medians at two crossings, 089243B (State Highway 160) and 089241M (Oil Storage Plant). See page A-9, Appendix A. The approximate total cost of SSMs at both crossings would be \$120,000. To this must be added requisite equipment upgrade costs of \$302,000, plus, at time of implementation, advance warning signs for an estimated \$3,000. Overall total for this option: \$425,000.

The wayside horns option would cost more, and is therefore not considered.

Fort Laramie summary: SSMs at every crossing, \$925,000, or sufficient SSMs to reduce QZRI to a level below the RIWH, \$425,000.

### **LaGrange (Goshen County)**

The three public crossings examined in LaGrange are within a one-mile stretch of the same UP line through the town. Because of intersection geometry or, in one case, a narrow gravel road, the least expensive quiet zone solution, on the crossing-by-crossing basis examined in Phase 1, is wayside horns at each crossing. This would cost an estimated total of \$345,000 for three sets of wayside horns, plus requisite equipment costs of \$1,201,000 (for gates, flashing lights, constant warning time circuitry and pavement markings, as indicated in Appendix A of the Phase 1 Study Report). Total for this option, \$1,546,000.

Another option, installation of SSMs at every crossing, would require four-quadrant gates at each crossing (other SSMs are not deemed feasible) at an estimated total cost of \$1,503,000, which includes advance warning signs, to which must be added the requisite equipment costs mentioned above, \$1,201,000. Total for this option, \$2,704,000.

Use of the FRA Quiet Zone Calculator shows that, in order to reduce the QZRI to a level at or below the RIWH, four-quadrant gates would be required (other SSMs are deemed not feasible) at two crossings, 816026J (1<sup>st</sup> Avenue) and 816028X (Highway 151). This somewhat surprising result – the requirement to add *two* SSMs – perhaps is a result of the very low risk indices at LaGrange crossings, which probably results from the comparatively low level of highway and railroad traffic at these crossings, as recorded in the U.S. DOT Crossing Inventory File. This option, installation of SSMs to the point where the QZRI is equal to or lower than the RIWH (see page A-10, Appendix A), would require approximately \$1,003,000 for installation of two four-quadrant gate systems plus advance warning signs, plus \$1,201,000 for the requisite equipment. Total, \$2,204,000.

LaGrange summary: SSMs at every crossing, \$2,704,000; or SSMs sufficient to reduce QZRI to at or below the RIWH, \$2,204,000; or wayside horns at every crossing, \$1,546,000.

### **Lingle (Goshen County)**

The single public crossing examined at Lingle is 089227S (Wyoming 156, or Main Street), and wayside horns are the Phase 1 Study recommendation. Thus the cost of a Lingle quiet zone would be \$115,000, to which another \$1,000 should be added for pavement markings. Total, \$116,000.

The SSM solution would have to be four-quadrant gates, at a cost of approximately \$502,000, which estimate includes pavement markings, and the advance warning signs which would have to be installed at time of implementation.

Lingle summary: SSM, \$502,000; or wayside horns, \$116,000.

### **Torrington (Goshen County)**

The six Torrington public crossings examined are all on the same four-mile stretch of BNSF track through the city. RLBA noticed at least one private crossing within this four-mile segment of track; thus, FRA requirements regarding private crossings would have to be followed if that crossing is to be included in a quiet zone.

The Phase 1 Crossing Assessment, which looks at individual crossings as opposed to inclusion of a group of crossings into one quiet zone, recommends wayside horns at five of the six crossings (089204K (County Road 171/RD 53D), 089205S (County Road 189/Lift Station Road), 089209U (C Street), 089210M (Radio Road) and 089211V (County Road)), and four-quadrant gates at the remaining crossing, 089208M (Main Street). The wayside horn is recommended

at the other five locations because of intersection geometry and other considerations.

One option would be to install SSMS at every crossing. This option could be implemented with four-quadrant gates at each intersection, at an estimated cost of \$3,006,000, which figure includes advance warning signs. Requisite equipment costs would add another \$156,000, for a total of \$3,162,000 for this option.

If wayside horns are installed at each intersection deemed feasible, plus four-quadrant gates on Main Street, this option would require an estimated \$1,076,000 plus another \$156,000 for requisite equipment. Total, \$1,232,000.

A third option, utilization of the FRA Quiet Zone Calculator, results in the requirement to install four-quadrant gates at two intersections (the two highest risk intersections are chosen), 089208M (Main Street) and 089209U (C Street), at an estimated cost of \$1,006,000 (includes advance warning signs at each of six crossings at time of implementation), to which would be added the \$156,000 for requisite equipment. See page A-11, Appendix A. Total, \$1,162,000.

Torrington summary: SSMS at every crossing, \$3,162,000; or addition of sufficient SSMS so as to reduce the QZRI to a level at or below the RIWH, \$1,162,000. The use of wayside horns as an option is not recommended because installation of SSMS at two crossings is less expensive and results in lower risk.

### **Thermopolis (Hot Springs County)**

Three public crossings in Thermopolis – 090462L (Shoshone Street), 090463T (Amoretti Street) and 090465G (Broadway) -- are located on a  $\frac{3}{4}$  mile stretch of the same BNSF line through that town, thus it makes sense to combine them into one quiet zone. Phase 1 recommends wayside horns at Shoshone Street and Amoretti Street, and four-quadrant gates at Broadway.

One option is to install SSMS at each crossing, and this would mean four-quadrant gates at all three crossings, since other SSMS are not deemed feasible. Cost of this option would be \$1,503,000, including advance warning signs at time of implementation, plus another \$402,000 in order to install requisite equipment, for a total of \$1,905,000.

The FRA Quiet Zone Calculator option requires four-quadrant gates at one intersection, and the highest risk intersection, 090465G (Broadway) is chosen. This brings the QZRI to a level below the RIWH (Appendix A, page A-12), thus qualifying the quiet zone at an estimated cost of \$503,000 (including advance

warning signs), to which should be added \$402,000 to install requisite equipment. Total, \$905,000.

The wayside horns option is not recommended, as it would cost more than the Quiet Zone Calculator option.

Thermopolis summary: SSMs at every intersection, \$1,905,000; or four-quadrant gates at Broadway, \$905,000.

### **Burns (Laramie County)**

Medians are feasible at the single public crossing examined at Burns, 817680H (Main Street). Since medians are the lowest cost solution, there is but one feasible option here, and the total cost would be \$62,000, which includes pavement markings and advance warning signs. Because use of SSMs at every crossing does not require use of the FRA Quiet Zone Calculator, it was not used.

Burns summary: medians, \$62,000.

### **Cheyenne (Laramie County)**

Three Cheyenne crossings are examined, 245684D (24<sup>th</sup> Street), 245617J (College Drive), and 810600N (Southwest Drive). Two of these crossings, 245684D and 245617J, are on the BNSF Front Range Subdivision and are almost three miles apart. The third crossing, 810600N, is located on Union Pacific's Wyoming Subdivision. As already stated, crossings on different rail lines must be treated as separate quiet zones. Phase 1 documents the existence of four-quadrant gates at 24<sup>th</sup> Street, recommends (on an individual crossing basis) medians at College Drive, and wayside horns at Southwest Drive.

BNSF line crossings (245684D and 245617J).

Four-quadrant gates are in place at 245684D (24<sup>th</sup> Street). It is likely that this will qualify this two-crossing quiet zone, so the FRA Quiet Zone Calculator is utilized. It turns out that, owing to the high risk index on College Drive, existing four-quadrant gates SSM at 24<sup>th</sup> Street are not sufficient to qualify a quiet zone. Addition of medians at College Drive reduces the QZRI to a level below the RIWH. See page A-13, Appendix A. This would cost approximately \$62,000 for the new SSM and advance warning signs, to which must be added \$1,000 for the addition of pavement markings on 24<sup>th</sup> Street. Total, \$63,000. This is the only recommended option for the BNSF line crossings, inasmuch as it is less expensive than the wayside horns option.

Cheyenne BNSF line summary: Add medians at College Drive, \$63,000.

Union Pacific line crossing (810600N).



At the single crossing on the Union Pacific line at Southwest Drive, either of two options is feasible: four-quadrant gates (\$500,000) or the wayside horn (\$115,000). To each option would be added the cost of pavement markings (\$1,000), and to the SSM option (four-quadrant gates) would be added the cost of advance warning signs (\$1,000).

Cheyenne Union Pacific line summary: SSM (four-quadrant gates), \$502,000; or wayside horns, \$116,000.

### **Pine Bluffs (Laramie County)**

The two designated Pine Bluffs crossings, 817675L (Main Avenue) and 817676T (Road 212), are located within a 1.25-mile stretch of Union Pacific main line. On an individual crossing basis, the Phase 1 Study recommends wayside horns at Main Avenue, and medians at Road 212.

As in other communities with multiple crossings, three potential options are considered: (1) SSMs at every crossing, (2) SSMs sufficient to reduce the QZRI to a level at or below the RIWH, and (3) wayside horns at each crossing where it is the least expensive option.

Under the first option, SSMs at every crossing, the SSMs would be four-quadrant gates at 817675L (Main Avenue), and medians at 817676T (Road 212), at an estimated cost of \$560,000, an additional \$2,000 for pavement markings, and an additional \$2,000 for advance warning signs at time of quiet zone implementation. Total, \$564,000.

The FRA Quiet Zone Calculator shows that addition of medians at Road 212 is insufficient to reduce the QZRI to a level at or below the RIWH. However, addition of four-quadrant gates at the other crossing, Main Avenue, sufficiently reduces the QZRI. See page A-14, Appendix A. The quiet zone cost under this option would be \$500,000 for four-quadrant gates, in addition to \$4,000 for requisite equipment (pavement markings) and advance warning signs. Total, \$504,000.

The third option, installation of wayside horns, is deemed feasible and would result in an estimated cost of \$230,000 for two wayside horn sets plus \$2,000 for pavement markings. Total, \$232,000.

Pine Bluffs summary: SSMs at both crossings, \$564,000; or addition of SSM (four-quadrant gates) at Main Avenue, \$504,000; or wayside horns at both crossings, \$232,000.

### **Cokeville (Lincoln County)**

On-site inspection of the single designated Cokeville public grade crossing, 807292G (Main Street) results in the recommendation that either wayside horns or four-quadrant gates are feasible. Wayside horns are recommended. The wayside horns option would cost an estimated \$115,000, to which should be added \$1,000 for pavement markings. The SSM option (four-quadrant gates) would cost \$500,000, plus \$1,000 for pavement markings and \$1,000 for advance warning signs. These appear to be the only feasible options.

Cokeville summary: SSM, \$502,000; or wayside horns, \$116,000.

### **Casper (Natrona County)**

Phase 1 recommendations for the two designated public crossings in Casper are medians at 089345U (Bryan Stock Trail) and wayside horn at 095107P (Hereford Lane). These two crossings are  $\frac{1}{4}$  mile apart on the same BNSF rail line. It appears that there may be sufficient distance between Hereford Lane and the nearest Evansville public grade crossing on the same BNSF rail line, 089342Y (Western Avenue) – another  $\frac{1}{4}$  mile – so that a  $\frac{1}{2}$ -mile-long quiet zone (the minimum length quiet zone) could be established separately by the community of Casper.

SSMs at every Casper crossing would mean a one-way-street-with-gates SSM at Hereford Lane, at an estimated cost of \$150,000, and medians at Bryan Stock Trail at an estimated \$60,000, to which should be added requisite equipment costs of \$401,000 (total for both crossings) plus \$2,000 for advance warning signs. Total for this option, \$613,000.

The FRA Quiet Zone Calculator shows a feasible quiet zone with the installation of medians at Bryan Stock Trail. See Calculator print-out at page A-15, Appendix A. This option would cost \$60,000, plus the above-mentioned requisite equipment costs and advance warning signs. Total for this option, \$463,000.

The wayside horn option also is considered feasible in Casper. Cost would be \$230,000 for two sets of wayside horns, plus requisite equipment costs for CWT at 095107P (Hereford Lane), \$150,000 for single track, and pavement markings at Bryan Stock Trail, \$1,000. Total, \$381,000.

Casper summary: SSMs at both crossings, \$613,000; or SSM at one crossing, \$463,000; or wayside horns at both crossings, \$381,000.

### **Evansville (Natrona County)**

Wyoming Department of Transportation designated five Evansville public grade crossings to be examined in this study. In the case of four of these crossings,

089341S (Curtis Street), 089340K (Evans Street), 089337C (Mystery Bridge Road/County 602), and 089336V (State Highway 253), the recommendation is medians. At the fifth crossing, 089342Y (Western Avenue), the recommendation is wayside horns.

Thus the all-SSM option results in installation of medians at the four crossings indicated above, and instead of wayside horns at Western Avenue, four-quadrant gates would be required, since wayside horns is not a SSM. Total for these five SSMs would be an estimated \$740,000, to which would be added \$854,000 for requisite equipment, plus another \$5,000 for the addition of advance warning signs at time of quiet zone implementation. Total, \$1,599,000.

The FRA Quiet Zone Calculator shows that the median SSM must be installed at three crossings, Mystery Bridge Road, Evans Street and Curtis Avenue, in order to reduce the QZRI to a level below the RIWH. See page A-16, Appendix A. Cost of three medians is estimated at \$180,000, to which must be added \$859,000 for requisite equipment and advance warning signs. Total, \$1,039,000.

The all wayside horns option is deemed feasible, and would cost an estimated \$575,000 for five sets of wayside horns, plus \$604,000 for CWT and pavement markings at four crossings. Total, \$1,179,000.

Evansville summary: SSMs at all crossings, \$1,599,000; or SSMs at enough crossings to reduce QZRI to level below RIWH, \$1,039,000; or wayside horns at each public crossing, \$1,179,000.

### **Casper-Evansville Combined Quiet Zone**

It is possible that combining Casper and Evansville crossings into one quiet zone could reduce total quiet zone costs for the two communities. The Hereford Lane public grade crossing in Casper is  $\frac{3}{4}$  mile from the Western Avenue crossing in Evansville. A combined quiet zone would contain seven public grade crossings over a four-mile stretch of the same BNSF rail corridor.

If SSMs are placed at every crossing, the quiet zone cost would be the sum of the costs of that option as stated above for Casper and Evansville.

By the same token, if wayside horns were placed at every crossing, the quiet zone cost also would be the sum of the costs of that option as stated above for Casper and Evansville.

It is the option of adding SSMs to the point where the QZRI is equal to or less than the RIWH that may result in a reduced total quiet zone cost. Using the FRA Quiet Zone Calculator, the QZRI may be reduced to a level below the RIWH with the addition of medians at the three highest-risk crossings, 089337C (Mystery Bridge Road), 089341S (Curtis Avenue) and 089345U (Bryan Stock Trail). See

page A-17, Appendix A. The first two crossings are in Evansville; Bryan Stock Trail is in Casper. The estimated cost of this quiet zone would be \$180,000 for the three median SSMs, plus \$1,255,000 upgrade costs for requisite equipment (including constant warning time circuitry, gates and pavement markings), plus an additional \$7,000 to install advance warning signs at time of implementation. Total, \$1,442,000. This is \$60,000 less than the total of the lowest-cost quiet zones if established separately by the two communities.

### **Lusk (Niobrara County)**

Wyoming Department of Transportation designated four public grade crossings to be examined in Lusk, 188627H (Airport Access), 188628P (Gun Club Road), 188630R (Third Avenue) and 188632E (Griffith Street). These four crossings are on a three-mile stretch of Union Pacific right of way through Lusk. The Phase 1 recommendations are medians at Airport Access and Third Avenue, and wayside horns at the other two crossings.

The SSMs at every crossing option would result in medians at Airport Access, four-quadrant gates at Gun Club Road, medians at Third Avenue, and four-quadrant gates at Griffith Street. Total SSM cost would be \$1,120,000, to which would be added \$404,000 for requisite equipment and another \$4,000 for advance warning signs. Total, \$1,528,000.

Using the FRA Quiet Zone Calculator, the addition of low cost SSM medians at the two crossings where they are feasible does not reduce the QZRI sufficiently. The SSM feasible at the other two crossings is four-quadrant gates. Thus the process is started anew with addition of four-quadrant gates at the highest risk crossing, Griffith Street. This does not reduce the QZRI sufficiently, therefore medians are added at one crossing. This action does reduce the QZRI to a level below the RIWH (see page A-18, Appendix A), and results in the least cost quiet zone which may be established under this option. Cost of SSMs is \$560,000, to which must be added \$404,000 for requisite equipment, and \$4,000 for advance warning signs. Total for this option, \$968,000.

Installation of wayside horns at every crossing would require approximately \$460,000 for four wayside horn sets, plus constant warning time circuitry (\$250,000, as there are two main tracks) at 188627H (Airport Access). Including pavement markings, the total for this option would be an estimated \$714,000.

Lusk summary: SSMs at all crossings, \$1,528,000; or SSMs at enough crossings to reduce QZRI to level below RIWH, \$968,000; or wayside horns, \$714,000.

## **Lusk Alternative**

Lusk may wish to consider leaving 188627H (Airport Access) out of the quiet zone. This airport access road was closed at the time of the RLBA inspection of that site; and the airport gate was locked. Also, this is a rural location, with only two residences in the vicinity, and those residences are approximately 100 yards and ¼ mile distant from the crossing. Finally, this crossing is at present protected only by crossbucks. There are no gates, no flashing lights and no constant warning time circuitry. Therefore to be included in a quiet zone, or even to have wayside horns installed, there would be the necessary expenditure of approximately \$401,000 just to upgrade the crossing with requisite equipment, before addition of SSMs or wayside horns.

The SSMs at every crossing option in this case would cost \$1,060,000, plus requisite equipment cost of \$3,000 for pavement markings, plus \$3,000 for advance warning signs. Total, \$1,066,000.

The SSMs-sufficient-to-reduce-QZRI in this case is tested using the FRA Quiet Zone Calculator, which shows that it is necessary to add four-quadrant gates at Griffith Street and medians at Third Avenue. See page A-19, Appendix A. This results in a cost of approximately \$560,000 for the two SSMs, to which must be added \$3,000 for pavement markings, and \$3,000 for advance warning signs. Total, \$566,000.

The wayside horns option in this case would require \$345,000 for wayside horn sets plus \$3,000 for the pavement markings, for a total of \$348,000.

Lusk Alternative summary: SSMs at all crossings, \$1,066,000; or SSMs at enough crossings to reduce QZRI to level below RIWH, \$566,000; or wayside horns, \$348,000.

Thus leaving the Airport Access crossing out of the quiet zone would reduce quiet zone costs \$366,000 to approximately \$348,000, in the case of the wayside horns option.

## **Chugwater (Platte County)**

One public grade crossing is examined at Chugwater, 245470L (Clay Avenue).

The SSM option deemed feasible at this single crossing is four-quadrant gates, in accordance with Phase 1 recommendations. Cost would be approximately \$500,000, to which another \$151,000 would be added for requisite equipment (constant warning time circuitry and pavement markings), and then another \$1,000 for advance warning signs. Total, \$652,000.

One other option is feasible at this location – wayside horns. Cost would be \$266,000, including constant warning time circuitry and pavements markings.

Chugwater summary: SSM, \$652,000; or wayside horns, \$266,000.

### **Glendo (Platte County)**

The two Glendo crossings are 089268W (A Street) and 089425M (5<sup>th</sup> Street), and they are separated by a 0.3 mile distance along the BNSF rail line. On an individual crossing basis, phase 1 recommends wayside horns at A Street and medians at 5<sup>th</sup> Street.

The all-SSMs option requires four-quadrant gates on A Street and medians on 5<sup>th</sup> Street, at a cost of \$560,000 for the SSMs, plus \$3,000 for advance warning signs, and pavement markings on 5<sup>th</sup> Street. Total, \$563,000.

The FRA Quiet Zone Calculator shows that installation of medians on 5<sup>th</sup> Street is not sufficient, and that installation of four-quadrant gates at A Street is sufficient, to reduce the QZRI. See page A-20, Appendix A. Cost would be \$500,000 plus another \$2,000 for advance warning signs, plus \$1,000 for pavement markings on 5<sup>th</sup> Street. Total, \$503,000.

Wayside horns at both crossing could be installed for a total of approximately \$230,000, plus \$1,000 for pavement markings. Total, \$231,000.

Glendo summary: SSMs at both crossings, \$563,000; or one SSM (four-quadrant gates) at A Street, \$503,000; or wayside horns at both crossings, \$231,000.

### **Wheatland (Platte County)**

The Phase 1 recommendation for all five Wheatland crossings -- 245488W (Cozad Road), 245489D (Cole Road), 245492L (Gilchrist Street), 245494A (Oak Street), and 245496N (North Road) -- is wayside horns. This is because insufficient roadway width, or intersection geometry, is not compatible with use of medians. The most expensive SSM, four-quadrant gates, is feasible at the five crossings.

The SSM at every crossing option would therefore cost approximately \$2,500,000, to which would be added \$1,204,000 for requisite equipment (constant warning time circuitry is lacking at all five crossings on this BNSF line, two of the crossings have multiple tracks (Gilchrist Street and Oak Street), and there are no gates or flashing lights at the Cozad Road crossing, 245488W. Another \$5,000 would be required for advance warning signs, for a total of \$3,709,000.

The FRA Quiet Zone Calculator shows that addition of four-quadrant gates at two crossings, Cole Road and Oak Street, will reduce the QZRI to a level below the RIWH. See page A-21, Appendix A. Cost would be approximately \$1,000,000 for the SSMs, to which \$1,204,000 would have to be added for requisite equipment, plus another \$5,000 for advance warning signs. Total, \$2,209,000.

The wayside horns option would require \$575,000 for the wayside horn sets, plus an additional \$1,204,000 for constant warning time circuitry, and flashing lights and gates at Cozad Road, and pavement markings at four crossings. Total, \$1,779,000.

Wheatland summary: All SSMs, \$3,709,000; or sufficient SSMs to reduce the QZRI, \$2,209,000; or wayside horns at all five crossings, \$1,779,000.

### **Clearmont (Sheridan County)**

Phase 1 recommends wayside horns for the single Clearmont crossing, 098898P (Meade Avenue).

The feasible SSM at this crossing is four-quadrant gates, at a cost of approximately \$500,000, plus \$251,000 for requisite equipment (CWT on two-track line, plus pavement markings), and another \$1,000 for advance warning signs. Total, \$752,000.

The wayside horns option would cost \$115,000, plus \$250,000 for constant warning time circuitry (two tracks), and \$1,000 for pavement markings. Total, \$366,000.

Clearmont summary: SSM, \$752,000; or wayside horns, \$366,000.

### **Ranchester (Sheridan County)**

The Phase 1 recommendations for Ranchester are wayside horns at 104151E (Coffeen Street) and medians at 104150X (County Road 120). The two crossings fall within a one-mile stretch of BNSF single-track line.

The SSMs at every crossing option would require four-quadrant gates at Coffeen Street, and medians at County Road 120, at a cost of \$560,000, plus requisite equipment costs of \$152,000 and an additional \$2,000 for advance warning signs. Total, \$714,000.

The FRA Quiet Zone Calculator shows that installation of four-quadrant gates on Coffeen Street is sufficient to reduce the QZRI to a level below the RIWH. See page A-22, Appendix A. This would cost an estimated \$500,000 for the SSM, plus requisite equipment costs of \$152,000, and an additional \$2,000 for advance warning signs. Total, \$654,000.

The wayside horns option would cost \$230,000 for horn sets, plus \$152,000 to install CWT and pavement markings. Total \$382,000.

Ranchester summary: SSMs at both crossings, \$714,000; or sufficient SSMs to reduce QZRI, \$654,000; or wayside horns, \$382,000.

### **Sheridan (Sheridan County)**

The single public grade crossing examined in Sheridan is 103877K (County Road 82), at BNSF railroad milepost (MP) 699.94. Phase 1 recommends wayside horns.

There are four BNSF tracks at the crossing, which is separated by 1.3 miles from a Sheridan quiet zone crossing, 104171R (5th Street), at MP 698.64. This observation is made because there are FRA 2006 Final Rule requirements regarding adjacent quiet zones as well as the minimum quiet zone length. It appears, from data provided by Wyoming Department of Transportation, that 103877K and 104171R are separated by no other public grade crossings. If this is so, they must be included in the same quiet zone. In other words, the existing quiet zone established around 104171R (5th Street) must be extended to include 103877K (County Road 82). This is because Section 222.35 of the 2006 Final Rule states that “multiple New Quiet Zones ... cannot be established on the same rail line within the boundaries of a single political jurisdiction unless they are separated by at least one public highway-rail grade crossing.”<sup>25</sup>

Thus RLBA assumes that 103877K (County Road 82) must be added to the existing quiet zone, qualified by the channelization SSM at 104171R (5th Street). Thus the option of SSMs at every crossing would require the addition of four-quadrant gates at County Road 82 at a cost of \$500,000, plus pavement markings, \$1,000, plus advance warning signs, \$1,000 . Total, \$502,000.

The FRA Quiet Zone Calculator shows that the existing channelization SSM at 104171R (5<sup>th</sup> Street) is sufficient to qualify a quiet zone including 103877K (County Road 82). See page A-23, Appendix A. The only additional cost would be pavement markings at County Road 82, plus advance warning signs when that crossing becomes included in the quiet zone. Total, \$2,000.

Installation of wayside horns at County Road 82 is feasible and would cost \$115,000. Adding pavement markings, the total would be \$116,000.

Sheridan summary: SSMs at both crossings, \$502,000; or addition of SSMs until QZRI is less than RIWH, \$2,000; or wayside horns, \$116,000.

<sup>25</sup> FRA 2006 Final Rule, 4. Rule Changes, Section 222.35, page 47620.



### **Granger (Sweetwater County)**

The single public crossing to be examined in Granger is 810480A. There is no street or road name shown on the U.S. DOT Crossing Inventory Information form, none on the signal cabinet, and none in the immediate vicinity of the crossing site. The crossing is on Union Pacific Railroad main line – three main line tracks and two other tracks. U.S. DOT Crossing Inventory Information shows 89 trains per day at this crossing.

Phase 1 recommends medians at this crossing. Cost would be \$60,000, to which would be added \$1,000 for pavement markings (on the paved side of the crossing) and \$1,000 for advance warning signs. Total, \$62,000. Other options are not considered as they would be more expensive.

Granger summary: medians, \$62,000.

### **Evanston (Uinta County)**

The single public crossing examined in Evanston is 810323G (County Road 111 and/or 65). The Phase 1 recommendation is wayside horns, which would cost \$115,000, to which would be added \$1,000 for pavement markings. Total, \$116,000.

The recommended SSM option is four-quadrant gates, at a cost of \$500,000, to which would be added \$1,000 for pavement markings and an additional \$1,000 for advance warning signs. Total, \$502,000.

Evanston summary: SSM (four-quadrant gates), \$502,000; or wayside horns, \$116,000.

### **Worland (Washakie County)**

The five public grade crossings in Worland are 099131E (Washakie Avenue), 090864T (Howell Street), 090866G (Culbertson Avenue), 090867N (Big Horn Avenue) and 924582K (Industrial Road). All are within a 1.5 miles segment of the same single-track BNSF Casper Subdivision rail line. The Phase 1 recommendations with regard to the individual crossings are wayside horns in the case of the three crossings on the south side (099131E, 090864T and 090866G), four-quadrant gates at 090867N (Big Horn Avenue) and medians at 924582K (Industrial Road).

The SSMs-at-all-crossings-option would place four-quadrant gates at four crossings and medians at the fifth (Industrial Road). Estimated cost is \$2,060,000 for the SSMs, to which would be added \$3,000 for pavement

markings at three crossings (Washakie Avenue is not paved), and another \$5,000 for advance warning signs. Total, \$2,068,000.

Use of the FRA Quiet Zone Calculator shows that a quiet zone including all five crossings may be qualified by placement of four-quadrant gates at 090867N (Big Horn Avenue) and medians at 924582K (Industrial Road). See page A-24, Appendix A. This would cost an estimated \$560,000, to which would be added \$3,000 for pavement markings at three crossings, and another \$5,000 for advance warning signs. Total, \$568,000.

Wayside horns are deemed feasible at all five crossings, provided they would be acceptable at 090867N (Big Horn Avenue), a downtown setting. Estimated cost would be \$575,000, to which would be added the \$3,000 for pavement markings at four crossings. Total, \$578,000.

Worland summary: All SSMs, \$2,068,000; or sufficient SSMs to reduce the QZRI, \$568,000; or wayside horns, \$578,000.

### **Newcastle (Weston County)**

Three public crossings in Newcastle are designated for evaluation, 064920E (Main Street), 064921L (Walker Avenue) and 064922T (Grove Avenue). Phase 1 recommends, on an individual crossing basis, four-quadrant gates at Main Street, and wayside horns at the other two crossings. These three public crossings lie within a 3/4 mile stretch of the same BNSF double-tracked main line through the community.

The all-SSM option requires four-quadrant gates at all intersections, since other SSMs are not deemed feasible. This would cost an estimated \$1,500,000, to which would be added \$3,000 for requisite equipment (pavement markings), and another \$3,000 for advance warning signs. Total: \$1,506,000.

The FRA Quiet Zone Calculator shows that installation of four-quadrant gates at 064922T (Grove Avenue) would reduce the QZRI to a level below the RIWH. See page A-25, Appendix A. Cost would be an estimated \$500,000, to which would be added \$3,000 for requisite equipment (pavement markings), and another \$3,000 for advance warning signs. Total: \$506,000.

Assuming wayside horns would be considered acceptable in the downtown setting of Main Street, wayside horns could be installed at the three crossings for a total of \$345,000, to which would be added another \$3,000 for requisite equipment (pavement markings). Total, \$348,000.

Newcastle summary: SSMs at all crossings, \$1,506,000; or SSMs sufficient to reduce the QZRI, \$506,000; or wayside horns at all three crossings, \$348,000.

## Summary

This Phase 2 Study provides, community by community, the options available for creation of quiet zones, or alternatively, if desired, installation of wayside horns where feasible.

A summary of costs by community is shown in Appendix B.

Inasmuch as this study does not include an investigation of the possible existence of additional public crossings which could have an effect upon quiet zone qualification, and also does not include a check for the existence of private or pedestrian crossings, which also may have an effect upon quiet zone qualification, it is recommended that these investigations be performed in any future pursuit of quiet zones in the communities studied.

## Appendix A

### FRA Quiet Zone Calculator Print-Outs

Included in this appendix are the FRA Quiet Zone Calculator print-outs in those cases where more than one public grade crossing is included in a prospective community quiet zone. Print-outs included in this appendix show the results where SSM(s) have been successfully applied, using the FRA Quiet Zone Calculator, to the point where the Quiet Zone Risk Index (QZRI) has been reduced to a level where it is equal to or less than the Risk Index with Horns (RIWH).

Where there is only one public grade crossing in the community, or where there are two prospective community quiet zones on two different rail lines (such as Laramie), each with only one crossing, no print-out is included because use of the FRA Quiet Zone Calculator is not appropriate.

Following is a listing of the communities where the Quiet Zone Risk Calculator was utilized. Print-outs for these communities follow this page.

- Basin (Big Horn County)
- Deaver (Big Horn County)
- Greybull (Big Horn County)
- Lovell (Big Horn County)
- Gillette (Campbell County)
- Douglas (Converse County)
- Moorcroft (Crook County)
- Fort Laramie (Goshen County)
- LaGrange (Goshen County)
- Torrington (Goshen County)
- Thermopolis (Hot Springs County)
- Cheyenne (Laramie County)
- Pine Bluffs (Laramie County)
- Casper (Natrona County)
- Evansville (Natrona County)
- Lusk (Niobrara County)
- Glendo (Platte County)
- Wheatland (Platte County)
- Ranchester (Sheridan County)
- Sheridan (Sheridan County)
- Worland (Washakie County)
- Newcastle (Weston County)

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Change Scenario: BASIN3\_30252

Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
090830Y	NORTH ST	168	Gates	0	4	2,564.61	<input type="button" value="MODIFY"/>
090831F	"B" STREET	131	Gates	0	4	2,396.96	<input type="button" value="MODIFY"/>
090832M	WYOMING AVE	98	Gates	0	0	10,238.02	<input type="button" value="MODIFY"/>
090833U	BIGHORN AVE	32	Gates	0	0	6,531.47	<input type="button" value="MODIFY"/>

**Step by Step Instructions:**

**Step 1:** To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

**Step 2:** Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

**Step 3:** Repeat Step (2) until the [SELECT](#) button is shown at the bottom right side of this page. Note that the [SELECT](#) button is shown **ONLY** when the Quiet Zone Risk Index falls below the NSRT or the Risk Index with Horn.

**Step 4:** To save the scenario and continue, click the [SELECT](#) button

\* Only Public At Grade Crossings are listed.  
 Click for [Supplementary Safety Measures \[SSM\]](#)  
 Click for ASM spreadsheet: [ASM](#) \* Note: The use of ASMs requires an application to and approval from the FRA.

Summary	
<b>Proposed Quiet Zone:</b>	BASIN3
<b>Type:</b>	New 24-hour QZ
<b>Scenario:</b>	BASIN3_30252
<b>Estimated Total Cost:</b>	\$200,000.00
<b>Nationwide Significant Risk Threshold:</b>	18775 .00
<b>Risk Index with Horns:</b>	6644.75
<b>Quiet Zone Risk Index:</b>	<b>5432.77</b>
<input type="button" value="Select"/>	

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Change Scenario: DEAVER2\_30265

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**Step 3:** Repeat Step (2) until the SELECT button is shown at the bottom right side of this page. Note that the SELECT button is shown ONLY when the Quiet Zone Risk Index falls below the NSRT or the Risk Index with Horn.

**Step 4:** To save the scenario and continue, click the SELECT button

Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
091482B	ST HWY 114	1268	Gates	0	13	3,525.83	MODIFY
091483H	CENTRAL AVE	496	Gates	0	0	11,991.12	MODIFY

\* Only Public At Grade Crossings are listed.  
 Click for [Supplementary Safety Measures \[SSM\]](#)  
 Click for ASM spreadsheet: ASM \* Note: The use of ASMs requires an application to and approval from the FRA.

Summary

<b>Proposed Quiet Zone:</b>	DEAVER2
<b>Type:</b>	New 24-hour QZ
<b>Scenario:</b>	DEAVER2_30265
<b>Estimated Total Cost:</b>	\$15,000.00
<b>Nationwide Significant Risk Threshold:</b>	18775 .00
<b>Risk Index with Horns:</b>	8878.97
<b>Quiet Zone Risk Index:</b>	7758.47

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Change Scenario: GREYBULL3\_30425

Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
086338Y	5TH ST SO	385	Gates	0	4	2,211.91	<input type="button" value="MODIFY"/>
091020K	13TH AVE N	211	Gates	0	0	10,893.55	<input type="button" value="MODIFY"/>

\* Only Public At Grade Crossings are listed.

[Click](#) for [Supplementary Safety Measures \[SSM\]](#)

[Click](#) for ASM spreadsheet:  \* Note: The use of ASMs requires an application to and approval from the FRA.

**Step by Step Instructions:**

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**Step 4:** To save the scenario and continue, click the [SELECT](#) button

Summary

<b>Proposed Quiet Zone:</b>	GREYBULL3
<b>Type:</b>	New 24-hour QZ
<b>Scenario:</b>	GREYBULL3_30425
<b>Estimated Total Cost:</b>	\$100,000.00
<b>Nationwide Significant Risk Threshold:</b>	18775 .00
<b>Risk Index with Horns:</b>	6949.02
<b>Quiet Zone Risk Index:</b>	<b>6552.73</b>

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Change Scenario: LOVELL\_30273

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Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
091498X	HAMPSHIRE AVE	61	Gates	0	0	2,522.02	MODIFY
091500W	SHOSHONE AVE	119	Gates	0	4	2,085.77	MODIFY

**Step by Step Instructions:**

**Step 1:** To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

**Step 2:** Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

**Step 3:** Repeat Step (2) until the [SELECT](#) button is shown at the bottom right side of this page. Note that the [SELECT](#) button is shown **ONLY** when the Quiet Zone Risk Index falls below the NSRT or the Risk Index with Horn.

**Step 4:** To save the scenario and continue, click the [SELECT](#) button

\* Only Public At Grade Crossings are listed.

Click for [Supplementary Safety Measures \[SSM\]](#)

Click for ASM spreadsheet: ASM \* Note: The use of ASMs requires an application to and approval from the FRA.

Summary	
<b>Proposed Quiet Zone:</b>	LOVELL
<b>Type:</b>	New 24-hour QZ
<b>Scenario:</b>	LOVELL_30273
<b>Estimated Total Cost:</b>	\$100,000.00
<b>Nationwide Significant Risk Threshold:</b>	18775 .00
<b>Risk Index with Horns:</b>	4229.51
<b>Quiet Zone Risk Index:</b>	2303.9

Select



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**Step 2:** Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

**Step 3:** Repeat Step (2) until the [SELECT](#) button is shown at the bottom right side of this page. Note that the [SELECT](#) button is shown **ONLY** when the Quiet Zone Risk Index falls below the NSRT or the Risk Index with Horn.

**Step 4:** To save the scenario and continue, click the [SELECT](#) button

Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
064969N	POTTER AVE	332	Gates	0	13	3,980.68	<input type="button" value="MODIFY"/>
064970H	GARNER LAKE RD	9593	Gates	0	13	23,460.17	<input type="button" value="MODIFY"/>
064975S	BROOKS AVE	4180	Gates	0	4	5,917.00	<input type="button" value="MODIFY"/>
064976Y	BURMA AVENUE	5048	Gates	0	0	34,348.77	<input type="button" value="MODIFY"/>
095097L	FOOTHILLS BLVD	497	Gates	0	0	19,411.73	<input type="button" value="MODIFY"/>
098836S	MCKENZIE ROAD	411	Gates	0	0	18,907.91	<input type="button" value="MODIFY"/>

\* Only Public At Grade Crossings are listed.

[Click](#) for [Supplementary Safety Measures \[SSM\]](#)

[Click](#) for ASM spreadsheet:  \* Note: The use of ASMs requires an application to and approval from the FRA.

Summary	
<b>Proposed Quiet Zone:</b>	Gillette7
<b>Type:</b>	New 24-hour QZ
<b>Scenario:</b>	GILLETTE7_30323
<b>Estimated Total Cost:</b>	\$130,000.00
<b>Nationwide Significant Risk Threshold:</b>	18775 .00
<b>Risk Index with Horns:</b>	24255.09
<b>Quiet Zone Risk Index:</b>	<b>17671.04</b>
<input type="button" value="Select"/>	

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Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
089291R	BROWNFIELD RD	2769	Gates	0	13	4,295.00	<input type="button" value="MODIFY"/>
089293E	CENTER ST	11290	Gates	0	0	37,533.44	<input type="button" value="MODIFY"/>
094931Y	RICHARDS ST	4774	Gates	0	13	4,625.62	<input type="button" value="MODIFY"/>

**Step by Step Instructions:**

**Step 1:** To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

**Step 2:** Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

**Step 3:** Repeat Step (2) until the [SELECT](#) button is shown at the bottom right side of this page. Note that the [SELECT](#) button is shown **ONLY** when the Quiet Zone Risk Index falls below the NSRT or the Risk Index with Horn.

**Step 4:** To save the scenario and continue, click the [SELECT](#) button

*\* Only Public At Grade Crossings are listed. Click for [Supplementary Safety Measures \[SSM\]](#)*

*Click for ASM spreadsheet:  \* Note: The use of ASMs requires an application to and approval from the FRA.*

Summary	
<b>Proposed Quiet Zone:</b>	DOUGLAS2
<b>Type:</b>	New 24-hour QZ
<b>Scenario:</b>	DOUGLAS2_30325
<b>Estimated Total Cost:</b>	\$30,000.00
<b>Nationwide Significant Risk Threshold:</b>	18775 .00
<b>Risk Index with Horns:</b>	16414.18
<b>Quiet Zone Risk Index:</b>	<b>15484.69</b>
<input type="button" value="Select"/>	

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Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
064947N	WARBONNET RD	41	Gates	0	0	19,867.21	<input type="button" value="MODIFY"/>
064950W	SHIPWHEEL RD	78	Gates	0	13	5,318.46	<input type="button" value="MODIFY"/>
927512F	NO NAME	100	Gates	0	0	634.42	<input type="button" value="MODIFY"/>

**Step by Step Instructions:**

**Step 1:** To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

**Step 2:** Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

**Step 3:** Repeat Step (2) until the [SELECT](#) button is shown at the bottom right side of this page. Note that the [SELECT](#) button is shown **ONLY** when the Quiet Zone Risk Index falls below the NSRT or the Risk Index with Horn.

**Step 4:** To save the scenario and continue, click the [SELECT](#) button

\* Only Public At Grade Crossings are listed.

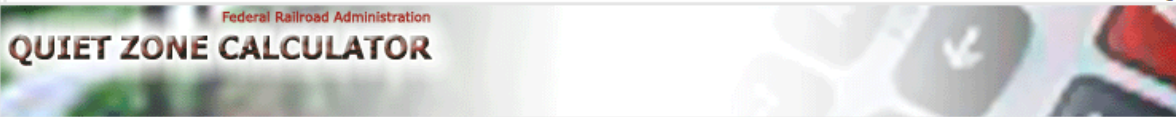
Click for [Supplementary Safety Measures \[SSM\]](#)

Click for ASM spreadsheet:  \* Note: The use of ASMs requires an application to and approval from the FRA.

Summary	
<b>Proposed Quiet Zone:</b>	MOORCROFT
<b>Type:</b>	New 24-hour QZ
<b>Scenario:</b>	MOORCROFT_30288
<b>Estimated Total Cost:</b>	\$15,000.00
<b>Nationwide Significant Risk Threshold:</b>	18775 .00
<b>Risk Index with Horns:</b>	9411.25
<b>Quiet Zone Risk Index:</b>	<b>8606.69</b>
<input type="button" value="Select"/>	

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Change Scenario: FORT LARAM\_30289

Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
089241M	OIL STORAGE PLANT	48	Gates	0	13	3,846.92	<input type="button" value="MODIFY"/>
089242U	S LARAMIE AVE	171	Gates	0	0	26,790.43	<input type="button" value="MODIFY"/>
089243B	STATE HWY 160	295	Gates	0	13	6,147.99	<input type="button" value="MODIFY"/>

**Step by Step Instructions:**

**Step 1:** To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

**Step 2:** Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

**Step 3:** Repeat Step (2) until the [SELECT](#) button is shown at the bottom right side of this page. Note that the [SELECT](#) button is shown ONLY when the Quiet Zone Risk Index falls below the NSRT or the Risk Index with Horn.

**Step 4:** To save the scenario and continue, click the [SELECT](#) button

\* Only Public At Grade Crossings are listed.

Click for [Supplementary Safety Measures \[SSM\]](#)

Click for ASM spreadsheet:  \* Note: The use of ASMs requires an application to and approval from the FRA.

Summary	
<b>Proposed Quiet Zone:</b>	FORT LARAMIE
<b>Type:</b>	New 24-hour QZ
<b>Scenario:</b>	FORT LARAM_30289
<b>Estimated Total Cost:</b>	\$30,000.00
<b>Nationwide Significant Risk Threshold:</b>	18775 .00
<b>Risk Index with Horns:</b>	15340.73
<b>Quiet Zone Risk Index:</b>	<b>12261.78</b>
<input type="button" value="Select"/>	

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Change Scenario:

Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
816026J	1ST AVE	160	Gates	0	4	23.52	<input type="button" value="MODIFY"/>
816027R	5TH AVE	15	Gates	0	0	76.46	<input type="button" value="MODIFY"/>
816028X	WYO 151	590	Gates	0	4	23.52	<input type="button" value="MODIFY"/>

**Step by Step Instructions:**

**Step 1:** To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

**Step 2:** Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

**Step 3:** Repeat Step (2) until the [SELECT](#) button is shown at the bottom right side of this page. Note that the [SELECT](#) button is shown **ONLY** when the Quiet Zone Risk Index falls below the NSRT or the Risk Index with Horn.

**Step 4:** To save the scenario and continue, click the [SELECT](#) button

\* Only Public At Grade Crossings are listed. [Click](#) for [Supplementary Safety Measures \[SSM\]](#)

[Click](#) for ASM spreadsheet:  \* Note: The use of ASMs requires an application to and approval from the FRA.

Summary	
<b>Proposed Quiet Zone:</b>	LAGRANGE
<b>Type:</b>	New 24-hour QZ
<b>Scenario:</b>	LAGRANGE_30290
<b>Estimated Total Cost:</b>	\$200,000.00
<b>Nationwide Significant Risk Threshold:</b>	18775 .00
<b>Risk Index with Horns:</b>	67.5
<b>Quiet Zone Risk Index:</b>	<b>41.17</b>
<input type="button" value="Select"/>	

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Change Scenario:

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**Step by Step Instructions:**

**Step 1:** To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

**Step 2:** Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

**Step 3:** Repeat Step (2) until the [SELECT](#) button is shown at the bottom right side of this page. Note that the [SELECT](#) button is shown **ONLY** when the Quiet Zone Risk Index falls below the NSRT or the Risk Index with Horn.

**Step 4:** To save the scenario and continue, click the [SELECT](#) button

Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
089204K	COUNTY ROAD 171	438	Gates	0	0	27,325.94	<input type="button" value="MODIFY"/>
089205S	COUNTY ROAD 189	393	Gates	0	0	26,608.88	<input type="button" value="MODIFY"/>
089208M	MAIN ST	10110	Gates	0	4	27,068.68	<input type="button" value="MODIFY"/>
089209U	C STREET	3198	Gates	0	4	9,656.25	<input type="button" value="MODIFY"/>
089210N	ROAD 149B KGOS RD	330	Gates	0	0	31,608.85	<input type="button" value="MODIFY"/>
089211V	COUNTY ROAD	663	Gates	0	0	30,210.25	<input type="button" value="MODIFY"/>

\* Only Public At Grade Crossings are listed.

**ALERT:** Quiet Zone qualifies because QZRI is less than Risk Index with Horns.

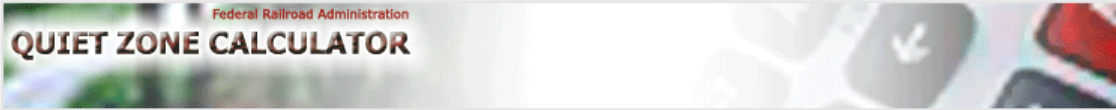
Click for [Supplementary Safety Measures \[SSM\]](#)

Click for ASM spreadsheet:  \* Note: The use of ASMs requires an application to and approval from the FRA.

Summary	
<b>Proposed Quiet Zone:</b>	TORRINGTON
<b>Type:</b>	New 24-hour QZ
<b>Scenario:</b>	TORRINGTON_30292
<b>Estimated Total Cost:</b>	\$200,000.00
<b>Nationwide Significant Risk Threshold:</b>	18775 .00
<b>Risk Index with Horns:</b>	31952.56
<b>Quiet Zone Risk Index:</b>	<b>25413.14</b>
<input type="button" value="Select"/>	

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Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
090462L	SHOSHONE ST	7	Gates	0	0	776.92	<a href="#">MODIFY</a>
090463T	AMORETTI ST	817	Gates	0	0	14,951.11	<a href="#">MODIFY</a>
090465G	BROADWAY ST	2472	Gates	0	4	3,592.06	<a href="#">MODIFY</a>

**Step by Step Instructions:**

**Step 1:** To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

**Step 2:** Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

**Step 3:** Repeat Step (2) until the [SELECT](#) button is shown at the bottom right side of this page. Note that the [SELECT](#) button is shown ONLY when the Quiet Zone Risk Index falls below the NSRT or the Risk Index with Horn.

**Step 4:** To save the scenario and continue, click the [SELECT](#) button

\* Only Public At Grade Crossings are listed.

[Click](#) for [Supplementary Safety Measures \[SSM\]](#)

[Click](#) for ASM spreadsheet: [ASM](#) \* **Note:**The use of ASMs requires an application to and approval from the FRA.

Summary	
<b>Proposed Quiet Zone:</b>	THERMOPOLIS
<b>Type:</b>	New 24-hour QZ
<b>Scenario:</b>	THERMOPOLI_30293
<b>Estimated Total Cost:</b>	\$100,000.00
<b>Nationwide Significant Risk Threshold:</b>	18775 .00
<b>Risk Index with Horns:</b>	7131.08
<b>Quiet Zone Risk Index:</b>	<b>6440.03</b>
<a href="#">Select</a>	

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Change Scenario:

Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
245617J	COLLEGE DR	4225	Gates	0	13	29,781.10	<input type="button" value="MODIFY"/>
245684D	24TH STREET	2667	Gates	0	4	3,835.58	<input type="button" value="MODIFY"/>

**Step by Step Instructions:**

**Step 1:** To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

**Step 2:** Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

**Step 3:** Repeat Step (2) until the [SELECT](#) button is shown at the bottom right side of this page. Note that the [SELECT](#) button is shown **ONLY** when the Quiet Zone Risk Index falls below the NSRT or the Risk Index with Horn.

**Step 4:** To save the scenario and continue, click the [SELECT](#) button

\* Only Public At Grade Crossings are listed.

**ALERT:** Quiet Zone qualifies because SSM has been applied in each crossing.

Click for [Supplementary Safety Measures \[SSM\]](#)

Click for ASM spreadsheet:  \* Note: The use of ASMs requires an application to and approval from the FRA.

Summary	
<b>Proposed Quiet Zone:</b>	CHEYENNE2
<b>Type:</b>	New 24-hour QZ
<b>Scenario:</b>	CHEYENNE2_30326
<b>Estimated Total Cost:</b>	\$115,000.00
<b>Nationwide Significant Risk Threshold:</b>	18775 .00
<b>Risk Index with Horns:</b>	51023.47
<b>Quiet Zone Risk Index:</b>	<b>16808.34</b>
<input type="button" value="Select"/>	



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Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
817675L	MAIN AVE	1192	Gates	0	4	23,004.31	<input type="button" value="MODIFY"/>
817676T	ROAD 212	861	Gates	0	0	60,537.00	<input type="button" value="MODIFY"/>

\* Only Public At Grade Crossings are listed.

**Step by Step Instructions:**

**Step 1:** To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

**Step 2:** Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

**Step 3:** Repeat Step (2) until the [SELECT](#) button is shown at the bottom right side of this page. Note that the [SELECT](#) button is shown **ONLY** when the Quiet Zone Risk Index falls below the NSRT or the Risk Index with Horn.

**Step 4:** To save the scenario and continue, click the [SELECT](#) button

**ALERT: Quiet Zone qualifies because QZRI is less than Risk Index with Horns.**

Click for [Supplementary Safety Measures \[SSM\]](#)

Click for ASM spreadsheet:  \* Note: The use of ASMs requires an application to and approval from the FRA.

Summary	
<b>Proposed Quiet Zone:</b>	PINE BLUFFS
<b>Type:</b>	New 24-hour QZ
<b>Scenario:</b>	PINE BLUFF_30334
<b>Estimated Total Cost:</b>	\$100,000.00
<b>Nationwide Significant Risk Threshold:</b>	18775 .00
<b>Risk Index with Horns:</b>	56456.45
<b>Quiet Zone Risk Index:</b>	<b>41770.65</b>
<input type="button" value="Select"/>	

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Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
089345U	BRYAN STOCK TRAIL	10071	Gates	0	13	5,412.07	<a href="#">MODIFY</a>
095107P	HEREFORD LN	1348	Gates	0	0	8,819.77	<a href="#">MODIFY</a>

**Step by Step Instructions:**

**Step 1:** To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

**Step 2:** Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

**Step 3:** Repeat Step (2) until the [SELECT](#) button is shown at the bottom right side of this page. Note that the [SELECT](#) button is shown **ONLY** when the Quiet Zone Risk Index falls below the NSRT or the Risk Index with Horn.

**Step 4:** To save the scenario and continue, click the [SELECT](#) button

\* Only Public At Grade Crossings are listed.

[Click](#) for [Supplementary Safety Measures \[SSM\]](#)

[Click](#) for ASM spreadsheet: [ASM](#) \* Note: The use of ASMs requires an application to and approval from the FRA.

Summary	
<b>Proposed Quiet Zone:</b>	CASPER
<b>Type:</b>	New 24-hour QZ
<b>Scenario:</b>	CASPER_30340
<b>Estimated Total Cost:</b>	\$15,000.00
<b>Nationwide Significant Risk Threshold:</b>	18775 .00
<b>Risk Index with Horns:</b>	10755.43
<b>Quiet Zone Risk Index:</b>	<b>7115.92</b>
<a href="#">Select</a>	

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Change Scenario:

Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
089336V	STATE HIGHWAY 253	1646	Gates	0	0	11,603.05	<input type="button" value="MODIFY"/>
089337C	MYSTERY BRIDGE RD	2017	Gates	0	13	2,907.04	<input type="button" value="MODIFY"/>
089340K	EVANS ST	1105	Gates	0	13	2,487.13	<input type="button" value="MODIFY"/>
089341S	CURTIS AVE	5195	Gates	0	13	3,688.16	<input type="button" value="MODIFY"/>
089342Y	WESTERN AVE	2020	Gates	0	0	12,499.28	<input type="button" value="MODIFY"/>

**Step by Step Instructions:**

**Step 1:** To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

**Step 2:** Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

**Step 3:** Repeat Step (2) until the [SELECT](#) button is shown at the bottom right side of this page. Note that the [SELECT](#) button is shown **ONLY** when the Quiet Zone Risk Index falls below the NSRT or the Risk Index with Horn.

**Step 4:** To save the scenario and continue, click the [SELECT](#) button

\* Only Public At Grade Crossings are listed.  
 Click for [Supplementary Safety Measures \[SSM\]](#)

Click for ASM spreadsheet:  \* Note: The use of ASMs requires an application to and approval from the FRA.

Summary	
<b>Proposed Quiet Zone:</b>	EVANSVILLE2
<b>Type:</b>	New 24-hour QZ
<b>Scenario:</b>	EVANSVILLE_30343
<b>Estimated Total Cost:</b>	\$45,000.00
<b>Nationwide Significant Risk Threshold:</b>	18775 .00
<b>Risk Index with Horns:</b>	8335.01
<b>Quiet Zone Risk Index:</b>	<b>6636.93</b>
<input type="button" value="Select"/>	

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Change Scenario:

Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
089336V	STATE HIGHWAY 253	1646	Gates	0	0	11,603.05	<input type="button" value="MODIFY"/>
089337C	MYSTERY BRIDGE RD	2017	Gates	0	13	2,907.04	<input type="button" value="MODIFY"/>
089340K	EVANS ST	1105	Gates	0	0	12,435.64	<input type="button" value="MODIFY"/>
089341S	CURTIS AVE	5195	Gates	0	13	3,688.16	<input type="button" value="MODIFY"/>
089342Y	WESTERN AVE	2020	Gates	0	0	12,499.28	<input type="button" value="MODIFY"/>
089345U	BRYAN STOCK TRAIL	10071	Gates	0	13	5,412.07	<input type="button" value="MODIFY"/>
095107P	HEREFORD LN	1348	Gates	0	0	8,819.77	<input type="button" value="MODIFY"/>

**Step by Step Instructions:**

**Step 1:** To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

**Step 2:** Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

**Step 3:** Repeat Step (2) until the [SELECT](#) button is shown at the bottom right side of this page. Note that the [SELECT](#) button is shown ONLY when the Quiet Zone Risk Index falls below the NSRT or the Risk Index with Horn.

**Step 4:** To save the scenario and continue, click the [SELECT](#) button

\* Only Public At Grade Crossings are listed. Click for [Supplementary Safety Measures \[SSM\]](#)

Click for ASM spreadsheet:  \* Note: The use of ASMs requires an application to and approval from the FRA.

Summary	
<b>Proposed Quiet Zone:</b>	CASPEREVANSVILLE
<b>Type:</b>	New 24-hour QZ
<b>Scenario:</b>	CASPEREVAN_30372
<b>Estimated Total Cost:</b>	\$45,000.00
<b>Nationwide Significant Risk Threshold:</b>	18775 .00
<b>Risk Index with Horns:</b>	9026.56
<b>Quiet Zone Risk Index:</b>	<b>8195</b>
<input type="button" value="Select"/>	

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Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
188627H	AIRPORT ACCESS	28	Gates	0	13	2,724.13	<a href="#">MODIFY</a>
188628P	GUN CLUB ROAD	79	Gates	0	0	11,893.90	<a href="#">MODIFY</a>
188630R	THIRD AVE	445	Gates	0	0	13,414.28	<a href="#">MODIFY</a>
188632E	GRIFFITH ST	610	Gates	0	4	3,709.92	<a href="#">MODIFY</a>

**Step by Step Instructions:**

**Step 1:** To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

**Step 2:** Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

**Step 3:** Repeat Step (2) until the [SELECT](#) button is shown at the bottom right side of this page. Note that the [SELECT](#) button is shown ONLY when the Quiet Zone Risk Index falls below the NSRT or the Risk Index with Horn.

**Step 4:** To save the scenario and continue, click the [SELECT](#) button

\* Only Public At Grade Crossings are listed.

[Click](#) for [Supplementary Safety Measures \[SSM\]](#)

[Click](#) for ASM spreadsheet: [ASM](#) \* Note: The use of ASMs requires an application to and approval from the FRA.

Summary	
<b>Proposed Quiet Zone:</b>	LUSK
<b>Type:</b>	New 24-hour QZ
<b>Scenario:</b>	LUSK_30374
<b>Estimated Total Cost:</b>	\$115,000.00
<b>Nationwide Significant Risk Threshold:</b>	18775 .00
<b>Risk Index with Horns:</b>	8923.78
<b>Quiet Zone Risk Index:</b>	<b>7935.55</b>
<a href="#">Select</a>	

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Change Scenario: LUSKALTERN\_30376

Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
188628P	GUN CLUB ROAD	79	Gates	0	0	11,893.90	<input type="button" value="MODIFY"/>
188630R	THIRD AVE	445	Gates	0	13	2,682.86	<input type="button" value="MODIFY"/>
188632E	GRIFFITH ST	610	Gates	0	4	3,709.92	<input type="button" value="MODIFY"/>

**Step by Step Instructions:**

**Step 1:** To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

**Step 2:** Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

**Step 3:** Repeat Step (2) until the [SELECT](#) button is shown at the bottom right side of this page. Note that the [SELECT](#) button is shown **ONLY** when the Quiet Zone Risk Index falls below the NSRT or the Risk Index with Horn.

**Step 4:** To save the scenario and continue, click the [SELECT](#) button

*\* Only Public At Grade Crossings are listed.*

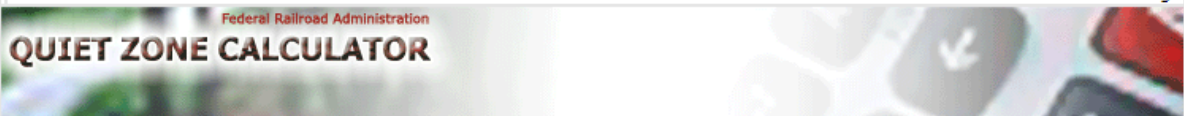
[Click](#) for [Supplementary Safety Measures \[SSM\]](#)

[Click](#) for ASM spreadsheet:  *\* Note: The use of ASMs requires an application to and approval from the FRA.*

Summary	
<b>Proposed Quiet Zone:</b>	LuskAlternative
<b>Type:</b>	New 24-hour QZ
<b>Scenario:</b>	LUSKALTERN_30376
<b>Estimated Total Cost:</b>	\$115,000.00
<b>Nationwide Significant Risk Threshold:</b>	18775 .00
<b>Risk Index with Horns:</b>	9176.42
<b>Quiet Zone Risk Index:</b>	6095.56
<input type="button" value="Select"/>	

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Change Scenario: GLEND0\_30391

Continue

Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
089268W	"A" STREET	870	Gates	0	4	8,051.13	MODIFY
089425M	5TH ST	17	Gates	0	0	634.42	MODIFY

**Create New Zone**

**Manage Existing Zones**

**Log Off**

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**Step by Step Instructions:**

**Step 1:** To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

**Step 2:** Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

**Step 3:** Repeat Step (2) until the [SELECT](#) button is shown at the bottom right side of this page. Note that the [SELECT](#) button is shown **ONLY** when the Quiet Zone Risk Index falls below the NSRT or the Risk Index with Horn.

**Step 4:** To save the scenario and continue, click the [SELECT](#) button

*\* Only Public At Grade Crossings are listed. Click for [Supplementary Safety Measures \[SSM\]](#)*

*Click for ASM spreadsheet: ASM \* Note: The use of ASMs requires an application to and approval from the FRA.*

Summary	
<b>Proposed Quiet Zone:</b>	GLEND0
<b>Type:</b>	New 24-hour QZ
<b>Scenario:</b>	GLEND0_30391
<b>Estimated Total Cost:</b>	\$100,000.00
<b>Nationwide Significant Risk Threshold:</b>	18775 .00
<b>Risk Index with Horns:</b>	13597.99
<b>Quiet Zone Risk Index:</b>	<b>4342.77</b>

Select

bx?zoneid=22837#

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**Step by Step Instructions:**

**Step 1:** To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

**Step 2:** Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

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**Step 4:** To save the scenario and continue, click the [SELECT](#) button

Change Scenario:

Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
245488W	COZAD RD	37	Gates	0	0	3,459.71	<input type="button" value="MODIFY"/>
245489D	COLE RD	1211	Gates	0	4	5,251.12	<input type="button" value="MODIFY"/>
245492L	GILCHRIST ST	1630	Gates	0	0	27,648.70	<input type="button" value="MODIFY"/>
245494A	OAK ST	1492	Gates	0	4	5,110.85	<input type="button" value="MODIFY"/>
245496N	NORTH RD	726	Gates	0	0	23,715.30	<input type="button" value="MODIFY"/>

\* Only Public At Grade Crossings are listed.

Click for [Supplementary Safety Measures \[SSM\]](#)

Click for ASM spreadsheet:  \* Note: The use of ASMs requires an application to and approval from the FRA.

Summary	
<b>Proposed Quiet Zone:</b>	WHEATLAND
<b>Type:</b>	New 24-hour QZ
<b>Scenario:</b>	WHEATLAND_30392
<b>Estimated Total Cost:</b>	\$200,000.00
<b>Nationwide Significant Risk Threshold:</b>	18775 .00
<b>Risk Index with Horns:</b>	13476.05
<b>Quiet Zone Risk Index:</b>	<b>13037.14</b>
<input type="button" value="Select"/>	



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Change Scenario: RANCHESTER\_30398

Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
104150X	COUNTY ROAD	112	Gates	0	0	22,617.79	<input type="button" value="MODIFY"/>
104151E	COFFEEN STREET	236	Gates	0	4	4,936.12	<input type="button" value="MODIFY"/>

**Step by Step Instructions:**

**Step 1:** To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

**Step 2:** Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

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**Step 4:** To save the scenario and continue, click the [SELECT](#) button

\* Only Public At Grade Crossings are listed.

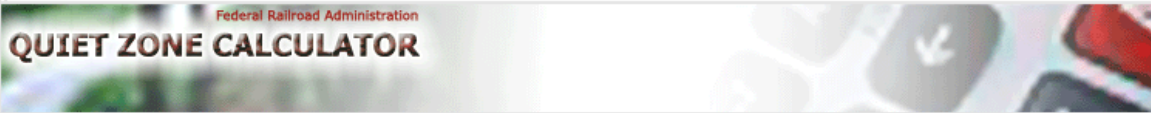
Click for [Supplementary Safety Measures \[SSM\]](#)

Click for ASM spreadsheet:  \* Note: The use of ASMs requires an application to and approval from the FRA.

Summary	
<b>Proposed Quiet Zone:</b>	RANCHESTER
<b>Type:</b>	New 24-hour QZ
<b>Scenario:</b>	RANCHESTER_30398
<b>Estimated Total Cost:</b>	\$100,000.00
<b>Nationwide Significant Risk Threshold:</b>	18775 .00
<b>Risk Index with Horns:</b>	15000.2
<b>Quiet Zone Risk Index:</b>	<b>13776.95</b>
<input type="button" value="Select"/>	

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- [Change Scenario: SHERIDAN\\_30441](#)
- [Continue](#)
- [Create New Zone](#)
- [Manage Existing Zones](#)
- [Log Off](#)

Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
103877K	COUNTY ROAD	258	Gates	0	0	21,983.56	<a href="#">MODIFY</a>
104171R	5TH ST/WYO 336	9002	Gates	0	12	11,121.88	<a href="#">MODIFY</a>

**Step by Step Instructions:**

**Step 1:** To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

**Step 2:** Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

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**Step 4:** To save the scenario and continue, click the [SELECT](#) button

\* Only Public At Grade Crossings are listed.

Click for [Supplementary Safety Measures \[SSM\]](#)

Click for ASM spreadsheet: [ASM](#) \* Note: The use of ASMs requires an application to and approval from the FRA.

Summary	
<b>Proposed Quiet Zone:</b>	SHERIDAN
<b>Type:</b>	New 24-hour QZ
<b>Scenario:</b>	SHERIDAN_30441
<b>Estimated Total Cost:</b>	\$13,000.00
<b>Nationwide Significant Risk Threshold:</b>	18775 .00
<b>Risk Index with Horns:</b>	19925.39
<b>Quiet Zone Risk Index:</b>	<b>16552.72</b>
<a href="#">Select</a>	

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Change Scenario:

Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
090864T	HOWELL STREET	581	Gates	0	0	7,239.71	<input type="button" value="MODIFY"/>
090866G	CULBERTSON AVE	1837	Gates	0	0	16,457.20	<input type="button" value="MODIFY"/>
090867N	BIG HORN AVE	7290	Gates	0	4	5,787.08	<input type="button" value="MODIFY"/>
099131E	WASHAKIE AVE	192	Gates	0	0	11,855.42	<input type="button" value="MODIFY"/>
924582K	INDUSTRIAL ROAD	70	Gates	0	13	1,719.59	<input type="button" value="MODIFY"/>

**Step by Step Instructions:**

**Step 1:** To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

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**Step 4:** To save the scenario and continue, click the [SELECT](#) button

\* Only Public At Grade Crossings are listed.

[Click](#) for [Supplementary Safety Measures \[SSM\]](#)

[Click](#) for ASM spreadsheet:  \* Note: The use of ASMs requires an application to and approval from the FRA.

Summary	
<b>Proposed Quiet Zone:</b>	WORLAND
<b>Type:</b>	New 24-hour QZ
<b>Scenario:</b>	WORLAND_30414
<b>Estimated Total Cost:</b>	\$115,000.00
<b>Nationwide Significant Risk Threshold:</b>	18775 .00
<b>Risk Index with Horns:</b>	9148.77
<b>Quiet Zone Risk Index:</b>	<b>8611.8</b>
<input type="button" value="Select"/>	

spx?zoneid=22857#

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- [Change Scenario: NEWCASTLE\\_30416](#)
- [Continue](#)
- [Create New Zone](#)
- [Manage Existing Zones](#)
- [Log Off](#)

Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
064920E	MAIN STREET	5180	Gates	0	0	69,942.42	<a href="#">MODIFY</a>
064921L	WALKER AVE	735	Gates	0	0	44,912.69	<a href="#">MODIFY</a>
064922T	GROVE AVE	783	Gates	0	4	21,698.01	<a href="#">MODIFY</a>

**Step by Step Instructions:**

**Step 1:** To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

**Step 2:** Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

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**Step 4:** To save the scenario and continue, click the [SELECT](#) button

\* Only Public At Grade Crossings are listed.

**ALERT: Quiet Zone qualifies because QZRI is less than Risk Index with Horns.**

Click for [Supplementary Safety Measures \[SSM\]](#)

Click for ASM spreadsheet: [ASM](#) \* Note: The use of ASMs requires an application to and approval from the FRA.

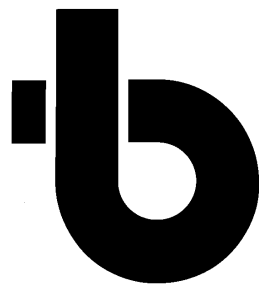
Summary	
<b>Proposed Quiet Zone:</b>	NEWCASTLE
<b>Type:</b>	New 24-hour QZ
<b>Scenario:</b>	NEWCASTLE_30416
<b>Estimated Total Cost:</b>	\$100,000.00
<b>Nationwide Significant Risk Threshold:</b>	18775 .00
<b>Risk Index with Horns:</b>	47042.28
<b>Quiet Zone Risk Index:</b>	<b>45517.7</b>
<a href="#">Select</a>	

**Appendix B**

**Costs by Community**

<u>County</u>	<u>Town</u>	<u>Option Costs (\$000)</u>			<u>Least Cost</u>
		<u>All SSMs</u>	<u>SSM reduc. of QZRI</u>	<u>Wayside Horns</u>	<u>Option (\$000)</u>
Albany	Laramie 1	502	NA	116	116
	Laramie 2	62	NA	NA	62
Big Horn	Basin	2008	1008	464	464
	Deaver	774	714	NA	714
	Frannie	501	NA	115	115
	Greybull	1004	504	232	232
	Lovell	1502	1002	730	730
	Manderwson	61	NA	NA	61
	Gillette	1051	431	875	431
Campbell	Medicine Bow	502	NA	116	116
	Rawlins	60	NA	NA	60
Converse	Douglas	925	425	647	425
Crook	Moorcroft	1064	64	291	64
Goshen	Fort Laramie	925	425	NA	425
	LaGrange	2704	2204	1546	1546
	Lingle	502	NA	116	116
	Torrington	3162	1162	NA	1162
	Thermopolis	1905	905	NA	905
Hot Springs	Burns	62	NA	NA	62
	Cheyenne 1	63	NA	NA	63
	Cheyenne 2	502	NA	116	116
	Pine Bluffs	564	504	232	232
	Cokeville	502	NA	116	116
Lincoln	Casper	613	463	381	381
	Evansville	1599	1039	1179	1039
	Casper-Evansville	2212	1442	1560	1442
Natrona	Lusk	1528	968	714	714
	Lusk Alternative	1066	566	348	348
Platte	Chugwater	652	NA	266	266
	Glendo	563	503	231	231
	Wheatland	3709	2209	1779	1779
Sheridan	Clearmont	752	NA	366	366
	Ranchester	714	654	382	382
	Sheridan	502	2	116	2
Sweetwater	Granger	62	NA	NA	62
Uinta	Evanston	502	NA	116	116
Washakie	Worland	2068	568	578	568
Weston	Newcastle	1506	506	348	348
					\$ 14,587

Note: Where alternative quiet zone are suggested (Casper-Evansville combined, and Lusk Alternative), their estimated costs are not included in the Least Cost Option column.



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