



**BOLTON
& MENK**

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December 8, 2016

DRAFT

Honorable Mayor and Council
City of Muscatine

Muscatine, Iowa

RE: Canadian Pacific Railroad Quiet Zone Investigation
Project No.: A13.112405
Engineering Report

Dear Mayor and Council:

This letter is a presentation of the Engineering report of the proposed railroad crossing safety improvements within the City of Muscatine.

1.0 Executive Summary

Bolton & Menk has completed the preliminary investigations for the Quiet Zone (QZ) Feasibility Study along the Canadian Pacific (CP) mainline track within the community. The area included in the study runs along Mississippi Drive from Hershey Avenue to Mad Creek, as shown in Attachment A.

The work has included multiple meetings with City staff and affected parties and one meeting with the Canadian Pacific representative responsible for Quiet Zone community coordination. Data collection included the physical inventory of each crossing using city provided aerial photography and field observations of existing conditions.

Various alternatives were considered during the study phase. Based on previous experience, improvements were selected to minimize the City's costs while meeting the minimum safety requirements established per Federal Railroad Administration (FRA) criteria. Safety measures typically include some mixture of the following:

- Medians or Channelization devices
- One-way streets with gates
- Four-quadrant gates
- Crossing closures

Safety Improvements recognized by the FRA fall into 2 categories;

Supplementary Safety Measures (SSM's) – Pre-approved risk reduction engineering treatments installed that maximize safety benefits and minimize risk.

Alternative Safety Measures (ASM's) – Safety Improvements that while not fully meeting the requirements are used to reduce risk, ASM's must be submitted to FRA for consideration of approval which may take several months and are subject to an annual review of the ASM's effectiveness.

The recommended method for creating a Quiet Zone is to install SSM's at each public crossing within the corridor being considered. This reduces the risk significantly for the users of the highway/rail crossing. However, this installation is not practical in most communities, which then requires the investigator to consider what is feasible at each crossing. Factors include:

- Is the crossing private or public
- Traffic volumes
- Location of adjacent driveways; commercial and residential
- Adjacent land uses
- Distance to adjacent side streets from the crossing]
- Condition of the crossing, location of gate arms and signals
- Width of crossing pads
- Roadway and right of way widths
- Sidewalk locations and pedestrian movements

The corridor studied for your QZ extends from Hershey Avenue on the west to Mad Creek on the east. The study area includes two public street crossings and four public pedestrian trail crossings. The total length of the QZ, if implemented, is approximately 1 mile in length. (Figure A)

We have proposed an initial and final option for upgrading the crossings to create a quiet zone.

The initial option includes the installation of temporary measures on four crossings: the street crossings at Iowa and Cedar Streets, and the pedestrian crossings at Chestnut and Sycamore Streets. These temporary measures will meet the quiet zone requirements while the Mississippi Drive improvements are being constructed.

Once this construction is complete and the new four-quadrant gates are installed at the Iowa and Cedar crossings the final QZ can be implemented. These will be a substantial upgrade from the existing gate configuration in terms of safety and quiet zone rating. Improvements will also be installed at four pedestrian crossings, which will include crossings at Hershey Avenue and Mad Creek.

Installation of the initial and final improvements will be phased to accommodate vehicular and pedestrian traffic to Riverside Park and nearby businesses. The four quadrant gates will be installed approximately 14-18 months after approval by the railroad.

Improvements are proposed for consideration at the Canadian Pacific crossings to meet local safety conditions.

Iowa Street – We have provided an initial and final option for this crossing. Initially Iowa Street will be allowed to stay open to two-way traffic while meeting QZ requirements. The permanent solution would include the installation of four quadrant gates after the crossing is reconstructed as part of the Mississippi Drive corridor improvement project. The Mississippi Drive project is proposed to be complete at Iowa Avenue prior to implementing this initial option.

Cedar Street – We have provided an initial and final option for this crossing. The initial option would consist of converting the Cedar Street crossing to a one-way street into the Riverside Park parking lot. The partial closure of this crossing is required in order for the corridor to meet QZ requirements during the initial phase. The permanent solution would include the installation of four quadrant gates after the crossing is reconstructed as part of the Mississippi Drive corridor reconstruction.

Appendix I – Crossing Improvement Matrix summarizes the feasibility of completing the implementation of the QZ based on the level of safety measures installed at each crossing in the corridor.

The following is a detailed description of the individual improvements considered at each crossing.

2.0 **Introduction**

The City of Muscatine requested Bolton & Menk, Inc. to prepare this Engineering Report of railroad safety improvements for six public railroad crossings on the Canadian Pacific Railroad mainline tracks. The crossings evaluated in this report are shown in Attachment A and include:

- Hershey Avenue pedestrian crossing
- Chestnut Street pedestrian crossing (FRA 607207M)
- Iowa Street (FRA 607206F)
- Sycamore Street pedestrian crossing (FRA 607205Y)
- Cedar Street (FRA 607204S)
- Mad Creek pedestrian crossing

The quiet zone calculation analysis includes updated traffic and train counts for each crossing. These counts will be updated in the FRA's inventory; Bolton & Menk has submitted the proper forms to update the inventory at each crossing. Currently the Hershey Avenue and Mad Creek crossings are not listed in the FRA's crossing inventory, and therefore cannot be used in the initial QZ calculations. Bolton & Menk has also submitted the forms to add these crossings to the inventory. If these two crossings are included in the inventory prior to construction, this will allow us to include them in the initial phase.

This report will provide the recommendations for improvements at these intersections to allow Muscatine to begin the process of establishing a Quiet Zone (QZ) on the Canadian Pacific mainline.

3.0 Recommended Improvements

3.1 Hershey Avenue Pedestrian Crossing (Attachment B)

The existing pedestrian railroad crossing at Hershey Avenue is an 11 foot wide asphalt trail and an at-grade crossing with 6 foot asphalt approaches both east and west of the crossing. The pavement condition of the asphalt trail and approaches are sufficient for the improvements recommended in this report.

The improvements recommended for this crossing include installing new fencing to create a 4 foot wide chicane pedestrian path on both sides of the crossing, as shown on Attachment B. Detectable warnings will be installed at the approaches to comply with ADA requirements, with 50 feet of fencing on each side of the trail on both sides of the crossing.

These improvements would be for increased safety at the crossing, but would not improve the quiet zone rating because it does not meet the requirements of an approved supplementary safety measure (SSM) and would be considered “open” for the quiet zone calculations.

3.2 Chestnut Street Pedestrian Crossing (Attachment C)

The existing pedestrian railroad crossing south of the Chestnut St. and Mississippi Drive intersection is a 10 foot wide concrete trail on the south side and a 6 foot wide concrete trail with a 10 foot asphalt approach on the north side of the crossing.

There is an initial and permanent option being considered for this pedestrian crossing, as shown in Attachment C. The initial option would include temporarily closing the pedestrian crossing from both sides with Type III barricades and safety fencing. The closure of this pedestrian crossing is not required to meet QZ requirements during the initial phase, but is included as an option should the City wish to close the crossing as a precaution during reconstruction of the Mississippi Drive corridor.

The permanent improvements would include installing fencing to create a 4 foot wide chicane pedestrian path on the south side of the crossing. A new pedestrian ramp and stair combination that meets ADA requirements will be constructed on the north side of the crossing as a part of the Mississippi Drive corridor reconstruction project. Fencing will be configured on this ramp to create a chicane pedestrian path leading up to the railroad crossing. Detectable warnings will be installed on both approaches, and new fencing will be installed along the 10 foot pedestrian path on the south side of the crossing.

These improvements would be for increased safety at the crossing, but would not improve the quiet zone rating because it does not meet the requirements of an approved supplementary safety measure (SSM) and would be considered “open” for the quiet zone calculations.

3.3 Iowa Street (Attachment D)

The railroad crossing on Iowa Street is a 51 foot wide asphalt street with at-grade crossing on both sides of the crossing. This crossing mainly includes local traffic patterns and limited heavy vehicles. This crossing is located on one of two accesses to the Riverside Park parking lot, with Cedar Street serving as the second access. The crossing is currently served by a two quadrant gate configuration. There are sidewalks on both sides of the crossing. Both accesses are planned to be reconstructed as part of the Mississippi Drive corridor reconstruction project. A new hotel is under construction in this location.

Attachment D displays the proposed initial and permanent configurations at the Iowa Street crossing. During the initial QZ improvements, Iowa Street will remain open to its current traffic configuration, while the Cedar Street crossing will be reduced to one-way traffic into the parking lot. Leaving the Iowa Street crossing open as-is will meet QZ requirements provided the Cedar Street one-way conversion is implemented properly.

Following the reconstruction of the Iowa Street crossing during the Mississippi Drive project, new four-quadrant gates will be installed at the crossing. The sidewalks on both sides of the crossing will be reconstructed to meet ADA & FRA requirements. The upgrade to four quadrant gates from the existing two quadrant configuration will improve the overall rating of the quiet zone. Construction of the Iowa and Cedar Street crossings will be staged to maintain access to the hotel and Riverside Park at all times.

3.4 Sycamore Street Pedestrian Crossing (Attachment E)

The existing pedestrian crossing south of the Sycamore St. and Mississippi Drive intersection is a 10 foot wide concrete trail with an 8 foot wide asphalt approach on the south side and a 10 foot wide concrete trail with steps and a 6 foot wide asphalt approach on the north side of the crossing. There is an initial and permanent option being considered for this pedestrian crossing, as shown in Attachment E. The initial option would include closing the pedestrian crossing from both sides with Type III barricades and safety fencing. The closure of this pedestrian crossing is not required to meet QZ requirements during the initial phase, but is included as an option should the City wish to close the crossing as a precaution during reconstruction of the Mississippi Drive corridor.

The permanent improvements would include installing fencing to create a 4 foot wide chicane pedestrian path on the south side of the crossing. A new pedestrian ramp and stair combination that meets ADA requirements will be constructed on the north side of the crossing as a part of the Mississippi Drive corridor reconstruction project. Fencing will be configured on this ramp to create a chicane pedestrian path leading up to the railroad crossing. Detectable warnings will be installed on both approaches, and new fencing will be installed along the 10 foot pedestrian path on the south side of the crossing.

These improvements would be for increased safety at the crossing, but would not improve the quiet zone rating because it does not meet the requirements of an approved supplementary safety measure (SSM) and would be considered "open" for the quiet zone calculations.



3.5 Cedar Street (Attachment F)

The railroad crossing on Cedar Street is a 41 foot wide asphalt street with at-grade crossing on both sides of the crossing. This crossing mainly includes local traffic patterns and limited heavy vehicles. This crossing is located on one of two accesses to the Riverside Park parking lot, Iowa Street being the other access. The existing crossing is served by a two quadrant gate configuration. There are sidewalks on both sides of the crossing. This crossing will be reconstructed as part of the Mississippi Drive corridor reconstruction project.

Attachment F displays the proposed initial and permanent configurations at the Cedar Street crossing. During the initial phase, traffic at the Cedar Street crossing will be limited to one-way traffic into the parking lot; this will be necessary in order to meet QZ requirements during the initial phase. Concrete barriers will be used to close the eastern half of the street at the railroad crossing, and the traffic signals at the Mississippi Dr. /Cedar St. intersection will be modified to accommodate the new traffic pattern.

Following the reconstruction of the Cedar Street crossing during the Mississippi Drive project, new four-quadrant gates will be installed at the crossing. The sidewalks on both sides of the crossing will be updated to meet ADA & FRA requirements. The upgrade to four quadrant gates from the existing two quadrant configuration will improve the overall rating of the quiet zone. Construction of the Iowa and Cedar Street crossings will be staged to maintain access to the hotel and park at all times.

3.6 Mad Creek Pedestrian Crossing (Attachment G)

The existing pedestrian crossing west of Mad Creek is a 12 foot wide asphalt trail with at-grade crossing on both sides of the crossing. The pavement condition of the asphalt trail is sufficient for the improvements recommended in this report.

The improvements recommended for this crossing include installing fencing to create a 4 foot wide chicane pedestrian path on both sides of the crossing, as shown in Attachment G. Detectable warnings will be installed at the approaches to comply with ADA requirements, with 25 feet of fencing on each side of the trail on both sides of the crossing.

These improvements would be for increased safety at the crossing, but would not improve the quiet zone rating because it does not meet the requirements of an approved supplementary safety measure (SSM) and would be considered “open” for the quiet zone calculations.

4.0 Summary

Utilizing the Federal Railroad Administration’s Quiet Zone Calculator, a comparison was completed between the existing crossing conditions and the same crossings with the proposed improvements listed above. A substantial increase in the safety of the crossing was noted as the Risk Index decreased by approximately 57% - 80% from the current configurations on these crossings depending upon the combination of improvements made at these crossings. The different results for 5 combinations (3 for the initial phase and 2 for the permanent improvements) are provided from the quiet zone calculator and shown in Attachment I. Any of these combinations of improvements will qualify for the Quiet Zone.

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The improvements recommended are designed to maximize the safety of the crossing as well as provide the most cost effective approach to establishing a Quiet Zone on the Canadian Pacific's mainline.

For the initial scenarios shown in Attachment I, it should be noted that all quiet zone calculations were run assuming Cedar Street is partially closed for one-way traffic as detailed previously in this report. For all scenarios shown, the pedestrian crossings at Chestnut and Sycamore Streets are not required to be closed to meet the quiet zone requirements. These scenarios are shown as an option to consider during construction of the Mississippi Drive project. We recommend the City

determine the most appropriate option for these pedestrian crossings based on the information provided and input from adjacent property owners, law enforcement, and others.

5.0 FRA Quiet Zone

Completion of the improvements detailed in this report will allow the City of Muscatine to qualify for designation of this corridor through the city as a quiet zone. The limits of the quiet zone would encompass the portion of Mississippi Drive from Hershey Avenue to Mad Creek, and would include downtown Muscatine. The Quiet Zone Risk Index (QZRI) based on current rules with the improvements in place would be below both the Risk Index with Horns (RIWH) and the Nationwide Significant Risk Threshold (NSRT), as shown in Attachment I. All 5 scenarios qualify for a quiet zone and require affirmation and inventory forms every 2.5 – 3 years. All improvements proposed are approved SSM's and this removes the requirement for annual review of the quiet zone.

Several notifications are required as outlined in the rules upon completion of the improvements to notify the Canadian Pacific, Highway authority (DOT) and the public of the intended action. These requirements may commence while the improvements are being constructed but cannot be completed until the improvements are in place.

We appreciate the opportunity to assist you with your engineering needs. If you have any questions or concerns regarding the information presented in this report, please don't hesitate to contact me at your convenience.

Sincerely,
BOLTON & MENK, INC.



Neil Guess, P.E.
Senior Project Manager



James H. Harbaugh, P.L.A.
Senior Project Manager

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EXHIBITS



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APPROXIMATE LENGTH OF QUIET ZONE
 HERSHEY AVE TO MAD CREEK: 5,866 LF (1.12 MI.)
 CHESTNUT ST TO CEDAR ST: 1,093 LF (0.21 MI.)

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NO.	REVISION	DATE	BY	CHKD	REA	DATE

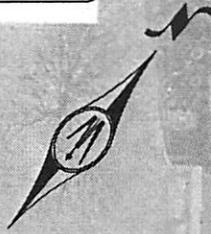
REVISION
 REVISION
 REVISION
 NOTES

MUSCATINE, IOWA
 MISSISSIPPI DRIVE QUIET ZONE (FINAL)
 CP RR CROSSINGS

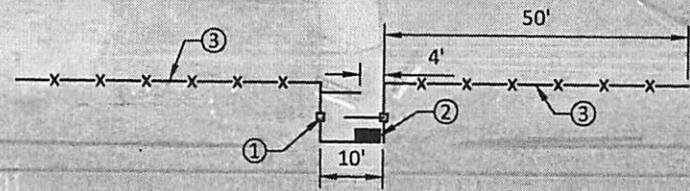
SHEET **A**

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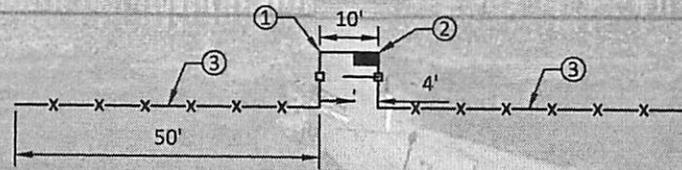
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HERSHEY AVE.



CPRR MAINLINE



NOTES:

- 1. INSTALL NEW CHICANED FENCING
- 2. INSTALL 4' X 2' DETECTABLE WARNING PANELS
- 3. INSTALL NEW FENCING

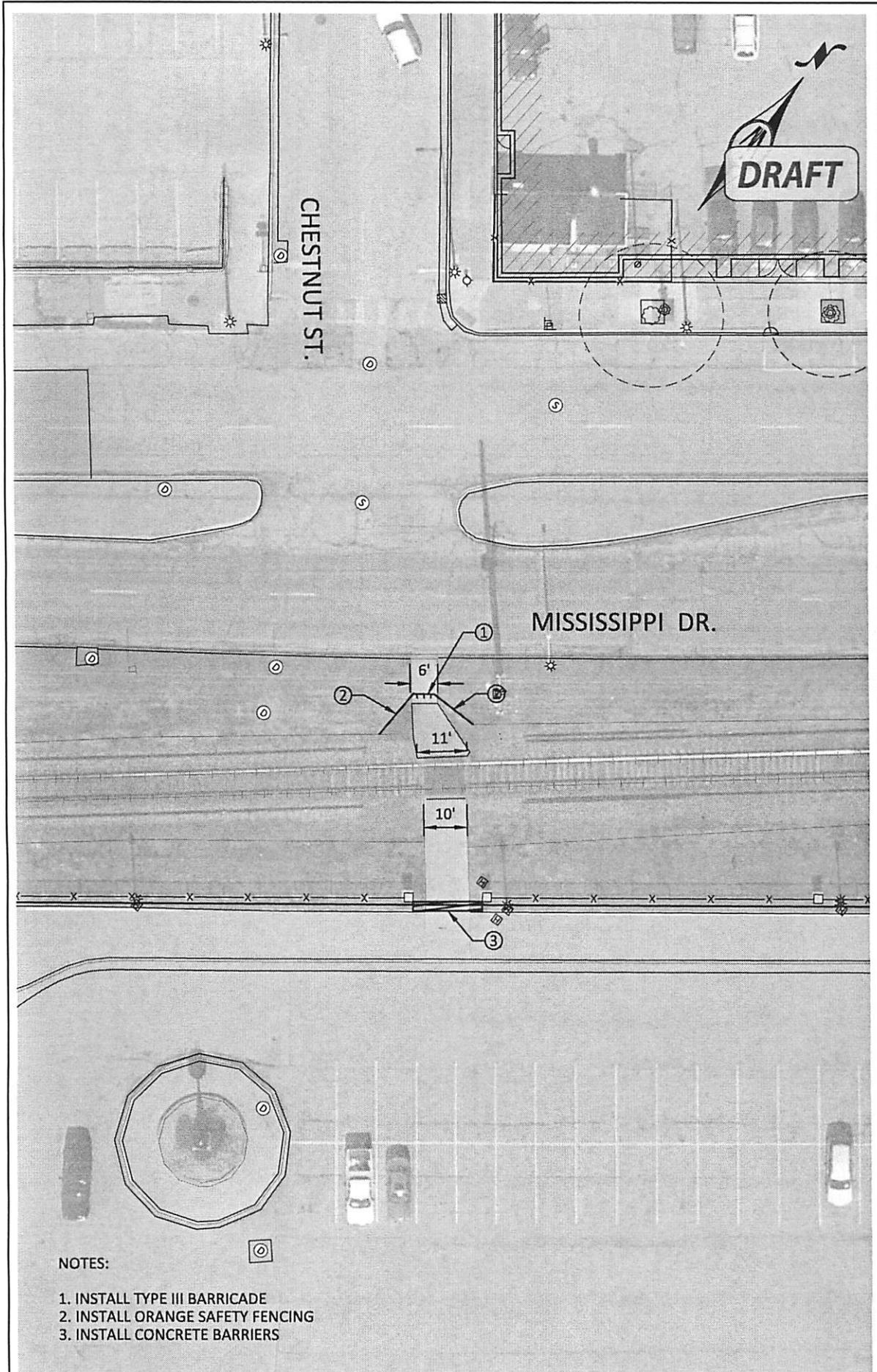


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CITY OF MUSCATINE, IOWA
 QUIET ZONE INVESTIGATION
 HERSHEY AVENUE PEDESTRIAN CROSSING

DECEMBER 2016

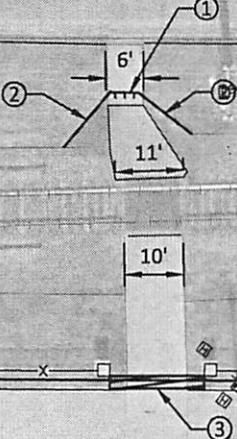
ATTACHMENT B



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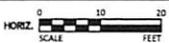
CHESTNUT ST.

MISSISSIPPI DR.



NOTES:

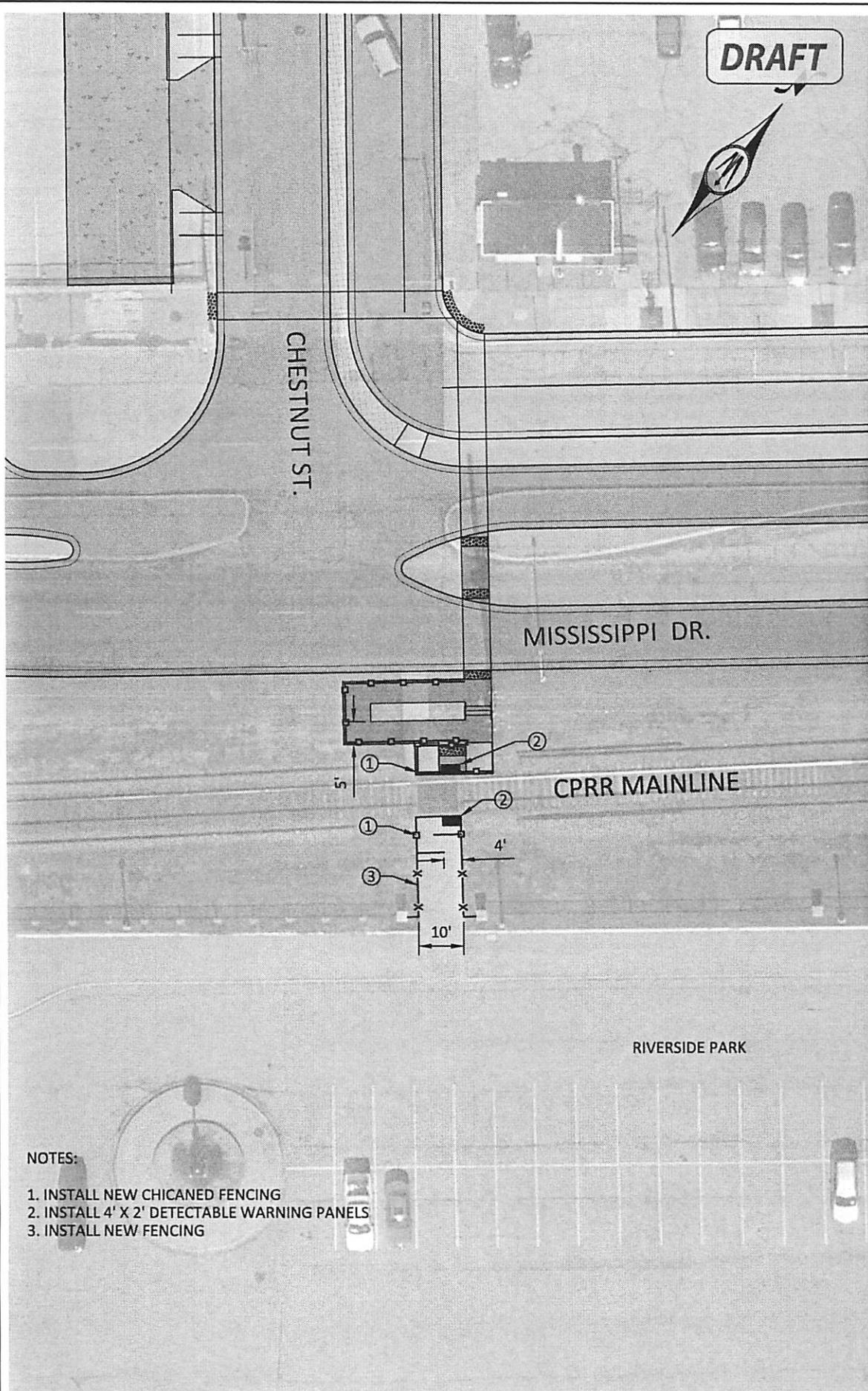
- 1. INSTALL TYPE III BARRICADE
- 2. INSTALL ORANGE SAFETY FENCING
- 3. INSTALL CONCRETE BARRIERS



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CITY OF MUSCATINE, IOWA
 QUIET ZONE INVESTIGATION
 CHESTNUT STREET PEDESTRIAN CROSSING (INITIAL)

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CHESTNUT ST.

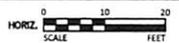
MISSISSIPPI DR.

CPRR MAINLINE

RIVERSIDE PARK

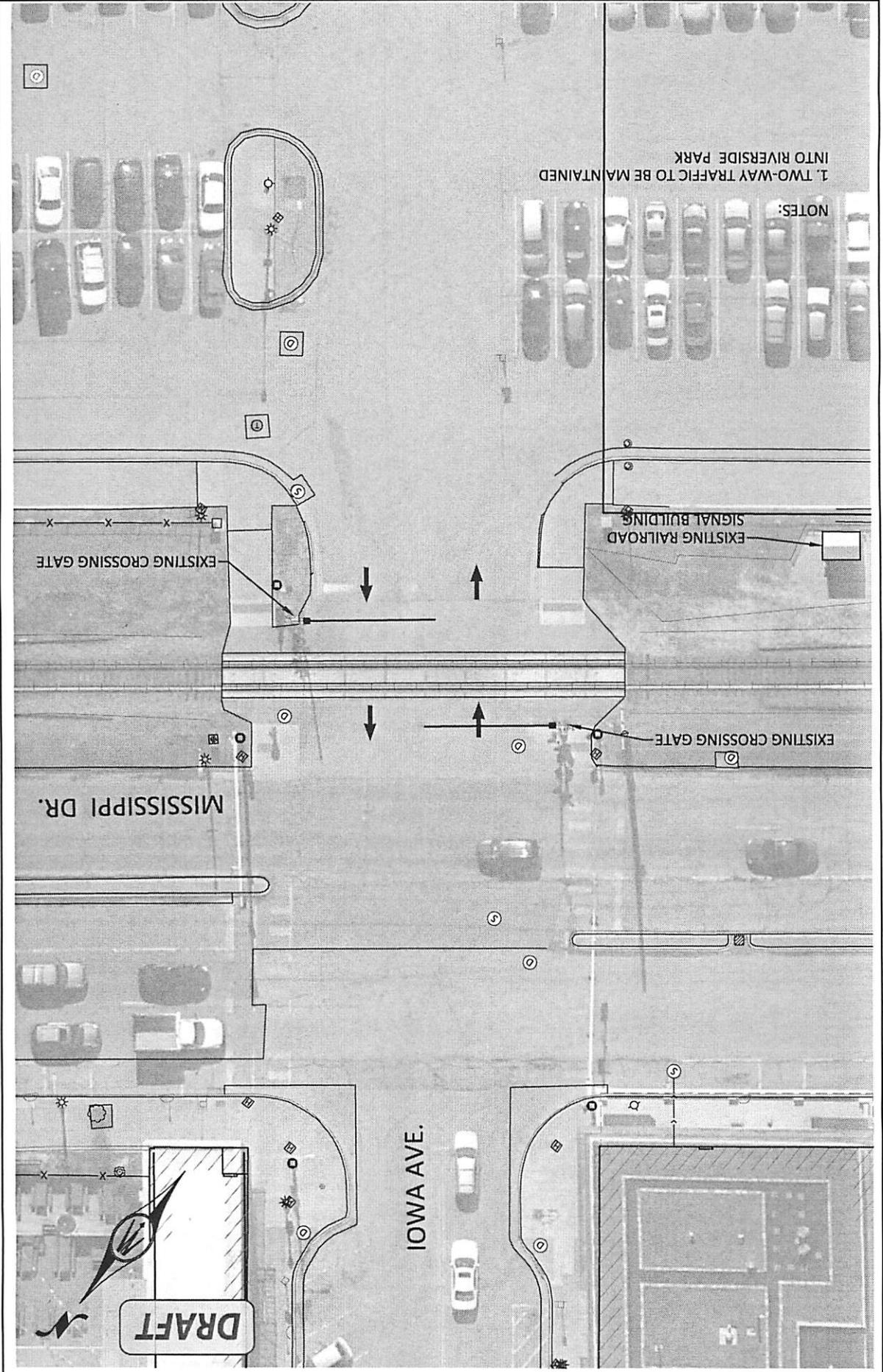
NOTES:

- 1. INSTALL NEW CHICANED FENCING
- 2. INSTALL 4' X 2' DETECTABLE WARNING PANELS
- 3. INSTALL NEW FENCING

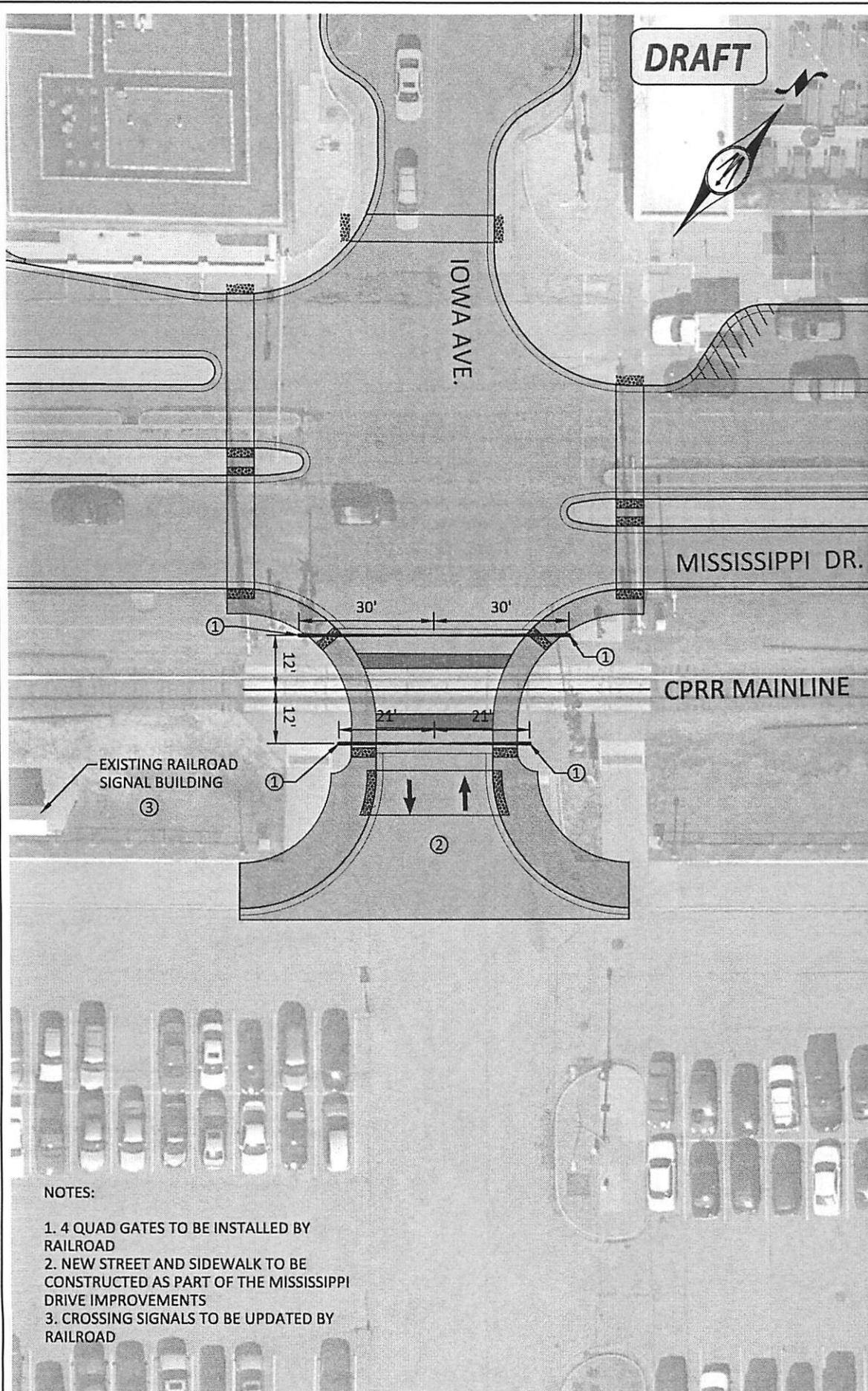
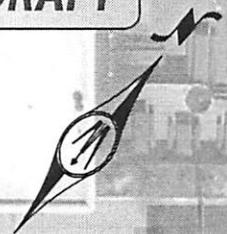


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CITY OF MUSCATINE, IOWA
 QUIET ZONE INVESTIGATION
 CHESTNUT STREET PEDESTRIAN CROSSING

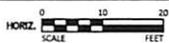


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NOTES:

- 1. 4 QUAD GATES TO BE INSTALLED BY RAILROAD
- 2. NEW STREET AND SIDEWALK TO BE CONSTRUCTED AS PART OF THE MISSISSIPPI DRIVE IMPROVEMENTS
- 3. CROSSING SIGNALS TO BE UPDATED BY RAILROAD

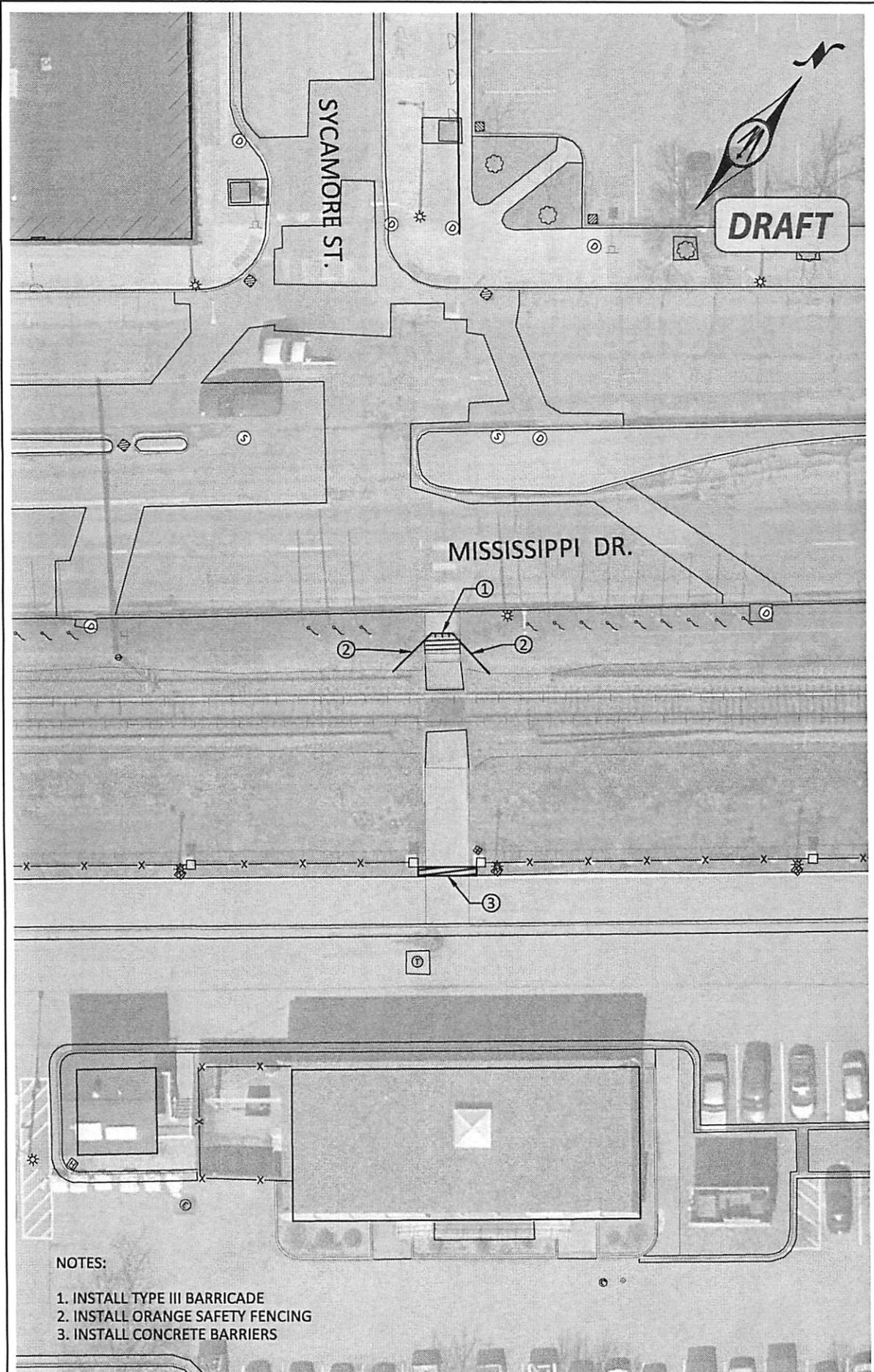


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CITY OF MUSCATINE, IOWA
 QUIET ZONE INVESTIGATION
 IOWA STREET CROSSING

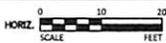
DECEMBER 2018

ATTACHMENT D-2



NOTES:

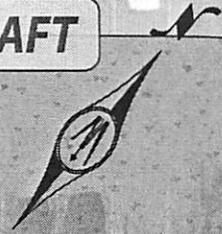
1. INSTALL TYPE III BARRICADE
2. INSTALL ORANGE SAFETY FENCING
3. INSTALL CONCRETE BARRIERS



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CITY OF MUSCATINE, IOWA
QUIET ZONE INVESTIGATION
SYCAMORE STREET PEDESTRIAN CROSSING (INITIAL)
DECEMBER 2016

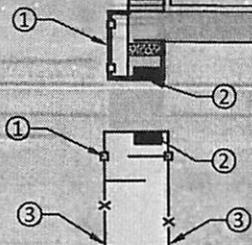
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SYCAMORE ST.

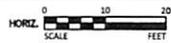
MISSISSIPPI DR.

CPRR MAINLINE



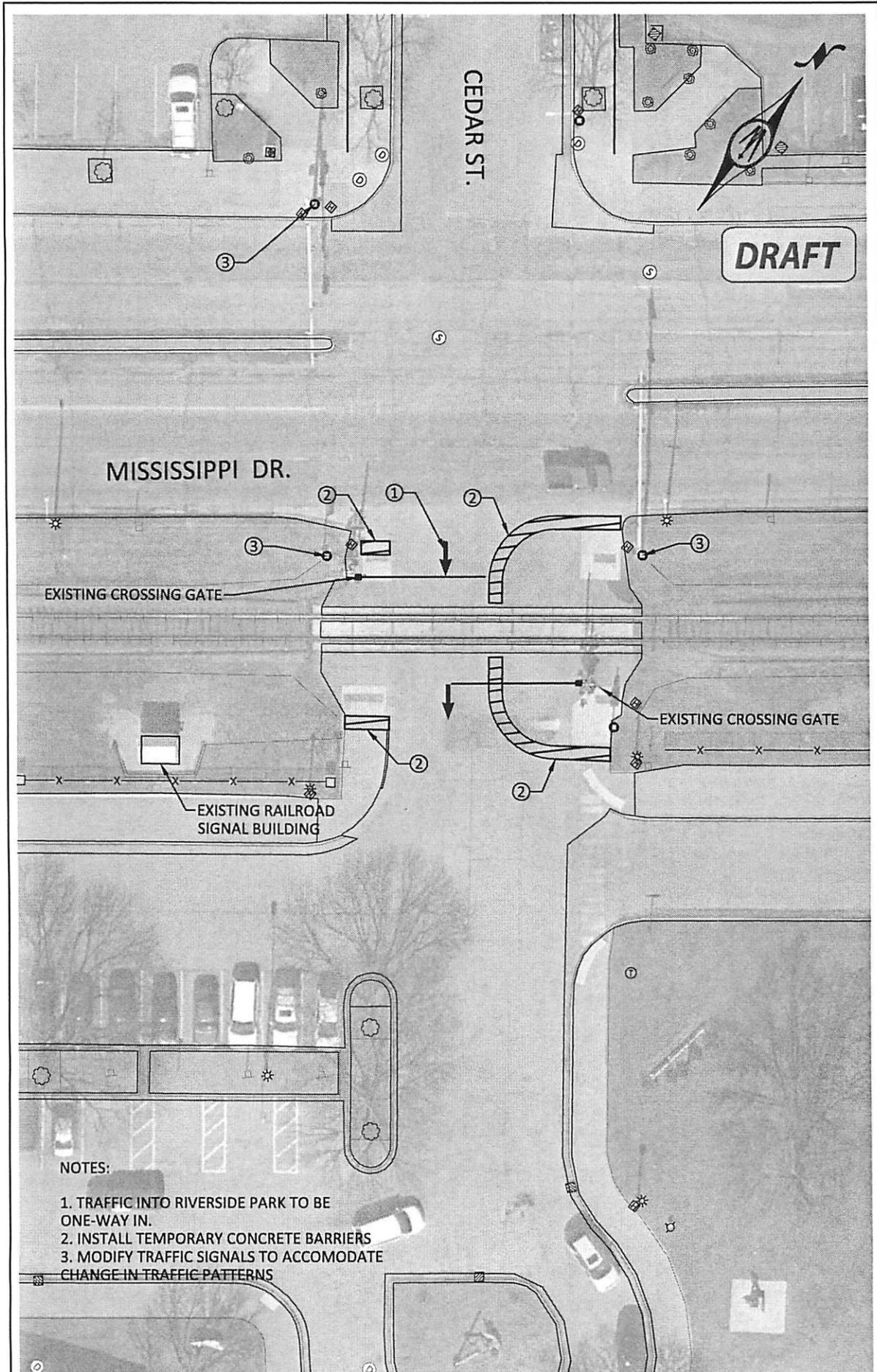
NOTES:

- 1. INSTALL NEW CHICANED FENCING
- 2. INSTALL 4' X 2' DETECTABLE WARNING PANELS
- 3. INSTALL NEW FENCING



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CITY OF MUSCATINE, IOWA
 QUIET ZONE INVESTIGATION
 SYCAMORE STREET PEDESTRIAN CROSSING



CEDAR ST.

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MISSISSIPPI DR.

EXISTING CROSSING GATE

EXISTING CROSSING GATE

EXISTING RAILROAD SIGNAL BUILDING

NOTES:

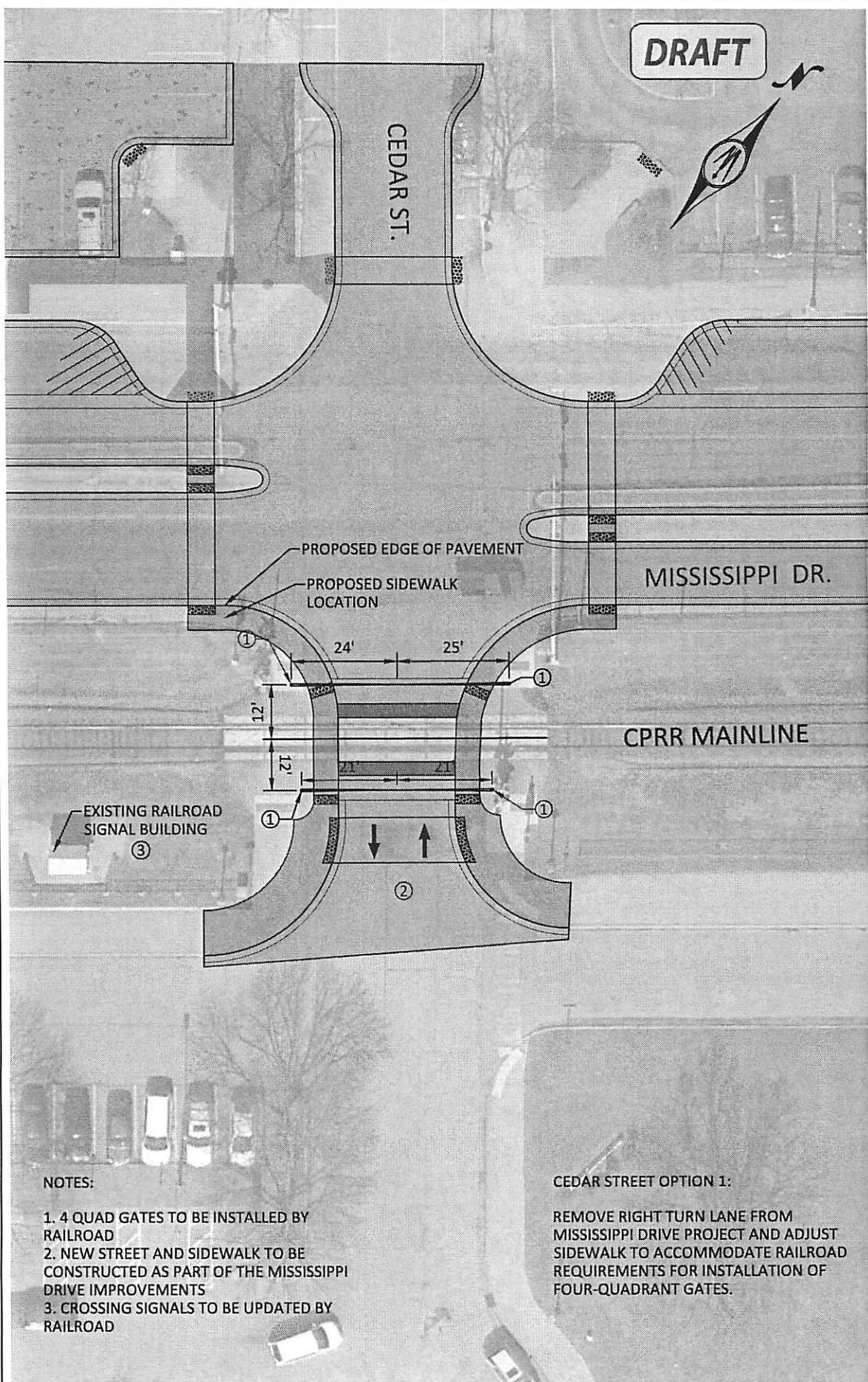
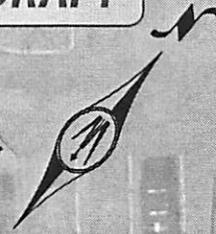
- 1. TRAFFIC INTO RIVERSIDE PARK TO BE ONE-WAY IN.
- 2. INSTALL TEMPORARY CONCRETE BARRIERS
- 3. MODIFY TRAFFIC SIGNALS TO ACCOMODATE CHANGE IN TRAFFIC PATTERNS



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CITY OF MUSCATINE, IOWA
QUIET ZONE INVESTIGATION
CEDAR STREET CROSSING (INITIAL)

DRAFT

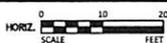


NOTES:

- 1. 4 QUAD GATES TO BE INSTALLED BY RAILROAD
- 2. NEW STREET AND SIDEWALK TO BE CONSTRUCTED AS PART OF THE MISSISSIPPI DRIVE IMPROVEMENTS
- 3. CROSSING SIGNALS TO BE UPDATED BY RAILROAD

CEDAR STREET OPTION 1:

REMOVE RIGHT TURN LANE FROM MISSISSIPPI DRIVE PROJECT AND ADJUST SIDEWALK TO ACCOMMODATE RAILROAD REQUIREMENTS FOR INSTALLATION OF FOUR-QUADRANT GATES.

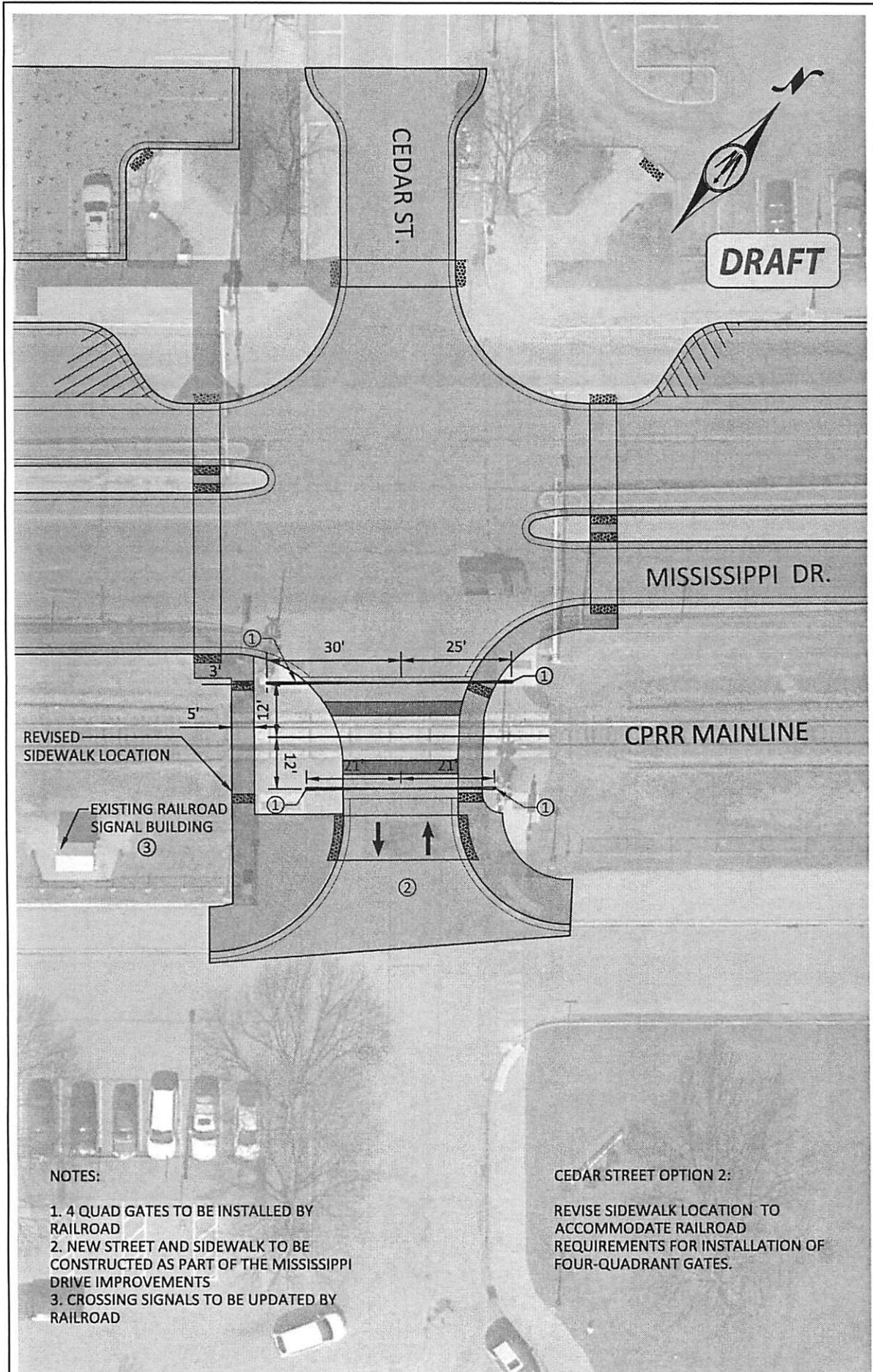


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CITY OF MUSCATINE, IOWA
QUIET ZONE INVESTIGATION
CEDAR STREET CROSSING OPTION 1

DECEMBER 2016

ATTACHMENT F-2

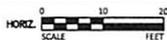


NOTES:

- 1. 4 QUAD GATES TO BE INSTALLED BY RAILROAD
- 2. NEW STREET AND SIDEWALK TO BE CONSTRUCTED AS PART OF THE MISSISSIPPI DRIVE IMPROVEMENTS
- 3. CROSSING SIGNALS TO BE UPDATED BY RAILROAD

CEDAR STREET OPTION 2:

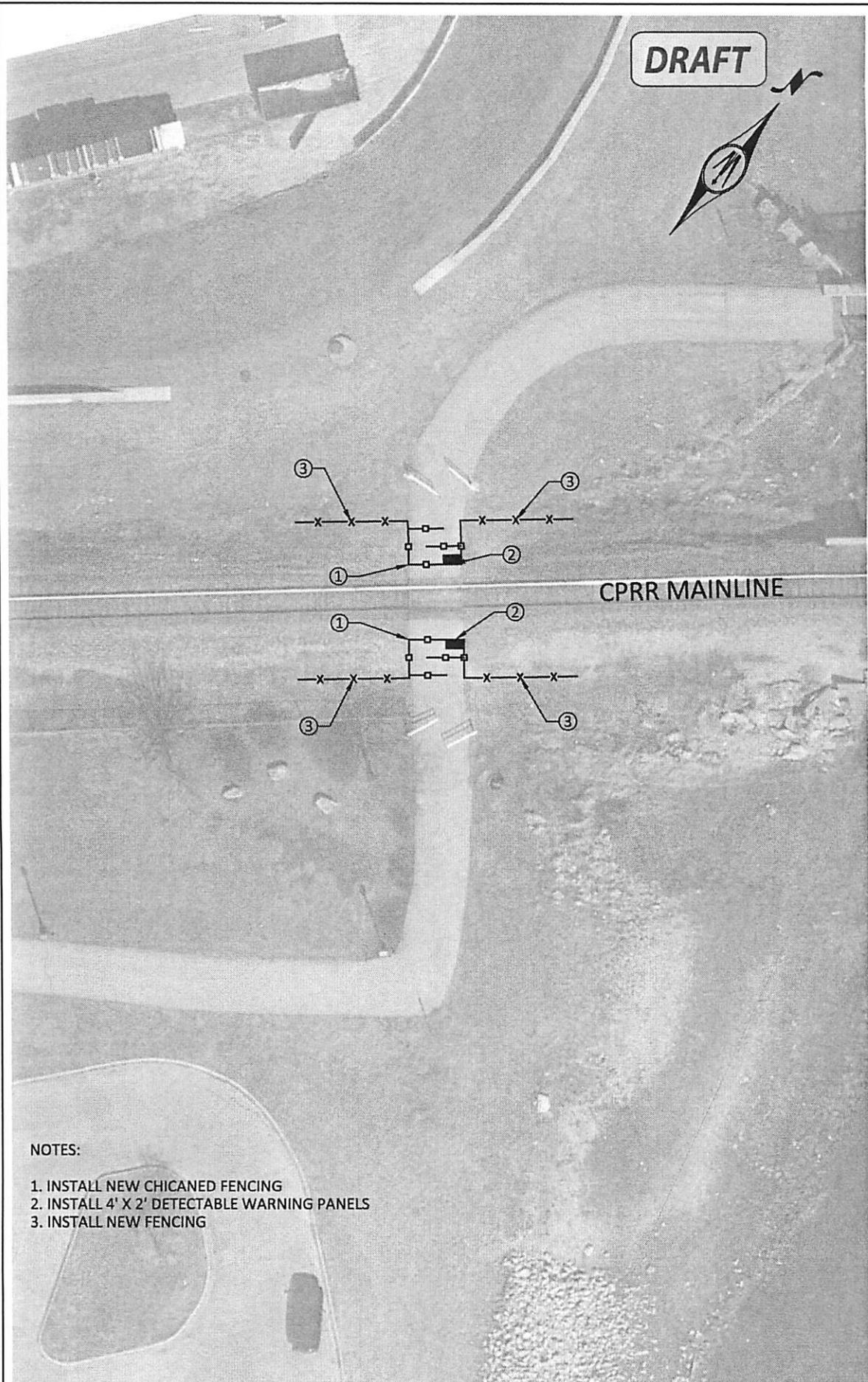
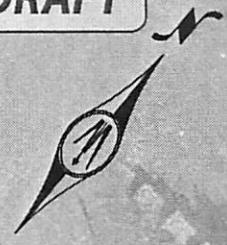
REVISE SIDEWALK LOCATION TO ACCOMMODATE RAILROAD REQUIREMENTS FOR INSTALLATION OF FOUR-QUADRANT GATES.



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CITY OF MUSCATINE, IOWA
 QUIET ZONE INVESTIGATION
 CEDAR STREET CROSSING OPTION 2

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NOTES:

- 1. INSTALL NEW CHICANED FENCING
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- 3. INSTALL NEW FENCING



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CITY OF MUSCATINE, IOWA
QUIET ZONE INVESTIGATION
MAD CREEK PEDESTRIAN CROSSING

DECEMBER 2018

ATTACHMENT G

DRAFT

IMPROVEMENT
MATRIX

City of Muscatine, Iowa
Quiet Zone Investigation

CROSSING IMPROVEMENT MATRIX

A13.112405

Attachment I

	Open	Chicane paths installed at pedestrian crossings for safety	QZRI < or = NSRT = Qualified; send affirmation and inventory form every 2.5-3 years
	Closed	No through traffic allowed	
	SSM Applied	SSM = Supplementary Safety Measure, One-way street with gates	QZRI < or = RIWH = qualified; send affirmation and inventory form every 2.5-3 years
	SSM Applied	SSM = Supplementary Safety Measure, 4 quadrant gates	

Crossing Scenario	Hershey Ave	Chestnut St.	Iowa St.	Sycamore St.	Cedar St.	Mad Creek	Quiet Zone Risk Index (QZRI)	Nationwide Significant Risk Threshold (NSRT)	Risk Index with Horns (RIWH)	Quiet Zone
EXISTING CONDITIONS										
#1							17035.53	14347.00	10213.15	Denied
4 CROSSING INITIAL QUIET ZONE										
#2	N/A					N/A	7320.18	14347.00	10213.15	Qualified
#3	N/A					N/A	3871.81	14347.00	10213.15	Qualified
#4	N/A					N/A	3392.18	14347.00	10213.15	Qualified
6 CROSSING PERMANENT QUIET ZONE										
#5							3871.81	14347.00	10213.15	Qualified
#6							3392.18	14347.00	10213.15	Qualified
Quiet Zone Calculator Computations were completed on November 11, 2016										

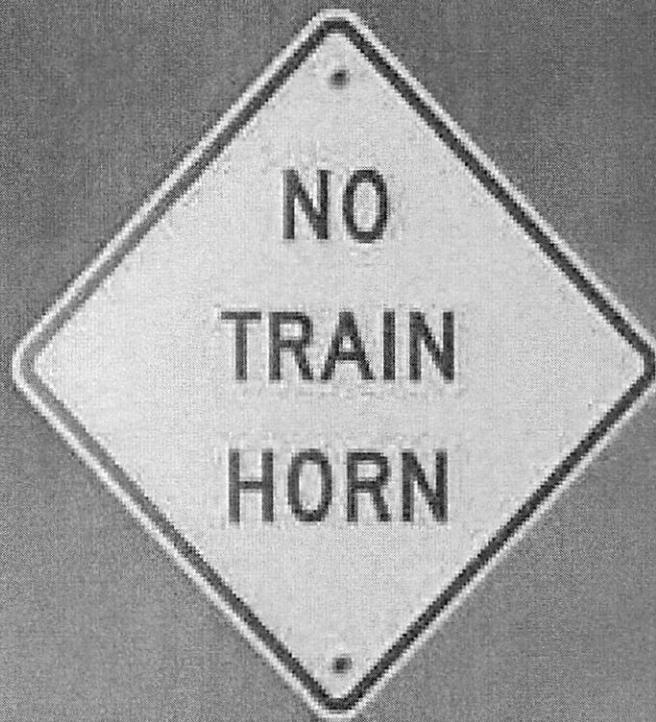
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FEDERAL RAILROAD
ADMINISTRATION

Guide to the Quiet Zone
Establishment Process



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GUIDE TO THE QUIET ZONE ESTABLISHMENT PROCESS

AN INFORMATION GUIDE

Federal Railroad Administration

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Federal Railroad Administration

Highway-Rail Crossing and Trespasser Programs Division

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Purpose of the Guide

This brochure was developed to serve as a guide for local decision makers seeking a greater understanding of train horn sounding requirements and how to establish quiet zones. Its purpose is to provide a general overview and thus does not contain every detail about the quiet zone establishment process. For more detailed and authoritative information, the reader is encouraged to review the official regulations governing the use of locomotive horns at public highway-rail grade crossings and the establishment of quiet zones that are contained in 49 CFR Part 222. A copy of the rule can be downloaded or printed at <http://www.fra.dot.gov/eLib/Details/L02809>.

About Quiet Zones



FRA is committed to reducing the number of collisions at highway-rail grade crossings, while establishing a consistent standard for communities who opt to preserve or enhance quality of life for their residents by establishing quiet zones within which routine use of train horns at crossings is prohibited.

Federal regulation requires that locomotive horns begin sounding 15–20 seconds before entering public highway-rail grade crossings, no more than one-quarter mile in advance. Only a public authority, the governmental entity responsible for traffic control or law enforcement at the crossings, is permitted to create quiet zones.

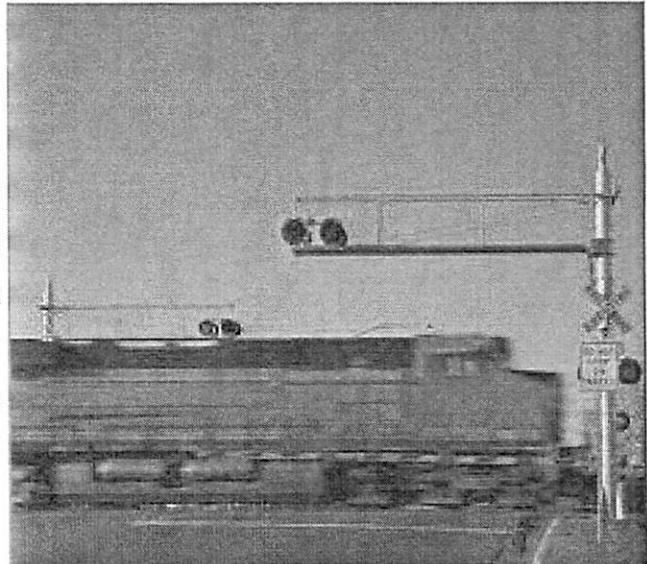
A quiet zone is a section of a rail line at least one-half mile in length that contains one or more consecutive public highway-rail grade crossings at which locomotive horns are not routinely sounded when trains are approaching the crossings. The prohibited use of train horns at quiet zones only applies to trains when approaching and entering crossings and does not include train horn use within passenger stations or rail yards. Train horns may be sounded in emergency situations or to comply with other railroad or FRA rules even within a quiet zone. Quiet zone regulations also do not eliminate the use of locomotive bells at crossings. Therefore, a more appropriate description of a designated quiet zone would be a “reduced train horn area.”

Communities wishing to establish quiet zones must work through the appropriate public authority that is responsible for traffic control or law enforcement at the crossings.

Historical Context

Historically, railroads have sounded locomotive horns or whistles in advance of grade crossings and under other circumstances as a universal safety precaution. Some States allowed local communities to create whistle bans where the train horn was not routinely sounded. In other States, communities created whistle bans through informal agreements with railroads.

In the late 1980's, FRA observed a significant increase in nighttime train-vehicle collisions at certain gated highway-rail grade crossings on the Florida East Coast Railway (FEC) at which nighttime whistle bans had been established in accordance with State statute. In 1991, FRA issued Emergency Order #15 requiring trains on the FEC to sound their horns again. The number and rate of collisions at affected crossings returned to pre-whistle ban levels.



In 1994, Congress enacted a law that required FRA to issue a Federal regulation requiring the sounding of locomotive horns at public highway-rail grade crossings. It also gave FRA the ability to provide for exceptions to that requirement by allowing communities under some circumstances to establish "quiet zones."

The Train Horn Rule became effective on June 24, 2005. The rule set nationwide standards for the sounding of train horns at public highway-rail grade crossings. This rule changed the criteria for sounding the horn from distance-based to time-based. It also set limits on the volume of a train horn. The rule also established a process for communities to obtain relief from the routine sounding of train horns by providing criteria for the establishment of quiet zones. Locomotive horns may still be used in the case of an emergency and to comply with Federal regulations or certain railroad rules.

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Public Safety Considerations

Because the absence of routine horn sounding increases the risk of a crossing collision, a public authority that desires to establish a quiet zone usually will be required to mitigate this additional risk. At a minimum, each public highway–rail crossing within a quiet zone must be equipped with active warning devices: flashing lights, gates, constant warning time devices (except in rare circumstances) and power out indicators.

In order to create a quiet zone, one of the following conditions must be met

1. ***The Quiet Zone Risk Index (QZRI) is less than or equal to the Nationwide Significant Risk Threshold (NSRT)*** with or without additional safety measures such as Supplementary Safety Measures (SSMs) or Alternative Safety Measures (ASMs) described below. The QZRI is the average risk for all public highway-rail crossings in the quiet zone, including the additional risk for absence of train horns and any reduction in risk due to the risk mitigation measures. The NSRT is the level of risk calculated annually by averaging the risk at all of the Nation’s public highway-rail grade crossings equipped with flashing lights and gates where train horns are routinely sounded.
2. ***The Quiet Zone Risk Index (QZRI) is less than or equal to the Risk Index With Horns (RIWH)*** with additional safety measures such as SSMs or ASMs. The RIWH is the average risk for all public highway-rail crossings in the proposed quiet zone when locomotive horns are routinely sounded.
3. ***Install SSMs at every public highway-rail crossing.*** This is the best method to reduce to reduce risks in a proposed quiet zone and to enhance safety.

SSMs are pre-approved risk reduction engineering treatments installed at certain public highway-rail crossings within the quiet zone and can help maximize safety benefits and minimize risk. SSMs include: medians or channelization devices, one-way streets with gates, four quadrant gate systems, and temporary or permanent crossing closures. Examples of SSMs are shown on the next page.

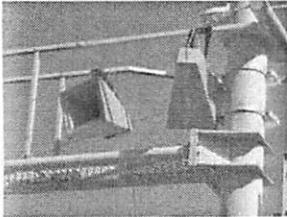
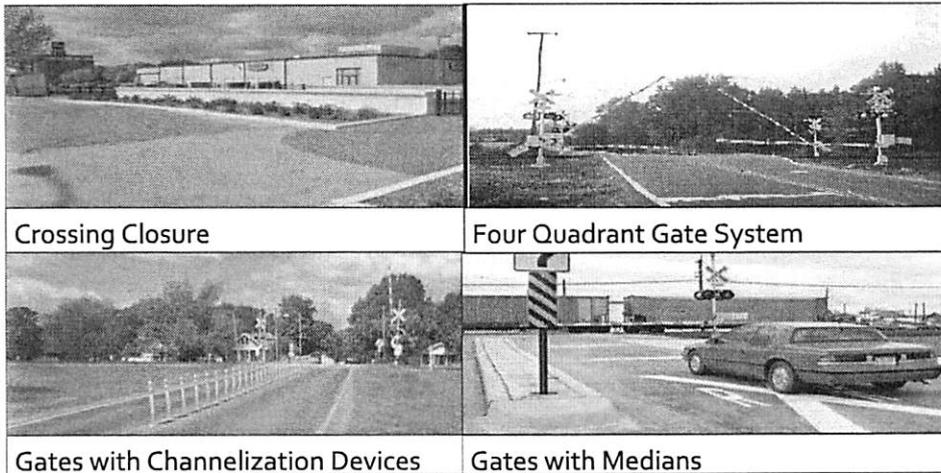
ASMs are safety systems, other than SSMs, that are used to reduce risk in a quiet zone. ASMs typically are improvements that do not fully meet the requirements to be SSMs and their risk reduction effectiveness must be submitted in writing and approved by FRA.

FRA strongly recommends that all crossings in the quiet zone be reviewed by a diagnostic team. A diagnostic team typically consists of representatives from the public authority, railroad, and State agency responsible for crossing safety and FRA grade crossing managers.

Public Safety Considerations continued

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Examples of SSMs



Wayside Horns The train horn rule also provides another method for reducing the impact of routine locomotive horn sounding when trains approach public highway-rail grade crossings. A wayside horn may be installed at highway-rail grade crossings that have flashing lights, gates, constant warning time devices (except in rare circumstances), and power out indicators. The wayside horn is positioned at the crossing and will sound when the warning devices are activated. The sound is directed down the roadway, which greatly reduces the noise footprint of the audible warning. Use of wayside horns is not the same as establishing a quiet zone although they may be used within quiet zones.

Cost Considerations

The enabling Federal statute did not provide funding for the establishment of quiet zones. Public authorities seeking to establish quiet zones should be prepared to finance the installation of SSMs and ASMs used. Costs can vary from \$30,000 per crossing to more than \$1 million depending on the number of crossings and the types of safety improvements required.

Legal Considerations

The courts will ultimately determine who will be held liable if a collision occurs at a grade crossing located within a quiet zone, based upon the facts of each case, as a collision may have been caused by factors other than the absence of an audible warning. FRA's rule is intended to remove failure to sound the horn as a cause of action in lawsuits involving collisions that have occurred at grade crossings within duly established quiet zones.

The Quiet Zone Establishment Process

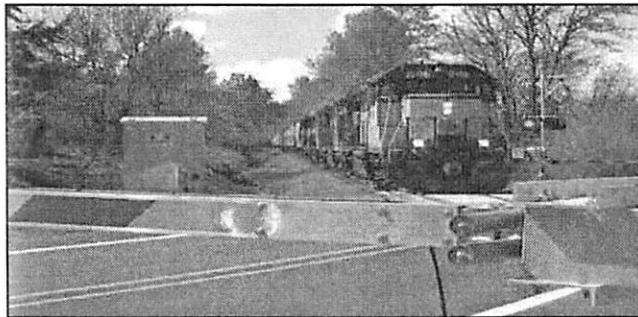
Under the Train Horn Rule, only public authorities are permitted to establish quiet zones. Citizens who wish to have a quiet zone in their neighborhood should contact their local government to pursue the establishment of a quiet zone. The following is a typical example of the steps taken to establish a quiet zone:

1. **Determine** which crossings will be included in the quiet zone. All public highway-rail crossings in the quiet zone must have, at a minimum, an automatic warning system consisting of flashing lights and gates. The warning systems must be equipped with constant warning time devices (except in rare circumstances) and power out indicators. The length of the quiet zone must be at least one-half mile in length.
2. **Identify** any private highway-rail grade crossings within the proposed quiet zone. If they allow access to the public or provide access to active industrial or commercial sites, a diagnostic review must be conducted and the crossing(s) treated in accordance with the recommendations of the diagnostic team.
3. **Identify** any pedestrian crossings within the proposed quiet zone and conduct a diagnostic review of those crossings too. They also must be treated in accordance with the diagnostic team's recommendations. *NOTE:* While it is not required by the regulations, FRA recommends that every crossing within a proposed quiet zone be reviewed for safety concerns.
4. **Update** the U.S. DOT Crossing Inventory Form to reflect current physical and operating conditions at each public, private, and pedestrian crossing located within a proposed quiet zone.
5. **Provide** a Notice of Intent (NOI) to all of the railroads that operate over crossings in the proposed quiet zone, the State agency responsible for highway safety and the State agency responsible for crossing safety. The NOI must list all of the crossings in the proposed quiet zone and give a brief explanation of the tentative plans for implementing improvements within the quiet zone. Additional required elements of the NOI can be found in 49 CFR 222.43(b). The railroads and State agencies have 60 days in which to provide comments to the public authority on the proposed plan.
6. **Alternative Safety Measures** – If ASMs are going to be used to reduce risk, an application to FRA must be made. The application must include all of the elements provided in 49 CFR 222.39(b)(1) and copies of the application must be sent to the entities listed in 49 CFR 222.39(b)(3). They will have 60 days to provide comments to FRA on the application. FRA will provide a written decision on the application typically within three to four months after it is received.

DRAFT**The Quiet Zone Establishment Process continued**

7. **Determine** how the quiet zone will be established using one of the following criteria: (Note that Options 2 through 4 will require the use of the FRA Quiet Zone Calculator available at <http://safetydata.fra.dot.gov/quiet/>.)

1. Every public highway-rail crossing in the proposed quiet zone is equipped with one or more SSMs.
2. The Quiet Zone Risk Index (QZRI) of the proposed quiet zone is less than or equal to the Nationwide Significant Risk Threshold (NSRT) without installing SSMs or ASMs.
3. The QZRI of the proposed quiet zone is less than or equal to the Nationwide Significant Risk Threshold (NSRT) after the installation of SSMs or ASMs.
4. The QZRI of the proposed quiet zone is less than or equal to the Risk Index with Horns (RIWH) after the installation of SSMs or ASMs.



8. **Complete** the installation of SSMs and ASMs and any other required improvements determined by the diagnostic team at all public, private, and pedestrian crossings within the proposed quiet zone.

9. **Ensure** that the required signage at each public, private, and pedestrian crossing is installed in accordance with 49 CFR Sections 222.25, 222.27, and 222.35, and the standards outlined in the Manual on Uniform Traffic Control Devices. These signs may need to be covered until the quiet zone is in effect.

10. **Establish** the quiet zone by providing a Notice of Quiet Zone Establishment to all of the parties that are listed in 49 CFR Section 222.43(a)(3). Be sure to include all of the required contents in the notice as listed in 49 CFR Section 222.43(d). The quiet zone can take effect no earlier than 21 days after the date on which the Notice of Quiet Zone Establishment is mailed.

*****Appendix C to the Train Horn Rule provides detailed, step by step guidance on how to create a quiet zone.*****

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Required Documentation

Public authorities interested in establishing a quiet zone are required to submit certain documentation during the establishment process. FRA has provided checklists for the various documents that can be found at <http://www.fra.dot.gov/Elib/Details/L03055>.

FRA’s Regional Grade Crossing Managers are available to provide technical assistance. A State’s department of transportation or rail regulatory agency also may be able to provide assistance to communities pursuing quiet zones.

Public authorities are encouraged to consult with the agencies in their State that have responsibility for crossing safety. Some States may have additional administrative or legal requirements that must be met in order to modify a public highway-rail grade crossing.

Role of Railroads

Communities seeking to establish a quiet zone are required to send a Notice of Intent and a Notice of Quiet Zone Establishment to railroads operating over the public highway-rail grade crossings within the proposed quiet zone. Railroad officials can provide valuable input during the quiet zone establishment process and should be included on all diagnostic teams. Listed below are links to the Class I Railroads and Amtrak.

<u>BNSF Railway (BNSF)</u>	<u>Canadian Pacific (CP)</u>
<u>CSX Transportation (CSX)</u>	<u>Norfolk Southern (NS)</u>
<u>Canadian National (CN)</u>	<u>Union Pacific (UP)</u>
<u>Kansas City Southern (KCS)</u>	<u>Amtrak (ATK)</u>

FINAL NOTE

The information contained in this brochure is provided as general guidance related to the Quiet Zone Establishment Process and should not be considered as a definitive resource. FRA strongly recommends that any public authority desiring to establish quiet zones take the opportunity to review all aspects of safety along its rail corridor. Particular attention should be given to measures that prevent trespassing on railroad tracks since investments made to establish a quiet zone may be negated if the horn has to be routinely sounded to warn trespassers.

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POINTS OF CONTACT

General Questions:

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Debra Chappell, 202-493-6018

Ron Ries, 202-493-6285

Regional Contacts

Region 1 Connecticut, Maine, Massachusetts, New Hampshire, New Jersey,
New York, Rhode Island, and Vermont

1-800-724-5991

Region 2 Delaware, Maryland, Ohio, Pennsylvania, Virginia, West Virginia ,
and Washington, D.C.

1-800-724-5992

Region 3 Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina,
South Carolina, and Tennessee

1-800-724-5993

Region 4 Illinois, Indiana, Michigan, Minnesota, and Wisconsin

1-800-724-5040

Region 5 Arkansas, Louisiana, New Mexico, Oklahoma, and Texas

1-800-724-5995

Region 6 Colorado, Iowa, Kansas, Missouri, and Nebraska

1-800-724-5996

Region 7 Arizona, California, Nevada, and Utah

1-800-724-5997

Region 8 Alaska, Idaho, Montana, North Dakota, South Dakota, Oregon,
Washington, and Wyoming

1-800-724-5998



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