NMRX Grade Crossing Pedestrian & Bicyclist Safety Study

Safety Devices, Crossing Evaluation Form and Standard Applications Toolbox

Prepared for

RIO METRO
REGIONAL TRANSIT DISTRICT

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APPENDICES

ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
MUTCD	Manual on Uniform Traffic Control Devices
MRCOG	Mid-Region Council of Governments
NCUTCD	National Committee on Uniform Traffic Control Devices
NMDOT	New Mexico Department of Transportation
NMRX	New Mexico Rail Runner Express
PROWAG	Public Rights-of-Way Accessibility Guidelines
RMRTD	Rio Metro Regional Transit District
TCRP	Transit Cooperative Research Program

1. INTRODUCTION

This Toolbox assembles pedestrian/bicyclist safety devices and techniques recommended by federal and other agency reports, introduces a pedestrian/bicyclist crossing evaluation form, and proposes Standard Applications for the benefit of pedestrians and bicyclists at railroad crossings within the New Mexico Rail Runner Express (NMRX) system. Together, these three components help establish minimum safety requirements upon which additional site-specific treatments may be considered, thereby making existing crossings safer and informing the design of new crossings. This also enables the Rio Metro Regional Transit District (RMRTD), NMDOT Rail Bureau and other agencies to more consistently assess crossings for potential safety improvements, and to promote the uniform application of treatments across the entire NMRX system from Belen to Santa Fe, NM.

The Toolbox not only accounts for the operational characteristics of NMRX, AMTRAK and BNSF trains, but also addresses the general behaviors of pedestrians and bicyclists and the real-world crossing situations they encounter along the system. Pedestrians have certain characteristics that need to be considered when planning and designing rail crossings. Pedestrians prefer the most direct route, and because of their maneuverability, may not stay on designated routes in order to find the shortest path to their destination. They are extremely vulnerable as they have essentially no protection from injury from a crash with vehicles. Pedestrians can be easily distracted and inattentive, particularly due to mobile device usage, and may ignore warning signs. These characteristics are discussed in further detail in TCRP Report 175, *Guidebook on Pedestrian Crossings of Public Transit Rail Services*.

In addition to some of the same pedestrian characteristics such as maneuverability, bicyclists also have some unique vulnerabilities that need to be considered. Bicyclists are sensitive to riding surface quality, so the physical condition of a railroad crossing is very important. If the crossing angle is too skewed or the crossing surface material is not in good condition and is susceptible to becoming slippery when wet, then a bicyclist may not be able to stay upright. Also, if the flange gaps are too large or the crossing surface has large cracks or joints, the bicyclist's or a wheelchair user's front wheel can get trapped, causing a loss of steering control or entrapment. These characteristics and needs present a challenge to providing safe rail crossings for pedestrians and bicyclists.

Pedestrians and bicyclists encounter many different types of crossing facilities along the NMRX system, including roadways with no pedestrian/bicyclist facilities; roadways with bicycle routes or lanes; sidewalks of varying width and distance from the roadway; and several types of pathway crossings, such as multi-use pathway crossings (e.g., Santa Fe Rail Trail), pathway crossings at stations, and short pathway crossings that serve a specific business or public facility. Because of this variety, this Toolbox primarily focuses on the most commonly encountered facilities, i.e., bicycle lanes, sidewalks, and multi-use pathways. However, while treatments at station crossings and short crossings that serve a specific building or public facility are not described to the same degree in this Toolbox, several devices and techniques presented may be adapted to these specific situations.

In addition to the different facility types, Quiet Zones—one or more consecutive crossings where the routine sounding of train horns is not required to mitigate noise impacts on adjoining neighborhoods—may pose additional safety risks because trains do not routinely sound their horns when approaching. Beginning with the introduction of the Rail Runner, Quiet Zones are now prevalent along the NMRX corridor, occurring in Santa Fe, San Felipe Pueblo, Sandia Pueblo, most of Albuquerque (except the South Valley), Isleta Pueblo and Belen; in essence, most of the main crossings in urban areas are in Quiet Zones.

2. BACKGROUND

The following resources were reviewed in the preparation of this Toolbox:

- *Manual on Uniform Traffic Control Devices* (MUTCD),
- *Guide for the Development of Bicycle Facilities (*AASHTO),
- *Guidance on Pedestrian Crossing Safety at or near Passenger Stations*, FRA
- *Compilation of Pedestrian Safety Devices in use at Grade Crossings*, FRA
- TCRP Report 175, *Guidebook on Pedestrian Crossings of Public Transit Rail Services*, FTA
- *Railroad-Highway Grade Crossing Handbook*, FHWA
- *RMRTD and NMDOT Construction Plans, Santa Fe Quiet Zone Crossings (CN 9900352), September 2014*

The reader is directed to the published agency and federal reports for detailed guidance on treatments generally available for use at pedestrian/bicyclist crossings. The Santa Fe Quiet Zone Crossings construction plans—which incorporated many treatments from those reports especially applicable to the NMRX system—resulted in additional signing and pavement markings, signals, gates and sidewalk and trail improvements at 16 Quiet Zone crossings in Santa Fe, NM in late 2014. Those plans now serve as a useful template and precedent for pedestrian/bicyclist crossing projects elsewhere along the system, and were heavily relied upon to develop the Standard Applications described in Section 6 and depicted in Appendix C.

3. TOOLBOX COMPONENTS

3.1 Safety Devices

This Toolbox provides minimum requirements for safety devices at pedestrian/bicyclist crossings. It relies heavily on the MUTCD for nationally adopted signing and striping practices, but also incorporates requirements and practices of NMDOT Rail Bureau and RMRTD. Beyond the basic signing and striping devices that have been implemented at all NMRX crossings, the Toolbox also provides a list of optional safety devices and other strategies for improving safety at crossings based on the MUTCD as well as other types of treatments used successfully around the nation.

3.2 Pedestrian/Bicyclist Crossing Evaluation Form

A major component of the Toolbox is the Pedestrian/Bicyclist Crossing Evaluation Form, which is to be used as a supplement to the *U.S. DOT Crossing Inventory Form* required by the Federal Railroad Administration (FRA). This USDOT form is provided in Appendix A.

The Pedestrian/Bicyclist Crossing Evaluation Form serves as an inventory-taking document to be completed in the field and supplemented with data obtained in office, such as accident history; pedestrian/bicyclist counts (if available); the number of jobs, households, and schools within a defined distance as a proxy for potential activity at the crossing; and any planned pedestrian/bicyclist facilities. The office data will likely be collected from various databases, planning documents or maps, such as

those available on the MRCOG website. This additional information will help inform and influence the types of safety improvements to be considered for a crossing.

The Pedestrian/Bicyclist Crossing Evaluation Form is discussed further in Section 5 and provided in Appendix B.

3.3 Standard Applications

After extensive review of the resources referenced in Section 2, it is apparent that there are many different situations and solutions for improving safety at pedestrian/bicyclist crossings. In order to convey the minimum requirements for pedestrian/bicyclist crossings, Standard Applications are provided that show typical safety treatments by crossing facility type, for example, sidewalks, multi-use pathways, and roadways with bicycle lanes or with no formal pedestrian/bicyclist facilities. The Standard Applications are provided in Appendix C and described in further detail in Section 6.

4. SAFETY DEVICES

Chapter 8 of the MUTCD, *Traffic Control for Railroad and Light Rail Transit Grade Crossings,* contains standards for signs, pavement markings and devices for both roadway and pedestrian/bicyclist crossings. The reader is directed to that chapter for more detailed information. This section, though based on the MUTCD, provides standards that are specific to the NMRX corridor; for instance, although the MUTCD provides minimum distances for device placement, in some cases, these distances have been modified to reflect requirements and practices of NMDOT Rail Bureau and RMRTD. The term "standard" therefore, is used herein to represent the application of MUTCD devices to suit NMRX conditions and practices, and to represent the minimums to which all NMRX crossings should meet as they are reconstructed through funding programs such as the Section 130 Railway-Highway Crossing Program.

4.1 Passive and Active Devices Currently in Use by NMRX

Passive traffic control devices provide warning to drivers, pedestrians and bicyclists that a grade crossing is present but do not indicate whether a train is approaching the crossing. As presently deployed on NMRX, passive controls consist of signs and pavement markings only. Guidance from the MUTCD and other resources require all highway-rail grade crossings to have, as a minimum, approved passive devices installed.

Active traffic control devices respond to the approach of a train by providing visual and audio alert to drivers, pedestrians and bicyclists. Active control devices include automatic gates, flashing-light signals, bells, and other active traffic control devices. While many states and commuter rail agencies have formulated their own warranting criteria for when to use active devices, no national warrants have been developed; therefore, most agencies, through engineering study, determine when active traffic control systems are to be used based on many factors. Some of the factors that influence the types of devices and improvements appropriate for grade crossings include, but are not limited to, the number of tracks at a crossing, traffic volume, sight distance, number of daily trains and accident history.

The following is a brief summary of standard passive and active devices currently used along the NMRX corridor, as well as their desired intent or application at NMRX crossings.

4.1.1 Passive Devices

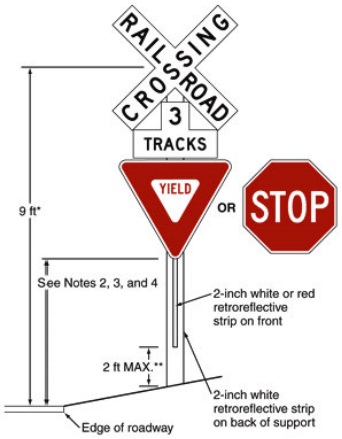
4.1.1.1 Signs

Minimum Signing Requirements

As a minimum, the Crossbuck Assembly shall be installed on all pedestrian/bicyclist crossings. Shared-use path size signs shall be installed where sidewalks or pathways are present in addition to existing roadway crossbuck signs. Where a roadway does not provide sidewalk or pathways, no additional shared-use path size pedestrian/bicyclist signing is needed.

- Crossbuck Assemblies satisfy the minimum signing requirements on each approach to highway and sidewalk/pathway crossings, and typically consist of:
  - One R15-1 Crossbuck sign;
  - R15-2P Number of Tracks plaque if there are two or more tracks;
  - R1-2 Yield or R1-1 Stop sign. A Yield sign shall be the default for Crossbuck Assemblies at passive grade crossings unless an engineering study determines that a Stop sign is appropriate.

  Crossbuck Assemblies shall meet the requirements of NMDOT Standard Drawings 701-21 and 701-22 for roadways and pathways, respectively.

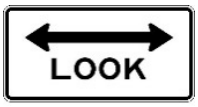


- I-13 Emergency Notification sign (ENS) with the USDOT grade crossing inventory number and emergency contact telephone number is a federal requirement for all grade crossings. Requirements for sign size, content, design and spacing are as per NMDOT Standard Drawings 701-21-4/5 and 701-22-4/5 for roadways and pathways, respectively. ENS signs meeting the requirements of these drawings have been installed at all public and pathway grade crossings.

Optional Signing

- W10-1 Grade Crossing Advance Warning sign is required on approaches to all highway crossings. Although not required by the MUTCD for pedestrian/ bicyclist facilities, pedestrian-sized versions of the W10-1 sign shall be installed on pathway approaches and on sidewalk approaches to crossings within Quiet Zones on the NMRX corridor.

- R15-8 Look signs in the MUTCD can be mounted separately next to the Crossbuck Assembly. Look signs were installed at all sidewalk and trail crossings in Santa Fe in 2014, and will be required for future installations elsewhere in the NMRX corridor as pedestrian/bicyclist crossings are improved. This sign is especially helpful for warning pedestrians/bicyclists



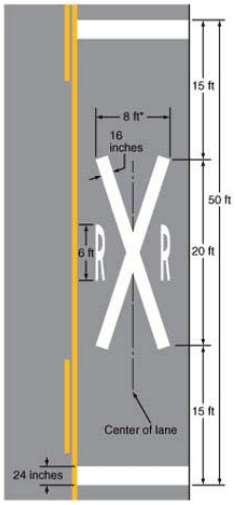
traveling on a sidewalk in the direction opposite the Crossbuck Assembly and Grade Crossing Advance Warning sign that are intended to warn road users.

- W10-9P No Train Horn signs shall be installed at pedestrian/bicyclist crossings in Quiet Zones. This sign should be mounted under the W10-1 Grade Crossing Advance Warning sign and beneath the R15-1 Crossbuck sign at the crossing itself.

4.1.1.2 Pavement Markings

Minimum Pavement Marking Requirements

- Grade Crossing pavement markings consisting of an X, the letters RR, a no-passing zone marking, and certain transverse lines must be installed on paved roadway crossings. However, while these markings are optional on pathways per the MUTCD, they were recently added at multi-use pathway crossings in Santa Fe and will be required for multi-use pathway crossings throughout the NMRX corridor.



- A Stop line is required where active control devices are used and at passive grade crossing where a Stop sign is installed in conjunction with the Crossbuck sign. The Stop line is placed at least 2 feet further from the nearest rail than an active device (if present), and at least 14 feet from the nearest rail.

- According to Chapter R3 Technical Requirements of the proposed Public Rights-of-Way Accessibility Guidelines (PROWAG) by the United States Access Board, detectable warning surfaces shall be located within 6 feet to 15 feet from the nearest rail. However, the NCUTCD Railroad/Light Rail Transit Technical Committee recommends that the detectable warning surface be placed a minimum of 12 feet from the nearest rail (see TCRP Report 175). In this Toolbox, and as reflected in the Standard Applications, the NCUTCD recommendation is preferred, as it places the detectable warning surface at a greater distance from the rail and better protects pedestrians from being too close to the tracks when a train passes. The detectable warning surface shall contrast visually with the adjacent surface (light-on-dark or dark-on-light), and, as installed in Santa Fe in 2014, may double as the Stop line.

- Look pavement markings were installed in Santa Fe in 2014 to reinforce the need to look before crossing the tracks. This pavement marking will be required on pedestrian approaches to Quiet Zone grade crossings that are not blocked by gate arms on the NMRX system.

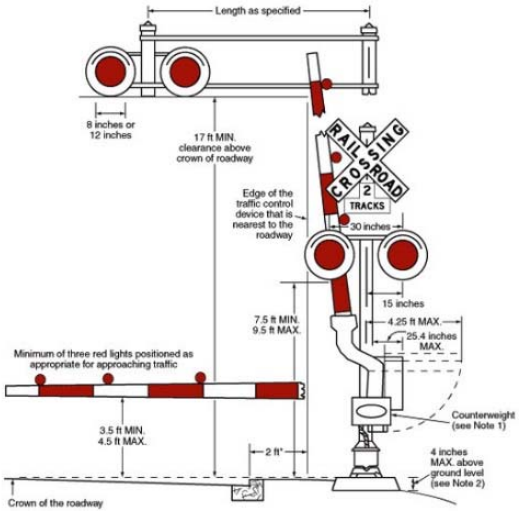
Other Pavement Markings

- No Bicycles pavement markings were also installed in Santa Fe to discourage bicyclists from riding along the crossing itself to cross a road. This pavement marking can be considered where this potential exists at other locations along the corridor.

4.1.2 Active Devices

The devices employed in active traffic control systems shall be actuated by some form of rail traffic detection.

- A flashing-light signal assembly (on a mast or cantilever) includes a standard R15-1 Crossbuck sign and R15-2P Number of Tracks plaque, as appropriate.
- Automatic gates/arms, along with flashing lights, are required in the Standard Applications where multi-use pathways cross the main track.
- At locations where bells are used in Quiet Zones, bells on each side of the crossing may be required by the design proposal, for example, if there are multiple lanes of traffic, considerable background noise or heavy traffic volumes.



4.2 Other Devices and Crossing Treatment Options

This section provides devices, strategies and techniques not currently used at NMRX crossings, but which may be considered for improving pedestrian/bicyclist safety in key locations if supported by later engineering studies.

4.2.1 Barrier-type Treatments

- Fencing/channelization can be used to direct pedestrians/bicyclists originating from multiple locations to a designated crossing. Fencing can also be used to keep people from walking around pedestrian automatic gates.

- Swing gates require pedestrians/bicyclists to come to a complete stop before crossing the tracks (see Example A). Swing gates should be considered where:
  - Pedestrian-to-train sight lines are restricted.
  - There is a high likelihood that pedestrians will quickly cross the tracks without looking.
  - The area has high levels of distracted pedestrians.

  Swing gates are also used as an escape route for pedestrians/bicyclists that may be trapped within a crossing when the automatic gate arms descend (see Example B). TCRP Report 175 further discusses the implementation of swing gates.

Swing Gate – Example A

Swing Gate – Example B

- Maze fencing is used to slow, channelize and reorient pedestrians/bicyclists so that they are forced to face the direction of a potentially approaching train. Along the NMRX system, maze fencing should require pedestrians/bicyclists to look both ways, as trains can approach from either direction on the main track and sidings.

- Temporary fencing/barriers can be used for special events that create more than normal pedestrian/ bicyclist traffic. These barriers enhance the existing safety treatments and can be easily removed once they are no longer needed.

4.2.2 Sign and Pavement Marking Treatments

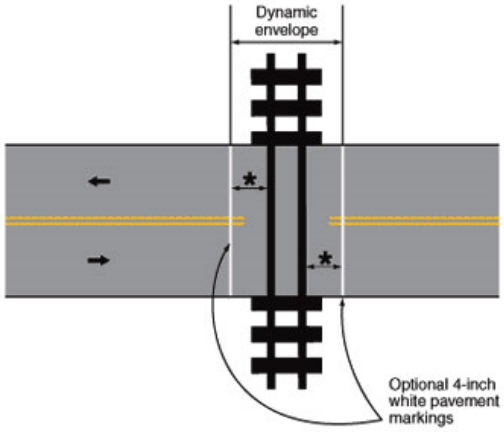
- A modification of the MUTCD sign W10-8 Trains May Exceed 80 MPH can be considered on the NMRX system at pathway crossings where trains pass at a high speed and do not stop. As current NMRX operating conditions do not allow 80 MPH speeds, a modification to this sign, for example Trains May Exceed 75 MPH, may be considered to warn pedestrians and bicyclists of high-speed passing trains. If used, this sign should be installed between the Grade Crossing Advance Warning sign (if present) and the crossing on all approaches.

- W10-13P No Gates or Lights plaque can be used at crossings that do not have these active devices. This sign is mounted below the Grade Crossing Advance Warning sign.

- Unique warning signs have been used when standard MUTCD signs do not convey the message most applicable to a particular situation. Many agencies have installed unique warning signs that are specific to that agency's jurisdiction or a special condition. An example is when there are multiple tracks at a crossing. Common non-standard signs include variations of Look Both Ways or Look for Trains. Review by FHWA and/or FRA is necessary before installing signs not found in the MUTCD.

- Signs for enforcement, such as the No Pedestrian sign shown with a train track symbol or No Trespassing signs can be used.

- Dynamic Envelope pavement markings are used to indicate the clearance required for the train equipment overhang. The asterisk in the figure below represents the distance between the rail and the dynamic envelope pavement marking. This distance should be 6 feet, or as advised by the operating railroad.



- Edge lines may be used to delineate the designated pedestrian/bicyclist route, and can be helpful when the distance across the tracks is long (due to a skewed grade crossing or multiple tracks) or where the pedestrian/bicyclist pathway surface is immediately adjacent to a vehicular traveled way. Edge lines were placed in Santa Fe at the crossings of Alcaldesa St. and Manhattan Ave.

4.2.3 Signal/Infrastructure Treatments

- One or more additional sets of flashing lights (wigwags) or traffic control devices may be installed between the tracks at multiple track crossings at stations; however, care must be taken to ensure these additional devices are not within the dynamic envelope or other required clearance. The separation between the sets of tracks may impact the ability to install additional wigwags or traffic control devices at some locations.

- W10-7 Activated Blank-Out Warning sign is blank by default, but shows a display as trains approach, warning users of an on-coming train. Other Activated Blank-Out Warning signs advise users to look in both directions before crossing the tracks, especially when there are multiple tracks. Though intended for light rail facilities per the MUTCD, according to TCRP Report 175, Blank-Out Warning signs are appropriate for use at any type of rail transit crossing with multiple trains approaching from multiple directions. Other messages, including the text Another Train Coming or 2nd Train Coming, can be considered at stations where a stopped train may obscure the approach of a second train.

4.2.4 Other Strategies and Techniques

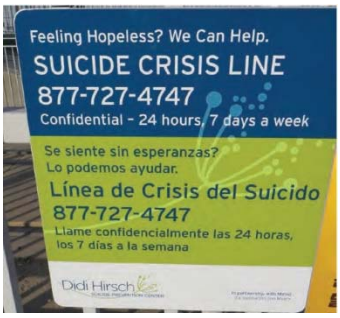
- Rail Safety Ambassadors are trained personnel assigned to "crossings to highlight improper behavior and educate the public on proper behavior, to provide assistance to users, and to identify and report any perceived safety concerns/hazards at stations and crossings." TCRP Report 175 details the Rail Safety Ambassador Program in further detail.

- Illumination is encouraged to improve nighttime visibility.

- Special Events – If there is a school event or other high pedestrian traffic event, even if it is temporary, an active warning system with automatic gates is recommended. If an active warning system is not possible, flaggers can be used to improve safety during special events.

- Safety Education – Active railroad safety programs can be effective at reaching students and other vulnerable populations who live near and/or are likely to cross railroad tracks on a daily basis. RMRTD staff, with support from Operation Lifesaver, have conducted safety outreach at schools, senior centers, and at other gatherings.

- Suicide prevention – Some cities in which suicides have occurred on their rail facilities have installed signs providing suicide crisis line information. A suicide prevention sign similar to the one shown at left, below, could be created with New Mexico Crisis and Access Line information. Similar efforts to link homeless persons with social services could also help reduce trespass and camping within NMRX right-of-way.



- Grade Crossing Separation – Since grade crossings are a potential source of conflict, consideration should be given to grade-separating a pedestrian/bicyclist facility from the train tracks, whether by overpass, underpass, or a large culvert-type crossing. Because grade separated crossings are costly, an engineering study should be conducted to evaluate the relative costs, benefits, impacts and issues of each design proposal.

- Grade Crossing Elimination – Guidance from the MUTCD recommends that any grade crossing that cannot be justified should be eliminated.

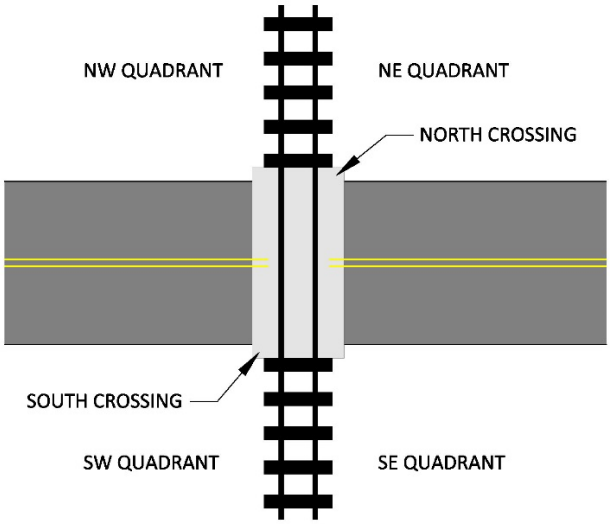
5. PEDESTRIAN/BICYCLIST CROSSING EVALUATION FORM

In order to determine what safety improvements should be incorporated into future projects, an evaluation process must compare existing pedestrian/bicyclist crossings of the NMRX main track against the Standard Applications introduced in Section 6 and depicted in Appendix C. In addition to a base assessment against the Standard Applications, the evaluation process can also identify site-specific conditions that this Toolbox could not anticipate, and/or demonstrate the need for some of the optional devices or strategies presented in Section 4.

To advance this effort, the project team developed the Pedestrian/Bicyclist Crossing Evaluation (PBCE) Form to inventory the condition of all pedestrian/bicyclist crossings of the NMRX main track (see Appendix B). The Form has two sections: 1) data collection to be completed on-site and 2) data collection to be completed in office. After the data collected in Sections 1 and 2 are compiled for all crossings, the project team will use this information to prioritize pedestrian/bicyclist crossings for potential Section 130 or Highway Safety Improvement Program funding.

5.1 Section 1

Section 1 of the PBCE Form serves to record existing grade crossing conditions. Each quadrant of a grade crossing is inventoried to ensure that all pedestrian/bicyclist approaches to the crossing are assessed. The observer is then asked to evaluate the condition of the pedestrian/bicyclist facilities within the crossing itself. Because the NMRX system runs north-south, the designations appearing on the PBCE Form include “North Crossing” and “South Crossing” as illustrated below:



5.2 Section 2

In addition to the in-field data collected in Section 1, the office component in Section 2 of the PBCE Form provides critical information about the context of the crossing, including the accident history; pedestrian/bicyclist counts (if available); the number of jobs, households, and schools within a defined distance as a proxy for potential activity at the crossing; and any planned pedestrian/bicyclist facilities. Along with Section 1, Section 2 will help prioritize the need for potential improvements by highlighting key considerations not readily visible in the field.

6. STANDARD APPLICATIONS

The MUTCD and the construction drawings prepared for the Santa Fe Quiet Zone Crossings project (CN 9900352) are the basis of the Standard Applications depicted in Appendix C. The Standard Applications generally convey, in a simple and concise form, the minimum treatments for various typical pedestrian/bicyclist crossing situations likely to be encountered along the NMRX corridor. More specifically, the passive devices and markings shown on the Standard Applications are required at every pedestrian/bicyclist approach of a given type (e.g., sidewalk, multi-use pathway). However, this requirement should not preclude the consideration of other passive devices that may not appear on the Standard Applications (e.g., channelization, swing gates). With respect to active devices and pedestrian/bicyclist facilities, multi-use pathways or similar off-street facilities that are specifically designed for use by bicyclists must also incorporate pedestrian/bicyclist-scaled lights, gates and bells at all crossings.

Whereas the MUTCD specifies minimum distances for sign placement, the Standard Applications have modified these in a few cases according to requirements and practices by NMDOT Rail Bureau and RMRTD. All other requirements, such as minimum sign sizes, mounting heights and lateral offsets shall be as per the MUTCD.

The Standard Applications do not attempt to illustrate every potential crossing treatment or address every type of crossing situation; rather, they are to be used as minimum requirements upon which other treatments may be added on an individual, site-specific basis. As stated in the MUTCD, “because of the large number of significant variables to be considered, no single standard system of traffic control devices is universally applicable for all highway-rail grade crossings”. It must also be noted that “the appropriate traffic control system to be used at a highway-rail grade crossing should be determined by an engineering study”. Thus, the Standard Applications also do not restrict the NMDOT Rail Bureau or RMRTD from mandating the installation of additional active or passive devices/markings.

The Standard Application designations are explained as follows:

SA-#**P** Standard Application – Number **P**assive

SA-#**A** Standard Application – Number **A**ctive

The pedestrian/bicyclist facility categories addressed in the Standard Applications include:

6.1 Roadway with No Pedestrian or Bicycle Facilities & Roadway with Dedicated Bicycle Lane

- **SA-1P** illustrates required devices at typical unpaved road crossings, such as private crossings.
- **SA-1A** illustrates required devices at typical paved road crossings along the NMRX corridor, which commonly have active devices.
- **SA-2A** illustrates the case of a paved road (again, which commonly have active devices) with bicycle lanes. This example could also apply to a designated bicycle route with paved shoulders. While no special signing treatments are provided for bicycle lanes, as signs are already provided for vehicles, the Stop line (when gates are present) has been extended into the bicycle lane and a small RR Xing symbol within the bicycle lane has been added.

6.2 Roadway with Sidewalk

The MUTCD considers sidewalks "to be part of a highway-rail or highway-LRT grade crossing rather than a pathway grade crossing" thus, minimum standards are based on MUTCD Chapters 8B *Signs and Markings* and 8C *Flashing-Light Signals, Gates, and Traffic Control Signals*. Two sidewalk conditions are considered here:

- Sidewalk immediately adjacent to the curb
    - **SA-3P-Case 1** provides supplemental passive devices for the sidewalk when the existing **automatic gate on the roadway does not extend across the sidewalk**.
    - **SA-3P-Case 2** addresses the situation where the existing **automatic gate on the roadway extends across the sidewalk** and provides supplemental passive devices for the sidewalk.

- Offset or buffered sidewalk
    - **SA-4P** illustrates the case when the existing automatic gate is between the roadway and the sidewalk, and provides supplemental passive devices for the sidewalk.
    - **SA-4A** provides recommended active devices for an offset sidewalk in the event that an engineering study or NMDOT Rail Bureau and/or RMRTD determine their installation is warranted.

6.3 Pathway

These Standard Applications consider a multi-use pathway that may either be offset from the roadway a short distance or altogether independent of the roadway. Minimum standards are based on MUTCD Chapter 8D *Pathway Grade Crossings*.

- **SA-5P** is applicable to multi-use pathways that cross industry or spur tracks. Passive devices are recommended as shown. Although active devices are not shown, their use may be warranted in certain situations.

- **SA-5A** is applicable to multi-use pathways that cross main tracks. The key difference from SA-5P is the requirement for active devices.

Appendix A

U.S. DOT Crossing Inventory Form

U. S. DOT CROSSING INVENTORY FORM

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

OMB No. 2130-0017

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

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

Part I: Location and Classification Information

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

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

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

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

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

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

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

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

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

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

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

Part II: Railroad Information

1. Estimated Number of Daily Train Movements

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

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

4. Type and Count of Tracks

Main _____ Siding _____ Yard _____ Transit _____ Industry _____

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

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

U. S. DOT CROSSING INVENTORY FORM

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

Part III: Highway or Pathway Traffic Control Device Information

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

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

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

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

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

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

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

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

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

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

Part IV: Physical Characteristics

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

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

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

Part V: Public Highway Information

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

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

6. LRS Milepost *

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

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

Submitted by _____ Organization _____ Phone _____ Date _____

Appendix B

Pedestrian/Bicyclist Crossing Evaluation Form

Date:_____ Crossing Number:_____

Evaluator:_____ Street Name/Highway Number:_____

PEDESTRIAN/BICYCLIST CROSSING EVALUATION FORM

Instructions: This form is to be completed as a supplement to the U.S. DOT CROSSING INVENTORY FORM (FORM FRA F 6180.71) for the inventory of pedestrian/bicyclist facilities.

APPROACHING QUADRANTS

PEDESTRIAN/BICYCLIST FACILITY	NE	NW	SE	SW	COMMENTS (e.g., other type or material)
Type: (S)idewalk, (P)athway, (I)nformal					
Material: (C)oncrete, (A)sphalt, (N)atural					
Width (Feet)					
Facility terminates before panel/transition material (if yes, estimate distance from panel in feet)					
Designated Bike (L)ane or Bike (R)oute with Paved Shoulder					

PASSIVE WARNING DEVICES	NE	NW	SE	SW	COMMENTS (e.g., obstructions, poor condition)
R15-1					
R15-2P (if multiple tracks)					
R15-8					
R1-1 or R1-2					
I-13 (pathway w/own xing #)					
W10-1					
W10-9P (Quiet Zone only)					
Other:					

ACTIVE WARNING DEVICES/BARRIERS	NE	NW	SE	SW	COMMENTS (e.g., other device)
Flashing-Light Pair Facing Approach					
Automatic Gate Arm (P)edestrian or (S)hared					
Bell or Audible Warning Device					
Other:					

PAVEMENT MARKINGS/SURFACING	NE	NW	SE	SW	COMMENTS (e.g., markings faded, incorrect placement)
Stop Line					
LOOK Symbol					
RR Xing Symbol					
Detectable Warning Surface					
Other:					

CROSSINGS

CROSSING INFORMATION	NORTH	SOUTH	COMMENTS (e.g., unusual design or environmental conditions)
Panel Material: (C)oncrete, (A)sphalt, (T)imber, (R)ubber, (O)ther			
Transition Material: (C)oncrete, (A)sphalt, (O)ther			
Narrowest Width of Facility (Feet)			
Panel Extends 3' Beyond Facility Edge			
Vertical Discontinuities (> 1/4")/Obstructions			
Flangeway Gap Width (2.5" or 3" Freight)			
Flangeway Fillers			
Skew Angle (if different from roadway)			

Provide additional comments and/or sketch of crossing on back of form if needed.

CROSSING DATA	
ACCIDENT HISTORY	
Total Accidents	
Accidents w/Injuries	
Accidents w/Fatalities	
Accidents w/Property Damage	
Accidents w/Pedestrians/Bicyclists	
WBAPS Predictive Collision Score	
PEDESTRIAN/BICYCLIST ACTIVITY	
Pedestrian/Bicyclist Counts (if available)	
Station or Transit Center within 1/4 mile	
Bus Stop within 1/4 mile	
Population within 1/4 mile	
Jobs within 1/4 mile	
Households within 1/4 mile	
Households within 1/4 mile w/no vehicle	
Schools within 1/4 mile	
PLANS/DESIGNATIONS	
Existing or Proposed Facilities Appearing in Adopted Pedestrian/Bicycle Plans	
Special Designations (e.g. Bicycle Boulevard, Bike Route) that Encourage Greater Activity	

Appendix C

Standard Applications

Q. What is the purpose of the Standard Applications?

A. The Standard Applications depict various pedestrian/bicyclist crossing scenarios common to the NMRX main corridor. Although they do not address every possible crossing scenario, the Standard Applications, with the support of other relevant references (e.g., MUTCD, *Guidebook on Pedestrian Crossings of Public Transit Rail Services*, AASHTO *Guide for the Development of Bicycle Facilities*), are intended to inform improvements to existing crossings or new crossings.

Q. Do the Standard Applications replace the need for a diagnostic review or engineering study?

A. No. Prior to designing improvements for an existing crossing or a new crossing, the consultant should conduct an in-field diagnostic review and invite the 1) railroad owner, 2) passenger and freight train operators, 3) the existing or proposed owner of the crossing facility, 4) relevant law enforcement agencies, and 5) any other party familiar with railroad operations or pedestrian/bicyclist activity at the crossing. The recommendations of the diagnostic review team should then be incorporated into an engineering study that defines the appropriate passive and active devices for the crossing.

Q. Do the Standard Applications replace the need for engineered drawings and specifications?

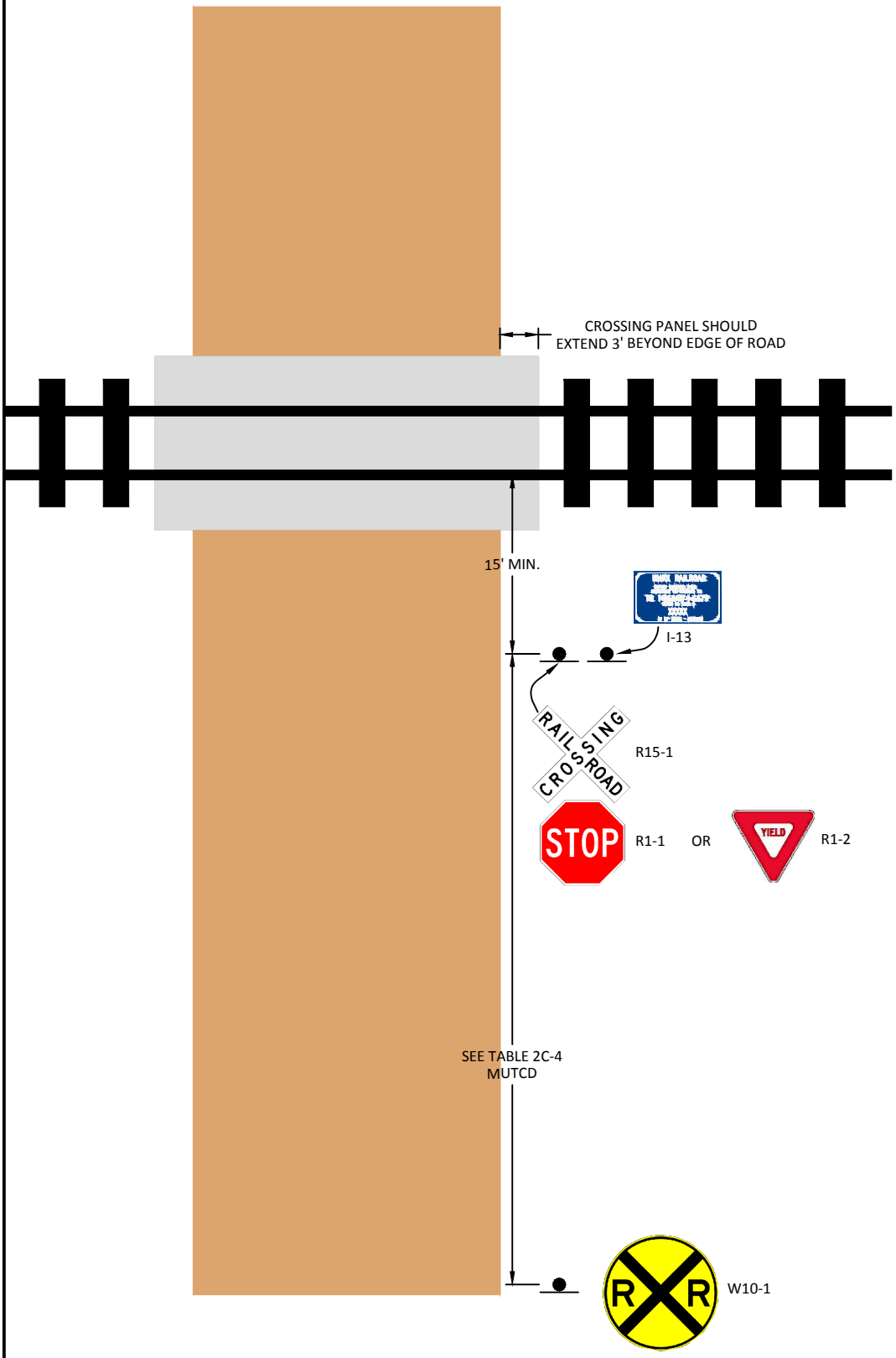
A. Similar to figures in the MUTCD, the Standard Applications identify the type and relationship of passive and active devices and markings that may be employed at NMRX crossings for the safety and benefit of pedestrians/bicyclists. However, because the Standard Applications cannot anticipate the unique conditions of every possible crossing, they do not prescribe exact locations, dimensions, materials, etc. Therefore, design consultants should produce engineered drawings and specifications specific to each crossing that are informed by the Standard Applications.

Q. Are any of the devices or markings shown on the Standard Applications required?

A. Yes. The passive devices and markings shown on the Standard Applications are minimally required at every pedestrian/bicyclist approach of a given type (e.g., sidewalk, pathway). However, this requirement should not preclude the consideration of other passive devices that may not appear on the Standard Applications (e.g., channelization, swing gates).

Furthermore, multi-use pathways or similar facilities that are specifically designed for use by bicyclists must incorporate pedestrian/bicyclist-scaled lights, gates and bells at all mainline crossings. The precedent for the installation of these active devices at multi-use pathway crossings within the NMRX corridor is evident at Alameda Blvd. and Rio Bravo Blvd. in Albuquerque, and also at several locations along the Santa Fe Rail Trail.

The previous requirements do not restrict the NMDOT Rail Bureau or Rio Metro from mandating the installation of additional active or passive devices/markings. Conditions that may warrant more rigorous treatments include, but are not limited to: the presence of a Quiet Zone; an adjacent transit stop, station or center; uses that generate high pedestrian activity (e.g., schools, hospitals, parks); restricted visibility; multiple tracks; train speed; train volume; and limited direct sunlight that results in prolonged snow and ice cover during the winter.



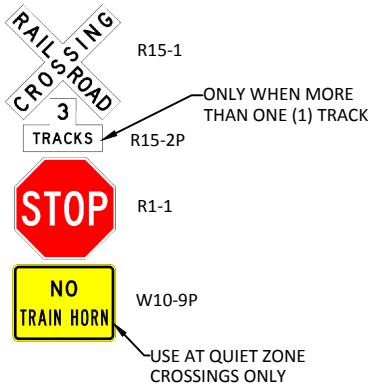
TYPICAL UNPAVED ROADWAY

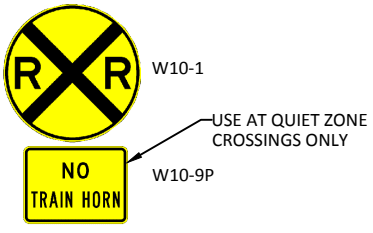
STANDARD MINIMUM DEVICE REQUIREMENTS
(TYPICAL FOR EACH APPROACH)

NOTES:

1. ALL SIGNS ARE CONVENTIONAL ROADWAY SIZE.
2. SIGNING SHOWN HERE WOULD ALSO APPLY TO A PAVED CROSSING WITH NO PEDESTRIAN OR BICYCLE FACILITIES, HOWEVER THE GRADE CROSSING PAVEMENT MARKING WOULD ALSO BE REQUIRED.

CONDITIONAL ASSEMBLIES

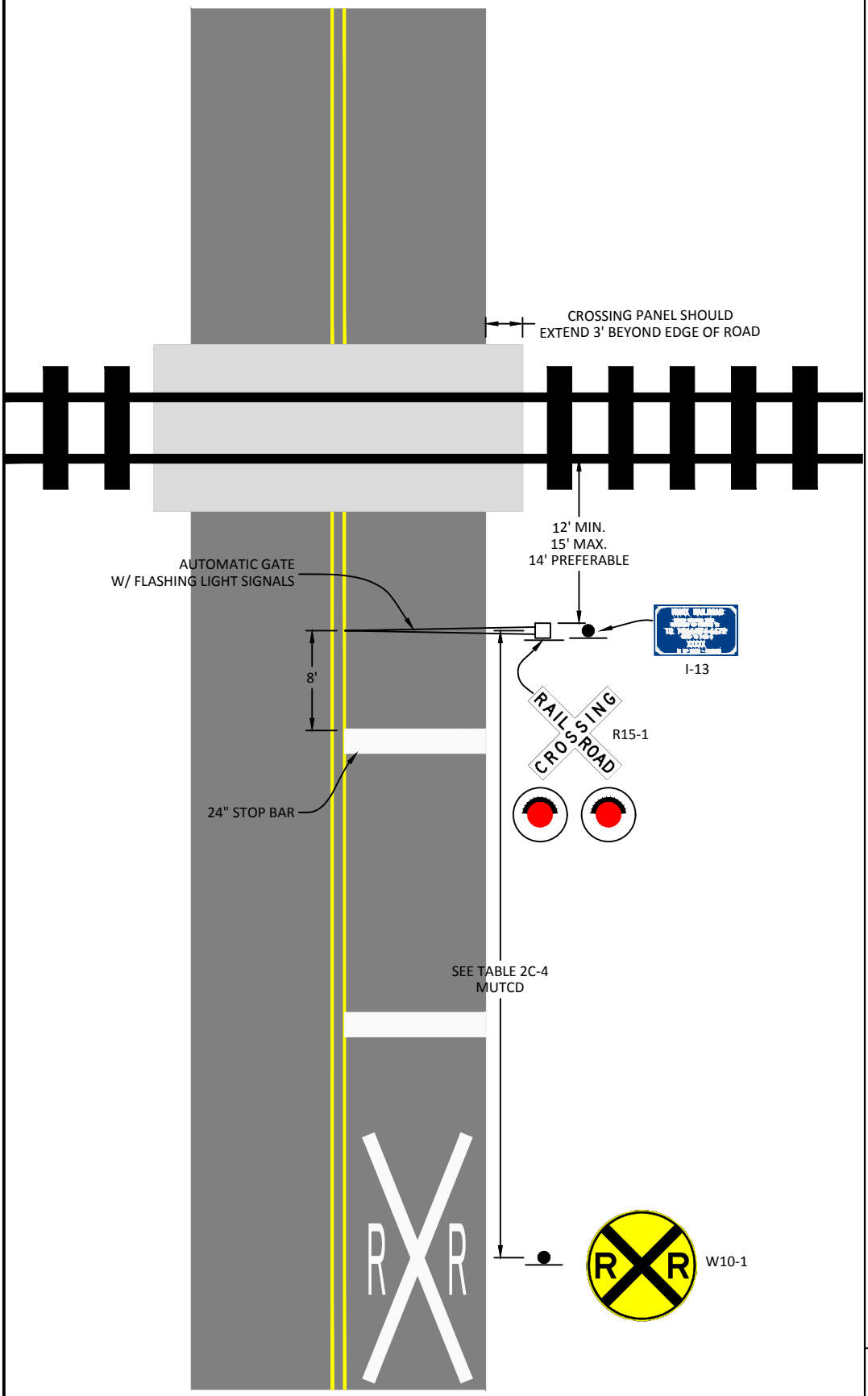




UNPAVED ROADWAY
WITH NO PEDESTRIAN OR
BICYCLE FACILITIES

PASSIVE

DWG SA-1P



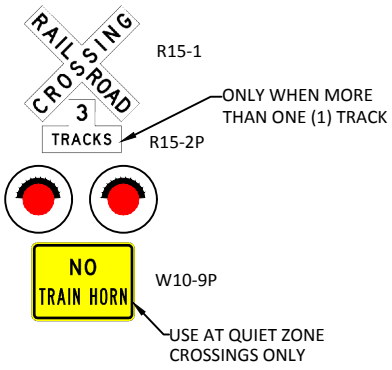
TYPICAL PAVED ROADWAY

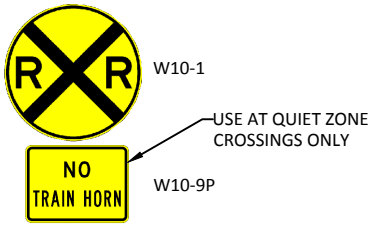
STANDARD MINIMUM DEVICE REQUIREMENTS
(TYPICAL FOR EACH APPROACH)

NOTES:

1. ALL SIGNS ARE CONVENTIONAL ROADWAY SIZE.
2. NOT ALL COMPONENTS OF THE GRADE CROSSING PAVEMENT MARKING ARE SHOWN IN ORDER TO SIMPLIFY THE FIGURE.

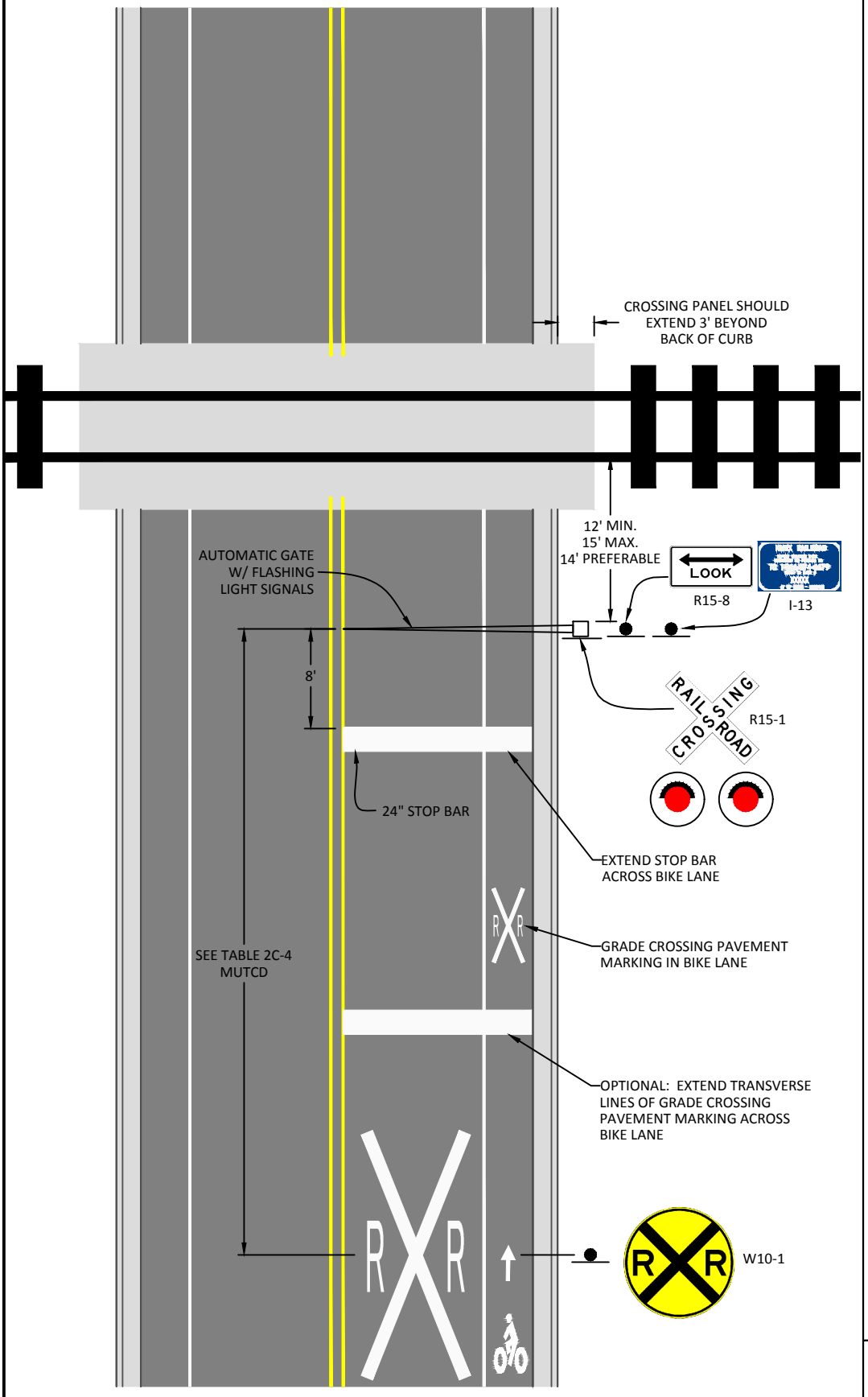
CONDITIONAL ASSEMBLIES





PAVED ROADWAY
WITH NO PEDESTRIAN OR
BICYCLE FACILITIES

ACTIVE



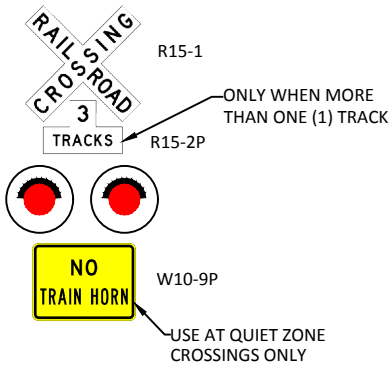
PAVED ROADWAY

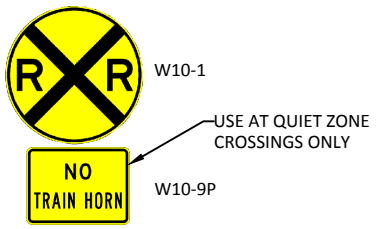
STANDARD MINIMUM DEVICE REQUIREMENTS
(TYPICAL FOR EACH APPROACH)

NOTES:

1. ALL SIGNS ARE CONVENTIONAL ROADWAY SIZE.
2. NOT ALL COMPONENTS OF THE GRADE CROSSING PAVEMENT MARKING ARE SHOWN IN ORDER TO SIMPLIFY THE FIGURE.

CONDITIONAL ASSEMBLIES

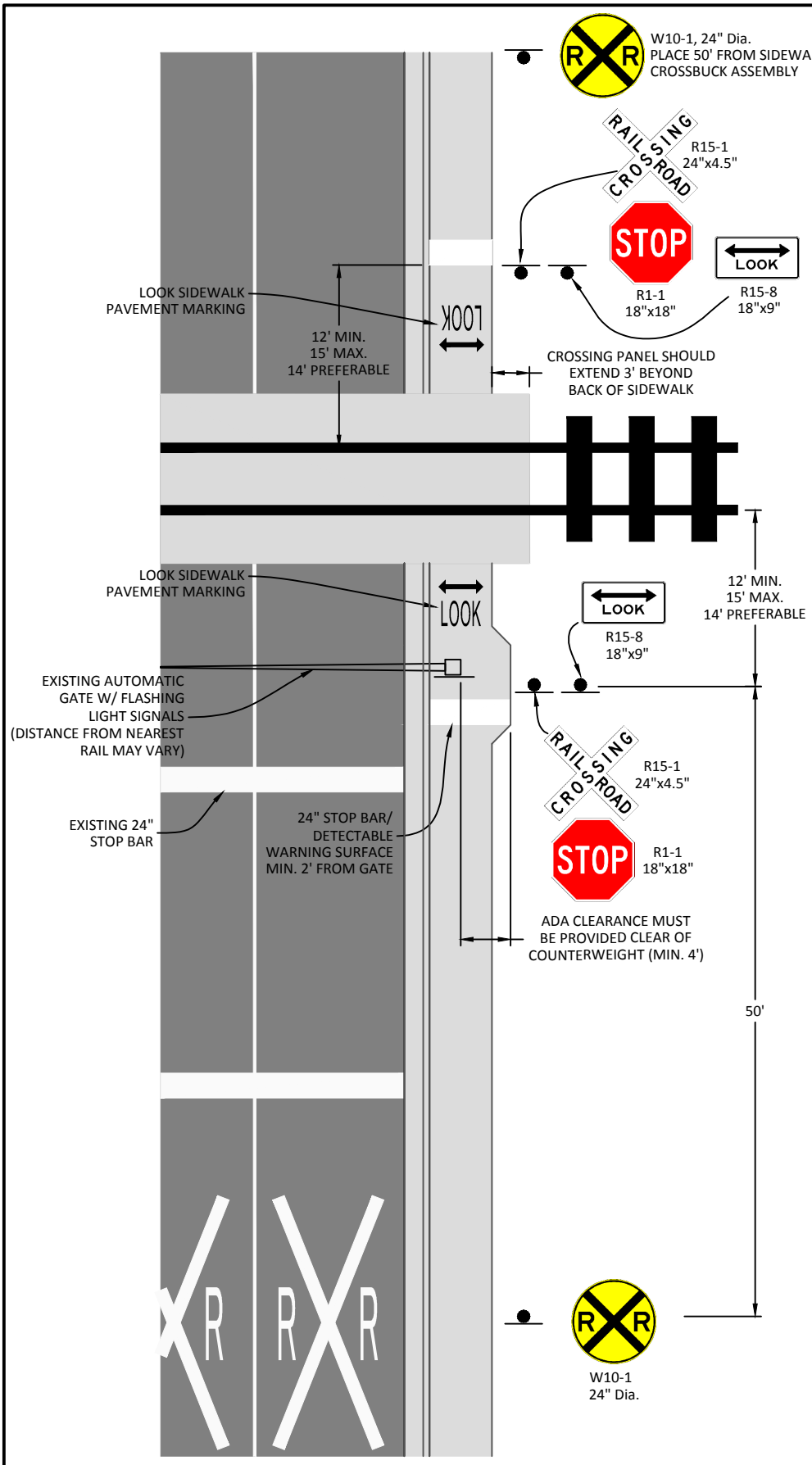




ROADWAY WITH DEDICATED BICYCLE LANE

ACTIVE

DWG SA–2A



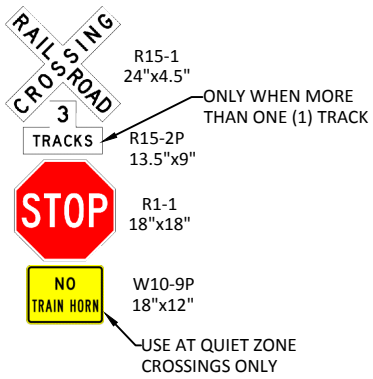
EXISTING ROADWAY WITH ACTIVE DEVICES

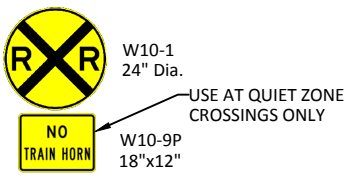
CASE 1: AUTOMATIC GATE DOES NOT EXTEND ACROSS SIDEWALK.
RECOMMENDED PASSIVE DEVICES FOR SIDEWALK
(TYPICAL FOR EACH ROADWAY APPROACH)

NOTES:

1. ALL SIGNS ARE SHARED-USE PATH SIZE AS INDICATED.
2. IN ORDER TO SIMPLIFY THE FIGURE ROADWAY DEVICES ARE NOT SHOWN.
3. SEPARATE ACTIVE DEVICES CAN BE CONSIDERED FOR THE SIDEWALK. REFER TO SA-4A.

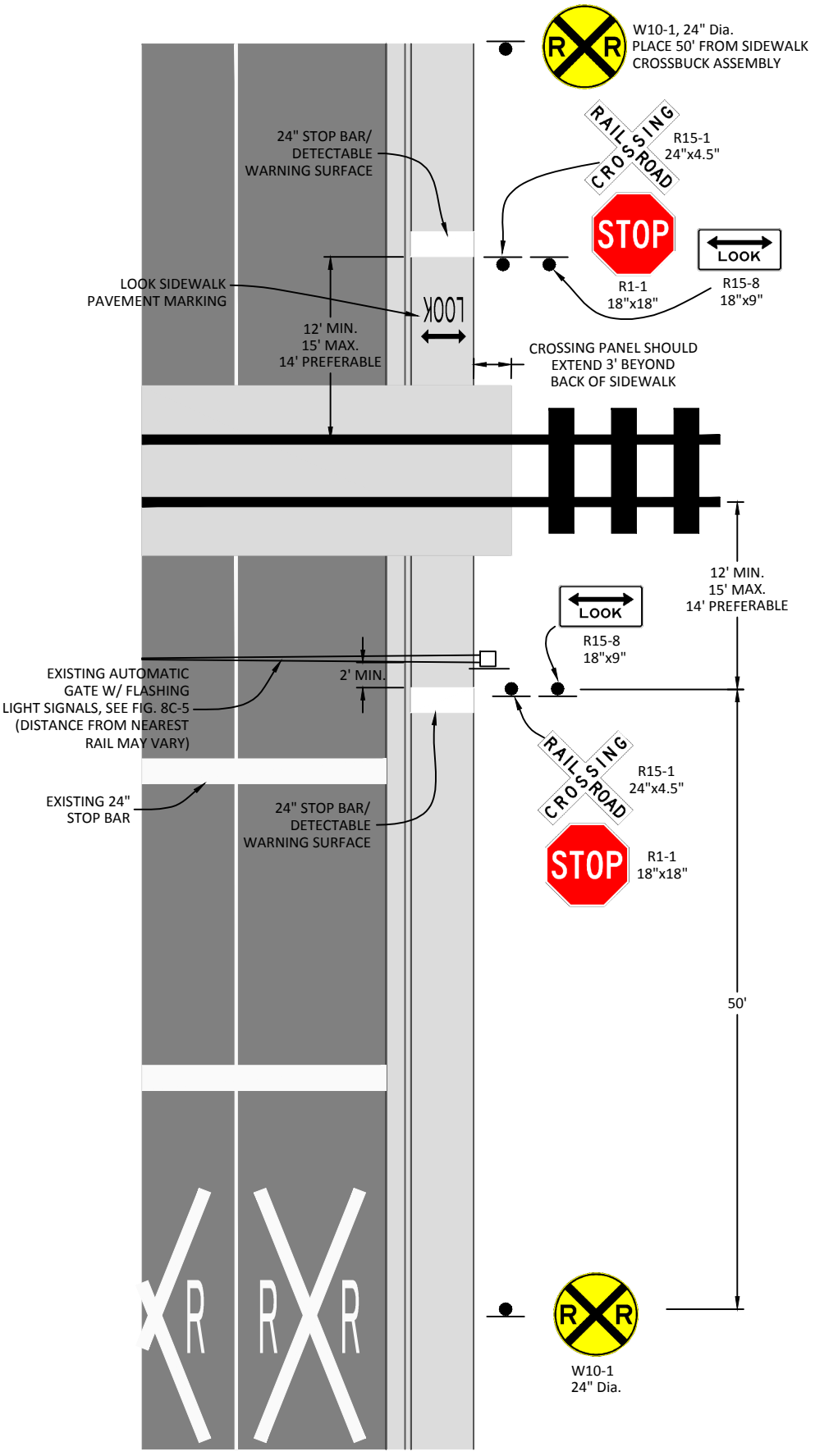
CONDITIONAL ASSEMBLIES





ROADWAY WITH ADJACENT SIDEWALK
CASE 1

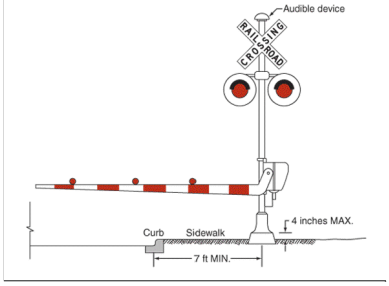
PASSIVE DEVICES ON SIDEWALK



EXISTING ROADWAY WITH ACTIVE DEVICES

CASE 2: AUTOMATIC GATE EXTENDS ACROSS SIDEWALK.
RECOMMENDED DEVICES FOR SIDEWALK
(TYPICAL FOR EACH ROADWAY APPROACH)

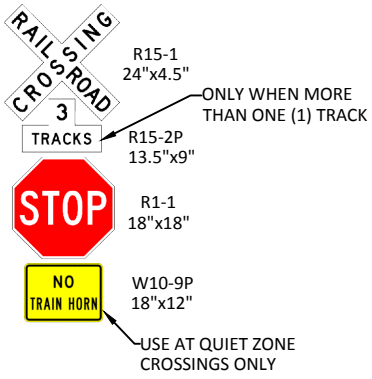
Figure 8C-5. Example of a Shared Pedestrian/Roadway Gate

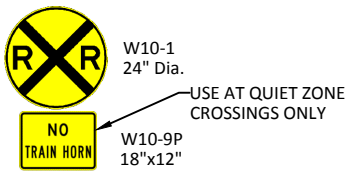


NOTES:

1. ALL SIGNS ARE SHARED-USE PATH SIZE AS INDICATED.
2. IN ORDER TO SIMPLIFY THE FIGURE ROADWAY DEVICES ARE NOT SHOWN.
3. SEPARATE ACTIVE DEVICES CAN BE CONSIDERED FOR THE CONTRA-FLOW APPROACH ON THE SIDEWALK. REFER TO SA-4A.

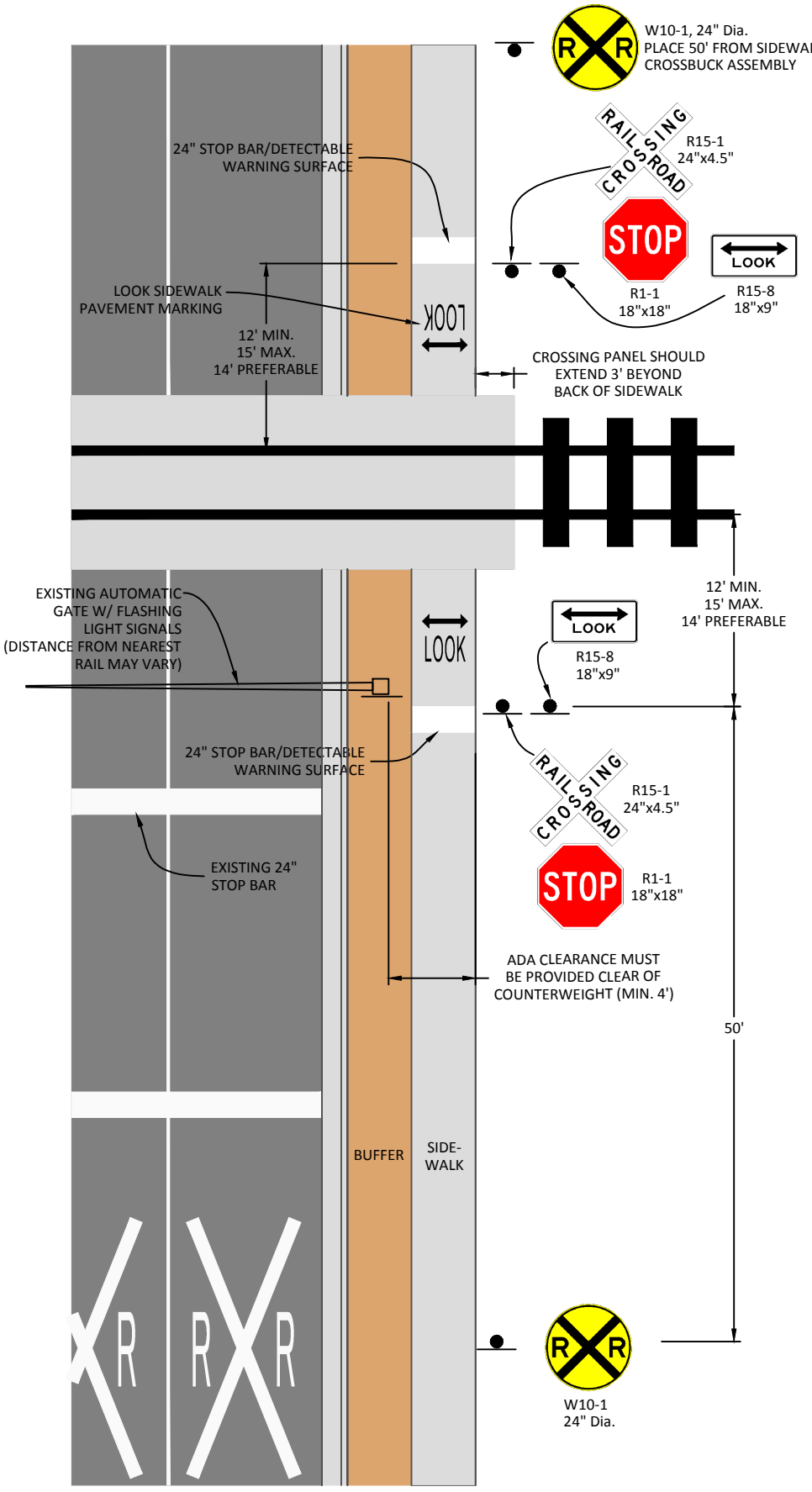
CONDITIONAL ASSEMBLIES





ROADWAY WITH ADJACENT SIDEWALK
CASE 2

PASSIVE DEVICES ON SIDEWALK



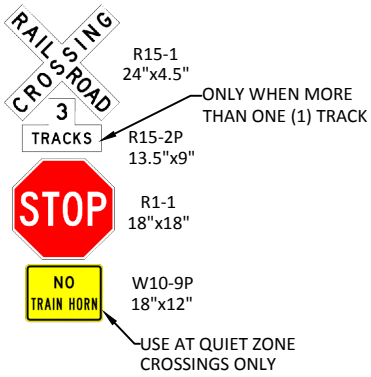
EXISTING ROADWAY WITH ACTIVE DEVICES

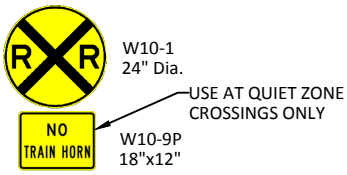
AUTOMATIC GATE BETWEEN SIDEWALK AND ROADWAY.
RECOMMENDED PASSIVE DEVICES FOR SIDEWALK
(TYPICAL FOR EACH ROADWAY APPROACH)

NOTES:

1. ALL SIGNS ARE SHARED-USE PATH SIZE AS INDICATED.
2. IN ORDER TO SIMPLIFY THE FIGURE ROADWAY DEVICES ARE NOT SHOWN.

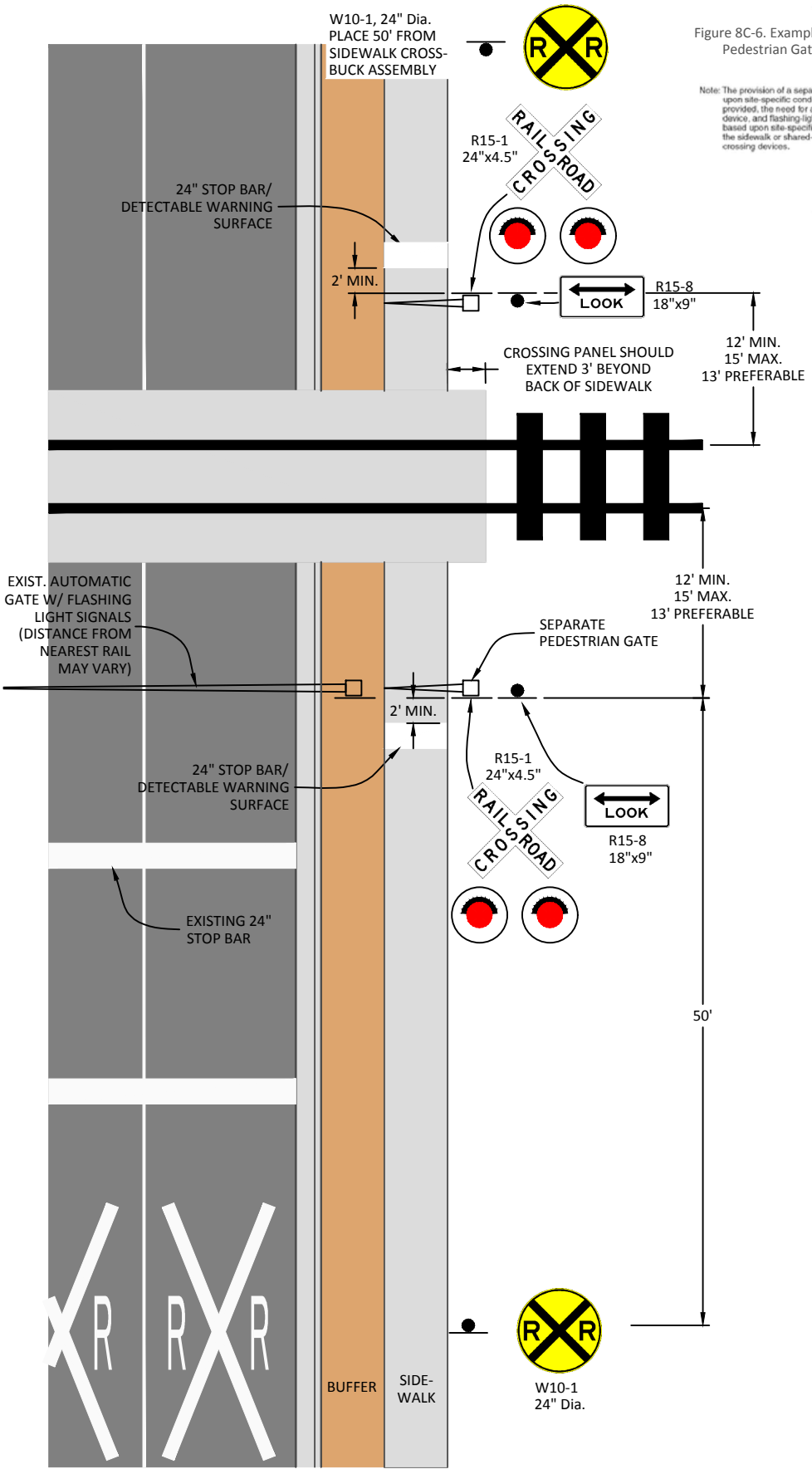
CONDITIONAL ASSEMBLIES





ROADWAY WITH OFFSET SIDEWALK

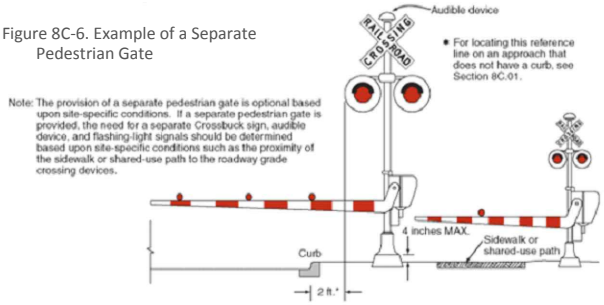
PASSIVE DEVICES ON SIDEWALK



EXISTING ROADWAY WITH ACTIVE DEVICES

AUTOMATIC GATE BETWEEN SIDEWALK AND ROADWAY.
RECOMMENDED ACTIVE DEVICES FOR SIDEWALK
(TYPICAL FOR EACH ROADWAY APPROACH)

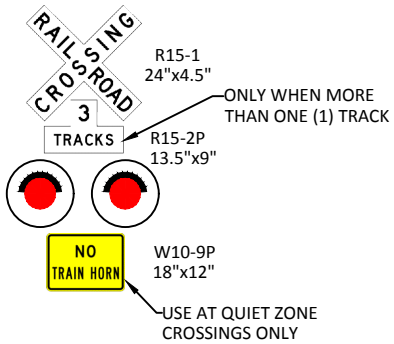
Figure 8C-6. Example of a Separate Pedestrian Gate

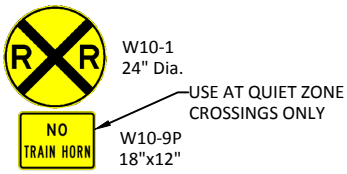


NOTES:

1. ALL SIGNS ARE SHARED-USE PATH SIZE AS INDICATED.
2. IN ORDER TO SIMPLIFY THE FIGURE ROADWAY DEVICES ARE NOT SHOWN.

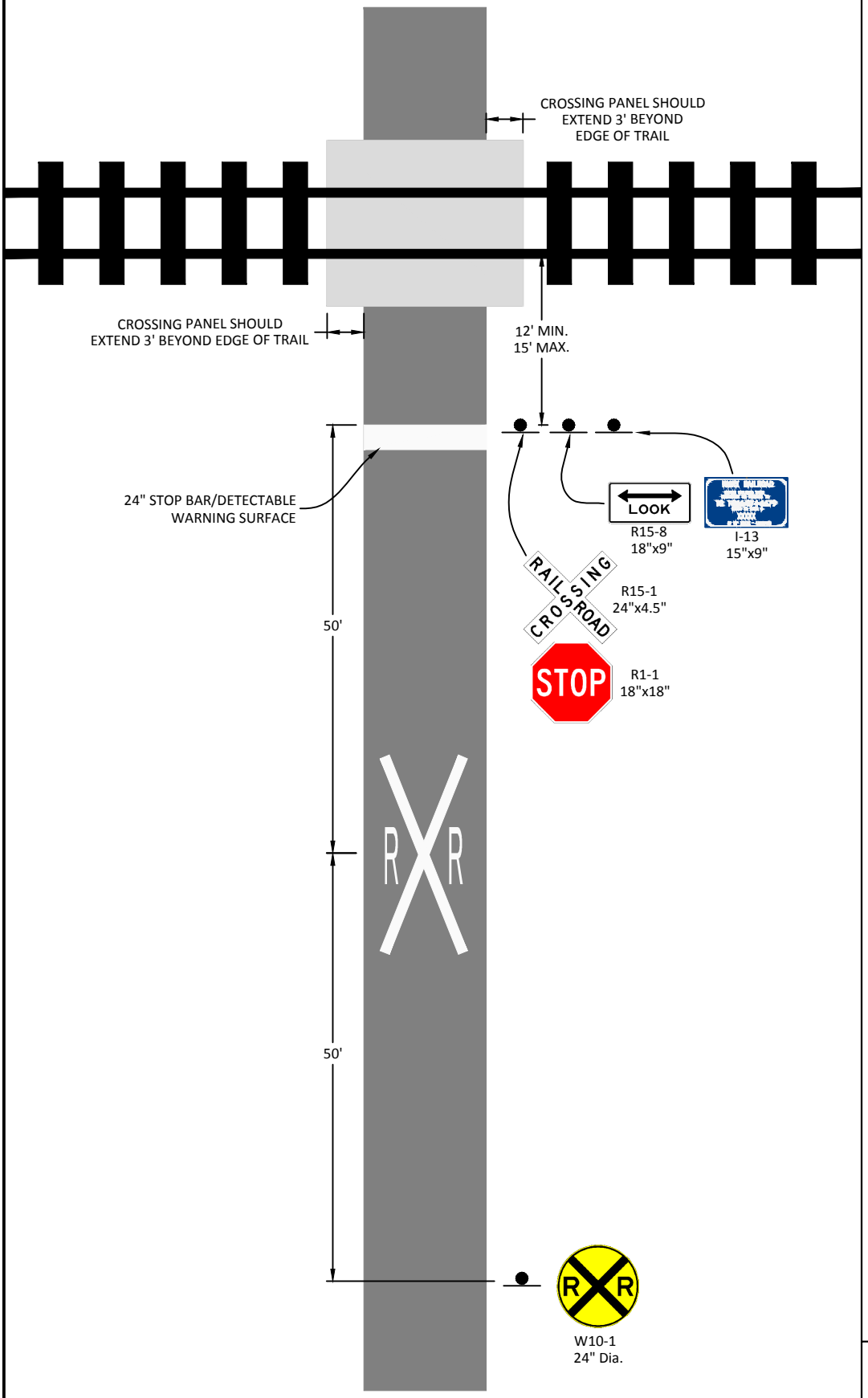
CONDITIONAL ASSEMBLIES





ROADWAY WITH OFFSET SIDEWALK

ACTIVE DEVICES ON SIDEWALK



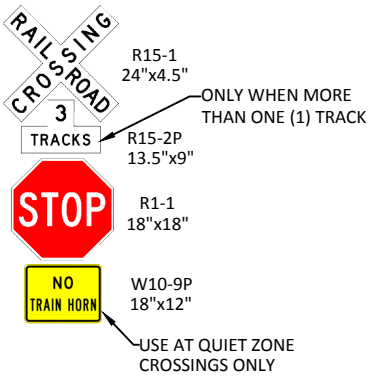
TYPICAL PATHWAY CROSSING

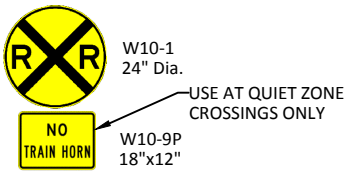
STANDARD MINIMUM DEVICE REQUIREMENTS
(TYPICAL FOR EACH APPROACH)

NOTES:

1. ALL SIGNS ARE SHARED-USE PATH SIZE AS INDICATED.
2. THIS STANDARD APPLICATION IS PERMISSIBLE ONLY AT INDUSTRY TRACK OR SPUR CROSSINGS.
3. THE I-13 (ENS) SIGN MAY BE ORIENTED AS SHOWN HERE (PERPENDICULAR TO THE PATH), OR ORIENTED SUCH THAT IT FACES THE SIDE OF THE PATH (PARALLEL).

CONDITIONAL ASSEMBLIES

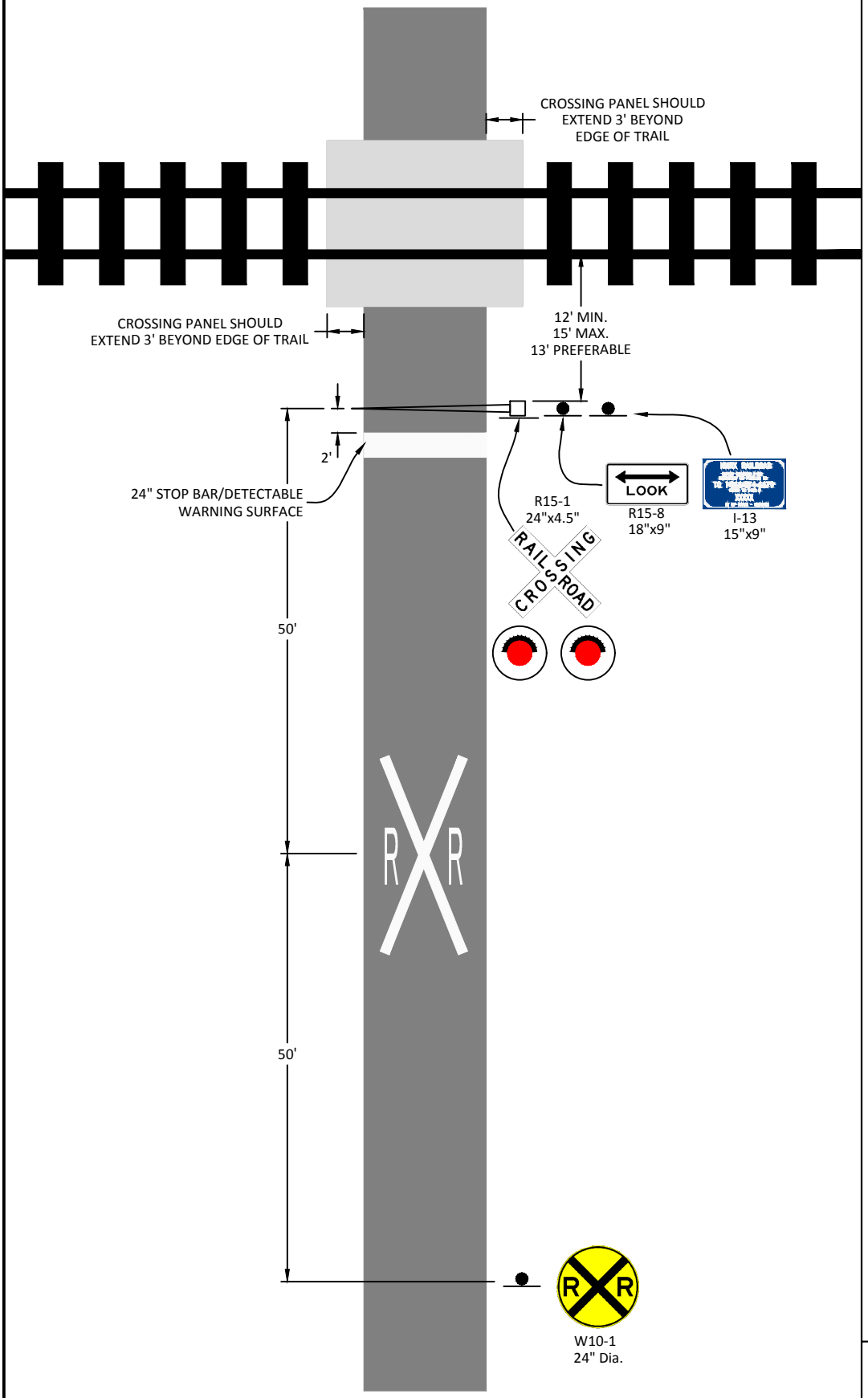




PATHWAY CROSSING
ON INDUSTRY OR SPUR

PASSIVE DEVICES

DWG SA–5P



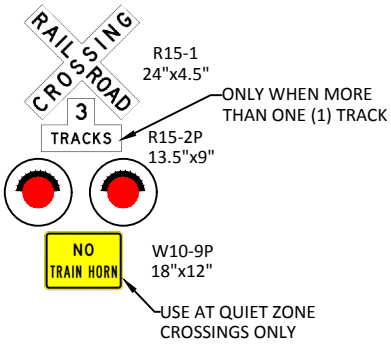
TYPICAL PATHWAY CROSSING

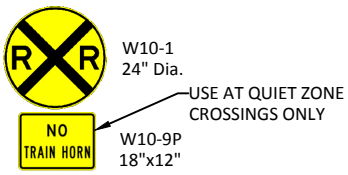
STANDARD MINIMUM DEVICE REQUIREMENTS
(TYPICAL FOR EACH APPROACH)

NOTES:

1. ALL SIGNS ARE SHARED-USE PATH SIZE AS INDICATED.
2. AT EXISTING TRAIL CROSSINGS, AN INCREMENTAL APPROACH CAN BE TAKEN AS AN INTERIM, BUT ULTIMATELY, THE TRAIL CROSSING WILL BE REQUIRED TO HAVE ALL OF THE DEVICES SHOWN.
3. THE I-13 (ENS) SIGN MAY BE ORIENTED AS SHOWN HERE (PERPENDICULAR TO THE PATH), OR ORIENTED SUCH THAT IT FACES THE SIDE OF THE PATH (PARALLEL).

CONDITIONAL ASSEMBLIES





PATHWAY

ACTIVE DEVICES

DWG SA-5A