

PART 8

TRAFFIC CONTROL FOR RAILROAD AND LIGHT RAIL TRANSIT GRADE CROSSINGS

CHAPTER 8A. GENERAL

Section 8A.02 Use of Standard Devices, Systems, and Practices at Highway-Rail Grade Crossings

Guidance:

~~02~~—*The appropriate traffic control system to be used at a highway-rail grade crossing should be determined by an engineering study involving both the highway agency and the railroad company.*

02A *Before any improvement is made at a railroad-highway crossing, an engineering study involving both the highway authority and the railroad company should be conducted to determine what actions should be taken to enhance safety at the crossing. Actions may include the installation of traffic control systems or other improvements that have a demonstrated capacity to enhance safety and operations at the crossing.*

02B *With regard to traffic control systems, the following should apply:*

- A. As a minimum, crossbucks, advance warning signs, appropriate regulatory signs, and pavement markings as prescribed in Part 8 of the MUTCD should be installed.
- B. The determination of the type of highway traffic control system, other than the minimum as required in A above, at a particular crossing is a two-step process.
 1. The first step is to calculate an Accident Prediction Value (APV) or hazard index of the crossing in question. The APV should be expressed in accidents per year. The APV should be calculated using the procedures from the Railroad-Highway Grade Crossing Handbook - Revised Second Edition (FHWA-SA-07-010), available through the National Technical Information Service. Using the calculated APV and the existing type of highway traffic control system at the crossing, the calculated APV should be compared to threshold values in Table 8A-100 to determine the type of traffic control system that should be installed.
 2. The second step is to have the crossing evaluated by a diagnostic team as required by the Alaska Policy on Railroad/Highway Crossings.
- C. When a diagnostic team recommends the installation of a traffic control system different from that indicated by APV threshold values, or recommends another type of crossing improvement, the recommendation of the diagnostic team should take precedence over the quantitative procedure.

Table 8A-100. Qualitative Procedure

| Existing Traffic Control Device | Calculated Accident Prediction Value, APV | Recommended Action for Improvement |
|---------------------------------|---|--|
| Passive | 0.08 to 0.12* | See note below. Flashing lights Flashing lights or gates and flashing lights |
| | 0.12 to 0.15 | |
| | 0.15 to 0.23 | |
| | 0.23 to 12.4 | |
| | 12.4 to 18.5 | Gates and flashing lights or grade separation |
| | Greater than 18.5 | Grade separation |
| Flashing lights | 0.12 to 0.18* | See note below Gates and flashing lights |
| | 0.18 to 3.7 | |
| | 3.7 to 5.6 | |
| | Greater than 5.6 | Grade separation |
| Gates | 1.32 to 1.98* | See note below Grade separation |
| | Greater than 1.98 | |

* When the calculated hazard index falls within this range, the decision may be to do nothing, improve the existing traffic control system, install a different type of traffic control system, or make some other improvement at the crossing.

Option:

03 The engineering study may include the Highway-Rail Intersection (HRI) components of the National Intelligent Transportation Systems (ITS) architecture, which is a USDOT accepted method for linking the highway, vehicles, and traffic management systems with rail operations and wayside equipment.

03A Consistent with the Alaska Policy on Railroad/Highway Crossings, other improvements that may be considered for enhancing crossing safety include:

- A. Improving sight distance to increase the visibility of the crossing and the train
- B. Closing the crossing
- C. Improving the approach alignment and/or grade of the roadway
- D. Instituting and enforcing railroad and/or highway operating regulations
- E. Improving the crossing surface
- F. Illuminating the crossing

Support:

04 More detail on Highway-Rail Intersection components is available from the USDOT's Federal Railroad Administration, 1200 New Jersey Avenue, SE, Washington, DC 20590, or www.fra.dot.gov.

Standard:

05 **Traffic control devices, systems, and practices shall be consistent with the design and application of the Standards contained in this Manual.**

06 **Before any new highway-rail grade crossing traffic control system is installed or before modifications are made to an existing system, ~~approval shall be obtained from the highway agency with the jurisdictional and/or statutory authority, and from the railroad company.~~ the Alaska Policy on Railroad/Highway Crossings shall be implemented.**

CHAPTER 8B. SIGNS AND MARKINGS

[Revise Table 8B-1 of the 2009 MUTCD as shown in this ATMS. The remainder of Table 8B-1 remains as shown in the 2009 MUTCD.]

Table 8B-1. Grade Crossing Sign and Plaque Minimum Sizes

| Sign or Plaque | Sign Designation | Section | Conventional Road | | Expressway | Minimum | Oversized |
|----------------|------------------|-----------------|-------------------|--|--------------|--------------|-----------|
| | | | Single Lane | Multi-Lane | | | |
| Stop | R1-1 | 8B.04, 8B.05 | 30 x 30 | 36 x 36 | 36 x 36 | — | 48 x 48 |
| Yield | R1-2 | 8B.04, 8B.05 | 36 x 36 x 36 | 48 x 48 x 48 <u>36 x 36 x 36</u> | 48 x 48 x 48 | 30 x 30 x 30 | — |

Section 8B.03 Grade Crossing (Crossbuck) Sign (R15-1) and Number of Tracks Plaque (R15-2P) at Active and Passive Grade Crossings

Standard:

- 05 If automatic gates are not present and if there are two or more tracks at a grade crossing, the number of tracks shall be indicated on a supplemental Number of Tracks (R15-2P) plaque (see Figure 8B-1) of inverted T shape mounted below the Crossbuck sign in the manner shown in Figure 8B-2.
- 06 On each approach to a highway-rail grade crossing and, if used, on each approach to a highway-LRT grade crossing, the Crossbuck sign shall be installed on the right-hand side of the highway on each approach to the grade crossing. Where restricted sight distance or unfavorable highway geometry exists on an approach to a grade crossing, an additional Crossbuck sign shall be installed on the left-hand side of the highway, possibly placed back-to-back with the Crossbuck sign for the opposite approach, or otherwise located so that two Crossbuck signs are displayed for that approach.
- 07 A strip of high-intensity or brighter retroreflective white material not less than **26** inches in width shall be used mounted on the back of each blade of each Crossbuck sign for the length of each blade, at all grade crossings where Crossbuck signs have been installed, except those where Crossbuck signs have been installed back-to-back.

Section 8B.04 Crossbuck Assemblies with YIELD or STOP Signs at Passive Grade Crossings

Standard:

- 15 A vertical strip of high-intensity or brighter retroreflective white material, not less than **2** inches in width, shall be used mounted on each Crossbuck support at passive grade crossings for the full length of the back of the support from the Crossbuck sign or Number of Tracks plaque to within 2 feet above the ground, except as provided in Paragraph 16.

Option:

- 16 The vertical strip of high-intensity or brighter retroreflective material may be omitted from the back sides of Crossbuck sign supports installed on one-way streets.
- 17 If a YIELD or STOP sign is installed on the same support as the Crossbuck sign, a vertical strip of red (see Section 2A.21) or white high-intensity or brighter retroreflective material that is at least 2 inches wide may be used on the front of the support from the YIELD or STOP sign to within 2 feet above the ground.

Section 8B.06 Grade Crossing Advance Warning Signs (W10 Series)

Standard:

- 01 A Grade Crossing Advance Warning (W10-1) sign (see Figure 8B-4) shall be used on each highway in advance of every highway-rail grade crossing, and every highway-LRT grade crossing in semi-exclusive alignments, except in the following circumstances:
- A. On an approach to a grade crossing from a T-intersection with a parallel highway if the distance from the edge of the track to the edge of the parallel roadway is less than 100 feet and W10-3 signs are used on both approaches of the parallel highway;
 - B. On low-volume, low-speed highways crossing minor spurs or other tracks that are infrequently used and road users are directed by an authorized person on the ground to not enter the crossing at all times that approaching rail traffic is about to occupy the crossing;
 - C. In business or commercial areas where active grade crossing traffic control devices are in use; or
 - D. Where physical conditions do not permit even a partially effective display of the sign.
- 02 The placement of the Grade Crossing Advance Warning sign shall be in accordance with Section 2C.05 and Table 2C-4.
- 03 A Yield Ahead (W3-2) or Stop Ahead (W3-1) Advance Warning sign (see Figure 2C-6) shall also be installed if the criteria for their installation given in Section 2C.36 are met. If a Yield Ahead or Stop Ahead sign is installed on the approach to the crossing, the W10-1 sign shall be installed upstream from the Yield Ahead or Stop Ahead sign. The Yield Ahead or Stop Ahead sign shall be located in accordance with Table 2C-4. The minimum distance between the signs shall be in accordance with Section 2C.05 and Table 2C-4.

Option:

- 04 ~~On divided highways and one-way streets, an additional W10-1 sign may be installed on the left-hand side of the roadway.~~

Guidance:

- 04A On divided highways and one-way streets, an additional W10-1 sign should also be installed on the left-hand side of the roadway.

Section 8B.09 DO NOT STOP ON TRACKS Sign (R8-8)

Guidance:

- 01 A DO NOT STOP ON TRACKS (R8-8) sign (see Figure 8B-1) should be installed whenever an engineering study determines that the potential for highway vehicles stopping on the tracks at a grade crossing is significant. Placement of the R8-8 sign should be determined as part of the engineering study. The sign, if used, should be located on the right-hand side of the highway on either the near or far side of the grade crossing, depending upon which position provides better visibility to approaching drivers.
- 02 If a STOP or YIELD sign is installed at a location, including at a circular intersection, that is downstream from the grade crossing such that highway vehicle queues are likely to extend beyond the tracks, a DO NOT STOP ON TRACKS sign (R8-8) should be used.
- 02A On divided highways and one-way streets, a second DO NOT STOP ON TRACKS sign should be placed on the near or far left-hand side of the highway-rail grade crossing to further improve visibility of the sign.

Option:

- 03 DO NOT STOP ON TRACKS signs may be placed on both sides of the track.
- 04 ~~On divided highways and one-way streets, a second DO NOT STOP ON TRACKS sign may be placed on the near or far left-hand side of the highway at the grade crossing to further improve visibility of the sign.~~

Section 8B.27 Pavement Markings

Standard:

- 01 All grade crossing pavement markings shall be retroreflectorized white. All other markings shall be in accordance with Part 3.
- 02 On paved roadways, pavement markings in advance of a grade crossing shall consist of an X, the letters RR, a no-passing zone marking (on two-lane, two-way highways with center line markings in compliance with Section 3B.01), and certain transverse lines as shown in Figures 8B-6 and 8B-7.
- 03 Identical markings shall be placed in each approach lane on all paved approaches to grade crossings where signals or automatic gates are located, ~~and~~ **and on all multilane roads.** at all other grade crossings where the posted or statutory highway speed is 40 mph or greater.
- 04 ~~Pavement markings shall not be required at grade crossings where the posted or statutory highway speed is less than 40 mph if an engineering study indicates that other installed devices provide suitable warning and control. Pavement markings shall not be required at grade crossings in urban areas if an engineering study indicates that other installed devices provide suitable warning and control.~~

Guidance:

- 05 Identical pavement markings should be placed in each approach lane on all paved approaches to highway-rail grade crossings. When pavement markings are used, a portion of the X symbol should be directly opposite the Grade Crossing Advance Warning sign. The X symbol and letters should be elongated to allow for the low angle at which they will be viewed.

Option:

- 06 When justified by engineering judgment, supplemental pavement marking symbol(s) may be placed between the Grade Crossing Advance Warning sign and the grade crossing.

[The following are new sections. There are no corresponding sections in the MUTCD.]

Section 8B.100 BICYCLES (skewed track crossing symbol) USE CAUTION (W10-100)

Standard:

- 01 The BICYCLES (skewed track crossing symbol) USE CAUTION (W10-100) sign shall be used on all paved roadways and paths in advance of railroad grade crossings that are skewed 15 degrees or more.

Guidance:

- 02 If used, the sign should be placed 65 feet in advance of the near rail of the skewed railroad crossing.

Section 8B.101 BUSES & HAZMAT VEHICLES USE RIGHT LANE Sign (R16-115)

Guidance:

- 01 If an extra lane has been provided for buses and hazmat vehicles to stop at railroad grade crossings, a BUSES & HAZMAT VEHICLES USE RIGHT LANE (R16-115) sign should be installed at the upstream end of the taper for the extra lane.

Support:

- 02 Certain vehicles, principally buses and vehicles transporting fuel or explosive substances, are required to stop before crossing a railroad grade (13 AAC 02.250). A bypass lane provides vehicles required to stop an opportunity to depart the through lanes before slowing and stopping at a railroad crossing, reducing the potential for severe rear-end crashes.

CHAPTER 8C. FLASHING-LIGHT SIGNALS, GATES, AND TRAFFIC CONTROL SIGNALS

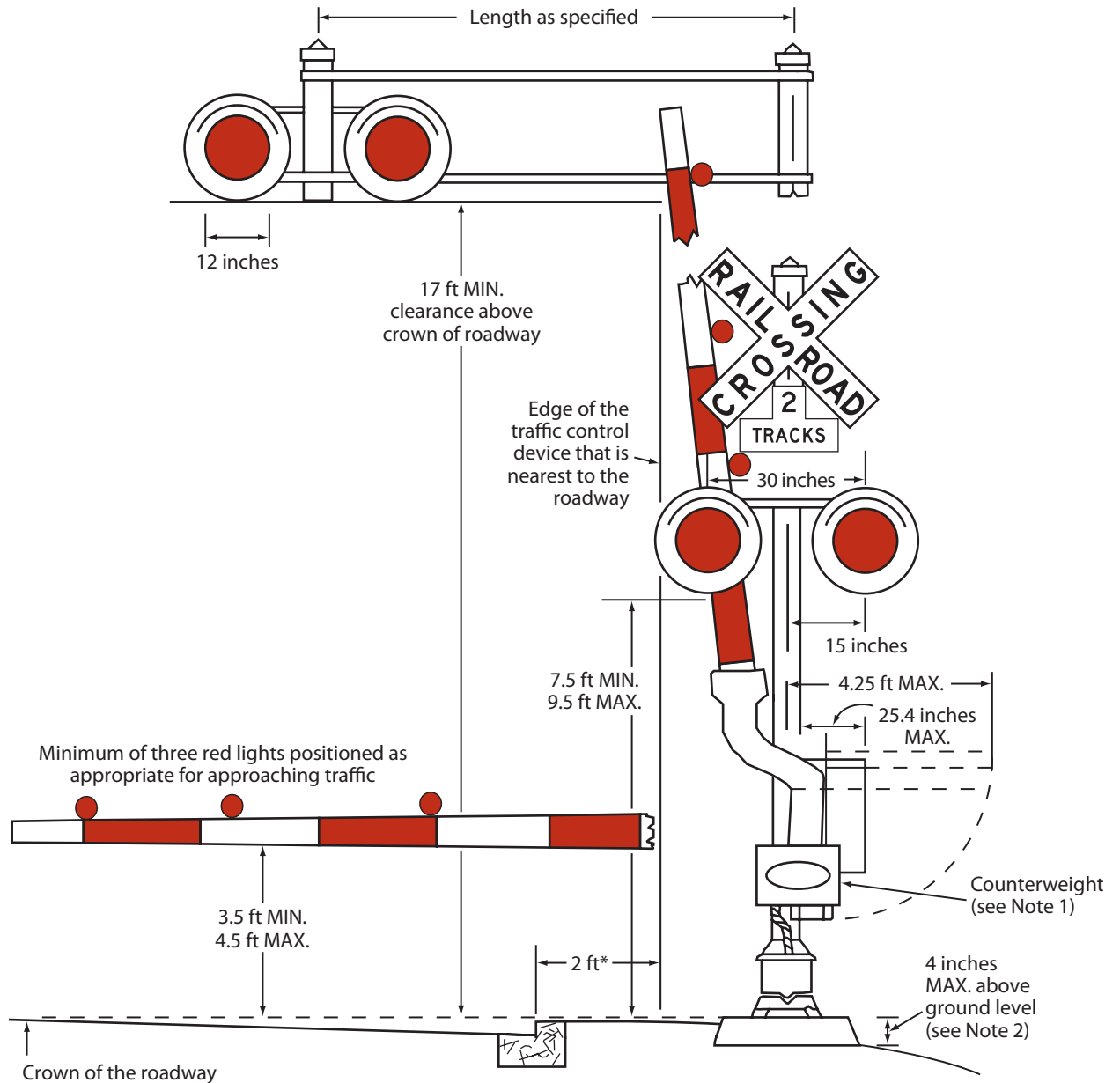
Section 8C.02 Flashing-Light Signals**Standard:**

- 04 When indicating the approach or presence of rail traffic, the flashing-light signal shall display toward approaching highway traffic two red lights mounted in a horizontal line flashing alternately.
- 05 If used, flashing-light signals shall be placed to the right of approaching highway traffic on all highway approaches to a grade crossing. They shall be located laterally with respect to the highway in compliance with Figure 8C-1 except where such location would adversely affect signal visibility.
- 06 If used at a grade crossing with highway traffic in both directions, back-to-back pairs of lights shall be placed on each side of the tracks. On multi-lane one-way streets and divided highways, flashing-light signals shall be placed on the approach side of the grade crossing on both sides of the roadway or shall be placed above the highway.
- 07 Each red signal unit in the flashing-light signal shall flash alternately. The number of flashes per minute for each lamp shall be 35 minimum and 65 maximum. Each lamp shall be illuminated approximately the same length of time. Total time of illumination of each pair of lamps shall be the entire operating time. Flashing-light units shall use ~~either 8-inch or~~ 12-inch nominal diameter lenses.

Guidance:

- 08 ~~In choosing between the 8-inch or 12-inch nominal diameter lenses for use in grade crossing flashing-light signals, consideration should be given to the principles stated in Section 4D.07.~~

Figure 8C-1. Composite Drawing of Active Traffic Control Devices for Grade Crossings Showing Clearances



*For locating this reference line on an approach that does not have a curb, see Section 8C.01.

Notes:

1. Where gates are located in the median, additional median width may be required to provide the minimum clearance for the counterweight supports.
2. The top of the signal foundation should be no more than 4 inches above the surface of the ground and should be at the same elevation as the crown of the roadway. Where site conditions would not allow this to be achieved, the shoulder side slope should be re-graded or the height of the signal post should be adjusted to meet the 17-foot vertical clearance requirement.

