

## PROTECTIVE DEVICES AT CROSSINGS

### 741-110-0010

#### **Purpose and Scope of Rules**

OAR 741-110-0020 through 741-110-0090 and 741-115-0010 through 741-115-0080 provide uniform standards for the location and type of protective devices to be installed and maintained at grade crossings.

Stat. Auth.: ORS 184.616, 184.619, 823.011, 824.202 and 824.220

Stat. Implemented: ORS 824.220

### 741-110-0020

#### **Application of Rules to Existing Protective Devices**

(1) Protective devices installed on or after October 1, 2003, shall comply with these rules.

(2) Except as required by OAR 741-110-0050 (4), protective devices installed at grade crossings are deemed to be in compliance with the rules and regulations of the Department, if the installations were performed in accordance with the rules in effect at the time of their installation.

Stat. Auth.: ORS 184.616, 184.619, 823.011, 824.202 and 824.220

Stat. Implemented: ORS 824.202

### 741-110-0030

#### **Standard Protective Devices**

(1) The devices listed in sections (2), (3), (4), (5), (6), and (7) of this rule are "standard protective devices."

(2) Passive Devices:

(a) Standard No. 1 (Crossbuck) is sign R15-1 as set forth in Section 8B.02 of the MUTCD.

(b) Standard No. 1S (Vehicle STOP Sign) is sign R1-1 as set forth in Section 2B.04 of the MUTCD.

(c) Standard No. 1T (Figure 2) (Railroad STOP Sign) is a fixed rectangular sign that shall bear the word "STOP" in white reflective letters on red reflective material, or in black letters on white reflective material.

(d) Standard No. 1M (Multiple Tracks Sign) is sign R15-2 as set forth in Section 8B.02 of the MUTCD.

(e) Stop Clearance Line is a stop line as set forth in Section 3B.16 of the MUTCD, which is 24 inches wide.

(f) "Illumination" (Figure 8) is a system of luminaires arranged in a unique pattern to provide direct lighting on the side of railroad equipment occupying a grade crossing during hours of darkness.

(3) Active Devices at Grade Crossings:

(a) Standard No. 2 (Flashing Light Signal) is as set forth in Section 8D.02 of the MUTCD, which has an audible warning device. For additional specifications for Standard No. 2, refer to subsections (e) and (f) of this section.

(b) Standard No. 2B (Cantilevered Flashing Light Signal) is as set forth in Section 8D.03 of the MUTCD, which has an audible warning device. For additional specifications on Standard No. 2B, refer to subsections (e) and (f) of this section.

(c) Standard No. 2P (Figure 3) (Multi-use Path Flashing Light Signal) is a signal that shall sound an audible warning device and alternately flash two 12-inch diameter, vertically mounted, red lights in both directions along the multi-use path so as to provide warning of an approaching train. For additional specifications on Standard No. 2P, refer to subsections (e) and (f) of this section.

(d) Standard No. 4 (Automatic Gate Signal) is as set forth in Section 8D.04 of the MUTCD.

(e) Light units on Standard Nos. 2, 2B and 2P shall be aligned so that insofar as it is practical to do so, at least one full 12-inch diameter red light shall be visible when viewed from any point on the roadway within the safe stopping distance.

(f) Unless otherwise specified, 12-inch diameter roundels (lenses) on Standard Nos. 2, 2B and 2P, if incandescent bulbs are used, shall be as follows:

(A) Front light units: roundel rated with a 30-degree horizontal and 15-degree downward spread.

(B) Back light units: roundel rated with a 70-degree horizontal spread.

(C) Cantilevered front and back light units: roundel rated with a 20-degree horizontal and 32-degree downward spread.

(g) Traffic Signal Preemption Control is as set forth in Section 8D.07 of the MUTCD.

Traffic Signal Preemption Control is required when railroad tracks are located on a roadway within 215 feet of a highway/highway intersection that is equipped with vehicle traffic signals. The distance is measured from the nearest rail at the crossing to the nearest vehicle stop location at the highway/highway intersection. Light rail transit lines, when operated in a street running mode, along with other traffic, may be exempted from this preemption requirement.

(4) Auxiliary Devices. The Department may authorize the installation of auxiliary signs and signals at a crossing. Such devices shall be installed so as not to obscure other crossing signs or signals at the crossing. Auxiliary devices are not necessarily limited to those described below:

(a) "EXEMPT" sign is a R15-3 sign as set forth in Section 8B.04 of the MUTCD.

(b) Advance Exempt Sign is a W10-1a sign as set forth in Section 8B.04 of the MUTCD.

(c) Part-time Turn Restriction Signals are as set forth in Section 8B.05 of the MUTCD.

(d) "DO NOT STOP ON TRACKS" sign is an R8-8 sign as set forth in section 8B.06 of the MUTCD.

(e) NO TURN ON RED signs are signs R10-11a or R10-11b or R10-11c as set forth in Section 2B.40 of the MUTCD.

(f) STOP HERE ON RED sign is sign R10-6 as set forth in Section 2B.40 of the MUTCD.

(5) Advance Warning Devices:

(a) Advance Warning Signs are W10 series signs as set forth in Section 8B.03 of the MUTCD.

(b) A Multi-use path Highway-Rail Grade Crossing Advance Warning Sign is a W10-1 sign, 18 inches in diameter, as set forth in Section 8B.03 of the MUTCD.

(c) "STOP AHEAD" sign is a W3-1 or W3-1a sign as set forth in Section 2C.26 of the MUTCD.

(d) Advance Warning Pavement Markings are as set forth in Section 8B.16 of the MUTCD.

(e) Train-Activated Advance Warning Device (Figure 6) is a signal that shall alternately flash two yellow lights along the highway in advance of a crossing, so as to provide warning of an approaching train.

(6) Guardrail is as depicted on Oregon Standard Drawing No. ERD445.

(7) Curb is a standard curb as depicted in Oregon Standard Drawing No. ERD700.

Stat. Auth.: ORS 184.616, 184.619, 823.011, 824.202 and 824.220

Stat. Implemented: ORS 824.220

## **741-110-0040**

### **Location of Protective Devices**

(1) Standard Nos. 1, 1S, 2, 2B, and 4 shall be located as set forth in Part 8 of the MUTCD.

(2) Standard No. 2P shall be located at the side of the multi-use path in advance of the grade crossing and to the right of approaching pedestrians or bicyclists.

(3) Standard No. 1T (Figure 2) shall be located adjacent to the track on which the stopping requirement applies. The sign shall be located not closer than six feet nor further than 25 feet from the nearest edge of the roadway.

(4) The stop clearance line described in OAR 741-110-0030(2)(e) shall be located perpendicular to the roadway centerline and not less than twelve feet from the nearest rail. Where automatic gates are installed, the line shall be located one foot in advance of where the gate arm crosses the roadway surface.

(5) Advance warning signs and advance warning pavement markings shall be located, where practical, at the safe stopping distance as defined in OAR 741-100-0020 (19) and depicted in Figure 5, but generally not less than 100 feet from the nearest track. Advance warning pavement markings shall be located, where practical, so that the transverse line nearest to the railroad-highway intersection is approximately adjacent to the advance warning sign, as depicted in Figure 5.

(6) "STOP AHEAD" signs and train-activated advance warning signals shall be located not less than 100 feet in advance of the advance warning sign. See Figures 5 and 6.

(7) Guardrails shall be located so that the face of the guardrail, at a point perpendicular to the roadway centerline, shall coincide with the outside edge of the roadway. No part of the guardrail shall be closer than ten feet from the centerline of the nearest track. Rural-type guardrail shall be used at crossings where the speed of vehicles on the approaches to the crossing exceeds 35 miles per hour. Urban guardrail may be used on roadways where vehicle speed is 35 miles per hour or less.

(8) Curb shall be located on the outside edge of the roadway. Active protective devices shall be located not closer than 4 feet 3 inches nor more than 5 feet behind face of curb. See Figure 7. Curb shall commence not less than 10 feet from centerline of nearest track and must extend 50 feet in advance of the automatic protective device. Curb may be used at crossings on roadways in urban settings where the speed of vehicles on the roadway approaches to the crossing does not exceed 35 miles per hour. Refer also to OAR 741-110-0090.

(9) Location of Illumination Devices. The system of luminaires shall be located at the grade crossing, as determined by field conditions, to light the side of the train during hours of darkness. See Figure 8.

(10) Location of Auxiliary Devices:

- (a) When authorized in writing by the Department, the "EXEMPT" sign shall be located as set forth in Section 8B.04 of the MUTCD.
  - (b) When authorized in writing by the Department, the advance "EXEMPT" sign shall be located as set forth in Section 8B.04 of the MUTCD.
  - (c) The "DO NOT STOP ON TRACKS" sign shall be located as set forth in Section 8B.06 of the MUTCD.
  - (d) The NO TURN ON RED sign shall be located as set forth in Section 2B.40 of the MUTCD.
  - (e) The STOP HERE ON RED sign shall be located as set forth in Section 2B.40 of the MUTCD.
- (11) Overhead Mounting of Signs and Signals. At the option of the public authority, or by Order of the Department, authorized signs and signals may be installed directly over a lane of traffic on the roadway.
- Stat. Auth.: ORS 184.616, 184.619, 823.011, 824.202 and 824.220  
Stat. Implemented: ORS 824.220

#### **741-110-0050**

##### **Authority Required for Installation, Removal or Change of Protective Devices/Exceptions**

No protective device shall be installed, removed or substituted for any other device, without prior authorization by Order of the Department, except:

- (1) Standard Nos. 1 and 1M may be installed by the railroad.
- (2) Wigwag signals may be replaced with two Standard No. 2 flashing light signals, upon written notice by the railroad.
- (3) Additional flashing light units may be installed on existing installations of Standard Nos. 2 and 2B by the railroad.
- (4) Worn out or destroyed protective devices may be replaced by a similar standard device; however, the replacement shall comply with the rules and regulations of the Department in effect at the time of replacement.

Stat. Auth.: ORS 184.616, 184.619, 823.011, 824.202 and 824.220

Stat. Implemented: ORS 824.202

#### **741-110-0060**

##### **Required Installation of Specified Protective Devices**

Unless otherwise ordered by the Department, the following protective devices shall be installed at the grade crossings described below.

- (1) Standard No. 1. Two crossbucks shall be installed at each grade crossing not equipped with standard active protective devices.
- (2) Standard No. 1T. One railroad STOP sign shall be installed, where physical circumstances permit, on each track approach to each crossing equipped with Standard Nos. 2, 2B or wigwag devices when the minimum signal activation requirement of OAR 741-110-0070(1) cannot be met.
- (3) Standard No. 1M. Two multiple track signs shall be installed at each grade crossing consisting of two or more tracks.
- (4) Stop Clearance Lines. One stop clearance line shall be installed on each paved roadway approach lane at each grade crossing.

(5) Advance Warning Signs. Two advance warning signs shall be installed in advance of each grade crossing. See OAR 741-110-0030(5) and 741-110-0040(5).

(6) Advance Warning Pavement Markings. Advance warning pavement markings shall be installed on each paved vehicle approach lane to each grade crossing.

(7) Guardrail or Curb. Guardrail or curb, as appropriate, shall be installed at each crossing equipped with active protective devices.

Stat. Auth.: ORS 184.616, 184.619, 823.011, 824.202 and 824.220

Stat. Implemented: ORS 824.202

#### **741-110-0070**

##### **Operation of Active Devices**

(1) Activation of Devices. Unless otherwise ordered by the Department, Standard Nos. 2, 2B, 2P, and 4 protective devices and wigwag devices shall be activated by approaching trains through control circuitry in such a manner as will provide a warning through continuous signal operation for a period of not less than 20 seconds nor more than 40 seconds before the arrival of a train traveling at the highest speed permissible over that particular track. Prolonged signal operation shall be avoided by reasonable operating and engineering practices.

(2) Cessation of Operation. The warning aspect of Standard Nos. 2, 2B, 2P and 4 protective devices and wigwag devices shall cease operation immediately after the passage of the train over the roadway unless approach circuits on adjacent tracks are occupied by an oncoming train.

(3) Advance Preemption (railroad detection) or other appropriate methods shall be used to provide a pedestrian clear-out interval (PCOI) before the vehicle clear-out interval (VCOI).

(a) When a VCOI is required, the indication for the track clearance phases shall be green.

(b) The road authority may submit an engineering study to the State Traffic Engineer to request a deviation from the standards. The State Traffic Engineer, together with the ODOT Rail Division Crossing Safety Section Manager, may authorize a signalized intersection operation consistent with the findings of the study.

Stat. Auth.: ORS 184.616, 184.619, 823.011, 824.202 and 824.220

Stat. Implemented: ORS 824.220

#### **741-110-0080**

##### **Observance of Railroad Stop Signs**

When Standard No. 1T is installed, traffic on the railroad shall stop prior to entering the roadway and proceed when safe to do so, but not before gate arms have fully lowered, or (in the case of a nongated crossing) not before active protective devices, if any, at the crossing have been fully activated for a period of not less than 20 seconds.

Stat. Auth.: ORS 823 & ORS 824

Stats Implemented: ORS 824.202

Hist.: PUC 3-1983, f. & ef. 3-16-83, (Order No. 83-143); PUC 3-1985, f. & ef. 4-8-85, (Order No. 85-291); RS 2-1996, f. & cert. ef. 3-14-96; Renumbered from 860-042-0096

**741-110-0090**

**Maintenance and Replacement of Protective Devices**

Protective devices installed at grade crossings shall be maintained in satisfactory condition, location and in proper alignment. Signs shall be legible at all times. Signal lenses shall be visible as required in OAR 741-110-0030(3)(e). After notification of damage, destruction, failure or malfunction of a protective device, the party responsible for its maintenance shall promptly replace or repair the device, and adequately protect the crossing in the interim.

Stat. Auth.: ORS 184.616, 184.619, 823.011, 824.202 and 824.220

Stat. Implemented: ORS 824.204 and 824.206