

ATTACHMENT NO. 37

Approved by NCUTCD Council January 20, 2006

TECHNICAL COMMITTEE: Railroad and Light Rail Transit Technical Committee

DATE OF ACTION: January 20, 2006

TOPIC: Crossbuck Assembly

ORIGIN OF REQUEST: NCUTCD Railroad and Light Rail Transit Technical Committee

AFFECTED PORTIONS OF MUTCD: Section 10C.02

DISCUSSION: The proposed changes below to Chapter 10C.02 compliment Part 5, Part 8 and Part 10 changes voted and passed by the NCUTCD in June 2004. Note that the January 2006 action by the National Committee was only to add the words "or has been omitted as provided in Part 8B," in the 3rd Standard, paragraph 4. All other changes to this part were approved by the National Committee in June 2004.

ACTION: Approved by National Committee

=====

Chapter 10B. Highway-Light Rail Transit Grade Crossing Control Systems

Section 10B.01 Introduction

Support:

The combination of devices selected or installed at a specific highway-light rail transit grade crossing is referred to as a Light Rail Transit Traffic Control System.

For the safety and integrity of operations by highway and light rail transit users, the highway agency with jurisdiction, the regulatory agency with statutory authority, if applicable, and the light rail transit authority jointly determine the need and selection of traffic control devices and the assignment of priority to light rail transit at a highway-light rail transit grade crossing.

The normal rules of the road and traffic control priority identified in the Uniform Vehicle Code govern the order assigned to the movement of vehicles at an intersection unless the local agency determines that it is appropriate to assign a higher priority to light rail transit. Examples of different types of light rail transit priority control include separate traffic control signal phases for light rail transit movements, restriction of movement of roadway vehicles in favor of light rail transit operations, and preemption of highway traffic signal control to accommodate light rail transit movements.

Standard:

Highway-light rail transit grade crossings in semiexclusive alignments shall be equipped with a combination of automatic gates and flashing-light signals, or flashing-light signals only, or traffic control signals, unless an engineering study indicates that the use of

Crossbuck Assemblies, or STOP, or YIELD, or advance warning signs alone, would be adequate.

Option:

Highway-light rail transit grade crossings in mixed-use alignments may be equipped with traffic control signals unless an engineering study indicates that the use of **Crossbuck Assemblies, or STOP, or YIELD, or advance warning signs alone**, would be adequate.

Support:

Sections 8B.04 and Figures 8B-1, 8B-2 and 8B-6 describe and contain information regarding the use and placement of Crossbuck Assemblies.

Section 10C.04 describes the appropriate conditions for the use of STOP or YIELD signs alone at a highway-light rail transit grade crossing.

Chapter 10C. Signs, Illumination, and Markings

Section 10C.01 Purpose

Support:

Signs and markings regulate, warn, and guide the road users so that they, as well as light rail transit vehicle operators, can take appropriate action.

Standard:

The design and location of signs shall conform to Part 2.

Support:

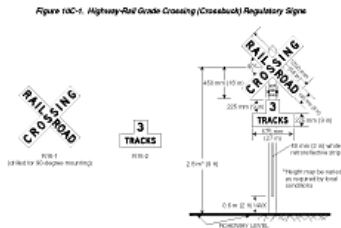
Section 8B.02 contains information regarding the sizes of signs for grade crossings.

Section 10C.02 Highway-Rail Grade Crossing (Crossbuck) Sign (R15-1) and Number of Tracks Sign (R15-2)

Standard:

The Highway-Rail Grade Crossing (R15-1) sign, commonly identified as the Crossbuck sign, shall be retroreflectorized white with the words RAILROAD CROSSING in black lettering, mounted as shown in Figure 10C-1.

Figure 10C-1 Highway-Rail Grade Crossing (Crossbuck) Regulatory Signs



(NOTE: Revise right panel of above figure to be consistent with proposed corresponding revision to Figure 8B-1)

~~As a minimum, one Crossbuck sign shall be used on each highway approach to every highway-light rail transit grade crossing on a semiexclusive alignment, alone or in combination with other traffic control devices.~~

Option:

A Crossbuck sign may be used on a highway approach to a highway-light rail transit grade crossing on a ~~semi-exclusive~~ or mixed-use alignment, alone or in combination with other traffic control devices.

Standard:

If automatic gates are not present where a Crossbuck sign is being used and if there are two or more tracks at the highway-light rail transit grade crossing, the number of tracks shall be indicated on a supplemental Number of Tracks (R15-2) sign of inverted T shape mounted below the Crossbuck sign in the manner and at the height indicated in Figure 10C-1.

Option:

The supplemental Number of Tracks sign may also be used at highway-light rail transit grade crossings with automatic gates.

Standard:

If used, the Crossbuck ~~Assembly sign~~ shall be installed on the right side of the highway on each approach to the highway-light rail transit grade crossing. Where restricted sight distance or unfavorable highway geometry exists on an approach to a highway-light rail transit grade crossing, an additional Crossbuck ~~Assembly sign~~ shall be installed on the left side of the highway, possibly placed back-to-back with the Crossbuck sign for the opposite approach, or otherwise located so that two Crossbuck ~~Assemblies sign~~ are displayed for that approach.

A strip of retroreflective white material not less than 50 mm (2 in) in width shall be used on the back of each blade of each Crossbuck sign for the length of each blade, at all highway-light rail transit grade crossings, except those where Crossbuck signs have been installed back-to-back.

A ~~vertical~~ strip of retroreflective white material, not less than 50 mm (2 in) in width, shall be used on each ~~Crossbuck Assembly~~ support at passive highway-light rail transit grade crossings for the full length of the ~~front and~~ back of the support from the ~~bottom of the~~ Crossbuck sign ~~or Number of Tracks sign~~ to within 0.6 m (2 ft) above ~~the edge of the~~ roadway, ~~except on the side of those supports where a STOP (R1-1) or YIELD (R1-2) sign or flashing lights have been installed or on the back side of supports for Crossbuck signs installed on one-way streets.~~

On Crossbuck Assemblies where the YIELD or STOP sign is on a separate post, ~~or is omitted in accordance with Part 8B,~~ a vertical strip of retroreflective white material, not less than 50 mm (2 in) in width, shall be on the front of the support from the bottom of the Crossbuck sign or Number of Tracks sign to within 0.6 m (2 ft) above the roadway level.

Formatted: Font color: Blue, Highlight

Option:

The vertical strip of retroreflective material may be omitted from the back sides of Crossbuck Assembly sign supports installed on one-way streets.

Guidance:

If used, Crossbuck Assemblies sign should be located with respect to the highway pavement or shoulder in accordance with the criteria in Chapter 2A and Figures 2A-1 and 2A-2, and should be located with respect to the nearest track in accordance with Figure 8D-2.

The minimum lateral clearance for the nearest edge of the Crossbuck Assembly sign should be 1.8 m (6 ft) from the edge of the shoulder or 3.7 m (12 ft) from the edge of the traveled way in rural areas, and 0.6 m (2 ft) from the face of the curb in urban areas.

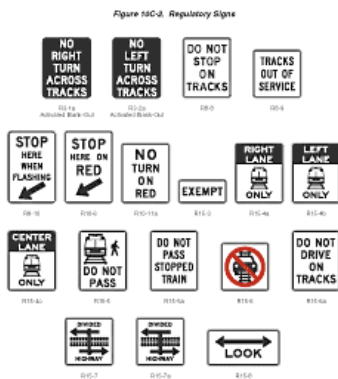
Where unusual conditions make variations in location and lateral clearance appropriate, engineering judgment should be used to provide the best practical combination of view and safety clearances.

Section 10C.03 LOOK Sign (R15-8)

Option:

A LOOK (for light rail transit vehicles) (R15-8) sign (see Figure 10C-2) may be mounted at highway-light rail transit grade crossings as a supplemental plaque on the Crossbuck Assembly (R15-1) sign post, or as a separate sign in the immediate vicinity of the highway-light rail transit grade crossing on the light rail transit right-of-way.

Figure 10C-2 Regulatory Signs



Section 10C.04 STOP (R1-1) or YIELD (R1-2) Signs at Highway-Light Rail Transit Grade Crossings

Standard:

For all highway-light rail transit grade crossings where STOP (R1-1) or YIELD (R1-2) signs alone are installed, the placement shall conform to the requirements of Sections 2B.06 and 2B.10. Stop Ahead (W3-1) or Yield Ahead (W3-2) Advance Warning signs (see Figure

2C-4) shall also be installed if the criteria for their installation given in Section 2C.29 is met.

Guidance:

The use of STOP or YIELD signs **alone** for road users at highway-light rail transit grade crossings should be limited to those crossings where the need and feasibility is established by an engineering study. Such crossings should have all of the following characteristics:

- A. The crossing roadways should be secondary in character (such as a minor street with one lane in each direction, an alley, or a driveway) with low traffic volumes and low speed limits. The specific thresholds of traffic volumes and speed limits should be determined by the local agencies.
- B. Light rail transit speeds do not exceed 40 km/h (25 mph).
- C. The line of sight for an approaching light rail transit operator is adequate from a sufficient distance such that the operator can sound an audible signal and bring the light rail transit vehicle to a stop before arriving at the crossing.
- D. The road user has sufficient sight distance at the stop line to permit the vehicle to cross the tracks before the arrival of the light rail transit vehicle.
- E. If at an intersection of two roadways, the intersection does not meet the warrants for a traffic control signal as specified in Chapter 4C.
- F. The light rail transit tracks are located such that vehicles are not likely to stop on the tracks while waiting to enter a cross street or highway.

If a STOP or YIELD sign is installed beyond the light rail transit crossing such that vehicle queues are likely to extend into the path of the light rail transit, a DO NOT STOP ON TRACKS sign (R8-8) should be posted in accordance with Section 10C.05.

Option:

~~If a STOP or YIELD sign is installed at a highway-light rail transit grade crossing, it may be installed on the Crossbuck post or on a separate post at the point where the vehicle is to stop, or as near to that point as practical.~~

Section 10C.15 Highway-Rail Grade Crossing Advance Warning Signs (W10 Series)

Standard:

A Highway-Rail Grade Crossing Advance Warning (W10-1) sign (see Figure 10C-3) shall be used on each highway in advance of every highway-light rail transit grade crossing in semiexclusive alignments except in the following circumstances:

- A. **On an approach to a highway-light rail transit 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 30 m (100 ft), and W10-3 signs are used on both approaches of the parallel highway; or**

- B. On low-volume, low-speed highways crossing minor spurs or other tracks that are infrequently used and are flagged by transit crews; or**
- C. In business districts where active highway-light rail transit grade crossing traffic control devices are in use; or**
- D. Where physical conditions do not permit even a partially effective display of the sign.**

Either an Active Control (W10-16) sign for those crossings with active traffic control devices or No Signal (W10-10) sign for those crossings without active traffic control devices shall be installed as a supplemental plaque directly beneath the Advance Warning sign, except where the highway-light rail transit grade crossing traffic control devices consist solely of traffic control signals.

Placement of the Highway-Rail Grade Crossing Advance Warning sign shall be in accordance with Chapter 2A and Table 2C-4.

If a Yield Ahead or Stop Ahead sign is installed on the approach to a crossing, the W10-1 sign with W10-10 supplemental plaque shall be installed in advance of 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:

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

Standard:

If the distance between the light rail transit tracks in a semiexclusive alignment and a parallel highway, from the edge of the tracks to the edge of the parallel roadway, is less than 30 m (100 ft), W10-2, W10-3, or W10-4 signs (see Figure 10C-3) shall be installed on each approach of the parallel highway to warn road users making a turn that they will encounter a highway-light rail transit grade crossing soon after making a turn, and a W10-1 sign for the approach to the tracks shall not be required to be between the tracks and the parallel highway.

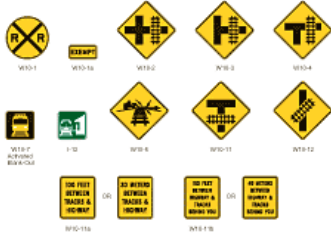
If the W10-2, W10-3, or W10-4 signs are used, sign placement in accordance with the guidelines for Intersection Warning signs in Table 2C-4 using the speed of through traffic shall be measured from the highway intersection.

Guidance:

If the distance between the light rail transit tracks and the parallel highway, from the edge of the tracks to the edge of the parallel roadway, is 30 m (100 ft) or more, a W10-1 sign should be installed in advance of the highway-light rail transit grade crossing, and the W10-2, W10-3, or W10-4 signs should not be used on the parallel highway.

Figure 10C-3 Warning Signs and Light Rail Station Sign

Figure W10-3: Warning Signs and Light Rail Station Sign



(NOTE: Add W-10-10 and W10-16 signs to the above figure)



W10-10



W10-16