



# Traffic Engineering, Operations & Safety Manual

## Chapter 8 Railroad Grade Crossings

### Section 1 Signs and Markings

#### 8-1-1 Grade Crossing Sign Installation

April 2026

#### PURPOSE

Railroad corporations have unique legal abilities and responsibilities. Due to this fact, some signage responsibility for highway traffic falls to the railroad. These requirements are listed in various sections of the Wisconsin State Statutes. This policy will clarify furnishing, installation and maintenance responsibilities for traffic signs at at-grade crossings.

#### DEFINITIONS












Passive Grade Crossings are defined as at-grade highway-railroad crossings without automatic gates or flashing-light signals.

Maintaining Authority is defined as the unit of government with the responsibility for roadway maintenance at a given crossing.

#### POLICY AND GUIDELINES

The following table summarizes the installation and maintenance responsibilities of various sign installed in conjunction with at-grade railroad crossings. See the text following the table for further details.

**Table 1. Signing Responsibilities**

SIGN		NAME	FURNISHED BY	INSTALLED BY	MAINTAINED BY
R1-1		Stop	Maintaining Authority	Maintaining Authority	Maintaining Authority
R1-2		Yield	Railroad	Railroad	Railroad
R8-9		Tracks Out of Service	Railroad	Railroad	Railroad
R15-1		Crossbucks	Railroad	Railroad	Railroad
R15-2P		# of Track	Railroad	Railroad	Railroad
R15-3P		Exempt	Maintaining Authority	Railroad	Railroad
W10-1		Grade Crossing Advance Warning	*	*	Maintaining Authority
W10-1aP		Exempt (Advance)	Maintaining Authority	Maintaining Authority	Maintaining Authority
W10-52P		Tracks Out of Service	Maintaining Authority	Maintaining Authority	Maintaining Authority
Other W10 series signs		Other Advance Warning	Maintaining Authority	Maintaining Authority	Maintaining Authority
I-13		Emergency Notification System	Railroad	Railroad	Railroad

## REGULATORY SIGNS

R1-1 (STOP) signs: STOP signs require authorization by the Office of the Commissioner of Railroads (OCR) or the local authority per State Statute [195.28](#) or [349.085](#), respectively. If authorized, these signs **shall** be furnished, installed and maintained by the maintaining authority, per [State Statute 349.07](#).

R1-2 (YIELD) signs: These signs **shall** be furnished, installed and maintained by the Railroad at all passive grade crossings without STOP signs per [State Statute 192.29\(5\)\(b\)](#). See WMUTCD 8B.04 for additional guidance.

R8-9 (TRACKS OUT OF SERVICE) signs: These signs *should* be used in place of R15-1 signs when railroad tracks have been temporarily or permanently abandoned, but not yet removed. These signs **shall** be furnished, installed and maintained by the Railroad. See [WMUTCD 8B.08](#) for additional guidance.

R15-1 (Crossbuck) signs: These signs **shall** be furnished, installed and maintained by the Railroad at all at-grade crossings, per [State Statute 192.29\(5\)\(a\)](#). See WMUTCD 8B.03 for additional guidance.

R15-2P (Number of Tracks) plaque: These plaques **shall** be used if there are two or more tracks. The railroad **shall** furnish, install and maintain an R15-2P (Number of Tracks) plaque below the R15-1 sign. See WMUTCD 8B.03 for additional guidance.

R15-3P (EXEMPT): When authorized by OCR per [State Statutes 195.285](#) and [346.45\(3\)\(d\)](#), these signs **shall** be installed underneath the R15-1 sign (or R15-2P sign, if present) at crossings. The initial furnishing of these signs **shall** be the responsibility of the maintaining authority but they **shall** be installed and maintained by the Railroad. See WMUTCD 8B.11 for additional guidance.

## WARNING SIGNS

\*W10-1 (Grade Crossing Advance Warning) sign: These signs **shall** be installed at all at-grade highway crossings, unless specifically not required per [WMUTCD 8B.06](#). When used, these signs (and any needed replacements) **shall** be furnished, upon request, by the Railroad for at-grade crossings of county or township maintained roadways, and by the maintaining authority for at-grade crossings of state, city, or village maintained roadways. These signs **shall** be installed and maintained by the maintaining authority per [State Statute 195.286\(1\)](#). See WMUTCD 8B.06 for additional guidance.

W10-1aPA (EXEMPT) sign: These signs **shall** be installed underneath the W10-1 sign at crossings declared Exempt by the OCR. These signs **shall** be installed and maintained by the maintaining authority per [State Statutes 195.285](#) and [346.45\(3\)\(d\)](#). See WMUTCD 8B.11 for additional guidance.

W10-52P (TRACKS OUT OF SERVICE) plaques: These plaques **shall** be used below the Grade Crossing Advance Warning (W10-1 through W10-4) sign when the R8-9 (TRACKS OUT OF SERVICE) sign is used. These plaques *should* be furnished, installed, and maintained by the maintaining authority. See WMUTCD 8B.08 for additional guidance.

All other W10 series signs – If used, these signs **shall** be furnished, installed and maintained by the maintaining authority.

## OTHER SIGNS

I-13 (Emergency Notification System Sign): These signs **shall** be furnished, installed and maintained by the Railroad at all at-grade highway crossings. These signs **shall** also be furnished, installed and maintained by the Railroad at all private at-grade crossings, per [State Statute 192.29\(6\)](#) and [Federal Code 23 CFR 655.603](#). See WMUTCD 8B.27 for additional guidance.

## 8-1-10 Dynamic Envelope and Do Not Block Pavement Markings

April 2026

### PURPOSE

The dynamic envelope and do not block pavement markings (see WMUTCD 8C.06, Figure 8C-3 and Figure 8C-4) are intended to encourage drivers to stop and remain at the stop bar. The transverse markings with associated cross-hatch provide a clear indication to drivers of where it is unsafe to stop their vehicle.

### POLICY AND GUIDELINES

The cross-hatching associated with the dynamic envelope markings presents a potential safety hazard to bicycles and motorcyclists, as pavement marking material offers significantly less surface friction than unmarked pavement. In addition, this large amount of marking creates a maintenance issue for the department. For these reasons, the

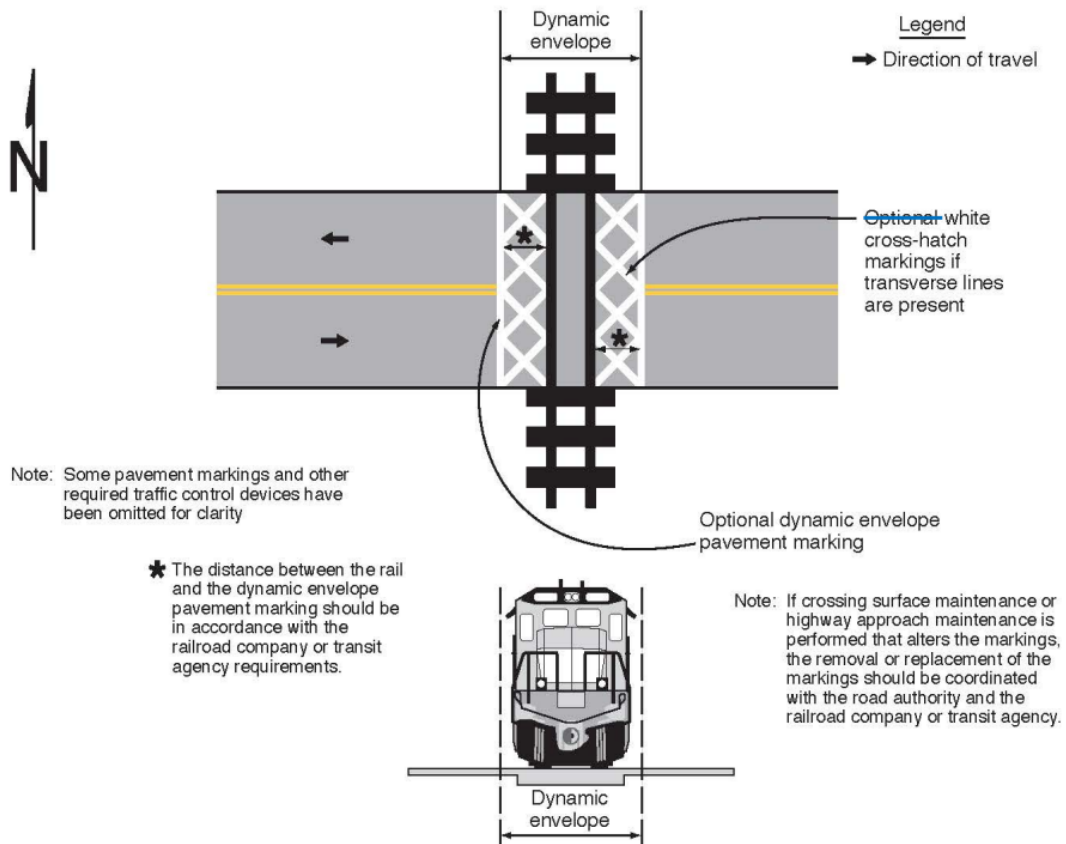
following policies **shall** apply to dynamic envelope marking installations on state-maintained roadways:

1. Dynamic envelope and do not block pavement markings **shall not** be installed on state-maintained roadways.
2. If installed along a detour route, the pavement markings **shall** be either temporary paint or temporary epoxy. After construction, the department will not remove the pavement markings. The maintaining authority of the roadway *may* remove the pavement markings, maintain the pavement markings, or allow the pavement markings to fade away.

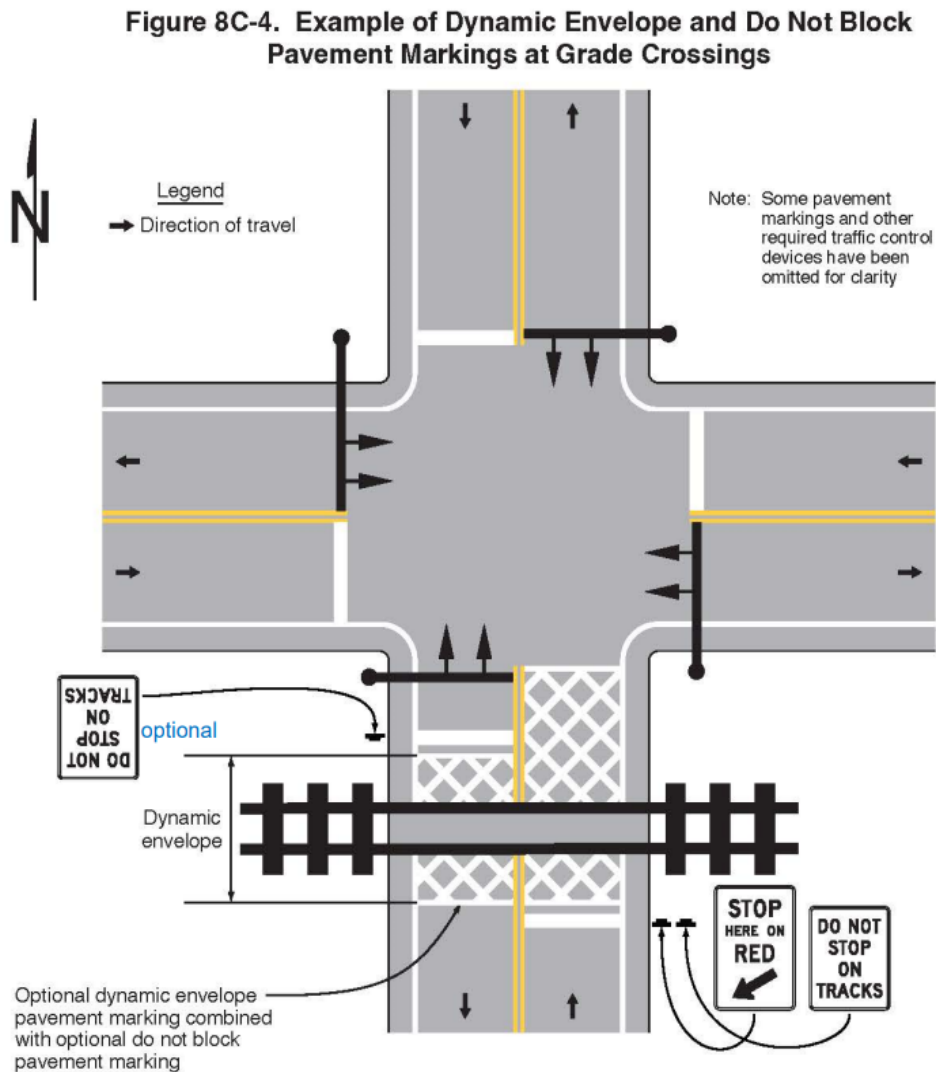
For more information regarding dynamic envelope and do not block pavement markings, refer to WMUTCD 8C.06 as well as Figures 8C-3 and 8C-4, pictured below.

**Figure 1.** Example of Dynamic Envelope Pavement Markings at Grade Crossings (WMUTCD Figure 8C-3)

**Figure 8C-3. Example of Dynamic Envelope Pavement Markings at Grade Crossings**



**Figure 2.** Example of Dynamic Envelope and Do Not Block Pavement Markings at Grade Crossings (WMUTCD Figure 8C-4)



## 8-1-20 Active Advance Warning Systems (AAWS)

April 2026

### BACKGROUND

WMUTCD 8D.13 allows for the use of warning beacons to supplement warning signs installed on an approach to a grade crossing. Per the WMUTCD, these systems *may* operate continuously or be activated upon the approach or presence of rail traffic. Only an Active Advance Warning System (AAWS) that activates upon the approach or presence of rail traffic *should* be interconnected to the railroad grade crossing warning system.

Per WMUTCD 8A.05, "OCR has jurisdiction at highway grade crossings regarding, but not limited to, determination of adequacy of warning devices (Wisconsin State Statute [191.19](#) and [195.28\(1\)](#)), approval of new grade crossings (Wisconsin State Statute [191.19\(1\)](#)) and approval of alterations at grade crossings (Wisconsin State Statute [195.29\(1\)](#)) as detailed in Wisconsin State Statutes Chapters 189, 191, 192, and 195."

### GUIDELINES

An AAWS *should* be installed on any state trunk highway approach to an at-grade railroad crossing with a posted speed limit of 65 mph or higher.

An AAWS *may* be installed on the state trunk highway system only under the following two scenarios:

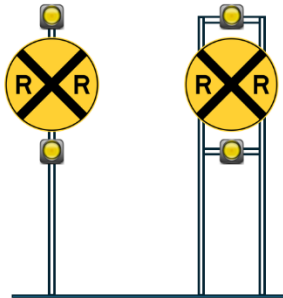
- On high-speed approaches (posted speeds of 55 mph or above) to grade crossings, or
- On blind approaches (defined as crossings that are not visible from the W10-1 sign due to site specific characteristics that cannot be otherwise addressed).

## DESIGN

An AAWS consists of a post mounted control enclosure with interconnection to the railroad grade crossing warning system. The control enclosure houses control electronics and associated components in a weather-resistant enclosure mounted on a post or pole. The control enclosure *should* be hard-wired for electrical service. Each individual flashing signal assembly *should* include the following elements:

- Sign support (two posts required with a 48" diameter sign, single post will suffice for the 36" sign)
- Grade Crossing Advance Warning Sign (W10-1)
- Two (2) 12-inch circular yellow flashing signal indications of a standard traffic signal face. These signal indications *should* be mounted in a vertical configuration with one above and one below the sign. See **Figure 1**.

**Figure 1.** AAWS Flasher Signal Assembly Options



The WHEN FLASHING (W16-13P) plaque **shall not** be included as part of the flashing signal assembly. The flashing signal indications are supplemental to the static warning sign and do not modify its meaning or the expectation that a train *may* be present at any time. Because the warning message is conveyed by the static sign independent of the flashing signal indications, temporary loss of the flashing signal indications does not diminish the conveyed warning, and battery backup is not required.

The Diagnostic Team, as defined in WMUTCD 1C.01, *should* include in their recommendation to OCR the location of the flashing signal assemblies. The number and location of flashing signal assemblies depend upon the number of approach lanes:

- On single lane approaches, a single flashing signal assembly **shall** be installed on the right-hand side of the roadway. A second flashing signal assembly *should* be considered on the left-hand side of the roadway, particularly if the approach roadway geometry limits visibility of the flashing signal assembly on the right-hand side of the roadway.
- For multi-lane approaches, two flashing signal assemblies are required: one on each side of the roadway.

## OPERATION

The AAWS flashing signal assemblies *should* begin flashing before the flashing light signals located at the grade crossing. The CIRCULAR YELLOW flashing signal indications *should* alternate flashing. If two flashing signal assemblies are installed, they *should* flash in unison.

The minimum amount of time that the AAWS flashing signal assemblies *should* begin flashing before the activation of the flashing light signals at the grade crossing **shall** be based on the travel time from the flashing signal assemblies to the center of the grade crossing at the posted speed, rounded to the nearest half second. See **Table 1**.

The distances provided in **Table 1** for the placement of the flashing signal assemblies are derived from the WMUTCD Table 2C-3, Condition B, 0 mph column, which reflects the stopping condition at the grade crossing.

Where vehicle queues are present or expected to extend upstream of the grade crossing, the flashing signal assemblies *should* be placed at a distance sufficient to provide advance warning to approaching drivers of queued conditions. In these situations, the required Advance Preemption Time (APT) **shall** be adjusted to account for the additional distance.

**Table 1.** Advance Preemption Time (APT) by Posted Speed Limit

Posted Speed Limit (mph)	Distance from Stop Bar to Flashing Signal Assembly (feet)*	APT (s)
25	155	4.5
30	200	4.5
35	250	5.0
40	305	5.5
45	360	5.5
50	425	6.0
55	495	6.5
60	570	6.5
65	645	7.0

\*Distances are from WMUTCD Table 2C-3.

The flasher signal assemblies *should* continue flashing until the flashing light signals at the crossing stop flashing.

#### **MAINTENANCE**

The AAWS flashing signal assemblies *should* be subject to joint annual inspection and filing requirements with the OCR in accordance with 49 CFR 234 Subpart D and WMUTCD 8D.09 to ensure operation remains as designed. Similar to other interconnected systems, the railroad company will have ongoing maintenance responsibility for the components of the grade crossing warning system and bungalow. The roadway authority will be responsible for ongoing maintenance of the AAWS flashing signal assemblies and associated control enclosure.