



Signal Training Bulletin

COMMITTEE G: Education & Training
Communication & Signal Division, AAR

E-1 Highway Grade Crossing Warning Devices- General

Approved September 1982

Definition: Electrically operated signals used to warn highway traffic of the presence or impending presence of a train at railroad-highway grade crossings.

Symbol: There are several different types of warning devices in use. Each type will be covered in separate Signal Training Bulletins. The symbol for a specific device will appear in the Bulletin describing the device.

Description: This is the first in a series of Signal Training Bulletins on the important subject of highway grade crossing warning devices. The intent of this Bulletin is to introduce these devices. Figures 1, 2, 3 and 4 illustrate warning devices in common use on North American railroad lines.

Note: 1- Bells are generally installed with all types of warning devices to provide audible warning.

2- A sign reading "RAILROAD CROSSING" is displayed on all warning devices.

3- Where two or more tracks cross the highway, a sign indicates the number of tracks.

Purpose and Application: The primary purpose of all highway grade crossing warning devices is to alert highway motorists that a train is approaching or occupying the crossing. The decision to install warning devices is governed mainly by the following three considerations:

- 1- Density of rail traffic and train speeds.
- 2- Density of highway traffic and vehicle speeds.
- 3- Historical data related to train-highway vehicle accidents at crossings.



Figure 1- The wig-wag is essentially a motor driven banner equipped with a red light for night indication. These devices are obsolete and no longer recommended by the AAR.

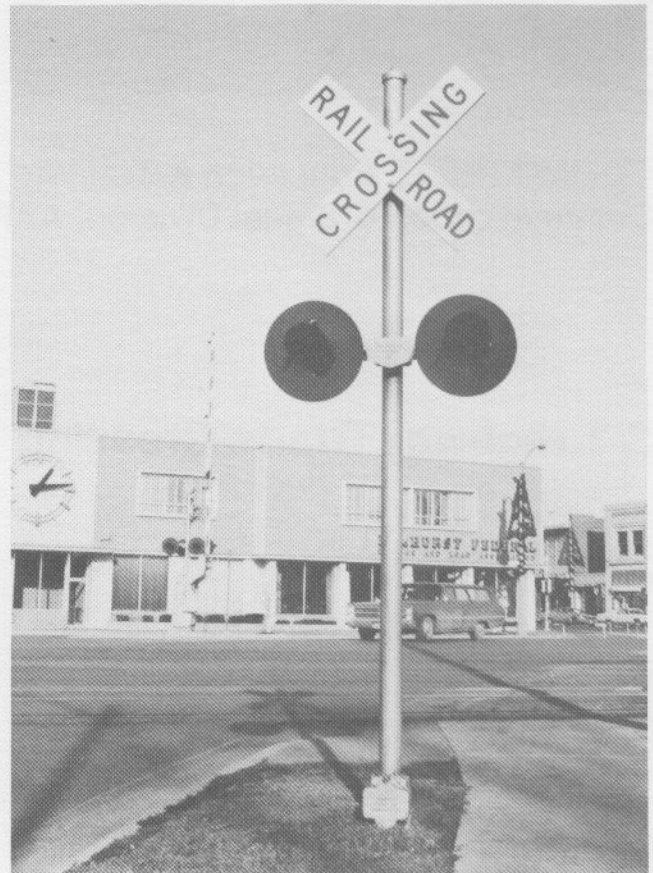


Figure 2- Modern installations use flashing-light signals. Flashing lights are more versatile in that additional lights and other adjuncts can be added.

General Information: Although warning devices are necessary for the warning of motorists and railroad personnel, they obviously do not contribute to the service rendered by railroads; i.e. transportation. Yet large and continuing expenditures of time and money are required each year for construction, maintenance, operation and renewal of warning devices. Since it is recognized that warning devices are installed for public safety, government bodies at all levels are involved in decisions on where warning devices will be installed and the type required. Also, the installation costs are shared between government bodies and railroads.

The Association of American Railroads took the impetus many years ago to investigate various types of warning devices in order that the best methods could be determined to permit the establishment of recommended practices. This important work continues today and is the responsibility of Committee D- Highway Grade Crossing Warning Systems of the Communication & Signal Division, AAR.

The AAR recommended practices are contained in the following publications: Signal Manual; Typical Circuits; and Principles and Practices, Chapter 23.

Railroads in the United States and Canada have generally adopted the AAR recommended practices in this area. This is also true of federal and state or provincial regulatory commissions in both countries.

Possibly the most important result of the AAR work is that uniformity of warning devices exists throughout the U.S. and Canada. Motorists understand the message conveyed by highway grade crossing warning devices whether they drive in California, Illinois, Ontario or Quebec.

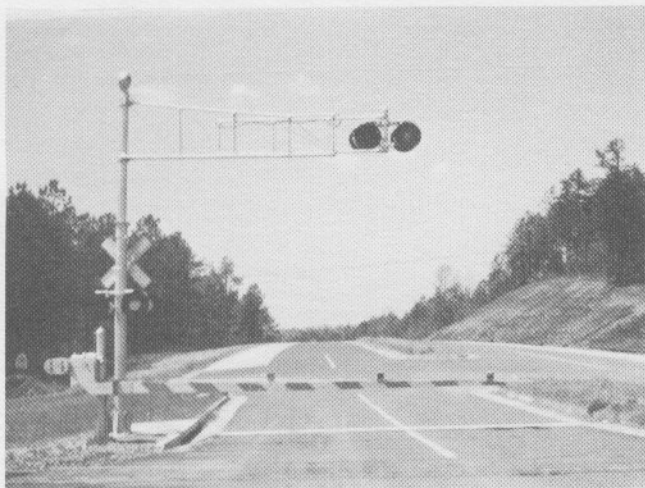


Figure 3- The cantilever is a modification of the basic flashing-light signal and employs a frame or platform on which flashing lights are mounted to position the lights over the driven portion of the highway. Cantilevers are required on wide or multi-lane highways.



Figure 4- Automatic crossing gates are commonly used adjuncts to flashing-light signals and are required where two or more main tracks cross a highway. In recent years, gates have been installed at single main line crossings where the density of rail or highway traffic warrants the additional safety that gates provide. The gate arms, which are available in wood, fiberglass or aluminum, are raised and lowered by a mechanism containing an electric motor, gears and electrical contacts. Additional lights are mounted on the gate arms. In some cases, a sidewalk arm is used to alert pedestrians.

Note: This Bulletin is for general information only. For specific applications consult the rules, standards and instructions published by your railroad.