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## **Guidance on the use of Traffic Channelizing Devices at Highway-Rail Grade Crossings**



Several types of traffic channelizing devices are finding new application at highway-rail grade crossings that are equipped with flashing light signals and crossing gates. These channelizing devices, when used appropriately, can reduce the risk of a collision between a vehicle and a train by 75%! This high level of risk reduction makes traffic channelizing devices a good choice to enhance safety and greatly reduce gate violations at highway-rail grade crossings.

Each device has its own special properties and installation requirements. This guidance is offered to facilitate the effective use of these traffic control devices.

The Federal Highway Administration issued the report "Guidance on Traffic Control Devices at Highway-Rail Grade Crossings." Channelizing devices may be grouped in a few general categories.

### **BARRIER WALL SYSTEMS**

Concrete barriers and similar proprietary systems are substantial, and may require a wide space between opposing lanes of traffic on approach to the grade crossing. While these are the most effective at deterring "drive-around" gate violations, their large

size may preclude their use in many applications.

In addition, the upstream end of a barrier must be equipped with a site-appropriate energy absorbing end treatment. For this reason, this class of device can be more cost effective where continuous runs of 150 feet or more may be achieved.



### **WIDE RAISED MEDIANS**

In special situations where median width is available, a raised median of between four and 100 feet in width may be employed. Such a wide median may prove effective in deterring gate violations, even though it does not actually constitute a true barrier as commonly defined.

In addition, a well-landscaped wide median will also provide aesthetic benefits to the surrounding neighborhood. A wide median, if attractively landscaped, is often the most aesthetically pleasing separation method.

### **NON-TRAVERSABLE CURB ISLANDS**

This class of device has the advantage of a narrower footprint, but its use should be restricted to approach roadways with posted speeds of 40 MPH or below. These devices are substantial enough that each installation should be carefully designed, as an inappropriately placed device can constitute a hazard if struck by an errant vehicle. These devices are generally from six to nine inches in height, and usually about 2 feet wide. They should be equipped with reboundable, reflectorized vertical panels, to

enhance device visibility, and to increase “drive-around” deterrence. Road users would encounter significant difficulty attempting to cross over such a non-traversable island, because the six to nine inch heights cannot be readily mounted by most vehicles.

Retroreflective materials (in the color appropriate for the direction of travel in adjacent lanes) should be applied to the curbs to enhance their low-light visibility.

### **TRAVERSABLE RAISED CURB SYSTEMS**

This class of channelizing device is the narrowest, and therefore the easiest to fit in a wide range of roadway cross-section widths.

Traversable raised curb systems should always be used with reboundable, reflectorized vertical panels. This combination of devices will present road users with a visual deterrent to crossing over into the opposing traffic lane

in order to violate lowered gates.

The curb portion is not more than six inches in height, and generally less than twelve inches in width. Curbs are formed with a rounded shape that will create minimal vehicle deflection upon impact. In most cases, these systems can be installed on existing roadway centerlines, without the need for widening the roadway approaches to the crossing

Retroreflective materials (in the color appropriate for the direction of travel in adjacent lanes) should be applied to the curbs to enhance their low-light visibility.

These traversable curbs may present less of a physical barrier to crossovers than the more substantial devices discussed previously, but they still provide a considerable deterrent to gate violations. These devices can be used where appropriate to enhance safety at a wide variety of gated crossings.

Special care should be taken during installation of

these devices. With proprietary systems, be careful to ensure that all anchorages to the pavement are completed according to the manufacturer's instructions or State or local standards; in addition, be sure that the attachment of each vertical panel is secure. Any deflectable hinges must function properly.

In the case of proprietary systems utilizing modular plastic curbs with vertical panels or road tubes, these devices should be known to have been crash tested. This will ensure that they do not have the potential to send an errant vehicle out of control when struck. In addition, the vertical elements should not separate upon impact, nor should impacted curbs separate from the pavement and become airborne.

The Office of Highway Safety of the Federal Highway Administration can supply the relevant test criteria and procedures; see their website at:

<http://safety.fhwa.dot.gov/>

**APPLICABILITY FOR QUIET ZONE ESTABLISHMENT** - see FRA website at:

<http://www.fra.dot.gov>

The Federal Railroad Administration has recognized these channelizing devices as qualified Supplemental Safety Measures when used according to its regulations for the use of locomotive horns at grade crossings, found at 49 CFR Part 222. For purposes of establishing a Quiet Zone under Part 222, these devices have been assigned an effectiveness rate that represents their ability to reduce the probability of a collision at a grade crossing. For traversable channelizing devices with vertical panels, the effectiveness rate is 0.75. For non-traversable channelizing devices, with or without vertical panels, the effectiveness rate is 0.80.

These values are used by the Quiet Zone Calculator in determining the risk of a collision at a crossing to be included in a (new or existing) quiet zone.



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