



**INSTRUCTIONAL MEMORANDUMS
To County Engineers**

To	County Engineers	Date	November 2001
From	Office of Local Systems	IM No.	3.213
Subject	Traffic Barriers (Guardrail and Bridge Rail)		

The purpose of this I.M. is to provide guidelines for determining the need for traffic barriers at roadway bridges and culverts. A traffic barrier is a device used to shield a roadside obstacle that is located on the right-of-way within an established minimum width clear zone (see I.M. [3.215](#) for clear zone instruction).

Roadside obstacles are classified as non-traversable objects (such as large culverts) and as fixed objects (such as unprotected ends of bridge rails). These roadside obstacles should first be reviewed for possible removal or relocation outside the Clear Zone. If this is not practical, then a traffic barrier may be necessary. A traffic barrier itself poses some risk to an errant motorist and should be installed only if it is clear that the barrier reduces the severity of potential crashes.

GUARDRAIL (Approach Guardrail):

In general, guardrail should be installed at:

1. All four bridge corners on newly constructed bridges on the Farm-to-Market system, except bridges located within an established speed zone of 35 mph or less.
2. On the approach bridge corners (right side) on new federally funded bridges constructed on the area service system, except bridges within a 35 mph or less speed zone. Consideration should be given to shielding the opposite corner if it is located on the outside edge of a curve. The FHWA will participate in guardrail at all four corners if desired by the county.
3. All four bridge corners on existing bridges within the termini of a 3R project on the Farm-to-Market System. Existing w-beam installations that are flared and anchored at both ends may be used as constructed without upgrading to current standards.
4. Culverts with spans greater than six feet (circular pipe culverts greater than 72" in diameter), if it is impractical to extend beyond the clear zone and grates are not utilized.

Design exceptions (see I.M. [3.218](#) for design exception instructions) to not utilize guardrail at bridges or culverts will be considered if the following conditions exist:

1. Current ADT at structure is less than 200 vehicles per day.
2. Structure width is 24' or greater.

3. Structure is on tangent alignment.
4. Benefit/cost Ratio is less than 0.80.

Other obstructions, within the right-of-way and clear zone, should be reviewed for removal, relocation, installation of a traffic barrier or the “do nothing” option based on a cost-effectiveness approach.

BRIDGE RAILS (Barrier Rail):

Bridge rails on newly constructed bridges should be constructed to the latest available standards (includes SL-1 type rail on structures with less than 1000 vpd). On bridge rehabilitation projects involving federal-aid, any substandard bridge rail should be reviewed for retrofitting.

Bridge rails which are both structurally deficient and functionally obsolete should be reviewed for upgrading as part of the 3R projects. Included with this I.M. is a “Bridge Rail Rating System” developed to assist in determining if a bridge rail should be upgraded with the 3R project and to what extent it should be upgraded. Any bridge which is programmed in the near future for replacement or rehabilitation may not require upgrading as part of the 3R project.

The rating system assigns points to five factors (Crashes, ADT, Width, Length and Type of bridge rail); the sum of these factors will indicate the degree or amount of upgrading required, if any. The crash factor involves crashes (property damage only, personal injury and fatality) in the last five years (Access ALAS). The types of bridge rail are from various county bridge standards. If the existing rail is not an old standard, then determine which type it is similar to and assign the corresponding points.

Consideration should be given to extending the guardrail through the bridge on short bridges or bridges which have no end posts. This may be less costly than attaching the guardrail as per standard [RE-27B](#) or constructing an end post.

BRIDGE RAIL RATING SYSTEM

5 FACTOR SYSTEM

POINTS	0	5	10	15	20
Crashes (in the last 5 years)	None	1 PDO	1 PI	1 F or 2 PDO's or 1 PI and 1 PDO	2 or more F's/PI's or 3 or more PDO's
ADT (current year)	< 200	200 - 299	300 - 399	400 - 750	> 750
Bridge Width (feet)	≥ 30	28	24	22	≤ 20
Bridge Length (feet)	< 50	50 - 99	100 - 149	150 - 200	> 200
Bridge Rail (type)	Aluminum Rail (1967 Standard)	Steel Box Rail (1964 Standard)	Formed Steel Beam Rail (1951 and 1957 Standards)	Steel Rail (1941 Standard) Concrete Rail (1928 Standard)	Angle Handrail (1928 Standard)

Abbreviations: PDO = Property Damage Only crash
PI = Personal Injury crash
F = Fatality crash

UPGRADING NEEDED

- under 25 Points No Upgrading at this time
- 25 - 50 Points Delineation according to Standard [RE-48A](#)
- 51 - 75 Points Block out with Thrie Beam to curb edge
(If existing approach guardrail is W-Beam, W-Beam may be used)
- Over 75 Points Retrofit