

Table 5-2. Barrier Guidelines for Non-Traversable Terrain and Roadside Obstacles^{a,b} (16)

Obstacle	Guidelines
Bridge piers, abutments, and railing ends	Shielding generally needed.
Boulders	Judgment decision based on nature of fixed object and likelihood of impact.
Culverts, pipes, headwalls	Judgment decision based on size, shape and location of obstacle.
Foreslopes and backslopes (smooth)	Shielding not generally needed.
Foreslopes and backslopes (rough)	Judgment decision based on likelihood of impact.
Ditches (parallel)	Refer to Figures 3-6 and 3-7.
Ditches (transverse)	Shielding generally needed if likelihood of head-on impact is high.
Embankment	Judgment decision based on fill height and slope (see Figure 5-1).
Retaining walls	Judgment decision based on relative smoothness of wall and anticipated maximum angle of impact.
Sign/luminaire supports ^c	Shielding generally needed for non-breakaway supports.
Traffic signal supports ^d	Isolated traffic signals within clear zone on high-speed rural facilities may need shielding.
Trees	Judgment decision based on site-specific circumstances.
Utility poles	Shielding may be needed on a case-by-case basis.
Permanent bodies of water	Judgment decision based on location and depth of water and likelihood of encroachment.

Notes:

- a) Shielding non-traversable terrain or a roadside obstacle is usually necessary when it is within the clear zone and cannot practically or economically be removed, relocated, or made breakaway, and it is determined that the barrier provides a safety improvement over the unshielded condition.
- b) Marginal situations, with respect to placement or omission of a barrier, will usually be decided by crash experience, either at the site or at comparable site(s).
- c) Where appropriate, most sign and luminaire supports should be of a breakaway design regardless of their distance from the roadway if there is reasonable likelihood of their being hit by an errant motorist. The placement and locations for breakaway supports also should consider the safety of pedestrians from potential debris resulting from impacted systems.
- d) In practice, relatively few traffic signal supports, including flashing light signals and gates used at railroad crossings, are shielded. If shielding is deemed necessary, however, crash cushions are sometimes used in lieu of a longitudinal barrier installation..