
Treatment Options for Objects within the Clear Zone

Design Manual
Chapter 8
Safety Design

Originally Issued: 12-13-00

Revised: 11-12-20

The main goal in establishing a forgiving roadside is to reduce the presence of roadside objects. These objects should be mitigated or eliminated whenever possible.

Choosing a Treatment Method

Use one or more of the following methods to reduce the likelihood of the object being struck (listed in order of preference):

1. Remove the object entirely.

Designers should first consider removing the object entirely.

- Portions of structures that stick up out of the ground may be cut off flush with the ground surface.
- Abandoned structures can be removed.

2. Redesign the object to make it traversable.

If removing the object is not practical or feasible, then consideration should be given to making the object traversable.

- Steep slopes can be flattened.
- Culvert openings may be fitted with safety grates.

3. Relocate the object to a point where it is less likely to be struck.

If making the object traversable is not practical or feasible, the designer should investigate whether the object can be relocated to an area where it is less likely to be struck.

- Power poles can be relocated to the right-of-way line.
- Culverts may be extended, placing the openings further from the roadway.

Relocated objects should be placed outside the clear zone, preferably near the right-of-way line. Each additional foot that an object is offset from the roadway provides an incremental safety benefit to drivers. However, the next foot out from a given offset provides less benefit than the previous one provided.

4. Make the object breakaway.

If the object cannot be removed, redesigned, or relocated, the designer should check to see if the object can be made breakaway. For example, light poles and sign supports can be constructed or replaced with a breakaway design.

5. Shield the object with a barrier.

Only after exhausting the above options should the designer consider shielding the object with a barrier.

- Steel beam guardrail, cable guardrail, and concrete barrier can be used to shield many types of objects.
- Blunt ends of otherwise crashworthy objects can be protected with a crash cushion.

6. Delineate the object (no treatment).

The presence of an object can be emphasized with pavement markings, signs, or object markers.

Some other factors to consider choosing a treatment method:

- Crash history involving the object.
- Current and projected traffic volumes.
- Distance of the object from the roadway.
- Severity of a crash into the untreated object vs. the treated object.
- Initial and maintenance costs of treatment methods.
- Presence of other objects in the vicinity and their distances from the roadway.
- Types of safety treatments, if any, that have been applied to the other objects.

Because barriers are typically located closer to the roadway than the objects they are protecting, installing a barrier may result in an increased number of crashes, although the severity of the crashes tends to be lessened. Whenever possible, objects should be removed, redesigned, relocated, or made breakaway rather than being shielded.

If the treatment options discussed previously are not practical or feasible, it may be acceptable, especially on very low volume roads, to leave an object in place and delineate it (no treatment). This is often driven by benefit-cost analysis; however, the decision whether or not to treat an object ultimately comes down to engineering judgement. If the option to not treat the object is chosen, document this decision according to Section [1C-8](#).



Some objects should not be left in place untreated. Refer to Section [8B-4](#) for warrants.

Chronology of Changes to Design Manual Section:

008A-003 Treatment Options for Obstacles within the Clear Zone

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| 11/12/2020 | Revised
Retitled the section. Reorganized material to improve readability. |
| 12/13/2010 | NEW
To document treatment options for obstacles within the clear zone |