



# Clear Zones and Roadside Terrain

*A clear zone is an unobstructed, traversable roadside area designed to enable a driver to stop safely or regain control of a vehicle that has accidentally left the roadway. Clear Zones are an effective strategy for prevention and mitigation of roadway departure crashes.*

## Definition of a Clear Zone

The *AASHTO Roadside Design Guide* defines a **clear zone** as the total roadside border area, starting at the edge of the traveled way, available for safe use by errant vehicles. This area may consist of a shoulder, a recoverable slope, a non-recoverable slope, and/or a clear run-out area.

A **recoverable slope** is a slope on which a motorist may, to a greater or lesser extent, retain or regain control of a vehicle by slowing or stopping. Slopes flatter than 1V:4H are generally recoverable. A **non-recoverable slope** is a traversable slope on which an errant vehicle will continue to the bottom. Embankment slopes between 1V:3H and 1V:4H may be considered traversable but non-recoverable if they are smooth and free of fixed objects. A **clear run-out area** is the area at the toe of a non-recoverable slope available for safe use by errant vehicles. Slopes steeper than 1V:3H are not considered traversable and are not considered part of the clear zone.

## MUTCD Requirements

The *Manual on Uniform Traffic Control Devices* (MUTCD) requires that sign supports within the clear zone be made breakaway or shielded by a barrier. All new sign installations shall meet these criteria. Existing sign supports located on highways posted at 50 mph or greater shall meet this criterion by January 17, 2013. On roads posted at speeds 45 mph or lower, the breakaway criterion may be met when upgrading sign retroreflectivity or by 2019, whichever comes first.

## Guidance on Clear Zone Dimensions

The design of the roadside is a project-specific task, and the selection and design of appropriate clear zone dimensions should be the responsibility of design professionals trained in roadside design issues. The FHWA believes that the most responsible method for determining clear zone width is based on a consistent design approach, guided by past crash history and a cost-effectiveness analysis.

The *AASHTO Roadside Design Guide* provides guidance to help highway agencies develop consistent design approaches for determining the widths of clear zones along roadways based on speed, traffic volume, roadside slope and curvature. This publication recommends clear zone ranges based on a width of 30 to 32 feet for flat, level terrain adjacent to a straight section of a 60 mph highway with an average daily traffic of 6,000 vehicles. For steeper slopes on a 70 mph roadway the clear zone range increases to 38 to 46 feet, and on a low speed, low volume roadway the clear zone range drops to 7 to 10 feet. For horizontal curves the clear zone can be increased by up to 50 percent from these figures.

Another AASHTO publication, *A Policy on Geometric Design of Highways and Streets* (Green Book), recommends a 10-foot minimum clear zone on collectors without curbs, low-speed rural collectors, and rural local roads. For local roads and streets, a minimum clear zone of 7 to 10 feet is considered desirable on sections without curb.

As a practical matter, the clear zone dimensions may be limited by available right-of-way; the location, frequency, and nature of roadside objects; the presence of valued resources such as wetlands; or the need to provide for pedestrians.

## Horizontal Clearance – Not the Same as a Clear Zone

Horizontal clearance is the lateral offset distance needed to provide clearance for vehicular traffic—for example, for mirrors on trucks and buses that are in the extreme right lane of a facility, or for opening curbside doors of parked vehicles. Horizontal clearance can be defined as the lateral offset distance from the edge of the traveled way, shoulder or other designated point, to a vertical roadside element. **It is not the same as a clear zone.** Curbs, walls, barriers, piers, sign and signal supports, mature trees, landscaping items, and power poles are primary examples of the type of features that require horizontal clearance.



Source: John Miller, Missouri DOT

## Managing the Highway Safety Impact of Trees

Trees are the single most commonly struck objects in serious roadside collisions. Crash severity is closely correlated with speed. Trees on low-speed residential streets, if positioned in locations where they do not impede driver visibility and with adequate set back, may not present a safety hazard. High-speed roads and highways should have clear zones free of trees and other fixed object hazards. The FHWA encourages highway agencies to work cooperatively with communities to improve safety while enhancing the environment by developing consensus policies related to tree planting, removal, or mitigation.



Source: FHWA

## Managing Roadside Vegetation

Road agencies have a responsibility to maintain regular vegetation control programs to prevent growth of trees and vegetation by the roadside that can become a safety hazard. In addition to roadside trees, tall grass, weeds, and brush can limit driver sight lines and obscure the visibility of traffic signs and signals, other vehicles, pedestrians, bicyclists, and animals. Uncontrolled vegetation may make it difficult for drivers who leave the roadway to regain control of their vehicle.

## For More Information

AASHTO *Roadside Design Guide*

[https://bookstore.transportation.org/item\\_details.aspx?ID=148](https://bookstore.transportation.org/item_details.aspx?ID=148)

Clear Zone and Horizontal Clearance Frequently Asked Questions

<http://www.fhwa.dot.gov/programadmin/clearzone.cfm>

*Highway Safety and Trees: The Delicate Balance* (DVD)

The DVD was designed for use at State and local highway agency meetings, public hearings, and town meetings.

To obtain copies, e-mail [report.center@fhwa.dot.gov](mailto:report.center@fhwa.dot.gov), and request publication number FHWA-SA-06-13.

*Highway Safety and Trees: The Delicate Balance* (Brochure)

[http://safety.fhwa.dot.gov/roadway\\_dept/clear\\_zones/fhwasa0612/](http://safety.fhwa.dot.gov/roadway_dept/clear_zones/fhwasa0612/)

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