

# Install W-beam Guardrail Or Concrete Barrier



Installing W-beam guardrails or concrete barriers is a roadside safety countermeasure designed to shield motorists from fixed objects, steep slopes, drop-offs, or other roadside hazards.

## Implementation Strategy

### How and Where to Apply

- Apply on segments with steep slopes, bridge ends, or fixed hazards where recovery zones are insufficient and departure risks are high.
- Install using AASHTO MASH standards, with W-beams where deflection is possible and concrete barriers in high-speed, narrow, or high-impact zones for containment. Not suitable on low-volume roads without major roadside hazards.
- The FHWA states "Guardrails are not designed to stop a vehicle, but to redirect it away from a hazard in a controlled manner".

### Use in a Safe System Approach

Guardrails and barriers support the Safe Roads and Safe Road Users elements of the Safe System Approach (SSA) by containing errant vehicles and reducing crash severity. They transform potentially fatal run-off-road crashes into survivable events, reinforcing the SSA principle that human mistakes should not result in death or serious injury.

### Key Stakeholders

State DOTs, MPOs, engineering consultants, construction contractors, safety advocacy groups.

### Proactive Implementation

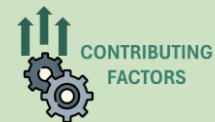
Proactive implementation involves identifying high-risk roadside locations through crash data and roadway assessments, then installing W-beam or concrete barriers before severe incidents occur. It emphasizes prevention by integrating safety hardware into road upgrades, ensuring consistent application, and maintaining standards to protect motorists from run-off-road and fixed-object crash hazards.

## Countermeasure Overview

**Objective:** Reduce the severity of the crash.

**Strategy:** Improve design and application of barrier and attenuation systems.

## Targeted Solution



- High Speed
- Reduced Visibility
- Driver inattention/distraction



- Cross-median
- Run-off road
- Head-on



- Principal Arterial
- Freeways
- Expressways



- Not Specified

## Safety Linkage



Run-off Road



Safe Roads



Safer Infrastructure

SAFE SYSTEM ROADWAY DESIGN

TIER 1  
TIER 2  
TIER 3  
TIER 4

Tier 1

## Selected Related Countermeasures

- CM1 Clear Zone Management
- CM2 Crash Cushions (Impact Attenuators)
- CM3 Breakaway Support Structures

**Cost:** \$\$\$ (Moderate to High)  
**Service Life:** 25 years

W-Beam Guardrail. Source: VHB.

40%

Reduces nighttime and run-off-road crashes and severity levels K and A on principal arterial – other freeways and expressways ([CMF ID: 8423](#))

40%

Reduces run-off-road and nighttime crashes across severity levels K, A, and B on principal arterial – other freeways and expressways ([CMF ID: 8376](#))



### Resources

- AASHTO. Roadside Design Guide, 4th Edition, 2011.
- FHWA. Roadway Widths and Lane Configurations on Urban Streets

