

SAFETY TREATMENTS AND COUNTERMEASURES

Highway design practice provides a broad range of alternative measures that can be used alone or in combination with others to mitigate the effects of geometric deficiencies and provide for safer operations on existing highways.

The known effectiveness of the mitigation strategies varies. Some, such as shoulder rumble strips, have been used for many years and are well proven. Others are new ideas that have been tried, but their effectiveness is still being studied. The body of knowledge on these strategies will continue to grow, so designers should consult the most recent research available to assess the effectiveness of particular strategies. (1) (2)

Sources:

- (1) Developing Geometric Design Criteria and Processes for Nonfreeway RRR Projects. FHWA Technical Advisory T 5040. 28
- (2) FHWA-SA-07-011: Mitigation Strategies for Design Exceptions
- (3) NCHRP Synthesis 432: Recent Roadway Geometric Design Research for Improved Safety and Operations
- (4) NCHRP Report 783: Evaluation of the 13 Controlling Criteria for Geometric Design
- (5) FHWA-SA-07-001: Good Practices: Incorporating Safety into Resurfacing and Restoration Projects
- (6) NCHRP Report 600: Human Factors Guidelines for Road Systems, 2nd.
- (7) FHWA-SA-14-075: Manual for Selecting Safety Improvements on High Risk Rural Roads
- (8) FHWA-SA-09-020: Low-Cost Safety Enhancements for Stop-Controlled and Signalized Intersections
- (9) FHWA website: Proven Safety Countermeasures
- (10) FHWA website: A Focused Approach to Safety Guidebook Toolbox
- (11) NCHRP Report 500: Guidance for Implementation of the AASHTO Strategic Highway Safety Plan
- (12) NCHRP Report 650: Median Intersection Design for Rural High-Speed Divided Highways.
- (13) Evaluations of Low Cost Safety Improvements Pooled Fund Study."Publications,"
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- (19) Crash Modification Factors Clearinghouse

The following table shows a partial list of potential safety treatments and countermeasures that are possible alternatives to reconstruction for several geometric deficiencies and safety issues. Discuss and coordinate proposed safety treatments and countermeasures with WisDOT Statewide Bureaus.

Table A1.1 Safety Treatments and Countermeasures

Geometric Deficiency or Safety Issue	Safety Treatments and Countermeasures
Narrow lanes and shoulders	Pavement edge lines
	Post delineators
	Safety Edge
Steep side slopes; roadside obstacles	Roadside hazard markings
	Slope flattening
	Round ditches
	Obstacle removal
	Breakaway safety hardware
	Guardrail
Pavement edge drop-off	Paved Shoulder
	Safety Edge
Run off Road Crashes	Signing and delineation
	Slope flattening
	Round ditches
	Obstacle removal
	Breakaway safety hardware
	Guardrail
	Shoulder Rumble Strips
Narrow bridge	Approach guardrail
	Hazard markers
	Pavement markings
Poor sight distance at hill crest	Signing
	Fixed-hazard removal
	Shoulder widening
	Driveway relocation
Sharp horizontal curve	Chevron signing or delineators
	Shoulder widening
	Appropriate superelevation
	Slope flattening
	Pavement antiskid treatment
	High Friction Surface Treatment
	Obstacle removal
	Obstacle shielding

Geometric Deficiency or Safety Issue	Safety Treatments and Countermeasures
Hazardous intersections	Signing and/or beacons
	Traffic signalization
	Fixed lighting
	Pavement antiskid treatment
	Speed controls
	Vision corners
	Access Management

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