NCHRP 17-113 COUNTERMEASURES

Widen Paved Shoulder from 4 ft to 8 ft

ROADWAY DEPARTURE

Wider paved shoulders on roadways can help reduce run-off road crashes, increase stability for vehicles, and improve maneuvering space for drivers.

Implementation Strategy

How and Where to Apply

- Widening shoulders to 8 ft is most effective on high-speed, limited-access highways where roadside recovery space is limited.
- This countermeasure increases the usable area beyond the travel lane, providing a stable surface for vehicles that drift or lose control, as well as space for emergency stops and enforcement activities.
- An 8 ft shoulder also facilitates maintenance, improves drainage, and accommodates cyclists in transitional areas when needed.

Use in a Safe System Approach

Wider shoulders support SSA by improving road design (Safe Roads) to provide recovery space for drivers who unintentionally leave the travel lane. This helps accommodate human mistakes (Safe Road Users) and reduces the severity of ROR crashes.

Key Stakeholders

State DOTs, Traffic Safety Analysts

Proactive Implementation

Ideal during reconstruction, resurfacing, or lane addition projects, shoulder widening can be phased in or targeted to segments with crash history, poor sight distance, or inadequate lateral support. Agencies should consider pavement strength, drainage, and long-term maintenance when upgrading from narrow shoulders to a full 8 ft. In areas with limited right-of-way, agencies may need to evaluate trade-offs between shoulder width, median treatments, and lane configurations to achieve optimal safety outcomes.

Countermeasure Overview

Objective: Keep vehicles from encroaching on the roadside

Strategy: Apply shoulder treatments

Targeted Solution

CONTRIBUTING FACTORS	▪ Reduced visibility ▪ Driver inattention
TARGET CRASH TYPE	▪ Run-off Road
ROAD FACILITY TYPE	▪ Principal Arterial Interstate
AREA TYPE	▪ All

Safety Linkage

NCHRP 500 Series	SAFE SYSTEM APPROACH
Run-off Road	Safe Roads
AASHTO'S TOWARD ZERO DEATHS	SAFE SYSTEM ROADWAY DESIGN (TIER 1, TIER 2, TIER 3, TIER 4)
Safer Infrastructure	Tier 1

Selected Related Countermeasures

- CM1 Flatten roadside slopes
- CM2 Pave existing unpaved shoulders
- CM3 Add or upgrade guardrail systems

Cost: $$(Moderate to High)

Service Life: 20 years

Benefit-Cost Ratio: 1.2:2

Wide Shoulder on Road, Source: Wikipedia.

Safety Benefits

41% Reduces risk of fixed object, head-on, run-off-road, and sideswipe crashes in rural area[1]

13% Reduces risk of fixed object, head-on, run-off-road, and sideswipe crashes in urban area[2]

[1] CMF ID: 6305
[2] CMF ID: 6308

Resources

- Analysis of the Shoulder Widening Need on the State Highway System
- Potential Safety Effects of Lane Width and Shoulder Width on Two-Lane Rural State Highways in Idaho