NCHRP 17-113 COUNTERMEASURES

Improve Pavement Friction (Increase Skid Resistance)

ROADWAY DEPARTURE

Improving pavement friction enhances tire grip, especially in wet conditions, reducing skidding and crash risks.

Implementation Strategy

How and Where to Apply

- Apply at curves, intersections, downhill grades, or locations with high crash rates related to skidding or loss of control, especially during wet conditions.
- Use high friction surface treatments (HFST), grooving, or textured overlays, following FHWA guidelines for proper material selection, surface preparation, and installation under recommended dry and temperature conditions.
- Not suitable where pavement friction is sufficient, on low-speed streets with minimal crashes, or where resurfacing won't address the safety issue.

Use in a Safe System Approach

Improving pavement friction supports Safe Roads and Safe Speeds by increasing tire grip and reducing skidding, especially on wet or curved roads. It reduces crash risk and severity, reinforcing the SSA principle that deaths and serious injuries are unacceptable.

Key Stakeholders

State DOTs, MPOs, local governments, engineering consultants, construction contractors.

Proactive Implementation

Proactive implementation targets high-risk locations like curves, intersections, or downhill segments with skidding or loss-of-control crashes. Agencies should use skid resistance testing and crash data to prioritize sites before severe incidents occur. Applying high-friction surface treatments in advance improves safety and prevents crashes, especially in wet conditions.

Countermeasure Overview

Objective: Keep vehicles from encroaching on the roadside.
Strategy: Provide skid-resistant pavement surfaces.

Targeted Solution

CONTRIBUTING FACTORS	▪ Reduced vehicle control ▪ Inadequate skid resistance
TARGET CRASH TYPE	▪ Run-off road ▪ Head-on
ROAD FACILITY TYPE (ARTERIAL, COLLECTOR, LOCAL)	▪ N/A
AREA TYPE	▪ Rural

Safety Linkage

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

Selected Related Countermeasures

- CM1 Pavement grooving
- CM2 Rumble strips
- CM3 High-friction overlays on bridge decks

Cost: $$ (Moderate)
Service Life: 10 years
Benefit-Cost Ratio: 26.7:1

Improve Pavement Friction. Source: FHWA.

Safety Benefits

- 48% Reduces wet road crashes and severity levels K, A, B, and C on all rural undivided roads (CMF ID: 2258)
- 42% Reduces wet road crashes and severity levels K, A, B, and C on all rural undivided roads (CMF ID: 2257)

Resources

- FHWA Proven Safety Countermeasure
- USDOT highway safety