NCHRP 17-113 COUNTERMEASURES

Change Street Surface Condition from Poor to Good

ROADWAY DEPARTURE

Improving road conditions prevents vehicles from encroaching on the roadside by providing skid-resistant pavement surfaces.

Implementation Strategy

How and Where to Apply

- Improve street surface condition from poor to good on rural roadways with high volumes where deteriorated pavement contributes to crash risk and road user discomfort.
- Surface condition upgrades may include full-depth pavement reconstruction, resurfacing, or targeted patching based on pavement condition index (PCI), ride quality, and crash data.
- Improved pavement conditions enhance vehicle control, reduce driver workload, and improve visibility of markings and surface-based signage.

Use in a Safe System Approach

Improving surface condition directly supports the SSA by reducing crash risk factors related to vehicle instability, hydroplaning, and driver error. Smoother surfaces support safe speed management and shorten stopping distances.

Key Stakeholders

State and Local Transportation Agencies, Public Works Departments, City Planners

Proactive Implementation

Pavement upgrades should be prioritized using data-driven methods that incorporate PCI ratings, crash history, and user complaints. Proactive investment in surface improvements can reduce maintenance backlogs, prevent further degradation, and improve safety equity. Research from the Missouri DOT showed that crash rates were significantly lower on good-condition pavements compared to poor ones.

Countermeasure Overview

Objective: Keep vehicles from encroaching on the roadside

Strategy: Provide skid-resistant pavement surfaces

Targeted Solution

CONTRIBUTING FACTORS	▪ Loss of Control ▪ Increased Stopping Distance
TARGET CRASH TYPE	▪ Run-off Road
ROAD FACILITY TYPE	▪ Rural two-lane ▪ Minor arterial
AREA TYPE	▪ Rural

Safety Linkage

- NCHRP 500 Series: Run-off Road
- SAFE SYSTEM APPROACH: Safe Roads
- AASHTO'S TOWARD ZERO DEATHS: Safer Infrastructure
- SAFE SYSTEM ROADWAY DESIGN: Tier 4

Selected Related Countermeasures

- CM1 High friction surface treatments
- CM2 Enhanced pavement markings
- CM3 Roadway drainage improvements

Cost: $$(moderate to high)

Service Life: 10 years

Road with potholes Source: Cincinnati Enquirer.

Safety Benefits

26% Helps reduce all crash severity types on all road types[1]

[1] CMF ID: 5627

Resources

- Friction enhancements to asphalt pavement surfaces
- Investigating the Potential to Use Phase Change Materials to Store Heat in Concrete Pavement to Reduce the Need for Anti-Icing
- Using Performance Engineered Mixtures to Improve Pavement Performance and Sustainability