NCHRP 17-113 COUNTERMEASURES

Install Profiled Thermoplastic Pavement Markings

ROADWAY DEPARTURE

Profiled thermoplastic pavement markings are raised, reflective lines that enhance visibility and provide tactile-auditory feedback to reduce nighttime and wet-weather lane departures.

Implementation Strategy

How and Where to Apply

- Install during resurfacing or upgrades where markings deteriorate quickly or visibility is poor in wet or dark conditions.
- Apply on freeways, rural arterials, curves, and ramps with a documented history of run-off-road or lane-departure crashes, especially under low-visibility conditions..
- The **FHWA** states that "Profiled markings are effective at improving nighttime visibility under wet conditions by maintaining retroreflectivity where flat markings fail."

Use in a Safe System Approach

Supports the Safe System Approach by improving Safer Roads and Safer People. It reinforces lane discipline, especially when visibility or attention is compromised, and helps reduce crash frequency and severity through early feedback.

Key Stakeholders

State and local transportation agencies, Metropolitan Planning Organizations (MPOs), Pedestrian Advocacy Groups and Community Organizations

Proactive Implementation

Incorporate profiled thermoplastic markings during planned resurfacing, restriping, or safety improvement projects—especially on corridors with documented lane-departure crashes or low nighttime visibility. Prioritize sites with recurring wet-weather incidents and ensure compatibility with snowplows and local noise considerations. Use systemic safety analysis to identify candidate road segments before crashes occur.

Countermeasure Overview

Objective: Keep vehicles from encroaching on the roadside

Strategy: Install edgeline profile marking, edgeline rumble strips or modified shoulder rumble strips on section with narrow or no paved shoulders

Targeted Solution

CONTRIBUTING FACTORS	▪ Reduced visibility ▪ Driver inattention
TARGET CRASH TYPE	▪ Run-off-road ▪ Head-on
ROAD FACILITY TYPE	▪ Not specified
AREA TYPE	▪ Rural

Safety Linkage

Run-Off-Road

Safer Infrastructure

Safe Roads

Tier 4

Source: Driven2Drive

Selected Related Countermeasures

- CM1 Reflective Raised Pavement Markers
- CM2 Wider Longitudinal Pavement Markings
- CM3 Wet-Reflective Pavement Markings

Cost: $ (Low)

Service Life: 5 years

Benefit-Cost Ratio: 3.65:1

Safety Benefits

11% Reduce all crashes Rural road[1]

3% Reduce Nighttime, wet road crashes Rural road[2]

[1] CMF ID: 9814
[2] CMF ID: 9798

Resources

- HWA Pavement Marking Handbook (2005)
- Manual on Uniform Traffic Control Devices (MUTCD), Part 3