NCHRP 17-113 COUNTERMEASURES

Widen Managed Lane Envelope

ROAD WAY DEPARTURE

Widening the managed lane envelope means increasing the lateral buffer between managed lanes (such as HOV or toll lanes) and general-purpose lanes using markings or separators to improve safety.

Implementation Strategy

How and Where to Apply

- Apply on freeways or expressways with existing or planned managed lanes (e.g., HOV, toll, or bus-only lanes).
- Use during restriping, pavement rehabilitation, or capacity expansion projects, especially in corridors with lane-change-related crash history near managed lane entry/exit points.
- Not recommended on constrained corridors where widening reduces general-purpose lanes or significantly impacts adjacent properties without strong safety benefits.

Use in a Safe System Approach

Widening managed lane envelopes improves safety margins, supports shared responsibility, addresses human mistakes, and ensures proactive, redundant protection by reducing conflicts and accommodating vulnerable users within safer roadway design.

Key Stakeholders

State DOTs, MPOs, engineering consultants, safety advocacy groups, freight/trucking associations.

Proactive Implementation

Proactively implementing widened managed lane envelopes during design, resurfacing, or capacity projects enhances safety and operations. Target corridors with high lane-change crash rates, and coordinate with enforcement and emergency responders. Integrating this treatment early supports Safe System goals, reduces retrofit costs, and improves managed lane effectiveness and driver compliance.

Countermeasure Overview

Objective: Keep vehicles from encroaching into opposite lane.
Strategy: Provide center two-way left-turn lanes for four- and two-lane roads.

Selected Related Countermeasures

- CM1 Channelizing Devices
- CM2 Managed Lane Access Control
- CM3 Dynamic Lane Use Control

Cost: $$$ (Moderate to High)
Service Life: 20 years

Targeted Solution

CONTRIBUTING FACTORS	▪ Fixed object ▪ Overturn
TARGET CRASH TYPE	▪ Run-off-road
ROAD FACILITY TYPE (ARTERIAL, COLLECTOR, LOCAL)	▪ N/A
AREA TYPE	▪ Urban ▪ Suburban

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

Widen Managed Lane Envelope. Source: FHWA.

Safety Benefits

4% Reduces other types of crashes and severities K, A, B, and C on urban and suburban divided roads (CMF ID: 9400)

2% Reduces crashes of all types and severities on urban and suburban divided roads (CMF ID: 9398)

Resources

- Safety Implications of Managed Lane Cross Sectional Elements, FHWA
- Manual on Uniform Traffic Control Devices (MUTCD)