NCHRP 17-113 COUNTERMEASURES

Improve Angle of Channelized Right Turn Lane

INTERSECTIONS

Sharpening the angle of a channelized right-turn lane bringing it closer to 90 degrees slows turning vehicles, improves visibility of pedestrians and cyclists, and reduces crash severity at intersections.

Implementation Strategy

How and Where to Apply

- Apply at intersections with high pedestrian volumes to reduce turning speed and improve crosswalk visibility.
- Use during roadway reconstruction or resurfacing to cost-effectively modify geometry for enhanced pedestrian safety.
- Not recommended where right-turn demand is low, space is constrained, or redesign causes major property impacts without significant safety benefits.

Use in a Safe System Approach

Improving channelized right-turn angles reduces conflicts and speeds, supports shared responsibility, addresses human mistakes, and ensures proactive, redundant safety through safer geometry, markings, and crossings for vulnerable users.

Key Stakeholders

State DOTs, MPOs, engineering consultants. urban planners, active road users.

Proactive Implementation

Identify intersections with frequent pedestrian or turning-related crashes using crash data and field reviews. Implement sharper right-turn angles during resurfacing or capital projects. Use temporary curb extensions or striping as interim solutions. Prioritize locations near schools, transit stops, and dense pedestrian zones to enhance safety before severe incidents occur.

Countermeasure Overview

Objective: Ensure that roadway design and traffic control elements support appropriate and safe speeds.
Strategy: Provide/improve right-turn channelization.

Targeted Solution

CONTRIBUTING FACTORS	▪ Sharp turning angles ▪ Excessive vehicle speeds
TARGET CRASH TYPE	▪ Right-turn
ROAD FACILITY TYPE	▪ N/A
AREA TYPE	▪ All

Safety Linkage

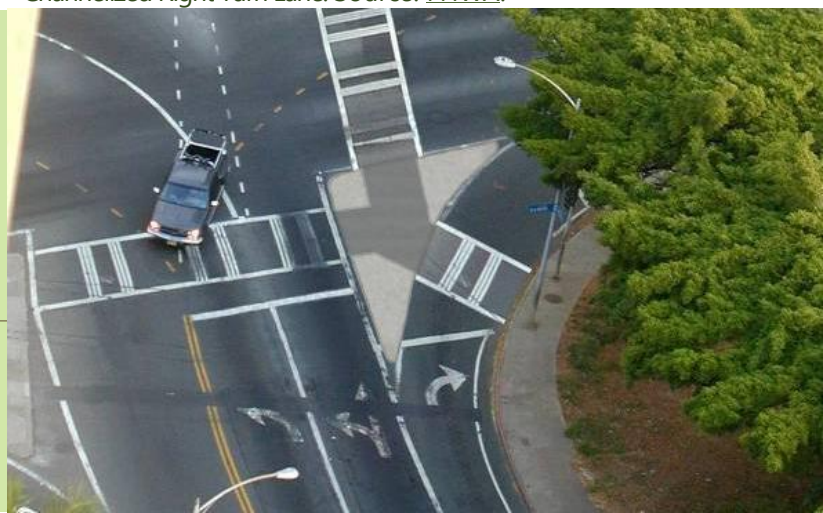
NCHRP 500	SAFE SYSTEM APPROACH
Intersection	Safe Roads
AASHTO'S TOWARD ZERO DEATHS	SAFE SYSTEM ROADWAY DESIGN
Safer Infrastructure	Tier 2

Selected Related Countermeasures

- CM1 Curb Radius Reduction
- CM2 High-Visibility Crosswalks
- CM3 Raised Crosswalks or Intersections

Cost: $$ (Moderate)
Service Life: 20 years
Benefit-Cost Ratio: 13.8:1

Channelized Right Turn Lane. Source: FHWA.



Safety Benefits

60% Reduces right turn & other types of crashes and all types of severities (CMF ID: 8431)

44% Reduces all types of crashes and K, A, B, C severities (CMF ID: 8429)

Resources

- Channelized Right-Turn Lanes, FHWA
- Roadway Intersection Design Guide, FHWA (2021)
- Toolbox for Operational Improvements at Signalized Intersections, NCHRP Report, TRB