NCHRP 17-113 COUNTERMEASURES

Introduce TWLTL on Rural Two-lane Roads

ROADWAY DEPARTURE

A Two-Way Left Turn Lane on rural roads provides a center lane for left turns in both directions, improving safety and traffic flow by removing turning vehicles from through lanes.

Implementation Strategy

How and Where to Apply

- TWLTL installations tend to be more effective in rural areas than in urban settings due to longer distances between intersections and higher speeds, where removing turning vehicles from the through lane greatly enhances safety.
- They are especially beneficial at sites with frequent rear-end crashes, such as locations where vehicles often turn into driveways, by providing a dedicated space for drivers to wait for safe gaps in oncoming traffic.

Use in a Safe System Approach

Installing TWLTLs on rural roads supports the Safe System Approach by reducing crash risks and improving traffic flow. It enhances safe roads, speeds, and user behavior by separating turning vehicles, lowering conflict points, and promoting predictable movements.

Key Stakeholders

Agency maintenance personnel, DOT, Local enforcement

Proactive Implementation

Proactive implementation of TWLTLs requires analyzing crash data to identify segments with high frequencies of rear-end or turning-related collisions, especially near driveways or minor intersections. Traffic engineering studies should evaluate turning volumes, roadway geometry, and available right-of-way to determine feasibility. Design must follow AASHTO and MUTCD guidelines, ensuring proper lane width, pavement markings, and signage for effective operation.

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 Dedicated left-turn lanes at intersections
- CM2 Raised medians
- CM3 Offset left-turn lanes

Cost: $ (Moderate to High)

Service Life: 20 years

Benefit-Cost Ratio: XX

Targeted Solution

CONTRIBUTING FACTORS	▪ High-speed traffic ▪ Risk-taking behavior ▪ Unexpected stops
TARGET CRASH TYPE	▪ Head on ▪ Rear-end ▪ Sideswipe
ROAD FACILITY TYPE	▪ Not Specified
AREA TYPE	▪ Rural

Safety Linkage

NCHRP 500 Series	SAFE SYSTEM APPROACH
Head on crashes	Safe Speeds
AASHTO'S TOWARD ZERO DEATHS	SAFE SYSTEM ROADWAY DESIGN
Safer Infrastructure	Tier 1

TIER 1 TIER 2 TIER 3 TIER 4

TWLTL in North Carolina. Source: FHWA

Safety Benefits

36% Reduce in all types of crash severities[1]

47% Reduce rear end crashes [1]

[1] CMF ID: 583
[2] CMF ID: 585

Resources

- FHWA Research on TWLTL