NCHRP 17-113 COUNTERMEASURES

# Add a Through Lane on Both Directions and a Raised Median

INTERSECTIONS

Added through lanes in each direction with a raised central median to improve traffic flow and safety.

## Implementation Strategy

### How and Where to Apply

- This treatment is best suited for undivided 2-lane highways experiencing high volumes, frequent head-on or opposite-direction run-off-road crashes and limited safe passing opportunities.
- A raised median separates opposing flows, channels left-turns to safe crossover points and provides refuge space for pedestrians and other non-motorized users.
- Avoid in constrained areas where added lanes would increase pedestrian conflicts, induce speeding, or disrupt existing land use access and best for widen roads.

### Key Stakeholders

State DOTs, traffic safety engineers, engineering consultants, urban planners, law enforcement agencies.

### Proactive Implementation

Agencies should target corridors with high volumes and record of head-on or run-off-road crashes for through-lane additions and raised median installation. Prioritize sites through data-driven corridor screening and safety audits. Integrate median and lane widening into planned resurfacing, major reconstruction, or access-management projects.

### Use in a Safe System Approach

This design applies SSA by adding raised medians and through lanes to reduce head-on conflicts and guide turns safely. It recognizes humans make mistakes by offering refuge areas and acknowledges human vulnerability by calming speeds, creating a forgiving roadway that minimizes crash severity and advances zero-fatality goals.

## Countermeasure Overview

**Objective:** Reduce Pedestrian Exposure to Vehicular Traffic
**Strategy:** Construct pedestrian refuge islands, raised medians

## Targeted Solution

| | |
|---|---|
| CONTRIBUTING FACTORS | ▪ Failure to yield<br>▪ Misjudgment of safe gaps<br>▪ Aggressive behavior |
| TARGET CRASH TYPE | ▪ Angle Crash<br>▪ Rear-end Crash<br>▪ Turning Crash |
| ROAD FACILITY TYPE | ▪ N/A |
| AREA TYPE | ▪ All |

## Safety Linkage

| | |
|---|---|
| NCHRP 500 Series | SAFE SYSTEM APPROACH |
| Intersection | Safe Roads |
| AASHTO'S TOWARD ZERO DEATHS | SAFE SYSTEM ROADWAY DESIGN<br>TIER 1<br>TIER 2<br>TIER 3<br>TIER 4 |
| Safer Infrastructure | Tier 1 |

## Selected Related Countermeasures

- CM1 Convert 2 L roadway to 4 L divided roadway
- CM2 Introduce Two-Way Left-Turn Lane on rural roads
- CM3 Five to six lanes conversion

**Cost:** $$$$ (High)
**Service Life:** 20 years

Through Lane on Both Directions and a Raised Media Source: VHB

## Safety Benefits

**67%** Reduces crashes of all types and severity outcomes K, A, B, and C on two-lane undivided urban roads (CMF ID: 7733)

**49%** Reduces crashes of all types and severity levels K, A, B, and C on undivided rural roads (CMF ID: 7735)

### Resources

- Pedestrian Safety Through a Raised Median and Redesigned Intersections
- Median Handbook, 2014