

# Provide Short 2+1 Road Sections



A 2+1 road section alternates two lanes in one direction and one in the opposite every few kilometers, allowing safe overtaking on rural highways with limited passing opportunities.

## Implementation Strategy

### How and Where to Apply

- Implement alternating 2+1 segments every 1.5 to 3 miles, ensuring safe lane transitions, adequate sight distance, and consistent design.
- Use in corridors with frequent head-on or overtaking-related crashes or where full four-lane widening is impractical due to cost or environmental constraints.
- The **FHWA** states that "2+1 roads can be an effective and lower-cost alternative to full four-lane expansion on rural highways, offering significant safety and operational benefits."

### Use in a Safe System Approach

Supports the Safe System Approach by enabling Safer Roads and Safer Speeds. This treatment proactively reduces the conditions that lead to severe head-on crashes and accommodates human error by providing controlled, dedicated overtaking zones.

### Key Stakeholders

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

### Proactive Implementation

Implement 2+1 road sections during resurfacing, safety upgrades, or capacity planning on rural highways. Use crash history and traffic volume data to prioritize segments. Design should ensure consistent spacing, clear markings, and safe transitions. Early integration minimizes costs and enhances safety without requiring full corridor reconstruction.

## Countermeasure Overview

**Objective:** Reduce the severity of the crash

**Strategy:** Improve design and application of barrier and attenuation systems

## Selected Related Countermeasures

- CM1** Passing Lanes
- CM2** Centerline Rumble Strips
- CM3** Median Barriers

**Cost:** \$ (High)

**Service Life:** 20 years

**Benefit-Cost Ratio:** 1.5:1

## Targeted Solution



**CONTRIBUTING FACTORS**

- Limited passing opportunities



**TARGET CRASH TYPE**

- Run-off-road
- Head-on



**ROAD FACILITY TYPE**

- All



**AREA TYPE**

- Rural

## Safety Linkage



**NCHRP 500 Series**

Run-off Roads



**AASHTO'S TOWARD ZERO DEATHS**

Safer Infrastructure

**SAFE SYSTEM APPROACH**

Safe Roads

**SAFE SYSTEM ROADWAY DESIGN**

TIER 1

TIER 2

TIER 3

TIER 4

Tier 1

Source: Driven2Drive

## Safety Benefits

47%

Reduce all crashes all road<sup>1</sup>

49%

Reduce Head on, Rear end, Sideswipe crashes Rural road<sup>2</sup>

<sup>1</sup> CMF ID: 10267

<sup>2</sup> CMF ID: 10268

## Resources

- FHWA Office of Safety
- AASHTO Green Book & Roadway Design Guides
- State DOT Design Manuals

