NCHRP 17-113 COUNTERMEASURES

Convert Flush Buffered Bike Lane to SBL with a blend of Flexi-post and other Vertical Elements

PEDESTRIANS AND BICYCLISTS

Separated bike lanes (SBL) with vertical elements are enhanced bicycle facilities that use posts or barriers to physically separate cyclists from motor vehicle traffic.

Implementation Strategy

How and Where to Apply

- Separated Bike Lanes (SBLs) with vertical elements are best applied on roads with high vehicle volumes, speeds above 25 mph, or documented bike-vehicle conflicts.
- They are typically implemented on arterials or collectors with sufficient width to maintain vehicle flow and emergency access.
- Best suited for corridors with high bicycle activity and frequent conflicts; avoid where roadway width, drainage, or maintenance constraints limit the safe placement of vertical elements.

Use in a Safe System Approach

Converting buffered bike lanes to separated bike lanes (SBL) with flexi-posts and other vertical elements supports the Safe Roads element by addressing human vulnerability and mistakes in traffic. Added physical barriers create redundancy and reinforce that death and serious injuries are unacceptable.

Key Stakeholders

State DOTs, MPOs, bicycle advocacy groups, community associations, engineering consultants, active road users.

Proactive Implementation

This upgrade can be deployed proactively along high-volume bike corridors, particularly where buffered lanes are underutilized due to perceived safety concerns. Cities may use bike network master plans, crash data, or origin-destination heatmaps to identify candidate corridors. The presence of youth riders, seniors, or e-mobility users further justifies proactive installation.

Countermeasure Overview

Objective: Reduce bicycle crashes along roadways
Strategy: Provide safe roadway facilities for parallel travel

Targeted Solution

CONTRIBUTING FACTORS	▪ Lack of dedicated space for bicyclists
TARGET CRASH TYPE	▪ Bicyclist ▪ Crossing-related
ROAD FACILITY TYPE	▪ Urban arterial ▪ Urban collector
AREA TYPE	▪ Urban

Safety Linkage

NCHRP 500 Series	SAFE SYSTEM APPROACH
Pedestrian and Bicyclist	Safe Road Users
AASHTO'S TOWARD ZERO DEATHS	SAFE SYSTEM ROADWAY DESIGN
Safer Vulnerable Users	Tier 3

Selected Related Countermeasures

- CM1 Add parking-protected bike lanes
- CM2 Implement green conflict zone markings
- CM3 Narrow vehicle lanes to provide buffer space

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

Separated Bike Lanes. Source: City of Minneapolis.

Safety Benefits

43%

Reduce vehicle-bicycle crashes on urban areas (CMF ID: 11302)

Resources

- FHWA CMF for Bike Lanes
- FHWA Bicycle Lanes