



# FEDERAL HIGHWAY ADMINISTRATION PROVEN SAFETY COUNTERMEASURES



U.S. Department of Transportation  
Federal Highway Administration

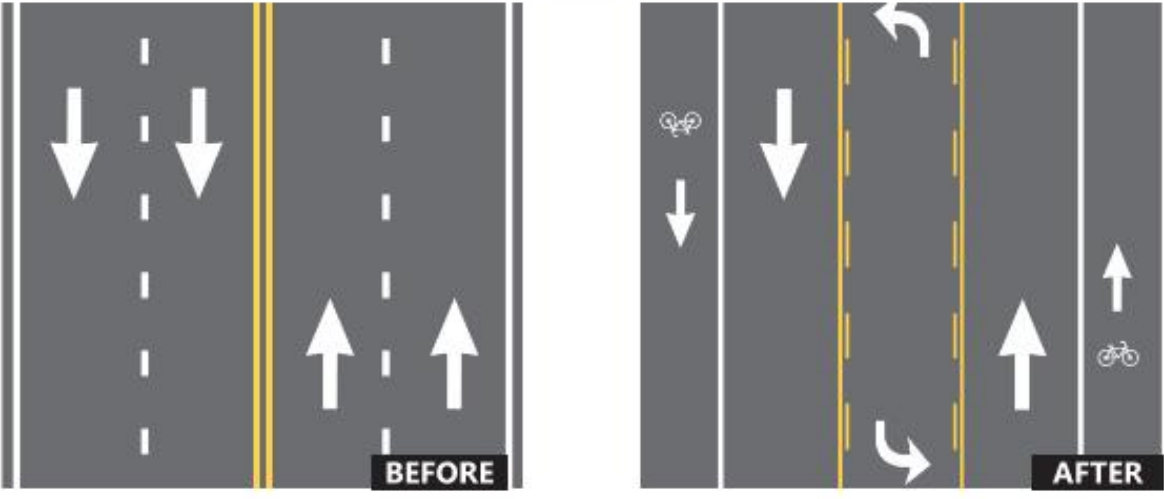
OFFICE OF SAFETY  
**Proven Safety Countermeasures**



**Safety Benefits:**  
4-Lane to 3-Lane  
Road Diet Conversions  
**19-47%**  
reduction in total crashes.<sup>1</sup>

### Road Diets (Roadway Reconfiguration)

A Road Diet, or roadway reconfiguration, can improve safety, calm traffic, provide better mobility and access for all road users, and enhance overall quality of life. A Road Diet typically involves converting an existing four-lane undivided roadway to a three-lane roadway consisting of two through lanes and a center two-way left-turn lane (TWLTL).




**BEFORE** **AFTER**

Before and after example of a Road Diet. Source: FHWA

**Benefits of Road Diet installations may include:**

- Reduction of rear-end and left-turn crashes due to the dedicated left-turn lane.
- Reduced right-angle crashes as side street motorists cross three versus four travel lanes.
- Fewer lanes for pedestrians to cross.
- Opportunity to install pedestrian refuge islands, bicycle lanes, on-street parking, or transit stops.
- Traffic calming and more consistent speeds.
- A more community-focused, Complete Streets environment that better accommodates the needs of all road users.




Road Diet project in Honolulu, Hawaii. Source: Leidos

A Road Diet can be a low-cost safety solution when planned in conjunction with a simple pavement overlay, and the reconfiguration can be accomplished at no additional cost. Typically, a Road Diet is implemented on a roadway with a current and future average daily traffic of 25,000 or less.

**For more information on this and other FHWA Proven Safety Countermeasures, please visit <https://safety.fhwa.dot.gov/provencountermeasures/> and [https://safety.fhwa.dot.gov/road\\_diets/](https://safety.fhwa.dot.gov/road_diets/).**

1 Evaluation of Lane Reduction "Road Diet" Measures on Crashes, FHWA-HRT-10-053, (2010).



**ZERO IS OUR GOAL**  
A SAFE SYSTEM EVERYONE GETS THERE

FHWA-SA-21-046



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**Safety Benefits:**  
**Left-Turn Lanes**  
**28-48%**  
reduction in total crashes.<sup>1</sup>  
**Positive Offset Left-Turn Lanes**  
**36%**  
reduction in fatal and injury crashes.<sup>2</sup>  
**Right-Turn Lanes**  
**14-26%**  
reduction in total crashes.<sup>1</sup>

### Dedicated Left- and Right-Turn Lanes at Intersections

Auxiliary turn lanes—either for left turns or right turns—provide physical separation between turning traffic that is slowing or stopped and adjacent through traffic at approaches to intersections. Turn lanes can be designed to provide for deceleration prior to a turn, as well as for storage of vehicles that are stopped and waiting for the opportunity to complete a turn.

While turn lanes provide measurable safety and operational benefits at many types of intersections, they are particularly helpful at two-way stop-controlled intersections. Crashes occurring at these intersections are often related to turning maneuvers. Since the major route traffic is free flowing and typically travels at higher speeds, crashes that do occur are often severe. The main crash types include collisions of vehicles turning left across opposing through traffic and rear-end collisions of vehicles turning left or right with other vehicles following closely behind. Turn lanes reduce the potential for these types of crashes.

lanes will lengthen crossing distances for pedestrians.

**Offset Turn Lanes**

Providing offset of left- and right-turn lanes to increase visibility can provide added safety benefits, and is preferable in many situations, particularly at locations with higher speeds, or where free-flow or permissive movements are possible.

At turn lanes with zero or negative offset, turning vehicles can block sightlines. For left-turn lanes, this usually involves opposing left-turning vehicles occupying the turn lanes at the same time. For right-turn lanes, this typically involves right-turning vehicles from the major road and vehicles entering the intersection from the minor road. In both scenarios, adding positive offset to turn lanes enhances the sight distance to approaching vehicles that conflict with the turning movement. Offset turn lanes should be considered when there is a high frequency of these types of conflicts in order to reduce the likelihood of a severe crash.

Installing left-turn lanes and/or right-turn lanes should be considered for the major road approaches for improving safety at both three- and four-leg intersections with stop control on the minor road, where significant turning volumes exist, or where there is a history of turn-related crashes. Pedestrian and bicyclist safety and convenience should also be considered when adding turn lanes at an intersection. Specifically, offset left- and right-turn



**Zero Offset** **Positive Offset**

Illustration comparing zero offset to positive offset of left- and right-turn lanes. Source: FHWA

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Left- and right-turn lanes on a two-lane road. Source: City of Greeley, CO

1 Harwood et al. Safety Effectiveness of Intersection Left- and Right-Turn Lanes. FHWA-HRD-02-089, (2002).  
2 Persaud et al. Safety Evaluation of Offset Improvements for Left-Turn Lanes. FHWA-HRT-09-035, (2009).



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FHWA-SA-21-041

## LOCAL EXAMPLE PROJECT WITH PROVEN SAFETY COUNTERMEASURES



### Recent Results: MO 115 (Natural Bridge Ave)



At a time when serious and fatal injury crashes are increasing in the City of St. Louis-

The road diet on Natural Bridge saved lives!

- ✓ Serious injury crashes reduced by 46%
- ✓ Fatal crashes reduced by 69%

