



*Engineering Guide*

# Two-Way Left-Turn Lanes (TWLTL)

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## *Benefits, Limitations and Design Guidelines*

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A two-way left-turn lane (jargon: TWLTL) is a street configuration that provides a center lane exclusively for left turning vehicles coming from either direction. They provide the most benefit on roads with closely spaced driveways. This guide provides background, benefits, limitations, design guidelines, and further resources for designing TWLTL installations.

### **Background Of Two-way Left-turn Lanes**

TWLTLs usually exist on urban streets combined with a single through lane in each direction. Also called a three-lane roadway, this geometry tends to be more flexible than roads with separate left turn lanes with fixed tapers and pocket storage lengths. It is also possible to find TWLTLs on roads with two lanes in each direction, a five-lane roadway, or even three lanes in each direction, a seven-lane roadway.

The purpose of a TWLTL is to move the left-turning traffic out of the through lane, similar to a standard left turn lane. However, the TWLTL lane allows left turns from either direction to use the same lane, reducing the overall width of the road compared to separate left turn lanes. Besides the reduced width, use of a TWLTL has been found to reduce crash rates 19% to 47%<sup>1</sup>, reduce vehicles speeds, and improve the safety of pedestrian crossings.

Due to the benefits of a TWLTL, converting a four lane undivided road (two lanes in each direction, no turn lanes, and no medians) to a three-lane road (one lane in each direction and a TWLTL down the middle) is a common safety enhancement project. This conversion is usually called a Road Diet.

Before and after data from road diets often show the three lane roads have similar capacities and lower crash rate than the original four lane road. Vehicle speeds have also been found to go down when a TWLTL is installed, making the road safer for non-motorized users. The project designers can either narrow the road in a Road Diet or use the extra pavement width for bicycle lanes, on-street parking, or shoulders. The road diet transition also benefits pedestrians by reducing the crossing distance, reducing crossing times and pedestrian exposure to traffic.

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<sup>1</sup> [https://safety.fhwa.dot.gov/road\\_diets/](https://safety.fhwa.dot.gov/road_diets/)



## Design Guidelines For Two-way Left-turn Lanes

**The center TWLTL width** can be as small as 11 feet, although 14 is preferred. Some agencies will provide a 16- or 18-foot lane to allow for a future raised median if needed

**Opposing white left turn arrows** should be placed with 8-16 feet between them according to the Manual on Uniform Traffic Control Devices

**The opposing left turn arrows** are to be placed at the beginning of and downstream of the TWLTL, then repeated approximately every 300 feet

**Pavement markings of a TWLTL** shall be a normal broken yellow line on the inside and a normal solid yellow line on the outside adjacent to the through lane

**Install an R3-9b sign** adjacent to the first set of the opposing left turn arrows from each direction.

**Consider pedestrian and bicyclist crossing** movements, with the potential need for refuge areas along a corridor in-place of the TWLTL

**Pavement textures, coloring, and other features** can be added to a TWLTL to increase their visibility and potentially their functionality

## Limitations Of Two-way Left-turn Lanes

- Limited to about 17,500 vehicles per day on a three-lane TWLTL or 28,000 vehicles per day on a five-lane TWLTL
- Not as safe as the addition of raised medians and exclusive turn lanes, particularly on high volume roadways of 20,000 or more vehicles per day
- Seven-lane roadways, three lanes of through traffic in both directions with a TWLTL have high crash rates
- Police should enforce TWLTL laws for turning only, not allowing passing
- Safety benefits degrade if the speed limit is 45 mph or more
- May not be appropriate for transit corridors where buses will regularly block the through lanes
- Access should be limited to 12 driveways per mile, or 440-foot spacing, as opposing left turning vehicles will overlap

## BENEFITS OF TWO-WAY LEFT-TURN LANES

- Allows opposing left turning movements to occupy the same lane, reducing the roadway width
- Removes left turning vehicles from the through lane, improving flow and road efficiency
- Reduces total crashes by approximately 30% or more
- Reduces vehicle speeds by one- to two-mph when compared with multiple through lane roads
- Reduces overall corridor travel times, even with slower vehicle speeds, by eliminating stops for through traffic behind left turning vehicles
- Can be implemented by simply changing the road striping and signing when transforming a four-lane undivided conversion to three-lane TWLTL
- Allows space for bicycle lanes without expanding the roadway when transforming a four-lane undivided conversion to three-lane TWLTL
- Improves pedestrian safety by reducing the vehicle exposure when transforming a four-lane undivided conversion to three-lane TWLTL

## Resources

- [FHWA Road Diet Case Studies](#)
- [FHWA's Road Diet Informational Guide](#)
- [Safety Evaluation of Installing Center Two-Way Left-Turn Lanes on Two-Lane Roads](#)
- [Safety and Operational Characteristics of Two-Way Left-Turn Lanes](#)
- [Missouri DOT Two Way Left Turn Lanes](#)
- [Texas DOT Urban Street Design](#)
- [Manual on Uniform Traffic Control Devices, Figure 3B-7 Example of Two-Way Left Turn Lane Marking Applications](#)