

# UNSIGNALIZED INTERSECTION SAFETY STRATEGIES



## Provide Left-Turn Lanes at Intersections

### WHERE TO USE

Unsignalized intersections with a high frequency of crashes resulting from the conflict between (1) vehicles turning left and following vehicles and (2) vehicles turning left and opposing through vehicles.



Photo by: FHWA

### DETAILS

Many crashes at unsignalized intersections are related to left-turn maneuvers. Left-turn lanes remove vehicles waiting to turn left from the through-traffic stream, thus reducing the potential for rear-end crashes. Because they provide a sheltered location for drivers to wait for a gap in opposing traffic, left-turn lanes may encourage drivers to be more selective in choosing a gap to complete the left-turn maneuver. This may reduce the potential for crashes between left-turn and opposing through vehicles.

### KEY TO SUCCESS

Make sure that any left-turn lane considered is operationally warranted based on traffic volumes or justified on the basis of an existing pattern of left-turn collisions.

### ISSUES

*Sight Distance.* In providing left-turn lanes, vehicles in opposing left-turn lanes may block their respective driver's view of approaching vehicles in the through lanes. This potential problem can be resolved by offsetting the left-turn lanes (see Strategy B3 fact sheet).

*Roadway Design.* If the shoulder and through lanes are restriped to make provision for a left-turn lane, part of the safety benefits may be lost due to the loss of shoulder, the greater proximity of traffic to roadside objects, and, possibly, a reduction in intersection sight distance.



**Turn Restrictions.** Provision of a left-turn lane on an intersection approach may involve restricting left turns in and out of driveways on that intersection approach. Such restrictions may be implemented by signing or provision of a median adjacent to the left-turn lane.

**Pedestrians.** When installation of left-turn lanes increases the overall width of the intersection, the additional width may cause problems for pedestrians crossing the intersection. One possible solution to this problem is to provide a pedestrian refuge island in the median.

### TIME FRAME ●●○

Implementation time may vary from 3 months to 4 years. At some locations, left-turn lanes can be quickly installed simply by restriping the roadway. At other locations, widening the roadway, installing a median, or acquiring additional right-of-way may be needed. Where right-of-way is required or where the environmental process requires analysis and documentation, project development and implementation may require as long as 4 years.

### COSTS ●●○○

Costs are highly variable. Where restriping within an existing roadway is possible, the costs are nominal. Where widening and/or reconstruction are necessary, costs will be significantly higher.

### EFFECTIVENESS

**PROVEN:** Research has determined that installation of a single left-turn lane on a major road approach would be expected to reduce total intersection crashes at rural unsignalized intersections by 28 % for four-legged intersections and by 44 % for three-legged intersections. At urban unsignalized intersections, installation of a left-turn lane on one approach would be expected to reduce total crashes by 27 % for four-legged intersections and by 33 % for three-legged intersections.

Installation of left-turn lanes on both major road approaches to a four-legged intersection would be expected to increase, but not quite double, the resulting effectiveness measures for total intersection crashes.

### COMPATIBILITY

This strategy can be used in conjunction with most other strategies for improving safety at unsignalized intersections.

### SUPPLEMENTAL INFORMATION

Optimal operation and safety of left-turn lanes require appropriate design. This includes sufficient length of lane and taper (see Strategy B2 fact sheet).

**For more details on this and other countermeasures:** <http://safety.transportation.org>

#### For more information contact:

FHWA Office of Safety Design  
E71, 1200 New Jersey Avenue SE  
Washington, D.C. 20590  
(202) 366-9064  
<http://safety.fhwa.dot.gov>

FHWA Resource Center - Safety and Design Team  
19900 Governor's Drive, Suite 301  
Olympia Fields, IL 60461  
(708) 283-3545  
<http://www.fhwa.dot.gov/resourcecenter>

