

# UNSIGNALIZED INTERSECTION SAFETY STRATEGIES



## Use Indirect Left-Turn Treatments to Minimize Conflicts at Divided Highway Intersections

### WHERE TO USE

Unsignalized intersections with operational and safety problems that can be traced to difficulties of accommodating left-turn demand.

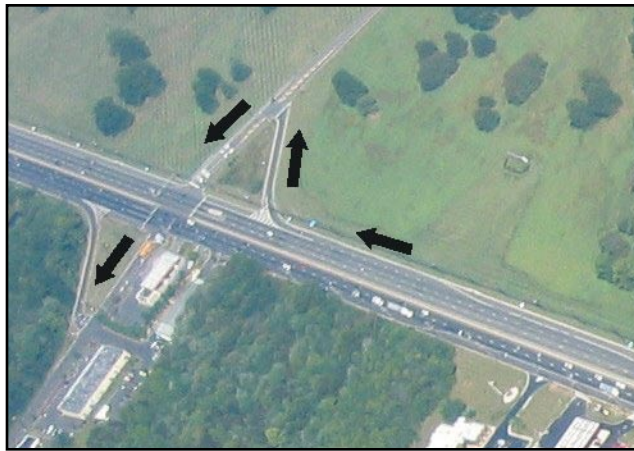


Photo by: FHWA

*Drivers are prohibited from turning left at the intersection. To complete the left hand turn, they must use the right lane exit and turn left at the minor intersection and subsequently travel through the major intersection.*

### DETAILS

Many operational and safety problems at two-lane and divided highways can be traced to difficulties of accommodating left-turn demand. Such difficulties involve both demand volume and the frequency of demand along a corridor. Furthermore, vehicles that slow down or stop to turn left in a lane used primarily by through traffic increase the potential for rear-end crashes. One way to address the impacts of such left-turn movements is the use of indirect left-turn treatments. Indirect left-turn treatments include the use of jug-handle roadways before the crossroad, loop roadways beyond the crossroad, and directional median crossovers beyond the crossroad. Indirect left-turn treatments enable drivers to make left turns efficiently on divided highways, including highways with relatively narrow medians.

### KEY TO SUCCESS

Make sure that this strategy is justified on the basis of high left-turn demand or an existing pattern of left-turn collisions.

Also, involve the affected owners of adjacent property and residents in the decision-making process to develop and maintain support for the project.



## ISSUES

Diverted traffic may contribute to safety problems at adjacent intersections or on alternative routes, resulting in no net benefit. Owners of properties where access may be reduced, especially those with commercial operations, may oppose this strategy. Thus, careful evaluation of the potential impacts of proposed improvements is needed to avoid or minimize such problems.

A temporary hazard may exist during the transition period after the changed condition is opened to traffic. Advance notification of drivers is important, both in terms of notification prior to instituting the change and in signing that provides the appropriate notice of a change.

## TIME FRAME ●●●○

Implementation time can vary from 3 months to 4 years. At some locations, indirect left turns can be implemented simply by appropriate signing. Other locations may require major reconstruction. Such projects require a substantial time for development and construction. Where right-of-way is required or where the environmental process requires analysis and documentation, the time will be longer.

## COSTS ●●●○○

Costs are highly variable. Where an improvement can be implemented by signing an existing roadway, the costs are nominal. Where reconstruction is necessary, costs over \$100,000 per intersection approach may be incurred.

## EFFECTIVENESS

**TRIED:** It is expected that this strategy will reduce (1) rear-end crashes resulting from the conflict between vehicles waiting to turn left and following vehicles, and (2) right-angle crashes resulting from the conflict between vehicles turning left and oncoming through vehicles.

One study concluded that installing indirect left-turn treatments may result in an 18-26% decrease in all crashes depending on the number of lanes.

## COMPATIBILITY

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

## SUPPLEMENTAL INFORMATION

Optimal operation and safety of indirect left turns requires appropriate design and signing.

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

### For more information contact:

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