

MEETING ALL ROAD USERS' NEEDS

MUTs can accommodate the needs of all roadway users, including bicyclists, pedestrians, transit, and commercial vehicles. Relocating the left turns reduces the number and complexity of conflicts between traffic, pedestrians, and bicyclists. Instead of being used for left turn lanes, the median can be designed as a pedestrian refuge area, allowing people to cross the intersection in two shorter stages. The reduced congestion associated with operational improvements can make bicycle facilities easier to install since additional lanes are not needed.

Greater efficiency also translates to fewer stops and less delay, making Median U-Turn corridors more reliable for transit and freight customers. And most importantly, the safety improvements mean emergency responders will spend less time responding to incidents at the intersection, even while they are able to travel through the intersection more easily.



Cyclist Lane Near an MUT Intersection, East Lansing, MI
Source: MUT Video FHWA-SA-14-018



Pedestrian Crossing at an MUT Intersection, Birmingham, MI
Source: MUT Video FHWA-SA-14-018



Bus Traveling an MUT Intersection, East Lansing, MI
Source: MUT Video FHWA-SA-14-018

SOURCES

- ¹ Federal Highway Administration, "Safety at Signalized Intersections (Long Version)." Available at: http://safety.fhwa.dot.gov/intersection/signalized/presentations/sign_int_pps051508/short/index.cfm
- ² Taylor, W.C., I. Lim, and D.R. Lighthizer, "Effect on Crashes After Construction of Directional Median Crossovers," *Transportation Research Record: Journal of the Transportation Research Board*, 1758 (2001).
- ³ Savage, W.F., "Directional Median Crossovers," *Journal of Traffic Engineering*, 44(11) (1974).

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MEDIAN U-TURN INTERSECTION



Clinton Township, MI MUT Intersection
Source: MUT Video FHWA-SA-14-018

AN INNOVATIVE, PROVEN
SOLUTION FOR IMPROVING
SAFETY AND MOBILITY AT
INTERSECTIONS



U.S. Department of Transportation
Federal Highway Administration

Safe Roads for a Safer Future
Investment in roadway safety saves lives
<http://safety.fhwa.dot.gov>

Motorists, pedestrians, and bicyclists face greater mobility challenges and safety risks at intersections as traffic volumes grow and congestion worsens. Agencies need safer, more balanced designs that keep people moving. Innovative intersection designs represent a solution, and are being built more often because they can deliver more for less.

WHAT IS A MEDIAN U-TURN INTERSECTION?

An MUT is sometimes referred to as an *Indirect Left* or *Michigan Left*

The Median U-Turn (MUT) intersection improves safety and efficiency by changing how left turns are handled. Instead of making a left turn at the main intersection, vehicles proceed through, make a U-turn a short distance downstream, and finally turn right back at the main intersection. The MUT can be used for either the major road or the minor road, or both. When used for the minor road, left turn traffic turns right, makes a U-turn downstream, and then travels through the main intersection.

The Median U-Turn is an excellent choice for locations with moderate to heavy volumes of through traffic and moderate left turns. When implemented at multiple intersections along a corridor, the MUT also can improve safety by reducing overall speed, even while increasing throughput and improving travel times.

IMPROVING SAFETY

Left turn crashes account for over 20 percent of fatal crashes at signalized intersections,¹ and the MUT design addresses this safety concern. By eliminating the direct left turning movement at the intersection, MUTs reduce the number of vehicle-to-vehicle conflict points by half. As a result, the MUT can reduce severe crashes caused by these conflicts by nearly 70 percent. In a study of eight roadway sections in Michigan between 1991 and 1997, researchers found an average reduction in total and injury crash frequencies of 31 and 32 percent respectively.²

REDUCING CONGESTION

The Median U-Turn allows for reduced signal phases at the intersections – in some cases by as much as half – resulting in significantly improved efficiency.

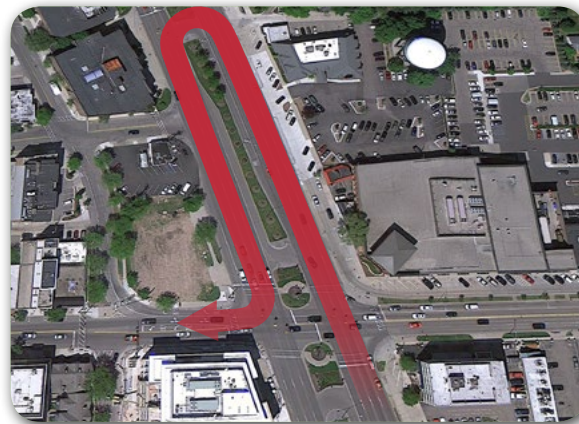
Without direct left turns, simple, two-phase signal cycles can be used at the main intersection, and at the U-turn intersection, if signalized. Studies have

shown a 20 to 50 percent improvement in intersection throughput for various lane configurations as a result of implementing the MUT design.³

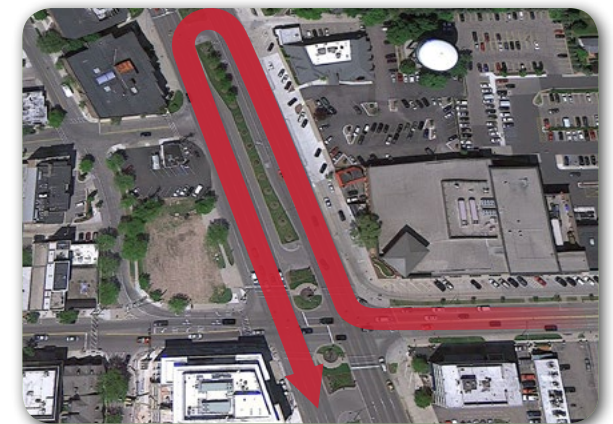
A PROVEN SOLUTION

The Median U-Turn concept is very adaptable. It is not limited only to roadways with wide medians. When constructed with narrow or no medians, paved bump-outs or “loons” are added to accommodate the U-turns. The Median U-Turn works well as a corridor treatment, but also has been applied successfully at single intersections. Partial MUTs also can be implemented where direct left turns are permitted from the minor road.

Without the need for left turn lanes at the main intersection, MUT designs can fit in smaller rights-of-way, resulting in fewer impacts to adjacent properties. This can make them less costly and quicker to build than a conventional design. Median U-Turns have been successfully built in many states, and have been used in Michigan for more than four decades, going back to the 1960s.



MUT Left Turn Maneuver from a Major Road, Birmingham, MI
Source: MUT Video FHWA-SA-14-018



MUT Left Turn Maneuver from a Minor Road, Birmingham, MI
Source: MUT Video FHWA-SA-14-018