



Woodward Avenue and East Maple Road, Birmingham, MI

MEDIAN U-TURN INTERSECTION

THE PROBLEM

A heavily traveled intersection servicing approximately 55,000 vehicles per day experienced queued traffic and high rates of crashes among left turning vehicles. This was complicated by an adjacent intersection approximately 150 feet away.

THE SOLUTION

A Median U-Turn design that allows for efficient movement while reducing conflict zones and improving safety for pedestrians.

THE OUTCOME

- More vehicles flowing freely along both streets and increased access to adjacent businesses.
- Brick truck aprons at the U-turns ensure easy movement of truck traffic.
- Signals changed to a two-phase operation, giving more time for pedestrians to cross the intersection safely.

CONTACT

Jeffrey Shaw, P.E.
FHWA Office of Safety
708-283-3524
jeffrey.shaw@dot.gov

Mark Doctor, P.E.
FHWA Resource Center
404-562-3732
mark.doctor@dot.gov

INTERSECTION LOCATION

42°32'48.4"N 83°12'40.7"W

Background

The Woodward Avenue corridor is an 8-lane boulevard servicing approximately 55,000 vehicles per day.¹ Stretching 27 miles from Detroit in the South to Pontiac in the North, it is one of the most heavily travelled roads in the greater Detroit area. Woodward Avenue was designated a "National Scenic Byway" in 2002 and an "All-American" road in 2009 by the Federal Highway Administration for its historic sites, culture, recreation, and heritage.

Challenges

The intersection needed to accommodate high volumes of traffic while still functioning as a vibrant downtown of mixed-use commercial areas, residential neighborhoods, and heavy pedestrian traffic. Originally, Woodward Avenue's wide median contributed to congestion. When two opposing vehicles wishing to turn left entered the intersection, the drivers often had difficulty maneuvering around each other, sometimes colliding head on or misjudging the other vehicle's travel path and ending up in a side-swipe accident. In addition, an adjacent intersection is located only about 150 feet away at Park Street.

Approach

Michigan DOT (MDOT) relocated all left turns approximately 600-700 feet away from the signalized intersection using the Median U-Turn (MUT) design. This reduced the number of conflict points and provides time for through movements by vehicles and pedestrians. MDOT also added truck aprons to enable the trucks that frequent the corridor to safely deliver their goods to local businesses and coordinated the signal timing with the Park Street intersection.

"The best thing about the MUT is that it ... frees up time for everybody to move through the intersection."

— Joseph Hummer, Ph.D., P.E.
Chair, Civil and Environmental Engineering
Wayne State University



Truck Turning at the Median U-Turn
Source: MUT Case Study Video FHWA-SA-14-051

Results

The Woodward Avenue and East Maple Road MUT intersection has reduced congestion at the signal, keeping more vehicles flowing freely along both streets, increasing access to adjacent businesses, and providing safer access to pedestrians and cyclists. The brick truck aprons at the U-turns also ensure easy movement of goods and cargo around the intersection.

¹ Michigan DOT, "2012 Average Daily Traffic (ADT) Map - Detroit Metro Area." Available at: http://mdotcf.state.mi.us/public/maps_adtmapharchive/pdf/2012adt/Detroit_Metro_Area.pdf

