

Median Left-Turn Intersection Design Reduces Traffic and Crashes

"Michigan Left Turn" Successfully Applied in Plano, Texas

Redesign of an intersection in the city of Plano, Texas, to institute a median left turn has reduced traffic backup by 60 percent and shortened delays by 35 seconds per vehicle, according to Lloyd Neal, the city's transportation engineering manager. Vehicle crashes at the intersection have also been reduced significantly since 2009.

Plano built the first median left-turn design in Texas at the intersection of Preston Road and Legacy Drive. The design has been so successful that it is scheduled for construction during 2015 at two other locations in Plano, pending city council approval to proceed.

Speaking to the Plano City Council in late April, Neal said that this intersection was redesigned because of the high number of accidents that were occurring there. The Preston Rd/Legacy Drive site had experienced excessive traffic volumes through the intersection and substantial left-turn traffic. About 7 percent of the traffic at this intersection was turning left, but that traffic was given over 34 percent of the available time from the traffic signal design, he added. A more effective design would give the time back to the through-traffic movement and, at the same time, improve safety and traffic throughput. Also the Plano City Council had implemented a directive to consider at-grade improvements before seeking grade separated road modifications such as overpasses.

With a median left-turn design, drivers make a right at an intersection, followed by a U-turn in a specially designed lane through the median. In Plano, the U-turn lane is approximately 400 feet from the intersection and built into the median dividing northbound and southbound traffic on Preston Road. Traffic within the U-turn lane is controlled with traffic lights. Thus, instead of going west on Legacy Drive to make a left turn onto southbound Preston Road, turn right to go north on Preston Road for a short distance, then make a U-turn to go southbound, for example. Plano designed the crossover median to accommodate large trucks that are 55 feet long with a 45-foot turning radius.

According to the city of Plano, there has been increasing driver acceptance of the

innovative median left-turn design in Plano. The number of calls complaining about unfamiliarity with the design has fallen over time.

Other issues that had emerged following the redesign of the intersection included driver inattention and drivers making illegal left turns from Legacy drive. Plano resolved these problems by posting "No U-Turn" signs at place where these turns are not allowed, increasing other signage, and increasing the police presence in the area of the intersection. The city also re-striped the road to allow left turns on red and continued other educational efforts.

According to Neal, median left-turn designs are being used more and more throughout the United States. It has been used on the East Coast in many locations including Washington, D.C., and Maryland. It has been used Louisiana, and it is employed so often in Michigan that the design is sometimes called a "Michigan left turn." It has also been used in several other countries including Mexico and Australia.

This design provides 20 to 50 percent greater capacity than direct left turns, according to the city of Plano. The design reduces the average delay for left-turning vehicles and through-traffic. Research and experience also have shown the median left-turn design increases traffic flow and safety by reducing the number and severity of intersection-related crashes. Research shows a 30 to 60 percent reduction in overall traffic collisions. The greatest reductions are those involving left-turn maneuvers (rear-end, head-on and failure to yield to oncoming traffic). Non-left-turn rear-end collisions may increase slightly. According to the city, an internal evaluation of this design determined high performance can be maintained under certain conditions that prohibit left turns on one road and not the other.

The use of median left turns also increases pedestrian and bicycle safety, according to the city. When using this design, non-motorized users are able to cross the road in a two-step manner. They cross the first half of the road, wait at the median and cross the second half of the road when safe to do so. By eliminating left-turn movements, more time can be given to pedestrian

crossing time.

For more information, please visit ht.H1t293000453_H1t293000454:BM_1_BM_2_p://plano.gov/Pages/turn.aspx and www.plano.gov/Departments/Engineering/Transportation/Public%20Presentations/Pages/2011.aspx, or contact Lloyd Neal at Lloydn@plano.gov.



The top city of Plano image (graphic) indicates traffic movement and the lower Google Earth image shows the redesign of the intersection under construction.