

## Texas Drive/ Milham Avenue at 12<sup>th</sup> Street

The Texas Drive/ Milham Avenue at 12<sup>th</sup> Street Intersection Improvement project is a cooperative effort between the Kalamazoo County Road Commission (KCRC) and the City of Portage. This intersection has been identified for improvements based upon traffic delay that has been increasing over the last several years. Specifically, the traffic volume during the peak hours of travel is sufficient to warrant action to improve this intersection. Also, portions of the pavement at this intersection are at the end of its service life limit and are due for replacement.

### CURRENT CONFIGURATION AND PROJECT BACKGROUND

The intersection of Texas Drive/ Milham Avenue at 12<sup>th</sup> Street is important as it is an entry point to Texas Township and the City of Portage. These roads are vital corridors connecting us to schools, places of employment, shopping and recreation.

The intersection currently operates under four-way stop control. The following performance factors are noted at this intersection:

- Long duration for a single vehicle to clear the intersection
- Traffic backups in all directions during peak period of travel
- Poor vision angle due to skew of Texas Drive
- Motorist confusion regarding driver right-of-way

Similarly, the intersection is not well suited for non-motorized users. This intersection is used by pedestrians and bicyclists as it is adjacent to a City of Portage park and Milham has bicycle lanes. The undesirable geometric characteristics noted above result in similar problems for these users.

Due to the motorist delay, the KCRC and the City of Portage partnered to develop a set of alternatives to address this situation. The purpose of the study was to seek solutions that reduce traffic congestion, while providing motorists and pedestrian a safe travel environment. The three alternatives studied are;

1. Four-way stop (current configuration)
2. New traffic signal installation
3. Modern Roundabout installation

### Alternative 1

The Four-way stop (current configuration) is not desirable due to the delays and performance factors noted above. The primary advantage of Alternative 1 is that the construction costs are limited to addition of sidewalks, crosswalks, and intersection pavement resurfacing. The alternative to retain the existing four-way stop does not address the traffic congestion that has been increasing over the last five years. Although this alternative was considered, it is rejected.

### Alternative 2

Under this approach the intersection would be reconstructed with Texas Drive/ Milham Avenue on a curve to allow vehicles to drive through the intersection at posted speed. A new traffic signal at this location requires substantial new right-of-way to reconstruct the intersection to the design speed. The impact of constructing a roadway curve at this location is significant, and it would result in disruption to business operating at this location. This approach potentially results in the need to completely purchase one or more business parcels. Additionally, the traffic signal would require superelevation on Texas Drive/ Milham Avenue that would create a problem for traffic on 12<sup>th</sup> Street. In addition to the cost of reconstructing the intersection alignment and the traffic signal new right-of-way costs are prohibitive. A signalized intersection with relatively higher speed will result in a higher frequency of severe crashes as compared with a four-way stop control intersection.

### Alternative 3

Under this approach, the intersection would be reconstructed with a modern roundabout. Based upon our analysis of the alternatives, the roundabout concept provides the safest and most efficient approach. The roundabout requires some new right-of-way, but since the roundabout can be centered on the existing right-of-way the new right-of-way is minimized. The cost of the new right of way is less than the traffic signal alternative, while the cost of the construction for the two alternatives is about the same. The advantages of the roundabout approach are noted in the discussion below.

The Kalamazoo County Road Commission has applied for Federal Congestion Mitigation and Air Quality (CMAQ) funds to improve this intersection. The funds are available for a project to install a roundabout at this intersection. Note that CMAQ funds cannot be used to fund a traffic signal project at this intersection.

## WHAT IS A ROUNDABOUT?

A modern roundabout is a transportation management tool that moves traffic through an intersection without the aid of traffic signals. It involves one-way traffic moving around a circular central island where entering traffic must yield to the traffic already in the roundabout. The objectives of roundabouts are to reduce traffic speeds and reduce the number and severity of crashes, while improving the traffic flow. Roundabouts are designed to accommodate all sizes of vehicles.

### Key Roundabout Points

Many people confuse modern roundabouts with traditional traffic circles or rotaries, such as those found on the East Coast or Europe. Below are two basic principles of the modern roundabout:

- 1. Modern roundabouts follow the “yield-at-entry” rule.** Approaching vehicles must wait for a gap in the circulating flow before entering the circle. Many traffic circles require circulating vehicles to grant the right of way to entering vehicles. Some traffic circles also use stop signs or traffic signals to control vehicle entry. At the low speed of operation of the roundabout, there are many gaps that are convenient for motorists to use. The capacity of a roundabout will be greater than the four way stop.
- 2. Modern roundabouts involve low speeds for entering and circulating traffic.** Roundabouts are generally much smaller than traffic circles, which naturally cause drivers to reduce speed within the circle, thus reducing the frequency of accidents. Approaching and through speeds for roundabouts are typically in the range of 10 - 12 miles per hour. Roundabouts achieve their relatively low speed through the diversion of traffic. The geometrics of the diversion island at the entry point of the roundabout and the central island (circle) of the roundabout cause the driver to slow down to the speed which the driver can navigate the roundabout.

## SAFETY AND OTHER BENEFITS

According to the Federal Highway Administration, installing a roundabout typically results in:\*

- A 76% reduction in injury-accidents
- A 90% reduction in fatalities
- A 40% reduction in pedestrian injuries
- 75% fewer “conflict points” compared to standard intersections

*\*Safety Statistics Excerpted from Federal Highway Administration, “Roundabouts: An Informational Guide,” June 2000*

### Less Delay

Roundabouts are designed to handle traffic more efficiently than signalized intersections. With traffic constantly moving and vehicles entering the intersections at lower speeds, more vehicles are able to move through the intersection at any given time.

### An Improved Environment

With more vehicles able to move through the intersection at any given time, there will be fewer vehicles idling. Because idling vehicles cause the most air pollution, roundabouts result in reduced air pollution.

Important Question - Why do roundabouts have such a good safety record?

1. **Conflicts are reduced.** With fewer conflict points, roundabouts eliminate the potential for hazardous conflicts, such as right angle and left-turn head on crashes.
2. **Speeds are reduced and are more consistent.** Low speeds driven in roundabouts allow drivers more time to react to potential conflicts, thus helping to improve the safety of roundabouts. Since most drivers travel at similar speeds though roundabouts, crash severity is reduced compared to the traditional intersections.

3. **Pedestrians cross one direction of traffic at a time.** Pedestrians need only cross one direction of traffic at a time at each roundabout approach, as compared to multiple lanes at signalized intersections.

## HOW DO I DRIVE THROUGH A ROUNDABOUT?

Follow these simple rules for driving in roundabouts:

1. **Speed: Slow down!** The objective of the roundabout is to keep traffic moving and allow for more capacity. The roundabout is designed to be driven at slow speed. To drive it properly and safely, it must be done at a safe speed. Roundabouts in urban areas are designed for speeds of less than 15 mph.
2. **Yielding:** Always yield to traffic in the roundabout and to your left. Motor vehicles should yield to bicyclists and pedestrians that are already in the crosswalk.
3. **Caution:** Allow large vehicles in the roundabout the extra turning radius needed to navigate the roundabout properly. The roundabout is designed with an interior concrete apron to provide trucks the additional space needed.

## Walking

Pedestrians will use sidewalks that approach the roundabout. The sidewalks also circle around the outside of the roundabout. Crosswalks are provided to cross traffic lanes and are clearly marked with the standard wide white crosswalk lines. Pedestrians have priority in the crosswalk. However, for safety's sake, pedestrians must never walk into the path of a vehicle if it is an immediate hazard. Although vehicles are required to yield to pedestrians, pedestrians should be sure that traffic sees them and is going to yield before stepping into the crosswalk. It is best to first satisfy yourself that vehicles have recognized your presence and right to cross. Use the median or "splitter island" as it allows you to cross one direction of traffic at a time.

# Bicycles

Bicycles travel through a roundabout in one of two ways:

1. Less experienced bicyclists enter the sidewalk through a turnoff and then function as a pedestrian travelling on the sidewalk and walking the bike through the crosswalk.
2. More advanced bicyclists use the roundabout as a vehicle, travelling in the roadway. Just as a vehicle, the bicycle travels the center of the lane, and yields to traffic in the roundabout when entering. Ride at the speed of the circular roadway to discourage cars from passing you. When you exit the roundabout, use your right hand signal. If you are unsure about using the roundabout, then dismount and walk your bike as a pedestrian at the designated crosswalks.

## LINKS:

- <http://wcroads.org/news/roundabouts/roundabout-index.htm>
- [http://www.michigan.gov/documents/mdot/MDOT\\_RoundaboutBrochure\\_312721\\_7.pdf](http://www.michigan.gov/documents/mdot/MDOT_RoundaboutBrochure_312721_7.pdf)
- <http://assets.aarp.org/rgcenter/ppi/liv-com/2009-02-streets.pdf>

## VIDEOS:

- Short Video from IIHS:  
<http://www.iihs.org/video.aspx/info/roundabout>
- Longer, thorough Video from Wisconsin:  
<http://dotmedia.wi.gov/main/Viewer/?peid=6ea250de-497a-44ea-8a40-9a9ee9fb3956>