

## Roundabout First Policy

### CRASH REDUCTION STRATEGY SUMMARY

#### WHAT?

A Roundabout First Policy is the process of considering a roundabout for an intersection before any other form of control at an intersection.

#### WHY?

Roundabouts are unsignalized alternatives to intersections and they typically allow traffic to continue through an intersection of two or more roads without stopping (See **Figure 1**). A common issue posed by roundabouts is the added right-of-way necessary for construction, though this is largely limited to built urban environments. Public input has followed a common trend with roundabouts. They are often met with concern before installation, and then satisfaction thereafter. This is in part due to the clear and positive safety and flow benefits.

There are many reasons to prefer a roundabout to a conventional signalized or even stop-controlled intersection. Roundabouts are proven to be safer, and can improve traffic flow. Numerous research studies conclude that roundabouts provide safety benefits for multiple crash types. Roundabouts are also able to better accommodate abnormal intersections, such as intersections with more than four approaches or an angled minor or major approach. Many of the safety benefits in roundabouts stem from the fact that they have fewer conflict points (See **Figure 2**). In a conventional intersection, 32 conflict points exist at which a crash may occur. This is reduced to eight conflict points in a typical roundabout. Furthermore the vehicle

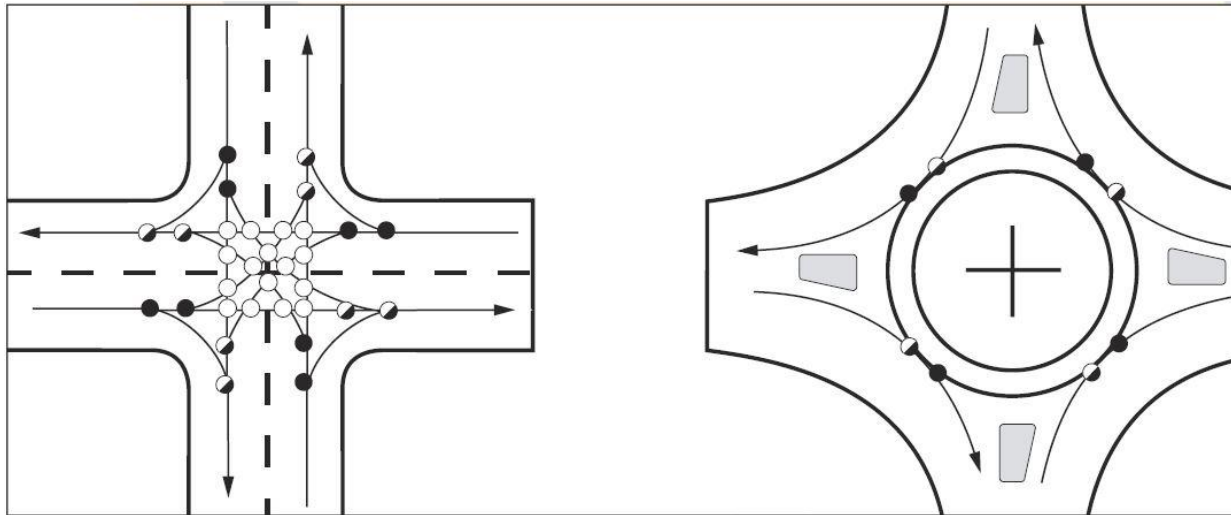
conflict points at a roundabout are unlikely to yield right-angle or head-on collisions which tend to be more severe crash types. Instead the majority will be rear-end or side-swipe collisions. In addition to less-severe crash types, crashes at roundabouts tend to occur at lower speeds which results in fewer injuries and fatalities.

**Figure 1 – Roundabout at Lake Las Vegas Parkway and Montelago Boulevard**



The New York State Department of Transportation (NYSDOT) established a Roundabout Design Unit (RDU) as part of a State Roundabout First Policy. The RDU determines whether or not a roundabout is feasible, prior to any other redesign analysis. If the RDU determines that a roundabout is feasible, then a roundabout is considered the preferred alternative.

Figure 2 – Conflict Points at Intersections



Signaled intersection:  
32 conflict points

Roundabout:  
8 conflict points

Source: Federal Highway Administration

The RDU assesses the intersection site for the following:

- Safety
- Capacity
- Operational problems
- Current performance of the intersection (coordinated)
- Emergency vehicle preemption
- Steep terrain

If the intersection is performing well with no safety concerns, a roundabout may not be recommended by the RDU.

## SAFETY BENEFITS

The following table summarizes the safety benefits of the implementation of offset left turn lanes.

Table 1 – Summary of Safety Benefits

|   | Yes | No |
|---|-----|----|
| <b>FHWA Proven Countermeasure</b>   | X   |    |
| <b>Included in the HSM</b>  | X   |    |
| 14.4.2.2 – Convert Signalized Intersection to a Modern Roundabout (CMF 0.52, See <b>HSM Table 14-3</b> )        |     |    |
| 14.4.2.3 – Convert a Stop-Controlled Intersection to a Modern Roundabout (CMF 0.56, See <b>HSM Table 14-4</b> ) |     |    |
| <b>Included in the CMF Clearinghouse *</b>  | X   |    |
| Convert unsignalized intersection to roundabout, CMF 0.56, serious injury, minor injury, 4 stars                |     |    |
| Convert intersection with minor-road stop control to modern roundabout, CMF 0.56, all, 5 stars                  |     |    |
| Convert signalized intersection to modern roundabout, CMF 0.52, all, 4 stars                                    |     |    |

\* Note: CMFs with less than a 4 star rating, may not be reliable and are not to be used in crash reduction.

## Other Safety Benefits

According to a study at the Insurance Institute for Highway Safety, at the installation of roundabouts where stop control and traffic signals were replaced, there was a 39% overall reduction in crashes, a 76% reduction in injury crashes, and a 90% reduction in fatal crashes. While roundabouts do pose a concern for those who are visually impaired, overall the safety benefits of roundabout implementation are positive. Bicycle crashes have been found to decrease 10-20% at roundabouts (Elvik et al., 1997). Analysis has shown that multi-lane roundabouts do not present as great a safety benefit as single-lane roundabouts (Persaud et al., 2001).

**Figure 3 – Roundabout at Kietzke Lane and Neil Road**



## How?

Roundabouts can be placed in many intersection locations in both urban and rural environments. A Roundabout First Policy generally states that if a roundabout is determined to be a feasible alternative to the current intersection location, it is to be considered the preferred alternative. In order to be feasible, sufficient right-of-way must exist at the intersection as roundabouts require additional right-of-way beyond a conventional intersection.

## SUMMARY

Roundabouts have clear safety benefits and can also increase throughput at some intersections. Conversion of an intersection to a roundabout has a CMF of 0.61. A roundabout first policy specifies that staff are to consider roundabouts first for all intersection improvements. Analysis has shown that single-lane roundabouts present the greatest safety benefit. Roundabouts are not feasible with high volumes of traffic or when an existing intersection does not have sufficient right-of-way.

## WORKS CITED

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*This document was prepared for the Nevada SHSP Intersections CEA Team (October 10, 2014).*