Appropriate and Inappropriate Sites for Roundabouts

**Conditions under which roundabouts may be appropriate:**
- Intersections warranting safety improvements (crash rate/severity, visibility, movement separation)
- Intersections with design-year entering peak-hour volumes typically not exceeding 2,400 to 2,800
- Intersections with unusual geometrics
- As an alternative to a low- or medium-volume signal
- As an alternative to all-way stop control
- Intersections with high side-street delays
- Intersections at which signal warrants are not met but delay problems still exist
- Intersections with high left- or U-turn volumes
- Intersections with five or more legs
- Locations with right-of-way limitations on approaches
- Locations at which road character limitations changes (i.e. 55 to 35 mph, rural to urban, divided to undivided)

**Conditions under which roundabouts may NOT be appropriate:**
- Intersections with design-year entering peak-hour volumes exceeding 2,400 to 2,800
- Locations with grades exceeding 3% or topography that might limit visibility, complicate construction or create unsafe conditions
- Locations with right-of-way limitations at the intersection
- Roadways on which a lack of large gaps caused by signal-related platooning could cause undesirable effects either upstream or downstream of a roundabout
- Intersections with unbalanced traffic, where major street traffic might be unduly delayed
- Locations with heavy pedestrian or bicycle movements; pedestrian special need areas
- Locations near emergency facilities (such as hospitals or fire stations) that could be negatively impacted by the inability to preempt traffic
- Locations with nearby generators of significant traffic that might have trouble negotiating the roundabout (such as high volumes of oversized trucks)

**Conditions under which roundabouts WILL NOT be used:**
- Locations with physical/geometric complications that make it impossible/uneconomical to construct a roundabout
- Routes where large vehicles will frequently use the intersection and sufficient space is unavailable
- Locations with nearby traffic control devices requiring preemption (railroad tracks, drawbridges)
- Locations with nearby bottlenecks that would routinely back up into the roundabout (overcapacity signals, freeway entrance ramps)
- Isolated intersections within a coordinated network
- Roadways with reversible lanes
Justification for multi-lane roundabouts

In general, the justification procedures used for single lane roundabouts are also used to justify multi-lane roundabouts. Only the volume-related justifications change: Multi-lane roundabouts may be considered appropriate for intersections with design-year entering peak-hour volumes typically not exceeding 3,700 vehicles (certain treatments, such as bypass lanes, could allow the accommodation of higher volumes.)

For multi-lane roundabouts, the justification process must also consider the nature of motorists in the area of the proposed roundabout (e.g. tourists, trucks, buses, senior drivers).

Multi-lane roundabouts present more complex design issues than those of single-lane roundabouts. They also present a more complex set of decisions to drivers. In recognition of these facts, roundabouts must be designed to minimize the number of circulating lanes to the extent that is operationally feasible. In other words, single-lane circulating roadways are preferred over multi-lane. The most significant point of confusion at a multi-lane roundabout is at the exit, where it may not be clear to motorists who may continue circulating and who may not. Single-lane exits reduce this confusion.

With the above concept in mind, it will often be desirable to consider roundabouts on which only a portion of the circulatory roadway carries multiple lanes. Such roundabouts can be subdivided into two categories:

1. instances where an additional “turning” lane is added within the roundabout to facilitate a heavy movement, and
2. instances when additional “through” capacity is carried through the roundabout on one street but not another (sometimes referred to as a “2-lane/1-lane” configuration).

Examples from both these categories of partial multi-lane roundabouts are available.

At freeway interchanges with one-way ramps (such as diamond interchanges), the teardrop configuration, which prevents circulating movement in front of one approach, may be used. Although one approach will not be required to yield to circulating traffic, that approach must still be designed to slow entering traffic to the
required operating speed. The designer will verify that the elimination of U-turn movements on the teardrop leg will not result in access problems on nearby roadways.

Roundabout dimensions are a function of operating speed and the design vehicle. The roundabout must be large enough to accommodate the design vehicle, but not so large as to encourage excessive speeds. These two parameters are the guiding elements in choosing roundabout dimensions; however, the following dimensions can be used as a general guide. In urban settings, the inscribed circle diameter for a four-leg two-lane roundabout typically ranges from 150 to 180 ft. In rural settings, the inscribed diameter typically ranges from 180 to 200 ft.

Multi-lane roundabouts with more than four legs are extremely complex from a driver’s point of view. They present unique challenges in signing and pavement marking. Wherever possible, the use of partial multi-lane configurations is encouraged with roundabouts having five or more legs.

Roundabouts with more than two circulating lanes are discouraged on Missouri state highways, and will be considered a design exception