Roundabouts are becoming increasingly common in the upper Midwest. They have documented safety benefits and generally will reduce overall delays at intersections. Several states require consideration of a roundabout at any intersection considered for traffic signal installation. River Falls recently installed a roundabout at Wasson lane and Cemetery Road, which appears to be working satisfactorily.

The “yield on entry” roundabout has reduced crashes at intersections with several studies reporting reductions in the vicinity of 40%. Injury crashes show reductions in the neighborhood of 70%, primarily as a result of the low speeds required at the roundabout. Pedestrian crashes, especially injury crashes show high reductions.

The safety improvements are primarily the result of lower speeds and fewer conflicts.

In a roundabout, vehicle/vehicle conflicts are reduced from 16 to 4. Pedestrian/vehicle conflicts are reduced from 16 to 8. Pedestrians are 8 times more likely to be seriously injured when struck by a 30 mph vehicle than a 20 mph vehicle.

Roundabouts can be very beneficial at offset intersections or at 5 or even some 6 legged intersections. It depends on the angles of approach and distances between the approaches.

Roundabouts will not work at every intersection. Even staunch roundabout advocates caution about installing them under certain conditions. A detailed analysis of an intersection is desirable before proposing installation.

For optimal operation, volumes on approaches should be even. When the volume split approaches 8:1 or 10:1, overall delays are likely to increase. One study reported that single lane roundabout efficiency begins to decrease with volumes above 8,000 ADT. Other benefits of roundabouts still make them worthy of consideration at higher volumes.

A roundabout will require additional right of way as compared to a standard intersection. The “inscribed circle” of a roundabout in an urban setting is 100 to 130 feet. Adding a grass berm and sidewalks will increase the circular right of way needed at an intersection from 112 to 142 feet. Cascade Ave right of way is 100 feet and cross streets generally 66 feet.
While the number of conflicts in a roundabout is decreased, motorists in the roundabout have a series of tasks that keep them busy. They must yield to traffic before entering. They must turn their vehicle right to enter, then turn left around the circle, and again turn right to exit, all the time watching traffic ahead of them and looking for their exit. Because of this, pedestrians are not allowed in the circle. Pedestrian crossings are generally about 50 feet back from the circle, where both approaching and exiting motorists will hopefully see them, and separating the motorist’s tasks in the roundabout from those associated with the pedestrians.

Pedestrians following the sidewalks and crossing the streets 50 feet from the roundabouts are theoretically safer than when crossing at a normal intersection. They only cross one lane at a time due to the “splitter” islands on the approaches. The speeds of vehicles are generally slower as they approach or leave the roundabout. This is borne out by the crash records at roundabouts.

Pedestrians do have a longer route at a roundabout. A pedestrian following the sidewalk will cross the roundabout approach 70 to 100 feet further away from the intersection than at a normal intersection. Some roundabouts have had problems of pedestrians crossing through the middle which is dangerous.

Some on street parking will be eliminated with the roundabout. The motorists on the approaches to the pedestrian crossings will need clear view of the crossing and the associated splitter island. If a roundabout were installed at Cascade Ave and 4th Street, 29 on-street parking spaces would be removed. At 2nd Street, there would only be a loss of two spaces.

Because the benefits of the roundabout are associated with low speed, continuous flow, it is necessary to eliminate driveways near the roundabout. A vehicle turning left just past the exit from a roundabout could quickly cause the flow of traffic in the roundabout to stop. A recent national roundabout presentation suggested no entrances within 200 feet (150 feet minimum) at any roundabout. This may be a little more than needed at some intersections along Cascade Ave.

Bicycles are a concern in roundabouts. Most roundabouts will provide a ramp or access for bicycles from the approach roadway to the adjacent sidewalk. Bicyclists are then mixed with pedestrians around the roundabout.

Concept 5A 9/5/07