

Making Roundabouts Work for Pedestrians and Bicycles

Location

Madison, Wisconsin

Examples of Strategies Employed in Madison

Pleasant View Rd – Valley View Rd – Junction Rd Roundabout

- ✓ Bicycle Ramps are provided on all approaches, with two approaches having a second exit ramp.
- ✓ Widened Sidewalks
- ✓ This roundabout has a pedestrian/bicyclist underpass
- ✓ A truck gore
- ✓ Vane islands are provided on all approaches

Pleasant View Rd, Mineral Point Rd

- ✓ Bicycle Ramps are provided on all approaches, with two approaches having a second exit ramp.
- ✓ Widened Sidewalks
- ✓ A truck gore
- ✓ Vane islands are provided on all approaches

Lien Rd, Zeier Rd, and Thompson Dr

- ✓ Bicycle Ramps are provided on all approaches.
- ✓ Widened Sidewalks
- ✓ Truck gores on all approaches



Figure 1: Junction Road - Pleasantview Road

“Lower approach and circulating speeds can improve safety for all users.”

- Robert Arseneau
City of Madison



Background

The City of Madison, Wisconsin has been building roundabouts for over fifteen years. Their first modern roundabout, constructed and opened to traffic in 1999, was successful and accepted by the local residents. Soon the modern roundabout became the City's preferred intersection design, whenever feasible, and this priority continues today.

Over time, people traveling across Madison have become more familiar with roundabouts and have gained confidence in their performance. However, Madison has also made walking and biking a high priority with ambitious goals, so concerns for pedestrian and bicyclist safety and access are still expressed at nearly every initial public meeting involving a roundabout proposal. To address these concerns and build roundabouts that are multimodal, City staff has collected a library of design techniques, which are intended to improve pedestrian and bicyclist safety. These techniques are applied in a holistic manner, considering all users and their needs, throughout the design process, to arrive at a balanced and optimal design.

Approach

Madison's approach to accommodating pedestrians and bicyclists is to consider their needs from the beginning of the design process, along with motorized traffic. The specific needs of each group are studied and prioritized, leading to a balanced design that serves all users. The concept of “balance” is very important, since choices about design features and geometry can result in tradeoffs between competing project goals. For example, reducing the number of lanes and lane widths improves pedestrian crossing safety, but can also reduce motor vehicle capacity of the intersection.

Non-Motorized User Consideration

The safety and comfort of all users (motorized and non-motorized) is improved when approach and circulating speeds are reduced. Speeds can be managed in multiple ways, including more pronounced entry curvature, narrower lanes and strategic use of landscaping features, to name a few. Even in cases where features that reduce speeds through a roundabout also reduce capacity, it is still possible to deliver a project that creates a safer, more usable intersection for pedestrians and bicyclists, that is also more efficient for motorized traffic even at high volume intersections. This is the basis of the City's holistic approach to roundabouts.

Landscaping features can be used to elicit more driver caution and alertness and to reduce speeds, but it must be carefully designed to screen only unnecessary information, such as the view of vehicles beyond the immediate conflict areas, while allowing the driver to focus on driving tasks, non-motorized users, and appropriate yielding. Judicious use and maintenance of landscaping can result in safer roundabouts.

A thoughtful approach to signing each roundabout can help reduce sign clutter and provide drivers with the ability to focus on the actions of pedestrians and bicyclists, while still providing the information needed to maneuver the roundabout comfortably and safely.

Lessons Learned

- Reducing vehicle speeds can benefit all users, motorized and non-motorized.
- Avoid “over-signing” that creates clutter and may distract drivers or hide pedestrians.
- Ensure that roadway lighting properly illuminates critical features at and along the roundabout, especially the pedestrian and bicycle facilities.
- Using landscaping to limit excessive sight distance can improve safety for all users, but must be designed carefully.
- Balanced, multimodal roundabout designs are possible when the needs of all users are considered explicitly and consistently throughout the project development process.



Figure 2: Pleasentview Road - Mineral Point

Learn More

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Pedestrian Considerations

Pedestrian safety for people of all ages and abilities is improved by lower vehicle speeds, shorter crossing distances, greater visibility and conspicuity, and drivers that are more attentive and focused on the pedestrians and crossings. Visibility of pedestrians at the intersection, especially the crosswalks, is critically important. The driver's view of the crosswalks, ramps and landings, and refuge areas should not be obstructed by signs, landscaping or any other feature. Crosswalks should be placed to allow drivers to see the crossing well in advance and to allow a focus on pedestrians that are present. During low-light conditions, visibility can be achieved or improved by ensuring that the intersection lighting is provided, and designed to avoid “negative contrast” or silhouetting at crosswalks.

At some roundabouts, there may be concerns about not enough gaps in traffic or that drivers will not yield appropriately to allow pedestrians to cross the street safely. Appropriate pavement markings and signing can improve motorists' tendency to yield, but other factors such as public information, enforcement campaigns, and pedestrian education have also been shown to work well. A rectangular rapid flashing beacon (RRFB) is an effective device to install at crossings where pedestrians may have difficulty crossing. The City has found that placing the conduit needed for RRFBs (or other treatments) is a low cost strategy that provides flexibility to address pedestrian crossing experience at a future date.

Bicyclist Considerations

Bicyclists approaching a roundabout can vary greatly in their cycling experience, skill and confidence. The majority of highly experienced bicyclists may decide to ride through the roundabout, while less experienced bicyclists may decide to exit the street and proceed as pedestrians across the roundabout. Knowledge about the user population should inform how to approach the design. For instance, a nearby elementary school or playground could result in regular use by inexperienced bicyclists who prefer to use the shared use paths and crosswalks. Wider bicycle off and on ramps and sidewalks, along with adequate refuge on the splitter islands to allow room for both pedestrians and bicycles, could better accommodate these users. Bicycle exit ramps should be provided on all approaches to allow bicyclists the option to exit the street before entering the roundabout.

In the City's experience, bicyclists who choose to ride through the roundabout usually prefer to ride near the center of their lane. This allows the bicyclist to control the lane and discourages motor vehicles from attempting to pass, while in the roundabout. Keeping the entry lanes less than 14 feet in width allows bicyclists better control of the lane. Truck gores for multi-lane roundabouts help to maintain narrower approach lanes while also channelizing and separating approach traffic.

When a roundabout gets larger and more complex due to traffic volumes, more bicyclists will choose to exit the street before entering the roundabout and cross at the crosswalks. In these cases, greater emphasis should be given to the facilities that allow bicyclists to do this, such as adding a second exit ramp on higher volume approaches that give a bicyclist another chance to exit the street. Wider sidewalks or a shared use path provides room for pedestrians (including those walking their bicycles) and a safe route to the next street crossing or ramp for bicyclists to re-enter the street as they proceed past the roundabout.

More Information

The City of Madison's website on roundabouts can be found here:
<http://www.cityofmadison.com/trafficEngineering/trafficRoundabouts.cfm>