



Circular Measures: The Impacts of Roundabouts on Bicycle and Pedestrian Systems

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In the beginning (in Brown County)...



Lineville/Cardinal Roundabout



Lineville/Rockwell Roundabout

The roundabouts were officially completed in October of 1999 (1st in state).

Designed to force traffic to travel at no more than 18 mph through intersection.

Each roundabout has a landscaped center island, patterned concrete truck apron, and a splitter island at each approach.

Splitter islands deflect traffic to right and serve as refuges for pedestrians and bicyclists.

Brown County currently has 16 roundabouts, and many more are planned.

Pedestrians at Roundabouts

Pedestrians are safer at roundabouts than at signalized or signed intersections because...

Roundabouts have far fewer conflict points.

- Single lane roundabouts with four approaches: 8 vehicle/pedestrian conflict points
- Signalized/signed intersections with four approaches: 24 vehicle/pedestrian conflict points

Severe crashes caused by inattentive driving are eliminated.

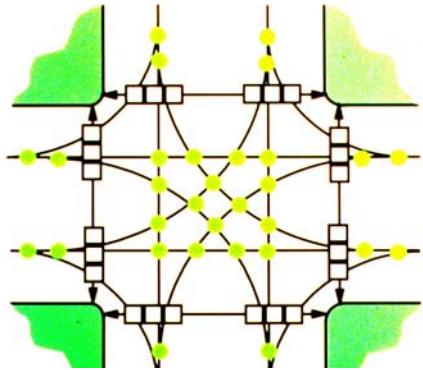
- People cannot run red lights, ignore stop signs, or make right turns on red.
- Drivers are forced to pay attention to their surroundings as they approach and pass through the roundabout intersections.

Pedestrian exposure to traffic is lower because the crossings are much shorter.

- People at single-lane roundabouts are able to walk about 13 feet between the curb and splitter island, wait for a gap in traffic, and walk another 13 feet from the island to the curb.

Conflict Points at a Signalized or Signed Intersection and a Single Lane Roundabout

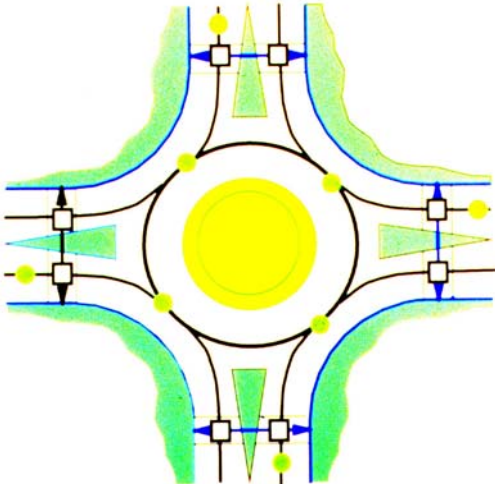
Conflicts at a Signalized or Signed Intersection



□ 24 Vehicle/Pedestrian Conflict Points

● 32 Vehicle/Vehicle Conflict Points

Conflicts at a Single Lane Roundabout



□ 8 Vehicle/Pedestrian Conflict Points

● 8 Vehicle/Vehicle Conflict Points

Comparison of Crossing Distances at the Lineville/Cardinal Roundabout and Other Two-Lane Street Intersections

Lineville/Cardinal Roundabout Crosswalk



Wooddale/Cardinal Crosswalk



VS.

Total Crossing Distance at Roundabout



Portion of Crossing Distance at Memorial/Velp Int.



VS.

Roundabouts in School Zones

In addition to the pedestrian benefits mentioned earlier, roundabouts enable motorists to avoid crashes when children incorrectly (or correctly) enter the street.

The crossing guard at the Lineville/Cardinal roundabout told the Green Bay Press-Gazette in February of 2001:

Crossing children at the roundabout is easy because she can stop one lane of slow moving traffic at a time.

She has seen no close calls or accidents at the roundabouts in the two years she has patrolled the area.

She has not had to report any drivers to the sheriff's department.

She loves the roundabouts because they enable her to easily get children across the street.

Bicyclists at Roundabouts

Bicyclists have two circulation options at BC roundabouts:

They can enter the traffic flow and travel through the roundabout as a vehicle

OR

they can leave the street prior to the intersection, cross the street at the designated crosswalks, and re-enter the street.

Bicycle Lane Termination Point



Bicycle Lane Entry Point





EAST WINDHAM ELEMENTARY





Bicyclists at Roundabouts

According to a former president of the Bicycle Federation of Wisconsin...

The roundabouts are safe and efficient for bicyclists.

Bicyclists appreciate not having to stop at the roundabouts because it is difficult to accelerate from a complete stop.

He supports the construction of single lane roundabouts elsewhere to enhance bicycling throughout the state.

And Bay View Middle School...

The Lineville Road Roundabouts prompted Bay View Middle School to permit its students to bicycle to school in the spring of 2000.

Roundabouts can minimize barriers to pedestrians and bicyclists by enabling the construction of narrower arterial streets. Why?

The capacity of roundabouts is greater than the capacity of signalized intersections.

Examples:

- Average delay per vehicle at an intersection that has a total major street volume of 1,000 vehicles per hour and 10 percent left turns.
 - Signalized intersection delay per vehicle: 13.5 seconds
 - Roundabout intersection delay per vehicle: 1.75 seconds

Delay reduction per vehicle with a roundabout: **11.75 seconds**

- Average delay per vehicle at an intersection that has a total major street volume of 1,000 vehicles per hour and 50 percent left turns.
 - Signalized intersection delay per vehicle: 16 seconds
 - Roundabout intersection delay per vehicle: 3 seconds

Delay reduction per vehicle with a roundabout: **13 seconds**

Source: *Roundabouts: An Informational Guide* by the Federal Highway Administration (2000).

Narrower arterial streets require less space for driving lanes, so bike lanes and sidewalks can be added within relatively narrow rights-of-way

Suggested Treatments for Arterial Street Corridors

Substitute roundabouts for traffic signals at major intersections.



Single-lane roundabout in De Pere, Wisconsin

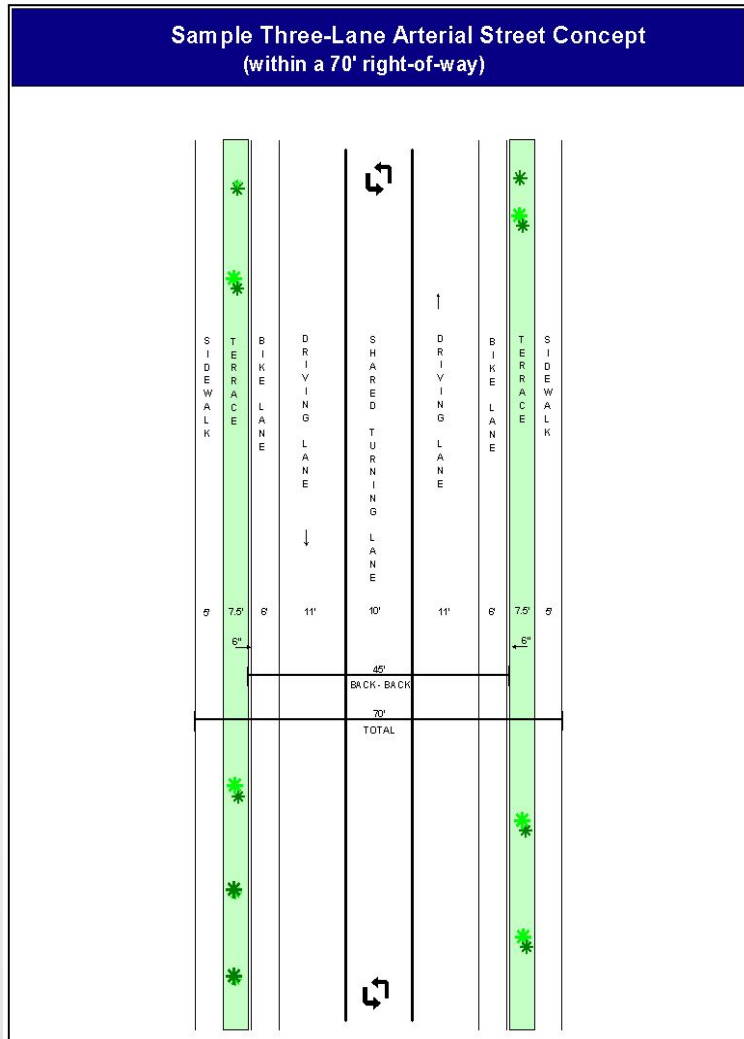


Single/double-lane roundabout in Coralville, Iowa

- Single-lane roundabouts at intersections with two- or three-lane streets
- Single/double lane roundabouts at intersections with four-lane streets
- Single/double lane roundabouts can also serve as transition points along segments

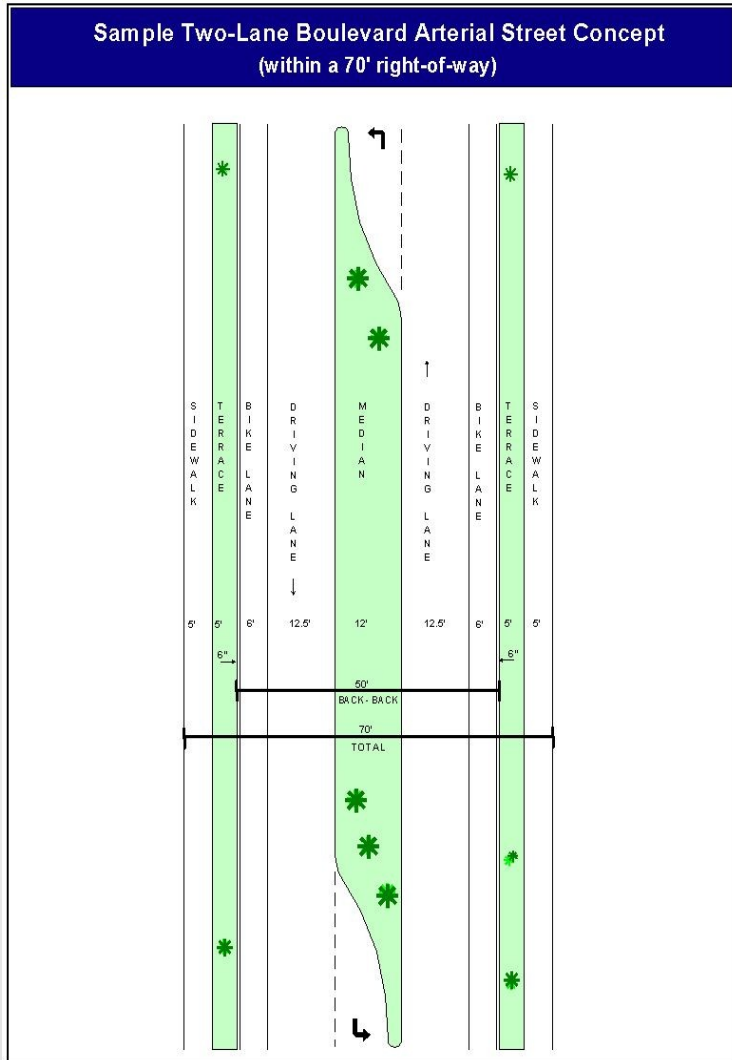
Suggested Treatments for Arterial Street Corridors

Three-lane streets work when arterial corridors contain driveways...



Suggested Treatments for Arterial Street Corridors

...but two-lane boulevards are ideal for streets that have little or no direct driveway access.





Scheuring Road in De Pere, Wisconsin



Chicago Street in De Pere, Wisconsin



Allouez Avenue in Allouez, Wisconsin

STH 52/17th/2nd/Gaynor in Wisconsin Rapids Before Roundabout

- Intersection was awkward and confusing
- Sidewalks not present in some places
- Crosswalks (where they exist) often deposit people in grass



Photos by MTJ Engineering

Intersection clearly not designed for pedestrians or bicyclists

STH 52/17th/2nd/Gaynor in Wisconsin Rapids After Roundabout

- Well-defined pedestrian crossings with refuges
- Sidewalks on all sides
- Pedestrian exposure to traffic minimized
- Intersection much less confusing for everyone (predictable)



STH 78/STH 92 in Mount Horeb Before Roundabout



Photos by MTJ Engineering

- Small intersection with lots of traffic
- Difficult to see pedestrians (poles, etc.)



- Sidewalks not present in some places
- Pedestrian crossing and bicycling conditions less than ideal

STH 78/STH 92 in Mount Horeb After Roundabout

- Crosswalks are well defined and pedestrian visibility is vastly improved
- Sidewalks now exist along both highways
- Bicycle lanes are present



Thompson Drive in Madison Before Roundabout

Was a four-lane street next to a residential area with...



No Bike Lanes



Very Poor Pedestrian Facilities

Thompson Drive in Madison After Roundabout

- Pedestrian facilities improved
- Bike facilities added
- Number of driving lanes reduced from four to three



Photo by MTJ Engineering

Conclusions

Pedestrians are safer at roundabouts than at signals and stop signs because fewer conflict points exist, inattentive driving crashes are eliminated, and exposure to traffic is minimized.

Roundabouts can improve pedestrian and bicyclist safety and accessibility in school zones.

Bicyclists have two circulation options at roundabouts.

Bicyclist crash rates are slightly reduced at roundabouts, but crash severity tends to decrease significantly.

Roundabouts help to enable the construction of narrower arterial streets, which minimizes barriers to pedestrians and bicyclists and allows the inclusion of ped and bike facilities in narrow rights-of-way.

Roundabouts can significantly improve pedestrian and bike safety and accessibility at awkward and unsafe intersections.

Additional treatments might be necessary for visually impaired pedestrians.

Want more information?

Check out our website

www.co.brown.wi.us/planning/transportation.html

Questions?



Comments?