

An aerial photograph of a roundabout intersection. The roundabout has a central landscaped island with a circular pattern. Several roads radiate from the center. The surrounding area includes residential houses, some with swimming pools, and open fields. The text "Pedestrian Safety at Roundabouts" is overlaid in white on the top half of the image.

Pedestrian Safety at Roundabouts

Presentation to the Howard-Suamico School Board
November 26, 2007

Roundabouts that have replaced stop signs and traffic signals have reduced the number and severity of pedestrian crashes throughout the world.

Pedestrian injuries have been reduced by as much as 89 percent.

Roundabouts are safer for pedestrians than other forms of intersection control because...

1. They minimize vehicle speeds.
2. There are fewer chances for crashes to occur.
3. They maximize driver and pedestrian awareness.
4. They minimize pedestrian exposure to traffic.

1. Roundabouts Minimize Vehicle Speeds



The curbed islands force people to drive slowly as they approach & pass through.

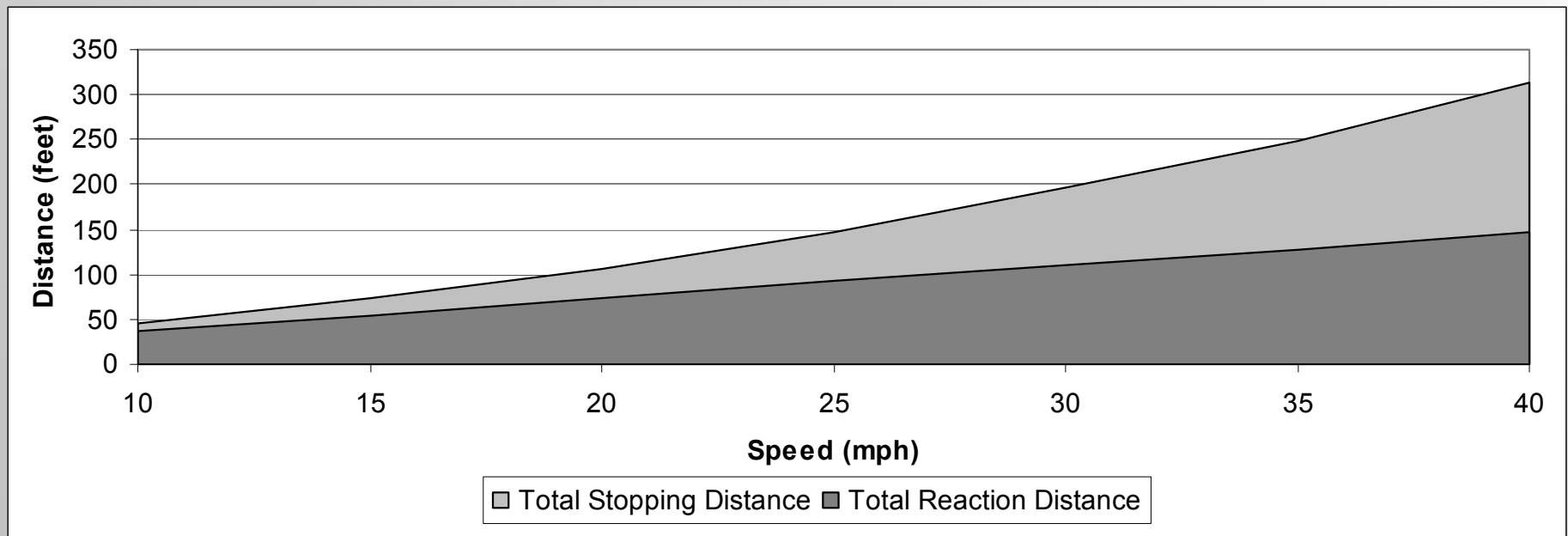
Slow speeds make it easy for drivers and pedestrians to avoid each other.

When pedestrian crashes happen at roundabouts, they tend to be minor.

On the other hand, pedestrian crashes that happen when people try to beat red lights, run stop signs and signals, etc. can result in serious injuries and deaths.

This is how long it can take to stop a car...

Speed (mph)	Perception Distance	Reaction Distance	Total Reaction Distance	Braking Distance	Total Stopping Distance
10	15	22	37	8	45
15	22	33	55	18	73
20	29	44	73	33	106
25	37	55	92	55	147
30	44	66	110	86	196
35	51	77	128	120	248
40	59	88	147	167	314



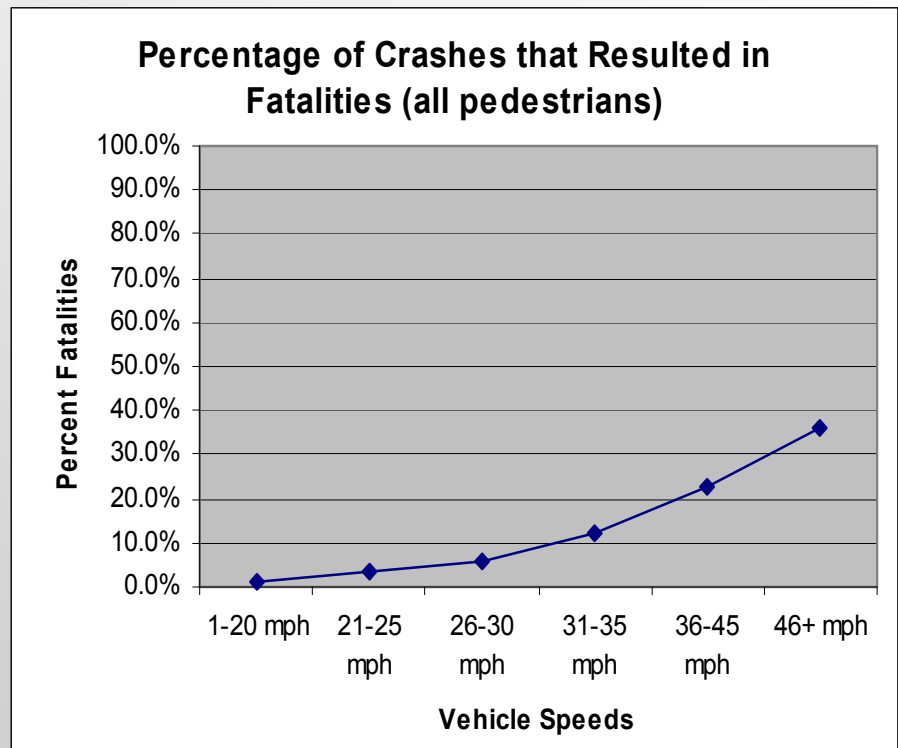
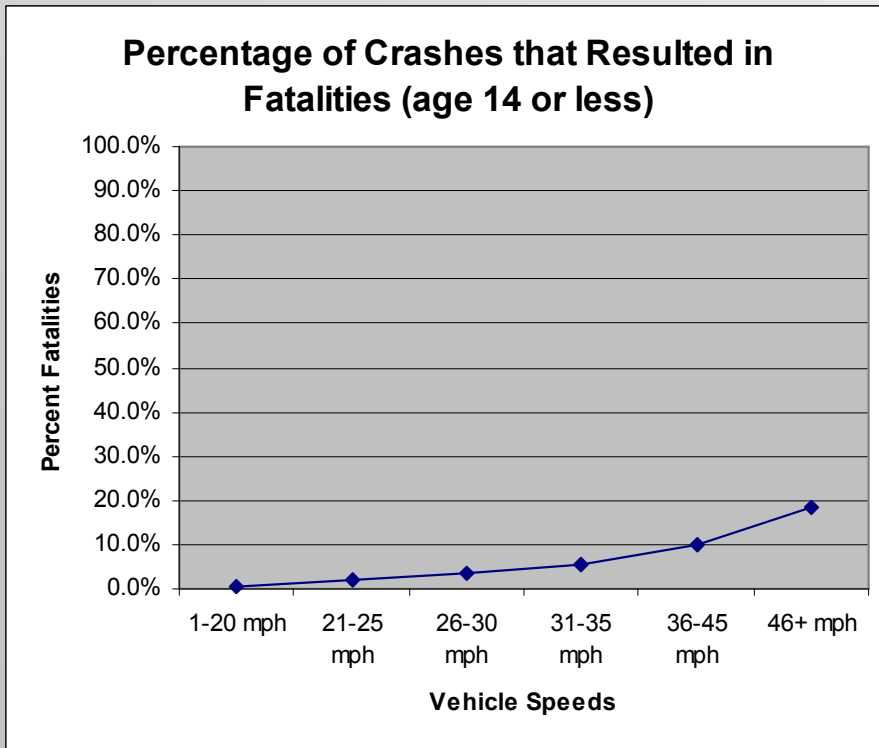
Assuming a driver perception time of 1 second and reaction time of 1.5 seconds. All distances are in feet.

Source: Institute of Transportation Engineers *Traditional Neighborhood Development Street Design Guidelines*.

...and this is what can happen if a car doesn't stop in time.

Example: Fatality rates by estimated vehicle travel speeds and pedestrian ages in Florida (1993-1996)

Pedestrian Age	1-20 mph	21-25 mph	26-30 mph	31-35 mph	36-45 mph	46+ mph
14 or less	0.7%	2.0%	3.7%	5.5%	9.8%	18.2%
All Pedestrians	1.1%	3.7%	6.1%	12.5%	22.4%	36.1%

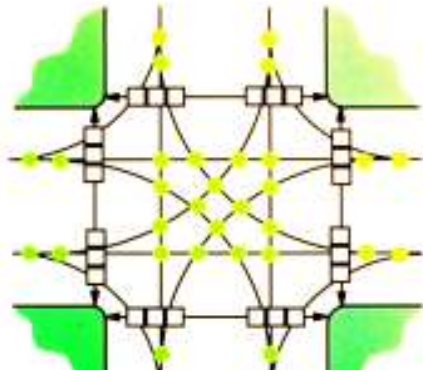


Lower vehicle speeds = safer pedestrian conditions

Source: National Highway Traffic Safety Administration, Literature Review on Vehicle Travel Speeds and Pedestrian Injuries – Table 7 (October 1999).

2. There are fewer chances for crashes to occur

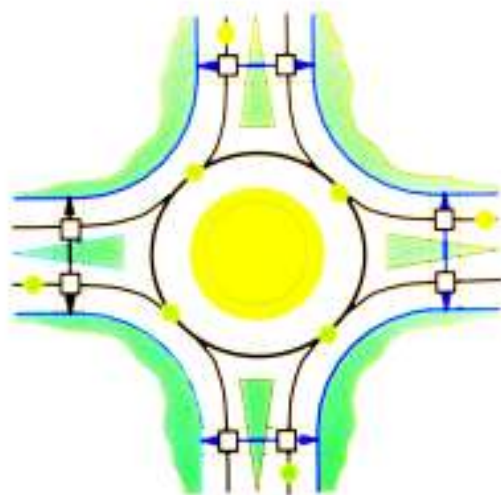
Conflicts at a Signalized or Signed Intersection



□ 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

Source: Alternate Street Design, Inc. *Roundabouts - Information Brief and Design Guide.*

3. Roundabouts maximize driver and pedestrian awareness

Pedestrian crashes that happen when drivers run red lights, miss stop signs, and make right turns on red don't happen at roundabouts.

The yield rule also encourages pedestrians to make sure drivers see them before crossing (no false sense of security like at stop signs and signals).

There is no guaranteed stop condition at any intersection, so pedestrians and drivers need to pay attention to each other.



**Example of a driver
yielding to a young
bicyclist**

08/25/2006

4. Roundabouts minimize pedestrian exposure to traffic

Narrow lanes + pedestrian refuges = minimal exposure to traffic

Lineville/Cardinal Roundabout Crosswalk



Total Crossing Distance at the Lineville/Cardinal Intersection



Woodale/Cardinal Crosswalk



Portion of Crossing Distance at the Memorial/Velp Frontage Road Intersection



VS.

VS.

Examples of roundabout studies near schools

Best example: Lineville Road between October of 1999 (when first roundabouts opened) and today.

Lineville Road's hazardous designation lifted by BC Sheriff's Department in 2000, which allowed students to bike and walk to school.

Lineville/Cardinal crossing guard praised the roundabout in a September 2001 Green Bay Press-Gazette article (after roundabout had been in place for two years).

Howard-Suamico school district representatives participated in making of roundabout video in 2003.

There have been no pedestrians or bicyclists hit at the Lineville/Cardinal or Lineville/Rockwell roundabouts.

What we have on Lineville Road

vs.

What we could have had on Lineville Road

What we have on Lineville Road...



...and what we could have had.



11/26/2007

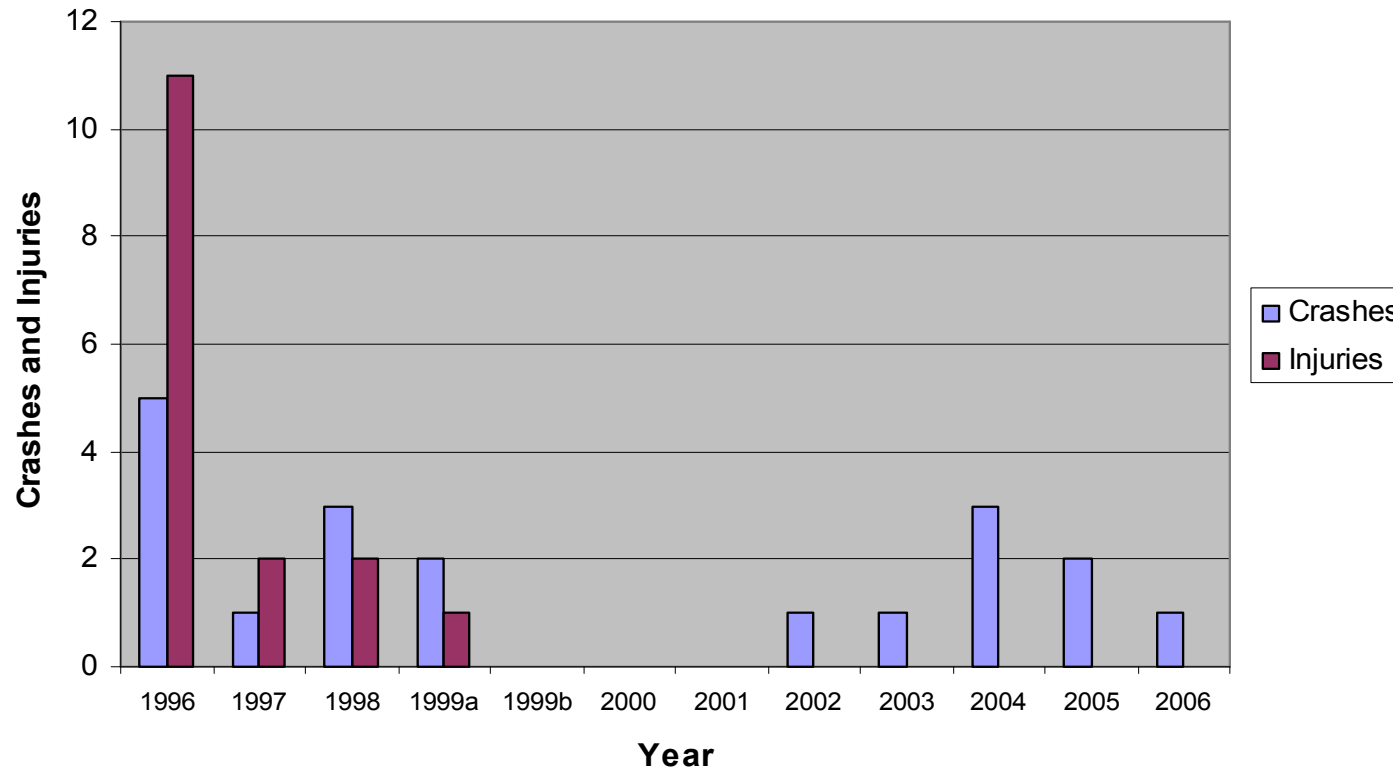


What we have...



...and what we could have had.

Reportable Crashes and Injuries at the Lineville/Cardinal Intersection (1996-2006)



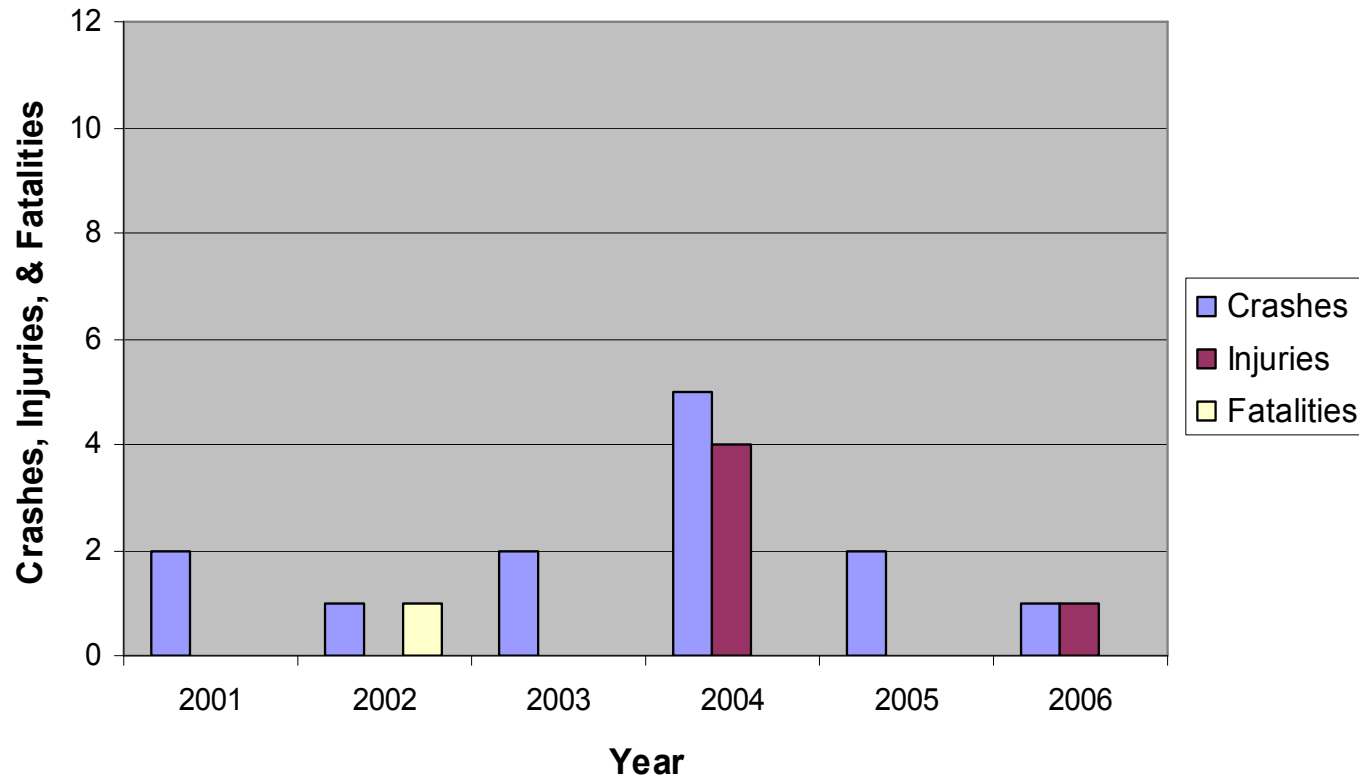
- 1999a: January 1, 1999 - July 31, 1999 (before roundabout - still a two-way stop).
- 1999b: August 1, 1999 - December 31, 1999 (during and after roundabout construction).

Notes

- New Bay Port High School opened in August of 2000.
- Traffic volumes have increased significantly since 1999 (high school, new development near intersection).
- Damage to vehicles before roundabout = severe, damage to vehicles with roundabout = minor.
- Most of the crashes at the roundabout caused by drivers who were 16 or 17 years old.
- **None of the crashes at the intersection involved pedestrians or bicyclists.**

Data Sources: Brown County Sheriff's Department crash records (1996-2001), Wisconsin Department of Transportation int. crash summaries.

Reportable Crashes, Injuries, and Fatalities at the Cardinal/Glendale Intersection (2001-2006)



- 2001 & 2002: Intersection controlled by a four-way stop.
- After 2002, the intersection was controlled by traffic lights.

Notes

- The 2002 fatality was a pedestrian.
- **Two of the five injuries between 2004 and 2006 were bicyclists.**

Want more information?

Check out our website

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

Questions or Comments?