

Roundabouts Lessons Learned

TRB Urban Street Symposium

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BURGESS & NIPLE
Engineers ■ Architects ■ Planners

Ideas in motion.

Why agencies choose roundabouts

- Safer
- More efficient (less delay)
- More aesthetic design opportunities
- Reduced vehicle emissions – greener!
- Access management (provides U-turn location)
- Less ROW required for approach lanes
- To deal with odd intersections



Design it right or you might have problems!

- Critical design features

- Speed profiles
- Path overlap
- Phi Angle
- Truck design
- Sight distance (Landscaping)
- Signing and pavement markings
- Lighting

Speed Profiles (fastest path)

- Most important -
 - Design entrance to slow traffic
- Good to do -
 - Smooth transitions
- Curvature on exit delays vehicle acceleration and lowers speeds at crosswalk



GARMIN VIRB™

12/30/2016 4:11 PM



LAT/LON GS
0 G



SPEED
47 MPH



ELEVATION
950 FT



GRADE
0%



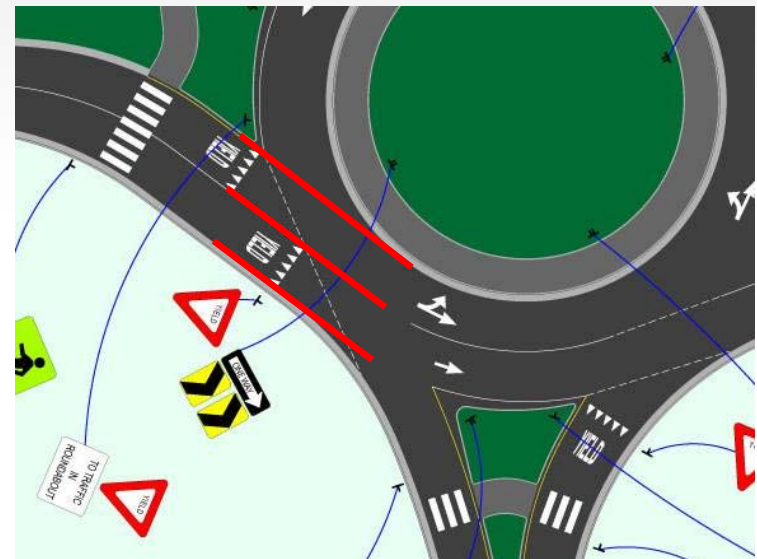
DISTANCE
0.0 MI



COURSE
356°

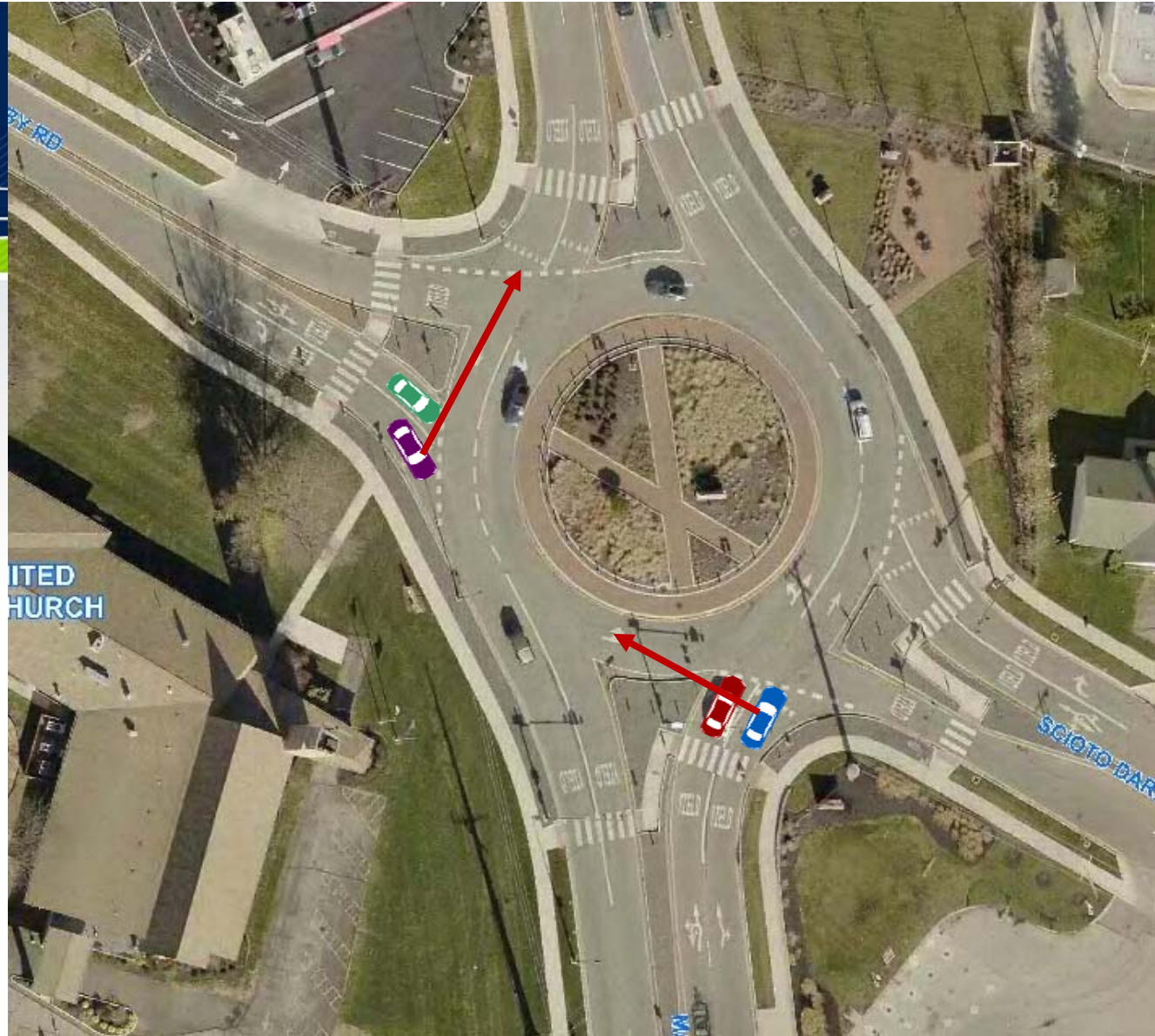
Avoid Path Overlap

- Multi-lane roundabouts
- Guide drivers into proper lane
- Can cause delay and crashes



Entry Angle

- 20-40 degrees preferred



Truck Paths

- Balance with speeds
- Truck drivers don't always know they can use the apron

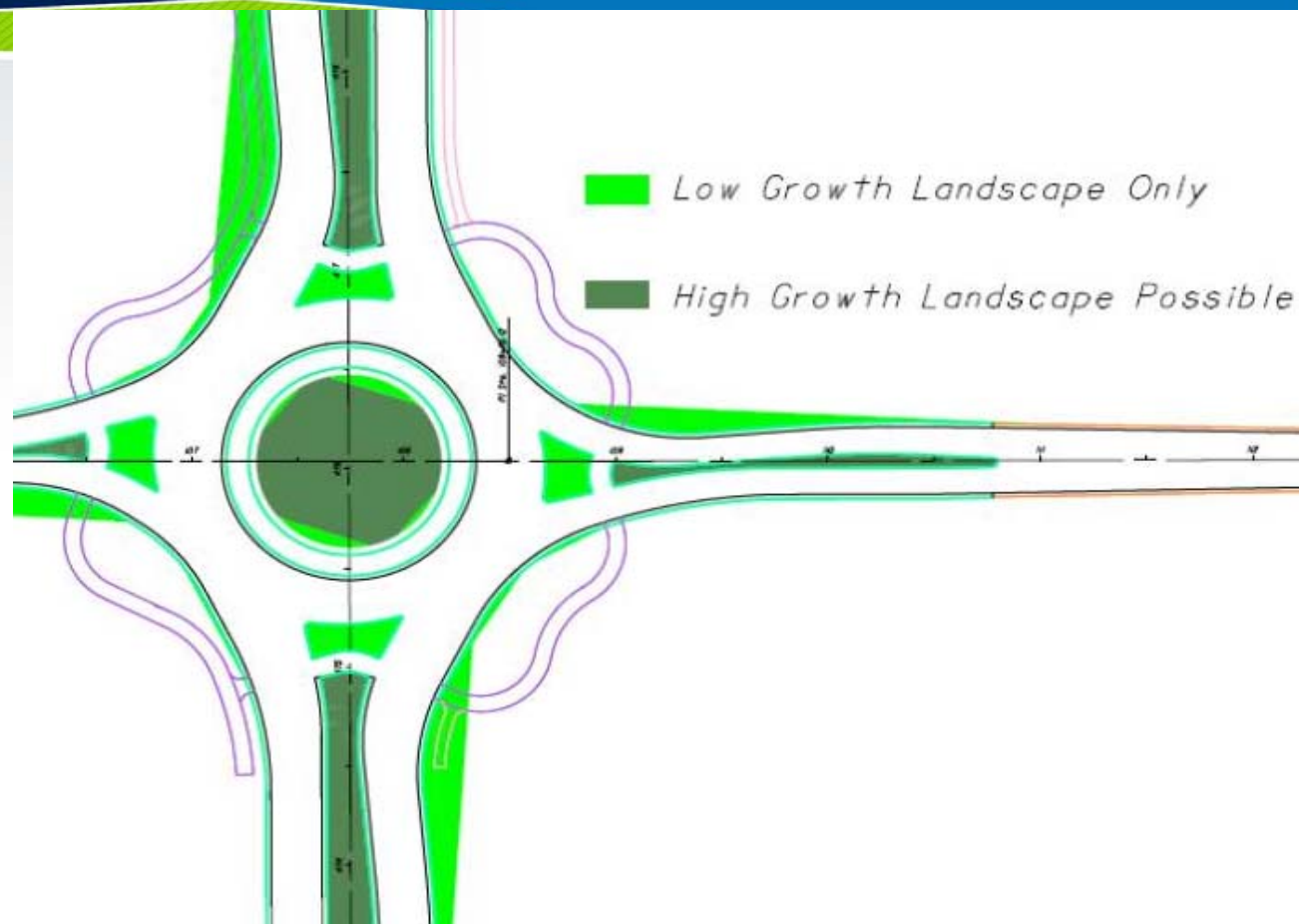


PHOTOGRAPHY SOURCE: Lee Rodegerdts



Sight Distances (Landscaping)

- Minimize “visual noise”
- Don’t block critical sight distances
- Don’t forget visibility of pedestrians!
- Use landscaping to make roundabout apparent



Signing and Pavement Marking

- Clear
- Concise
- Avoid over-kill
- Consider overhead lane use signs



Lighting

- Illuminate pedestrians and bicyclists
- Illuminate curbs and vehicle path
- Make driver aware of approaching roundabout

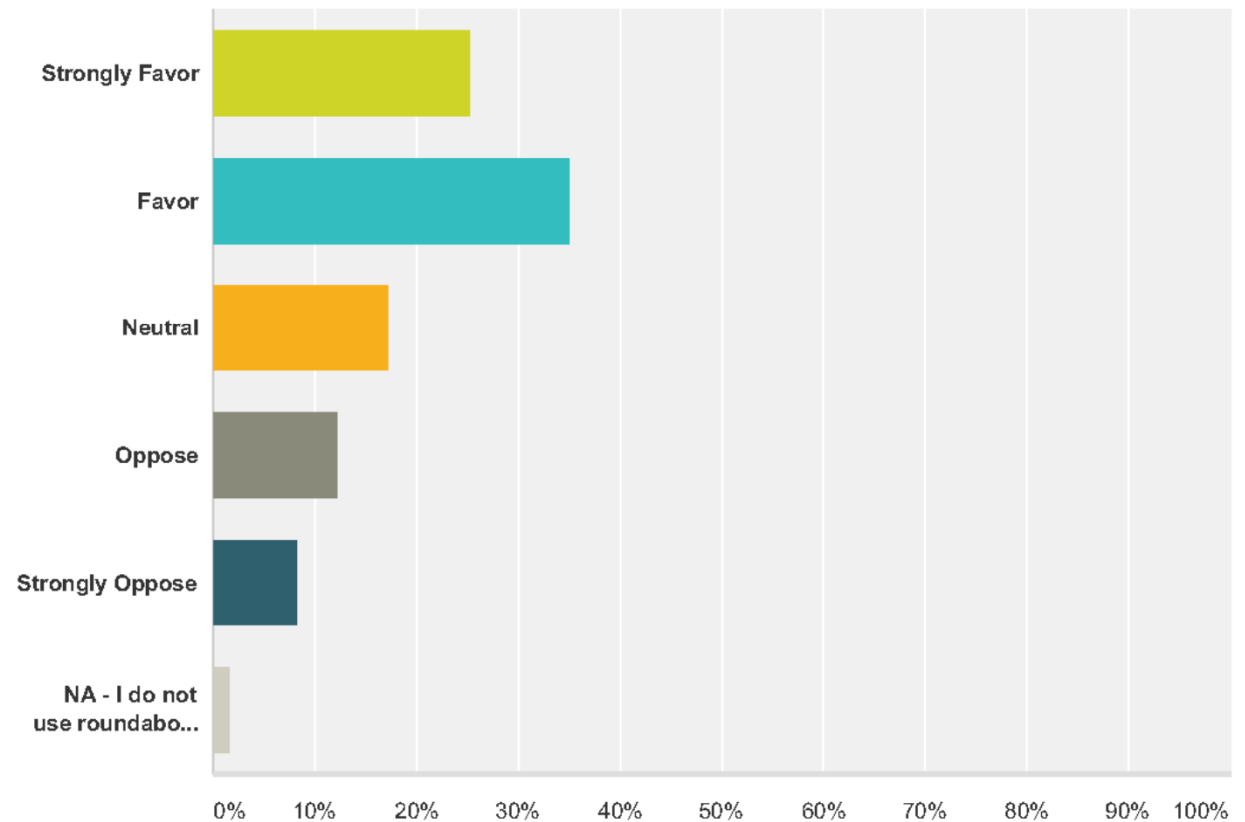




In areas where there are roundabouts, people like them!

Q3 As a driver, how would you rate your general opinion of roundabouts?

Answered: 2,789 Skipped: 218

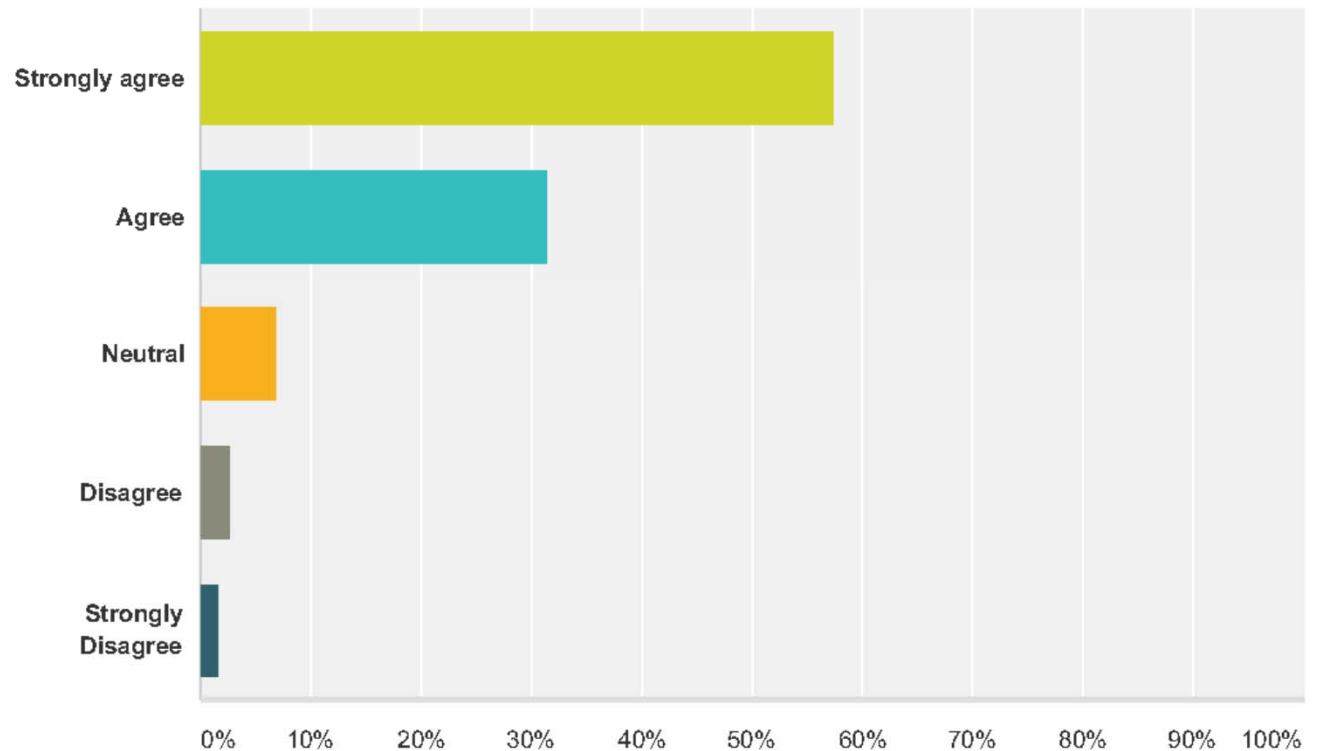


Single lane roundabouts are easy!

- Easiest to design
- People find them easy to navigate

Q17 Single-lane roundabouts are easy to use and understand.

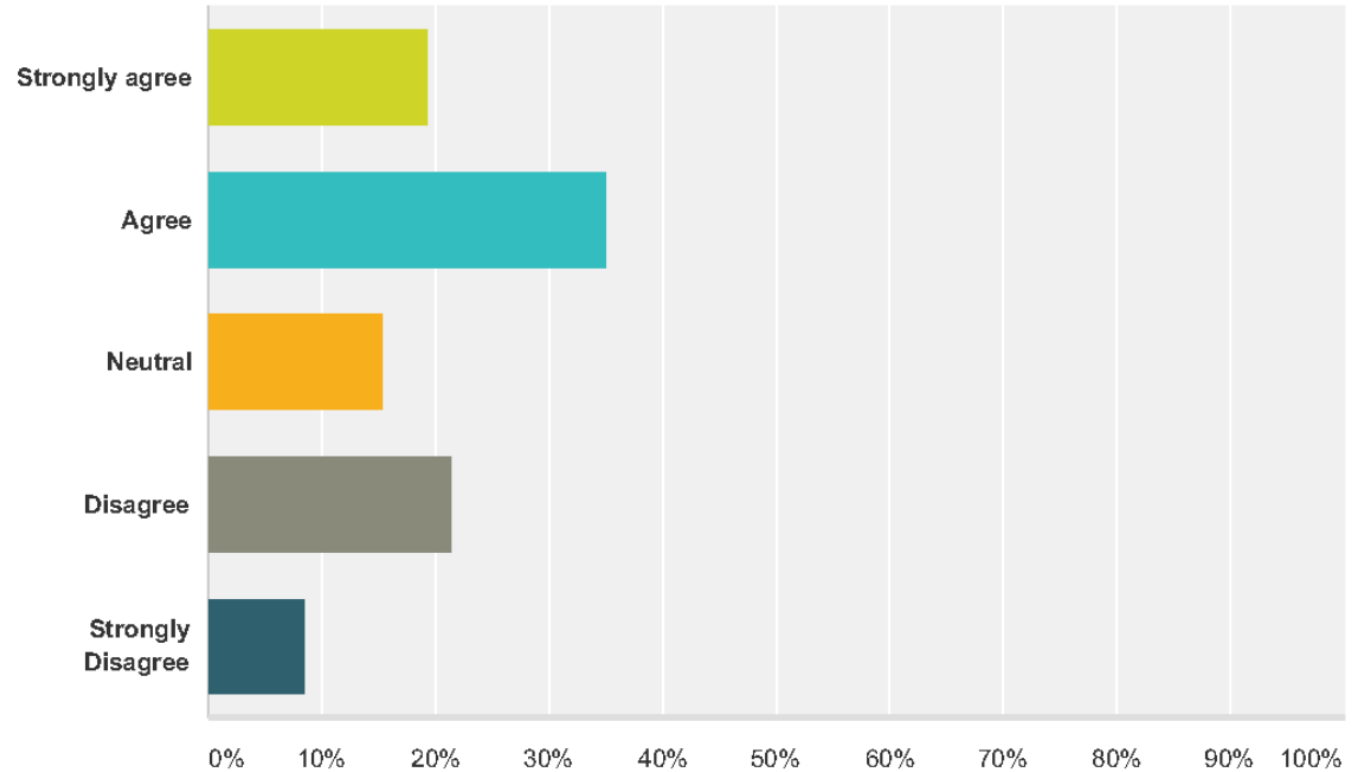
Answered: 2,681 Skipped: 326



Multilane roundabouts are harder, but not bad

Q18 Multi-lane roundabouts are easy to use and understand.

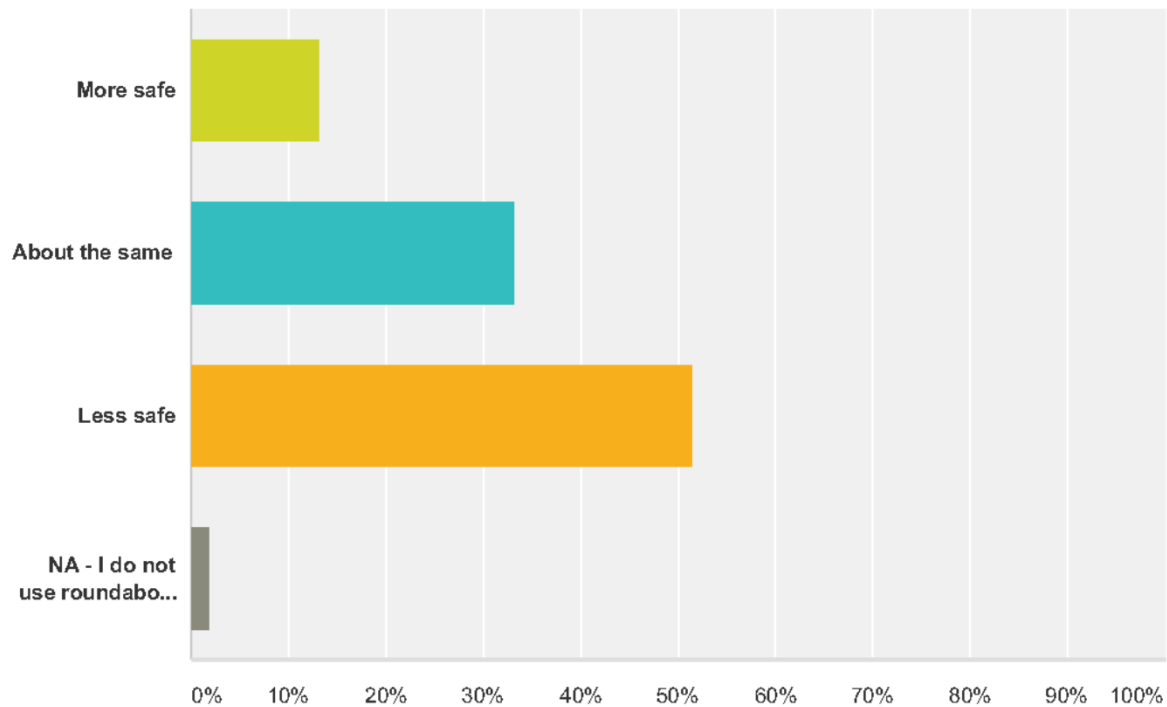
Answered: 2,682 Skipped: 325



People will not believe you when you say roundabouts are safer

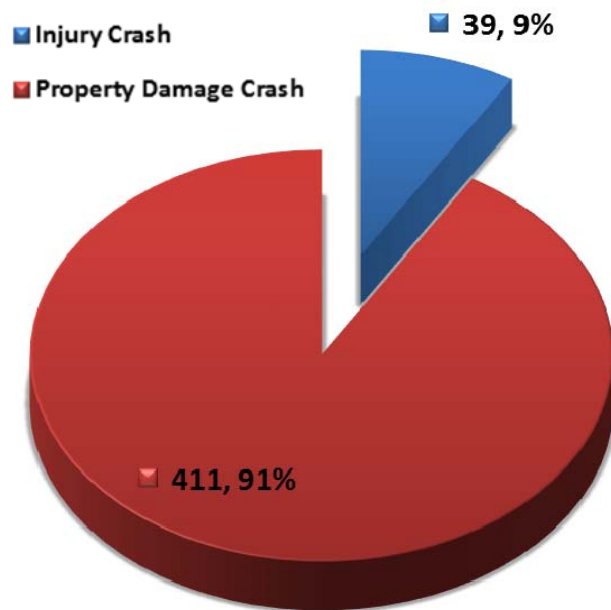
Q7 As a motorist, how safe do you feel in a roundabout compared to an intersection with traffic signals?

Answered: 2,790 Skipped: 217



But roundabouts are “safe”

Frequency of Crashes by Severity



Since opening in 2011

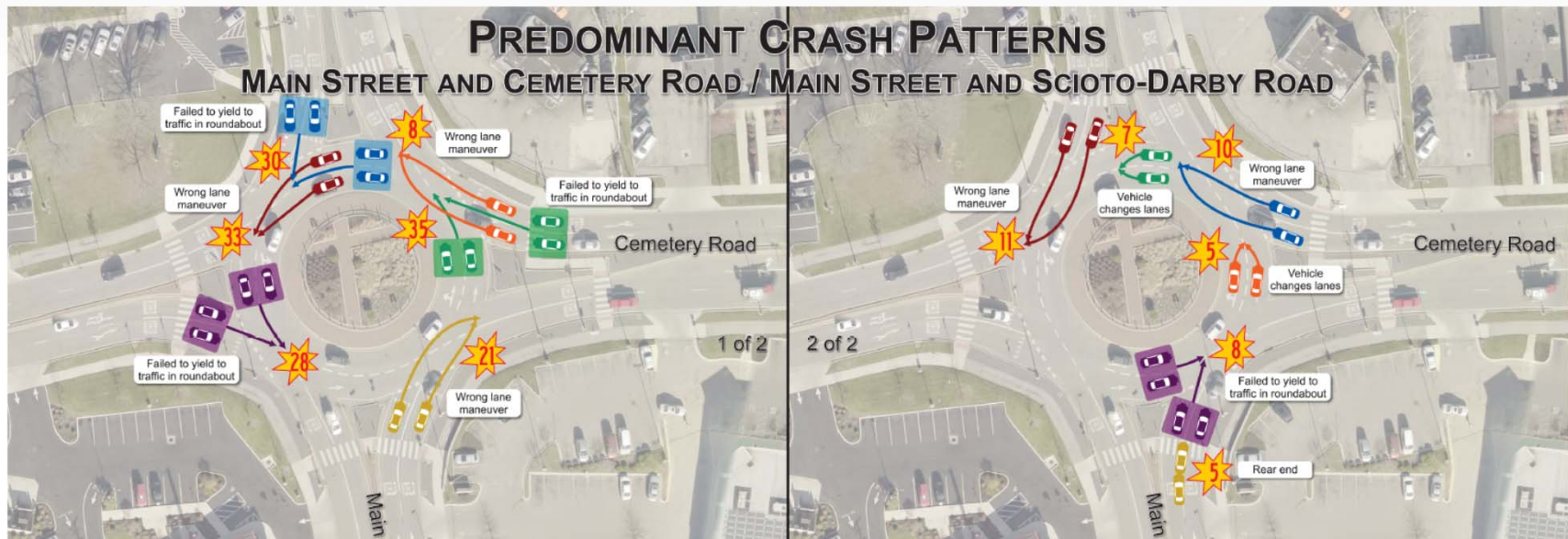
- Few reported injuries
- Serious injuries or fatalities are very rare
- Favorable speeds and collision angles

Total Crashes	Fatality	Total Injury	Injury Severity			EMS Transport
			Serious Injury	Minor Visible Injury	No Visible Injury	
231	0	18	0	7	11	2

2014-2016 (3 years)

Roundabouts are safer, but the number of crashes could increase after installation

- Especially at multilane roundabouts
- And especially at “double-double” roundabouts

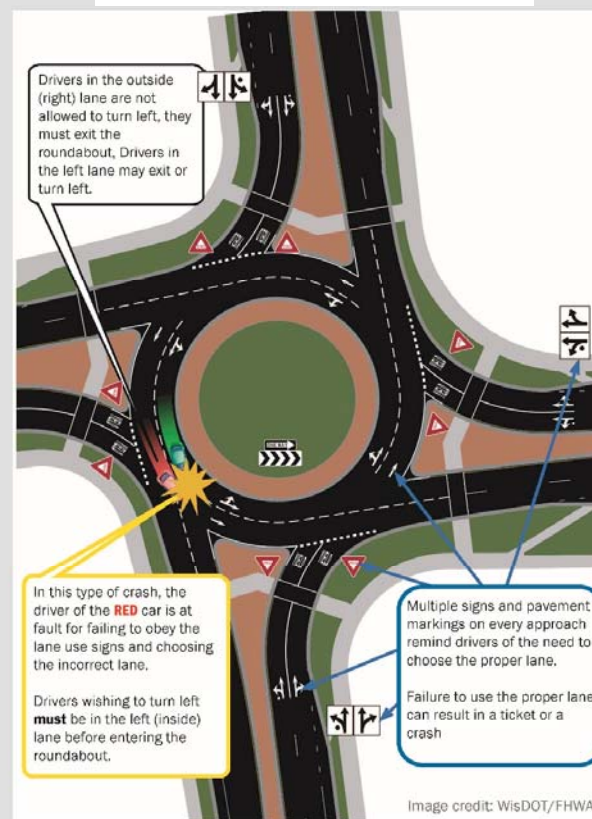


Top 2 Driver Mistakes

Not yielding to all lanes of traffic



Turning from wrong lane



Not yielding to all circulating traffic



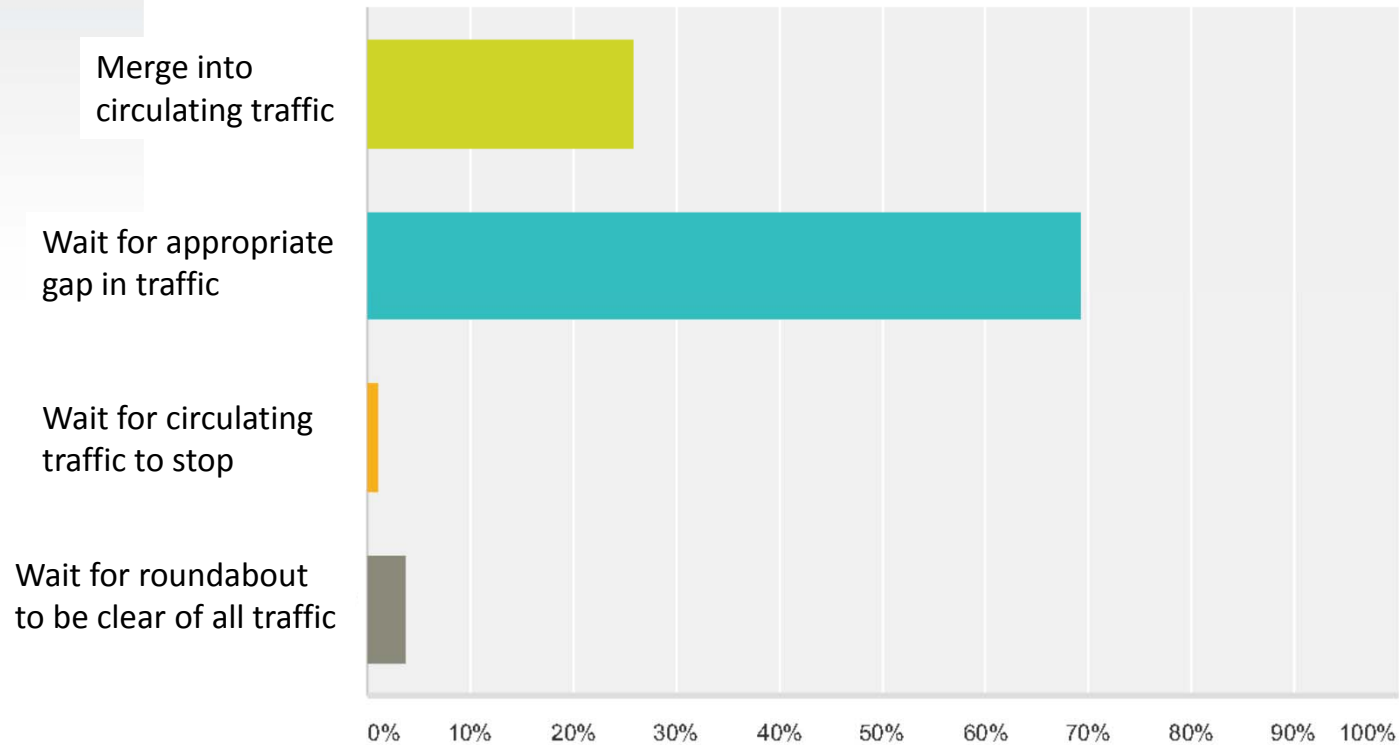
Turning from the wrong lane



Some people think they should “merge” into traffic

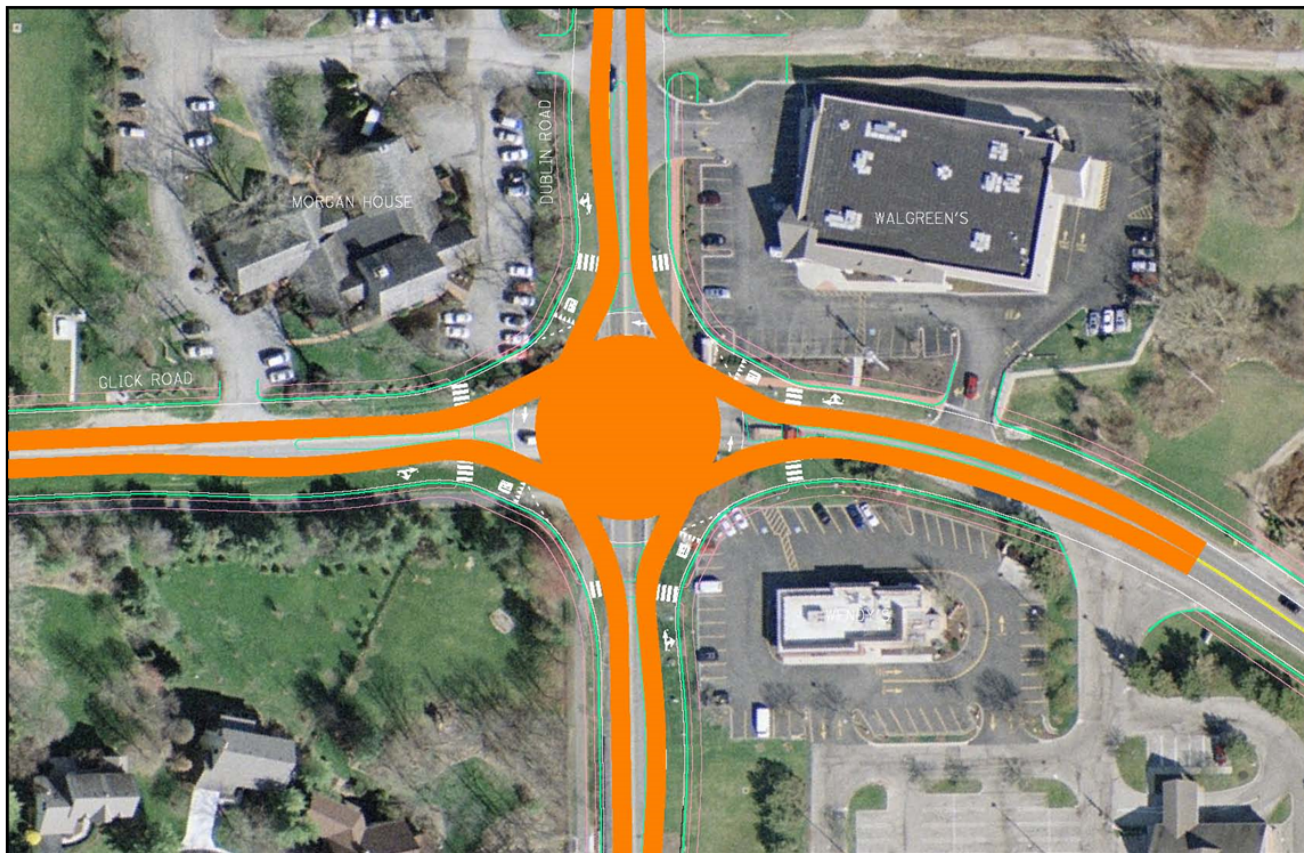
Q20 How should a motorist enter a multi-lane roundabout?

Answered: 2,645 Skipped: 362

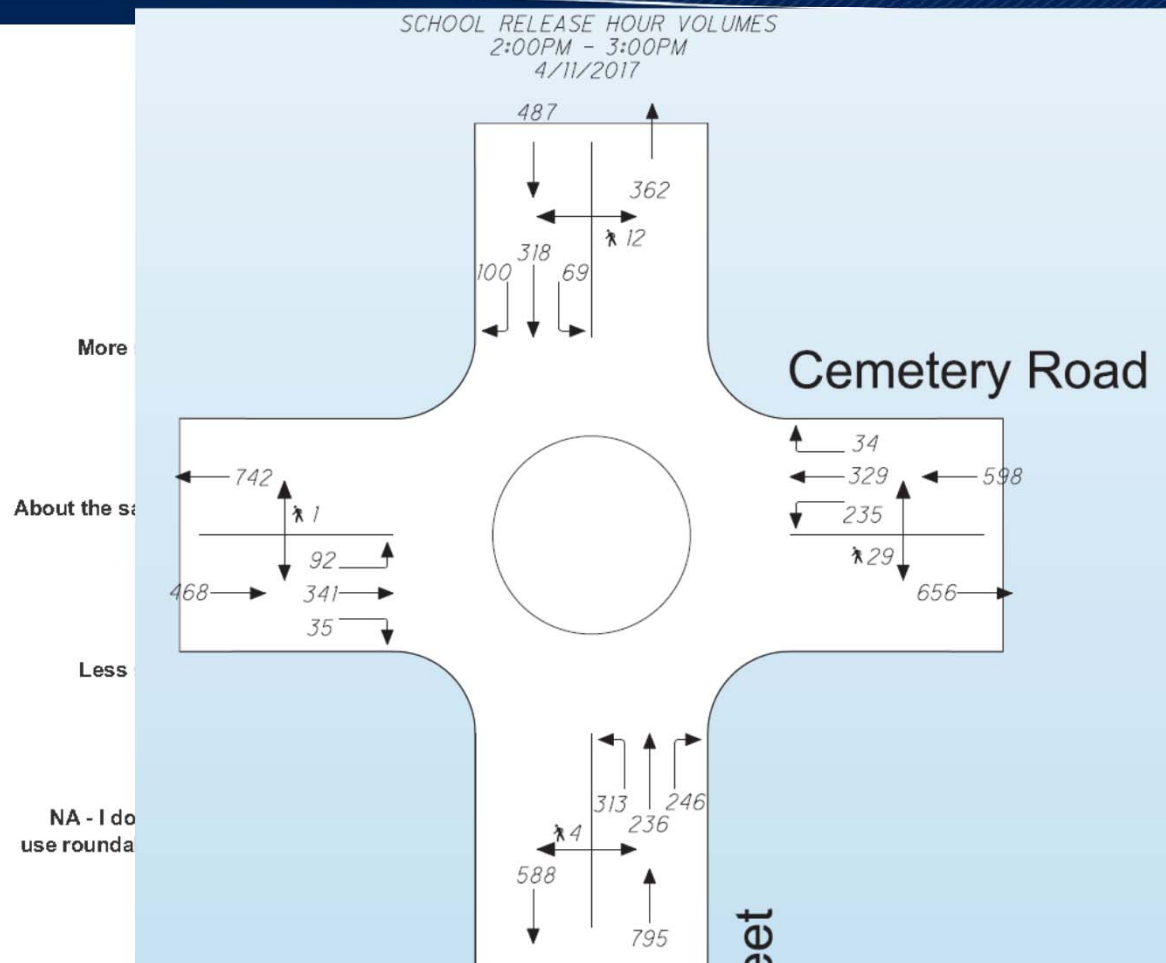


It is better to start smaller, expand later (if needed)

Single-lane Roundabout Footprint (Orange versus 2030 Design)

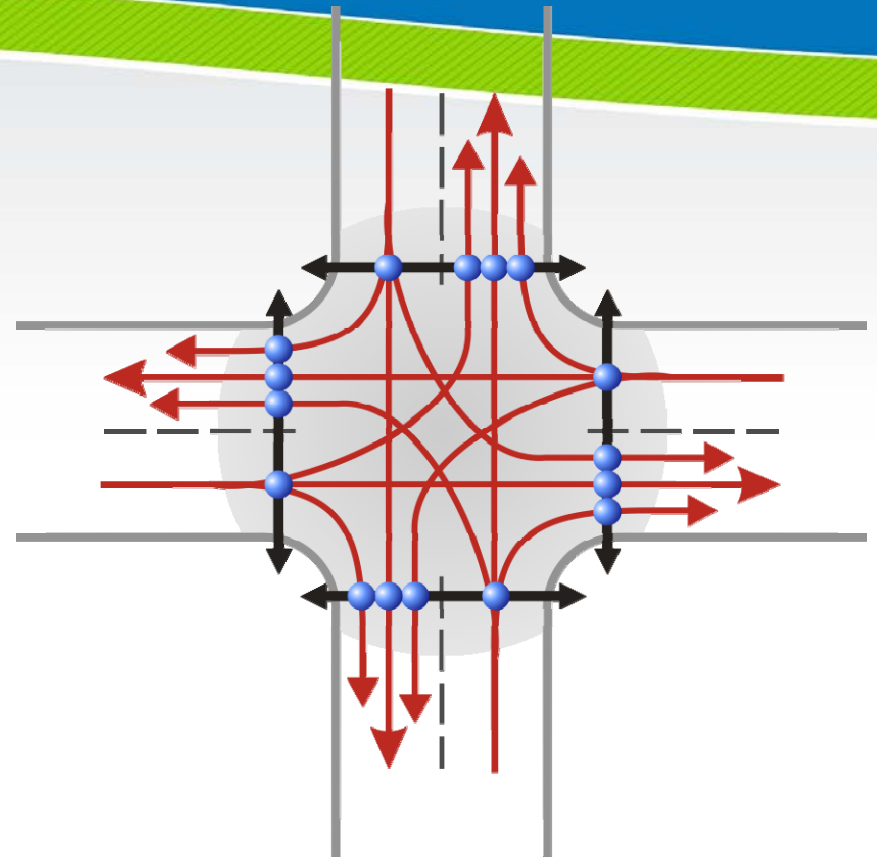


People will say they are not safe for pedestrians, but they are...



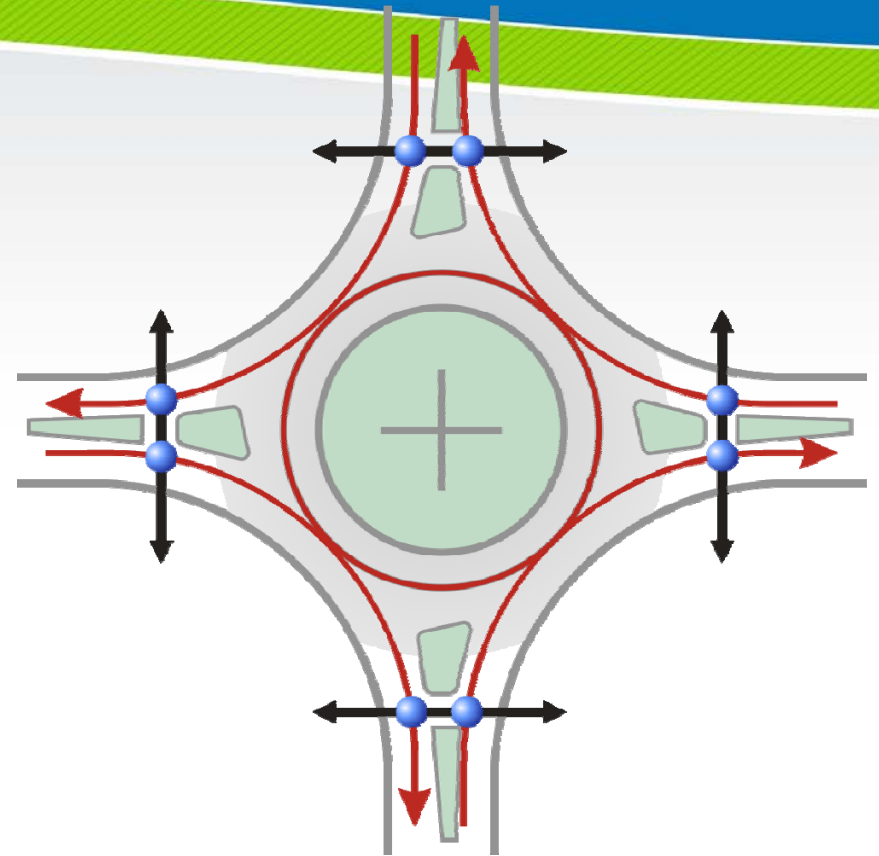
Do signalized intersections feel safer?

- Key vehicle/pedestrian conflicts:
 1. Right turns on green (legal)
 2. Crossing movements on red (high-speed, illegal)
 3. Left on green (legal for permitted phasing)
 4. Right on red (typically legal)

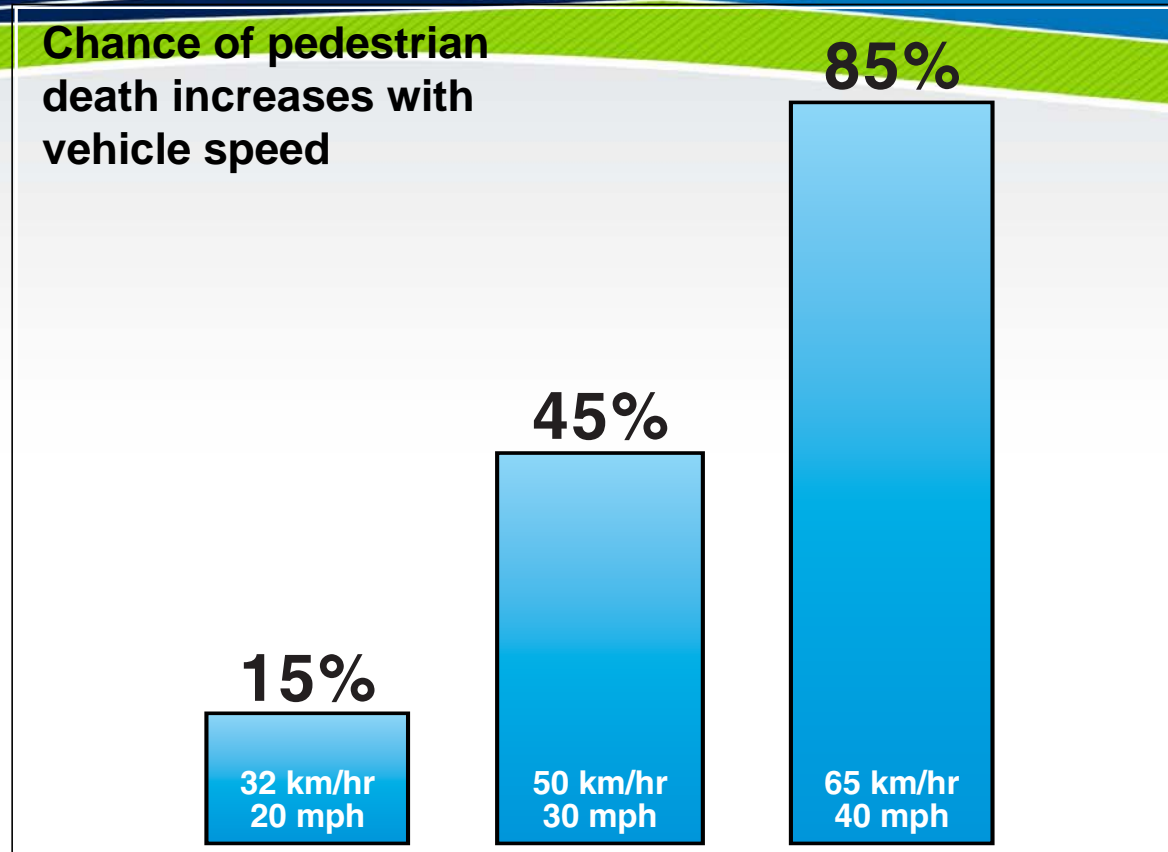


Roundabouts are easy to cross, but there are some challenges

- 2 conflicts exist for each crossing
 - Conflict with entering vehicles
 - Conflict with exiting vehicles
- Biggest issues
 - Second lane conflicts (multilane)
 - Exit leg vehicle yielding
 - Blind pedestrians



Lower speed at roundabouts is safer for pedestrians



Source: United Kingdom

Reduced number approach lanes creates opportunities



A few people will be strongly opposed to a new roundabout – until it actually opens

Managing Editor of Athens Messenger

*When you're wrong, you're wrong.
And when it comes to the Richland
Avenue roundabout, I'm woman
enough to admit I was wrong.*

*It seems as though the engineers behind the
roundabout knew exactly what they were
doing when they brought the roundabout
concept to Athens.*

*I will gladly attend the dedication ceremony ... and personally
thank the individuals behind the project.*

Contact

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