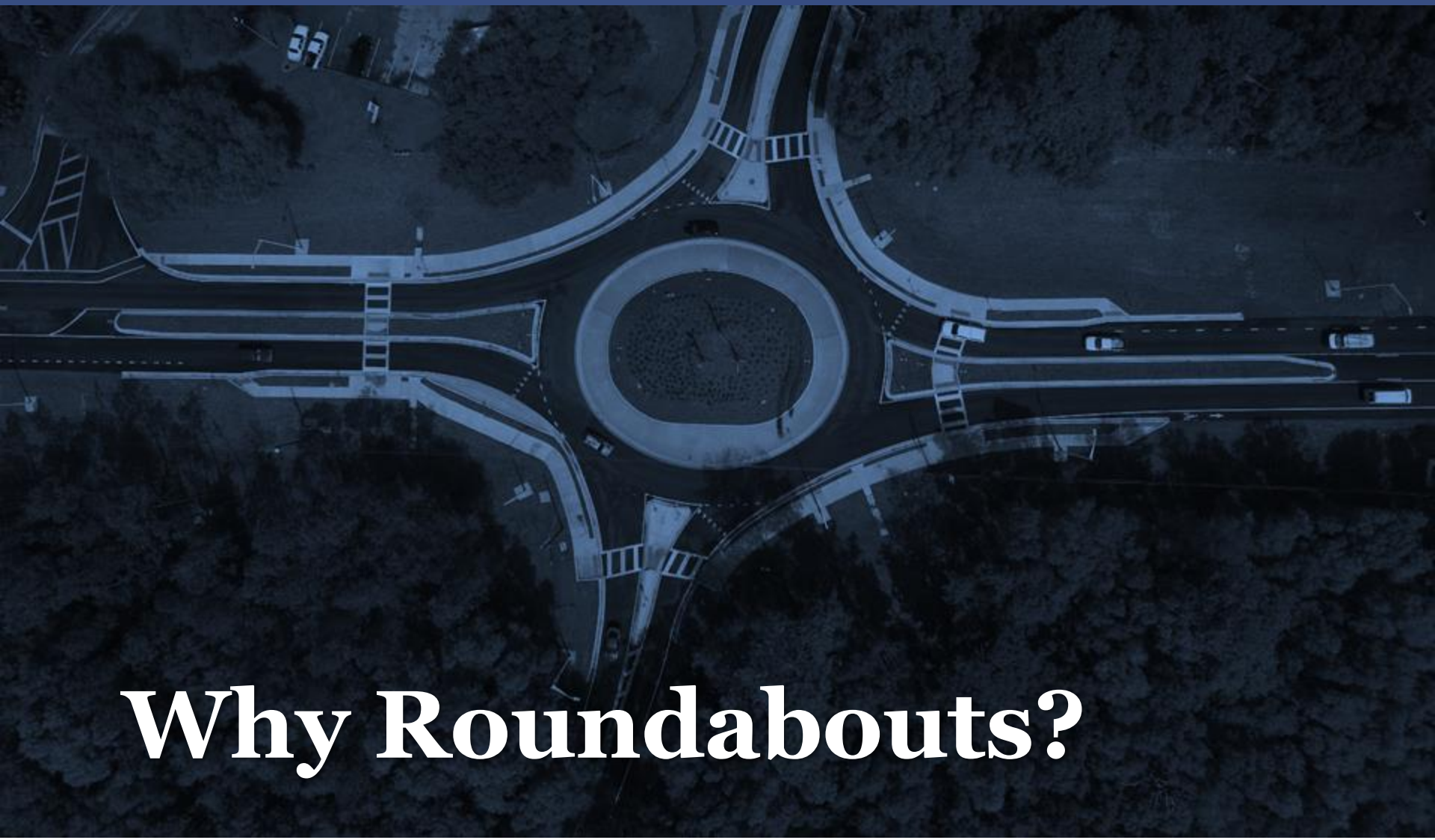
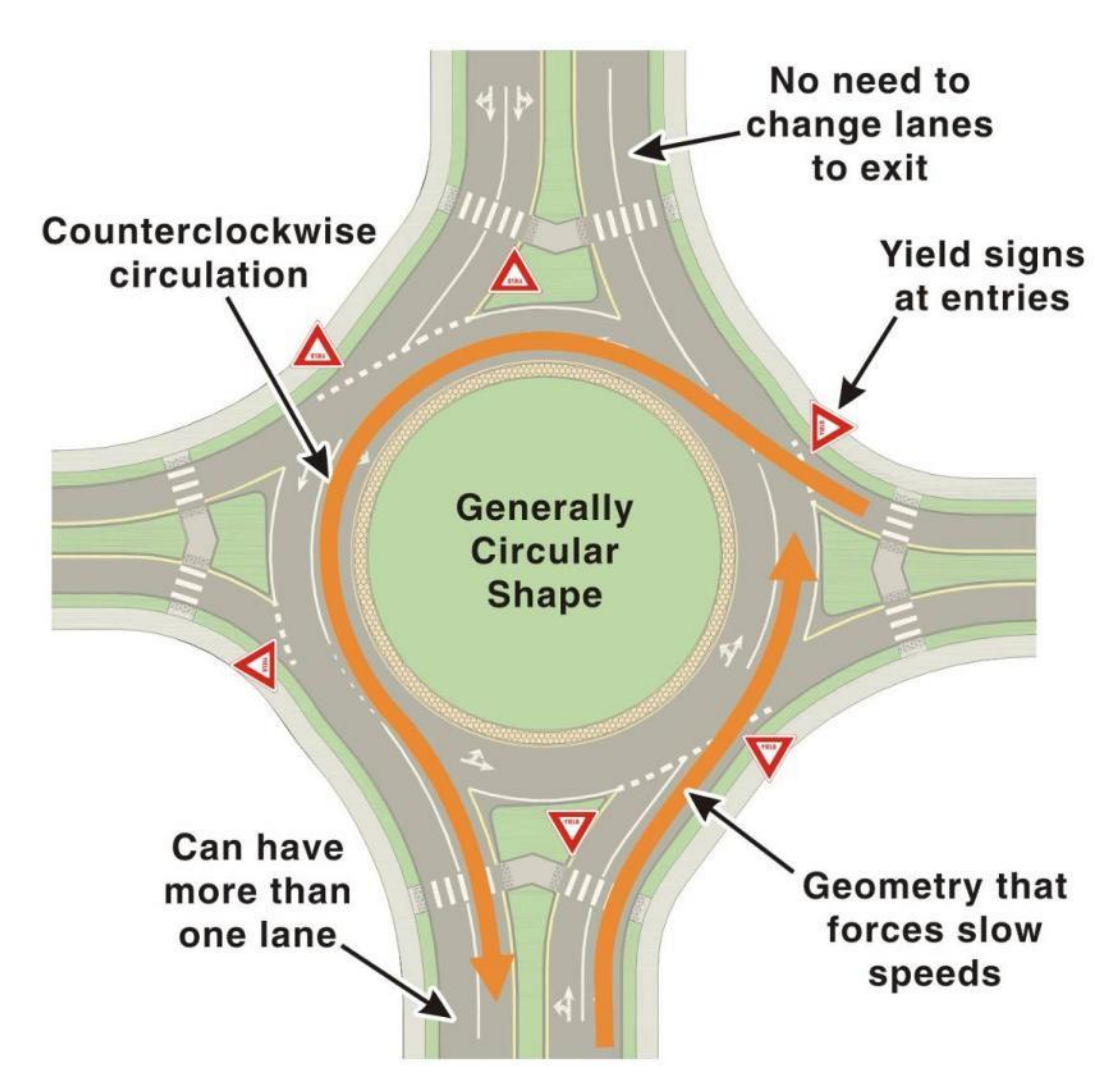


Why Roundabouts?

What is a Modern Roundabout?



NCHRP Report 672, Exhibit 1-1

Why Roundabouts?

- Safer than Signalized or Stop Controlled Intersections
  - 35% reduction in **ALL** crashes
  - 76% reduction in **INJURY** crashes
- Reduces Delay, Improves Traffic Flow
- May reduce need for widening a road or adding turn lanes
- Reduced Emissions and Wasted Fuel
- Better Aesthetics/Landscaping Options
- Supports Access Management
- Traffic Calming

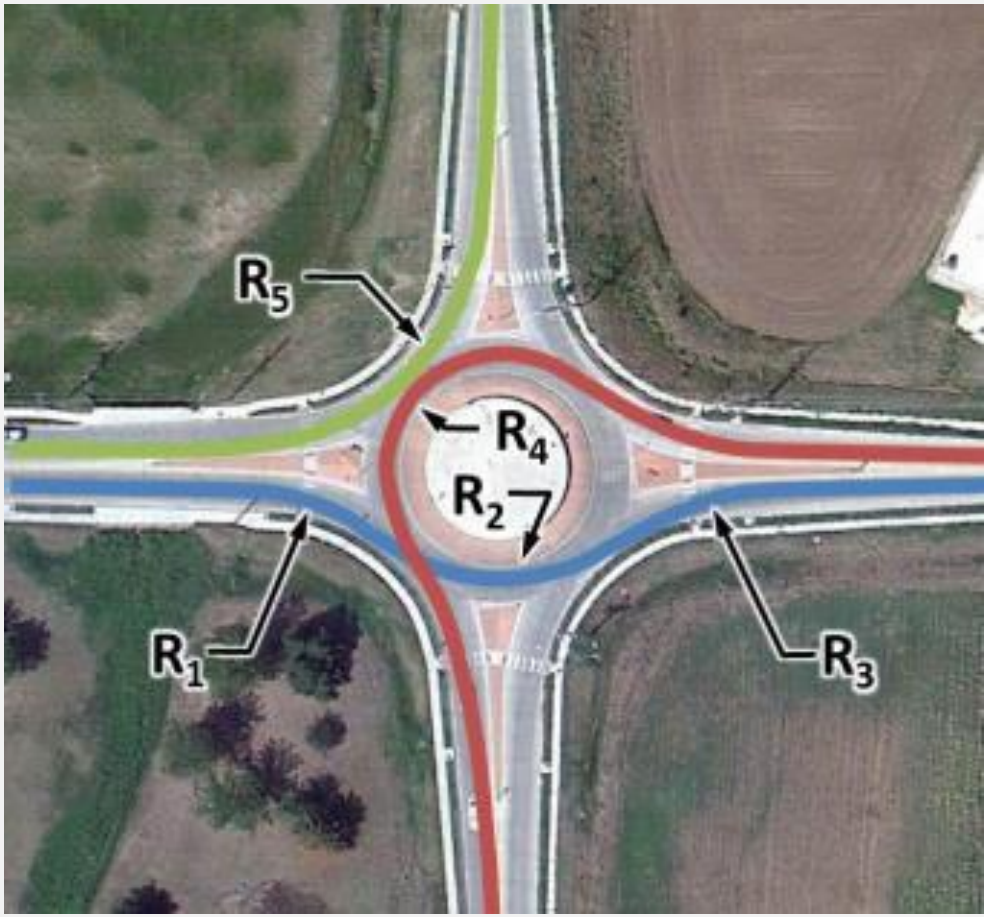
Safety Performance

- Roundabouts are one of FHWA's 20 Proven Safety Countermeasures
- Roundabouts have a proven safety record for reducing motor vehicle crashes, particularly fatal and injury crashes
- Experience is due to basic contributing factors:
  - Reduced vehicle speeds
  - Reduced conflict severity
  - Reduced driver decisions
  - Reduced conflict points

Speeds: REDUCED

- "Fastest Path" speed control through roundabouts
  - 25 mph for single-lane
  - 30 mph for two-lane

- Slow intersection speeds =
  - Increased time for driver reaction
  - Decreased chance for injury or fatality

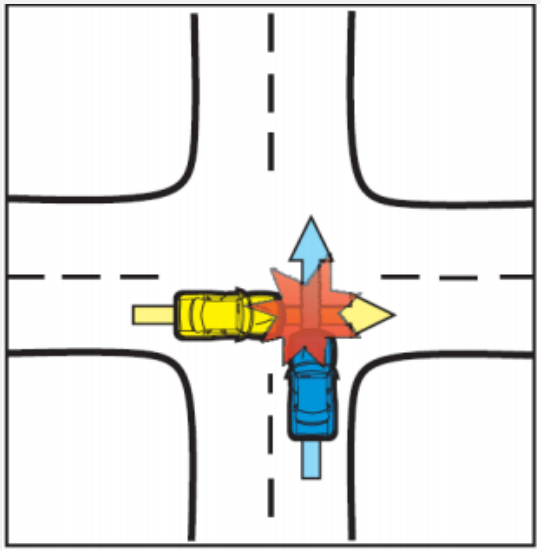


Severity of Conflicts: REDUCED

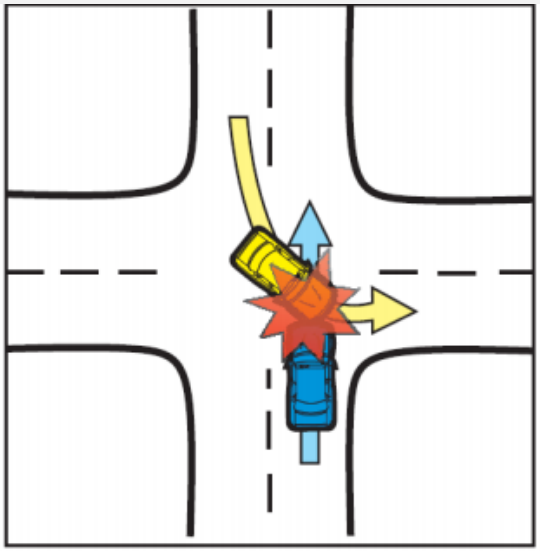
- Roundabouts remove the most severe head-on and right-angle crash types.

Typical 4-leg intersection

Right-Angle

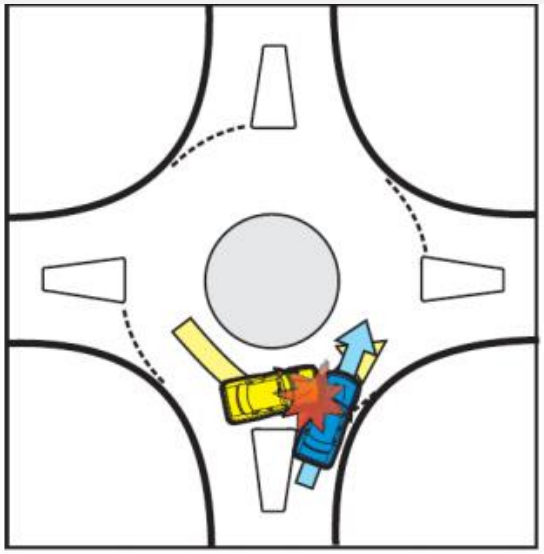


Left Turn



Roundabout

Sideswipe / Shallow-Angle



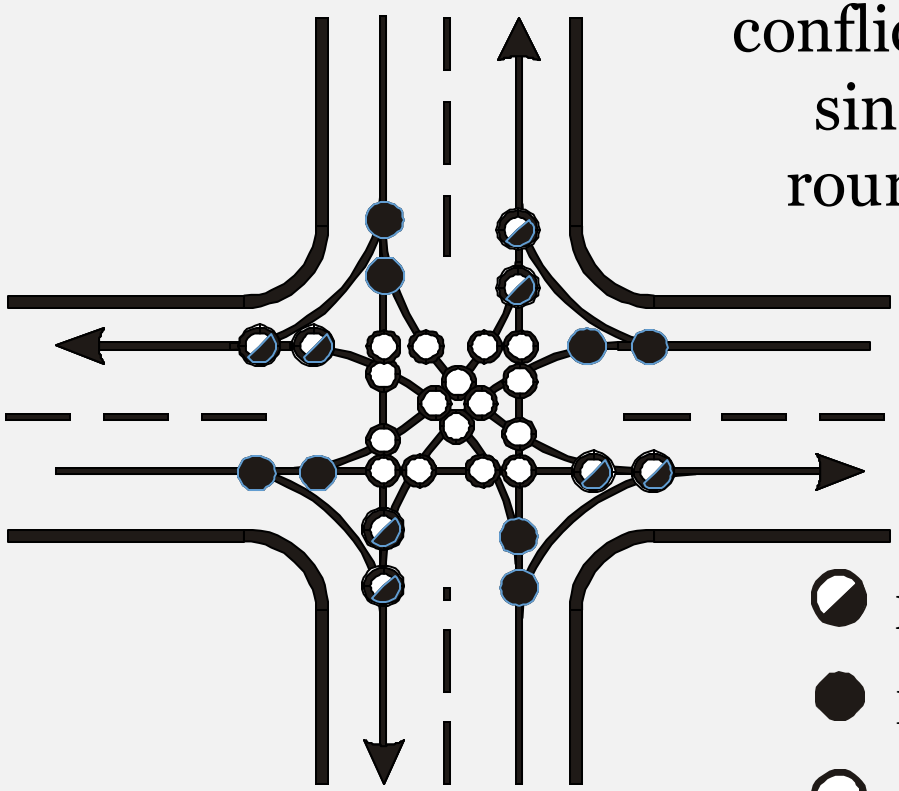
Kansas Roundabout Guide, Second Edition

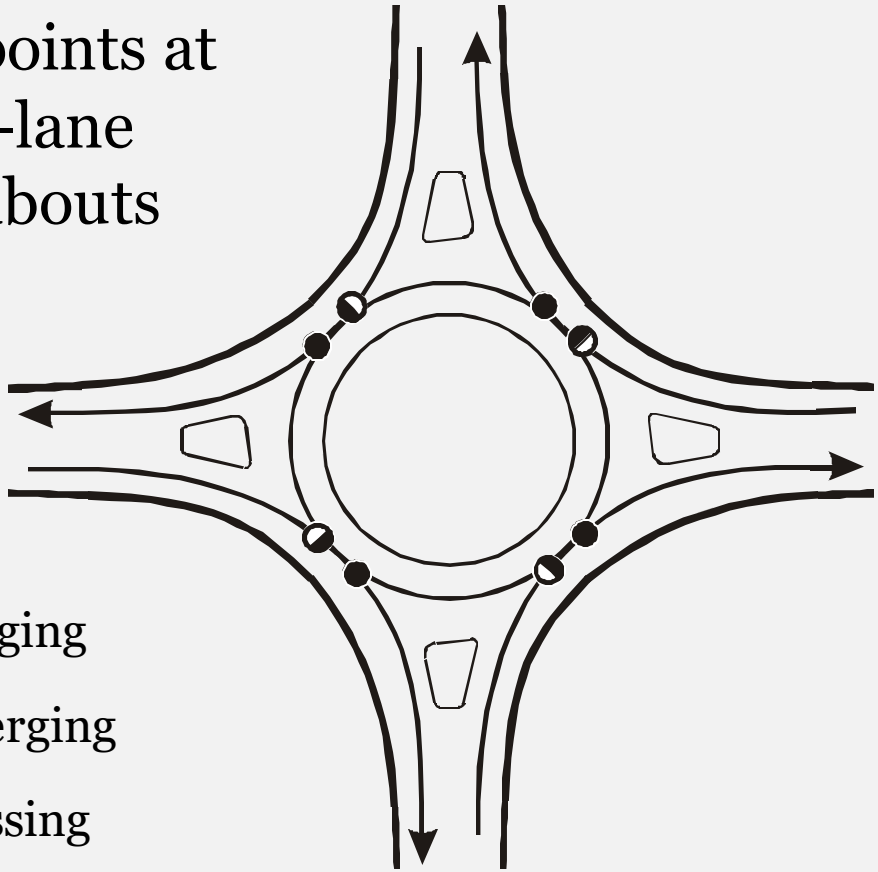
Vehicle Conflict Points: REDUCED

Up to 32 conflict points

8 conflict points

Up to 75% fewer conflict points at single-lane roundabouts





Merging

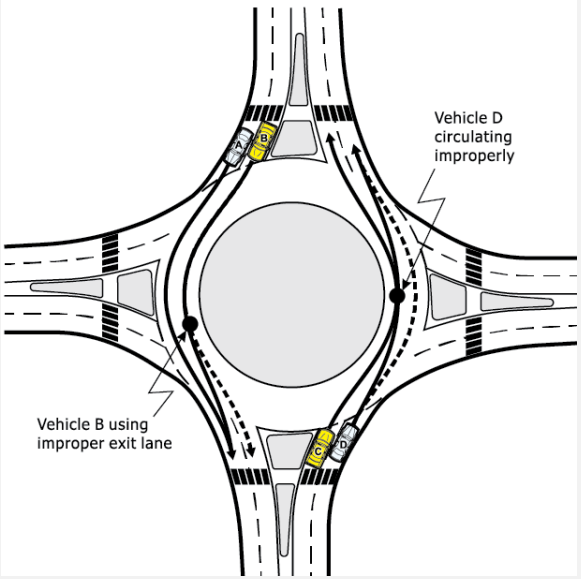
Diverging

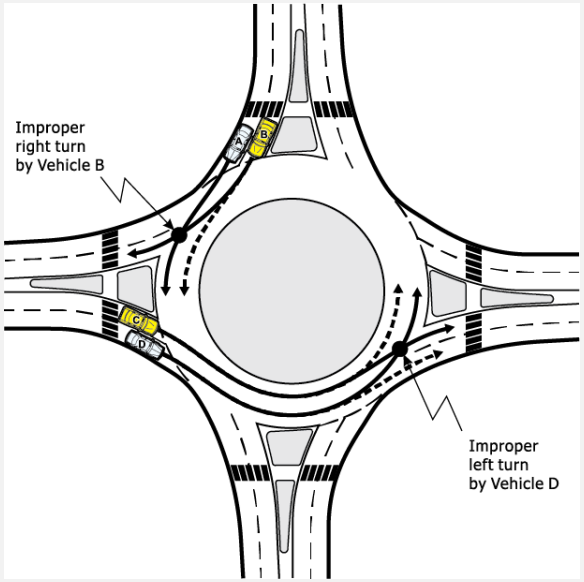
Crossing

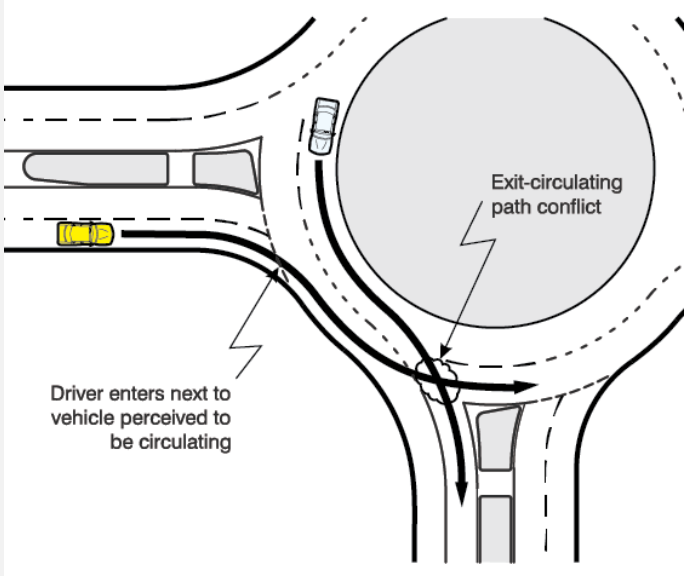
NCHRP Report 672, Exhibit 5-2

Vehicle Conflict Points: Multilane Roundabouts

- Additional lanes may increase conflicts points
  - Conflicts eliminated/minimized through proper design
  - Typically fewer conflict points than conventional intersection
- Conflict types typically low-severity (fender-bender)







Safety Study Results
TWSC to Roundabout Conversions

- Convert two-way stop control to roundabout

44% — All crashes

87% — Fatal/injury crashes in rural area

78 % — 1-lane

72 % — 2-lane

Fatal/injury crashes in urban/suburban areas

Safety Study Results
Signal to Roundabout Conversions

- Convert signalized intersection to roundabout

21% All crashes

66% Fatal/injury crashes

Safety Comparison
Signal or Stop Control?

Traffic Signal

- Higher speeds:
  - Little response time
  - More severe crashes
- Greater conflict points
  - Red light-running
  - Permissive lefts
- Some crash reductions
  - Reduce angle crashes compared to TWSC
  - May increase rear-end

Single-Lane Roundabout

- Slower speeds:
  - Increased reaction time
  - Fewer severe crashes
- Fewer conflict points
- Greater crash reductions
- FHWA Proven Safety Countermeasure

Basics of Roundabout Operations

- Vehicles in the roundabout have Right-of-Way
- YIELD prior to entering
- Travel counter-clockwise around central island

Roundabouts Operations

- Efficient during peak *and* off-peak periods

Stops

Idling

Delay

Operational Alternatives Comparison

Traffic Signal

- Vehicles may have to stop regardless of presence/absence of demand on other legs
- Longer stopped queues and delay
- Higher off-peak delay
- Can prioritize major movements

Roundabout

- Vehicles do not have to stop if no conflicting traffic
- Shorter queues - traffic within queues continue to move
- Lower peak and off-peak delay
- All movements treated equally

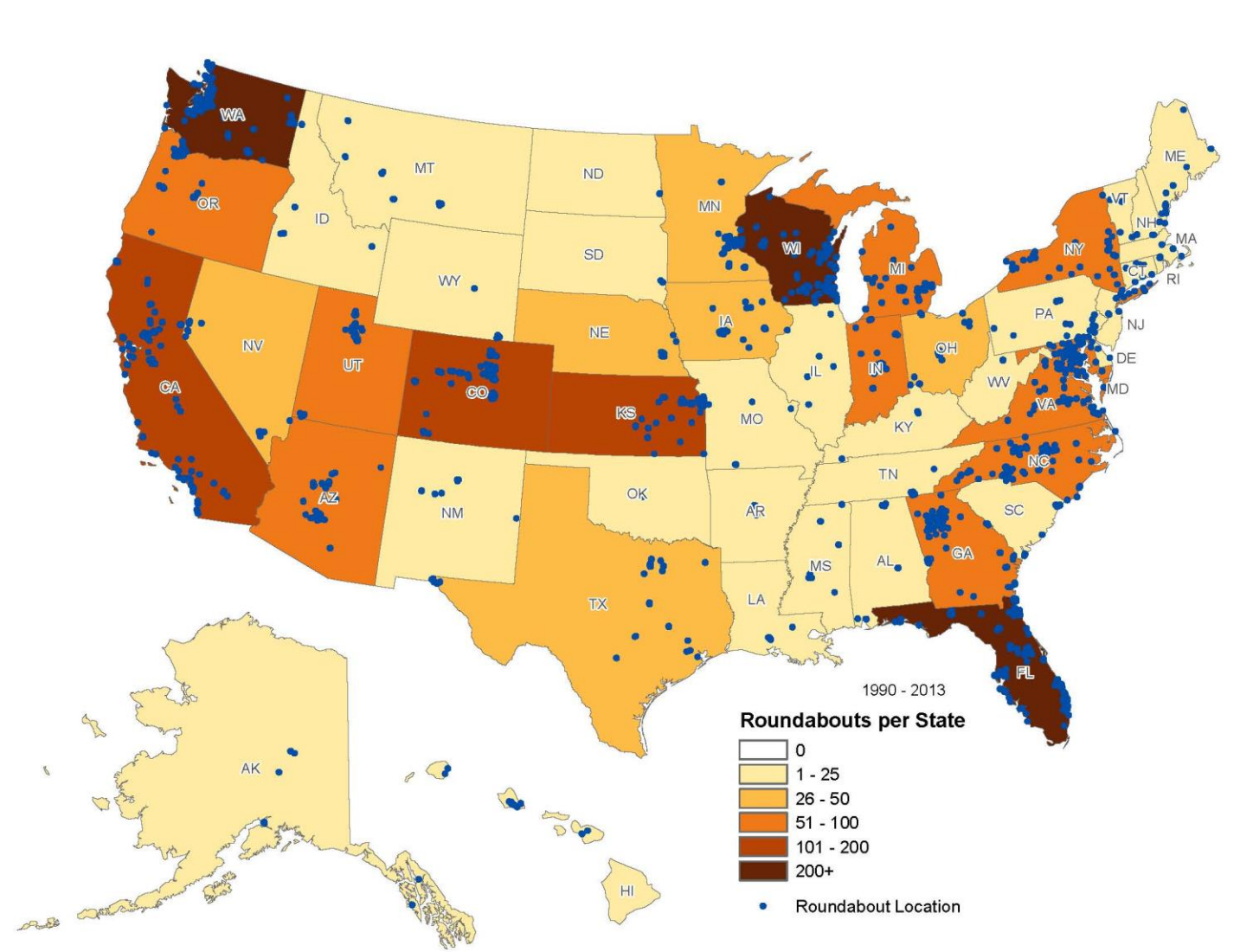
Why Not Just Install a Signal?

- Traffic signals can only be considered where the intersection meets warrants in the *Manual on Uniform Traffic Control Devices*
  - Minor street volumes must meet minimum volumes levels to allow for signal consideration

- Unwarranted traffic signals can result in excessive delay, noncompliance, and increased frequency of crashes.

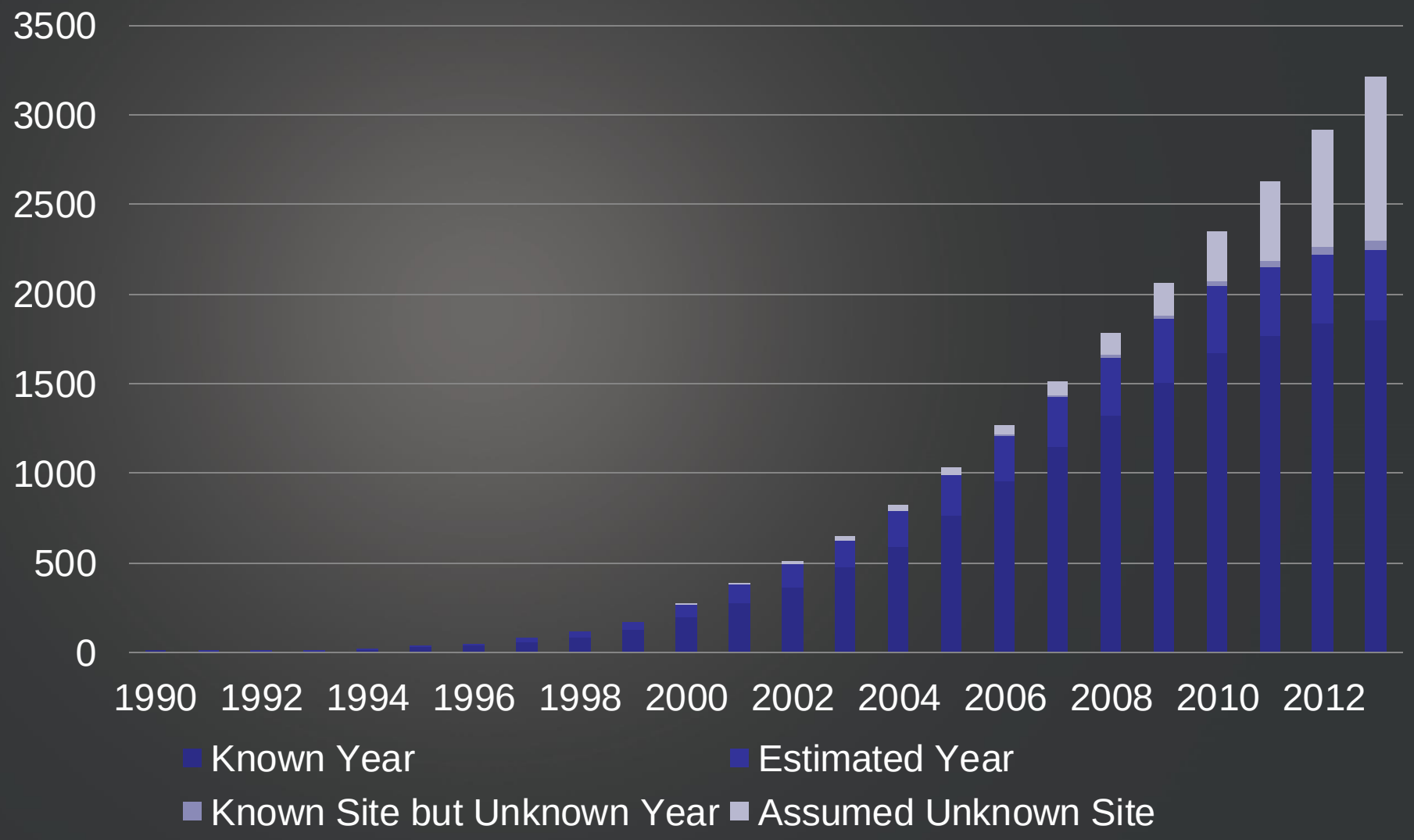
- Increased stops & delay during off-peak hours.
  - Less flexible to changing traffic conditions
  - Require regular updates to signal timings

Over 25 Years of US Experience With Roundabouts



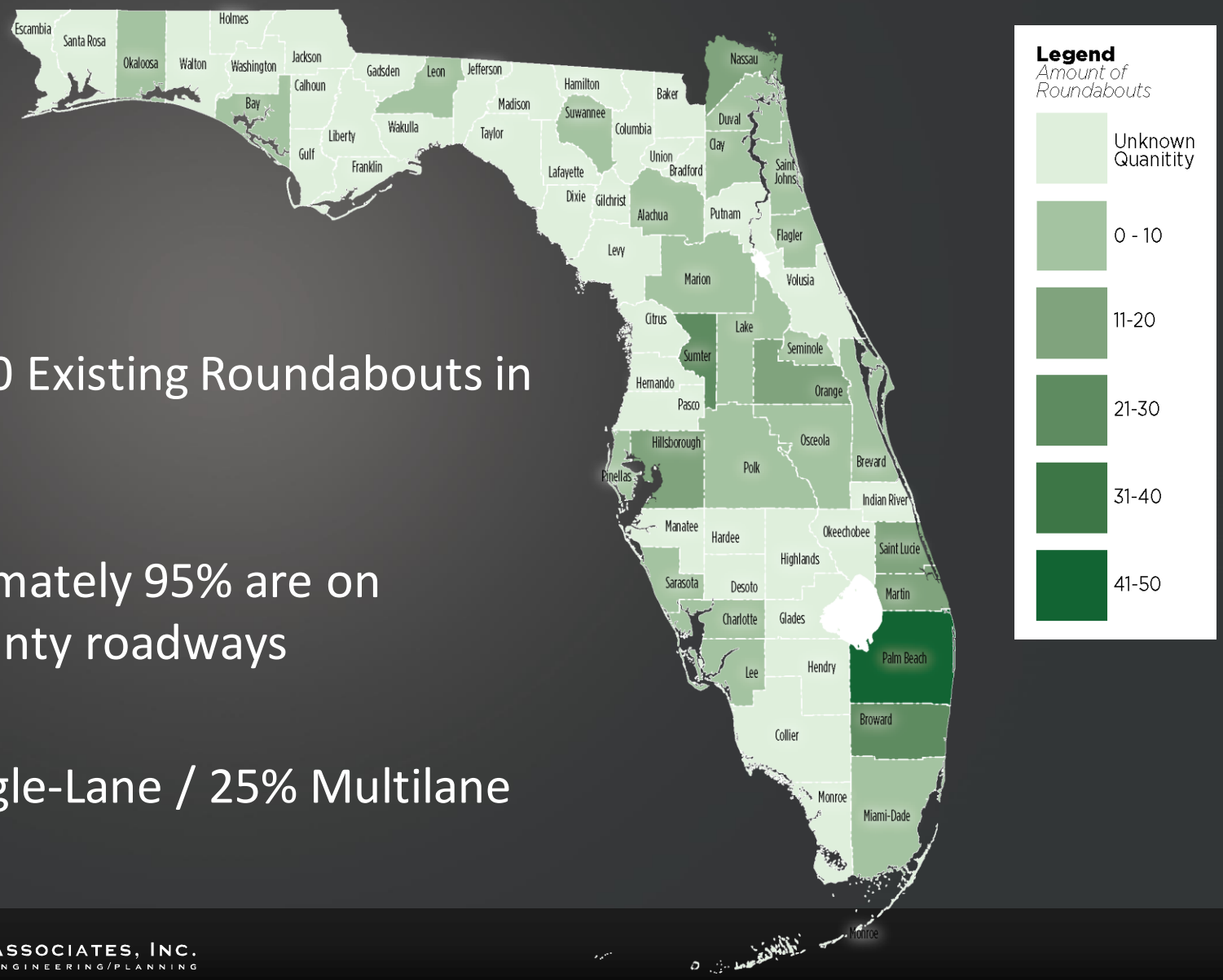
Source: Rodegerdts, L. A., "Status of Roundabouts in North America", TRB 4th International Conference on Roundabouts, Seattle, WA, April 2014.

…to a cumulative total of about 3,500 today.



Based on database at roundabouts.kittelson.com

Current Roundabout Implementation



- Over 300 Existing Roundabouts in Florida
- Approximately 95% are on City/County roadways
- 75% Single-Lane / 25% Multilane

Single-Lane Roundabout Examples

Five Points Roundabout
Sarasota, FL

SR A1A at Amelia Village Cir
Amelia Island, FL

Multilane Roundabout Examples

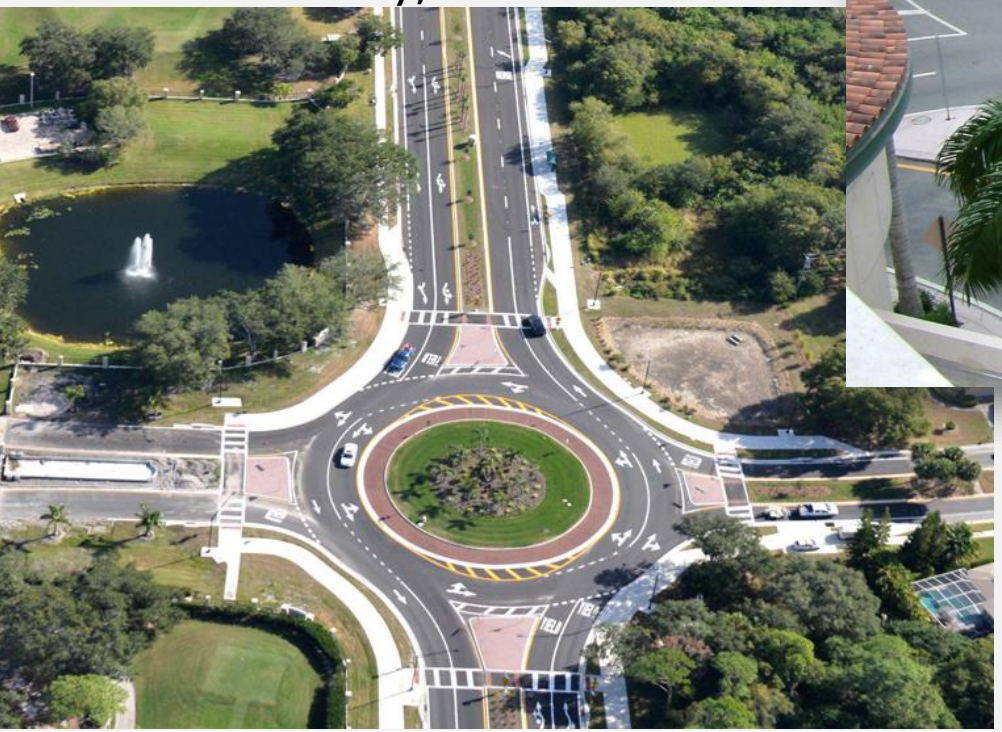
Causeway Blvd at Coronado Dr
Clearwater Beach, FL

40th St at Riverhills Dr
Tampa, FL

Multilane Roundabout Examples

Segovia St at Biltmore Way,
Coral Gables, FL

Bee Ridge Road,
Sarasota County, FL



Multilane Roundabout Examples

Roundabouts on High Speed Roadways (Isebrands)

- Study of 19 rural roundabouts
  - Posted Speeds 45 to 65 mph
  - Sites in Maryland, Oregon, Washington, Kansas, Wisconsin, & Minnesota
  - When converted from stop-control to roundabout:
    - 67% reduction in total crashes
    - 87% reduction in injury/fatal crashes

SR 44 at Grand Ave (Deland, FL)

SR 44 at Grand Ave (Deland, FL)

Placeholder Slide for Roundabout Video

Video removed due to file size.

SR 33 at Deen Still Rd (Polk County)

SR 17 at Hunt Brothers Rd (Polk County)

CR 561 at CR 455 (Lake County)

CR 561 at CR 455 (Lake County)

Placeholder Slide for Roundabout Video

Video removed due to file size.

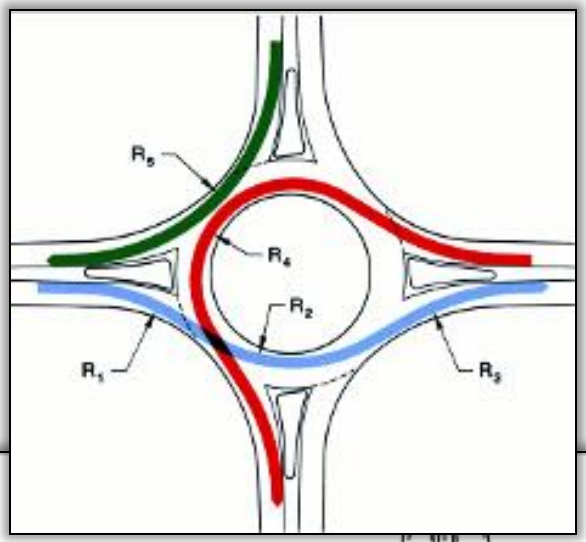
CR 561 at CR 455 (Lake County)

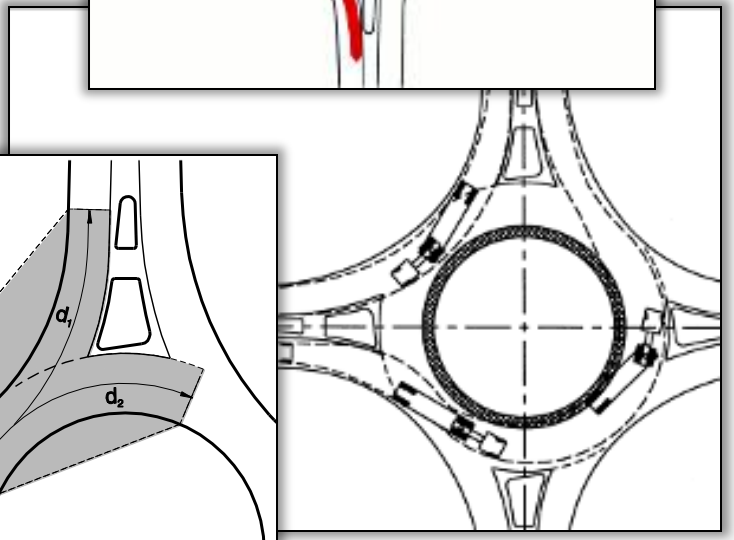
According to Lake County Public Information:

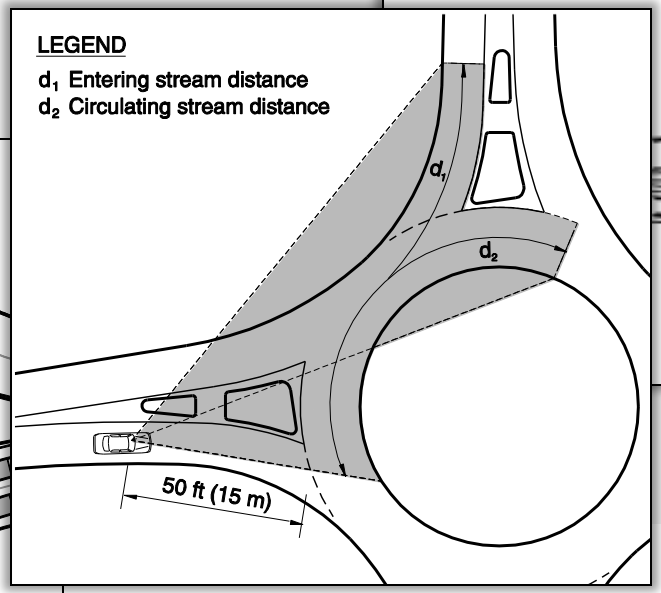
- From 2002-2012
  - 32 Crashes
  - 2 Fatalities
  - 3.2 crashes per year
- First year after roundabout opened
  - ***No crashes***

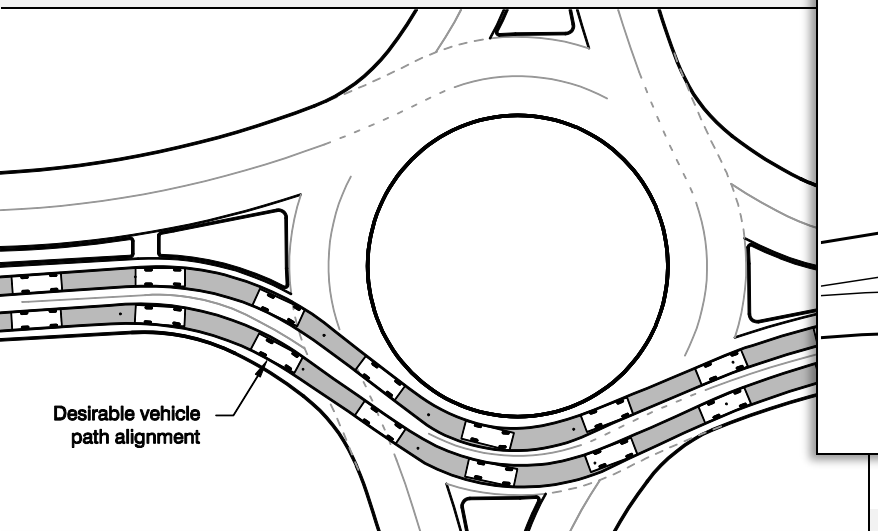
Roundabout Design is More Than Just Drawing a Circle

- Fastest path speed control
- Vehicle path alignment
- Design vehicle accommodation
- Non-motorized users
- Sight distance and visibility
- Driver view angles









Designing for Trucks

- Trucks considered during earliest planning stages
- Truck aprons provided to accommodate the largest vehicle reasonably anticipated to use the intersection
  - May include oversize vehicles (mobile homes, etc.)

Roundabout Public Reaction

- Typical experience (but not always):
  - Wide range of opinions toward roundabouts
  - Negative reactions before construction
  - Shift towards neutral or positive reactions after construction

- Common misconceptions based on rotaries or neighborhood traffic circles
- In some US communities, roundabouts are now being requested by residents

FDOT

Roundabout Public Opinion ITE Study

	Before Construction	After Construction
Strongly Favor	16%	32%
Somewhat Favor	15%	31%
Don't Know	14%	9%
Somewhat Oppose	14%	13%
Strongly Oppose	41%	15%

31%

63%

55%

28%

ITE Journal, Sept. 2002 (Retting, et al.) Survey in KS, MD, and NV

FDOT

Examples of Public Reactions *After* Roundabout Installation

"We don't even have the striping done yet and it is just working like a dream," he said last week, watching as cars flowed down Shenandoah Road from the winery loop, merging with vehicles on Highway 49."

"Sanders initially opposed the roundabout. "I wanted to keep Plymouth the way it was. I liked the old Plymouth with the rural look, no sidewalks. Why are we having to look like Napa?"

Now, she says she loves it.

The Sacramento Bee, Jan 2018

Livingston Parish drivers coming around on roundabouts

A new roundabout has opened in Denham Springs at the intersection of Cockerham and Lockhart Roads.

"It keeps traffic flowing. You're not sitting there waiting for your turn," Make Nevels said.

So far, drivers are giving it rave reviews.

"It's working better than that red light was," Harry Young said.

It's still a work in progress, and it may confuse drivers who haven't seen them before.

Young's Home Appliances has been on Lockhart Road for 37-years. They say the roundabout is an attitude adjustment for their customers.

"People aren't getting stuck in traffic, they don't get aggravated."

WBRZ, Feb 23

FDOT

Examples of Public Reactions *After* Roundabout Installation

Intersection fixes might be circular

Time for a retraction.

I know you will find this impossible to believe, but three years ago your favorite columnist erred.

It was not an error of fact, but of judgment. In February 2002, I came before you and ridiculed the ``roundabout,'' a traffic engineering concept that was being tested in a handful of cities around the country.

But since then, I have seen the light.

Barely a year old, Dublin's roundabout is located directly in front of Muirfield. And it's working exactly the way it was drawn up.

In the heart of rush hour on a recent Thursday afternoon, I approached the circle and saw four cars ahead of me. In no more than five seconds, all four cars were out of my way, and I was on the circle. The layout, signs and striping made it obvious who was supposed to do what.

The Beacon Journal, Jun 2005