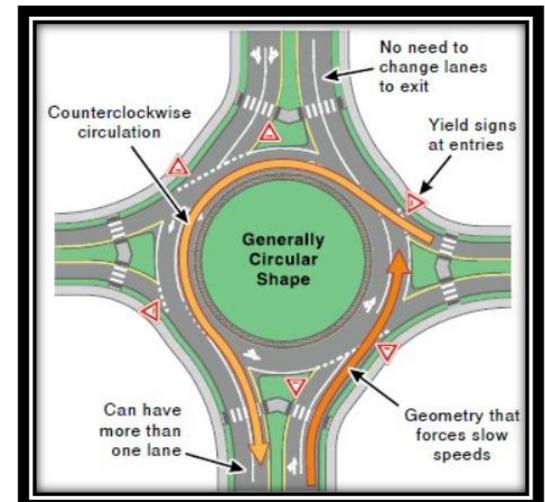




Roundabouts in Florida

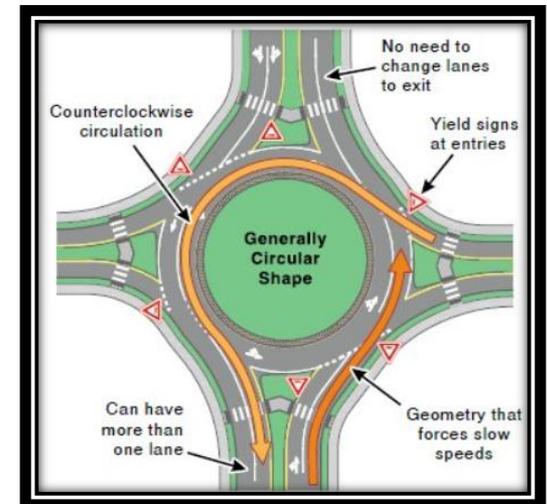
Part 1 – Lesson's Learned

Part 2 – Critical Features



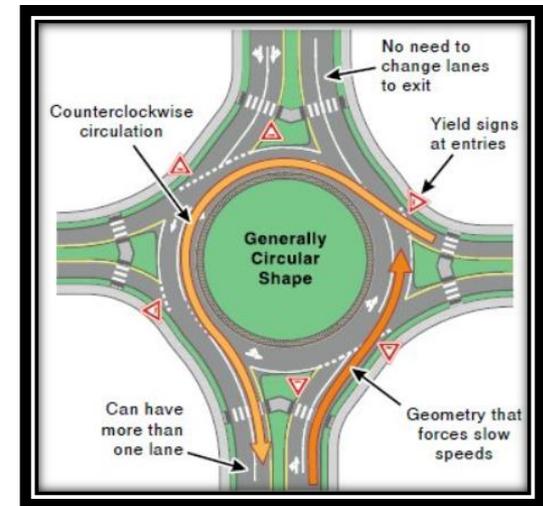
Part 1 Topics

- How is Florida doing
 - FDOT, Off-System and Nationally
Presented by Paul Hiers
- Successes and Challenges
 - District One Rural Roundabouts
Presented by Walt Breuggeman
 - District Five SR 44 Roundabout
Presented by ????



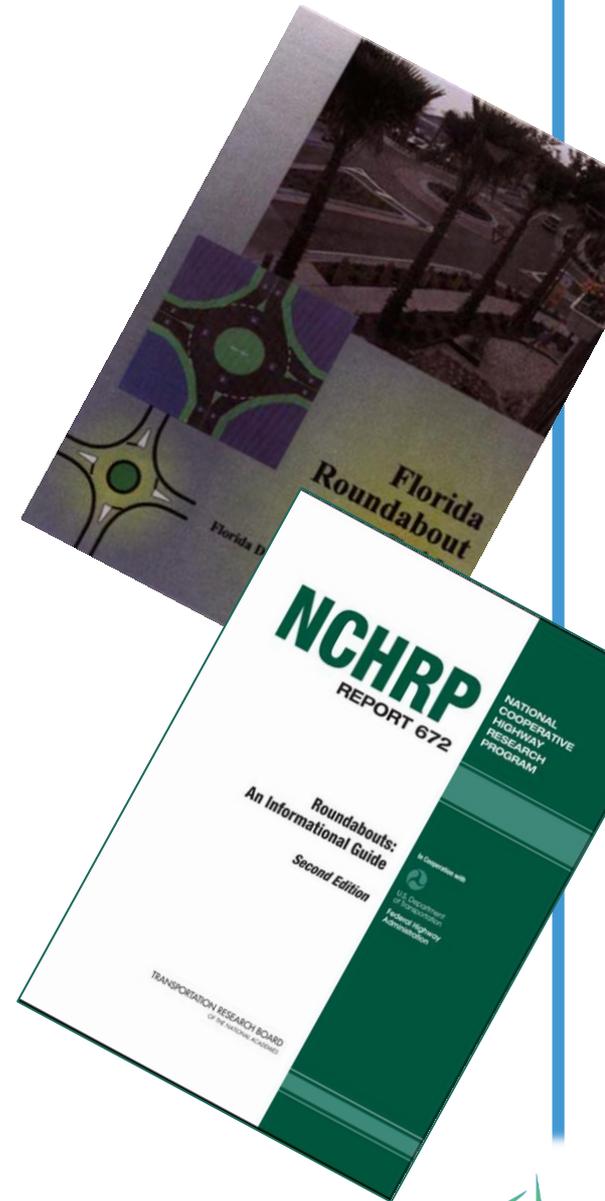
Part 2 Topics

- Central Office Review
 - Process and Common Errors
 - Design Requirements on SHS
- When Things Go Wrong
- Critical Features
 - Signing
 - Landscaping
 - Lighting
 - Aprons and Splitter Islands
 - Design Vehicle
 - Path Overlap
- Driver Mistakes



A Little History

- 1996 One of two States with a Roundabout Design Guide
 - PPM stated roundabouts are the preferred intersection control on SHS
- 2007 Roundabout Guide Sunsetting and Adopted FHWA Guide
 - PPM stated that roundabouts shall be considered.
- 2012 Formally adopted NCHRP 672
 - PPM stated that roundabouts must be evaluated.
- 2014 Provided tools for Evaluation
 - PPM dropped “preferred”
 - Given “equal consideration”



How is FDOT doing?

Roundabouts on SHS

2012 – 7

2014 – 13 after 18 years of “preferred”

2015 – 21

2016 – 29 projected



How is FDOT doing?

2015

- 8,483 Signals on SHS
 - An increase of 9 from 2014
- 21 Roundabouts on SHS
 - An increase of 8 from 2014

(according to RCI)

District	Constructed	Planned
1	3	4
2	7	1
3	0	2
4	9	2
5	0	6
6	0	0
7	2	0
FTE	0	0

Why should we want more?

Vehicles

- 35% reduction in total crashes
- 75% reduction in injury crashes
- 90% reduction in fatal crashes

Pedestrians and Cyclists

- 54% reduction in total crashes

Why are we not building more?

- Initial Investment
- Resistance from Public or Businesses
- Project Schedule (R/W, Utilities)
- Not safe for Pedestrians and Cyclists
- ADA concerns (2-Lane)



How is Florida doing

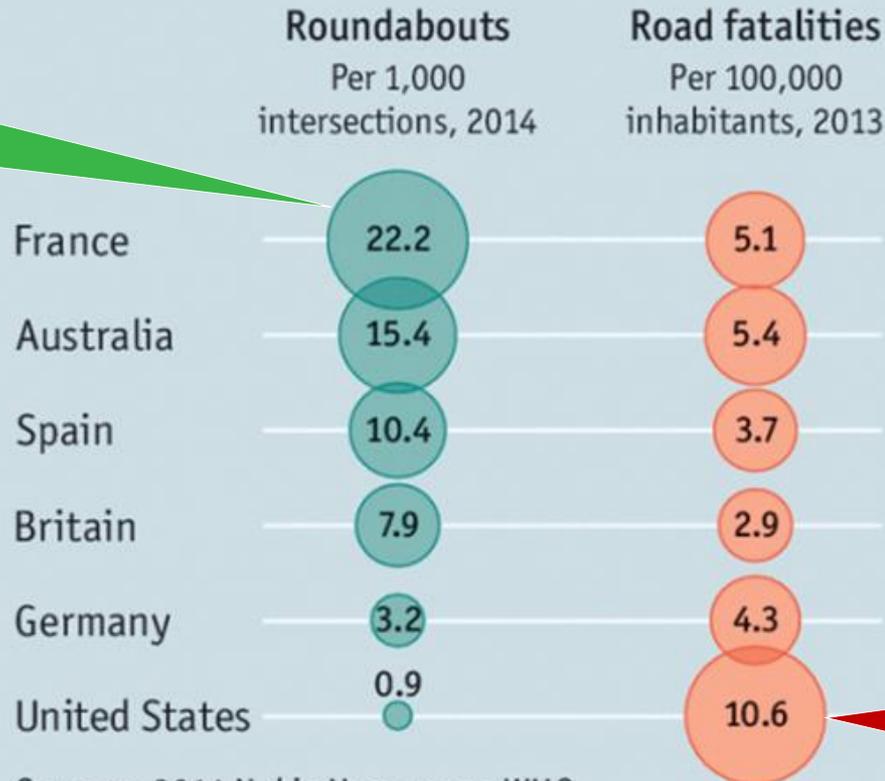
- Approximately 300 “roundabouts” on Off-system Roads
- The Villages in Sumter/Marion Counties has 30 two-lane modern roundabouts.
- Downtown Ft. Pierce:



How is the US doing?

FRANCE –
300 NEW
ROUNDBABOUTS
EACH YEAR

Circles of life



Sources: 2014 Nokia Here maps; WHO

US – 8,200
INTERSECTION
RELATED
FATALITIES EACH
YEAR

Rural Roundabouts

SR 33 at Deen Still Road

SR 17 at Hunt Brothers Road

Rural Roundabouts

- Programmed due to High Number of Fatalities
- Prior to current Roundabout checklist found in Intersection Design Guide
- SR 33 / Deen Still – 5 fatalities and 29 injury crashes from 2005 to 2014.
- SR 17 / Hunt Brothers – 2 fatalities and 23 injury crashes from 2005 to 2014

Rural Roundabouts

- Significant crash history dating back several years
- Neither intersection met signal warrants
- Signal may reduce some crashes, but would likely create additional rear end collisions
- For Deen Still, County implemented rumble strips, stop ahead signage, and a flashing beacon on top of the stop sign
- Additional fatality crashes after implementation of minor improvements

SR 33 at Deen Still Road - Aerial



Roundabout Screening

- Does the intersection have any geometric or visibility limitations that would complicate construction?
- Does major roadway AADT exceed 90% of total intersection AADT?
- Does the intersection have pedestrians that would have difficulty crossing the road?
- Is the intersection located within a coordinated signal network?
- Is there downstream conditions that could cause queues to back up into the intersection?
- Would the roundabout create impacts to 4(f) or environmentally sensitive sites?

SR 33 at Deen Still Road – 150' I.D.

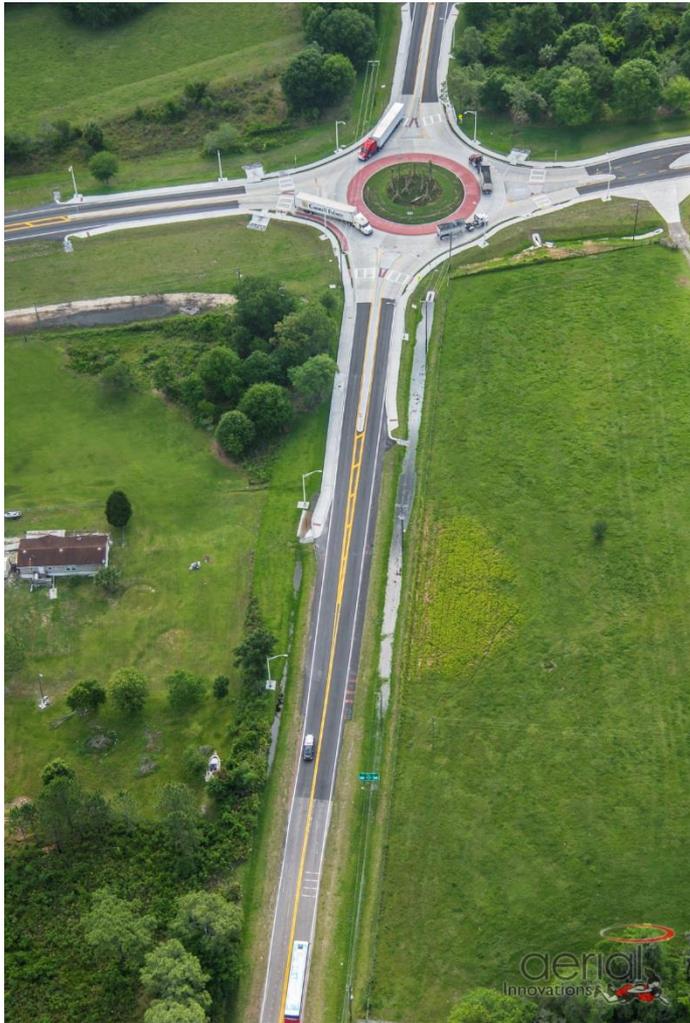
- Side streets under stop control
- Traffic signal not warranted
- 21.7% truck traffic
- Significantly higher speeds
- No realistic detour available
- It is in the Green Swamp
- Circle to be concrete
- Concrete circle does present a constructability issue
- Had adequate R/W for temporary pavement / MOT

SR 33 at Deen Still Road – 150' I.D.

- Less than a mile from Van Fleet Trail
- Constructing sidewalk
- Posted speed limit not changed
- Geometrically designed to lower speeds

SR 33 at Deen Still Road

LOOKING EAST



LOOKING NORTH



SR 17 at Hunt Brothers Rd - 115' I.D.

- Flashing Beacon Signal
- 3% truck traffic
- 55 mph posted on SR 17
- Lowered approach speed limit to 45 mph
- Circle to be asphalt
- No sidewalk due to right of way constraints and lack of pedestrian usage
- Part of bike trail
- Detour allowed for quicker construction

SR 17 at Hunt Brothers Pre-Construction



SR 17 at Hunt Brothers Construction



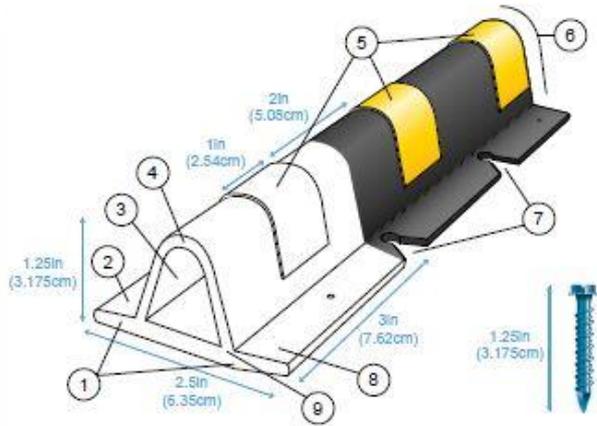
SR 17 at Hunt Brothers



SR 17 at Hunt Brothers



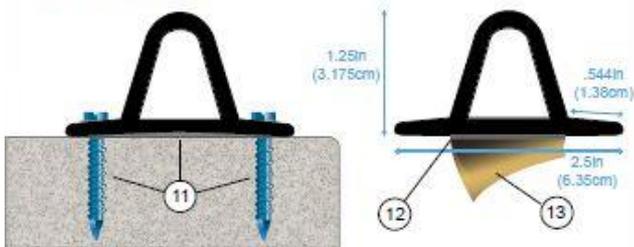
SR 17 at Hunt Brothers Pilot Project – Median Alert



Connector



Installation Cutaway

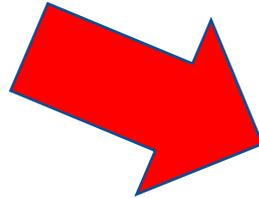


Truck Movements

- AutoTurn is conservative
- Right turn movements are many times the tightest movement
- A 115' inscribed diameter roundabout can be designed adequately to accommodate a WB-62FL truck
- Most drivers appear to be adapting

Stakeholder's Support

- Business owner expressed concern



SR 44 at Grand A Tragic Loss of Life



SR 44 at Grand Crash Summary

Year	2010	2011	2012	2013	2014	Jan-June 2015	Total
Total Crashes	1	3	5	9	3	9	30
Injury Crashes	1	2	3	5	2	5	18
Fatal Crashes				1			1*

- Crash Statistics
 - 63% of crashes resulted in injury/fatality
 - 97% during dry conditions
 - 70% daytime / 30% nighttime

SR 44 at Grand

Safety Alternatives Comparison

Traffic Signal

- Expected Crash Reductions
 - 13% Total
 - 41% Injury
- Reduce angle crashes
- May increase rear-end
- Higher speeds:
 - more severe crashes

Roundabout

- Expected Crash Reductions
 - 71% Total
 - 87% Injury
- Fewer conflict points
- Slower speeds:
 - increase reaction time
 - reduce severe crashes

SR 44 at Grand

Monetized Safety Benefits

Roundabout vs Existing Stop Control

- \$8 million in crash reduction benefits

Roundabout vs Signal

- \$4.4 million in crash reduction benefit

Questions



Paul Hiers, PE
CO Roadway Criteria Administrator
paul.hiers@dot.state.fl.us

Walt Breuggeman, P.E.
FDOT District One Project Manager
walter.breuggeman@dot.state.fl.us