



GDOT'S ROUNDABOUT PROGRAM

GDOT Division of Engineering
Daniel Pass, P.E.

2011 Georgia
Transportation Summit

Presentation Overview

- 1. Roundabouts in the US**
- 2. Why Roundabouts?**
- 3. GDOT's Evolving Policy**
- 4. Today's Roundabout Program**
- 5. Challenges Ahead**

RBTs Across the US

1. RBTs in the US

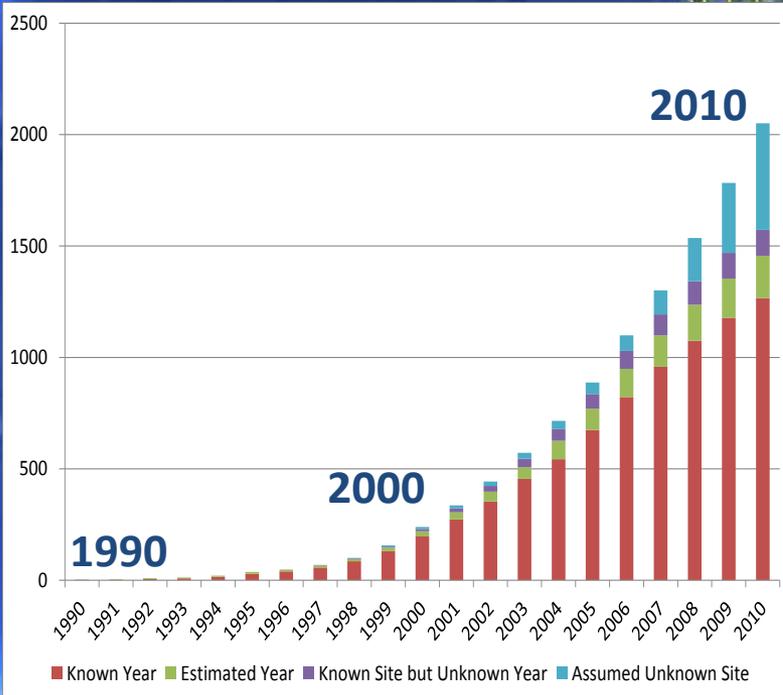
2. RBTs in the Southeast

3. RBTs in Georgia

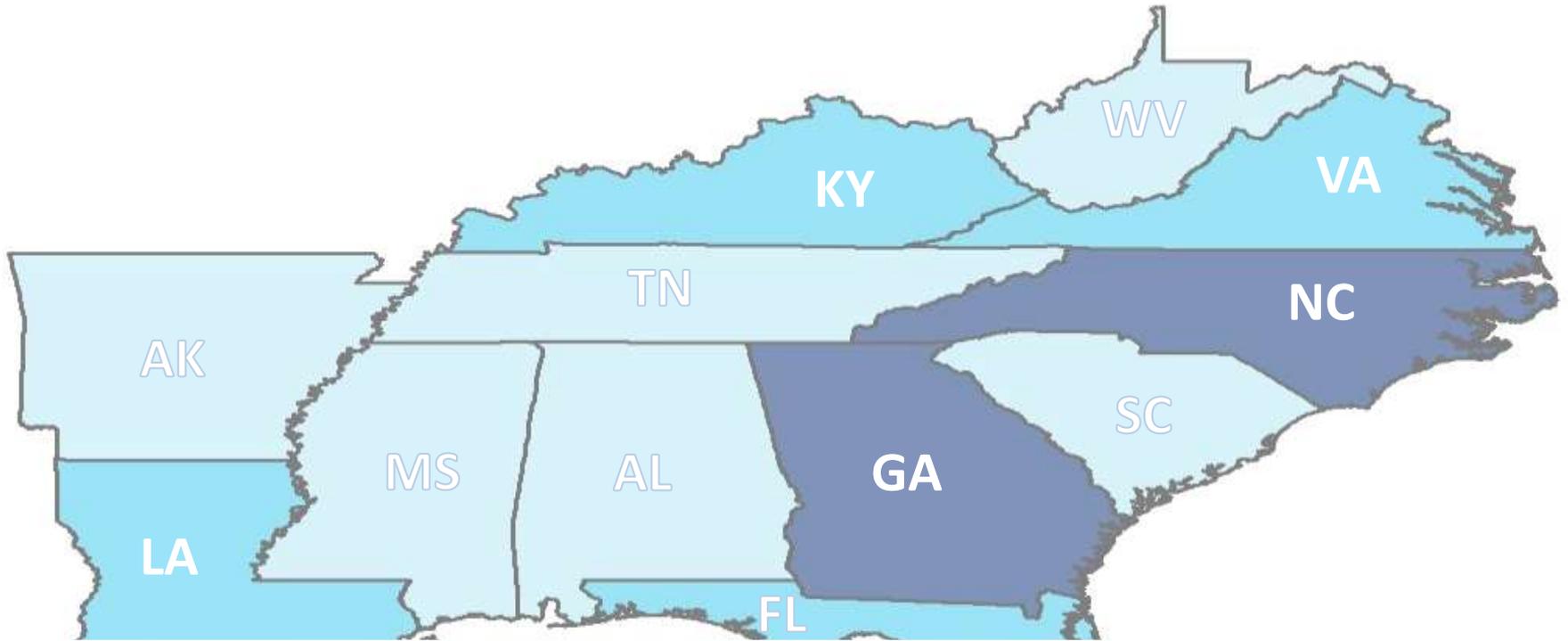
City of Roswell/Gresham Smith & Partners
Grimes Bridge Rd @ Warsaw Rd/Norcross St

Why Roundabouts? – RBT In all 50 States

Lee Rodegerdts
Kittelson roundabout database

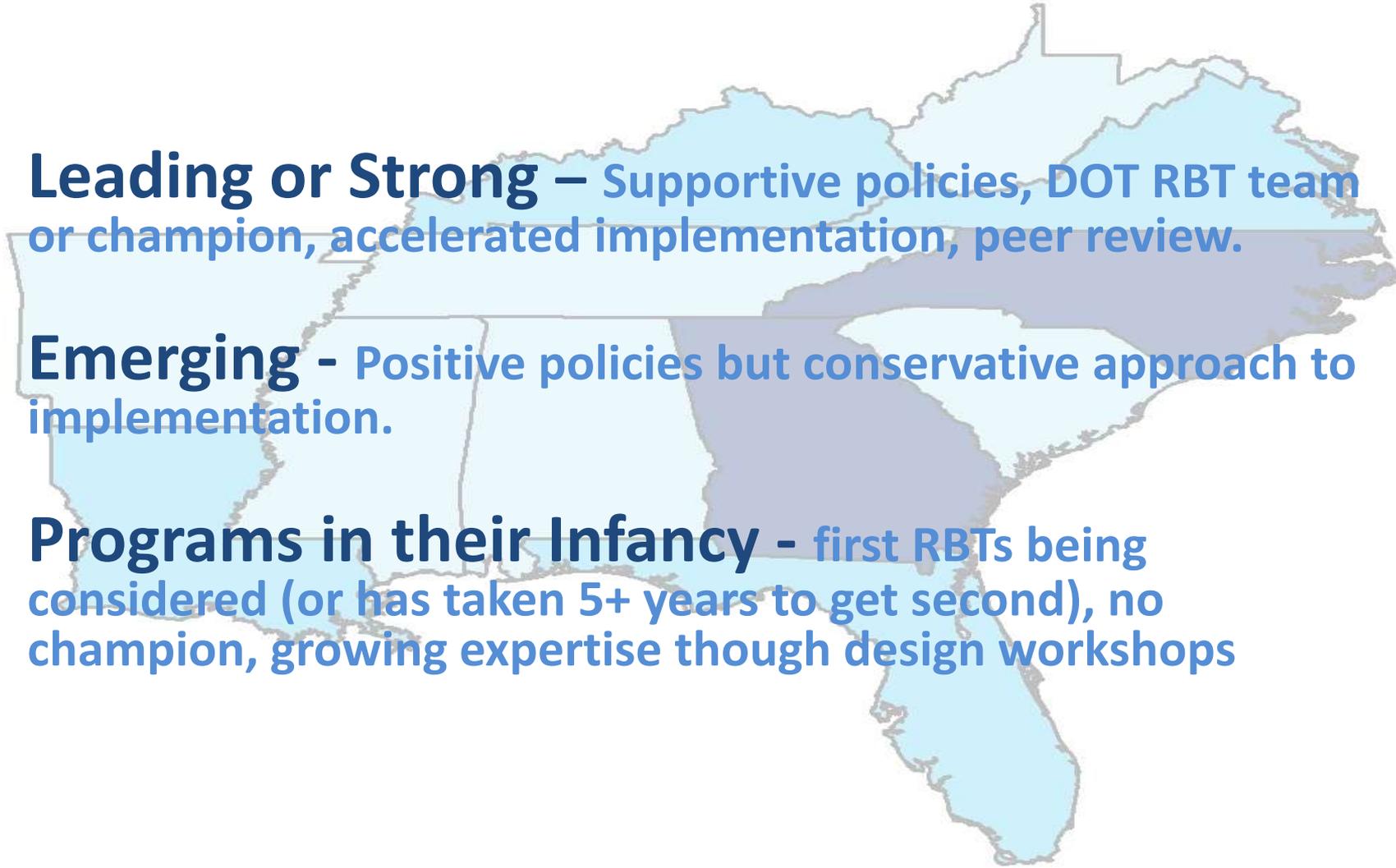


Why Roundabouts? – RBT Programs in Southeast



Program Status	States
Leading or Strong	<i>Georgia, North Carolina</i>
Emerging	<i>Kentucky, Louisiana, Virginia, Florida</i>
Programs in Their Infancy	<i>Alabama, Arkansas, Mississippi, South Carolina, Tennessee, West Virginia</i>

Why Roundabouts? – Program Characteristics

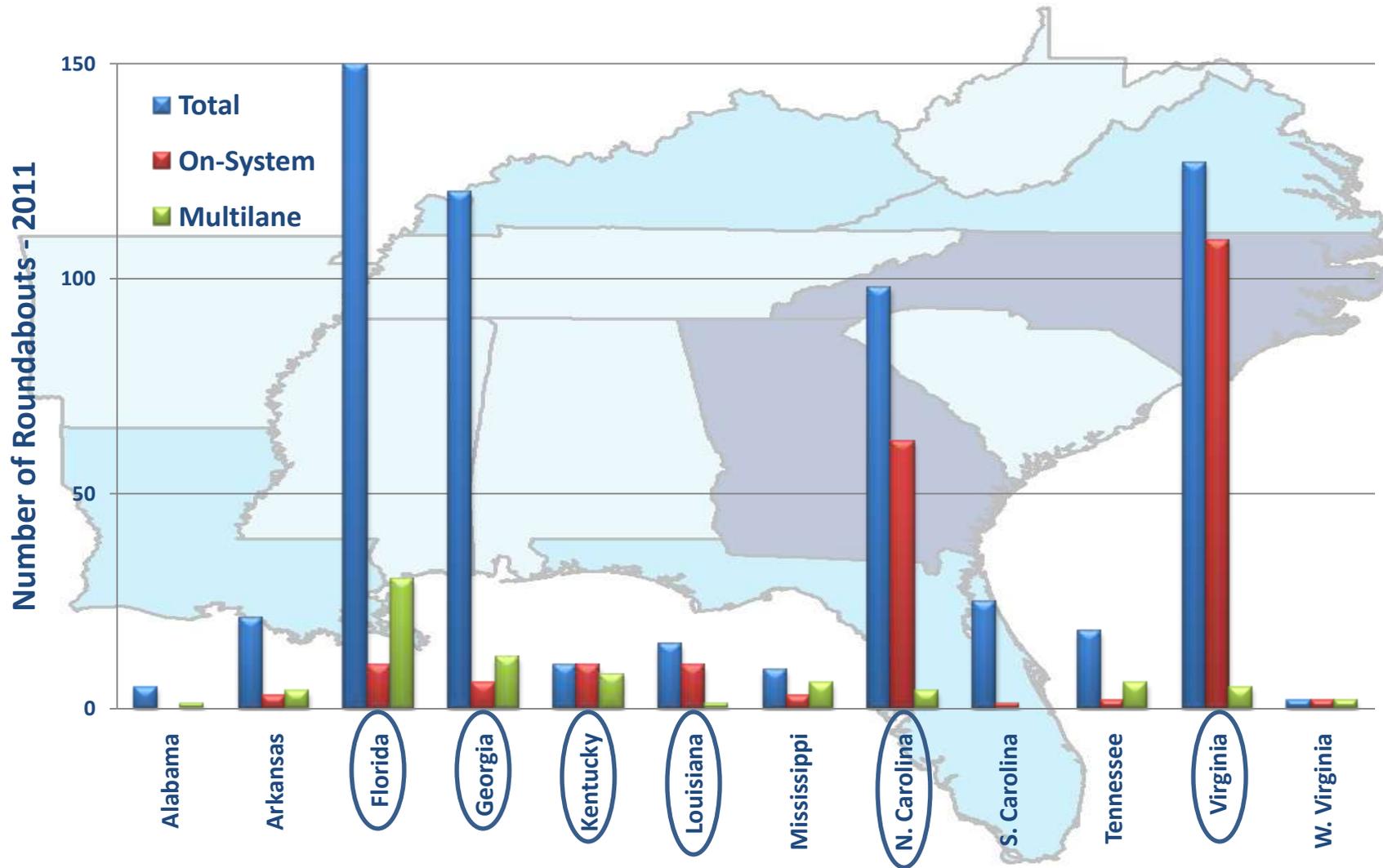
A map of the state of Georgia is shown in the background, colored in a light blue shade. Overlaid on the map are three text blocks, each describing a different level of roundabout program maturity. The text is in a dark blue font.

Leading or Strong – Supportive policies, DOT RBT team or champion, accelerated implementation, peer review.

Emerging - Positive policies but conservative approach to implementation.

Programs in their Infancy - first RBTs being considered (or has taken 5+ years to get second), no champion, growing expertise though design workshops

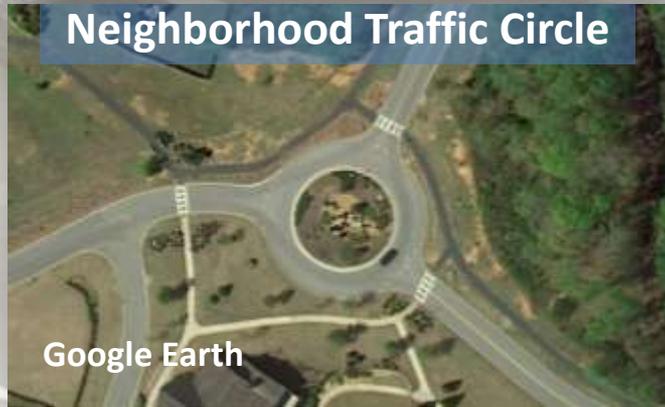
Why Roundabouts? – RBT Numbers, Constructed



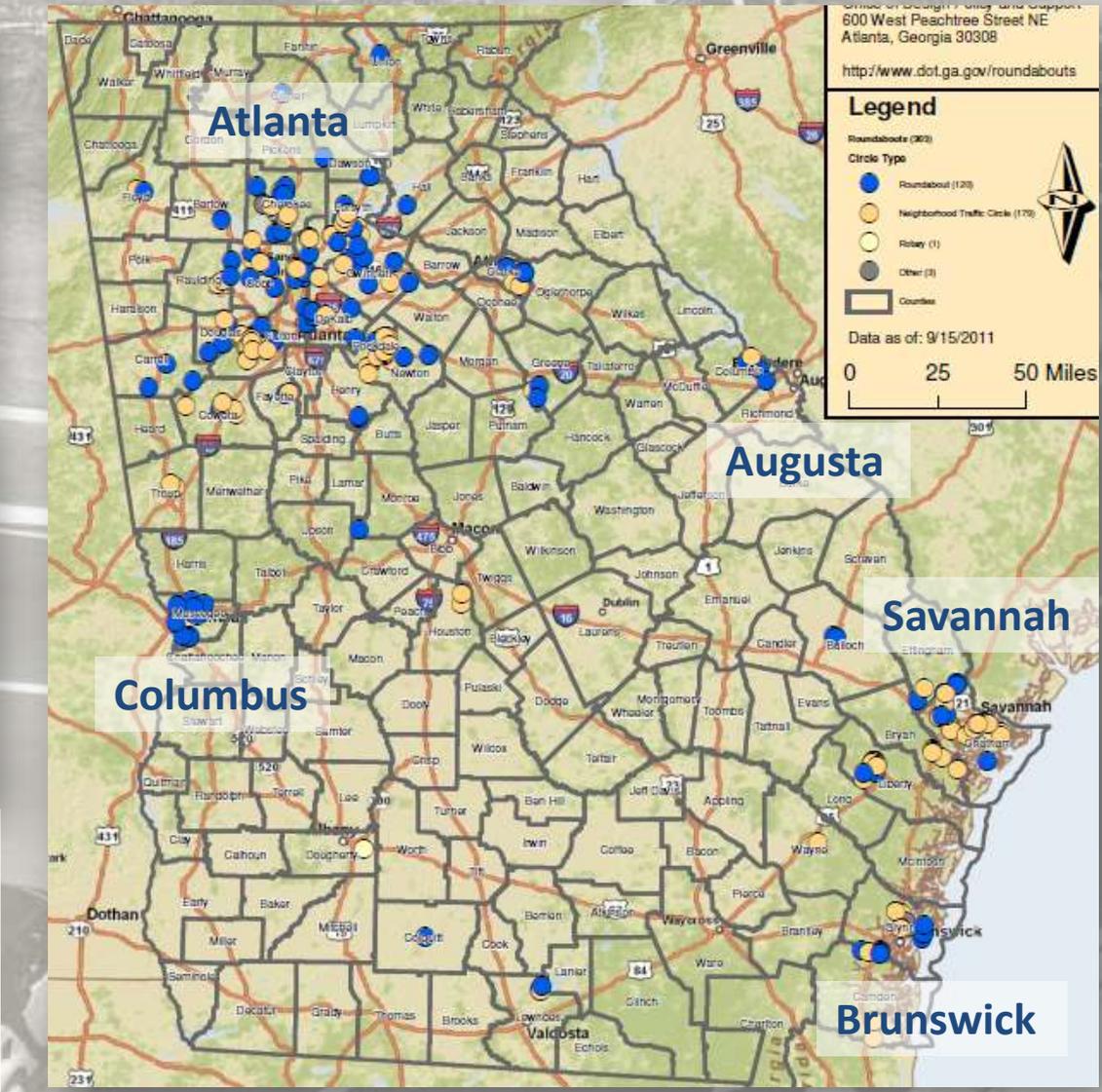
Why Roundabouts? - Challenges

1. **Public perception** - (8) Louisiana, Virginia, South Carolina, Alabama, Arkansas, Florida, Mississippi, Georgia
2. **Departmental support/policy** - (4) Alabama, Arkansas, Florida, West Virginia
3. **Design experience/guidance** - (4) Kentucky, South Carolina, Tennessee, North Carolina.
4. **Poorly performing roundabouts** - (2) Alabama, Mississippi
5. **Lighting costs** - (2) Louisiana, Georgia

Roundabouts in Georgia – Statewide RBTs, Constructed



- RBTs (120+)
- Neighborhood Traffic Circles (210+)
- Rotary (1)



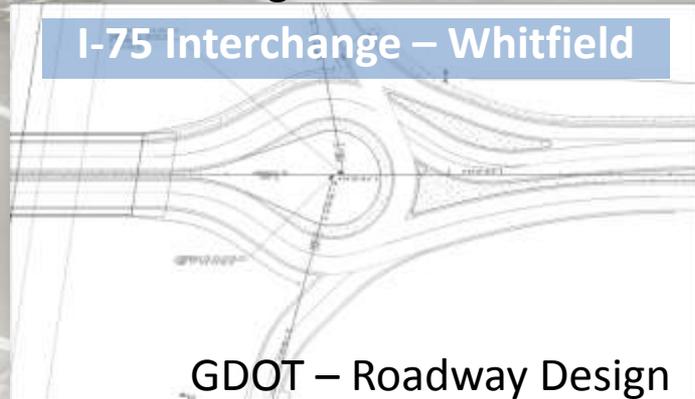
Roundabouts in Georgia – Statewide Proposed RBTs

I-75 Interchange - Dalton



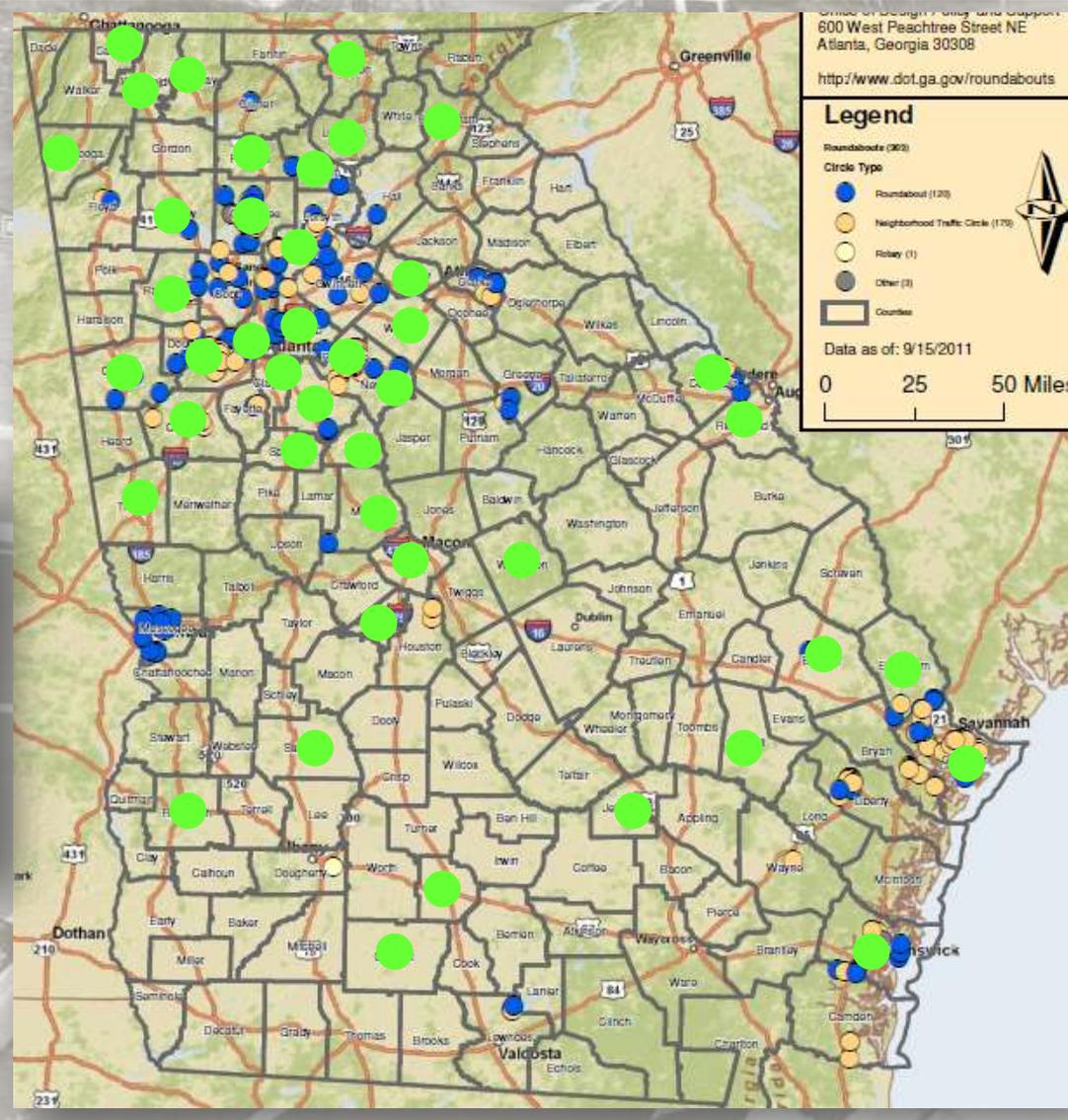
American Consulting Professionals

I-75 Interchange – Whitfield



GDOT – Roadway Design

- 75+ projects
- 43 counties
- 15+ multilane RBTs





Why Roundabouts?

1. Challenges

2. Opportunities

Glynn County/Thomas & Hutton
Demere Rd at Fredricka Rd

Why Roundabouts? - Opportunities

- 1. Increased Safety** - lower crash rates, more than 5 legs, bad skews.
- 2. Operational Efficiency** - higher intersection capacities, where signal warrants are not met
- 3. Difficult Geometry**
- 4. Reduced Impacts** - smaller overall intersection footprint
- 5. Reduced Costs (present & future)** - bridges requirements at interchanges, uncertainties in future traffic patterns.
- 6. Quality of Life** - gateways/aesthetics, complete streets

Why Roundabouts? - Increased Safety

Traffic Control Prior to RBT	% Reduction in Injury Crashes
Signalized	78
All-Way Stop	No significant change
Two-Way Stop	82

NCHRP 572, Table 28

Reduced:

- speed
- driver decision
- conflicts
- crash severity

Chance of pedestrian death if hit by a motor vehicle

mph

20



5%

30



40%

40



80%

50



100%

NCHRP 672, Exhibit 5-15

Why Roundabouts? – Operational Efficiency

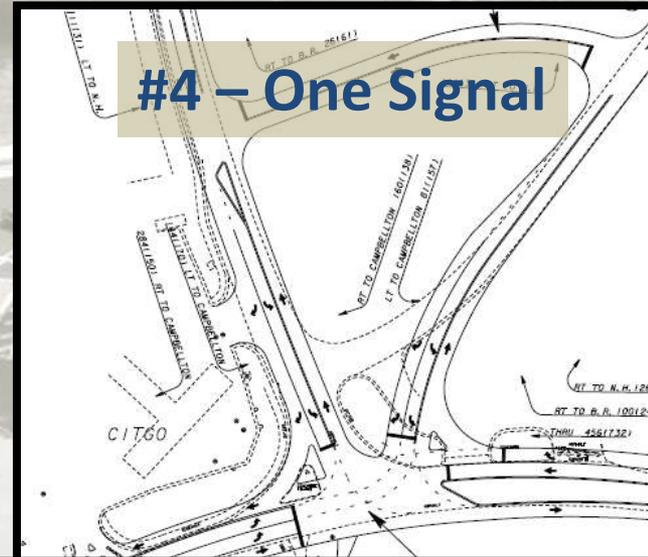
#1 - Stop & Signal



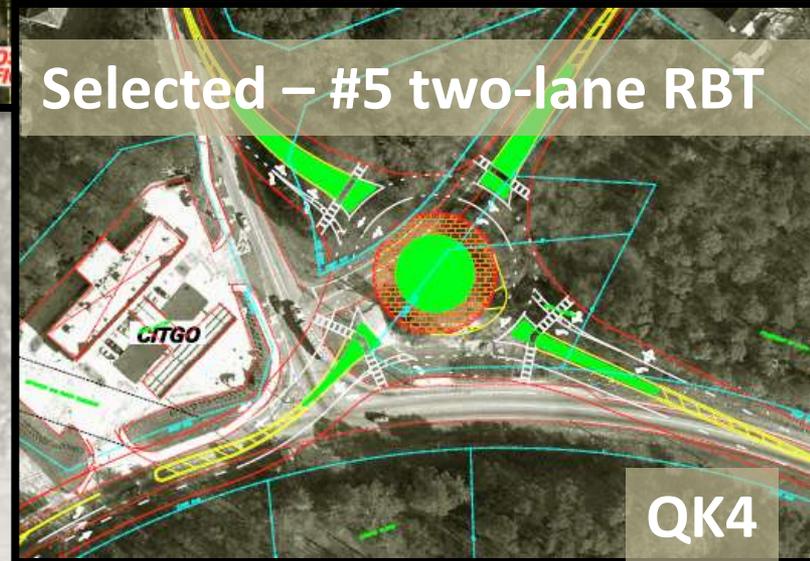
#2 – RBT & Signal



#4 – One Signal



Selected – #5 two-lane RBT

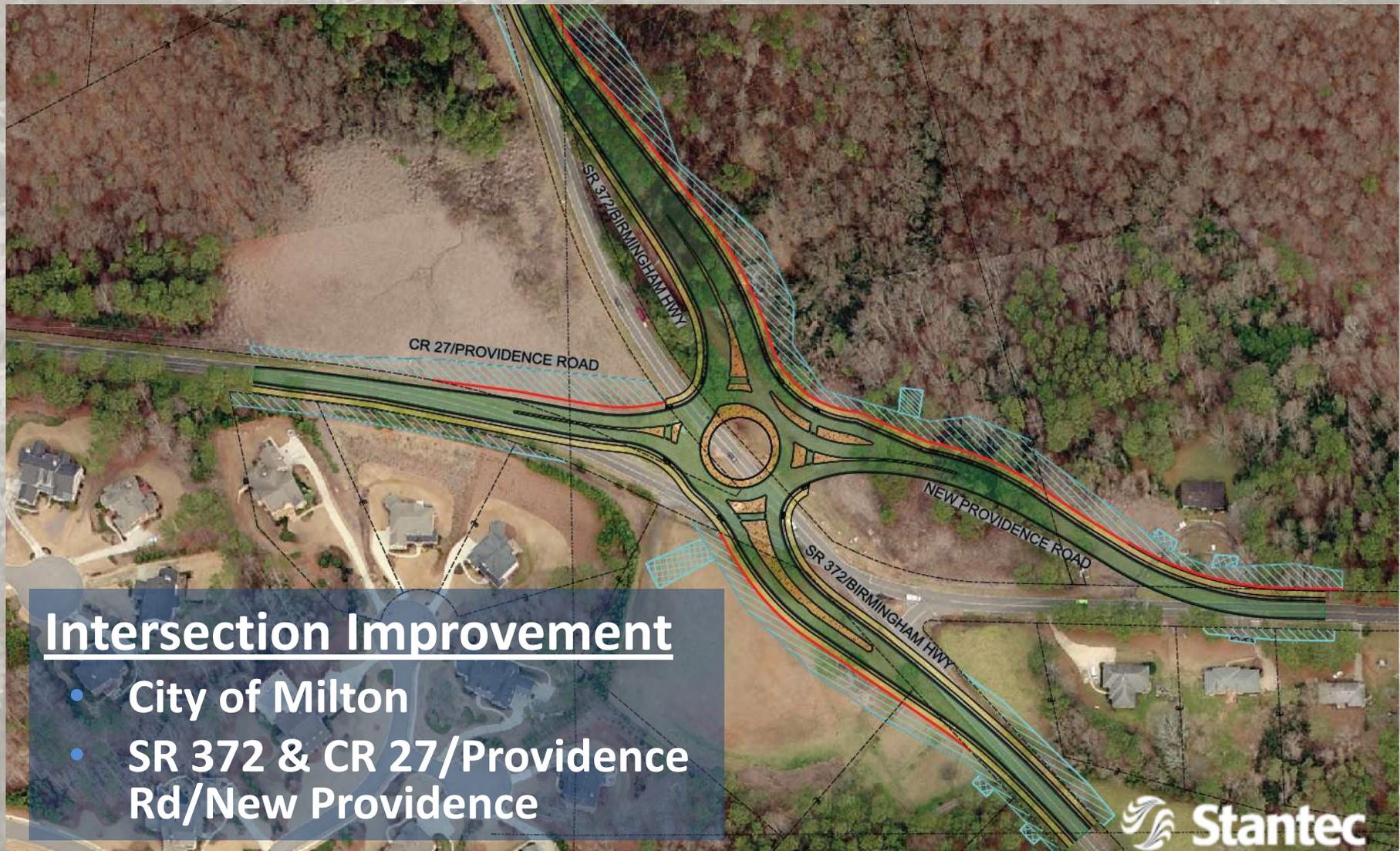


Intersections Improvement

Fulton - SR 166 @ Boat Rock/New Hope

- LOS of F in current year
- 2 Intersections - excessive queues, poor LOS
- Multilane RBT best overall performance

Why Roundabouts? – Difficult Geometry



Intersection Improvement

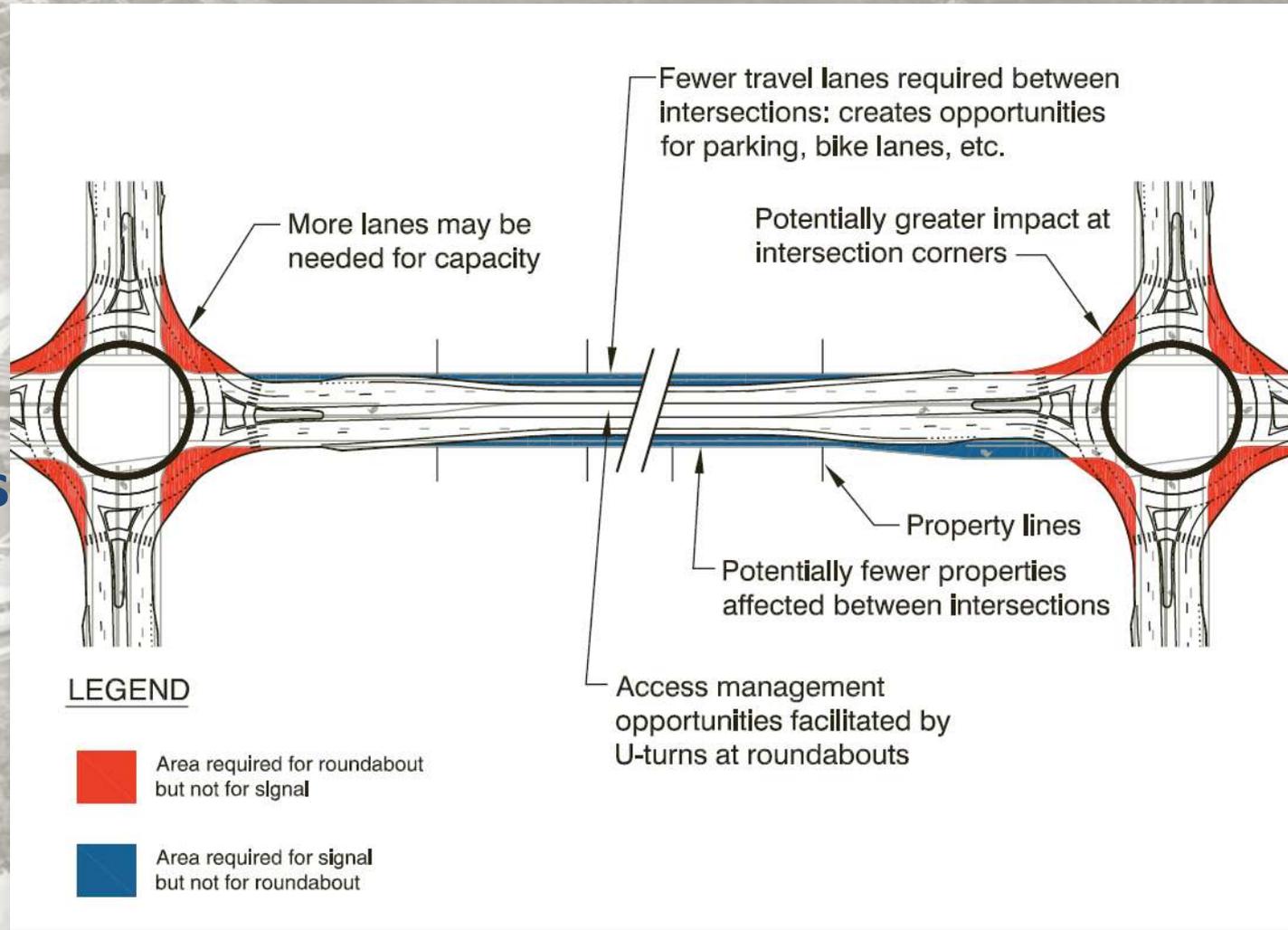
- City of Milton
- SR 372 & CR 27/Providence Rd/New Providence



Why Roundabouts? – Less Impacts

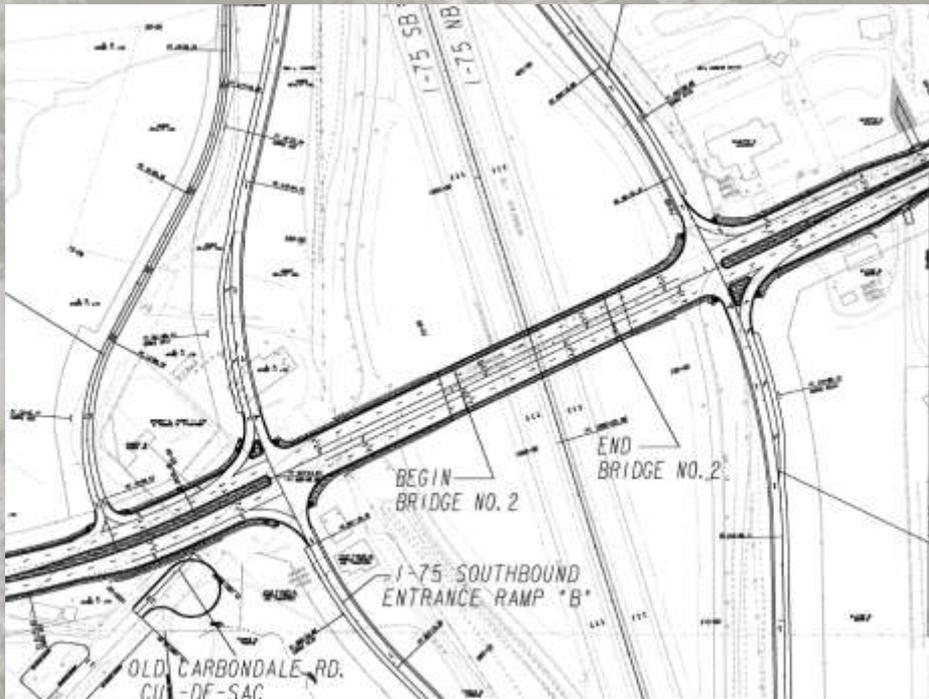
Reduced:

- overall footprint
- # of lanes between intersections
- vehicle storage



NCHRP 672, Exhibit 2-1

Why Roundabouts? – Reduced Cost



Ourston Roundabout Engineering



Interchange Reconstruction

- I-75, Whitfield County
- Conventional Layout – \$46M
- RBT layout – \$18M

Why Roundabouts? – Quality of Life



NCHRP 672 - Annapolis, Maryland

GDOT Policy Evolution

1. Southeast States
2. GDOT Chronology
3. When Considered

Cobb County/Gresham Smith and Partners
West Sandtown at Villa Rica Rd

GDOT Policy Evolution – Southeast DOT Policies

Routinely Considered

Georgia, Virginia, Kentucky

Considered on case-by-case

Louisiana, N. Carolina, S. Carolina, Tennessee,
W. Virginia

Seldom Considered

Alabama, Arkansas, Florida, Mississippi

Responses from survey for 2011 Southeast Roundabout Peer Exchange

GDOT Policy Evolution – Chronology

TOPPS 4A-2 - Chief Engineer Policy

- Dec. 04, neutral policy, single lane only
- Mar. 08, encouraged as intersection alternative
- Mar. 09, mandates consideration as alternate allows multi-lane RBTs

GDOT DPM, Ch. 8 – Jun. 10

- validation process
- design policy
- peer review requirement
- illumination requirement

GDOT Policy Evolution – When Considered?

A RBT shall be considered for:

1. new location & reconstruction;
2. major safety or operational improvement; and
3. requests for a traffic signal.

Today's Roundabout Program

1. Planning & Programming

2. Plan Development

- **Peer Review**
- **Public Involvement**
- **Standards & Details**
- **Illumination**

Douglas County/Gresham Smith & Partners
SR 5 at SR 166

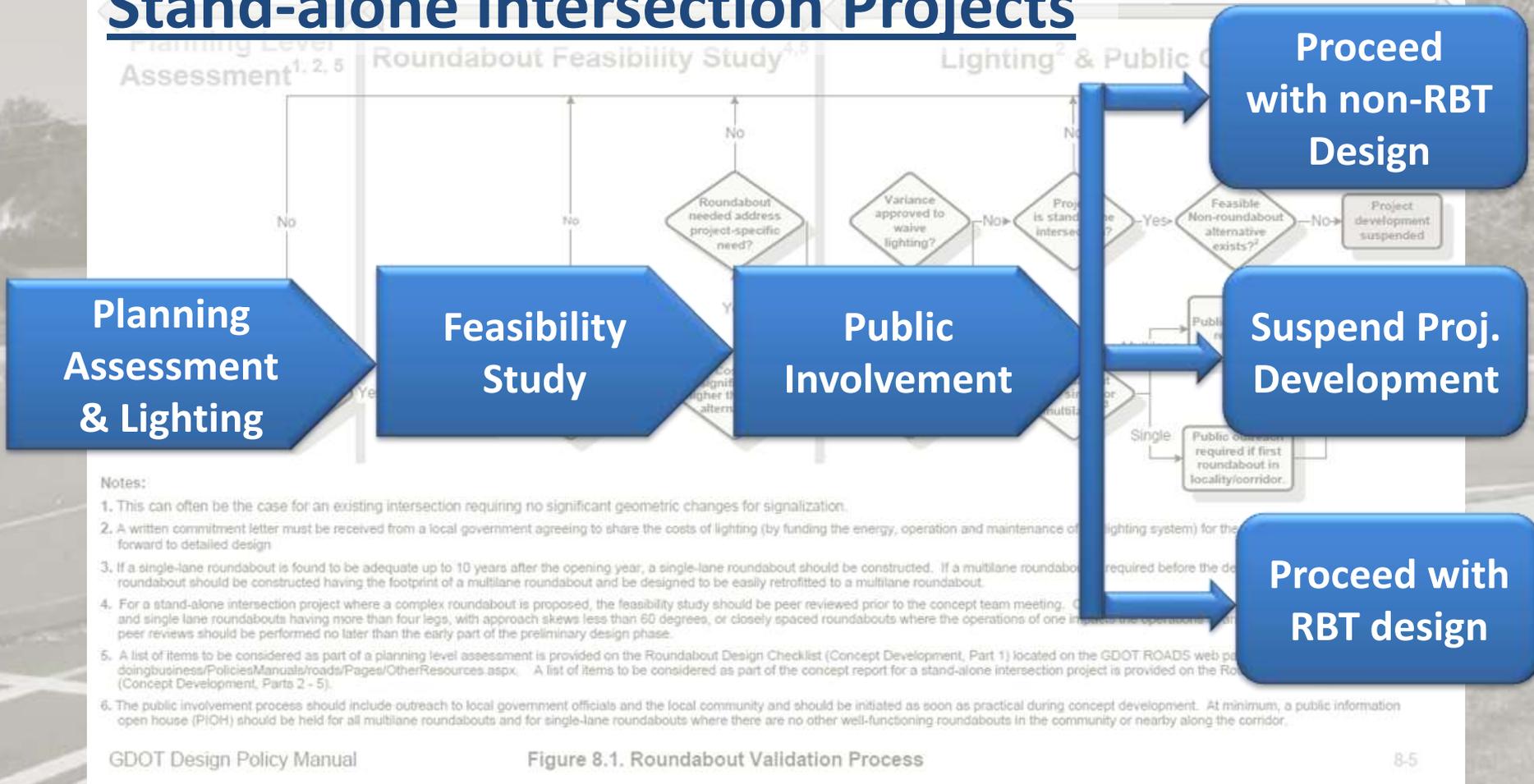
Today's RBT Program – Planning & Programming

GDOT Projects Types:

- Safety Program (46)
- Local Government projects - LAP (14)
- Standard longitudinal projects (10+)
- Non-safety intersection projects (5)

GDOT Policy Evolution – RBT Validation

Stand-alone Intersection Projects



Today's RBT Program – Plan Development

Feasibility Studies

- selection, layout

Construction Plans

- detailed design

GDOT Design Policy Manual

8. ROUNDABOUTS

8.1. Introduction

A modern roundabout is a type of circular intersection with yield control at entry, counterclockwise circulation, and a low-speed environment. Roundabouts offer many benefits, including increased safety, operational, and other benefits when compared to signalized intersections. Specifically, they have fewer conflict points, less traffic delays, fuel consumption, and air pollution. More information can be found on the [GDOT Roundabouts web page](http://www.dot.state.ga.us/travelingingeorgia/) <http://www.dot.state.ga.us/travelingingeorgia/>

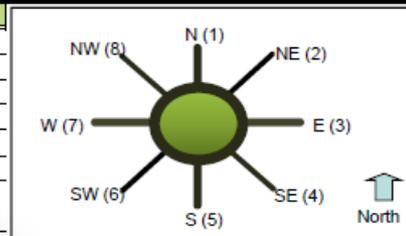
Roundabouts are categorized into three basic types. A detailed introduction to each is provided in the [Research Program \(NCHRP\) Report 672, Roundabouts](#), a chapter of the GDOT Design Policy Manual specifically addresses single-lane and multilane

Roundabout Analysis Tool
Single Lane

11/1/2011
Version 1.3

General & Site Information

Analyst: _____
Agency/Company: _____
Date: _____
Project Name or PI#: _____
Year, Peak Hour: _____
County/District: _____
Intersection: _____



GDOT ROUNDABOUT DESIGN CHECKLIST - CONCEPT DEVELOPMENT

- 1) This checklist is specifically written for a standalone intersection project. Some minor adjustments may be needed for a consultant designed roundabout with respect to roles. For linear or interchange reconstruction projects much of the concept development effort can be accomplished during the preliminary design. Additional items should be added as necessary to define/document the design. The preparation of a roundabout design may be terminated at any time during the process, if a decision is made to eliminate a roundabout from further consideration. In this case, documentation should be organized and retained to support this decision.
- 2) This checklist includes work items which are specific to the roundabout project and does not include many items which would be common to all conventional intersection projects. The level of detail and timing of some tasks will vary with the complexities of the roundabout and site constraints.
- 3) The checklist is meant to combine certain categories of information and is not meant to reflect a precise sequence of performance. Any items which do not apply to a specific project can be marked as "N/A" (i.e. not applicable).

PI Number: _____ County: _____
Design Phase Leader: _____ Design Office: _____
Description: _____

No.	Completed	Action By	Item	Commentary <small>(Can modify text to replace with project specific info, will show in bold letters.)</small>
1. Operations - Planning Level Assessment - See DPM Section 8.2.1				
1	<input type="checkbox"/>	<input type="checkbox"/>	Vicinity Map	Map showing roadways within approximately 1 mile +/- of each direction from the roundabout.
2	<input type="checkbox"/>	<input type="checkbox"/>	Intersection Layout	Show layout of existing intersection including site constraints such as property, access buildings. A recent aerial photo from any source is sufficient.
3	<input type="checkbox"/>	<input type="checkbox"/>	Letter of support from local government	Letter of support is required from local government for project to proceed as a roundabout - See DPM figure B.1.
4	<input type="checkbox"/>	<input type="checkbox"/>	Crash history	Send request to Norm Crezeman of GDOT Crash Reporting Unit.
5	<input type="checkbox"/>	<input type="checkbox"/>	Pedestrian and bike activity	Estimate level of activity. Sources may include site inspection, local GDOT and government offices.

Entry Legs (FROM)					
	SE (4)	S (5)	SW (6)	W (7)	NW (8)
	0	0	0	0	0
	SE	S	SW	W	NW
%	100%	100%	100%	100%	100%
	0%	0%	0%	0%	0%
	0%	0%	0%	0%	0%
	0%	0%	0%	0%	0%
	0.92	0.92	0.92	0.92	0.92
0	1.000	1.000	1.000	1.000	1.000

	SE	S	SW	W	NW
	0	0	0	0	0
	0	0	0	0	0

Today's RBT Program – Approved Peer Reviewers

- **Kittelson & Associates (Apr. 10)**
 - Justin Bansen, FL; Lee Rodegerdts, OR; Ed Myers, Md
- **Ourston Roundabout Engineering (Jun. 10)**
 - Mark Lenters, WI; Troy Pankratz, WI
- **NE Roundabouts (Aug. 11)**
 - Howard McCulloch, NY
- **Roundabout & Traffic Engineering (Oct. 11)**
 - Scott Ritchie, AZ
- **MJT Engineering (Oct. 11)**
 - Mark Johnson, WI

Today's RBT Program – Peer Review

Feasibility Studies

- stand-alone intersections, prior to concept
- Longitudinal projects – early preliminary

Construction plans

- Preferable, PFPR plans

Consultants approved for roundabout peer review by Office of Design Policy & Support.

Separate class code to be setup by Dec 2011.

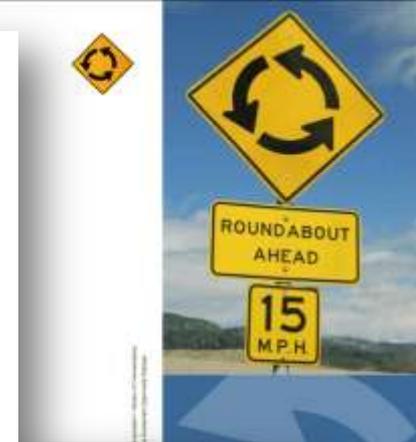
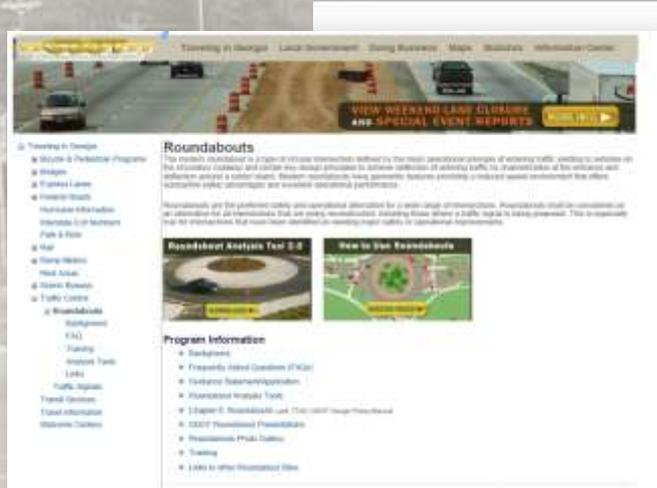
Today's RBT Program – Public Involvement

Required

- all multilane RBTs
- most Single Lane RBTs

Prior to PIOH

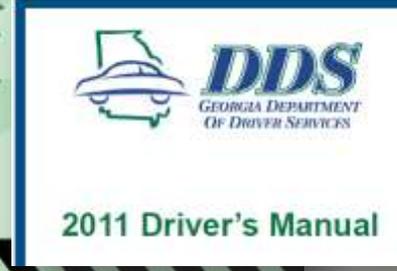
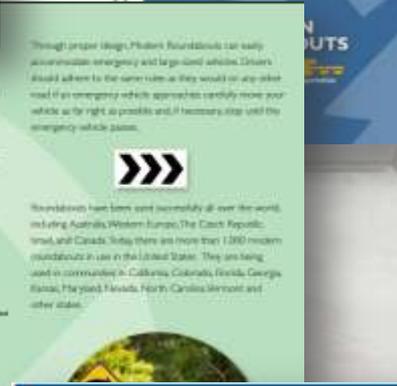
- complete Peer Review
- meet with local government
- see GDOT DPM Section 8.2.5



Howard McCulloch



Howard McCulloch

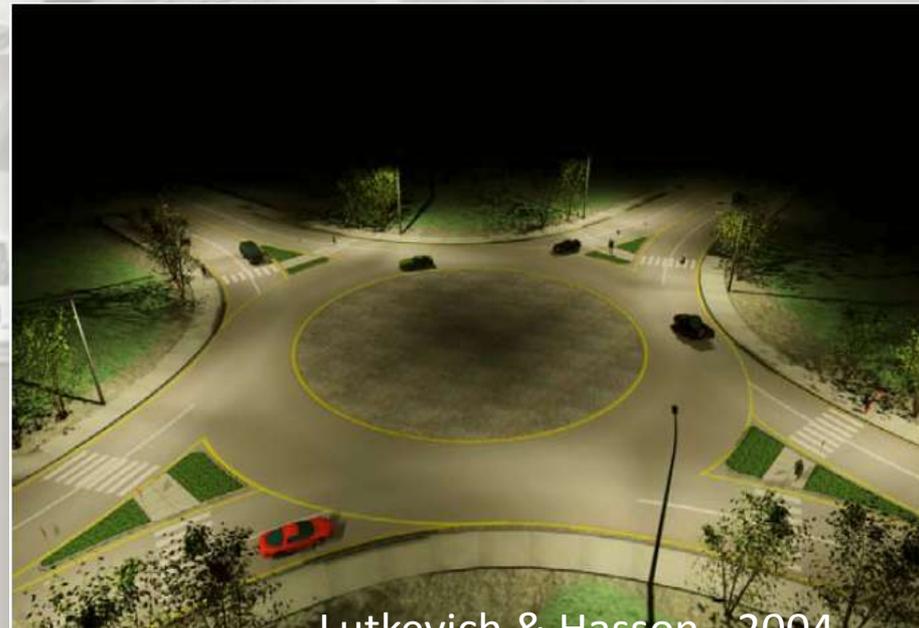


Today's RBT Program – Illumination

IES Design Guide for RBT Lighting

- visibility of RBT at a distance
- visibility of key conflict areas (e.g., crosswalks)

Approach lighting – 25 lux



Lutkevich & Hasson - 2004

Challenges Ahead



Newton Co. – City of Covington/URS Corp
Turner Lake at Clark St

Challenges Ahead – key initiatives

- **Public involvement/Education:** Statewide program, materials
- **Multilane RBTs:** Practices for accommodating standard trucks at. Safety for vision impaired pedestrians at multilane RBTs.
- **Oversized Trucks:** Needs and methods of accommodation.
- **Signing and Marking:** developing standardized construction details
- **Lighting:** Reducing energy and maintenance costs.



Challenges Ahead – Special Initiatives

1. Training

- Applied Roundabout Design Classes
- 2011 International Conference
- 2011 Southeastern US Roundabouts Peer Exchange

2. Research

- Capacity Calibration at RBTs - *Georgia Tech/Kittelson*
- Public Education/Involvement on RBTs – *est. 2012*
- Illumination at RBTs – *est. 2012*

Southeastern U.S. Roundabouts Peer Exchange

 U.S. Department of Transportation
Federal Highway Administration

 Kittelson
Kittelson Design Associates, Inc.

 ite

 Georgia Department of Transportation

Challenges Ahead – The GDOT Roundabout Team

Scott Zehngraff - szehngraff@dot.ga.gov, *Office of Traffic Operations*

Daniel Pass - dpass@dot.ga.gov, *Office of Design Policy & Support*

Paul DeNard - pdenard@dot.ga.gov, *Office Traffic Operations*

Other GDOT SMEs

Steven Bookholdt, Robert Graham - *design*

Derrick Cameron - *project manager*

Mike England - *public involvement*

Kimberly Nesbitt - *contracting*

Tiffany Robinson - *capacity*

Glen Williams - *software*

An aerial photograph of a roundabout under construction. The road is paved and has white lane markings. Several orange traffic cones are placed around the perimeter and in the center of the roundabout. A white sign with a black arrow pointing right is visible in the center. The background shows a line of trees.

Questions & Discussion

www.dot.state.ga.us/travelingingeorgia/roundabouts/