

Georgia's ICE Policy and Tools

Alan Davis, PE, PTOE

Georgia Department of Transportation
Office of Traffic Operations



Overview

- ❖ Quick Facts
- ❖ GDOT's ICE Policy
 - Background
 - ICE Policy
 - ICE Process
- ❖ Lessons Learned



Georgia Quick Facts

Intersection Types

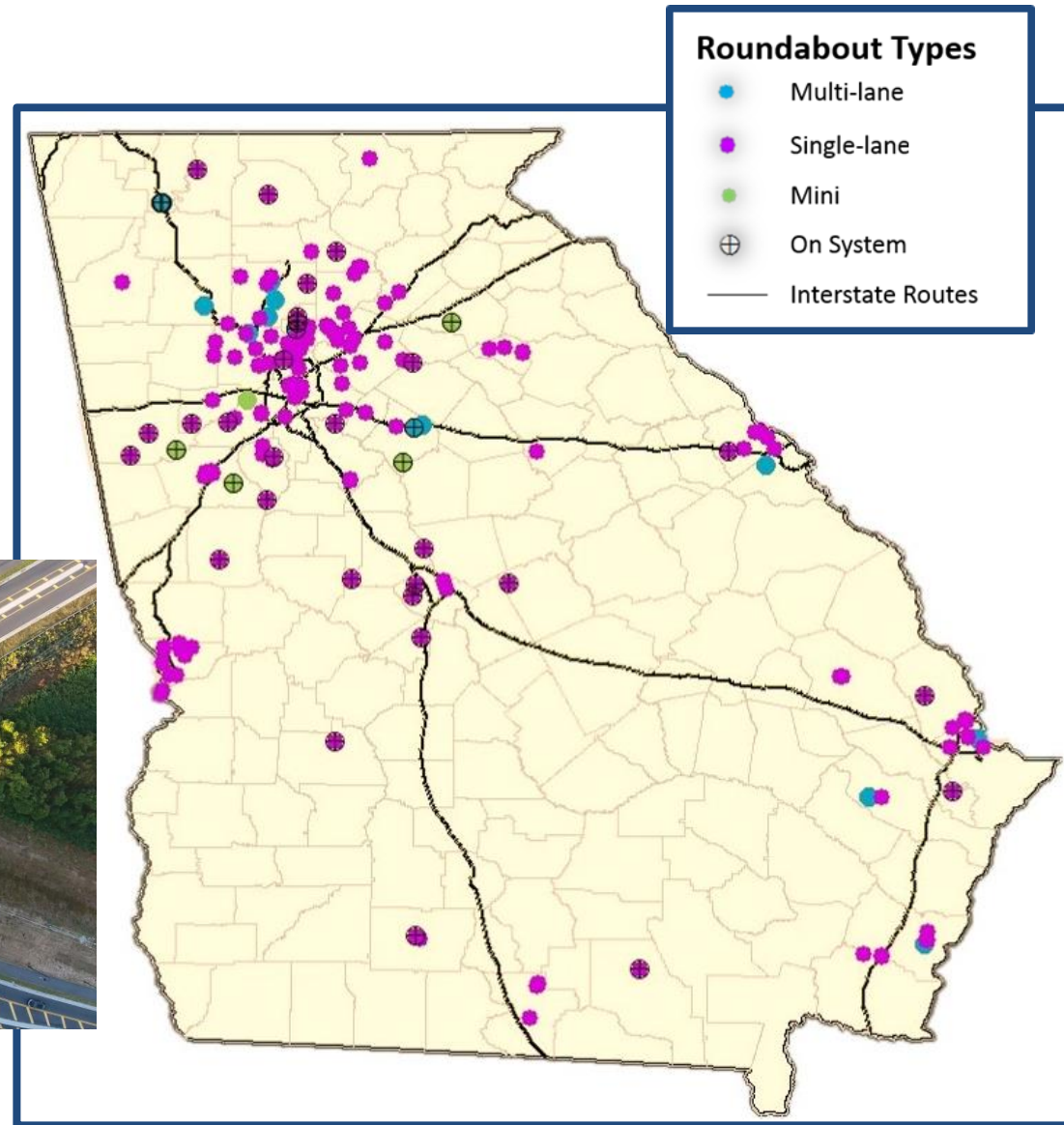
- 9,500+ Traffic Signals
- 100+ On System AWSC



Georgia Quick Facts

Intersection Types

- 9,500+ Traffic Signals
- 100+ On System AWSC
- 175+ Roundabouts



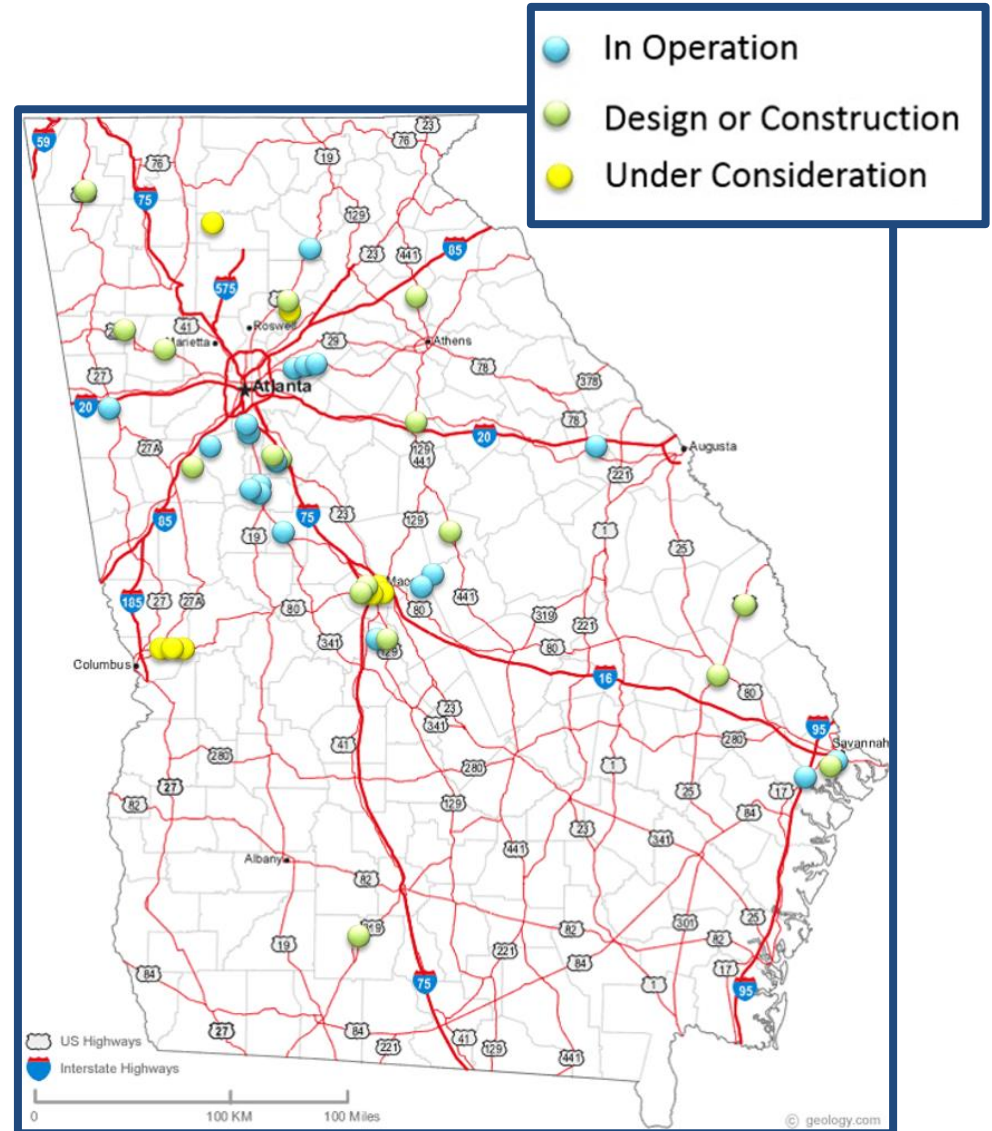


I-285 @ Riverside Dr

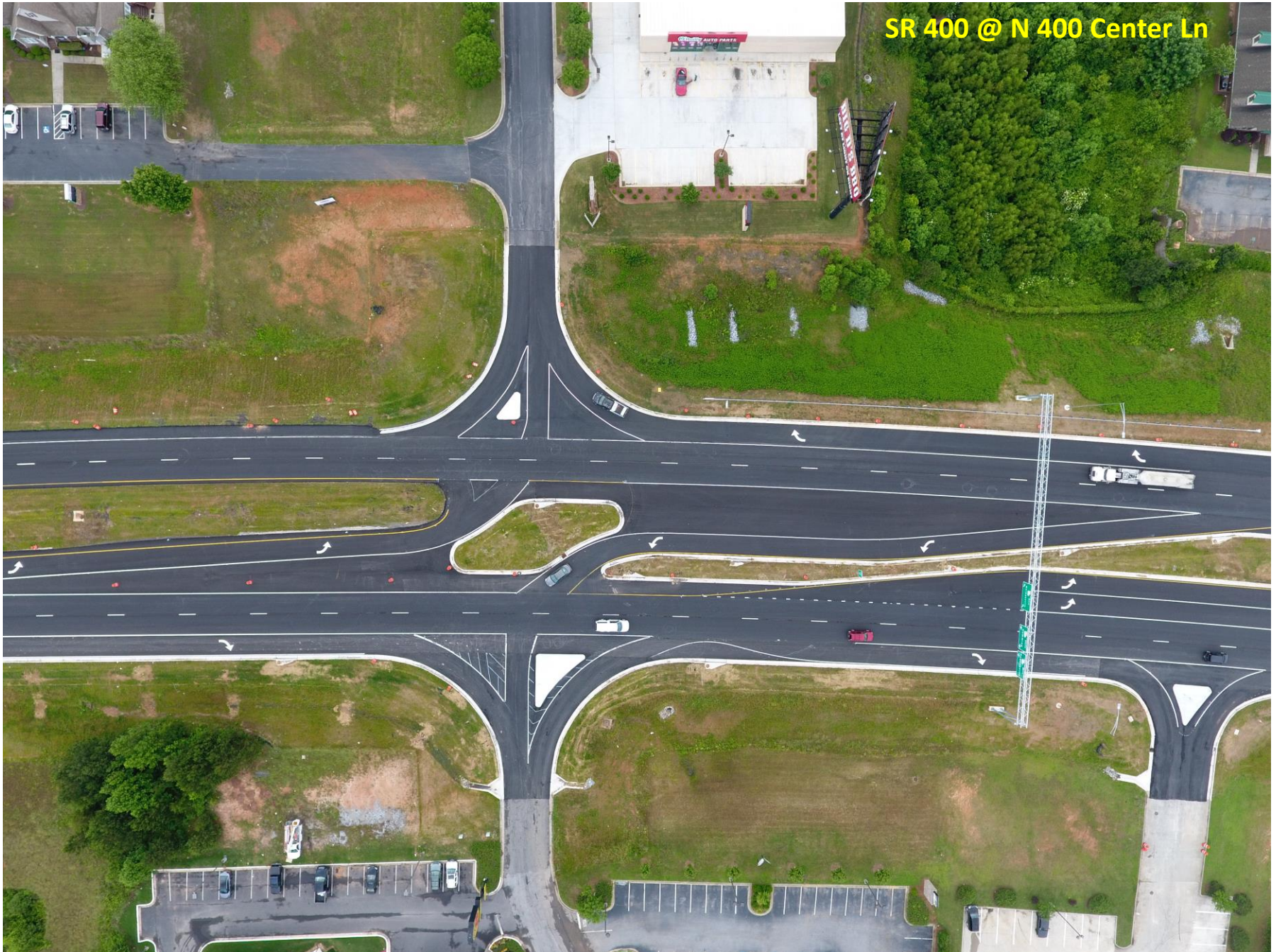
Georgia Quick Facts

Intersection Types

- 9,500+ Traffic Signals
- 100+ On System AWSC
- 175+ Roundabouts
- 30+ RCUTS



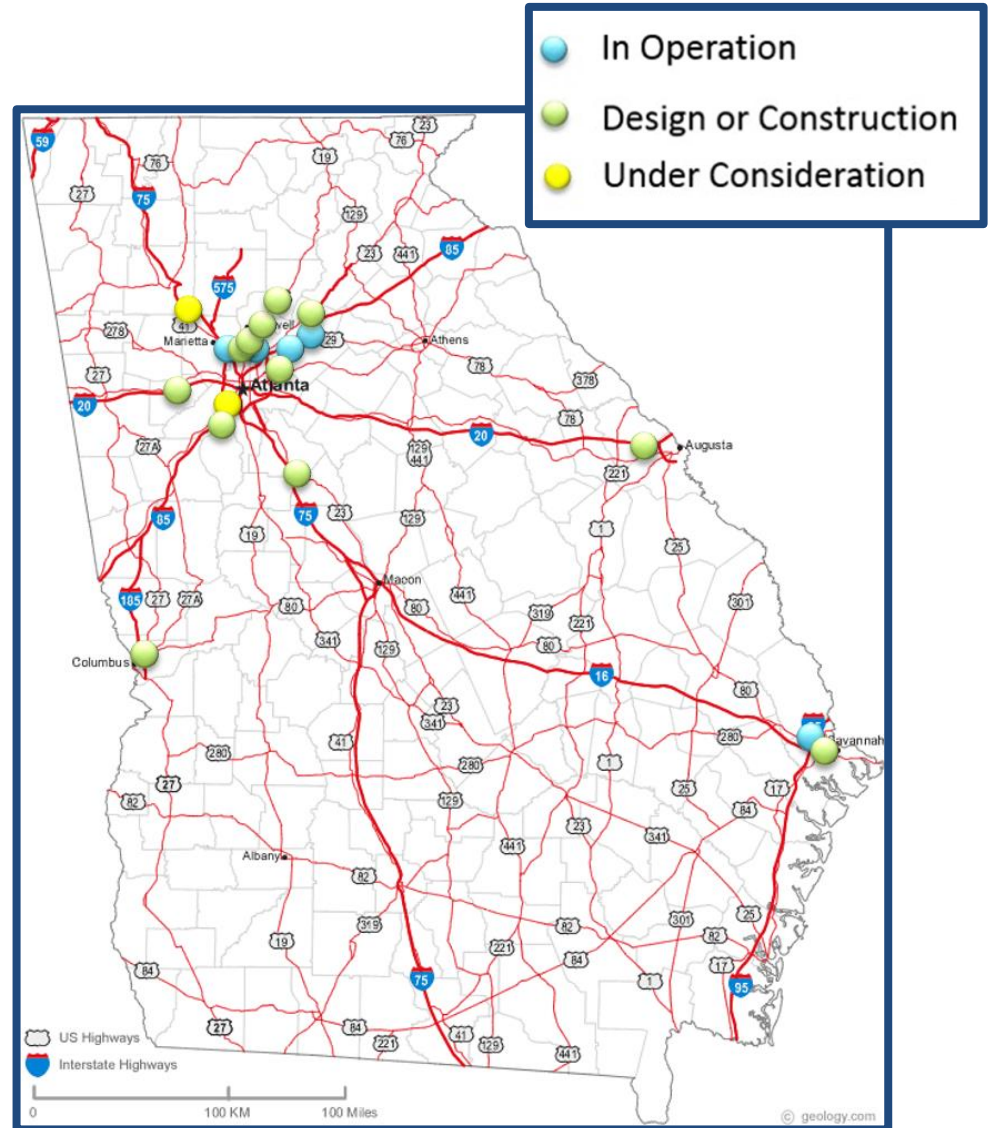
SR 400 @ N 400 Center Ln



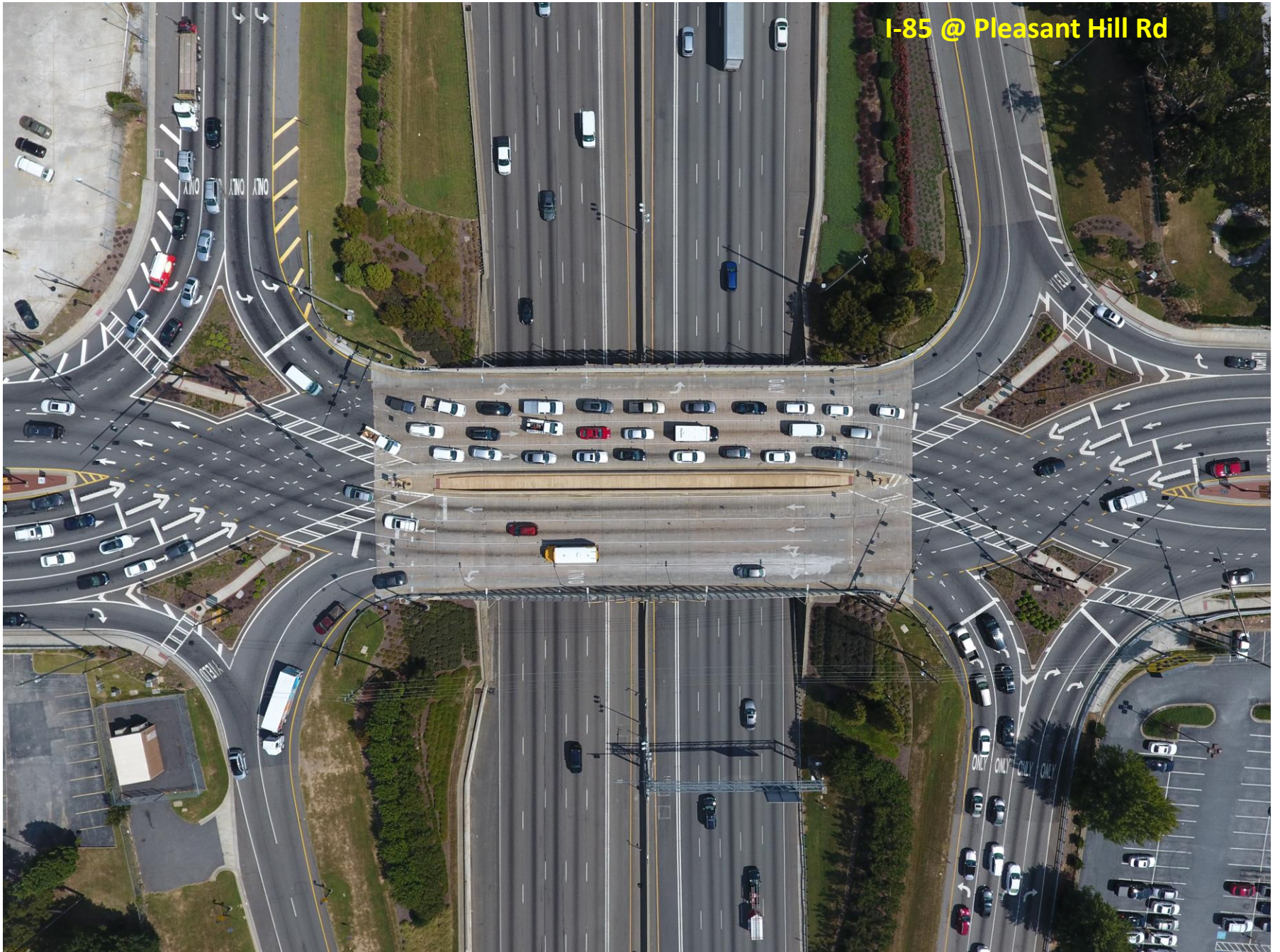
Georgia Quick Facts

Intersection Types

- 9,500+ Traffic Signals
- 100+ On System AWSC
- 175+ Roundabouts
- 25+ RCUTS
- 5 DDIs



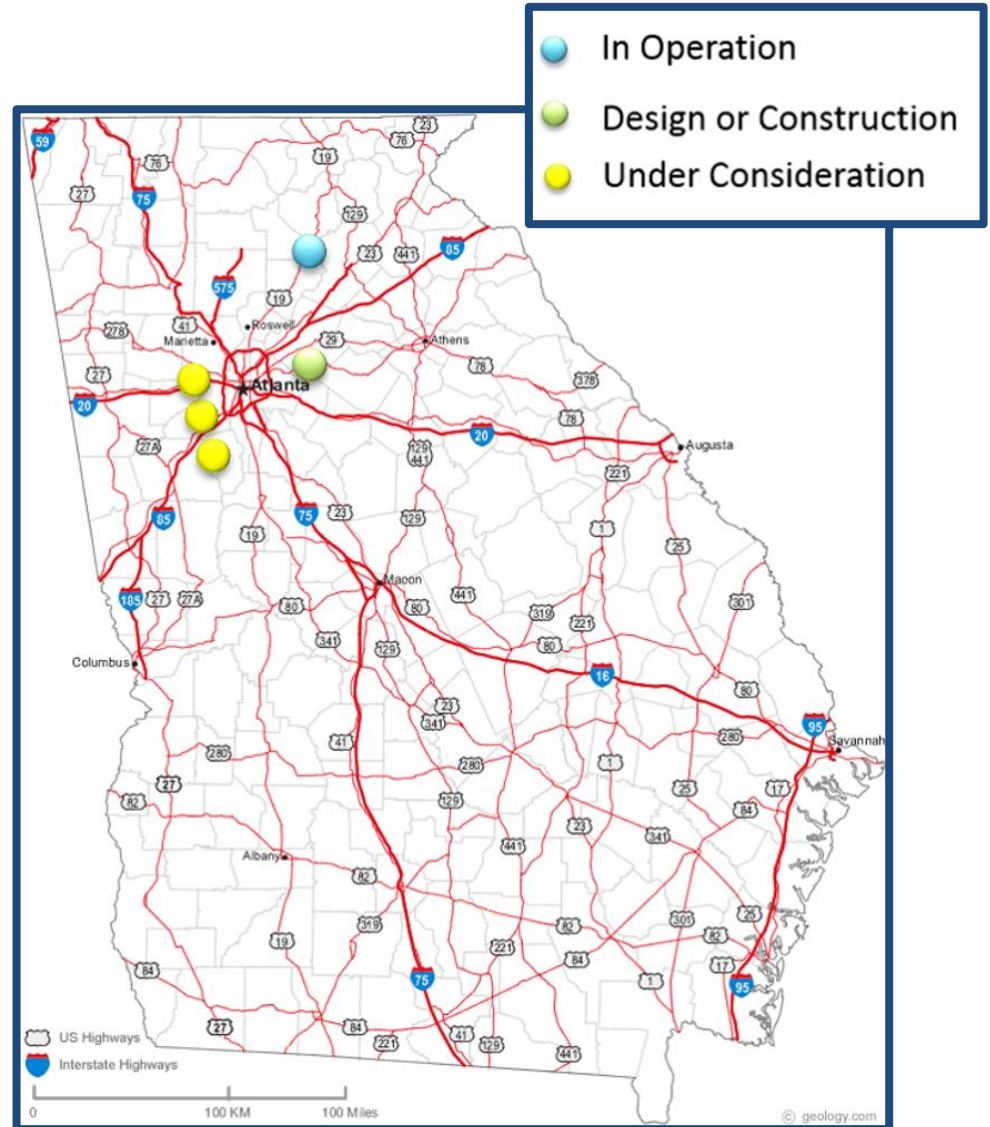
I-85 @ Pleasant Hill Rd



Georgia Quick Facts

Intersection Types

- 9,500+ Traffic Signals
- 100+ On System AWSC
- 175+ Roundabouts
- 25+ RCUTS
- 5 DDIs
- 1 CFI



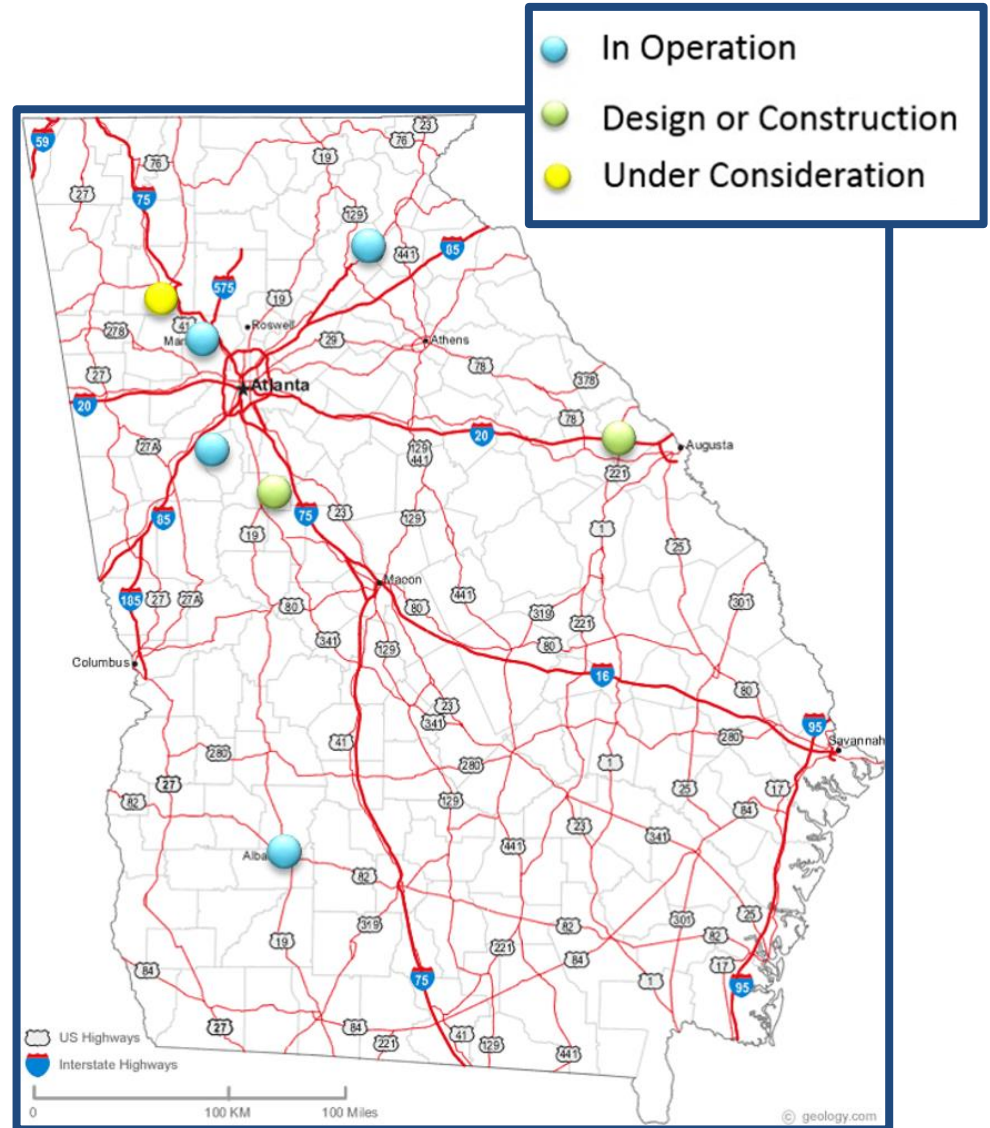
SR 400 @ SR 53



Georgia Quick Facts

Intersection Types

- 9,500+ Traffic Signals
- 100+ On System AWSC
- 175+ Roundabouts
- 25+ RCUTS
- 5 DDIs
- 1 CFI
- 5+ Continuous Green T



Intersection Control Evaluation

BACKGROUND

GDOT Mission Statement

Deliver a transportation system focused on innovation, safety, sustainability and mobility



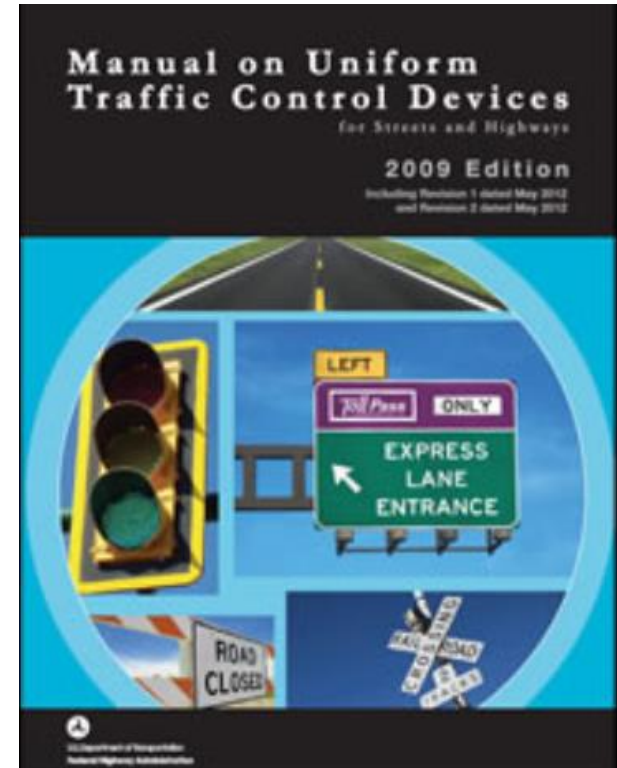
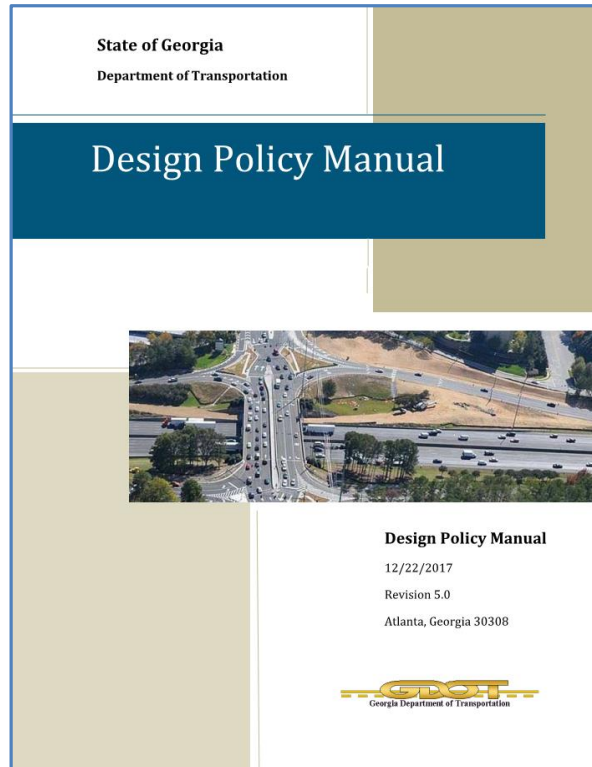
Why ICE??

Integrate safety into our decision making process for intersection control on ALL projects



Intersection Control Policy Before ICE

- **GDOT Design Policy Manual**
 - Ch. 7 Design Policy Manual: At Grade Intersections
 - Ch. 8 Design Policy Manual: Roundabouts
- **MUTCD**



Leading up to ICE

- Frustration due to the lack of non-traditional alternatives considered
- Create a level playing field for all alternatives
- Desire to infuse safety throughout our decision making process by bringing attention to “non-traditional” intersection types
- Provide documentation to support the intersection control decision

ICE Policy Timeline

June 2013:
GDOT approached
FHWA about ICE

September 2015:
Meeting with
Chief Engineer

June 2016: Attended
Peer Exchange in
Matteson Illinois

June 2017: Chief
Engineer Signs
Memo Announcing
ICE Policy

2013

2014

2015

2016

2017

2018

January 2015:
ICE Peer Exchange
Webinar

December 2015:
Formed Working
Group and
Advisory Group

May 2017: Meeting
with Commissioner
and Chief Engineer

July 2017:
Ice Policy
effective date

Implementation

- ICE is required for all projects that do not have concept approval by July 1, 2017
- If ICE would delay the concept report submittal for any projects that have schedules set by July 1, 2017, ICE may be completed during the preliminary design phase
- Submittals during preliminary design must occur no later than 1/3 of the way through the time allotted for preliminary design



Intersection Control Evaluation

THE POLICY

Location and format

<http://www.dot.ga.gov/>



Home -> Business & Government -> Design Manuals -> Manuals & Guides

Intersection Control Evaluation
ICE Policy Training Presentation
ICE Tool Training Presentation
Intersection Control Evaluation (ICE) Policy
Intersection Control Evaluation (ICE) Policy: Appendix A - Stage 1
Intersection Control Evaluation (ICE) Policy: Appendix B - Stage 2
Intersection Control Evaluation (ICE) Policy: Appendix C
Intersection Control Evaluation (ICE) Policy: Appendix D
Intersection Control Evaluation (ICE) Policy: Tool V2.01
Intersection Control Evaluation (ICE) Policy: Tool V2.01 Example
Memo



Scroll to
bottom of
the page

Requirements & Waiver

Not Required

No changes to intersection footprint or control

Required

Project is on State route/NHS and/or uses State or Federal money

Waiver

ICE may be waived based on appropriate evidence and a written request

Approvals

Level 1: Chief Engineer (or Designee)

- Projects going through Plan Development Process
- New or revised signal permits
- New median openings



Level 2: District Engineer with notification to Chief Engineer

Projects that are not level 1 where:

- Leg is added to intersection
- Intersection control is changes

Level 3: District Engineer

- QR, Driveway Permits, Maintenance Work that does not qualify as level 2

Intersection Control Evaluation

THE PROCESS

ICE – The Process



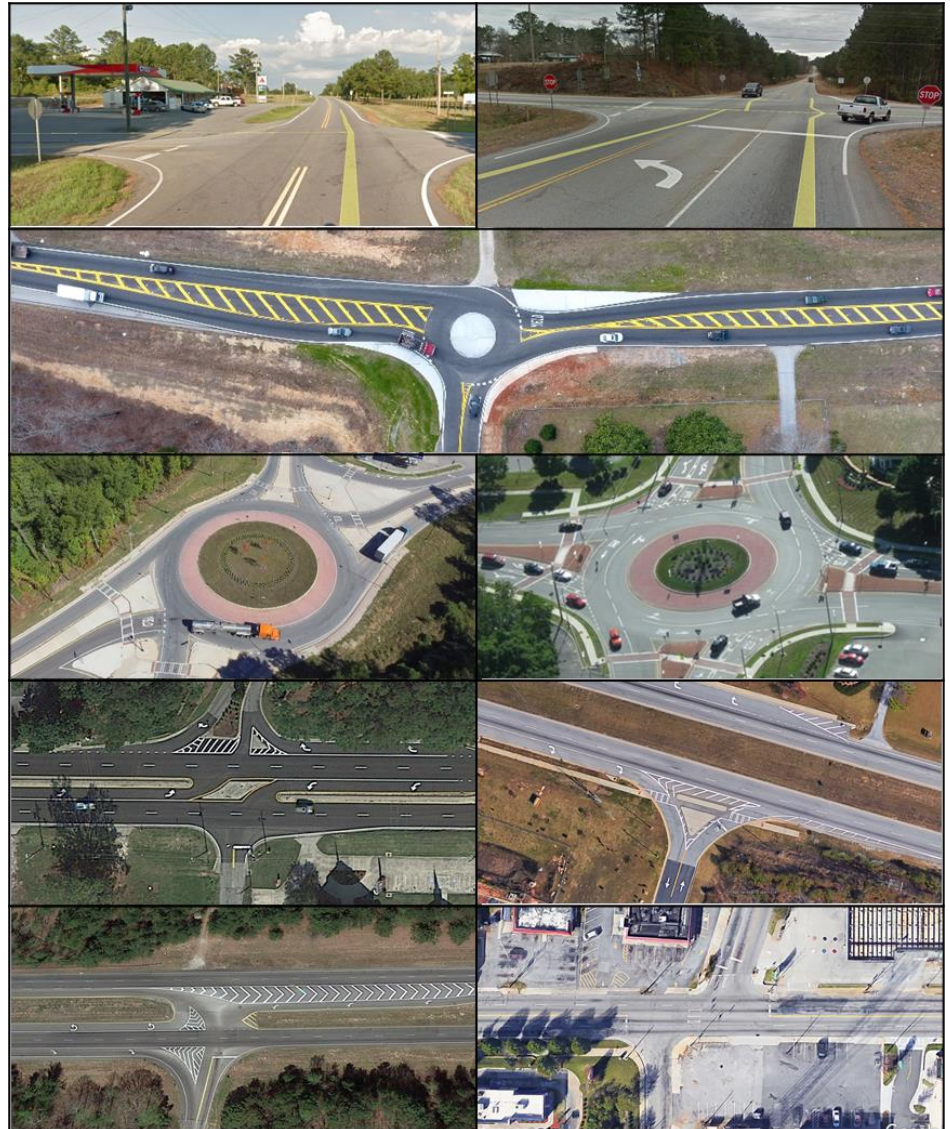
Screening effort to eliminate non-competitive options and identify alternatives for further consideration

Detailed evaluation of the alternatives identified in Stage 1 in order to support the selection of the preferred alternative that will be advanced to detailed design

Stage 1 - Screening

Unsignalized

- Minor Stop
- All-Way Stop
- Mini Roundabout
- Single Lane Roundabout
- Multilane Roundabout
- RCUT
- RIRO w/Downstream U-Turn
- High-T (unsignalized)
- Offset-T Intersections
- Diamond Interchange (Stop)
- Diamond Interchange (RAB)
- Turn Lane/Median Improvements
- Other



Stage 1 - Screening

Signalized



- Signal
- Median U-Turn
- RCUT
- Displaced Left Turn (CFI)
- Continuous Green-T
- Jughandle
- Diamond Interchange (signal)
- Quadrant Roadway
- Diverging Diamond
- Single Point Interchange
- Turn Lane/Median Improvements
- Other

Stage 1 - Screening

1. Does alternative address the **project need** in a **balanced manner** and **in scale** with the project?
2. Does alternative **improve safety performance** in terms of reducing severe crashes?
3. Does alternative incorporate **convenience** and **accessibility** for **pedestrians and/or bicyclists**
4. Does alternative **improve (or preserve) traffic operations** (congestion, delay, reliability, etc.)?
5. Does alternative **appear feasible** given the site **characteristics, constrains and location context**?
6. Does alternative **appear feasible** with respect to **other project factors**?
7. **Overall feasible alternative?**

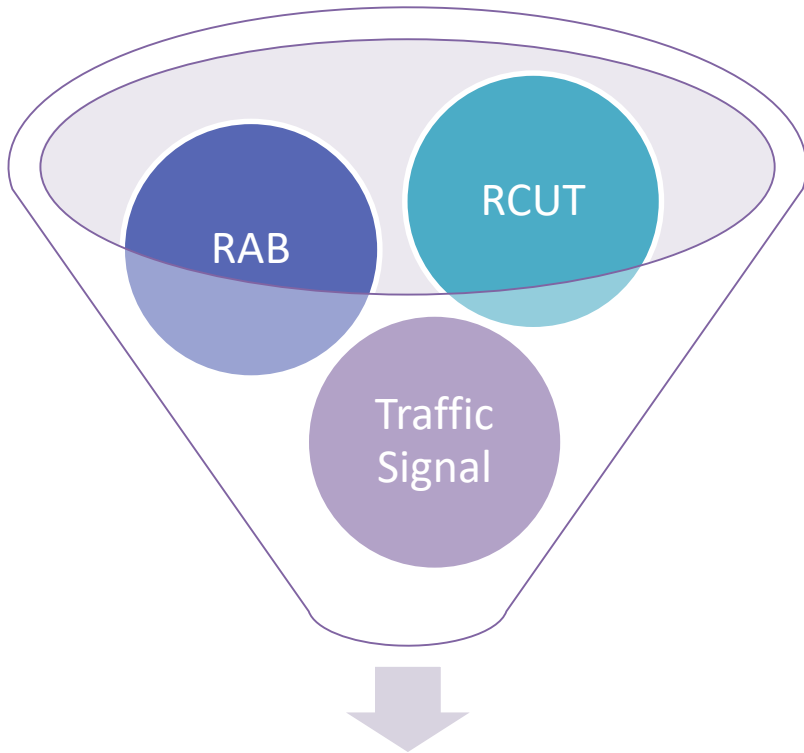
ICE Documentation

Stage 1

- Completed Stage 1 Decision Record
- Single intersection projects may proceed seamlessly to Stage 2
- For corridor projects a concurrence memo is recommended

Stage 2 - Alternative Selection

Shortlist of Alternatives
from Stage 1



Preferred Alternative

- Total Project Cost
- Traffic Operations
- Safety Analysis
- Environmental Impacts
- Stakeholder Posture

ICE Documentation

Stage 1

- Completed Stage 1 Decision Record
- Single intersection projects may proceed seamlessly to Stage 2
- For corridor projects a concurrence memo is recommended

Stage 2

- Completed Alternative Selection Decision Record with Supporting documentation
- Included in Project Concept Report or as a stand-alone document
- Completed waiver form if the ICE recommended alternative is not selected as the preferred alternative

Intersection Control Evaluation

THE TOOL

ICE Tool

- Excel Based
- Streamline the process for evaluating alternatives
- Provide standardized decision records for Stage 1 and Stage 2
- Assists the analyst in choosing the best alternative for the intersection

Location and format

<http://www.dot.ga.gov/>



Home -> Business & Government -> Design Manuals -> Manuals & Guides

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Scroll to
bottom of
the page

ICE Progress

- Every project letting out of Traffic Ops has had ICE performed during concept development
- Several Corridor projects are going back though and making ICE related changes
- More alternative intersection forms being considered and chosen in concept
- To date have held 15 training classes for GDOT, consultants, local government officials with more planned (trained over 400 people)

Lessons Learned

- Important to have support and buy-in from upper management
- Policy needs to have enough teeth to be effective but allow enough flexibility to be able to work within different programs
- Policy is a living document
- Important to conduct proactive training and technical assistance

Acknowledgments

- Jeff Shaw & FHWA partners
- GDOT Management
- Jonathan Reid - Arcadis

Thank
You!



Thank you!

Christina Barry, P.E.


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404-635-2922

Georgia Department of Transportation
Office of Traffic Operations

Introduction

- Project information will be automatically populated to other tabs
- Cell Colors: White = Automatically populated; Blue = Editable; Gray = Drop Down



GDOT INTERSECTION CONTROL EVALUATION (ICE) TOOL

ICE Version 2.13 | Revised

GDOT PI # (or MVA#) 0012345 **Request By:** Bulloch County
County: Bulloch **GDOT District:** 5 - Jesup
Major (State) Road: SR 67 BY **Speed Limit:** 55 mph
Minor (Crossing) St: Cypress Lake Rd **Speed Limit:** 45 mph
Major ST Direction: East/West **Area Type:** Suburb/Transition
Intersection Control: Conventional (Minor Stop)
Prepared By: D5 Traffic Ops **Analyst:** G. Floyd
Date: 3/13/2018 **Project ID:** N/A
Proj Purpose: Safety Improvements for skewed multi-laned hwy with stop-controlled minor streets

Note: Enter current year traffic data in blue boxes

2018	Existing (current) Yr	[6700 / 9000]			
2022	Project Opening Yr	(0)	(14)	(48)	(43)
2042	Project Design Yr	0	6	11	45

EB SR 67 BY

[7100 / 9600]	(6)	5	[1000 / 11000]
	(439)	558	
	(25)	11	
	(0)	0	

2022 / 2042

Intersection Daily

Entering Volume:

28600 / 38500

WB SR 67 BY

[8200 / 11000]	121	(126)
	45	(47)
	17	(17)
	183	(190)

Peak Hour % Trucks

NB	SB	EB	WB
3%	3%	3%	3%

SB Cypress Lake Rd

[6600 / 8900]	17	268	27	0
	(175)	(572)	(48)	(0)
	312 (795)			
	[6600 / 8900]			

NB Cypress Lake Rd

[6600 / 8900]	17	268	27	0
	(175)	(572)	(48)	(0)
	312 (795)			
	[6600 / 8900]			


Annual Growth Rate: 1.5%

K Factor: 10%

Legend:
 000 = AM Peak Hr Volume
 (000) = PM Peak Hr Volume
 [000/000] = 2022 / 2042 ADT (est)

Approach Splits: SR 67 BY - 0.52 / Cypress Lake Rd - 0.48

Stage 1

 GDOT ICE STAGE 1: SCREENING DECISION RECORD		ICE Version 2.12 Revised 02/20/2018						
GDOT PI #	0012345	Note: Up to 5 alternatives may be selected and evaluated; Use this ICE Stage 1 to screen 5 or fewer alternatives to evaluate in Stage 2						
Project Location:	SR 67 BY @ Cypress Lake Rd							
Prepared by:	D5 Traffic Ops							
Analyst:	G. Floyd							
Date:	3/13/2018							
Answer "Yes" or "No" to each policy question for each control type to identify which alternatives should be evaluated in the Stage 2 Decision Record; enter justification in the rightmost column								
Intersection Alternative (see "Intersections" tab for detailed description of intersection/interchange type)								
		<div> <div> 1. Does alternative address the project need in a balanced manner and in scale with the project? 2. Does alternative improve safety performance in terms of reducing severe crashes? 3. Does alternative incorporate safety, convenience and accessibility for pedestrians and/or bicyclists? 4. Does alternative improve (or preserve) traffic operations (congestion, delay, reliability, etc.)? 5. Does alternative appear feasible given the site characteristics, constraints & location context? 6. Does alternative appear feasible with respect to other project factors? 7. Overall feasible alternative (select alternative for further evaluation in Stage 2)? </div> <div>Screening Decision</div> </div>						
Unsignalized Intersections	Conventional (Minor Stop)	No	No	No	No	No	No	No
	Conventional (All-Way Stop)	No	No	No	No	No	No	No
	Mini Roundabout	No	No	No	No	No	No	No
	Single Lane Roundabout	No	No	No	No	No	No	No
	Multilane Roundabout	No	No	No	No	No	No	No
	RCUT (stop control)	No	No	No	No	No	No	No
	RIO w/down stream U-Turn	No	No	No	No	No	No	No
	High-T (unsignalized)	No	No	No	No	No	No	No
	Offset-T Intersections	No	No	No	No	No	No	No
	Diamond Interch (Stop Control)	No	No	No	No	No	No	No
	Diamond Interch (RAB Control)	No	No	No	No	No	No	No
	No LT Lane Improvements	No	No	No	No	No	No	No
	No RT Lane Improvements	No	No	No	No	No	No	No
	No Median Improvements	No	No	No	No	No	No	No
Other Unsignalized (provide description):	No	No	No	No	No	No	No	
Signalized Intersections	Traffic Signal	No	No	No	No	No	No	No
	Median U-Turn (Indirect Left)	No	No	No	No	No	No	No
	RCUT (signalized)	No	No	No	No	No	Yes	No

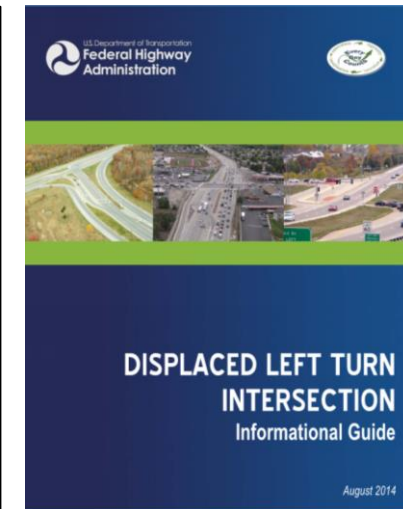
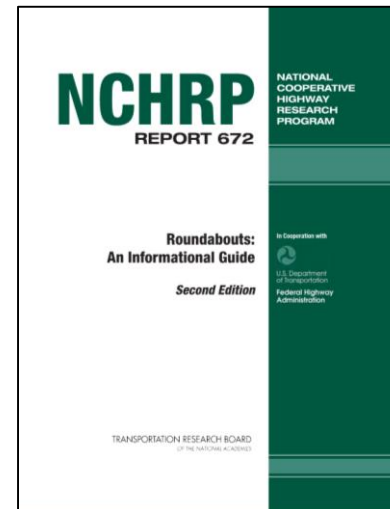
- Yes/no questions for each alternative
- Enter screening justification decision
- May attach additional sheets if needed
- Row will turn Green if question 7 is answered with "yes"

Intersections Tab

INTERSECTION CONTROL TYPE DESCRIPTIONS
Click on intersection images for additional resource publications ICE Version 2.121 Revised 02/28/2010


Unsignalized At-Grade Intersections	Signalized At-Grade Intersections
 <p>Conventional Minor Street at All-Way Stop: At minor street stop (2-way stop) intersections, vehicles on the minor street stop and give right-of-way to major street. At all-way stop (AWS) intersections, all vehicles must stop and take turns entering the intersection.</p>	 <p>Signalized Intersection: The most common type of signalized intersection with high driver familiarity. Signal could be simple two-phase or more complex 8-phase to serve vehicular demand. Left turns can be permitted or protected (or combination of both). At a conventional 4-leg</p>
 <p>Mini Roundabouts: Roundabout type characterized by small diameter and traversable central island; offer most of the benefits of single-lane roundabouts with added benefit of a smaller footprint; best suited to lower-speed environments and where environmental constraints preclude use.</p>	 <p>Median U-Turns: Left turn movements otherwise occurring at the main intersection are made via U-turn in the median, preceding or following right turns. U-turns may be on a major roadway or on both major and minor roadways. A conventional MUT has 16</p>
 <p>Single-Lane Roundabouts: Form of circular intersection in which traffic travels counterclockwise around a central island and in which entering traffic must yield to circulating traffic. Circulating traffic has priority with exterior controlled by yield. Geometry allows all traffic into and thru the</p>	 <p>Signalized RCUT: Similar to the Median U-turn but features break in cross-street traffic that allows signals on opposite directions to operate independently. Left turns can make directly turn onto the minor road but minor road thru and left turn movements are made using the directional U-turn</p>
 <p>Multilane Roundabouts: Share same circular travel and yield-at-entry in single-lane roundabouts, but include multiple entry and circulatory lanes for one or more approaches that must accommodate vehicles traveling side by side. Important design features include proper entry path alignment and</p>	 <p>Displaced Left-Turn (DLT): Left turn traffic crosses opposing lanes in advance of main intersection and are stored in additional lanes. At main intersection, thru and left turns can be made simultaneously during same signal phase. A full DLT (bathhouse) has 28</p>
 <p>Restricted Crossing U-Turn (RCUT): Redirection of minor street left turn movements or right turns followed by a U-turn movement via a downstream directional crossover in the median (+/- 500 feet from the main intersection). An RCUT intersection has 14 conflict points and can provide substantial safety</p>	 <p>Continuous Green-T: Three-leg intersection that features raised channelization to allow the "tap" through movement to operate under continual green. The opposite direction intersects with the major and minor street left at a signalized intersection (minor left turn merge with the</p>
 <p>Bypass or Downstream U-Turn: Redirection of minor street thru & left turn movements or right turns followed by a U-turn via directional median crossover (+/- 500 feet from main intersection). Major street lefts are also made indirectly, passing the crossing street and using the same U-turn crossover in</p>	 <p>Jughandle: Much like an at-grade diamond interchange, ramps on the major street diverge from the right side in advance of a cross-street intersection, removing the left turn movement from directly at the cross-street intersection. Major street left turns are made at minor, stop-controlled intersections on</p>

- Intersection descriptions and pictures
- Click on a picture for more information



Stage 2

- Comparison between alternatives
- Warrant analysis, no build operational analysis, crash data entered at top of


 GDOT ICE STAGE 2: ALTERNATIVE SELECTION DECISION RECORD		ICE Version 2.13 Revised 03/12/2018																																																												
GDOT PI # (or N/A) 0012345 County: Bulloch Project Location: SR 67 BY @ Cypress Lake Rd Existing Intersection Control: Conventional (Minor Stop)		GDOT District: 5 - Jesup Area Type: Suburb/Transition Date: 3/13/2018 Agency/Firm: D5 Traffic Ops Analyst: G. Floyd																																																												
Opening / Design Year Traffic Operations		Type of Analysis: Conventional Non-Safety Funded Project																																																												
Intersection meets signal/AWS warrants? Traffic Analysis Measure of Effectiveness Traffic Analysis Software Used Analysis Time Period 2022 Opening Yr No-Build Peak Hr Intersection 2022 Opening Yr No-Build Peak Hr Intersection V/C 2042 Design Yr No-Build Peak Hr Intersection Delay 2042 Design Yr No-Build Peak Hr Intersection V/C	<table border="1"> <thead> <tr> <th colspan="2">Meets AWS only</th> </tr> <tr> <th colspan="2">Intersection Delay</th> </tr> <tr> <th colspan="2">HCS 2010</th> </tr> <tr> <th>AM Peak Hr</th> <th>PM Peak Hr</th> </tr> </thead> <tbody> <tr> <td>18.7 sec</td> <td>26.2 sec</td> </tr> <tr> <td>0.08</td> <td>0.10</td> </tr> <tr> <td>83.0 sec</td> <td>108.9 sec</td> </tr> <tr> <td>0.15</td> <td>0.19</td> </tr> </tbody> </table>	Meets AWS only		Intersection Delay		HCS 2010		AM Peak Hr	PM Peak Hr	18.7 sec	26.2 sec	0.08	0.10	83.0 sec	108.9 sec	0.15	0.19	Complete Streets Warrants Met? <input type="checkbox"/> PEDESTRIANS <input type="checkbox"/> BICYCLES <input type="checkbox"/> TRANSIT	<table border="1"> <thead> <tr> <th rowspan="2">Crash Data: Enter 5 most recent years of intersection crash data</th> <th colspan="3">Crash Severity</th> <th rowspan="2"></th> </tr> <tr> <th>PDO</th> <th>Injury Crash*</th> <th>Fatal Crash*</th> </tr> </thead> <tbody> <tr> <td>Angle</td> <td>12</td> <td>21</td> <td>1</td> <td>57%</td> </tr> <tr> <td>Head-On</td> <td>0</td> <td>0</td> <td>0</td> <td>0%</td> </tr> <tr> <td>Rear End</td> <td>14</td> <td>2</td> <td>0</td> <td>27%</td> </tr> <tr> <td>Sideswipe - same</td> <td>0</td> <td>0</td> <td>0</td> <td>0%</td> </tr> <tr> <td>Sideswipe - opposite</td> <td>1</td> <td>0</td> <td>0</td> <td>2%</td> </tr> <tr> <td>Not Collision w/Motor Veh</td> <td>9</td> <td>0</td> <td>0</td> <td>15%</td> </tr> <tr> <td>TOTALS:</td> <td>36</td> <td>23</td> <td>1</td> <td>60</td> </tr> </tbody> </table> <p><small>* Number of crashes resulting in injuries / fatalities, not number of persons</small></p>	Crash Data: Enter 5 most recent years of intersection crash data	Crash Severity				PDO	Injury Crash*	Fatal Crash*	Angle	12	21	1	57%	Head-On	0	0	0	0%	Rear End	14	2	0	27%	Sideswipe - same	0	0	0	0%	Sideswipe - opposite	1	0	0	2%	Not Collision w/Motor Veh	9	0	0	15%	TOTALS:	36	23	1	60
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Stage 2

Alternatives Analysis:	Alternative 1		Alternative 2		Alternative 3		
Proposed Control Type/Improvement:	Multilane Roundabout		RCUT (stop control)		RIRO w/down stream U-Turn		
Project Cost: (From CostEst Worksheet)	Additional description here		Additional description here		Additional description here		
Construction Cost	\$1,948,000		\$346,000		\$237,000		
ROW Cost	\$124,000		\$0		\$0		
Environmental Cost	\$13,000		\$0		\$0		
Reimbursable Utility Cost	\$24,000		\$5,000		\$3,000		
Design & Contingency Cost	\$533,000		\$82,000		\$56,000		
Cost Adjustment (justification req'd)	0%		0%		0%		
Total Cost	\$2,642,000		\$433,000		\$296,000		
Traffic Operations:							
Traffic Analysis Software Used	GDOT RND Tool 4.1		HCS7		HCS7		
Analysis Period	AM Peak Hr	PM Peak Hr	AM Peak Hr	PM Peak Hr	AM Peak Hr	PM Peak Hr	
2022 Design Yr Build Intersection Delay	8.4 sec	11.7 sec	45.0 sec	47.9 sec	58.3 sec	60.1 sec	
2022 Design Yr Build Intersection V/C	0.25	0.30	0.38	0.45	0.39	0.50	
Safety Analysis:							
Predefined CRF: PDO	63%		20%		35%		
Predefined CRF: Fatal/Inj	63%		36%		54%		
Predefined CRF Source:	FHWA Clearinghouse #s 4927 / 4927		FHWA Clearinghouse #s 351 / 353		FHWA Clearinghouse #s 5555 / 5556		
User Defined CRF: PDO							
User Defined CRF: Fatal/Inj							
User Defined CRF Source (write in if applicable):							

- **Project Cost:** Project Cost can be estimated using the CostEst Tab or by another method
- **Traffic Operations:** AM and PM DHV analysis
- **Safety analysis:**
 - Prepopulated based on existing intersection control
 - CRFs from FHWA Clearinghouse
 - Can be overridden with user defined CRFs

Cost Tab



GDOT ICE TOOL: COST ESTIMATING AID
 ICE Version 2.12 | Revised 02/20/2018

Cost Estimate Tool Used? ☒ Yes

Project Information
 Location: SR 67 BY @ Cypress Lake Rd County: Bulloch Date: 3/13/2018
 GDOT PI # (or N/A): 0012345 Area Type: Suburb/Transition Agency/Firm: D5 Traffic Ops
 Existing Intersection Control: Conventional (Minor Stop) GDOT District: 5 - Jesup Analyst: G. Floyd
 Type of Analysis: Conventional Non-Safety Funded Project Major Street Direction: East/West

Table 1: Existing Conditions

	EB SR 67 BY			WB SR 67 BY			NB Cypress Lake Rd			SB Cypress Lake Rd		
Movement	Left Turn	Thru	Right Turn	Left Turn	Thru	Right Turn	Left Turn	Thru	Right Turn	Left Turn	Thru	Right Turn
Number of Lanes	1	2	1	1	2	1	0	1	0	0	1	0
Lane Widths*	12'	12'	12'	12'	12'	12'	0'	12'	0'	0'	12'	0'
Bay Length**	250'		250'	250'		250'	0'		0'	0'		0'
Median Width		44'			44'			0'			0'	
Right-of-Way	200'						50'					

Table 2: Proposed Conditions

	Maintenance Roundabout	RCUT (stop control)	RFB w/down stream LL	N/A	N/A
Proposed Pavement Type	F.D. Asphalt	F.D. Asphalt	F.D. Asphalt	F.D. Asphalt	F.D. Asphalt
Reimbursable Utility:	Minimal	Minimal	Minimal	Moderate	Moderate
# of Driveway(s) Impacted	0	0	0	0	0
Modify/Replace Traffic Signal	0	0	0	0	0
Lighting Poles (ea)	0	0	0	0	0
Flashing Beacons (ea)	0	0	0	0	0
RFB/PHB Ped Crossings (ea)	0	0	0	0	0
New/Replace Sidewalks (LF)	0'	0'	0'	0'	0'
New/Replace Cross Drains (LF)	0'	0'	0'	0'	0'
New/Replace Guardrail (LF)	725'	0'	0'	0'	0'
New Retaining Wall (LF)	0'	0'	0'	0'	0'
Bridge: New/Widen/Replace (sqft)	0	0	0	0	0
Add ROW/Easements/Demolition	\$0	\$0	\$0	\$0	\$0

Site Context
 Topography: Level
 Traffic Mgmt Plan: Maintain Traffic
 Project Size: Single Intersection

Intersections
 Signal Poles: Strain Pole
 Design Vehicle: WB-67
 Existing Interchange?: No

Roundabouts
 Inscribed DIA - Mini: 70
 Inscribed DIA - Single: 150
 Inscribed DIA - Multi: 200
 Circulating Lane Width: 16

Cost Multipliers
 Grading Complete: 15%
 Reimbursable Utility: 2%
 Traffic Control: 20%
 Project Size: 0%
 Prelim Engineering: 12%
 Project Contingency: 20%

ROW Costs
 Prevalent ROW Type: Mixed (Average)
 ROW Cost/Acre: \$72,188
 ROW Multiplier: 1.6

- Must indicate if tab will be used
- Enter information for Existing and Proposed conditions
- Provides high level planning cost estimate for the purpose of comparison between alternatives

Stage 2

Alternatives Analysis:	Alternative 1	Alternative 2	Alternative 3
Proposed Control Type/Improvement:	Multilane Roundabout	RCUT (stop control)	RIRO w/down stream U-Turn
Project Cost: (From CostEst Worksheet)	<i>Additional description here</i>	<i>Additional description here</i>	<i>Additional description here</i>
Construction Cost	\$1,948,000	\$346,000	\$237,000
ROW Cost	\$124,000	\$0	\$0
Environmental Cost	\$13,000	\$0	\$0
Reimbursable Utility Cost	\$24,000	\$5,000	\$3,000
Design & Contingency Cost	\$533,000	\$82,000	\$56,000
Cost Adjustment (justification req'd)	0%	0%	0%
Total Cost	\$2,642,000	\$433,000	\$296,000

Traffic Operations:	GDOT RND Tool 4.1		HCS7		HCS7	
Traffic Analysis Software Used	AM Peak Hr		PM Peak Hr		PM Peak Hr	
Analysis Period	8.4 sec		11.7 sec		45.0 sec	
2022 Design Yr Build Intersection Delay	0.25		0.30		0.38	
2022 Design Yr Build Intersection V/C	0.25		0.30		0.39	

Safety Analysis:	FHWA Clearinghouse #s		FHWA Clearinghouse #s		FHWA Clearinghouse #s	
Predefined CRF: PDO	63%		20%		35%	
Predefined CRF: Fatal/Inj	63%		36%		54%	
Predefined CRF Source:	4927 / 4927		351 / 353		5555 / 5556	
User Defined CRF: PDO						
User Defined CRF: Fatal/Inj						
User Defined CRF Source (write in if applicable):						

- **Project Cost:** Project Cost can be estimated using the CostEst Tab or by another method
- **Traffic Operations:** AM and PM DHV analysis
- **Safety analysis:**
 - Prepopulated based on existing intersection control
 - CRFs from FHWA Clearinghouse
 - Can be overridden with user defined CRFs

Stage 2

Environmental Impacts:¹			
Historic District/Property	None	None	None
Archaeology Resources	None	None	None
Graveyard	None	None	None
Stream	None	None	None
Underground Tank/Hazmat	None	None	None
Park Land	None	None	None
EJ Community	None	None	None
Wooded Area	Minimal	None	None
Wetland	None	None	None
<i>Note: If environmental impacts are significant (RED), provide justification impacts.</i>			
Stakeholder Posture:	<i>¹ Environmental impacts are only preliminary estimates; detailed environmental impacts are required for final decision.</i>		
Local Community Support	Unknown	Unknown	Unknown
GDOT Support	Neutral	Strong	Neutral
Final ICE Stage 2 Score:	5.0	6.0	6.3
Rank of Control Type Alternatives:	3	2	1
<p>Note: Stage 2 score is not given (shown as "-") if signal or AWS is selected as control type.</p> <p>Provide additional comments and/or explain any unique analysis inputs, or results (as necessary):</p> <p>The existing and design year intersection delays were determined using the TWSC Analysis Tool. The TWSC Analysis Tool does not provide a delay value for the entire intersection. A delay value for the entire intersection was used (SB Cypress Lake Rd). This office recommends the intersection to address the targeted crash types while accommodating left-turns from the northbound approach.</p>			

- **Environmental:** None, Minimal, or Adverse
- **Stakeholder Posture:** 6 choices including unknown
- **Score:** Ranks alternatives based on the 5 sections of the Alternatives analysis
- **Additional Comments:** Provide additional comments or explanation to support the analysis

Environmental Tab

ICE ENVIRONMENTAL FACTORS	
ICE Version 2.12 Revised 02/20/2018	
Project Information	
GDOT District: 5 - Jesup	Date: 3/13/2018
Requested By: Bulloch County	Area Type: Suburb/Transition
County: Bulloch	Prepared By: D5 Traffic Ops
Project Location: SR 67 BY @ Cypress Lake Rd	Analyst: G. Floyd
Existing Intersection Control: Conventional (Minor Stop)	
Environmental Factors	
In the box below, document any significant environmental factors for any alternative considered. Include a plan and costs for mitigation that retains the proposed intersection type as a viable alternative. Include in ICE documentation package <u>only if one or more alternatives have significant impacts</u> .	
Proposed Intersection Control	
#1:	Multilane Roundabout
None	
Proposed Intersection Control	
#2:	RCUT (stop control)
None	
Proposed Intersection Control	
#3:	RIO w/down stream U-Turn
None	


- Optional; but should be used where an adverse environmental impact is indicated
- Attach additional sheets as necessary

Stage 2

Environmental Impacts:¹			
Historic District/Property	None	None	None
Archaeology Resources	None	None	None
Graveyard	None	None	None
Stream	None	None	None
Underground Tank/Hazmat	None	None	None
Park Land	None	None	None
EJ Community	None	None	None
Wooded Area	Minimal	None	None
Wetland	None	None	None
<i>Note: If environmental impact is significant (RED), provide justification impact won't occur. Environmental impacts are only preliminary estimates; detailed environmental impact analysis is required.</i>			
Stakeholder Posture:			
Local Community Support	Unknown	Unknown	Unknown
GDOT Support	Neutral	Strong	Neutral
Final ICE Stage 2 Score:	5.0	6.0	6.3
Rank of Control Type Alternatives:	3	2	1
<i>Note: Stage 2 score is not given (shown as "-") if signal or AWS is selected as control type.</i>			
Provide additional comments and/or explain any unique analysis inputs, or results (as necessary):	The existing and design year intersection delays were determined using the TWSC Analysis Tool does not provide a delay value for the entire intersection. A delay value was used (SB Cypress Lake Rd). This office recommends the intersection to address the targeted crash types while accommodating left-turns from the northbound approach.		

- **Environmental:** None, Minimal, or Adverse
- **Stakeholder Posture:** 6 choices including unknown
- **Score:** Ranks alternatives based on the 5 sections of the Alternatives analysis
- **Additional Comments:** Provide additional comments or explanation to support the analysis

Waiver



GDOT INTERSECTION CONTROL EVALUATION (ICE) WAIVER FORM

ICE Version 2.12 | Revised 4/02/2012

Waiver Request - Level 2 / 3

In certain circumstances where an ICE may otherwise be required, an ICE may be waived based on appropriate evidence presented with a written request. Scenarios in which an ICE waiver request may be considered include:

- Proposed improvements do not substantially alter the character of the intersection, and are considered minor in nature, such as extending existing turn lane(s) or modifying signal phasing at an existing traffic signal
- The intersection consists of a public roadway intersecting a divided, multi-lane roadway where the access will be limited to a closed median with only right-in/out access that will operate acceptably; or
- The intersection is along an undivided, two-lane roadway that will not be widened and meets the following criteria:
 - Low risk in terms of exposure (total intersection entering volume less than 1,000 vehicles / day)
 - Latest 5 years of crash history is not indicative of a crash problem (no discernible crash patterns coupled with low crash frequency and severity)
 - Layout has no unusual or undesirable geometric features (such as restricted sight distance)
 - The proposed changes are not expected to adversely affect safety

If only one alternative is determined to be feasible from the ICE Stage 1, then a waiver may be submitted in lieu of completing ICE Stage 2. The waiver must clearly explain why there is no other feasible alternative. A Waiver Form should also be submitted to document an agreed upon decision to select a preferred alternative other than the highest scoring alternative in Stage 2.

District Engineer (depending on Waiver level). Questions regarding the waiver process should be routed to the State Traffic Engineer.

Project Information: Location: SR 67 Y by Cypress Lake Rd
 County: Bulloch
 GDOT District: 5 - Jesup
 Area Type: Suburban/Transition
 Existing Intersection Control: Conventional (Minor Stop)

GDOT PI # (or N/A): 0012345

Requested By: Bulloch County

Prepared By: D5 Traffic Ops

Analyst: G. Floyd

Date: 3/13/2018

Waiver Request Type: Quick Response Project

Traffic and Operations Data:

section meets signal/AW/S warrants?

Traffic Analysis Type:

Existing Avg Daily Traffic (Major Street):

Existing Avg Daily Traffic (Minor Street):

Analysis Period:

2017 Opening Yr Peak Hour

2017 Opening Yr Peak Hour

2022 Design Yr Peak Hour Intersection

2022 Design Yr Peak Hour Intersection

	Meets AWS only
	Intersection Delay
	12,200
	3,290
AM Peak	PM Peak
26.2 sec	26.2 sec
0.10	0.10
108.9 sec	108.9 sec
0.19	0.19

*Crash data required for all existing intersections. ADT's required if available (from data collected at nearest GDOT count station). Capacity data is optional unless needed to further back up the waiver request.

Crash Data (Required):*		Crash Severity			
Crash Type	Crash Data	Crash Severity			
		PDD	Injury	Crash	Fatal
Angle	12	21	1	0	0
Head-On	0	0	0	0	0
Rear End	14	2	0	0	0
Sideswipe - same	0	0	0	0	0
Sideswipe - opposite	1	0	0	0	0
Motorist Commitment/Minor	9	0	0	0	0
TOTALS:		36	23	1	0

* Number of crashes resulting in injuries / fatalities, not number of crashes.

Description of Work / Justification for Waiver (Required):

The RCUT alternative addresses far side right-angle collisions without restricting movements from the mainline. The proposed work will include minor modifications to existing left-turn lanes at the intersection as well as the construction of a downstream turn break and deceleration lane. Concrete restrictions will also be added to the median

Proposed Intersection Control: RCUT (stop control)

REQUESTED BY: _____ **Date:** _____

Title: _____


APPROVED BY: _____ **Date:** _____

Name: _____

District Engineer or (Approved Delegate)

- May be used for waiving:
 - ICE Stage 1 and Stage 2 analysis
 - Stage 2 when only 1 alternative is feasible from stage 1
 - Results from Stage 2
- Enter enough information to justify waiver request

FAQ



GDOT INTERSECTION CONTROL EVALUATION (ICE) TOOL

Georgia Department of Transportation

ICE Version 2.12 | Revised 02/20/2018

Frequently Asked Questions:

Question 1: What is new in ICE Version 2.1 compared to version 2.0?

ANS: Enhancements have been made to reduce or simplify data requirements, provide reviewers with AM/PM and forecast intersection traffic data and better predict alternative cost estimates. However, the minor changes to scoring criteria and alternatives analysis should not substantially impact alternative scoring and ranking compared to the previous software version. Specific changes include:

- Intersection graphics and text have been enhanced, including photos and document links for each junction type
- Several intersection types were added, including signalized and unsignalized Diamond and Dual Roundabout interchanges
- Users are asked to input both AM and PM peak period volumes and analysis results. The volume input data is used to project existing and design year entering intersection volumes and average daily traffic for approaches. Stage 2 operations analysis use a weighted average of AM and PM intersection delay and V/C results.
- In Stage 2, users can now analyze and compare intersection operations by Delay and V/C or Network Delay
- Right-of-Way impact is selected by land use type and cost per acre is auto-populated from countywide averages
- Additional CMF data is now auto-populated using FHWA CMF Clearinghouse and other resources as appropriate

Question 2: Several intersection control alternatives include multiple intersections. How is intersection delay compared to the base intersection conditions of a singular intersection?

ANS: Engineering judgement is required on a case-by-case basis, but the general principle is to add the delay incurred by vehicles with longer travel paths weighed by the number (or percentage) of those vehicles making that movement

Question 3: Not all tools give overall intersection delay and V/C ratios. Which delay value should I use?

ANS: For unsignalized intersections (where one or more movements are not required to stop for approach movement delay. If all intersection movements have some form of intersection control, use the overall intersection delay of each approach delay multiplied by the volume on each approach.

Question 4: How do I analyze multiple intersections along a corridor?

ANS: The ICE tool is designed for individual intersection analyses, but an ICE analysis is required for all intersections along a corridor (unless otherwise stipulated in the ICE waiver section). Use intersection control choices to ensure corridor continuity (as appropriate) and document the analysis. The tool will rank intersections highest but provide better continuity along the overall corridor.

Question 5: For an ICE Waiver, when is the traffic and crash data required and when is it optional?

ANS: Crash data is required for all existing intersections. ADT's are required if available (traffic count station site). Capacity data is optional unless needed to justify the basis of the ICE process is being waived altogether to show that it will operate acceptably).

Question 6: Which worksheets should be printed and included in an ICE submittal?

ANS: Submissions for and ICE Waiver require submission of the singular Waiver worksheet, Introduction, Stage 1 and Stage 2 worksheets, with CostEst (if used) and Scoring worksheets as optional.

- Frequently Asked Questions
- Update log for Tool Versions
- Contact Information

Tool Version Tracking

Tool Version	Release Date	Tool Updates:
2.0	7/17/2017	- Initial ICE Tool release date, corresponding with ICE Policy release date of July 1, 2017
2.01	9/18/2017	- Modifications made to the Waiver type to include other submittal categories and data requirements
2.1	1/5/2018	- Intersection worksheet graphics/text have been enhanced, including photos & document links for interchange types - Added intersection types, including Diamond Interchanges (signal & unsignalized) and Dual Roundabout interchange - Cost of Right-of-Way (by acre) for rural and urban parcels are now auto-populated based on individual countywide data - Additional CMF data is now auto-populated using FHWA CMF Clearinghouse and other resources as appropriate - Users can now choose to analyze and compare intersection operations by Delay and V/C or Network Delay
2.11	1/25/2018	- Fixed bug to report ROW costs for all Counties
2.12	2/20/2018	- Fixed bug to in calculating B/C ratio for Safety Funded Projects - Updated Multi-File Summary sheet to include PI#, waiver and Stage 1 and Stage 2 Decision Matrix w/signature line

Multi-file ICE Summary Spreadsheet

Multi-File Results Tab: Summary for longitudinal Projects with more than one intersection going through ICE

RIRO Waivers: Form to waiver multiple low volume right in/right out intersections

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