Using the ICE 2.0

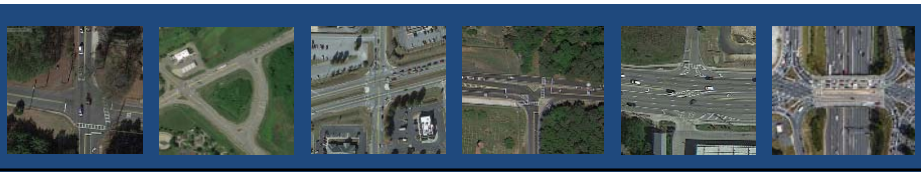
to Conduct Intersection Control Evaluations

Training Workshop

August 2017

Jonathan Reid, PE PTOE

ARCADIS



Purpose of ICE Tool

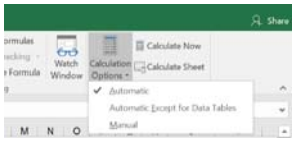
- Tool goal: provide a **simplified and consistent way** of using data to assess and quantify intersection control benefits
  - Traffic
  - Safety
  - Cost
  - Environmental Impact
  - Stakeholder Posture

- Support ICE policy to provide **traceability, transparency, consistency and accountability** when identifying and selecting intersection control
- Reduce time required to analyze and compare multiple intersection alternatives
- Select alternative that **reflects the overall best value** in terms of specific performance-based criteria.

What the ICE Tool is NOT

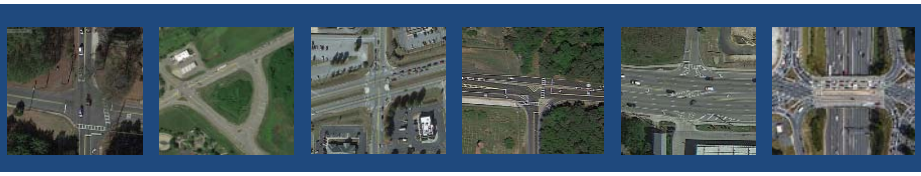
- Not viable for 100% of alternative studies due to extent of control possibilities and geometric variabilities
- A determinate of final project cost for the preferred alternative
- A replacement for good engineering judgment in evaluating alternatives

NOTE: *Before you get started, make sure that Calculation Options (under FORMULAS tab) is set to Automatic calculations*



Case Study: SR 22 @ Fulton Mill Road

- Rural intersection in Bibb County, GA
- Minor stop, skewed intersection with high-crash history (1 fatality)
- SR 22 is four-lane median-divided highway; narrows to two lanes west of Fulton Mill Intersection
- Not exact representation - liberties taken to illustrate tool functions

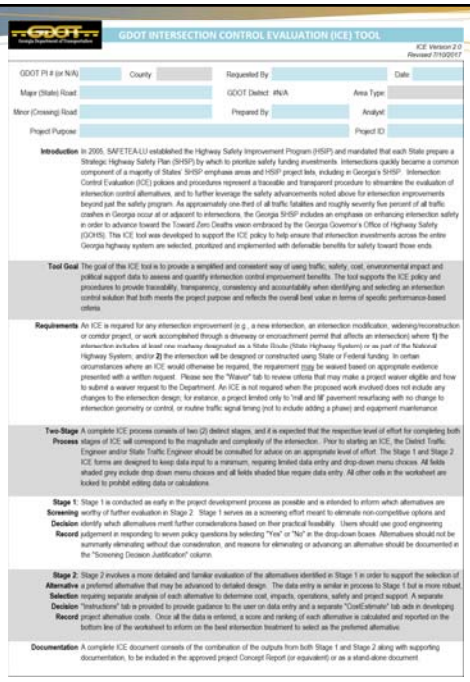


Intersection Control Evaluation

ICE 2.0 TOOL – INTRODUCTION

SAMPLE BLANK INTRODUCTION WORKSHEET

Always fill out the INTRODUCTION tab first, whether completing a full ICE analysis (Stage 1 and Stage 2) or the WAIVER form


GDOT INTERSECTION CONTROL EVALUATION (ICE) TOOL

ICE Version 2.0
Revised 7/10/2017

GDOT PI # (or N/A) | County | Requested By | Date
Major (State) Road | GDOT District: #N/A | Area Type
Minor (Crossing) Road | Prepared By | Analyst
Project Purpose | Project ID

Introduction In 2005, SAFETEA-LU established the Highway Safety Improvement Program (HSIP) and mandated that each State prepare a Strategic Highway Safety Plan (SHSP) by which to prioritize safety funding investments. Intersections quickly became a common component of a majority of States' SHSP emphasis areas and HSIP project lists, including in Georgia's SHSP. Intersection Control Evaluation (ICE) policies and procedures represent a traceable and transparent procedure to streamline the evaluation of intersection control alternatives, and to further leverage the safety advancements noted above for intersection improvements beyond just the safety program. As approximately one-third of all traffic fatalities and roughly seventy five percent of all traffic crashes in Georgia occur at or adjacent to intersections, the Georgia SHSP includes an emphasis on enhancing intersection safety in order to advance toward the Toward Zero Deaths vision embraced by the Georgia Governor's Office of Highway Safety (GOHS). This ICE tool was developed to support the ICE policy to help ensure that intersection investments across the entire Georgia highway system are selected, prioritized and implemented with defensible benefits for safety toward those ends.

Tool Goal The goal of the ICE tool is to provide a simplified and consistent way of using traffic, safety, cost, environmental impact and political support data to assess and quantify intersection control improvement benefits. The tool supports the ICE policy and procedures to provide traceability, transparency, consistency and accountability when identifying and selecting an intersection control solution that both meets the project purpose and reflects the overall best value in terms of specific performance-based criteria.

Requirements An ICE is required for any intersection improvement (e.g., a new intersection, an intersection modification, widening/reconstruction or corridor project, or work accomplished through a driveway or encroachment permit that affects an intersection) where **1)** the intersection includes at least one roadway designated as a State Route (State Highway System) or as part of the National Highway System, and/or **2)** the intersection will be designed or constructed using State or Federal funding. In certain circumstances where an ICE would otherwise be required, the requirement may be waived based on appropriate evidence presented with a written request. Please see the "Waiver" tab to review criteria that may make a project waiver eligible and how to submit a waiver request to the Department. An ICE is not required when the proposed work involved does not include any changes to the intersection design; for instance, a project limited only to "mill and fill" pavement resurfacing with no change to intersection geometry or control, or routine traffic signal timing (not to include adding a phase) and equipment maintenance.

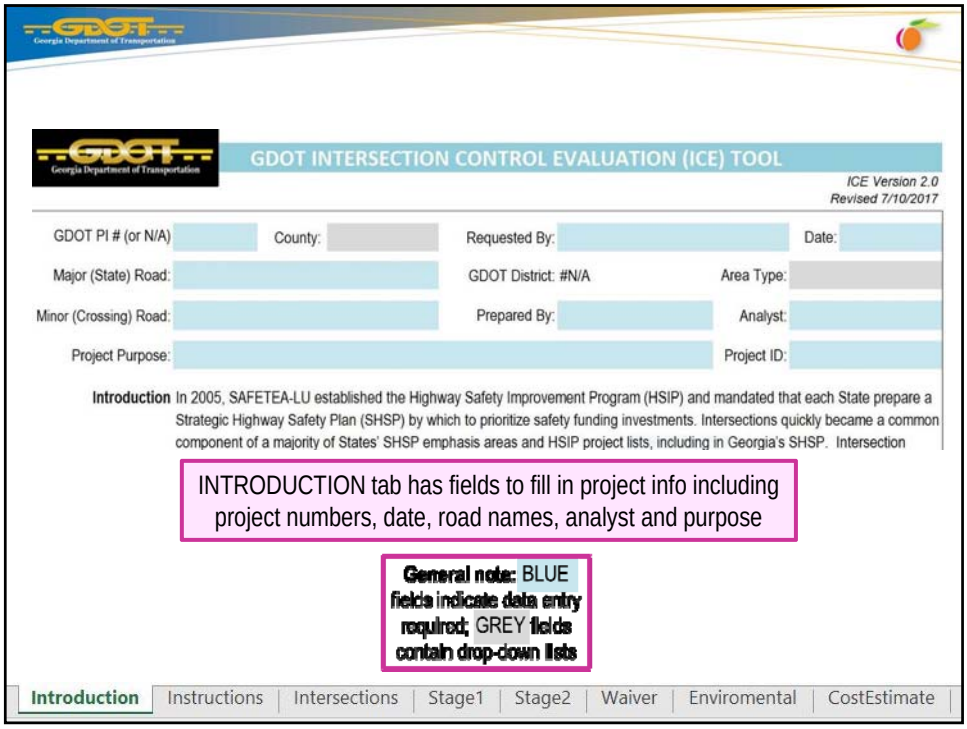
Two-Stage Process A complete ICE process consists of two (2) distinct stages, and it is expected that the respective level of effort for completing both stages of ICE will correspond to the magnitude and complexity of the intersection. Prior to starting an ICE, the District Traffic Engineer and/or State Traffic Engineer should be consulted for advice on an appropriate level of effort. The Stage 1 and Stage 2 ICE forms are designed to keep data input to a minimum, requiring limited data entry and drop-down menu choices. All fields shaded grey include drop down menu choices and all fields shaded blue require data entry. All other cells in the worksheet are locked to prohibit editing data or calculations.

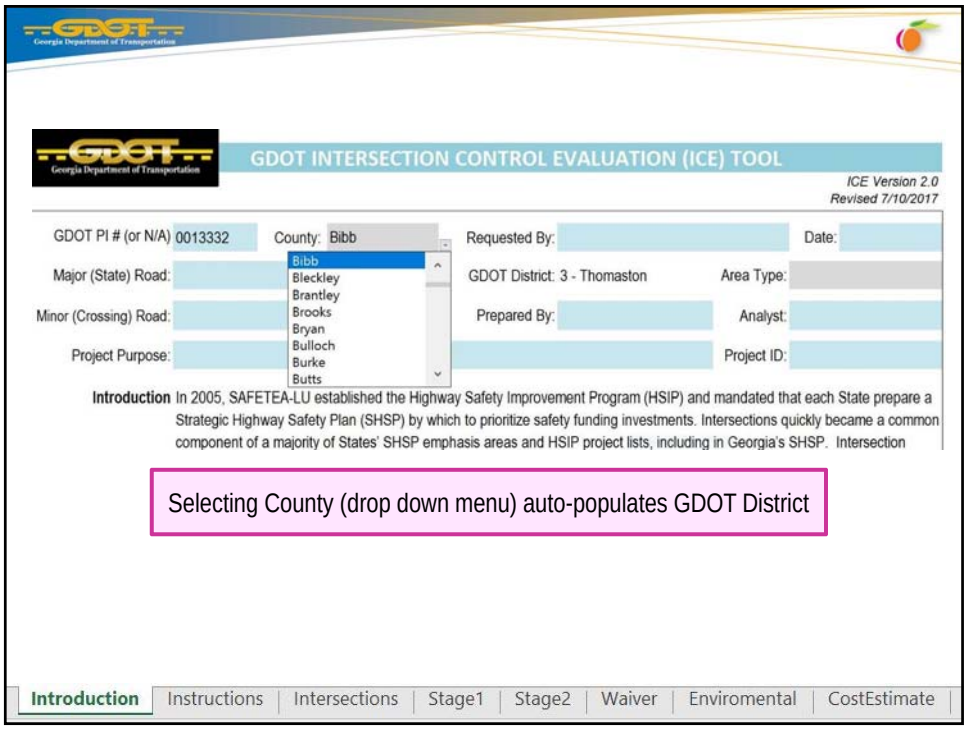
Stage 1: Screening Decision Record Stage 1 is conducted as early in the project development process as possible and is intended to inform which alternatives are worthy of further evaluation in Stage 2. Stage 1 serves as a screening effort meant to eliminate non-competitive options and identify which alternatives merit further considerations based on their practical feasibility. Users should use good engineering judgement in responding to seven policy questions by selecting "Yes" or "No" in the drop-down boxes. Alternatives should not be summarily eliminating without due consideration, and reasons for eliminating or advancing an alternative should be documented in the "Screening Decision Justification" column.

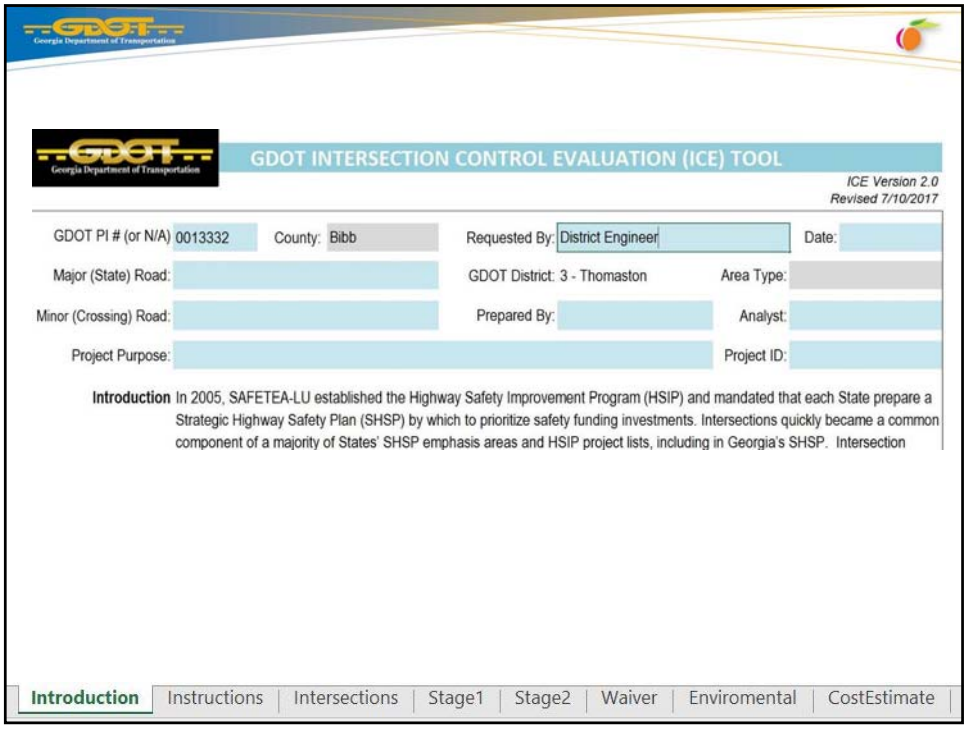
Stage 2: Alternative Selection Decision Record Stage 2 involves a more detailed and familiar evaluation of the alternatives identified in Stage 1 in order to support the selection of a preferred alternative that may be advanced to detailed design. The data entry is similar in process to Stage 1 but is more robust, requiring separate analysis of each alternative to determine cost, impacts, operations, safety and project support. A separate "Instructions" tab is provided to provide guidance to the user on data entry and a separate "CostEstimate" tab aids in developing project alternative costs. Once all the data is entered, a score and ranking of each alternative is calculated and reported on the bottom line of the worksheet to inform on the best intersection treatment to select as the preferred alternative.

Documentation A complete ICE document consists of the combination of the outputs from both Stage 1 and Stage 2 along with supporting documentation, to be included in the approved project Concept Report (or equivalent) or as a stand-alone document.

Introduction | Instructions | Intersections | Stage1 | Stage2 | Waiver | Enviromental | CostEstimate


GDOT INTERSECTION CONTROL EVALUATION (ICE) TOOL
ICE Version 2.0
Revised 7/10/2017
GDOT PI # (or N/A)
County:
Requested By:
Date:
Major (State) Road:
GDOT District: #N/A
Area Type:
Minor (Crossing) Road:
Prepared By:
Analyst:
Project Purpose:
Project ID:
Introduction In 2005, SAFETEA-LU established the Highway Safety Improvement Program (HSIP) and mandated that each State prepare a Strategic Highway Safety Plan (SHSP) by which to prioritize safety funding investments. Intersections quickly became a common component of a majority of States' SHSP emphasis areas and HSIP project lists, including in Georgia's SHSP. Intersection
INTRODUCTION tab has fields to fill in project info including project numbers, date, road names, analyst and purpose
General note: BLUE fields indicate data entry required; GREY fields contain drop-down lists
Introduction
Instructions
Intersections
Stage1
Stage2
Waiver
Enviromental
CostEstimate


GDOT INTERSECTION CONTROL EVALUATION (ICE) TOOL
ICE Version 2.0
Revised 7/10/2017
GDOT PI # (or N/A) 0013332
County: Bibb
Requested By:
Date:
Major (State) Road:
GDOT District: 3 - Thomaston
Area Type:
Minor (Crossing) Road:
Prepared By:
Analyst:
Project Purpose:
Project ID:
Bibb
Bleckley
Brantley
Brooks
Bryan
Bulloch
Burke
Butts
Introduction In 2005, SAFETEA-LU established the Highway Safety Improvement Program (HSIP) and mandated that each State prepare a Strategic Highway Safety Plan (SHSP) by which to prioritize safety funding investments. Intersections quickly became a common component of a majority of States' SHSP emphasis areas and HSIP project lists, including in Georgia's SHSP. Intersection
Selecting County (drop down menu) auto-populates GDOT District
Introduction
Instructions
Intersections
Stage1
Stage2
Waiver
Enviromental
CostEstimate



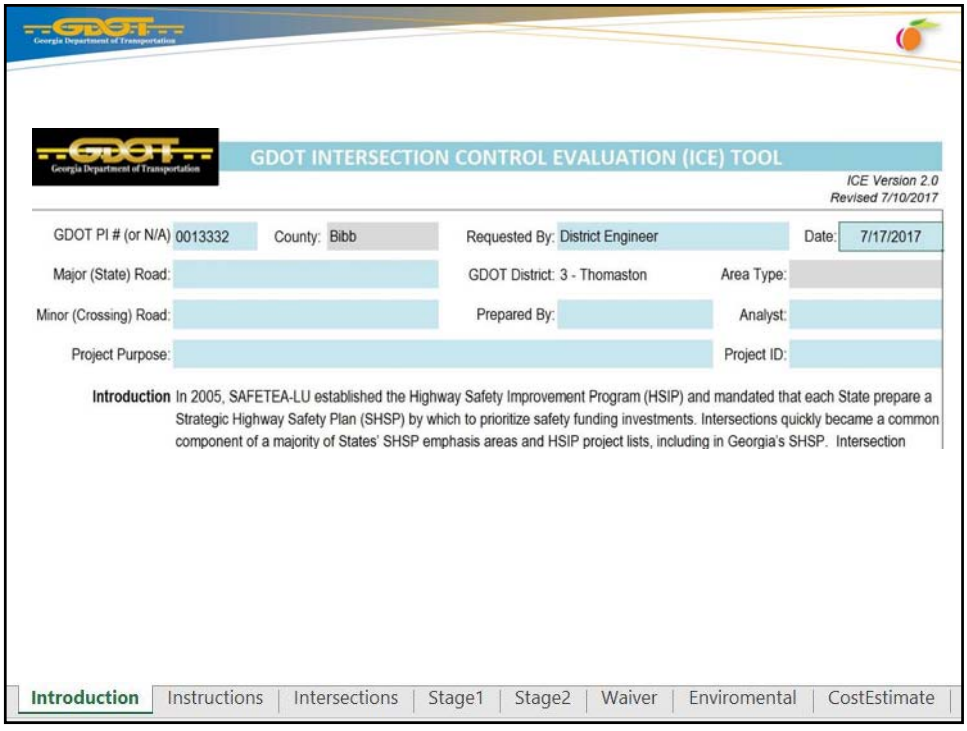
GDOT INTERSECTION CONTROL EVALUATION (ICE) TOOL

ICE Version 2.0
Revised 7/10/2017

GDOT PI # (or N/A)	0013332	County: Bibb	Requested By:	District Engineer	Date:
Major (State) Road:			GDOT District: 3 - Thomaston		Area Type:
Minor (Crossing) Road:			Prepared By:		Analyst:
Project Purpose:					Project ID:

Introduction In 2005, SAFETEA-LU established the Highway Safety Improvement Program (HSIP) and mandated that each State prepare a Strategic Highway Safety Plan (SHSP) by which to prioritize safety funding investments. Intersections quickly became a common component of a majority of States' SHSP emphasis areas and HSIP project lists, including in Georgia's SHSP. Intersection

Introduction | Instructions | Intersections | Stage1 | Stage2 | Waiver | Enviromental | CostEstimate



GDOT INTERSECTION CONTROL EVALUATION (ICE) TOOL

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Revised 7/10/2017

GDOT PI # (or N/A)	0013332	County: Bibb	Requested By:	District Engineer	Date: 7/17/2017
Major (State) Road:			GDOT District: 3 - Thomaston		Area Type:
Minor (Crossing) Road:			Prepared By:		Analyst:
Project Purpose:					Project ID:

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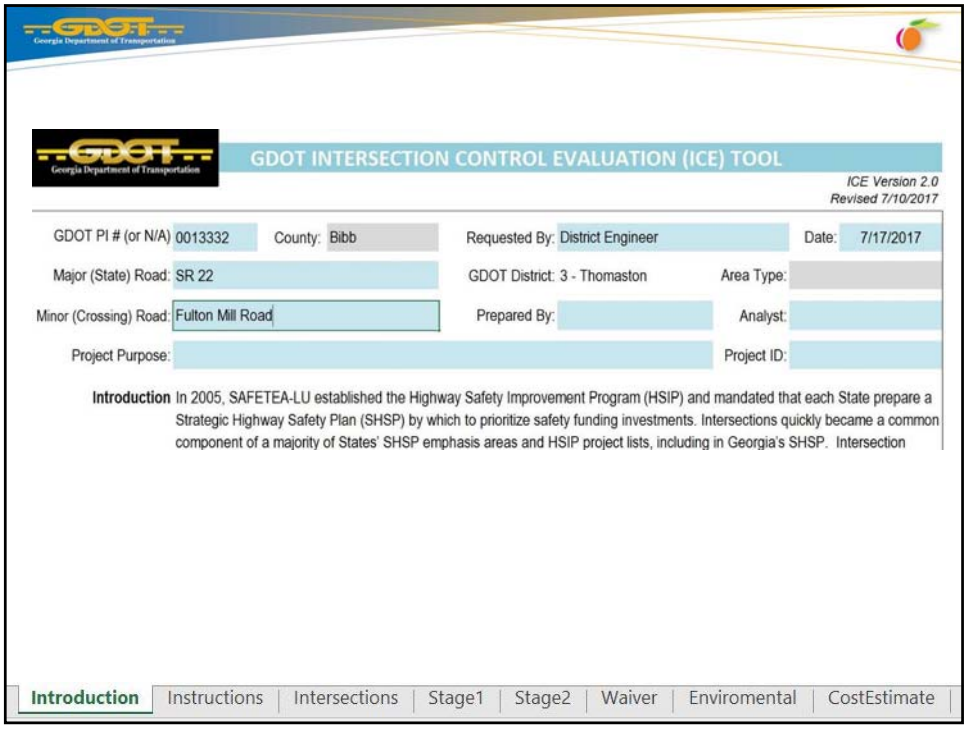
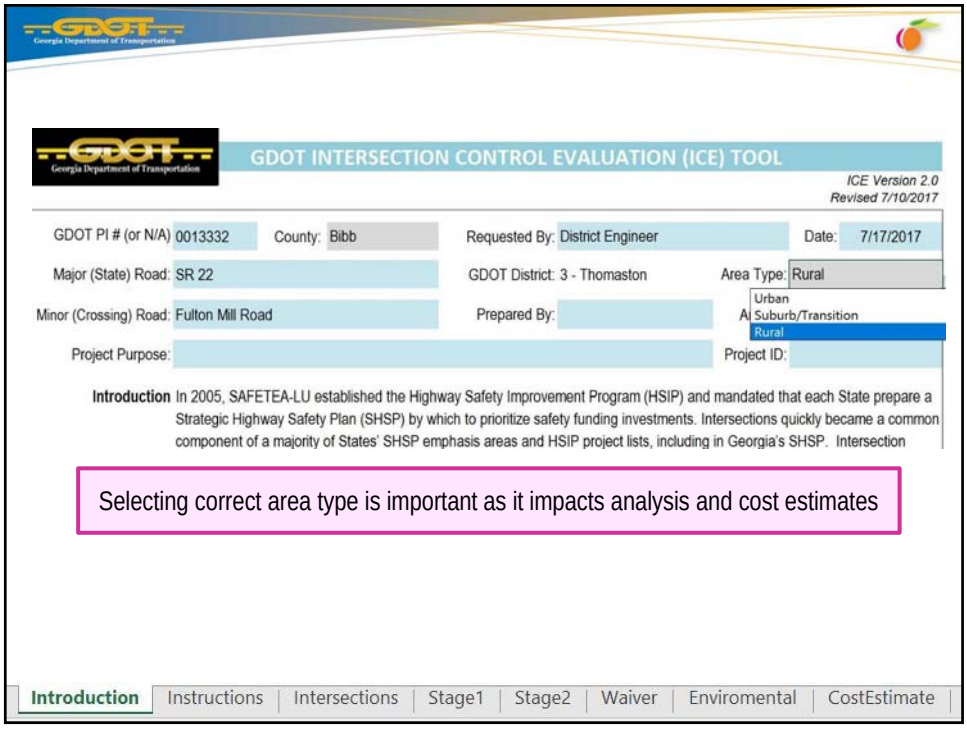
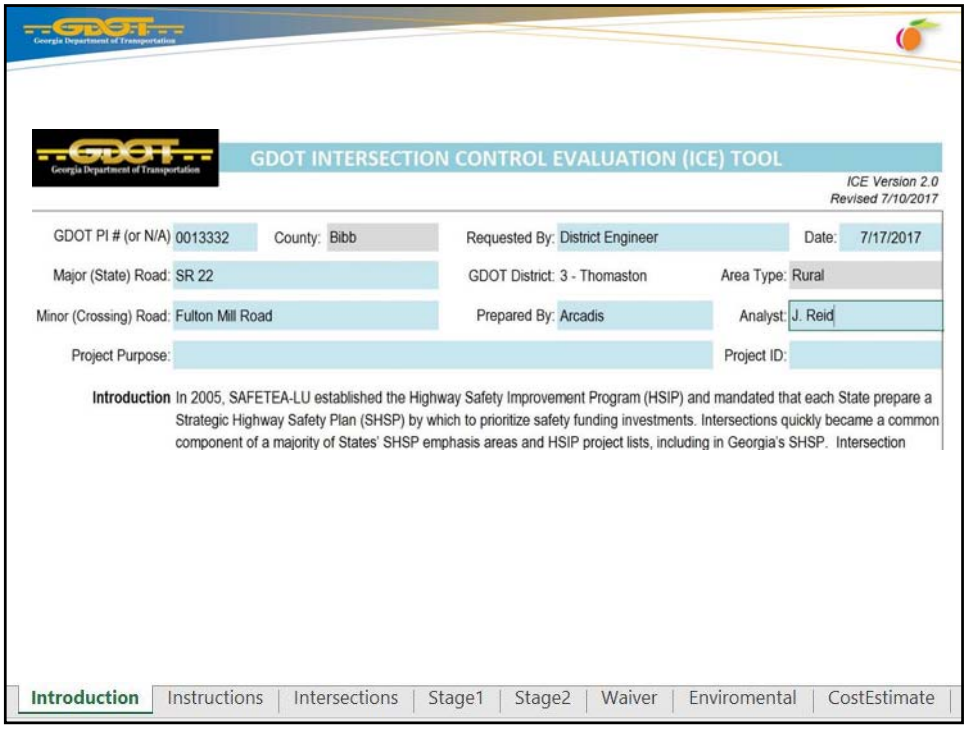
Introduction | Instructions | Intersections | Stage1 | Stage2 | Waiver | Enviromental | CostEstimate





Selecting correct area type is important as it impacts analysis and cost estimates



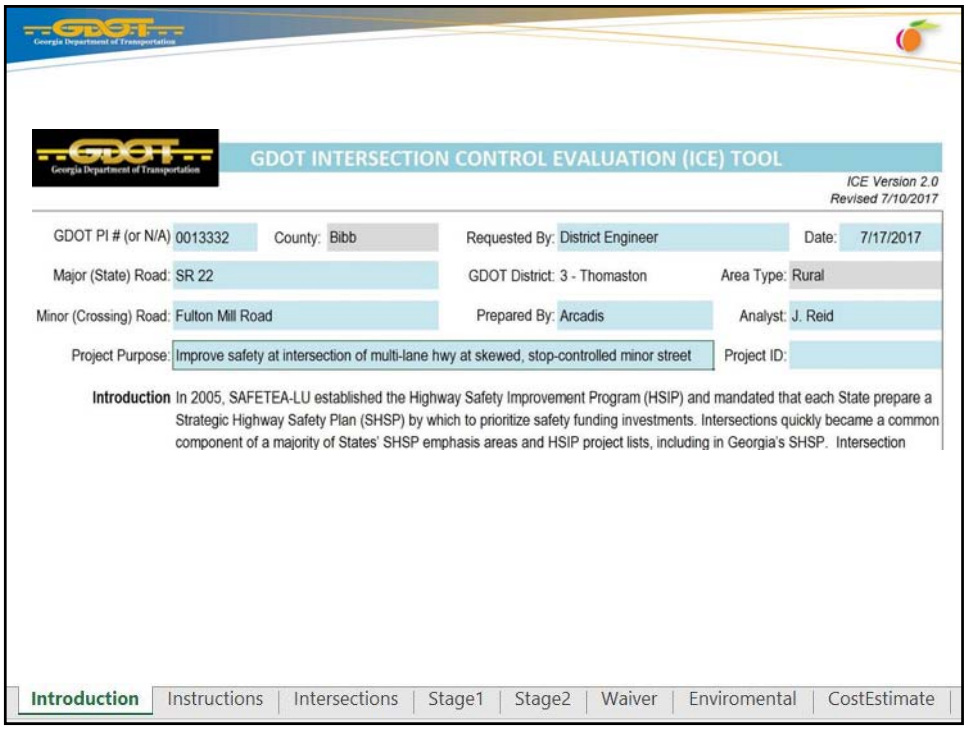
GDOT INTERSECTION CONTROL EVALUATION (ICE) TOOL

ICE Version 2.0
Revised 7/10/2017

GDOT PI # (or N/A)	0013332	County:	Bibb	Requested By:	District Engineer	Date:	7/17/2017
Major (State) Road:	SR 22			GDOT District:	3 - Thomaston	Area Type:	Rural
Minor (Crossing) Road:	Fulton Mill Road			Prepared By:	Arcadis	Analyst:	J. Reid
Project Purpose:						Project ID:	

Introduction In 2005, SAFETEA-LU established the Highway Safety Improvement Program (HSIP) and mandated that each State prepare a Strategic Highway Safety Plan (SHSP) by which to prioritize safety funding investments. Intersections quickly became a common component of a majority of States' SHSP emphasis areas and HSIP project lists, including in Georgia's SHSP. Intersection

Introduction | Instructions | Intersections | Stage1 | Stage2 | Waiver | Enviromental | CostEstimate



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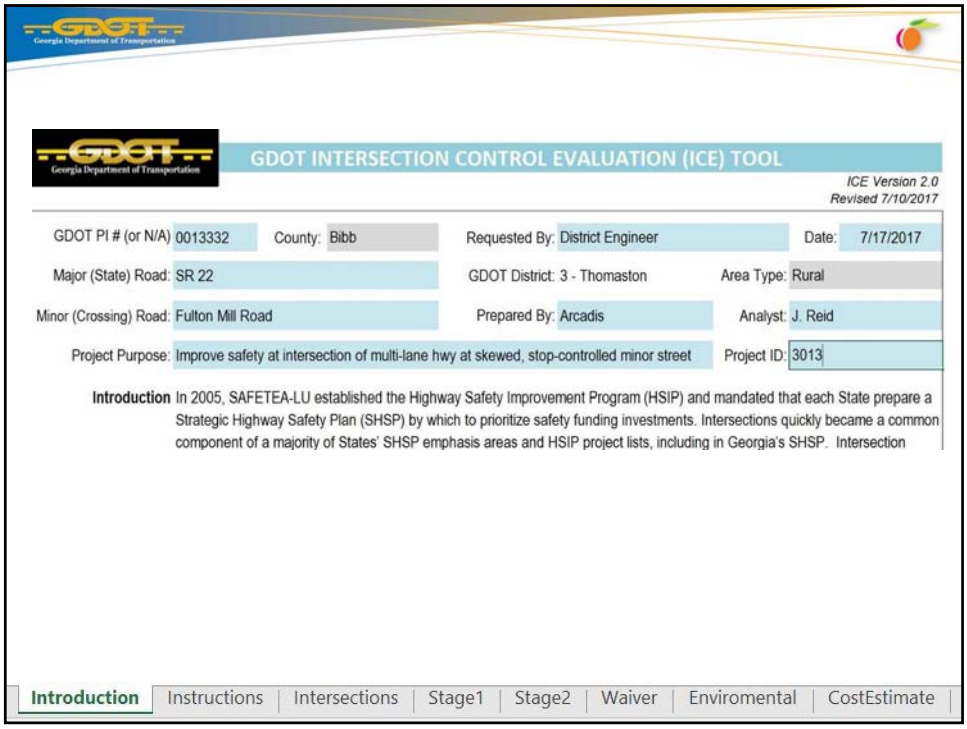
GDOT PI # (or N/A)	0013332	County:	Bibb	Requested By:	District Engineer	Date:	7/17/2017
Major (State) Road:	SR 22			GDOT District:	3 - Thomaston	Area Type:	Rural
Minor (Crossing) Road:	Fulton Mill Road			Prepared By:	Arcadis	Analyst:	J. Reid
Project Purpose:	Improve safety at intersection of multi-lane hwy at skewed, stop-controlled minor street					Project ID:	

Introduction In 2005, SAFETEA-LU established the Highway Safety Improvement Program (HSIP) and mandated that each State prepare a Strategic Highway Safety Plan (SHSP) by which to prioritize safety funding investments. Intersections quickly became a common component of a majority of States' SHSP emphasis areas and HSIP project lists, including in Georgia's SHSP. Intersection

Introduction | Instructions | Intersections | Stage1 | Stage2 | Waiver | Enviromental | CostEstimate


GDOT INTERSECTION CONTROL EVALUATION (ICE) TOOL
ICE Version 2.0
Revised 7/10/2017
GDOT PI # (or N/A) 0013332
County: Bibb
Requested By: District Engineer
Date: 7/17/2017
Major (State) Road: SR 22
GDOT District: 3 - Thomaston
Area Type: Rural
Minor (Crossing) Road: Fulton Mill Road
Prepared By: Arcadis
Analyst: J. Reid
Project Purpose: Improve safety at intersection of multi-lane hwy at skewed, stop-controlled minor street
Project ID: 3013
Introduction In 2005, SAFETEA-LU established the Highway Safety Improvement Program (HSIP) and mandated that each State prepare a Strategic Highway Safety Plan (SHSP) by which to prioritize safety funding investments. Intersections quickly became a common component of a majority of States' SHSP emphasis areas and HSIP project lists, including in Georgia's SHSP. Intersection
Introduction
Instructions
Intersections
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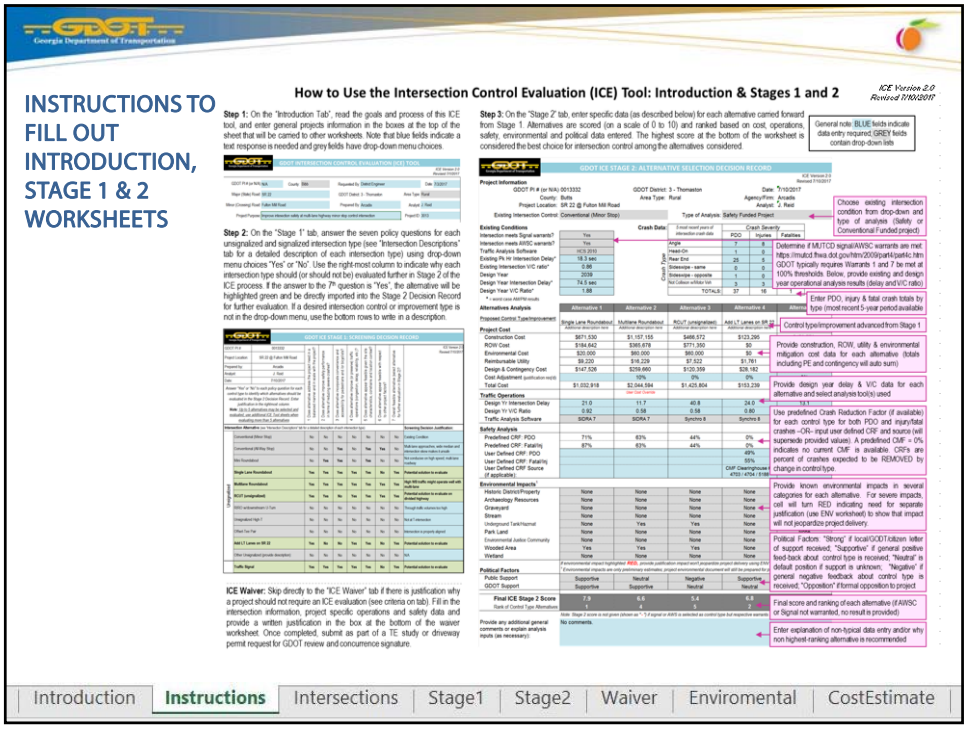
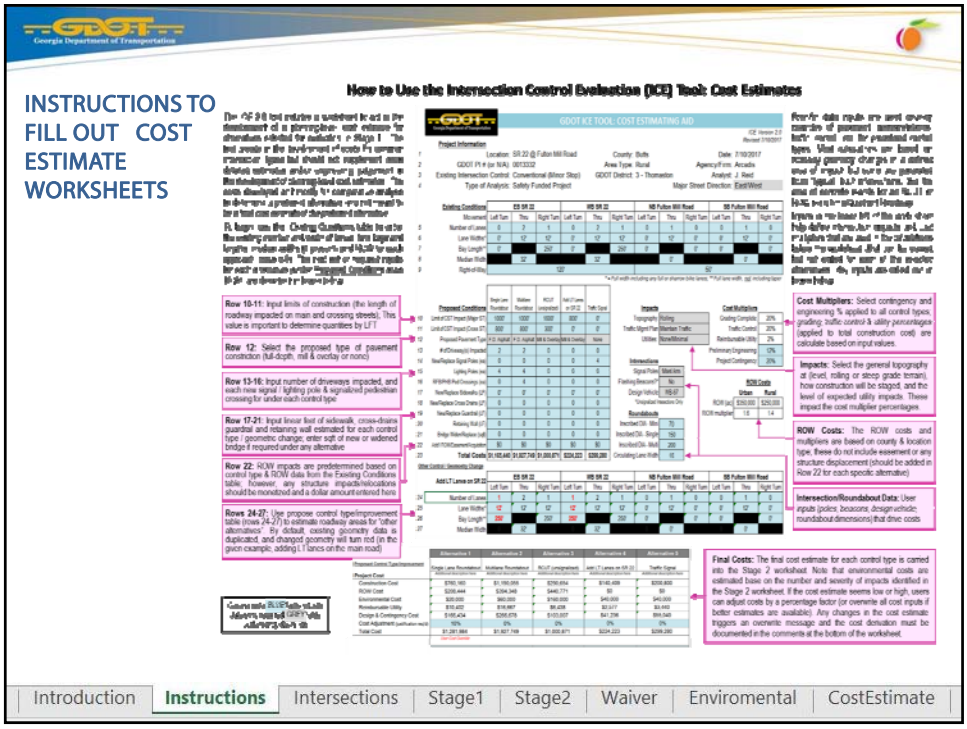
Stage2
Waiver
Enviromental
CostEstimate


Intersection Control Evaluation
ICE 2.0 TOOL – INSTRUCTIONS & INTERSECTIONS

INSTRUCTIONS TO FILL OUT INTRODUCTION, STAGE 1 & 2 WORKSHEETS



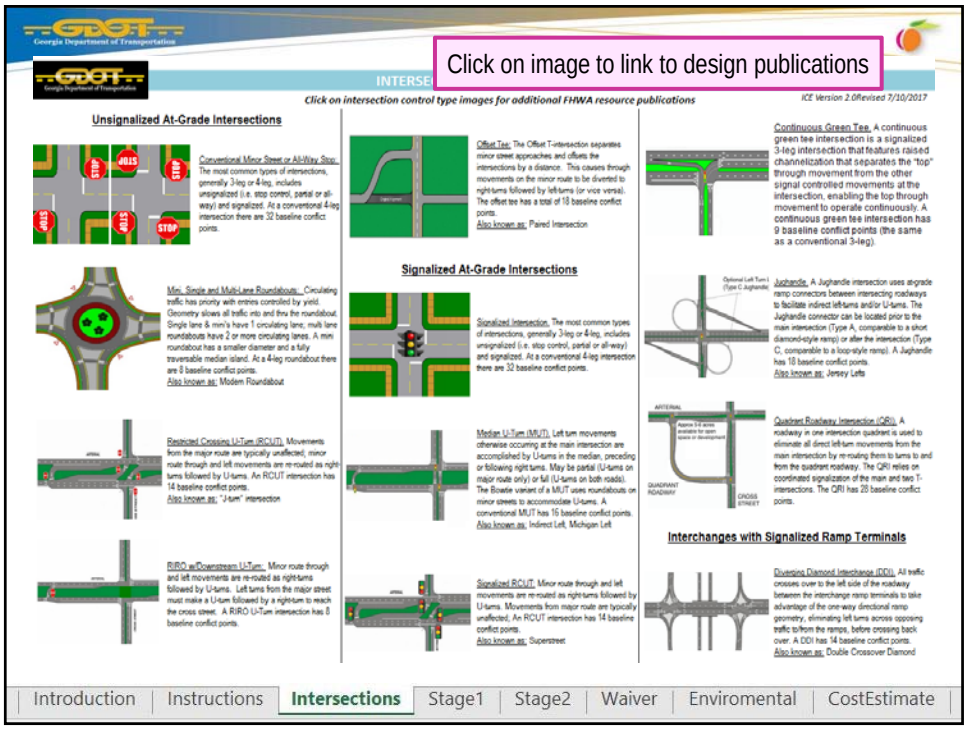
INSTRUCTIONS TO FILL OUT COST ESTIMATE WORKSHEETS



Intersection Control Types

Unsignalized	Signalized
• Minor Stop	• Signal w/turn lanes mainline
• All-Way Stop	• Median U-Turn
• Mini Roundabout	• Superstreet
• Single Lane Roundabout	• Displaced Left Turn (CFI)
• Multilane Roundabout	• Continuous Green-Tee
• RCUT	• Jughandle
• RIRO w/downstream U-Turn	• Quadrant Roadway
• High-T	• Diverging Diamond
• Offset-Tee Pair	• Single Point Interchange
• Other	• Other

Introduction | Instructions | **Intersections** | Stage1 | Stage2 | Waiver | Enviromental | CostEstimate




Unsignalized At-Grade Intersections
U.S.Department of Transportation
Federal Highway Administration
RESTRICTED CROSSING
U-TURN INTERSECTION
Informational Guide
August 2014
Introduction
Instructions
Intersections
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Intersection Control Evaluation
ICE 2.0 TOOL – STAGE 1

SAMPLE BLANK FULL STAGE 2 WORKSHEET

GDOT ICE STAGE 1: SCREENING DECISION RECORD

ICE Version 2.0
Revised 7/10/2017

GDOT PI #	0000000
Project Location:	@
Prepared by:	0
Analyst:	0
Date:	1/0/1900

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.
***Note:** Up to 5 alternatives may be selected and evaluated; use additional ICE Tool sheets when evaluating more than 5 alternatives*

	Intersection Alternative (see "Intersections" tab for a detailed description of each intersection type)	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 bicyclists?	4 Does alternative improve (or preserve) traffic operations (congestion, delay, reliability, etc.)?	5 Does alternative appear feasible given the site characteristics, constraints and 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)?	Screening Decision Justification:
Unsignalized	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 (unsignalized)	No	No	No	No	No	No	No	
	RIRO w/downstream U-Turn	No	No	No	No	No	No	No	
	Unsignalized High-T	No	No	No	No	No	No	No	
	Offset-Tee Pair	No	No	No	No	No	No	No	
	Other Unsignalized 1 (provide description):	No	No	No	No	No	No	No	
	Other Unsignalized 2 (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	No	No	
	Displaced Left Turn (DLT)	No	No	No	No	No	No	No	
	Signalized High-T	No	No	No	No	No	No	No	
	Jughandle (Any Corner)	No	No	No	No	No	No	No	
	Quadrant Roadway (Any Corner)	No	No	No	No	No	No	No	
	Diverging Diamond (Ramp Terminals)	No	No	No	No	No	No	No	
	Single Point Interchange (Ramp Terminals)	No	No	No	No	No	No	No	
	Other Signalized 1 (provide description):	No	No	No	No	No	No	No	
	Other Signalized 1 (provide description):	No	No	No	No	No	No	No	

= Intersection type selected for more detailed analysis in Stage 2 Alternative Selection Decision Record

Introduction | Instructions | Intersections | **Stage1** | Stage2 | Waiver | Enviromental | CostEstimate

GDOT ICE STAGE 1: SCREENING DECISION RECORD

ICE Version 2.0
Revised 7/10/2017

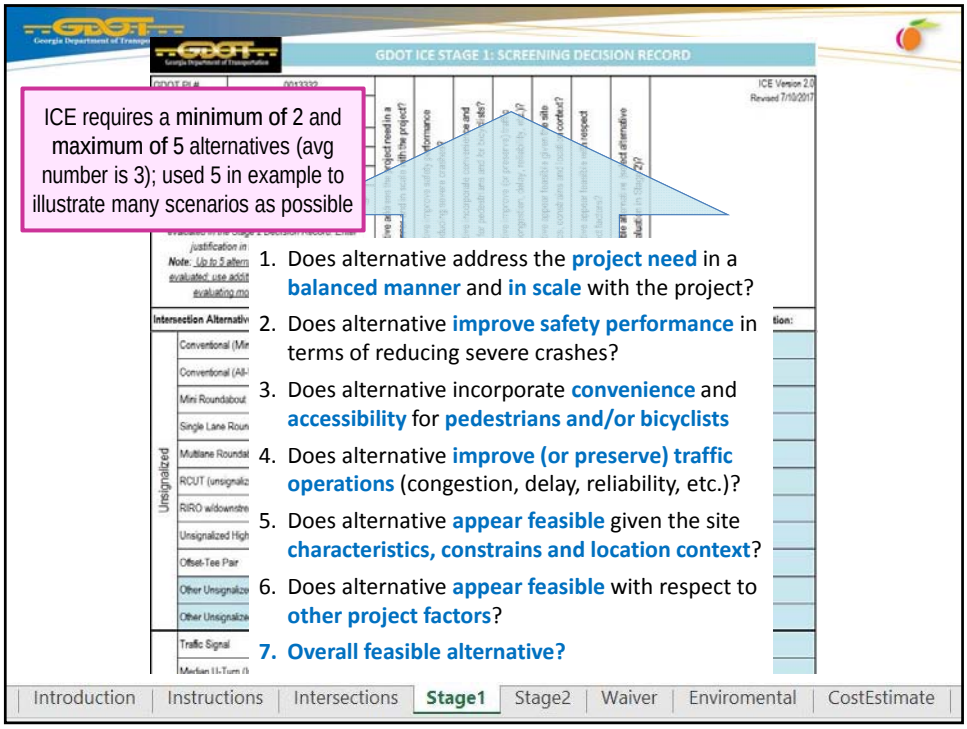
GDOT PI #	0013332
Project Location:	SR 22 @ Fulton Mill Road
Prepared by:	Arcadis
Analyst:	J. Reid
Date:	7/17/2017

All project data carried into Stage 1 worksheet

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.
***Note:** Up to 5 alternatives may be selected and evaluated; use additional ICE Tool sheets when evaluating more than 5 alternatives*

	Intersection Alternative (see "Intersections" tab for a detailed description of each intersection type)	1 Does alternative address the balanced manner and in sc	2 Does alternative improve s in terms of reducing severe	3 Does alternative incorporat accessibility for pedestrian	4 Does alternative improve (c operations (congestion, del	5 Does alternative appear fea characteristics, constraints	6 Does alternative appear fea to other project factors?	7 Overall feasible alternative for further evaluation in Sta	Screening Decision Justification:
Unsignalized	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 (unsignalized)	No	No	No	No	No	No	No	
	RIRO w/downstream U-Turn	No	No	No	No	No	No	No	
	Unsignalized High-T	No	No	No	No	No	No	No	
	Offset-Tee Pair	No	No	No	No	No	No	No	
	Other Unsignalized 1 (provide description):	No	No	No	No	No	No	No	
	Other Unsignalized 2 (provide description):	No	No	No	No	No	No	No	
	Traffic Signal	No	No	No	No	No	No	No	
	Median U-Turn (Indirect Left)	No	No	No	No	No	No	No	

Introduction | Instructions | Intersections | **Stage1** | Stage2 | Waiver | Enviromental | CostEstimate


GDOT ICE STAGE 1: SCREENING DECISION RECORD
ICE requires a minimum of 2 and maximum of 5 alternatives (avg number is 3); used 5 in example to illustrate many scenarios as possible
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?
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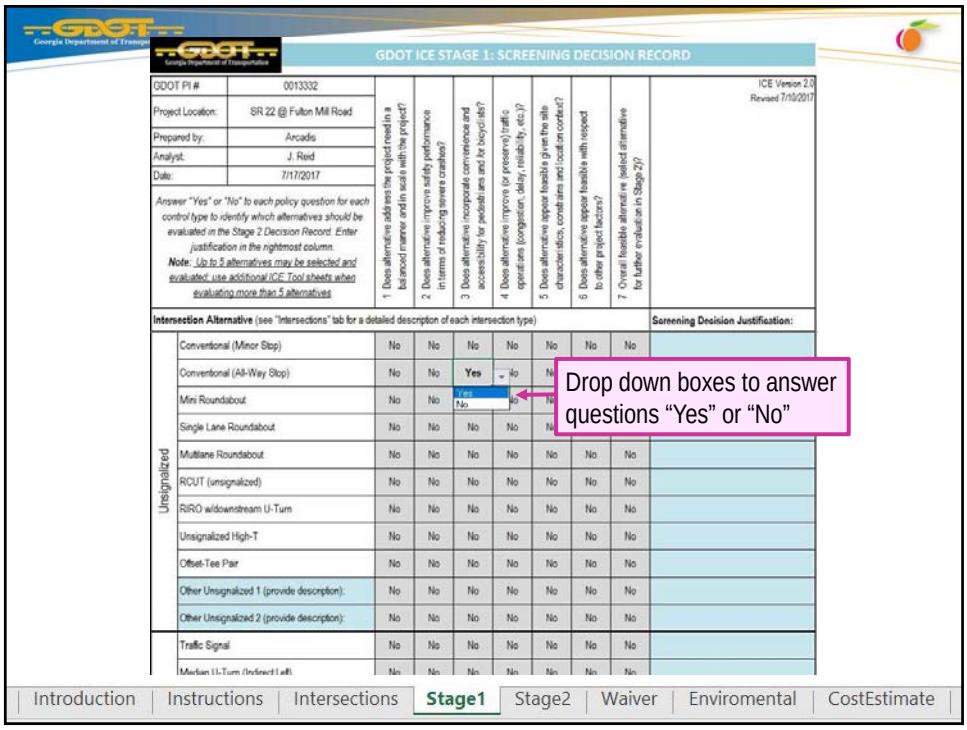
GDOT ICE STAGE 1: SCREENING DECISION RECORD
GDOT PI # 0013332
Project Location: SR 22 @ Fulton Mill Road
Prepared by: Arcadis
Analyst: J. Reid
Date: 7/17/2017
Drop down boxes to answer questions "Yes" or "No"
Introduction
Instructions
Intersections
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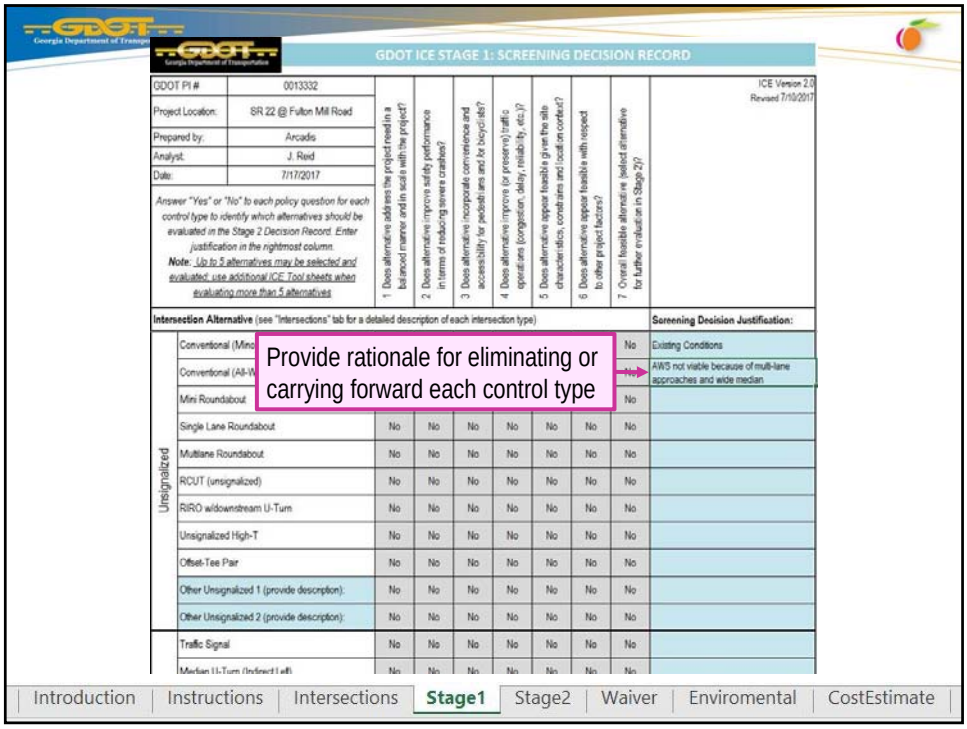
CostEstimate



GDOT ICE STAGE 1: SCREENING DECISION RECORD

GDOT PI #	0013332
Project Location:	SR 22 @ Fulton Mill Road
Prepared by:	Arcadis
Analyst:	J. Reid
Date:	7/17/2017

ICE Version 2.0
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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.
Note: Up to 5 alternatives may be selected and evaluated; use additional ICE Tool sheets when evaluating more than 5 alternatives.

Intersection Alternative (see "Intersections" tab for a detailed description of each intersection type)	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, constraints and / 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)?	Screening Decision Justification:
Unsignalized: Conventional (Minor Stop)							No	Existing Conditions
Unsignalized: Conventional (All-Way Stop)							No	AWS not viable because of multi-lane approaches and wide median
Unsignalized: Mini Roundabout							No	
Unsignalized: Single Lane Roundabout	No	No	No	No	No	No	No	
Unsignalized: Multilane Roundabout	No	No	No	No	No	No	No	
Unsignalized: RCUT (unsignalized)	No	No	No	No	No	No	No	
Unsignalized: RIRO w/downstream U-Turn	No	No	No	No	No	No	No	
Unsignalized: Unsignalized High-T	No	No	No	No	No	No	No	
Unsignalized: Offset-Tee Pair	No	No	No	No	No	No	No	
Unsignalized: Other Unsignalized 1 (provide description):	No	No	No	No	No	No	No	
Unsignalized: Other Unsignalized 2 (provide description):	No	No	No	No	No	No	No	
Traffic Signal	No	No	No	No	No	No	No	
Median U-Turn (Indirect Left)	No	No	No	No	No	No	No	

Provide rationale for eliminating or carrying forward each control type

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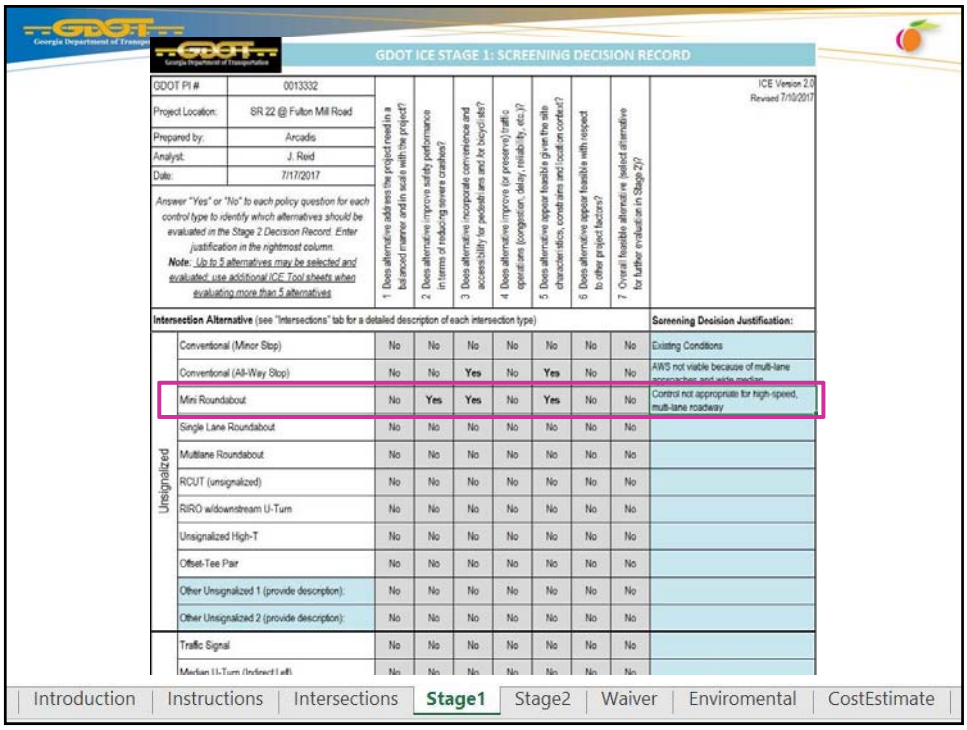

GDOT ICE STAGE 1: SCREENING DECISION RECORD

GDOT PI #	0013332
Project Location:	SR 22 @ Fulton Mill Road
Prepared by:	Arcadis
Analyst:	J. Reid
Date:	7/17/2017

ICE Version 2.0
Revised 7/10/2017

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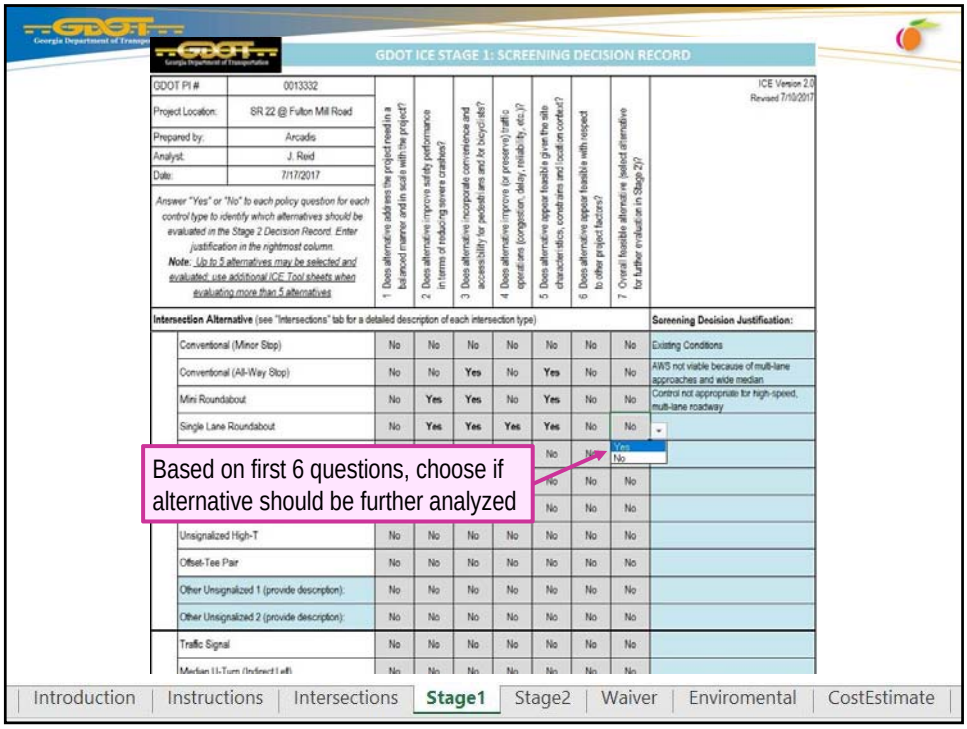
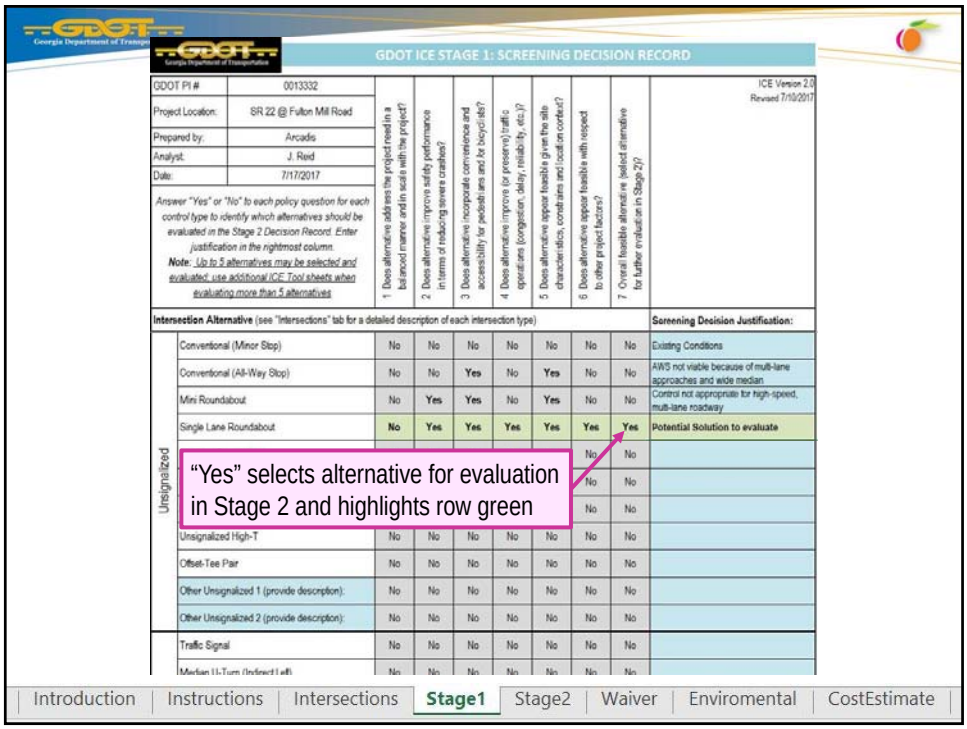
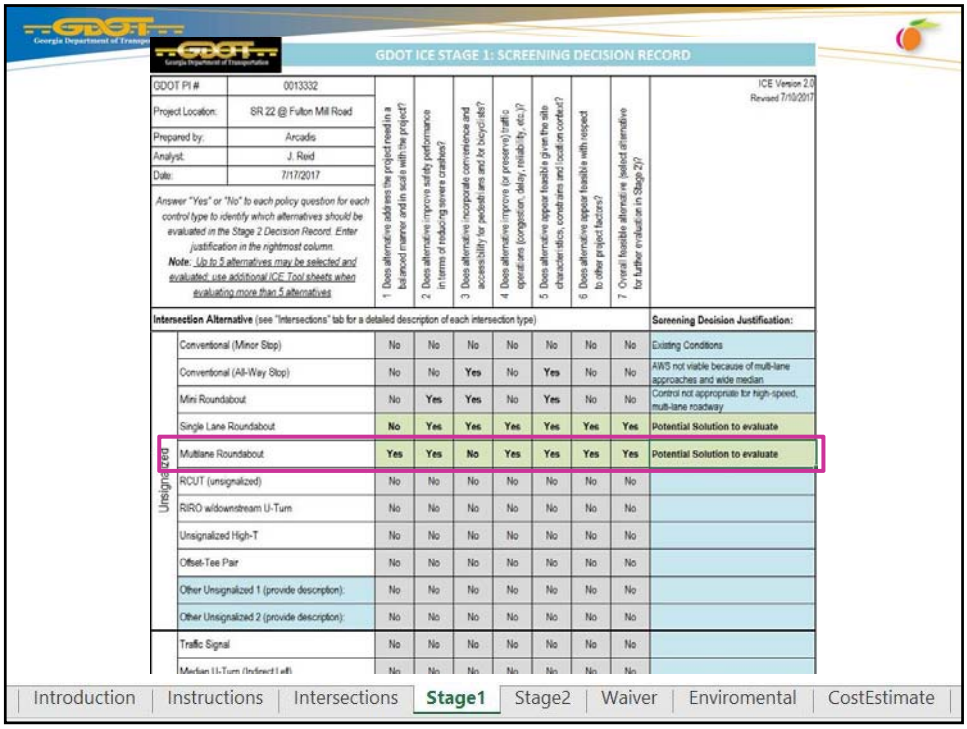
Unsignalized: Conventional (All-Way Stop)	No	No	**Yes**	No	**Yes**	No	No	AWS not viable because of multi-lane approaches and wide median
Unsignalized: Mini Roundabout	No	**Yes**	**Yes**	No	**Yes**	No	No	Control not appropriate for high-speed, multi-lane roadway
Unsignalized: Single Lane Roundabout	No	No	No	No	No	No	No	
Unsignalized: Multilane Roundabout	No	No	No	No	No	No	No	
Unsignalized: RCUT (unsignalized)	No	No	No	No	No	No	No	
Unsignalized: RIRO w/downstream U-Turn	No	No	No	No	No	No	No	
Unsignalized: Unsignalized High-T	No	No	No	No	No	No	No	
Unsignalized: Offset-Tee Pair	No	No	No	No	No	No	No	
Unsignalized: Other Unsignalized 1 (provide description):	No	No	No	No	No	No	No	
Unsignalized: Other Unsignalized 2 (provide description):	No	No	No	No	No	No	No	
Traffic Signal	No	No	No	No	No	No	No	
Median U-Turn (Indirect Left)	No	No	No	No	No	No	No	

Introduction | Instructions | Intersections | **Stage1** | Stage2 | Waiver | Enviromental | CostEstimate


GDOT ICE STAGE 1: SCREENING DECISION RECORD
Based on first 6 questions, choose if alternative should be further analyzed
Introduction
Instructions
Intersections
Stage1
Stage2
Waiver
Enviromental
CostEstimate


GDOT ICE STAGE 1: SCREENING DECISION RECORD
"Yes" selects alternative for evaluation in Stage 2 and highlights row green
Introduction
Instructions
Intersections
Stage1
Stage2
Waiver
Enviromental
CostEstimate



GDOT ICE STAGE 1: SCREENING DECISION RECORD

ICE Version 2.0
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GDOT PI #	0013332
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Date:	7/17/2017

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	Conventional (All-Way Stop)	No	No	**Yes**	No	**Yes**	No	No	AWS not viable because of multi-lane approaches and wide median
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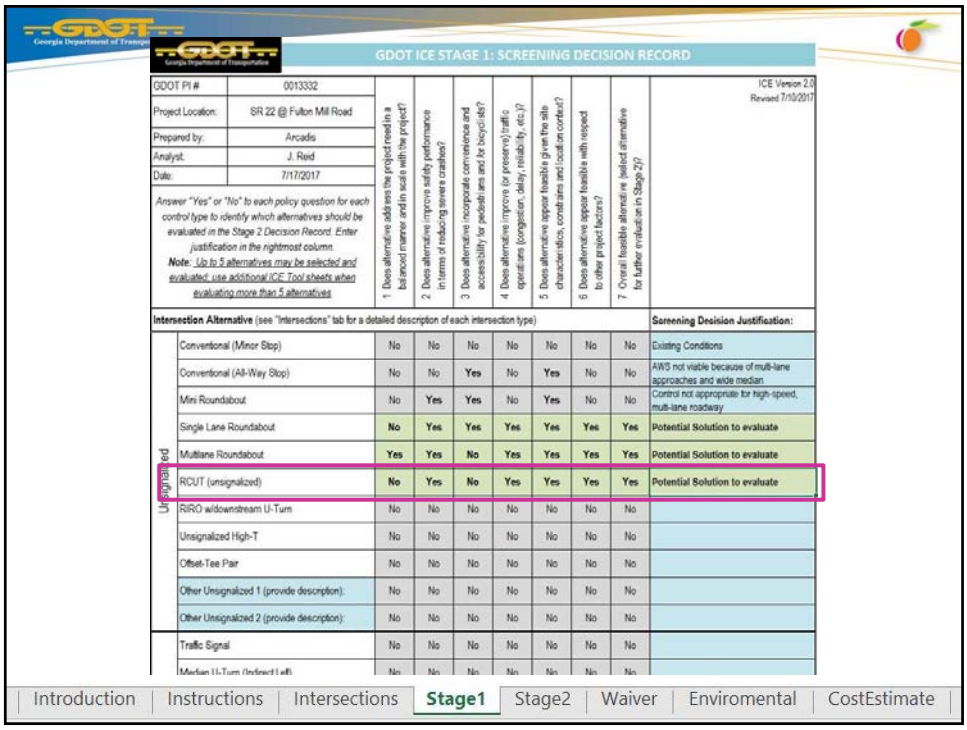
	Single Lane Roundabout	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Potential Solution to evaluate**
	Multilane Roundabout	**Yes**	**Yes**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Potential Solution to evaluate**
	RCUT (unsignalized)	No	No	No	No	No	No	No	
	RIRO w/downstream U-Turn	No	No	No	No	No	No	No	
	Unsignalized High-T	No	No	No	No	No	No	No	
	Offset-Tee Pair	No	No	No	No	No	No	No	
	Other Unsignalized 1 (provide description):	No	No	No	No	No	No	No	
	Other Unsignalized 2 (provide description):	No	No	No	No	No	No	No	
	Traffic Signal	No	No	No	No	No	No	No	
	Median U-Turn (Indirect Left)	No	No	No	No	No	No	No	

Introduction | Instructions | Intersections | **Stage1** | Stage2 | Waiver | Enviromental | CostEstimate



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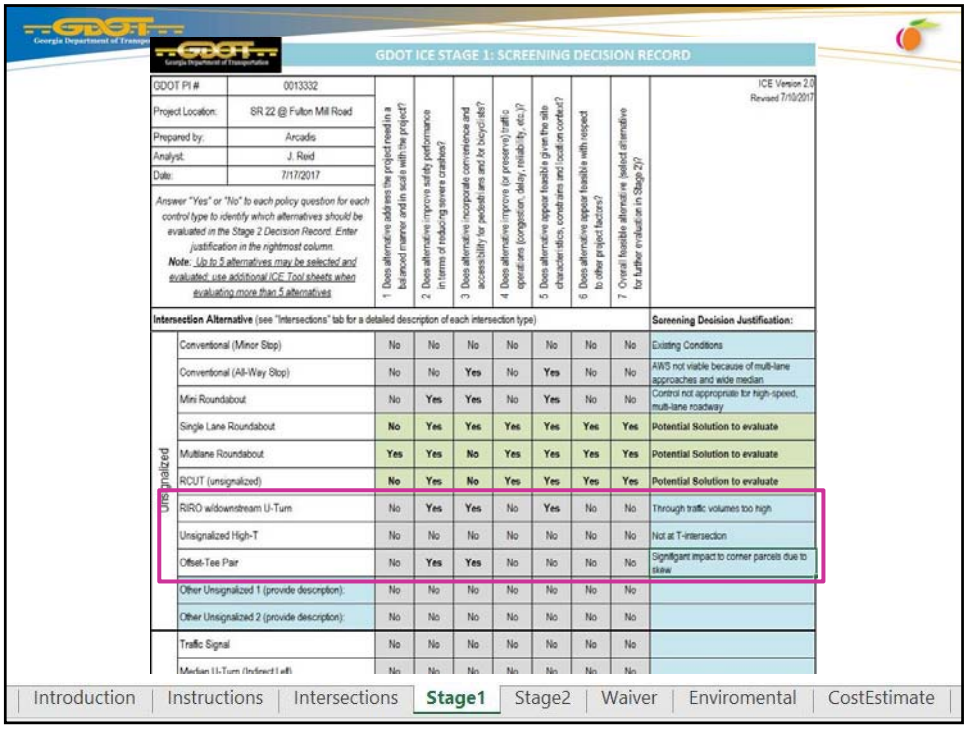
	RIRO w/downstream U-Turn	No	No	No	No	No	No	No	
	Unsignalized High-T	No	No	No	No	No	No	No	
	Offset-Tee Pair	No	No	No	No	No	No	No	
	Other Unsignalized 1 (provide description):	No	No	No	No	No	No	No	
	Other Unsignalized 2 (provide description):	No	No	No	No	No	No	No	
	Traffic Signal	No	No	No	No	No	No	No	
	Median U-Turn (Indirect Left)	No	No	No	No	No	No	No	

Introduction | Instructions | Intersections | **Stage1** | Stage2 | Waiver | Enviromental | CostEstimate



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	Unsignalized High-T	No	No	No	No	No	No	No	Not at T-intersection
	Offset-Tee Pair	No	**Yes**	**Yes**	No	No	No	No	Significant impact to corner parcels due to skew
	Other Unsignalized 1 (provide description):	No	No	No	No	No	No	No	
	Other Unsignalized 2 (provide description):	No	No	No	No	No	No	No	
	Traffic Signal	No	No	No	No	No	No	No	
	Median U-Turn (Indirect Left)	No	No	No	No	No	No	No	

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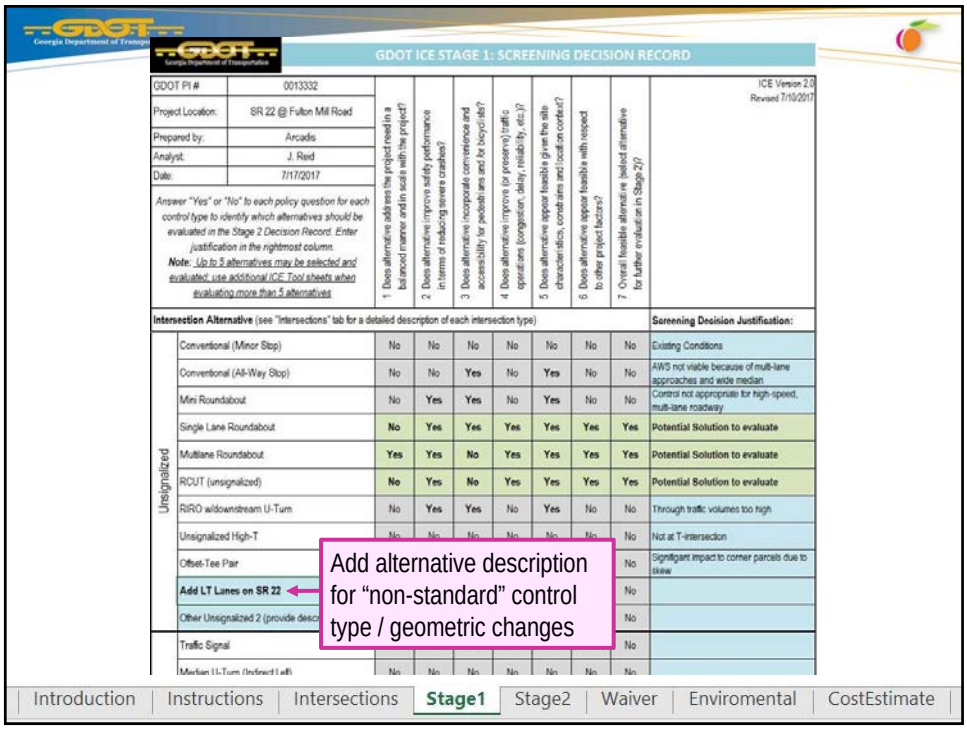

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ICE Version 2.0
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	RIRO w/downstream U-Turn	No	**Yes**	**Yes**	No	**Yes**	No	No	Through traffic volumes too high
	Unsignalized High-T	No	No	No	No	No	No	No	Not at T-intersection
	Offset-Tee Pair	No	**Yes**	**Yes**	No	No	No	No	Significant impact to corner parcels due to skew
	Add LT Lanes on SR 22	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	
	Other Unsignalized 2 (provide desc	No	No	No	No	No	No	No	
	Traffic Signal	No	No	No	No	No	No	No	
	Median U-Turn (Indirect Left)	No	No	No	No	No	No	No	

Add alternative description for "non-standard" control type / geometric changes

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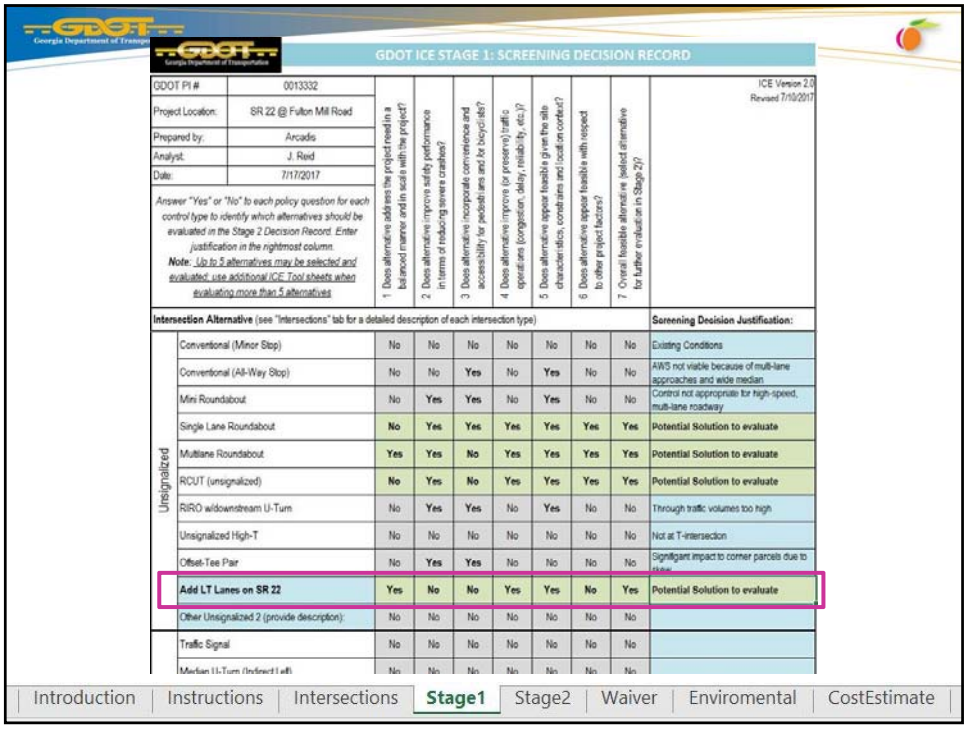

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ICE Version 2.0
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	Conventional (All-Way Stop)	No	No	**Yes**	No	**Yes**	No	No	AWS not viable because of multi-lane approaches and wide median
	Mini Roundabout	No	**Yes**	**Yes**	No	**Yes**	No	No	Control not appropriate for high-speed, multi-lane roadway
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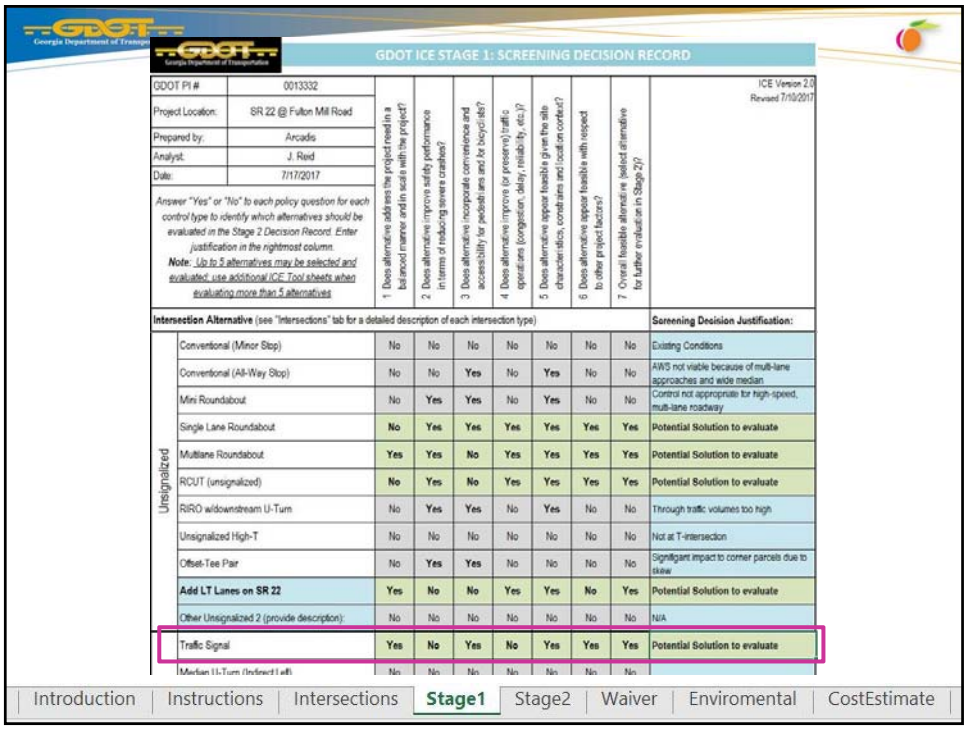
	Multilane Roundabout	**Yes**	**Yes**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Potential Solution to evaluate**
	RCUT (unsignalized)	**No**	**Yes**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Potential Solution to evaluate**
	RIRO w/downstream U-Turn	No	**Yes**	**Yes**	No	**Yes**	No	No	Through traffic volumes too high
	Unsignalized High-T	No	No	No	No	No	No	No	Not at T-intersection
	Offset-Tee Pair	No	**Yes**	**Yes**	No	No	No	No	Significant impact to corner parcels due to skew
	Add LT Lanes on SR 22	**Yes**	**No**	**No**	**Yes**	**Yes**	**No**	**Yes**	**Potential Solution to evaluate**
	Other Unsignalized 2 (provide description):	No	No	No	No	No	No	No	
	Traffic Signal	No	No	No	No	No	No	No	
	Median U-Turn (Indirect Left)	No	No	No	No	No	No	No	

Introduction | Instructions | Intersections | **Stage1** | Stage2 | Waiver | Enviromental | CostEstimate



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	Mini Roundabout	No	**Yes**	**Yes**	No	**Yes**	No	No	Control not appropriate for high-speed, multi-lane roadway
	Single Lane Roundabout	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Potential Solution to evaluate**
	Multilane Roundabout	**Yes**	**Yes**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Potential Solution to evaluate**
	RCUT (unsignalized)	**No**	**Yes**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Potential Solution to evaluate**
	RIRO w/downstream U-Turn	No	**Yes**	**Yes**	No	**Yes**	No	No	Through traffic volumes too high
	Unsignalized High-T	No	No	No	No	No	No	No	Not at T-intersection
	Offset-Tee Pair	No	**Yes**	**Yes**	No	No	No	No	Significant impact to corner parcels due to skew
	Add LT Lanes on SR 22	**Yes**	**No**	**No**	**Yes**	**Yes**	**No**	**Yes**	**Potential Solution to evaluate**
	Other Unsignalized 2 (provide description):	No	No	No	No	No	No	No	N/A
	Traffic Signal	**Yes**	**No**	**Yes**	**No**	**Yes**	**Yes**	**Yes**	**Potential Solution to evaluate**
	Median U-Turn (Indirect Left)	No	No	No	No	No	No	No	

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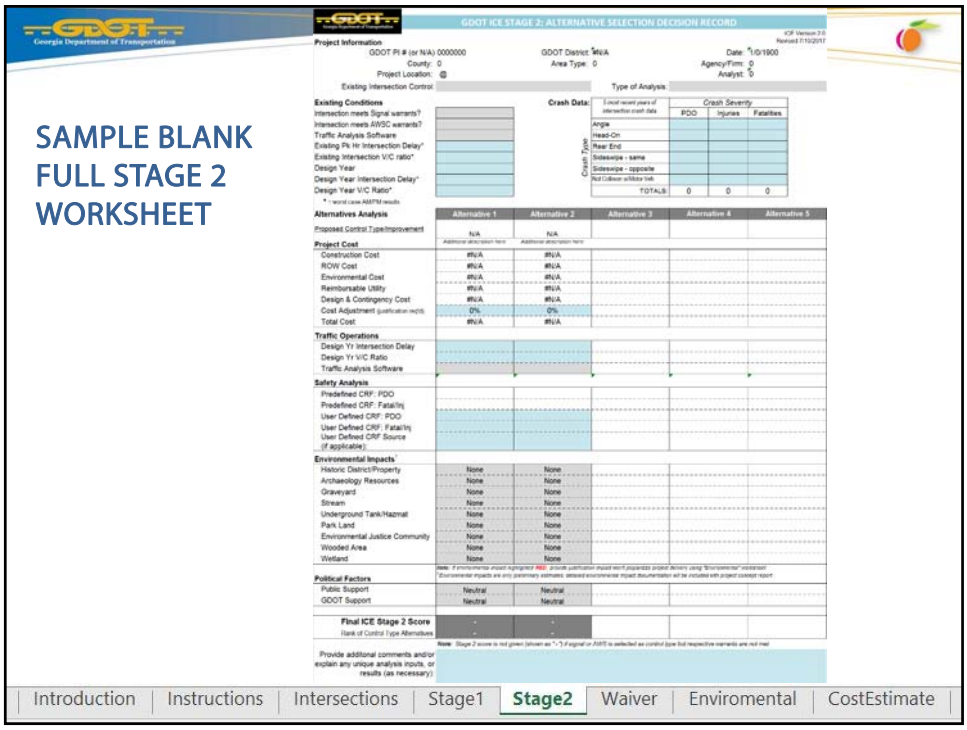
Intersection Control Evaluation

ICE 2.0 TOOL – STAGE 2



SAMPLE BLANK FULL STAGE 2 WORKSHEET

GDOT ICE STAGE 2: ALTERNATIVE SELECTION DECISION RECORD

Project Information

GDOT PI # (or N/A) 0000000 | GDOT District: #N/A | Date: 1/0/1900
County: 0 | Area Type: 0 | Agency/Firm: 0
Project Location: | Analyst: 0
Existing Intersection Control | Type of Analysis:

Existing Conditions

Intersection meets Signal warrants?
Intersection meets AWSC warrants?
Traffic Analysis Software
Existing Pk Hr Intersection Delay*
Existing Intersection V/C ratio*
Design Year
Design Year Intersection Delay*
Design Year V/C Ratio*
* = worst case AM/PM results

Crash Data: (3 most recent years of intersection crash data)

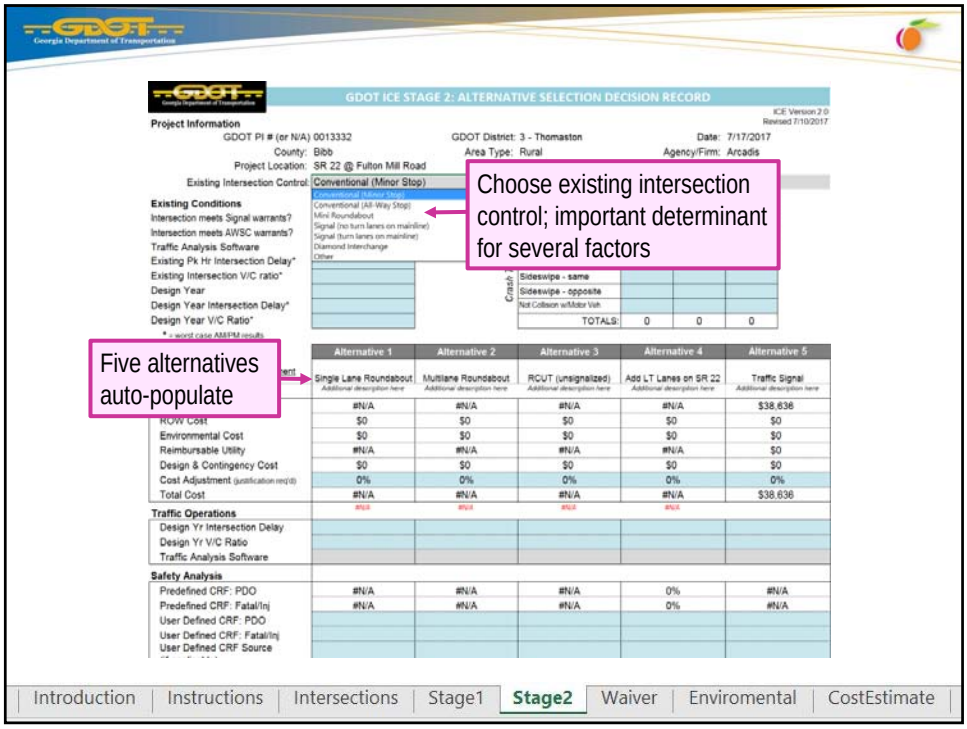
Crash Type	Crash Severity: PDO	Injuries	Fatalities
Angle			
Head-On			
Rear End			
Sideswipe - same			
Sideswipe - opposite			
Not Collision w/Motor Veh			
TOTALS	0	0	0

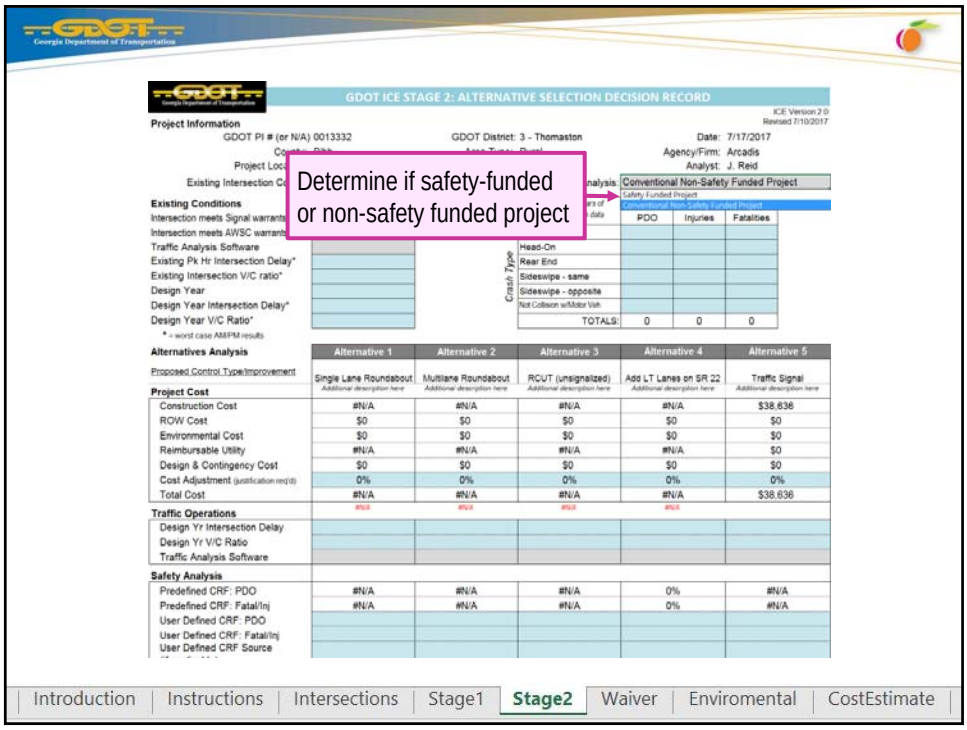
Alternatives Analysis	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Proposed Control Type/Improvement	N/A (Additional description here)	N/A (Additional description here)			
Project Cost					
Construction Cost	#N/A	#N/A			
ROW Cost	#N/A	#N/A			
Environmental Cost	#N/A	#N/A			
Reimbursable Utility	#N/A	#N/A			
Design & Contingency Cost	#N/A	#N/A			
Cost Adjustment (justification req'd)	0%	0%			
Total Cost	#N/A	#N/A			
Traffic Operations					
Design Yr Intersection Delay					
Design Yr V/C Ratio					
Traffic Analysis Software					
Safety Analysis					
Predefined CRF: PDO					
Predefined CRF: Fatal/Inj					
User Defined CRF: PDO					
User Defined CRF: Fatal/Inj					
User Defined CRF Source (if applicable)					
Environmental Impacts					
Historic District/Property	None	None			
Archaeology Resources	None	None			
Graveyard	None	None			
Stream	None	None			
Underground Tank/Hazmat	None	None			
Park Land	None	None			
Environmental Justice Community	None	None			
Wooded Area	None	None			
Wetland	None	None			
Note: If environmental impact highlighted RED, provide justification impact won't jeopardize project delivery using "Environmental" worksheet. "Environmental impacts are only preliminary estimates; detailed environmental impact documentation will be included with project concept report.					
Political Factors					
Public Support	Neutral	Neutral			
GDOT Support	Neutral	Neutral			
Final ICE Stage 2 Score (Rank of Control Type Alternatives)	-	-			

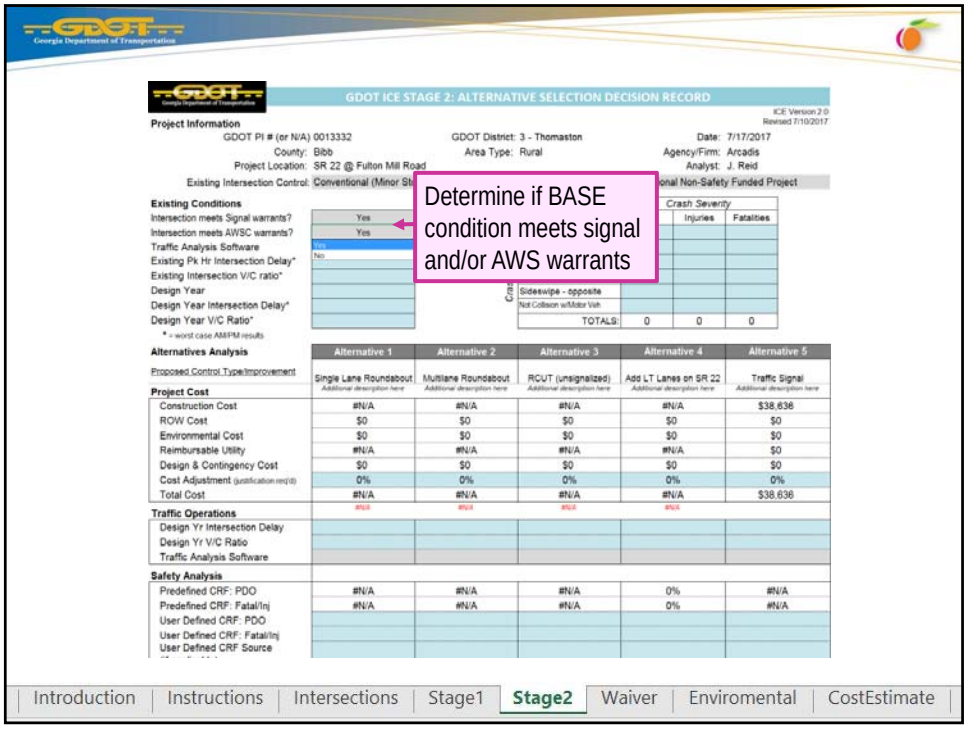
Note: Stage 2 score is not given (shown as "-") if signal or AWS is selected as control type but respective warrants are not met

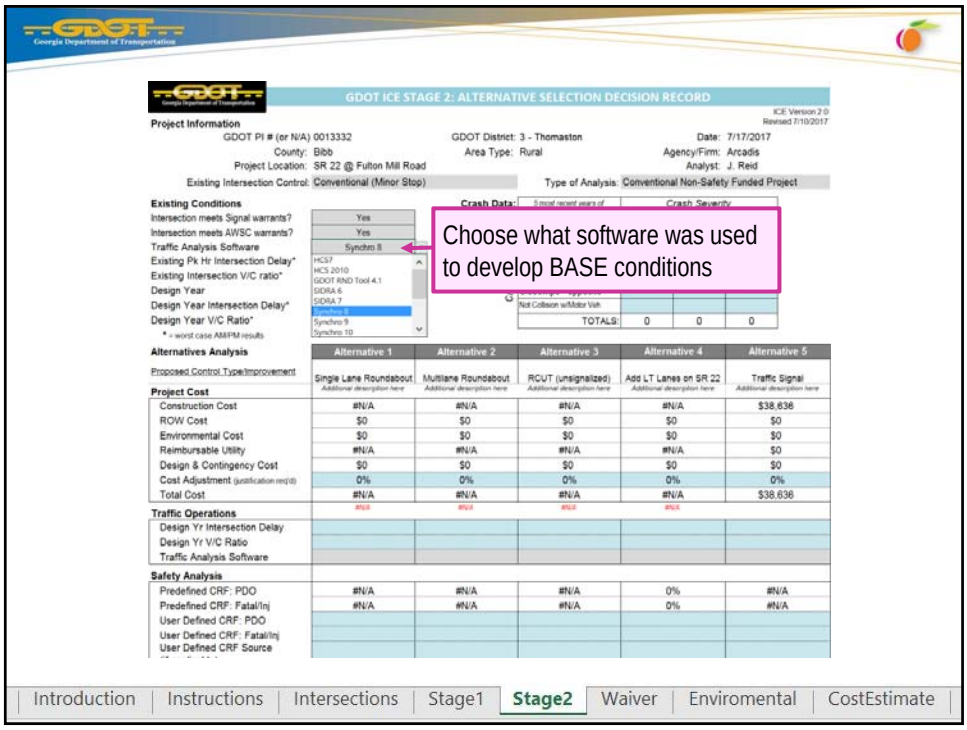
Provide additional comments and/or explain any unique analysis inputs, or results (as necessary):

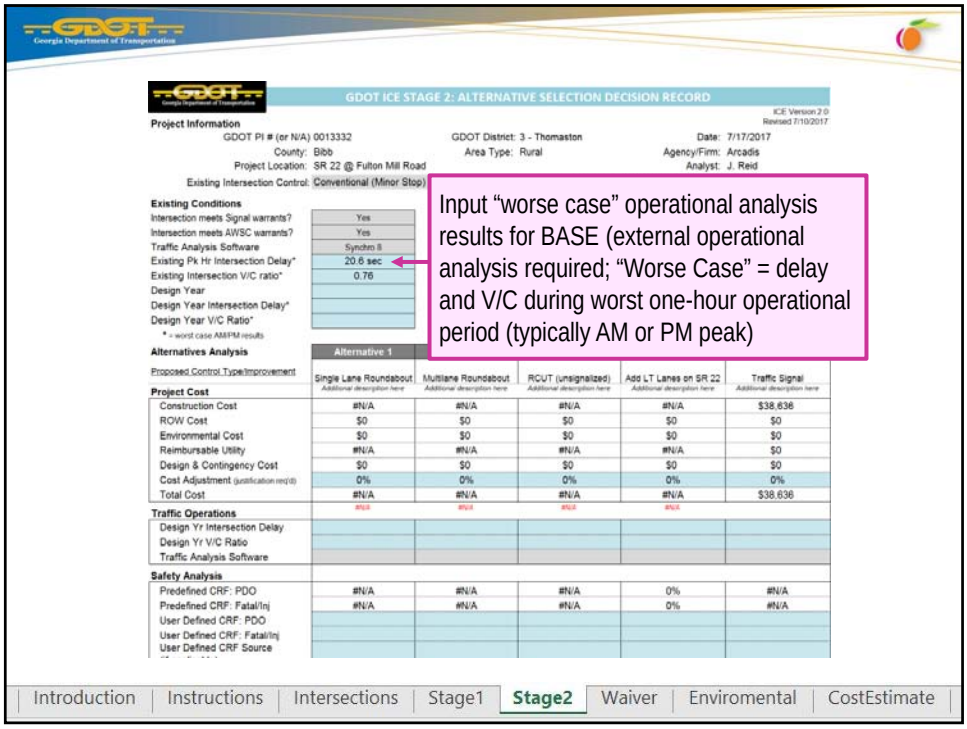
Introduction | Instructions | Intersections | Stage1 | **Stage2** | Waiver | Enviromental | CostEstimate


GDOT ICE STAGE 2: ALTERNATIVE SELECTION DECISION RECORD
Choose existing intersection control; important determinant for several factors
Five alternatives auto-populate
Introduction
Instructions
Intersections
Stage1
Stage2
Waiver
Enviromental
CostEstimate

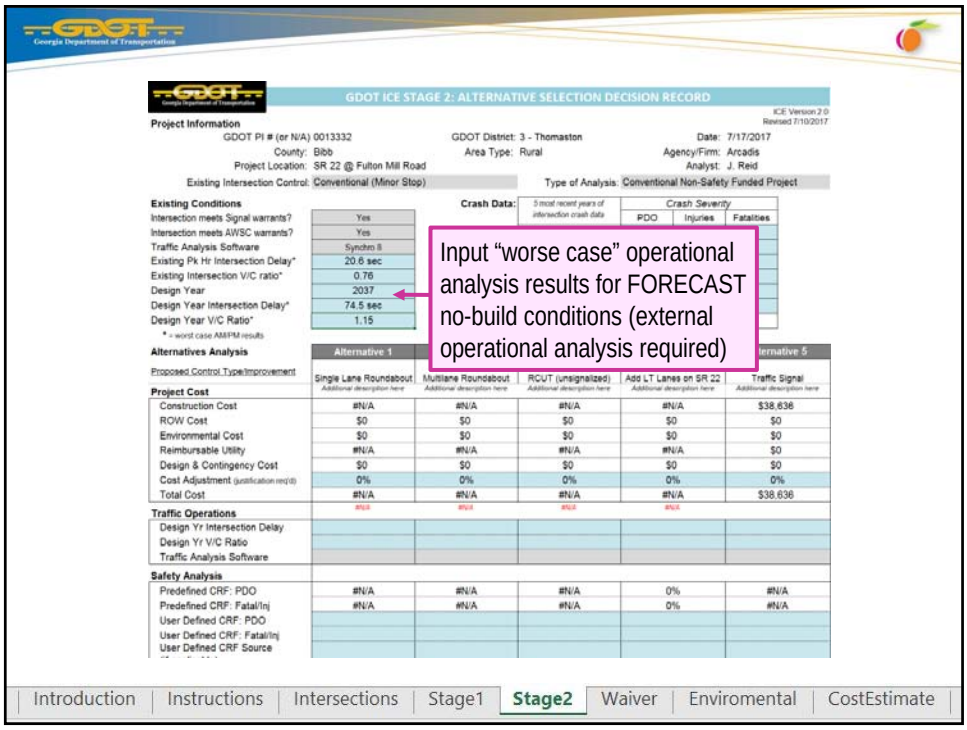

GDOT ICE STAGE 2: ALTERNATIVE SELECTION DECISION RECORD
Determine if safety-funded or non-safety funded project
Introduction
Instructions
Intersections
Stage1
Stage2
Waiver
Enviromental
CostEstimate


GDOT ICE STAGE 2: ALTERNATIVE SELECTION DECISION RECORD
Determine if BASE condition meets signal and/or AWS warrants
Introduction
Instructions
Intersections
Stage1
Stage2
Waiver
Enviromental
CostEstimate

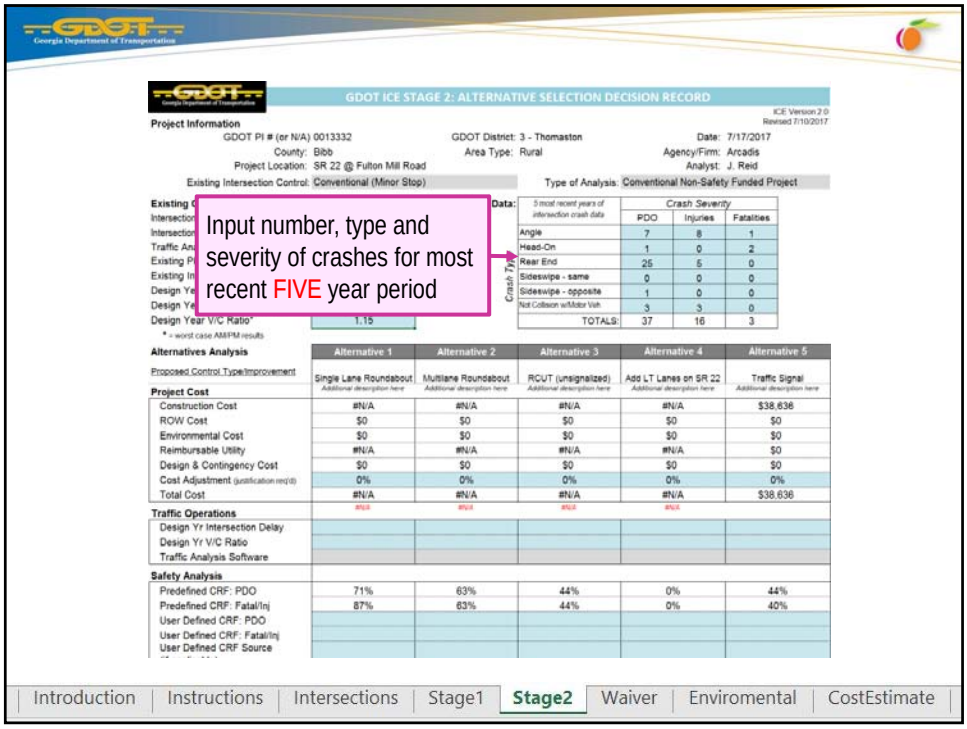

GDOT ICE STAGE 2: ALTERNATIVE SELECTION DECISION RECORD
Choose what software was used to develop BASE conditions
Introduction
Instructions
Intersections
Stage1
Stage2
Waiver
Enviromental
CostEstimate

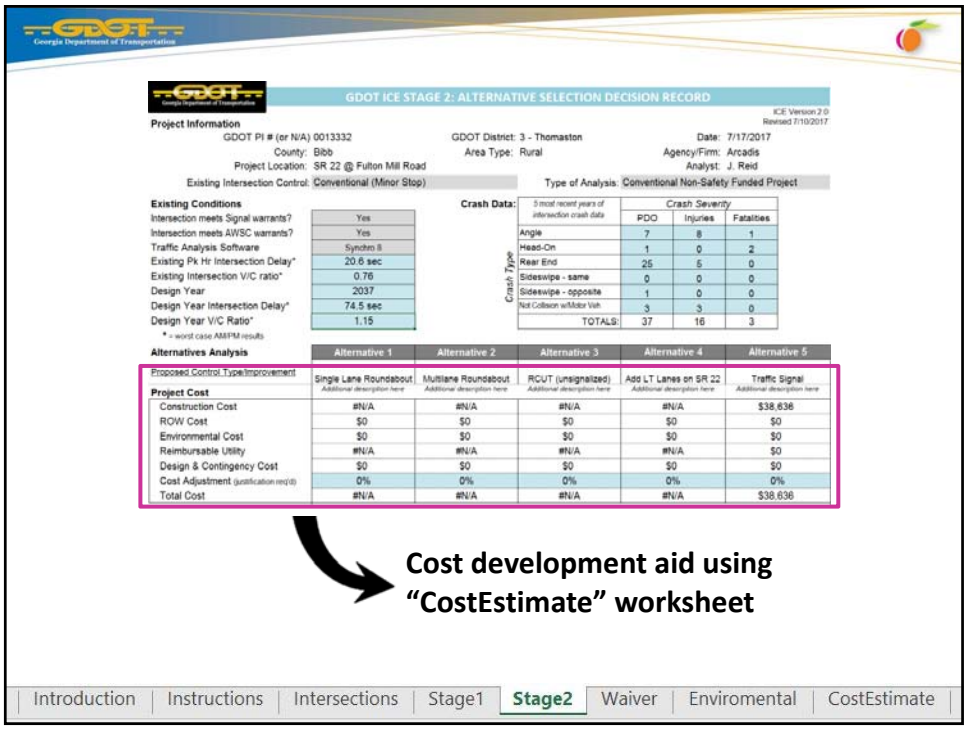


Input "worse case" operational analysis results for BASE (external operational analysis required; "Worse Case" = delay and V/C during worst one-hour operational period (typically AM or PM peak)



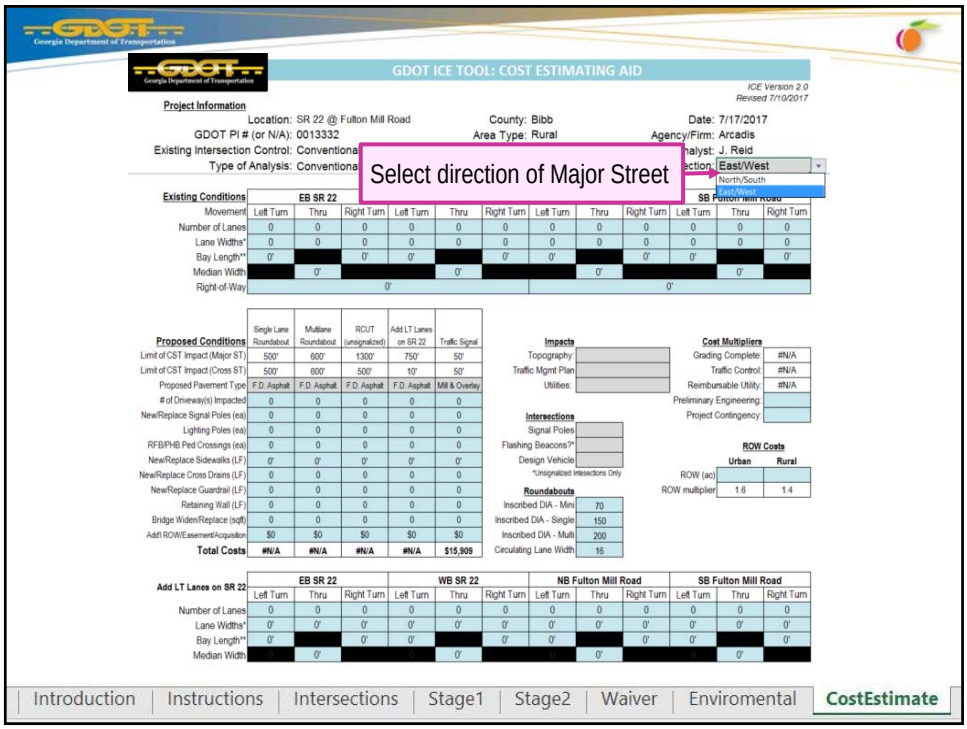
Input "worse case" operational analysis results for FORECAST no-build conditions (external operational analysis required)

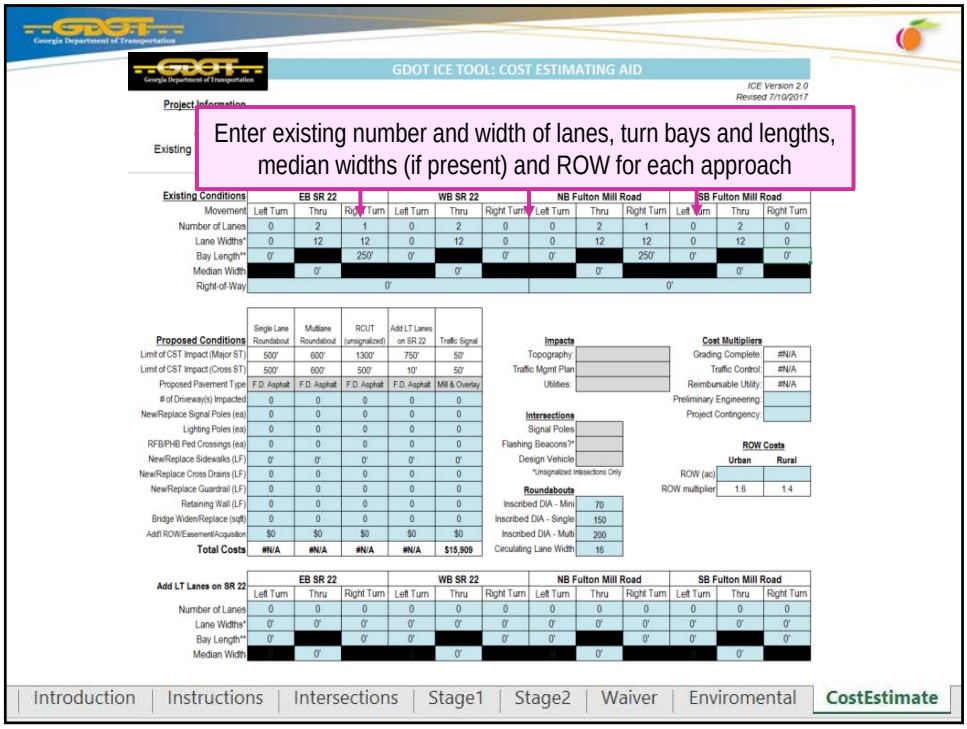

GDOT ICE STAGE 2: ALTERNATIVE SELECTION DECISION RECORD
Input number, type and severity of crashes for most recent FIVE year period
Introduction
Instructions
Intersections
Stage1
Stage2
Waiver
Enviromental
CostEstimate

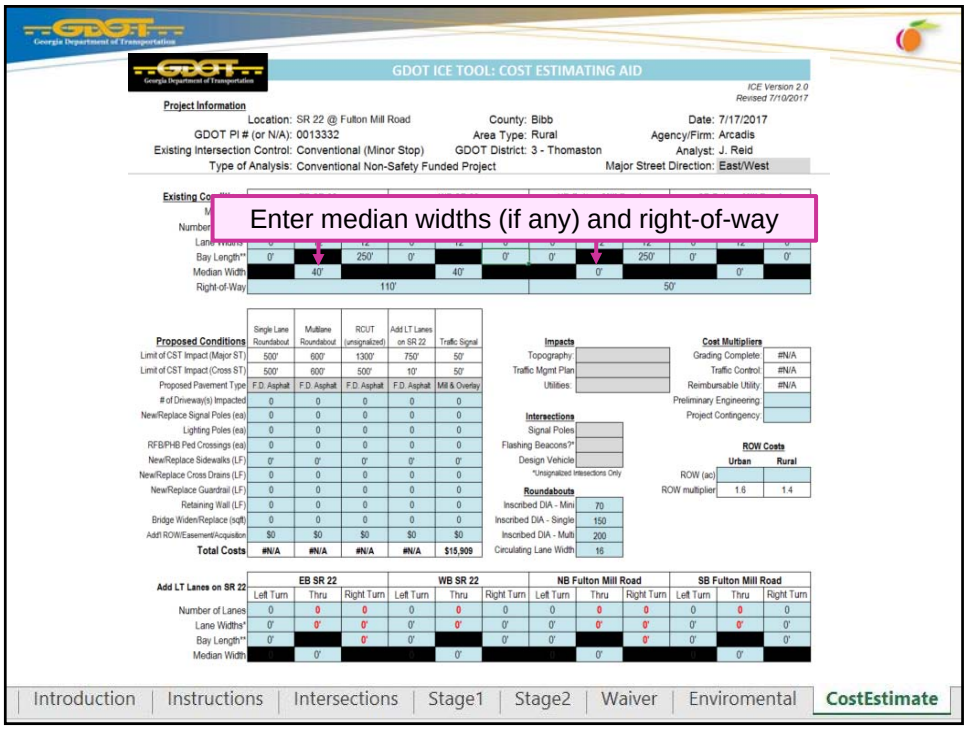

GDOT ICE STAGE 2: ALTERNATIVE SELECTION DECISION RECORD
Cost development aid using "CostEstimate" worksheet
Introduction
Instructions
Intersections
Stage1
Stage2
Waiver
Enviromental
CostEstimate

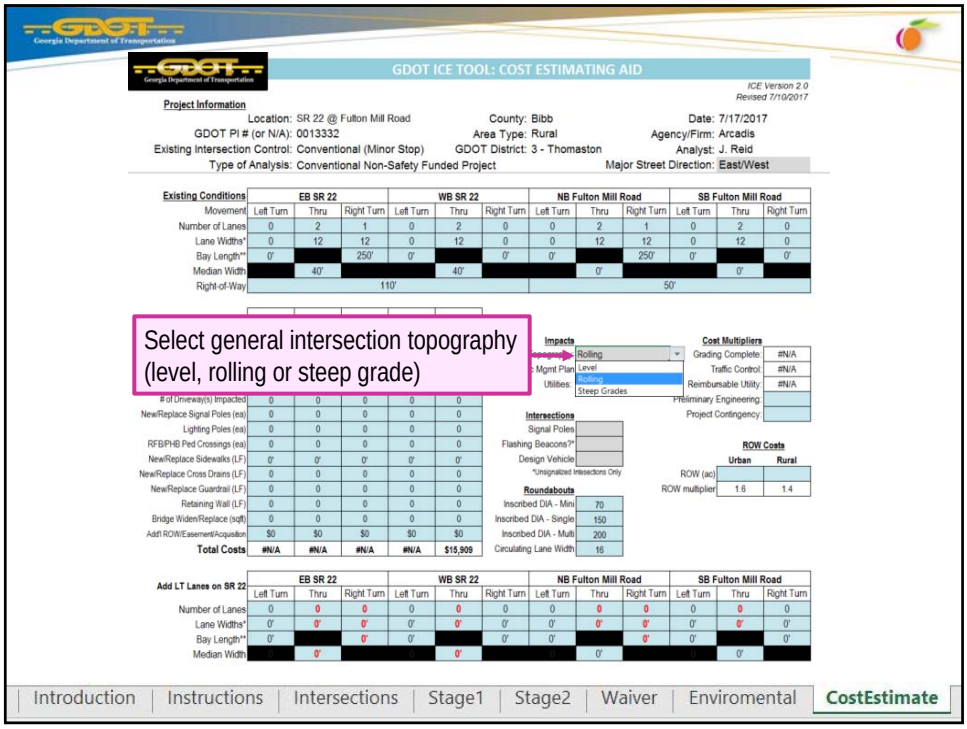
Intersection Control Evaluation

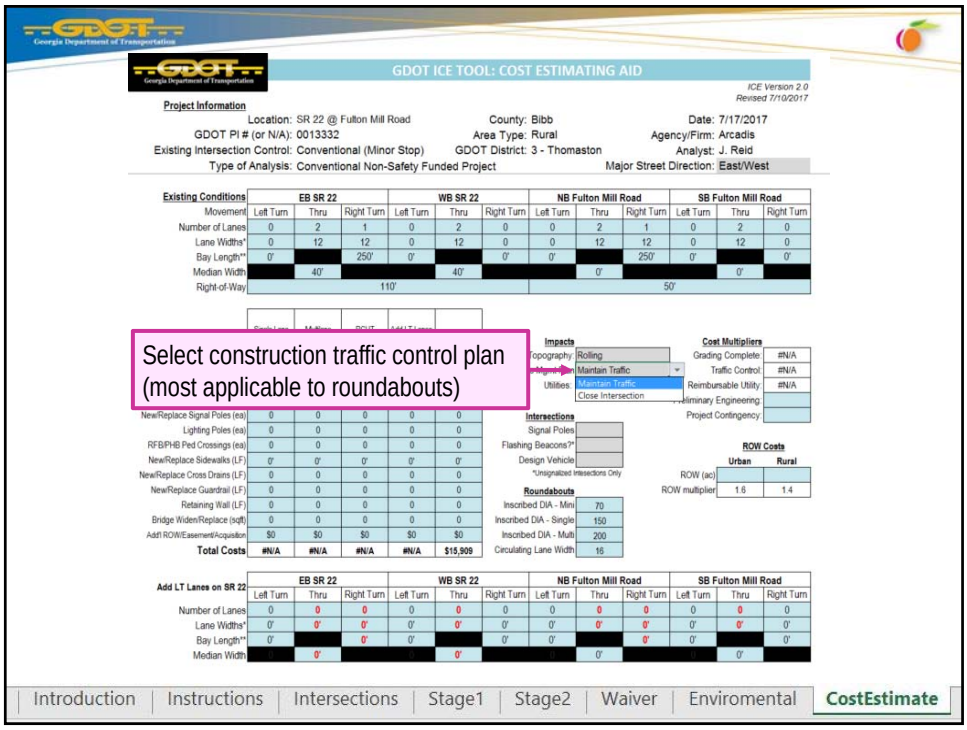
ICE 2.0 TOOL – COST WORKSHEET

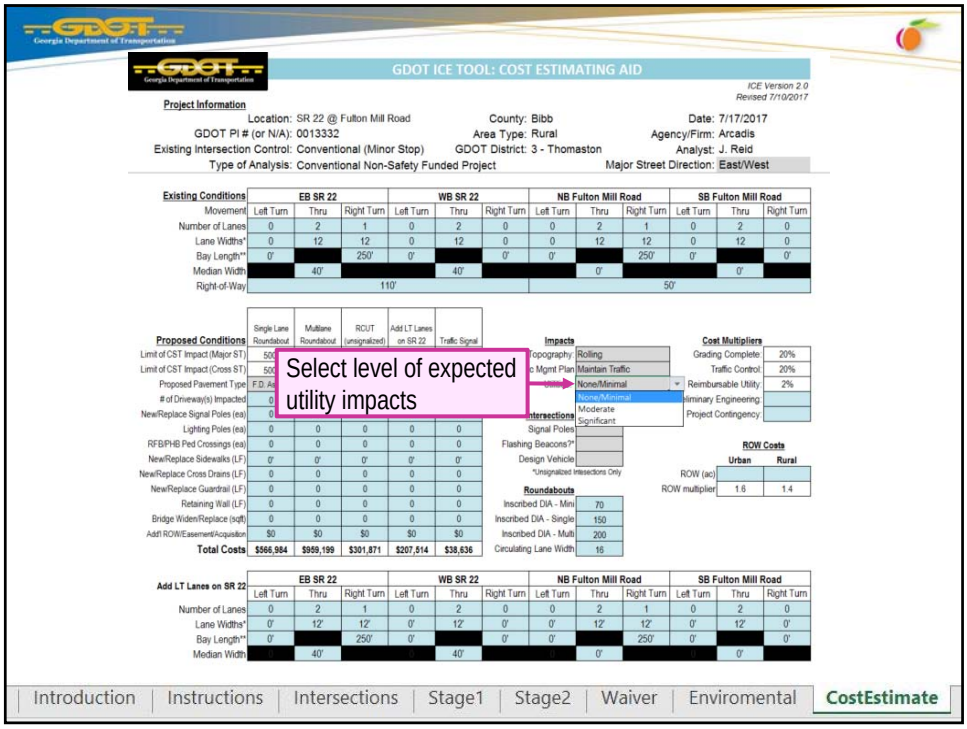


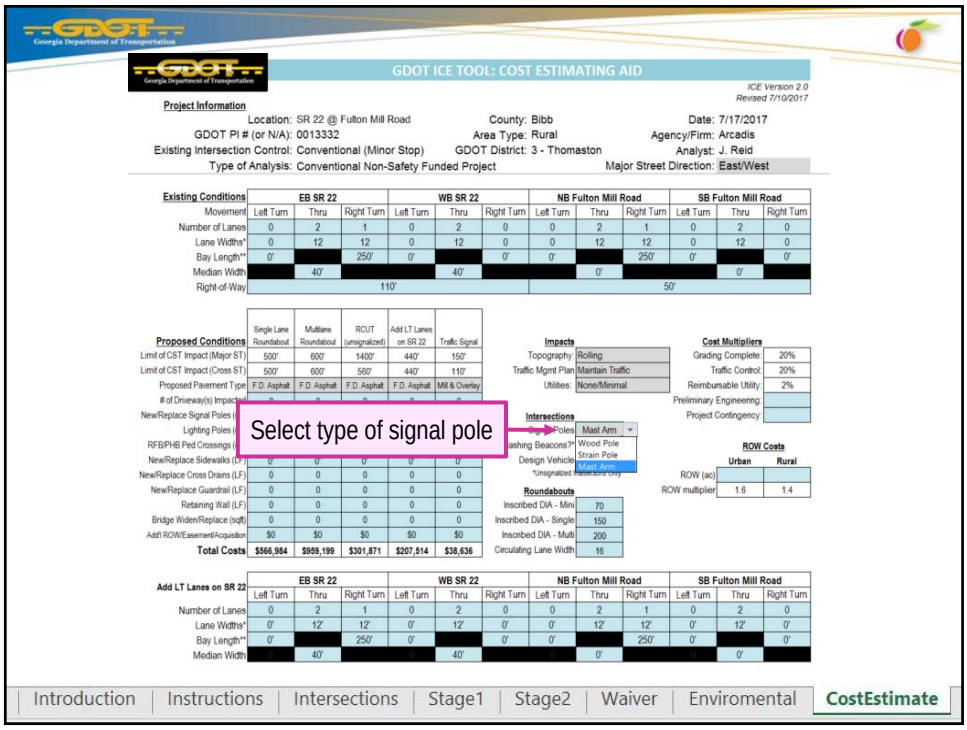

GDOT ICE TOOL: COST ESTIMATING AID
ICE Version 2.0
Revised 7/10/2017
Enter existing number and width of lanes, turn bays and lengths, median widths (if present) and ROW for each approach
Introduction
Instructions
Intersections
Stage1
Stage2
Waiver
Enviromental
CostEstimate

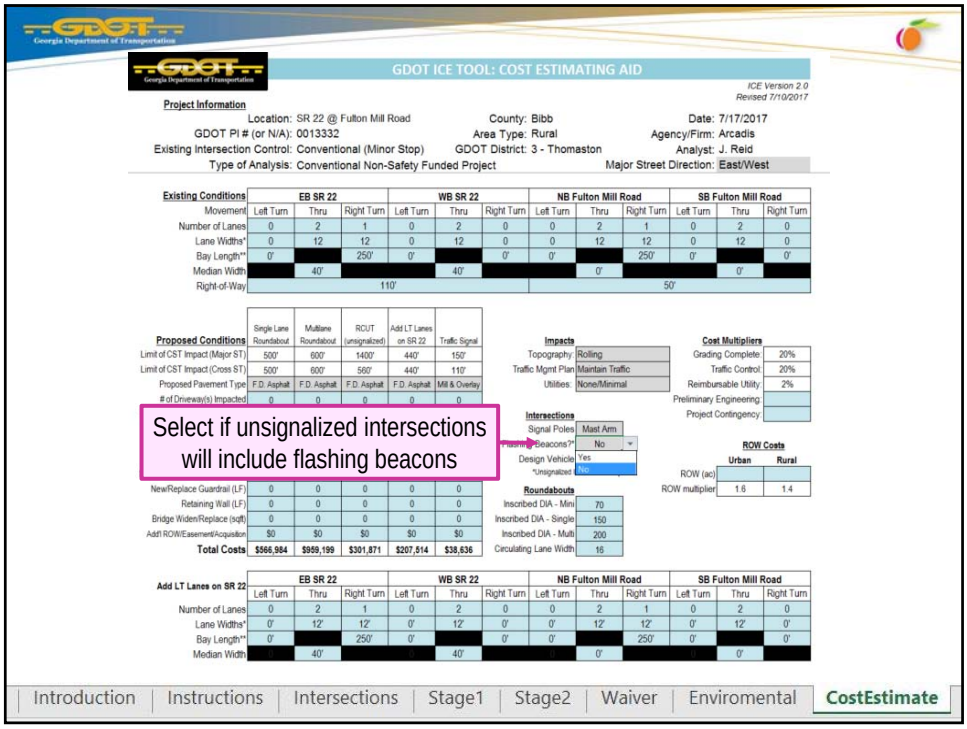

GDOT ICE TOOL: COST ESTIMATING AID
ICE Version 2.0
Revised 7/10/2017
Project Information
Location: SR 22 @ Fulton Mill Road
County: Bibb
Date: 7/17/2017
GDOT PI # (or N/A): 0013332
Area Type: Rural
Agency/Firm: Arcadis
Existing Intersection Control: Conventional (Minor Stop)
GDOT District: 3 - Thomaston
Analyst: J. Reid
Type of Analysis: Conventional Non-Safety Funded Project
Major Street Direction: East/West
Enter median widths (if any) and right-of-way
Introduction
Instructions
Intersections
Stage1
Stage2
Waiver
Enviromental
CostEstimate

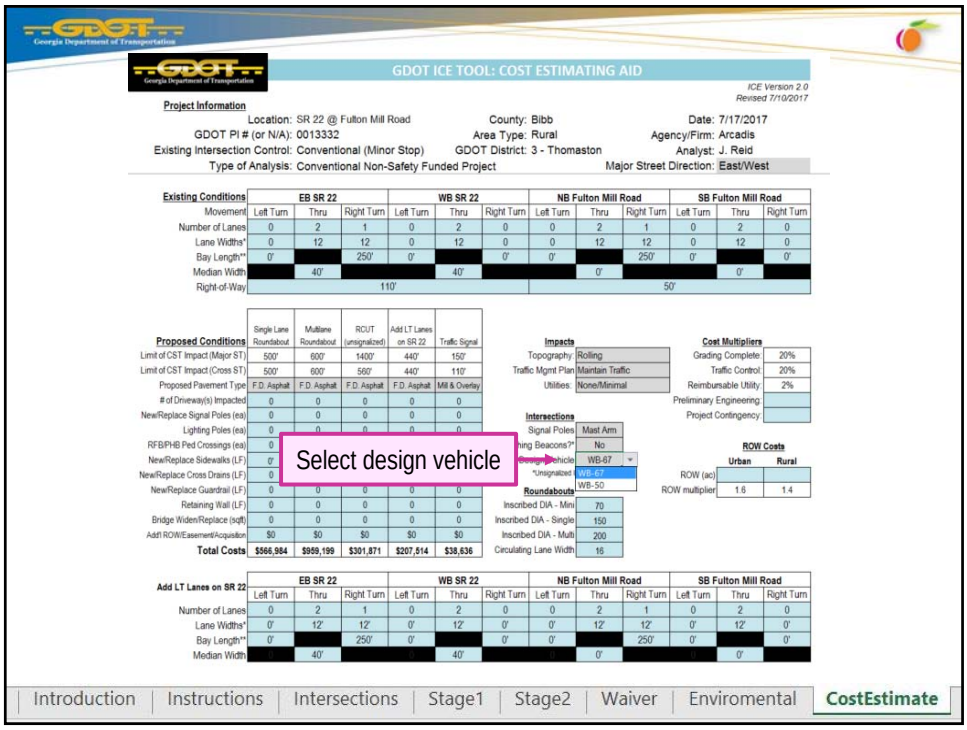

GDOT ICE TOOL: COST ESTIMATING AID
Select general intersection topography (level, rolling or steep grade)
Introduction
Instructions
Intersections
Stage1
Stage2
Waiver
Enviromental
CostEstimate

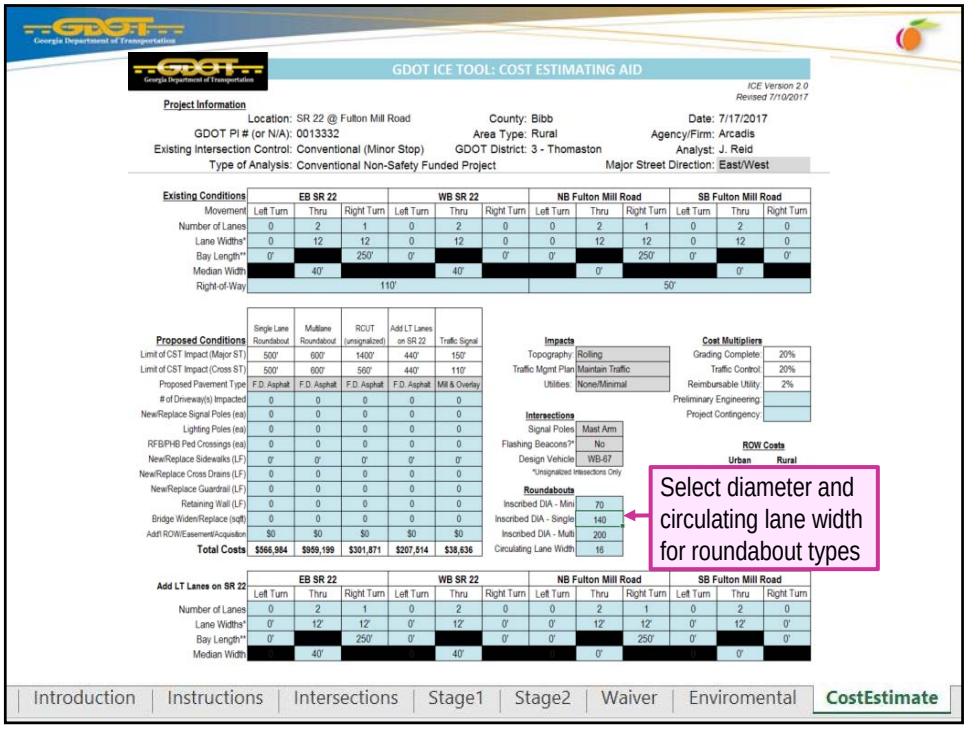

GDOT ICE TOOL: COST ESTIMATING AID
Select construction traffic control plan (most applicable to roundabouts)
Introduction
Instructions
Intersections
Stage1
Stage2
Waiver
Enviromental
CostEstimate

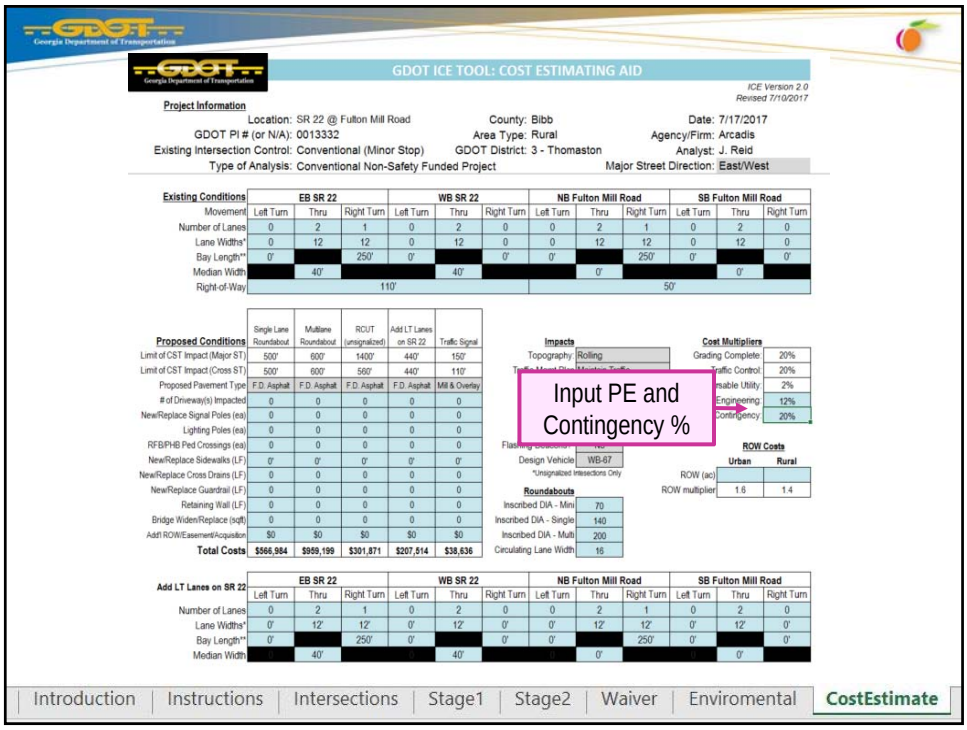

GDOT ICE TOOL: COST ESTIMATING AID
ICE Version 2.0
Revised 7/10/2017
Project Information
Location: SR 22 @ Fulton Mill Road
County: Bibb
Date: 7/17/2017
GDOT PI # (or N/A): 0013332
Area Type: Rural
Agency/Firm: Arcadis
Existing Intersection Control: Conventional (Minor Stop)
GDOT District: 3 - Thomaston
Analyst: J. Reid
Type of Analysis: Conventional Non-Safety Funded Project
Major Street Direction: East/West
Existing Conditions
EB SR 22
WB SR 22
NB Fulton Mill Road
SB Fulton Mill Road
Movement
Number of Lanes
Lane Widths*
Bay Length**
Median Width
Right-of-Way
110'
50'
Proposed Conditions
Single Lane Roundabout
Multilane Roundabout
RCUT (unsignalized)
Add LT Lanes on SR 22
Traffic Signal
Total Costs
$566,984
$959,199
$301,871
$207,514
$38,636
Select level of expected utility impacts
Impacts
Topography: Rolling
Traffic Mgmt Plan: Maintain Traffic
Utilities: None/Minimal
None/Minimal
Moderate
Significant
Intersections
Signal Poles
Flashing Beacons?*
Design Vehicle
*Unsignalized Intersections Only
Roundabouts
Inscribed DIA - Mini: 70
Inscribed DIA - Single: 150
Inscribed DIA - Multi: 200
Circulating Lane Width: 16
Cost Multipliers
Grading Complete: 20%
Traffic Control: 20%
Reimbursable Utility: 2%
Preliminary Engineering:
Project Contingency:
ROW Costs
Urban
Rural
ROW (ac)
ROW multiplier: 1.6
1.4
Add LT Lanes on SR 22
Introduction
Instructions
Intersections
Stage1
Stage2
Waiver
Enviromental
CostEstimate

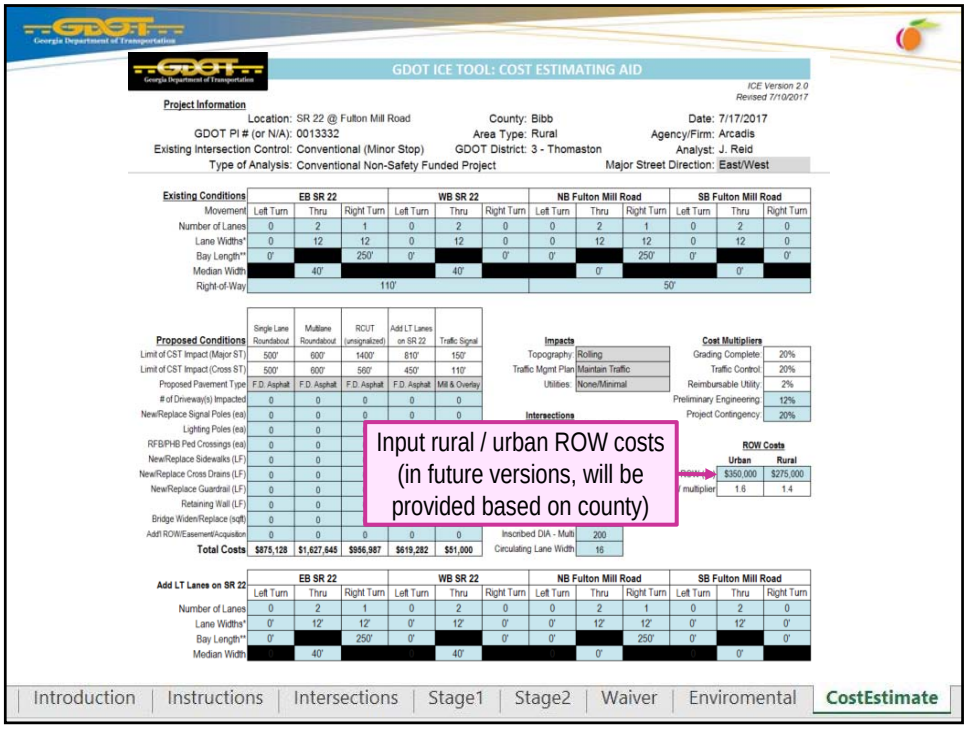

GDOT ICE TOOL: COST ESTIMATING AID
ICE Version 2.0
Revised 7/10/2017
Project Information
Location: SR 22 @ Fulton Mill Road
County: Bibb
Date: 7/17/2017
GDOT PI # (or N/A): 0013332
Area Type: Rural
Agency/Firm: Arcadis
Existing Intersection Control: Conventional (Minor Stop)
GDOT District: 3 - Thomaston
Analyst: J. Reid
Type of Analysis: Conventional Non-Safety Funded Project
Major Street Direction: East/West
Existing Conditions
EB SR 22
WB SR 22
NB Fulton Mill Road
SB Fulton Mill Road
Movement
Number of Lanes
Lane Widths*
Bay Length**
Median Width
Right-of-Way
110'
50'
Proposed Conditions
Single Lane Roundabout
Multilane Roundabout
RCUT (unsignalized)
Add LT Lanes on SR 22
Traffic Signal
Total Costs
$566,984
$959,199
$301,871
$207,514
$38,636
Select type of signal pole
Impacts
Topography: Rolling
Traffic Mgmt Plan: Maintain Traffic
Utilities: None/Minimal
Intersections
Signal Poles: Mast Arm
Wood Pole
Strain Pole
Mast Arm
Flashing Beacons?*
Design Vehicle
Roundabouts
Inscribed DIA - Mini: 70
Inscribed DIA - Single: 150
Inscribed DIA - Multi: 200
Circulating Lane Width: 16
Cost Multipliers
Grading Complete: 20%
Traffic Control: 20%
Reimbursable Utility: 2%
Preliminary Engineering:
Project Contingency:
ROW Costs
Urban
Rural
ROW (ac)
ROW multiplier: 1.6
1.4
Add LT Lanes on SR 22
Introduction
Instructions
Intersections
Stage1
Stage2
Waiver
Enviromental
CostEstimate

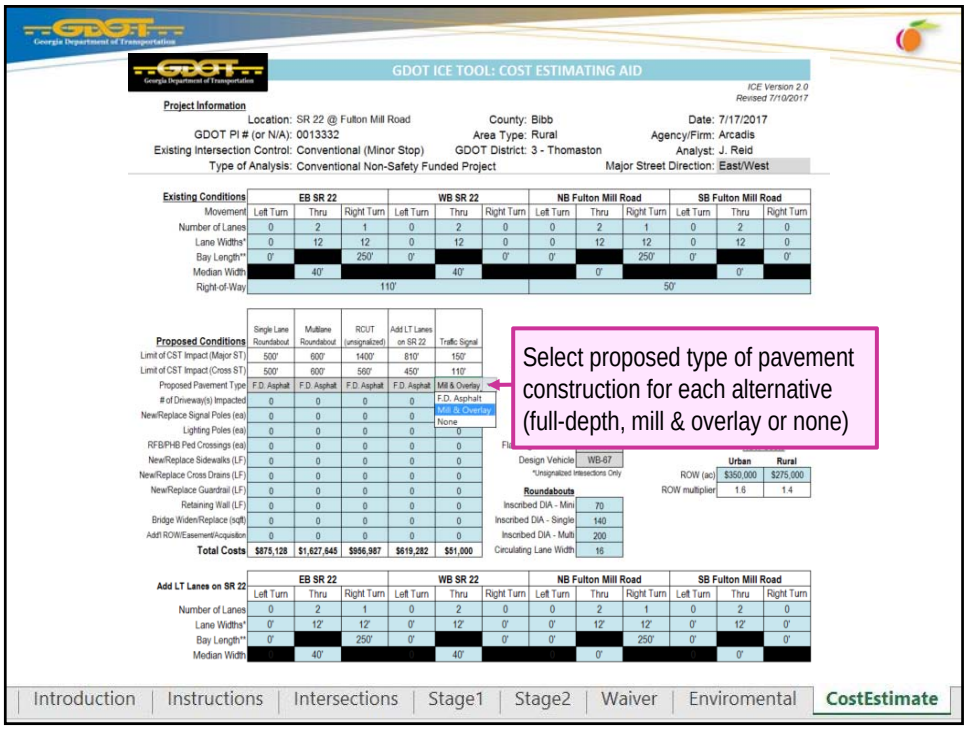

GDOT ICE TOOL: COST ESTIMATING AID
ICE Version 2.0
Revised 7/10/2017
Project Information
Location: SR 22 @ Fulton Mill Road
County: Bibb
Date: 7/17/2017
GDOT PI # (or N/A): 0013332
Area Type: Rural
Agency/Firm: Arcadis
Existing Intersection Control: Conventional (Minor Stop)
GDOT District: 3 - Thomaston
Analyst: J. Reid
Type of Analysis: Conventional Non-Safety Funded Project
Major Street Direction: East/West
Existing Conditions
EB SR 22
WB SR 22
NB Fulton Mill Road
SB Fulton Mill Road
Movement
Left Turn
Thru
Right Turn
Number of Lanes
Lane Widths*
Bay Length**
Median Width
Right-of-Way
110'
50'
Proposed Conditions
Single Lane Roundabout
Multilane Roundabout
RCUT (unsignalized)
Add LT Lanes on SR 22
Traffic Signal
Limit of CST Impact (Major ST)
Limit of CST Impact (Cross ST)
Proposed Pavement Type
# of Driveway(s) Impacted
New/Replace Guardrail (LF)
Retaining Wall (LF)
Bridge Widen/Replace (sqft)
Add'l ROW/Easement/Acquisition
Total Costs
$566,984
$959,199
$301,871
$207,514
$38,636
Impacts
Topography: Rolling
Traffic Mgmt Plan: Maintain Traffic
Utilities: None/Minimal
Intersections
Signal Poles: Mast Arm
Flashing Beacons?*: No
Design Vehicle
*Unsignalized
Yes
No
Roundabouts
Inscribed DIA - Mini: 70
Inscribed DIA - Single: 150
Inscribed DIA - Multi: 200
Circulating Lane Width: 16
Cost Multipliers
Grading Complete: 20%
Traffic Control: 20%
Reimbursable Utility: 2%
Preliminary Engineering:
Project Contingency:
ROW Costs
Urban
Rural
ROW (ac)
ROW multiplier: 1.6
1.4
Add LT Lanes on SR 22
Select if unsignalized intersections will include flashing beacons
Introduction
Instructions
Intersections
Stage1
Stage2
Waiver
Enviromental
CostEstimate


GDOT ICE TOOL: COST ESTIMATING AID
ICE Version 2.0
Revised 7/10/2017
Project Information
Location: SR 22 @ Fulton Mill Road
County: Bibb
Date: 7/17/2017
GDOT PI # (or N/A): 0013332
Area Type: Rural
Agency/Firm: Arcadis
Existing Intersection Control: Conventional (Minor Stop)
GDOT District: 3 - Thomaston
Analyst: J. Reid
Type of Analysis: Conventional Non-Safety Funded Project
Major Street Direction: East/West
Existing Conditions
EB SR 22
WB SR 22
NB Fulton Mill Road
SB Fulton Mill Road
Movement
Left Turn
Thru
Right Turn
Number of Lanes
Lane Widths*
Bay Length**
Median Width
Right-of-Way
110'
50'
Proposed Conditions
Single Lane Roundabout
Multilane Roundabout
RCUT (unsignalized)
Add LT Lanes on SR 22
Traffic Signal
Limit of CST Impact (Major ST)
Limit of CST Impact (Cross ST)
Proposed Pavement Type
# of Driveway(s) Impacted
New/Replace Signal Poles (ea)
Lighting Poles (ea)
RFB/PHB Ped Crossings (ea)
New/Replace Sidewalks (LF)
New/Replace Cross Drains (LF)
New/Replace Guardrail (LF)
Retaining Wall (LF)
Bridge Widen/Replace (sqft)
Add'l ROW/Easement/Acquisition
Total Costs
$566,984
$959,199
$301,871
$207,514
$38,636
Impacts
Topography: Rolling
Traffic Mgmt Plan: Maintain Traffic
Utilities: None/Minimal
Intersections
Signal Poles: Mast Arm
Flashing Beacons?*: No
Design Vehicle
*Unsignalized
WB-67
WB-50
Roundabouts
Inscribed DIA - Mini: 70
Inscribed DIA - Single: 150
Inscribed DIA - Multi: 200
Circulating Lane Width: 16
Cost Multipliers
Grading Complete: 20%
Traffic Control: 20%
Reimbursable Utility: 2%
Preliminary Engineering:
Project Contingency:
ROW Costs
Urban
Rural
ROW (ac)
ROW multiplier: 1.6
1.4
Add LT Lanes on SR 22
Select design vehicle
Introduction
Instructions
Intersections
Stage1
Stage2
Waiver
Enviromental
CostEstimate


GDOT ICE TOOL: COST ESTIMATING AID
ICE Version 2.0
Revised 7/10/2017
Project Information
Location: SR 22 @ Fulton Mill Road
County: Bibb
Date: 7/17/2017
GDOT PI # (or N/A): 0013332
Area Type: Rural
Agency/Firm: Arcadis
Existing Intersection Control: Conventional (Minor Stop)
GDOT District: 3 - Thomaston
Analyst: J. Reid
Type of Analysis: Conventional Non-Safety Funded Project
Major Street Direction: East/West
Existing Conditions
EB SR 22
WB SR 22
NB Fulton Mill Road
SB Fulton Mill Road
Movement
Left Turn
Thru
Right Turn
Number of Lanes
Lane Widths*
Bay Length**
Median Width
Right-of-Way
110'
50'
Proposed Conditions
Single Lane Roundabout
Multilane Roundabout
RCUT (unsignalized)
Add LT Lanes on SR 22
Traffic Signal
Limit of CST Impact (Major ST)
Limit of CST Impact (Cross ST)
Proposed Pavement Type
# of Driveway(s) Impacted
New/Replace Signal Poles (ea)
Lighting Poles (ea)
RFB/PHB Ped Crossings (ea)
New/Replace Sidewalks (LF)
New/Replace Cross Drains (LF)
New/Replace Guardrail (LF)
Retaining Wall (LF)
Bridge Widen/Replace (sqft)
Add'l ROW/Easement/Acquisition
Total Costs
$566,984
$959,199
$301,871
$207,514
$38,636
Impacts
Topography: Rolling
Traffic Mgmt Plan: Maintain Traffic
Utilities: None/Minimal
Intersections
Signal Poles: Mast Arm
Flashing Beacons?*: No
Design Vehicle: WB-67
*Unsignalized Intersections Only
Roundabouts
Inscribed DIA - Mini: 70
Inscribed DIA - Single: 140
Inscribed DIA - Multi: 200
Circulating Lane Width: 16
Cost Multipliers
Grading Complete: 20%
Traffic Control: 20%
Reimbursable Utility: 2%
Preliminary Engineering:
Project Contingency:
ROW Costs
Urban
Rural
Add LT Lanes on SR 22
Introduction
Instructions
Intersections
Stage1
Stage2
Waiver
Enviromental
CostEstimate
Select diameter and circulating lane width for roundabout types


GDOT ICE TOOL: COST ESTIMATING AID
ICE Version 2.0
Revised 7/10/2017
Project Information
Location: SR 22 @ Fulton Mill Road
County: Bibb
Date: 7/17/2017
GDOT PI # (or N/A): 0013332
Area Type: Rural
Agency/Firm: Arcadis
Existing Intersection Control: Conventional (Minor Stop)
GDOT District: 3 - Thomaston
Analyst: J. Reid
Type of Analysis: Conventional Non-Safety Funded Project
Major Street Direction: East/West
Existing Conditions
EB SR 22
WB SR 22
NB Fulton Mill Road
SB Fulton Mill Road
Movement
Left Turn
Thru
Right Turn
Number of Lanes
Lane Widths*
Bay Length**
Median Width
Right-of-Way
110'
50'
Proposed Conditions
Single Lane Roundabout
Multilane Roundabout
RCUT (unsignalized)
Add LT Lanes on SR 22
Traffic Signal
Limit of CST Impact (Major ST)
Limit of CST Impact (Cross ST)
Proposed Pavement Type
# of Driveway(s) Impacted
New/Replace Signal Poles (ea)
Lighting Poles (ea)
RFB/PHB Ped Crossings (ea)
New/Replace Sidewalks (LF)
New/Replace Cross Drains (LF)
New/Replace Guardrail (LF)
Retaining Wall (LF)
Bridge Widen/Replace (sqft)
Add'l ROW/Easement/Acquisition
Total Costs
$566,984
$959,199
$301,871
$207,514
$38,636
Impacts
Topography: Rolling
Design Vehicle: WB-67
*Unsignalized Intersections Only
Roundabouts
Inscribed DIA - Mini: 70
Inscribed DIA - Single: 140
Inscribed DIA - Multi: 200
Circulating Lane Width: 16
Cost Multipliers
Grading Complete: 20%
Traffic Control: 20%
Engineering: 12%
Contingency: 20%
ROW Costs
Urban
Rural
ROW (ac)
ROW multiplier: 1.6
1.4
Add LT Lanes on SR 22
Introduction
Instructions
Intersections
Stage1
Stage2
Waiver
Enviromental
CostEstimate
Input PE and Contingency %


GDOT ICE TOOL: COST ESTIMATING AID
ICE Version 2.0
Revised 7/10/2017
Project Information
Location: SR 22 @ Fulton Mill Road
County: Bibb
Date: 7/17/2017
GDOT PI # (or N/A): 0013332
Area Type: Rural
Agency/Firm: Arcadis
Existing Intersection Control: Conventional (Minor Stop)
GDOT District: 3 - Thomaston
Analyst: J. Reid
Type of Analysis: Conventional Non-Safety Funded Project
Major Street Direction: East/West
Existing Conditions
EB SR 22
WB SR 22
NB Fulton Mill Road
SB Fulton Mill Road
Movement
Left Turn
Thru
Right Turn
Number of Lanes
Lane Widths*
Bay Length**
Median Width
Right-of-Way
110'
50'
Proposed Conditions
Single Lane Roundabout
Multilane Roundabout
RCUT (unsignalized)
Add LT Lanes on SR 22
Traffic Signal
Limit of CST Impact (Major ST)
Limit of CST Impact (Cross ST)
Proposed Pavement Type
# of Driveway(s) Impacted
New/Replace Signal Poles (ea)
Lighting Poles (ea)
RFB/PHB Ped Crossings (ea)
New/Replace Sidewalks (LF)
New/Replace Cross Drains (LF)
New/Replace Guardrail (LF)
Retaining Wall (LF)
Bridge Widen/Replace (sqft)
Add'l ROW/Easement/Acquisition
Total Costs
$875,128
$1,627,645
$856,987
$619,282
$51,000
Impacts
Topography: Rolling
Traffic Mgmt Plan: Maintain Traffic
Utilities: None/Minimal
Intersections
Cost Multipliers
Grading Complete: 20%
Traffic Control: 20%
Reimbursable Utility: 2%
Preliminary Engineering: 12%
Project Contingency: 20%
Input rural / urban ROW costs (in future versions, will be provided based on county)
ROW Costs
Urban
Rural
ROW (ac): $350,000 $275,000
ROW multiplier: 1.6 1.4
Inscribed DIA - Multi: 200
Circulating Lane Width: 16
Add LT Lanes on SR 22
Introduction
Instructions
Intersections
Stage1
Stage2
Waiver
Enviromental
CostEstimate


GDOT ICE TOOL: COST ESTIMATING AID
ICE Version 2.0
Revised 7/10/2017
Project Information
Location: SR 22 @ Fulton Mill Road
County: Bibb
Date: 7/17/2017
GDOT PI # (or N/A): 0013332
Area Type: Rural
Agency/Firm: Arcadis
Existing Intersection Control: Conventional (Minor Stop)
GDOT District: 3 - Thomaston
Analyst: J. Reid
Type of Analysis: Conventional Non-Safety Funded Project
Major Street Direction: East/West
Existing Conditions
EB SR 22
WB SR 22
NB Fulton Mill Road
SB Fulton Mill Road
Movement
Left Turn
Thru
Right Turn
Number of Lanes
Lane Widths*
Bay Length**
Median Width
Right-of-Way
110'
50'
Proposed Conditions
Single Lane Roundabout
Multilane Roundabout
RCUT (unsignalized)
Add LT Lanes on SR 22
Traffic Signal
Limit of CST Impact (Major ST)
Limit of CST Impact (Cross ST)
Proposed Pavement Type
F.D. Asphalt
Mill & Overlay
None
# of Driveway(s) Impacted
New/Replace Signal Poles (ea)
Lighting Poles (ea)
RFB/PHB Ped Crossings (ea)
New/Replace Sidewalks (LF)
New/Replace Cross Drains (LF)
New/Replace Guardrail (LF)
Retaining Wall (LF)
Bridge Widen/Replace (sqft)
Add'l ROW/Easement/Acquisition
Total Costs
$875,128
$1,627,645
$856,987
$619,282
$51,000
Select proposed type of pavement construction for each alternative (full-depth, mill & overlay or none)
Design Vehicle: WB-67
*Unsignalized Intersections Only
Roundabouts
Inscribed DIA - Mini: 70
Inscribed DIA - Single: 140
Inscribed DIA - Multi: 200
Circulating Lane Width: 16
ROW (ac): $350,000 $275,000
ROW multiplier: 1.6 1.4
Add LT Lanes on SR 22
Introduction
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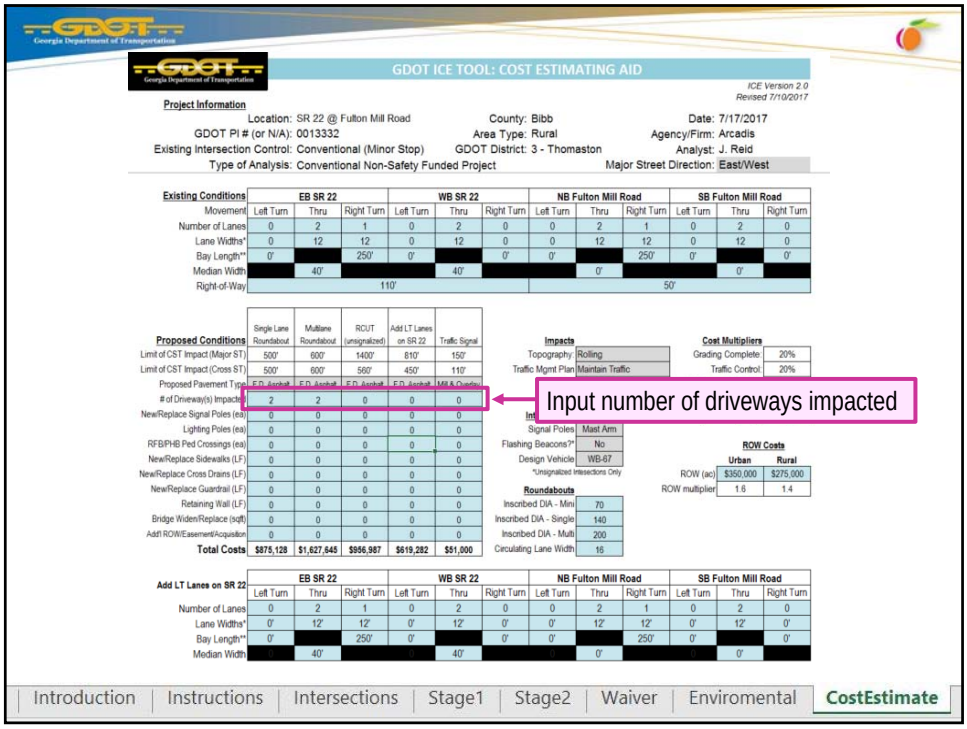
Intersections
Stage1
Stage2
Waiver
Enviromental
CostEstimate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GDOT District: 3 - Thomaston
Analyst: J. Reid
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Major Street Direction: East/West
Existing Conditions
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WB SR 22
NB Fulton Mill Road
SB Fulton Mill Road
Movement
Left Turn
Thru
Right Turn
Number of Lanes
Lane Widths*
Bay Length**
Median Width
Right-of-Way
110'
50'
Proposed Conditions
Single Lane Roundabout
Multilane Roundabout
RCUT (unsignalized)
Add LT Lanes on SR 22
Traffic Signal
Limit of CST Impact (Major ST)
Limit of CST Impact (Cross ST)
Proposed Pavement Type
# of Driveway(s) Impacted
New/Replace Signal Poles (ea)
Lighting Poles (ea)
RFB/PHB Ped Crossings (ea)
New/Replace Sidewalks (LF)
New/Replace Cross Drains (LF)
New/Replace Guardrail (LF)
Retaining Wall (LF)
Bridge Widen/Replace (sqft)
Add'l ROW/Easement/Acquisition
Total Costs
$875,128
$1,627,645
$856,987
$619,282
$51,000
Impacts
Topography: Rolling
Traffic Mgmt Plan: Maintain Traffic
Signal Poles: Mast Arm
Flashing Beacons?*: No
Design Vehicle: WB-67
*Unsignalized Intersections Only
Roundabouts
Inscribed DIA - Mini: 70
Inscribed DIA - Single: 140
Inscribed DIA - Multi: 200
Circulating Lane Width: 16
Cost Multipliers
Grading Complete: 20%
Traffic Control: 20%
ROW Costs
Urban
Rural
ROW (ac): $350,000 $275,000
ROW multiplier: 1.6 1.4
Add LT Lanes on SR 22
Input number of driveways impacted
Introduction
Instructions
Intersections
Stage1
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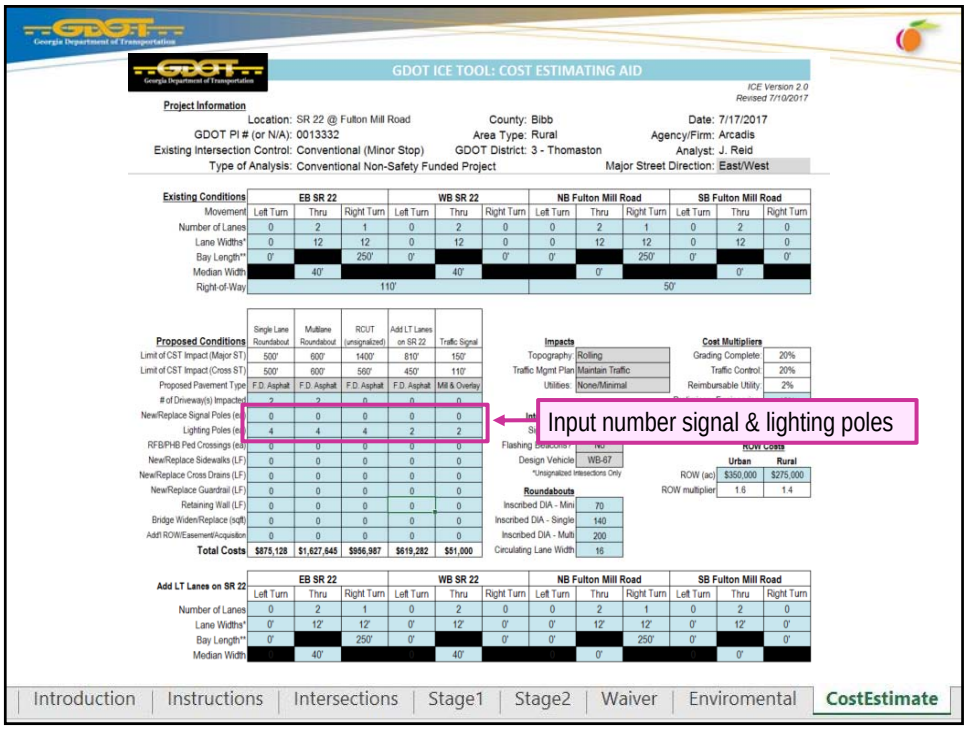
Waiver
Enviromental
CostEstimate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GDOT District: 3 - Thomaston
Analyst: J. Reid
Type of Analysis: Conventional Non-Safety Funded Project
Major Street Direction: East/West
Existing Conditions
EB SR 22
WB SR 22
NB Fulton Mill Road
SB Fulton Mill Road
Movement
Left Turn
Thru
Right Turn
Number of Lanes
Lane Widths*
Bay Length**
Median Width
Right-of-Way
110'
50'
Proposed Conditions
Single Lane Roundabout
Multilane Roundabout
RCUT (unsignalized)
Add LT Lanes on SR 22
Traffic Signal
Limit of CST Impact (Major ST)
Limit of CST Impact (Cross ST)
Proposed Pavement Type
# of Driveway(s) Impacted
New/Replace Signal Poles (ea)
Lighting Poles (ea)
RFB/PHB Ped Crossings (ea)
New/Replace Sidewalks (LF)
New/Replace Cross Drains (LF)
New/Replace Guardrail (LF)
Retaining Wall (LF)
Bridge Widen/Replace (sqft)
Add'l ROW/Easement/Acquisition
Total Costs
$875,128
$1,627,645
$856,987
$619,282
$51,000
Impacts
Topography: Rolling
Traffic Mgmt Plan: Maintain Traffic
Utilities: None/Minimal
Design Vehicle: WB-67
*Unsignalized Intersections Only
Roundabouts
Inscribed DIA - Mini: 70
Inscribed DIA - Single: 140
Inscribed DIA - Multi: 200
Circulating Lane Width: 16
Cost Multipliers
Grading Complete: 20%
Traffic Control: 20%
Reimbursable Utility: 2%
ROW Costs
Urban
Rural
ROW (ac): $350,000 $275,000
ROW multiplier: 1.6 1.4
Add LT Lanes on SR 22
Input number signal & lighting poles
Introduction
Instructions
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Stage1
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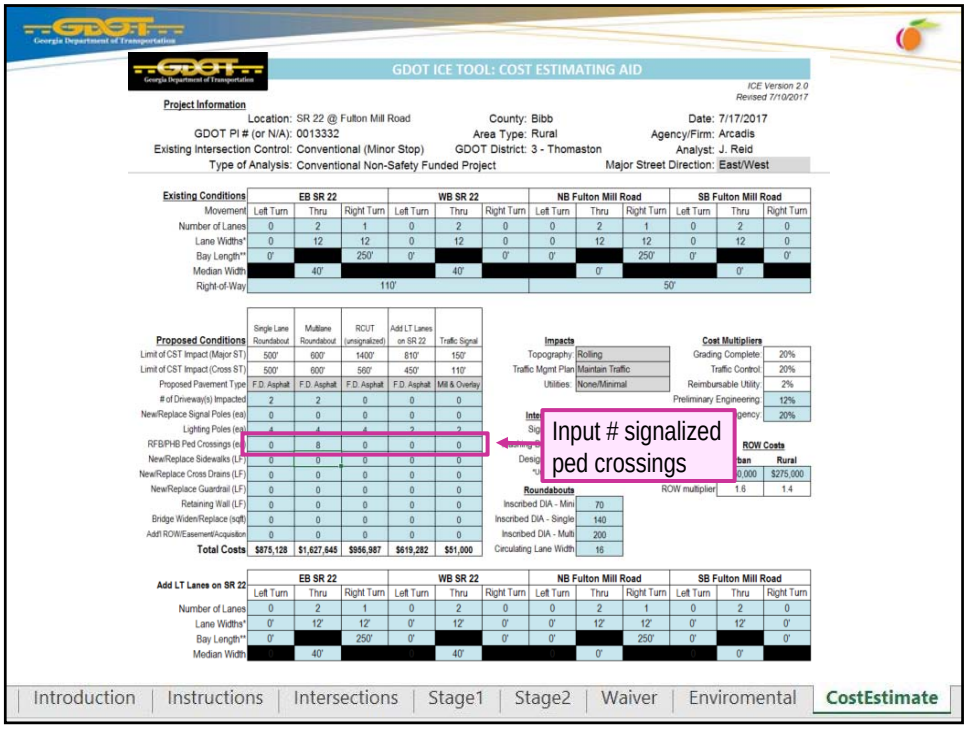
Enviromental
CostEstimate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WB SR 22
NB Fulton Mill Road
SB Fulton Mill Road
Movement
Number of Lanes
Lane Widths*
Bay Length**
Median Width
Right-of-Way
110'
50'
Proposed Conditions
Single Lane Roundabout
Multilane Roundabout
RCUT (unsignalized)
Add LT Lanes on SR 22
Traffic Signal
Limit of CST Impact (Major ST)
Limit of CST Impact (Cross ST)
Proposed Pavement Type
# of Driveway(s) Impacted
New/Replace Signal Poles (ea)
Lighting Poles (ea)
RFB/PHB Ped Crossings (ea)
New/Replace Sidewalks (LF)
New/Replace Cross Drains (LF)
New/Replace Guardrail (LF)
Retaining Wall (LF)
Bridge Widen/Replace (sqft)
Add'l ROW/Easement/Acquisition
Total Costs
$875,128
$1,627,645
$856,987
$619,282
$51,000
Impacts
Topography: Rolling
Traffic Mgmt Plan: Maintain Traffic
Utilities: None/Minimal
Cost Multipliers
Grading Complete: 20%
Traffic Control: 20%
Reimbursable Utility: 2%
Preliminary Engineering: 12%
Project Contingency: 20%
ROW Costs
Urban
Rural
$275,000
ROW multiplier: 1.6 1.4
Roundabouts
Inscribed DIA - Mini: 70
Inscribed DIA - Single: 140
Inscribed DIA - Multi: 200
Circulating Lane Width: 16
Input # signalized ped crossings
Add LT Lanes on SR 22
Introduction
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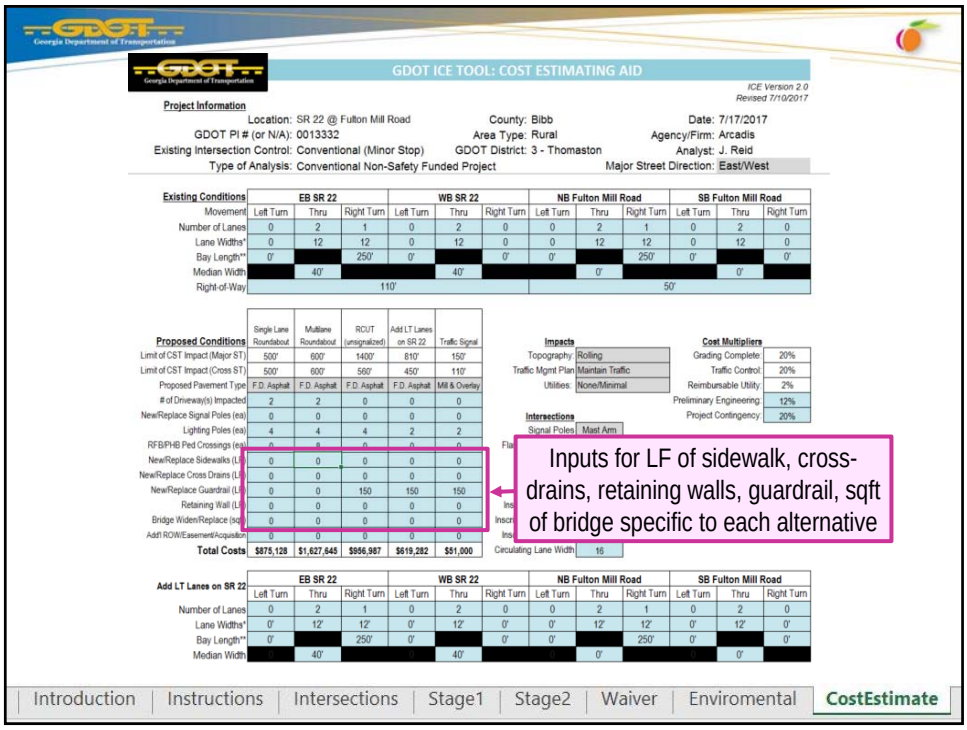
Waiver
Enviromental
CostEstimate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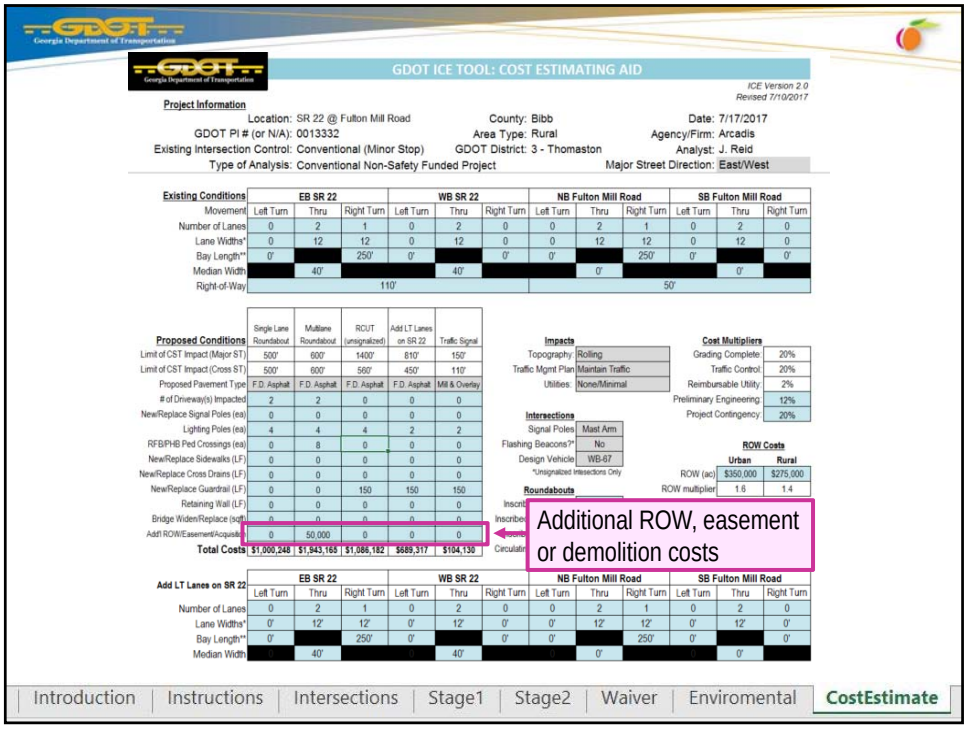
Major Street Direction: East/West
Existing Conditions
EB SR 22
WB SR 22
NB Fulton Mill Road
SB Fulton Mill Road
Movement
Number of Lanes
Lane Widths*
Bay Length**
Median Width
Right-of-Way
110'
50'
Proposed Conditions
Single Lane Roundabout
Multilane Roundabout
RCUT (unsignalized)
Add LT Lanes on SR 22
Traffic Signal
Limit of CST Impact (Major ST)
Limit of CST Impact (Cross ST)
Proposed Pavement Type
# of Driveway(s) Impacted
New/Replace Signal Poles (ea)
Lighting Poles (ea)
RFB/PHB Ped Crossings (ea)
New/Replace Sidewalks (LF)
New/Replace Cross Drains (LF)
New/Replace Guardrail (LF)
Retaining Wall (LF)
Bridge Widen/Replace (sqft)
Add'l ROW/Easement/Acquisition
Total Costs
$875,128
$1,627,645
$856,987
$619,282
$51,000
Impacts
Topography: Rolling
Traffic Mgmt Plan: Maintain Traffic
Utilities: None/Minimal
Cost Multipliers
Grading Complete: 20%
Traffic Control: 20%
Reimbursable Utility: 2%
Preliminary Engineering: 12%
Project Contingency: 20%
Intersections
Signal Poles: Mast Arm
Circulating Lane Width: 16
Inputs for LF of sidewalk, cross-drains, retaining walls, guardrail, sqft of bridge specific to each alternative
Add LT Lanes on SR 22
Introduction
Instructions
Intersections
Stage1
Stage2
Waiver
Enviromental
CostEstimate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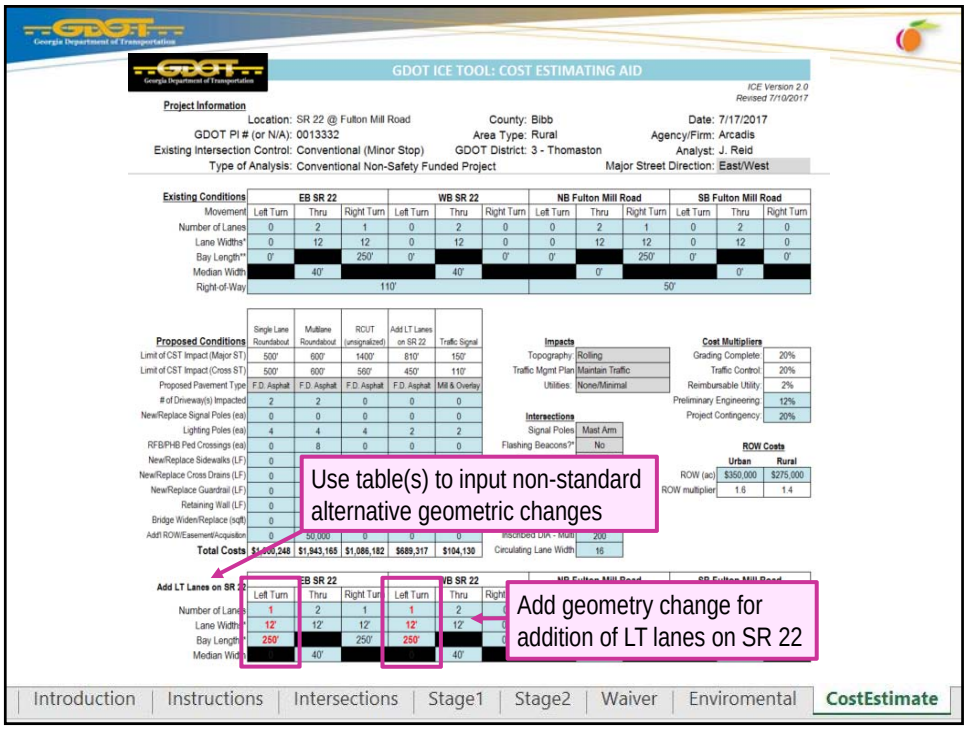
Existing Conditions
EB SR 22
WB SR 22
NB Fulton Mill Road
SB Fulton Mill Road
Movement
Left Turn
Thru
Right Turn
Number of Lanes
Lane Widths*
Bay Length**
Median Width
Right-of-Way
110'
50'
Proposed Conditions
Single Lane Roundabout
Multilane Roundabout
RCUT (unsignalized)
Add LT Lanes on SR 22
Traffic Signal
Limit of CST Impact (Major ST)
Limit of CST Impact (Cross ST)
Proposed Pavement Type
# of Driveway(s) Impacted
New/Replace Signal Poles (ea)
Lighting Poles (ea)
RFB/PHB Ped Crossings (ea)
New/Replace Sidewalks (LF)
New/Replace Cross Drains (LF)
New/Replace Guardrail (LF)
Retaining Wall (LF)
Bridge Widen/Replace (sqft)
Add'l ROW/Easement/Acquisition
Total Costs
$1,000,248
$1,943,165
$1,086,182
$689,317
$104,130
Impacts
Topography: Rolling
Traffic Mgmt Plan: Maintain Traffic
Utilities: None/Minimal
Intersections
Signal Poles: Mast Arm
Flashing Beacons?*: No
Design Vehicle: WB-67
*Unsignalized Intersections Only
Roundabouts
Cost Multipliers
Grading Complete: 20%
Traffic Control: 20%
Reimbursable Utility: 2%
Preliminary Engineering: 12%
Project Contingency: 20%
ROW Costs
Urban
Rural
ROW (ac): $350,000 $275,000
ROW multiplier: 1.6 1.4
Additional ROW, easement or demolition costs
Add LT Lanes on SR 22
Introduction
Instructions
Intersections
Stage1
Stage2
Waiver
Enviromental
CostEstimate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GDOT District: 3 - Thomaston
Analyst: J. Reid
Type of Analysis: Conventional Non-Safety Funded Project
Major Street Direction: East/West
Existing Conditions
EB SR 22
WB SR 22
NB Fulton Mill Road
SB Fulton Mill Road
Movement
Left Turn
Thru
Right Turn
Number of Lanes
Lane Widths*
Bay Length**
Median Width
Right-of-Way
110'
50'
Proposed Conditions
Single Lane Roundabout
Multilane Roundabout
RCUT (unsignalized)
Add LT Lanes on SR 22
Traffic Signal
Limit of CST Impact (Major ST)
Limit of CST Impact (Cross ST)
Proposed Pavement Type
# of Driveway(s) Impacted
New/Replace Signal Poles (ea)
Lighting Poles (ea)
RFB/PHB Ped Crossings (ea)
New/Replace Sidewalks (LF)
New/Replace Cross Drains (LF)
New/Replace Guardrail (LF)
Retaining Wall (LF)
Bridge Widen/Replace (sqft)
Add'l ROW/Easement/Acquisition
Total Costs
$1,000,248
$1,943,165
$1,086,182
$689,317
$104,130
Impacts
Topography: Rolling
Traffic Mgmt Plan: Maintain Traffic
Utilities: None/Minimal
Intersections
Signal Poles: Mast Arm
Flashing Beacons?*: No
Inscribed Dia - Multi: 200
Circulating Lane Width: 16
Cost Multipliers
Grading Complete: 20%
Traffic Control: 20%
Reimbursable Utility: 2%
Preliminary Engineering: 12%
Project Contingency: 20%
ROW Costs
Urban
Rural
ROW (ac): $350,000 $275,000
ROW multiplier: 1.6 1.4
Use table(s) to input non-standard alternative geometric changes
Add LT Lanes on SR 22
Left Turn
Thru
Right Turn
Number of Lanes: 1 2 1 1 2
Lane Widths*: 12' 12' 12' 12' 12'
Bay Length**: 250' 250' 250'
Median Width
Add geometry change for addition of LT lanes on SR 22
Introduction
Instructions
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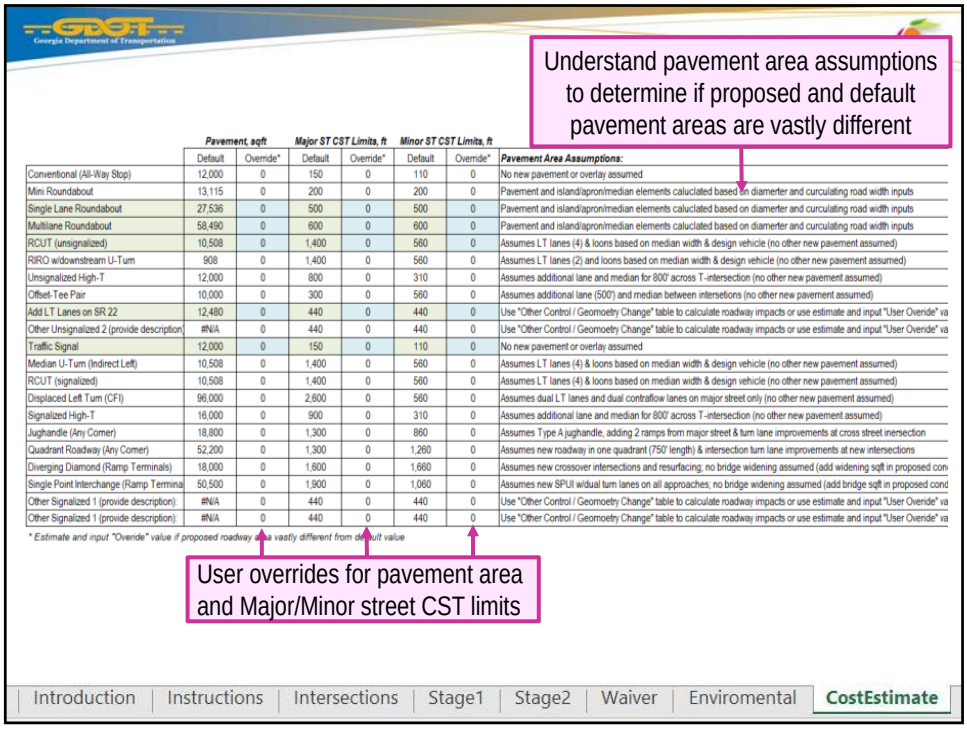
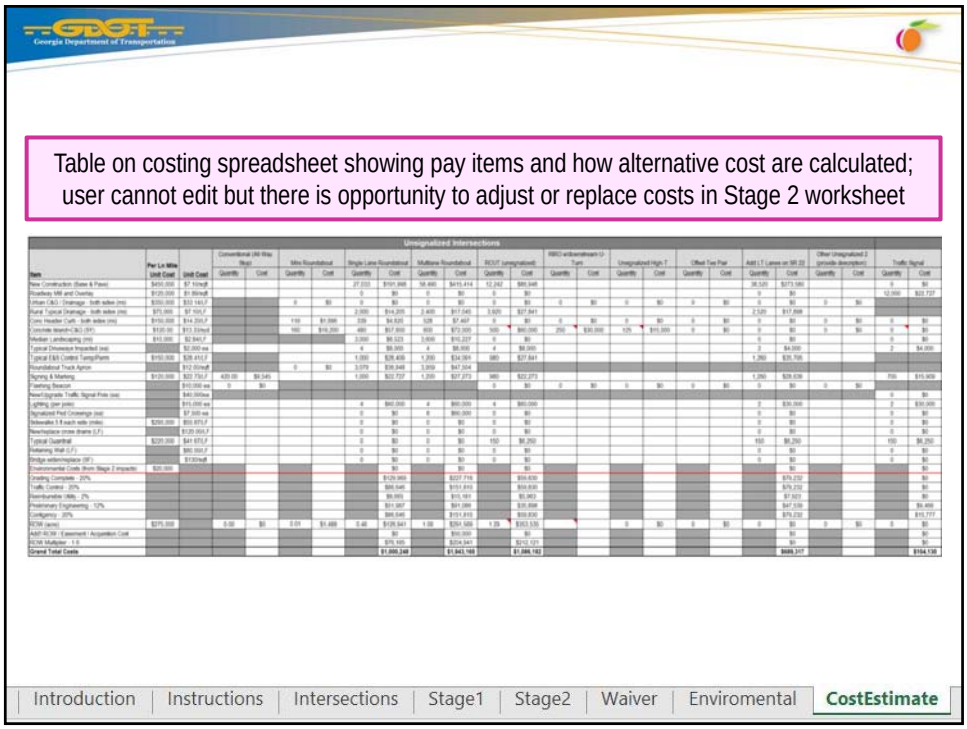
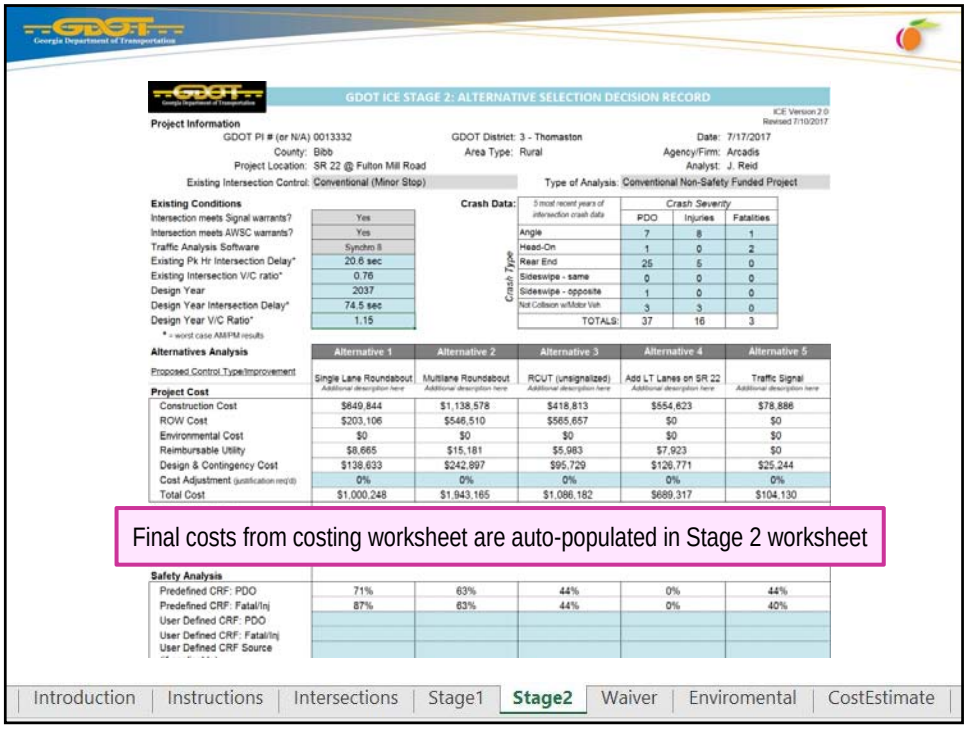
Waiver
Enviromental
CostEstimate



	Pavement, sqft		Major ST CST Limits, ft		Minor ST CST Limits, ft		
	Default	Override*	Default	Override*	Default	Override*	Pavement Area Assumptions:
Conventional (All-Way Stop)	12,000	0	150	0	110	0	No new pavement or overlay assumed
Mini Roundabout	13,115	0	200	0	200	0	Pavement and island/apron/median elements calculated based on diamerter and curculating road width inputs
Single Lane Roundabout	27,536	0	500	0	500	0	Pavement and island/apron/median elements calculated based on diamerter and curculating road width inputs
Multilane Roundabout	58,490	0	600	0	600	0	Pavement and island/apron/median elements calculated based on diamerter and curculating road width inputs
RCUT (unsignalized)	10,508	0	1,400	0	560	0	Assumes LT lanes (4) & loons based on median width & design vehicle (no other new pavement assumed)
RIRO w/downstream U-Turn	908	0	1,400	0	560	0	Assumes LT lanes (2) and loons based on median width & design vehicle (no other new pavement assumed)
Unsignalized High-T	12,000	0	800	0	310	0	Assumes additional lane and median for 800' across T-intersection (no other new pavement assumed)
Offset-Tee Pair	10,000	0	300	0	560	0	Assumes additional lane (500') and median between intersetions (no other new pavement assumed)
Add LT Lanes on SR 22	12,480	0	440	0	440	0	Use "Other Control / Geomoetry Change" table to calculate roadway impacts or use estimate and input "User Overide" va
Other Unsignalized 2 (provide description	#N/A	0	440	0	440	0	Use "Other Control / Geomoetry Change" table to calculate roadway impacts or use estimate and input "User Overide" va
Traffic Signal	12,000	0	150	0	110	0	No new pavement or overlay assumed
Median U-Turn (Indirect Left)	10,508	0	1,400	0	560	0	Assumes LT lanes (4) & loons based on median width & design vehicle (no other new pavement assumed)
RCUT (signalized)	10,508	0	1,400	0	560	0	Assumes LT lanes (4) & loons based on median width & design vehicle (no other new pavement assumed)
Displaced Left Turn (CFI)	96,000	0	2,600	0	560	0	Assumes dual LT lanes and dual contraflow lanes on major street only (no other new pavement assumed)
Signalized High-T	16,000	0	900	0	310	0	Assumes additional lane and median for 800' across T-intersection (no other new pavement assumed)
Jughandle (Any Corner)	18,800	0	1,300	0	860	0	Assumes Type A jughandle, adding 2 ramps from major street & turn lane improvements at cross street inersection
Quadrant Roadway (Any Corner)	52,200	0	1,300	0	1,260	0	Assumes new roadway in one quadrant (750' length) & intersection turn lane improvements at new intersections
Diverging Diamond (Ramp Terminals)	18,000	0	1,600	0	1,660	0	Assumes new crossover intersections and resurfacing; no bridge widening assumed (add widening sqft in proposed con
Single Point Interchange (Ramp Termina	50,500	0	1,900	0	1,060	0	Assumes new SPUI w/dual turn lanes on all approaches; no bridge widening assumed (add bridge sqft in proposed cond
Other Signalized 1 (provide description):	#N/A	0	440	0	440	0	Use "Other Control / Geomoetry Change" table to calculate roadway impacts or use estimate and input "User Overide" va
Other Signalized 1 (provide description):	#N/A	0	440	0	440	0	Use "Other Control / Geomoetry Change" table to calculate roadway impacts or use estimate and input "User Overide" va

* Estimate and input "Overide" value if proposed roadway area vastly different from default value





GDOT ICE STAGE 2: ALTERNATIVE SELECTION DECISION RECORD

ICE Version 2.0
Revised 7/10/2017

Project Information

GDOT PI # (or N/A): 0013332 | GDOT District: 3 - Thomaston | Date: 7/17/2017
County: Bibb | Area Type: Rural | Agency/Firm: Arcadis
Project Location: SR 22 @ Fulton Mill Road | Analyst: J. Reid
Existing Intersection Control: Conventional (Minor Stop) | Type of Analysis: Conventional Non-Safety Funded Project

Existing Conditions

Intersection meets Signal warrants?	Yes
Intersection meets AWSC warrants?	Yes
Traffic Analysis Software	Synchro 8
Existing Pk Hr Intersection Delay*	20.6 sec
Existing Intersection V/C ratio*	0.76
Design Year	2037
Design Year Intersection Delay*	74.5 sec
Design Year V/C Ratio*	1.15

* = worst case AM/PM results

Crash Data: 5 most recent years of intersection crash data

Crash Type	Crash Severity: PDO	Injuries	Fatalities
Angle	7	8	1
Head-On	1	0	2
Rear End	25	5	0
Sideswipe - same	0	0	0
Sideswipe - opposite	1	0	0
Not Collision w/Motor Veh	3	3	0
TOTALS:	37	16	3

Alternatives Analysis

Proposed Control Type/Improvement

Project Cost	Alternative 1: Single Lane Roundabout	Alternative 2: Multilane Roundabout	Alternative 3: RCUT (unsignalized)	Alternative 4: Add LT Lanes on SR 22	Alternative 5: Traffic Signal
Construction Cost	$849,844	$1,138,578	$418,813	$554,623	$78,886
ROW Cost	$203,106	$546,510	$565,657	$0	$0
Environmental Cost	$0	$0	$0	$0	$0
Reimbursable Utility	$8,665	$15,181	$5,983	$7,923	$0
Design & Contingency Cost	$138,633	$242,897	$95,729	$126,771	$25,244
Cost Adjustment (justification req'd)	0%	0%	0%	0%	0%
Total Cost	$1,000,248	$1,943,165	$1,086,182	$689,317	$104,130

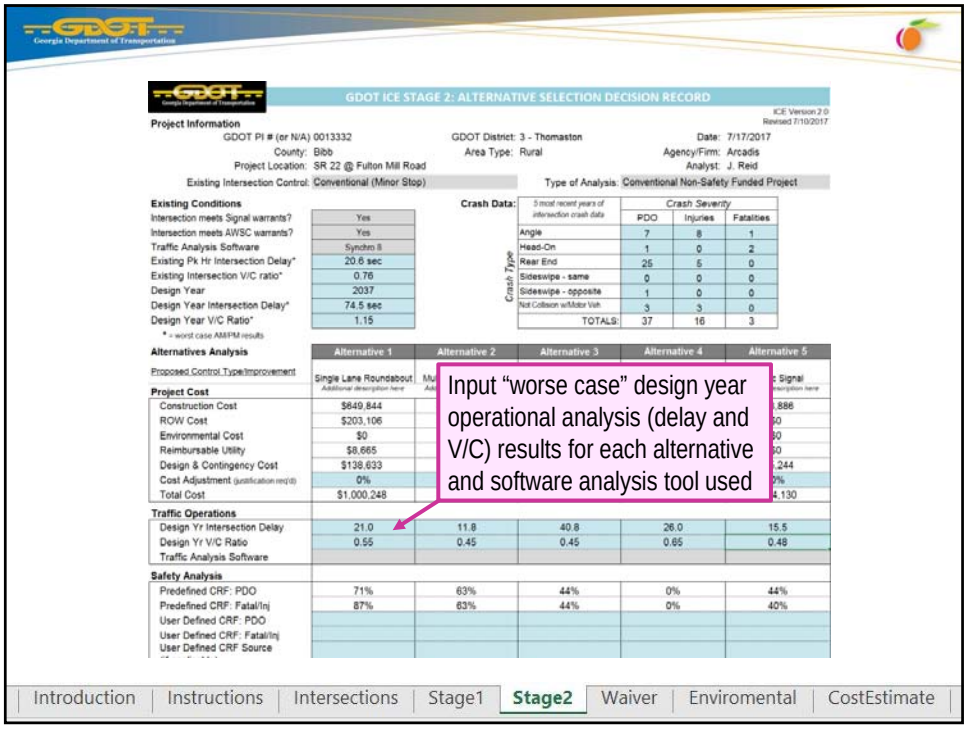
Final costs from costing worksheet are auto-populated in Stage 2 worksheet

Safety Analysis					
Predefined CRF: PDO	71%	63%	44%	0%	44%
Predefined CRF: Fatal/Inj	87%	63%	44%	0%	40%
User Defined CRF: PDO					
User Defined CRF: Fatal/Inj					
User Defined CRF Source					

Introduction | Instructions | Intersections | Stage1 | **Stage2** | Waiver | Enviromental | CostEstimate

Intersection Control Evaluation

STAGE 2: OPERATIONS & SAFETY


GDOT ICE STAGE 2: ALTERNATIVE SELECTION DECISION RECORD
Input "worse case" design year operational analysis (delay and V/C) results for each alternative and software analysis tool used
Introduction
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Intersections
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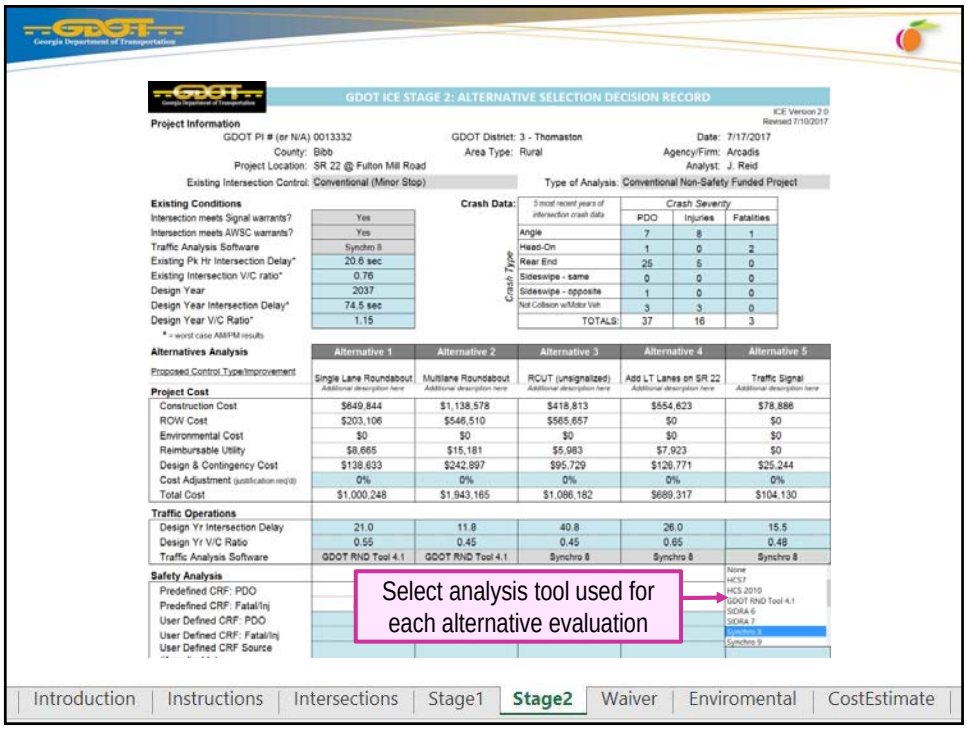
Stage2
Waiver
Enviromental
CostEstimate


GDOT ICE STAGE 2: ALTERNATIVE SELECTION DECISION RECORD
Select analysis tool used for each alternative evaluation
Introduction
Instructions
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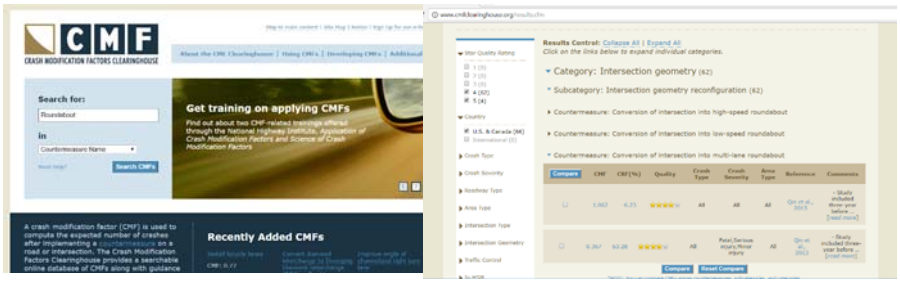
Stage1
Stage2
Waiver
Enviromental
CostEstimate

Safety Determination Using CMFs

- Safety benefit by change of intersection control determined using FHWAs CMF Clearinghouse (www.cmfclearinghouse.org)
  - CMFs (Crash Modification Factor) used to compute the expected number of crashes after implementing a given improvement
  - CRFs (Crash Reduction Factors) estimates % reduction in crashes
- Many CMFs predefined based on existing/proposed control; others users may have to find or develop (and document)



GDOT ICE STAGE 2: ALTERNATIVE SELECTION DECISION RECORD

ICE Version 2.0
Revised 7/10/2017

Project Information

GDOT PI # (or N/A) 0013332 | GDOT District: 3 - Thomaston | Date: 7/17/2017
County: Bibb | Area Type: Rural | Agency/Firm: Arcadis
Project Location: SR 22 @ Fulton Mill Road | Analyst: J. Reid
Existing Intersection Control: Conventional (Minor Stop) | Type of Analysis: Conventional Non-Safety Funded Project

Existing Conditions

Intersection meets Signal warrants?	Yes
Intersection meets AWSC warrants?	Yes
Traffic Analysis Software	Synchro 8
Existing Pk Hr Intersection Delay*	20.6 sec
Existing Intersection V/C ratio*	0.76
Design Year	2037
Design Year Intersection Delay*	74.5 sec
Design Year V/C Ratio*	1.15

* = worst case AM/PM results

Crash Data: 5 most recent years of intersection crash data

Crash Type	Crash Severity: PDO	Injuries	Fatalities
Angle	7	8	1
Head-On	1	0	2
Rear End	25	5	0
Sideswipe - same	0	0	0
Sideswipe - opposite	1	0	0
Not Collision w/Motor Veh	3	3	0
TOTALS:	37	16	3

Alternatives Analysis

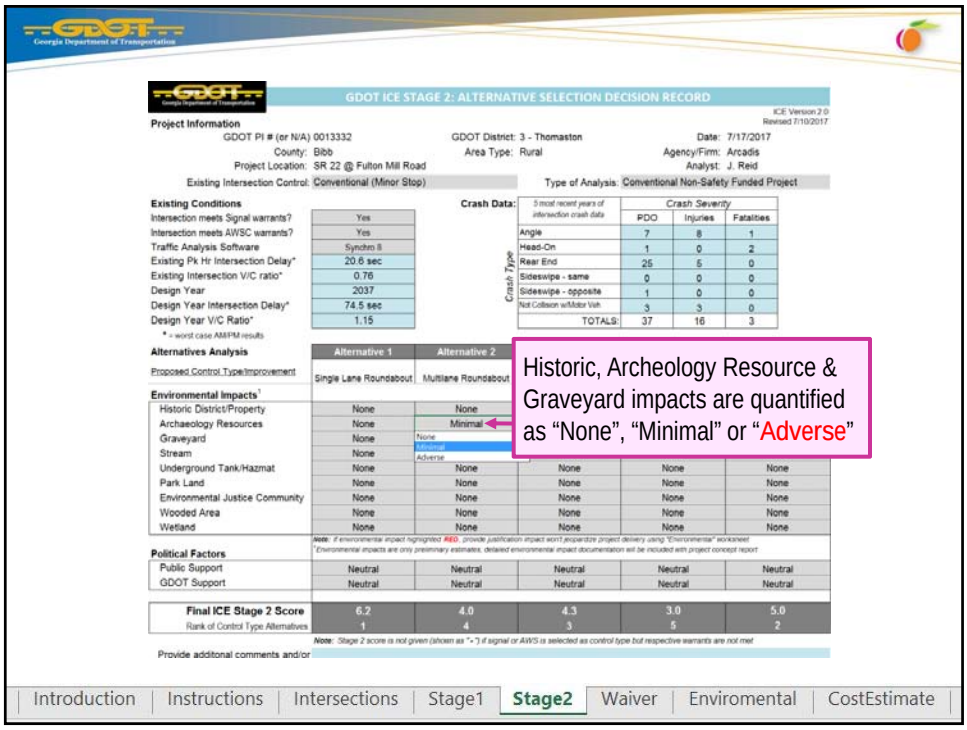
Proposed Control Type/Improvement	Alternative 1: Single Lane Roundabout	Alternative 2: Multilane Roundabout	Alternative 3: RCUT (unsignalized)	Alternative 4: Add LT Lanes on SR 22	Alternative 5: Traffic Signal
Construction Cost	$649,844	$1,138,578	$418,813	$554,623	$78,886
ROW Cost	$203,106	$546,510	$565,657	$0	$0
Environmental Cost					
Reimbursable Utility					
Design & Contingency Cost					
Cost Adjustment (justification					
Total Cost					
Traffic Operations					
Design Yr Intersection Dela					
Design Yr V/C Ratio					
Traffic Analysis Software	GDOT RND Tool 4.1	GDOT RND Tool 4.1	Synchro 8	Synchro 8	Synchro 8
Safety Analysis					
Predefined CRF: PDO	71%	63%	44%	0%	44%
Predefined CRF: Fatal/Inj	87%	63%	44%	0%	40%
User Defined CRF: PDO				25%	
User Defined CRF: Fatal/Inj				30%	
User Defined CRF Source (if applicable):				CMF Clearinghouse #s 4703 / 4704	

Known CMF values auto-populate; if shown as zero (no safety benefit, user can best define using FHWA clearing-house or other known studies (include justification)

Introduction | Instructions | Intersections | Stage1 | **Stage2** | Waiver | Enviromental | CostEstimate

Intersection Control Evaluation

ICE 2.0 TOOL – ENVIRONMENTAL / POLITICAL DATA



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Sideswipe - opposite	1	0	0
Not Collision w/Motor Veh	3	3	0
TOTALS:	37	16	3

Alternatives Analysis

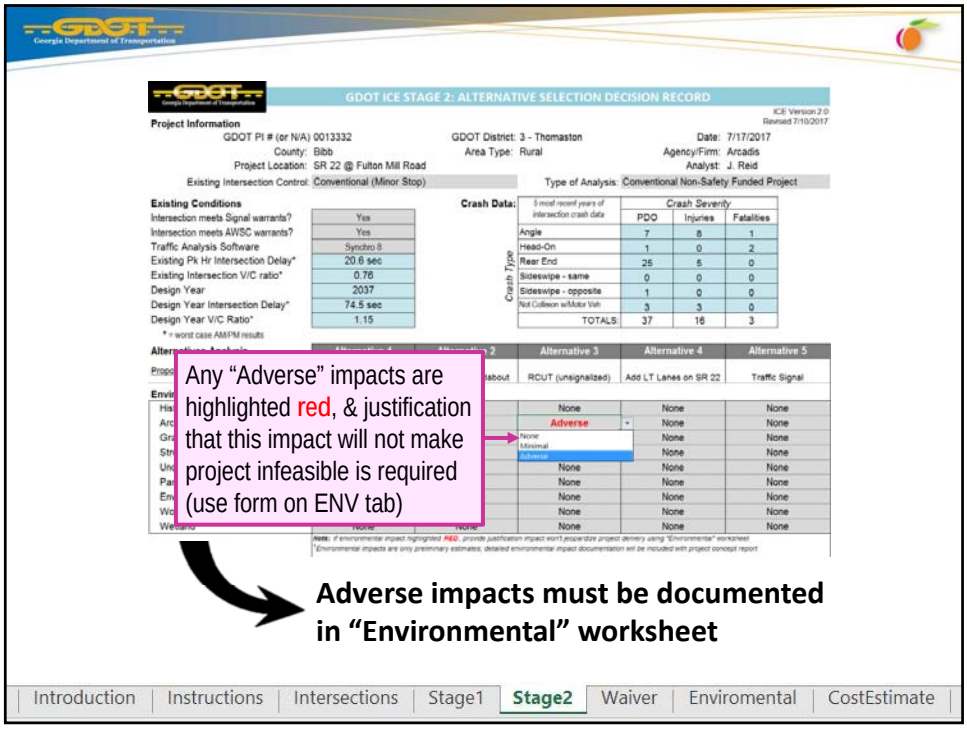
	Alternative 1	Alternative 2			
Proposed Control Type/Improvement	Single Lane Roundabout	Multilane Roundabout			
Environmental Impacts[1]					
Historic District/Property	None	None			
Archaeology Resources	None	Minimal			
Graveyard	None	None / Minimal / Adverse			
Stream	None				
Underground Tank/Hazmat	None	None	None	None	None
Park Land	None	None	None	None	None
Environmental Justice Community	None	None	None	None	None
Wooded Area	None	None	None	None	None
Wetland	None	None	None	None	None
Political Factors					
Public Support	Neutral	Neutral	Neutral	Neutral	Neutral
GDOT Support	Neutral	Neutral	Neutral	Neutral	Neutral
Final ICE Stage 2 Score	6.2	4.0	4.3	3.0	5.0
Rank of Control Type Alternatives	1	4	3	5	2

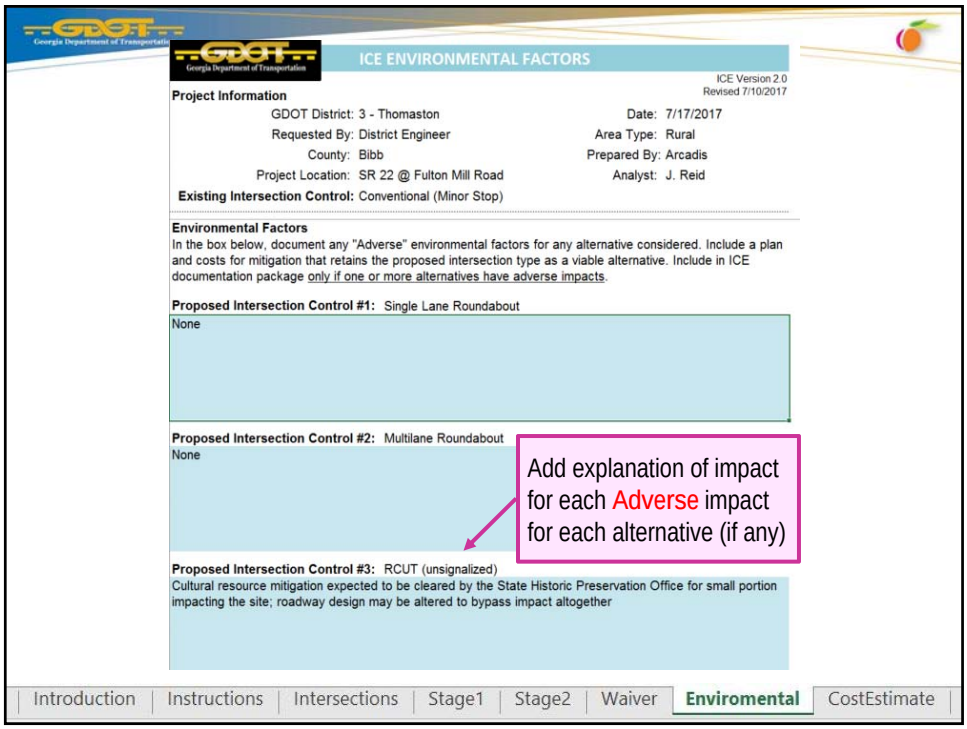
Note: Stage 2 score is not given (shown as "-") if signal or AWSC is selected as control type but respective warrants are not met

Provide additonal comments and/or

Introduction | Instructions | Intersections | Stage1 | **Stage2** | Waiver | Enviromental | CostEstimate

Historic, Archeology Resource & Graveyard impacts are quantified as "None", "Minimal" or "Adverse"


GDOT ICE STAGE 2: ALTERNATIVE SELECTION DECISION RECORD
Any "Adverse" impacts are highlighted red, & justification that this impact will not make project infeasible is required (use form on ENV tab)
Adverse impacts must be documented in "Environmental" worksheet
Introduction
Instructions
Intersections
Stage1
Stage2
Waiver
Enviromental
CostEstimate


ICE ENVIRONMENTAL FACTORS
Add explanation of impact for each Adverse impact for each alternative (if any)
Introduction
Instructions
Intersections
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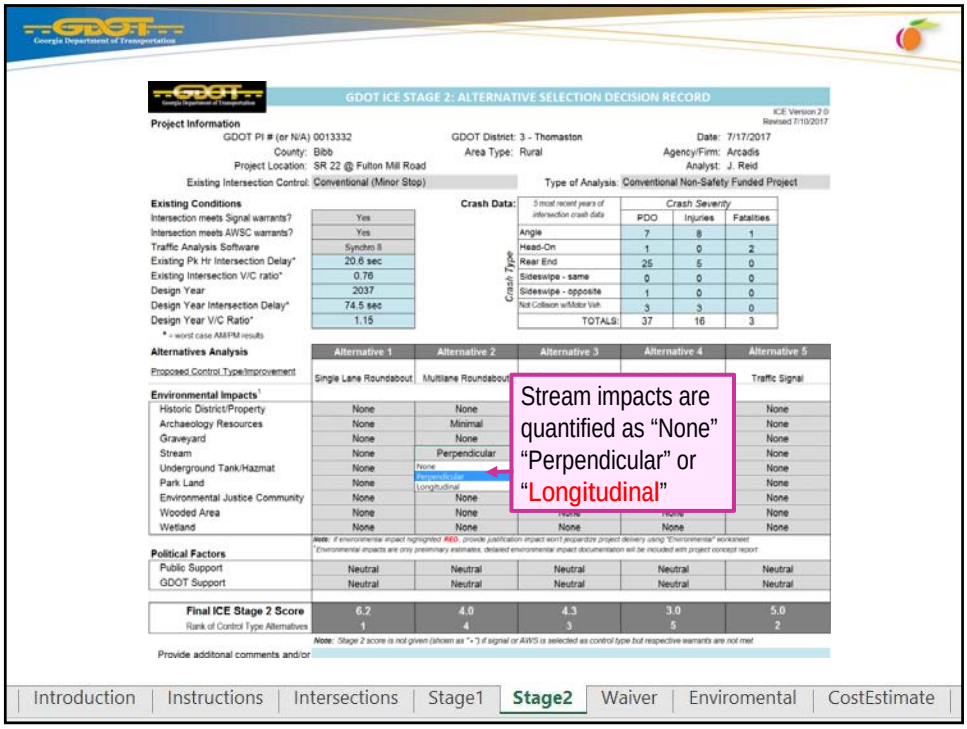
Enviromental
CostEstimate



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Sideswipe - opposite	1	0	0
Not Collision w/Motor Veh	3	3	0
TOTALS:	37	16	3

Alternatives Analysis

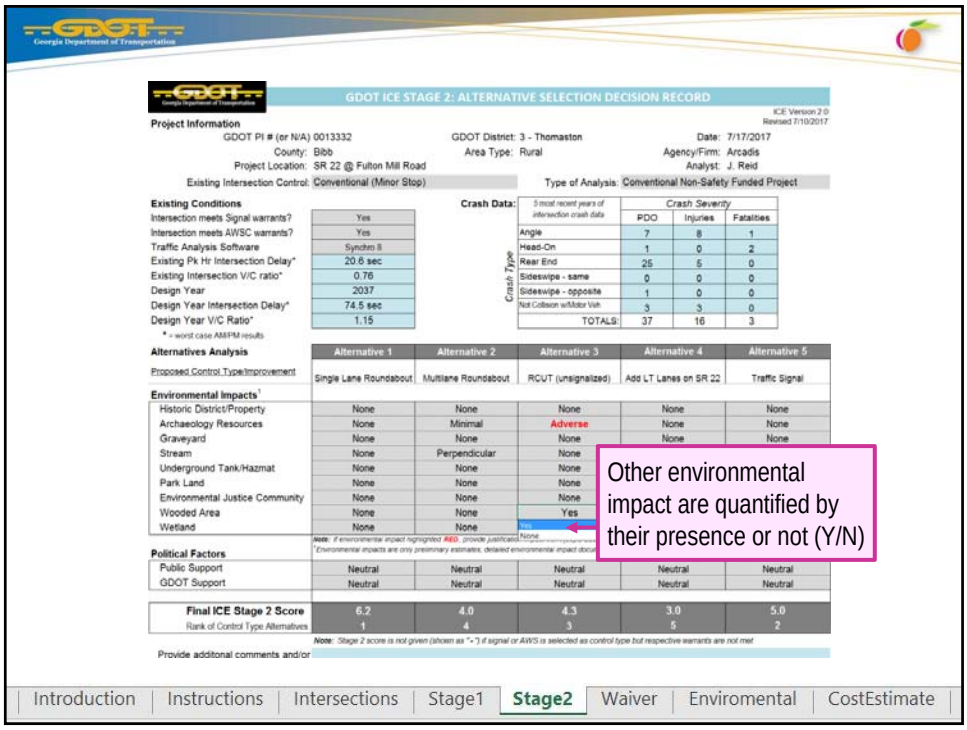
	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Proposed Control Type/Improvement	Single Lane Roundabout	Multilane Roundabout			Traffic Signal
Environmental Impacts[1]					
Historic District/Property	None	None			None
Archaeology Resources	None	Minimal			None
Graveyard	None	None			None
Stream	None	Perpendicular			None
Underground Tank/Hazmat	None	None / Perpendicular / Longitudinal			None
Park Land	None	None			None
Environmental Justice Community	None	None			None
Wooded Area	None	None			None
Wetland	None	None	None	None	None
Political Factors					
Public Support	Neutral	Neutral	Neutral	Neutral	Neutral
GDOT Support	Neutral	Neutral	Neutral	Neutral	Neutral
Final ICE Stage 2 Score	6.2	4.0	4.3	3.0	5.0
Rank of Control Type Alternatives	1	4	3	5	2

Note: Stage 2 score is not given (shown as "-") if signal or AWSC is selected as control type but respective warrants are not met

Provide additonal comments and/or

Introduction | Instructions | Intersections | Stage1 | **Stage2** | Waiver | Enviromental | CostEstimate

Stream impacts are quantified as "None" "Perpendicular" or "Longitudinal"



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Alternatives Analysis

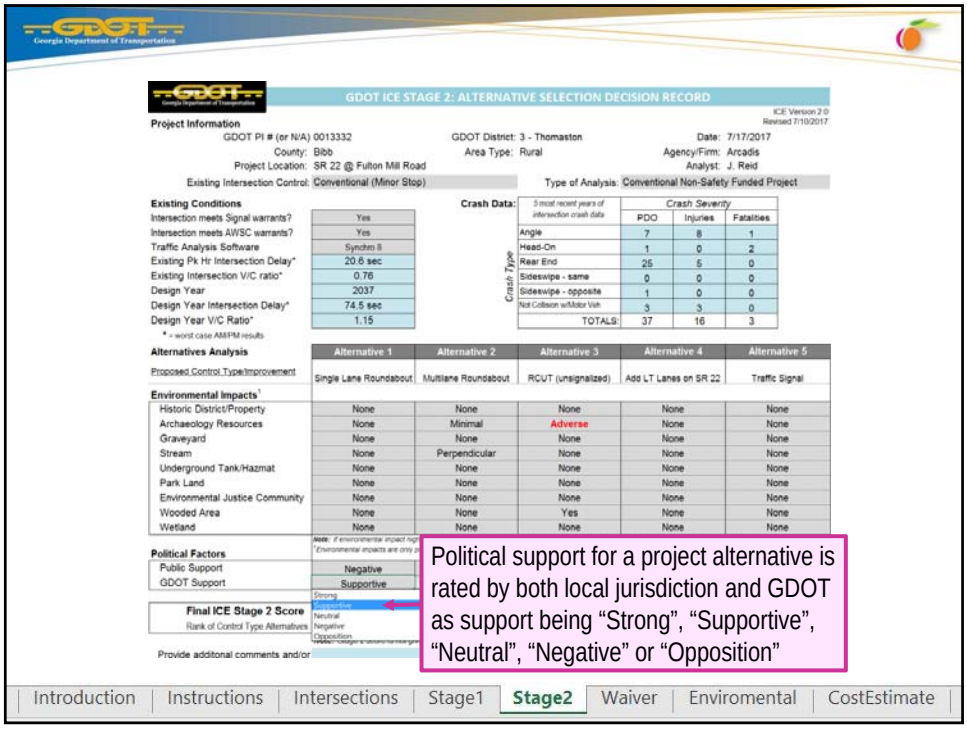
	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Proposed Control Type/Improvement	Single Lane Roundabout	Multilane Roundabout	RCUT (unsignalized)	Add LT Lanes on SR 22	Traffic Signal
Environmental Impacts[1]					
Historic District/Property	None	None	None	None	None
Archaeology Resources	None	Minimal	Adverse	None	None
Graveyard	None	None	None	None	None
Stream	None	Perpendicular	None		
Underground Tank/Hazmat	None	None	None		
Park Land	None	None	None		
Environmental Justice Community	None	None	None		
Wooded Area	None	None	Yes		
Wetland	None	None	Yes / None		
Political Factors					
Public Support	Neutral	Neutral	Neutral	Neutral	Neutral
GDOT Support	Neutral	Neutral	Neutral	Neutral	Neutral
Final ICE Stage 2 Score	6.2	4.0	4.3	3.0	5.0
Rank of Control Type Alternatives	1	4	3	5	2

Note: Stage 2 score is not given (shown as "-") if signal or AWSC is selected as control type but respective warrants are not met

Provide additonal comments and/or

Introduction | Instructions | Intersections | Stage1 | **Stage2** | Waiver | Enviromental | CostEstimate

Other environmental impact are quantified by their presence or not (Y/N)



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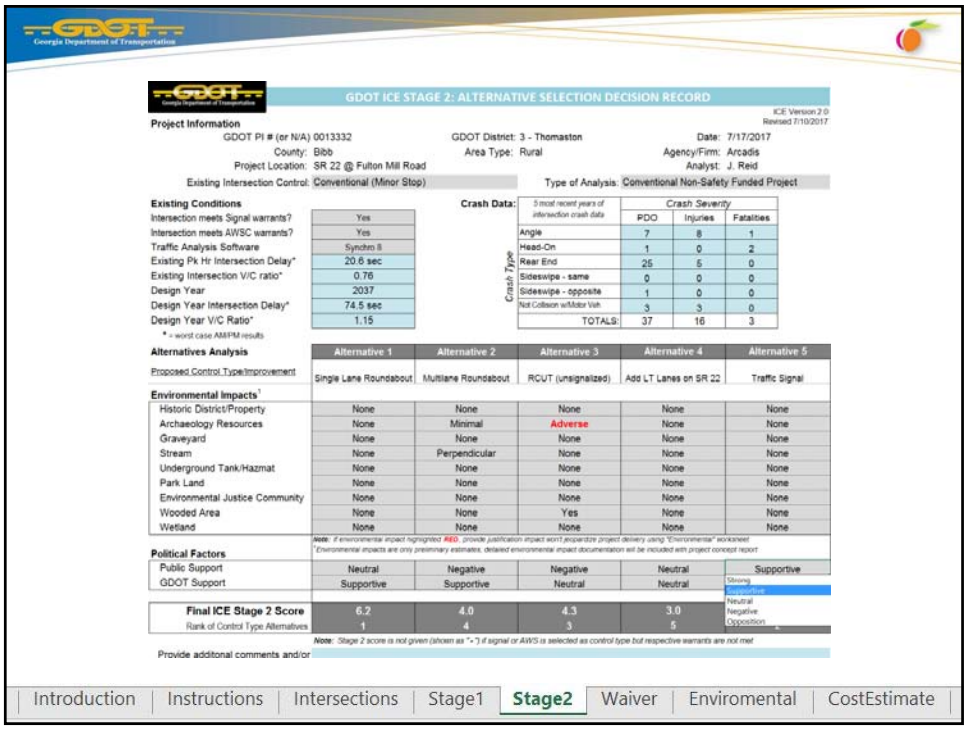
Environmental Impacts[1]					
Historic District/Property	None	None	None	None	None
Archaeology Resources	None	Minimal	Adverse	None	None
Graveyard	None	None	None	None	None
Stream	None	Perpendicular	None	None	None
Underground Tank/Hazmat	None	None	None	None	None
Park Land	None	None	None	None	None
Environmental Justice Community	None	None	None	None	None
Wooded Area	None	None	Yes	None	None
Wetland	None	None	None	None	None
Political Factors					
Public Support	Negative				
GDOT Support	Supportive				
Final ICE Stage 2 Score					
Rank of Control Type Alternatives					

Strong / Supportive / Neutral / Negative / Opposition

Provide additonal comments and/or

Political support for a project alternative is rated by both local jurisdiction and GDOT as support being "Strong", "Supportive", "Neutral", "Negative" or "Opposition"

Introduction | Instructions | Intersections | Stage1 | **Stage2** | Waiver | Enviromental | CostEstimate



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Historic District/Property	None	None	None	None	None
Archaeology Resources	None	Minimal	Adverse	None	None
Graveyard	None	None	None	None	None
Stream	None	Perpendicular	None	None	None
Underground Tank/Hazmat	None	None	None	None	None
Park Land	None	None	None	None	None
Environmental Justice Community	None	None	None	None	None
Wooded Area	None	None	Yes	None	None
Wetland	None	None	None	None	None
Political Factors					
Public Support	Neutral	Negative	Negative	Neutral	Supportive
GDOT Support	Supportive	Supportive	Neutral	Neutral	
Final ICE Stage 2 Score	6.2	4.0	4.3	3.0	
Rank of Control Type Alternatives	1	4	3	5	

Strong / Supportive / Neutral / Negative / Opposition

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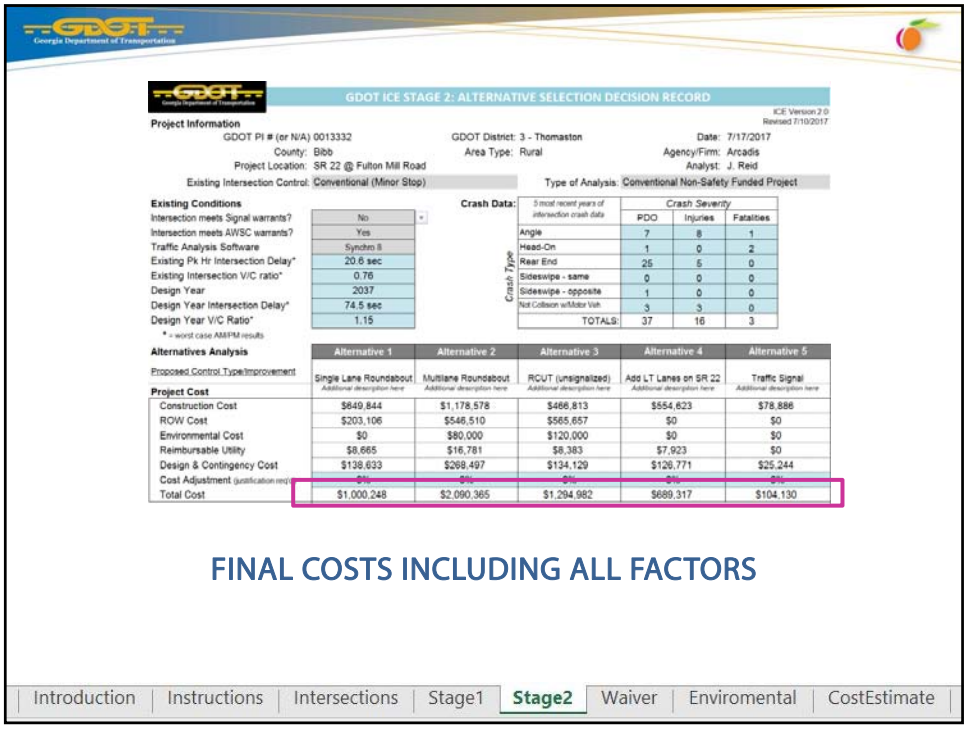

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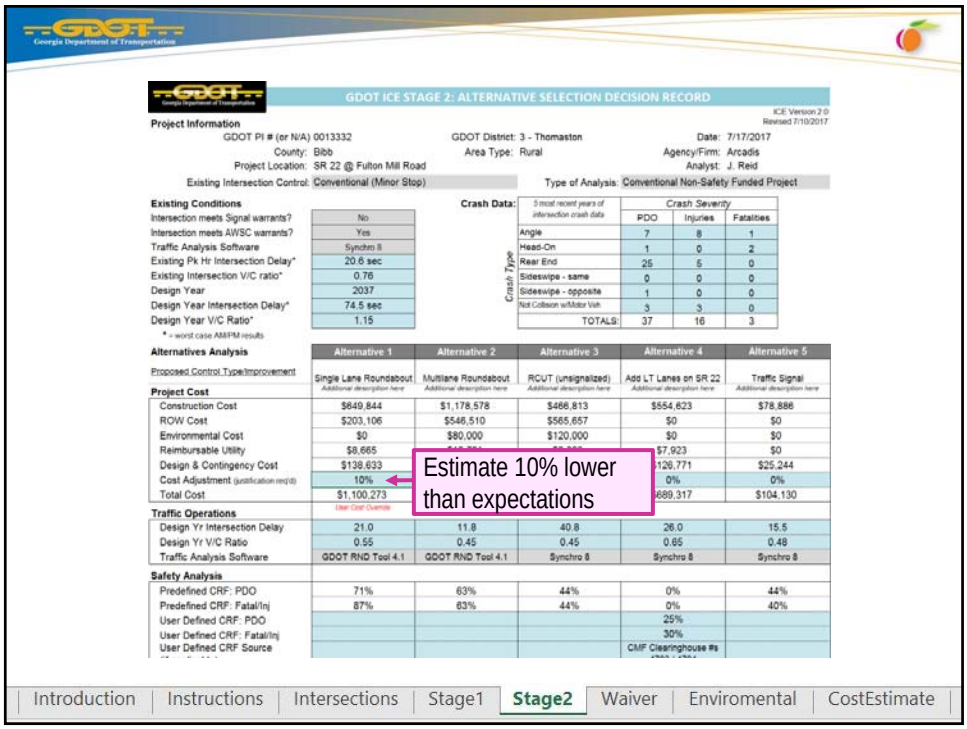
Project Cost					
Construction Cost	$849,844	$1,178,578	$486,813	$554,623	$78,886
ROW Cost	$203,106	$546,510	$565,657	$0	$0
Environmental Cost	$0	$80,000	$120,000	$0	$0
Reimbursable Utility	$8,665	$16,781	$8,383	$7,923	$0
Design & Contingency Cost	$138,633	$268,497	$134,129	$126,771	$25,244
Cost Adjustment (justification req'd)	0%	0%	0%	0%	0%
Total Cost	$1,000,248	$2,090,365	$1,294,982	$689,317	$104,130

FINAL COSTS INCLUDING ALL FACTORS

Introduction | Instructions | Intersections | Stage1 | **Stage2** | Waiver | Enviromental | CostEstimate



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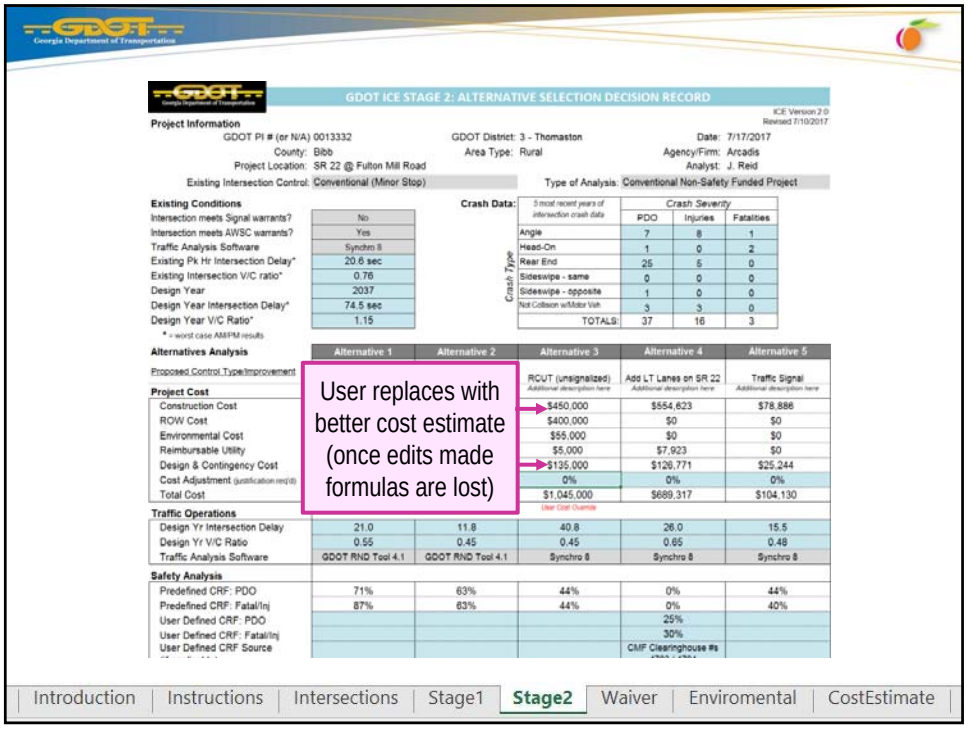
ROW Cost	$203,106	$546,510	$565,657	$0	$0
Environmental Cost	$0	$80,000	$120,000	$0	$0
Reimbursable Utility	$8,665			$7,923	$0
Design & Contingency Cost	$138,633			126,771	$25,244
Cost Adjustment (justification req'd)	10%			0%	0%
Total Cost	$1,100,273			689,317	$104,130
Traffic Operations	User Cost Override				
Design Yr Intersection Delay	21.0	11.8	40.8	26.0	15.5
Design Yr V/C Ratio	0.55	0.45	0.45	0.65	0.48
Traffic Analysis Software	GDOT RND Tool 4.1	GDOT RND Tool 4.1	Synchro 8	Synchro 8	Synchro 8
Safety Analysis					
Predefined CRF: PDO	71%	63%	44%	0%	44%
Predefined CRF: Fatal/Inj	87%	63%	44%	0%	40%
User Defined CRF: PDO				25%	
User Defined CRF: Fatal/Inj				30%	
User Defined CRF Source				CMF Clearinghouse #s	

Estimate 10% lower than expectations

Introduction | Instructions | Intersections | Stage1 | **Stage2** | Waiver | Enviromental | CostEstimate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5 most recent years of intersection crash data
Crash Severity
PDO
Injuries
Fatalities
Crash Type
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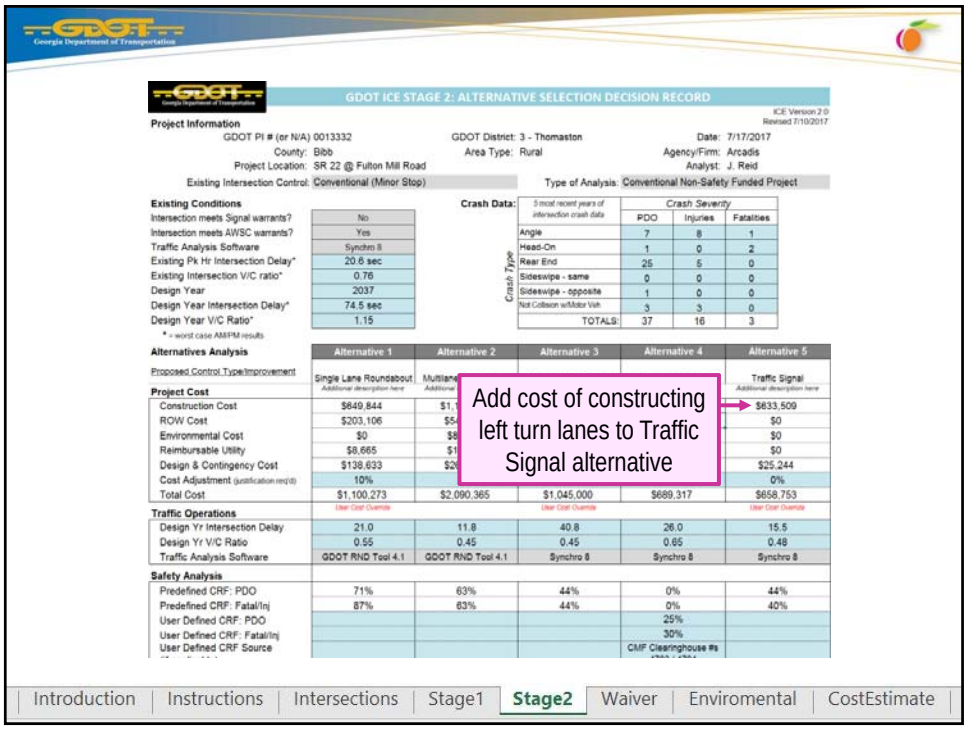
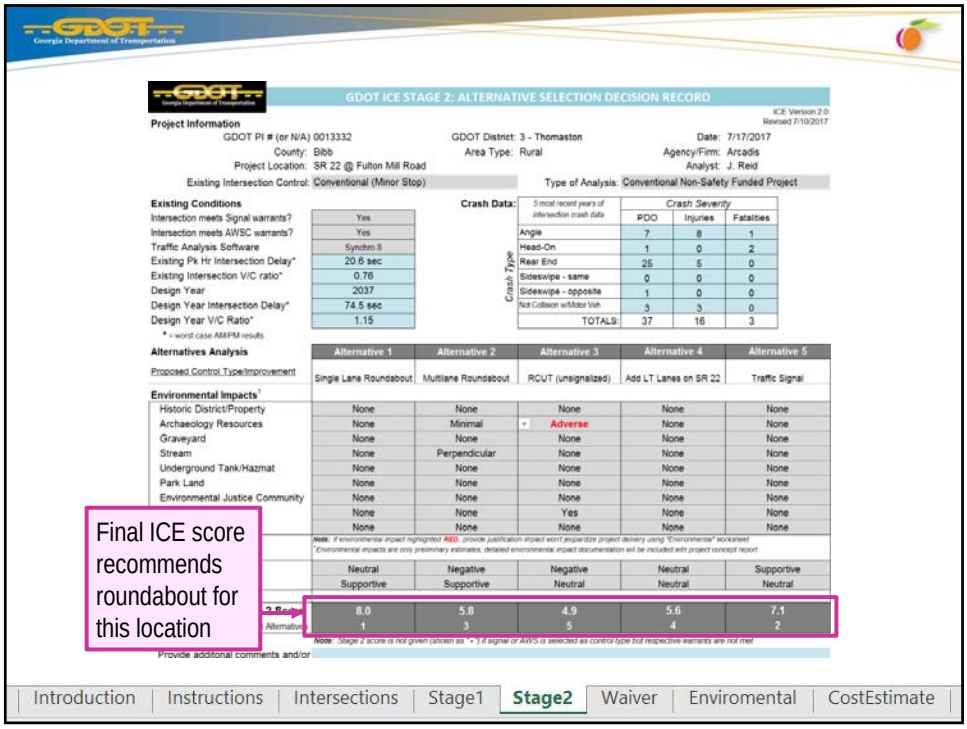
Head-On 1 0 2
Rear End 25 5 0
Sideswipe - same 0 0 0
Sideswipe - opposite 1 0 0
Not Collision w/Motor Veh 3 3 0
TOTALS: 37 16 3
Alternatives Analysis
Alternative 1
Alternative 2
Alternative 3
Alternative 4
Alternative 5
Proposed Control Type/Improvement
RCUT (unsignalized)
Add LT Lanes on SR 22
Traffic Signal
Project Cost
Construction Cost $450,000 $554,623 $78,886
ROW Cost $400,000 $0 $0
Environmental Cost $55,000 $0 $0
Reimbursable Utility $5,000 $7,923 $0
Design & Contingency Cost $135,000 $126,771 $25,244
Cost Adjustment 0% 0% 0%
Total Cost $1,045,000 $689,317 $104,130
User Cost Override
Traffic Operations
Design Yr Intersection Delay 21.0 11.8 40.8 26.0 15.5
Design Yr V/C Ratio 0.55 0.45 0.45 0.65 0.48
Traffic Analysis Software GDOT RND Tool 4.1 GDOT RND Tool 4.1 Synchro 8 Synchro 8 Synchro 8
Safety Analysis
Predefined CRF: PDO 71% 63% 44% 0% 44%
Predefined CRF: Fatal/Inj 87% 63% 44% 0% 40%
User Defined CRF: PDO 25%
User Defined CRF: Fatal/Inj 30%
User Defined CRF Source CMF Clearinghouse #s
User replaces with better cost estimate (once edits made formulas are lost)
Introduction
Instructions
Intersections
Stage1
Stage2
Waiver
Enviromental
CostEstimate


GDOT ICE STAGE 2: ALTERNATIVE SELECTION DECISION RECORD
ICE Version 2.0
Revised 7/10/2017
Project Information
GDOT PI # (or N/A) 0013332
County: Bibb
Project Location: SR 22 @ Fulton Mill Road
GDOT District: 3 - Thomaston
Area Type: Rural
Date: 7/17/2017
Agency/Firm: Arcadis
Analyst: J. Reid
Existing Intersection Control: Conventional (Minor Stop)
Type of Analysis: Conventional Non-Safety Funded Project
Existing Conditions
Intersection meets Signal warrants? No
Intersection meets AWSC warrants? Yes
Traffic Analysis Software Synchro 8
Existing Pk Hr Intersection Delay* 20.6 sec
Existing Intersection V/C ratio* 0.76
Design Year 2037
Design Year Intersection Delay* 74.5 sec
Design Year V/C Ratio* 1.15
* = worst case AM/PM results
Crash Data:
5 most recent years of intersection crash data
Crash Severity
PDO
Injuries
Fatalities
Crash Type
Angle 7 8 1
Head-On 1 0 2
Rear End 25 5 0
Sideswipe - same 0 0 0
Sideswipe - opposite 1 0 0
Not Collision w/Motor Veh 3 3 0
TOTALS: 37 16 3
Alternatives Analysis
Alternative 1
Alternative 2
Alternative 3
Alternative 4
Alternative 5
Proposed Control Type/Improvement
Single Lane Roundabout
Traffic Signal
Project Cost
Construction Cost $849,844 $833,509
ROW Cost $203,106 $0
Environmental Cost $0 $0
Reimbursable Utility $8,665 $0
Design & Contingency Cost $138,633 $25,244
Cost Adjustment 10% 0%
Total Cost $1,100,273 $2,090,365 $1,045,000 $689,317 $658,753
User Cost Override
Traffic Operations
Design Yr Intersection Delay 21.0 11.8 40.8 26.0 15.5
Design Yr V/C Ratio 0.55 0.45 0.45 0.65 0.48
Traffic Analysis Software GDOT RND Tool 4.1 GDOT RND Tool 4.1 Synchro 8 Synchro 8 Synchro 8
Safety Analysis
Predefined CRF: PDO 71% 63% 44% 0% 44%
Predefined CRF: Fatal/Inj 87% 63% 44% 0% 40%
User Defined CRF: PDO 25%
User Defined CRF: Fatal/Inj 30%
User Defined CRF Source CMF Clearinghouse #s
Add cost of constructing left turn lanes to Traffic Signal alternative
Introduction
Instructions
Intersections
Stage1
Stage2
Waiver
Enviromental
CostEstimate


GDOT ICE STAGE 2: ALTERNATIVE SELECTION DECISION RECORD
Project Information
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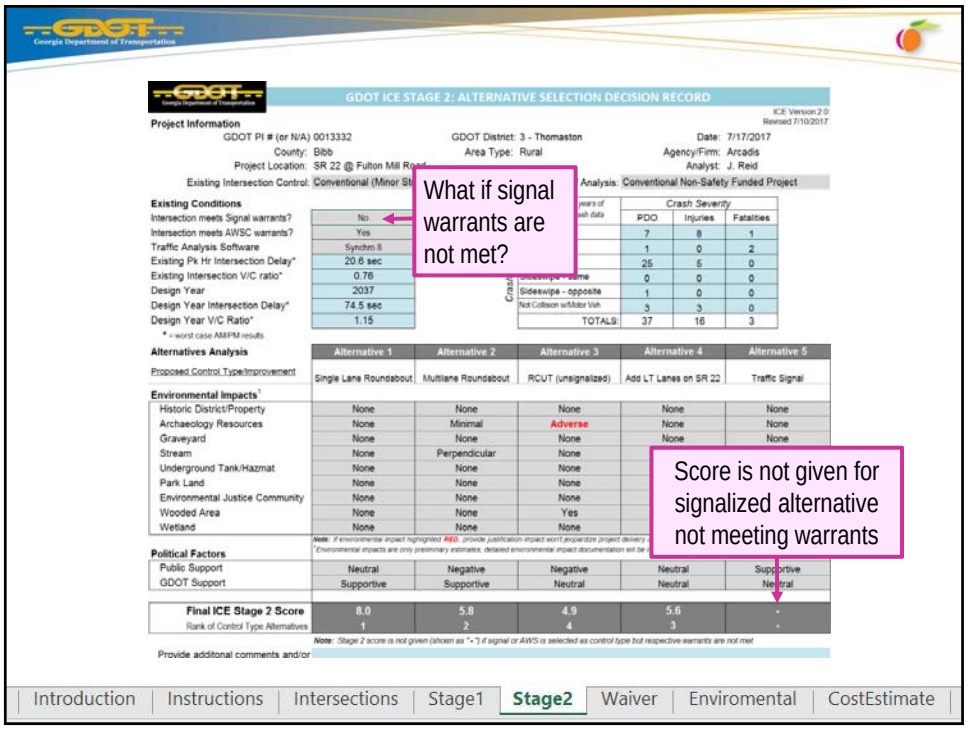
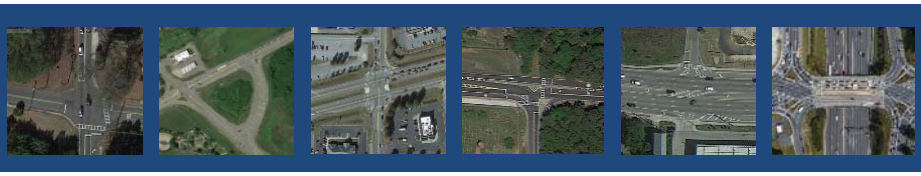
Type of Analysis: Conventional Non-Safety Funded Project
Existing Conditions
Intersection meets Signal warrants? Yes
Intersection meets AWSC warrants? Yes
Traffic Analysis Software Synchro 8
Existing Pk Hr Intersection Delay* 20.6 sec
Existing Intersection V/C ratio* 0.76
Design Year 2037
Design Year Intersection Delay* 74.5 sec
Design Year V/C Ratio* 1.15
Crash Data:
Crash Severity
PDO Injuries Fatalities
Angle 7 8 1
Head-On 1 0 2
Rear End 25 5 0
Sideswipe - same 0 0 0
Sideswipe - opposite 1 0 0
Not Collision w/Motor Veh 3 3 0
TOTALS: 37 16 3
Alternatives Analysis
Alternative 1 Alternative 2 Alternative 3 Alternative 4 Alternative 5
Proposed Control Type/Improvement
Single Lane Roundabout Multilane Roundabout RCUT (unsignalized) Add LT Lanes on SR 22 Traffic Signal
Environmental Impacts
Historic District/Property None None None None None
Archaeology Resources None Minimal Adverse None None
Graveyard None None None None None
Stream None Perpendicular None None None
Underground Tank/Hazmat None None None None None
Park Land None None None None None
Environmental Justice Community None None None None None
None None Yes None None
None None None None None
Neutral Negative Negative Neutral Supportive
Supportive Supportive Neutral Neutral Neutral
8.0 5.8 4.9 5.6 7.1
1 3 5 4 2
Provide additonal comments and/or
Final ICE score recommends roundabout for this location
Introduction Instructions Intersections Stage1 Stage2 Waiver Enviromental CostEstimate


GDOT ICE STAGE 2: ALTERNATIVE SELECTION DECISION RECORD
Project Information
GDOT PI # (or N/A) 0013332
County: Bibb
GDOT District: 3 - Thomaston
Area Type: Rural
Date: 7/17/2017
Agency/Firm: Arcadis
Analyst: J. Reid
Existing Intersection Control: Conventional (Minor St
Analysis: Conventional Non-Safety Funded Project
Existing Conditions
Intersection meets Signal warrants? No
Intersection meets AWSC warrants? Yes
Traffic Analysis Software Synchro 8
Existing Pk Hr Intersection Delay* 20.6 sec
Existing Intersection V/C ratio* 0.76
Design Year 2037
Design Year Intersection Delay* 74.5 sec
Design Year V/C Ratio* 1.15
Crash Severity
PDO Injuries Fatalities
7 8 1
1 0 2
25 5 0
0 0 0
1 0 0
3 3 0
TOTALS: 37 16 3
Alternatives Analysis
Alternative 1 Alternative 2 Alternative 3 Alternative 4 Alternative 5
Proposed Control Type/Improvement
Single Lane Roundabout Multilane Roundabout RCUT (unsignalized) Add LT Lanes on SR 22 Traffic Signal
Environmental Impacts
Historic District/Property None None None None None
Archaeology Resources None Minimal Adverse None None
Graveyard None None None None None
Stream None Perpendicular None
Underground Tank/Hazmat None None None
Park Land None None None
Environmental Justice Community None None None
Wooded Area None None Yes
Wetland None None None
Political Factors
Public Support Neutral Negative Negative Neutral Supportive
GDOT Support Supportive Supportive Neutral Neutral Neutral
Final ICE Stage 2 Score 8.0 5.8 4.9 5.6 -
Rank of Control Type Alternatives 1 2 4 3 -
Provide additonal comments and/or
What if signal warrants are not met?
Score is not given for signalized alternative not meeting warrants
Introduction Instructions Intersections Stage1 Stage2 Waiver Enviromental CostEstimate



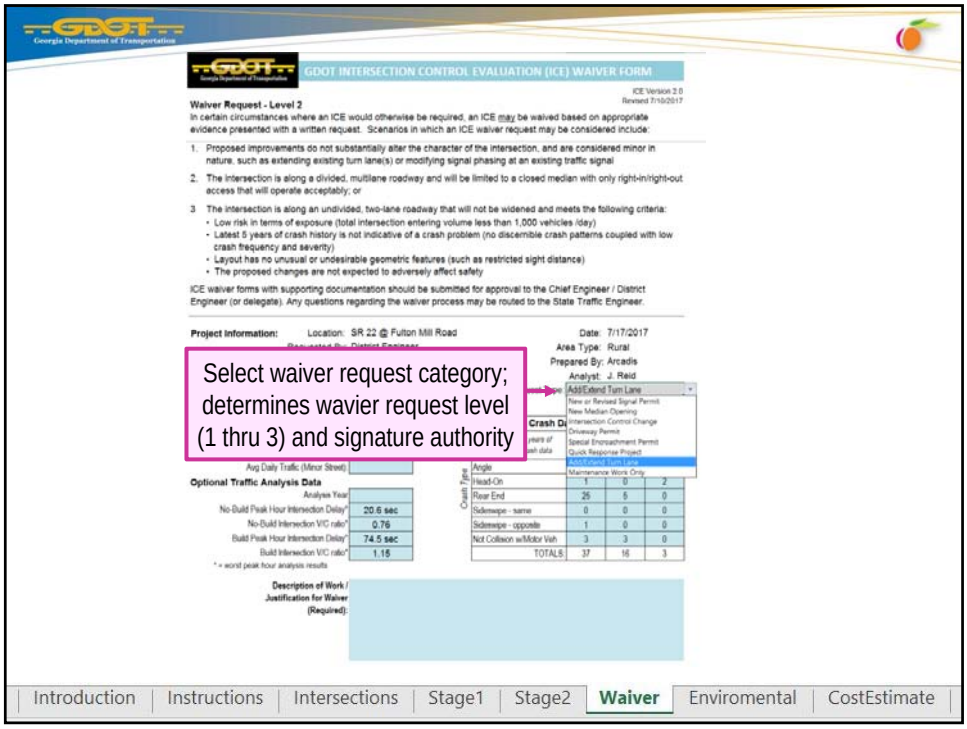
Intersection Control Evaluation

ICE 2.0 TOOL – ICE WAIVER FORM

Waiver Eligible

In certain circumstances the ICE requirement ***may*** be waived based on appropriate evidence presented with written request

- Proposed improvements don't substantially alter intersection character
- Considered minor in nature
- Intersection is along a divided, multilane roadway and will be limited to a closed median with right-in/right-out access only
- Intersection is along an undivided, two-lane roadway that will not be widened and:
  - Low risk in terms of exposure (less than 1,000 vehicles entering per day).
  - Latest 5 years of crash history is not indicative of a crash problem
  - No undesirable geometric features
  - Proposed changes will not adversely affect safety


GDOT INTERSECTION CONTROL EVALUATION (ICE) WAIVER FORM
Waiver Request - Level 2
Project Information:
Location: SR 22 @ Fulton Mill Road
Date: 7/17/2017
Area Type: Rural
Prepared By: Arcadis
Analyst: J. Reid
Select waiver request category; determines wavier request level (1 thru 3) and signature authority
Add/Extend Turn Lane
Optional Traffic Analysis Data
No-Build Peak Hour Intersection Delay* 20.6 sec
No-Build Intersection V/C ratio* 0.76
Build Peak Hour Intersection Delay* 74.5 sec
Build Intersection V/C ratio* 1.15
Description of Work / Justification for Waiver (Required):
Introduction
Instructions
Intersections
Stage1
Stage2
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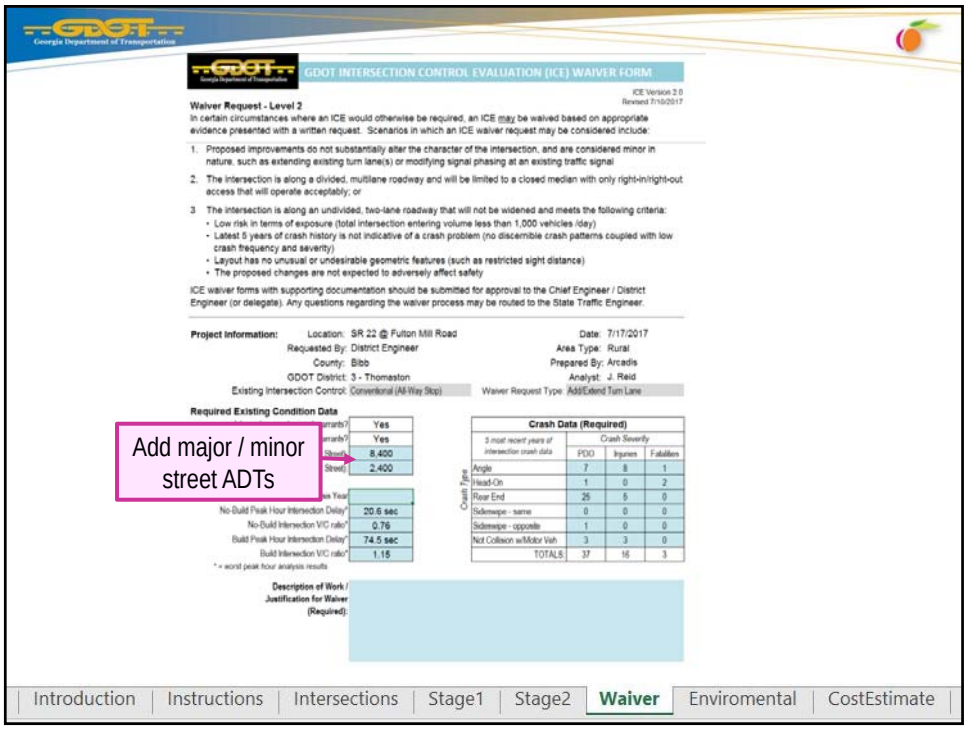
Enviromental
CostEstimate


GDOT INTERSECTION CONTROL EVALUATION (ICE) WAIVER FORM
Waiver Request - Level 2
Project Information:
Location: SR 22 @ Fulton Mill Road
Requested By: District Engineer
County: Bibb
GDOT District: 3 - Thomaston
Existing Intersection Control: Conventional (All-Way Stop)
Date: 7/17/2017
Area Type: Rural
Prepared By: Arcadis
Analyst: J. Reid
Waiver Request Type: Add/Extend Turn Lane
Required Existing Condition Data
Add major / minor street ADTs
Yes
Yes
8,400
2,400
No-Build Peak Hour Intersection Delay* 20.6 sec
No-Build Intersection V/C ratio* 0.76
Build Peak Hour Intersection Delay* 74.5 sec
Build Intersection V/C ratio* 1.15
Crash Data (Required)
Description of Work / Justification for Waiver (Required):
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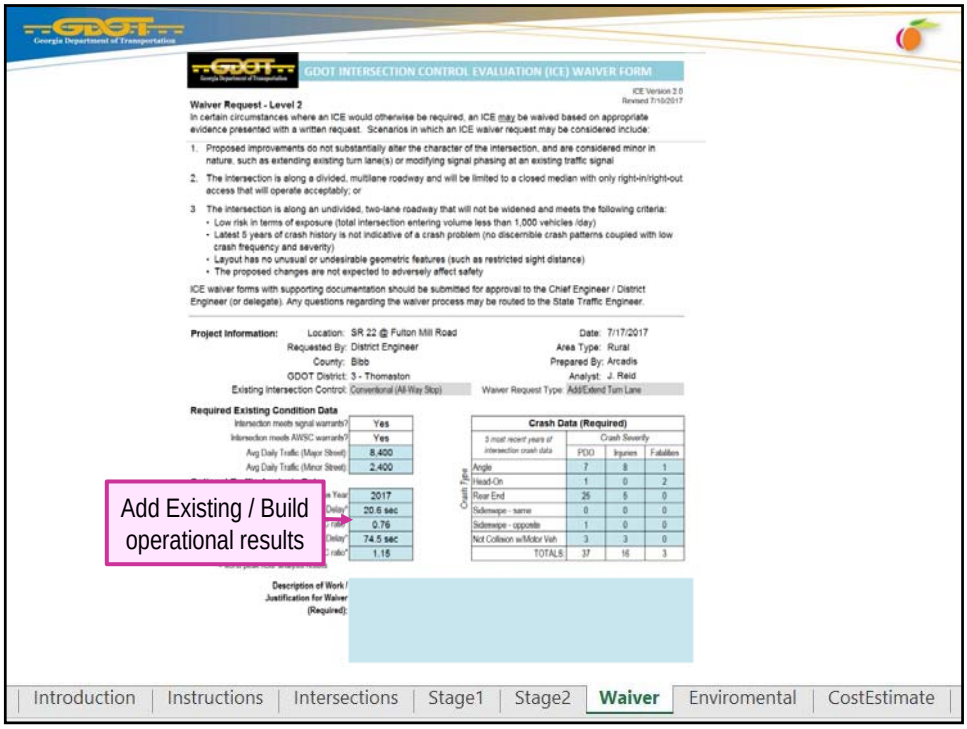
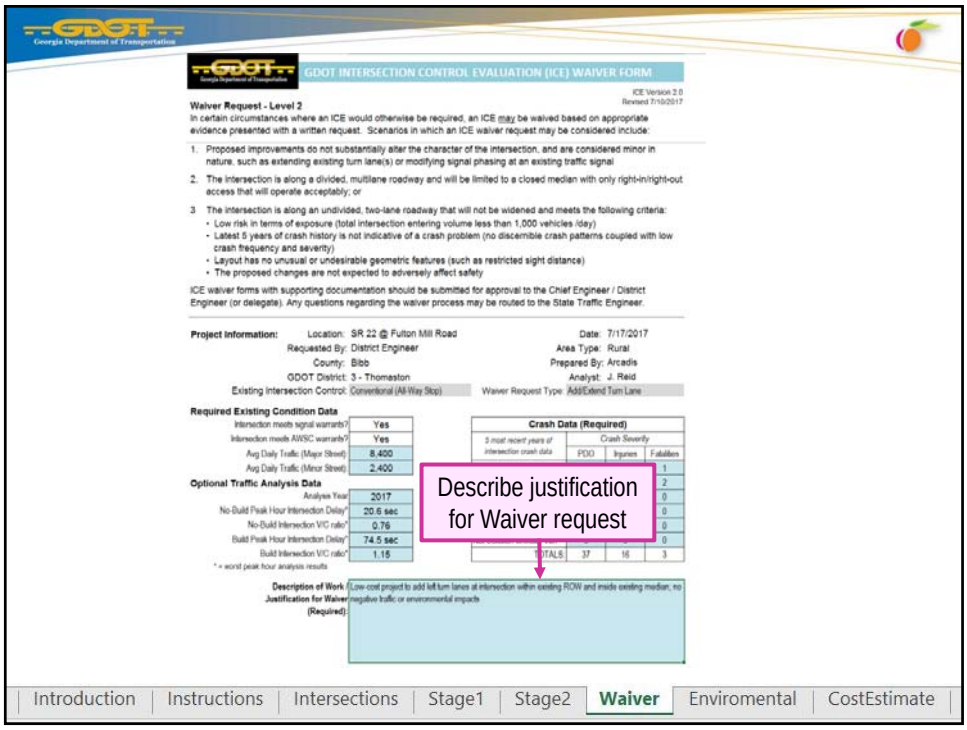
Enviromental
CostEstimate


GDOT INTERSECTION CONTROL EVALUATION (ICE) WAIVER FORM
Waiver Request - Level 2
Project Information:
Location: SR 22 @ Fulton Mill Road
Requested By: District Engineer
County: Bibb
GDOT District: 3 - Thomaston
Existing Intersection Control: Conventional (All-Way Stop)
Date: 7/17/2017
Area Type: Rural
Prepared By: Arcadis
Analyst: J. Reid
Waiver Request Type: Add/Extend Turn Lane
Required Existing Condition Data
Optional Traffic Analysis Data
Crash Data (Required)
Add Existing / Build operational results
Description of Work / Justification for Waiver (Required):
Introduction
Instructions
Intersections
Stage1
Stage2
Waiver
Enviromental
CostEstimate


GDOT INTERSECTION CONTROL EVALUATION (ICE) WAIVER FORM
Waiver Request - Level 2
Project Information:
Location: SR 22 @ Fulton Mill Road
Requested By: District Engineer
County: Bibb
GDOT District: 3 - Thomaston
Existing Intersection Control: Conventional (All-Way Stop)
Date: 7/17/2017
Area Type: Rural
Prepared By: Arcadis
Analyst: J. Reid
Waiver Request Type: Add/Extend Turn Lane
Required Existing Condition Data
Optional Traffic Analysis Data
Crash Data (Required)
Describe justification for Waiver request
Low-cost project to add left turn lanes at intersection within existing ROW and inside existing median; no negative traffic or environmental impacts
Introduction
Instructions
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Stage1
Stage2
Waiver
Enviromental
CostEstimate

Now What?

- After July 1, 2017 Official ICE Policy approval and guidance:
  - Always start with most recent tool version on website
  - Workshop presentation and video tutorial will be posted
  - Submit: **Introduction**, **Stage 1** and **Stage 2** one-page summaries with TE's and/or CR's (total of 3 pages plus Environmental form if used); OR one- page waver request

- Check website for version updates (ver2.1 Fall 2017)
  - More predetermined CMF's and costing tool updates
  - More control types (diamond interchange)
  - Predictive safety factors for new intersections
- Provide Feedback on the Tool – Please!
  - Provide feedback from use of Tool on projects of differing intersection control, geometry etc. to incorporate needed changes in future versions

Questions

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