INTERSECTION CONTROL EVALUATION

ALDOT PRE-CONSTRUCTION CONFERENCE

VIRTUAL MEETING

MAY 26, 2021

SIGNALIZED INTERSECTION

STOP CONTROL


55
84

UNSIGNALIZED HIGH-T

ROUNDABOUT

RESTRICTED CROSSING U-TURN (RCUT)

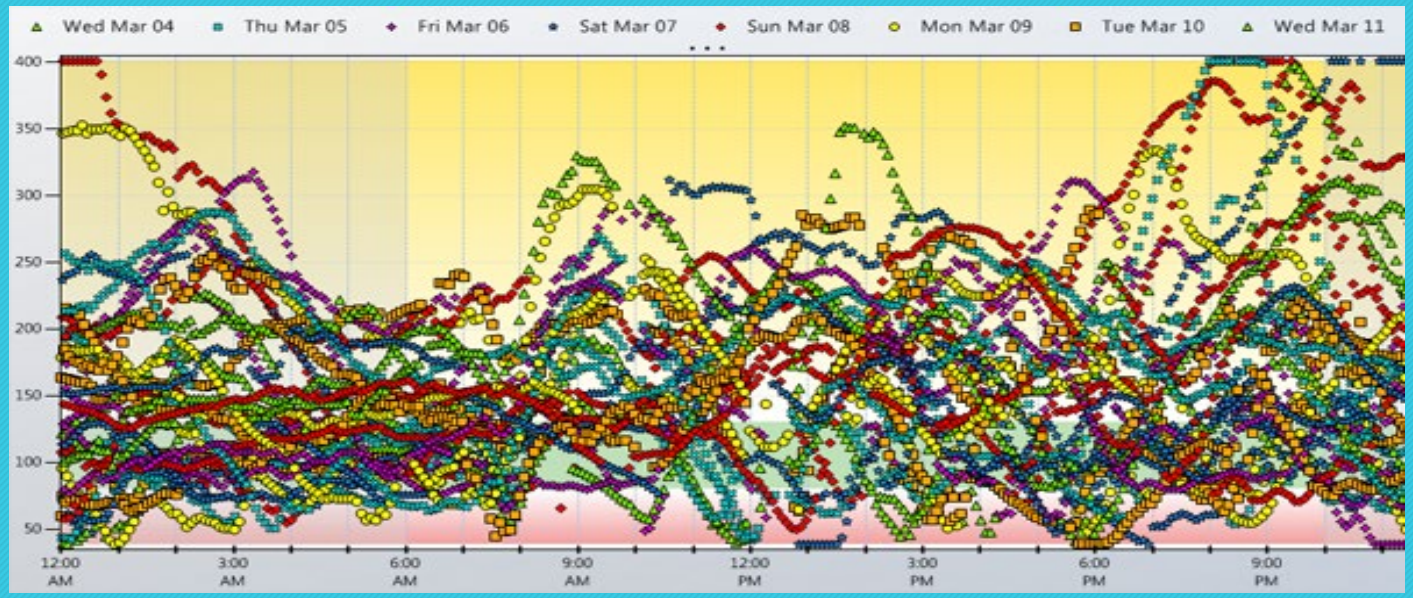
DIVERGING DIAMOND INTERCHANGE (DDI)

ALDOT MISSION STATEMENT

To provide a safe, efficient, environmentally sound intermodal transportation system for all users, especially the taxpayers of Alabama.

What is Intersection Control Evaluation (ICE)?

- Data driven, performance based framework and approach used to objectively screen alternatives and identify an optimal geometric and control solution for an intersection.



Purpose of ICE

Provide:

- Traceability
- Transparency
- Consistency
- Accountability

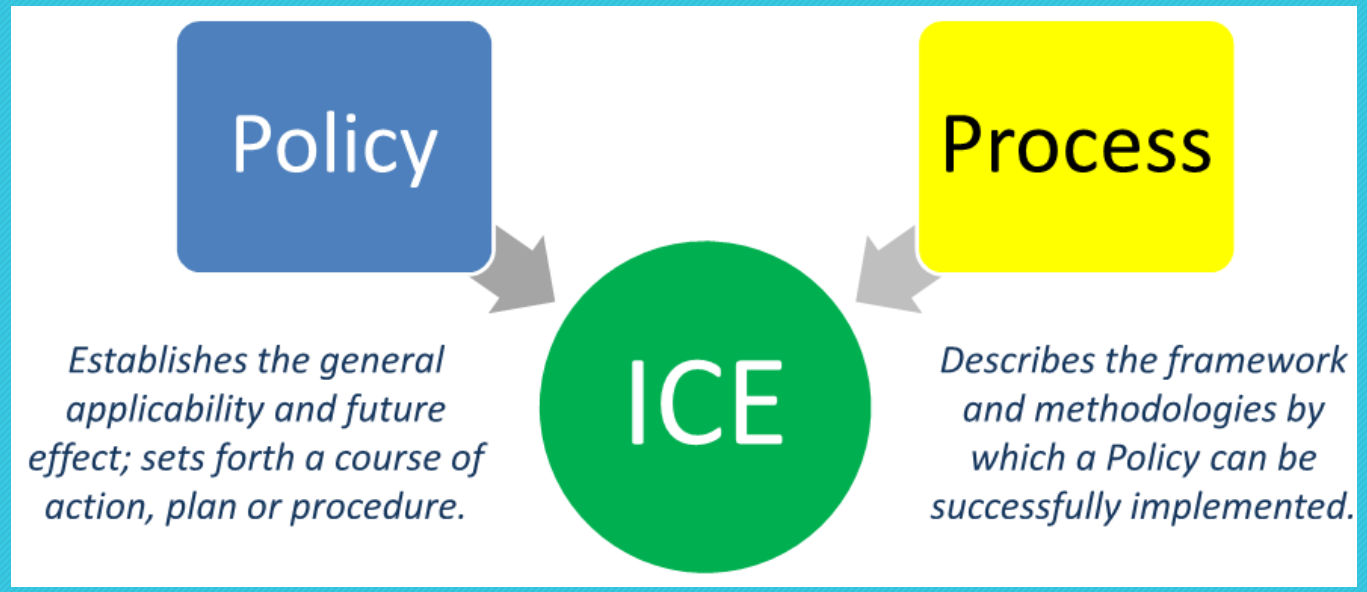
Promote an emphasis on:

- Context sensitivity
- Key performance outcomes
- Cost-effectiveness
- Sustainability

Mainstream and sustain implementation of proven, innovative access strategies.

ICE is a Policy and a Process

To identify and select an intersection control solution that both meets the project purpose and reflects the overall best value in terms of specific performance-based criteria.



Why ICE?

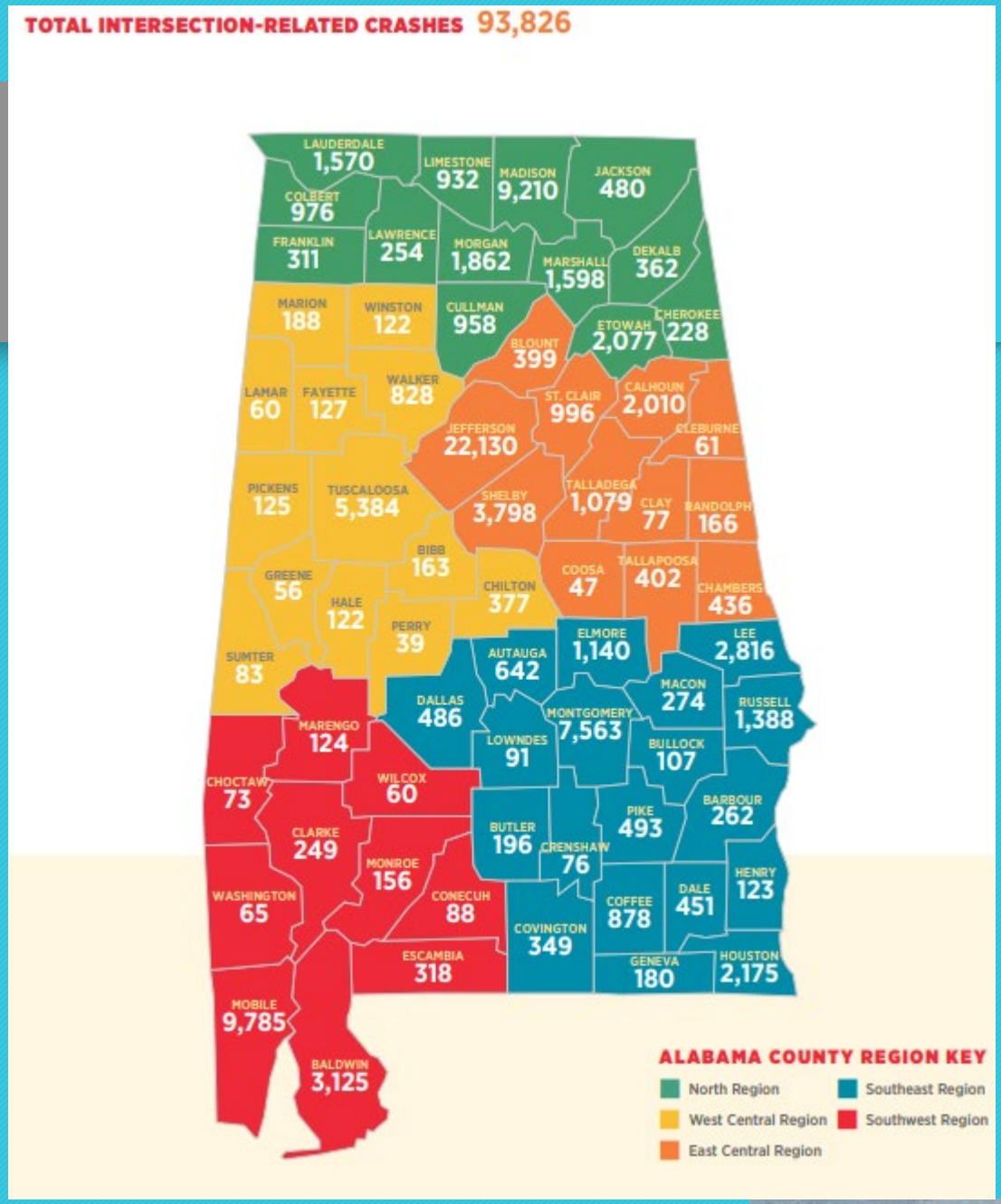
Integrate safety into decision making process for intersection control on ALL projects

2019 CRASH FACTS

Total Crashes = 159,102

Intersection Related Crashes = 93,826

59% of all crashes in Alabama are intersection related



Do Other States ICE?

GDOT
Georgia Department of Transportation

GDOT Publications
Policies & Procedures

Policy: 4A-5- Intersection Control Evaluation (ICE) Policy
Section: Traffic Control - Traffic Operations
Office/Department: oCOMSR CHIEF ENGINEER

Reports To: oDEPT OF TRANSPORTATION
Contact: 404-631-1000

INTERSECTION CONTROL EVALUATION (ICE) POLICY

NOTE: As indicated in the letter issued by the Chief Engineer on 06/08/2017, this ICE policy takes effect on 7/1/2017. Therefore, an ICE must be performed for any project or proposed work that does not have concept approval by July 1, 2017. For GDOT projects, if consultant services have already been procured prior to the effective date, but the concept has not been approved, the Office of Traffic Operations will perform the ICE evaluation upon request by the project manager. Additionally, if performing the ICE evaluation for projects that have schedules already set by July 1, 2017 would delay the concept report submittal, the ICE may be performed during preliminary design phase and should be submitted for approval no later than one-third of the way through the time allotted for preliminary design.

I. INTRODUCTION & BACKGROUND

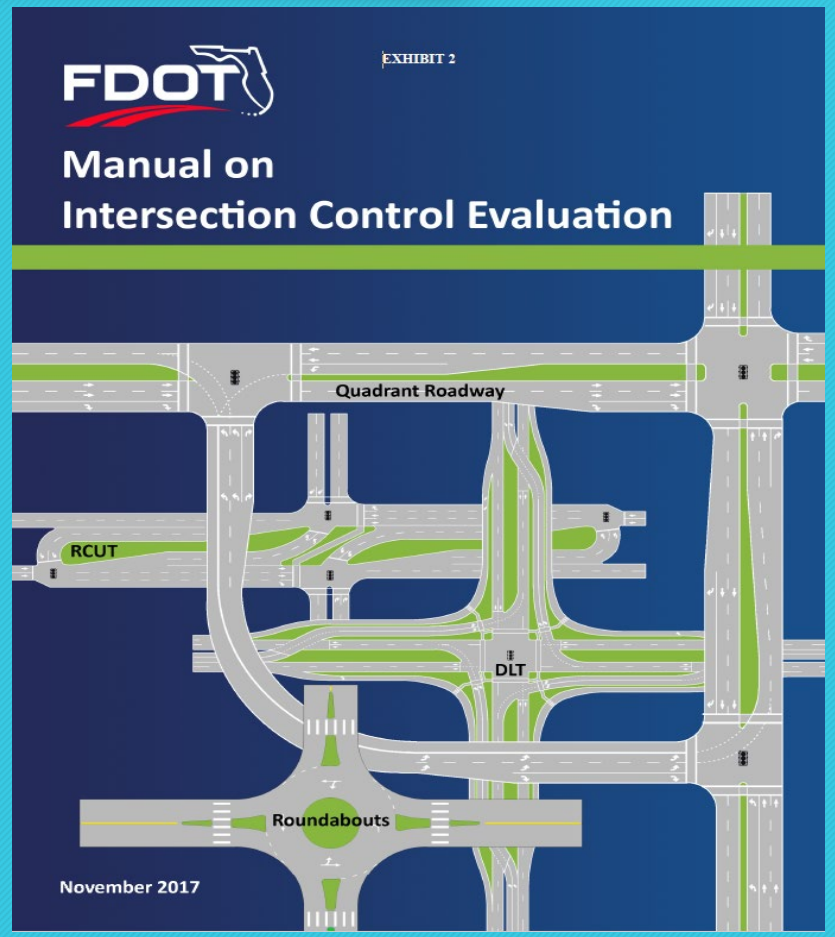
In 2005, SAFETEA-LU established the Highway Safety Improvement Program (HSIP) and mandated that each State prepare a Strategic Highway Safety Plan (SHSP) by which to prioritize safety funding investments. Intersections quickly became a common component of a majority of States' SHSP emphasis areas and HSIP project lists, including in Georgia's SHSP. In 2010, AASHTO published the first edition of the Highway Safety Manual (HSM), which mainstreamed a rigorous scientific approach and a new generation of statistical models for evaluating the substantive safety performance of highways and intersections. 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. Approximately **one-third of all traffic fatalities** and roughly **seventy five percent of all traffic crashes** in Georgia occur at or adjacent to intersections. Accordingly, 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 policy was developed and adopted 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.

Intersections are a necessary component of the road network, connecting different routes and facilities, and providing the needed access to adjacent residential, commercial and industrial development. They are comparatively discrete, comprising only a small portion of total road system mileage, but account for a high percentage of all crashes, especially severe crashes that produce injuries and fatalities. Intersections are planned points of conflict for all modes of users – pedestrians, bicyclists, motorcyclists, transit, trucks and passenger vehicles.

In recent years, a number of innovative intersection designs have been introduced across the United States. Experience to date with these innovative designs suggests significantly greater safety and operational benefits could be realized at a system level with broader implementation. Consequently, a consistent and objective evaluation process that is built upon performance-based criteria is needed. The Intersection Control Evaluation (ICE) policy and process fulfills that need.

Other States Include:

- California
- Indiana
- Minnesota
- Nevada
- Pennsylvania
- Washington
- Wisconsin



ALDOT ICE

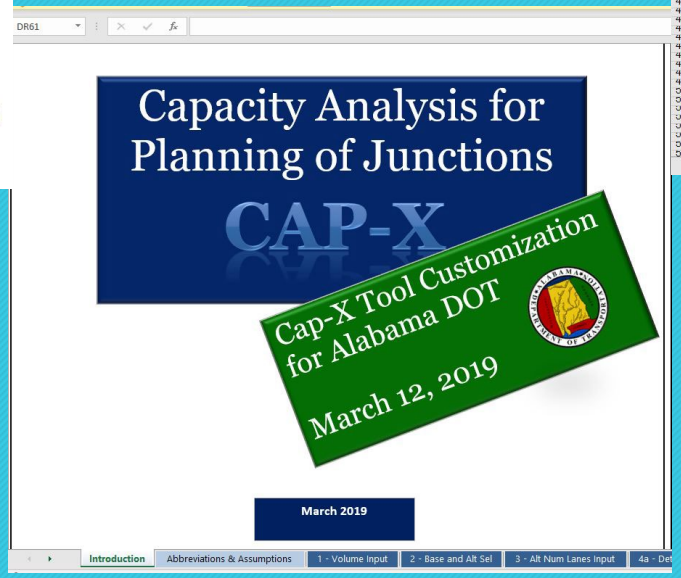
- RECEIVED APPROVAL FROM ALDOT ADMINISTRATION TO PROCEED WITH DEVELOPING A STANDARD OPERATING PROCEDURE AND ANALYSIS TOOL
- APPROACHED THIS AS A RESEARCH PROJECT
- DETERMINE IF STANDARD OPERATING PROCEDURE AND ANALYSIS TOOL COULD BE DEVELOPED AND BE USER FRIENDLY
- BE PATIENT

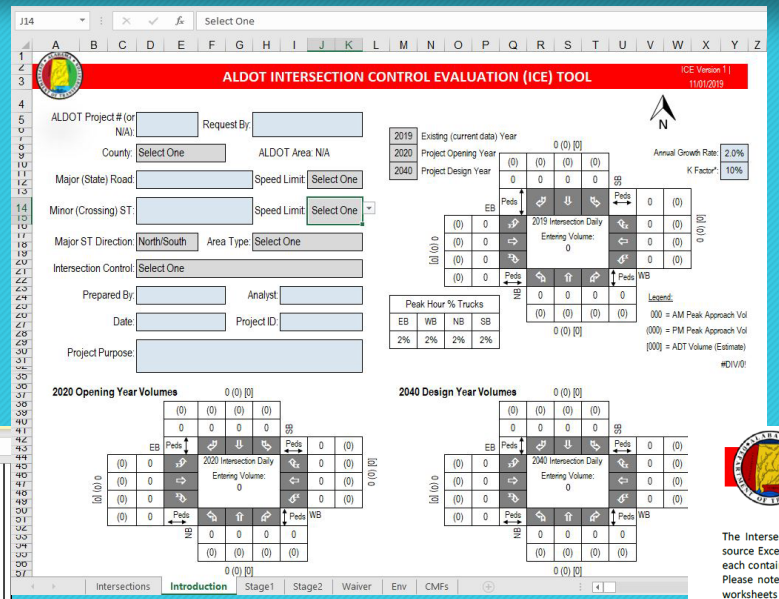
ALDOT ICE COMMITTEE

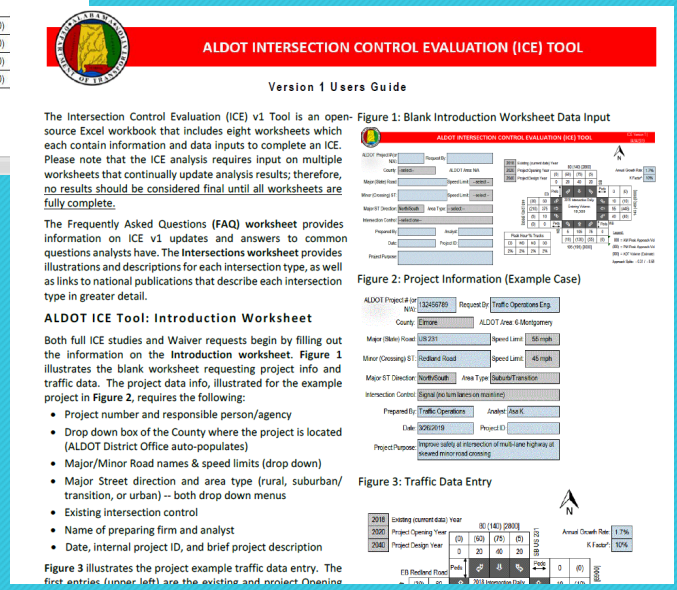
Design	Construction	Maintenance	Region/Area
Steve Walker	Russell Kirkpatrick	Kerry NeSmith	Ramsey Ashmore
Taylor Stoudenmire		Andrew Harry	
Cooper Calhoun		Asa Kirkus	
John Michael Walker		Eric Bertolotti	
Stuart Manson			

INTERSECTION CONTROL EVALUATION

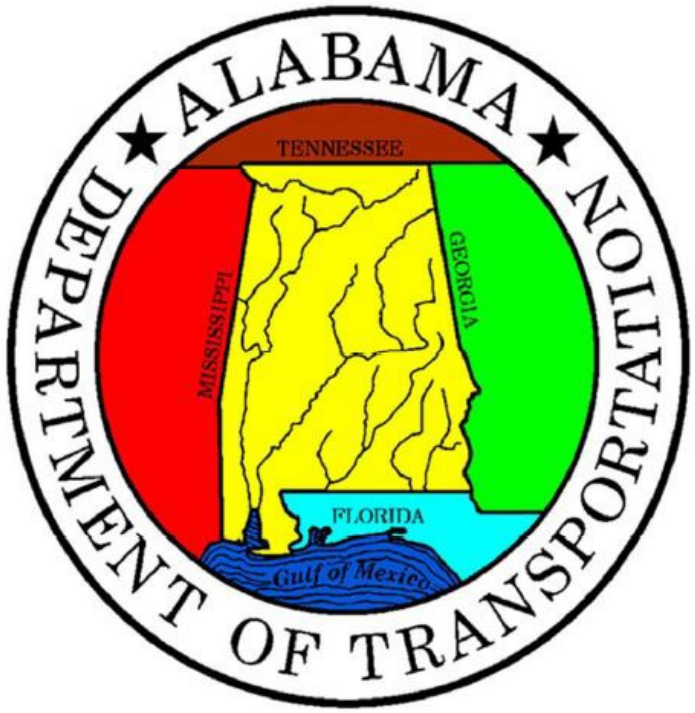
STANDARD OPERATING PROCEDURE FOR CONDUCTING INTERSECTION CONTROL EVALUATION (ICE)







ICE STANDARD OPERATING PROCEDURE (SOP)



STANDARD OPERATING PROCEDURE FOR CONDUCTING INTERSECTION CONTROL EVALUATION (ICE)

Table of Contents

ICE STANDARD OPERATING PROCEDURE (SOP) CATEGORY 1

Category 1 projects are to be approved by the Region Engineer (or delegate). Category 1 includes any projects that are going through the GDCP process (ICE approved as part of the concept approval). Design Bureau and the Area Pre-Construction Section should act as the reviewing entity for each other prior to submittal to the Region Engineer, regardless of which group acts as project lead. Category 1 will add, modify, or remove an intersection.

ICE STANDARD OPERATING PROCEDURE (SOP) CATEGORY 2

Category 2 projects will be approved by the Area Maintenance Engineer (or delegate). Before final approval the ICE shall be submitted to the State Traffic Operations Engineer for review and comment. Category 2 projects include any work being performed with state funds as a maintenance activity involving existing or new intersections.

ICE STANDARD OPERATING PROCEDURE (SOP) CATEGORY 3

Category 3 projects will be approved by the Area Maintenance Engineer (or delegate). Category 3 includes work being done through permit that will add, modify, or remove an intersection.

If safety funds will be utilized on a project involving an intersection, the Safety Section will also be a reviewer before final approval.

ICE STANDARD OPERATING PROCEDURE (SOP) WAIVER REQUEST

Examples of scenarios in which an ICE waiver request may be considered include:

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

An ICE and/or waiver is not required for a Category 3 project when it meets the criteria as shown above.

ICE STANDARD OPERATING PROCEDURE (SOP) STAGE 1

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.

ICE STANDARD OPERATING PROCEDURE (SOP) STAGE 2

Stage 2 involves a more detailed and familiar evaluation of the alternatives identified in Stage 1 to support the selection of a preferred alternative that may be advanced to detailed design. The combined output of Stage 1 and Stage 2 along with supporting documentation should be documented in the approved Concept Report. Related studies referenced in the GDCP and other Policies, such as a Traffic Impact Analysis, Signal Warrant Analysis, etc., may need to be partially or wholly completed to perform ICE Stage 2.

DATA COLLECTION

Route & Direction		AL-51 (NB)			AL-51 (SB)			Gateway Dr.		
Time			↓	↳		↑	↱	↰		↑
am	6:00	0	34	25	0	11	14	9	0	2
am	6:15	0	47	17	0	16	13	10	0	4
am	6:30	0	38	26	0	11	17	19	0	17
am	6:45	0	85	48	0	46	35	16	0	26
am	7:00	0	77	45	0	37	23	17	0	14
am	7:15	0	62	53	0	49	13	29	0	21
am	7:30	0	101	53	0	30	20	45	0	16
am	7:45	0	110	58	0	47	16	32	0	16
am	8:00	0	72	48	0	29	20	18	0	17
am	8:15	0	42	38	0	34	20	11	0	17
am	8:30	0	36	35	0	34	26	16	0	21
am	8:45	0	41	47	0	20	23	13	0	11
am	9:00	0	37	32	0	24	29	15	0	20
am	9:15	0	30	24	0	22	13	16	0	8
am	9:30	0	37	21	0	17	17	17	0	14
am	9:45	0	34	39	0	15	23	12	0	13
am	10:00	0	31	35	0	19	11	22	0	11
am	10:15	0	27	15	0	15	14	11	0	23
am	10:30	0	31	40	0	23	17	23	0	21
am	10:45	0	39	30	0	39	13	22	0	32
am	11:00	0	43	34	0	45	20	27	0	27
am	11:15	0	30	22	0	33	24	23	0	23

PEAK HOURS

	AL-51 (SB)			AL-51 (NB)			Gateway Dr. (EB)		
		↑	Right		↓	Left	Left		Right
	0	11	14	0	34	25	9	0	2
6-7	0	110	88	0	247	136	62	0	61
7-8	0	155	69	0	345	212	124	0	70
8-9	0	112	98	0	156	152	55	0	69
9-10	0	73	64	0	132	119	67	0	46
10-11	0	122	64	0	140	119	83	0	103
11-12	0	158	98	0	145	113	90	0	108
12-13	0	163	80	0	172	101	110	0	128
13-14	0	180	77	0	157	106	111	0	127
14-15	0	184	79	0	162	123	126	0	145
15-16	0	250	88	0	202	160	130	0	158
16-17	0	318	87	0	161	134	147	0	175
17-18	0	369	118	0	220	126	174	0	212

PEAK HOUR VOLUME

7-8	0	196	92	0	440	232	180	0	84
17-18	0	380	136	0	236	144	188	0	220

PEAK HOUR FACTOR

7-9	0.00	0.79	0.75	0.00	0.78	0.91	0.69	0.00	0.83
17-19	0.00	0.97	0.87	0.00	0.93	0.88	0.93	0.00	0.96

Capacity Analysis for Planning of Junctions

CAP-X

Cap-X Tool Customization for Alabama DOT

March 12, 2019

March 2019

Capacity Analysis for Planning of Junctions

Input Worksheet 1

Project Name:	*AL-51 & Gateway Dr (AM)*
Project Number:	*N/A*
Location	*Lee County, AL*
Date	December 4, 2019
Number of Intersection	3
Which leg is the minor street?	W

Reset Tool to Defaults

Traffic Volume Demand

	Volume (Veh/hr)				Percent (%)	
	U-Turn	Left	Thru	Right	Heavy Vehicles	Volume Growth
Eastbound	0	124	0	70	4.00%	0.00%
Westbound	0	0	0	0	2.00%	0.00%
Southbound	0	0	155	69	5.00%	0.00%
Northbound	0	212	345	0	5.00%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	**0.80**	**0.95**		**0.85**		

Truck to PCE Factor		**Suggested = 2.00**	2.00
ALDOT Context Zone		**C2-Rural**	
Critical Lane Volume Threshold	2-phase signal	**Suggested = 1800**	**1800**
	3-phase signal	**Suggested = 1750**	**1750**
	4-phase signal	**Suggested = 1700**	**1700**

Capacity Analysis for Planning of Junctions

Input Worksheet 2

Project Name:	*AL-51 & Gateway Dr (AM)*
Project Number:	*N/A*
Location:	*Lee County, AL*
Date:	December 4, 2019
Analysis Type:	At-Grade Intersections and Interchanges

Number of Lanes for Non-roundabout Intersections

TYPE OF INTERSECTION	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Traffic Signal	FULL		1	1	1		1	1	1		1	1	1		1	1	1
Two-Way Stop Control	N-S		1	1	1		1	1	1		1	1	1		1	1	1
All-Way Stop Control	FULL		1	1	1		1	1	1		1	1	1		1	1	1
Continuous Green T	W		1	2				2	1		1		1				
Partial Displaced Left Turn	N-S		1	1	1		1	1	1		1	1	1		1	1	1
Displaced Left Turn	FULL		1	1	1		1	1	1		1	1	1		1	1	1
Signalized Restricted Crossing U-Turn	N-S	1	1	1	1	1	1	1	1				1				1
Unsignalized Restricted Crossing U-Turn	N-S	1	1	1	1	1	1	1	1				1				1
Median U-Turn	N-S	1		1	1	1		1	1			1	1			1	1
Partial Median U-Turn	N-S	1		1	1	1		1	1		1	1	1		1	1	1

For shared lanes, enter "0" in L or R

Capacity Analysis for Planning of Junctions

Input Worksheet 2

Project Name:	*AL-51 & Gateway Dr (AM)*
Project Number:	*N/A*
Location:	*Lee County, AL*
Date:	December 4, 2019
Analysis Type:	At-Grade Intersections and Interchanges

Volume Echo with Shared Lane Adjustment for Non-roundabout Intersections

TYPE OF INTERSECTION	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Traffic Signal	FULL		223	362	0		0	163	72		126	0	71		0	0	0
Two-Way Stop Control	N-S		223	362	0		0	163	72		126	0	71		0	0	0
All-Way Stop Control	FULL		223	362	0		0	163	72		126	0	71		0	0	0
Continuous Green T	W		223	362				163	72		126		71				
Partial Displaced Left Turn	N-S		223	362	0		0	163	72		126	0	71		0	0	0
Displaced Left Turn	FULL		223	362	0		0	163	72		126	0	71		0	0	0
Signalized Restricted Crossing U-Turn	N-S	0	223	362	0	0	0	163	72				71				0
Unsignalized Restricted Crossing U-Turn	N-S	0	223	362	0	0	0	163	72				71				0
Median U-Turn	N-S	0		362	0	0		163	72			0	71			0	0
Partial Median U-Turn	N-S	0		362	0	0		163	72		126	0	71		0	0	0

Capacity Analysis for Planning of Junctions

Results Worksheet

		Estimated Volume-to-Capacity Ratio			
Project Name:	AL-51 & Gateway Dr (AM)	Number of Configurations			
Project Number:	N/A	< 0.750	0.750 - 0.875	0.875 - 1.00	≥ 1.00
Location	Lee County, AL	11	0	0	0
Date	December 4, 2019				

Results for Non-roundabout Intersections

TYPE OF INTERSECTION	Sheet	Zone 1 (North)		Zone 2 (South)		Zone 3 (East)		Zone 4 (West)		Zone 5 (Center)		Overall v/c Ratio	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
		CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C				
Traffic Signal	FULL									543	0.31	0.31	Good	Good	Excellent
Two-Way Stop Control	N-S									--	0.58	0.58	Fair	Good	Excellent
All-Way Stop Control	FULL									1017	0.57	0.57	Excellent	Excellent	Excellent
Continuous Green T	W									449	0.26	0.26	Fair	Fair	Excellent
Partial Displaced Left Turn	N-S	488	0.27	398	0.22					495	0.28	0.28	Good	Good	Excellent
Displaced Left Turn	FULL	488	0.27	398	0.22	0	0.00	356	0.20	495	0.27	0.27	Good	Good	Excellent
Signalized Restricted Crossing U-Turn	N-S	235	0.13	743	0.41	488	0.27	398	0.22			0.41	Excellent	Excellent	Good
Unsignalized Restricted Crossing U-Turn	N-S	235	0.00	585	0.16	488	0.00	163	0.22			0.22	Good	Good	Good
Median U-Turn	N-S	514	0.29	743	0.41					817	0.45	0.45	Excellent	Excellent	Good
Partial Median U-Turn	N-S	514	0.29	585	0.33					718	0.41	0.41	Excellent	Excellent	Good

Capacity Analysis for Planning of Junctions

Dynamic Results Summary

TYPE OF INTERSECTION	Overall V/C Ratio	V/C Ranking	Multimodal Score	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
Unsignalized Restricted Crossing U-Turn N-S	0.22	1	6.7	Good	Good	Good
2 X 1	0.24	2	8.3	Good	Excellent	Excellent
Continuous Green T W	0.26	3	4.4	Fair	Fair	Excellent
Displaced Left Turn	0.27	4	7.2	Good	Good	Excellent
Partial Displaced Left Turn N-S	0.28	5	7.2	Good	Good	Excellent
Traffic Signal	0.31	6	7.2	Good	Good	Excellent
Signalized Restricted Crossing U-Turn N-S	0.41	7	9.4	Excellent	Excellent	Good
Partial Median U-Turn N-S	0.41	7	9.4	Excellent	Excellent	Good
Median U-Turn N-S	0.45	9	9.4	Excellent	Excellent	Good
1 X 1	0.48	10	10.0	Excellent	Excellent	Excellent

Use the "yes/no" drop-down menus in Step 2 (Base and Alt Selection) to exclude intersection types from summary rankings, if they are not applicable.

ALDOT INTERSECTION CONTROL EVALUATION (ICE) TOOL

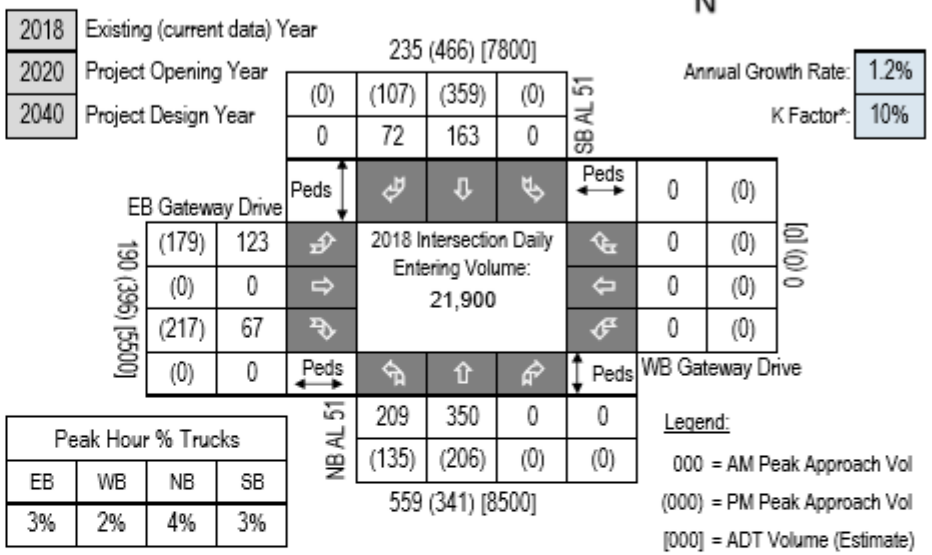
ICE Version 1 | 11/01/2019

ALDOT Project # (or N/A):	N/A	Request By:	Andrew Harry
County:	Lee	ALDOT Area:	6-Montgomery
Major (State) Road:	AL 51	Speed Limit:	45 mph
Minor (Crossing) ST:	Gateway Drive	Speed Limit:	45 mph
Major ST Direction:	North/South	Area Type:	Rural
Intersection Control:	Conventional (Minor Stop)		
Prepared By:	CHA	Analyst:	K Farabee
Date:	5/1/2020	Project ID:	20-TF-014
Project Purpose:	Evaluate ALDOT ICE Tool and Policy		

2018	Existing (current data) Year
2020	Project Opening Year
2040	Project Design Year

Annual Growth Rate: 1.2%

K Factor*: 10%



Peak Hour % Trucks			
EB	WB	NB	SB
3%	2%	4%	3%

Legend:

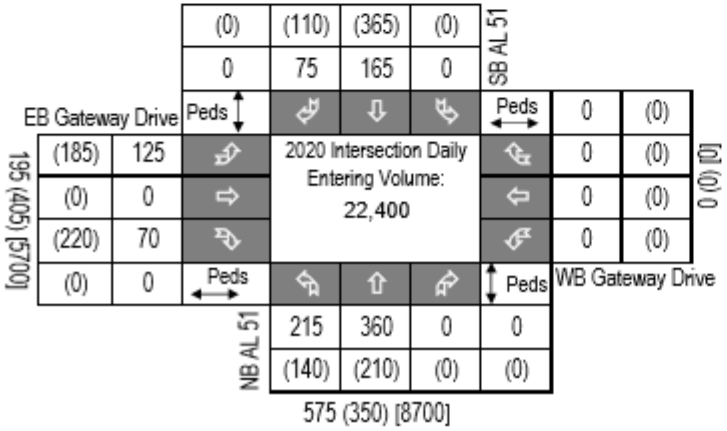
000 = AM Peak Approach Vol

(000) = PM Peak Approach Vol

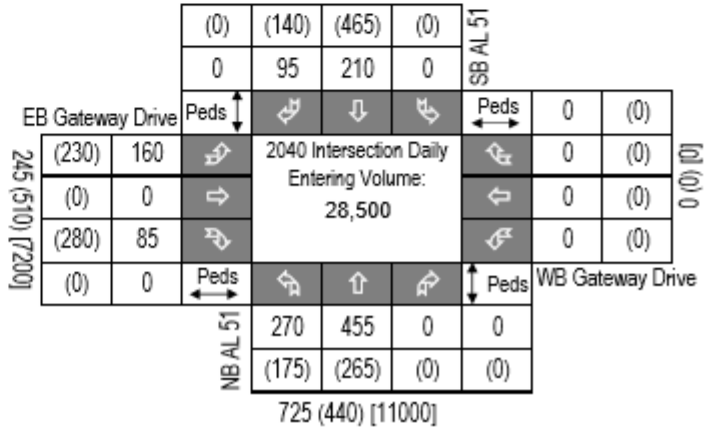
[000] = ADT Volume (Estimate)

Approach Splits: AL 51 - 0.73 / Gateway Drive - 0.27

2020 Opening Year Volumes



2040 Design Year Volumes



ALDOT ICE STAGE 1: SCREENING DECISION RECORD

ICE Version 1 | 11/01/2019

ALDOT Proj #	N/A
Project Location:	AL 51 @ Gateway Drive
Prepared by:	CHA
Analyst:	K Farabee
Date:	5/1/2020

Note: Up to 5 alternatives may be selected and evaluated; Use this ICE Stage 1 to screen 5 or fewer alternatives to evaluate in Stage 2

Input V/C Ratio and Multimodal Score based on top 10 results from Cap-X Tool. Answer "YES" or "NO" if alternative is a viable option resulting in further evaluation in Stage 2. Input justification for screening decision in last column for all alternatives.

	Intersection Alternative (see "Intersections" tab for detailed description of intersection/interchange type)	CAP-X OUTPUTS: V/C RATIO AM	V/C RATIO PM	V/C RATIO RANKING	MULTIMODAL SCORE	Is alternative a viable option for advancement to Stage 2? (YES / NO)	Screening Decisions Justification:
Unsignalized Intersections	Conventional (Minor Stop)	0.67	0.82	8	5.6	No	No Build Option.
	Conventional (All-Way Stop)	0.69	0.84	9	10	No	Volumes and Context Not to Scale.
	Mini Roundabout			--		No	Volumes and Context Not to Scale.
	Single Lane Roundabout	0.49	0.43	6	10	Yes	Potential Solution to Evaluate.
	Multilane Roundabout	0.24	0.22	2	8.3	Yes	Potential Solution to Evaluate.
	RCUT (stop control)	0.23	0.66	7	6.7	No	Volumes and Context Not to Scale.
	RIRO w/down stream U-Turn			--		No	Volumes and Context Not to Scale.
	High-T (unsignalized)			--		No	Volumes and Context Not to Scale.
	Offset-T Intersections			--		No	N/A
	Diamond Interch (Stop Control)			--		No	N/A
	Diamond Interch (Roundabout Control)			--		No	N/A
	No LT Lane Improvements No RT Lane Improvements			--		No	N/A
	Other unignalized (provide description):			--		No	N/A
ections	Traffic Signal	0.26	0.31	4	7.2	Yes	Potential Solution to Evaluate.
	Median U-Turn (Indirect Left)			--		No	N/A
	RCUT (signalized)	0.25	0.37	5	9.4	No	Volumes and Context Not to Scale.
	Displaced Left Turn (CFI)	0.21	0.22	1	7.2	No	Volumes and Context Not to Scale.
	Continuous Green-T	0.26	0.3	3	4.4	Yes	Potential Solution to Evaluate.

ALDOT ICE STAGE 2: ALTERNATIVE SELECTION DECISION RECORD

ICE Version 1 | 11/01/2019

ALDOT Proj # (or N/A): N/A
County: Lee
Project Location: AL 51 @ Gateway Drive
Existing Intersection Control: Conventional (Minor Stop)

ALDOT Area: 6-Montgomery
Area Type: Rural

Date: 5/1/2020
Agency/Firm: CHA
Analyst: K Farabee

Type of Analysis: Conventional Non-Safety Funded Project

Opening / Design Year Traffic Operations

Intersection meets signal/AWS warrants?	Meets Signal Warrants	
Traffic Analysis Measure of Effectiveness	Intersection Delay	
Traffic Analysis Software Used	HCS7	
Analysis Time Period	AM Peak Hr	PM Peak Hr
2020 Opening Yr No-Build Peak Hr Intersection Delay	60.5 sec	51.6 sec
2020 Opening Yr No-Build Peak Hr Intersection V/C	0.73	0.76
2040 Design Yr No-Build Peak Hr Intersection Delay	324.3 sec	272.5 sec
2040 Design Yr No-Build Peak Hr Intersection V/C ratio	1.49	1.43

Crash Data: Enter 5 most recent years of intersection crash data	*Crash Severity* PDO	Injury Crash*	Fatal Crash*	
Crash Type Angle	16	20	1	50%
Head-On	0	0	0	0%
Rear End	29	3	0	43%
Sideswipe - same	0	0	0	0%
Sideswipe - opposite	0	1	0	1%
Not Collision w/Motor Veh	4	0	0	5%
TOTALS:	49	24	1	74

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

Alternatives Analysis:

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Proposed Control Type/Improvement:	Single Lane Roundabout	Multilane Roundabout	Traffic Signal	Continuous Green-T	N/A
Project Cost: (From CostEst Worksheet)	*Additional description here*	*Additional description here*	*Add LT bays all approaches*	*Additional description here*	
Construction Cost	$520,000	$800,000	$135,000	$265,000	
ROW Cost	$1,000	$3,000	$0	$0	
Environmental Cost	$0	$0	$0	$0	
Reimbursable Utility Cost	$6,000	$25,000	$2,000	$4,000	
Design & Contingency Cost	$155,000	$240,000	$45,000	$70,000	
Cost Adjustment (justification req'd)	0%	0%	0%	0%	
Total Cost	$682,000	$1,068,000	$182,000	$339,000	$0

Traffic Operations:

Traffic Analysis Software Used	SIDRA 7		SIDRA 7		Synchro 9		Synchro 9		
Analysis Period	AM Peak Hr	PM Peak Hr	AM Peak Hr	PM Peak Hr	AM Peak Hr	PM Peak Hr	AM Peak Hr	PM Peak Hr	
2040 Design Yr Build Intersection Delay	12.2 sec	14.6 sec	6.6 sec	12.0 sec	7.8 sec	10.2 sec	16.8 sec	21.2 sec	
2040 Design Yr Build Intersection V/C	0.75	0.76	0.38	0.76	0.48	0.50	0.74	0.81	

Safety Analysis:					
Predefined CRF: PDO	71%	32%	44%	45%	
Predefined CRF: Fatal/Inj	87%	71%	40%	49%	
Predefined CRF Source:	FHWA Clearinghouse #s 229 / 230	FHWA Clearinghouse #s 236 / 237	FHWA Clearinghouse #s 7982 / 7984	FHWA Clearinghouse #s 7982/8655 / 7984/8656	
User Defined CRF: PDO					
User Defined CRF: Fatal/Inj					
User Defined CRF Source (write in if applicable):					
Environmental Impacts:[1]					
Historic District/Property	None	None	None	None	
Archaeology Resources	None	None	None	None	
Graveyard	None	None	None	None	
Stream	None	None	None	None	
Underground Tank/Hazmat	None	None	None	None	
Park Land	None	None	None	None	
EJ Community	None	None	None	None	
Wooded Area	None	None	None	None	
Wetland	None	None	None	None	
Stakeholder Posture:	*Note: If environmental impact is significant (RED), provide justification impact won't jeopardize project delivery using "Env" worksheet*				
	[1] Environmental impacts are only preliminary estimates; detailed environmental impact documentation will be included with project concept report				
Local Community Support	Neutral	Neutral	Neutral	Neutral	
ALDOT Support	Neutral	Neutral	Neutral	Neutral	
Final ICE Stage 2 Score:	5.8	4.4	5.8	5.2	
Rank of Control Type Alternatives:	2	4	1	3	

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):	Roundabouts were analyzed in SIDRA 8 software

Resolution						
To be filled out by ALDOT Area Operations Engineer and Region Engineer						
Project Determination	Select One					
Comments						
AOE Name		Signature		Date		
RE Name		Signature		Date		

ALDOT INTERSECTION CONTROL EVALUATION (ICE) WAIVER FORM

ICE Version 1 | 11/01/2019

Waiver Request - N/A

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

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

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

ICE waiver forms with supporting documentation should be submitted for approval to the Region Engineer or Area Maintenance Engineer (depending on Waiver level). Questions regarding the waiver process should be routed to the State Traffic Operations Engineer.

Project Information:

Location: @
County: Select One
ALDOT Area: N/A
Area Type: Select One
Existing Intersection Control: Select One

ALDOT Proj # (or N/A): 0000000
Requested By: 0
Prepared By: 0
Analyst: 0
Date: 1/0/1900
Waiver Request Type: Select One

Traffic and Operations Data:[1]

Intersection meets signal/AWS warrants?	None	
Traffic Analysis Type:	Intersection Delay	
Existing Avg Daily Traffic (Major Street):	0	
Existing Avg Daily Traffic (Minor Street):	0	
Analysis Period:	AM Peak	PM Peak
2020 Opening Yr Peak Hour Intersection Delay:	0.0 sec	0.0 sec
2020 Opening Yr Peak Hour Intersection V/C:	0.00	0.00
2040 Design Yr Peak Hour Intersection Delay:	0.0 sec	0.0 sec

Crash Data (Required):[1]

Crash Type	*Crash Data: Enter 5 most recent years of intersection crash data*	*Crash Severity* PDO	Injury Crash*	Fatal Crash*
	Angle	0	0	0
	Head-On	0	0	0
	Rear End	0	0	0
	Sideswipe - same	0	0	0
	Sideswipe - opposite	0	0	0

ALDOT INTERSECTION CONTROL EVALUATION (ICE) TOOL

Version 1 Users Guide

The Intersection Control Evaluation (ICE) v1 Tool is an open-source Excel workbook that includes eight worksheets which each contain information and data inputs to complete an ICE. Please note that the ICE analysis requires input on multiple worksheets that continually update analysis results; therefore, no results should be considered final until all worksheets are fully complete.

The Frequently Asked Questions **(FAQ) worksheet** provides information on ICE v1 updates and answers to common questions analysts have. The **Intersections worksheet** provides illustrations and descriptions for each intersection type, as well as links to national publications that describe each intersection type in greater detail.

ALDOT ICE Tool: Introduction Worksheet

Both full ICE studies and Waiver requests begin by filling out the information on the **Introduction worksheet**. **Figure 1** illustrates the blank worksheet requesting project info and traffic data. The project data info, illustrated for the example project in **Figure 2**, requires the following:

- Project number and responsible person/agency
- Drop down box of the County where the project is located (ALDOT District Office auto-populates)

Figure 1: Blank Introduction Worksheet Data Input

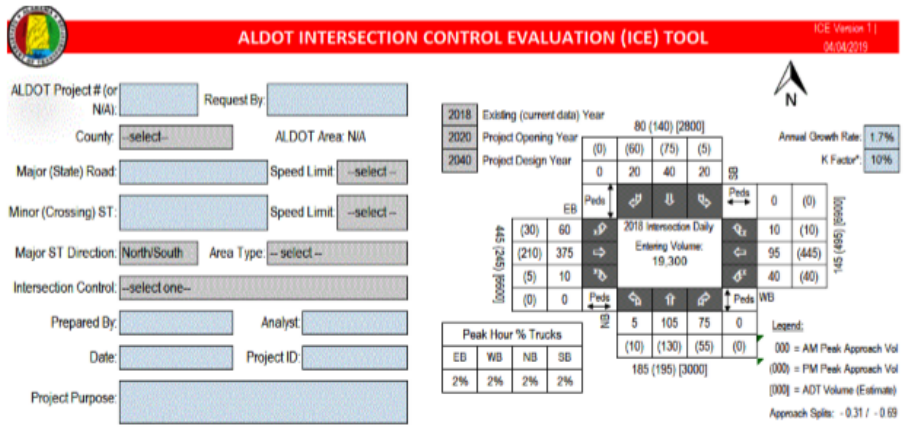
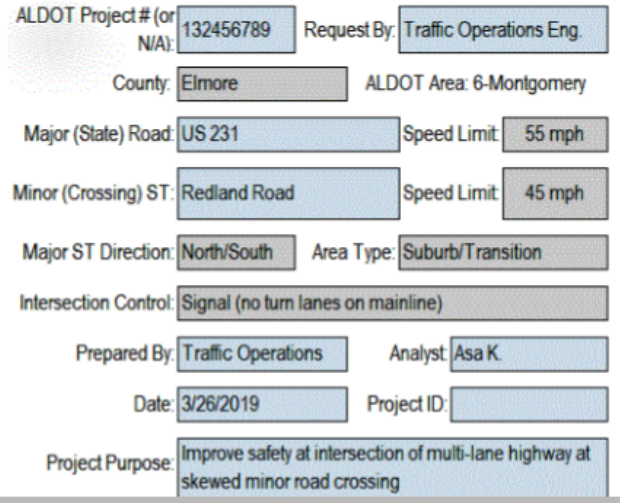
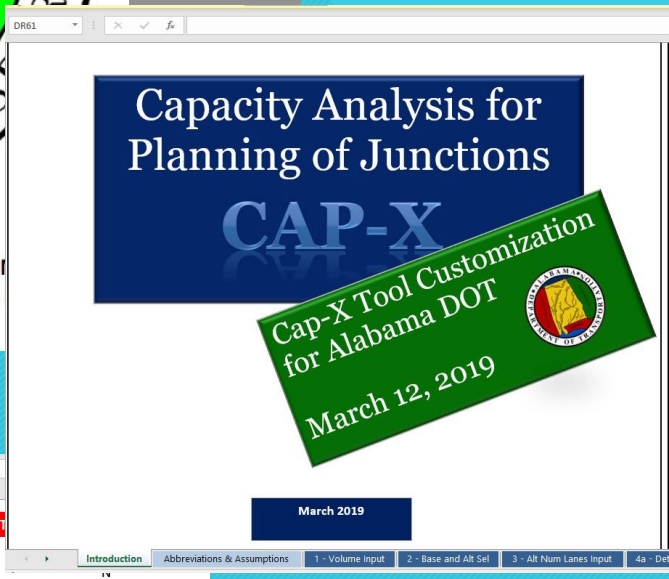


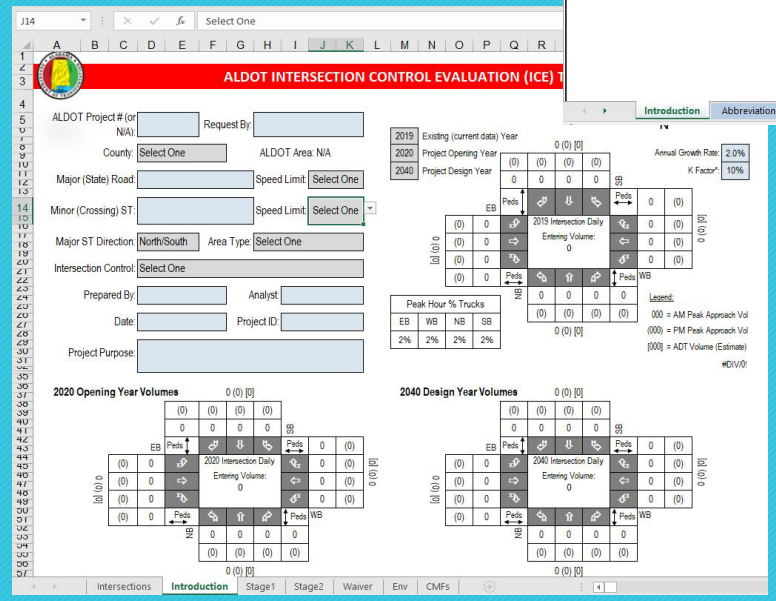
Figure 2: Project Information (Example Case)



ICE SOP STATUS

- ALDOT ICE SOP AND ANALYSIS TOOL HAVE BEEN DEVELOPED
- SEVERAL INTERSECTIONS HAVE BEEN IDENTIFIED AND ANALYSISED BY THE ALDOT ICE COMMITTEE
- CURRENTLY HAVE A CONSULTANT PERFORMING ANALYSIS AND PROVIDING FEED BACK ON THE SOP AND ANALYSIS TOOL





ICE SOP MOVING FORWARD

- DETERMINE IF THIS WILL BE IMPLEMENTED
- RECOMMEND WORKING WITH CONSULTANT

THANK YOU

Andrew O. Harry, P.E.
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34-242-6275 (Office)