Interchange Improvements at I-85 Exit 16 (Waugh Interchange) Montgomery County

Roundabouts at SR-126 and US-80 & US-80 and Marler Road

ASCE Montgomery Branch

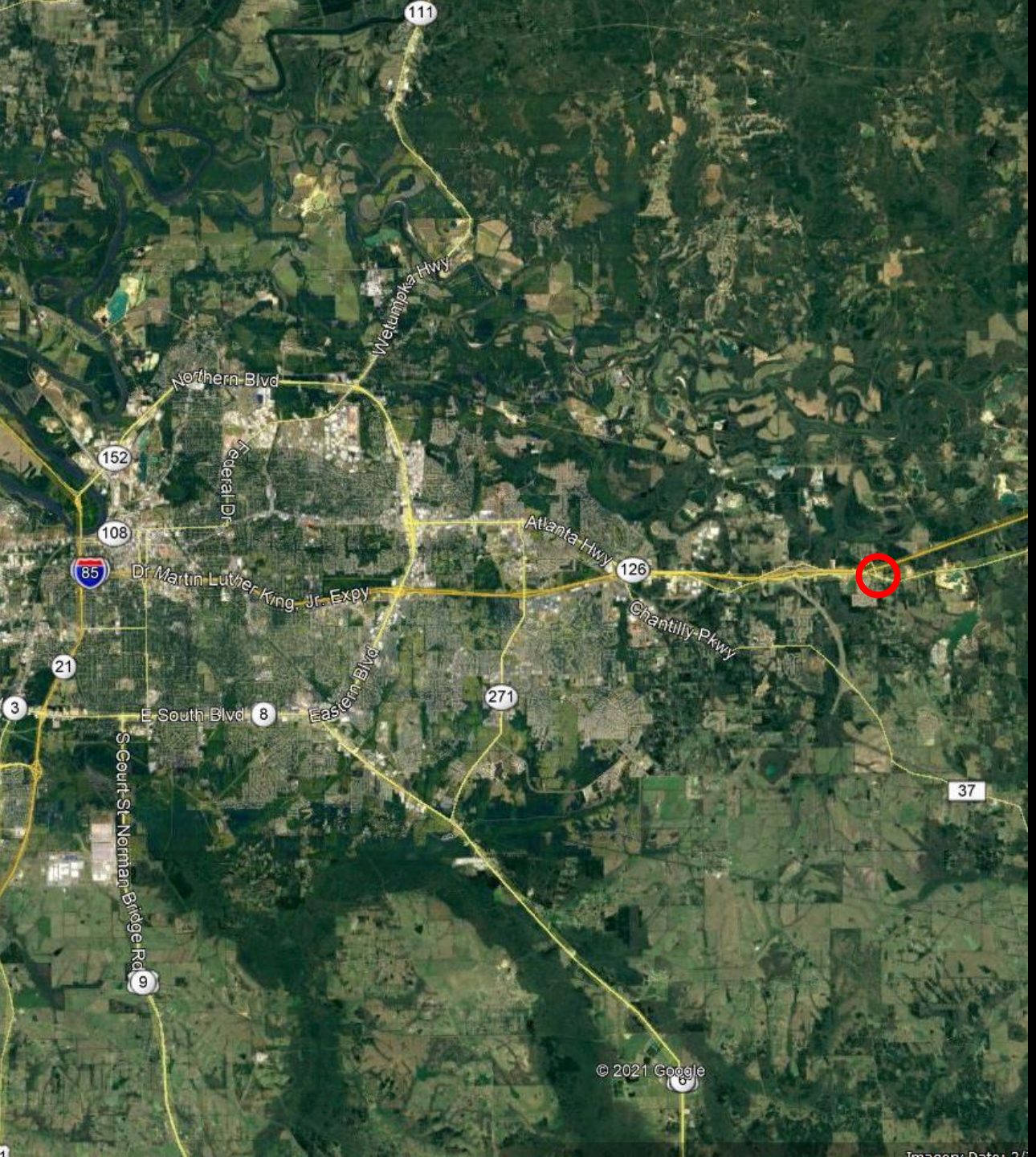
December 2021 Branch Meeting

December 14, 2021

Blair Perry, PE – State Transportation Leader, Gresham Smith

Leslie Corlett, PE – Project Engineer, Gresham Smith

Gresham Smith



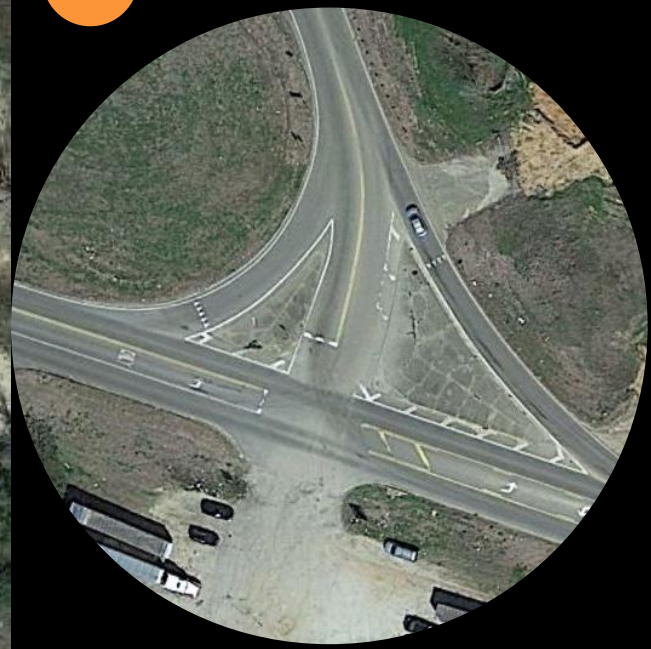
Project Area

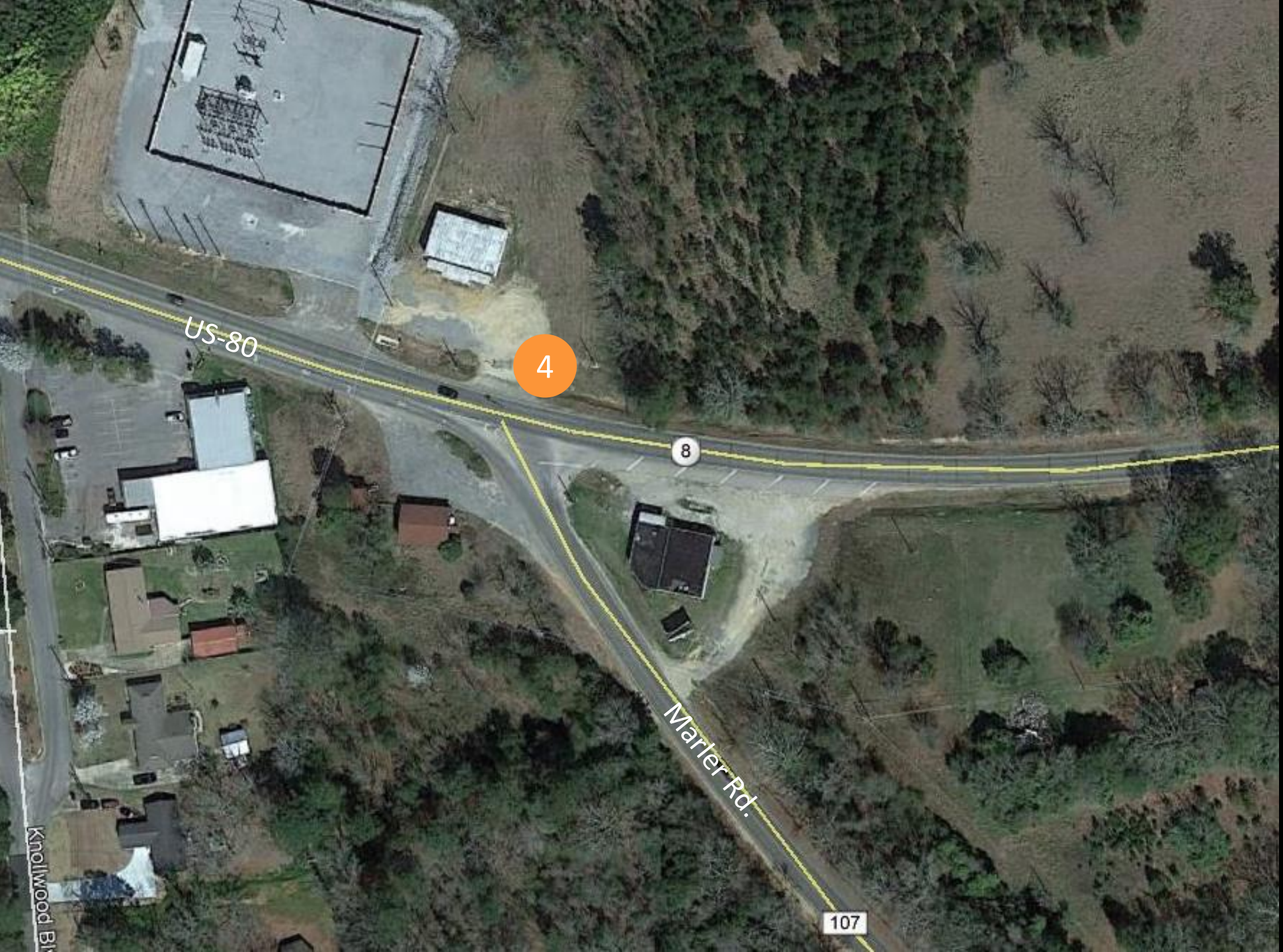
- I-85 at SR-126 (Exit 16 / Waugh Interchange)
- 5 miles east of Atlanta Highway/Chantilly Parkway Interchange
- Town of Pike Road


Existing Interchange Area
I-85 Exit 16
126
Atlanta Hwy
I-85 SB
1
SR-126
85
2
Future Gas Station
I-85 SB
SR-126
3
8
US-80
4
Cottonwood Dr
Maple Dr
Knollwood Blvd
Marler Rd.

Existing Interchange Area

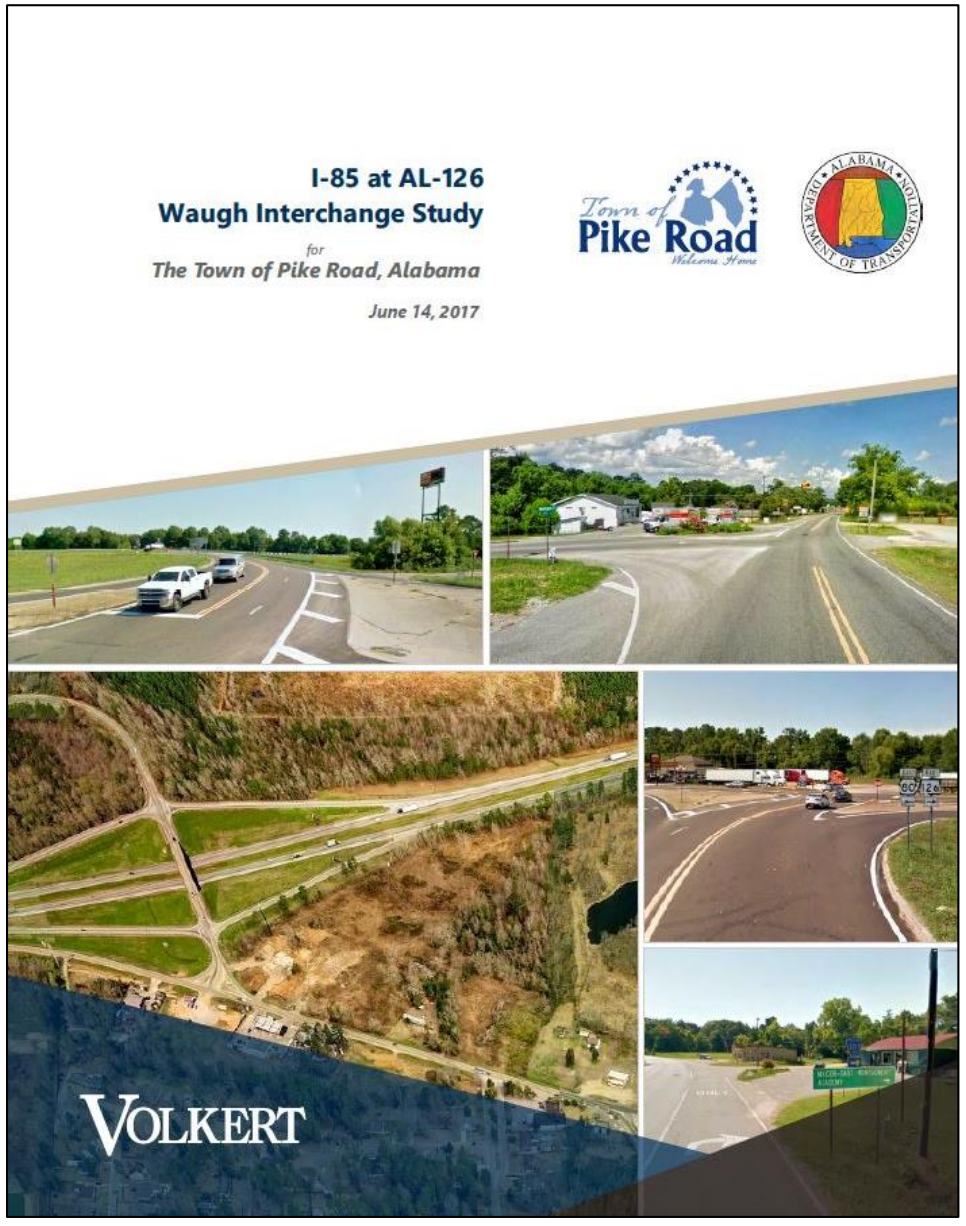
3



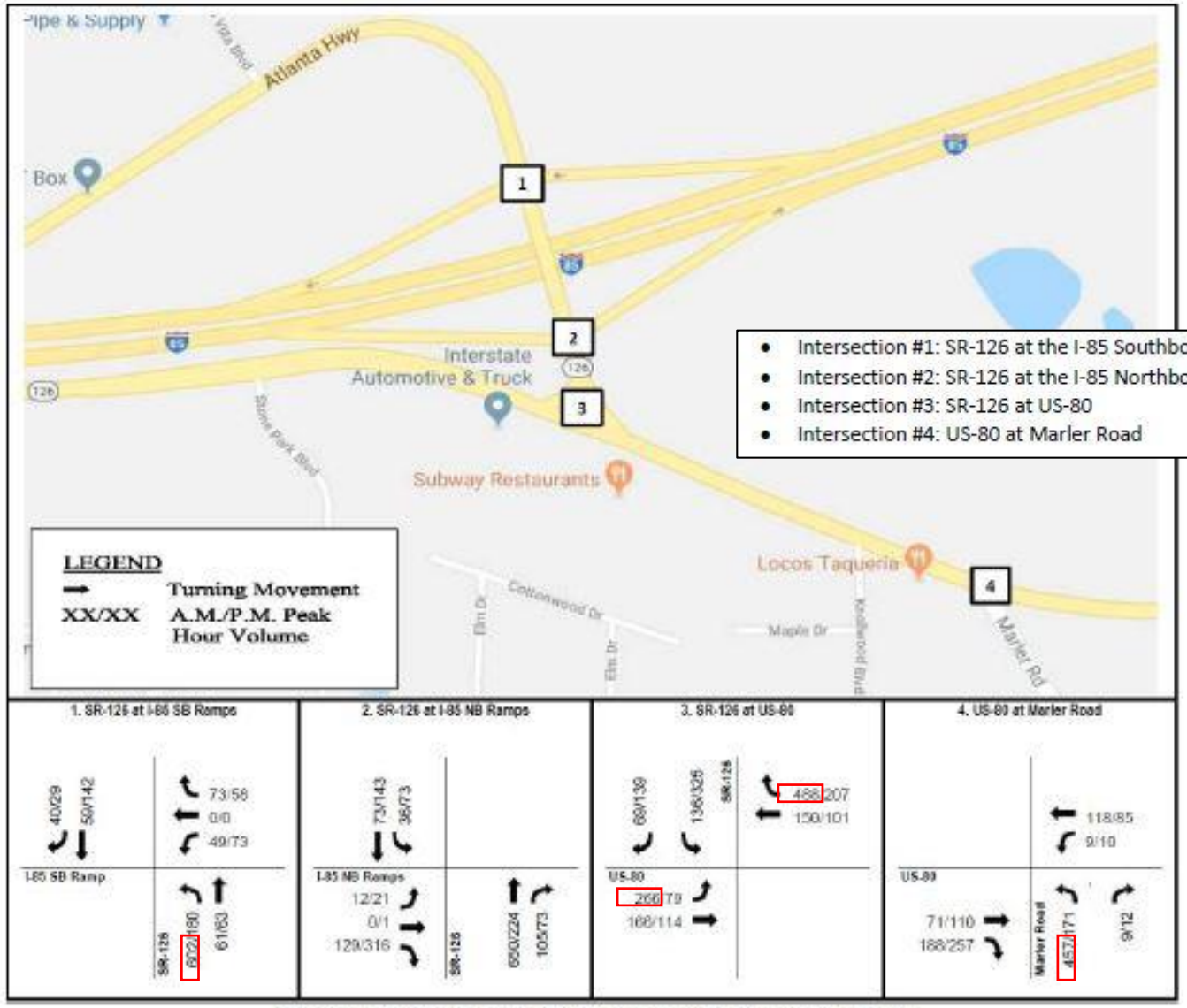


Existing
US-80 /
Marler Rd.
Intersection

Previous Interchange Study



Traffic Data was collected on January 17, 2019



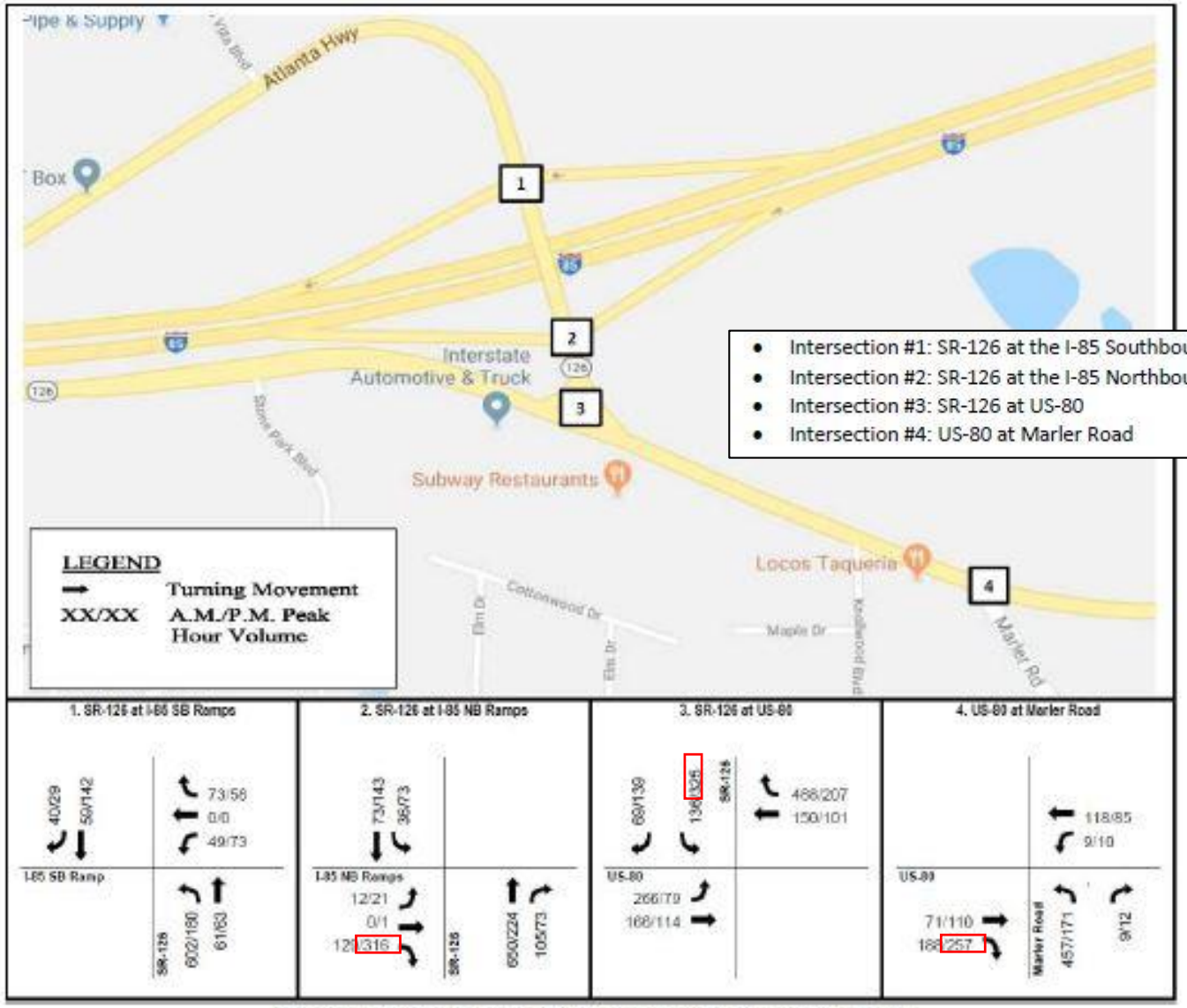
- Intersection #1: SR-126 at the I-85 Southbound Ramps
- Intersection #2: SR-126 at the I-85 Northbound Ramps
- Intersection #3: SR-126 at US-80
- Intersection #4: US-80 at Marler Road

Figure 5. Existing (2019) AM and PM Peak Hour Volumes

Existing 2019
AM and PM
Peak Hour Volumes

Turning Movement Volumes

Traffic Data was collected on January 17, 2019



- Intersection #1: SR-126 at the I-85 Southbound Ramps
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- Intersection #3: SR-126 at US-80
- Intersection #4: US-80 at Marler Road

Figure 5. Existing (2019) AM and PM Peak Hour Volumes

Existing 2019
AM and PM
Peak Hour Volumes

Turning Movement Volumes

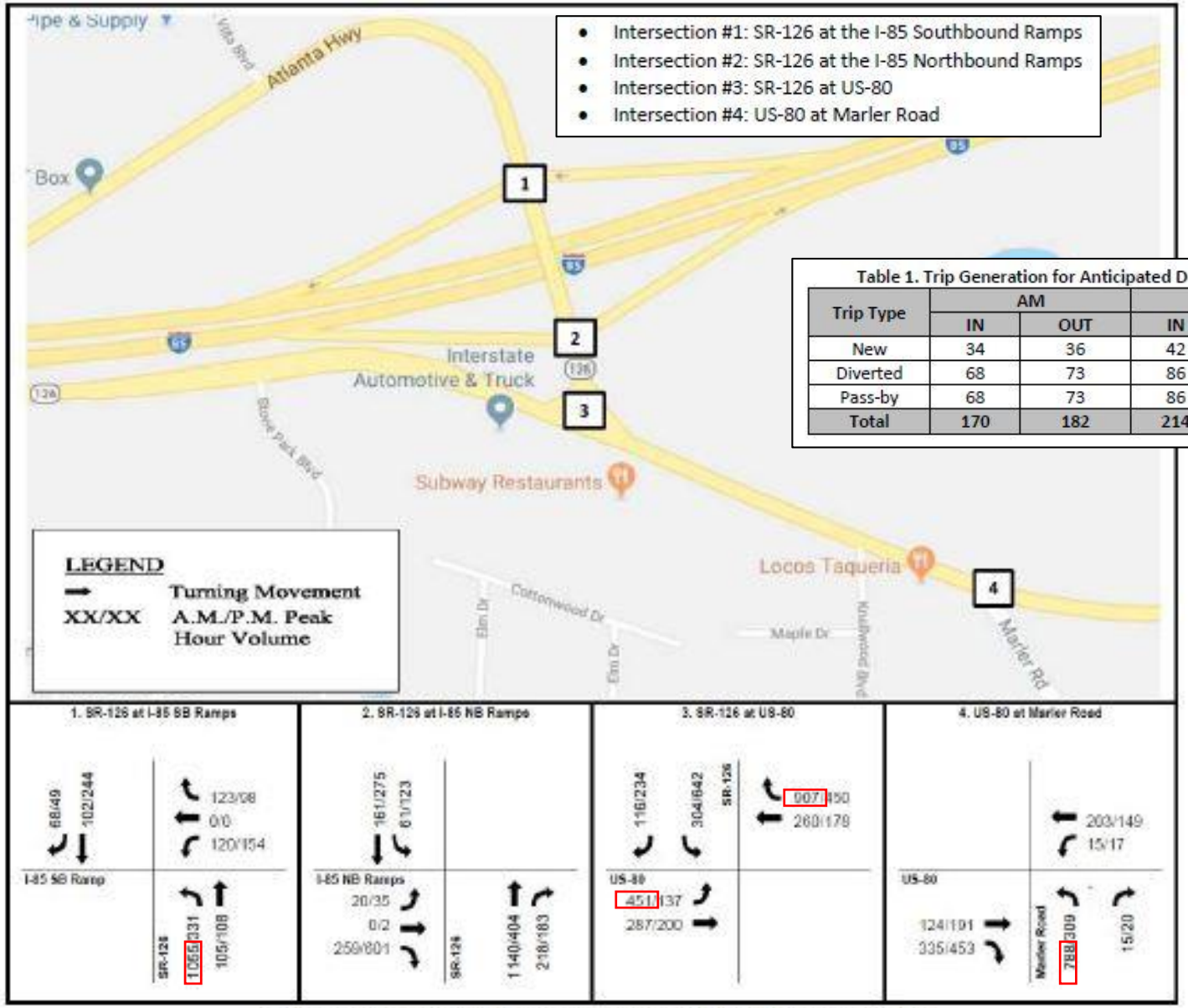


Table 1. Trip Generation for Anticipated Development

Trip Type	AM		PM	
	IN	OUT	IN	OUT
New	34	36	42	40
Diverted	68	73	86	80
Pass-by	68	73	86	80
Total	170	182	214	200

Figure 6. Design Year (2042) AM and PM Peak Hour Volumes

Future 2042
AM and PM
Peak Hour Volumes

2042 Turning Movement Volumes

Table 2: Preliminary Sidra Intersection Level of Service – Design Year (2042)*

	Approach	AM Peak		PM Peak	
		LOS	Delay	LOS	Delay
Intersection #1 SR-126 at I-85 Southbound Ramps	Westbound (Southbound I-85 Off-ramp)	C	19.4	A	7.3
	Northbound (SR-126)	A	6.7	A	4.1
	Southbound (SR-126)	C	15.3	A	8.6
	Overall Intersection	**A**	**9.6**	**A**	**6.3**
Intersection #2 SR-126 at I-85 Northbound Ramps	Eastbound (Northbound I-85 Off-ramp)	A	6.2	C	22.9
	Northbound (SR-126)	A	9.2	A	5.7
	Southbound (SR-126)	A	4.5	A	5.7
	Overall Intersection	**A**	**8.2**	**B**	**12.4**
Intersection #3 SR-126 at US-80	Eastbound (US-80)	D	27.6	B	14.9
	Westbound (US-80)	A	1.9	A	1.3
	Southbound (SR-126)	A	6.1	A	9.0
	Overall Intersection	**B**	**10.8**	**A**	**7.4**
Intersection #4 US-80 at Marler Road	Eastbound (US-80)	A	8.7	B	10.2
	Westbound (US-80)	C	24.0	A	7.3
	Northbound (Marler Road)	D	27.2	A	8.1
	Overall Intersection	**C**	**20.2**	**A**	**9.2**

*All LOS values are based on HCM 2010 – Roundabout Intersection Capacity

2042 Sidra Traffic Analysis

Table 3: Detailed VISSIM Intersection Level of Service – Design Year (2042)*

	Approach	AM Peak		PM Peak	
		LOS	Delay	LOS	Delay
Intersection #1 SR-126 at I-85 Southbound Ramps	Westbound (Southbound I-85 Off-ramp)	B	13.8	A	3.2
	Northbound (SR-126)	A	1.1	A	0.4
	Southbound (SR-126)	D	30.7	A	7.6
	Overall Intersection	**A**	**6.2**	**A**	**3.3**
Intersection #2 SR-126 at I-85 Northbound Ramps	Eastbound (Northbound I-85 Off-ramp)	A	7.3	B	14.1
	Northbound (SR-126)	N/A (Free-flow)			
	Southbound (SR-126)	B	11.7	C	22.2
	Overall Intersection	**A**	**9.3**	**B**	**17.2**
Intersection #3 SR-126 at US-80	Eastbound (US-80)	A	4.3	A	9.2
	Westbound (US-80)	A	8.1	A	4.0
	Southbound (SR-126)	A	3.7	A	4.1
	Overall Intersection	**A**	**6.1**	**A**	**5.0**
Intersection #4 US-80 at Marler Road	Eastbound (US-80)	A	4.3	A	4.1
	Westbound (US-80)	D	25.9	A	3.7
	Northbound (Marler Road)	A	8.8	A	3.7
	Overall Intersection	**A**	**9.5**	**A**	**3.9**

*All LOS values are based on HCM 2010 – Roundabout Intersection Capacity (Intersections #1, #3, and #4) and Signalized Intersection Capacity (Intersection #2)

2042 VISSIM Traffic Analysis

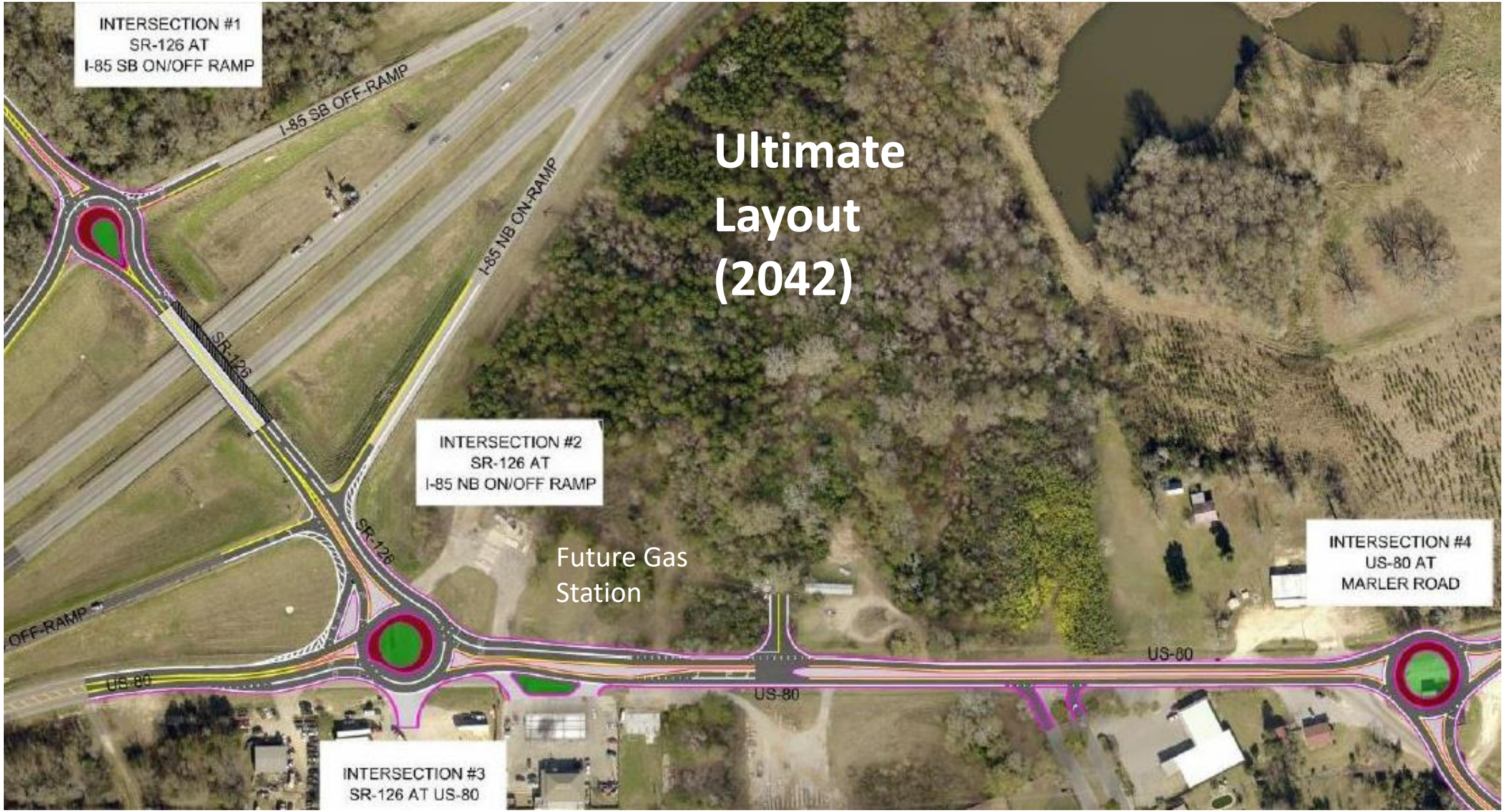

INTERSECTION #1
SR-126 AT
I-85 SB ON/OFF RAMP
I-85 SB OFF-RAMP
I-85 NB ON-RAMP
SR-126
Ultimate
Layout
(2042)
INTERSECTION #2
SR-126 AT
I-85 NB ON/OFF RAMP
SR-126
Future Gas
Station
INTERSECTION #4
US-80 AT
MARLER ROAD
OFF-RAMP
US-80
US-80
US-80
INTERSECTION #3
SR-126 AT US-80

Table 4: Detailed VISSIM Intersection Level of Service – Interim Year (2037)*

	Approach	AM Peak		PM Peak	
		LOS	Delay	LOS	Delay
Intersection #1 SR-126 at I-85 Southbound Ramps	Westbound (Southbound I-85 Off-ramp)	C	16.7	A	2.6
	Northbound (SR-126)	A	2.3	A	0.8
	Southbound (SR-126)	F	51.4	A	6.6
	Overall Intersection	**A**	**9.8**	**A**	**3.0**
Intersection #2 SR-126 at I-85 Northbound Ramps	Eastbound (Northbound I-85 Off-ramp)	A	4.6	D	25.2
	Northbound (SR-126)	N/A (Free-flow)			
	Southbound (SR-126)	A	2.1	A	3.2
	Overall Intersection	**A**	**3.5**	**C**	**16.7**
Intersection #3 SR-126 at US-80	Eastbound (US-80)	A	4.6	B	10.5
	Westbound (US-80)	C	19.2	A	4.2
	Southbound (SR-126)	A	3.2	A	3.3
	Overall Intersection	**B**	**11.7**	**A**	**4.9**
Intersection #4 US-80 at Marler Road	Eastbound (US-80)	A	4.0	A	3.7
	Westbound (US-80)	C	16.0	A	3.3
	Northbound (Marler Road)	A	6.8	A	3.4
	Overall Intersection	**A**	**7.0**	**A**	**3.6**

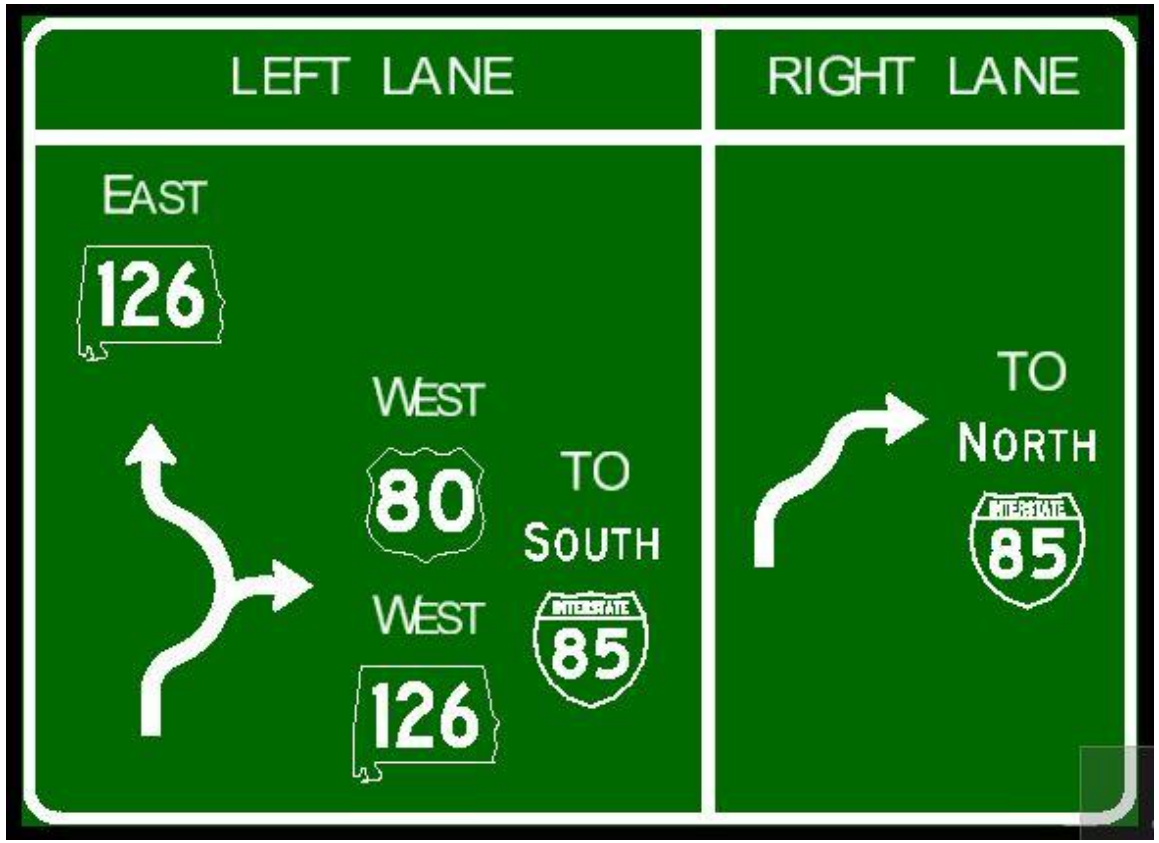
*All LOS values are based on HCM 2010 – Roundabout Intersection Capacity (Intersections #1, #3, and #4) and Unsignalized Intersection Capacity (Intersection #2)

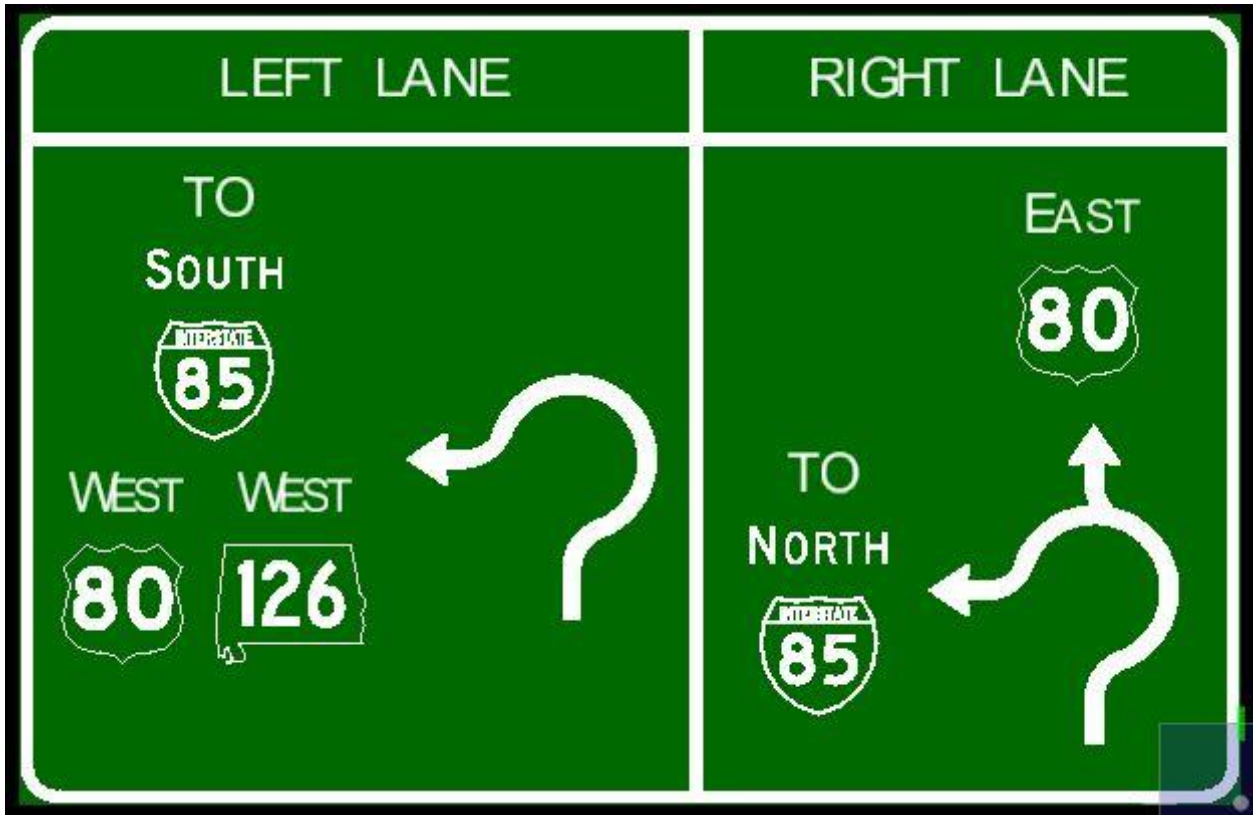
VISSIM Year of Failure Analysis


INTERSECTION #1
SR-126 AT
I-85 SB ON/OFF RAMP
I-85 SB OFF-RAMP
I-85 NB ON-RAMP
Phase 1
Layout
INTERSECTION #2
SR-126 AT
I-85 NB ON/OFF RAMP
SR-126
Future Gas
Station
INTERSECTION #4
US-80 AT
MARLER ROAD
I-85 NB OFF-RAMP
US-80
US-80
US-80
INTERSECTION #3
SR-126 AT US-80

SR-126/US-80 – Key Operational Element
Get drivers in correct lane on approach

SR-126 EB Approach Guide Sign



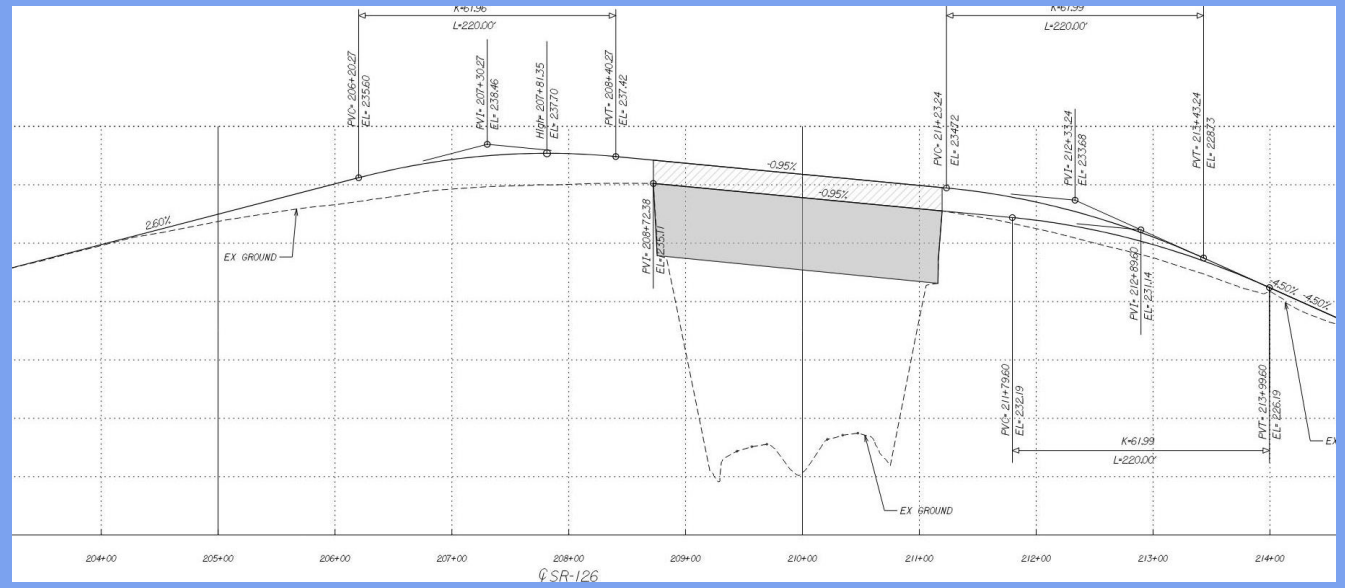


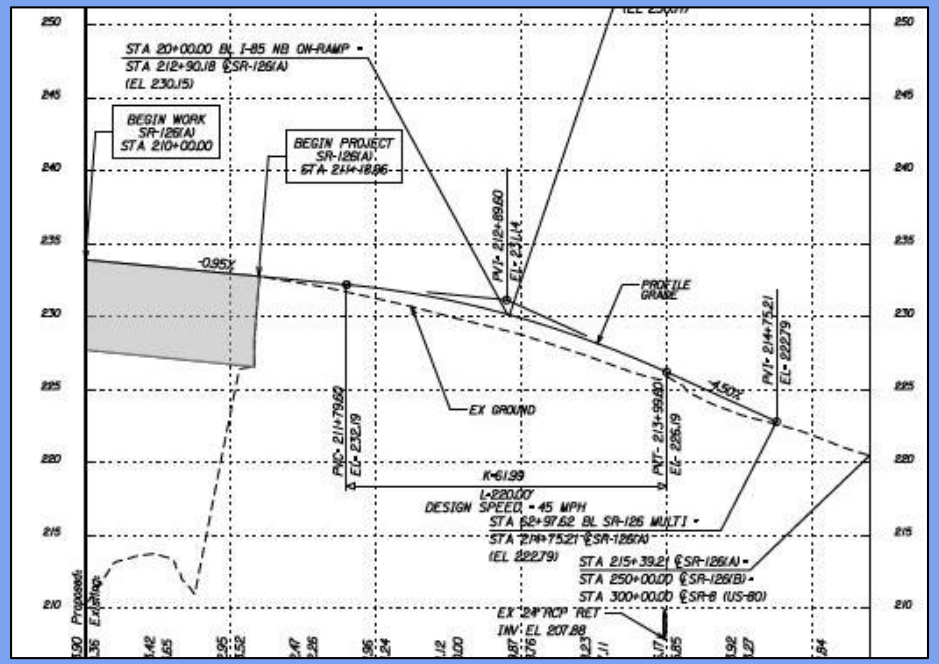
US-80/SR-126 WB Approach Guide Sign

Design Challenges

- Profiles - accommodate future I-85 bridge replacement
- Stay inside of ROW
  - Keep Roundabouts as small as possible
  - Future truck stop/gas station
- Keep Design Speeds of Approaches low
- Design for Access to all properties
- High Truck Volumes
- Traffic Control Plan (TCP) – maintaining traffic during construction

SR-126A Ultimate Profile (Phase 2)



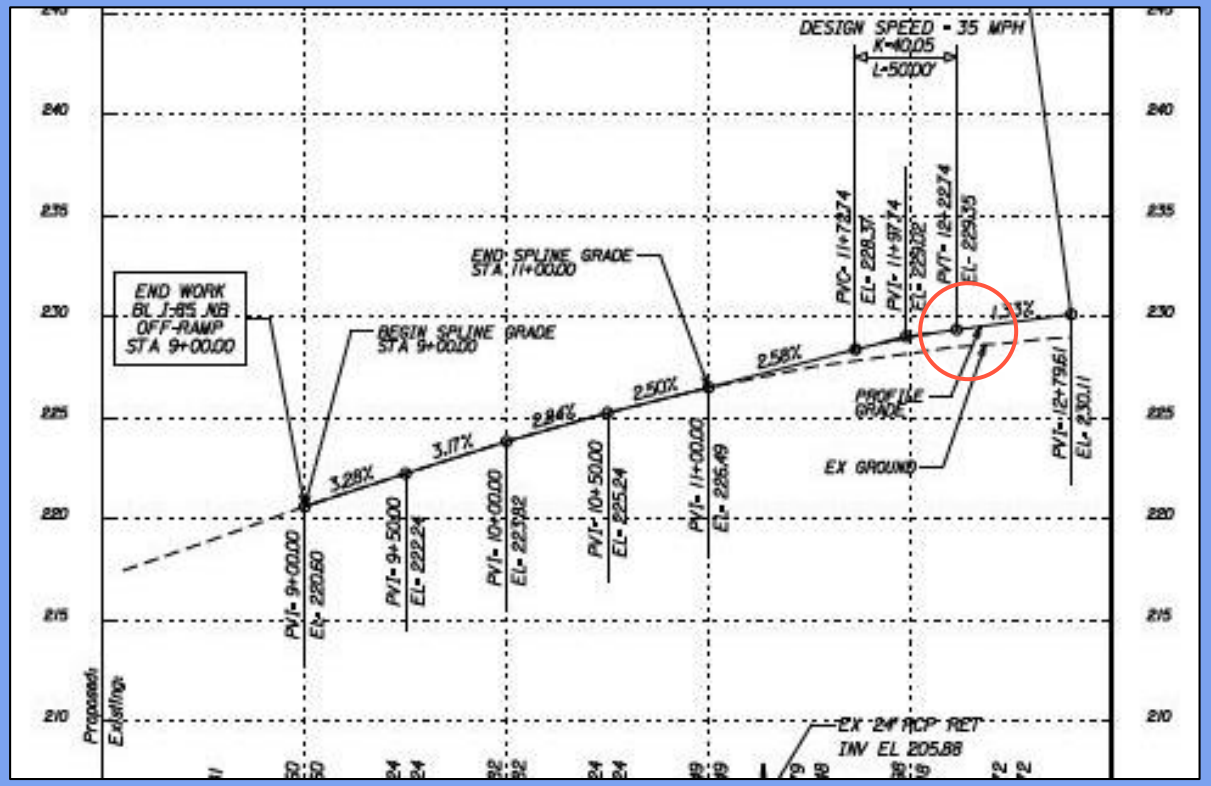


SR-126A Phase 1 Profile

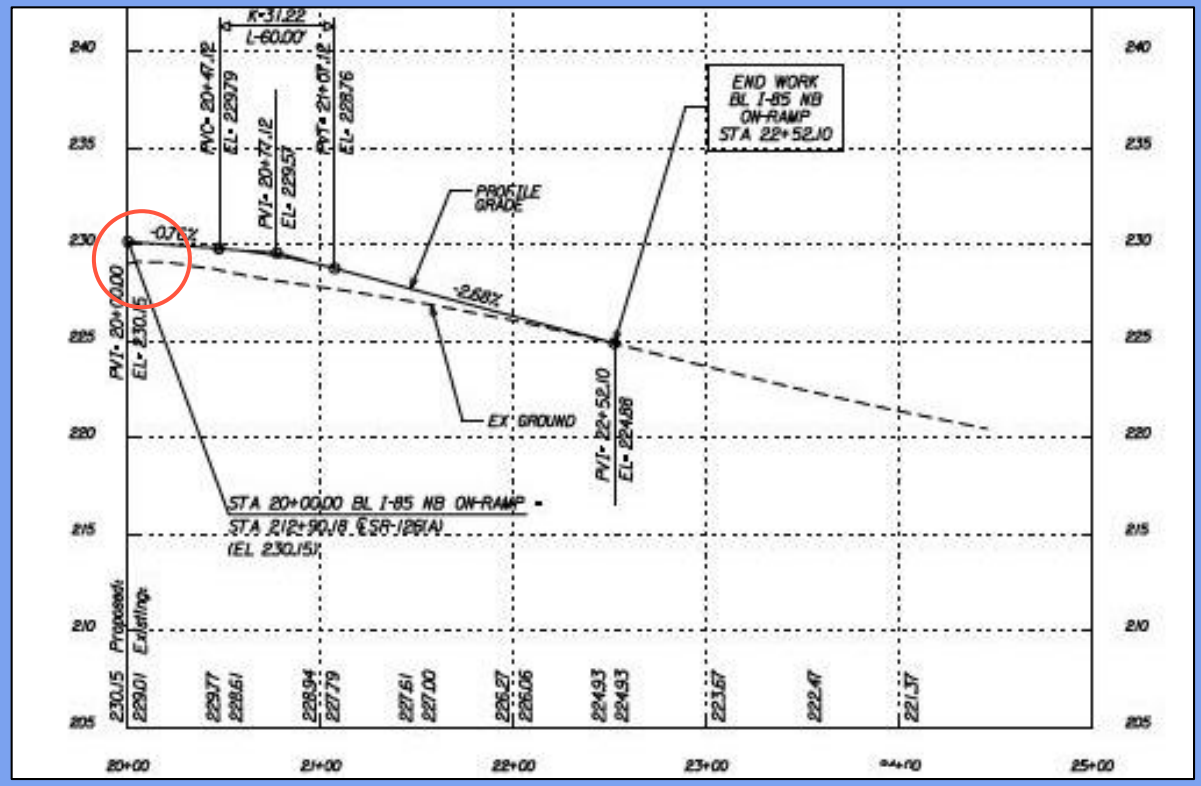
Profile Design Challenges
Ultimate vs. Phase 1 Profiles

- New bridge over I-85 (SR-126A) in Phase 2
- New bridge will be approximately 2 feet higher than existing bridge
- Design Phase 1 profiles to accommodate Ultimate Phase 2 project
  - SR-126
  - SR-126/US-80 roundabout
  - I-85 NB Off-Ramp tie
  - I-85 NB On-Ramp tie

Profile Design Challenges
Raise I-85 NB Ramp Profiles



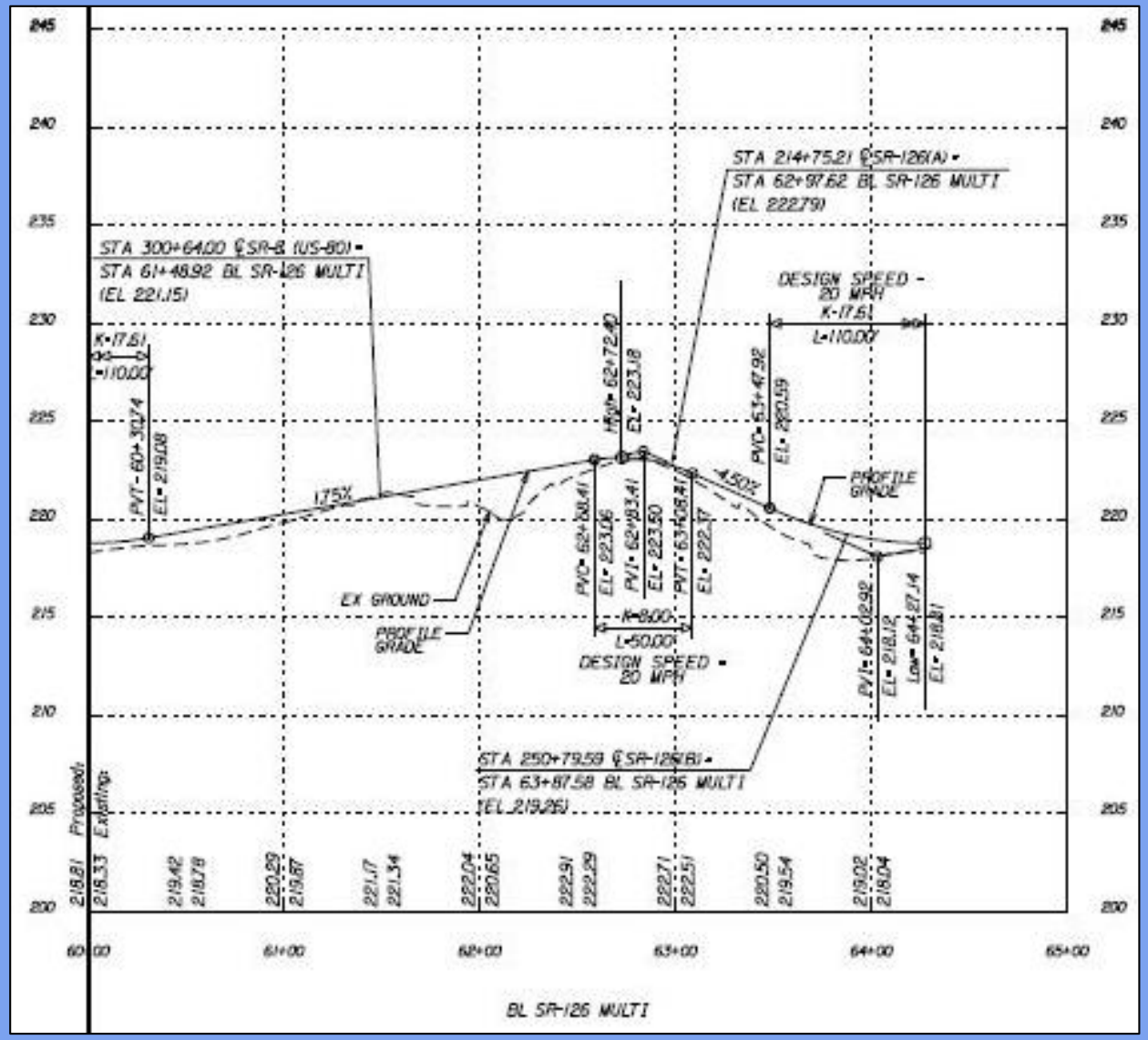
I-85 NB Off-Ramp Profile



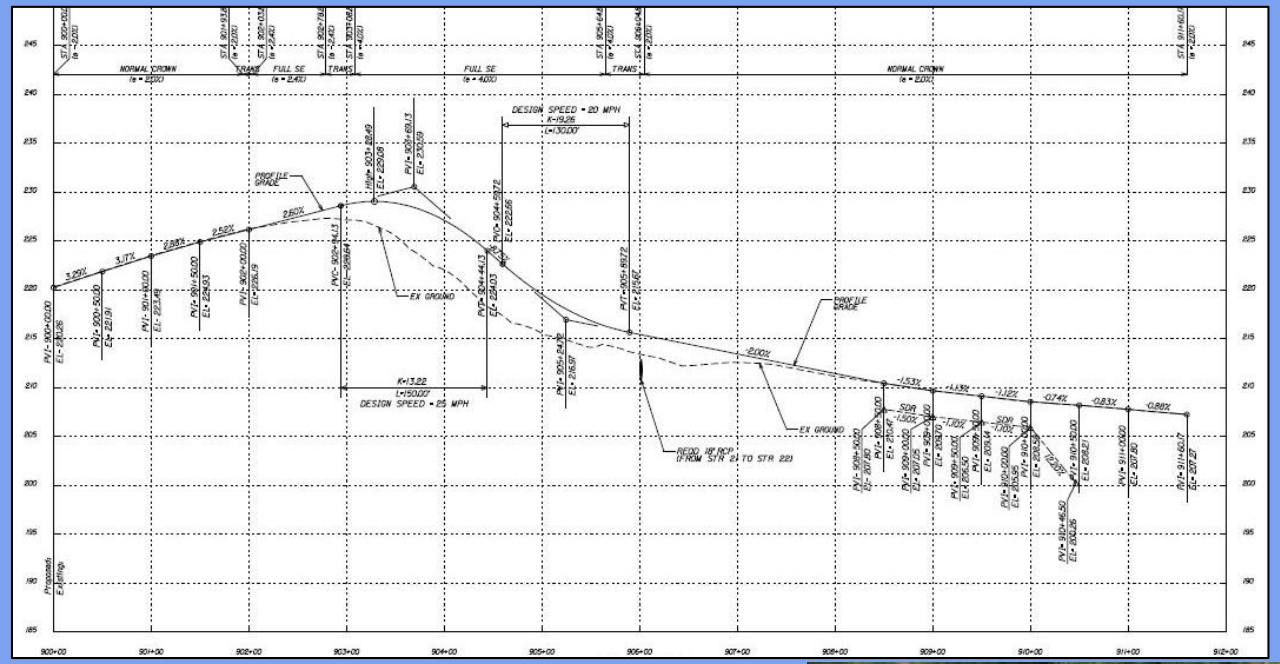
I-85 NB On-Ramp Profile

Profile Design Challenges
SR-126/US-80 Ramp Profile

- SR-126A, SR-126B and US-80 alignments all tie to Multi-Lane Roundabout Alignment
- Circulatory Roadway profile is high to avoid existing pavement removal in roundabout and on approaches
  - Maintenance of traffic



SR-126 at US-80 (#3) Profile



I-85 NB Loop Ramp Profile

Profile Design Challenges
I-85 NB Ramp/SR-126 WB Loop

I-85 Loop Ramp touches 3 alignments

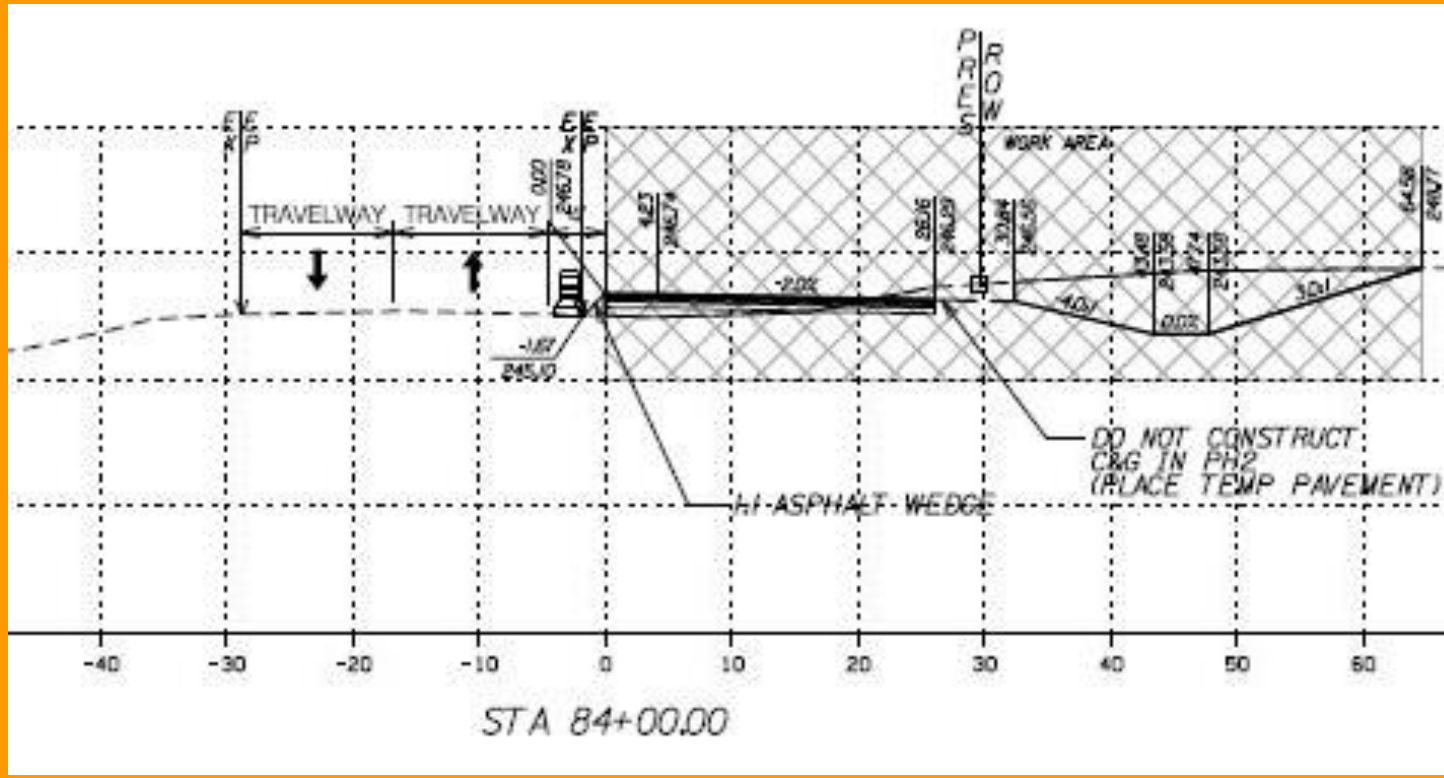
- I-85 NB Off-Ramp
- SR-126(A) (offset by truck apron)
- SR-126(B)

Curve Radius = 85’

- Largest radius we could get in that tight area

Traffic Control Plan (TCP)

- Building roundabouts on top of existing intersection challenging
- Protection of the construction & CE&I workers
- Four phase TCP to maintain traffic during construction
- Included phased TCP cross-sections in plans



And then COVID-19……..
Public Involvement Meeting

- ALDOT Public Involvement Website
- Gresham Smith Roundabout Presentation
- ALDOT Roundabout Presentation
- Project Layouts
- Renderings (Still and Fly-Around)
- Traffic Simulation Video

Online Public Involvement for HSIP-5119(250): Roundabouts on SR-126 at I-85 Southbound Ramp, at SR-126/US-80 Intersection and on US-80 at Marler Rd

I-85 SB Ramp Intersection Concept Map (Phase II)

Project Overview

Location: Waugh (Montgomery County)

The Alabama Department of Transportation (ALDOT), in collaboration with the Federal Highway Administration (FHWA) and the Town of Pike Road, is proposing the installation of roundabouts and access management techniques along SR-126 and SR-8(US-80) from the I-85 Southbound ramps to Marler Road. This area experiences a high traffic volume with congestion throughout the day and can back up traffic on I-85. The proposed modifications to the roadway are designed to improve the flow and safety of traffic. The current plans convert three intersections into roundabouts and convert some driveways to a right in/right out only turn movement to aid in preventing crashes.

All comments regarding the project proposal must be received on or before October 2, 2020 in order to be included in the administrative record.

Contact US

Project Videos

FUTURE TRAFFIC SIMULATION | ROUNDABOUT INFORMATION (VIDEO - NO AUDIO)

Online Public Involvement for Project HSIP-5119 (250)

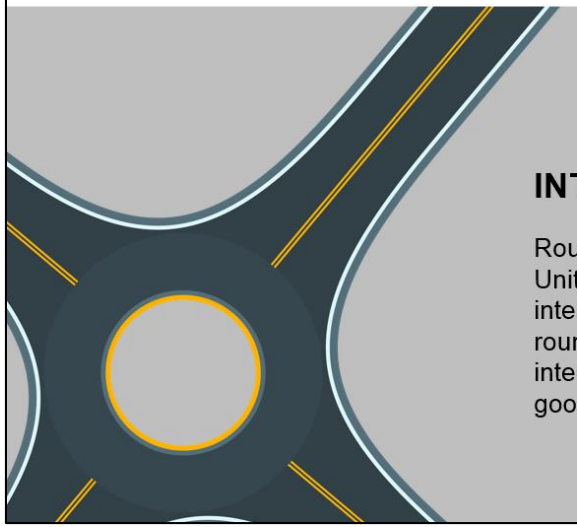
Montgomery County, AL

Gresham Smith

ALDOT Roundabout Presentation

UNDERSTANDING ALABAMA'S

ROUNDABOUTS



INTERSECTION SAFETY

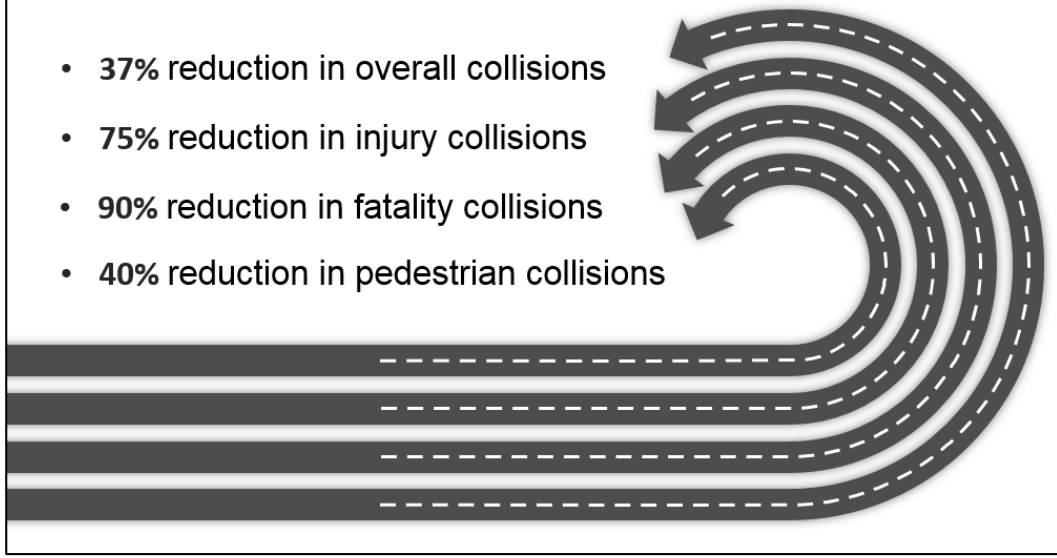
Roughly 25% of all traffic fatalities in the Unites States are associated with intersections. In many locations, roundabouts have proven to be a safe intersection design that keeps people and goods moving.

ROUNDABOUT

SAFETY RESEARCH

Studies have shown that roundabouts typically achieve:

- **37%** reduction in overall collisions
- **75%** reduction in injury collisions
- **90%** reduction in fatality collisions
- **40%** reduction in pedestrian collisions



INSTALLATION OF ROUNDABOUTS ON SR-126 AT I-85 EXIT 16 SOUTHBOUND RAMPS, AND AT SR-126 (SR-8) (US-80) INTERSECTION, AND ON SR-8 (US-80) AT MARLER ROAD, MONTGOMERY COUNTY

PLAN LAYOUT

LEGEND

EXISTING PAVEMENT TO BE RETAINED
EXISTING PAVEMENT TO BE REMOVED
PROPOSED PAVEMENT OR OVERLAY
PROPOSED PAVEMENT (BY OTHERS)
PROPOSED CONCRETE ISLAND
PROPOSED GRASS
PROPOSED TRUCK APRON
PROPOSED GRAVEL DRIVEWAY
REQUIRED TEMPORARY EASEMENT
EXISTING RIGHT OF WAY
REQUIRED RIGHT OF WAY
PROPERTY LINES
EXISTING DENIED ACCESS (D.A.) FENCE
REQUIRED DENIED ACCESS (D.A.) FENCE

ALABAMA DEPARTMENT OF TRANSPORTATION

Index to Project

Prepared By:

Gresham Smith

DATE: 8/23/2020

INSTALLATION OF ROUNDABOUTS ON SR-126 AT I-85 EXIT 16 SOUTHBOUND RAMPS, AND AT SR-126 (SR-8) (US-80) INTERSECTION, AND ON SR-8 (US-80) AT MARLER ROAD, MONTGOMERY COUNTY
INSET A

PLAN LAYOUT

LEGEND

ALABAMA DEPARTMENT OF TRANSPORTATION

Prepared By:

Gresham Smith

DATE: 8/23/2020

INSTALLATION OF ROUNDABOUTS ON SR-126 AT I-85 EXIT 16 SOUTHBOUND RAMPS, AND AT SR-126 (SR-8) (US-80) INTERSECTION, AND ON SR-8 (US-80) AT MARLER ROAD, MONTGOMERY COUNTY
INSET B

PLAN LAYOUT

LEGEND

ALABAMA DEPARTMENT OF TRANSPORTATION

Prepared By:

Gresham Smith

DATE: 8/23/2020

INSTALLATION OF ROUNDABOUTS ON SR-126 AT I-85 EXIT 16 SOUTHBOUND RAMPS, AND AT SR-126 (SR-8) (US-80) INTERSECTION, AND ON SR-8 (US-80) AT MARLER ROAD, MONTGOMERY COUNTY
INSET C

PLAN LAYOUT

ALABAMA DEPARTMENT OF TRANSPORTATION

Prepared By:

Gresham Smith

DATE: 8/23/2020


Installation of
Roundabout
on SR-126
at SR-8 (US-80) Intersection
Gresham
Smith


AM Peak Hour (2042)
US-80
US-80
Market Road
© 2020 DigitalGlobe
© 2020 Microsoft Corporation
© CNES (2020) Distribution Airbus DS
Note: Video is shown at 2x speed

Current Project Status

- Environmental Document (Categorical Exclusion) Approved
- ALDOT acquiring right of way
- ALDOT coordinating utility relocations
- Update drainage and cross sections at new gas station
- Plans 90% complete; scheduled for FBC submittal late February 2022
- Scheduled for June 24, 2022 letting

Questions?

Blair Perry, P.E.
State Transportation Leader – Alabama
205.298.9232
blair.perry@greshamsmith.com

Gresham Smith