

NC 55 Bypass at Avent Ferry Road "Reverse" RCUT

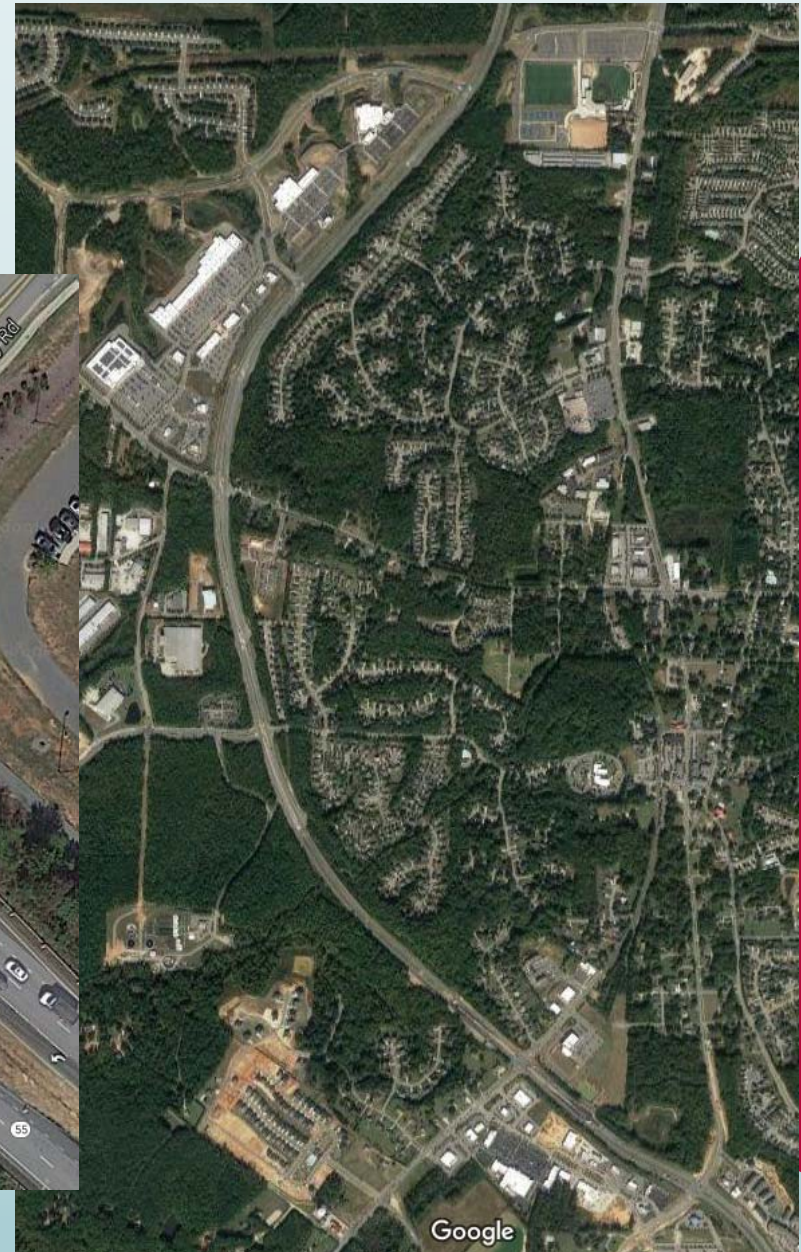
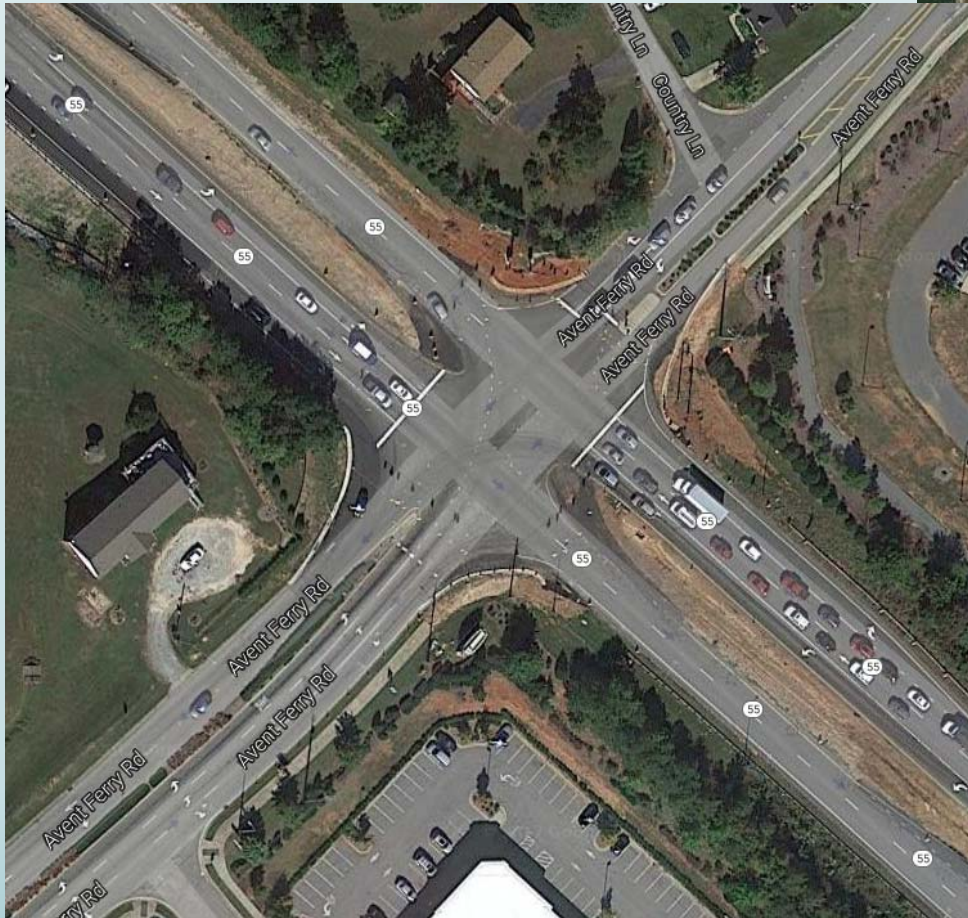
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Urban Street Symposium 5
May 22, 2017

NC 55 Bypass

Holly Springs, NC



Outline

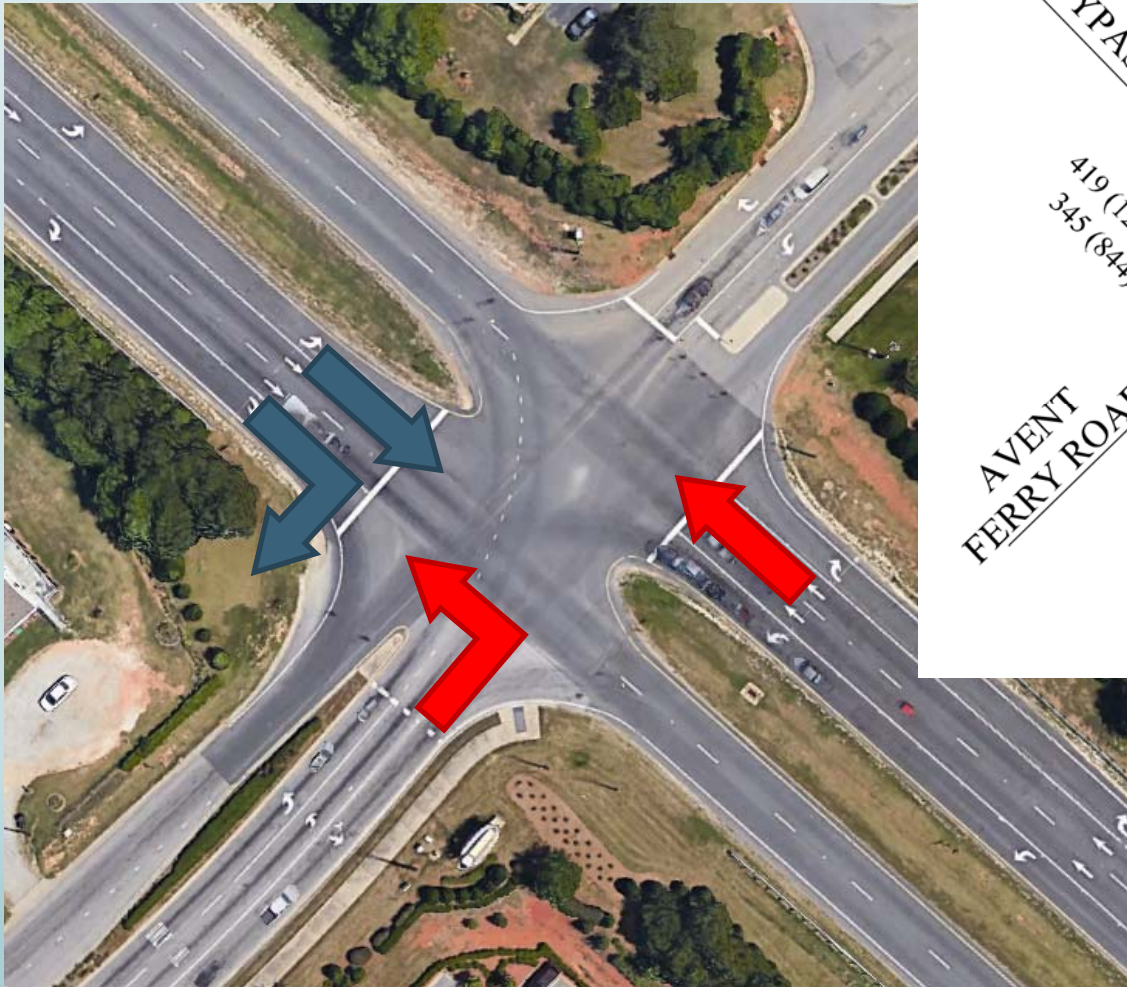
- Project Need
- Alternatives Analysis
- Design
- Funding
- Construction
- Results

Project Need

- 8-Phase signal created bottleneck
- Multi-cycle delays on multiple approaches
- Queuing issues
 - AM: Eastbound Avent Ferry Rd.
 - PM: Southbound NC 55 Bypass & Westbound Avent Ferry Rd.

Project Need

- Heavy movements



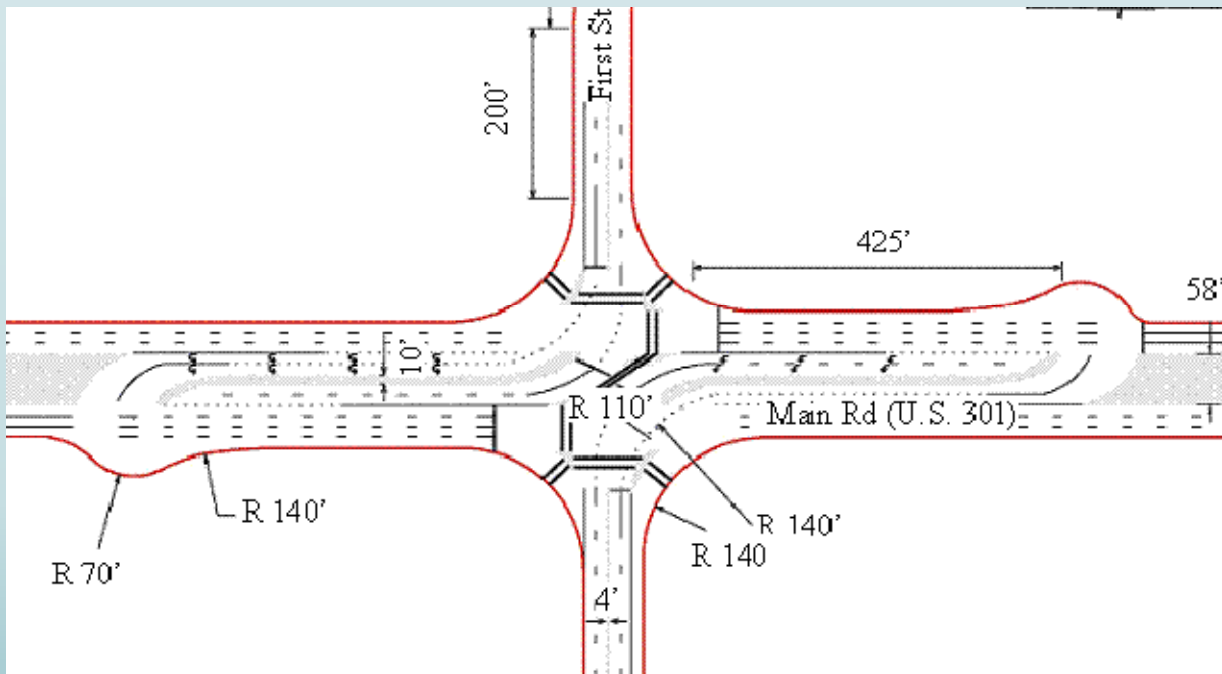
Project Need

- Development prohibits interchange
- Grades make traditional widening cost prohibitive



Alternatives Analysis

- Full-movement intersection
- Restricted Crossing U-Turn (w/ mainline lefts)
- Reverse RCUT (w/ side street lefts)



Source: FHWA-HRT-09-059

Alternatives Analysis

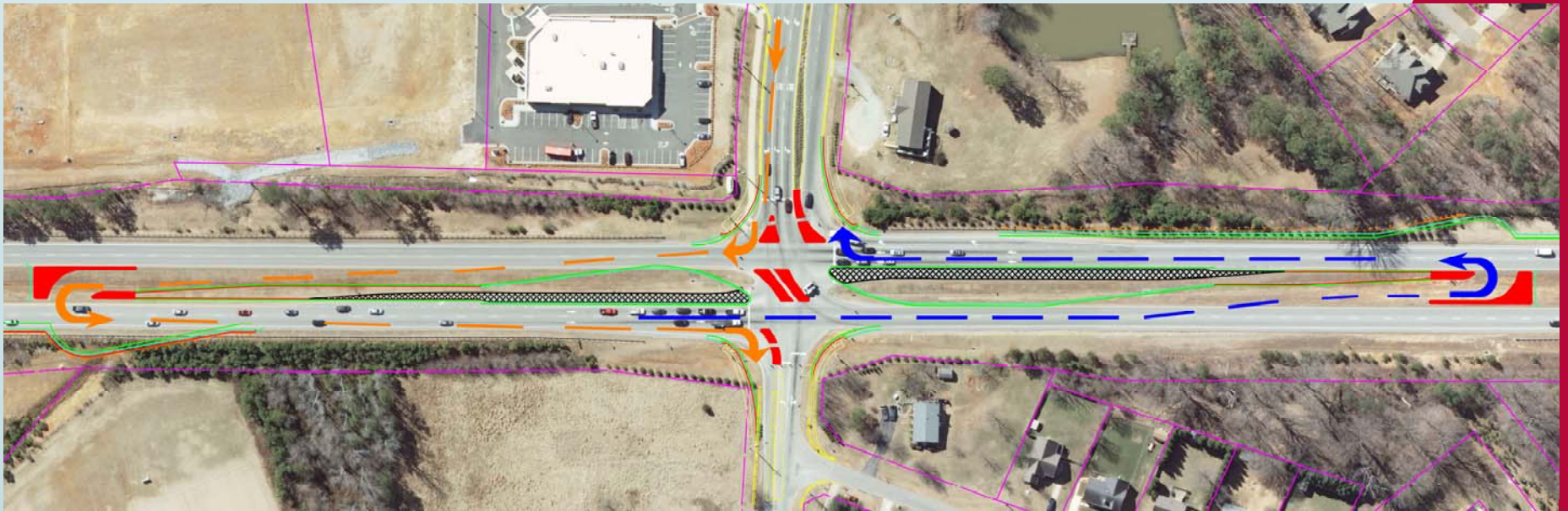
Intersection Level-of-Service Summary		
Condition	AM Peak Hour LOS (Delay in seconds)	PM Peak Hour LOS (Delay in seconds)
NC 55 at Avent Ferry Road (Signalized)		
Existing	D (50.2)	E (55.5)
Full-Movement Widening	D (45.7)	D (39.8)
RCUT	NB Crossover - B (10.6) SB Crossover - B (18.7)	NB Crossover - B (11.9) SB Crossover - B (16.8)
Reverse RCUT	C (28.4)	B (16.5)
NC 55 at U-Turn (N) Avent Ferry Road (Signalized)		
RCUT	A (4.2)	B (12.0)
Reverse RCUT	A (3.5)	A (6.6)
NC 55 at U-Turn (S) Avent Ferry Road (Signalized)		
RCUT	C (34.5)	B (15.4)
Reverse RCUT	B (13.4)	A (3.6)

Funding

- Project Budget = \$1,400,000
- Funding Sources
 - Discretionary funds from state legislature
 - NCDOT spot safety
 - Town funds

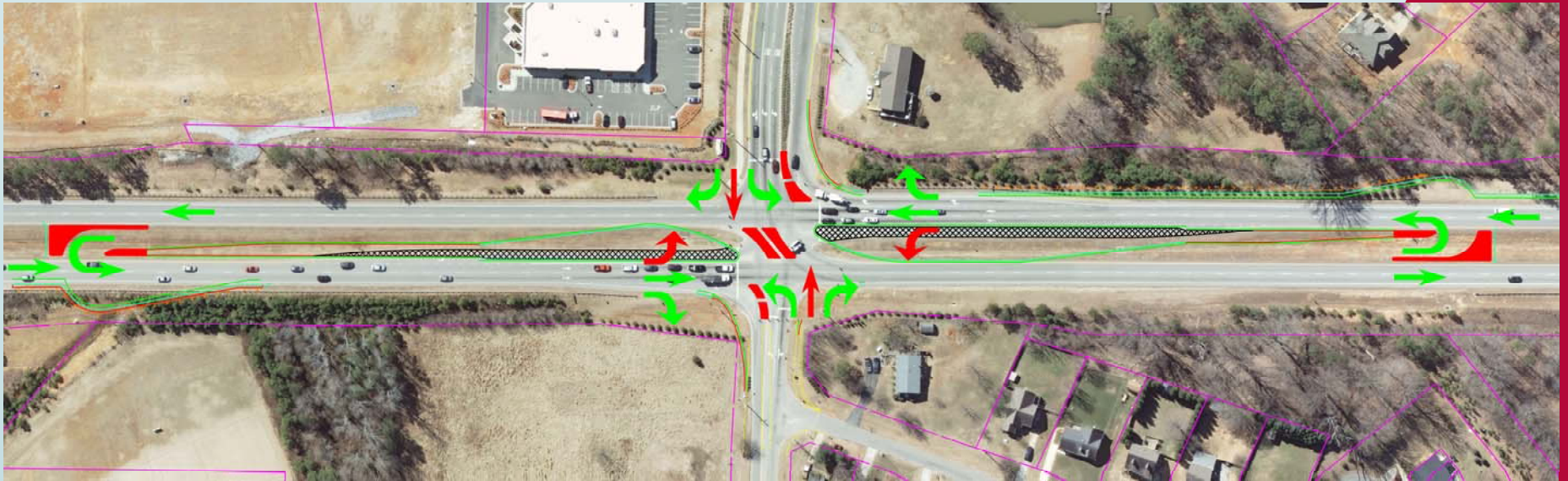
Public Education

- Social media
- Public meetings



Public Education

- Social media
- Public meetings

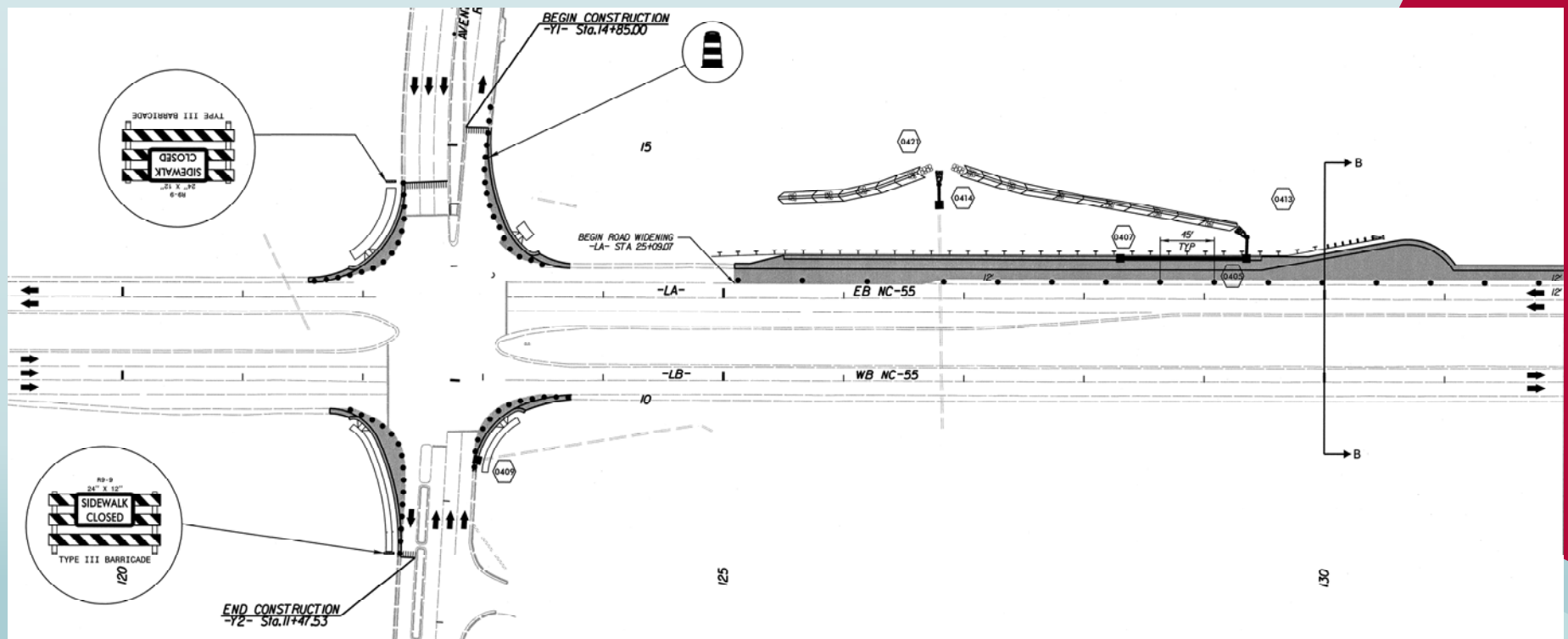


Construction Phasing

- High speed / high volume facility
- RCUT Advantages
 - Majority of work in the median or shoulders
 - Limited lane closures
 - Relatively simple construction

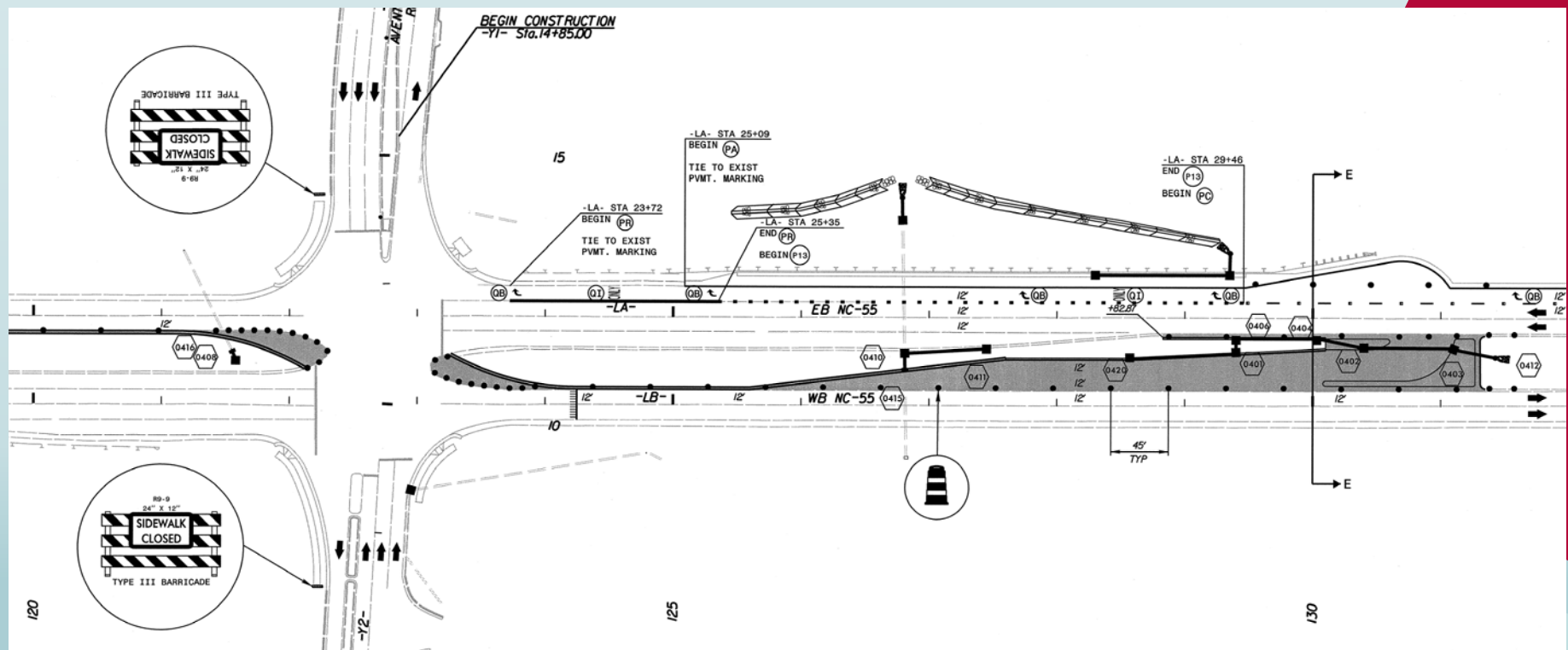
Construction Phasing

- Step 1:
 - Increase curb radii
 - U-turn bulb-outs

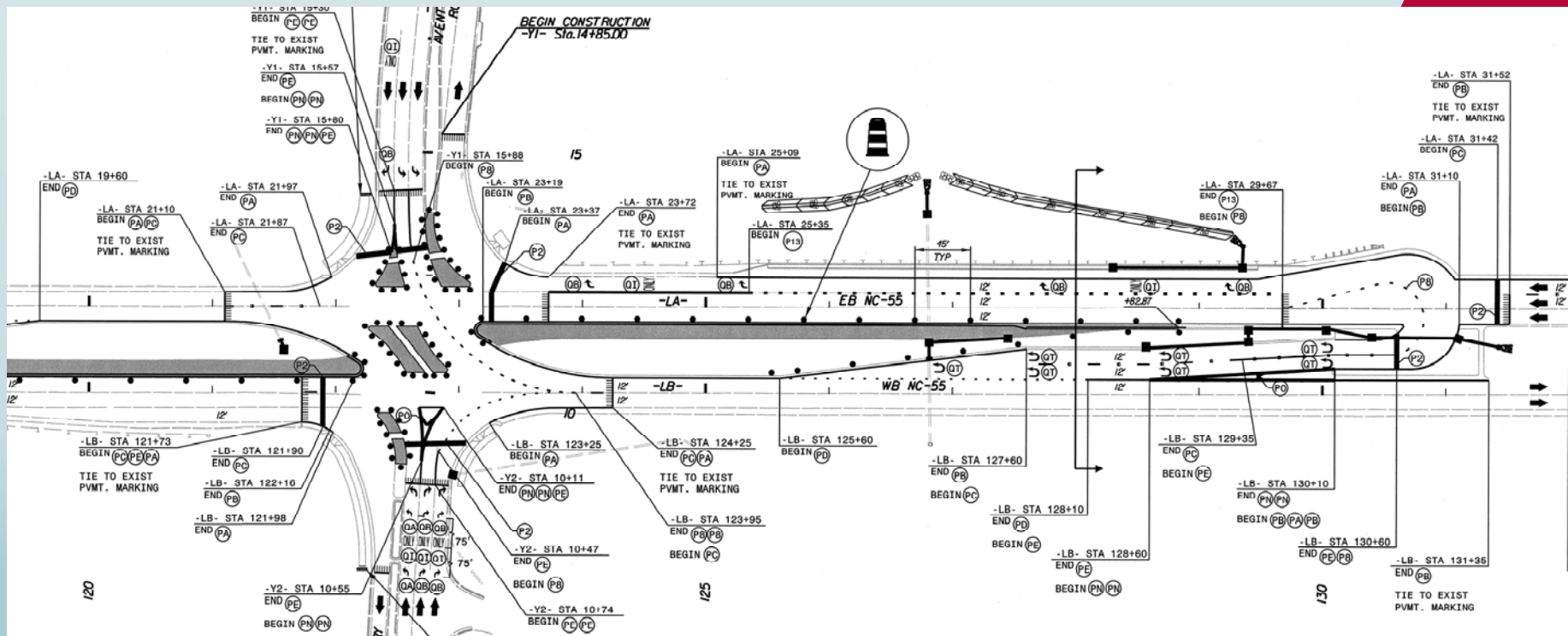


Construction Phasing

- Step 2:
 - U-turn lanes
 - U-turn signals



- Step 3:
 - Crossover median islands and signal
 - Remove mainline left-turn lanes

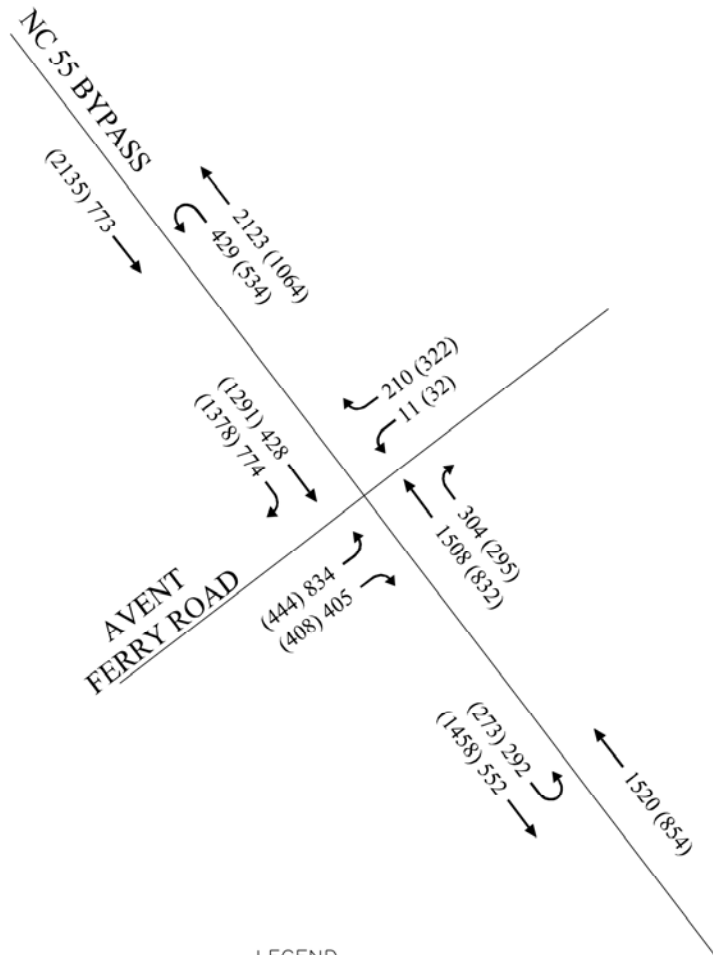


Results

Reverse RCUT Level-of-Service Comparison		
Condition	AM Peak Hour LOS (Delay in seconds)	PM Peak Hour LOS (Delay in seconds)
NC 55 at Avent Ferry Road (Signalized)		
2013 Traffic	C (28.4)	B (16.5)
2017 Traffic	C (28.7)	B (19.7)
NC 55 at U-Turn (N) Avent Ferry Road (Signalized)		
2013 Traffic	A (3.5)	A (6.6)
2017 Traffic	A (3.9)	B (19.1)
NC 55 at U-Turn (S) Avent Ferry Road (Signalized)		
2013 Traffic	B (13.4)	A (3.6)
2017 Traffic	A (2.5)	A (0.9)

Results

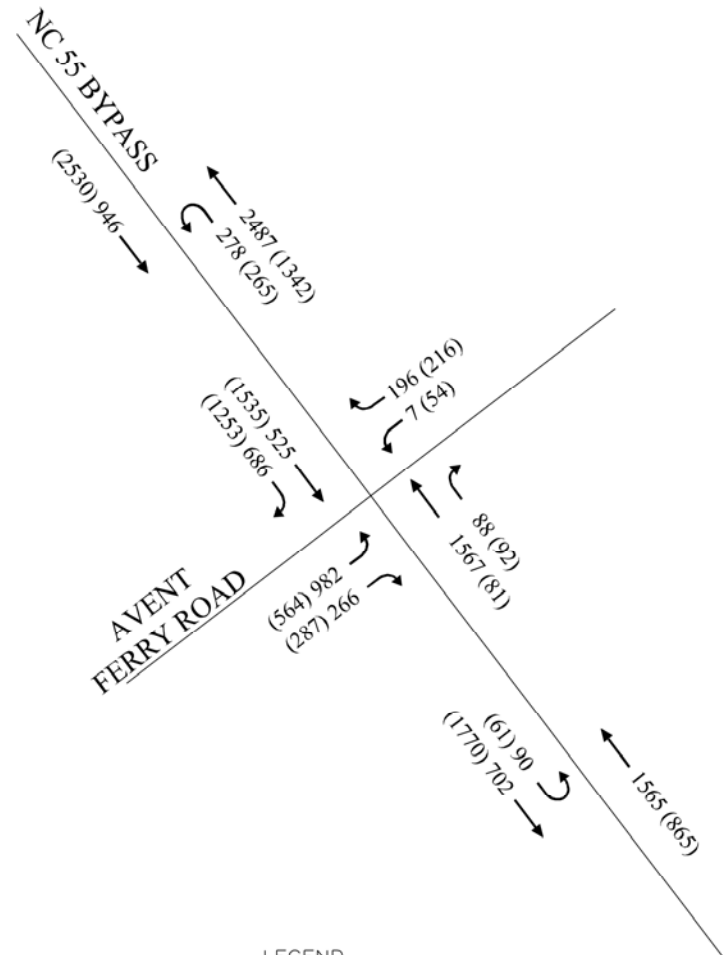
2013 TRAFFIC
(PRE-CONSTRUCTION)



LEGEND

XX AM PEAK HOUR
(XX) PM PEAK HOUR

2017 TRAFFIC
(POST-CONSTRUCTION)

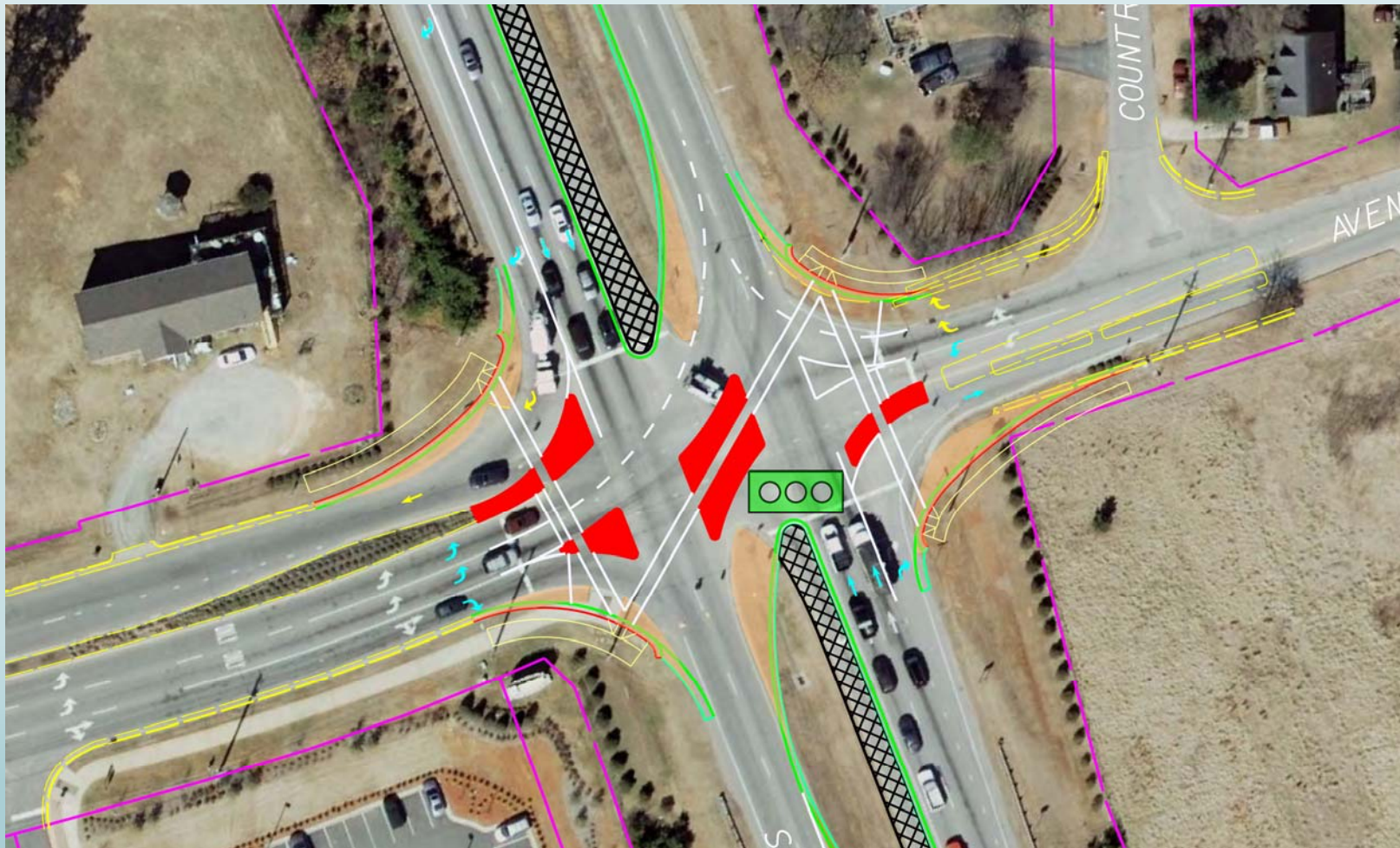


LEGEND

XX AM PEAK HOUR
(XX) PM PEAK HOUR

Results

- More bike/ped friendly



Results

Average Travel Time (MM:SS)

Location	Direction	AM Peak Hour			PM Peak Hour		
		Before	After	%Imp	Before	After	%Imp
NC 55	Southbound	5:42	4:20	24%	<u>10:47</u>	<u>5:30</u>	<u>49%</u>
	Northbound	5:32	5:28	1%	4:47	4:34	5%
Avent Ferry Rd/ NC 55	Southbound	1:40	1:41	-1%	5:39	3:44	<u>34%</u>
	Northbound	3:23	2:27	<u>28%</u>	4:39	2:32	46%

Questions?