

# ARTERIAL

PRESERVATION PROGRAM

US 17 Arterial Preservation Plan

*November 19, 2020; 1:00 PM – 3:00 PM*



# Meeting Agenda

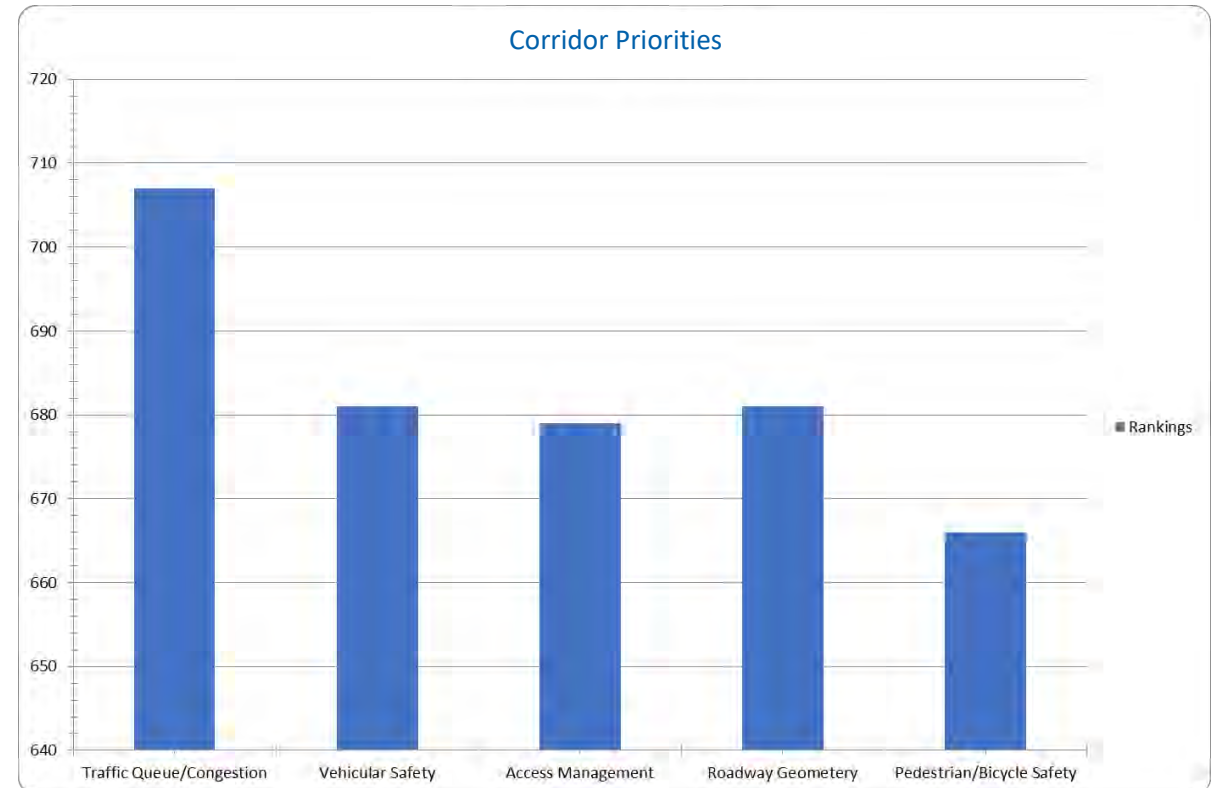
- Introductions/Goal of Today's Meeting
- Public Involvement Survey
- Innovative Intersection Concepts
- Future No-Build Study Intersection Evaluation
- Next Steps

# Introductions

- Goals of today's meeting is to:
  - Gain direction on intersections for concept development
  - NOTE: Specific concepts will not be determined today
- Discuss:
  - Innovative intersection types that may be considered
  - Future No Build Intersection analysis

# Public Involvement Survey

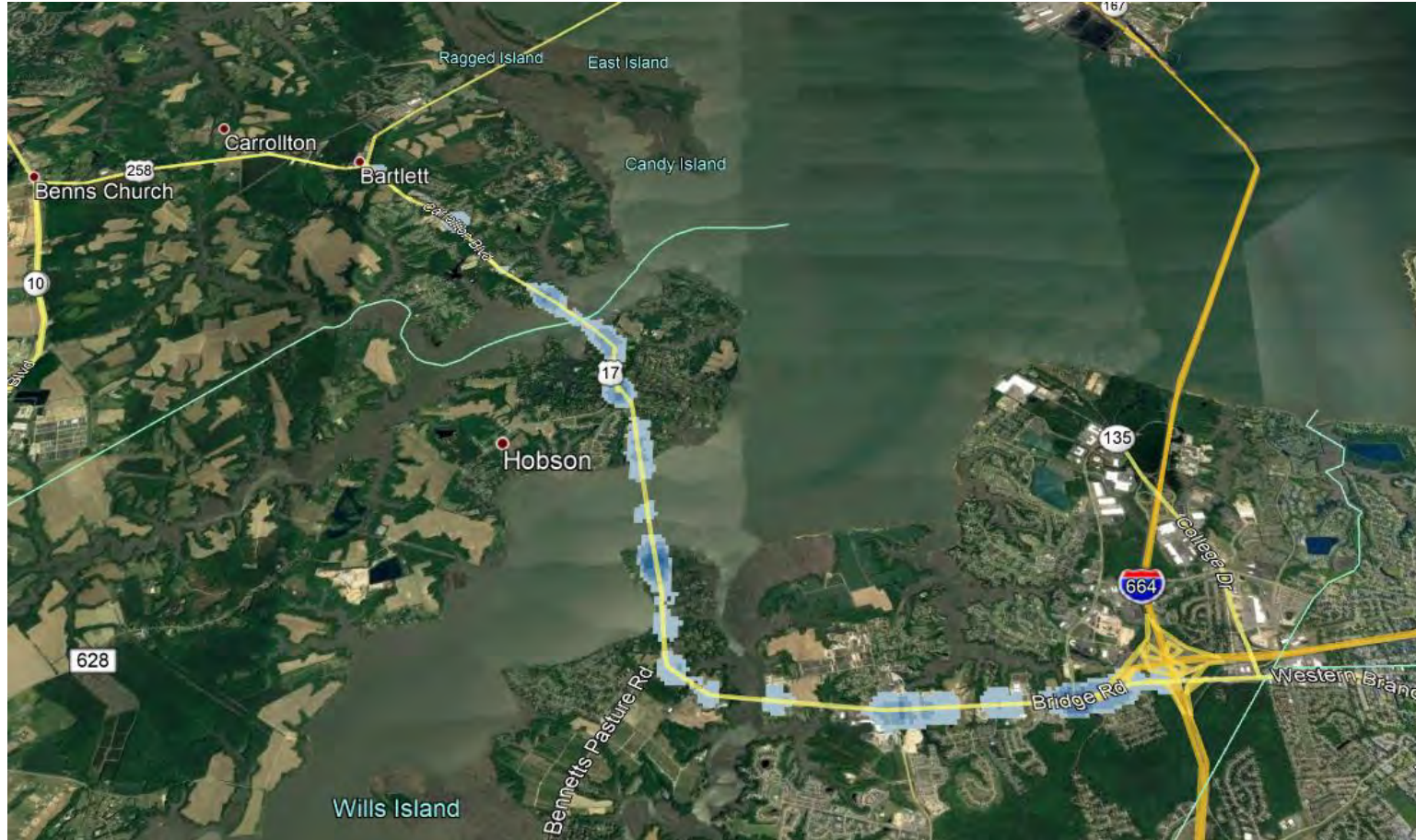
- MetroQuest Survey conducted in September
- 1,239 participants
- Over 2,000 “pins” dropped on the survey map



# Public Involvement Survey - Congestion



# Public Involvement Survey - Safety



# Innovative Intersection Fundamentals

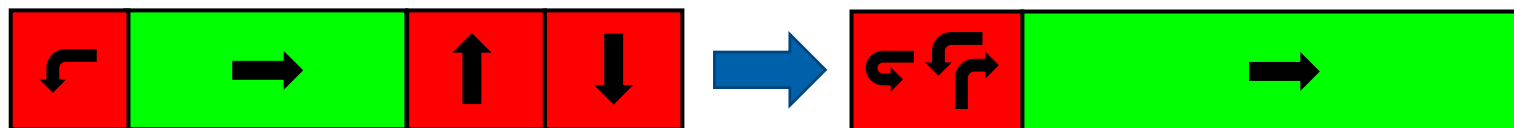
## Re-Route Left Turn Movements

- More efficiently serves through traffic



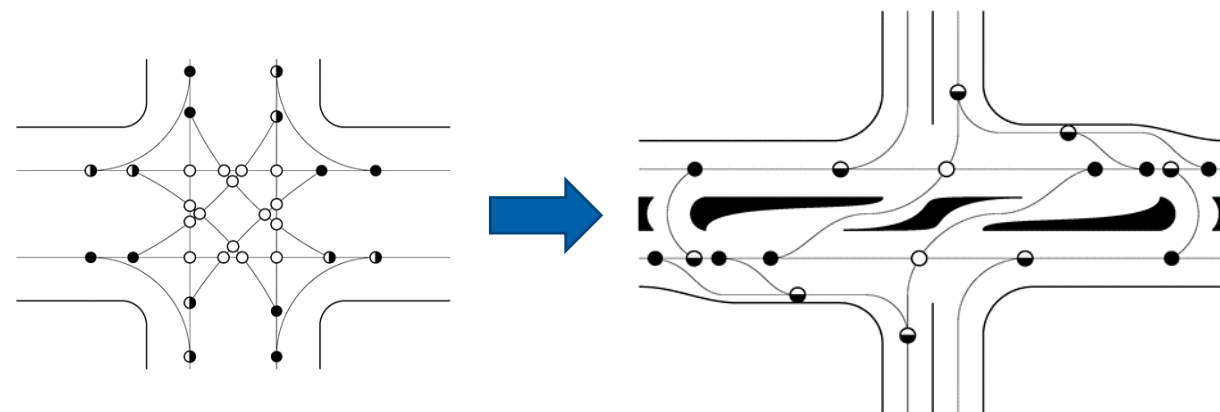
## Reduce Signal Phases

- Reduces delay



## Remove and Separate Conflicts

- Improves safety



# Innovative Intersections for Consideration

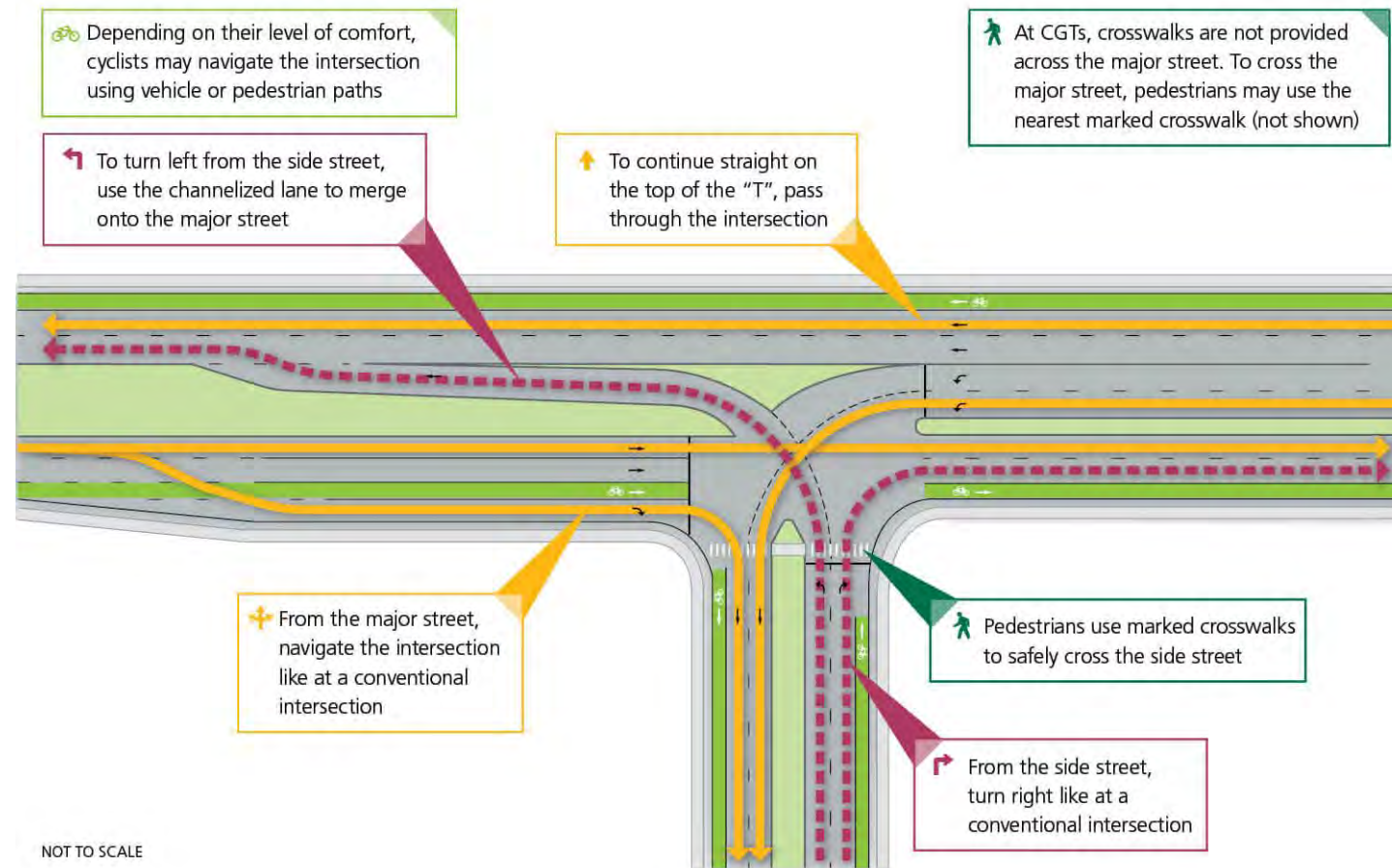
- Continuous Green-T (CGT)
- Restricted Crossing U-Turn (RCUT)
- Thru-Cut
- Displaced Left Turn (DLT)

## Innovative Intersection Website:

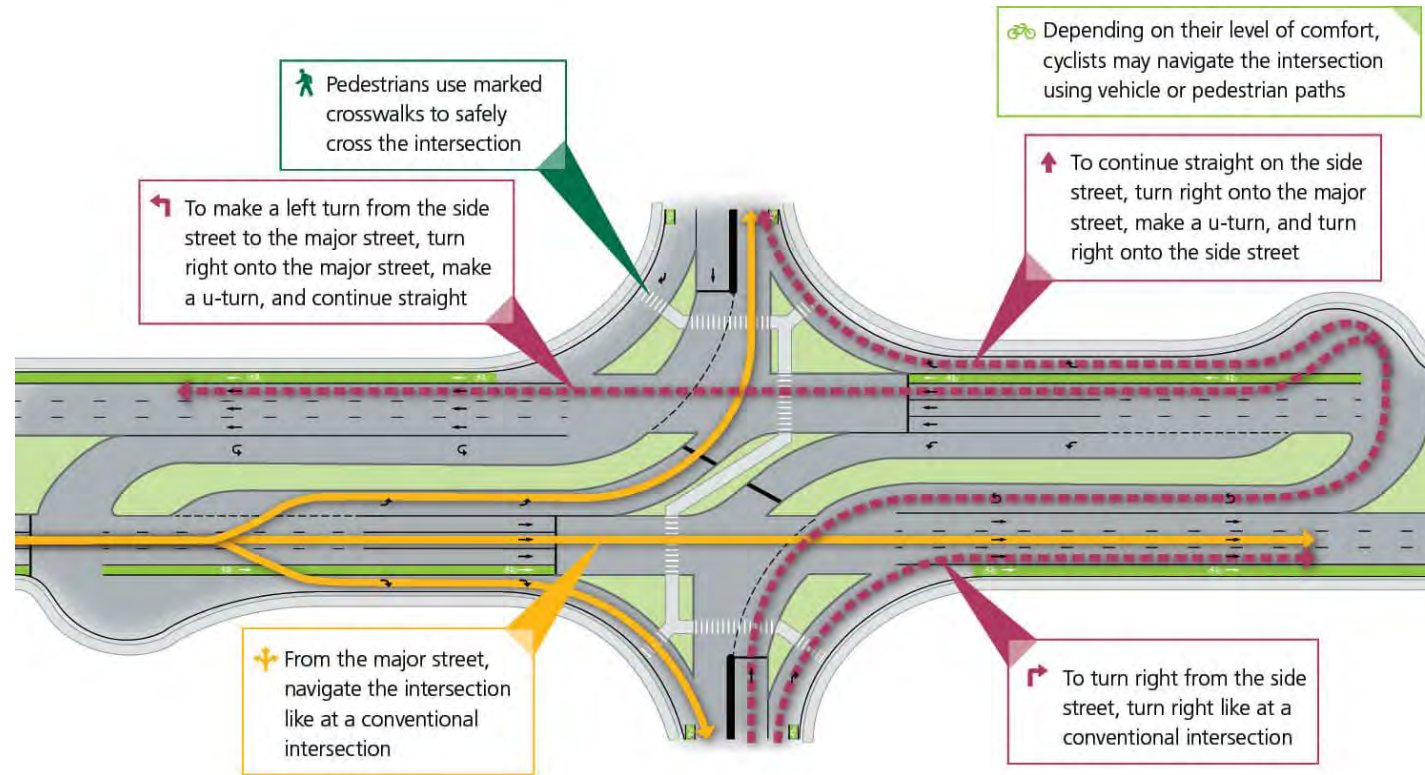
<http://www.virginiadot.org/innovativeintersections/>



# Continuous Green-T (CGT)



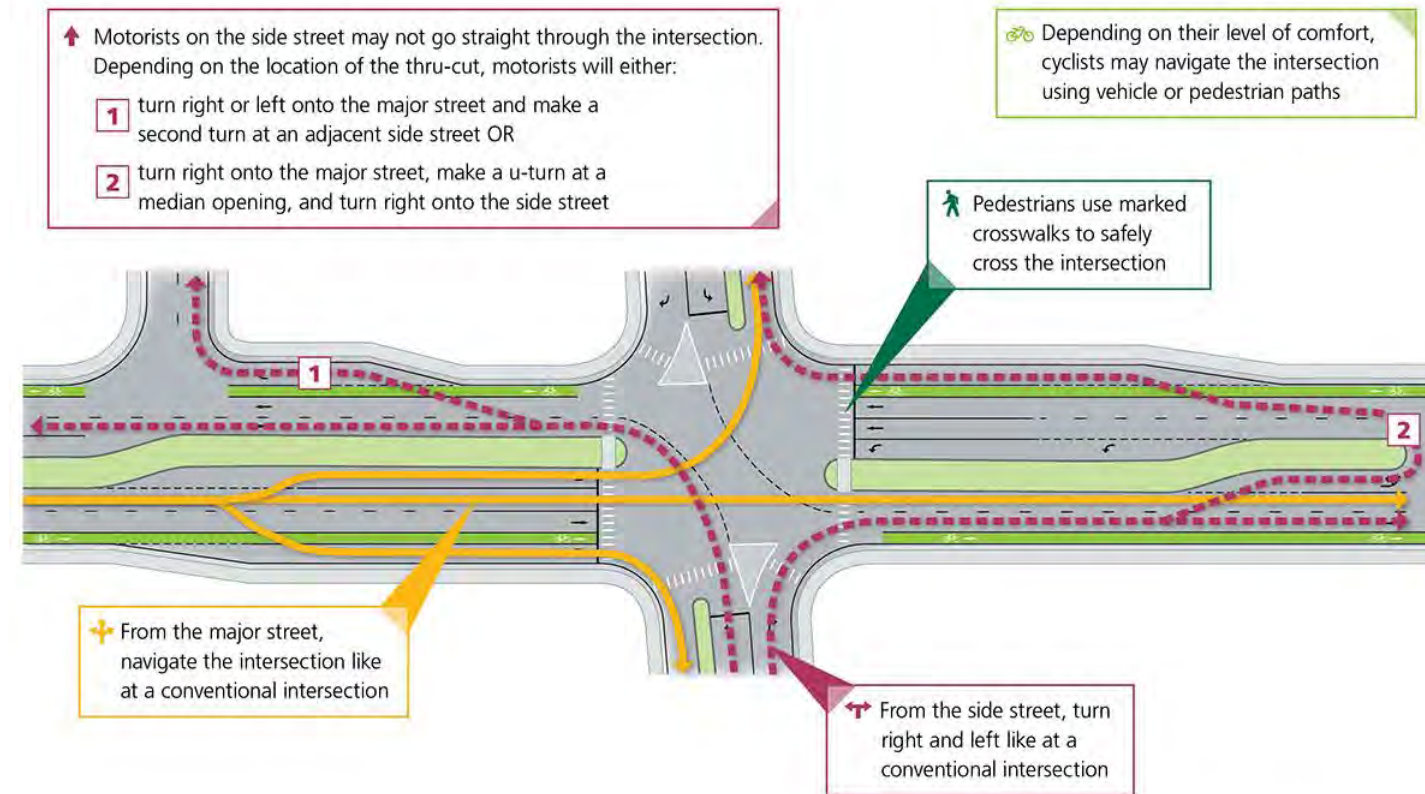
# Restricted Crossing U-Turn (RCUT)



NOT TO SCALE

Note: For simplicity, only two directions of traffic are shown. Opposing traffic follows similar routes.

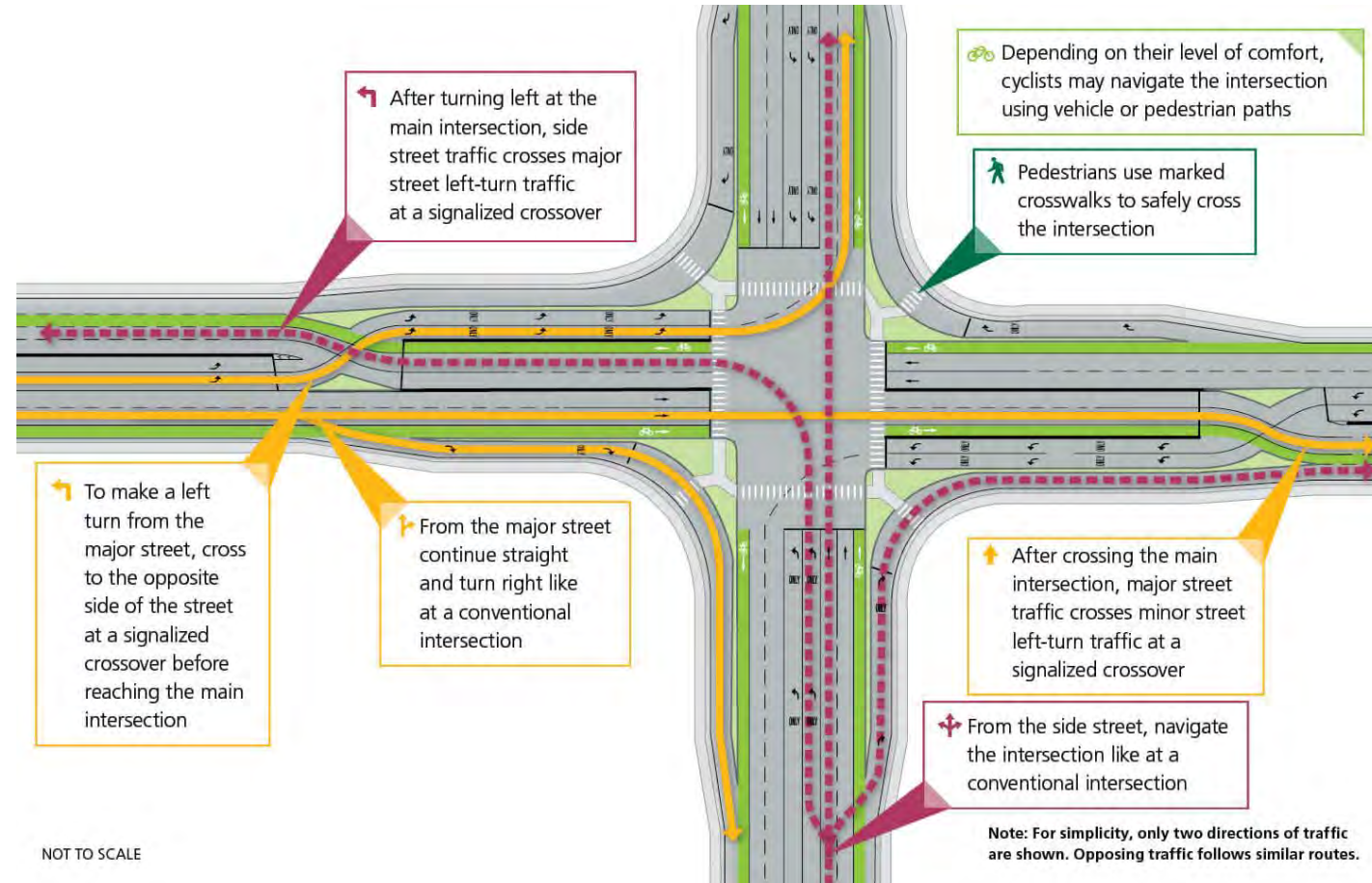
# Thru-Cut



NOT TO SCALE

Note: For simplicity, only two directions of traffic are shown. Opposing traffic follows similar routes.

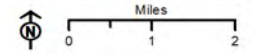
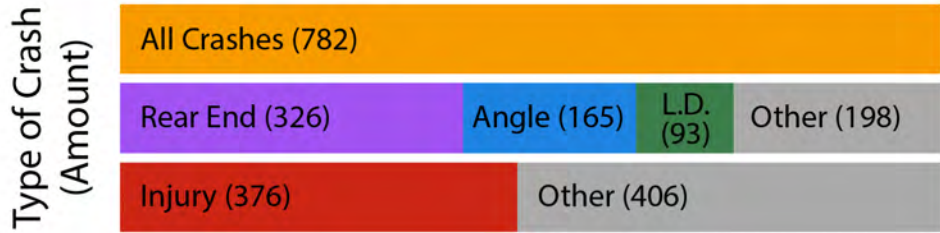
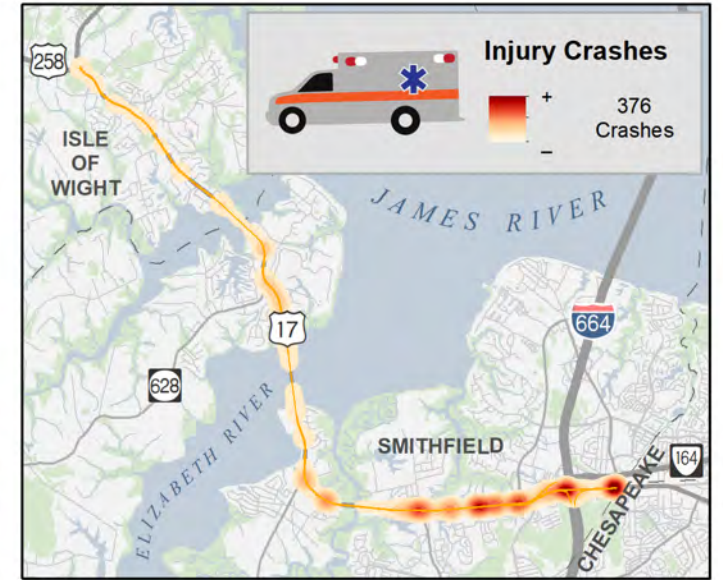
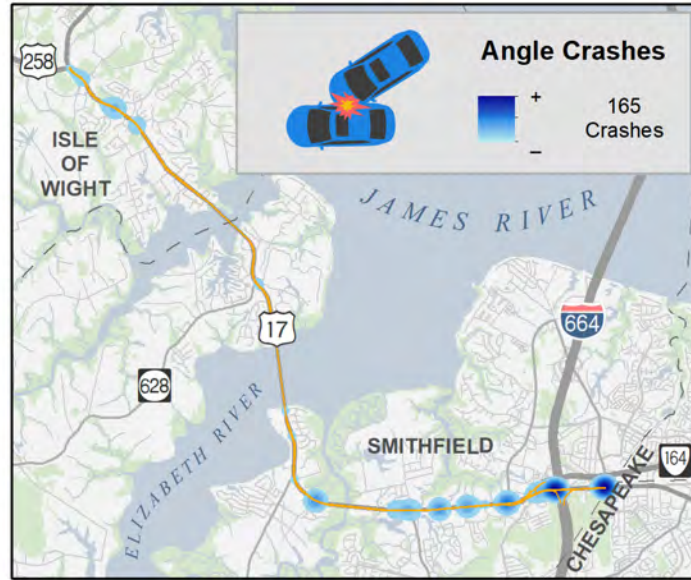
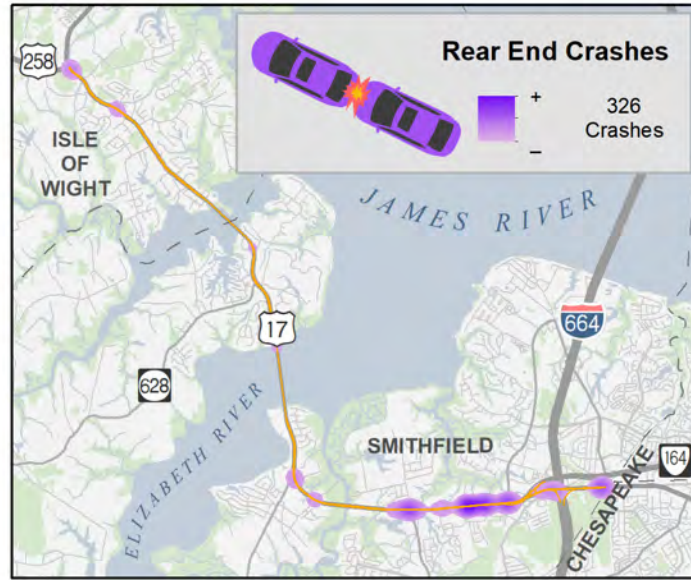
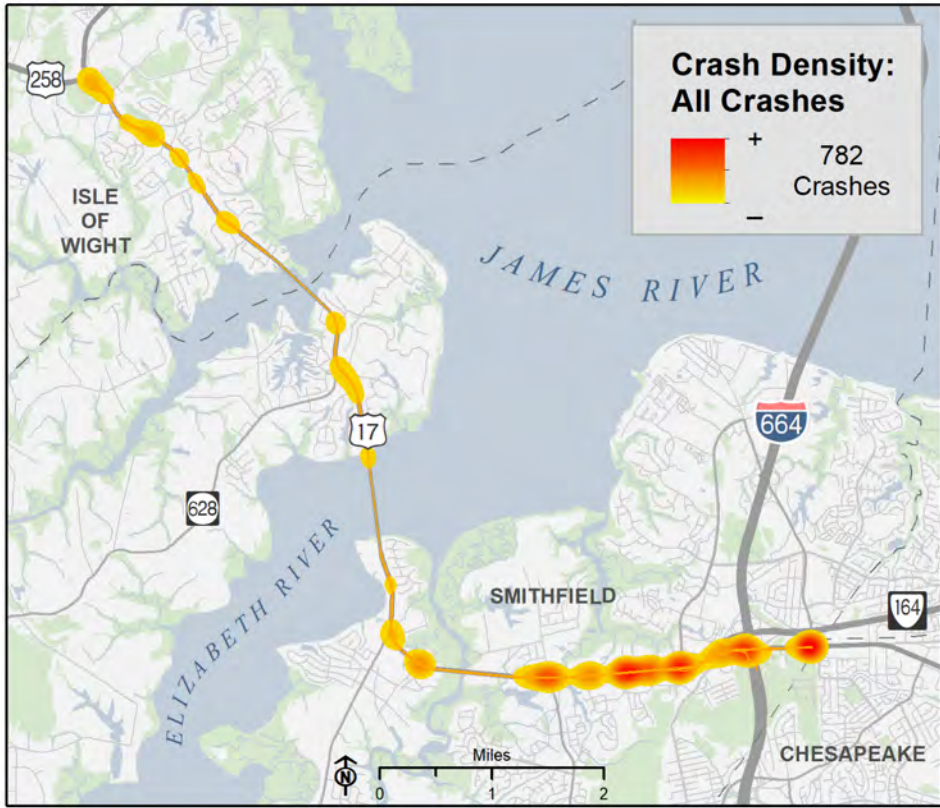
# Displaced Left Turn



# Study Intersection Evaluation

US 17 Arterial Preservation Plan

Projected Future Volumes			
From	To	2019 AADT	2045 AADT
WCL Chesapeake	I-664; SR 164	24,000	30,000
I-664; SR 164	Rte. 626 - Shoulders Hill Rd	36,000	51,000
Rte. 626 - Shoulders Hill Rd	Rte. 627 - Bennetts Pasture Rd	28,000	36,000
Rte. 627 - Bennetts Pasture Rd	Rte. 628 - Crittenden Rd	21,000	30,000
Rte. 628 - Crittenden Rd	Isle of Wight County Line	16,000	30,000
Isle of Wight County Line	US 258 / SR 32	16,000	32,000



## Isle of Wight


- US 17 STARS Study north of US 258
- US 17 and US 258 Westbound leg with capacity improvements


## City of Suffolk


- US 17 and Shoulders Hill Rd Intersection Improvement and Widening
- US 17 and Crittenden Road and Clubhouse Drive Realignment
- US 17 and Bernhowe Manor Lane to Harbour View Blvd Widening (SMART SCALE)



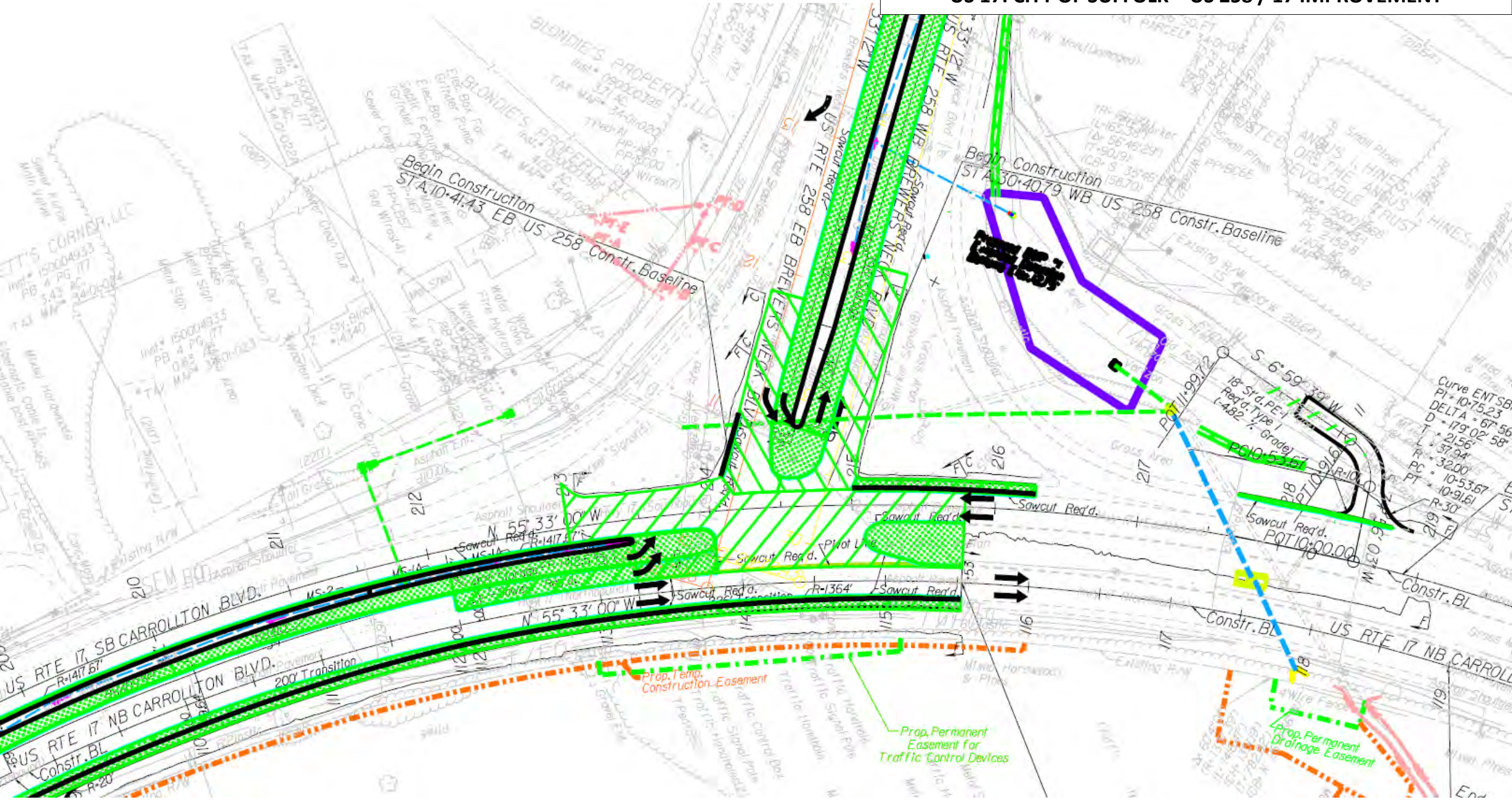


 Signalized Intersection

 Unsignalized Intersection

 Median Crossover







Future Fourth Leg at US 258/17  
Development




Failure by ~2028

Brewers Neck Blvd

Channell Way

Omera Dr

Ashby Way

-  Signalized Intersection
-  Unsignalized Intersection
-  Median Crossover



AT-GRADE Intersections

Intersection Results							
		Congestion			Pedestrian	Safety	Notes
Type	Dir	Maximum V/C	Accommodation Compared to Conventional	Weighted Total Conflict Points			
Conventional	-	1.12		48	Traditional Widening w/EB Triple Lefts		
Full Displaced Left Turn	-	0.89	-	40	Plus Widening US 17		
Partial Displaced Left Turn	-	1.07	-	44	EB and WB relocated plus US 17 Widening		

Grade Separated

Interchange Results							
		Congestion			Pedestrian	Safety	Notes
Type	Dir	Maximum V/C	Accommodation Compared to Traditional Diamond	Weighted Total Conflict Points			
Traditional Diamond	-	0.96		28			
Diverging Diamond	-	0.95	-	20			
Partial Cloverleaf	-	0.54		20			
Single Point	-	0.91	-	32			



Princess Anne Rd

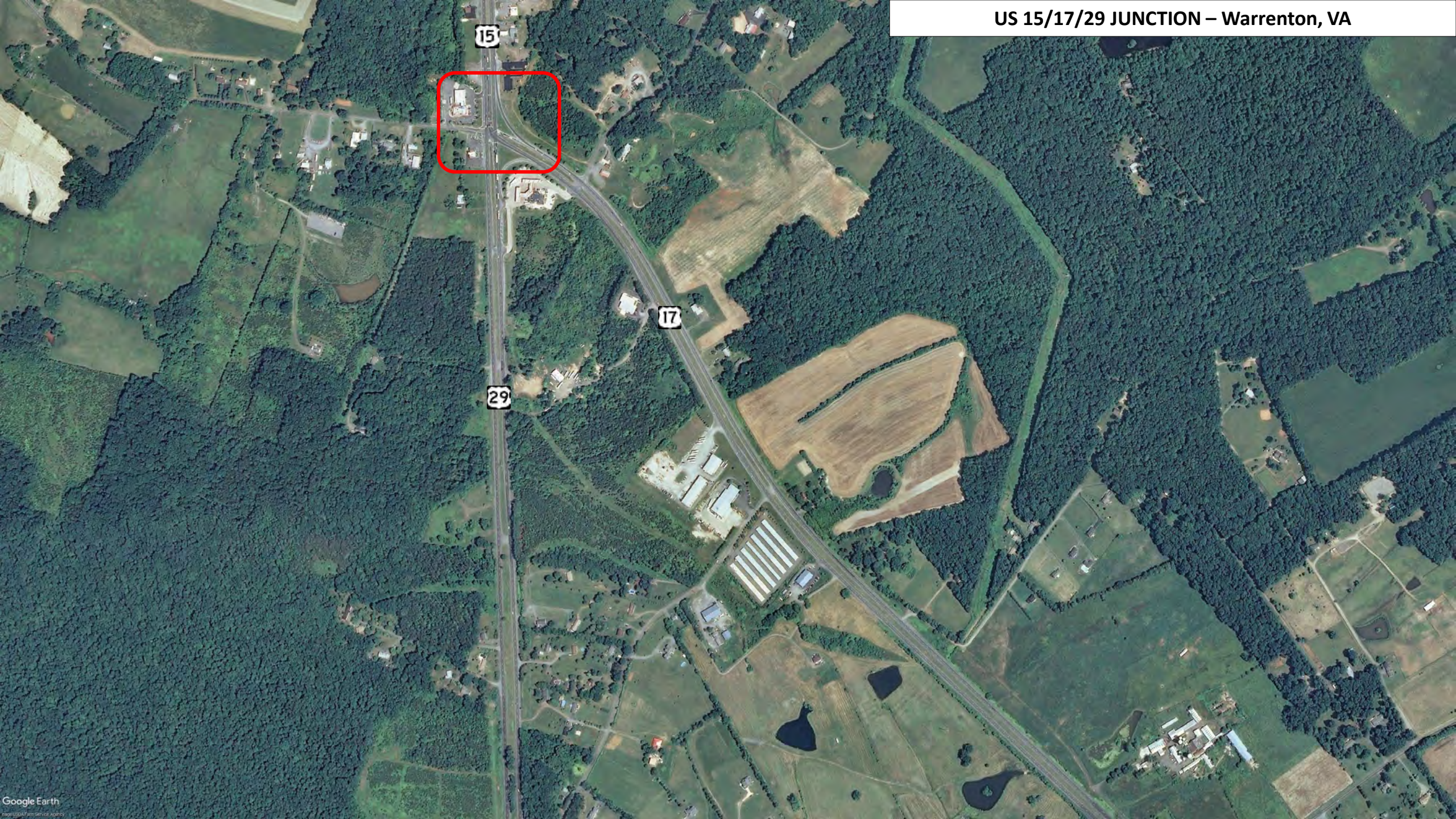
Military Hwy



Princess Anne Rd

Military Hwy



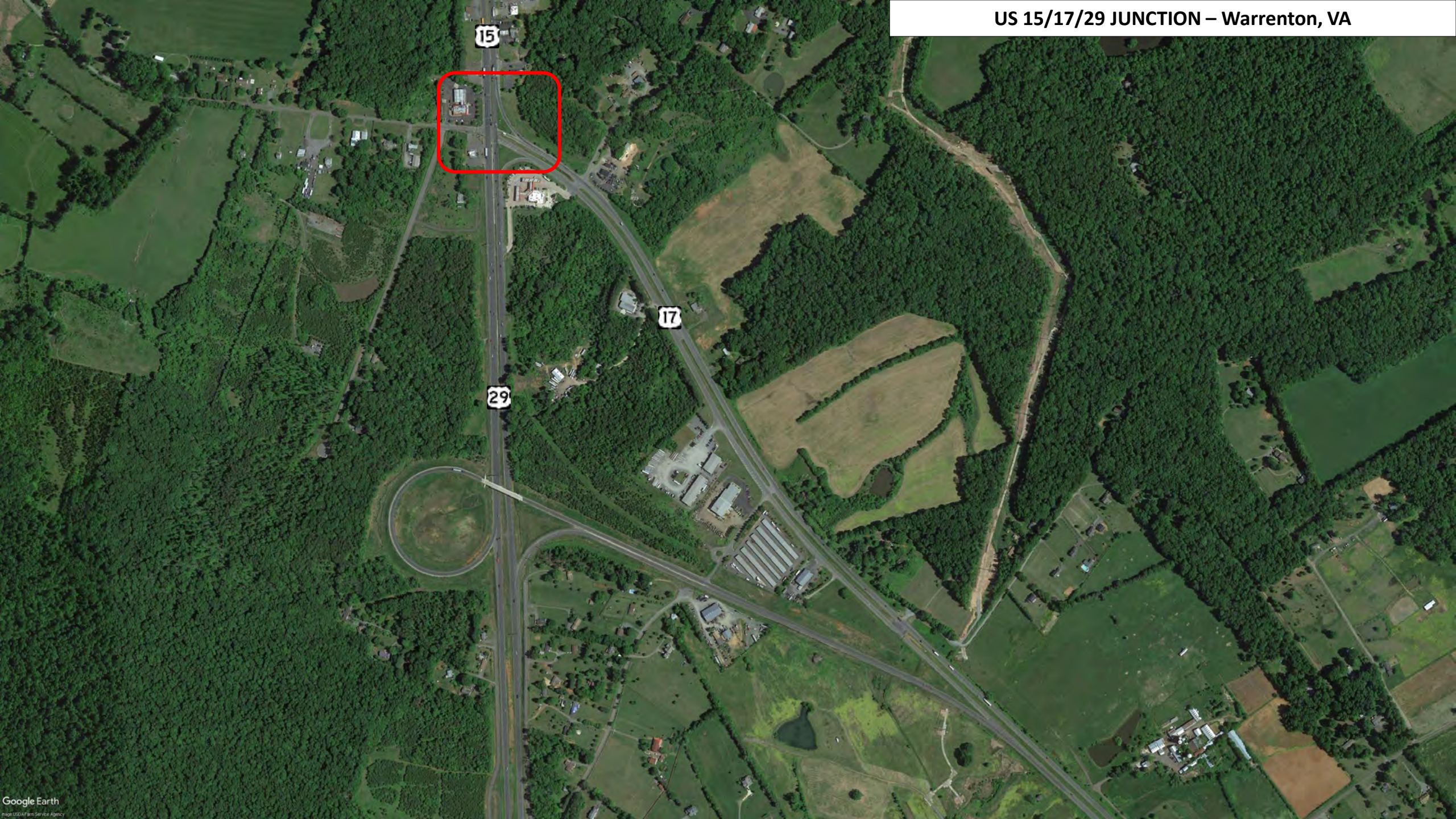


15

17

29







258

Channell Way

B  
D

Omera Dr




Ashby Way

C  
C

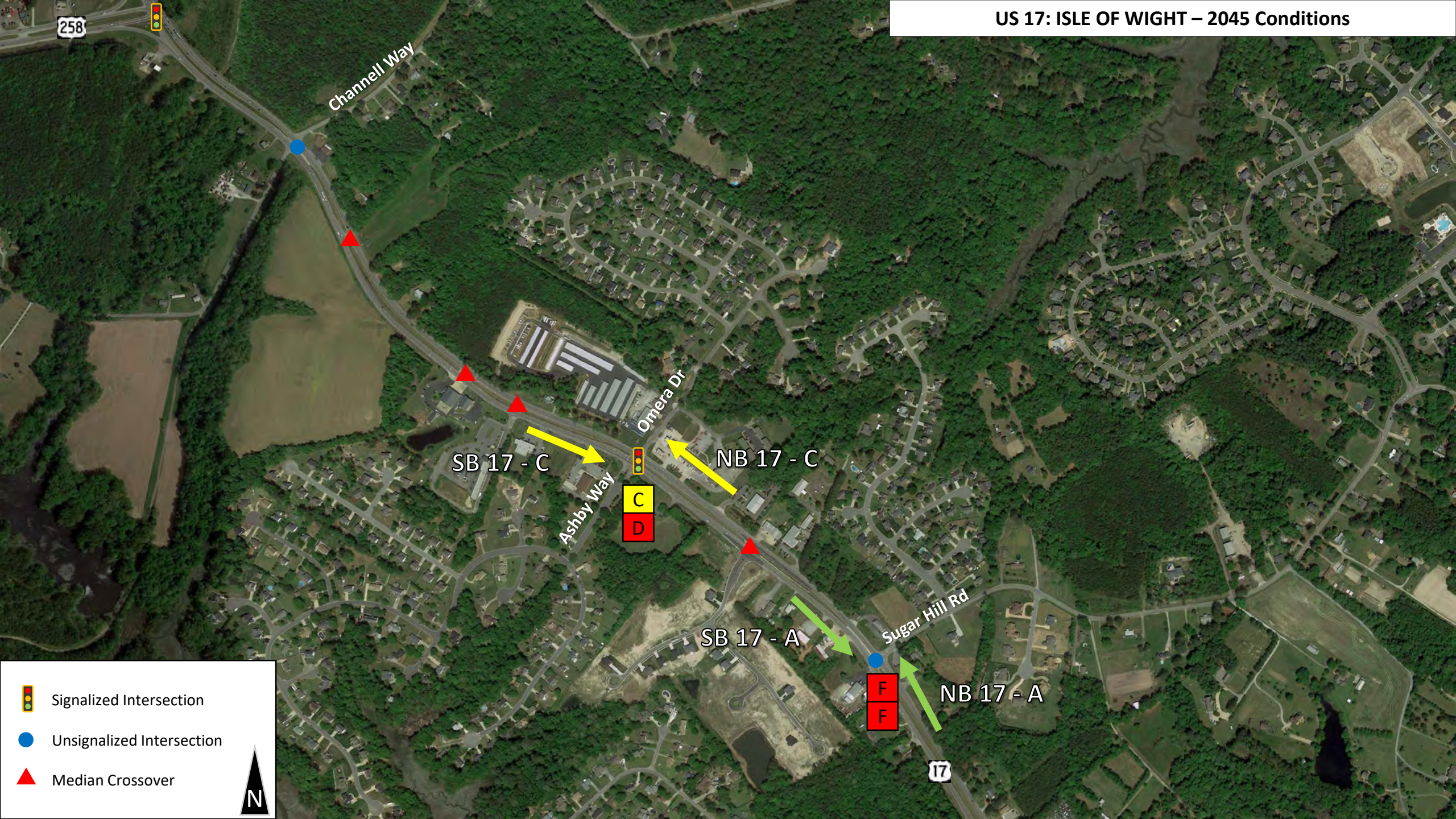
Sugar Hill Rd




A  
B


17

-  Signalized Intersection
-  Unsignalized Intersection
-  Median Crossover





-  Signalized Intersection
-  Unsignalized Intersection
-  Median Crossover



SB 17 - C

NB 17 - C

SB 17 - A

NB 17 - A

Channell Way

Omera Dr

Ashby Way

Sugar Hill Rd

258

17



INTERSECTION  
GRADE ISSUE

ACCESS & SAFETY ISSUES

ACCESS & SAFETY ISSUES

ONGOING DEVELOPMENT

US 17: ISLE OF WIGHT – FIRE STATION TO SUGAR HILL RD



RCUT / THRU-CUT

Omera Dr

Ashby Way

Sugar Hill Rd

 Potential U-turn Areas

US 17 & Omera Drive




Type	Dir	Maximum V/C	Accommodation Compared to Conventional	Weighted Total Conflict Points	
Conventional	-	0.90		48	
Restricted Crossing U-Turn	-	0.79		20	

US 17 & Spring Hill Road

Type	Dir	Maximum V/C	Accommodation Compared to Conventional	Weighted Total Conflict Points	
Continuous Green-T	-	0.82	-	12*	
Restricted Crossing U-Turn	-	0.80		20	
Two-Way Stop Control	-	38.76		48	

US 17: ISLE OF WIGHT – Existing Conditions



-  Signalized Intersection
-  Unsignalized Intersection
-  Median Crossover








Cedar Grove Rd

17

B

B

• Access Management Deficiency  
• Potential Operation Deficiency

-  Signalized Intersection
-  Unsignalized Intersection
-  Median Crossover



17





Southbound LOS

D  
D

Hazelwood Sr Bridge


C  
E


Northbound LOS


17

Eclipse Dr

B  
B

 Signalized Intersection

 Unsignalized Intersection

 Median Crossover



Southbound LOS **E**  
**D**




Hazelwood Sr Bridge

Northbound LOS **E**  
**E**

17


Eclipse Dr


**B**  
**B**

-  Signalized Intersection
-  Unsignalized Intersection
-  Median Crossover








 Signalized Intersection

 Unsignalized Intersection

 Median Crossover





-  Signalized Intersection
-  Unsignalized Intersection
-  Median Crossover





**Storm Water Management Facility**

**Typical Section**

**Typical Section**

RTE. 17 (BRIDGE ROAD)

CLUBHOUSE DRIVE

CRITTENDEN ROAD

RTE. 17 (BRIDGE ROAD)

GOVERNORS POINT DR

Mr. D. Farney  
CRITTE DEN RD  
100' x 100' x 100'  
100' x 100' x 100'  
100' x 100' x 100'  
100' x 100' x 100'  
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Mr. D. Farney  
CRITTE DEN RD  
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Mr. D. Farney  
CRITTE DEN RD  
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100' x 100' x 100'



SB 17 - C


Clubhouse Dr


NB 17 - D


Crittenden Rd

Governors Pointe Dr

• Potential Operational Deficiency

 Signalized Intersection

 Unsignalized Intersection

 Median Crossover





Southbound LOS

E  
E


Godwin Jr Bridge


D  
E


Northbound LOS

17

Bennetts Creek Landing

 Signalized Intersection

 Unsignalized Intersection

 Median Crossover



17

E  
E

Northbound LOS

E  
E




Southbound LOS

Godwin Jr Bridge

17

Potential Operational Deficiency

Bennetts Creek Landing

-  Signalized Intersection
-  Unsignalized Intersection
-  Median Crossover





17

C  
C

Northbound LOS

B  
C




Southbound LOS

Godwin Jr Bridge

17


Potential Operational Deficiency


Bennetts Creek Landing


-  Signalized Intersection
-  Unsignalized Intersection
-  Median Crossover





 Signalized Intersection

 Unsignalized Intersection

 Median Crossover



17

Bennetts Pasture Rd

B  
B

C  
C

A  
A

Lee Farm Ln

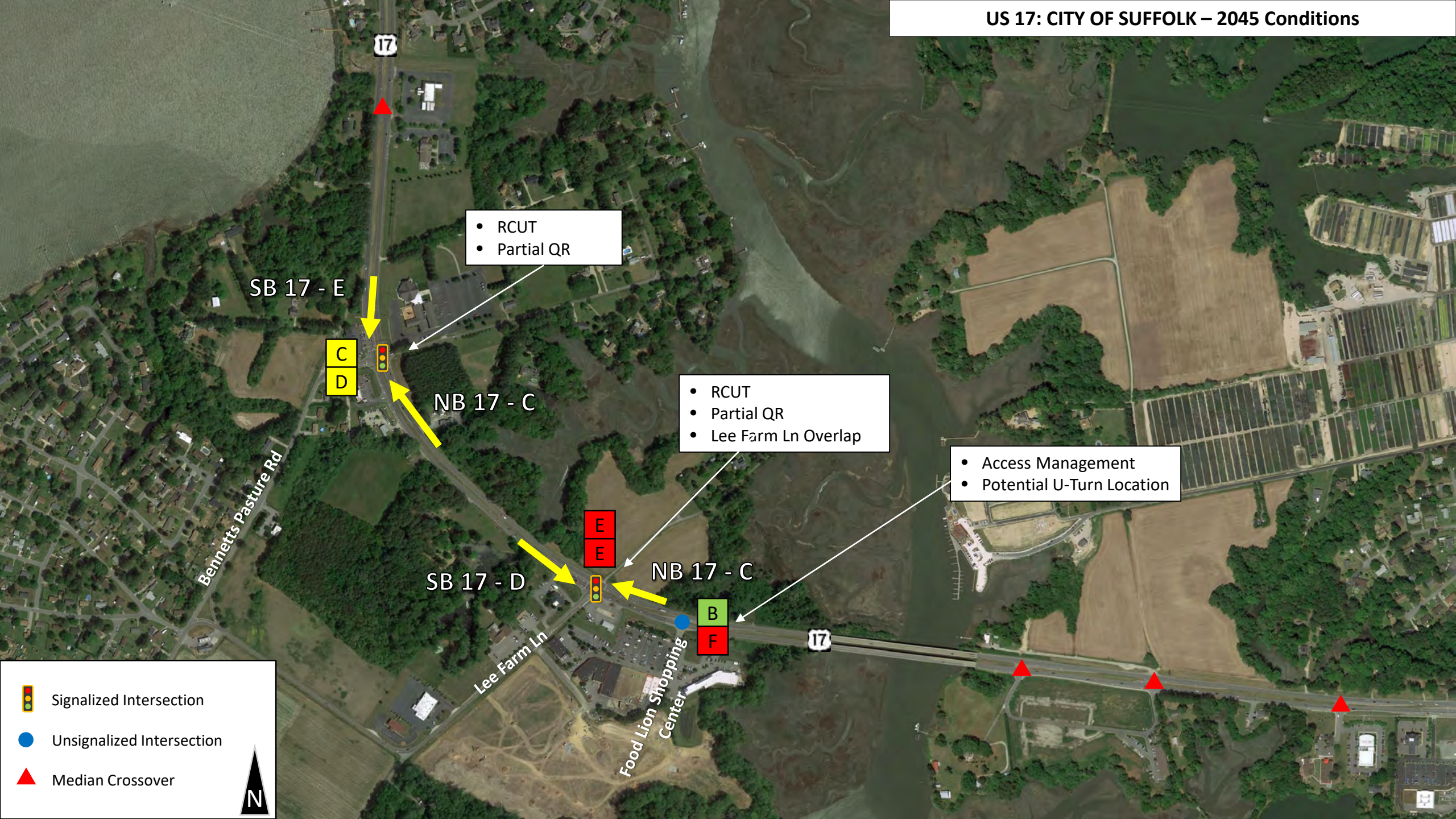
Food Lion Shopping Center

17

▲

▲

▲



- RCUT
- Partial QR

- RCUT
- Partial QR
- Lee Farm Ln Overlap

- Access Management
- Potential U-Turn Location

SB 17 - E


C  
D


NB 17 - C

SB 17 - D

NB 17 - C

B  
F

 Signalized Intersection

 Unsignalized Intersection


 Median Crossover





2019 Volumes																
Bennetts Creek Lane						Lee Farm Lane										
(3)	(1)	(6)	↶	20	(20)	(0)	(0)	(0)	↶	0	(0)					
2	2	10	←	461	(1159)	0	0	0	←	580	(1300)	←	714	(1609)		
↷	↓	↘	↷	100	(180)	↷	↓	↘	↷	144	(319)	↷	62	(60)		
(2)	0	↶	↶	↑	↷	(2)	0	↶	↶	↑	↷					
(950)	1036	→	94	6	59	(982)	1101	→	2	0	359	(1227)	1442	→	10	28
(170)	95	↷	(161)	(2)	(58)	(30)	4	↷	(59)	(0)	(245)	(0)	18	↷	(10)	(76)
Bennetts Pasture Road					Lee Farm Lane					Food Lion Shopping Center						

2045 Volumes																
Bennetts Creek Lane						Lee Farm Lane										
(3)	(1)	(6)	↶	20	(20)	(0)	(0)	(0)	↶	0	(0)					
2	2	10	←	1153	(2270)	0	0	0	←	1311	(2468)	←	1484	(2864)		
↷	↓	↘	↷	141	(253)	↷	↓	↘	↷	183	(406)	↷	62	(60)		
(2)	0	↶	↶	↑	↷	(2)	0	↶	↶	↑	↷					
(2025)	1797	→	133	6	83	(2072)	1884	→	3	0	456	(2384)	2322	→	10	28
(239)	134	↷	(227)	(2)	(82)	(39)	6	↷	(75)	(0)	(312)	(0)	18	↷	(10)	(76)
Bennetts Pasture Road					Lee Farm Lane					Food Lion Shopping Center						



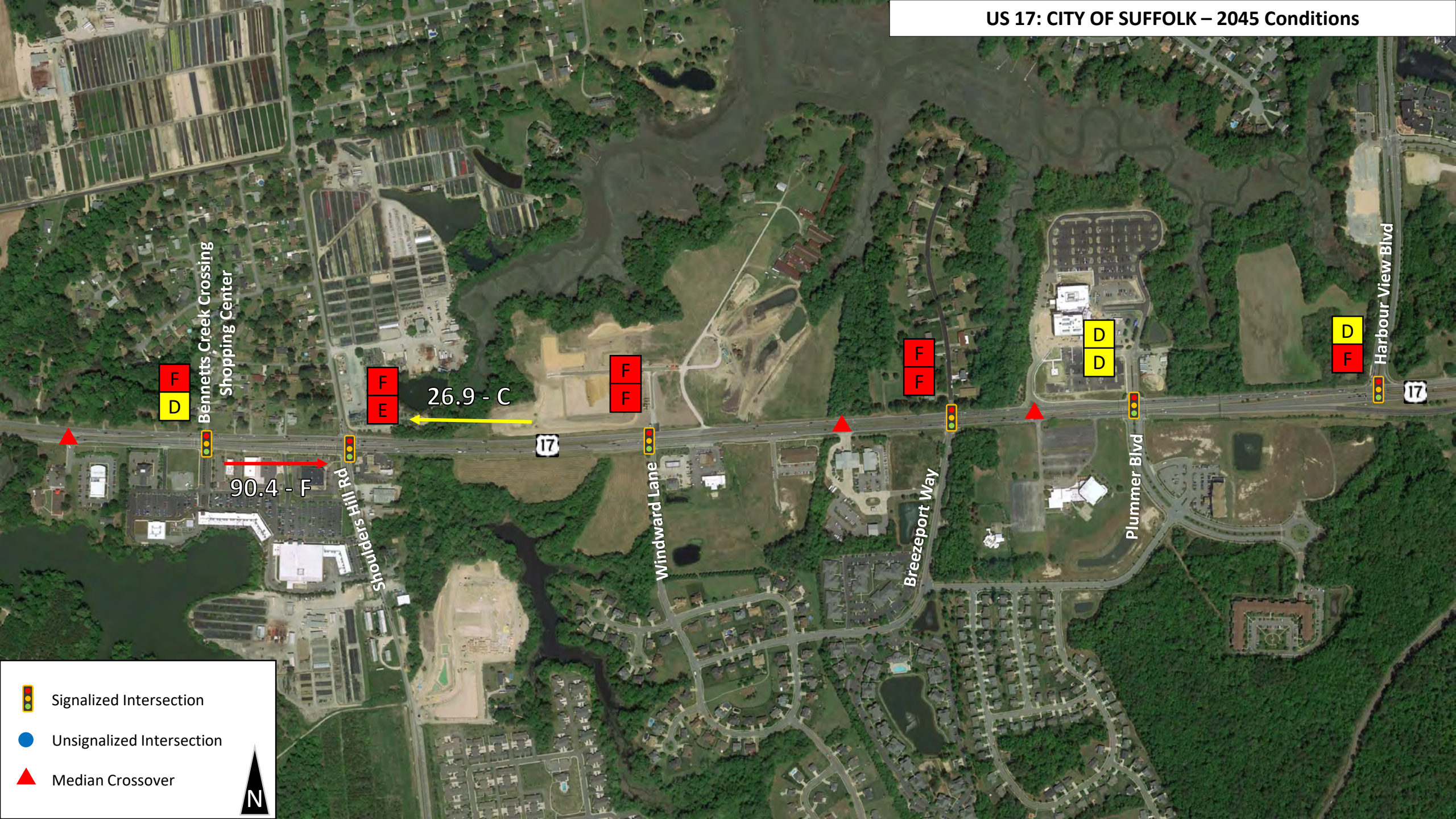
 Signalized Intersection




 Unsignalized Intersection

 Median Crossover







-  Signalized Intersection
-  Unsignalized Intersection
-  Median Crossover



F  
D

Bennetts Creek Crossing  
Shopping Center

90.4 - F

Shoulders Hill Rd

F  
E

26.9 - C

17

F  
F

Windward Lane

F  
F

Breezeport Way

D  
D

Plummer Blvd

D  
F

Harbour View Blvd

17



NB US 17 CHOKEPOINT

SB US 17 CHOKEPOINT

Bennetts Creek Crossing Shopping Center

Shoulders Hill Rd

Windward Lane

Breezeport Way

Plummer Blvd

Harbour View Blvd

C  
C

C  
D

F  
F




F  
F

F  
F

D  
F

29.3 - C

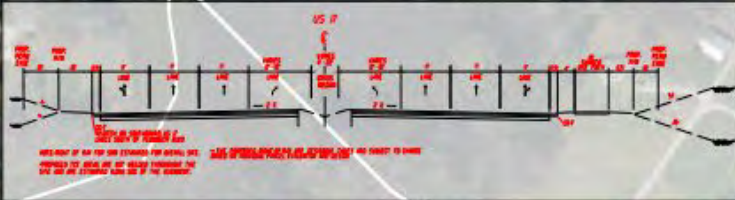
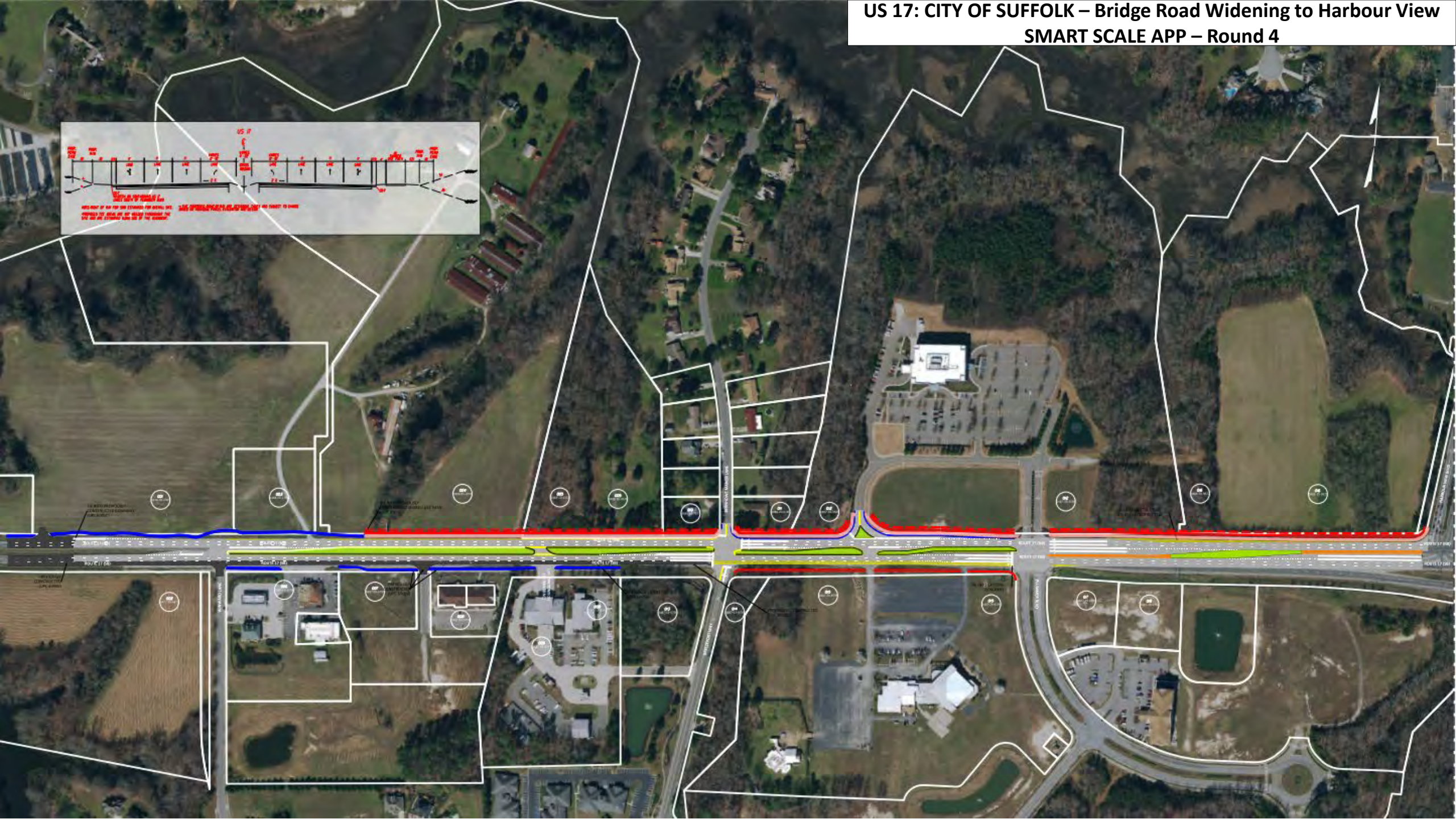
40.3 - D

-  Signalized Intersection
-  Unsignalized Intersection
-  Median Crossover





**US 17: CITY OF SUFFOLK – Bridge Road Widening to Harbour View  
SMART SCALE APP – Round 4**



TO BE EXISTING/PROPOSED  
CITY OF SUFFOLK

EXISTING/PROPOSED  
CITY OF SUFFOLK

EXISTING/PROPOSED  
CITY OF SUFFOLK

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EXISTING/PROPOSED  
CITY OF SUFFOLK

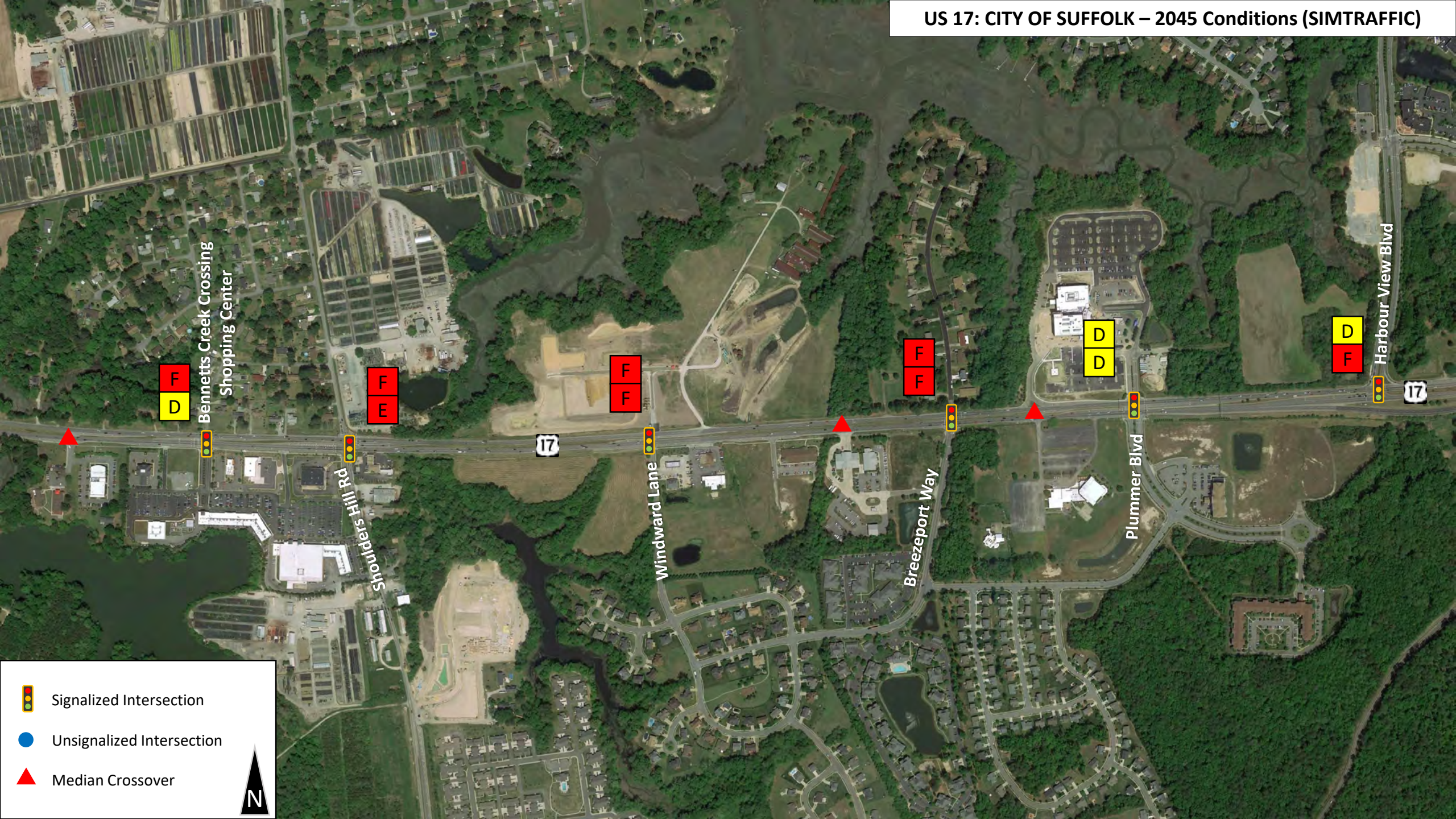
EXISTING/PROPOSED  
CITY OF SUFFOLK


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EXISTING/PROPOSED  
CITY OF SUFFOLK

EXISTING/PROPOSED  
CITY OF SUFFOLK



 Signalized Intersection

 Unsignalized Intersection

 Median Crossover



F  
D

Bennetts Creek Crossing  
Shopping Center

F  
E

Shoulders Hill Rd

F  
F

Windward Lane

F  
F

Breezeport Way

D  
D

Plummer Blvd

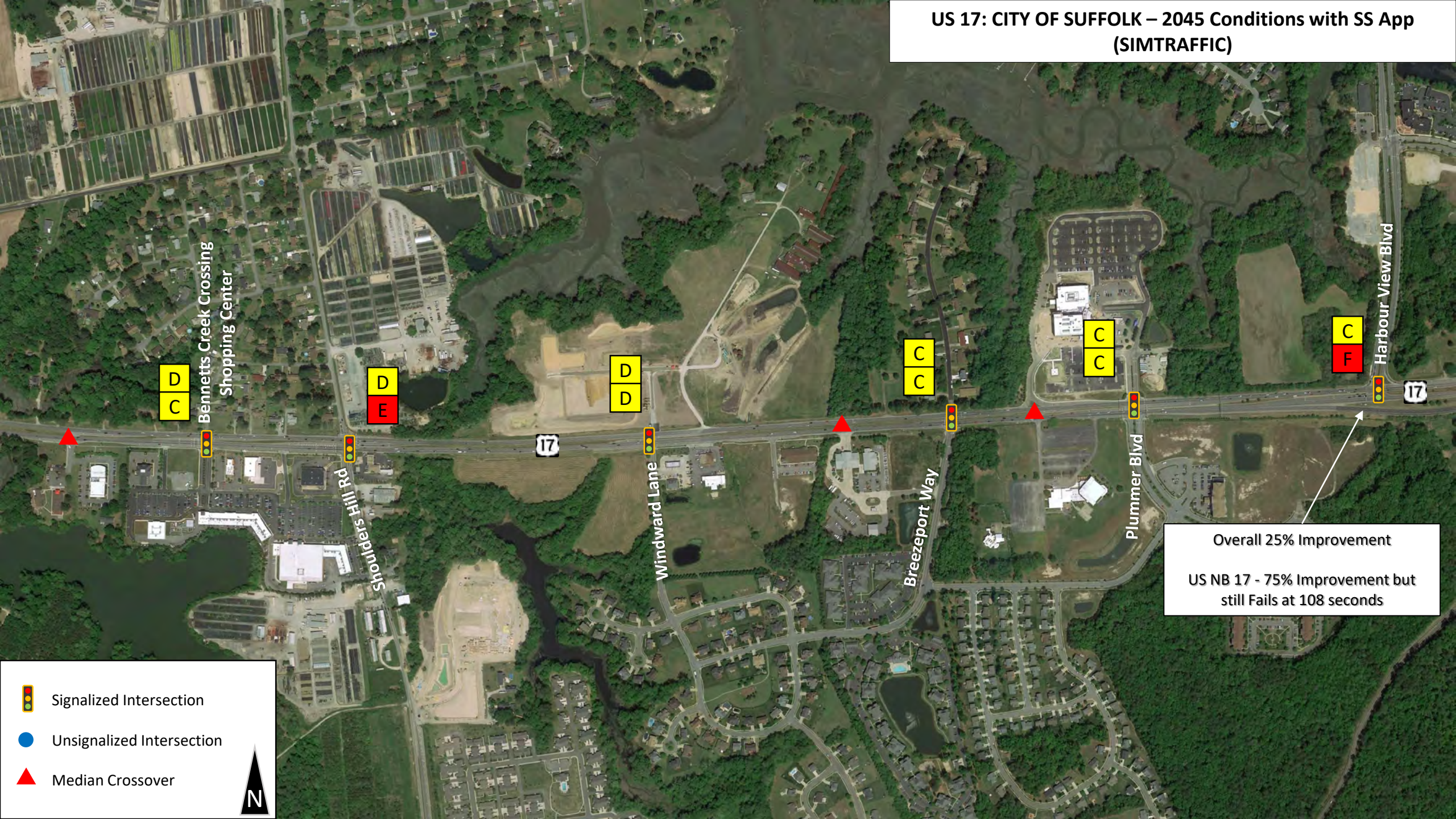
D  
F

Harbour View Blvd

17

17

US 17: CITY OF SUFFOLK – 2045 Conditions with SS App (SIMTRAFFIC)



C  
D

Bennetts Creek Crossing Shopping Center

D  
E

Shoulders Hill Rd

D  
D

Windward Lane

C  
C

Breezeport Way




C  
C

Plummer Blvd

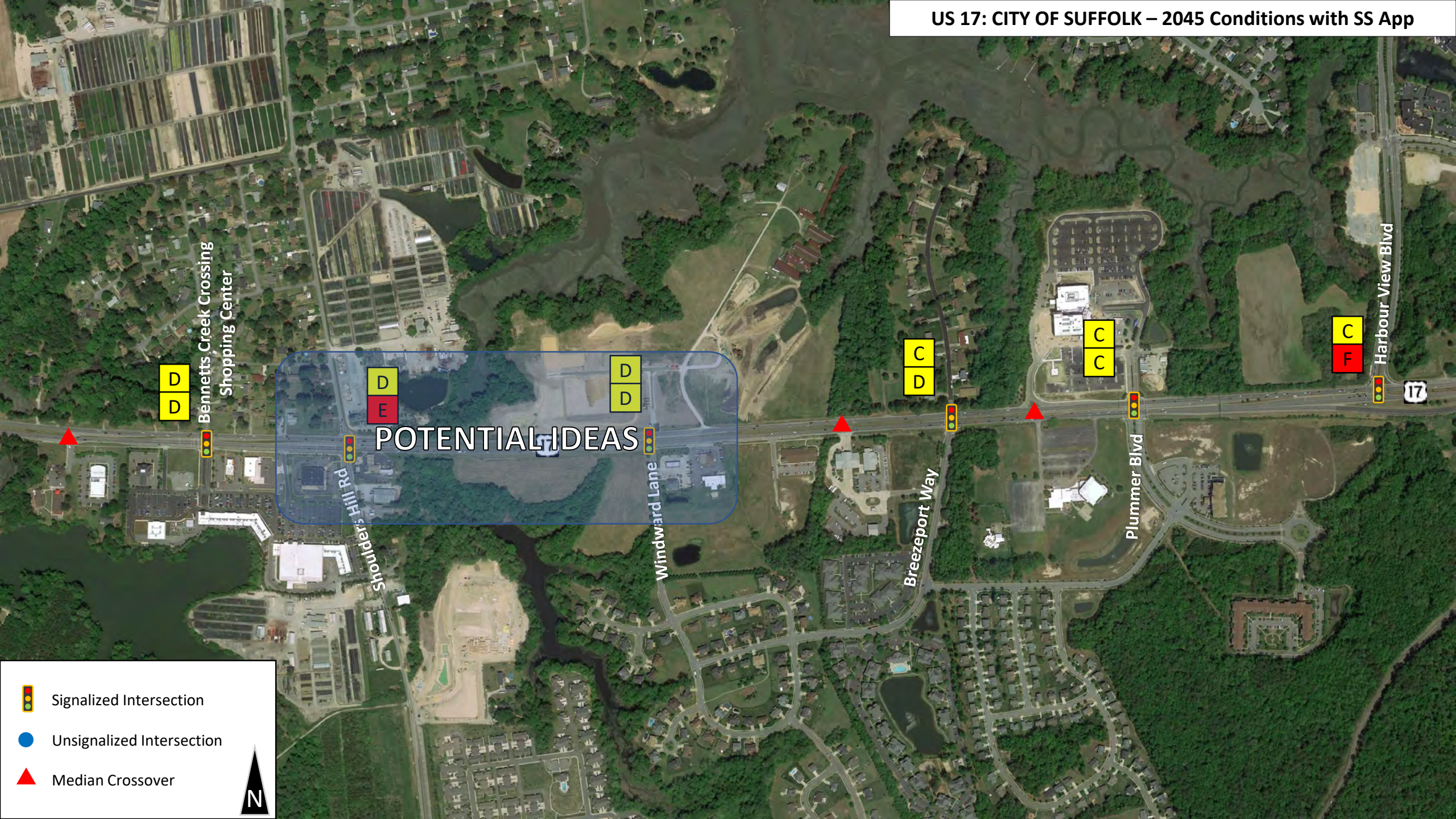
C  
F

Harbour View Blvd

Overall 25% Improvement  
US NB 17 - 75% Improvement but still Fails at 108 seconds

-  Signalized Intersection
-  Unsignalized Intersection
-  Median Crossover





POTENTIAL IDEAS

D  
D

Bennetts Creek Crossing  
Shopping Center

D  
E

Shompley's Hill Rd

D  
D

Windward Lane

C  
D

Breezeport Way

C  
C

Plummer Blvd

C  
F

Harbour View Blvd

17

Signalized Intersection

Unsignalized Intersection

Median Crossover







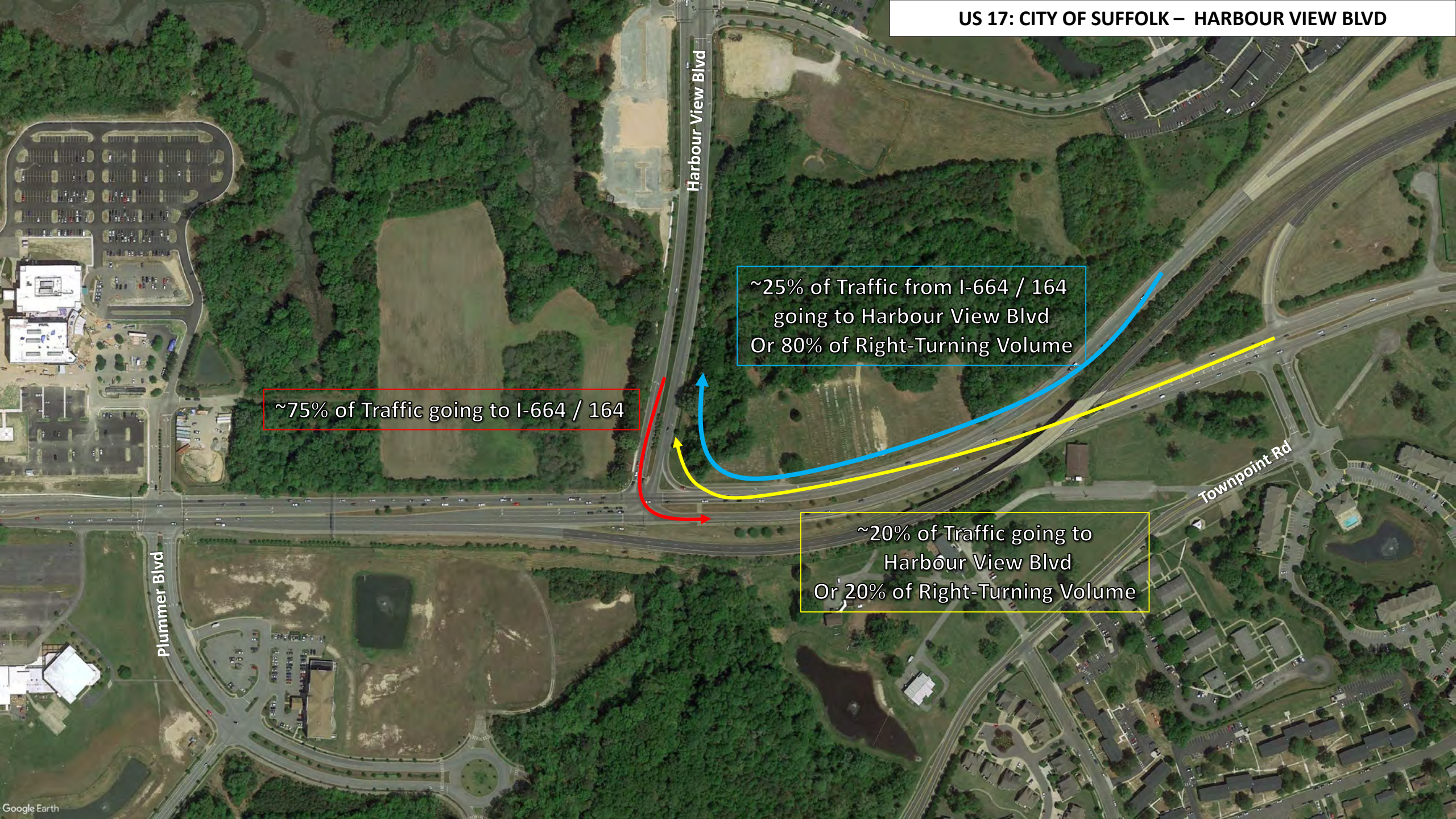
Harbour View Blvd

Queueing impacts I-664 and 164

17

Sensitivity Analysis – PM Peak Hour

Growth Rates	Year	V/C	SB US 17 Delay	NB US 17 Delay
1% Growth Rate	2029	1.01	22.8 - C	59.9 - E
17 APP Projected Volumes	2026	1.09	22.5 – C	63.9 - E



~75% of Traffic going to I-664 / 164

~25% of Traffic from I-664 / 164 going to Harbour View Blvd Or 80% of Right-Turning Volume

~20% of Traffic going to Harbour View Blvd Or 20% of Right-Turning Volume



Harbour View Blvd

Plummer Blvd

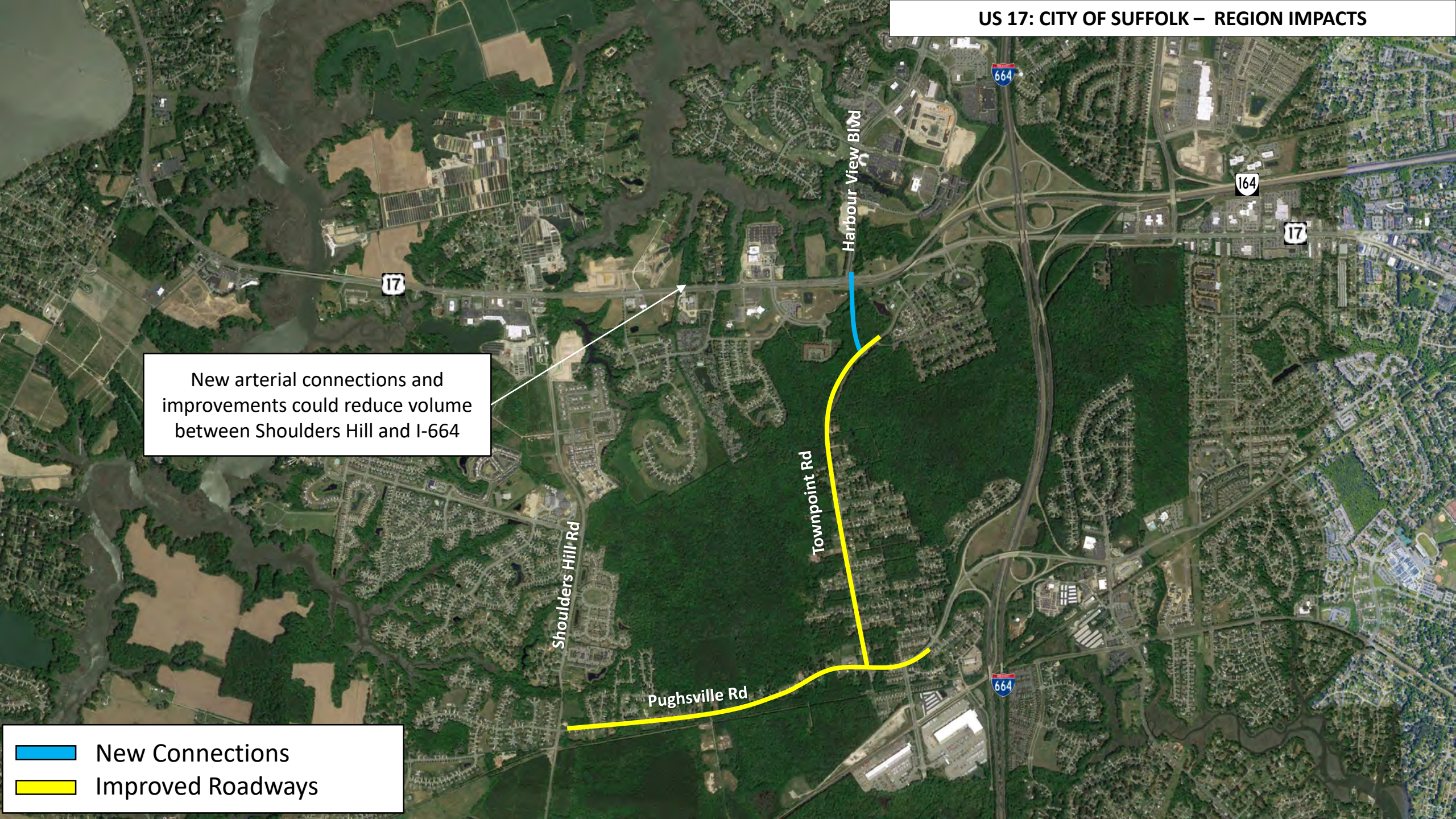
Townpoint Rd

Connect to Plummer Blvd?

Connect to Townpoint Rd?

Or Both?







New arterial connections and improvements could reduce volume between Shoulders Hill and I-664


 New Connections  
 Improved Roadways


# US 17: CITY OF SUFFOLK – Existing Conditions

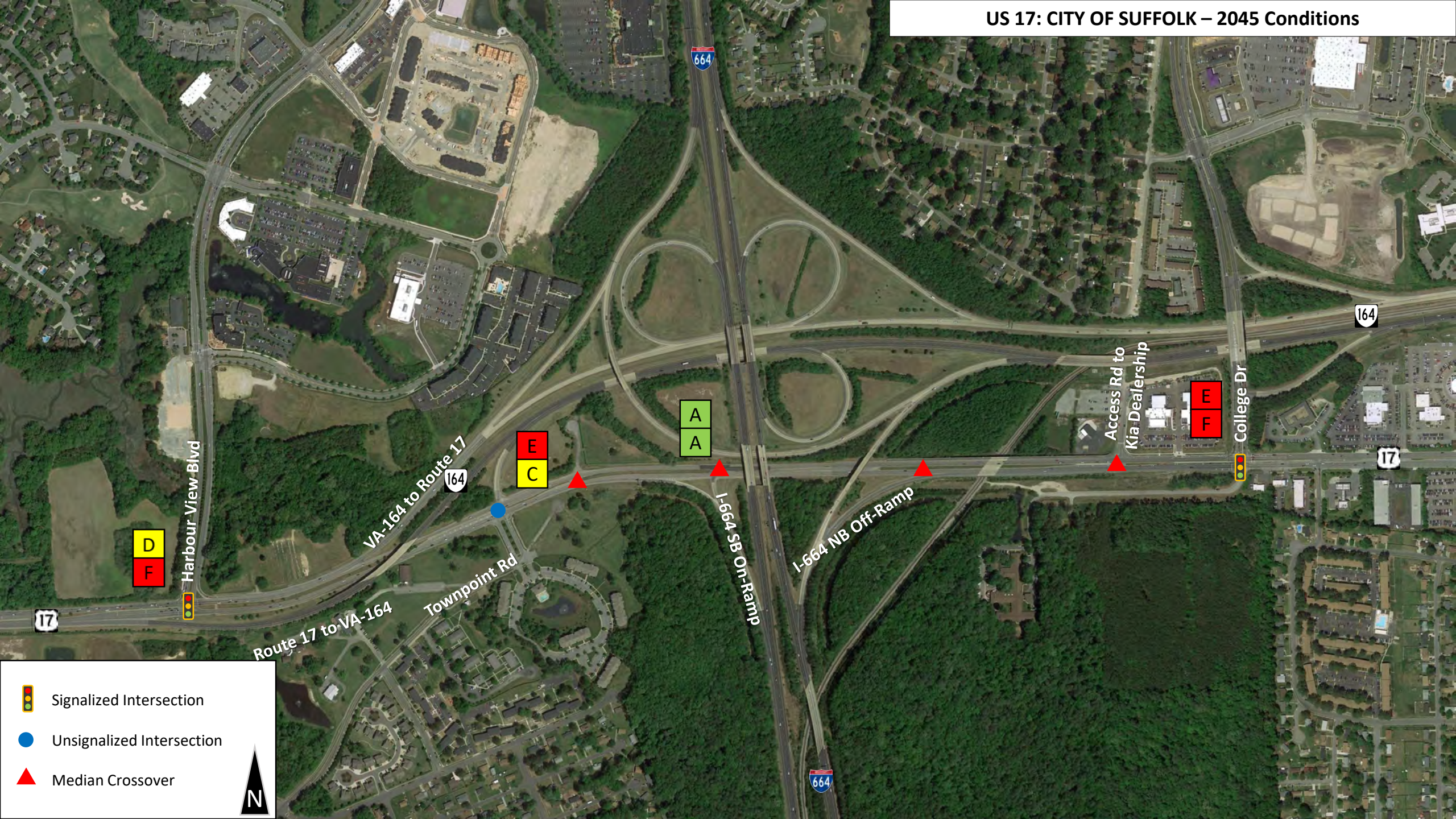


 Signalized Intersection

 Unsignalized Intersection

 Median Crossover





D  
F

Harbour View Blvd

VA-164 to Route 17

164

E  
C

Townpoint Rd

A  
A

I-664 SB On-Ramp

I-664 NB Off-Ramp




Access Rd to  
Kia Dealership

E  
F

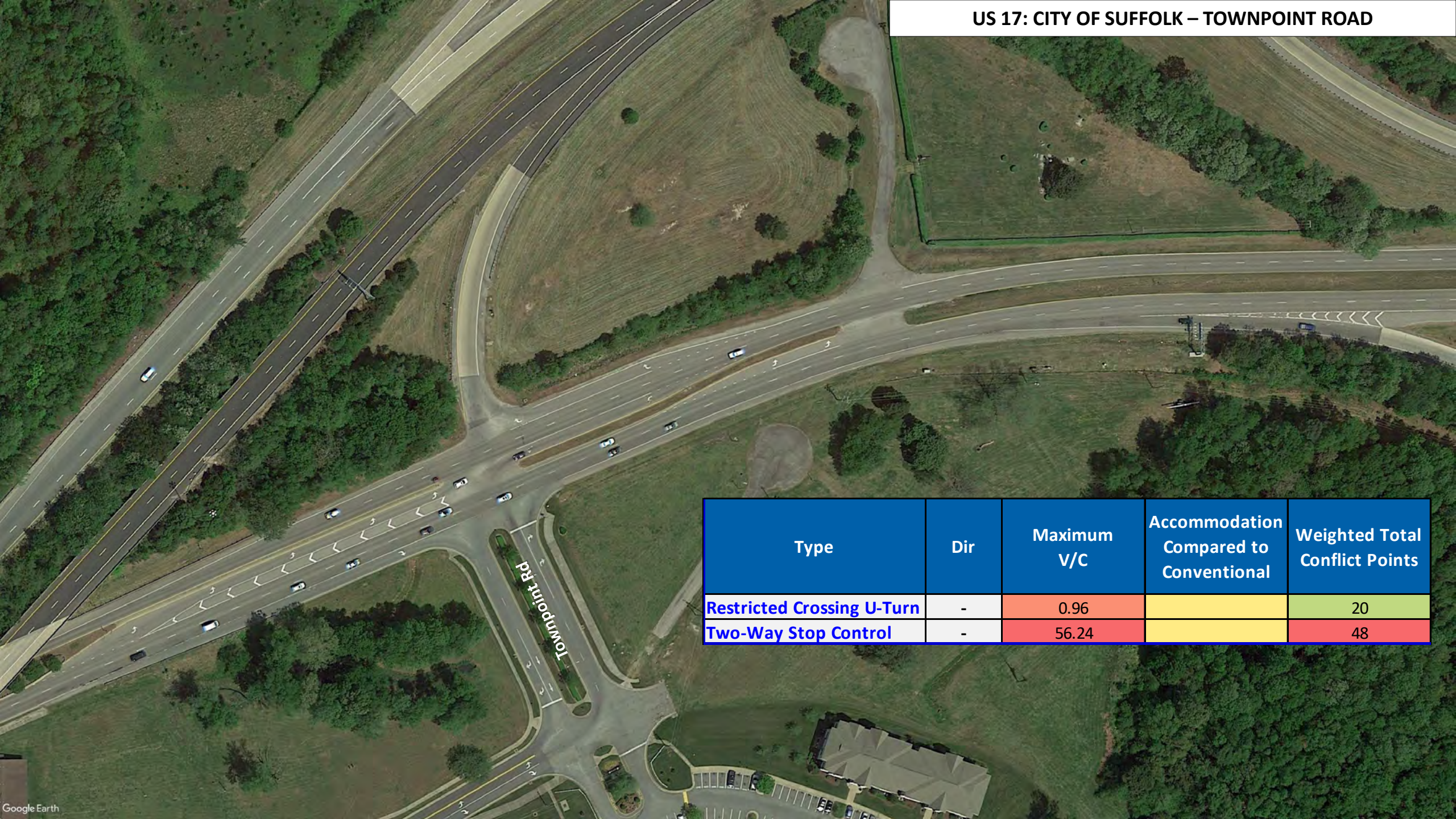
College Dr

164

17

-  Signalized Intersection
-  Unsignalized Intersection
-  Median Crossover





Type	Dir	Maximum V/C	Accommodation Compared to Conventional	Weighted Total Conflict Points
Restricted Crossing U-Turn	-	0.96		20
Two-Way Stop Control	-	56.24		48

18 Angle Crashes  
(VDOT 2015-2019)

2019 Turn Movement Volumes			
		←	390 (747)
		↙	356 (441)
(632)	465	→	
(704)	548	↘	
Exit to I-664S			

2045 Turn Movement Volumes			
		←	634 (1187)
		↙	452 (560)
(1362)	930	→	
(889)	853	↘	
Exit to I-664S			



US 17: CITY OF SUFFOLK – COLLEGE DRIVE



(846)	(7)	(791)	↶	535	(858)
555	9	404	←	525	(894)
↶	↓	↷	↷	9	(12)
(817)	700	↷	↶	↑	↷
(1127)	932	→	6	3	8
(16)	16	↷	(7)	(13)	(9)
Lynn Drive					

Type	Dir	Maximum V/C	Accommodation Compared to Conventional	Weighted Total Conflict Points	
Conventional	-	0.90		48	US 17 DUAL LEFT & COLLEGE DR DUAL RT
Partial Median U-Turn	-	0.92	+	28	
Restricted Crossing U-Turn	-	0.94		20	

- THRU-CUT
- RIGHT-IN/RIGHT-OUT OF MINOR APPORACH
- OVERLAPS

# Bridge Crossings

- Suffolk 2035 Comprehensive Plan
  - Second span to Mills E. Godwin Bridge over Nansemond River – 4 travel lanes
  - Second span to Hazelwood Bridger over Chuckatuck Creek – 4 travel lanes
- Isle of Wight Transportation Study (2019)
  - Widen bridge over Chuckatuck Creek – 4 travel lanes
- HRTPO 2045 LRTP
  - Mills Godwin Bridge widening
- Round 1 SMART SCALE Application
  - 1034: Mills Godwin Bridge Widening
- Should bridge concept be considered?
  - Evaluate second span vs widened deck
  - Evaluate inclusion of shared use path



# Next Steps

- Recommendation Development
  - VDOT
  - Stakeholder Breakout meetings
    - VDOT
    - Isle of Wight
    - Suffolk
- Initial Concepts

# US 17 Arterial Preservation Plan

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# ARTERIAL

PRESERVATION PROGRAM

US 17 Arterial Preservation Plan

*November 19, 2020; 1:00 PM – 3:00 PM*

