ARTERIAL
PRESERVATION PROGRAM

US 17 Arterial Preservation Plan

June 15, 2020; 2:00 PM – 4:00 PM

VDOT
Virginia Department of Transportation

Michael Baker
INTERNATIONAL

Meeting Agenda

- Introductions/Goal of Today's Meeting
- Purpose of Study
- Arterial Preservation
- Scope of Work Overview
- Field Review/Existing Conditions
- Next Steps

Introductions

- Study Participants
  - City of Suffolk
  - Isle of Wight County
  - Hampton Roads Transportation Planning Organization
  - Virginia Department of Transportation
  - Michael Baker International (study consultant)

Introductions

- Goals of today's meeting is to:
  - Kick-off the study process and review findings on study corridor
- Discuss:
  - Scope of work and end products
  - Roles and responsibilities
  - Study intersections

Purpose of Study

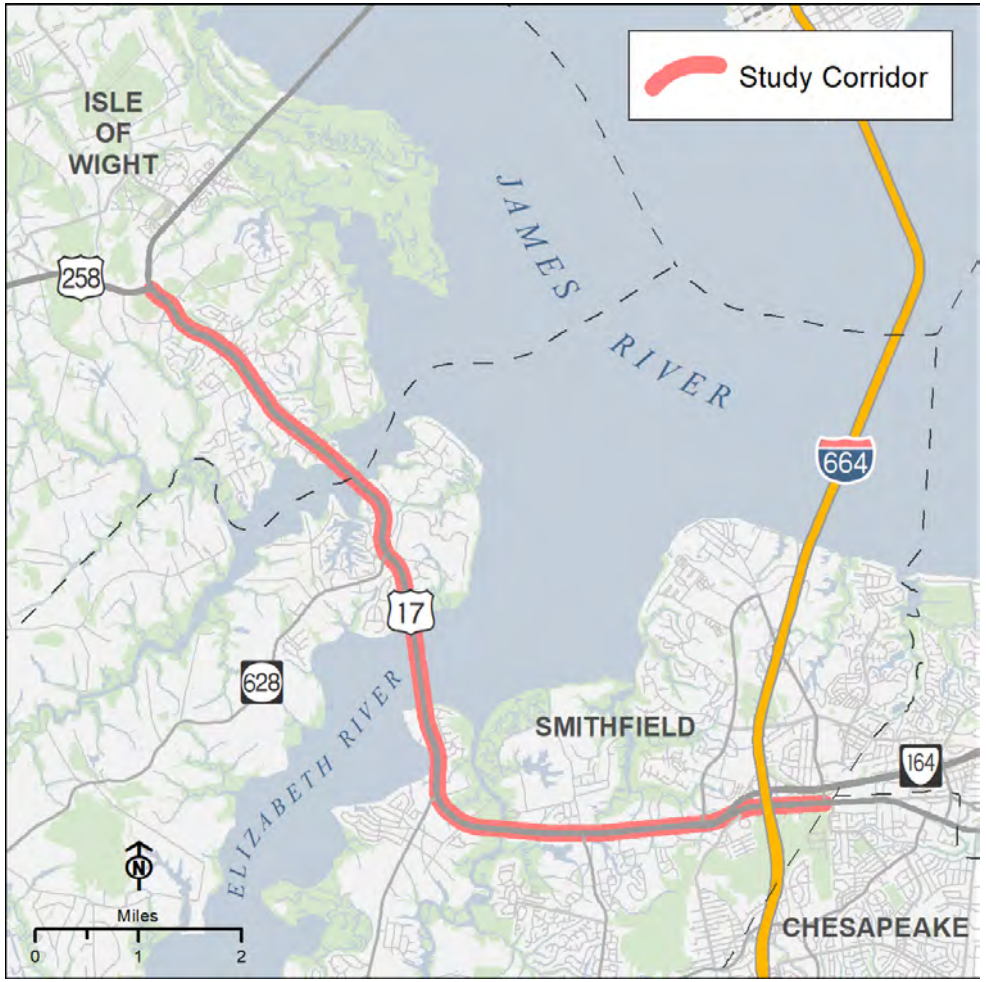
- To ensure safety while preserving and improving the capacity of the Commonwealth's arterial highway network without wide scale road widenings while also accommodating economic development

Study will identify recommendations to:

- Result in a safer corridor
- Preserve and improve corridor capacity and efficiency
- Maintain the Commonwealth's mobility & thus economic competitiveness
- Lower long-term infrastructure capital and maintenance costs

Project Study Area

- US 17, from US 258 (Brewers Neck Blvd) in Isle of Wight County to College Drive in the City of Suffolk
- Study area is 10.5 miles in length
- Project will be coordinated with on-going US 17 study north of US 258



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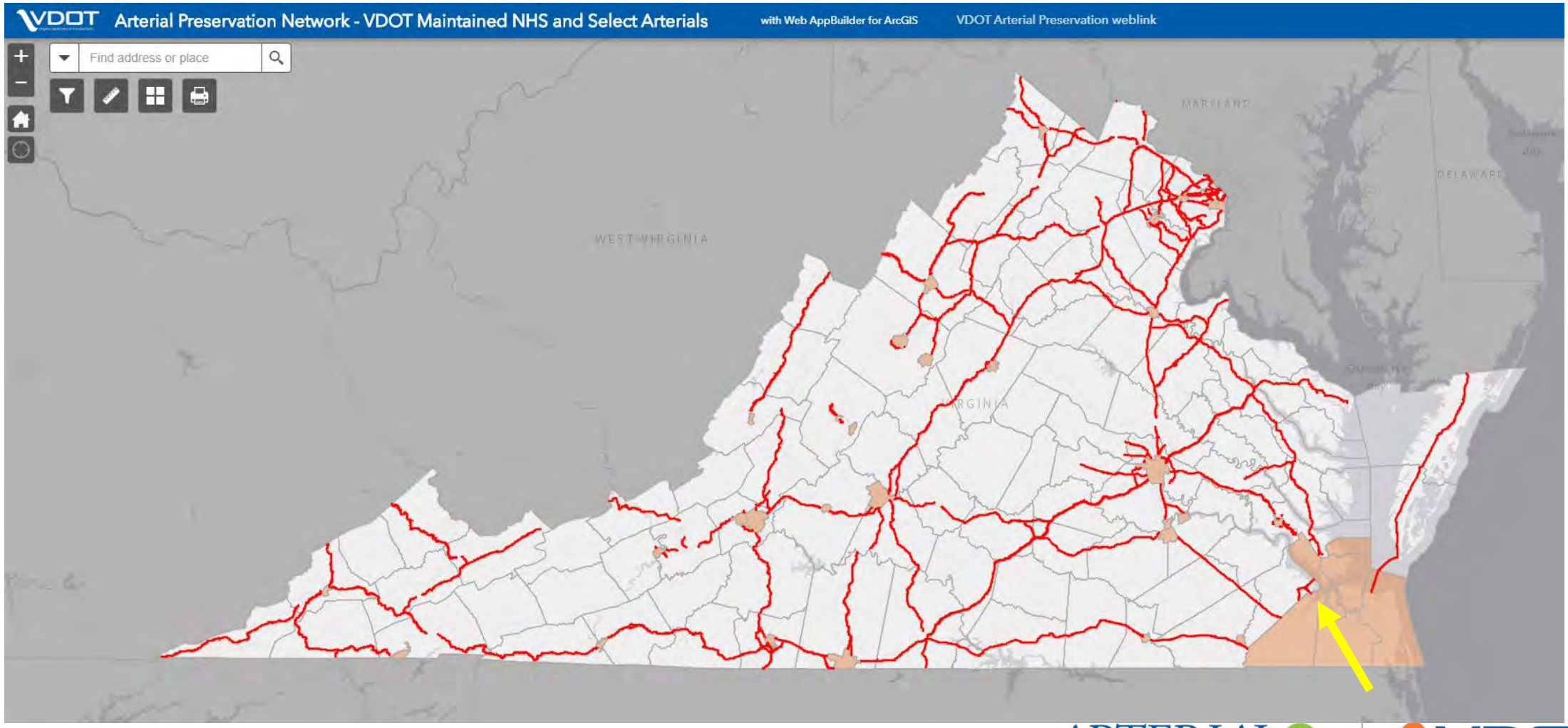
Arterial Preservation



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Arterial Preservation

- Access points and signal proliferation are adversely affecting performance of critical routes in the Commonwealth of Virginia.
- The transportation system must be managed as a limited resource by preserving capacity, improving traffic safety, and providing an acceptable level of service for through travel.
- Preservation and enhancement strategies will promote the use of innovative transportation solutions that minimize delays for through traffic and improve safety while considering local economic development goals.

Arterial Preservation

PROGRAM GOALS:

To preserve and enhance the capacity of the Arterial Preservation Network while ensuring that:

- Mainline through traffic is served with priority
- Access points and traffic controls do not degrade travel speed and safety
- Safety is improved

Arterial Preservation

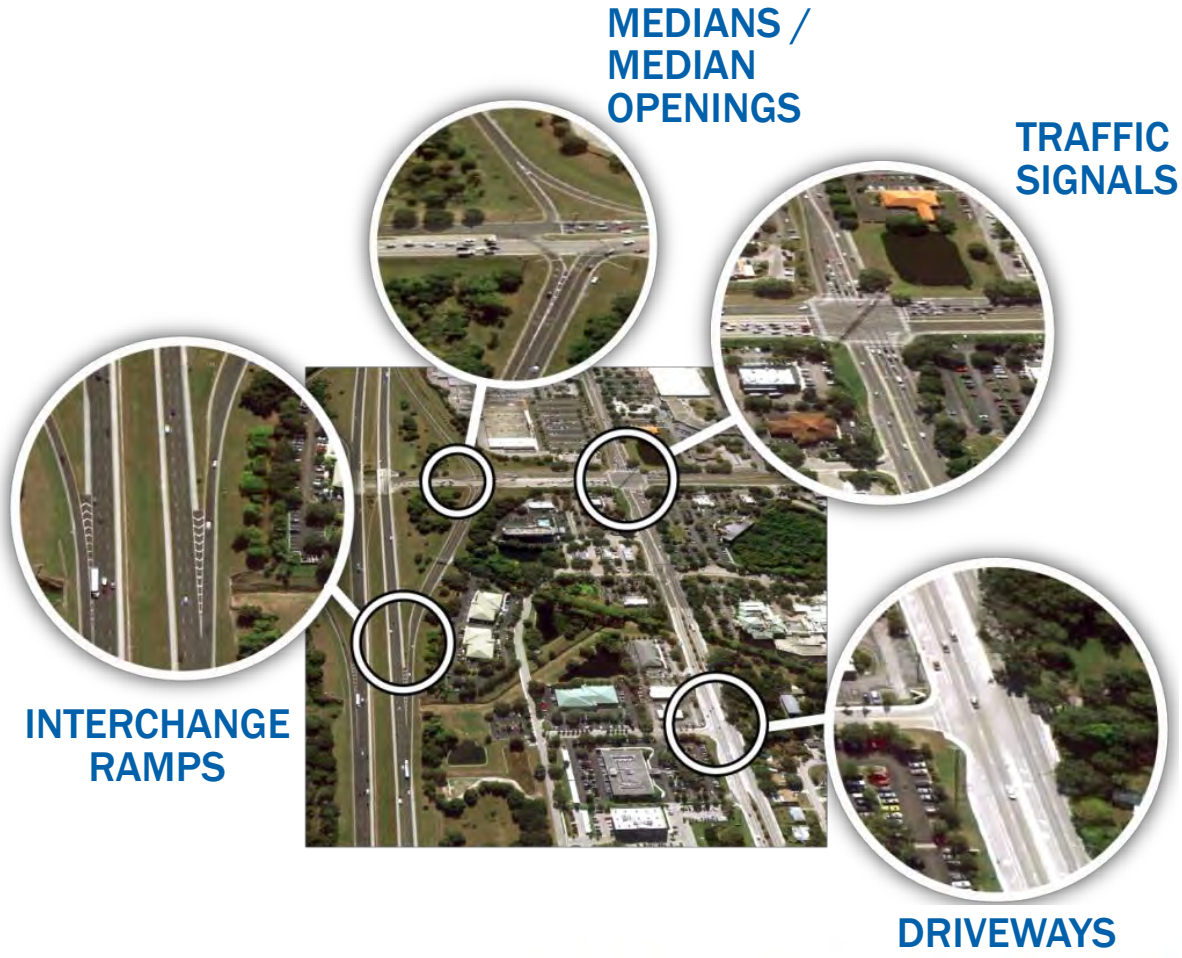
IMPLEMENTATION STRATEGIES

- Solicit public input throughout each planning process and in multiple forms
- Improve access management
- Educate all stakeholders on the benefits of improved mobility
- Encourage comprehensive transportation and zoning planning efforts
- Eliminate unwarranted traffic signals
- Implement innovative intersection configurations where appropriate

Access Management

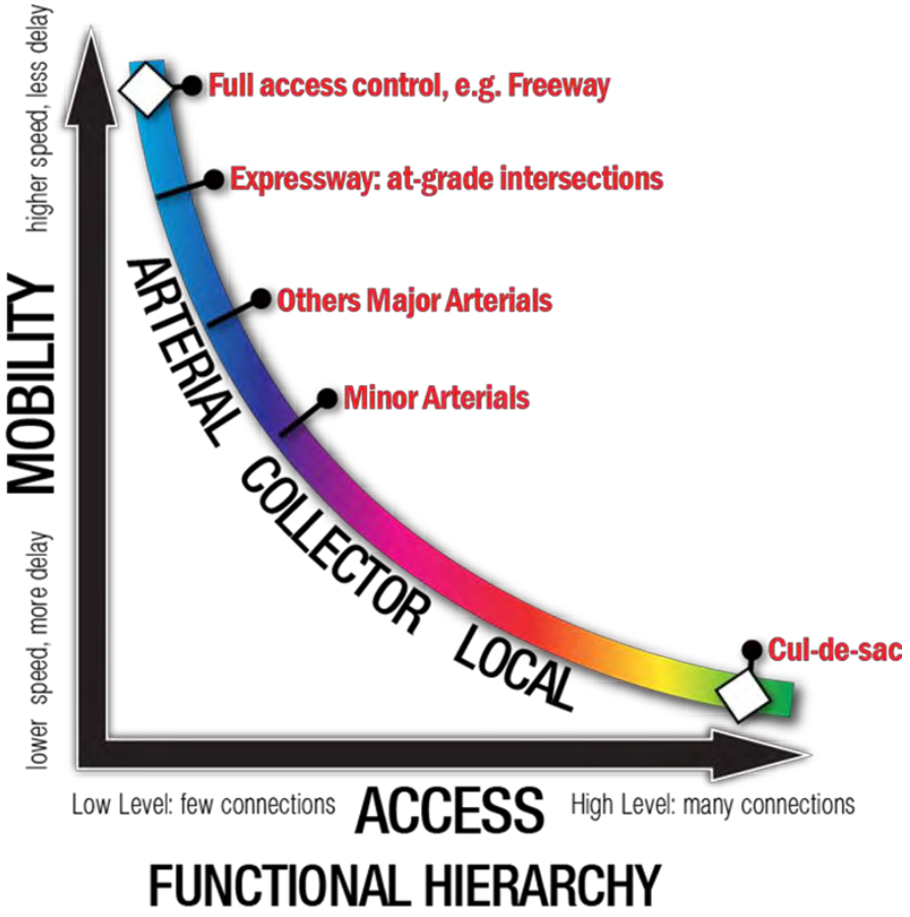
What is Access Management?

Access management involves the location, spacing, and design of driveways, medians, median openings, traffic signals, and interchanges



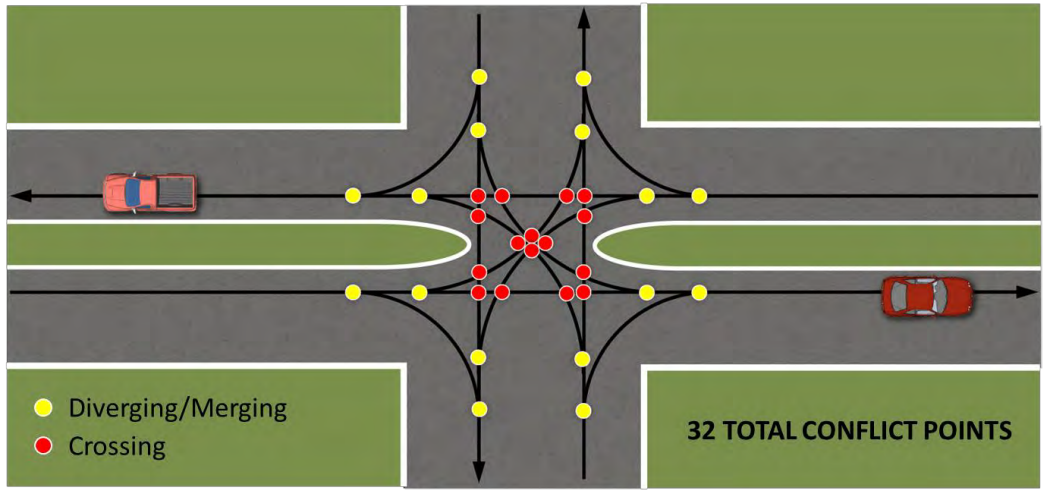
Guiding Principles

- Limit the number of conflict points
- Separate conflict points
  - Reduce the number of median openings
  - Provide directional median openings
  - Improve driveway design
  - Consolidate driveways to reduce frequency
- Look at conflict points from a network perspective

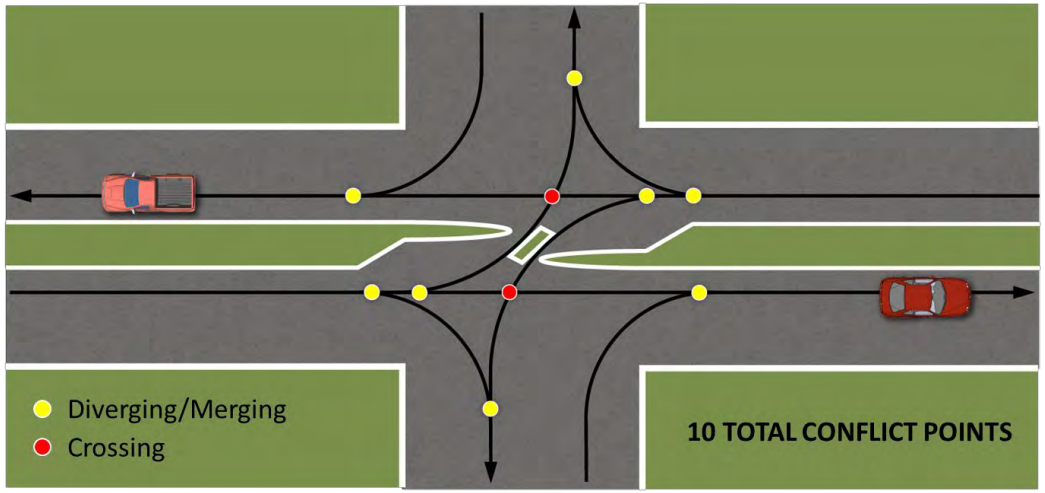


Conflict Points

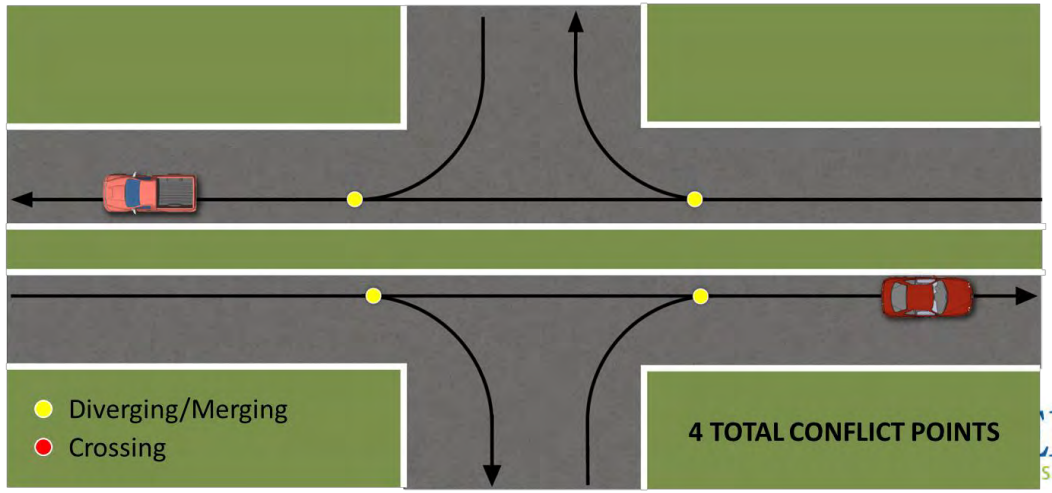
FULL UNSIGNALIZED MEDIAN OPENING



DIRECTIONAL MEDIAN OPENING

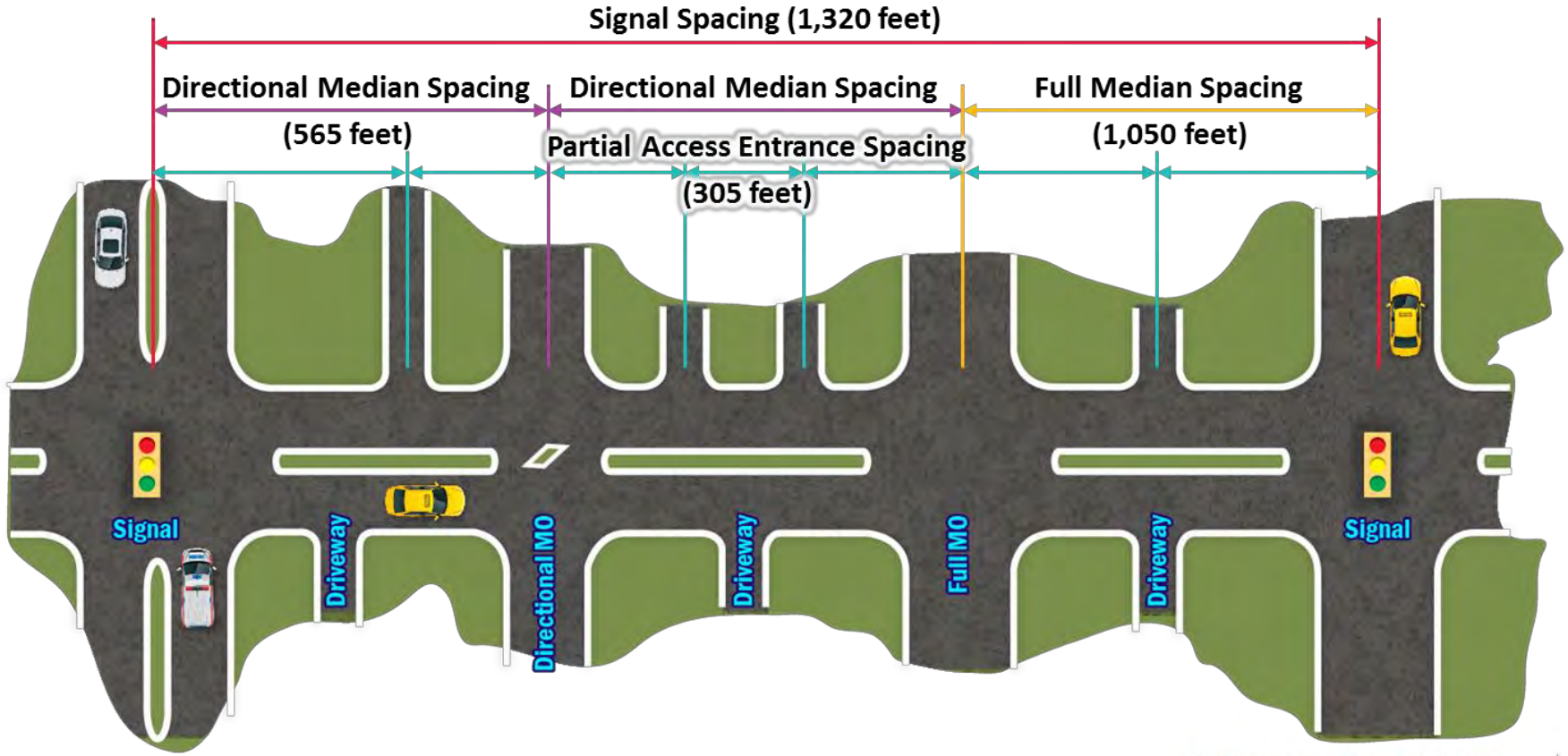


RIGHT-IN/RIGHT-OUT DRIVEWAY



Access Management Guidelines

- VDOT Spacing Standards (*35-45 MPH Principal Arterial*)



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Access Management Benefits

- Increased Signal Spacing Benefits
  - Improves traffic flow
  - Reduces congestion
  - Improves air quality

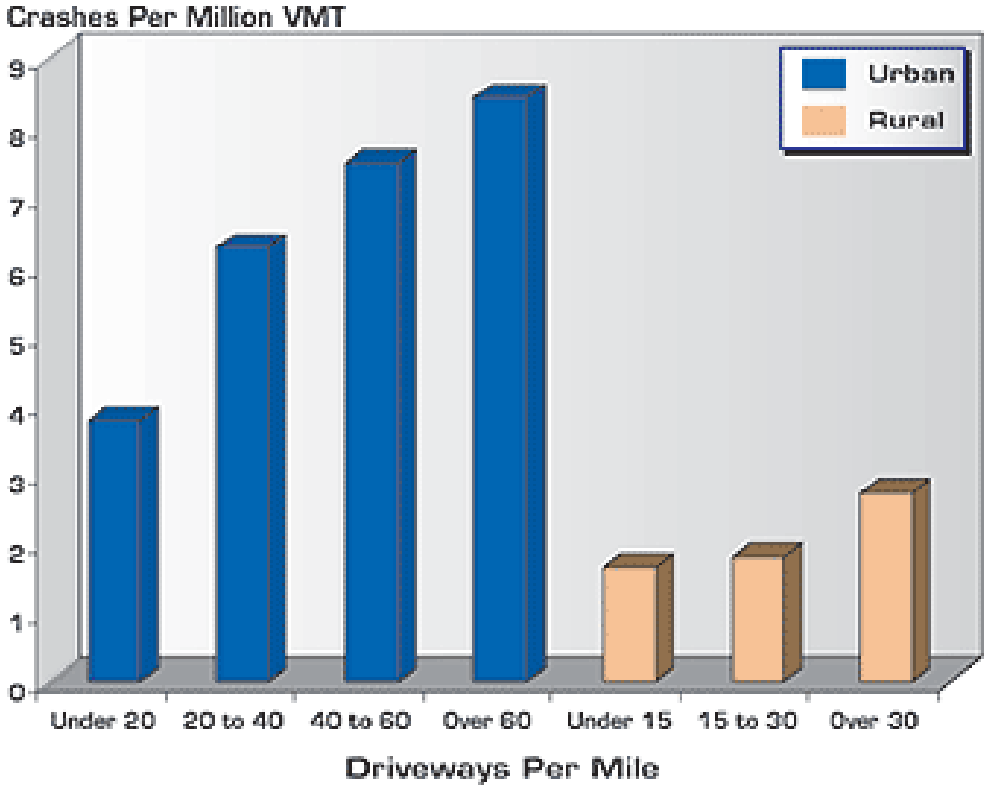
Signals per Mile	Increase in Travel Time (%)
2	-
3	9
4	16
5	23
6	29
7	34
8	39

Signals per Mile	Crashes per Million VMT
Under 2	3.53
2 to 4	6.89
4 to 6	7.49
6 +	9.11

Source: Federal Highway Administration (FHWA)
https://ops.fhwa.dot.gov/access_mgmt/docs/benefits_am_trifold.htm

Access Management Benefits

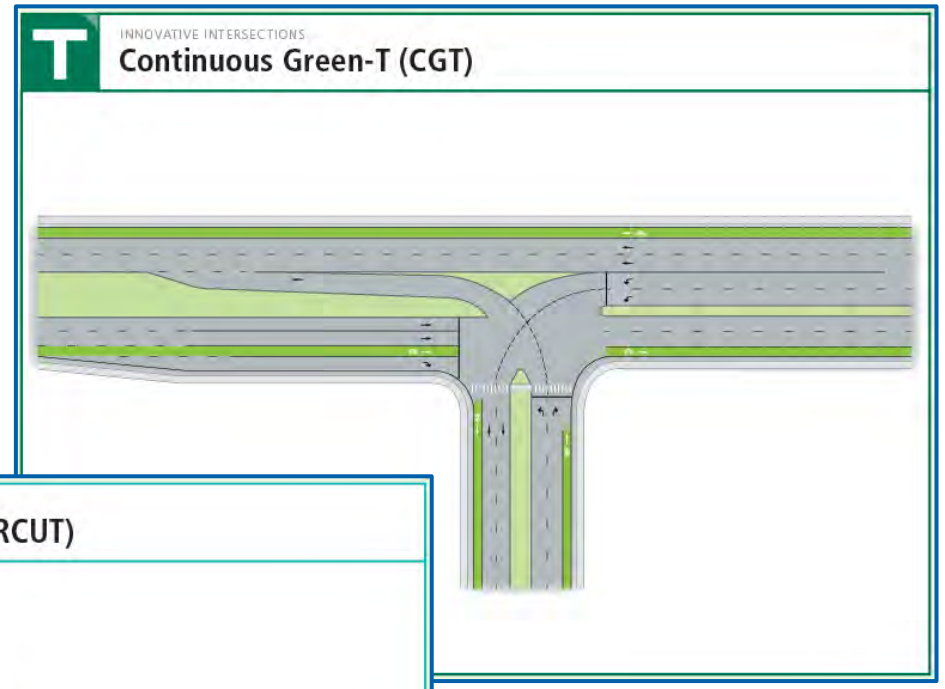
- Increased Driveway Spacing Benefits
  - Reduces number of potential conflicts
  - Increases roadway speeds
  - Reduces the rate of car crashes

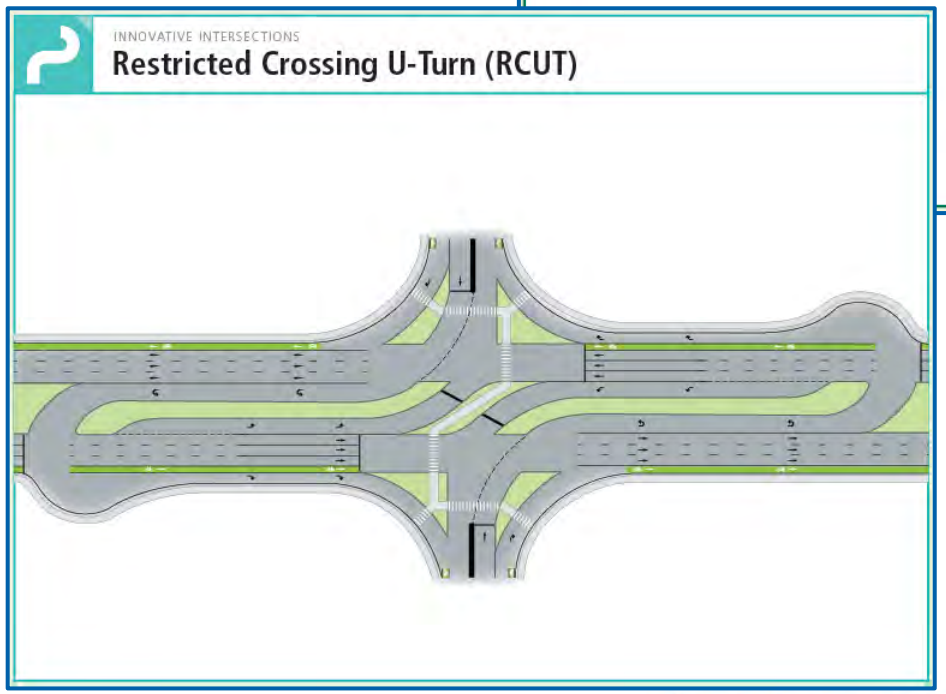


Source: Federal Highway Administration (FHWA)
https://ops.fhwa.dot.gov/access_mgmt/docs/benefits_am_trifold.htm

Innovative Intersections

- Designs where traffic movements are modified to:
  - Improve safety
  - Reduce delay
  - Increase efficiency
- Can reduce delays and crashes as much as 50%
- Also known as:
  - Alternative
  - Non-traditional
  - Unconventional
  - Reduced Conflict





Innovative Intersection Fundamentals

Re-Route Left Turn Movements

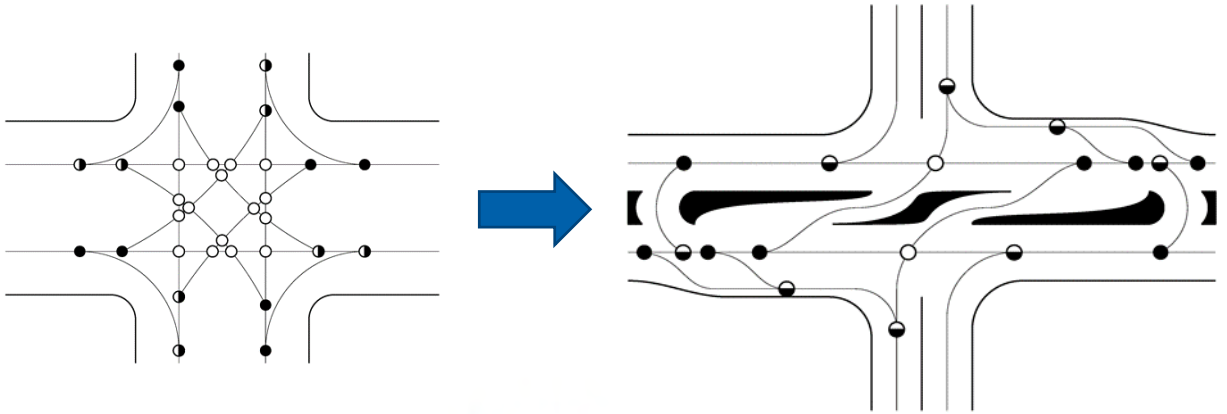
- More efficiently serves through traffic

Reduce Signal Phases

- Reduces delay

Remove and Separate Conflicts

- Improves safety



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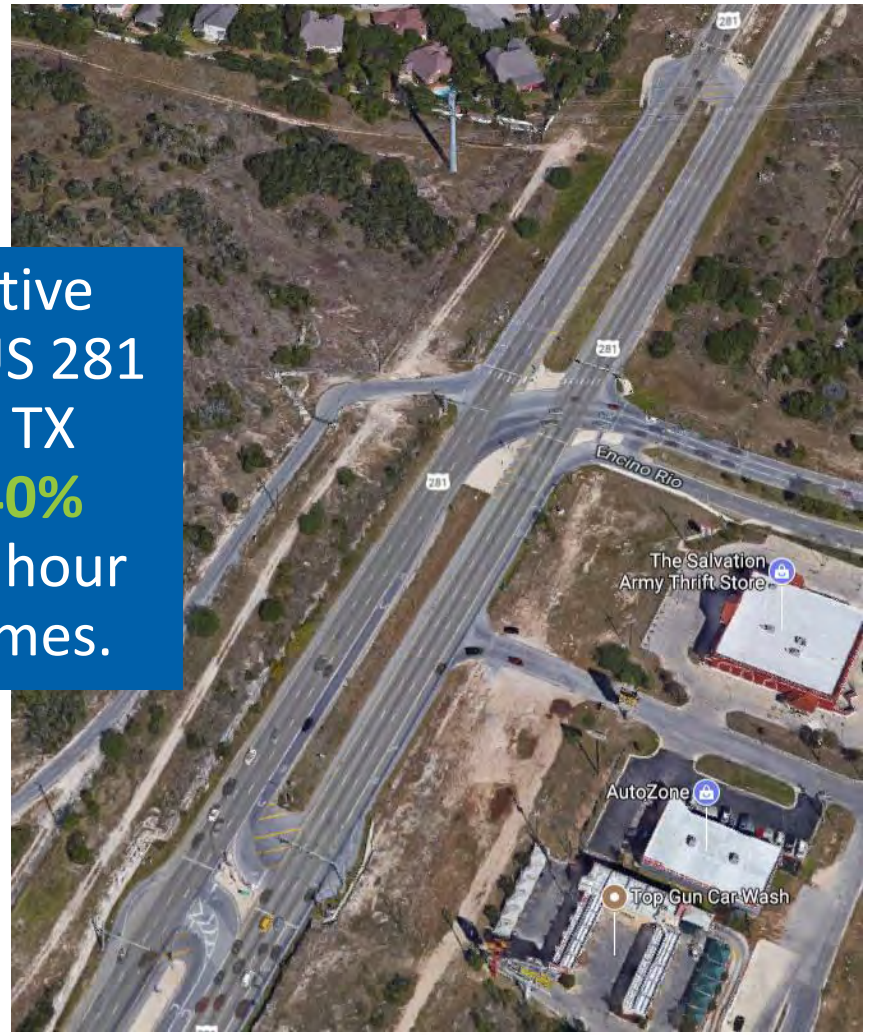
Innovative Intersection Benefits

Series of innovative intersections on US 281 in San Antonio, TX resulted in **34-40%** decrease in peak hour corridor travel times.



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Innovative Intersection Benefits

US 1 at Camp Easter Rd, Vass, NC

Safety analysis of RCUT intersections with stop signs in NC found that fatal and injury, angle, and left-turn crashes decreased by more than half following RCUT installation.

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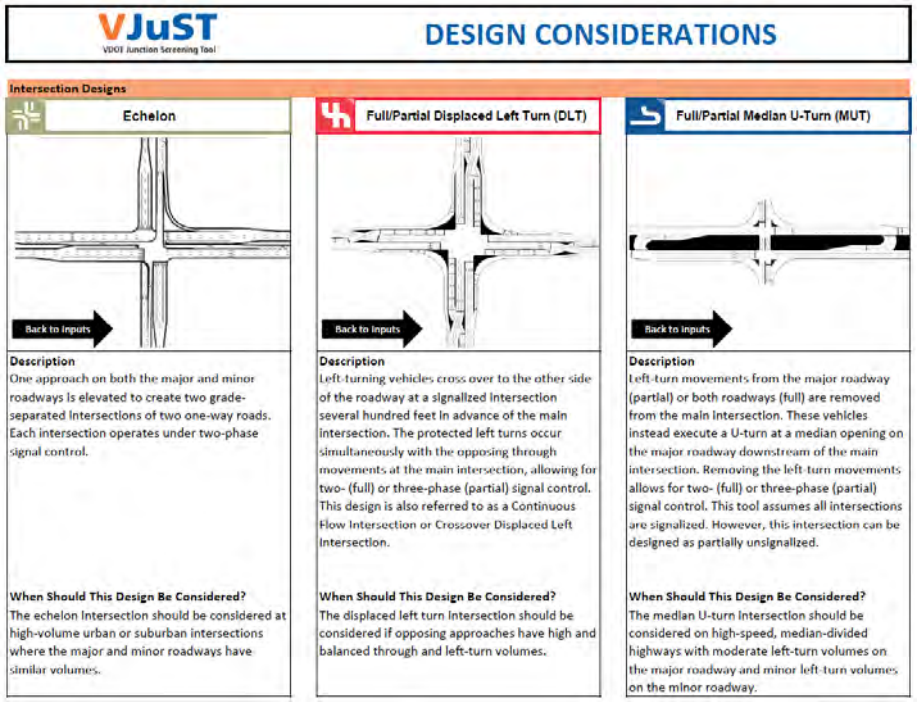
Innovative Intersection Tools

- VDOT Junction Screening Tool (VJuST)
  - Conceptually compares traditional vs. innovative intersections
  - Website http://www.virginiadot.org/info/alternative_intersection_informational_design_guides.asp



Arterial Preservation Resources

Arterial Preservation Website:

http://www.virginiadot.org/programs/vdot_arterial_preservation_program.asp

Innovative Intersection Website:

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

Scope of Work

1. **Study will identify up to eight priority intersections for the development of detailed recommendations**
   a. Historic traffic volumes
   b. Potential for safety improvement (PSI)
   c. Crash history
   d. Field observations
   e. Stakeholder input
2. **Horizon year of 2040**
3. **Arterial Preservation techniques will be applied where feasible**
4. **Will identify opportunities to improve roadway geometrics and access management**

Scope of Work

Category 1 (All locations)

- Analysis of existing conditions using the SimTraffic software (due to oversaturated conditions)
- Develop future traffic volumes at each intersection
- Analysis of future minimally managed condition using the SimTraffic software
- Suggest a recommendation for future study based on the operational analysis of the future minimally managed condition, safety and, field visit. The recommendation will be described using text in the report, but a sketch and detailed cost estimate will not be developed.
- Planning level cost estimate for the suggested recommendation
- This category does not include a detailed/SimTraffic analysis of the suggested recommendation

Category 2 (Eight locations to be determined by stakeholders)

- Analysis of the future conditions with the recommendation in place
- Detailed cost estimate
- Detailed conceptual sketch

Scope of Work - Category 1 Locations

Isle of Wight County

1. Route 17/Route 258
2. Route 17/Channell Way – (counts to be provided by VDOT)
3. Route 17/Ashby Way/Omera Dr
4. Route 17/Sugar Hill Rd
5. Route 17/Cedar Grove Rd

City of Suffolk

6. Route 17/Eclipse Dr
7. Route 17/Crittenden Rd
8. Route 17 /Clubhouse Dr
9. Route 17/Bennetts Pasture Rd
10. Route 17/Lee Farm Ln
11. Route 17/Food Lion Shopping Center – (counts to be provided by VDOT)
12. Route 17/Bennetts Creek Crossing Shopping Center
13. Route 17/Shoulder Hill Rd
14. Route 17/Windward Lane – (counts to be provided by VDOT)
15. Route 17/Breezeport Way
16. Route 17/Plummer Blvd
17. Eastbound Route 17 ramp diverge to eastbound Route 164
18. Westbound Route 17 ramp merge from Route 164
19. Route 17/Harbor View Blvd
20. Route 17/Townpoint Rd
21. Route 17/I-664 southbound on-ramp
22. Route 17/I-664 northbound off-ramp
23. Route 17/Access Road to Kia Dealership
24. Route 17/College Drive

Locations to be advanced to Category 2 will be determined by stakeholders

Scope of Work

1. Crash Data Collection ✓
2. Site Field Review ✓
3. Existing Conditions ✓
4. Future Land Use
5. Traffic Volume Forecasting/Projections
6. Development of Alternatives and Recommendations
7. Report Development

Meetings and Public Involvement will be ongoing throughout the study

Detailed Recommendation Example

US 58 Arterial Preservation Plan
Figure 9
Intersection #11: US 58 and Market Dr
City of Emporia

Recommendation: Reconfigure intersections to coordinated signalized intersections. The westbound direction at Market Dr and the eastbound direction at New Rd will be free-flow. Construct new intersection east of Market Dr and US 58 to include Continuous Green-T for southbound left-turns and u-turn area for US 58 Business left-turns onto US 58 (pictured left).

ROW Impacts: Land acquisition will be required for new intersection and connection to Market Rd. Market Rd between New Rd and Market Dr will require improvements.

Improvement Type: Congestion, Safety, Travel Time Preservation

Traffic Operations:

Total Intersection Delay (s)	AM	PM
Existing Conditions	25.6 - C	32.3 - C
2040 No Build Conditions (Conventional Intersection)	27.4 - C	87.9 - F
2040 Build Conditions	19.9 - B	31.0 - C

Cost: $3.1M to $4.9M

- Standard Movements
- Southbound Market Dr to Eastbound US 58
- Southbound Market Dr to US 58 Business
- Northbound US 58 Business to Westbound US 58
- Northbound US 58 Business & Eastbound US 58 To Market Dr

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Framework Document

- Summary of study scope
- Deliverables
  - Who will do and/or provide what and when
    - It is expected that the local/regional stakeholders will take the lead on outreach to local elected officials and the public during the course of most studies.
- Examples of information provided by external study team representatives
  - Studies/traffic data
  - Mapping/GIS
  - Current and Future zoning, local improvement plans in vicinity,
  - Comp Plan
  - Land Development activities - approved and pending within and adjacent to study area
- Project timeline
  - Meetings will be held at key decision points
- Signature line for all study team representatives, agreeing to the details included in the Framework

Previous Work and Funded Improvements

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)

Site Visit Video

Condition and Access Management Summary

Access Management

- Signals and unsignalized intersections within close proximity of each other
- Insufficient turn lane tapers and storage lengths
- Right-turn lanes not consistently provided

INVENTORY				
Locality	Total Number of Crossovers	Signalized	Unsignalized	Median Crossover
Isle of Wight	13	3	2	8
Suffolk	32	12	5	15

CROSSOVERS		
VDOT STANDARD REF	MEETS	DOES NOT MEET
Access Management	7	38
Turn Lane Lengths	16	29

Signage and Markings

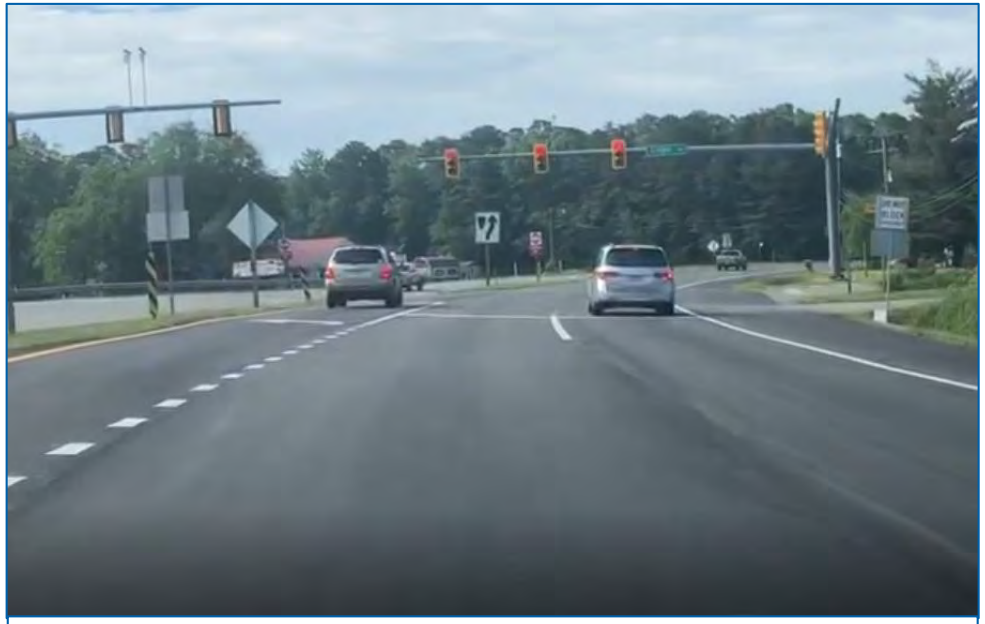
- Visible and Good in both Directions
- High-Vis Backplates on Signals

Isle of Wight	13	3	2	8
Suffolk	32	12	5	15

Shoulders (Non-urban/curb and gutter cross-sections)

- Overall US 17 Study Area <10’ Total / <8’ Paved along US 17 both ways
- Westbound lanes more consistent north of Hazelwood Sr Bridge: 3’ – 5’ paved shoulders
- Bridge Approaches: 0’-2’ paved shoulders

Observations



High-Vis Backplates / Newer Pavement (Overlay) / Pavement Markings

US 17 Northbound Shoulders on Godwin Jr Bridge Approach

US 17 Southbound Shoulders on Godwin Jr Bridge Approach

I-664 / SR 164 Area Observations

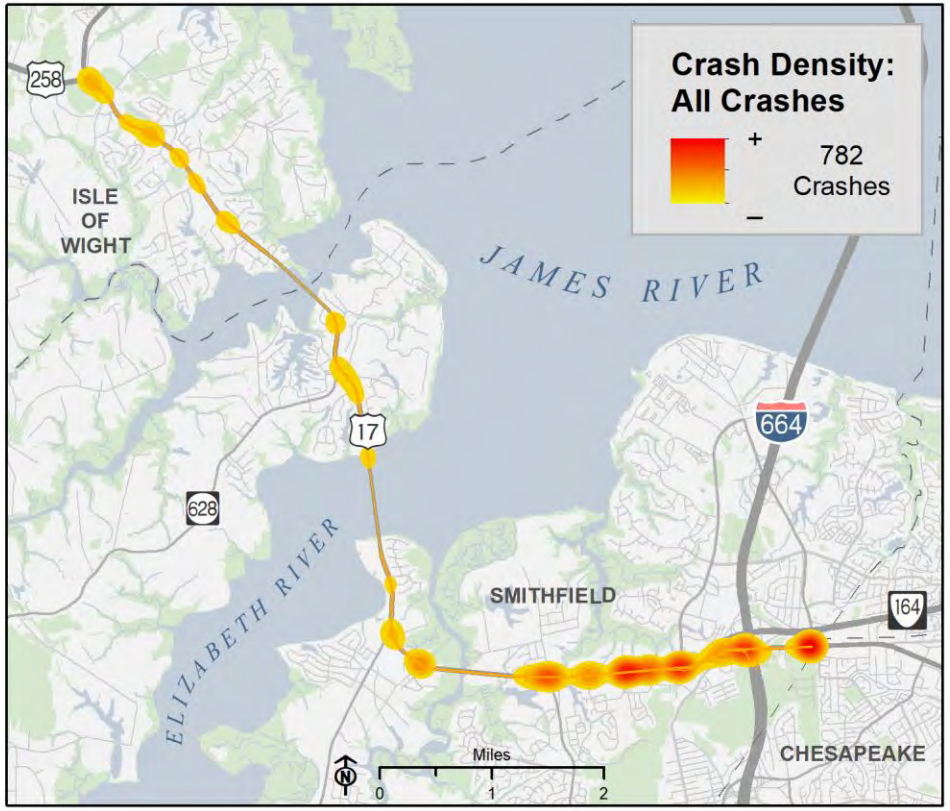
US 17 Northbound Towards Harbour View Blvd Merge from Two-Lanes to One-lane

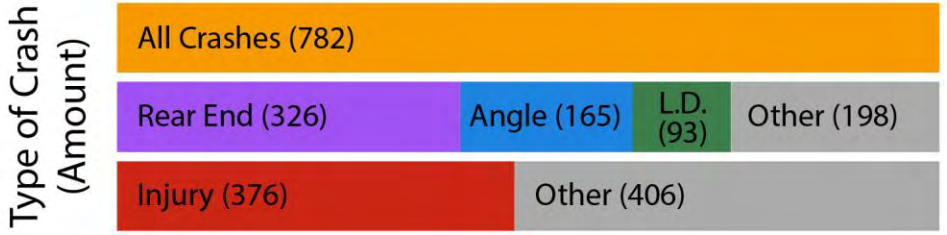
US 17 Southbound Looking at US 17 Northbound Left-turn onto I-664

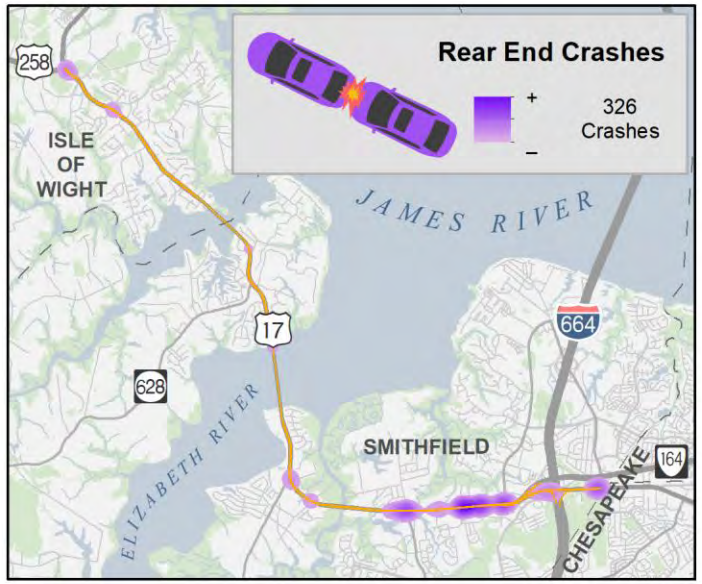
US 17 Northbound Towards Harbour View Blvd Weave / Merge with I-664 Off-Ramp

US 17 Northbound Looking at US 17 Northbound Left-turn onto I-664


SPEED LIMIT 45
17
1260'
1940'
Bennetts Pasture Rd
560'
Lee Farm Ln
Food Lion Shopping Center
17
2050'
800'
1105'
EXAMPLE
Signalized Intersection
Unsignalized Intersection
Median Crossover
N


Crash Density:
All Crashes
782
Crashes
ISLE
OF
WIGHT
JAMES RIVER
ELIZABETH RIVER
SMITHFIELD
CHESAPEAKE
258
17
628
664
164
Miles
0
1
2


Type of Crash
(Amount)
All Crashes (782)
Rear End (326)
Angle (165)
L.D.
(93)
Other (198)
Injury (376)
Other (406)


Rear End Crashes
326
Crashes
ISLE
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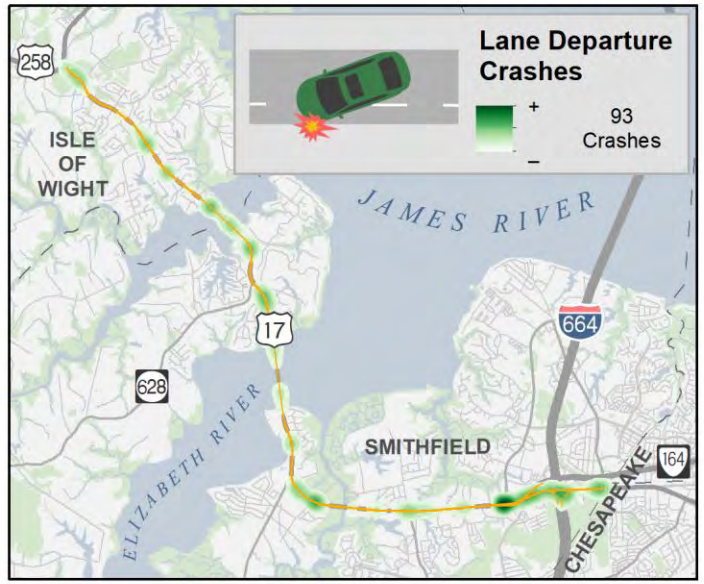
WIGHT
JAMES RIVER
ELIZABETH RIVER
SMITHFIELD
CHESAPEAKE
258
17
628
664
164


Lane Departure
Crashes
93
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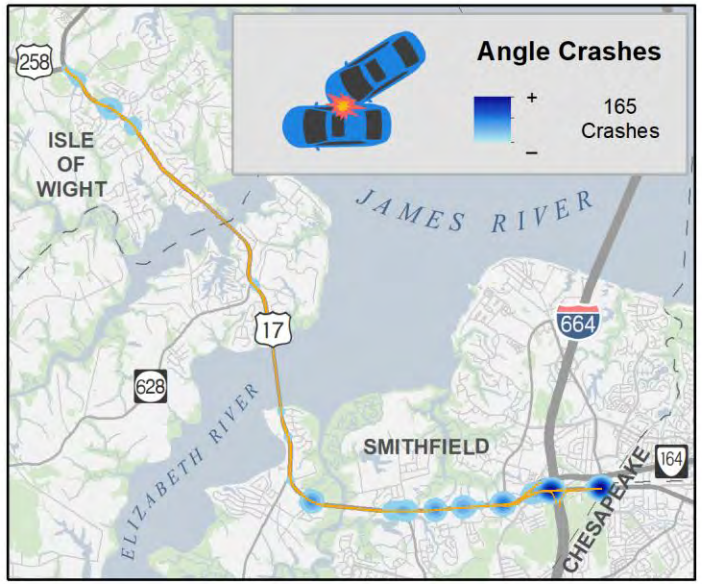
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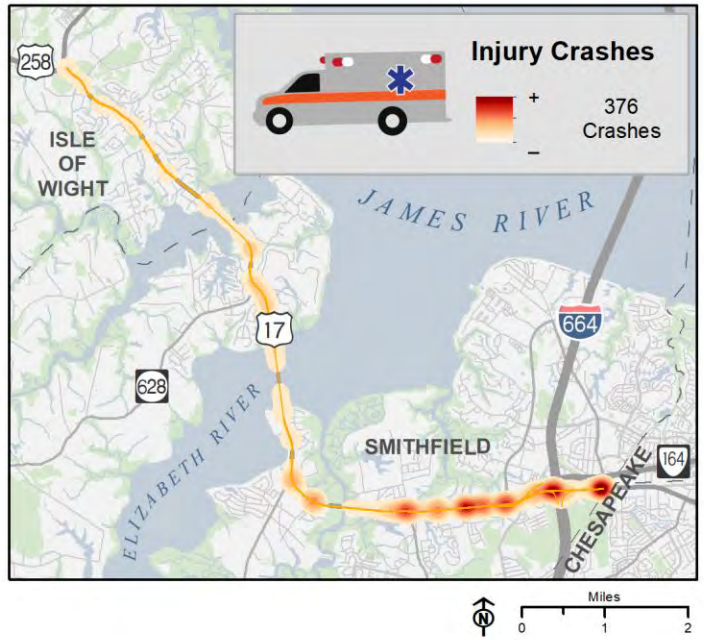
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376
Crashes
ISLE
OF
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JAMES RIVER
ELIZABETH RIVER
SMITHFIELD
CHESAPEAKE
258
17
628
664
164
Miles
0
1
2

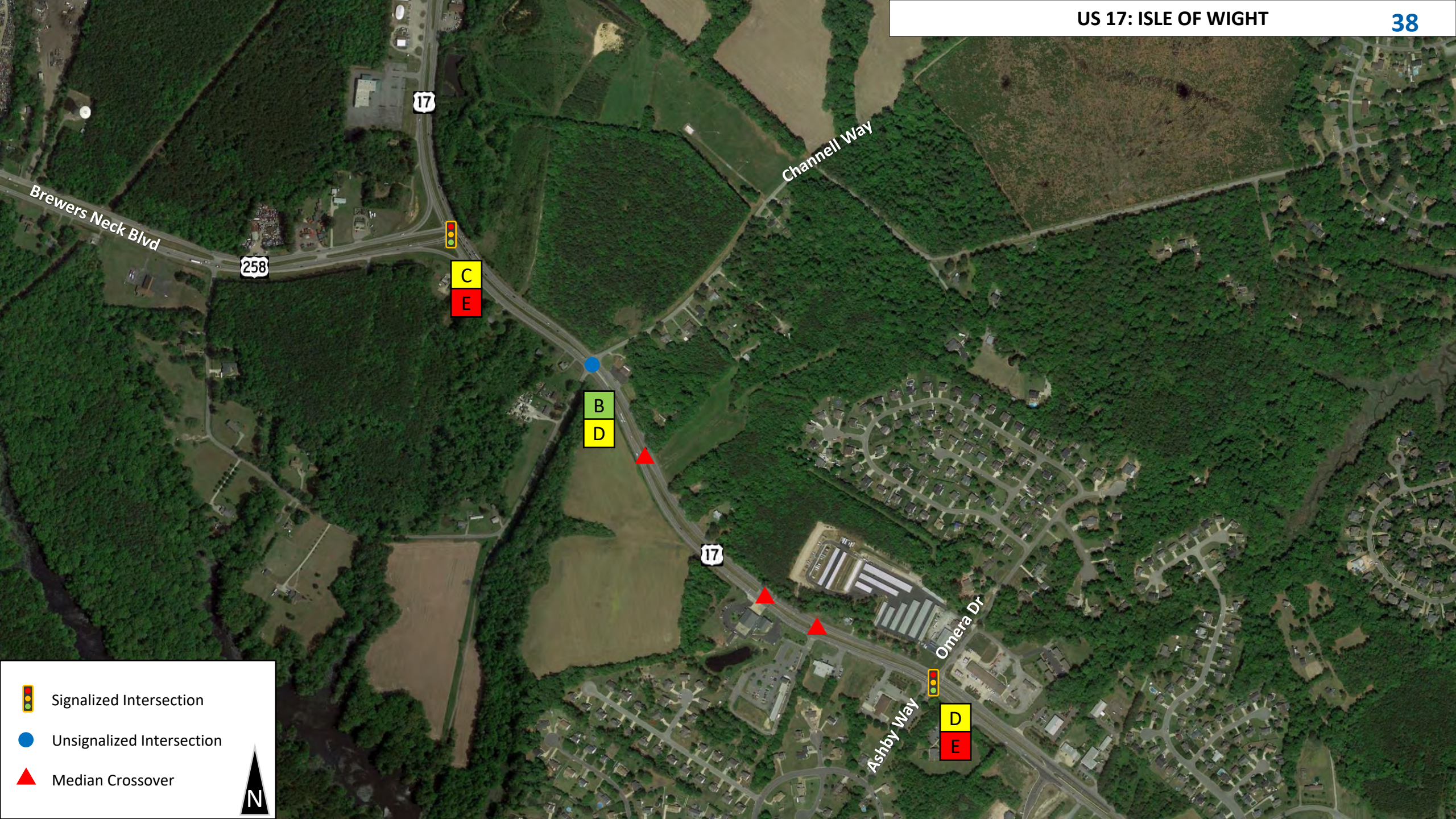
Safety Summary

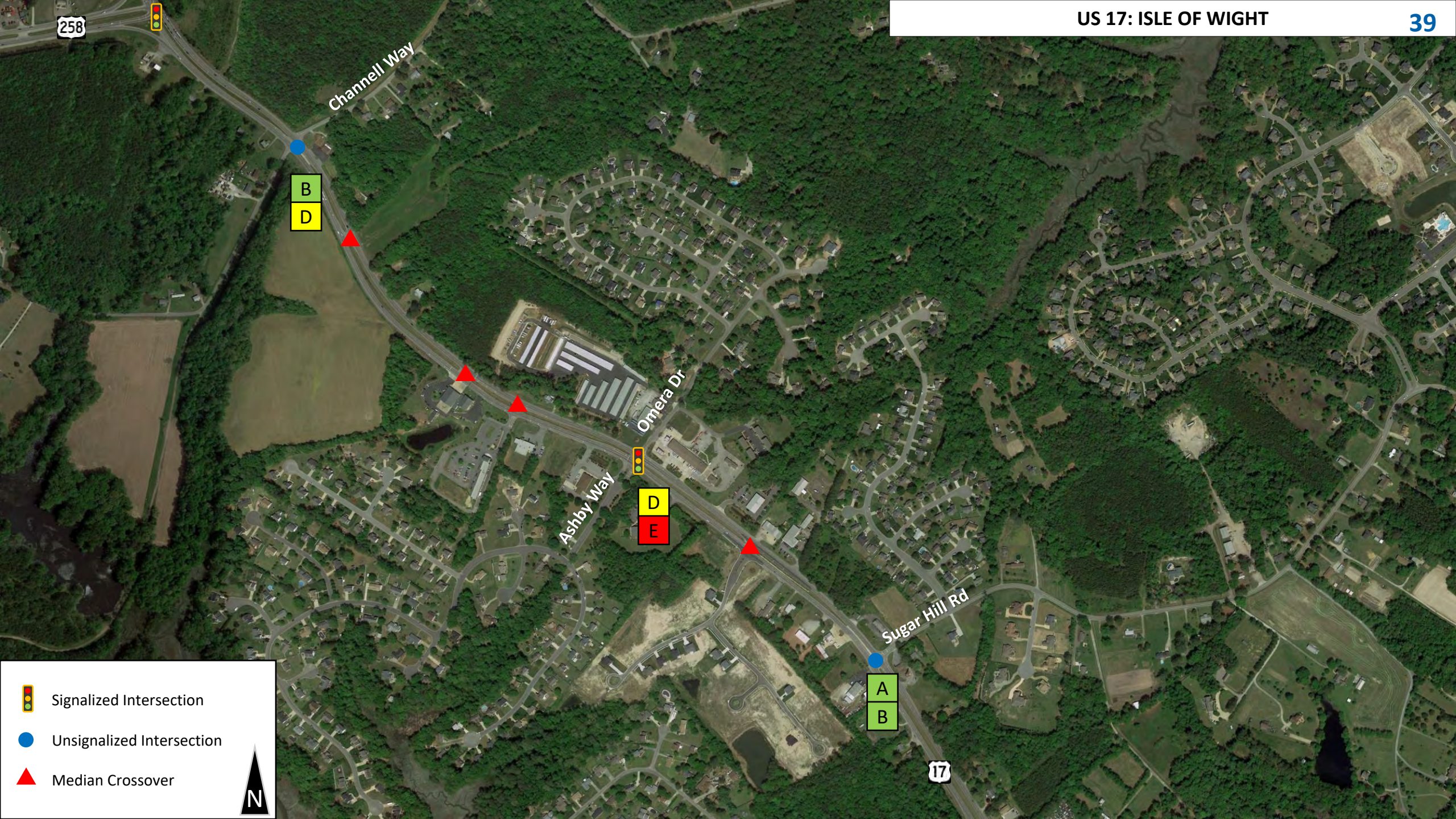
Historical ADT						
From	To	# of Crashes	Period of Analysis (Years)	Segment Length (Mi.)	2019 AADT	Crash Rate
WCL Chesapeake	I-664; SR 164	183	5	0.66	24,000	633.04
I-664; SR 164	Rte. 626 - Shoulders Hill Rd	250	5	1.81	36,000	210.23
Rte. 626 - Shoulders Hill Rd	Rte. 627 - Bennetts Pasture Rd	90	5	1.54	28,000	114.37
Rte. 627 - Bennetts Pasture Rd	Rte. 628 - Crittenden Rd	83	5	2.47	21,000	87.68
Rte. 628 - Crittenden Rd	Isle of Wight County Line	32	5	1.17	16,000	93.67
Isle of Wight County Line	US 258 / SR 32	137	5	2.43	16,000	193.08

Safety Summary

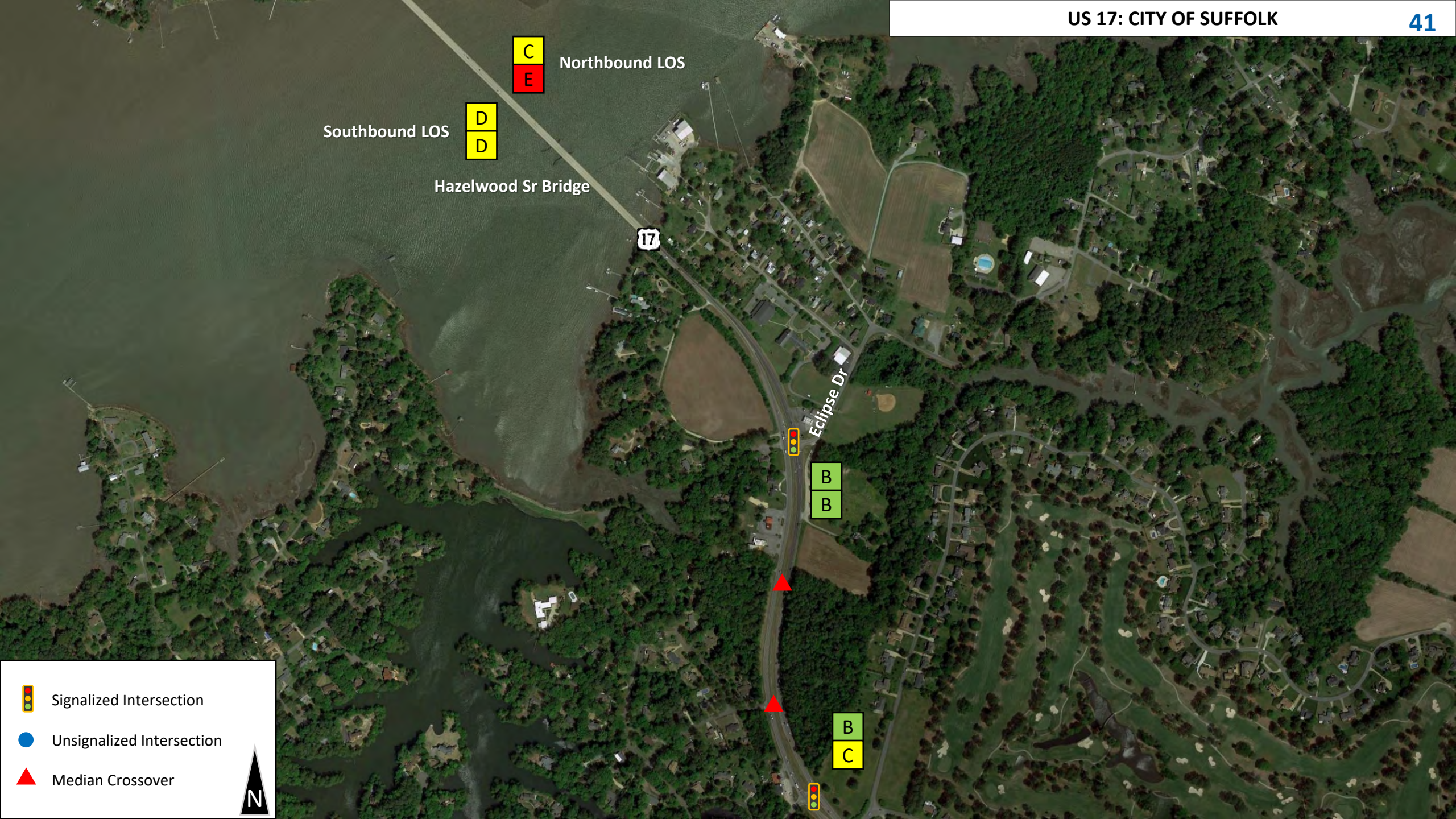
- **Rear-ends mostly occurring at signalized intersections**
- **High Density of Angle crashes occurring near Lee Farm Ln Area, I-664 Southbound On-Ramp, and College Drive**
- **High Density of Side-swipes occurring at Harbor View Blvd**
  - Merge between US 17 northbound and I-664 eastbound off ramp
- **Lane Departures/Side-swipes also frequently occurring along bridges**

US 17 VTrans Safety Needs	
Intersection	**Locality**
Channell Way / Deep Bottom Drive	Isle of Wight
Ashby Way / Omega Drive	Isle of Wight
Sugar Hill Road	Isle of Wight
Clubhouse Drive	Suffolk
Bennetts Creek Landing	Suffolk
Lee Farm Lane	Suffolk
Shoulders Hill Road / Knotts Neck Road	Suffolk
Harbour View Boulevard	Suffolk
Entrance to Kia Dealership	Suffolk
College Drive / Lynn Drive	Suffolk


17
Brewers Neck Blvd
258
Channell Way
C
E
B
D
17
Omera Dr
Ashby Way
D
E
Signalized Intersection
Unsignalized Intersection
Median Crossover
N


258
Channell Way
B
D
Omera Dr
Ashby Way
D
E
Sugar Hill Rd
A
B
17
Signalized Intersection
Unsignalized Intersection
Median Crossover
N


17
Cedar Grove Rd
A
D
17
Signalized Intersection
Unsignalized Intersection
Median Crossover
N


C
E
Northbound LOS
D
D
Southbound LOS
Hazelwood Sr Bridge
17
Eclipse Dr
B
B
B
C
Signalized Intersection
Unsignalized Intersection
Median Crossover
N


B
C
A
A
Clubhouse Dr
17
Crittenden Rd
Governors Pointe Dr
17
Signalized Intersection
Unsignalized Intersection
Median Crossover
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17
C
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Northbound LOS
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Southbound LOS
Godwin Jr Bridge
17
Bennetts Creek Landing
Signalized Intersection
Unsignalized Intersection
Median Crossover
N


17
B
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C
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A
Bennetts Pasture Rd
Lee Farm Ln
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17
Signalized Intersection
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Median Crossover
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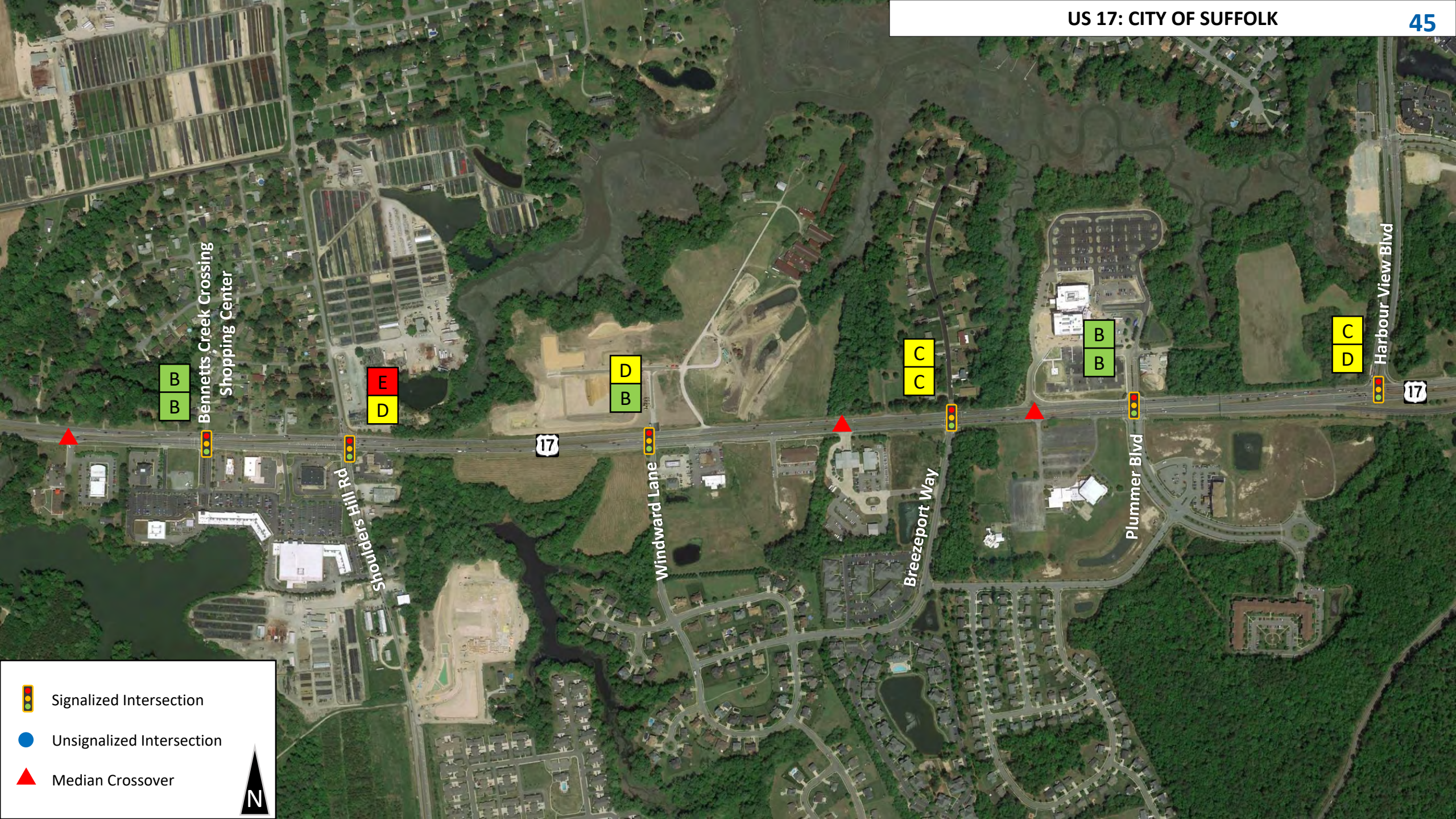
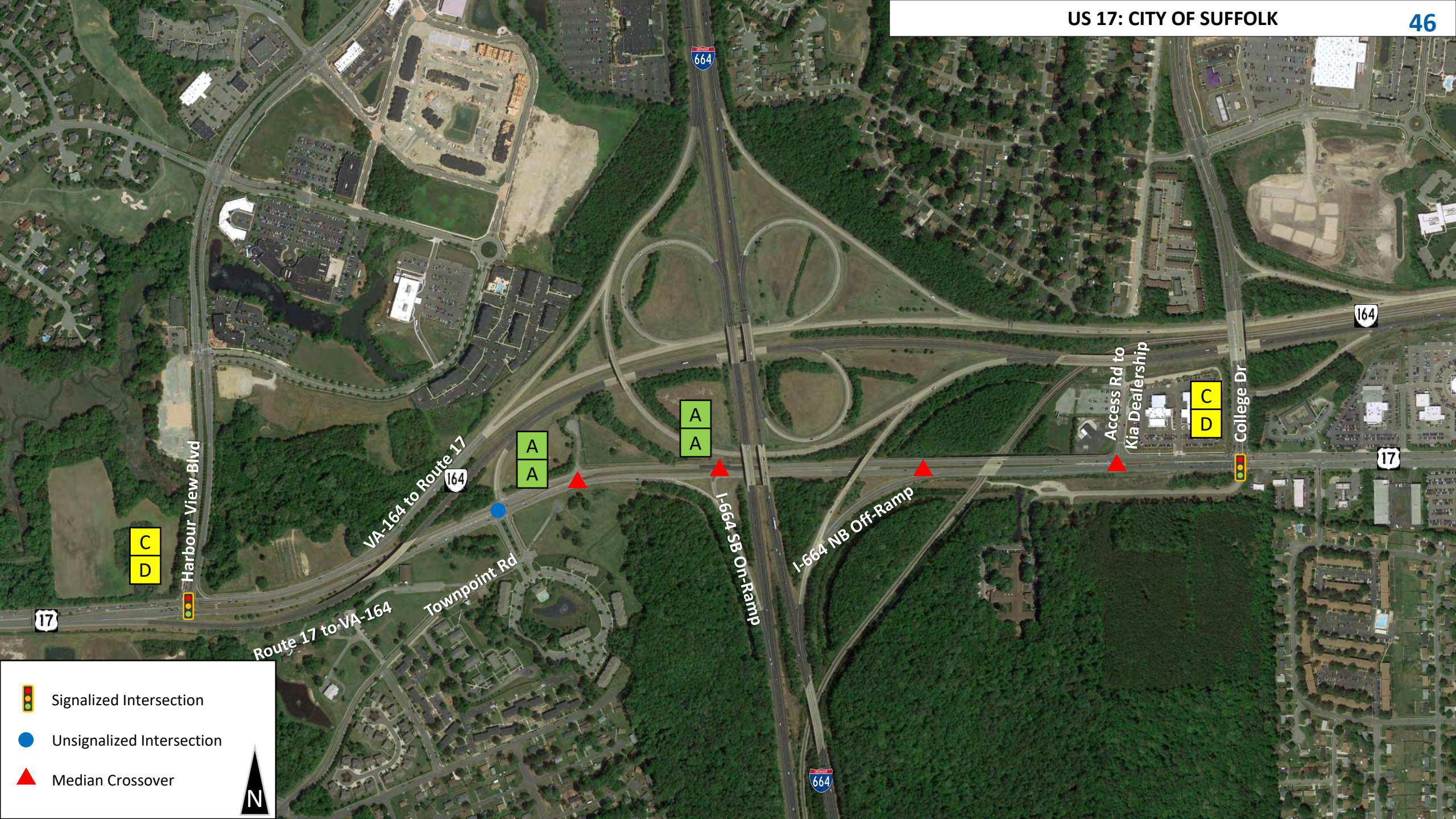

B
B
Bennetts Creek Crossing Shopping Center
E
D
Shoulders Hill Rd
17
D
B
Windward Lane
C
C
Breezeport Way
B
B
Plummer Blvd
C
D
Harbour View Blvd
17
Signalized Intersection
Unsignalized Intersection
Median Crossover
N


664
164
17
A
A
A
A
C
D
C
D
Harbour View Blvd
VA-164 to Route 17
Townpoint Rd
Route 17 to VA-164
I-664 SB On-Ramp
I-664 NB Off-Ramp
Access Rd to Kia Dealership
College Dr
Signalized Intersection
Unsignalized Intersection
Median Crossover
N

Operational Summary

- **Isle of Wight: Most congestion between Brewers Neck Blvd and Ashby Way**
- **City of Suffolk: Most Congestion in urban area between Shoulders Hill Rd and Harbour View Blvd**

● Planned and/or funded improvements

Intersections of Interest – Operations

	US 17 Intersecting Roadway	Locality	AM DELAY (sec)	AM LOS	PM DELAY (sec)	PM LOS
●	Brewers Neck Blvd	Isle of Wight	29.9	C	55.3	E
	Ashby Way	Isle of Wight	44.5	D	60.2	E
	Cedar Grove Rd	Isle of Wight	8.9	A	53.5	D
	Channell Way	Isle of Wight	10.4	B	25	D
●	Shoulders Hill Rd	Suffolk	70.6	E	48.6	D
	Windward Ln	Suffolk	36.8	D	14.6	B
	College Dr	Suffolk	30.3	C	32.9	C
●	Bernhowe Manor Ln	Suffolk	25.9	C	28.9	C
	Harbour View Blvd	Suffolk	22.6	C	43.1	D
	Lee Farm Lane	Suffolk	22.9	C	21	C

TIME PERIOD	Northbound		Southbound	
	DENSITY (pc/ln/mi)	LOS	DENSITY (pc/ln/mi)	LOS
Hazelwood Mem. Bridge				
AM	4.9	C	9.3	D
PM	14.0	E	11.7	D
Godwin Mem. Bridge				
AM	4.9	C	9.3	E
PM	14.0	E	11.7	E

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Schedule Overview and Major Milestones

US 17 Arterial Preservation Plan: April 2020 - March 2021

Activity	April	May	June	July	August	September	October	November	December	January	February	March
Data collection, field review, existing condition assessment												
Future land use, traffic volume projections, & identification of needs												
Develop draft alternatives and recommendations												
Development of draft study report												
Comment responses and report revisions												
Submittal of final report												

LEGEND

- Stakeholder Meeting
- VDOT Meeting
- Public Information Meeting

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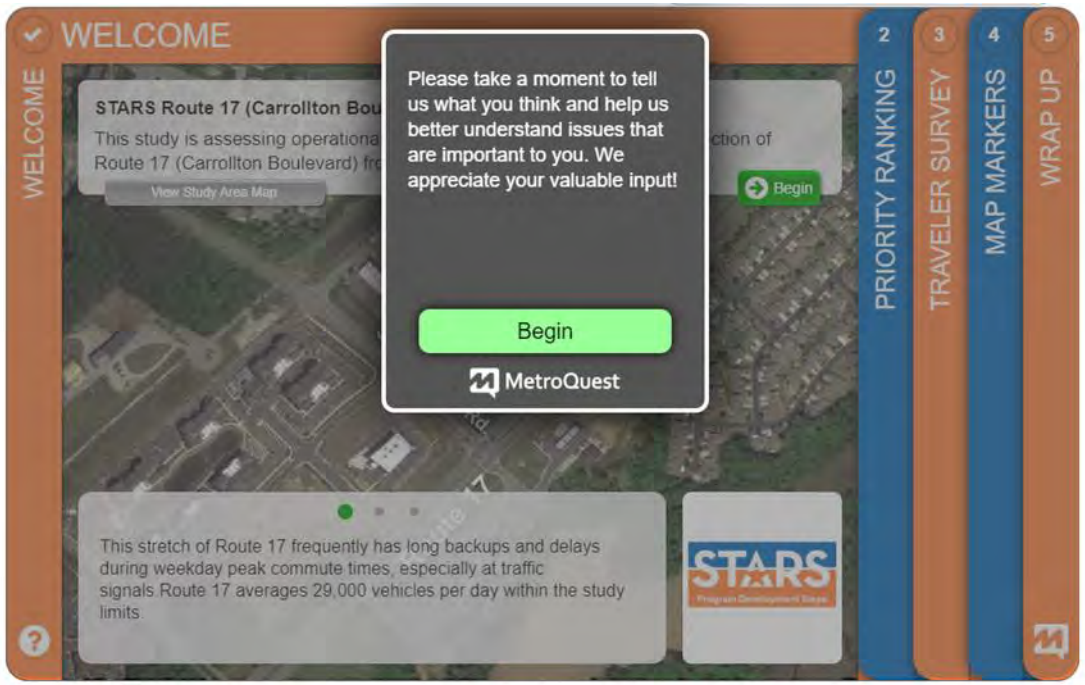
Next Steps

- Public Outreach
  - MetroQuest Survey
- Develop future land use data
  - Use HRTPO model data
  - Stakeholders to review socioeconomic data from model
- Begin recommendations development



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US 17 Arterial Preservation Plan

VDOT District Contact
Jerry Pauley
Jerry.Pauley@VDOT.Virginia.gov
(757) 956-3114

VDOT Central Office Contact
Phil Kempf
Philip.Kempf@VDOT.Virginia.gov
(804) 225-3566

Consultant Team Contacts
Brad Shelton
Brad.Shelton@mbakerintl.com
(804) 287-3161

Dan Scolese
Dan.Scolese@mbakerintl.com
(804) 287-3168

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US 17 Arterial Preservation Plan

June 15, 2020; 2:00 PM – 4:00 PM

Michael Baker
INTERNATIONAL

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Virginia Department of Transportation