US 301 / Route 207 Arterial Preservation Plan – Final Recommendations

April 25, 2018; 5:00 PM – 7:00 PM
L. E. Smoot Memorial Library
Arterial Preservation Program

Background
Slow Erosion of Safety and Capacity

• Virginia’s arterials have become “main streets” for local growth

• Placing direct access and traffic signals at every business or residential development adds to congestion on primary routes.

• Serves the local economy and tax revenues but over time at the expense of safety, capacity and mobility – affecting movement of people and goods across the state and region.
Why This Matters

• Preparing for future traffic and economic development reduces the need for expensive, disruptive "retrofit" projects

• Route 301 and Route 207 are anticipated to see additional commercial and residential development

• Additional traffic likely to use corridor with Governor Harry W. Nice Bridge replacement and construction on Interstate 95
Arterial Preservation Program
Access Management Overview
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
  - Improve driveway design
  - Consolidate driveways to reduce frequency
- Look at conflict points from a network perspective
Conflict Points

FULL UNSIGNALIZED MEDIAN OPENING
- 32 TOTAL CONFLICT POINTS
- Diverging/Merging
- Crossing

DIRECTIONAL MEDIAN OPENING
- 10 TOTAL CONFLICT POINTS
- Diverging/Merging
- Crossing

RIGHT-IN/RIGHT-OUT DRIVEWAY
- 4 TOTAL CONFLICT POINTS
- Diverging/Merging
- Crossing
Access Management Guidelines

VDOT Spacing Standards (35-45 MPH Principal Arterial)
Arterial Preservation Program

Innovative Intersections Overview
Innovative Intersections

• Intersection designs which:
  • Improve safety
  • Reduce delay
  • Increase efficiency
• Can reduce delays and crashes as much as 50%
• Also known as:
  • Alternative
  • Non-traditional
  • Unconventional
  • Reduced Conflict
Study Area
Project Stakeholders / Working Group

- King George County
- Caroline County
- FAMPO
- Core Study Team – VDOT and Consultant
- Town of Port Royal
- Department of Defense
- Town of Bowling Green
Key challenges identified in study corridor

• Safety concerns
  • Lack of adequate shoulders
  • Poor sight distance in certain locations

• Operational challenges
  • High number of crossovers & new signals
  • Weekend congestion near Governor Nice Bridge
  • Weekday congestion near military facilities & other developed areas

• Future traffic growth
  • Continued development pressure
  • Widening of Governor Nice Bridge
  • Diversion to 301/207 due to significant construction along I-95
Traffic count highlights

Year: 2016
Average Daily Traffic

- 26,000 ADT
  - 6% trucks
  - K = 9.3%

- 21,000 ADT
  - 6% trucks
  - K = 9.5%

- 14,000 ADT
  - 6% trucks
  - K = 9.6%

- 14,000 ADT
  - 11% trucks
  - K = 8.8%

- 9,200 ADT
  - 7% trucks
  - K = 8.9%

- 11,000 ADT
  - 7% trucks
  - K = 8.9%

- 13,000 ADT
  - 11% trucks
  - K = 7.9%

- 8,000 ADT
  - 11% trucks
  - K = 8.5%
Example recommendations

• There are 81 crossovers and 37 intersections along the corridor

• Recommendations were prepared for each of the above and are available tonight for your review

• The following slides show a few examples

• After the presentation, you can talk with staff and see individual recommendations at one of the viewing stations or look up a specific location in the printed copies on the tables
Intersections & Median Crossovers
King George County

1) Intersection #25: Jersey Rd with US 301
   Recommendation: Lengthen existing turn lanes on US 301; Widen median opening
   Cost: $0.5M to $0.6M

2) Crossover #36:
   Recommendation: Remove Crossover
   Cost: $0.2M to $0.3M

3) Crossover #37:
   Recommendation: Construct left-turn lanes on US 301
   Cost: $0.4M to $0.5M

4) Crossover #38:
   Recommendation: Remove Crossover
   Cost: $0.2M to $0.3M

5) Crossover #39:
   Recommendation: Construct left-turn lanes on US 301
   Cost: $0.4M to $0.5M

6) Crossover #40:
   Recommendation: Remove Crossover
   Cost: $0.2M to $0.3M

7) Crossover #41:
   Recommendation: Construct left-turn lanes on US 301; Widen median opening
   Cost: $0.5M to $0.6M
Intersection #26: US 301 with Route 3 Quadrant Roadway (QR)
Improvement Type: Congestion, Economic Development

Recommendation: Reconfigure main intersection at Route 3 with US 301 disallowing lefts. Construct quadrant roadway with signalized intersection on US 301 and Unsignalized intersection on Route 3

Quadrant Cost: $2.8M to $4.8M

Possible area for development opportunities if access management principles can be satisfied
Intersection #26: US 301 with Route 3 Median U-Turn (MUT)

Improvement Type: Congestion, Economic Development

Recommendation: Reconfigure main intersection at Route 3 with US 301 disallowing lefts. Construct single lane signalized U-turn areas north and south of main intersection.

Median U-Turn Cost: $1.8M to $3.2M

- Standard Movements
- Re-routed left turn movements
Intersection #33: US 301 with Dahlgren Rd
Quadrant Roadway (QR)
Improvement Type: Congestion, Economic Development

Recommendation: Reconfigure main intersection at Dahlgren Rd with US 301 disallowing lefts. Construct quadrant roadway with signalized continuous green-t intersection on US 301 and signalized intersection on Dahlgren Rd

Quadrant Cost: $3.5M to $6.1M

Possible area for development opportunities if access management principles can be satisfied.
US 301/Rte 207 Arterial Preservation Plan
Figure 34
Intersection #33: US 301 with Dahlgren Rd
Median U-Turn (MUT)
Improvement Type: Congestion, Economic Development

Recommendation: Reconfigure main intersection at Dahlgren Rd with US 301 disallowing lefts, construct two-lane signalized U-turn areas north and south of main intersection.

Cost: $2.6M to $4.2M

- Standard Movements
- Re-routed left turn movements
Next Steps

• Finalize Study Report
  • Will be posted to project webpage by end of May 2018

• Work with County & Town officials to implement solutions
  • Identify priorities & seek funding
  • No date has been established for construction
  • Recommendations will be implemented as opportunity and funding permits
How to find more information

• Arterial Preservation Program Website
  • http://www.virginiadot.org/programs/vdot_arterial_perservation_program.asp

• US 301 / Route 207 Project Web Page
  • http://www.virginiadot.org/projects/fredericksburg/route_301_and_route_207_corridor_study.asp
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Extra slides beyond this point – not part of main presentation
Balance between Mobility and Access
Roadway Hierarchy

Functional Classification
Access Management Benefits

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

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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 Intersection Fundamentals

Re-Route Left Turn Movements
• More efficiently serves through traffic

Reduce Signal Phases
• Reduces delay

Remove and Separate Conflicts
• Improves safety
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