US 301: SECTION 2 - LEVELS ROAD EXTENDED TO EAST OF NORFOLK SOUTHERN RAILROAD

US 301 Project Development

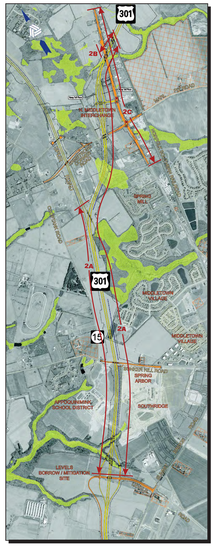
7A

Section 2:

US 301, Levels Road Extended to East of Norfolk Southern Railroad (NSRR), including:

Section 2 is 4.5 miles long and divided into three construction contracts: 2A, 2B and 2C and includes:

- 2 lanes in each direction with controlled access
- 54 foot wide median (reduced from ROD width of 66 feet)
- Design Speed: 70 mph/Posted Speed: 65 mph
- Pavement: Concrete
- Bunker Hill Road Overpass of New US 301
- Provision for future US 301 Interchange with Spur Road (northbound US 301 to northbound Spur Road (right hand exit) and southbound Spur Road to southbound US 301)
- New North Middletown Interchange with Summit Bridge Road, including a New US 301 Overpass
- Interchange ramps at Summit Bridge Road to be tolled (to and from north only)
- Improvements to Summit Bridge Road and Armstrong Corner Road / Marl Pit Road to accommodate New US 301 Interchange
- New US 301 Overpass of Summit Bridge Road
- New US 301 Overpass of Norfolk Southern Railroad
- New US 301 Overpass of Armstrong Corner Road



Agency Coordinations / Public Output:

- Adopted refinements were presented at the March 2009 Workshop. The public and resource agencies did not object to the refinements.

Community Commitment:

- Landscaped visual earth berms constructed as early as practicable during roadway construction at :
- Southridge (ROD: 10' x 2480' / Refined: 10' x 3,000')
- Middletown Village (ROD: 16' x 2000' / Refined: 16' x 2700')
- Springmill (ROD: 6' x 2200' / Refined: 6' x 1800')
- Appoquinimick High School (ROD: Not included / current: 5'x2000')

8.15.11

7B

Decisions Since March 2009 Workshop

Adopted Refinement: Provides right exit ramp from Northbound US 301 to Northbound Spur Road

Advantages

- Improved operation and safety based on slower right lane speeds and driver expectations
- Simplifies advance signing by allowing safe placement adjacent to right shoulder
- Improved skew for ramp bridge over US 301, which simplifies design and construction
- Shorter 2-span structure over US 301, approximately 300' total bridge length for the right exit versus 700' for the left exit
- Reduces construction costs for bridge structure and retaining walls by $5.25M versus the left exit configuration
- Retaining walls are not needed

Disadvantages

- Additional right-of-way needed
- Closer to the Springmill community, i.e. 1,600' for the right exit versus 1,700' for the left exit
- Increased wetland (7.61 vs. 7.31 acres) and forest impacts (6.04 vs. 5.41 acres)

Right Exit Ramp

FEIS/ROD Option: Provided left exit from northbound US 301 to northbound Spur Road

Advantages

- Reduced right-of-way needs
- Somewhat farther distance from the Springmill community east of US 301

Disadvantages

- Reduced operation and safety based on higher left lane speeds and driver expectations
- Complicates advance signing by placing and protecting signs in the median, especially during future mainline widening
- The bridge structure will have a greater visual impact versus the right exit design, due to the deeper girder section which will create a higher profile
- Longer multi-span structure over US 301, which may require a cross girder support for efficiency and therefore introduces a fracture critical design element
- Placement of the south abutment reduces sight distance for vehicles on the US 301 SB approach
- Higher construction costs for bridge structure versus the right exit.
- Significant retaining wall length of approximately 2,000 feet which may be perceived as a visual impact to the community and the historic property.

Left Exit Ramp

8.5.11

7C

Decisions Since March 2009 Workshop

Adopted Refinement: Provide Diamond interchange configuration between new US 301 and Summit Bridge Road with Roundabouts (Blue)

Advantages

- Provides single point access with Existing US 301
- Minimizes wetland impacts (1.53 vs. 1.85 acres) along tax ditch to the west of proposed US 301
- Improves geometry of US 301 Bridge over Existing US 301; i.e. reduces skew and the ramp gore is no longer on the bridge
- Provides tangent sections along on-and off-ramps to facilitate tolling operations
- Reduces Waters of the US impacts
- Separates ramp movements from Existing US 301 Intersection

Disadvantages

- Impacts on Mid Farms community
- Reduces distance between New US 301 and Middletown Baptist Church
- Increases construction cost by $1M

Roundabouts

Advantages

- Provides full movements, including u-turns (i.e. does not require turn bays)
- Can easily accommodate traffic if parcel west of interchange is developed (Potential DelDOT Maintenance Facility / Park and Ride Facility)
- Typically reduces speeds and eliminates left turn and right angle conflicts, improving safety (less accidents, especially fatalities)
- Generally less expensive/more flexible for traffic growth
- More convenient for drivers during off-peak travel periods
- Will not require traffic signal maintenance (i.e. detection, timing plans)
- Separates ramp movements from Existing US 301 Intersection

Disadvantages

- None identified

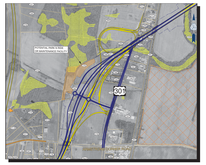
FEIS/ROD Option: Provided Partial Cloverleaf Option (Yellow)

Advantages

- Provided a lower New US 301 profile from Armstrong Corner Road to Summit Bridge Road
- Increased the distance between US 301 and Middletown Baptist Church

Disadvantages

- Not traditional type interchange
- Wider bridge needed over Existing US 301 because of deceleration lane for loop ramp
- Additional turn lanes on Existing US 301 for access ramps and loops to New US 301
- Impacts on Midland Farms community
- Required 2 additional signals to be placed on Existing US 301



Preferred Configuration (blue)
FEIS/ROD Configuration (yellow)

8.5.11

7D

Project Refinement

Summit Bridge Road Improvements

- 2 Lanes in each direction with a concrete curb median
- Signalized intersection at Summit Bridge Road and new Interchange Connector Road
- Access to existing driveways will be maintained
- Widening and reconstruction of Marl Pit Road and Armstrong Corner Road to accommodate dedicated turn lanes at proposed intersection

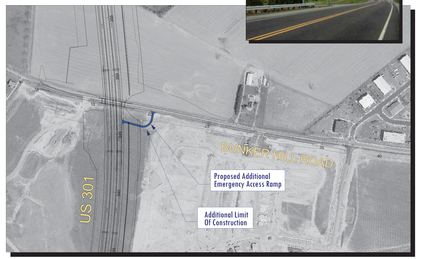
8.5.11

7E

Project Refinement

Bunker Hill Road - Emergency Access

- Ramp At Bunker Hill Road Area
  - Provides Direct Access for Volunteer Hose Fire Co. from Downtown Fire Station Spur Road
  - One-11' Lane, 8% Grade
  - Requires Break In Visual Mitigation Berm for Spring Arbor/Southridge Development
    - Negligible Increase In Noise (1 dBA)



8.5.11