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ALTERNATIVE RETAINED FOR DETAILED EVALUATION - PURPLE + SPUR ALTERNATIVE

ALIGNMENT OPTIONS IN BOYDS CORNER ROAD AREA

Option 1

Description

- Provides new US 301 alignment just north of existing SR 896 (Boyds Corner Road – west of Jamison Corner Road)

YELLOW and PURPLE + SPUR

Advantages

- Leaves minimal "dead" space between Boyds Corner Road and new US 301
- Minimizes impacts on proposed "Livable Delaware" community (Bayberry)
- Avoids impacts to Emerson Farm and residences, located just north of proposed Town Center (Bayberry)
- Avoids impacts to southwest corner of Grande View Farms
- Avoids impacts to one of last three operating dairy farms (Emerson Farm) in New Castle County

Disadvantages

- Requires acquisition of New Covenant Presbyterian Church
- Results in difficult skew of new US 301 bridge over Boyds Corner Road
- Direct impact on proposed Bayberry South community (southside of existing Boyds Corner Road from east of Cedar Lane Road to Shallcross Lake Road)
- New US 301 is elevated and creates a barrier between proposed Bayberry South and Bayberry North / Bayberry Town Center

Option 2

Description

- Shifts New US 301 alignment 1800 feet north of New Covenant Presbyterian Church, impacting part of Town Center (Bayberry)

YELLOW and PURPLE + SPUR

Advantages

- Avoids New Covenant Presbyterian Church
- Provides improved skew of new US 301 bridge over Boyds Corner Road
- Shifts new US 301 farther away from Cedar Lane Schools
- Minimizes impacts on proposed "Livable Delaware" Community (Bayberry)

Disadvantages

- Impacts southwest corner of Grande View Farms community
- Results in greater wetland impacts than Option 1
- Isolates Church between Boyds Corner Road, new US 301 and realigned Jamison Corner Road
- New US 301 creates a barrier between proposed Bayberry South and Bayberry North / Bayberry Town Center
- Increases length of new US 301 (increased costs)
- Requires long bridge structure over the intersection of Boyds Corner Road, the entrance to Grande View Farms, and Shallcross Lake Road (increased costs and potential safety considerations)
- Decreases distance between new US 301 and historic resources
- Impacts on proposed "Livable Delaware" community (Bayberry)

ALIGNMENT OPTIONS IN BOYDS CORNER ROAD AREA

Option 3 (New)

Description

- Shifts New US 301 alignment to 1,500 feet north of New Covenant Presbyterian Church and adjacent to north boundary of proposed Town Center (Bayberry)

YELLOW and PURPLE + SPUR

Advantages

- Avoids New Covenant Presbyterian Church
- Provides improved skew of new US 301 bridge over Boyds Corner Road
- Shifts new US 301 farther away from Cedar Lane Schools
- Minimizes impacts to Emerson Farm and residences along Jamison Corner Road
- Avoids impacts to one of last three operating dairy farms in New Castle County

Disadvantages

- Impacts southwest corner of Grande View Farms community
- Results in greater wetland impacts than Option 1
- Isolates Church between Boyds Corner Road, new US 301 and realigned Jamison Corner Road
- New US 301 creates a barrier between proposed Bayberry South and Bayberry North / Bayberry Town Center
- Increases length of new US 301 (increased costs)
- Requires long bridge structure over the intersection of Boyds Corner Road, the entrance to Grande View Farms, and Shallcross Lake Road (increased cost and potential safety considerations)
- Decreases distance between new US 301 and historic resources
- Impacts on proposed "Livable Delaware" community (Bayberry)

Option4 (New)

Description

- Shifts New US 301 alignment to 230 feet north of New Covenant Presbyterian Church. Impacts southwest corner of proposed Town Center (Bayberry)

YELLOW and PURPLE + SPUR

Advantages

- Avoids New Covenant Presbyterian Church
- Provides improved skew of new US 301 bridge over Boyds Corner Road
- Shifts new US 301 farther away from Cedar Lane Schools
- Minimizes impacts to Emerson Farm and residences, along Jamison Corner Road
- Avoids impacts to southwest corner of Grande View Farms
- Avoids impacts to one of last three operating dairy farms (Emerson Farm) in New Castle County

Disadvantages

- Isolates Church between Boyds Corner Road, new US 301 and realigned Jamison Corner Road
- Impacts on proposed "Livable Delaware" community (Bayberry)
- New US 301 is elevated and creates a barrier between proposed Bayberry South and Bayberry North / Bayberry Town Center

ENGINEERING - TRAFFIC & SAFETY CONSIDERATIONS

ENGINEERING / TRAFFIC

Advantages

- Mid-number of properties directly impacted
- Low impact on existing communities (within 600 feet)
- Improves safety by separating local from through traffic, including truck traffic
- Significant reduction in traffic on existing US 301, Boyds Corner Road, Cedar Lane Road, Choptank Road and SR 299
- Third highest volume using new US 301

Disadvantages

- Higher potential for traffic impacts during construction along existing Boyds Corner Road
- Proximity to new Appoquinimink High School (under construction) west of Middletown, Cedar Lane Elementary School and Middle School (under construction)
- Not possible to lower new US 301 roadway profile along Boyds Corner Road, due to overpasses of Boyds Corner Road (2), realigned Shallcross Lake Road, US 13 and SR 1; therefore, difficult to mitigate indirect impacts (noise, visual, etc.) on adjacent communities
- Overall width of SR 896 and new US 301 creates significant barrier
- Requires acquisition of the New Covenant Presbyterian Church under Boyds Corner Road Area Option 1
- 2nd highest cost to construct

Comparison of the Retained Alternatives - Engineering

APRIL 10-11, 2006 ALTERNATIVES IMPACT MATRIX	YELLOW RANGE OF IMPACTS	PURPLE + SPUR RANGE OF IMPACTS	BROWN NORTH RANGE OF IMPACTS	BROWN SOUTH RANGE OF IMPACTS	GREEN + SPUR NORTH RANGE OF IMPACTS	GREEN + SPUR SOUTH RANGE OF IMPACTS
General Considerations						
Preliminary Cost (5 million)[1]	$65M	$67M - $97M	$48M	$54M	$57 - $59M	$61M - $97M
ENGINEERING CONSIDERATIONS						
Total length of alternative (miles)	12.7 - 12.9	13.3 - 15.5	15.5	15.9	12.6	12.3
Total Area of Limit of Construction (acres)	655 - 665.49	813 - 859	521	562	663 - 675	647 - 812
Number of Properties Impacted	104	142 - 167	119	123	125 - 146	123 - 148
Design Exceptions						
Number	3	4	5	5	5	5
1 Location(s)	Levels Road/SR15	Levels Road/SR15	Levels Road/SR15	Levels Road/SR15	Levels Road/SR15	Levels Road/SR15
Type	Grade	Diamond	Diamond	Diamond	Diamond	Diamond
2 Location(s)	North of Middletown	North of Middletown	SR896 at the base of Summit Bridge	North of Middletown	North of Middletown	North of Middletown
Type	Alignment	Diamond	Partial Cloverleaf	Half Diamond	Diamond	Diamond
3 Location(s)	SR1 at Boyds Corner Road	SR1 at Boyds Corner Road	Jamison Corner Road/Cedar Lane	Jamison Corner Road	Jamison Corner Road	Jamison Corner Road
Type	Directional	Diamond	Partial Cloverleaf	Partial Cloverleaf	Diamond	Diamond
4 Location(s)		SR15/SR896/Choptank Road	Jamison Corner Road	Jamison Corner Road	SR1 North of Toll Plaza	SR1 South of Toll Plaza
Type		Diamond	Diamond	Diamond	Directional	Directional
5 Location(s)			SR1 North of Toll Plaza	SR1 North of Toll Plaza	SR15/SR896/Choptank Road	SR15/SR896/Choptank Road
Type			Directional	Directional	Diamond	Diamond
6 Location(s)						
Type						
7 Location(s)						
Type						
Interchanges						
Number	11	11	8	8	9	9
1 Location(s)	Stewartsburg Lane	Stewartsburg Lane	Stewartsburg Lane	Stewartsburg Lane	Stewartsburg Lane	Stewartsburg Lane
2 Location(s)	Middletown Business & Technology Park	Bunker Hill Road	Bunker Hill Road	Bunker Hill Road	Bunker Hill Road	Bunker Hill Road
3 Location(s)	Boyds Corner Road	Boyds Corner Road	Boyds Corner Road	Boyds Corner Road	Boyds Corner Road	Boyds Corner Road
4 Location(s)	Bristol Street	Cedar Lane Rd/US 301 Local	CR6 Detour/Hyatt Road	CR6 Detour/Hyatt Road	Cedar Lane Rd/US 301 Local	Cedar Lane Rd/US 301 Local
5 Location(s)	Main Rd Bricyd	Norfolk Southern Railroad	Churchtown Road	Churchtown Road	Norfolk Southern Railroad	Norfolk Southern Railroad
6 Location(s)	Existing US 301	SR 896	Norfolk Southern Railroad	Norfolk Southern Railroad	SR896	SR896
7 Location(s)	Norfolk Southern Railroad	Jamison Corner Road	Rattlesnake Road	Rattlesnake Road	Hyetts Corner Road	Hyetts Corner Road
8 Location(s)	SR896	SR 896	Hyetts Corner Road	Hyetts Corner Road	Old Churchtown Road	Old Churchtown Road
9 Location(s)	Jamison Corner Road	Shallcross Lake Road			Churchtown Road	Churchtown Road
10 Location(s)	Cedar Lane	Jamison Corner Road				
11 Location(s)	Shallcross Lake Road	Churchtown Road				

Note 1: Cost Estimate includes Right of Way costs and Relocation costs for displaced properties.
Note 2: The Brown alternative includes costs for property acquisition at Summit Airport; however, it does not include any costs for improvements to the airport that may be required due to property acquisition.
April 10, 2006

CULTURAL & ENVIRONMENTAL RESOURCES

Advantages

- Low wetland impacts
- Lowest high quality wetlands impacts
- Mid-range Waters of the US impacts
- Low DNREC Tidal Wetland impacts
- Low floodplain impacts
- Mid-range forestland impacts
- Mid-range impact to Species Habitat Areas (wildlife & plants)

Disadvantages

- High Agricultural District impacts
- Potential noise and visual effects on Vandergrift property (Historic)
- High number of residential noise impacts

Note: Detailed evaluation process is on-going to identify cultural resources and assess potential effects

Comparison of the Retained Alternatives - Cultural Resources

APRIL 10-11, 2006 ALTERNATIVES IMPACT MATRIX	YELLOW RANGE OF IMPACTS	PURPLE + SPUR RANGE OF IMPACTS	BROWN-NORTH RANGE OF IMPACTS	BROWN-SOUTH RANGE OF IMPACTS	GREEN + SPUR NORTH RANGE OF IMPACTS	GREEN + SPUR SOUTH RANGE OF IMPACTS	RANGE OF IMPACTS
Potential Impacts on Cultural Resources							
Historic Properties[1]							
Properties to be evaluated for Direct Effects[2]	4	5	6	5	8	8	5 - 8
Properties to be evaluated for Visual and Audible Effects[3]	12	12-13	9	9	12	12	9 - 13
Properties to be evaluated for Site Alternative[4]	12	12-13	9	9	12	12	9 - 13
Acres of Land Disturbance (acres)	655-665	812-859	521	562	663-675	647-812	521 - 859
Palustrine Water: Pre-Historic Sensitivity in the Limit of Disturbance							
High Sensitivity Area (acres / % of total area)	10.1 (1%) - 10.9 (1%)	17.7 (1%) - 17.8 (1%)	49 (2.9%)	51 (2.3%)	19 (1%) - 19 (2.8%)	21 (1.2%) - 21 (2.2%)	10.1 (1%) - 21 (2.2%)
Moderate Sensitivity Area (acres / % of total area)	81 (10.7%) - 87.1 (11.2%)	128 (10.7%) - 167 (14.8%)	80 (20.6%)	224 (28.7%)	28 (20.2%) - 31 (27.3%)	27 (20.2%) - 31 (27.3%)	81 (10.7%) - 224 (28.7%)
Low Sensitivity Area (acres / % of total area)	524 (68.4%) - 531 (69.2%)	679 (60.2%) - 777 (65.0%)	501 (51.6%)	584 (54.1 %)	538 (61.2%) - 570 (66.1%)	479 (38.1%) - 698 (59.1%)	479 (38.1%) - 777 (65.0%)
Total Palustrine Area (acres / % of total area)	607 (79.1%) - 629 (79.9%)	825 (73.1%) - 957 (80.0%)	631 (72.4%)	847 (78.2%)	585 (71%) - 621 (89.4%)	527 (41.9%) - 751 (63.7%)	527 (41.9%) - 957 (80.0%)
Palustrine Water: Historic Sensitivity in the Limit of Disturbance							
High Sensitivity Area (acres / % of total area)	30 (4.0%) - 41 (5.2%)	7.8 (0.6%) - 8.0 (0%)	0.8 (0%)	1.8 (0.2%)	0.8 (0%) - 7.8 (0%)	0.8 (0%) - 41 (4.1%)	41 (4.1%)
Moderate Sensitivity Area (acres / % of total area)	326 (37.2%) - 336 (39.7%)	526 (43.3%) - 598 (49.7%)	216 (23.8%)	272 (25.0%)	186 (22.8%) - 205 (26.6%)	186 (22.7%) - 205 (26.6%)	216 (23.8%) - 598 (49.7%)
Low Sensitivity Area (acres / % of total area)	469 (57.4%) - 511 (59.9%)	683 (56.4%) - 812 (67.5%)	691 (76.6%)	806 (74.1%)	577 (75%) - 613 (79.5%)	577 (70.2%) - 695 (77.6%)	469 (57.4%) - 691 (77.6%)
Cultural Resources[5]							
Number of Historic Properties	15	16-17	8	9	16-17	16-17	8 - 17
Potential Section 4(f) Properties							
Number of Historic Properties[6]	4	5	5	5	5	5	5 - 4

Date of Historical Design Update: 03/07/06 03/07/06 01/10/06 01/10/06 01/12/06 01/12/06
Date of Impact Update: 03/07/06 03/07/06 01/10/06 01/10/06 01/12/06 01/12/06

Note 1: Historic Properties are resources Listed on or Determined Eligible for the National Register of Historic Places based on Consultant Recommendations dated 1/12/2006.
Note 2: Properties to be evaluated for Direct Effects include any property within the limit of disturbance for the Alternative, and also includes situations where direct/indirect of all or some of the contributing components to the resource is proposed.
Note 3: Properties to be evaluated for Visual and Audible Effects are located within 300 feet of the centerline of the alternative.
Note 4: Number of Properties to be evaluated for Site Alternative refers the unique number of historic properties with potential direct, visual or audible effects. Because some properties will be evaluated for more than one alternative, this number IS NOT the total of the two lines above it.
Note 5: Listing of potential NRHP or Eligible Properties is based on the Consultant Recommendations that may be directly, visually, or audibly affected by the Alternative (within 300 feet of the centerline).
Note 6: Number of resources Listed on or Determined Eligible for the National Register of Historic Places (Consultant Recommendation) that may be directly affected by the Alternative (within the limit of disturbance).
Determine Not Adversely Impact Sites are generally exempt from Section 4(f) protection. This column IS THE SAME as the Number of Properties to be evaluated for Direct Effects (see above).

Comparison of the Retained Alternatives - Natural Resources

APRIL 10-11, 2006 ALTERNATIVES IMPACT MATRIX	YELLOW RANGE of IMPACTS	PURPLE + SPUR RANGE of IMPACTS	BROWN NORTH RANGE of IMPACTS	BROWN SOUTH RANGE of IMPACTS	GREEN + SPUR NORTH RANGE of IMPACTS	GREEN + SPUR SOUTH RANGE of IMPACTS	RANGE OF IMPACTS
Potential Impacts on Natural Resources							
Wetlands and Waterways							
Total length of Stream Crossings (feet)	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Total Area of Wetlands Impacted (acres)	19.1 - 20.4	24.7 - 28.4	15.7 - 16.2	16.7 - 17.2	17.1 - 17.6	17.1 - 17.6	15.7 - 28.4
Palustrine Forested	7.4 - 7.4	9.3 - 9.3	6.1 - 6.1	6.1 - 6.1	6.1 - 6.1	6.1 - 6.1	6.1 - 9.3
Palustrine Scrub-Shrub	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4
Palustrine Emergent	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4
Palustrine Total	10.2 - 10.2	12.1 - 12.1	8.9 - 8.9	8.9 - 8.9	8.9 - 8.9	8.9 - 8.9	8.9 - 12.1
Marine Water	8.9 - 10.2	12.6 - 16.3	6.8 - 7.3	7.8 - 8.3	8.2 - 8.7	8.2 - 8.7	6.8 - 16.3
Tidal Water	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0
Perennial Stream	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0
Intermittent Stream	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0
Ditches/Canals	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0
Impacts to Forest Interior							
Total Forest Interior Impacted (acres)	0	0	0	0	0	0	0
Number of Forest Interior Fragmentations	0	0	0	0	0	0	0
Average Distance of Forest Interior Fragmentation (feet)	0	0	0	0	0	0	0
Impacts to Species Habitat Areas							
Total Acreage Impacted	19.1 - 20.4	24.7 - 28.4	15.7 - 16.2	16.7 - 17.2	17.1 - 17.6	17.1 - 17.6	15.7 - 28.4
Forest Interior Habitat	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0
Forest Edge Habitat	8.0 - 8.0	9.3 - 9.3	6.1 - 6.1	6.1 - 6.1	6.1 - 6.1	6.1 - 6.1	6.1 - 9.3
Shrub Habitat	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4
Grassland Habitat	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4
Total Forest Edge Habitat	9.4 - 9.4	10.7 - 10.7	7.5 - 7.5	7.5 - 7.5	7.5 - 7.5	7.5 - 7.5	7.5 - 10.7
Total Grassland Habitat	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4
Total Forest Interior Habitat	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0
Total Shrub Habitat Impacted	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4
Total Forest Edge Habitat Impacted	9.4 - 9.4	10.7 - 10.7	7.5 - 7.5	7.5 - 7.5	7.5 - 7.5	7.5 - 7.5	7.5 - 10.7
Total Grassland Habitat Impacted	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4	1.4 - 1.4
Impacts to Species Habitat Areas							
Number of Species Impacted	0	0	0	0	0	0	0
Number of Species Impacted with Suitable Habitat	0	0	0	0	0	0	0
Number of Species Impacted with Suitable Habitat and Potential Habitat	0	0	0	0	0	0	0
Number of Species Impacted	0	0	0	0	0	0	0
Date of Impact Update	03/07/06	03/07/06	01/10/06	01/10/06	01/12/06	01/12/06	

April 10, 2006 - Draft w/Progress. Impacts 01/10/07 incorporated into this alternative's Wetlands Impact analysis.
Note1: Total Forested ROW Wetlands equal total of Left, Centerline and Right Side study segments. (LCRW and SCRWR1 Cap Wetlands cannot be added together. Wetlands are based on Delineations, updated on February 10, 2006.
Note2: Total Length of Stream Crossings is based on the Centerline Alternative. Stream Crossings are based on Delineations, updated on February 10, 2006. Stream Crossings are based on the Alternative's Centerline. Any Stream Crossing within the Alternative's Limit of Disturbance is considered to be affected. The number of crossings is the number of unique numbered streams (currently alternative's Centerline Alternative).
Note3: Forest Interior Wetlands are based on Delineations, updated on February 10, 2006.
Note 4: Includes DP01C, Bell Atlantic/Verizon's Verizon Lands and DABBS. Sources include stream segments within wetlands. Some Alternatives are also included in the Tax Ditch Impacts.
Note 5: Impacts to Species Habitat Areas are based on Consultant Recommendations, Delaware Wildlife Species Conservation Plan, Delaware Wildlife Species Conservation Plan Species Profiles, and Delaware Nongame and Endangered Species Program's Species Profiles. Habitat Impacts are based on Delineations, updated on February 10, 2006. Habitat Impacts are based on Alternative's Centerline. Habitat Impacts are based on Alternative's Limit of Disturbance. Habitat Impacts are based on Alternative's Limit of Disturbance. Habitat Impacts are based on Alternative's Limit of Disturbance