ALTERNATIVE RETAINED FOR DETAILED EVALUATION - BROWN ALTERNATIVE

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US 301 Project Development

DESCRIPTION OF THE BROWN ALTERNATIVE

4 LANES - LIMITED ACCESS - ON NEW LOCATION

The Brown Alternative would provide a four-lane, limited access tolled highway constructed on new location on a north/south alignment (Ridge Route) from the Delaware/Maryland state line to south of Summit Bridge. It would then continue on new location on an east alignment, south of the C&D Canal, and interchange with SR 1 between the Biddles Corner Toll Plaza and the SR 1 bridge over the C&D Canal. The North Option extends north to SR 15 / SR 896 and then curves east along existing SR 896 toward SR 1. The South Option extends just north of Churchtown Road and then curves northeast between Summit Bridge Farms and Dickerson Farm passing through the northern portion of Summit Airport, before curving east toward SR 1. Interchanges would be provided at Levels Road, SR 896 South of Summit Bridge and Jamison Corner Road with either Option.

BROWN Alternative at Airmont
(Looking east along Hyetts Corner Road)

Existing Condition

Rendering of BROWN Alternative
(Green South+Spur Alternative in background)

ENGINEERING / TRAFFIC / SAFETY / COMMUNITY

Advantages

- Lowest number of properties directly impacted
- Mid-range impacts on traffic during construction (SR 15 / SR 896)
- 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
- Second highest traffic volume using new US 301
- Mid-range cost to construct
- Lowest residential noise impacts and indirect impacts to historic resources

Disadvantages

- Major Impacts on Summit Airport – (FAA designated reliever airport, 85 employees, 100 based aircraft, State Police helicopter operations) - FAA likely to oppose Brown Alternatives
  - Brown South – direct impact on existing airport runway and support buildings and on expansion plans - a fatal flaw
  - Brown North - impacts the clear zone and expansion plans (potential fatal flaw)
- Complex 3-level interchange at US 301 / SR 896 / SR 15, south of Summit Bridge – difficult to mitigate indirect effects (noise, visual ,etc.) on Lea Eara Farms and Summit Bridge Farms communities
- Proximity to Airmont community
- Proximity to new Appoquinimink High School (under construction) west of Middletown and St. George's Vo-Tech High School

Note: Visual earth berms would be provided between new US 301 and the Southridge, Middletown Village, Chesapeake Meadow, Summit Bridge Farms (Brown South only) Lea Eara Farms (Brown North only) and Airmont communities

Comparison of the Retained Alternatives - Engineering

NOVEMBER 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 ($ millions)[1]	$686-$758	$616 - $680	$550-$608	$499-$551	$534 - $590	$526 - $582
ENGINEERING CONSIDERATIONS						
Total length of alternative (miles)	19.4	16.9	17.5	15.9	17.5	17.3
Total Area of Limit of Construction (acres)	870.5	901.9	895.9	894.3	897.4	876.3
Number of Properties Impacted	377	154	100	100	132	130
Interchange(s)						
Number	4	5	5	5	6	6
1 Location(s)	Levels Road/SR15	Levels Road/SR15	Levels Road/SR15	Levels Road/SR15	Levels Road/SR15	Levels Road/SR15
Type	Split Diamond	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	Slip Ramps	Diamond	Partial Cloverleaf	Half Diamond	Diamond	Diamond
3 Location(s)	SR1 at Boyds Corner Road	SR1 at Boyds Corner Road	SR896 north of Summit Aviation	SR896 north of Summit Aviation	Jamison Corner Road	Jamisons Corner Road
Type	Directional	Directional	Partial Cloverleaf	Partial Cloverleaf	Diamond	Diamond
4 Location(s)	SR15/SR896/Choptank Road	SR15/SR896/Choptank Road	Jamison Corner Road	Jamison Corner Road	SR1 North of Toll Plaza	SR1 North of Toll Plaza
Type	Partial Cloverleaf	Directional	Diamond	Diamond	Directional	Directional
5 Location(s)		Bethel Church Road	SR1 North of Toll Plaza	SR1 North of Toll Plaza	SR15/SR896/Choptank Road	SR15/SR896/Choptank Road
Type		Partial Cloverleaf	Directional	Directional	Directional	Directional
6 Location(s)					Bethel Church Road	Bethel Church Road
Type					Partial Cloverleaf	Partial Cloverleaf
7 Location(s)						
Type						
Overpass(es)						
Number	11	11	8	8	9	9
1 Location(s)	Strawberry Lane	Strawberry Lane	Strawberry Lane	Strawberry Lane	Strawberry Lane	Strawberry 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)	Bunker Hill Road	Bohemia Mill/Armstrong Corner Road	Bohemia Mill Road	Bohemia Mill Road	Bohemia Mill/Armstrong Corner Road	Bohemia Mill/Armstrong Corner Road
4 Location(s)	Broad Street	US 301 Local	Old School House Road	Old School House Road	US 301 Local	US 301 Local
5 Location(s)	Marl Pit Road	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	Ratledge Road	Ratledge Road	Hyetts Corner Road	Hyetts Corner Road
8 Location(s)	SR896	SR 896	Hyett's Corner Road	Hyett's Corner Road	Old Schoolhouse Road	Old Schoolhouse Road
9 Location(s)	Jamison Corner Road	Shallcross Lake Road			Churchtown Road	Churchtown Road
10 Location(s)	SR896	Old Schoolhouse 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 acquition at Summit Airport; however, it does not include any costs for improvements to the airport that may be required due to property acquisition.

June 22, 2006

CULTURAL & NATURAL ENVIRONMENT

Advantages

- Low wetland impacts (Brown South)
- Low waters of the US impacts (Brown South)
- Lowest cultural resources indirectly affected

Disadvantages

- High high quality wetland impacts (Brown North)
- Highest impact to Species Habitat Areas (Brown North)
- High forestland impacts (Brown South)
- High impacts on Agricultural Preservation Easements

Comparison of the Retained Alternatives - Cultural Resources

NOVEMBER 2006 ALTERNATIVES CULTURAL MATRIX	YELLOW: Boyd's Corner Road Option 4 Spur Option 2		PURPLE: Boyd's Corner Road Option 4 Armstrong Corner Road Option 2A Spur Option 3B		BROWN: NORTH		BROWN: SOUTH		GREEN with SPUR: NORTH Armstrong Corner Road Option 2A Spur Option 3B		GREEN with SPUR: SOUTH Armstrong Corner Road Option 2A Spur Option 3B	
Potential Impacts on Cultural Resources												
Historic Properties[1]												
Count of Properties to be evaluated for Direct Effects[2]	4		0		0		0		0		0	
Count of Properties to be evaluated for Visual and Audible Effects[3]	15		17		11		11		13		15	
Count of Properties to be evaluated for this Alternative[5]	17		17		11		11		13		15	
Total Area of Limit of Disturbance (acres)	876		916		911		909		910		891	
Predictive Model: Pre-Historic Sensitivity in the Limit of Disturbance												
High Sensitivity Area [acres | % of total area]	16	1.8%	24	2.7%	26	2.9%	28	3.0%	26	2.8%	28	3.1%
Moderate Sensitivity Area [acres | % of total area]	106	12.1%	212	23.1%	287	31.5%	272	29.9%	238	26.1%	292	32.8%
Low Sensitivity Area [acres | % of total area]	528	60.3%	552	60.3%	496	54.4%	483	53.1%	558	61.3%	482	54.1%
Nil Sensitivity Area [acres | % of total area]	225	25.7%	128	14.0%	101	11.1%	127	14.0%	89	9.7%	88	9.9%
Predictive Model: Historic Sensitivity in the Limit of Disturbance												
High Sensitivity Area [acres | % of total area]	91	10.4%	35	3.8%	30	3.3%	31	3.4%	34	3.7%	32	3.6%
Moderate Sensitivity Area [acres | % of total area]	272	31.0%	187	20.4%	186	20.4%	182	20.0%	177	19.4%	177	19.8%
Low Sensitivity Area [acres | % of total area]	513	58.6%	694	75.7%	694	76.3%	696	76.5%	700	76.8%	682	76.6%
Area of Potential Effects												
Number of Historic Properties[3]	17		17		11		11		13		15	
Potential Section 4(f) Properties												
Number of Historic Properties[4]	4		0		0		0		0		0	
Date of Alternative Design Update	07/14/06		07/14/06		07/14/06		07/14/06		07/14/06		07/14/06	
Date of Impacts Update	08/02/06		08/02/06		08/02/06		08/02/06		08/02/06		08/02/06	

Note 1: Historic Properties are resources Listed on or Determined Eligible for the National Register of Historic Places based on Consultant Recommendations dated 05/31/2006
Note 2: Properties to be evaluated for Direct Effects include any property within the limit of disturbance for the Alternative, and also include situations where demolition 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 600 feet of the centerline of the Alternative.
Note 4: Number of Properties to be evaluated for this Alternative reflects the unique number of historic properties with potential direct, visual or audible effects. Because some properties will be evaluated for more than one effect type, this number IS NOT the total of the three lines above it.
Note 5: Number of properties Listed on or Determined Eligible for the National Register of Historic Places (Consultant Recommendation) that may be directly, visually, or audible affected by the Alternative (within 600 feet of the centerline).
This number IS THE SAME as the Number of Properties to be Evaluated for this Alternative (see above).
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).
Assumes that Archeological Sites are generally exempted from Section 4(f) protection. This number IS THE SAME as the Number of Properties to be evaluated for Direct Effects (see above).

Comparison of the Retained Alternatives - Natural Resources

NOVEMBER 2006 ALTERNATIVES ENVIRONMENTAL IMPACT MATRIX	YELLOW: Boyd's Corner Road Option 4 Spur Option 2	PURPLE with SPUR: Boyd's Corner Road Option 4 Armstrong Corner Road Option 2A Spur Option 3B	BROWN: NORTH	BROWN: SOUTH	GREEN with SPUR: NORTH Armstrong Corner Road Option 2A Spur Option 3B	GREEN with SPUR: SOUTH Armstrong Corner Road Option 2A Spur Option 3B
Total Length of Alternative (miles)	19.4	16.9	17.5	15.9	17.5	17.3
Total Area of Limit of Construction (acres)	870.5	901.9	895.9	894.3	897.4	876.3
Potential Wetland/Waters of the US Impacts						
Total Area of Potential ACOE Wetlands[1] **(acres)**	50.5	24.9	23.9	18.5	26.2	28.3
High Quality	8.6	7.6	11.5	9.9	9.0	9.6
Palustrian Forested	1.4	3.7	5.6	5.4	4.5	4.0
Palustrian Emergent	3.0	2.9	4.4	2.7	2.9	2.9
Palustrian Shrub-Scrub	0	0	0	0	0	0
Palustrian Mixed	4.2	1.0	1.6	1.8	1.5	2.7
Medium Quality	30.6	13.2	4.2	7.3	13.2	13.6
Palustrian Forested	18	3.9	1.9	5.0	4.1	3.8
Palustrian Emergent	1.5	7.6	0.8	0.8	7.6	7.6
Palustrian Shrub-Scrub	0	0	0	0	0	0
Palustrian Mixed	10.7	1.7	1.5	1.5	1.5	2.2
Low Quality	11.2	4.2	8.2	1.3	4.0	5.1
Palustrian Forested	0.5	1.3	0.9	0.7	1.3	1.3
Palustrian Emergent	5.6	2.8	7.3	0.6	2.7	3.8
Palustrian Shrub-Scrub	0	0	0	0	0	0
Palustrian Mixed	5.2	0	0	0	0	0
Other Wetlands						
Type and/or quality undetermined to date	0	0	0	0	0	0
Number of Wetlands Impacted	33	45	39	35	43	40
Number of Wetland Crossings	4	9	10	8	8	8
Number of Wetlands with Complete Fragmentation	7	6	3	4	6	7
Waters of the US (non-wetland)[2]	20,708	16,257	15,158	14,278	15,515	16,326
Streams (linear feet)	215	260	921	1,895	327	521
Ditches (linear feet)	20,492	15,997	14,237	12,383	15,188	15,805
Open Waters (ponds, SWM) (acres)	3.4	3.2	3.2	5.8	3.2	3.2
DNREC Sub-Aqueous Lands (linear feet)	7,167	6,461	7,885	8,232	8,162	8,481
Area of DNREC State of Delaware Tidal Wetlands[1] **(acres)**	0.4	0.4	0.4	0.4	0.4	0.4
Recharge Areas (acres)	614	563	494	486	486	501
Tax Ditches (linear feet)	81	1,511	0	192	1,511	1,511
Tax Ditch Watershed area (acres)	12	67	28	56	67	67
Area of Hydric Soils (acres)	158	147	119	115	146	145
Potential Floodplain Impacts - FEMA						
Area of 100-Year Floodplain (acres)	1.5	1.5	1.0	1.0	1.0	1.0
Potential Agricultural Impacts						
Agricultural Districts - Ten-Year (number)	1	1	1	1	1	1
Area (acres)	14.1	32.6	32.6	32.6	32.6	32.6
Number of Agricultural Districts within 3 miles of Alternative	9	7	6	6	6	6
Agricultural Preservation Easements - Permanent (number)	0	1	1	1	1	1
Area (acres)	0	6.0	9.4	12.4	6.0	6.0
Number of Agricultural Easements within 3 miles of Alternative	3	3	2	2	2	2
Agricultural Suitability (Land Evaluation Site Assessment Model)[3]						
Total LESA Model (score)	192	203	198	202	210	204
LESA Model without existing and planned development (score)	212	218	202	209	218	213
Prime Farmland Soil Area (acres)	203	415	412	424	437	398
Ratio of prime farmland to total prime farmland in New Castle County (percent) (74,454 acres total)	0.27	0.56	0.55	0.57	0.59	0.53
Potential Hazardous Waste Impacts						
Number of EPA Sites	0	0	0	0	0	0
Number of Sites identified as potential sources of contamination	9	9	8	8	6	6
Number of NPDES Locations	0	0	0	0	0	0
Potential Natural Resource Impacts						
Natural Areas Inventory (acres)	0.3	0.3	0	0	0	0
State Resource Areas[4]	0.8	2.3	2	1	2	2
Protected (acres)	0.8	2.3	1.9	1.2	2.0	2.0
Green Infrastructure (acres)	0	0	0	0	0	0
Forestland: 2002 Land Use	36.9	39.9	37.4	51.0	34.1	36.8
Deciduous (acres)	21.4	39.2	35.8	46.6	33.4	36.1
Evergreen (acres)	9.2	0	1.0	3.7	0	0
Mixed (acres)	6.3	0.7	0.7	0.7	0.7	0.7
State Forest Lands						
State-Owned State Forest Properties (acres)	0	0	0	0	0	0
Conservation Easement Properties (acres)	0	0	0	0	0	0
Potential Rare, Threatened and Endangered Species Areas[5]	tbd	tbd	tbd	tbd	tbd	tbd
Habitat Areas (Wildlife & Plant) (acres)[5]	42.3	54.9	67.5	57.6	54.6	49.4
Potential Section 4(f) Properties						
Number of Publicly-Owned Parks and Recreation Areas[6]	0	0	0	0	0	0
Acres of Publicly-Owned Parks and Recreation Areas	0	0	0	0	0	0
Federally Owned	0	0	0	0	0	0
State Owned	0	0	0	0	0	0
County Owned	0	0	0	0	0	0
Municipal Owned	0	0	0	0	0	0
Number of Publicly-Owned Wildlife and Waterfowl Refuges	0	0	0	0	0	0
Number of Historic Properties[7]	4	0	0	0	0	0
Date of Alternative Design Update	09/20/06	09/20/06	09/20/06	09/20/06	09/20/06	09/20/06
Date of Impacts Update	09/26/06	09/26/06	09/26/06	09/26/06	09/26/06	09/26/06

Work in Progress. Impacts DO NOT include portions of the alternatives in Maryland, except wetlands.

Note 1: Total Potential ACOE Wetlands equals total of high, medium, low and other quality wetlands.
ACOE and DNREC Tidal Wetlands should not be added together.
Wetlands are based on field delineations, updated on February 10, 2006.
Field delineations were done using Global Positioning System (GPS) and verified by ACOE. Field delineations extend length of alternative, including Maryland.
Some impacts may include a small percentage of 2002 Land Use data (instead of field delineations) where the alternative has been revised to extend beyond the fieldwork area.
The number of wetlands impacted is the number of unique wetland features within the limit of disturbance (LOD) for the alternative.
The number of crossings is the number of unique wetland features spanned by structures included in the alternative.
Delaware's Tidal Wetlands were identified using DNREC's delineation maps.

Note 2: Includes GPS'd, field delineated streams, ditches, ponds and SWMs. Does not include stream segments within wetlands. Some ditches are also included in the Tax Ditch impacts.

Note 3: The Land Evaluation Site Assessment (LESA) Model is a State and Federally approved land analysis system; this 300 point-based rating system identifies farm parcels that are most suitable for long-term agricultural practices.
The Land Evaluation (LE) factor is determined by using a land use dependent soil productivity index, the Site Assessment (SA) factor is derived from non-soil factors many of which are non-agricultural.
A higher LESA score indicates high agricultural suitability for a particular parcel.
The LESA score for each parcel impacted by each alternative was calculated, that LESA score was multiplied by amount of land within the parcel impacted by each alternative to obtain the acre-weighted total score for the specific segment of land impacted.
The same math was applied to each parcel affected; the acre-weighted total score for each segment of a parcel affected was then added and divided by the number of acres impacted by each alternative. The result was the acre-weighted score for each corresponding alternative

Note 4: State Resource Areas include State Parks and Forests. Properties listed include protected and proposed designations.

Note 5: Anticipated impacts to Rare, Threatened and Endangered Species based on coordination to date with DNREC. Detailed evaluation and coordination with DNREC and US Fish and Wildlife Service is continuing.
The data represented in the Potential Rare, Threatened and Endangered (RTE) Species Areas row are not exhaustive.
These data represent known occurrences of RTE Species, not potential habitat for RTE Species. Many habitats that may be impacted by the US 301 project have never been surveyed for RTE's and;
that these yet to be surveyed areas may well harbor RTE's that would not be represented in the ratings given to them in the matrix.
The habitats represented encompass both upland and wetland terrestrial habitats

Note 6: From DNREC's Outdoor Recreation Inventory and New Castle County Parks files.

Note 7: Same as total of Historic Properties. Assumes that Archeological Sites are generally exempted from Section 4(f) protection.