

ALTERNATIVE RETAINED FOR DETAILED EVALUATION - BROWN ALTERI





301/ US 301 Project Development

DESCRIPTION OF THE BROWN ALTERNATIVE 4 LANES - LIMITED ACCESS -ON NEW LOCATION

The Brown Alternative would be 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, to intersect 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 towards SR 1. The South Option extends just north of Churchtown Road and then curves northeast between Summit Bridge Farm and Dickerson Farm passing through the northern portion of Summit Airport, before curving east toward SR 1. An interchange with Jamison Corner Road is proposed with either Option.

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







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







ENGINEERING - TRAFFIC & SAFETY CONSIDERATIONS

ENGINEERING / TRAFFIC

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

- Impacts on Summit Airport FAA designated reliever airport, 85 employees, 100 based aircraft, State Police helicopter operations
- Complex 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
- Highest number of existing communities within 600 ft
- Proximity to new Appoquinimink High School (under construction) west of Middletown and St. George's Vo-Tech High School

Comparison of the Retained Alternatives - Engineering

ALTERNATIVES IMPACT MATRIX	YELLOW RANGE OF IMPACTS	PURPLE + SPUR RANGE OF IMPACTS	BROWN NORTH RANGE OF IMPACTS	BROWN SOUTH RANGE OF IMPACTS	NORTH RANGE OF IMPACTS	SOUTH RANGE OF IMPACTS
General Considerations						
Preliminary Cost (\$ millions) ¹	\$694	\$618 - \$674	\$581	\$541	\$531 - \$582	\$618 - \$674
ENGINEERING CONSIDERATIONS						
Total length of alternative (miles)	12.7 - 12.9	15.3 - 15.5	15.5	15.9	17.5	17.3
Total Area of Limit of Construction (acres)	855 - 880.49	813 - 889	921	907	863 - 935	847 - 919
Number of Properties Impacted	354	140 - 167	113	123	125 - 149	123 - 148
Interchange(s)						
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	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	Jamison Corner Road	Jamison Corner Road	SR1 North of Toll Plaza	SR1 North 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						
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 Mil/Armstrong Corner Road	Bohemia Mill Road	Bohemia Mill Road	Bohemia Mill/Armstrong Corner Road	Bohemia Mil/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	Raffedge 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				

CULTURAL & ENVIRONMENTAL RESOURCES

Advantages

- Mid-range wetland impacts
- Mid-range high quality wetlands impact
- Mid-range Waters of the US impacts
- Less potential impacts to cultural resources
- Mid-range forestland impacts

- High DNREC Tidal Wetland impacts
- High floodplain impacts
- High Agricultural District impacts
- Mid-range forestland impacts
- High impact to Species Habitat Areas (wildlife & plants)

- Detailed evaluation process is on-going to identify cultural resources and assess potential effects
- Phase II & III Bog Turtle Survey currently underway

Comparison of the Retained Alternatives - Cultural Resources

propose distributions	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		ANG MPA	E OF CTS
Potential Impacts on Cultural Resources										
Historic Properties ¹										
Properties to be evaluated for Direct Effect	2	4	0	0	0	0	0	0	-	4
Properties to be evaluated for Visual and A	udible Effects ²	13		9	9	10	12	9		13
Properties to be evaluated for this Alternati	ive ⁴	15	12-13	9	9	10	12	9		15
Total Area of Limit of Disturbance (acres)		855-880	813-889	921	907	863-935	847-919	813		935
Predictive Model: Pre-Historic Sensitivity in										
High Sensitivity Area (acres % of total are		15 (1.7%) - 15 (1.8%)	17 (1.9%) - 17 (2.1%)	20 (2.2%)	21 (2.3%)	19 (2.1%) - 19 (2.3%)	21 (2.3%) - 21 (2.5%)	15 (1.7	%) -	21 (2.5%)
Moderate Sensitivity Area (acres % of tot		91 (10.7%) - 97 (11.2%)	162 (19.1%) - 167 (19.0%)	261 (28.6%)	254 (28.0%)	210 (24.5%) - 214 (23.6%)	238 (28.2%) - 242 (27.2%)	91 (10.		261 (28.6%)
Low Sensitivity Area [acres % of total are	a]	524 (60.8%) - 551 (62.5%)		527 (57.8%)	504 (55.6 %)	524 (62.2%) - 575 (63.5%)	479 (58.1%) - 498 (59.1%)	479 (58.	1%) -	577 (65.0%)
Nil Sensitivity Area [acres % of total area		223 (25.3%) - 225 (26.3%)	116 (13.7%) - 131 (14.9%)	103 (11.3%)	127 (14.0%)	87 (10.1%) - 98 (10.8%)	87(10.3%) - 98 (11.0%)	87 (10.1	%) -	225 (26.3%)
Predictive Model: Historic Sensitivity in the	Limit of Disturbance								-	
High Sensitivity Area [acres % of total a	rea)	38 (4.4%) - 41 (4.7%)	7 (0.9%) - 9 (1.0%)	5 (0.5%)	5 (0.5%)	5 (0.6%) - 7 (0.8%)	7 (0.8%) - 8 (0.9%)	5 (0.5%	٠ (۵	41 (4.7%)
Moderate Sensitivity Area (acres % of to	tal area	328 (37.3%) - 328 (38.1%)	199 (23.5%) - 228 (26.1%)	216 (23.6%)	212 (23.4%)	196 (22.8%) - 226 (24.9%)	196 (23.3%) - 226 (25.4%)	196 (22.)	3%) -	328 (38.1%)
Low Sensitivity Area (acres % of total ar	wal	490 (57.4%) - 511 (58.0%)	605 (74.4%) - 652 (73.3%)	691 (75.8%)	688 (76.1%)	637 (75.7%) - 673 (74.3%)	620 (75.2%) - 655 (73.6%)	490 (57.4	1%) -	691 (75.8%)
Area of Potential Effects										
Number of Historic Properties ⁵		15	12-13	9	9	10-11	11-12	9		15
Potential Section 4(f) Properties										
Number of Historic Properties ⁶		4	0	0	0	0	0	0		4
	Date of Alternative Design Update	01/12/06	03/12/06	11/18/05	10/18/05	01/12/06	01/12/05			

Comparison of the Retained Alternatives - Natural Resources

		PURPLE +	BROWN		GREEN + SPUR			
APRIL 10-11, 2006 ALTERNATIVES IMPACT MATRIX	YELLOW RANGE of IMPACTS	SPUR RANGE of IMPACTS	NORTH RANGE of IMPACTS	SOUTH RANGE of IMPACTS	NORTH RANGE of IMPACTS	SOUTH RANGE of IMPACTS	RANGE OF IMPACTS	
Total Length of Alternative (miles) Total Assa of Lindt of Fountervision (posses)	12.7 - 12.9 855 - 880	15.3 - 15.5	15.5 921	15.9	17.5 - 17.5	17.3 - 17.3 847 - 219	12.7 - 17.5 813 - 935	
otential Wetland Waters of the US Impacts								
Total Area of Potential ACOE Wetlands' (scres)	54.1 - 56.7 10.2 - 10.3	26.5 - 31.6	29.0	23.7	31.5 - 35.7	27.0 - 31.0	23.7 - 56.	
High Quality Dalastican Economical		8.4 - 10.6	14.0	12.5	10.5 - 12.0	11.3 - 12.6	8.4 - 14.	
Palustian Foreign	3.0 - 3.0		5.6 4.4	5.5 2.7	4.3 - 5.3	39 - 48	14 - 56	
Palustrian Strub-Scrub	0.0 - 0.0	0.0 - 0.0	0.0	0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 0.0	
Palustrian Mixed	5.9 - 5.9	2.6 - 3.1	4.0	4.2	4.0 - 4.4	5.2 - 5.6	2.6 - 5.9	
Medium Quality Data of an Constant	28.4 - 30.8 13.6 - 17.2	8.5 - 13.7 4.0 - 6.4	6.8	9.9 7.7	16.7 - 21.1	10.2 - 14.7	6.8 - 30 4.6 - 17	
Palustian Emergent			0.5	0.8			0.8 - 7.8	
Palustrian Shrub-Scrub		1.5 - 7.8	0.0	0.0	1.5 - 7.1 0.0 : 0.0	1.5 - 7.2 0.0 : 0.0	0.0 - 0.0	
Paluetian Mixed	10.3 - 13.1	11 - 13	1.5	1.5	5.1 - 6.3	28 - 30	1.1 - 13	
Low Quality Palvation Forested		2.9 - 4.5	8.2 0.9	1.3	3.2 - 4.2	4.5 - 5.4	0.0 - 0.5	
Paketian Foreign	8.5 - 8.9	2.9 - 3.6	7.3	0.7	3.2 - 3.3	45 - 46	0.6 - 8.1	
Palustian Shrub-Scrub	0.0 - 0.0	0.0 - 0.0	0.0	0.0	0.0 - 0.0	0.0 - 0.0		
Palustian Mad	5.2 - 5.2	0.0 - 0.0	0.0	0.0	0.0 - 0.0	0.0 - 0.0	0.0 - 5.2	
Other Wetlands Type and/or quality undeterminded to date	1.0 . 1.0						00.56	
Type and/or quarty a resembled to date Number of Witlands Impacted	30 - 45	45 - 55	0.0 38	0.0 32	42 - 50	42 . 50	32 - 55	
Number of Wetland Crossings	20 - 40	6 . 9	20	52	7 . 50	42 : 50	2 - 50	
Number of Wetlands with Complete Fragmentation	10 - 10	4 - 6	2	3	4 - 5	5 - 6	2 - 10	
Waters of the US (non-wedand)	18,613 - 21,282	14,063 - 16,019	13,879	13,178	12,902 - 13,959	13,750 - 14,994	12902 - 21	
Streams (linear feet)	215 - 215	250 - 271	923	1,895	355 - 355	532 - 532	215 - 18	
Osen Waters (ponds, SWM) (acres)	18,397 - 21,067	13,793 - 15,759	12,955	11,280	12,547 - 13,605	13,228 - 14,462	11280 - 21	
DNREC Sub-Assessus Lands (Snear feet)	5.921 - 6.579	4.693 - 6.433	7,958	8.019	6.403 - 6.918	6.970 - 7.482	4693 - 80	
Area of DNRSC State of Delaware Tidal Wedands' (acres)	06 - 06	96 - 96	1.5	15	15 - 15	15 - 15	1 - 1	
Recharge Areas (acres)	614 - 629	513 - 582	454	476	441 - 506	460 - 525	441 - 60	
Tax Ditches (linear feet) Tax Ditch Watershed area (acres)	81 - 81	51 - 624		192	51 - 624	51 - 624	0 - 60	
Tax Ditch Watershed area (acres)	12 : 12	33 - 50	28	55	33 - 58	123 : 53		
Avea of Hydric Soils (acres) otential Floodolain Impacts - FEMA	156 . 178	123 . 176	117	112	132 . 183	123 . 138	112 - 17	
Area of 100-Year Floodplain (acres)	17 . 17	17 . 17	25	25	25 . 25	25 . 25	17.24	
oterfal Agricultural Impacts	1.1 * 1.2	1.1 - 1.1			20 . 20	20 . 20	1.7 * 2.	
Agricultural Districts - Ten-Year (number)	1 - 1	1 - 1	- 1	- 1	1 - 1	1 - 1	14 1 : 3c	
Area (acres) Number of Apricultural Districts within 2 miles of Alternative	14.1 - 14.1	29.2 - 29.5	29.2	29.2	29.2 - 29.5	29.2 - 29.5		
Number of Agricultural Districts within 3 miles of Alternative Apricultural Preservation Easements - Permanent Injuriber)	2 - 2	7 - 7	- 6	6	7 - 7	7 - 7	6 - 9	
Agricultural Preservation Easements - Permanent (number)	0 : 0	61 61	1 04	11.7	61 1 61	61 61	0 - 1	
Number of Agricultural Easements within 3 miles of Attemptive	6 . 6	6 . 6	2	2	3 . 3	3 . 3	2 - 6	
Apricultural Suitability (Land Evaluation Site Assessment Model?								
Total LESA Model (score)	194 - 195	203 - 206	122	203	213 - 213	205 - 207 217 - 220	194 - 21	
LESA Model without existing and planned development (score)	222 . 225 191 - 197	222 . 224 461 . 445	202	209	224 . 225	217 . 220 416 - 452	202 - 22	
Prime Farmland Soil Area (acres) Ratio of prime farmland to total prime farmland in New Castle County (perpent) (74.454 acres total)	191 - 197	401 - 442	425	438	455 - 491 0.51 - 0.55	416 - 452 055 - 051	191 - 46	
ote etial Hazardous Waste Impacts	0.20 - 0.20	0.54 - 0.59	9.50	0.59	0.01 - 0.00	0.50 - 0.01	0.3 - 0.	
	0 - 0	0 - 0	0	0	0 - 0	0 - 0	0 - 0	
Number of Sites identified as potential sources of contamination Number of MRISO Locations	8 - 8		7	7	5 - 5	5 - 5	5 - 8	
Number of NPDES Locations otential Natural Resource Impacts	0 - 0	0 - 0			0 - 0	0 - 0	0 - 0	
Natural Areas Inventory (acres)	0 . 0				0 . 0		0 - 0	
State Resource Areas	27 - 27	27 - 27		ě	0 0	0 . 0		
	0 - 0	0 - 0	ō	ō	0 - 0	0 - 0	0 - 0	
Proposed (acres)	27 - 27	2.7 - 2.7	0	0	0 - 0	0 - 0	0 - 2	
Forestand: 2002 Land Use Decidious (some)	38.8 - 42.3 23.1 - 26.0	39.2 - 46.8 38.5 - 46.1	42.1 40.4	55.4 51.1	47.2 - 52.4 46.5 - 51.7	40.0 - 45.1 32.3 - 44.5	38.8 - 55 23.1 - 51	
Evergreen (acres)	23.1 - 26.0	38.5 - 46.1 0.0 - 0.7	1.0	3.7		00 - 07		
Mired (acres)	63 . 63		0.7	0.7	0.0 - 0.7 0.7 : 0.7	0.0 - 0.7	0.7 - 6	
State Forest Lands	0 - 0	0 : 0		- 6	0 - 0	0 - 0	8:8	
				0	8 : 8	0 - 0	0 - 0	
State-Owned State Forest Properties (agres)	0 - 0							
State-Owned State Forest Properties (acres) Consequation Consequent Properties (acres)	0 : 0	0 : 0	0	0		0 - 0		
State-Owned State Forest Properties (agres)		40.4 - 54.5	67.5	57.0	50.6 - 54.3	43.9 - 47.6	12 de determi 42.5 - 63	
State-Cured State Forest Poperties (scree) Consensión Essenerel Poperties (scree) Popertiel Res. Prospécies de Consensor Popertiel Res. Prospécies de Consensor Popertiel Res. Prospécies de Consensor Popertie Areas (Wolfrie & Plant) (scree)* Popertie Areas (Wolfrie & Plant) (scree)*	42.5 - 46.3	0 - 0	67.5	57.0		43.9 - 47.6		
State-Guesed State Founts (Expense) Consumention Statement Properties (Extract) Consumention Statements (Properties (Extract) Statement (Extract)	42.5 - 46.3	0 - 0 40.4 - 54.5 0 - 0	67.5	57.0		43.9 - 47.6	0 - 0	
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State-Guesed State Founts (Expense) Consumention Statement Properties (Extract) Consumention Statements (Properties (Extract) Statement (Extract)	42.5 - 46.3	0 - 0 40.4 - 54.5 0 - 0	67.5	57.0		43.9 - 47.6 0 - 0 0 - 0	0 - 0	
State-Gened State Found Progenite (2014) Contravolutio Statement Progenite (2014) Function (Mark, Uniquency and Londonymol Statement Assault Statement (Mark, Uniquency and Londonymol Statement Assault Statement (Mark) Statement Statement (Mark) Number of Palicity General Parks and Stocrastion Annual Facility Contral Statement (Mark) Statement (0 - 0 42.5 - 46.3 0 - 0 0 - 0	0 - 0 40.4 - 54.5 0 - 0 0 - 0	67.5	57.0 0 0	50.6 - 54.3 0 - 0 0 - 0	0 - 0	0 - 0 0 - 0 0 - 0 0 - 0	
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