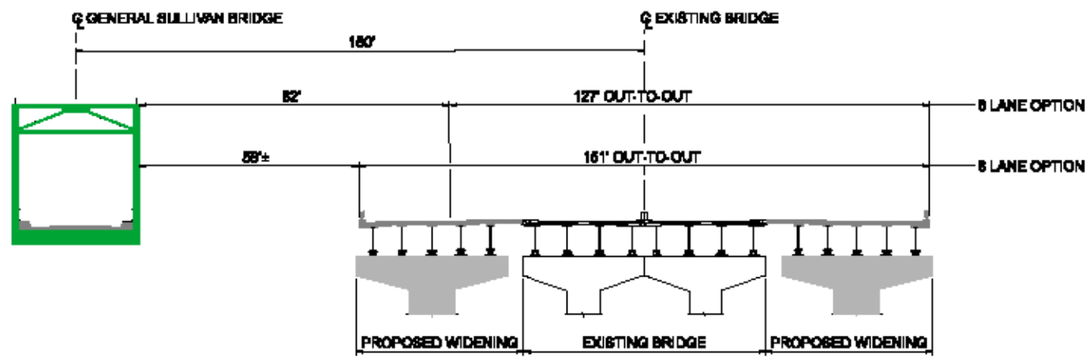
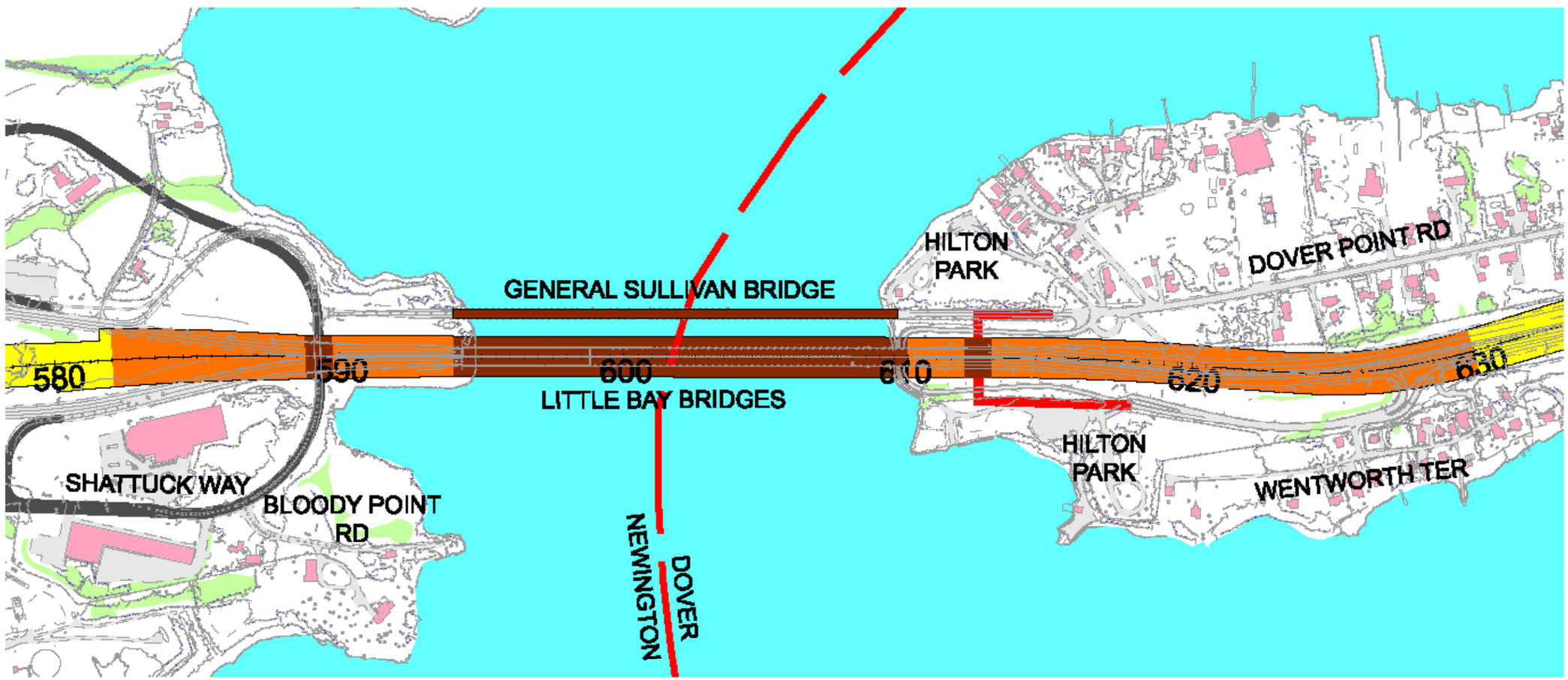
New Hampshire DOT
Department of Transportation

Conceptual Cross-Section





Legend:

- Existing Pavement
- Building
- Water
- Wetlands
- Conceptual Roadway Improvements
- 1 or 2 Lane Conceptual Roadway
- Proposed Bridge Improvements
- Newington Interim Safety Improvements

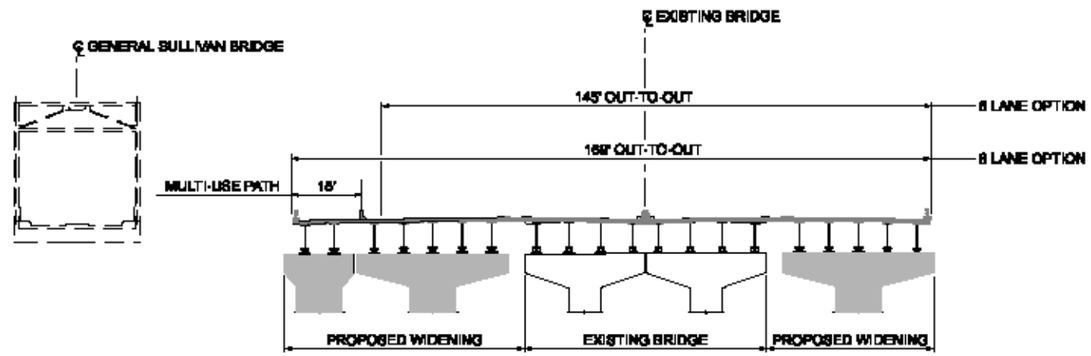
0 200 400 Feet

Vanasse Hangen Brustlin, Inc.

Figure 2.4-33
Widen Little Bay Bridges to Both Sides and Rehabilitate General Sullivan Bridge

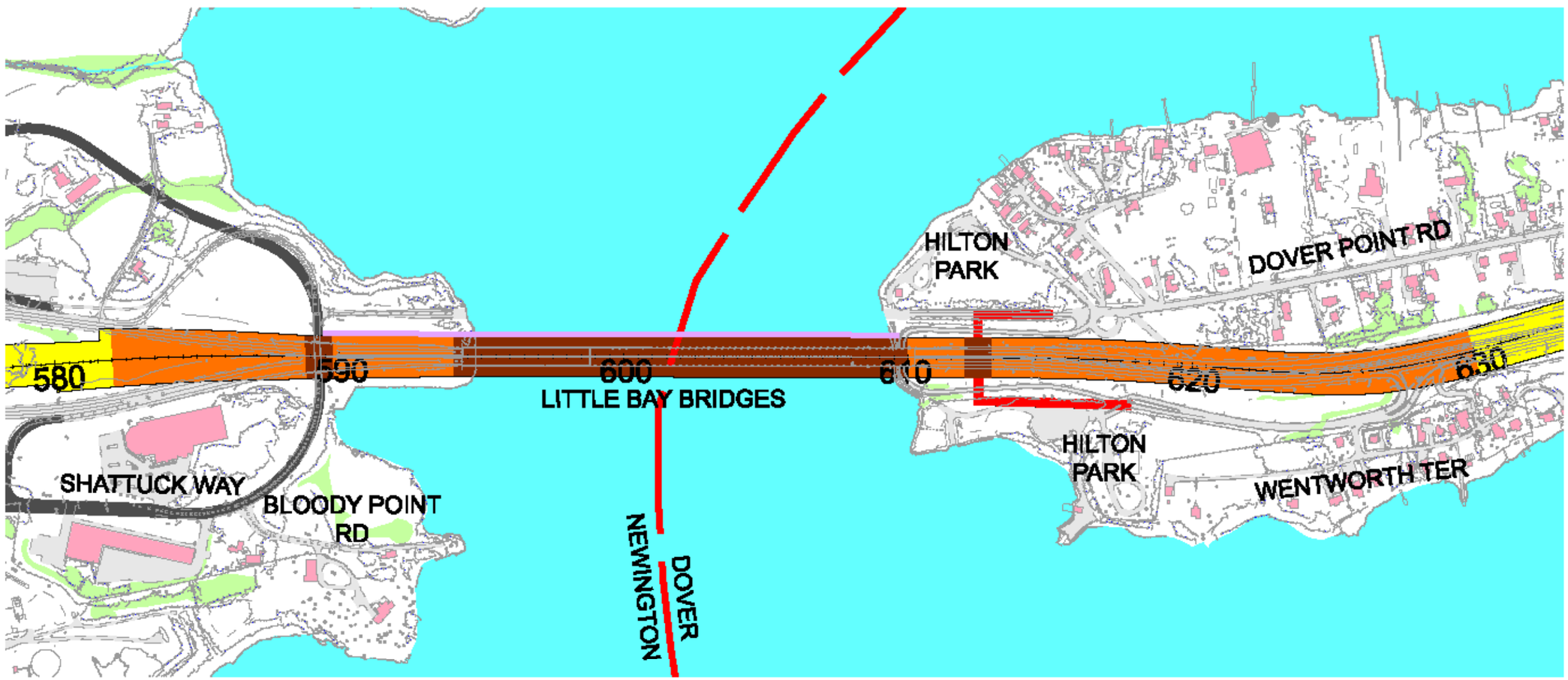
New Hampshire DOT
Department of Transportation

Conceptual Cross-Section



Legend:

- Existing Pavement
- Building
- Water
- Wetlands
- Conceptual Roadway Improvements
- 1 or 2 Lane Conceptual Roadway
- Proposed Bridge Improvements
- Multi-use Pathway
- Newington Interim Safety Improvements

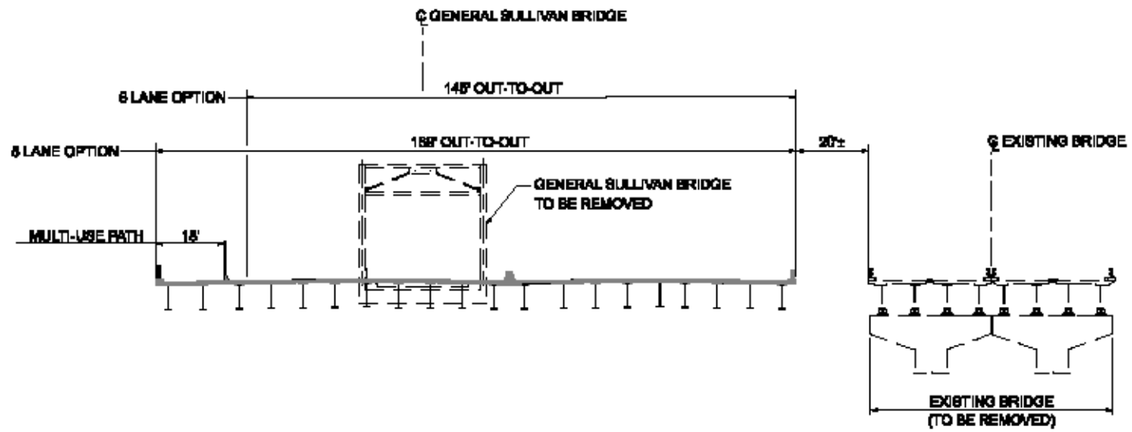


0 200 400 Feet

Vanasse Hangen Brustlin, Inc.

Figure 2.4-34
Widen Little Bay Bridges to Both Sides with Multi-Use Path and Remove General Sullivan Bridge

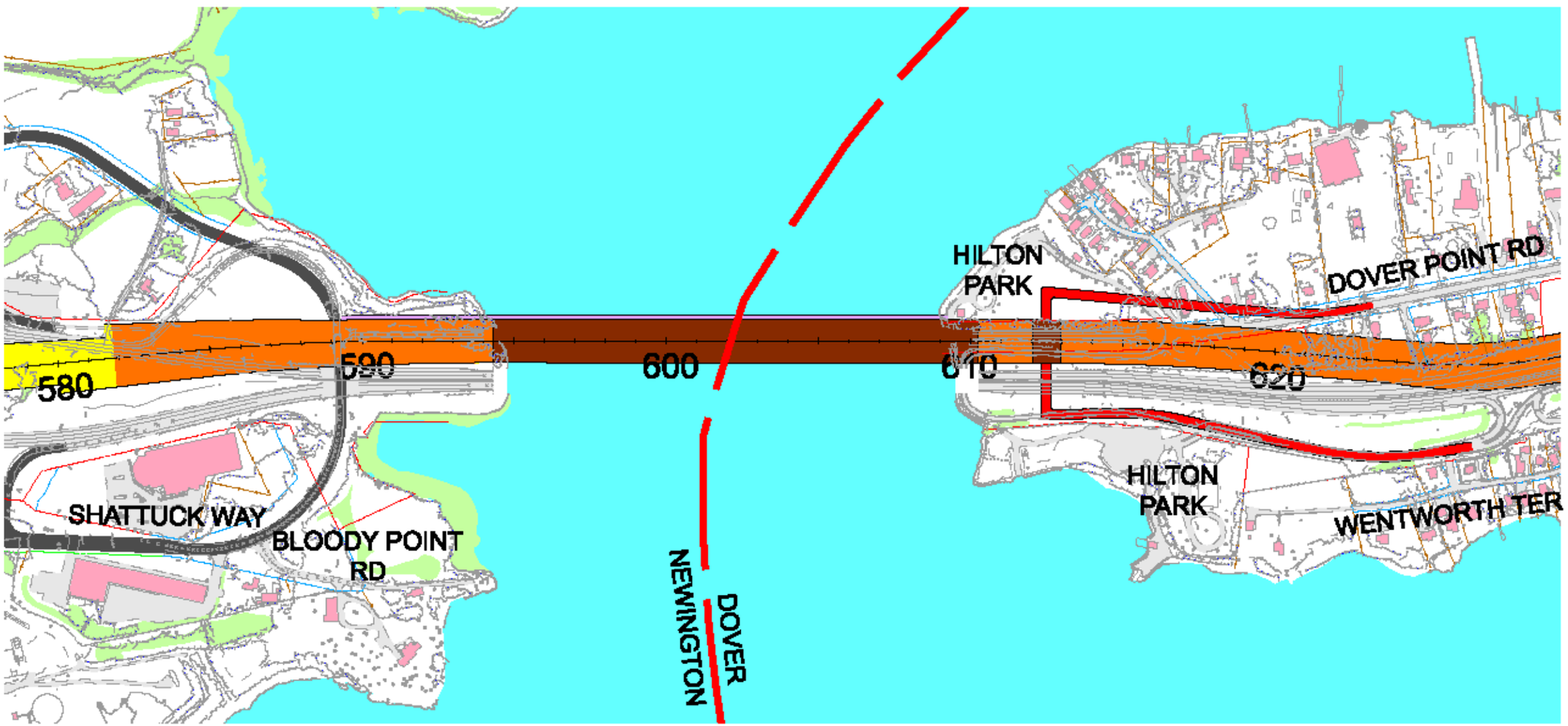
Conceptual Cross-Section



New Hampshire DOT
Department of Transportation

Legend:

- Existing Pavement
- Building
- Water
- Wetlands
- Conceptual Roadway Improvements
- 1 or 2 Lane Conceptual Roadway
- Proposed Bridge Improvements
- Multi-use Pathway
- Newington Interim Safety Improvements

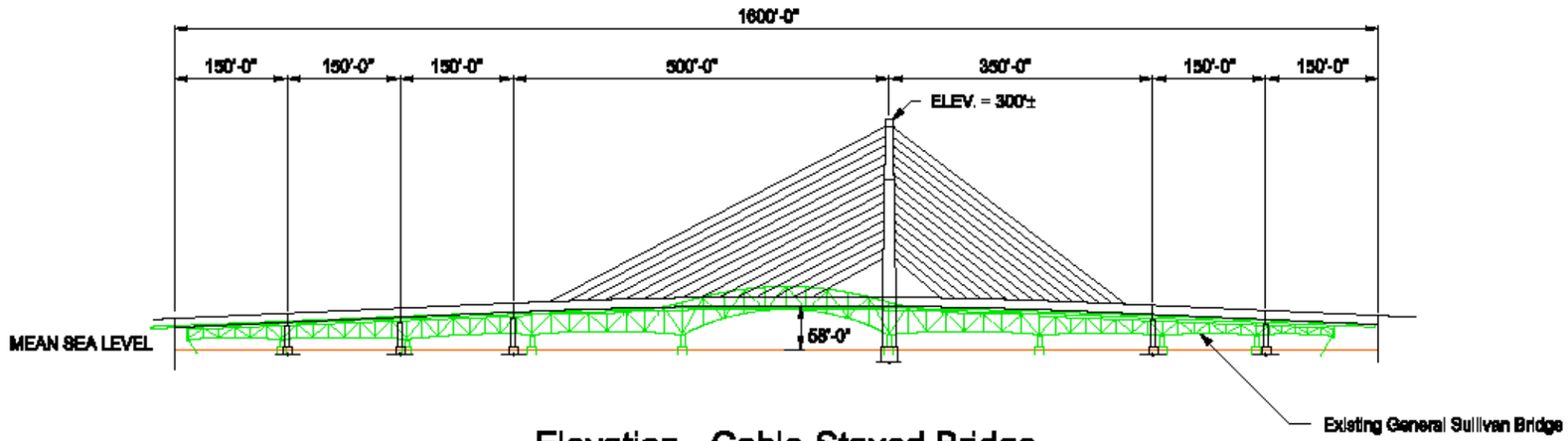


0 200 400 Feet

Vanasse Hangen Brustlin, Inc.

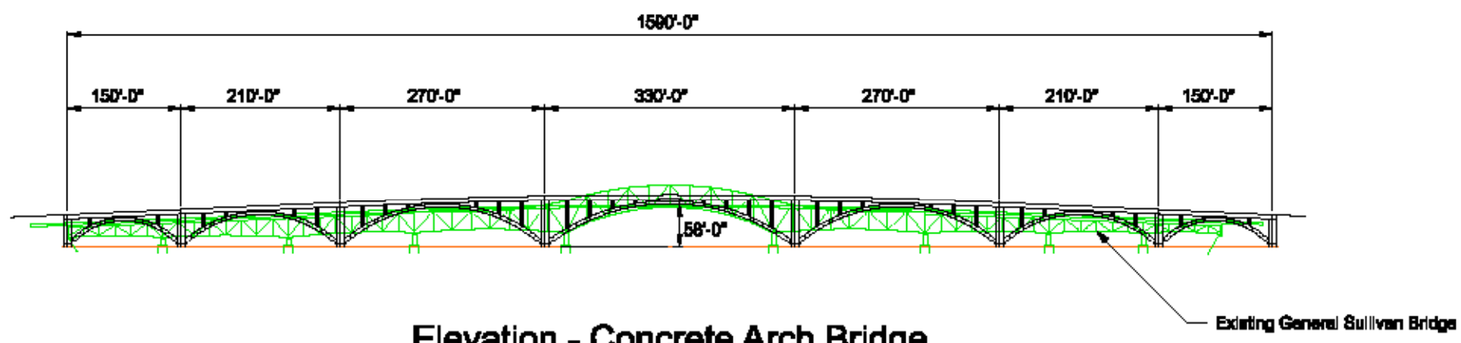
Figure 2.4-35
Construct New Bridge with Multi-Use Path - Replace Little Bay Bridges and General Sullivan Bridge

Date Created: 03/05/2007



Elevation - Cable-Stayed Bridge

N.T.S.



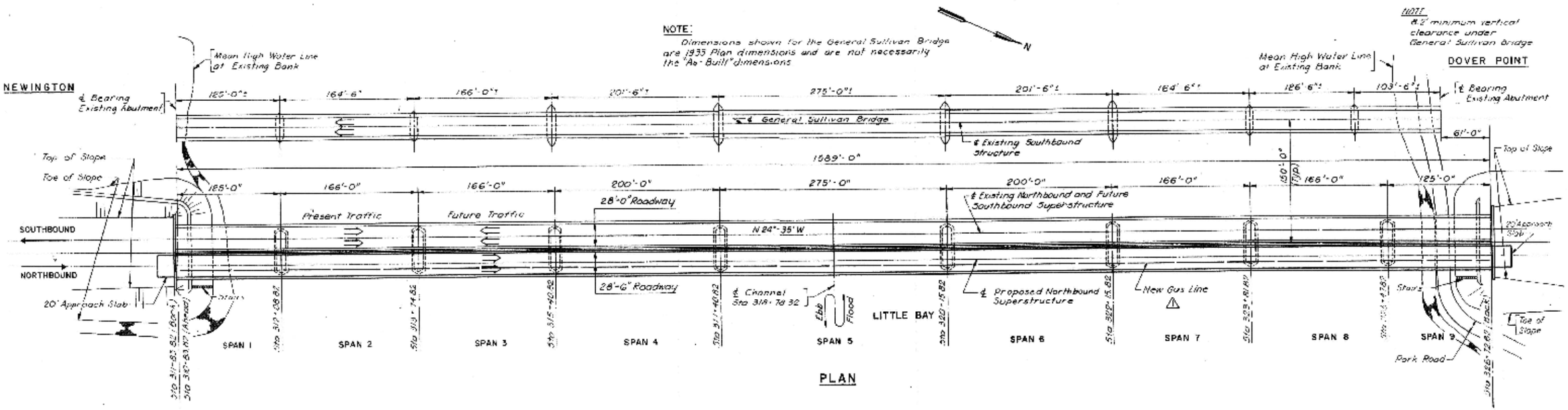
Elevation - Concrete Arch Bridge

N.T.S.

Vanasse Hangen Brustlin, Inc.

Figure 2.4-36
Conceptual Elevations of
New Signature Bridge Alternatives

New Hampshire DOT
Department of Transportation



* Clearance dimensions in this figure shown to mean low water.

Note:
Figures on this sheet are from the General Plan and Elevation, NHDOT Project No. P-2222-D, Contract #1, U.S. Route 4, N.H. Rte 16 and Spaulding Turnpike over Little Bay prepared by Hardesty & Hanover, Inc. dated March, 1982.

0 50 100 Feet

Vanasse Hangen Brustlin, Inc.

Figure 2.4-37
Existing Little Bay Bridges
Plan and Elevation

Date Created: 10/9/2007

Newington - Dover, NH NHS-027-1(37)/11238

Summary of Roadway and Bridge Impacts (Eight Lanes)

IMPACTS	UNIT OF MEASUREMENT	NO BUILD	ROADWAY SEGMENT NEWINGTON			BRIDGE SEGMENT WIDEN WEST		ROADWAY SEGMENT DOVER	
			ALT 10A	ALT 12A	ALT 13	Remove GSB	Rehab GSB	ALT 2	ALT 3
WATER QUALITY, AQUATIC LIFE, & FISHERIES	Number of Perennial Stream Crossings	0	1	1	1	0	0	0	0
	Length of Perennial Stream Crossings (Feet)	0	420	330	290	0	0	0	0
	Number of Intermittent Stream Crossings	0	0	0	0	0	0	0	0
	Length of Intermittent Stream Crossings (Feet)	0	0	0	0	0	0	0	0
GROUNDWATER QUALITY	Stratified-Drift Aquifer Under New Roadway Area (Acres)	0	4.0	4.0	4.6	1.2	1.2	8.1	8.3
	Number of Well Head Protection Area (WHPA) crossings	0	0	0	0	0	0	0	0
FLOODPLAINS	Floodplain Area Impacted (Acres)	0	0	0	0	0.4	0.4	1.5	0.8
	Floodplain Volume Impacts (Acre-feet)	0	0	0	0	2.7	2.7	1.5	1.2
WETLANDS	TOTAL Wetland Impacted (Acres)	0	13.6	12.8	11.8	1.1	0.9	8.2	7.9
PEM		0	4.7	4.7	3.2	0.2	0.2	2.6	2.5
PFO		0	6.7	6.4	6.8	0.2	0.2	5.4	5.4
POW		0	0	0	0	0	0	0	0
PSS		0	2.2	1.7	1.6	0	0	0.1	0
E1/E2		0	0	0	0	0.6	0.5	0.1	0
THREATENED & ENDANGERED SPECIES	Number of Populations Impacted	0	0	0	0	0	0	0	0
VISUAL	Impacts to Views from and to the Highway (Qualitative)	N/A	Mod	Mod	Low/Mod	Low	Low	Mod	Mod
ARCHAEOLOGICAL	Number of Sensitive Areas Affected (Native American / Historic)	0	9	11	8	5	6	9	8
	Verified Sites and Cemetaries (ac)	0	0	0.03	0	0.2	0.2	0.01	0
	Exhibits Sensitivity (ac)	0	6.6	9.5	5.3	1.8	1.9	12.6	14.4
	Exhibits Probable Sensitivity (ac)	0	23.1	23.9	20.4	3.5	2.8	0.6	0.6
HISTORICAL	Number of Potentially Eligible or Listed Sites Impacted (Adverse Effect)	0	3	3	3	1	1	1	1
RIGHT-OF-WAY DISPLACEMENT	Number of Residential Total Property Acquisitions	0	1	0	0	0	0	0	0
	Number of Business Total Property Acquisitions	0	0	0	0	1	1	1	1
PUBLIC PARKS & RECREATIONAL LAND[1]	Number of Affected Recreational 4(f) Properties	0	0	0	0	1	1	1	1
	Area of Affected Recreational 4(f) Properties (Acres)	0	0	0	0	0.002	0.002	0.4	0.4
PETROLEUM & HAZARDOUS MATERIALS	Number of Potentially Contaminated Properties Impacted	0	19	19	19	0	0	1	1
FARMLANDS	Active Farmlands Impacted (Acres)	0	0	0	0	0	0	0	0
Important Farmland Soils (Acres)	Prime	0	3.8	7.8	2.7	0	0	0	0
	Unique	0	0	0	0	0	0	0	0
	Statewide	0	0	1.5	0	0	0	0	0
	Local	0	0.01	0.01	0.01	0	0	0	0
WILDLIFE HABITAT[2]	High Value Habitat Impacted (Acres)	0	24.9	26.7	20.8	2.3	2.6	3.6	3.7
Riparian Areas	Riparian Impact Areas (Acres)	0	6.8	6.9	4.6	0	0	0	0
Unfragmented Lands (>25 acres)	Impacts to Unfragmented Lands (Acres)	0	12.0	13.1	9.0	0	0	0	0
HYDRODYNAMICS	Change in Tidal Flow Characteristics	0				Minimal	Minimal		
AIR	Microscale CO Exceedances (2025)	0	0	0	0	0	0	0	0
NOISE	Number of Receptors Exceeding FHWA Abatement Criteria	0	1	1	1	0	0	85	85

NOTES:
1 Hilton Park is located in the Bridge Segment of the study area. Bayview Park is located in the Dover portion.
2 High Value Habitat and other wildlife habitat measures are based on mapping by NH F&G D (Coarse Filter Analysis).

Selected Alternative

Figure 2.5-1
Summary of Environmental Impacts

Newington - Dover, NH 11238

Summary of Costs (FY 2007) for the Newington - Dover 6-lane Alternatives

COST FACTORS AND TRANSPORTATION DATA		ROADWAY SEGMENT NEWINGTON			BRIDGE SEGMENT		ROADWAY SEGMENT DOVER		COMBINED SEGMENT COMPARISON RANGE		
		ALT 10A	ALT 12A	ALT 13	WIDEN LITTLE BAY BRIDGE (LBB) TO THE WEST & REHABILITATE GENERAL SULLIVAN BRIDGE (GSB) FOR USE AS MULTI-USE PATH LBB w/GSB	WIDEN LITTLE BAY BRIDGE (LBB) TO THE WEST, INCLUDE MULTI-USE PATH AND REMOVE GENERAL SULLIVAN BRIDGE (GSB) LBB w/o GSB	ALT 2	ALT 3	MINIMUM ROADWAY LENGTH / NUMBER OF BRIDGES (ALT 13, LBB w/o GSB, ALT 2)	MAXIMUM ROADWAY LENGTH / NUMBER OF BRIDGES (ALT 12A, LBB w/GSB, ALT 3)	UNIT
TRANSPORTATION DATA	LENGTH OF FREEWAY (LANE MILES)	9.5	9.5	9.5	3.7	3.7	6.8	6.8	20.0	20.0	LANE MILES
	LENGTH OF RAMPS (LANE MILES)	2.3	2.3	2.5	0	0	2.3	2.4	4.8	4.7	LANE MILES
	LENGTH OF LOCAL ROADWAYS (LANE MILES)	6.2	6.6	5.0	1.1	1.1	4.0	4.6	10.1	12.3	LANE MILES
	TOTAL LENGTH OF IMPROVEMENTS (LANE MILES)	18.0	18.4	17.0	4.8	4.8	13.1	13.8	34.9	37.0	LANE MILES
	NUMBER OF BRIDGES	3	7	1	1	1	1	2	3	10	EACH
COST FACTORS	ALL COSTS ARE IN MILLIONS OF DOLLARS (FY 2007)								LOWEST COMBINED SEGMENT COST (ALT 13, LBB w/o GSB, ALT 2)	HIGHEST COMBINED SEGMENT COST (ALT 12A, LBB w/GSB, ALT 3)	$
ROADWAY COST	ALL ROADWAY COSTS ASSOCIATED w/ FREEWAY, RAMPS & LOCAL ROADS	39.3	41.8	36.3	12.2	12.2	32.0	32.2	80.5	86.2	MILLIONS
	COST ASSOCIATED WITH INTELLIGENT TRANSPORTATION SYSTEM DEPLOYMENT	0.9	0.9	0.9	0.5	0.5	0.6	0.6	2.0	2.0	MILLIONS
RAIL ACCOMMODATION COST (1)	ALL ROADWAY AND BRIDGE COSTS ASSOCIATED WITH ACCOMMODATING PEASE SPUR	1.3	2.3	0.1					0.1	2.3	MILLIONS
	TOTAL ROADWAY AND PEASE SPUR ACCOMMODATION COSTS	41.5	45.0	37.3	12.7	12.7	32.6	32.8	82.6	90.5	MILLIONS
BRIDGE COST	COST FOR ALL BRIDGES (EXCEPT LITTLE BAY, GENERAL SULLIVAN, AND PEASE SPUR)	13.2	16.3	9.4	1.2	1.2	6.9	10.0	17.5	27.6	MILLIONS
	WIDEN LITTLE BAY BRIDGE TO SIX LANES				52.8	62.1			62.1	52.8	MILLIONS
	REHABILITATE GENERAL SULLIVAN BRIDGE FOR PEDESTRIAN / BICYCLE USE				26.0				0.0	26.0	MILLIONS
	REMOVE GENERAL SULLIVAN BRIDGE					5.7			5.7	0.0	MILLIONS
	TOTAL BRIDGE COST	13.2	16.3	9.4	80.0	69.0	6.9	10.0	**85.2**	**106.3**	MILLIONS
ROADWAY AND BRIDGE COST TOTAL		**54.7**	**61.3**	**46.7**	**92.7**	**81.6**	**39.5**	**42.8**	**167.8**	**196.8**	MILLIONS
PRELIMINARY ENGINEERING	COST ASSOCIATED WITH DESIGN ENGINEERING, GEOTECHNICAL EVALUATION	3.8	4.3	3.3	6.5	5.7	2.8	3.0	**11.7**	**13.8**	MILLIONS
RIGHT OF WAY COSTS (2)	ESTIMATED COST FOR RIGHT OF WAY ACQUISITIONS	2.1	2.2	1.0	0.0	0.0	1.1	1.2	2.1	3.4	MILLIONS
TOTAL SEGMENT COST		**60.6**	**67.8**	**51.0**	**99.1**	**87.3**	**43.3**	**47.0**	**181.7**	**214.0**	MILLIONS
BUS COSTS (3)	COMBINATION OF THREE BUS ALTERNATIVES (ALTERNATIVES 1,2,3)	5.5							5.5	5.5	MILLIONS
RAIL COSTS (4)	RANGE OF RECOMMENDED NEAR TERM AND FUTURE RAIL SERVICE	1.7 TO 13.5							1.7 #	1.7 #	MILLIONS
PARK AND RIDE COSTS (5)	COMBINATION OF TWO PARK AND RIDE LOTS IN ROCHESTER AND DOVER	4.7							4.7	4.7	MILLIONS
MITIGATION AND ENHANCEMENT COSTS	WETLAND CREATION, RESTORATION, PRESERVATION. (INCLUDING RIGHT OF WAY AND CONST COST)	**4.6**							**4.6**	**4.6**	MILLIONS MILLIONS
RANGE OF TOTAL COSTS									**198.2**	**230.5**	MILLIONS

w/ NEAR TERM RAIL COST ALTERNATIVE 1 C

(1) THE RAIL ACCOMMODATION COST FOR NEWINGTON ALTERNATIVES 10A, 12A AND 13 ARE FOR ONLY THOSE NECESSARY ROADWAY ELEMENTS (BRIDGE, EXCAVATION AND DRAINAGE COSTS) THAT NEED TO BE CONSTRUCTED AS PART OF THESE ALTERNATIVES TO ALLOW FOR THE OPERATION OF THE PEASE SPUR, IF REACTIVATED. FOR ALTERNATIVE 13, THE COST TO ACCOMMODATE THE SPUR IS THE COST ASSOCIATED WITH THE MEDIAN PIER SUBSTRUCTURE ONLY ($120,000), NO OTHER ROADWAY ELEMENTS NEED TO BE CONSTRUCTED AS PART OF ALTERNATIVE 13 TO ACCOMMODATE THE RR SPUR. IF THE SPUR IS REACTIVATED, THE RAIL CAN BE ELEVATED (OVERPASS) WITHOUT SIGNIFICANTLY IMPACTING THE OPERATION OF THE TURNPIKE (ESTIMATED COST IS $5.0 MILLION).

(2) ESTIMATED COST FOR RIGHT OF WAY ACQUISITIONS (BASED UPON 2004 MUNICIPAL ASSESSMENT RECORDS AND AVERAGE LAND VALUES IN NEWINGTON AND DOVER.) THE ESTIMATED COSTS DO NOT REPRESENT ACTUAL APPRAISED VALUES OF ACQUISITIONS OR OTHER RIGHT OF WAY DAMAGES, AND ALSO DO NOT INCLUDE APPRAISAL, RELOCATION, OR OTHER ADMINISTRATIVE COSTS.

(3) COSTS ASSOCIATED WITH IMPROVING BUS SERVICE IN SEACOAST AREA INCLUDE A COMBINATION OF ALTERNATIVES: BUS ALTERNATIVE 1 @ $0.4 MILLION; BUS ALTERNATIVE 2 @ $440,000; BUS ALTERNATIVE 3 @ $4.5 MILLION. IN ADDITION, THE COST ASSOCIATED WITH AN ENHANCEMENT OF THE EXISTING BUS TRANSFER POINT AT THE FOX RUN MALL IS $115,000.

(4) COSTS ASSOCIATED WITH IMPROVING RAIL SERVICE INCLUDE A RANGE OF ALTERNATIVES: FOR NEAR TERM, ALTERNATIVE 1C IS RECOMMENDED WHICH EXPANDS THE EXISTING *DOWNEASTER* SERVICE ($1.7 MILLION); ALTERNATIVES 1A & 1B INVOLVE FUTURE EXPANSION OF SERVICE INTO DOVER AND ROCHESTER (RANGE OF FUTURE COSTS ARE $11.6 TO $12.1 MILLION)

(5) THE COSTS ASSOCIATED WITH THE CONSTRUCTION OF A PARK AND RIDE LOT IN DOVER ARE $3.4 MILLION. THE COSTS FOR THE PARK AND RIDE LOT IN ROCHESTER RANGES FROM $1.2 TO $1.3 MILLION DEPENDING UPON WHICH SITE IS SELECTED.

SUMMARY OF COSTS (FY 2007) SIX-LANE ALTERNATIVES
FIGURE 2.6-1

J:\51429\sheets\DEIS & FEIS COST Estimate\FEIS Cost estimate\FEIS_cost summary 6-LANE JUL6LANE FEIS.xls

Newington - Dover, NH 11238

Summary of Costs (FY 2007) for the Newington - Dover 8-lane Alternatives

COST FACTORS AND TRANSPORTATION DATA		ROADWAY SEGMENT NEWINGTON ALT 10A	ROADWAY SEGMENT NEWINGTON ALT 12A	ROADWAY SEGMENT NEWINGTON ALT 13	BRIDGE SEGMENT WIDEN LITTLE BAY BRIDGE (LBB) TO THE WEST & REHABILITATE GENERAL SULLIVAN BRIDGE (GSB) FOR USE AS MULTI-USE PATH: LBB w/GSB	BRIDGE SEGMENT WIDEN LITTLE BAY BRIDGE (LBB) TO THE WEST, INCLUDE MULTI-USE PATH AND REMOVE GENERAL SULLIVAN BRIDGE (GSB): LBB w/o GSB	ROADWAY SEGMENT DOVER ALT 2	ROADWAY SEGMENT DOVER ALT 3	COMBINED SEGMENT COMPARISON RANGE: MINIMUM ROADWAY LENGTH / NUMBER OF BRIDGES (ALT 13, LBB w/o GSB, ALT 2)	COMBINED SEGMENT COMPARISON RANGE: MAXIMUM ROADWAY LENGTH / NUMBER OF BRIDGES (ALT 12A, LBB w/ GSB, ALT 3)	
TRANSPORTATION DATA	LENGTH OF FREEWAY (LANE MILES)	10.6	10.6	10.6	5.0	5	7.6	7.6	23.2	23.2	LANE MILES
	LENGTH OF RAMPS (LANE MILES)	2.3	2.1	2.5	0	0	2.5	2.4	5.0	4.5	LANE MILES
	LENGTH OF LOCAL ROADWAYS (LANE MILES)	6.2	6.6	5.0	1.1	1.1	4.1	4.6	10.2	12.3	LANE MILES
	TOTAL LENGTH OF IMPROVEMENTS (LANE MILES)	19.1	19.3	18.1	6.1	6.1	14.2	14.6	38.4	40.0	LANE MILES
	NUMBER OF BRIDGES	3	7	1	1	1	1	2	3	10	EACH
COST FACTORS	ALL COSTS ARE IN MILLIONS OF DOLLARS (FY 2007)								LOWEST COMBINED SEGMENT COST (ALT 13, LBB w/o GSB, ALT 2)	HIGHEST COMBINED SEGMENT COST (ALT 12A, LBB w/ GSB, ALT 3)	$
ROADWAY COST	ALL ROADWAY COSTS ASSOCIATED w/ FREEWAY, RAMPS & LOCAL ROADS	40.3	42.9	37.5	13.1	13.1	32.9	33.1	83.5	89.1	MILLIONS
	COST ASSOCIATED WITH INTELLIGENT TRANSPORTATION SYSTEM DEPLOYMENT	0.9	0.9	0.9	0.5	0.5	0.6	0.6	2.0	2.0	MILLIONS
RAIL ACCOMMODATION COST (1)	ALL ROADWAY AND BRIDGE COSTS ASSOCIATED WITH ACCOMMODATING PEASE SPUR	1.3	2.3	0.1					0.1	2.3	MILLIONS
	TOTAL ROADWAY COST	42.5	46.1	38.5	13.6	13.6	33.5	33.7	85.7	93.4	MILLIONS
BRIDGE COST	COST FOR ALL BRIDGES (EXCEPT LITTLE BAY, GENERAL SULLIVAN, AND PEASE SPUR)	13.2	16.4	9.4	2.0	2.0	6.9	10.0	18.3	28.4	MILLIONS
	WIDEN LITTLE BAY BRIDGE TO EIGHT LANES				63.0	72.4			72.4	63.0	MILLIONS
	REHABILITATE GENERAL SULLIVAN BRIDGE FOR PEDESTRIAN / BICYCLE USE				26.0				0.0	26.0	MILLIONS
	REMOVE GENERAL SULLIVAN BRIDGE					5.7			5.7	0.0	MILLIONS
	TOTAL BRIDGE COST	13.2	16.4	9.4	91.0	80.1	6.9	10.0	**96.3**	**117.4**	MILLIONS
ROADWAY AND BRIDGE COST TOTAL		**55.7**	**62.5**	**47.9**	**104.6**	**93.7**	**40.4**	**43.7**	**182.0**	**210.8**	MILLIONS
PRELIMINARY ENGINEERING	COST ASSOCIATED WITH DESIGN ENGINEERING, GEOTECHNICAL EVALUATION	3.9	4.4	3.4	7.3	6.6	2.8	3.1	12.6	14.7	MILLIONS
RIGHT OF WAY COSTS (2)	ESTIMATED COST FOR RIGHT OF WAY ACQUISITIONS	2.1	2.2	1.0	0.0	0.0	1.1	1.2	2.1	3.4	MILLIONS
TOTAL SEGMENT COST		**61.7**	**69.1**	**52.3**	**111.9**	**100.2**	**44.3**	**48.0**	**196.7**	**228.9**	MILLIONS
BUS COSTS (3)	COMBINATION OF THREE BUS ALTERNATIVES AND ENHANCED TRANSFER POINT	5.5							5.5	5.5	MILLIONS
RAIL COSTS (4)	RECOMMENDED NEAR TERM AND FUTURE RAIL SERVICE	1.7							1.7 #	1.7 #	MILLIONS
PARK AND RIDE COSTS (5)	COMBINATION OF TWO PARK AND RIDE LOTS IN ROCHESTER AND DOVER	4.7							4.7	4.7	MILLIONS
MITIGATION AND ENHANCEMENT COSTS	WETLAND CREATION, RESTORATION, PRESERVATION. (INCLUDING RIGHT OF WAY AND CONST COST)	**4.6**							**4.6**	**4.6**	MILLIONS / MILLIONS
RANGE OF TOTAL COSTS									**213.2**	**245.4**	MILLIONS

THE COLOR SHOWN IN THE SEGMENT COLUMNS ABOVE IDENTIFIES THE DEPARTMENTS SELECTED ALTERNATIVE

w/ NEAR TERM RAIL COST ALTERNATIVE 1 C

(1) THE RAIL ACCOMMODATION COST FOR NEWINGTON ALTERNATIVES 10A, 12A AND 13 ARE FOR ONLY THOSE NECESSARY ROADWAY ELEMENTS (BRIDGE, EXCAVATION AND DRAINAGE COSTS) THAT NEED TO BE CONSTRUCTED AS PART OF THESE ALTERNATIVES TO ALLOW FOR THE OPERATION OF THE PEASE SPUR, IF REACTIVATED. FOR ALTERNATIVE 13, THE COST TO ACCOMMODATE THE SPUR IS THE COST ASSOCIATED WITH THE MEDIAN PIER SUBSTRUCTURE ONLY ($120,000), NO OTHER ROADWAY ELEMENTS NEED TO BE CONSTRUCTED AS PART OF ALTERNATIVE 13 TO ACCOMMODATE THE RR SPUR. IF THE SPUR IS REACTIVATED, THE RAIL CAN BE ELEVATED (OVERPASS) WITHOUT SIGNIFICANTLY IMPACTING THE OPERATION OF THE TURNPIKE (ESTIMATED COST IS $5.0 MILLION).

(2) ESTIMATED COST FOR RIGHT OF WAY ACQUISITIONS (BASED UPON 2004 MUNICIPAL ASSESSMENT RECORDS AND AVERAGE LAND VALUES IN NEWINGTON AND DOVER) THE ESTIMATED COSTS DO NOT REPRESENT ACTUAL APPRAISED VALUES OF ACQUISITIONS OR OTHER RIGHT OF WAY DAMAGES, AND ALSO DO NOT INCLUDE APPRAISAL, RELOCATION, OR OTHER ADMINISTRATIVE COSTS

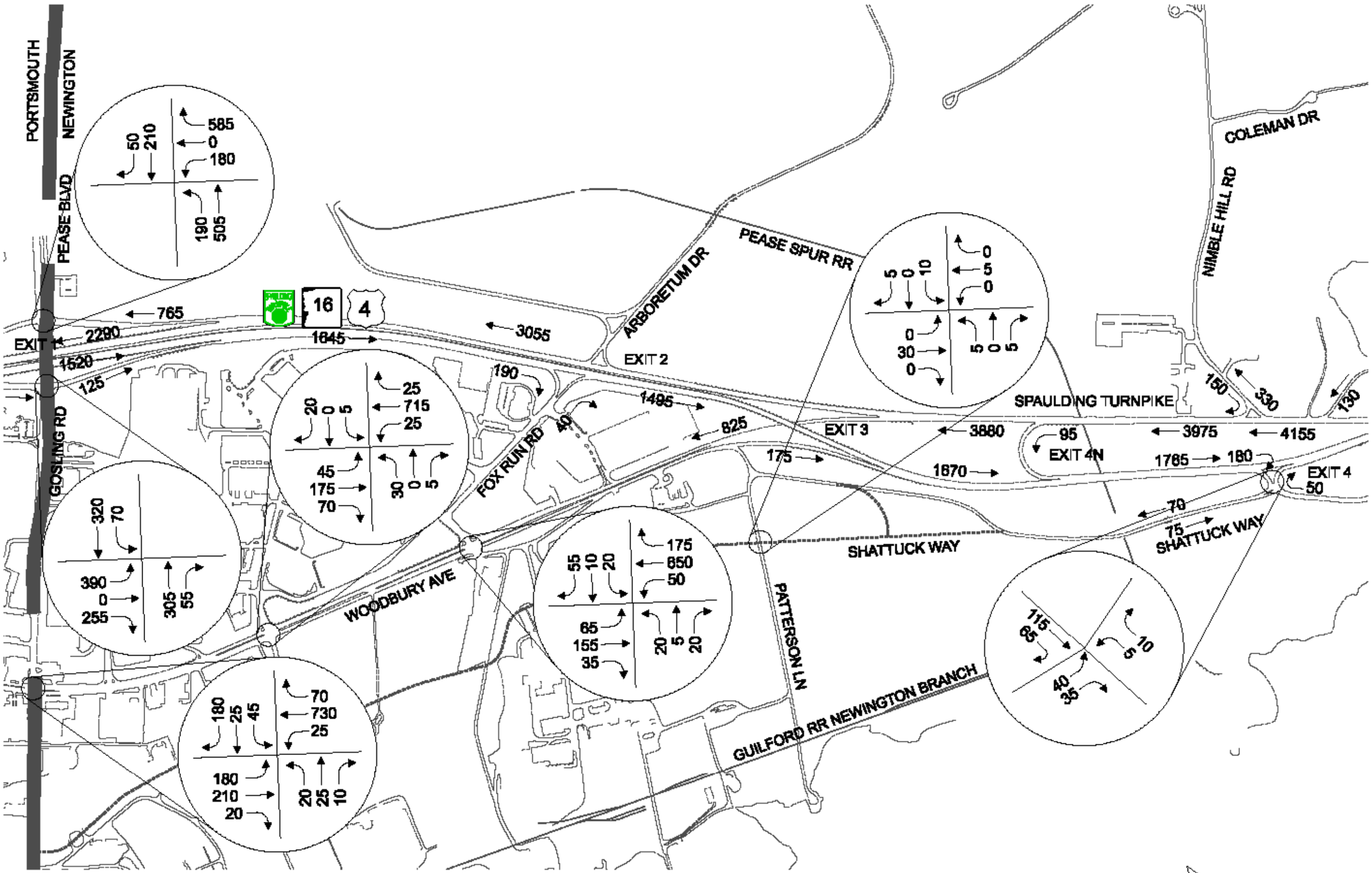
(3) COSTS ASSOCIATED WITH IMPROVING BUS SERVICE IN SEACOAST AREA INCLUDE A COMBINATION OF ALTERNATIVES: BUS ALTERNATIVE 1 @ $0.4 MILLION; BUS ALTERNATIVE 2 @ $440,000; BUS ALTERNATIVE 3 @ $4.5 MILLION. IN ADDITION, THE COST ASSOCIATED WITH AN ENHANCEMENT OF THE EXISTING BUS TRANSFER POINT AT THE FOX RUN MALL IS $115,000.

(4) COSTS ASSOCIATED WITH IMPROVING RAIL SERVICE INCLUDE A RANGE OF ALTERNATIVES: FOR NEAR TERM, ALTERNATIVE 1C IS RECOMMENDED WHICH EXPANDS THE EXISTING *DOWNEASTER* SERVICE ($1.7 MILLION); ALTERNATIVES 1A & 1B INVOLVE FUTURE EXPANSION OF SERVICE INTO DOVER AND ROCHESTER (RANGE OF FUTURE COSTS ARE $11.6 TO $12.1 MILLION)

(5) THE COSTS ASSOCIATED WITH THE CONSTRUCTION OF A PARK AND RIDE LOT IN DOVER ARE $3.4 MILLION. THE COSTS FOR THE PARK AND RIDE LOT IN ROCHESTER RANGES FROM $1.2 TO $1.3 MILLION DEPENDING UPON WHICH SITE IS SELECTED.

SELECTED ALTERNATIVE COST (MILLIONS)	
NEWINGTON SEGMENT (ALT 13)	52.3
BRIDGE SEGMENT (LBB w/o GSB)	111.9
DOVER SEGMENT (ALT 3)	48.0
BUS SERVICE	5.5
RAIL SERVICE	1.7
PARK AND RIDE LOTS	4.7
MITIGATION	4.6
TOTAL	228.7

SUMMARY OF COSTS (FY 2007) EIGHT-LANE ALTERNATIVES
FIGURE 2.6-2



New Hampshire DOT
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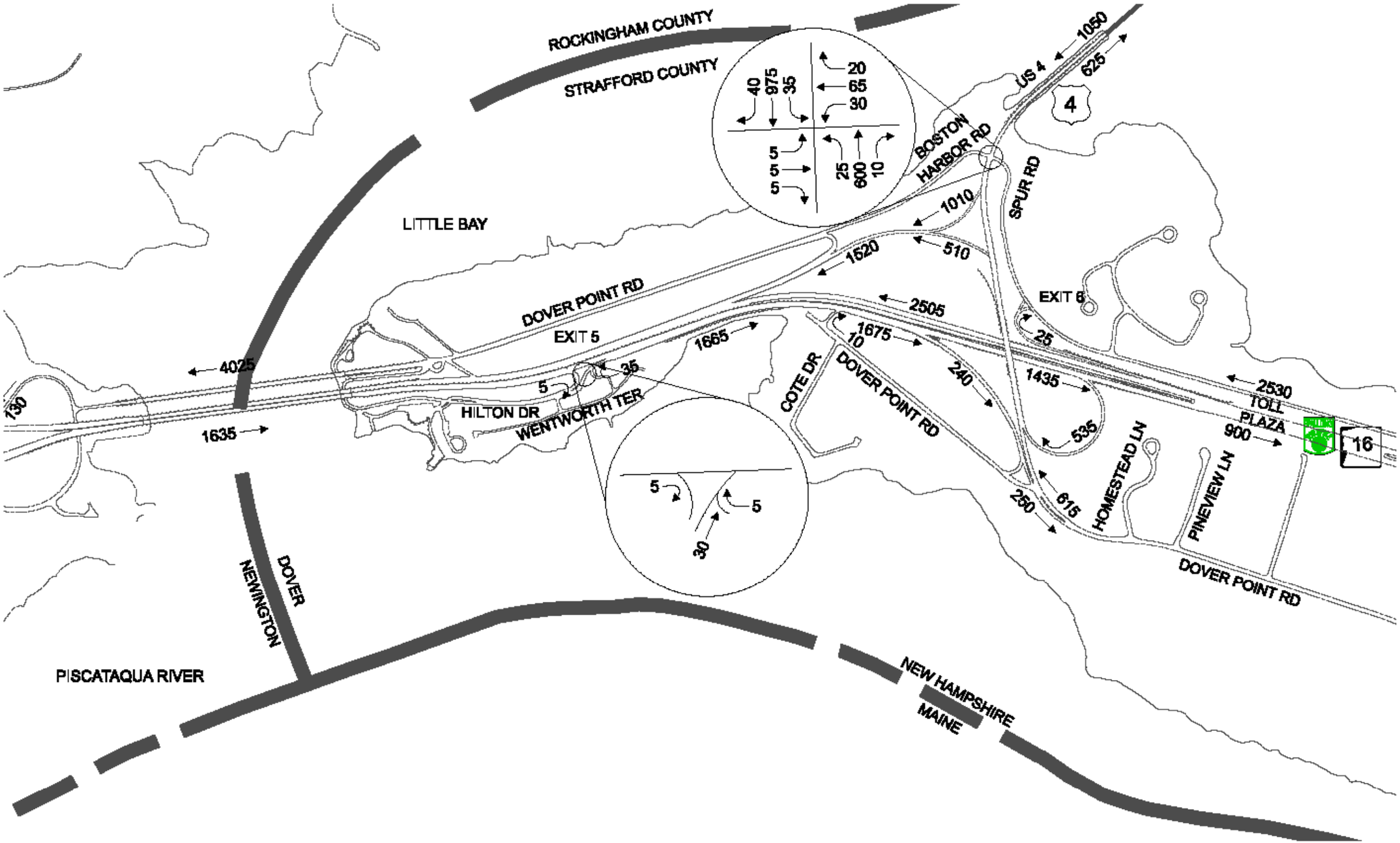
Vanasse Hangen Brustlin, Inc.

Figure 3.2-1 - Newington
2003 Existing Conditions
Weekday AM Peak Hour
Sheet 1 of 2

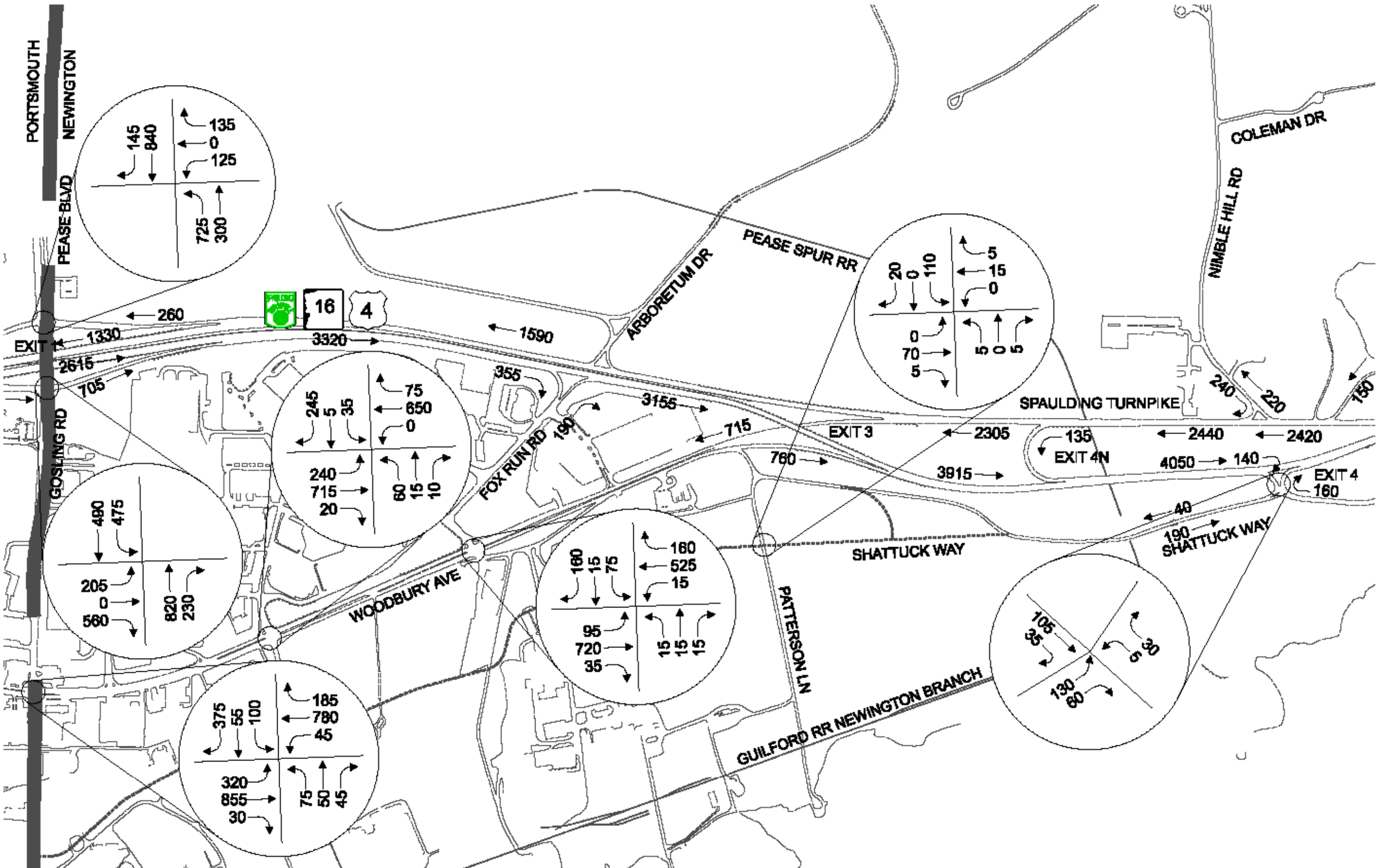
0 375 750 Feet

Date Created:10/8/2007



Vanasse Hangen Brustlin, Inc.

Figure 3.2-1 - Dover
2003 Existing Conditions
Weekday AM Peak Hour
Sheet 2 of 2



New Hampshire DOT
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Vanasse Hangen Brustlin, Inc.

Figure 3.2-2 - Newington
2003 Existing Conditions
Weekday PM Peak Hour
Sheet 1 of 2

0 375 750 Feet

Date Created:10/8/2007

New Hampshire DOT
Department of Transportation

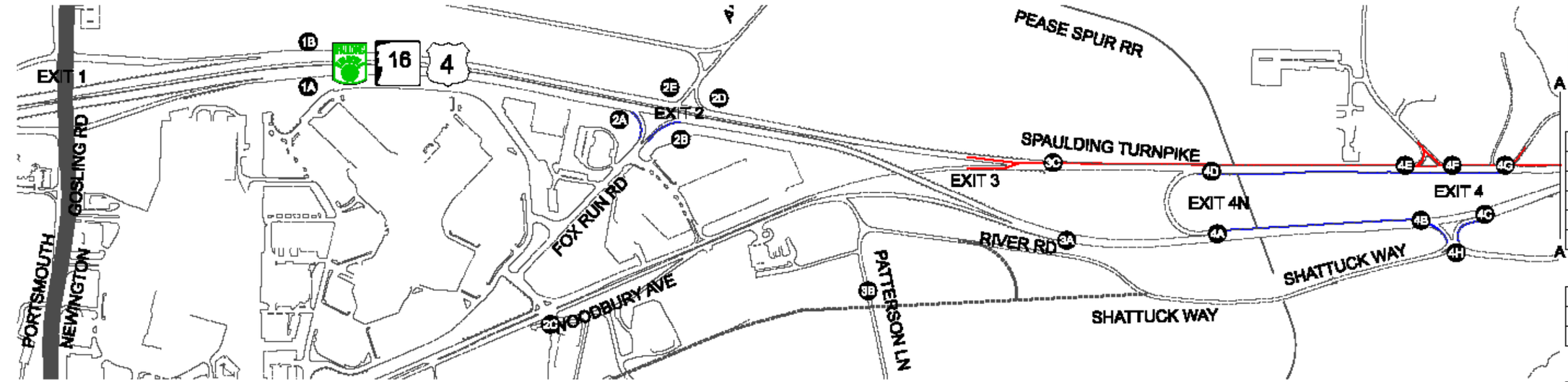
ROCKINGHAM COUNTY
STRAFFORD COUNTY
LITTLE BAY
PISCATAQUA RIVER
DOVER NEWINGTON
NEW HAMPSHIRE
MAINE
US 4
4
BOSTON HARBOR RD
SPUR RD
DOVER POINT RD
EXIT 5
EXIT 6
HILTON DR
WENTWORTH TER
COTE DR
HOMESTEAD LN
PINEVIEW LN
TOLL PLAZA
16

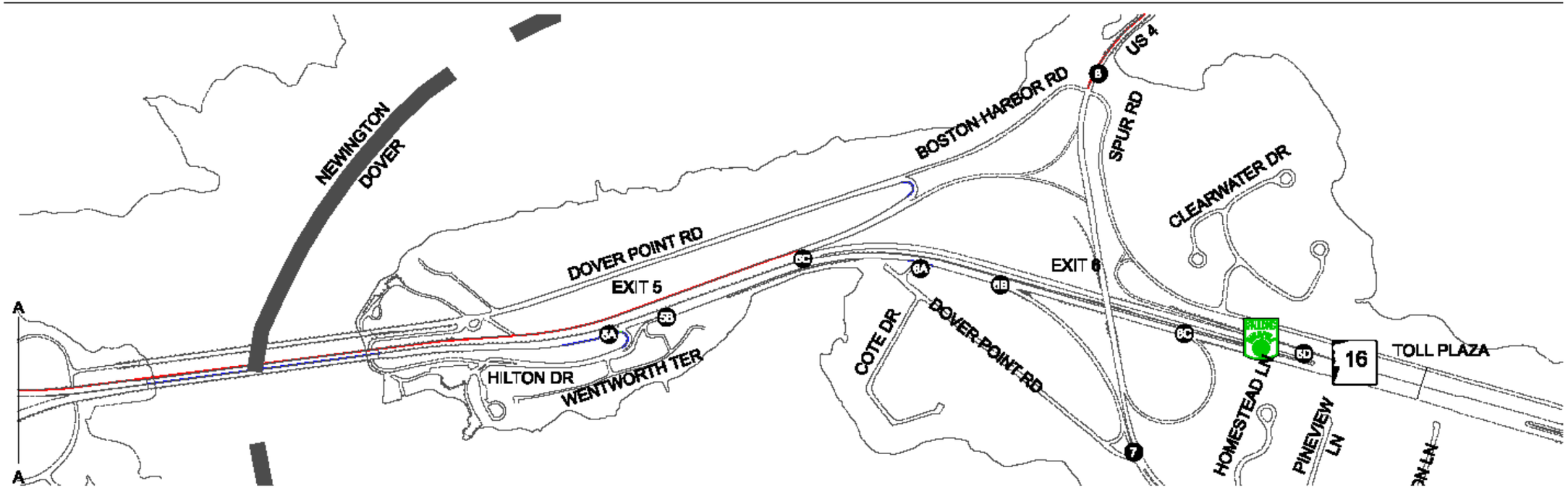
35 830 25
15 25 10
15 0 5
70 1120 25
5 5
35
890 1150
845 265 1110 1160 4110 40 710 3400 1200 2375 1025 470 715
2270 150 4070 4105 40 5

0 375 750 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.2-2 - Dover
2003 Existing Conditions
Weekday PM Peak Hour
Sheet 2 of 2





New Hampshire DOT
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Arterial LOS

Node From	Node To	2003 LOS
2C	3C	D
3B	4H	A
7	NORTH	D
8	WEST	E

Signalized Intersection LOS

Node	2003 LOS
2C	B
8	C

Unsignalized Intersection LOS

Node	2003 LOS
3B	A
4H	B

Weave Analysis LOS

Node From	Node To	2003 LOS
4G	4F	E
4E	4D	F
4A	4B	B
6A	6B	B

Ramp Junction LOS

Node	2003 LOS
2A	B
2B	B
3A	B
3C	E
4A	B
4B	B
4C	B
4D	D
4E	E
4F	F
4G	F
5A	B
5B	B
6A	B
6B	B
6C	B
6D	B

Legend:

CAPACITY DEFICIENCY

SUBSTANDARD GEOMETRICS

Freeway LOS

Node From	Node To	2003 LOS
Spaulding Turnpike NB		
1A	2A	B
2B	3A	B
4A	4B	C
4C	5A	B
5B	6A	B
6C	TOLL	A

Freeway LOS

Node From	Node To	2003 LOS
Spaulding Turnpike SB		
TOLL	6D	C
6D	5C	C
5C	4G	E
4E	3C	E
3C	2D	D
2E	1B	D

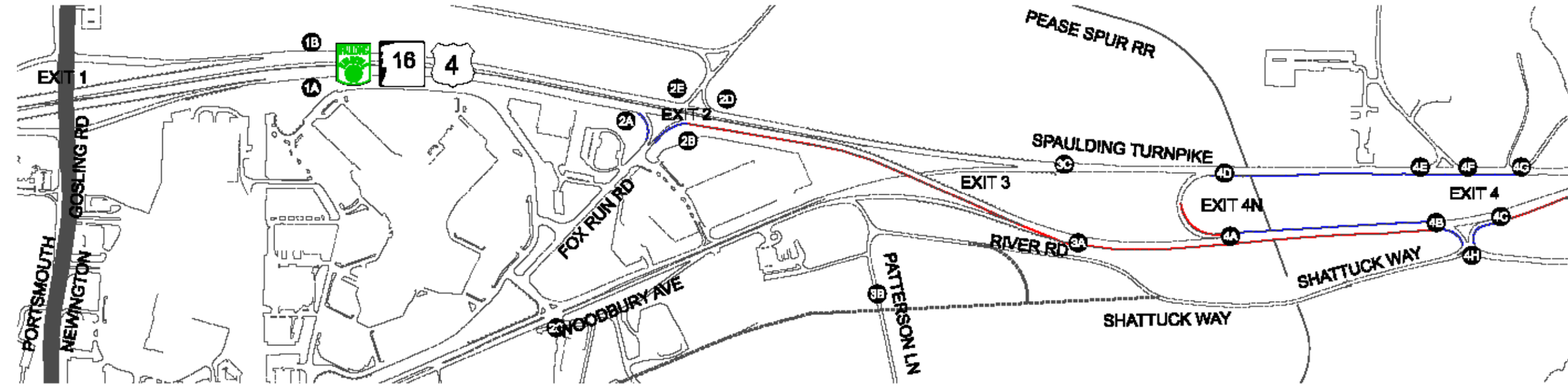
N

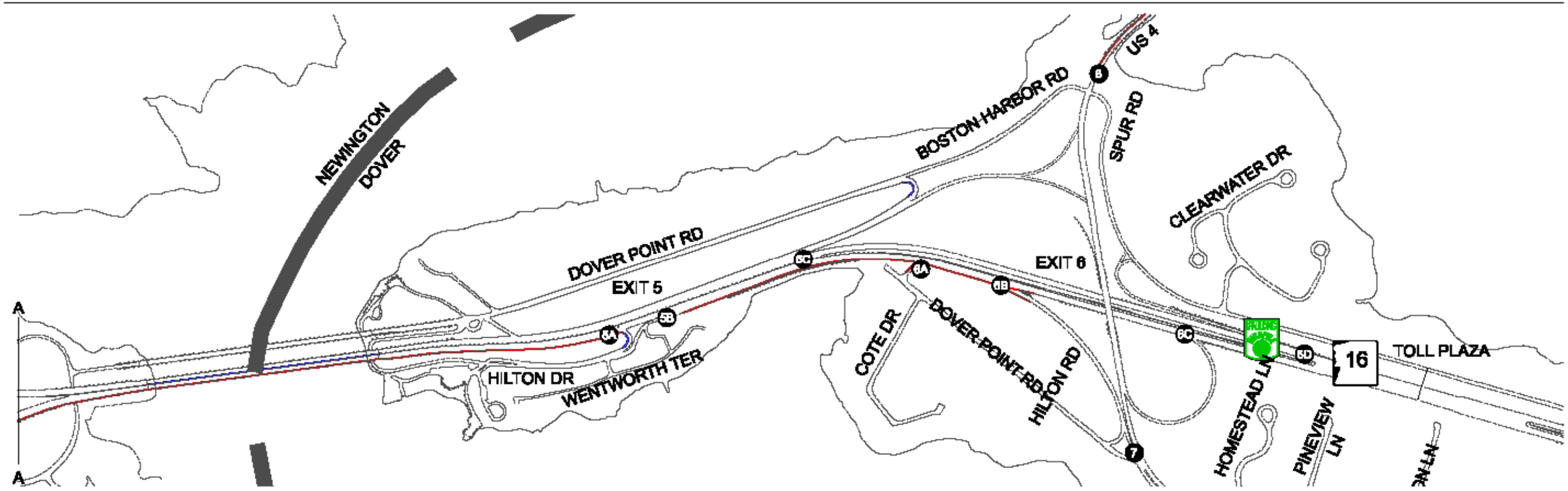
0 375 750 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.2-3
Level of Service Summary
2003 Existing Conditions
Weekday AM Peak Hour

Date Created:10/9/2007 j:\91412\wad\alphaw3DE01g030208.dgn





New Hampshire DOT
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Arterial LOS

Node From	Node To	2003 LOS
2C	3C	D
3B	4H	C
7	NORTH	D
8	WEST	E

Signalized Intersection LOS

Node	2003 LOS
2C	B
8	C

Unsignalized Intersection LOS

Node	2003 LOS
3B	B
4H	B

Weave Analysis LOS

Node From	Node To	2003 LOS
4G	4F	C
4E	4D	D
4A	4B	E
6A	6B	E

Ramp Junction LOS

Node	2003 LOS
2A	D
2B	C (F)*
3A	D (F)*
3C	C
4A	F
4B	D
4C	D
4D	C
4E	C
4F	C
4G	C
5A	D
5B	D
6A	E
6B	E
6C	D
6D	A

* Isolated facility analyses do not account for impacts associated with system deficiencies and failures. Field observations have confirmed that ramp nodes 2B & 3A and freeway segment 2B to 3A are regularly blocked by the rolling queue on the Turnpike, resulting from system capacity issues at Exits 4 through 6

Legend:

CAPACITY DEFICIENCY

SUBSTANDARD GEOMETRICS

Freeway LOS

Node From	Node To	2003 LOS
Spaulding Turnpike NB		
1A	2A	D
2B	3A	D (E)*
4A	4B	E
4C	5A	E
5B	6A	E
6C	TOLL	C

Freeway LOS

Node From	Node To	2003 LOS
Spaulding Turnpike SB		
TOLL	6D	B
6D	5C	B
5C	4G	C
4E	3C	C
3C	2D	B
2E	1B	B

N

0 375 750 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.2-4
Level of Service Summary
2003 Existing Conditions
Weekday PM Peak Hour

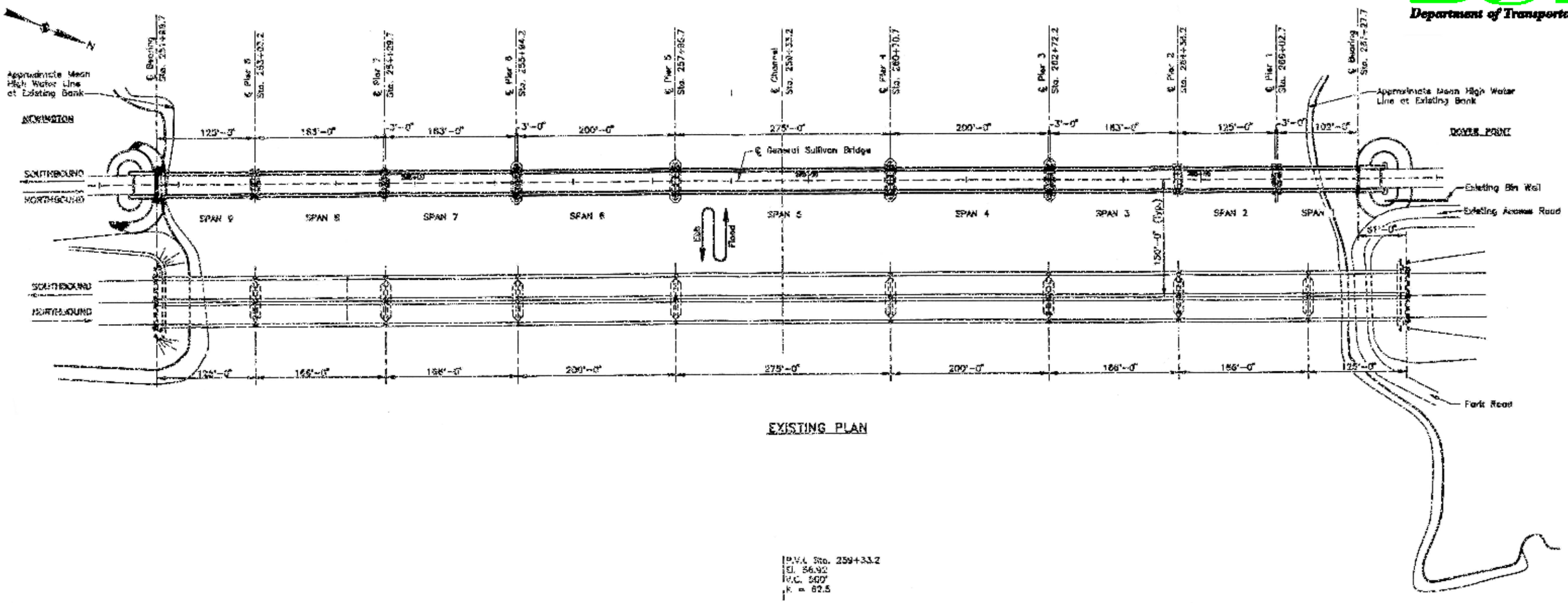
Date Created:10/9/2007

INTERSECTION	Spaulding Tpk Exit 1 / Gosling Rd	Spaulding Tpk Exit 1 NB / Gosling Rd	Spaulding Tpk Exit 1 SB / Gosling Rd	Between Exits 1 - 2	Spaulding Tpk Exit 2 / Fox Run Rd	Spaulding Tpk Exit 2 NB / Fox Run Rd	Spaulding Tpk Exit 2 SB / Fox Run Rd	Between Exits 2 - 3	Spaulding Tpk Exit 3 / Woodbury Ave	Spaulding Tpk Exit 3 NB / Woodbury Ave	Spaulding Tpk Exit 3 SB / Woodbury Ave	Between Exits 3 - 4	Spaulding Tpk Exit 4	Spaulding Tpk Exit 4N Turnaround	Spaulding Tpk Exit 4 / Nimble Hill Rd	Spaulding Tpk Exit 4 / River Rd	Spaulding Tpk Exit 4S Turnaround	Between Exit 4 - Bridge	Spaulding Tpk on Little Bay Bridge	Between Bridge - Exit 5	Spaulding Tpk Exit 5	Spaulding Tpk Exit 5 / Hilton Dr	Spaulding Tpk Exit 5 / Wentworth Ter	Between Exits 5 - 6	Spaulding Tpk Exit 6	Spaulding Tpk Exit 6N / Dover Pt Rd	Spaulding Tpk Exit 6W / Rt 4	Spaulding Tpk Exit 6 / Spur Rd	Between Exit 6 - Toll	Woodbury Ave / Gosling Rd	Woodbury Ave / Fox Run Rd	Woodbury Ave / River Rd	Gosling Rd / Industrial Access Rd	River Rd / Patterson Ln	River Rd / Industrial Access Rd	Dover Point Rd / Cote St	Rt 4 / Boston Hr Rd / Spur Rd / Dover Pt Rd	Along Spaulding Tpk (Dover)	Along Spaulding Tpk (Newington)	Along Woodbury Ave (Newington)	Along Gosling Rd	Along Fox Run Rd	Along River Rd	Along Nimble Hill Rd (STpk - Fox Point Rd)	Along Dover Point Rd (s/o Pineview Dr)	Along Boston Harbor Rd	Along Cote Dr	Along Route 4 (Dover)	Along Spur Rd	TOTAL	PERCENT
YEAR																																																			
1997	9	4		4	1	1		1	6		1	3	7	1	4	1		5	11	3				1	3	3	4		3	15	2						2	1	6	19	6	2		2	2	2		9		144	11%
1998	10			1	2	1			2		1	1	5	1		2		1	19	5	2		1			5	13		4	17							2		7	20	16		1	1	3	1		12		156	12%
1999	16	1	3	1	3			1	2		1	8	9	1	3	1		4	15	3	4			3	1	5	5		4	18	2	1					12		8	14	18	3	1		1	1		12	2	187	15%
2000	11	7	3	3	4			3	2		2	8	5	5	5	1	1	5	24	7	2		1		4	2	1		3	24		2					6		7	23	14	1	1		5		1	8		201	16%
2001	9	6	3	2	4	4			2			3	9	7	1	2	3	5	28	7	5			2	2	1	3		3	22	2						6		15	25	19	3	4		4			9		220	17%
2002	5			4	6			1	5			3	7	3		2	2	6	29	4	1			1	2	3	1		5	6	1						6		15	23	8	1	1	1	3	2		10	1	168	13%
2003	6	1		6	4			3	7			6	8	4	1	1	2	9	33	6	3			2	1	3	3		2	4							4	2	5	27	17	6	1	1	1	1		7		187	15%
Total	66	19	9	21	24	6	0	9	26	0	5	32	50	22	14	10	8	35	159	35	17	0	2	9	13	22	30	0	24	106	7	3	0	0	0	0	38	3	63	151	98	16	9	5	19	7	1	67	3	1263	100%
TYPE																																																			
Angle	2														1					1										4							3				9					1				21	2%
Rear-End	8	3	2	2	6	2		1	3			5	8	4	4	6	1	3	36	11	1				2	4	5		2	13	2	1					12		13	6	6		1		6	2		26		207	16%
Head-on																														1											1						1	1		4	0%
Sideswipe	1		1									1		2			1		2		1						1		1	1							1														13	1%
Fixed Object	3			2	2				2			2	2	2			1	1	7	3	2			1		2			2	3							1	2	5	3	1					1		2	1	53	4%
Other/Unknown	52	16	6	17	16	4		8	21		5	24	40	14	9	4	5	31	114	20	13		2	8	11	16	24		19	84	5	2					21	1	45	142	81	16	8	5	13	3		38	2	965	76%
Total	66	19	9	21	24	6	0	9	26	0	5	32	50	22	14	10	8	35	159	35	17	0	2	9	13	22	30	0	24	106	7	3	0	0	0	0	38	3	63	151	98	16	9	5	19	7	1	67	3	1263	100%
SEVERITY																																																			
Property Damage	6			3	2				6			1	4	2	1	2		3	10	2	1					4				12	3	1					12		7	9	6	2			3	1		16	2	121	10%
Personal Injury	16	5	2	3	5	2		2	7		1	5	8	3	1	3	2	11	31	5	4			4	5	5	7		4	25		1					8		9	40	24	6	4		8	1		12	1	280	22%
Pedestrian Injury																			1	1										1																		1		4	0%
Fatality																																													1					1	0%
Unknown/None	44	14	7	15	17	4		7	13		4	26	38	17	12	5	6	21	117	27	12		2	5	8	13	23		20	68	4	1					18	3	47	102	68	8	5	5	7	5	1	38		857	68%
Total	66	19	9	21	24	6	0	9	26	0	5	32	50	22	14	10	8	35	159	35	17	0	2	9	13	22	30	0	24	106	7	3	0	0	0	0	38	3	63	151	98	16	9	5	19	7	1	67	3	1263	100%
DAY OF WEEK																																																			
Mon-Fri	53	15	7	19	21	2		8	21		5	26	45	17	9	9	7	30	135	29	14		1	9	12	16	28		15	81	6	2					26	3	55	105	82	9	6	4	11	4	1	43	2	993	79%
Sat-Sun	13	4	2	2	3	4		1	5			6	5	5	5	1	1	5	24	6	3		1		1	6	2		9	25	1	1					12		8	46	16	7	3	1	8	3		24	1	270	21%
Total	66	19	9	21	24	6	0	9	26	0	5	32	50	22	14	10	8	35	159	35	17	0	2	9	13	22	30	0	24	106	7	3	0	0	0	0	38	3	63	151	98	16	9	5	19	7	1	67	3	1263	100%
SURFACE CONDITION																																																			
Dry	36	13	4	19	19	5		7	20		4	27	42	17	10	9	7	27	124	22	11			6	11	18	26		16	75	5	2					30		48	115	66	11	7	4	14	6	1	52	3	939	74%
Wet	14	4	2		4	1		2	4			5	5	5	2	1	1	5	20	8	4		1	2	1	3	3		5	26	1						7	1	9	24	26	2	2		4	1		12		217	17%
Snow/Ice	13	2	3	2	1				1		1		3		1			3	14	5	2		1	1	1	1	1		3	3	1						1	2	3	9	4	2		1	1					86	7%
Other/Unknown	3								1						1				1											2		1								3	3	2	1						3		21	2%
Total	66	19	9	21	24	6	0	9	26	0	5	32	50	22	14	10	8	35	159	35	17	0	2	9	13	22	30	0	24	106	7	3	0	0	0	0	38	3	63	151	98	16	9	5	19	7	1	67	3	1263	100%
WEATHER																																																			
Clear/Cloudy	44	13	4	18	20	5		6	20		4	27	45	18	12	9	8	31	130	24	12			7	12	19	28		18	90	5	2					31	1	49	127	74	14	8	5	15	6	1	57	3	1022	81%
Rain	8	2	2	2	3	1		1	4			4	3	4	1	1		2	18	6	3		1	2		2	1		3	13	1	1					5	1	8	16	18	1	1		3	1		7		150	12%
Snow/Ice	12	3	3	1	1				1		1	1	2					2	11	5	2		1		1	1	1		3	2	1						1	1	4	6	3	1			1			1		73	6%
Other/Unknown	2	1						2	1						1															1							1		2	2	3							2		18	1%
Total	66	19	9	21	24	6	0	9	26	0	5	32	50	22	14	10	8	35	159	35	17	0	2	9	13	22	30	0	24	106	7	3	0	0	0	0	38	3	63	151	98	16	9	5	19	7	1	67	3	1263	100%
SEASON																																																			
Winter (Dec-Feb)	24	5	4	6	6	1		2	3		2	2	18	7	2	2	2	7	28	10	3			3	2	4	6		5	35	2						3	2	20	39	34	8	1	1	4	2		12		317	25%
Spring (Mar-May)	17	6	2	2	5	1		3	4		1	4	10	3	6	1	1	11	35	12	5		1	2	3	7	6		3	27	1	1					15	1	11	42	21	1	3		4	1		9		288	23%
Summer (Jun-Aug)	14	4		8	11	2		3	7			14	12	10	4	3	2	13	39	7	2		1	1	4	5	11		7	21	2	1					9		15	34	27	3	1	2	5	3		19	3	329	26%
Fall (Sept-Nov)	11	4	3	5	2	2		1	12		2	12	10	2	2	4	3	4	57	6	7			3	4	6	7		9	23	2	1					11		17	36	16	4	4	2	6	1	1	27		329	26%
Total	66	19	9	21	24	6	0	9	26	0	5	32	50	22	14	10	8	35	159	35	17	0	2	9	13	22	30	0	24	106	7	3	0	0	0	0	38	3	63	151	98	16	9	5	19	7	1	67	3	1263	100%

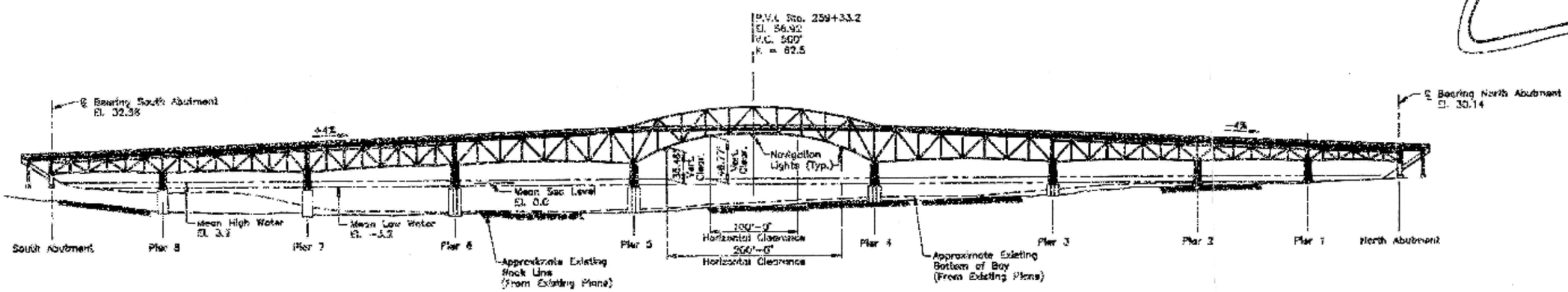
Source: New Hampshire Department of Safety, Dover Police Department, Newington Police Department, and Portsmouth Police Department.

Figure 3.2-5
Spaulding Turnpike - Crash Summary (1997-2003)

New Hampshire DOT
Department of Transportation



EXISTING PLAN



EXISTING ELEVATION

Note:
Figures on this sheet are from the Existing Plan and Elevation figure in the report: General Sullivan Bridge over Little Bay Bridges Rehabilitation Final Report prepared by Kimball Chase, Inc. dated June, 1991.

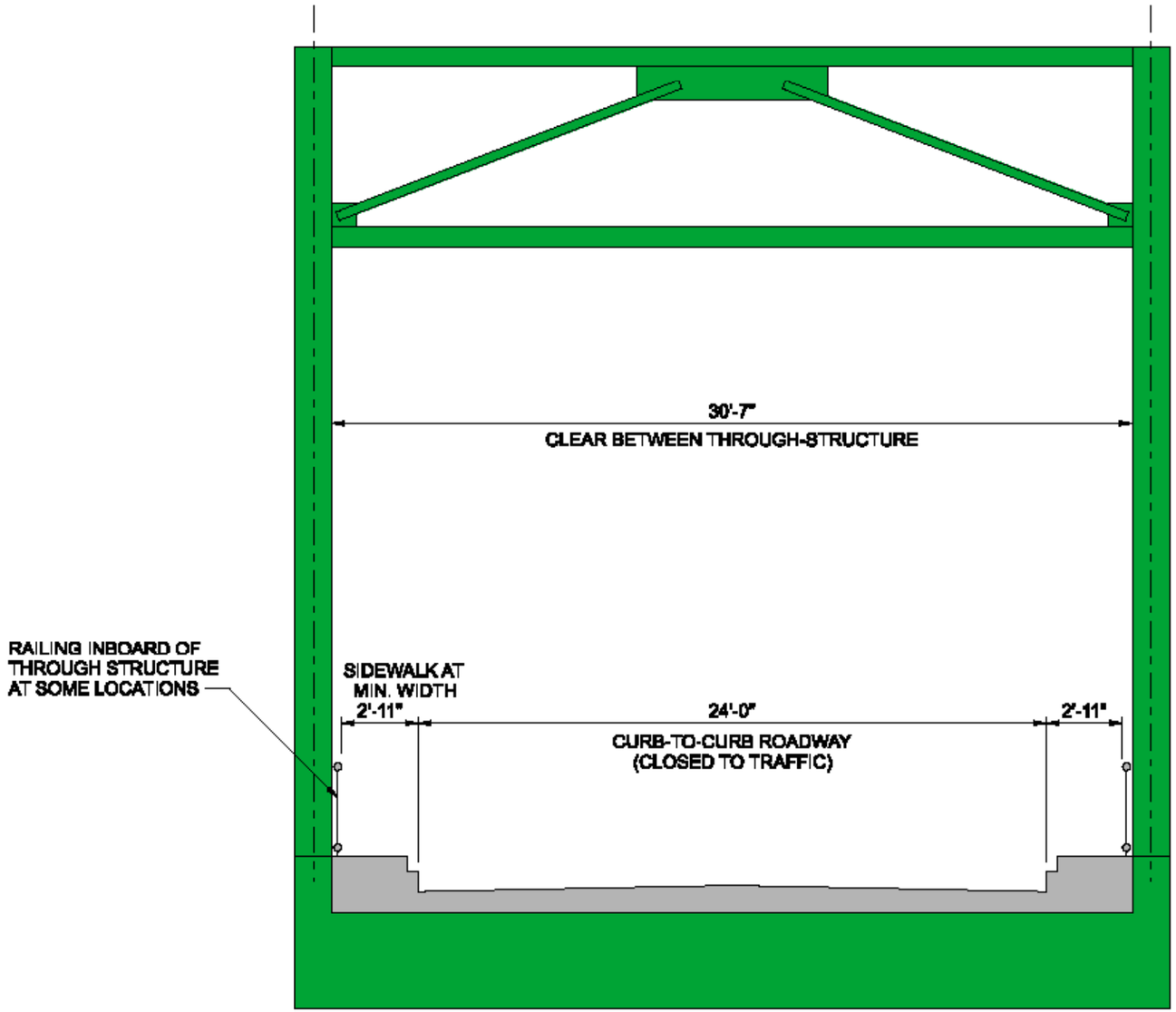
0 50 100 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.2-6
Existing General Sullivan Bridge Plan and Elevation

Date Created: 10/9/2007

New Hampshire DOT
Department of Transportation



EXISTING CROSS SECTION

GENERAL SULLIVAN BRIDGE

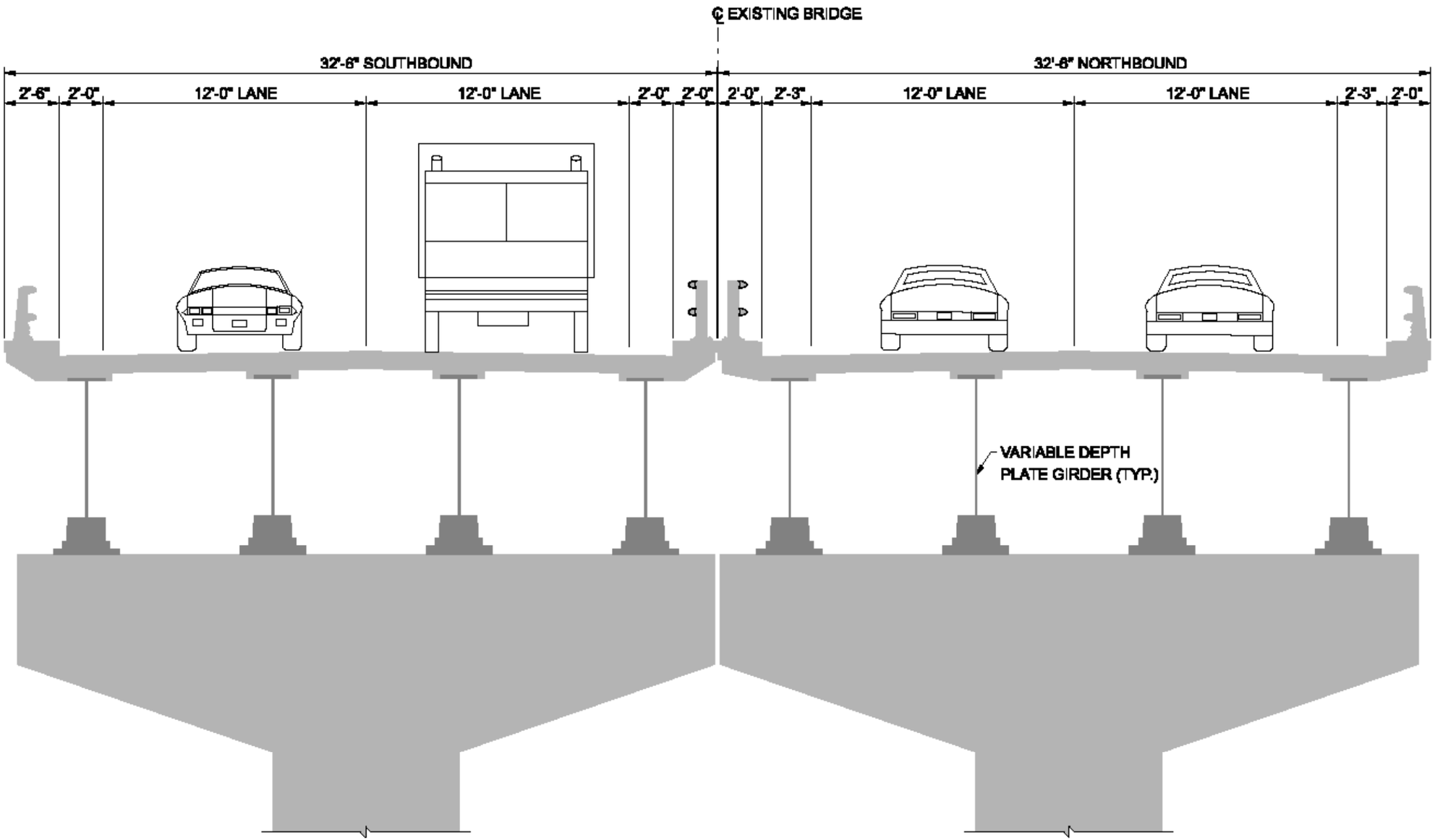
0 2.5 5 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.2-7
Existing General Sullivan Bridge
Cross Section

Date Created: 10/9/2007

New Hampshire DOT
Department of Transportation



EXISTING CROSS SECTION

LITTLE BAY BRIDGES

0 2.5 5 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.2-8
Existing Little Bay Bridges
Cross Section

Date Created: 10/9/2007

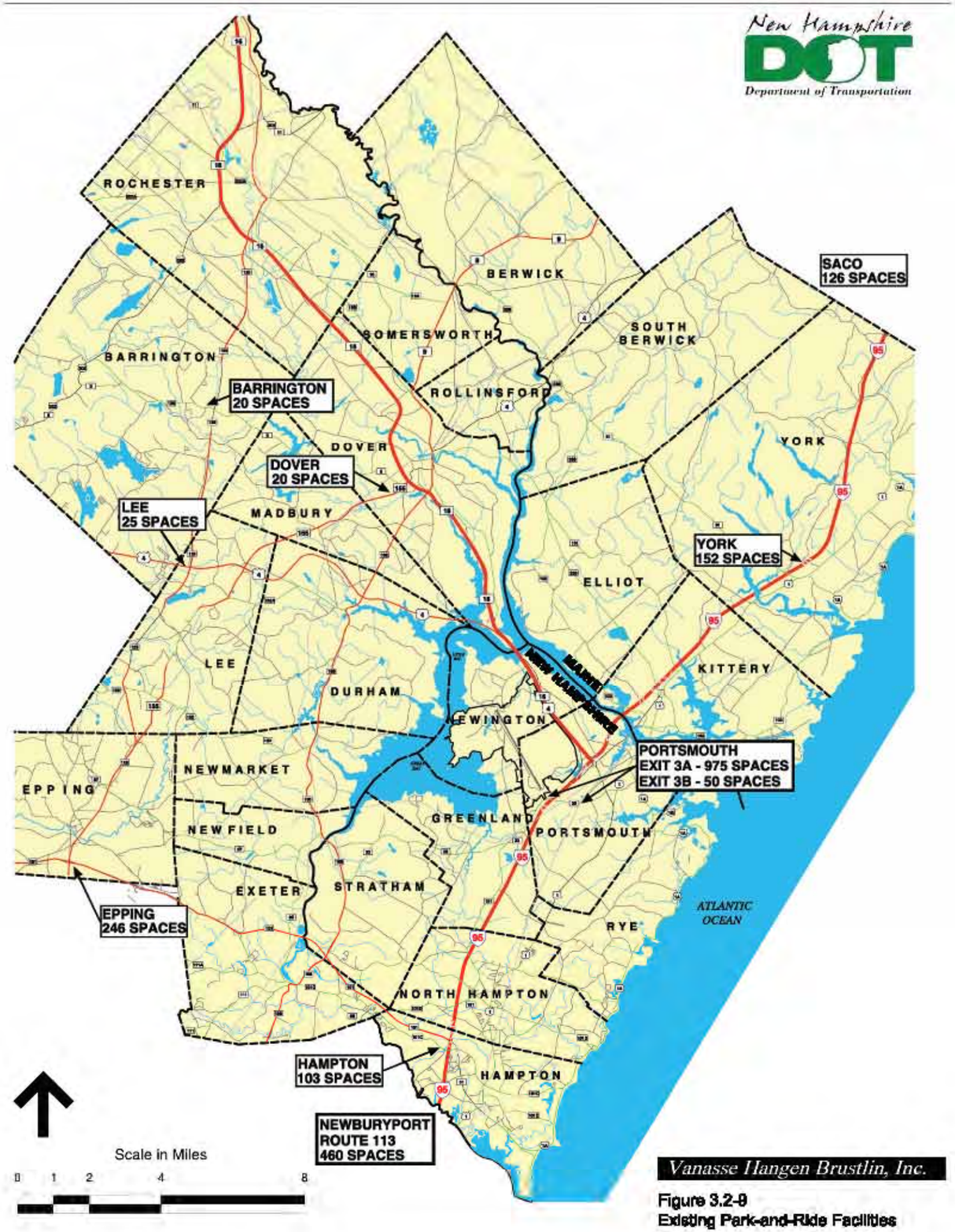
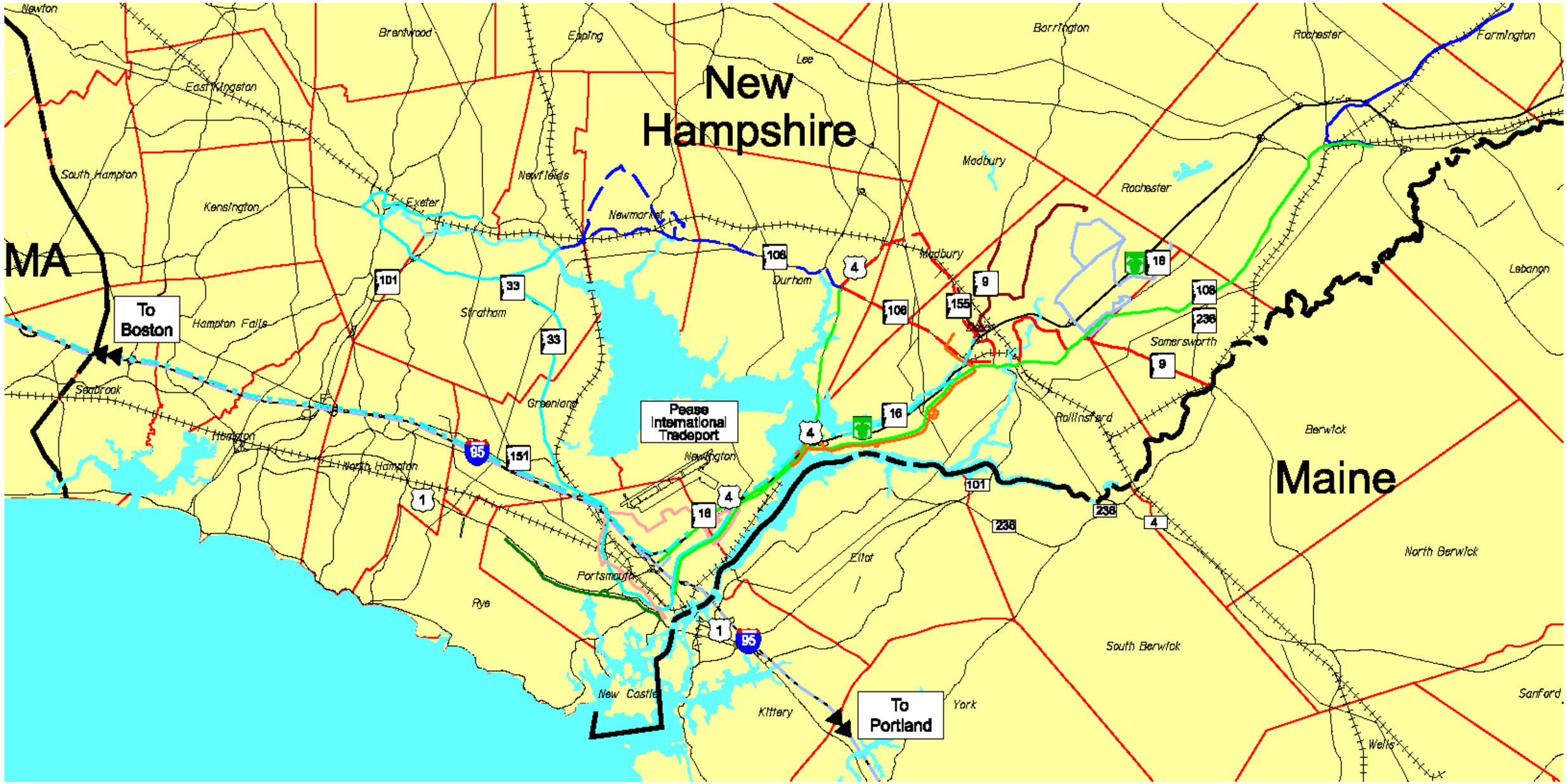


Figure 3.2-9
Existing Park-and-Ride Facilities

New Hampshire DOT
Department of Transportation



Legend:

COAST Services
- Route 1
- Route 2
- Route 6
- Route 7
- Dover Points North
- Dover Points South
- Dover Points West
- Lafayette Road Trolley
- Pease Tradeport Trolley

Wildcat Transit Services
- Route 3
- Route 4
- Route 5

Commuter/Intercity Services
- C&J
- Vermont Transit

- State Line
- Town Line

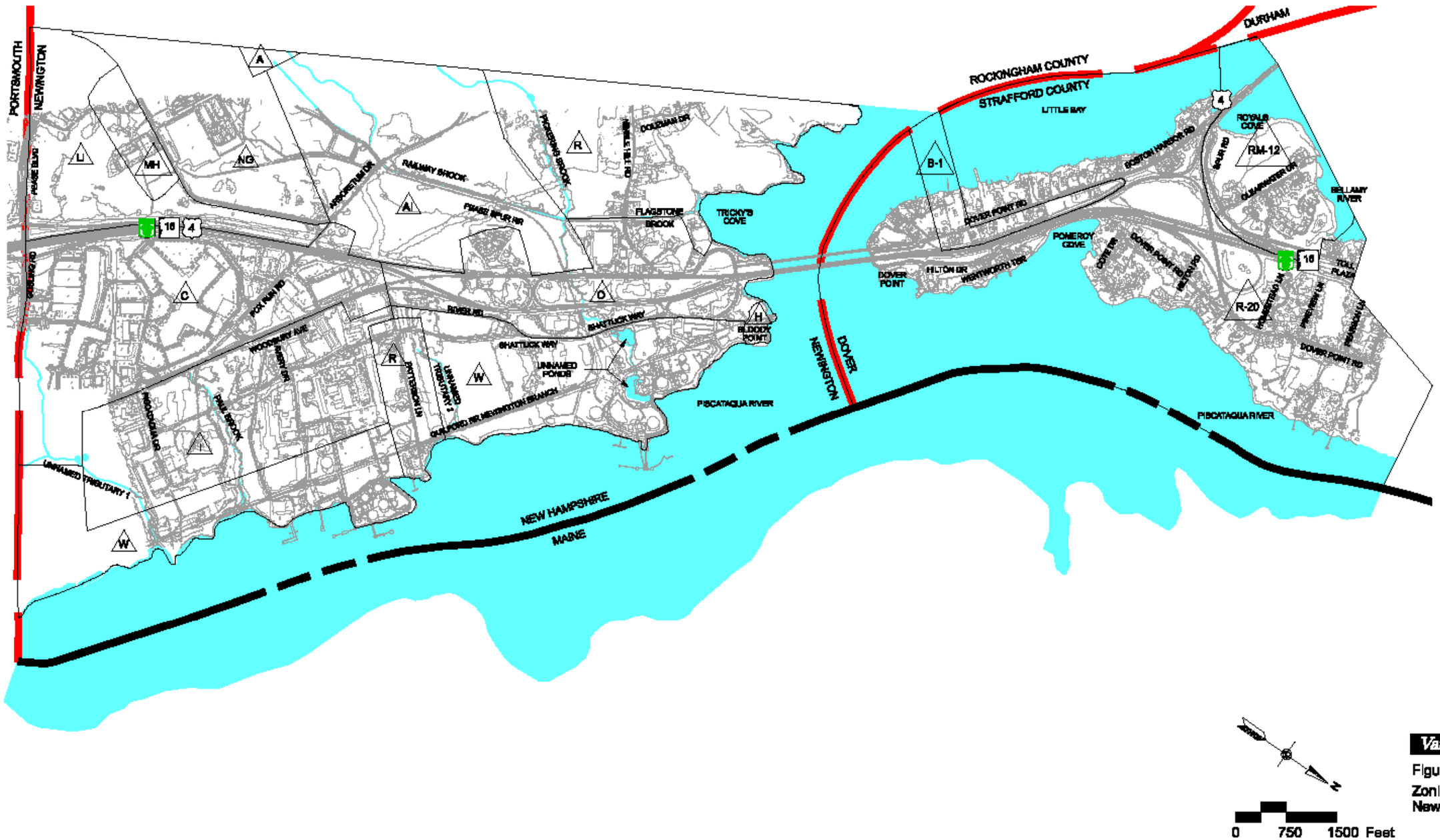
0 6000 12000 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.2-10
Existing Bus Services

Date Created 10/8/2007 J:\51425\cad\arlp\new\DEIS\fig030213.dgn

New Hampshire DOT
Department of Transportation



Legend:

- SURFACE WATERS
- TOWNLINE
- STATELINE

NEWINGTON ZONING

- R — RESIDENTIAL DISTRICT
- C — COMMERCIAL DISTRICT
- AI — AIRPORT INDUSTRIAL DISTRICT
- I — INDUSTRIAL DISTRICT
- MH — MOBILE HOME DISTRICT
- H — HISTORIC DISTRICT
- W — WATERFRONT INDUSTRIAL DISTRICT
- A — AIRPORT DISTRICT
- O — OFFICE DISTRICT
- LI — LIGHT INDUSTRIAL
- NG — NEW HAMPSHIRE NATIONAL GUARD (NOT LOCALLY ZONED)

DOVER ZONING

- B-1 — NEIGHBORHOOD BUSINESS DISTRICT
- RM-12 — LOW-DENSITY MULTIRESIDENTIAL DISTRICT
- R-20 — LOW-DENSITY RESIDENTIAL DISTRICT

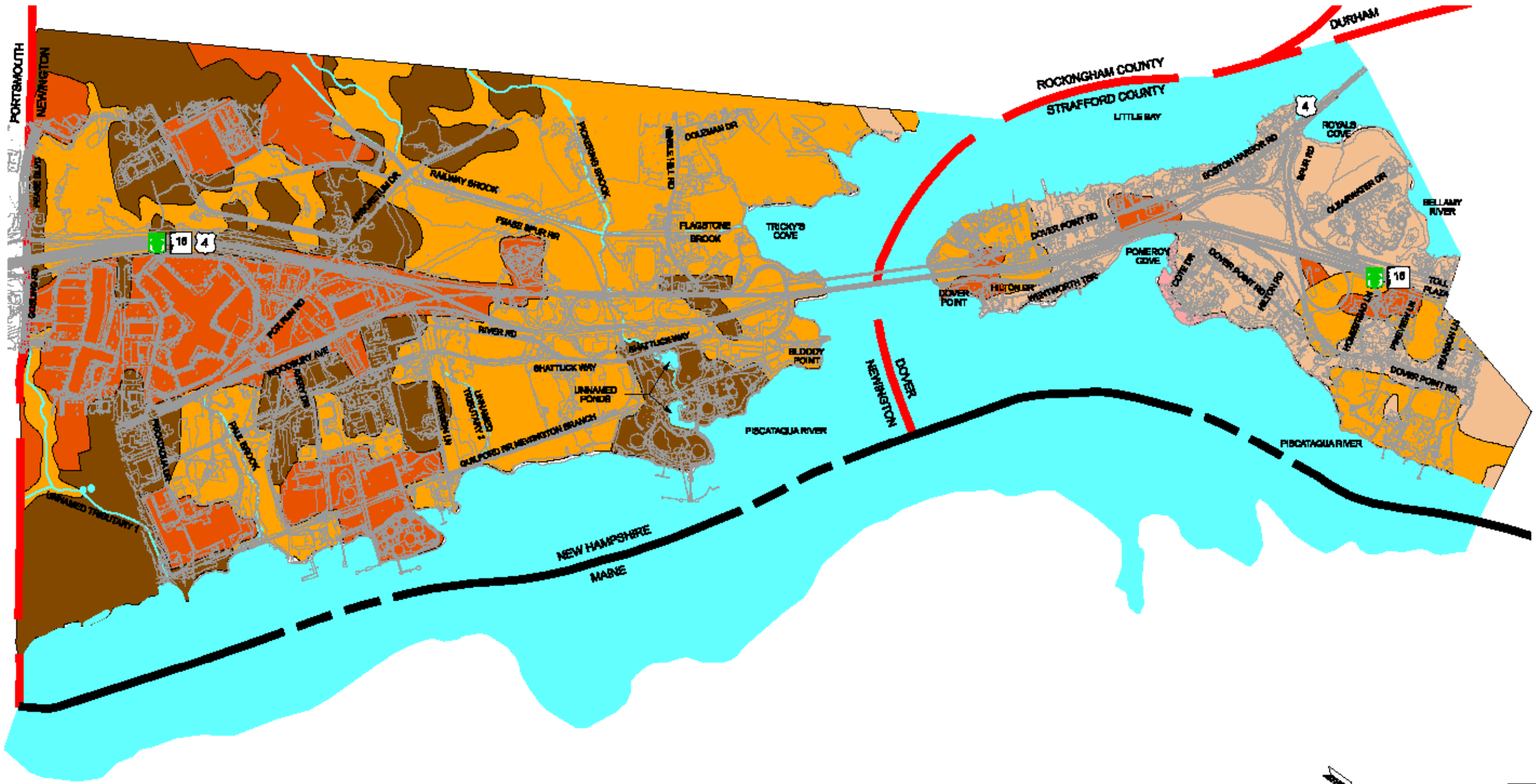
0 750 1500 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.3-1
Zoning Districts,
Newington and Dover

Date Created:10/9/2007 j:\p1428\acad\alp\new3\DE010p030001.dgn

New Hampshire DOT
Department of Transportation



Legend:

- SURFACE WATERS
- TOWNLINE
- STATELINE
- MARINE/LACUSTRINE
- GLACIOFLUVIAL
- ANTHROPOGENIC
- ORGANIC MATERIAL
- TILL

0 750 1500 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.4-1
Major Soil Associations

Date Created: 10/9/2007 j:\s1-f2\wsd\alphaw3\DE\fig030401.dgn

New Hampshire DOT
Department of Transportation

Legend:

- SURFACE WATERS
- TOWNLINE
- STATELINE
- PRIME FARMLANDS
- FARMLANDS OF STATEWIDE IMPORTANCE
- FARMLANDS OF LOCAL IMPORTANCE

PORTSMOUTH
NEWINGTON
PEASE BLVD
CONSTITUTION DR
ARBORETUM DR
RAILWAY BROOK
PEASE SPUR RD
SHERMAN BROOK
DOUGLAS DR
MIDDLE HILL RD
FLAGSTONE BROOK
TRICKY'S COVE
ROCKINGHAM COUNTY
STRAFFORD COUNTY
LITTLE BAY
DURHAM
ROYALS COVE
BOSTON HARBOR RD
SPUR RD
CLEARWATER DR
BELLAMY RIVER
DOVER POINT RD
POMEROY COVE
COVE DR
DOVER POINT RD
BELLAMY
TOLL PLAZA
HILTON DR
WINTWORTH DR
DOVER POINT
FOX RUN RD
WOODBURY AVE
RIVER RD
SHATTUCK WAY
BLODGY POINT
UNNAMED POND
UNNAMED TRIBUTARY 2
GULPEE BROOK
PISCATAQUA RIVER
NEWINGTON
DOVER
UNNAMED TRIBUTARY 1
NEW HAMPSHIRE
MAINE

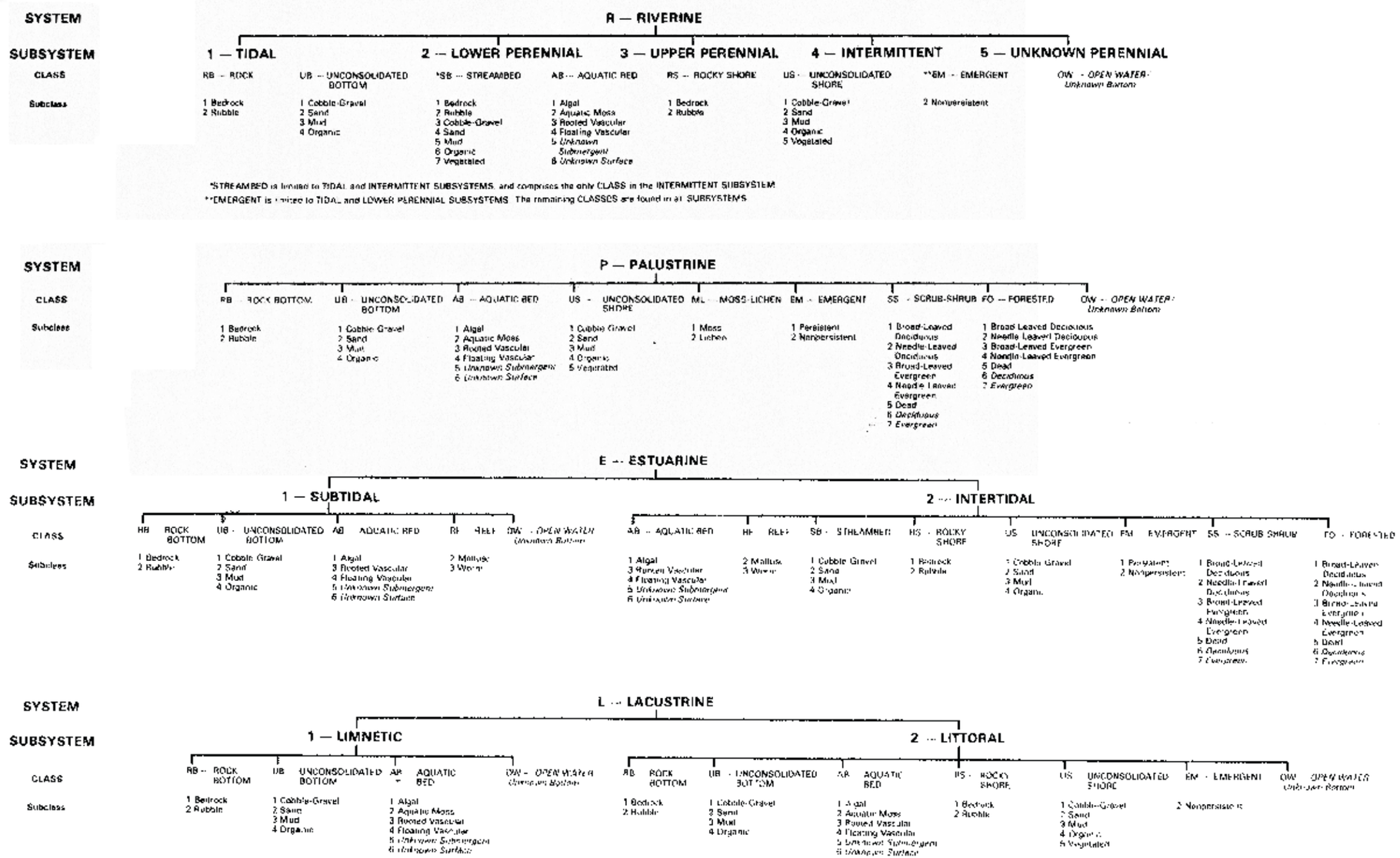
Source: NRCS soil survey, Rockingham & Strafford counties. Farmland soils in urbanized areas of Dover and Newington (US Census Bureau) are not shown, as per Farmland Protection Policy Act.

0 750 1500 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.5-1
Important Farmland Soils

Date Created 10/9/2007



Vanasse Hangen Brustlin, Inc.

Figure 3.6-1
Wetland Classification System
(Cowardin, *et al.* 1979)

Source: USFWS, National Wetlands Inventory, after Cowardin, *et al.* (1979).

New Hampshire DOT
Department of Transportation

Legend:

TOWNLINE

STATELINE

DOMINANT WETLAND COVER TYPE

PALUSTRINE, FORESTED

PALUSTRINE, SCRUB-SHRUB

PALUSTRINE, EMERGENT

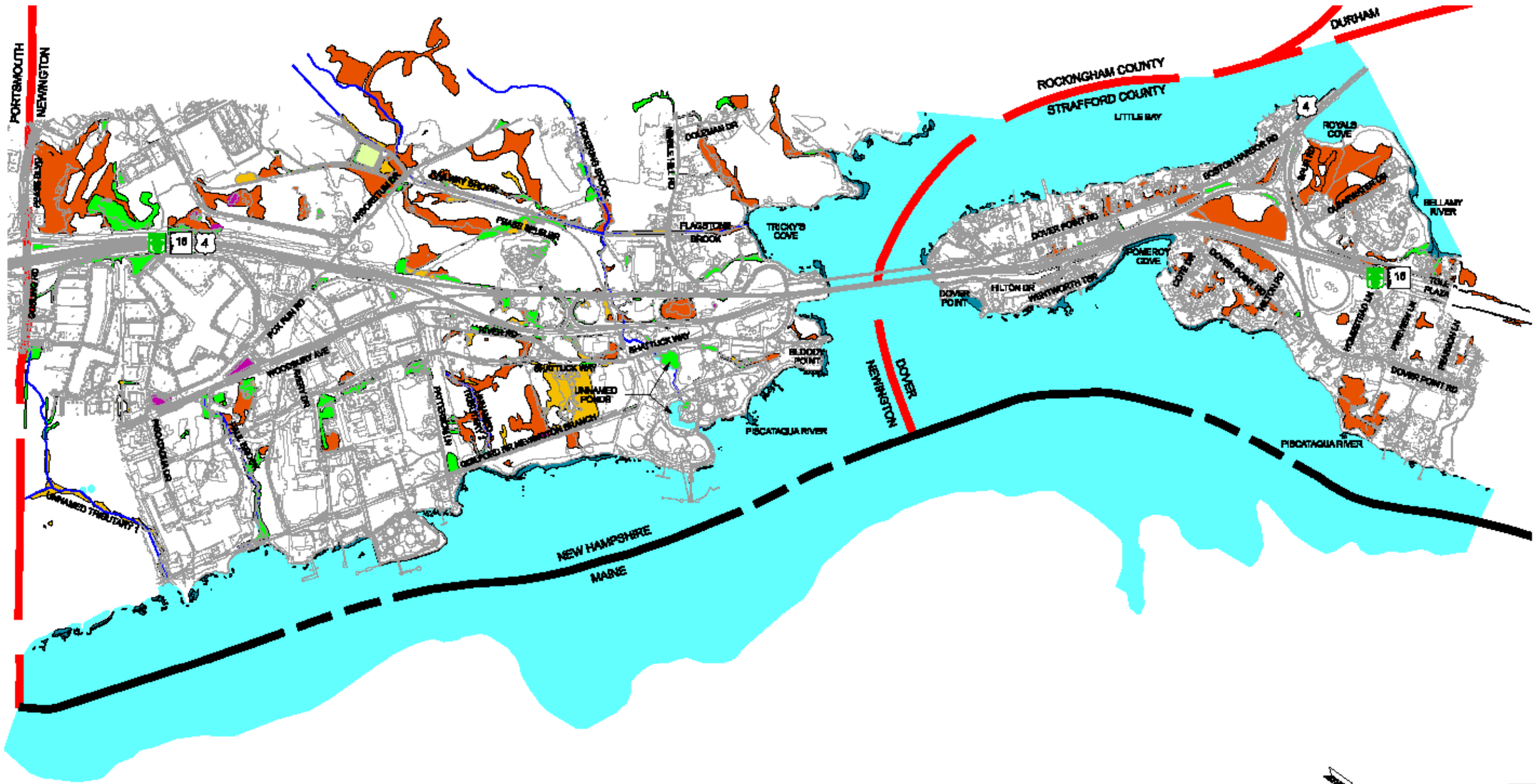
PALUSTRINE, UNCONSOLIDATED BOTTOM

ESTUARINE, INTERTIDAL

ESTUARINE, SUBTIDAL

POTENTIAL VERNAL POOLS

RIVERINE, LOWER OR UPPER PERENNIAL

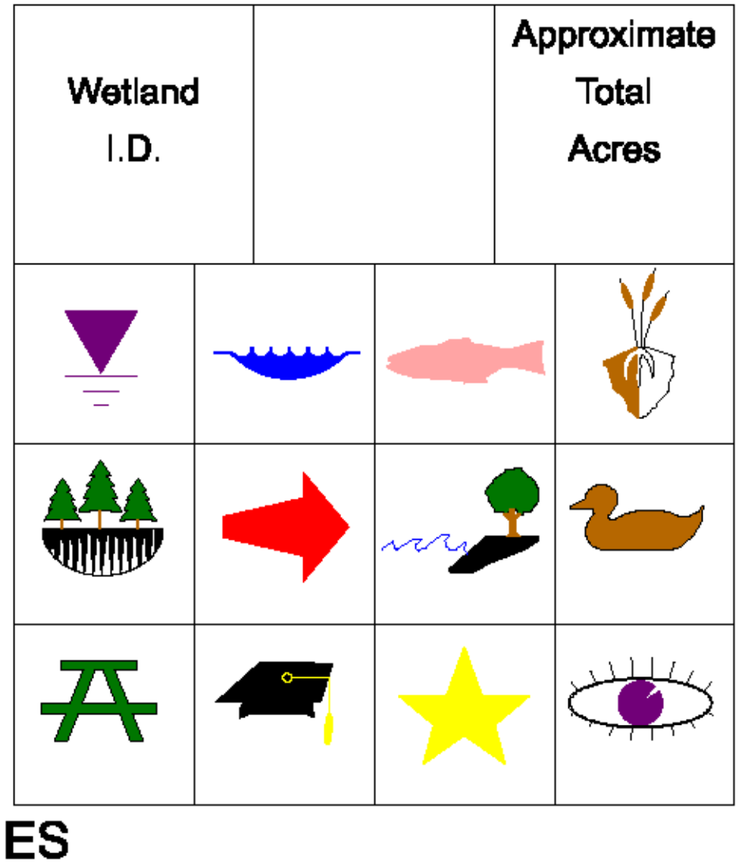


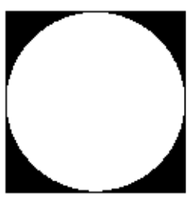
Vanasse Hangen Brustlin, Inc.

Figure 3.6-2
Terrestrial Wetland Resources

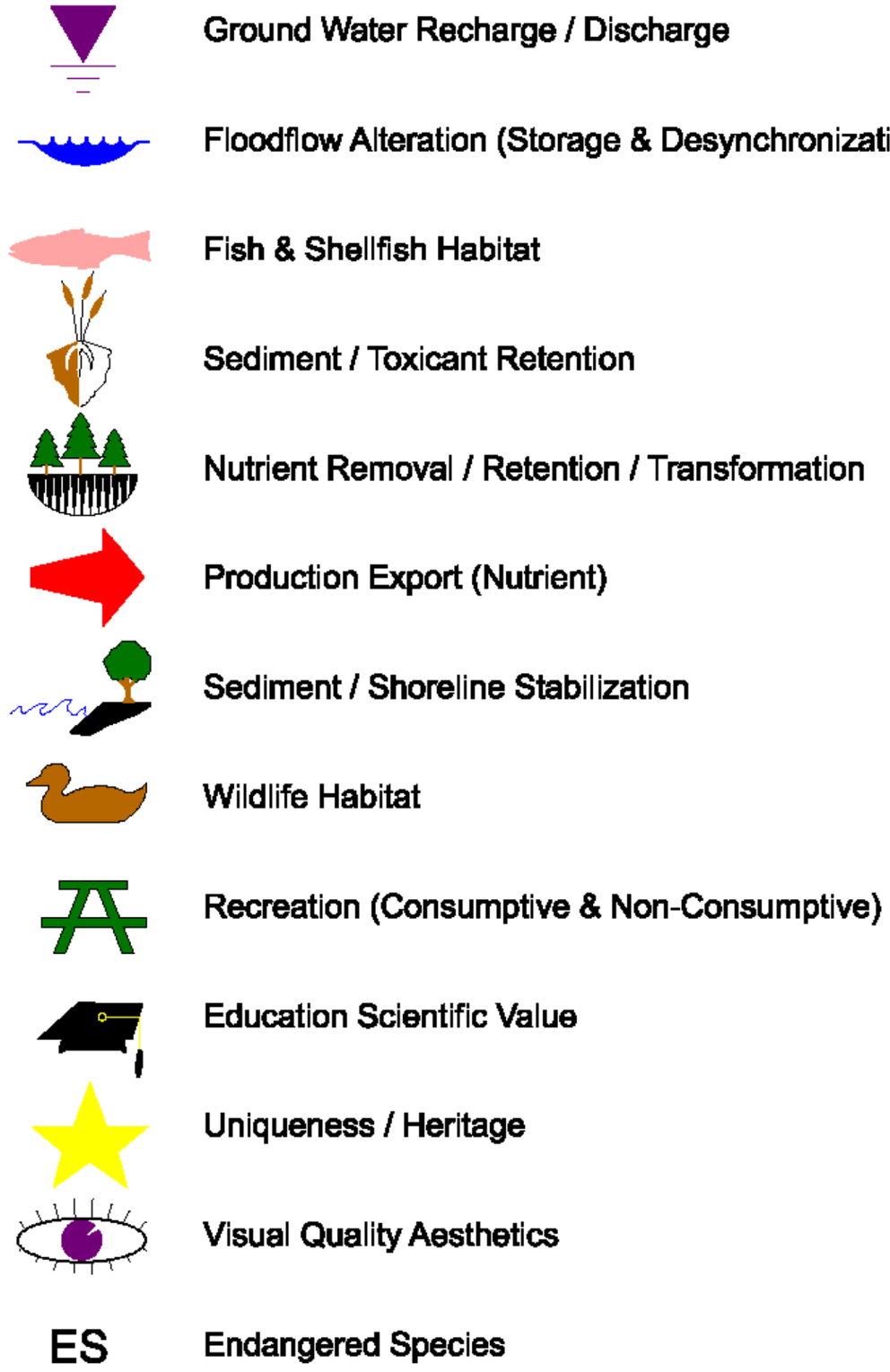
0 750 1500 Feet

Date Created:10/9/2007 J:\s1412\esa\sa\shows\3DE\fig030602.dgn





Indicates Principal Function or Value



Vanasse Hangen Brustlin, Inc.

Figure 3.6-3
Wetland Systems
Functions and Values
Sheet 1 of 6

New Hampshire DOT
Department of Transportation

NEWINGTON

PEASE BLVD

ARBORETUM DR

N-1

N-2

N-3b

PVP 6

PVP 7

PVP 8

16

4

SPAULDING TURNPIKE

Legend:

- Existing Roadway
- Existing Building
- Existing Property Lines
- Existing LAROW
- Existing CAROW
- Existing ROW
- PFO Wetland
- PSS Wetland
- PEM Wetland
- POW Wetland
- Estuarine Wetland
- Potential Vernal Pool
- Riverine Wetland
- Wetland System

Note:
Unlabeled wetlands are isolated and/or not impacted by any alternative.

0 200 400 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.6-3
Wetland Systems Functions and Values
Sheet 2 of 8

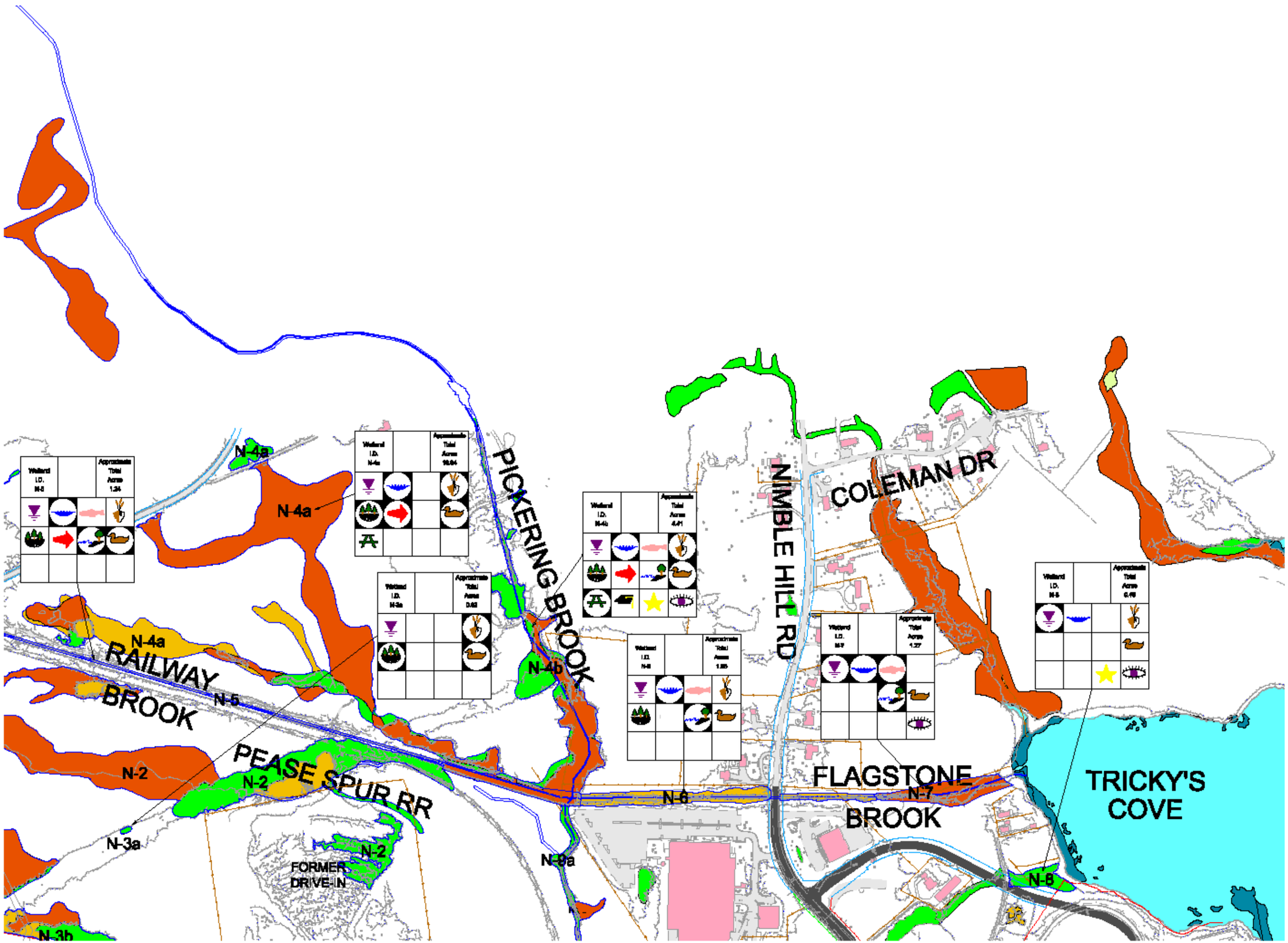
Date Created: 1/19/2007

New Hampshire DOT
Department of Transportation

Legend:

- Existing Roadway
- Existing Building
- Existing Property Lines
- Existing LAROW
- Existing CAROW
- Existing ROW
- PFO Wetland
- PSS Wetland
- PEM Wetland
- POW Wetland
- Estuarine Wetland
- Potential Vernal Pool
- Riverine Wetland
- # Wetland System

Note:
Unlabeled wetlands are isolated and/or not impacted by any alternative.



Vanasse Hangen Brustlin, Inc.

Figure 3.6-3
Wetland Systems Functions and Values
Sheet 3 of 8

Date Created: 1/29/2007

New Hampshire DOT
Department of Transportation

GOSLING RD
FOX RUN RD
WOODBURY AVE
AVERY DR
SHATTUCK WAY
PISCATAQUA DR
UNNAMED TRIBUTARY 1
ISAAC DOW HOUSE
BEANE FARM
PVP 1
PVP 2
PVP 3
N-13
N-14
N-15a
N-15b
N-16
N-19c

Legend:

- Existing Roadway
- Existing Building
- Existing Property Lines
- Existing LAROW
- Existing CAROW
- Existing ROW
- PFO Wetland
- PSS Wetland
- PEM Wetland
- POW Wetland
- Estuarine Wetland
- Potential Vernal Pool
- Riverine Wetland
- # Wetland System

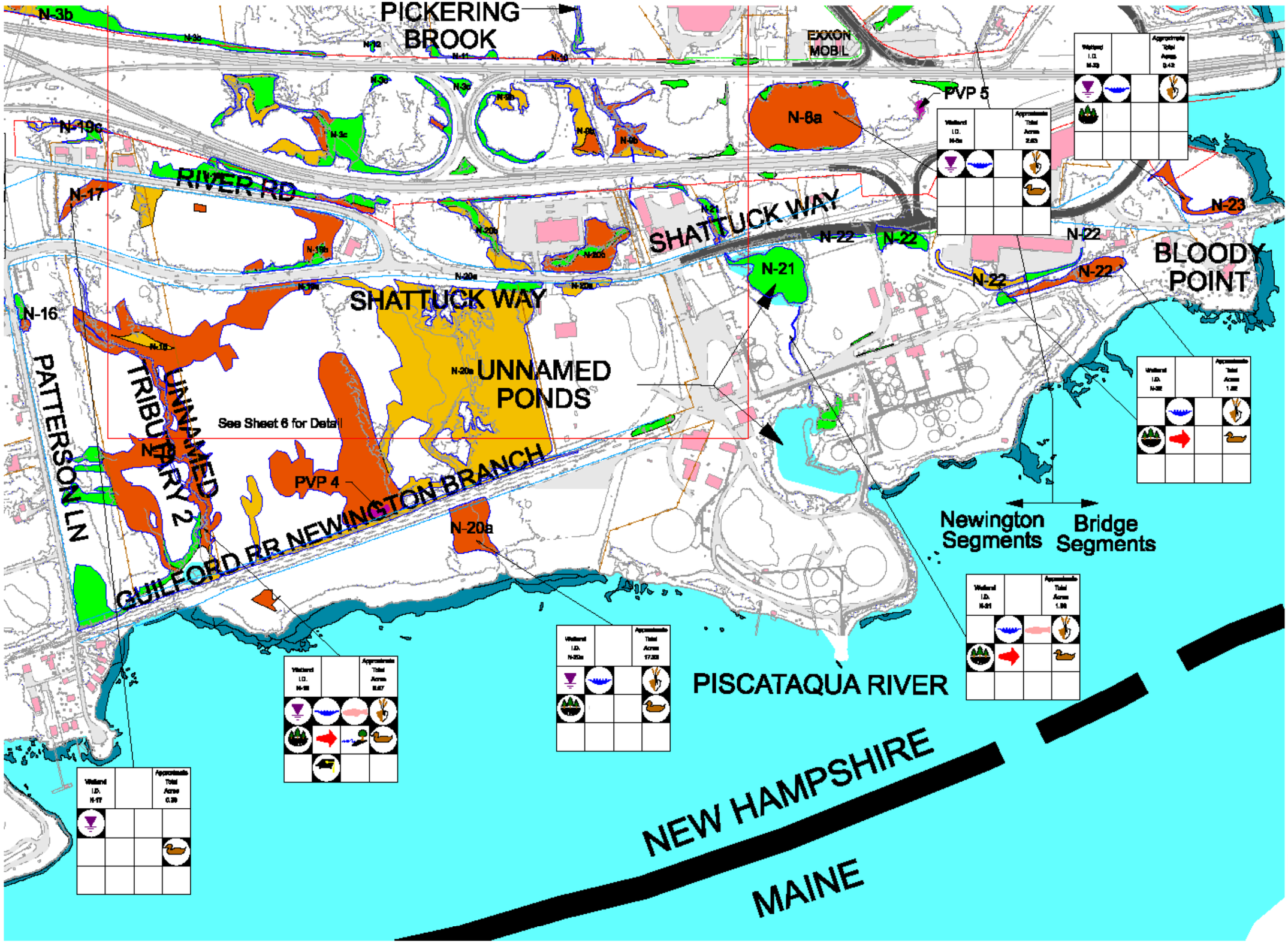
Note:
Unlabeled wetlands are isolated and/or not impacted by any alternative.

0 200 400 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.6-3
Wetland Systems Functions and Values
Sheet 4 of 8

Date Created: 1/19/2007



New Hampshire DOT Department of Transportation

Legend:

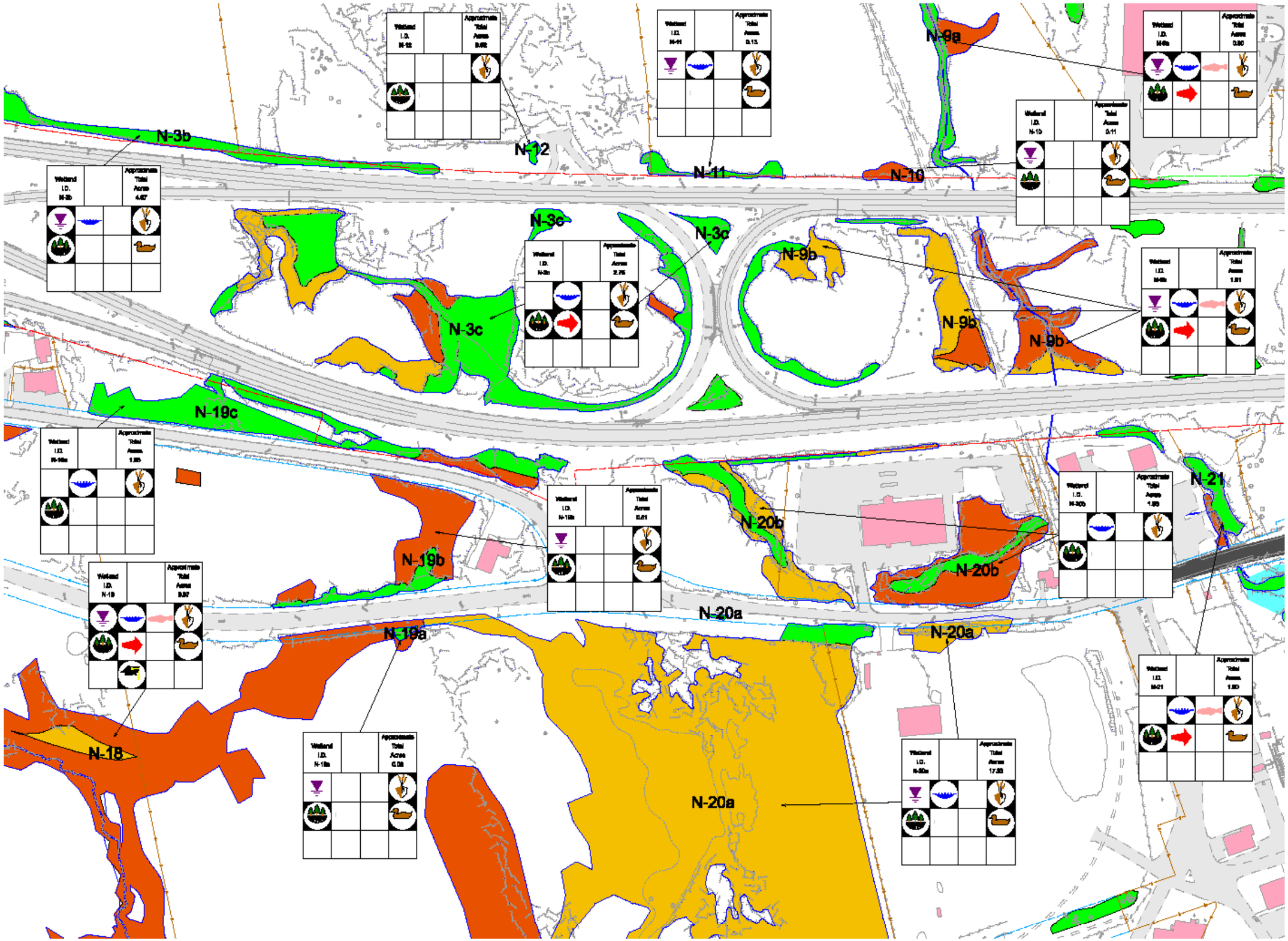
- Existing Roadway
- Existing Building
- Existing Property Lines
- Existing LAROW
- Existing CAROW
- Existing ROW
- PFO Wetland
- PSS Wetland
- PEM Wetland
- POW Wetland
- Estuarine Wetland
- Potential Vernal Pool
- Riverine Wetland
- # Wetland System

Note:
Unlabeled wetlands are isolated and/or not impacted by any alternative.

Vanasse Hangen Brustlin, Inc.

Figure 3.6-3
Wetland Systems Functions and Values
Sheet 5 of 8

Date Created: 1/29/2007



New Hampshire DOT
Department of Transportation

Legend:

- Existing Roadway
- Existing Building
- Existing Property Lines
- Existing LAROW
- Existing CAROW
- Existing ROW
- PFO Wetland
- PSS Wetland
- PEM Wetland
- POW Wetland
- Estuarine Wetland
- Potential Vernal Pool
- Riverine Wetland
- # Wetland System

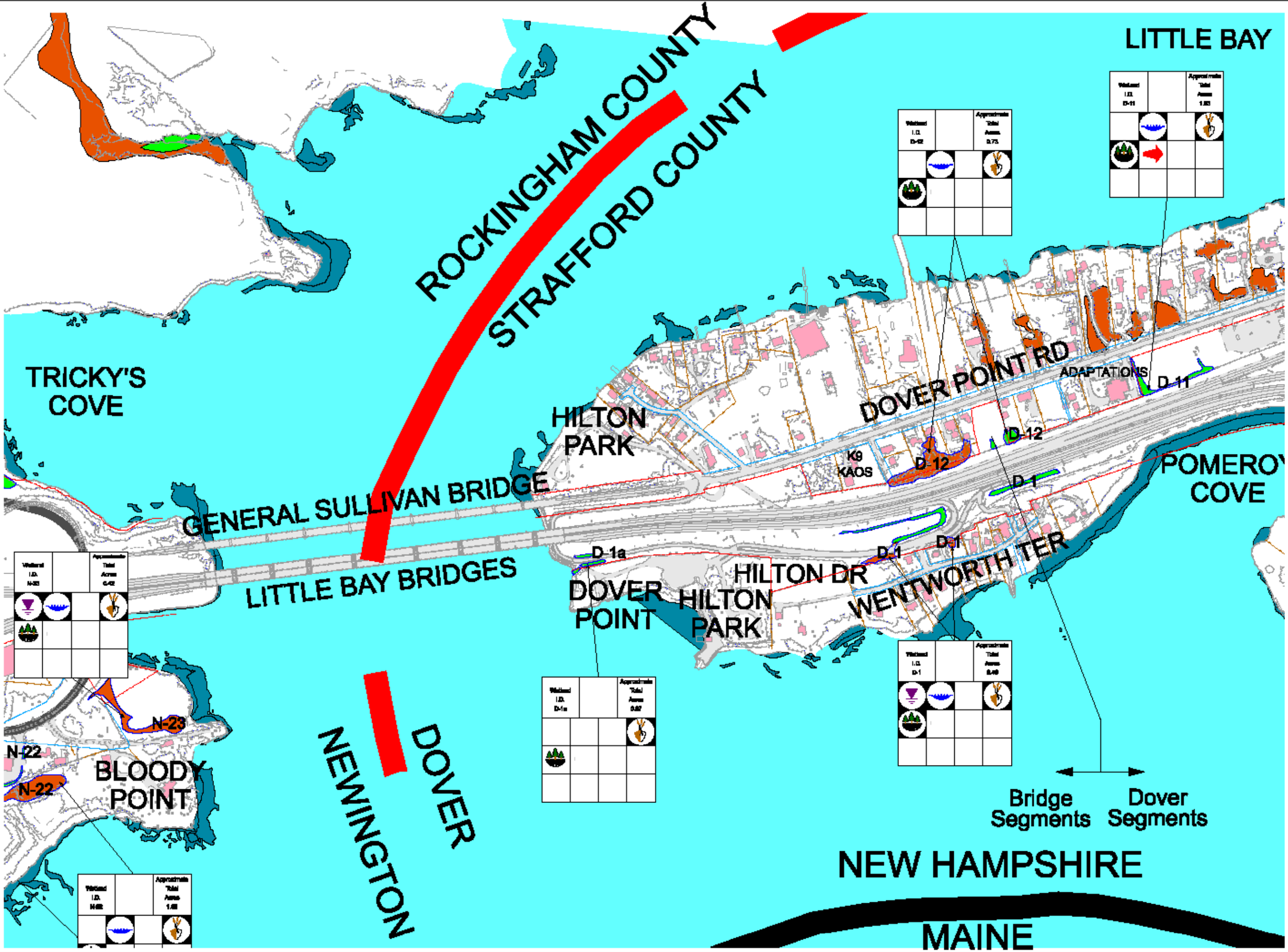
Note:
Unlabeled wetlands are isolated and/or not impacted by any alternative.

0 100 200 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.6-3
Wetland Systems Functions and Values
Sheet 6 of 8

Date Created: 1/29/2007



New Hampshire DOT
Department of Transportation

Legend:

- Existing Roadway
- Existing Building
- Existing Property Lines
- Existing LAROW
- Existing CAROW
- Existing ROW
- PFO Wetland
- PSS Wetland
- PEM Wetland
- POW Wetland
- Estuarine Wetland
- Potential Vernal Pool
- Riverine Wetland
- # Wetland System

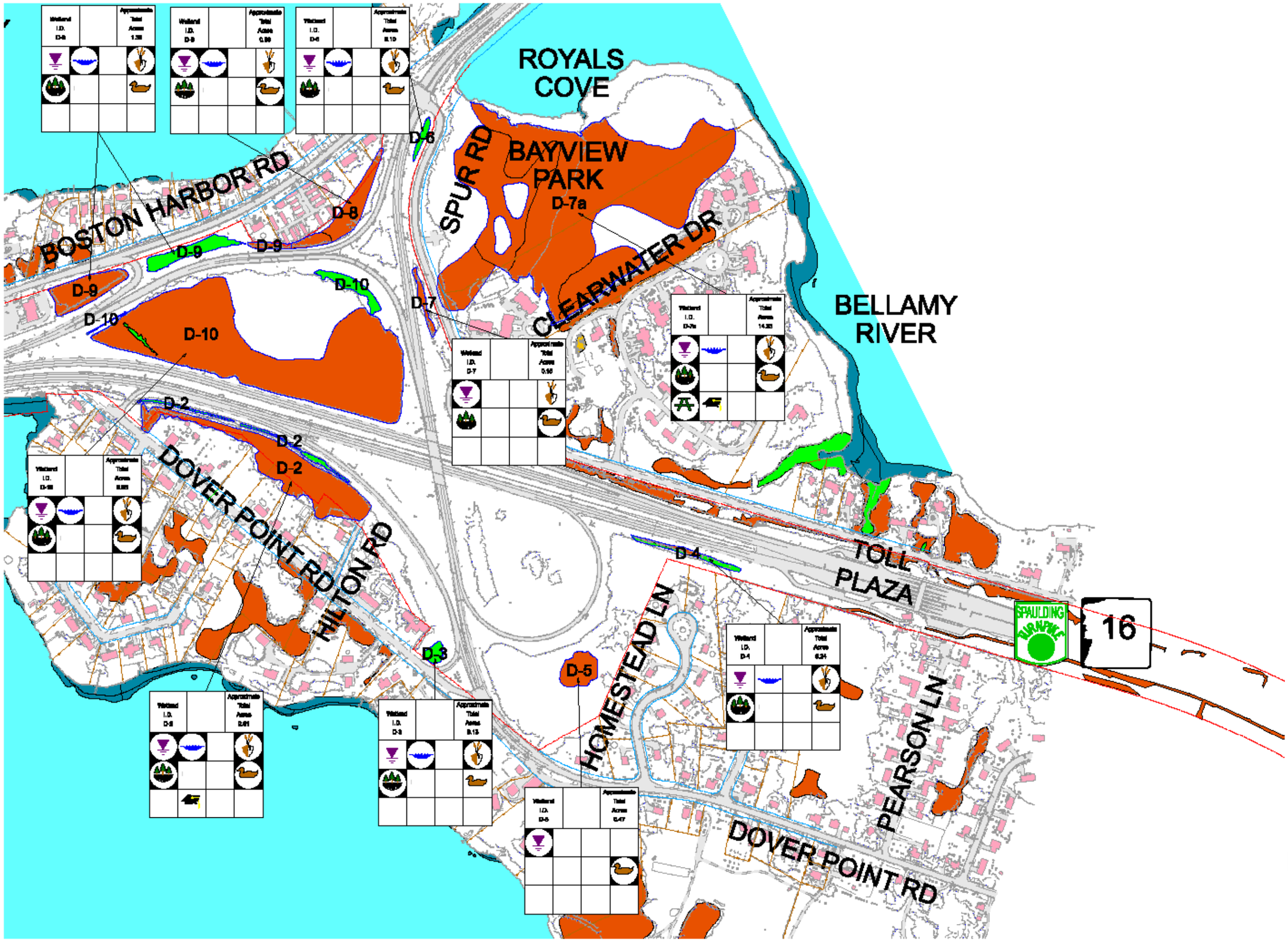
Note:
Unlabeled wetlands are isolated and/or not impacted by any alternative.

0 200 400 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.6-3
Wetland Systems Functions and Values
Sheet 7 of 8

Date Created: 1/29/2007



New Hampshire DOT
Department of Transportation

Legend:

- Existing Roadway
- Existing Building
- Existing Property Lines
- Existing LAROW
- Existing CAROW
- Existing ROW
- PFO Wetland
- PSS Wetland
- PEM Wetland
- POW Wetland
- Estuarine Wetland
- Potential Vernal Pool
- Riverine Wetland
- # Wetland System

Note:
Unlabeled wetlands are isolated and/or not impacted by any alternative.

0 200 400 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.6-3
Wetland Systems Functions and Values
Sheet 8 of 8

Date Created: 10/9/2007

Wetland Number	Wetland Name	Watershed	Total Wetland Area (acres)	Cover Type(s)	Groundwater Recharge/ Discharge	Floodflow Alteration	Fish and Shellfish Habitat	Sediment/ Toxicant Retention	Nutrient Removal	Production Export	Sediment/ Shoreline Stabilization	Wildlife Habitat	Recreation	Educational/ Scientific Value	Uniqueness/ Heritage	Visual Quality/ Aesthetics
N-1	Newington 1	Coastal Drainage	9.1	PFO1E	✓	O		O	O	✓		O				
N-2	Newington 2	Great Bay	36.2	PSS1E & PFO1/4E & PEM/SS1E	✓	O		O	O	O		O	✓		O	
N-3a	Newington 3a	Coastal Drainage	0.0	PEM/SS1C	✓			O	O			O				
N-3b	Newington 3b	Coastal Drainage	4.9	PEM1E	O	✓		O	O			✓				
N-3c	Newington 3c	Coastal Drainage	2.8	PEM1E & PFO1E & PSS1E		O		O	O	O		O				
N-4a	Newington 4a	Great Bay	10.6	PFO1E & PEM1E & PSS1E	✓	O		O	O	O		O	✓			
N-4b	Newington 4b	Great Bay	4.4	PFO5H & PEM1E & R2UB3Hb	✓	O	✓	O	✓	✓	✓	O	O	✓	✓	✓
N-5	Newington 5	Great Bay	1.2	R2UB2/1Hbhx & PSS1E & PFO1E	✓	O	✓	✓	✓	✓	O	O				
N-6	Newington 6	Great Bay	1.1	PSS1E & R3UB3H	✓	O	✓	✓	✓		O	✓				
N-7	Newington 7	Great Bay	1.3	PFO1E & R3UB1Hh & E2EM & E2US3	O	O	O				O	✓				✓
N-8	Newington 8	Great Bay	0.5	PEM1C & E2EM1	O	✓		✓				✓			✓	✓
N-8a	Newington 8a	Coastal Drainage	2.9	PFO1C & PEM1E	O	O		O				O				
N-9a	Newington 9a	Coastal Drainage	0.8	R2UB3Hb & PFO1E & PEM1E	O	O	✓	✓	✓	✓		✓				
N-9b	Newington 9b	Coastal Drainage	1.8	R2UB3Hb & PFO1E & PEM1E	✓	O	✓	O	O	✓		O				
N-10	Newington 10	Coastal Drainage	0.1	PFO1C	O			O	✓			O				
N-11	Newington 11	Coastal Drainage	0.1	PFO/EM1E	✓	O		O				O				
N-12	Newington 12	Coastal Drainage	0.0	PEM1E				O	O							
N-13	Newington 13	Coastal Drainage	4.5	PEM1E & PSS1E & PFO1E & R2UB1H	✓	O		O	O			O				
N-14	Newington 14	Coastal Drainage	3.2	PEM1C & PFO1C	✓	O		O	O							
N-15a	Newington 15a	Coastal Drainage	0.9	PEM1C	✓	✓		O								
N-15b	Newington 15b	Coastal Drainage	0.4	PFO1E	O	O		✓	✓							
N-16	Newington 16	Coastal Drainage	1.0	PEM1E	✓	O		O	O							
N-17	Newington 17	Coastal Drainage	0.3	PFO1C	O							O				
N-18	Newington 18	Coastal Drainage	9.0	PFO1E & PEM1E	O	O	O	O	O	✓	✓	O		O		
N-19a	Newington 19a	Coastal Drainage	0.0	PFO1C	✓			O	O			O				
N-19b	Newington 19b	Coastal Drainage	0.8	PEM1E	✓			O	O			O				
N-19c	Newington 19c	Coastal Drainage	1.6	PEM1E		O		O	O							
N-20a	Newington 20a	Coastal Drainage	17.3	PSS/EM1E	✓	O		O	O			O				
N-20b	Newington 20b	Coastal Drainage	1.9	PSS/EM1E & PFO1E		O		O	O							
N-21	Newington 21	Coastal Drainage	1.5	PEM1E & R2UB3Hb		O	✓	O	O	✓		✓				
N-22	Newington 22	Coastal Drainage	1.5	PEM1E & PFO1E		O		O	O	✓		✓				
N-23	Newington 23	Coastal Drainage	0.4	PFO1C	O	O		O	✓							

Figure 3.6-4
Summary of Wetland Resources (Sheet 1 of 2)

Wetland Number	Wetland Name	Watershed	Total Wetland Area (acres)	Cover Type(s)	Groundwater Recharge/ Discharge	Floodflow Alteration	Fish and Shellfish Habitat	Sediment/ Toxicant Retention	Nutrient Removal	Production Export	Sediment/ Shoreline Stabilization	Wildlife Habitat	Recreation	Educational/ Scientific Value	Uniqueness/ Heritage	Visual Quality/ Aesthetics
D-1	Dover 1	Coastal Drainage	0.5	PEM1E & PFO1E	O	O		O	O							
D-1a	Dover 1a	Coastal Drainage	0.1	PEM1A				O	✓							
D-2	Dover 2	Coastal Drainage	2.6	PFO1E & PSS1E & PEM1E	O	O		O	O			O		✓		
D-3	Dover 3	Coastal Drainage	0.1	PEM1E	✓	O		O	O			✓				
D-4	Dover 4	Bellamy River	0.2	PFO1E & PEM1E	✓	✓		O	O			✓				
D-5	Dover 5	Coastal Drainage	0.5	PFO1B	O							O				
D-6	Dover 6	Bellamy River	0.1	PEM1E	✓	O		O	✓			✓				
D-7	Dover 7	Bellamy River	0.2	PFO1B	O			✓	✓			O				
D-7a	Dover 7a	Bellamy River	14.3	PFO1/4E	O	✓		O	O			O	O	✓		
D-8	Dover 8	Bellamy River	0.8	PFO1/4E	O	O		✓	✓			O				
D-9	Dover 9	Coastal Drainage	1.4	PFO1E & PEM1E	✓	O		O	O			✓				
D-10	Dover 10	Coastal Drainage	9.0	PFO1E/ & PEM1E	O	O		O	O			O				
D-11	Dover 11	Coastal Drainage	1.8	PEM1E		O		O	O	✓						
D-12	Dover 12	Coastal Drainage	0.7	PEM1E & PFO1E		O		O	O							

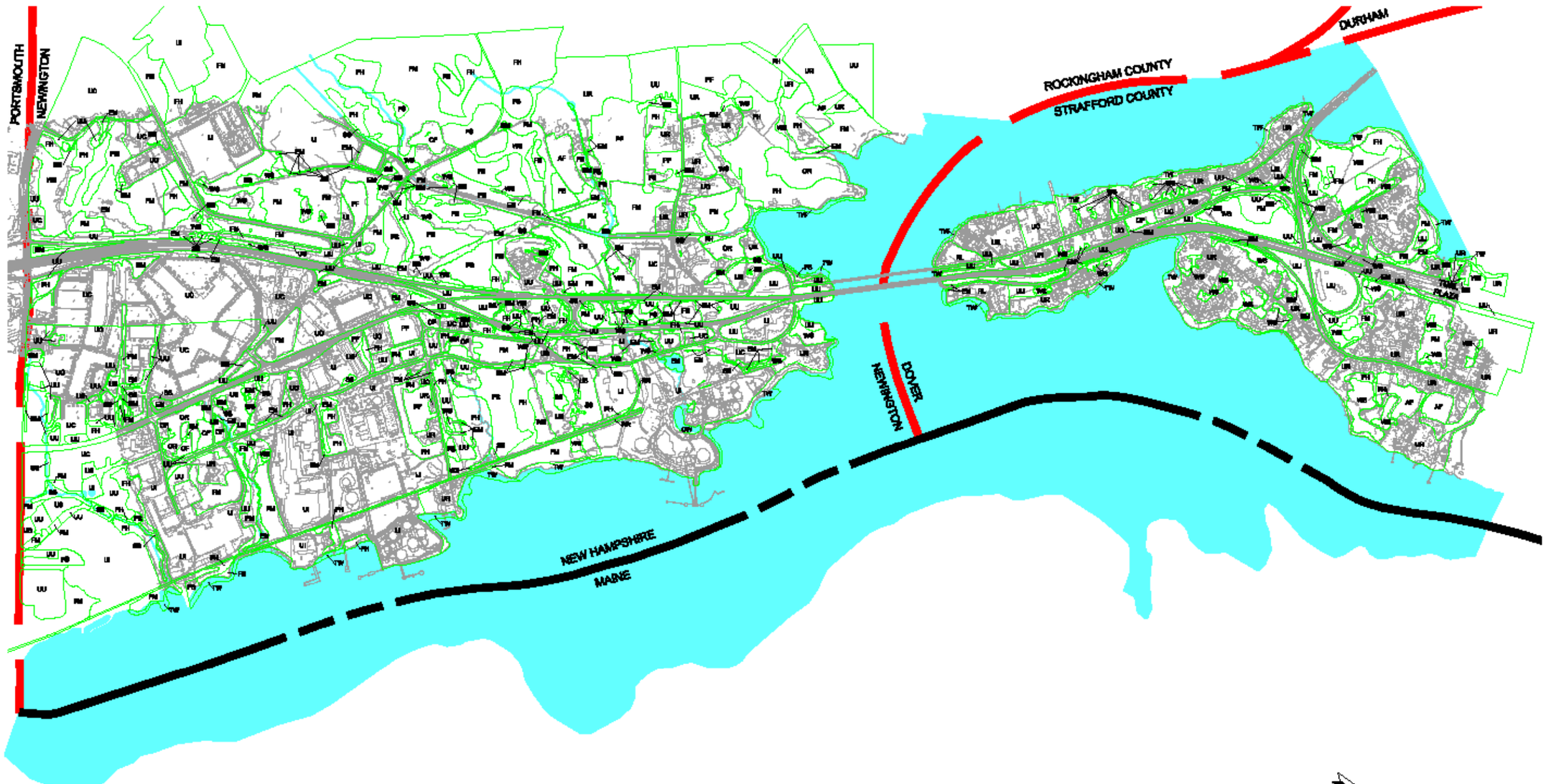
✓ = Function Present

O = Principal Function

Note: No known populations of wetland-dependent threatened or endangered species are present in the study area wetlands that are subject to impact from the proposed alternatives.

Figure 3.6-4
Summary of Wetland Resources (Sheet 2 of 2)

New Hampshire DOT
Department of Transportation



Legend:

- SURFACE WATERS
- TOWNLINE
- STATELINE

TW	Tidal Wetland
UI	Urban Industrial
UC	Urban Commercial
OW	Open Water
UU	Urban Undeveloped
US	Upland Shrub
FM	Forested Mixed
FH	Forested Hardwood
FS	Forested Softwood
RR	Railroad
UR	Urban Residential
PF	Pasture, Field
OR	Orchard
AF	Agriculture Field
OF	Old Field
RL	Recreational Land
WS	Wooded Swamp
SS	Scrub-Shrub Swamp
EM	Emergent Marsh

N

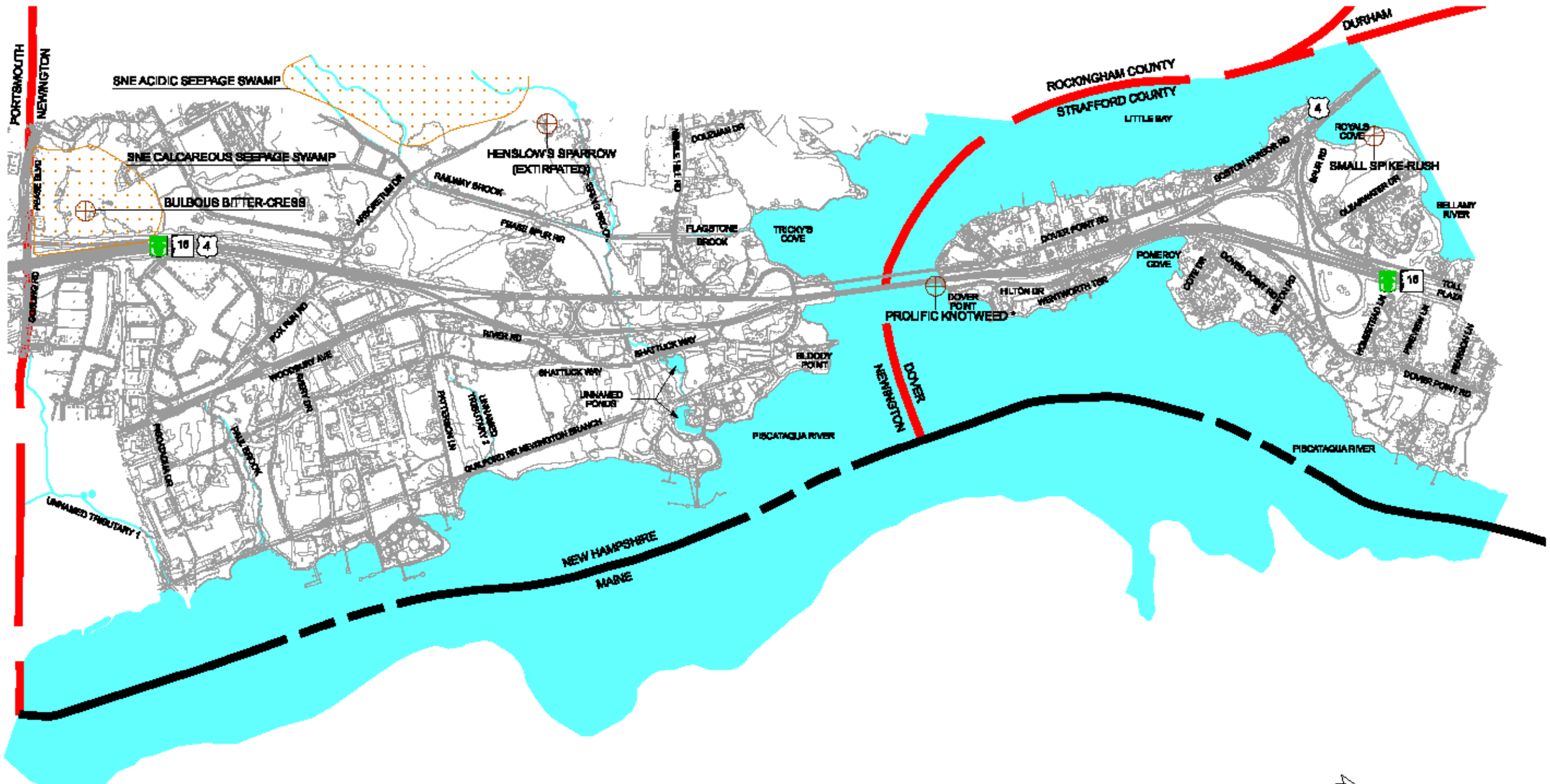
0 750 1500 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.7-1
Wildlife Habitat Cover Types

Date Created:10/9/2007 J:\61428\acad\alphaex3\DE\61g030r01.dgn

New Hampshire DOT
Department of Transportation



Legend:

- SURFACE WATERS
- TOWNLINE
- STATELINE
- POPULATION OF PROTECTED SPECIES
- EXEMPLARY NATURAL COMMUNITY (NHNHB)

0 750 1500 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.8-1
Threatened and Endangered Species

* Prolific knotweed population known only from an historic record.

Date Created:10/9/2007 J:\61492\acad\alphaxe3\DE61g030801.dgn

New Hampshire DOT
Department of Transportation

Legend:

- SURFACE WATERS
- TOWNLINE
- STATELINE
- WATERSHED BOUNDARY

PORTSMOUTH
NEWINGTON
PEASE BLVD
CONSTITUTIONS RD
16
4
ARCHSTUM LN
RAILWAY BROOK
PEASE SPUR RD
THOMPSONS BROOK
FLAGSTONE BROOK
DOUGLAS DR
TRICKY'S COVE
ROCKINGHAM COUNTY
STRAFFORD COUNTY
LITTLE BAY
DURHAM
GREAT BAY WATERSHED
BELLAMY RIVER WATERSHED
ROYALS COVE
SPUR RD
BOSTON HARBOR RD
DOVER POINT RD
POMEROY COVE
COVE DR
DOVER POINT RD EXT
HILTON DR
WINTWORTH DR
DOVER POINT
BELLAMY RIVER
TOLL PLAZA
DOVER POINT RD
FOX RUN RD
RIVER RD
SHATTUCK WAY
BLOODY POINT
WOODBURY AVE
BERRY DR
UNNAMED PONDS
PATTERSON LN
UNNAMED TRIBUTARY 2
GUILFORD RR NEWINGTON BRANCH
PISCATAQUA RIVER
NEWINGTON
DOVER
COASTAL DRAINAGE WATERSHED
PISCATAQUA RIVER
TALL BROOK
MOODY DR
UNNAMED TRIBUTARY 1
NEW HAMPSHIRE
MAINE

Note: The watershed boundaries shown here are taken from the USGS HUC 12-digit code (from GRANIT). The break between the Great Bay watershed and the Coastal Drainage was modified based on field observations of the Railway / Flagstone / Pickering Brook system with the USGS boundary shown as a dashed line and the modified boundary shown as a solid line.

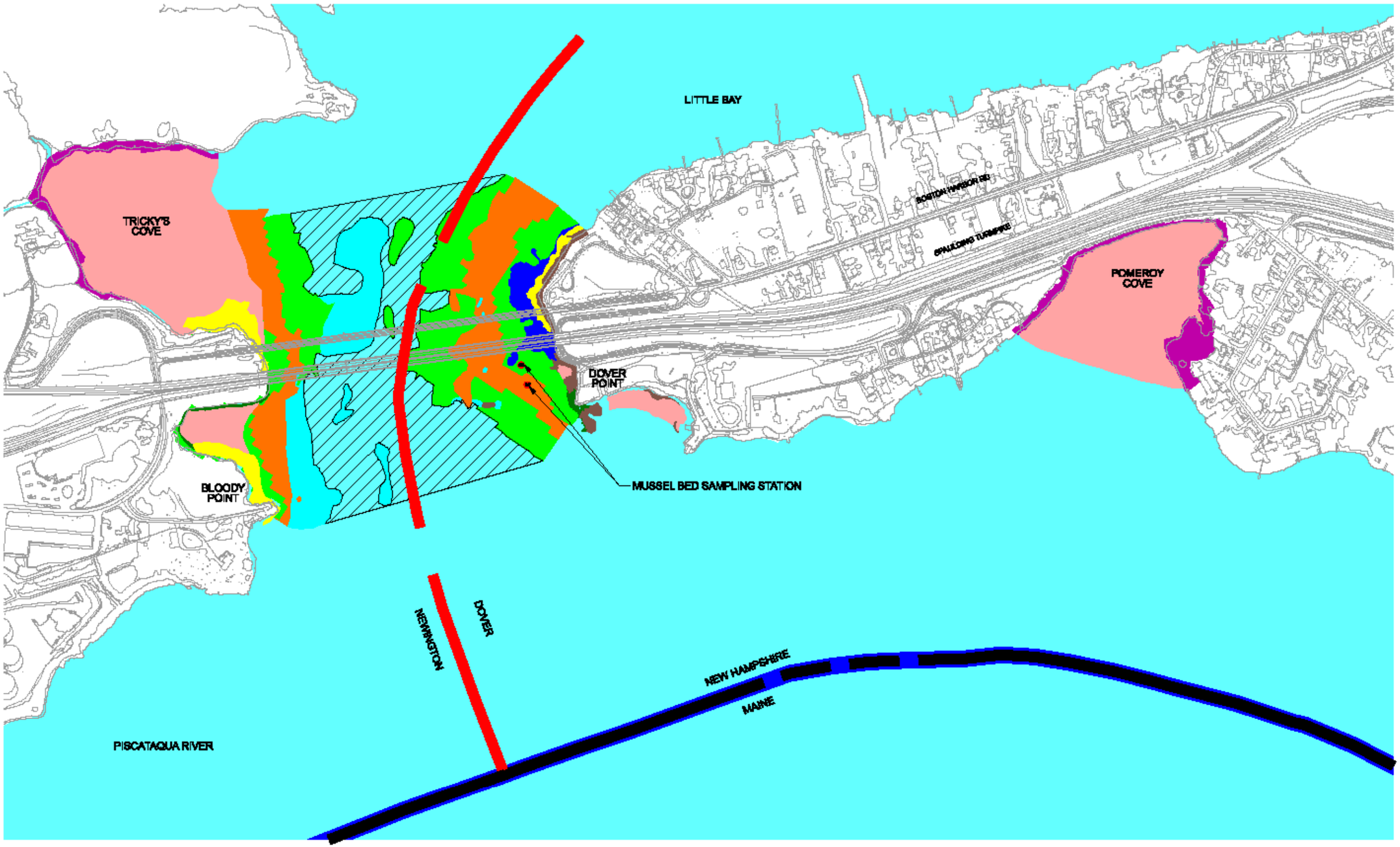
N

0 750 1500 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.9-1
Watersheds and Surface Water Resources

Date Created:10/9/2007 J:\61/61\wetlands\phase3\DE61g030901.dgn



New Hampshire DOT
Department of Transportation

Legend:

- SURFACE WATERS
- TOWNLINE
- STATELINE

INTERTIDAL HABITATS

- HARD BOTTOM WITH ROCKWEED
- MUDFLAT
- ROCK / ALGAL / ABUNDANT MUSSEL
- ROCK / ALGAL / SPARSE MUSSEL
- SALT MARSH
- SCATTERED ROCK / ALGAL / SOFT SEDIMENT

SUBTIDAL HABITATS

- KELP BED
- MACROALGAL (NON-KELP) BED
- MUSSEL REEF
- OTHER
- MUSSEL BED SAMPLING STATION

N

0 250 500 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.10-1
Intertidal and Subtidal Habitats

Date Created:10/9/2007 j:\s1412\wadlab\new3\DE\fig\031001.dgn

New Hampshire DOT
Department of Transportation

Legend:

STREAM

OPEN WATER

100-YEAR FLOODPLAIN

PORTSMOUTH
NEWINGTON
DURHAM
ROCKINGHAM COUNTY
STRAFFORD COUNTY
LITTLE BAY
* el. 7.2 (NGVD 29)
el. 8 (NGVD 29)
ROYALS COVE
BELLAMY RIVER
TOLL PLAZA
BOSTON HARBOR RD
DOVER POINT RD
POMEROY COVE
DOVER POINT
HILTON DR
NORTH DOVER RD
COLBAIN DR
RAILWAY BROOK
PEASE BYPASS RR
PEASE BLVD
ARCHSTUM DR
FLAGSTONE BROOK
TRICKY'S COVE
OLD TURNPIKE RD
PEASE BROOK
FOX RUN RD
RIVER RD
SHATTUCK WAY
BLOODY POINT
UNNAMED PONDS
UNNAMED TRIBUTARY 2
PATTERSON LN
GRILFORD RR NEWINGTON BRANCH
WOODBURY AVE
PISCATAQUA DR
PAUL BROOK
UNNAMED TRIBUTARY 1
PISCATAQUA RIVER
NEWINGTON
DOVER
* el. 9 (NGVD 29)
* el. 8 (NGVD 29)
NEW HAMPSHIRE
MAINE
0 750 1500 Feet

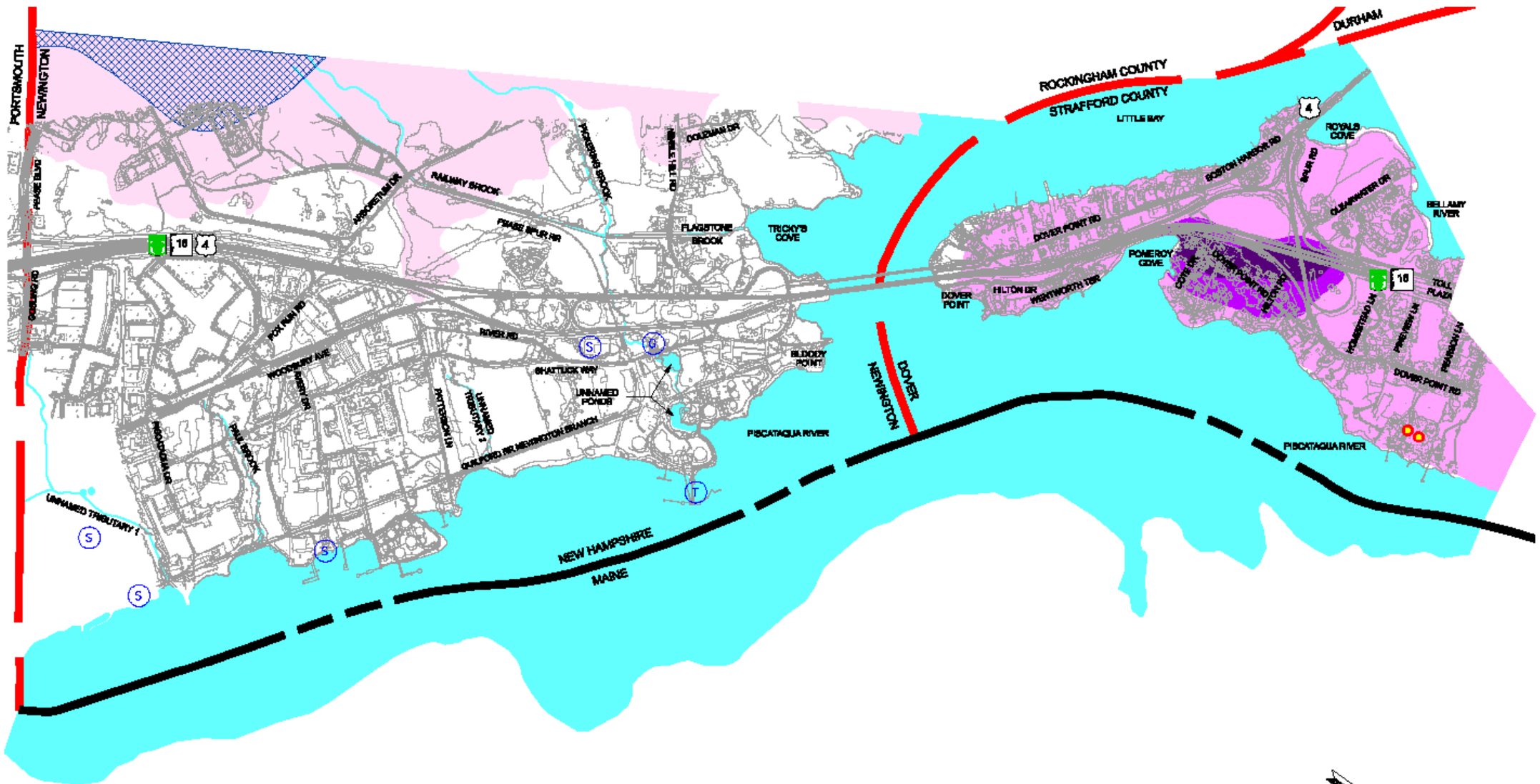
Vanasse Hangen Brustlin, Inc.

Figure 3.11-1
Study Area Floodplain Map

* 100-Year Flood Elevation

Source: FEMA Flood Insurance Study
Rockingham County Study #33015CZ001A (May 3, 2005)
Strafford County Study #33017CZ000A (May 17, 2005)

New Hampshire DOT
Department of Transportation



Vanasse Hangen Brustlin, Inc.

Figure 3.12-1
Groundwater Resources

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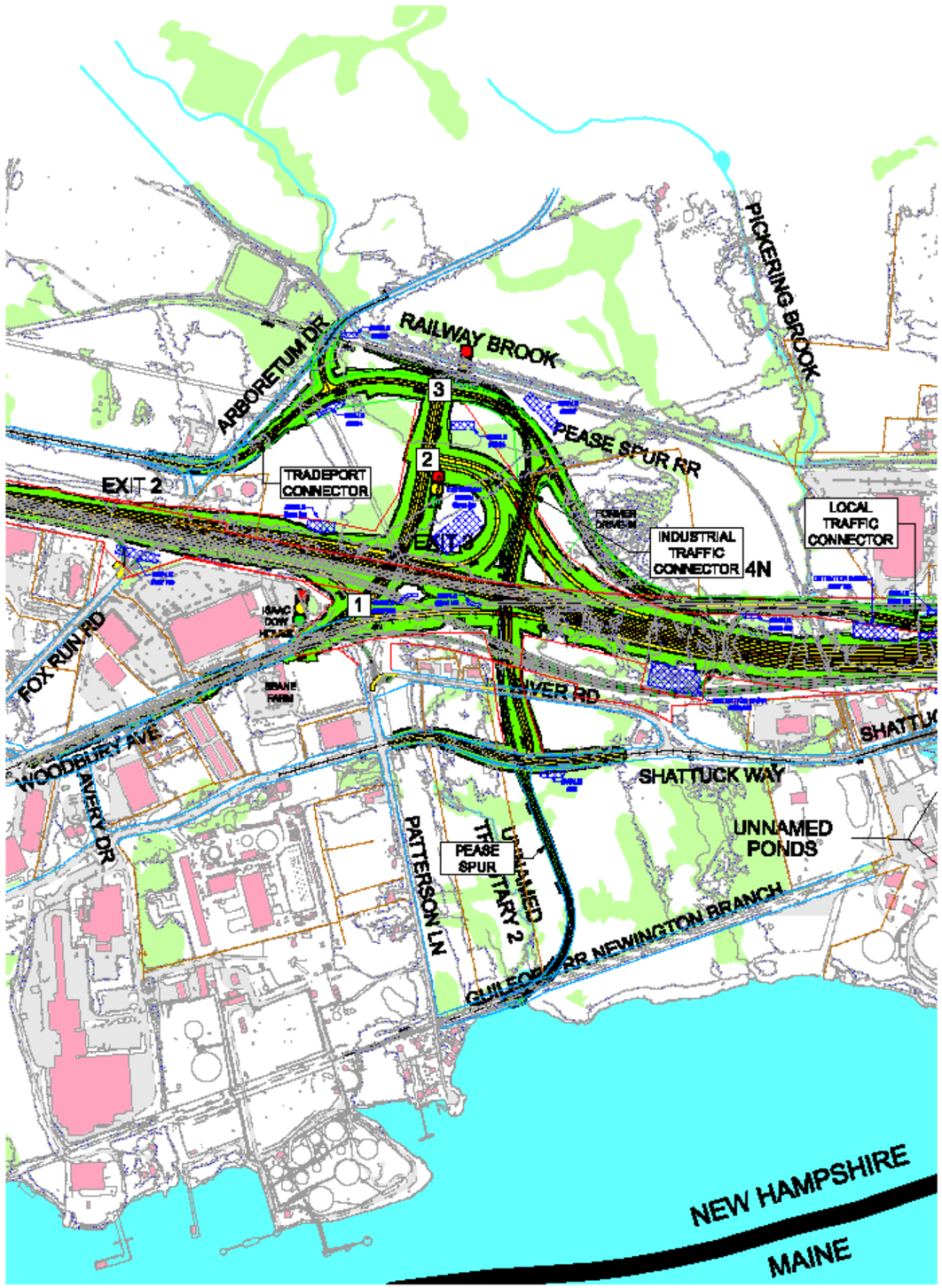
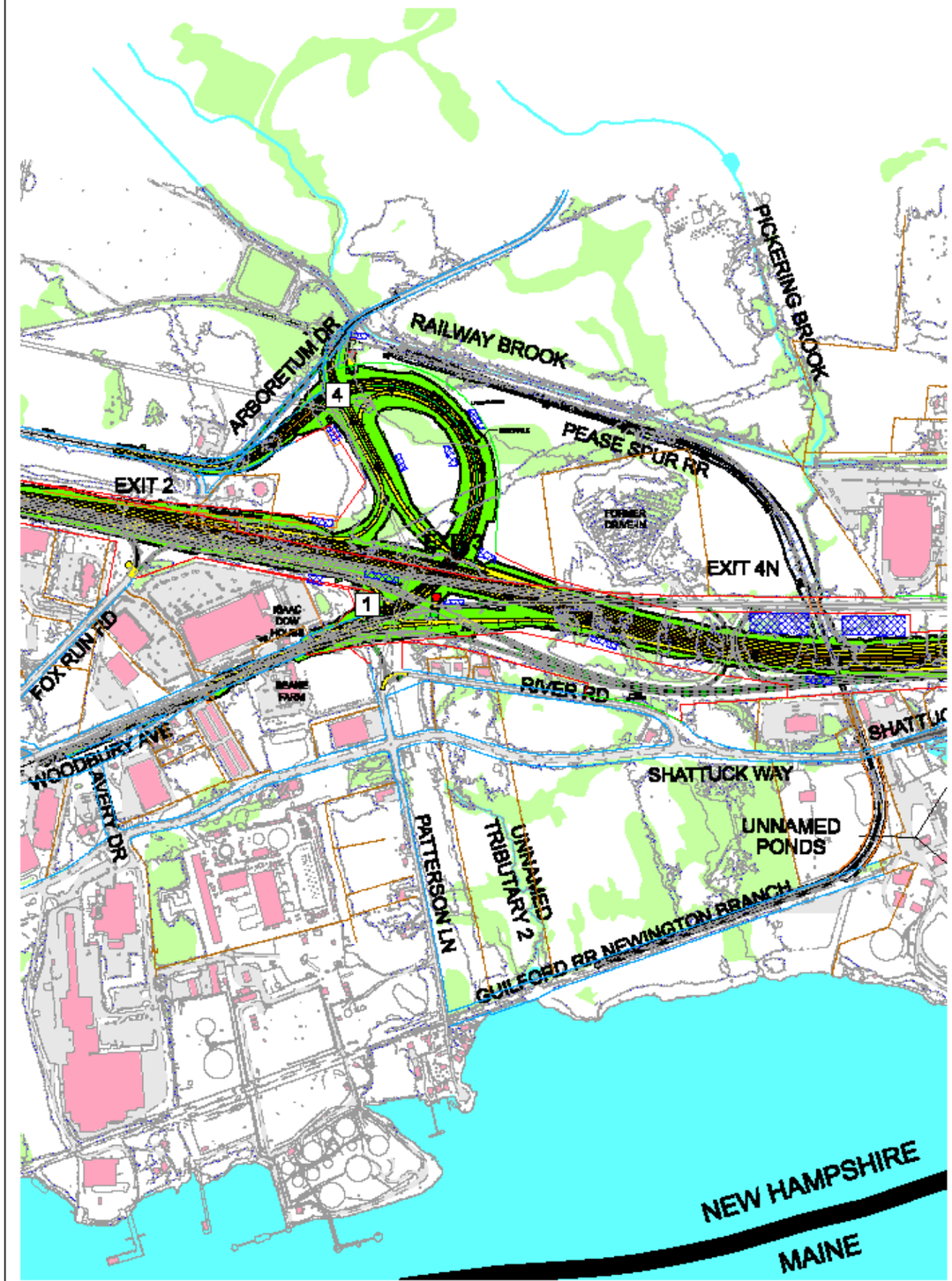
NEWINGTON ALTERNATIVE 12A*



* Newington Alternative 10A and 12A have Similar Signalized Intersection Configurations.

NEWINGTON ALTERNATIVE 13



New Hampshire DOT Department of Transportation

Legend:

- Existing Roadway
- Existing Building
- Existing Wetland
- Existing Property Lines
- Proposed Roadway
- Proposed Bridge
- Proposed Rail Corridor
- Proposed Acquisition
- Pavement Removal
- Existing LAROW
- Existing CAROW
- Existing ROW
- Proposed LAROW
- Proposed CAROW
- Proposed ROW
- Newington Interim Safety Improvements
- # Microscale Study Area Intersection Location

0 400 800 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.13-1
Microscale Study Area Intersections, Newington Alternatives

Date Created: 12/9/2007

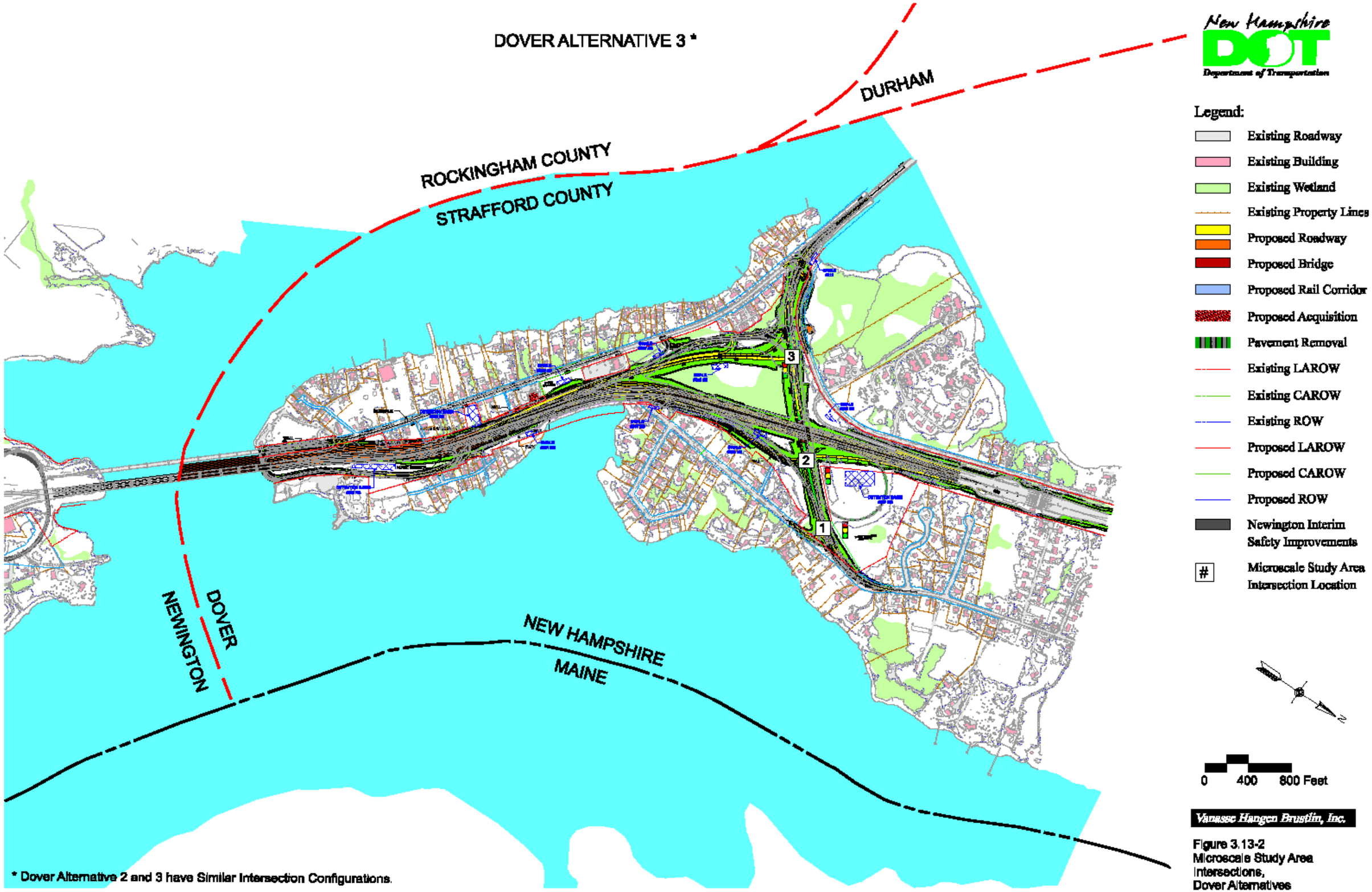
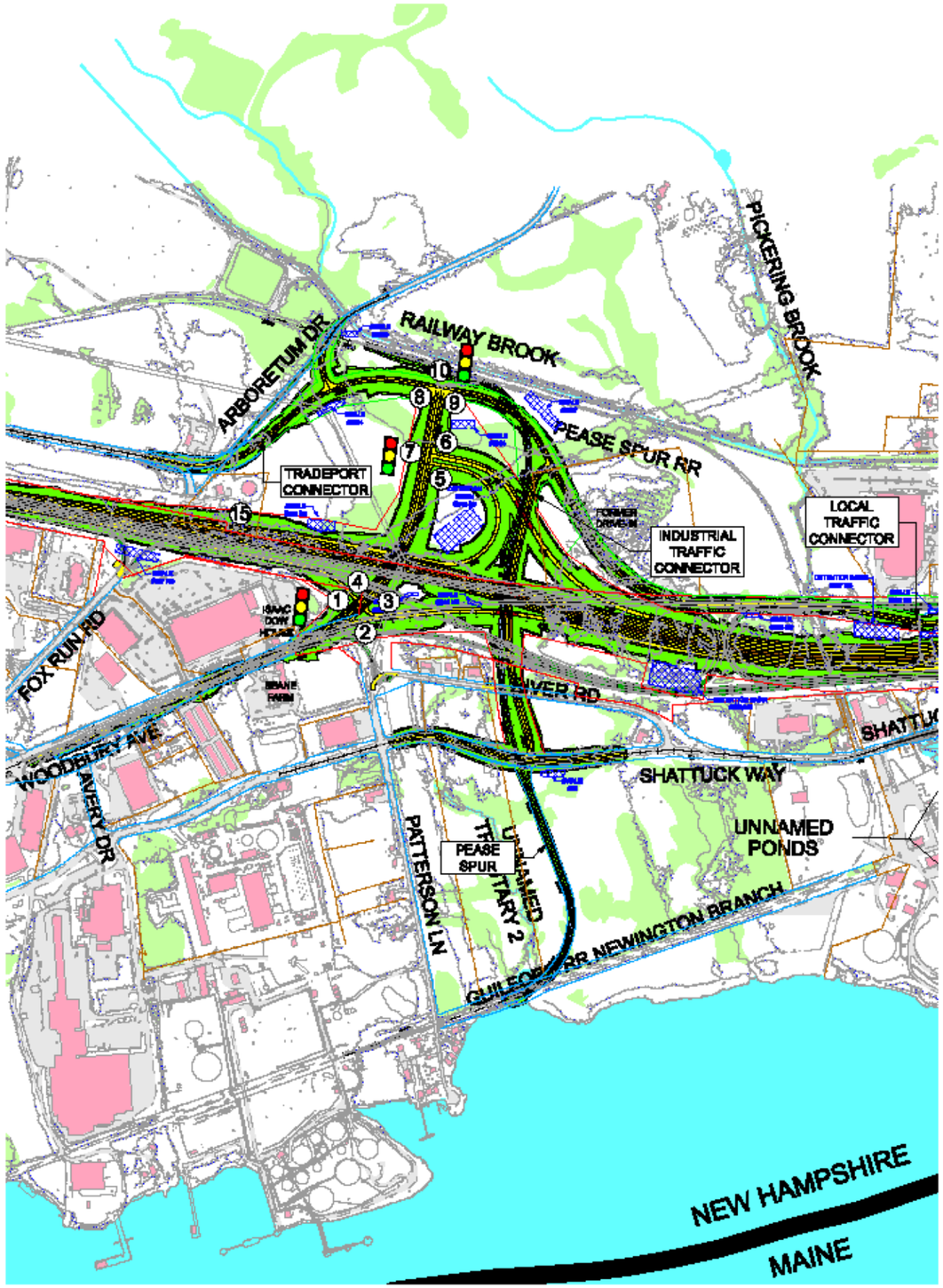


Figure 3.13-2
Microscale Study Area Intersections, Dover Alternatives

* Dover Alternative 2 and 3 have Similar Intersection Configurations.

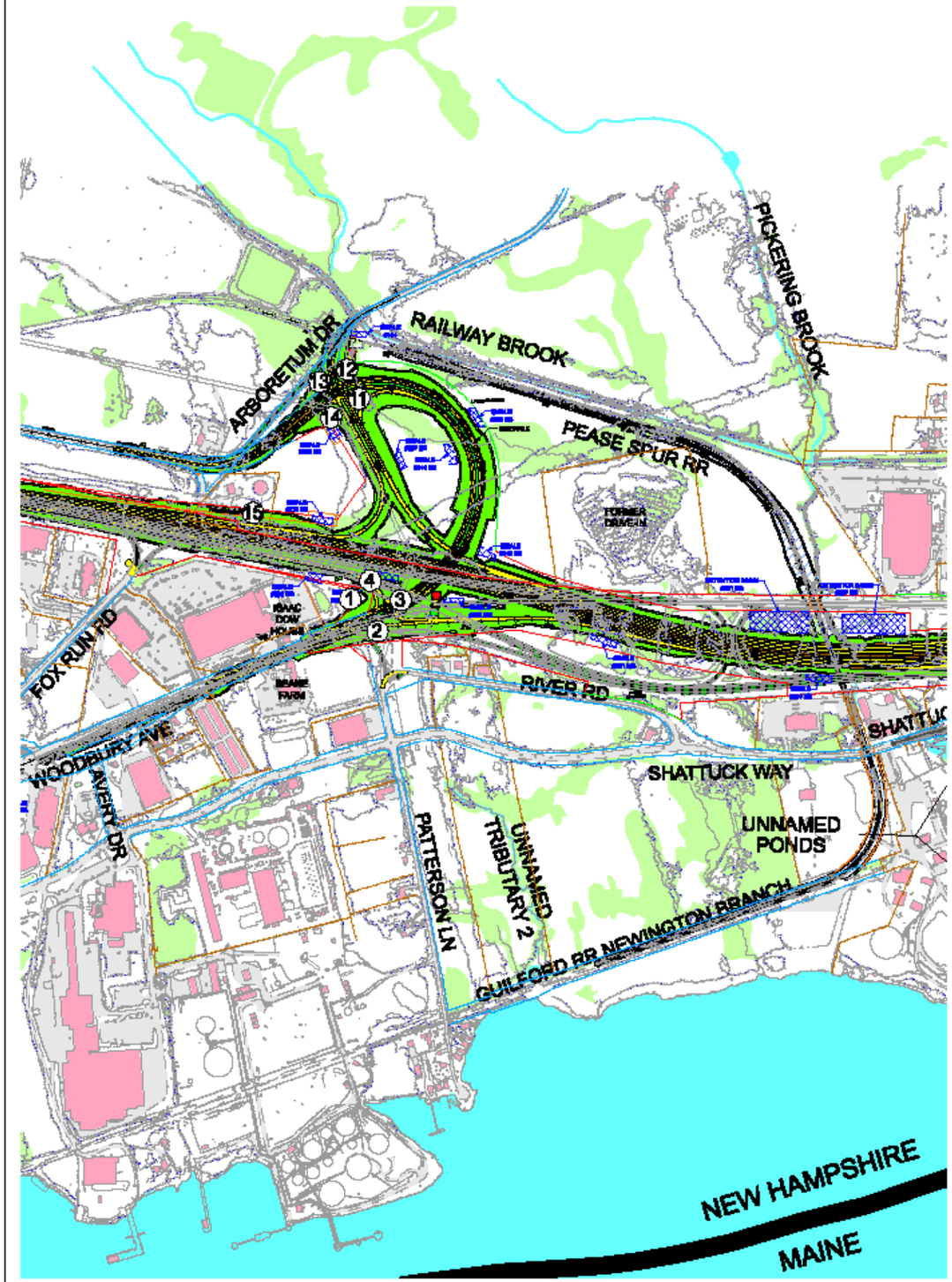
Date Created: 12/9/2007

NEWINGTON ALTERNATIVE 12A *



* Newington Alternative 10A and 12A have Similar Signalized Intersection Configurations.

NEWINGTON ALTERNATIVE 13



New Hampshire DOT
Department of Transportation

Legend:

- Existing Roadway
- Existing Building
- Existing Wetland
- Existing Property Lines
- Proposed Roadway
- Proposed Bridge
- Proposed Rail Corridor
- Proposed Acquisition
- Pavement Removal
- Existing LAROW
- Existing CAROW
- Existing ROW
- Proposed LAROW
- Proposed CAROW
- Proposed ROW
- Newington Interim Safety Improvements
- Microscale Receptor Location

0 400 800 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.13-3
Microscale Receptor Locations
Newington Alternatives

Date Created: 1/29/2007

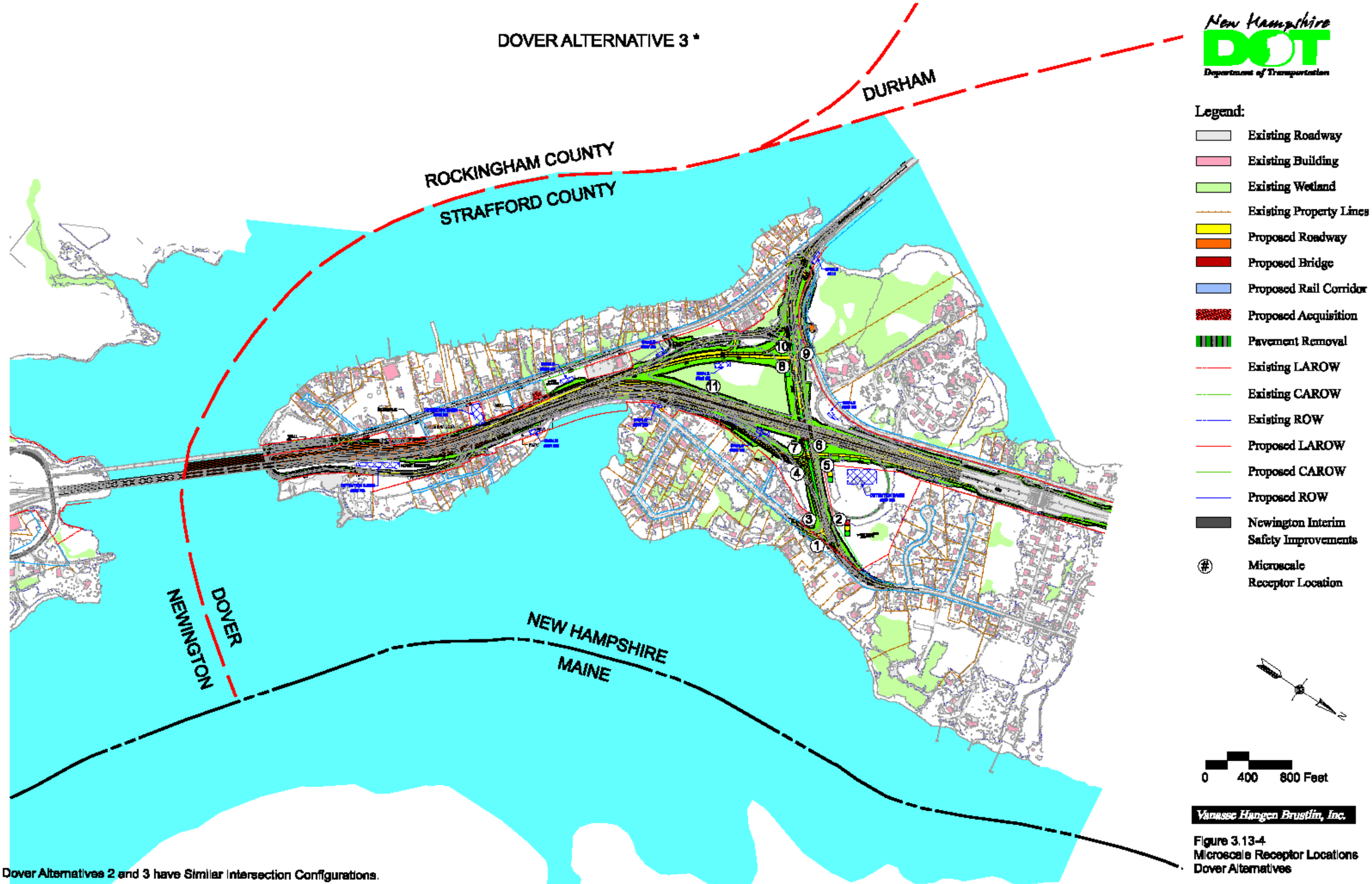


Figure 3.13-4
Microscale Receptor Locations
Dover Alternatives

* Dover Alternatives 2 and 3 have Similar Intersection Configurations.

New Hampshire DOT
Department of Transportation

Legend:

- SURFACE WATERS
- TOWNLINE
- STATELINE
- EXISTING NOISE MONITORING LOCATION
- NOISE EVALUATION AREA

PORTSMOUTH
NEWINGTON
ROCKINGHAM COUNTY
STRAFFORD COUNTY
DURHAM
DOVER
NEWINGTON
NEW HAMPSHIRE
MAINE
PISCATAQUA RIVER
LITTLE BAY
BELLAMY RIVER
AREA 1
AREA 2
AREA 3
AREA 4
AREA 5
AREA 6
AREA 7
AREA 8
AREA 9
AREA 10
AREA 11
AREA 12
AREA 13
AREA 14
FLAGSTONE BROOK
TRICKY'S COVE
BLOODY POINT
DOVER POINT
ROYALS COVE
POMEROY COVE
UNNAMED PONDS
UNNAMED TRIBUTARY 1
UNNAMED TRIBUTARY 2
GUILFORD RR NEWINGTON BRANCH
TOLL PLAZA

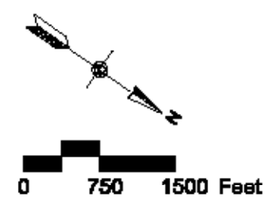


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Figure 3.14-1
Noise Sensitive Receptor Locations

Note: Areas 13 and 14 extend approximately 2,600 and 2,500 feet north of the limits of the study area, respectively. These areas incorporate neighborhoods near and north of the Dover Tolls that may be impacted by noise from the Turnpike.

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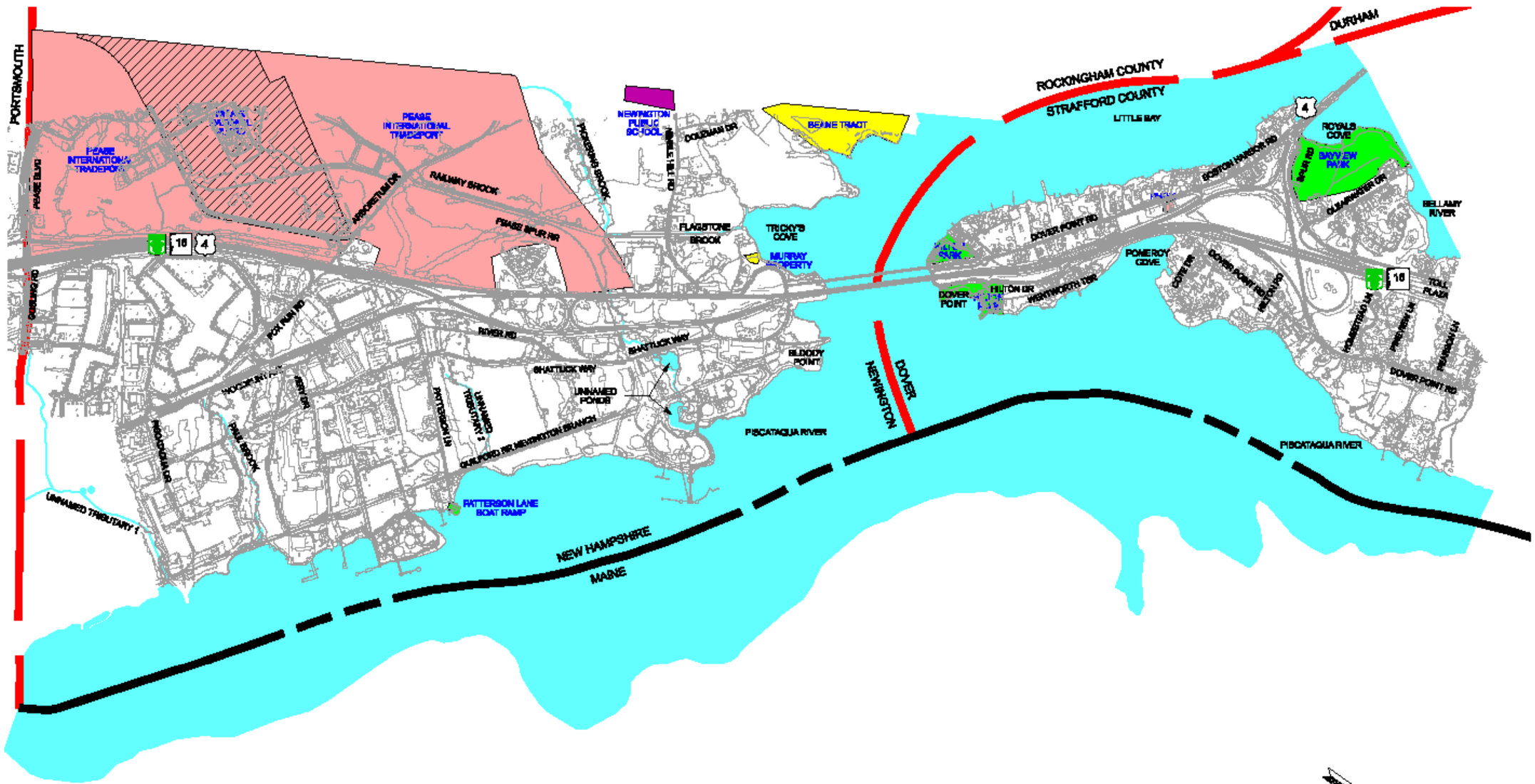
New Hampshire DOT
Department of Transportation



Legend:

- SURFACE WATERS
- TOWNLINE
- STATELINE
- PEASE INTL. TRADEPORT
- NH AIR NATIONAL GUARD
- PARKS AND RECREATION
- SCHOOL
- CONSERVATION LAND

Vanasse Hangen Brustlin, Inc.

Figure 3.15-1
Community Resources

Date Created 10/9/2007 | J:\61428\acad\alpha\aa3DE01g001d01.dgn

New Hampshire DOT
Department of Transportation

Legend:

- SURFACE WATERS
- TOWNLINE
- STATELINE
- NWN/DOV — HISTORIC STRUCTURE (LISTED OR ELIGIBLE FOR LISTING)
- BOUNDARY OF LISTED OR ELIGIBLE PROPERTY

PORTSMOUTH
NEWINGTON
ROCKINGHAM COUNTY
STRAFFORD COUNTY
DURHAM
DOVER
NEW HAMPSHIRE
MAINE
PISCATAQUA RIVER
TRICKY'S COVE
FLAGSTONE BROOK
UNNAMED PONDS
UNNAMED TRIBUTARY 1
UNNAMED TRIBUTARY 2
DOVER POINT
HILTON DR
WEIGHWORTH DR
POMEROY COVE
ROYALS COVE
BELLAMY RIVER
TOLL PLAZA
NWN 0148
NWN 0228
NWN 0205
NWN 0168
NWN 0204
NWN 0201
NWN 0224
DOV 0104
DOV 0098
AREA DOV-CH
AREA DOV-CB
DOV 0125
DOV 0099
DOV 0093
DOV 0136
DOV 0151
DOV 0134
DOV 0158
GENERAL SULLIVAN BRIDGE

Vanasse Hangen Brustlin, Inc.

Figure 3.17-1
Historical Structures

0 750 1500 Feet

Note: The DeRochemont property (NWN 0224) was determined eligible for listing as part of an earlier project.

Date Created 10/9/2007

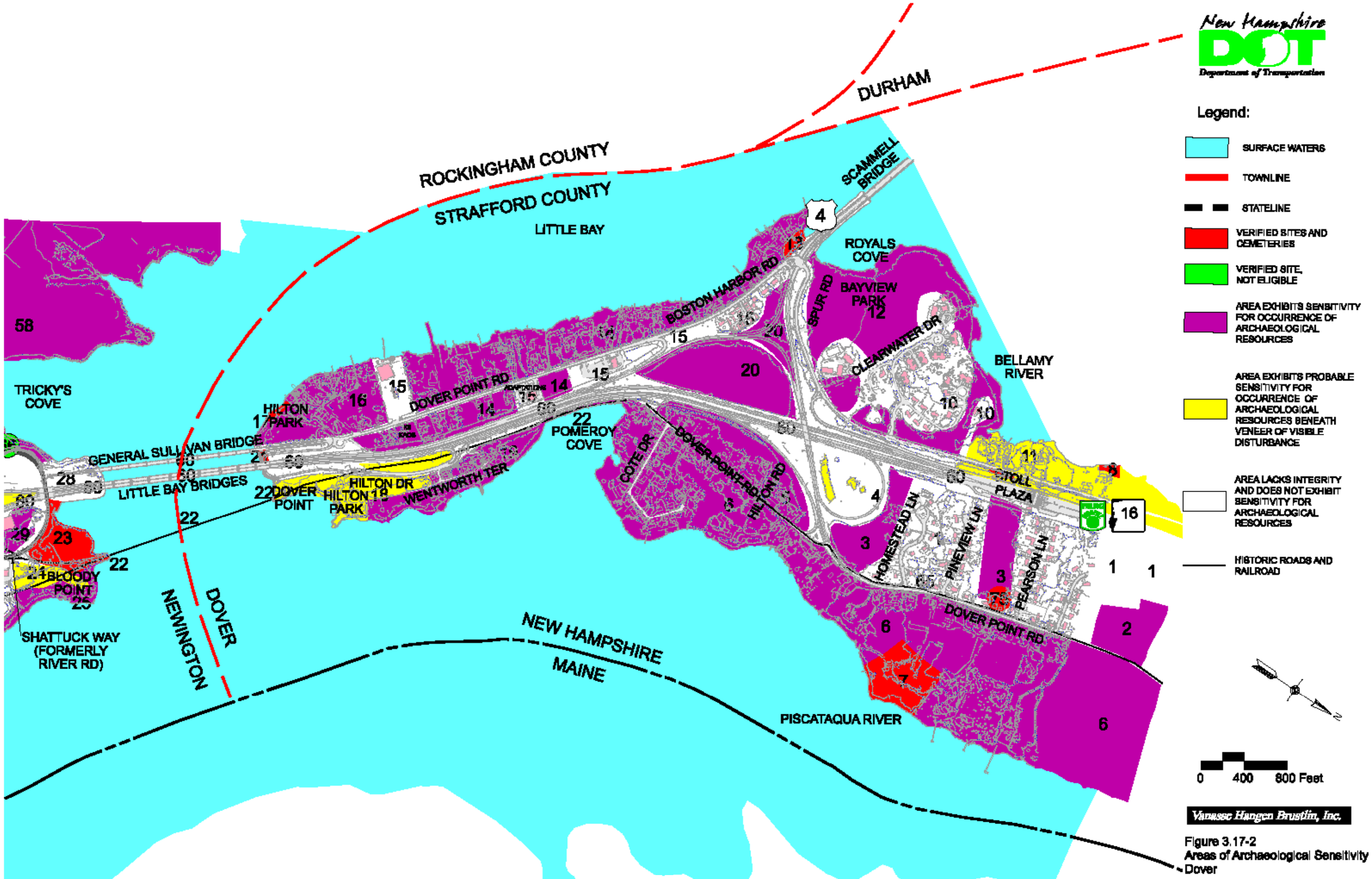


Figure 3.17-2
Areas of Archaeological Sensitivity
Dover

Date Created: 12/9/2007

New Hampshire DOT
Department of Transportation

Legend:

- SURFACE WATERS
- TOWNLINE
- STATELINE
- VERIFIED SITES AND CEMETERIES
- VERIFIED SITE, NOT ELIGIBLE
- AREA EXHIBITS SENSITIVITY FOR OCCURRENCE OF ARCHAEOLOGICAL RESOURCES
- AREA EXHIBITS PROBABLE SENSITIVITY FOR OCCURRENCE OF ARCHAEOLOGICAL RESOURCES BENEATH VENEER OF VISIBLE DISTURBANCE
- AREA LACKS INTEGRITY AND DOES NOT EXHIBIT SENSITIVITY FOR ARCHAEOLOGICAL RESOURCES
- HISTORIC ROADS AND RAILROAD

0 400 800 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.17-3
Areas of Archaeological Sensitivity
Newington

Date Created: 12/9/2007