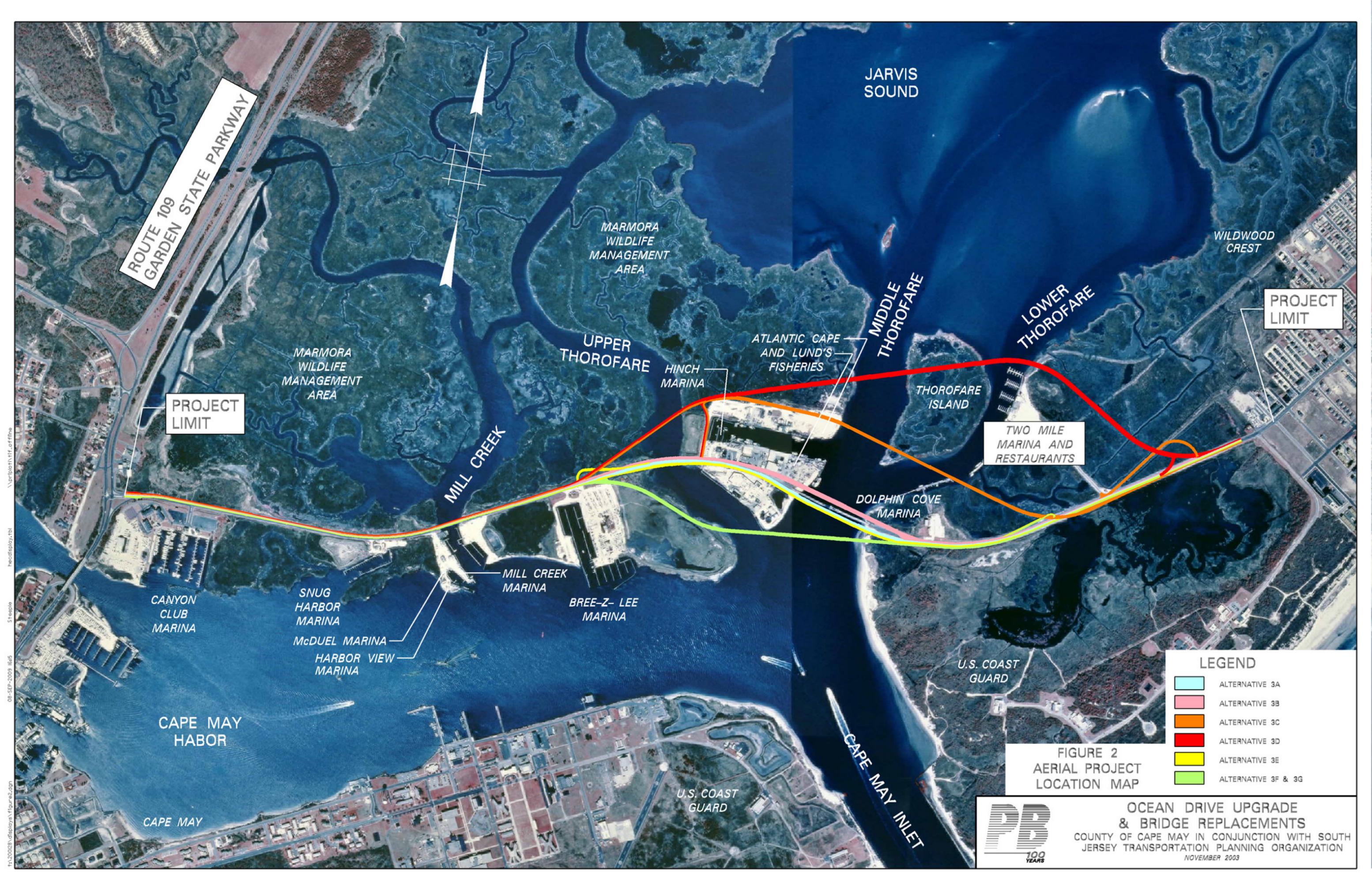




**Figure 1**  
**Project Location Map**



ROUTE 109  
GARDEN STATE PARKWAY

JARVIS  
SOUND

WILDWOOD  
CREST

PROJECT  
LIMIT

MARMORA  
WILDLIFE  
MANAGEMENT  
AREA

MARMORA  
WILDLIFE  
MANAGEMENT  
AREA

PROJECT  
LIMIT

UPPER  
THOROFARE

MILL CREEK

HINCH  
MARINA

ATLANTIC CAPE  
AND LUND'S  
FISHERIES

MIDDLE  
THOROFARE

THOROFARE  
ISLAND

LOWER  
THOROFARE

TWO MILE  
MARINA AND  
RESTAURANTS

DOLPHIN COVE  
MARINA

MILL CREEK  
MARINA

BREE-Z- LEE  
MARINA

CANYON  
CLUB  
MARINA

SNUG  
HARBOR  
MARINA

McDUEL MARINA

HARBOR VIEW  
MARINA

U.S. COAST  
GUARD

CAPE MAY  
HARBOR

CAPE MAY

U.S. COAST  
GUARD

CAPE MAY INLET

LEGEND	
	ALTERNATIVE 3A
	ALTERNATIVE 3B
	ALTERNATIVE 3C
	ALTERNATIVE 3D
	ALTERNATIVE 3E
	ALTERNATIVE 3F & 3G

FIGURE 2  
AERIAL PROJECT  
LOCATION MAP



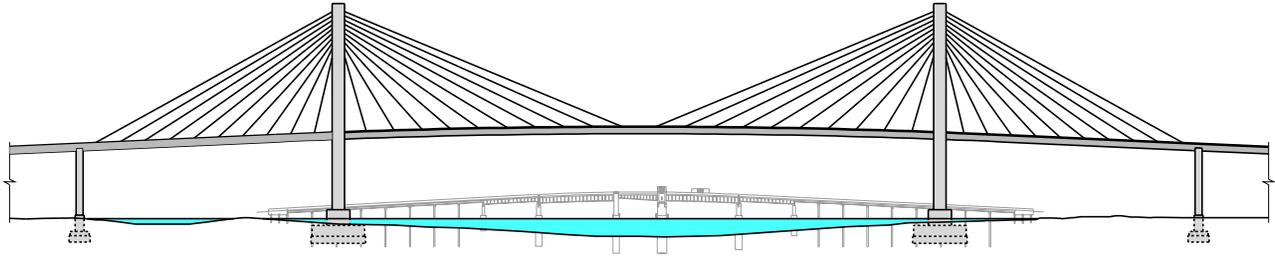
OCEAN DRIVE UPGRADE  
& BRIDGE REPLACEMENTS  
COUNTY OF CAPE MAY IN CONJUNCTION WITH SOUTH  
JERSEY TRANSPORTATION PLANNING ORGANIZATION  
NOVEMBER 2003

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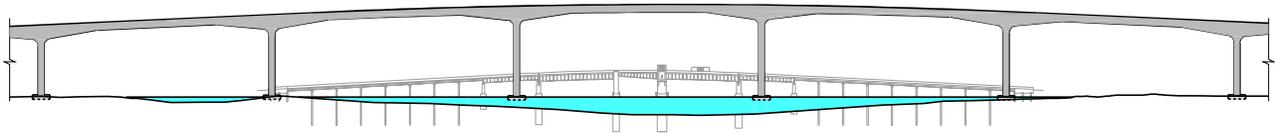
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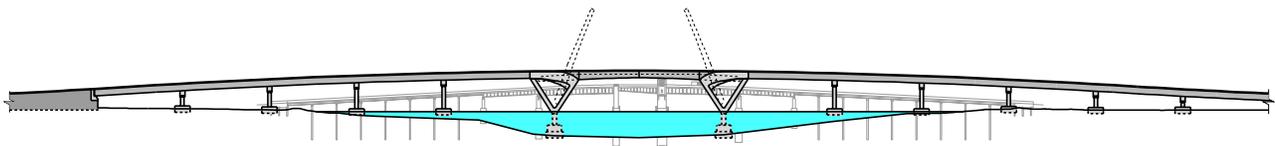
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**CABLE STAYED BRIDGE**  
(ALIGNMENT ALTERNATIVE 3G)



**SEGMENTAL BRIDGE**  
(ALIGNMENT ALTERNATIVES 3C, 3D, 3E & 3F)



**MOVABLE BRIDGE**  
(ALIGNMENT ALTERNATIVES 3A & 3B)

TYPICAL BRIDGE ELEVATIONS



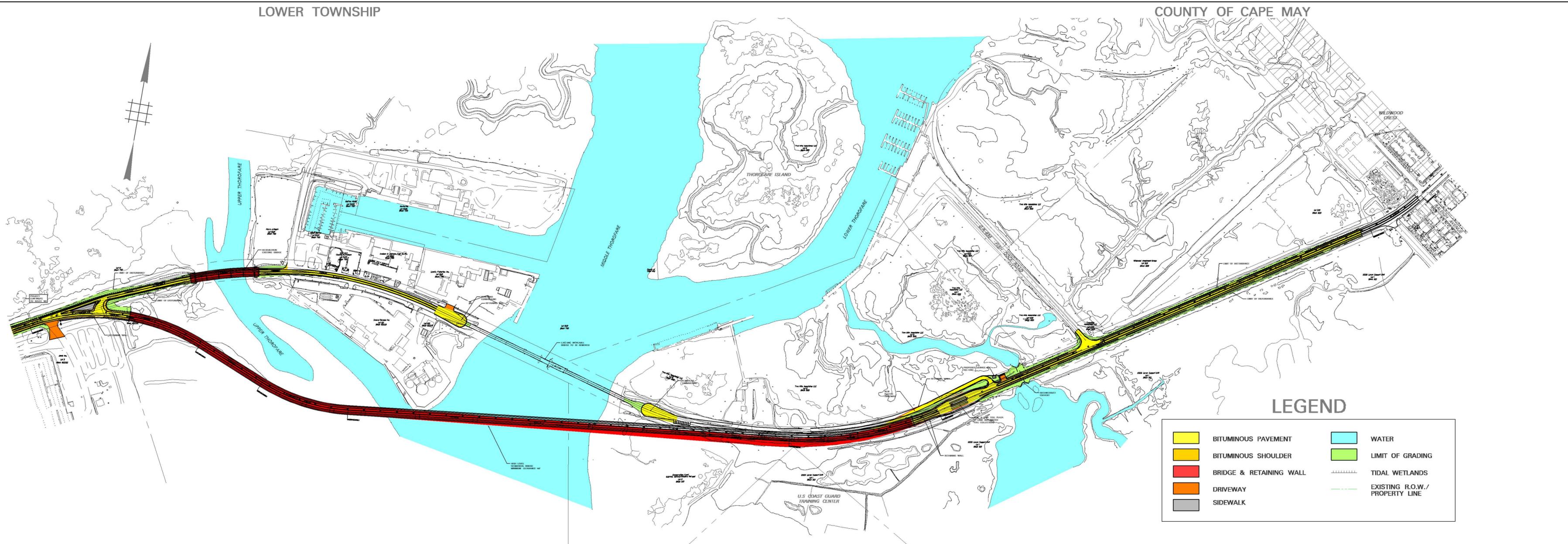
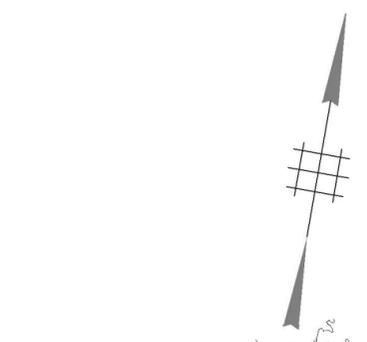
OCEAN DRIVE IMPROVEMENTS  
COUNTY OF CAPE MAY IN CONJUNCTION WITH SOUTH  
JERSEY TRANSPORTATION PLANNING ORGANIZATION

JUNE 2003

EXISTING BRIDGE SHOWN FOR COMPARISON PURPOSES.

LOWER TOWNSHIP

COUNTY OF CAPE MAY



LEGEND

	BITUMINOUS PAVEMENT		WATER
	BITUMINOUS SHOULDER		LIMIT OF GRADING
	BRIDGE & RETAINING WALL		TIDAL WETLANDS
	DRIVEWAY		EXISTING R.O.W./PROPERTY LINE
	SIDEWALK		

ALTERNATIVE 3F

FIGURE 20

PLANS FOR THIS ALTERNATIVE ARE INCLUDED IN APPENDIX "E"



OCEAN DRIVE UPGRADE  
 & BRIDGE REPLACEMENTS  
 COUNTY OF CAPE MAY IN CONJUNCTION WITH SOUTH  
 JERSEY TRANSPORTATION PLANNING ORGANIZATION  
 NOVEMBER 2003

**Figure 28**  
**Ocean Drive Improvements and Middle Thorofare Bridge Replacement**  
**Alternatives Comparison Matrix**

Ocean Drive Improvements & Middle Thorofare Bridge Replacement Alternatives	3A	3B	3C	3D	3E	3F	3G
<b>1A. Engineering - Roadway</b>							
- Proposed Travel Lane and Shoulder Width (each direction)	12 ft. travel lane & 8 ft. shoulder	12 ft. travel lane & 8 ft. shoulder	12 ft. travel lane & 8 ft. shoulder	12 ft. travel lane & 8 ft. shoulder	12 ft. travel lane & 8 ft. shoulder	12 ft. travel lane & 8 ft. shoulder	12 ft. travel lane & 8 ft. shoulder
- Total Project Length (miles)	2.7	2.7	3.2	3.0	2.9	2.8	2.8
- Total Length of Roadway not including bridges (miles)	2.2	2.2	2.1	1.8	1.9	1.7	1.7
- Design Speed & (Posted Speed Limit)	55 mph (40-50 mph)						
- Raises Roadway Above 100-year Flood Elevation	Yes						
- Roadway Shift to Accommodate Traffic During Construction	Varies	North	North	North	Varies	Varies	Varies
- Alignment of Ocean Drive in the Vicinity of Middle Thorofare	Parallel (South)	Parallel (North)	Shifted (North)	Shifted (North)	Parallel (South)	Shifted (South)	Shifted (South)
- Access to Businesses Between Upper Thorofare & Wildwood Crest	via existing Ocean Drive	via existing Ocean Drive	via new access road	via new access road	via existing Ocean Drive	via existing Ocean Drive	via existing Ocean Drive
- Middle Thorofare Bridge Toll Facility	New 4-lane Toll Facility, Semi-Automated, Constructed Adjacent to Middle Thorofare Bridge	New 4-lane Toll Facility, Semi-Automated, Constructed Adjacent to Middle Thorofare Bridge	New 4-lane Toll Facility, Semi-Automated, Constructed Adjacent to Middle Thorofare Bridge	New 4-lane Toll Facility, Semi-Automated, Constructed Adjacent to Middle Thorofare Bridge	New 4-lane Toll Facility, Semi-Automated, Constructed Adjacent to Middle Thorofare Bridge	New 4-lane Toll Facility, Semi-Automated, Constructed Adjacent to Middle Thorofare Bridge	New 4-lane Toll Facility, Semi-Automated, Constructed Adjacent to Middle Thorofare Bridge
<b>1B. Engineering - Structures</b>							
- Total Length of Bridge Structures (feet)	2357	2320	5592	6202	5053	5577	5517
- Retaining Walls (feet)	920	150	1140	535	3870	2920	2920
- Culvert Near Fish Dock Road	New Concrete Box Culvert						
- Mill Creek Bridge	Replacement						
- Proposed Bridge Type	Prestressed Concrete Box Beam						
- Total Structure Length (feet)	312	312	312	312	312	312	312
- Total Number of Piers	3	3	3	3	3	3	3
- Upper Thorofare Bridge	Replacement	Replacement	New Bridge On New Alignment	New Bridge On New Alignment	Replacement	Replacement	Replacement
- Proposed Bridge Type	Prestressed Concrete Box Beam	Prestressed Concrete Box Beam	Segmental Concrete Box Beams (Span-by-Span)	Segmental Concrete Box Beams (Span-by-Span)	Prestressed Concrete Box Beam	Prestressed Concrete Box Beam	Prestressed Concrete Box Beam
- Total Structure Length (feet)	365	365	640	640	365	365	365
- Total Number of Piers	4	4	3	3	4	4	4
- Middle Thorofare Bridge	New Bridge On Parallel Alignment	New Bridge On Parallel Alignment	New Bridge On Shifted Alignment	New Bridge On Shifted Alignment	New Bridge On Parallel Alignment	New Bridge On Shifted Alignment	New Bridge On Shifted Alignment
- Proposed Bridge Type	Mid-level Bascule (Moveable) Bridge	Mid-level Bascule (Moveable) Bridge	High-level Segmental (Fixed) Bridge	High-level Cable-Stayed (Fixed) Bridge			
- Construction (main span / approaches)	Open Pier / Prestressed I-Girders	Open Pier / Prestressed I-Girders	Balanced Cantilever / Span-by-Span	Cable-Stayed / Span-by-Span			
- Maximum Structure Height (feet)	55	55	126	85	126	126	126 (300 - Top of Tower)
- Maximum Structure Grade	6%	6%	5%	5%	6%	6%	4.5%
- Approximate Reduction in Bridge Openings	30%	30%	100%	100%	100%	100%	100%
- Horizontal Clearance at Upper Thorofare Channel (feet)	N/A	N/A	N/A	N/A	N/A	150	150
- Minimum Vertical Clearance at Upper Thorofare Channel (feet)	N/A	N/A	N/A	N/A	N/A	90	90
- Horizontal Clearance at Middle Thorofare Channel (feet)	180	180	310	155	330	330	840
- Minimum Vertical Clearance at Middle Thorofare Channel (feet)	45	45	75	75	116	116	116
- Horizontal Clearance at Lower Thorofare Channel (feet)	N/A	N/A	215	N/A	N/A	N/A	N/A
- Minimum Vertical Clearance at Lower Thorofare Channel (feet)	N/A	N/A	116	N/A	N/A	N/A	N/A
- Total Structure Length (feet)	1680	1643	4640	5250	4376	4900	4840
- Total Number of Piers	11	10	21	29	21	22	20
		<b>Rank</b>		<b>Rank</b>		<b>Rank</b>	
<b>2. Cost/Constructibility</b>							
- Approximate Construction Duration (years)	3.5	3.5	3	3.5	3	2.5	2.5
- Traffic Disruption	High (access impacts)	High (access impacts)	Low (Shifted Alignment)	Low (Shifted Alignment)	Moderate	Low (Shifted Alignment)	Low (Shifted Alignment)
- Constructibility	Complex (maintenance of access)	Complex (maintenance of access)	Moderate (some offline construction)	Complex (mod. Wetland constraints)	Complex (piers in existing shoulder)	Moderate (offline construction)	Moderate (offline w/ min.piers in water)
- Cost to Construct	\$87,042,139	\$89,304,307	\$124,384,914	\$130,516,548	\$123,369,396	\$128,645,695	\$128,627,938
- Total Life Cycle Cost (Bridges Only, 2003 dollars)	\$49,105,000	\$50,098,000	\$67,176,000	\$71,991,000	\$62,388,000	\$70,725,000	\$71,888,000
<b>3. Right-of-Way &amp; Access</b>							
- Right-of-Way Acquisition (acres)	0.56	0.16	8.61	4.50	0.84	0.67	0.67
- Easements (Bridge, Slope, Construction) (acres)	2.44	2.40	10.65	14.35	3.43	7.90	7.90
- Riparian Grants	Yes						
- Impacted Properties (Requiring ROW Acquisition or Easement)	7	3	7	5	6	4	4
- Driveway Closures	3	3	0	0	0	0	0
- Driveway Modifications	15	13	7	7	7	7	7
<b>4. Traffic</b>							
- Approximate Reduction in Bridge Openings	30%	30%	100%	100%	100%	100%	100%
- Design Year (2027) Level of Service (Summer AM/Summer PM & Sat.)	C/D						
- Toll Plaza Queueing	Yes	Yes	No	No	No	No	No
<b>5. Socio-Economic</b>							
- Potential Business Impacts	1	5	2	2	3	1	1
- Estimated Loss of Annual Revenues	\$45,000,000	\$119,550,000	\$3,340,000	\$3,340,000	\$1,270,000	\$420,000	\$420,000
- Estimated Loss of Employees of Impacted Businesses	152	660	143	143	58	22	22
- Aesthetics							
- Ocean Drive Corridor	+	+	-	-	-	-	-
- Wildwood Crest	+	+	-	-	-	-	-
- Cape May	+	+	+	+	-	-	-
- Community Support	--	--	+	--	-	++	+++
- Parkland Resources							
- Marmora Wildlife Management Area (acres)	No Impact	No Impact	4.2	4.4	0.6	No Impact	No Impact
- Two Mile Unit, Cape May National Wildlife Refuge	No Impact						
- Public Waterfront Access	--	-	++	++	-	++	++
- Navigation Channel (Middle Thorofare)	130	130	130	130	130	130	130
- Horizontal Clearance at Middle Thorofare Channel (feet)	130	130	310	155	330	330	840

**Figure 28**  
**Ocean Drive Improvements and Middle Thorofare Bridge Replacement**  
**Alternatives Comparison Matrix**

Ocean Drive Improvements & Middle Thorofare Bridge Replacement Alternatives	3A		3B		3C		3D		3E		3F		3G	
<b>6. Cultural Resources</b>														
- Historic Architecture														
- Middle Thorofare Bridge	Adverse Effect	2												
- Cape May Historic District	No Effect	3												
- Hornbeam (Bouy Tender)	No Effect	3												
- Cold Spring Historic District	No Effect	3												
- Historic Cold Spring Village Railroad Station	No Effect	3												
- Historic Cold Spring Village Junction Control Tower	No Effect	3												
- Garden State Parkway Historic District	No Effect	3												
- Archaeology														
- Historic	No Effect	3												
- Prehistoric	No Effect	3												
<b>7. Environmental</b>														
- Wetlands/Open Water Impacts														
- Total Wetland/Open Water - Fill (Acres)	2.66	5	2.92	5	6.93	1	6.54	2	2.82	3	2.22	5	2.22	5
- Wetland/Open Water Impacts From Piers (Acres)	0.31	4	0.29	4	0.36	4	0.75	4	0.25	3	0.40	3	0.40	2
- Number of Piers in Wetlands/Open Water	18	2	14	2	19	2	35	2	23	2	29	3	27	4
- Total Wetland Shading (Acres)	0.68	5	0.61	5	2.88	3	5.10	1	1.70	4	3.10	2	3.09	2
- Coastal/Aquatic Resources														
- Submerged Aquatic Vegetation	No	3	No	3	No	2	No	1	No	3	No	3	No	3
- Shellfish	Prohibited	3	Prohibited	3	Prohibited	2	Prohibited	1	Prohibited	3	Prohibited	2	Prohibited	2
- Beaches/Dunes	Yes	2	Yes	2	Yes	2	Yes	1	Yes	2	Yes	2	Yes	3
- Subtidal/Inter-tidal Shallows	Yes	3	Yes	3	Yes	2	Yes	2	Yes	3	Yes	3	Yes	3
- Natural Heritage Priority Site	Yes	2	No	3	No	3	No	3	Yes	2	Yes	2	Yes	2
- Fish/Wildlife Resources														
- Raptor Concentration Sites	Yes	3	Yes	3	Yes	2	Yes	1	Yes	3	Yes	3	Yes	3
- Waterfowl Concentration Sites	Yes	3	Yes	3	Yes	2	Yes	1	Yes	3	Yes	3	Yes	3
- Shorebird Concentration Sites	Yes	3	Yes	3	Yes	2	Yes	1	Yes	3	Yes	3	Yes	3
- Wadingbird Concentration Sites	Yes	3	Yes	3	Yes	2	Yes	1	Yes	3	Yes	3	Yes	3
- Essential Fish Habitat	Yes	3	Yes	3	Yes	2	Yes	1	Yes	3	Yes	2	Yes	3
- Migratory Birds	Yes	3	Yes	3	Yes	2	Yes	1	Yes	3	Yes	3	Yes	1
- Endangered Species	No	3	No	3	Yes	2	Yes	1	Yes	2	No	3	No	3
- Hydraulic & Hydrology	No Impact	3												
- Maximum Scour Depth (Feet)	66	1	66	1	35	3	35	3	35	3	36	3	54	2
- Air & Noise	No Impact	3												
- Hazardous Materials	No Impact	3												
<b>Total Rank</b>		<b>151</b>		<b>148</b>		<b>145</b>		<b>125</b>		<b>157</b>		<b>171</b>		<b>171</b>