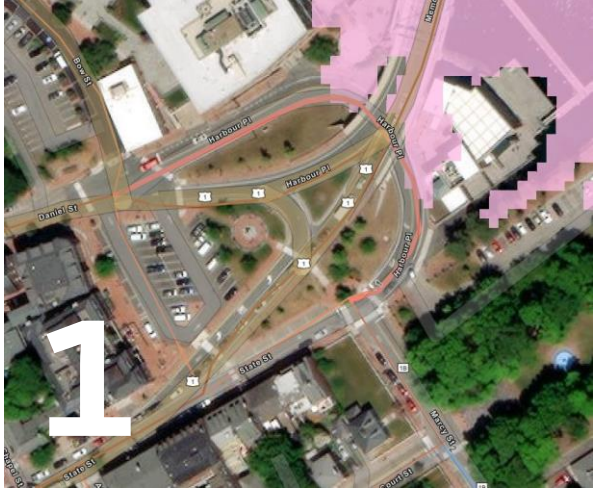
Appendix C: Site Profiles



Municipality: Portsmouth

Location: State St., Daniel St.

Cross Streets: Marcy St., Bow St.

Impacts Begin:	**4.0 Foot sea-level rise**
Tolerance for Flood Risk (High, Medium, Low, Very Low):	Low
Plan for Sea-level Rise Impacts by:	2080
State or Local Roads:	State and Local
Current Traffic Volume (Average Annual/Peak):	Daniel St 5,800 AADT State St 8,500 AADT Both west of site
Pavement Condition:	Fair
Infrastructure at Site:	Rip Rap/ Revetment
Water/Sewer Infrastructure:	Sewer and Water
Known Site Contamination:	No known site contamination
Existing Tidal Wetland Types (Upstream/ Downstream):	None
Invasive Species Present:	None
FEMA Floodplain Category:	X, AE
Average Ground Elevation:	14ft
Design Flood Elevation:	12ft (2050) 15.3ft (2100)
Projected Groundwater Rise:	1.2-2.2ft (2050) 5.2-6.2ft (2100)
Depth to Future Groundwater:	Data Needed
Projected Precipitation Estimates for 10-year 24-hour storm:	5.83 inches – 20% increase volume from present day

Site Description:

Site 1 contains approximately 550 feet of road segment and includes 2 intersections. The segment of State Street that loops under the Memorial bridge and merges into Daniel Street provides a connection between these two one-way streets and connections to Marcy Street and Bow Street. This roadway carries only a portion of the traffic that utilize both those roadways but provides access to Harbor Walk Park and Prescott Park.

Anticipated Site Impacts from Sea-Level Rise

At 4.0 feet of sea-level rise State Street becomes inundated from the adjacent Piscataqua River.

Estimated Impacts of closure due to SLR

Closing this connection will impact access to adjacent buildings and will require that vehicles utilize Dutton and Scott Avenues (Memorial Bridge approach) to transition between State and Daniel Streets.

Surrounding Land Use Profile

	Acres	Percent
Forested	0.0	0%
Industrial / Comm	1.3	39%
Open Wetlands	0.0	0%
Other/Idle	0.0	0%
Recreation	0.3	8%
Residential	0.6	18%
Transportation	1.1	35%
Water	0.0	0%

Municipality: Portsmouth

Location: Marcy Street

Cross Streets: Court St., Mechanic St., Hancock St.

Impacts Begin:	**4.0 Foot sea-level rise**
Tolerance for Flood Risk (High, Medium, Low, Very Low):	Low
Plan for Sea-level Rise Impacts by:	2080
State or Local Roads:	Local
Current Traffic Volume (Average Annual/Peak):	2,800 AADT 3,500 Peak
Pavement Condition:	Fair
Infrastructure at Site:	None
Water/Sewer Infrastructure:	Sewer and Water
Known Site Contamination:	No known site contamination
Existing Tidal Wetland Types (Upstream/ Downstream):	None
Invasive Species Present:	None
FEMA Floodplain Category:	X, AE
Average Ground Elevation:	27ft
Design Flood Elevation:	12ft (2050) 15.3ft (2100)
Projected Groundwater Rise:	1.2-2.2ft (2050) 5.2-6.2 (2100)
Depth to Future Groundwater:	Data Needed
Projected Precipitation Estimates for 10-year 24-hour storm:	5.83 inches – 20% increase volume from present day

Site Description:

Site 2 contains approximately 700 feet of road segment and includes 2 intersections. The portion of Marcy Street that is largely adjacent to Prescott Park and the Trial gardens to the east and Strawberry Banke to the west.

Anticipated Site Impacts from Sea-Level Rise

At 4.0 feet of sea-level rise Marcy Street becomes inundated from the adjacent Piscataqua River through Prescott Park just north of Mechanic Street. Pierce Island Road will be inundated limiting access to the island.

Estimated Impacts of closure due to SLR

Closing this section of Marcy Street will force some additional traffic to Court Street, South Street and Pleasant Street however the numerous city streets provide multiple routing choices that tends to disperse traffic throughout the area, resulting in many roads showing small increases in volume and few showing large increases.

Surrounding Land Use Profile

	Acres	Percent
Forested	0.0	0%
Industrial / Comm	1.3	32%
Open Wetlands	0.0	0%
Other/Idle	0.0	0%
Recreation	1.2	31%
Residential	0.7	17%
Transportation	0.8	21%
Water	0.0	0%

Municipality: Portsmouth

Location: Junkins Ave., Parrott Ave.

Cross Streets: Richards Ave., Lincoln Ave.

Impacts Begin:	**4.0 Foot sea-level rise**
Tolerance for Flood Risk (High, Medium, Low, Very Low):	Low
Plan for Sea-level Rise Impacts by:	2080
State or Local Roads:	State and Local
Current Traffic Volume (Average Annual/Peak):	N/A – Model uses 500 vehicles per day as baseline
Pavement Condition:	Fair
Infrastructure at Site:	Rip Rap/Revetment, Wall Tidal Crossing 70 Tidal Crossing 71
Water/Sewer Infrastructure:	Sewer and Water
Known Site Contamination:	Yes
Existing Tidal Wetland Types (Upstream/ Downstream):	Intertidal salt marsh
Invasive Species Present:	None
FEMA Floodplain Category:	X, AE
Average Ground Elevation:	27ft
Design Flood Elevation:	12ft (2050) 15.3ft (2100)
Projected Groundwater Rise:	(2050) (2100)
Depth to Future Groundwater:	Data Needed
Projected Precipitation Estimates for 10-year 24-hour storm:	5.83 inches – 20% increase volume from present day

Site Description:

Site 3 contains approximately 2950 feet (0.56 miles) of road segment and includes 2 intersections. Junkins Avenue crosses South Mill Pond on a causeway and connects Pleasant Street to Parrott Avenue, and South Street. Junkins Avenue provides access to Portsmouth City Hall and Police Department. Parrott Avenue follows the north edge of South Mill Pond, connects between Junkins and Richards Avenues, and provides access to the City Library and Middle School. Both roadways access the South Mill Pond Playground and Leary Field.

Anticipated Site Impacts from Sea-Level Rise

At 4.0 feet of sea-level rise Junkins Avenue and Parrott Avenue become inundated from South Mill Pond. This impacts the Middle School, Leary Field, and the public library as well.

Estimated Impacts of closure due to SLR

The model indicates that closing these roadways forces additional traffic onto surrounding streets such as Miller, Richards, and Lincoln Avenues (+17 to 60% volume). South Street also sees increased volume from closures on Junkins, Parrott, and New Castle Avenues and Marcy Street.

Surrounding Land Use Profile

	Acres	Percent
Forested	0.3	2%
Industrial / Comm	3.8	27%
Open Wetlands	0.0	0%
Other/Idle	0.3	2%
Recreation	3.5	24%
Residential	1.8	13%
Transportation	2.6	18%
Water	1.9	13%

Municipality: Portsmouth/ New Castle

Location: New Castle Avenue/ Portsmouth Avenue

Cross Streets: Marcy Street

Impacts Begin:	**4.0 Foot sea-level rise**
Tolerance for Flood Risk (High, Medium, Low, Very Low):	Low
Plan for Sea-level Rise Impacts by:	2080
State or Local Roads:	State and Local
Current Traffic Volume (Average Annual/Peak):	3,200 AADT 3,800 Peak
Pavement Condition:	Good/Poor
Infrastructure at Site:	Rip Rap/ Revetment, Wall, Bridge, Causeway
Water/Sewer Infrastructure:	Sewer and Water
Known Site Contamination:	No known site contamination
Existing Tidal Wetland Types (Upstream/ Downstream):	None
Invasive Species Present:	None
FEMA Floodplain Category:	X, AE, VE
Average Ground Elevation:	17ft
Design Flood Elevation:	12ft (2050) 15.3ft (2100)
Projected Groundwater Rise:	(2050) (2100)
Depth to Future Groundwater:	Data Needed
Projected Precipitation Estimates for 10-year 24-hour storm:	5.83 inches – 20% increase volume from present day

Site Description:

The segment of Marcy Street/New Castle Avenue/ Portsmouth Avenue from roughly Holmes Court in Portsmouth to New Castle Island. Provides northern connection between New Castle Island and mainland via a causeway between New Castle and Goat Islands and bridges between Goat and Shapleigh Islands and Shapleigh Island and the mainland. Predominantly residential land use in this area however the roadway is a significant bike/pedestrian route and tourist route and an evacuation route from New Castle Island.

Anticipated Site Impacts from Sea-Level Rise

At 4.0 feet of sea-level rise the roadway becomes inundated from the adjacent Piscataqua River.

Estimated Impacts of closure due to SLR

Closing this roadway cuts access to New Castle Island from Portsmouth as well as isolates 50+ houses. Combined with sites 5, 6, & 7, this results in the elimination of access to New Castle Island.

Surrounding Land Use Profile

	Acres	Percent
Mixed Urban	0.5	2%
Industrial / Comm	0.0	0%
Open Wetlands	0.0	0%
Other/Idle	2.6	8%
Recreation	0.0	0%
Residential	11.3	37%
Transportation	5.5	18%
Water	10.7	35%

Municipality: New Castle

Location: NH 1B

Cross Streets: Neal Pit Lane

Impacts Begin:	**4.0 Foot sea-level rise**
Tolerance for Flood Risk (High, Medium, Low, Very Low):	Low
Plan for Sea-level Rise Impacts by:	2080
State or Local Roads:	State and Local
Current Traffic Volume (Average Annual/Peak):	3,200 AADT 3,800 Peak
Pavement Condition:	Good/Poor
Infrastructure at Site:	Rip Rap/ Revetment, Wall, Bridge, Causeway
Water/Sewer Infrastructure:	Sewer and Water
Known Site Contamination:	No known site contamination
Existing Tidal Wetland Types (Upstream/ Downstream):	None
Invasive Species Present:	None
FEMA Floodplain Category:	X, AE, VE
Average Ground Elevation:	17ft
Design Flood Elevation:	12ft (2050) 15.3ft (2100)
Projected Groundwater Rise:	(2050) (2100)
Depth to Future Groundwater:	Data Needed
Projected Extreme Precipitation Estimates for 10-year 24-hour storm:	5.83 inches – 20% increase volume from present day

Site Description:

Site 5 contains 0.1 miles of road segment, 1 intersection, and 3 tidal stream crossings on Wentworth Road in New Castle near the intersection with Neals Pit Lane. This roadway provides the southern access to New Castle Island via a Bascule Bridge (set to be replaced by a fixed bridge in 2023) and is an evacuation route from the island. Provides access to Wentworth by the Sea hotel, Great Island Common.

Anticipated Site Impacts from Sea-Level Rise

At 4.0 feet of sea-level rise NH 1B is impacted at Neals Pit Lane where the roadway passes over a tidal stream and would be closed at that location. This site is linked to Sites 4, 6, and 7 as they combine to restrict access to New Castle Island by 4.0 feet of sea-level rise. If all cannot be addressed, either 4 and 5, or 5, 6, and 7 will be necessary to maintain access to New Castle Island.

Surrounding Land Use Profile*

	Acres	Percent
Forested	2.4	15%
Industrial / Comm	0.0	0%
Open Wetlands	0.6	4%
Other/Idle	1.2	7%
Recreation	1.9	11%
Residential	6.7	41%
Transportation	2.3	14%
Water	1.3	8%

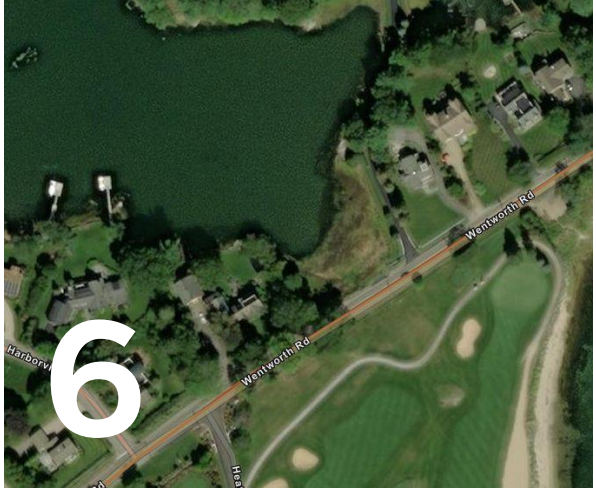
*Includes data for Sites 5, 6, and 7

Estimated Impacts of closure due to SLR

The closure at Neals Pit Lane in New Castle (3,200 AADT estimated) is one of four sections on NH 1B (Sites 4,5,6, and 7) that potentially eliminates access to New Castle Island by 4.0 feet of sea-level rise. Inundation at this site will separate the transportation network on the island into two pieces and addressing flooding at the site will ensure that full access within New Castle Island is maintained. To maintain some access to the island itself, sites 4 and 5, or sites 5, 6, and 7 will need to be addressed.

Adaptation Options

Site 5,6 & 7	NH 1B in Rye and New Castle
Accommodate	• Different materials: The pavement at these locations could be redesigned and reconstructed with materials (e.g. coarser gravels) that are not as susceptible to changes in moisture levels, allowing the traffic carrying capacity of the roadway to be maintained while the underlying layers are at a range of saturation levels. These modifications would accommodate SLR up to the level of pavement surface inundation while maintaining the existing roadway elevation. • Culverts at the sites could be evaluated and potentially redesigned to increase capacity and prevent or decrease the level of flooding of the roadway as well as increase the rate of pavement drainage. • Draining the pond to the west of site 5 could help to alleviate flooding issues at this site. • A causeway or bridge are not viable options at these sites, due to the expense and relatively short distance impacted by SLR. • Regular detours are not a viable option at these sites due to the lack of an alternative route.
Resist	• The roadway can be redesigned and rebuilt to raise the elevation of the pavement surface above expected SLR levels. This would necessitate construction of retaining walls or increased shoulder area and/or embankments, which may impact adjacent wetlands. • Berms would not be effective at these sites because they would only shift the flooding elsewhere.
Retreat	• There are limited alternate route options for these sites. A considerable distance separates the three locations of the impacts. Retreat would likely not be recommended unless the entire island is abandoned or alternate transportation (e.g. ferry service) implemented.



Municipality: Rye

Location: NH 1B

Cross Streets: Harborview Drive

Impacts Begin:	**4.0 Foot sea-level rise**
Tolerance for Flood Risk (High, Medium, Low, Very Low):	Low
Plan for Sea-level Rise Impacts by:	2080
State or Local Roads:	State
Current Traffic Volume (Average Annual/Peak):	3,200 AADT 5,100 Peak
Pavement Condition:	Fair
Infrastructure at Site:	None
Water/Sewer Infrastructure:	Water Only
Known Site Contamination:	No known site contamination
Existing Tidal Wetland Types (Upstream/ Downstream):	Low/High Marsh
Invasive Species Present:	Yes
FEMA Floodplain Category:	X, AE, VE
Average Ground Elevation:	28ft
Design Flood Elevation:	12ft (2050) 15.3ft (2100)
Projected Groundwater Rise:	(2050) (2100)
Depth to Future Groundwater:	Data Needed
Projected Extreme Precipitation Estimates for 10-year 24-hour storm:	5.85 inches – 20% increase volume from present day

Site Description:

Site 6 includes a short section (700 Feet) of NH 1B (Wentworth Road) in Rye near Sanders Poynt and the Wentworth By The Sea Country Club. This roadway provides the southern access to New Castle Island via a Bascule Bridge (set to be replaced by a fixed bridge in 2023) and is an evacuation route from the island. Provides access to Wentworth by the Sea hotel, Great Island Common.

Anticipated Site Impacts from Sea-Level Rise

At 4.0 feet of sea-level rise NH 1B is impacted at a low-lying segment of roadway adjacent to the Wentworth By The Sea Country Club and is anticipated to inundate the roadway rendering it unusable at least twice per day. This site is linked to Sites 4, 5, and 7 as they combine to restrict access to New Castle Island by 4.0 feet of sea-level rise. If all cannot be addressed, either 4 and 5, or 5, 6, and 7 will be necessary to maintain access to New Castle Island.

Surrounding Land Use Profile*

	Acres	Percent
Forested	2.4	15%
Industrial / Comm	0.0	0%
Open Wetlands	0.6	4%
Other/Idle	1.2	7%
Recreation	1.9	11%
Residential	6.7	41%
Transportation	2.3	14%
Water	1.3	8%

*Includes data for Sites 5, 6, and 7

Estimated Impacts of closure due to SLR

The closure near Sanders Poynt in Rye (3,200 AADT estimated) is one of four sections on NH 1B (Sites 4,5,6, and 7) that potentially eliminates access to New Castle Island by 4.0 feet of sea-level rise. Inundation at this site just south of the bridge over the Piscataqua River to New Castle Island would limit access to that community as well as a few residences in Rye. The only available alternate Route to access this area is via the north end of NH 1B beginning in Portsmouth and requires crossing two other locations subject to inundation from sea-level rise. To maintain some access to New Castle Island, sites 4 and 5, or sites 5, 6, and 7 will need to be addressed.

Adaptation Options

Site 5,6 & 7	NH 1B in Rye and New Castle
Accommodate	• Different materials: The pavement at these locations could be redesigned and reconstructed with materials (e.g. coarser gravels) that are not as susceptible to changes in moisture levels, allowing the traffic carrying capacity of the roadway to be maintained while the underlying layers are at a range of saturation levels. These modifications would accommodate SLR up to the level of pavement surface inundation while maintaining the existing roadway elevation. • Culverts at the sites could be evaluated and potentially redesigned to increase capacity and prevent or decrease the level of flooding of the roadway as well as increase the rate of pavement drainage. • Draining the pond to the west of site 5 could help to alleviate flooding issues at this site. • A causeway or bridge are not viable options at these sites, due to the expense and relatively short distance impacted by SLR. • Regular detours are not a viable option at these sites due to the lack of an alternative route.
Resist	• The roadway can be redesigned and rebuilt to raise the elevation of the pavement surface above expected SLR levels. This would necessitate construction of retaining walls or increased shoulder area and/or embankments, which may impact adjacent wetlands. • Berms would not be effective at these sites because they would only shift the flooding elsewhere.
Retreat	• There are limited alternate route options for these sites. A considerable distance separates the three locations of the impacts. Retreat would likely not be recommended unless the entire island is abandoned or alternate transportation (e.g. ferry service) implemented.

Municipality: Rye

Location: NH 1B

Cross Streets: Between Portsmouth Marina and Harborview Drive

Impacts Begin:	**4.0 Foot sea-level rise**
Tolerance for Flood Risk (High, Medium, Low, Very Low):	Low
Plan for Sea-level Rise Impacts by:	2080
State or Local Roads:	State
Current Traffic Volume (Average Annual/Peak):	3,200 AADT 5,100 Peak
Pavement Condition:	Fair
Infrastructure at Site:	Tidal Crossing 65
Water/Sewer Infrastructure:	Water Only
Known Site Contamination:	No known site contamination
Existing Tidal Wetland Types (Upstream/ Downstream):	High Marsh/Intertidal Habitat
Invasive Species Present:	Yes
FEMA Floodplain Category:	X, AE
Average Ground Elevation:	20ft
Design Flood Elevation:	12ft (2050) 15.3ft (2100)
Projected Groundwater Rise:	(2050) (2100)
Depth to Future Groundwater:	Data Needed
Projected Extreme Precipitation Estimates for 10-year 24-hour storm:	5.85 inches – 20% increase volume from present day

Site Description:

Site 7 includes a short section (800 Feet) of NH 1B (Wentworth Road) in Rye near the Portsmouth Marina. The site does include a tidal crossing. The current culvert is undersized and in poor condition. This roadway provides the southern access to New Castle Island via a Bascule Bridge (set to be replaced by a fixed bridge in 2023) and is an evacuation route from the island. Provides access to Wentworth by the Sea hotel, Great Island Common.

Anticipated Site Impacts from Sea-Level Rise

At 4.0 feet of sea-level rise NH 1B is impacted at a low-lying segment of roadway west of the Portsmouth Marina. Flooding at this location will restrict access to New Castle Island as well as the Wentworth By The Sea Country Club and approximately 50 residences. This site is linked to Sites 4, 5, and 7 as they combine to restrict access to New Castle Island by 4.0 feet of sea-level rise. If all cannot be addressed, either 4 and 5, or 5, 6, and 7 will be necessary to maintain access to New Castle Island.

Surrounding Land Use Profile*

	Acres	Percent
Forested	2.4	15%
Industrial / Comm	0.0	0%
Open Wetlands	0.6	4%
Other/Idle	1.2	7%
Recreation	1.9	11%
Residential	6.7	41%
Transportation	2.3	14%
Water	1.3	8%

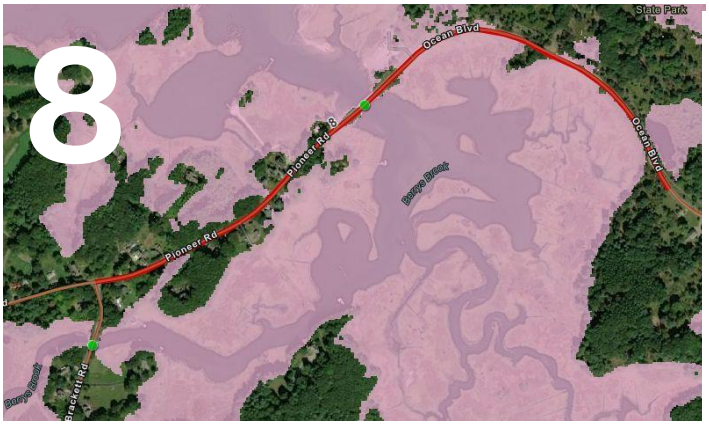
*Includes data for Sites 5, 6, and 7

Estimated Impacts of closure due to SLR

A roadway closure near Portsmouth Marina in Rye (3,200 AADT estimated) is one of four sections on NH 1B (Sites 4,5,6, and 7) that potentially eliminates access to New Castle Island by 4.0 feet of sea-level rise. Inundation at this site just south of the bridge over the Piscataqua River to New Castle Island would limit access to that community as well as residences in Rye. The only alternate route to this location is via the north end of NH 1B beginning in Portsmouth and that includes crossing three other locations impacted by sea-level rise. To maintain some access to New Castle Island, sites 4 and 5, or sites 5, 6, and 7 will need to be addressed.

Adaptation Options

Site 5,6 & 7	NH 1B in Rye and New Castle
Accommodate	• Different materials: The pavement at these locations could be redesigned and reconstructed with materials (e.g. coarser gravels) that are not as susceptible to changes in moisture levels, allowing the traffic carrying capacity of the roadway to be maintained while the underlying layers are at a range of saturation levels. These modifications would accommodate SLR up to the level of pavement surface inundation while maintaining the existing roadway elevation. • Culverts at the sites could be evaluated and potentially redesigned to increase capacity and prevent or decrease the level of flooding of the roadway as well as increase the rate of pavement drainage. • Draining the pond to the west of site 5 could help to alleviate flooding issues at this site. • A causeway or bridge are not viable options at these sites, due to the expense and relatively short distance impacted by SLR. • Regular detours are not a viable option at these sites due to the lack of an alternative route.
Resist	• The roadway can be redesigned and rebuilt to raise the elevation of the pavement surface above expected SLR levels. This would necessitate construction of retaining walls or increased shoulder area and/or embankments, which may impact adjacent wetlands. • Berms would not be effective at these sites because they would only shift the flooding elsewhere.
Retreat	• There are limited alternate route options for these sites. A considerable distance separates the three locations of the impacts. Retreat would likely not be recommended unless the entire island is abandoned or alternate transportation (e.g. ferry service) implemented.



Municipality: Rye

Location: NH 1A (Pioneer Road)

Cross Streets: Brackett Road

Impacts Begin:	**4.0 Foot sea-level rise**
Tolerance for Flood Risk (High, Medium, Low, Very Low):	Very Low
Plan for Sea-level Rise Impacts by:	2075
State or Local Roads:	State and Local Roads
Current Traffic Volume (Average Annual/Peak):	3,700 AADT 4,800 Peak
Pavement Condition:	Fair
Infrastructure at Site:	Rip Rap/Revetment, Wall, Bridge Tidal Crossing 59
Water/Sewer Infrastructure:	Water Only
Known Site Contamination:	No known site contamination
Existing Tidal Wetland Types (Upstream/ Downstream):	High Marsh/Intertidal Habitat Freshwater Wetlands
Invasive Species Present:	None
FEMA Floodplain Category:	X, AE
Average Ground Elevation:	12ft
Design Flood Elevation:	15ft (2050) 18.3ft (2100)
Projected Groundwater Rise:	1.2-2.2ft (2050) 3.2-6.2ft (2100)
Depth to Future Groundwater:	Data Needed
Projected Extreme Precipitation Estimates for 10-year 24-hour storm:	4.89 inches – 20% increase volume from present day

Site Description:

This section of NH 1A (Pioneer Road) provides access to Odiorne Point State Park and the Seacoast Science Center from the north and west. The roadway crosses Berrys Brook and wraps around the large tidal wetland area that surrounds that water way and is likely inundated over long stretches.

Anticipated Site Impacts from Sea-Level Rise

At 4.0 feet of sea-level rise the roadway becomes inundated from the Berrys Brook/Seavey Creek estuary in multiple locations between the Odiorne Point Boat Launch and the entrance to Odiorne Point State Park and impacts access to both those locations.

Estimated Impacts of closure due to SLR

Closing this roadway restricts access to Odiorne Point and combined with flooding at Site #9, eliminates it entirely. Traffic under this scenario would be re-routed to Brackett and Sagamore Roads to navigate around closures and access the coast.

Surrounding Land Use Profile

	Acres	Percent
Forested	7.2	32%
Industrial / Comm	0.0	0%
Open Wetlands	4.8	21%
Other/Idle	0.0	0%
Recreation	0.8	4%
Residential	5.5	24%
Transportation	2.9	13%
Water	1.4	6%

Municipality: Rye

Location: NH 1A (Pioneer Road)

Cross Streets: Parsons Road

Impacts Begin:	**4.0 Foot sea-level rise**
Tolerance for Flood Risk (High, Medium, Low, Very Low):	Very Low
Plan for Sea-level Rise Impacts by:	2075
State or Local Roads:	State and Local Roads
Current Traffic Volume (Average Annual/Peak):	1,400 AADT 4,100 Peak
Pavement Condition:	Good/Fair
Infrastructure at Site:	Tidal Crossing 58 Berm, Rip Rap, Revetment, Wall
Water/Sewer Infrastructure:	Water Only
Known Site Contamination:	No known site contamination
Existing Tidal Wetland Types (Upstream/ Downstream):	High Salt Marsh/High Salt Marsh Freshwater Marsh
Invasive Species Present:	None
FEMA Floodplain Category:	AO, AE, VE, X
Average Ground Elevation:	13ft
Design Flood Elevation:	15ft (2050) 18.3ft (2100)
Projected Groundwater Rise:	3.2-4.2ft (2050) 5.2-6.2ft (2100)
Depth to Future Groundwater:	Data Needed
Projected Extreme Precipitation Estimates for 10-year 24-hour storm:	4.89 inches – 20% increase volume from present day

Site Description:

This section of NH 1A (Pioneer Road) provides access to Odiorne Point State Park and the Seacoast Science Center from the south and stretches from entrance road south to Pulpit Rock Road along NH 1A. In addition to recreational areas, there are many residences on the southern portion of this segment.

Anticipated Site Impacts from Sea-Level Rise

A long stretch of roadway is expected to be inundated at 4.0 feet of sea-level rise due to the presence of both tidal/wave action east of the site and increased water in the Seavey Creek and adjacent wetlands west of the roadway. Flooding is anticipated from the southern end of the state park to approximately Davis Road, isolating Odiorne Point and the many houses in that area.

Estimated Impacts of closure due to SLR

Closing this roadway restricts access to Odiorne Point and combined with flooding at Site #8, eliminates it entirely. Traffic under this scenario would be re-routed to Brackett and Sagamore Roads to navigate around closures and access the coast.

Surrounding Land Use Profile

	Acres	Percent
Forested	1.3	6%
Industrial / Comm	0.3	1%
Open Wetlands	2.8	14%
Other/Idle	3.6	17%
Recreation	1.9	9%
Residential	4.6	22%
Transportation	5.4	26%
Water	0.9	4%

Municipality: Rye

Location: Marsh Rd, Parsons Rd

Cross Streets: Brackett Rd, NH 1A (Ocean Blvd)

Impacts Begin:	**1.0 Foot sea-level rise**
Tolerance for Flood Risk (High, Medium, Low, Very Low):	Low
Plan for Sea-level Rise Impacts by:	2030
State or Local Roads:	State and Local Roads
Current Traffic Volume (Average Annual/Peak):	N/A – Model uses 500 vehicles per day as baseline
Pavement Condition:	Fair
Infrastructure at Site:	Tidal Crossing 56 Tidal Crossing 57
Water/Sewer Infrastructure:	Water Only
Known Site Contamination:	No known site contamination
Existing Tidal Wetland Types (Upstream/ Downstream):	Freshwater Marsh
Invasive Species Present:	None
FEMA Floodplain Category:	AE, X
Average Ground Elevation:	17ft
Design Flood Elevation:	15ft (2050) 18.3ft (2100)
Projected Groundwater Rise:	2.2-3.2ft (2050) 2.2-3.2ft (2100)
Depth to Future Groundwater:	Data Needed
Projected Extreme Precipitation Estimates for 10-year 24-hour storm:	4.90 inches – 20% increase volume from present day

Site Description:

SLR Group 10 contains 0.55 miles of road segment, 4 intersections, and 2 tidal stream crossings. Parsons Rd/Marsh Road serves as a east-west connection between Brackett Rd and NH 1A. Wallis Sands State Beach is located at the southern end of this site. Marsh Road has one side street (Alan Court) located at the southern end of the road, and two driveways both located at the northern end close to the intersection with Parsons Road. The western portion of Parsons Road has a few residential units but is much more densely used in the section east of Marsh Rd that parallels NH 1A.

Anticipated Site Impacts from Sea-Level Rise

At 1' of sea-level rise Marsh Road is impacted in the southern-most section where the roadway passes through Parsons Creek Marsh and would be closed at that location. Under the 1.7' scenario, further inundation is expected on Parsons Road adjacent to Marsh Pond as well as in the area between Marsh Rd and Starboard Way. Four feet of sea-level rise expands the areas of impact on Marsh Road to Alan Court and extends flooding on Parsons Road at both locations inundated at lower levels.

Surrounding Land Use Profile

	Acres	Percent
Forested	1.3	10%
Industrial / Comm	0.4	3%
Open Wetlands	3.1	23%
Other/Idle	0.6	4%
Recreation	0.2	1%
Residential	4.5	33%
Transportation	2.8	21%
Water	0.6	4%

Estimated Impacts of closure due to SLR

The closure of Marsh Road in Rye (1000 AADT estimated) eliminates a connection from interior Rye to NH 1A near Wallis Sands State Park. The closure shifts Marsh Road traffic south to Wallis Road and north to Parsons Road to continue access. The Regional Travel Demand Model (Model) does not include the easterly portion of Parsons Road and so indicates all traffic on Marsh Road redirecting towards Wallis Road to access Bracket and Sagamore Roads. In the short term, this has implications for Bracket Road as the southern portion would receive more traffic while the northern portion may see a drop off in traffic as it becomes the less direct pathway and drivers choose Clark and Sagamore Roads instead. Realistically, some of the traffic currently using Marsh Road would move further north to access destinations on Parsons Road directly. This pattern holds through the 1.0 foot and 1.7 foot scenarios however the impacts of the 4.0 foot scenario shift traffic further. At four feet of sea-level rise, the entirety of Marsh Road and Parsons Road become inaccessible due to inundation on those roadways as well as NH 1A which is impacted south of Marsh Road and in multiple locations along Odiorne Point. Maintaining travel on Ocean Blvd around Odiorne point is likely to be costly and technically challenging as the roadway is facing flooding from interior marshlands as well as direct inundation and wave action from the ocean. Under this scenario, ensuring access to Marsh Road and Parsons Road may be an option that is both less costly and technically challenging.

Adaptation Options

Site 10	Marsh Rd, Parsons Rd /Rye
Accommodate	• Different materials: The pavement at these locations could be redesigned and reconstructed with materials (e.g. coarser gravels) that are not as susceptible to changes in moisture levels, allowing the traffic carrying capacity of the roadway to be maintained while the underlying layers are at a range of saturation levels. These modifications would accommodate SLR up to the level of pavement surface inundation while maintaining the existing roadway elevation. • New culverts at the site will not be sufficient to handle SLR due to the geometry and site conditions • A causeway or bridge along the impacted stretch is a viable option due to the geometry and site conditions. • In the near future, regular detours with routine deployment of temporary signage or installation of permanent signage are a viable option at these sites due to multiple alternate routes.
Resist	• The roadway can be redesigned and rebuilt to raise the elevation of the pavement surface above expected SLR levels. This would necessitate increased shoulder area and/or embankments, which may impact adjacent wetlands. • Berms could be constructed along the edges of the roadway along the affected areas to keep the water off the roadway. Because this may impact adjacent wetlands and adjacent homes, a hydrology and hydraulics analysis is recommended.
Retreat	• Retreat is possible given the limited infrastructure and dwellings and alternate routes. Retreat would need to be considered in conjunction with sections of Ocean Blvd (sites 8 and 9) See additional details in Task 1D.

Municipality: Rye

Location: NH 1A

Cross Streets: Marsh Road, Wallis Road

Impacts Begin:	**4.0 Foot sea-level rise**
Tolerance for Flood Risk (High, Medium, Low, Very Low):	Low
Plan for Sea-level Rise Impacts by:	2080
State or Local Roads:	State and Local Roads
Current Traffic Volume (Average Annual/Peak):	2,100 AADT 6,300 Peak
Pavement Condition:	Poor
Infrastructure at Site:	Tidal Crossing 51 (bridge) Tidal Crossing 53 Tidal Crossing 54 Tidal Crossing 55
Water/Sewer Infrastructure:	Water Only
Known Site Contamination:	No known site contamination
Existing Tidal Wetland Types (Upstream/ Downstream):	High Marsh/ High Marsh
Invasive Species Present:	Yes
FEMA Floodplain Category:	AO, E, X
Average Ground Elevation:	14ft
Design Flood Elevation:	15ft (2050) 18.3ft (2100)
Projected Groundwater Rise:	2.2-3.2ft (2050) 3.2-4.2ft (2100)
Depth to Future Groundwater:	Data Needed
Projected Extreme Precipitation Estimates for 10-year 24-hour storm:	4.92 inches – 20% increase volume from present day

Site Description:

Site 11 contains just over 1 mile of road segments on NH 1A and Wallis Road between Wallis Sands State Beach Park and Concord Point in Rye. The site includes 3 intersections and 4 tidal stream crossings, (1 bridge) and is situated adjacent to Parsons Creek Marsh for much of its length. This segment provides access to Wallis Sands State Beach Park, Pirates Cove Beach, commercial uses, and approximately 80 residences. Wallis Road provides an east-west connection between NH 1A and Brackett Road, Sagamore Road, and Rye's town center. This location is immediately south of Site #10.

Anticipated Site Impacts from Sea-Level Rise

At 4.0 feet of sea-level rise, NH 1A is impacted multiple locations through this segment. Starting at the northern end, flooding is expected to encroach on the road in 4-5 locations between Wallis Sands State Beach Park and Old Ocean Blvd, and two locations between Old Ocean Blvd and Wallis Road. South of Wallis Road, there is one location along with several sites where the water is very near the roadway. Wallis Road is inundated between NH 1A and Oceanview Avenue impacting access to Appledore Avenue and the houses on that street.

Surrounding Land Use Profile

	Acres	Percent
Forested	0.0	0%
Industrial / Comm	4.1	14%
Open Wetlands	9.3	32%
Other/Idle	0.6	2%
Recreation	1.6	6%
Residential	7.3	25%
Transportation	5.7	20%
Water	0.1	1%

Estimated Impacts of closure due to SLR

Closure on this section of NH 1A would have direct impacts on access to Wallis Sands State Park and nearly 100 residences. Wallis Road provides an east-west connection between interior Rye and the coast. Wallis Road also provides connections to Brackett and Sagamore Roads that facilitate north-south travel. Closure shifts NH 1A traffic to interior parallel routes such as Sagamore Road and Brackett Road (also impacted by sea-level rise).

Adaptation Options

Site 11	NH 1A and Wallis Road in Rye
Accommodate	• Different materials: The pavement at this location could be redesigned and reconstructed with materials (e.g. coarser gravels) that are not as susceptible to changes in moisture levels, allowing the traffic carrying capacity of the roadway to be maintained while the underlying layers are at a range of saturation levels. These modifications would accommodate SLR up to the level of pavement surface inundation while maintaining the existing roadway elevation. • Culverts at the sites could be evaluated and potentially redesigned to increase capacity and prevent or decrease the level of flooding of the roadway as well as increase the rate of pavement drainage. • A causeway or bridge is not a viable option at this site due to length of roadway impacted. • In the near future, regular detours with permanent signage are a viable option at these sites due to multiple alternate routes.
Resist	• The roadway can be redesigned and rebuilt to raise the elevation of the pavement surface above expected SLR levels. This would necessitate construction of retaining walls or increased shoulder area and/or embankments, which may impact adjacent wetlands. • Berms would not be effective at this site because they would only shift the flooding elsewhere.
Retreat	• Retreat is possible given the limited infrastructure and dwellings and existing alternate routes. Retreat would need to be considered in conjunction with sections of NH 1A and Marsh and Parsons Road (sites 8, 9, and 10).

Municipality: Rye

Location: Brackett Road

Cross Streets: Wallis Road, Washington Road

Impacts Begin:	**4.0 Foot sea-level rise**
Tolerance for Flood Risk (High, Medium, Low, Very Low):	Low
Plan for Sea-level Rise Impacts by:	2080
State or Local Roads:	Local Roads
Current Traffic Volume (Average Annual/Peak):	1,500 AADT 2,600 Peak Count site is not on this segment
Pavement Condition:	No Data
Infrastructure at Site:	Tidal Crossing 52
Water/Sewer Infrastructure:	Water Only
Known Site Contamination:	No known site contamination
Existing Tidal Wetland Types (Upstream/ Downstream):	High Salt Marsh/High Salt Marsh Freshwater Marsh
Invasive Species Present:	No
FEMA Floodplain Category:	X, AE
Average Ground Elevation:	25ft
Design Flood Elevation:	15ft (2050) 18.3ft (2100)
Projected Groundwater Rise:	0.7-1.2ft (2050) 1.2-2.2ft (2100)
Depth to Future Groundwater:	Data Needed
Projected Extreme Precipitation Estimates for 10-year 24-hour storm:	4.91 inches – 20% increase volume from present day

Site Description:

The southern-most section of Bracket Road between Wallis Road and Washington Road is impacted beginning at the 4.0' SLR scenario. This roadway parallels NH 1A and provides a local connector between Wallis and Washington Roads. The roadway is primarily residential and sees impacts in the area south of Geremia Street where it runs parallel to the tidal marsh.

Anticipated Site Impacts from Sea-Level Rise

A short section of roadway is expected to be inundated at 4.0 feet of sea-level rise around Geremia Street and near the tidal stream crossing further south. Access could be limited to a few houses south of Geremia Street and potentially those on Geremia Street itself.

Estimated Impacts of closure due to SLR

Closing this roadway eliminates a parallel road to NH 1A and restricts alternatives for travel along the coast. Through traffic that would typically utilize this roadway would likely use Long John Road instead.

Surrounding Land Use Profile

	Acres	Percent
Forested	2.0	13%
Active Agricultural	0.1	1%
Open Wetlands	4.0	25%
Other/Idle	0.3	2%
Recreation	0.0	0%
Residential	7.5	47%
Transportation	2.0	13%
Water	0.0	0%

Municipality: Rye

Location: NH 1A

Cross Streets: Locke Rd, Harbor Road

Impacts Begin:	**4.0 Foot sea-level rise**
Tolerance for Flood Risk (High, Medium, Low, Very Low):	Low
Plan for Sea-level Rise Impacts by:	2080
State or Local Roads:	State and Local
Current Traffic Volume (Average Annual/Peak):	3,300 AADT 5,800 Peak
Pavement Condition:	Good/Fair
Infrastructure at Site:	Tidal Crossing 45 Tidal Crossing 46 Tidal Crossing 47 Tidal Crossing 50 (bridge) Shoreline Structures
Water/Sewer Infrastructure:	Water Only
Known Site Contamination:	No known site contamination
Existing Tidal Wetland Types (Upstream/ Downstream):	High Marsh/ High Marsh. Fresh and tidal
Invasive Species Present:	Yes
FEMA Floodplain Category:	X, AO, AE, VE
Average Ground Elevation:	15ft
Design Flood Elevation:	7-24ft (2050) 10.3-27.3ft (2100)
Projected Groundwater Rise:	0.7-4.2ft (2050) 3.2-8.2ft (2100)
Depth to Future Groundwater:	Data Needed
Projected Precipitation Estimates for 10-year 24-hour storm:	4.94 inches– 20% increase volume from present day

Site Description:

This lengthy segment extends from Washington Road south along NH 1A to roughly the area of E. Atlantic Avenue and provides access to residential areas and Rye Harbor. NH 1A passes through both the Awcomin Marsh and Rye Harbor Marsh. There is significant residential development in the area with most houses located south of Locke Road but others along Harbor Road and many along NH 1A north of Rye Harbor. The area adjacent to Harbor Road is frequently inundated during storm and extreme high tide events.

Anticipated Site Impacts from Sea-Level Rise

This segment of NH 1A experiences consistent impacts beginning around 4.0 feet SLR and at multiple locations. Flooding is expected on NH 1A in 3-4 locations adjacent to the harbor. South of the bridge (Tidal Crossing 50), the roadway is inundated along the western face of the harbor to an area 700-800 feet south of Harbor Road. Both Harbor Road and Locke Road are inundated as well. Further south, water again appears to encroach on the roadway just north of E. Atlantic Avenue. Flooding impacts many houses along NH 1A to Cable Road and isolates others along Locke, Harbor, and Old Beach Roads.

Surrounding Land Use Profile

	Acres	Percent
Forested	4.4	8%
Industrial / Comm	0.7	1%
Open Wetlands	12.7	24%
Other/Idle	6.8	13%
Recreation	1.9	3%
Residential	14.4	27%
Transportation	10.9	20%
Water	2.1	4%

Estimated Impacts of closure due to SLR

Closure on this section of NH 1A would inundate or impact access to Rye Harbor and over 100 residences between Cable Road and Washington Road. Closure of NH 1A will shift traffic to interior parallel routes such as Central Road Sagamore Road and the western segments of Wallis Road. South Road, Love Lane, and Woodland Road also would likely see increased volumes of traffic as they provide access around other inundated areas along NH 1A. Closure of Locke Road and Harbor Road west of NH 1A impacts access/egress from the coast and serves to concentrate traffic in the Jenness Beach area as one of the few easily accessible locations in Rye under this scenario.

Adaptation Options

Site 13	NH 1A and Locke Road in Rye
Accommodate	• Different materials: The pavement at these locations could be redesigned and reconstructed with materials (e.g. coarser gravels) that are not as susceptible to changes in moisture levels, allowing the traffic carrying capacity of the roadway to be maintained while the underlying layers are at a range of saturation levels. These modifications would accommodate SLR up to the level of pavement surface inundation while maintaining the existing roadway elevation. • Culvert along Locke Rd could be evaluated and potentially redesigned to increase capacity and prevent, or decrease the level of flooding of the roadway as well as increase the rate of pavement drainage. • A causeway or bridge is not a viable option at this site due to length of roadway impacted. • In the near future, regular detours with permanent signage are a viable option at these sites due to multiple alternate routes.
Resist	• The roadway can be redesigned and rebuilt to raise the elevation of the pavement surface above expected SLR levels. This would necessitate increased shoulder area and/or embankments, which may impact adjacent wetlands. The roadway may also be categorized as a dam if this were done and impacts of wave action would need to be considered. • Berms would not be effective at this site because they would only shift the flooding elsewhere.
Retreat	• Retreat is a possible option for Locke Rd due to alternative access to existing dwellings. Retreat along Ocean Blvd needs to be considered with respect to the status of Rye Harbor and the remainder of Ocean Blvd.

Municipality: North Hampton/ Hampton

Location: NH 1A

Cross Streets: Sea Road, Noreast Lane, Appledore Ave

Impacts Begin:	**4.0 Foot sea-level rise**
Tolerance for Flood Risk (High, Medium, Low, Very Low):	Low
Plan for Sea-level Rise Impacts by:	2080
State or Local Roads:	State and Local
Current Traffic Volume (Average Annual/Peak):	5,300 AADT 8,200 Peak Count site is north of this segment
Pavement Condition:	Good/Poor
Infrastructure at Site:	Tidal Crossing 33 Tidal Crossing 34 Tidal Crossing 35 Tidal Crossing 36
Water/Sewer Infrastructure:	Water and Sewer
Known Site Contamination:	No known site contamination
Existing Tidal Wetland Types (Upstream/ Downstream):	High Salt Marsh/ Intertidal Habitat /Invasive Dominant
Invasive Species Present:	Yes
FEMA Floodplain Category:	AO, AE, VE
Average Ground Elevation:	10ft
Design Flood Elevation:	11ft (2050) 14.3 (2100)
Projected Groundwater Rise:	0.7-2.2ft (2050) 2.2-4.2ft (2100)
Depth to Future Groundwater:	Data Needed
Projected Precipitation Estimates for 10-year 24-hour storm:	4.97 inches – 20% increase volume from present day

Site Description:

This segment straddles the Hampton/North Hampton town lines in the vicinity of North Hampton Beach Park. Northern end is in the vicinity of Sea Road where an undersized culvert drains the Little River and adjacent wetlands into the Atlantic Ocean. Southern end of inundated area is in the vicinity of Noreast Drive in Hampton. Huckleberry Lane (Hampton), Appledore Avenue (North Hampton) and Viano Island (North Hampton) are also all inundated at 4' SLR.

Anticipated Site Impacts from Sea-Level Rise

NH 1A is expected to be inundated at 4.0 feet of sea-level rise around between Sea Road in North Hampton and Noreast Lane in Hampton. This will impact access to North Hampton State Beach Park as well as residences along NH 1A, Appledore Ave, and Viano Island.

Estimated Impacts of closure due to SLR

Closing this roadway eliminates a section of NH 1A and forces vehicles to parallel routes such as Woodland Avenue which anticipates a more than 100% increase in volume under this scenario.

Surrounding Land Use Profile

	Acres	Percent
Forested	0.0	0%
Industrial/Commercial	1.4	8%
Open Wetlands	2.4	14%
Other/Idle	1.1	6%
Recreation	0.0	0%
Residential	7.8	46%
Transportation	4.1	24%
Water	0.1	1%

Municipality: Hampton

Location: Cusack Road

Cross Streets: NH 1A, North Shore Road

Impacts Begin:	**1.7 Foot sea-level rise**
Tolerance for Flood Risk (High, Medium, Low, Very Low):	Low
Plan for Sea-level Rise Impacts by:	2045
State or Local Roads:	Local
Current Traffic Volume (Average Annual/Peak):	900 AADT 1,000 Peak
Pavement Condition:	Fair/Poor
Infrastructure at Site:	Tidal Crossing 17
Water/Sewer Infrastructure:	Water and Sewer
Known Site Contamination:	No known site contamination
Existing Tidal Wetland Types (Upstream/ Downstream):	High Marsh/ High Freshwater
Invasive Species Present:	Yes
FEMA Floodplain Category:	AO, AE, VE
Average Ground Elevation:	5ft
Design Flood Elevation:	12ft (2050) 15.3ft (2100)
Projected Groundwater Rise:	0.7-2.2ft (2050) 2.2-3.2ft (2100)
Depth to Future Groundwater:	Data Needed
Projected Precipitation Estimates for 10-year 24-hour storm:	4.98 inches – 20% increase volume from present day

Site Description:

Cusack Road provides a connection from Hampton neighborhoods north of High Street to NH 1A. Development on the road is concentrated on either end as the central portion is on a causeway through the northern part of the Meadow Pond wetlands. Development is primarily residential in nature and abuts the wetland area along each edge.

Anticipated Site Impacts from Sea-Level Rise

Cusack Road will see regular impacts beginning at around 1.7 feet sea-level rise. Development both north and south of the roadway adjacent to the wetlands will begin to experience inundation and the area and number of buildings impacted expands at 4.0 feet of sea-level rise. Outside of those buildings that are inundated, the flooding of this roadway would have limited impacts on accessibility to adjacent land uses.

Surrounding Land Use Profile

	Acres	Percent
Forested	0.0	0%
Industrial / Comm	0.0	0%
Open Wetlands	2.2	42%
Other/Idle	0.2	5%
Recreation	0.0	0%
Residential	1.7	33%
Transportation	1.0	20%
Water	0.0	0%

Estimated Impacts of closure due to SLR

Closure of Cusack Road due to sea-level rise by itself would have minimal impact to the transportation network as it is a relatively low-volume roadway with multiple alternative routes available. Under sea-level conditions that are higher by 1.7 feet or more, the closure of this roadway, combined with the closure of High Street, forces traffic north to North Shore Road or south to Winnacunnet Road to connect between the interior and the coast. Woodland and North Shore Roads experience significantly higher traffic volumes as does Winnacunnet Road.

Adaptation Options

Site 15	Cusack Road in Hampton
Accommodate	• Different materials: The pavement at this location could be redesigned and reconstructed with materials (e.g. coarser gravels) that are not as susceptible to changes in moisture levels, allowing the traffic carrying capacity of the roadway to be maintained while the underlying layers are at a range of saturation levels. These modifications would accommodate SLR up to the level of pavement surface inundation while maintaining the existing roadway elevation. • Resizing culverts would not be an effective solution due to the geometry and site conditions. • A causeway or bridge is not a viable option at this site due to length of roadway impacted. • In the near future, regular detours with permanent signage are a viable option at these sites due to multiple alternate routes.
Resist	• The roadway can be redesigned and rebuilt to raise the elevation of the pavement surface above expected SLR levels. This would necessitate increased shoulder area and/or embankments, which may impact adjacent wetlands. • Berms could be constructed along the edges of the roadway along the affected areas to keep the water off the roadway.
Retreat	• Retreat is a viable option due to the lack of development along the impacted area and existing alternate routes.

Municipality: Hampton

Location: High Street

Cross Streets: NH 1A, Mill Pond Lane, Kings Highway

Impacts Begin:	**1.0 Foot sea-level rise**
Tolerance for Flood Risk (High, Medium, Low, Very Low):	Low
Plan for Sea-level Rise Impacts by:	2080
State or Local Roads:	State and Local
Current Traffic Volume (Average Annual/Peak):	5,600 AADT 8,900 Peak
Pavement Condition:	Fair/Poor
Infrastructure at Site:	Tidal Crossing 15 Tidal Crossing 16
Water/Sewer Infrastructure:	Sewer & water
Known Site Contamination:	No known site contamination
Existing Tidal Wetland Types (Upstream/ Downstream):	High Marsh/ High Freshwater/ Saltwater
Invasive Species Present:	Yes
FEMA Floodplain Category:	AE, AO
Average Ground Elevation:	5ft
Design Flood Elevation:	11-12ft (2050) 14.3-15.3(2100)
Projected Groundwater Rise:	0.2-1.2ft (2050) 1.2-3.2ft (2100)
Depth to Future Groundwater:	Data Needed
Projected Precipitation Estimates for 10-year 24-hour storm:	4.98 inches – 20% increase volume from present day

Site Description:

High Street is the portion of NH 27 between US 1 and NH 1A. The area impacted by SLR is the eastern-most segment between Mill Pond Lane and NH1A as this segment sits on a low causeway through the Meadow Pond marsh area. Development along this section of the corridor is primarily residential and is along both eastern and western edges of the wetland as well as along the north side of the street where it passes through the marsh.

Anticipated Site Impacts from Sea-Level Rise

High Street is inundated between Mill Pond Lane and Kings Highway where the roadway passes through the Meadow Pond marsh/wetland area. The data indicates that flooding along this section of High Street would begin by 1.0 feet of sea-level rise, would be widespread, and would impact all the residential units in that area as well as some along Gentian Road, Greene Street, and Meadow Pond Road. 4.0 feet of SLR extends flooding further into the neighborhoods adjacent to Meadow Pond much of the development between the existing wetlands and NH 1A. More of High Street is flooded under higher SLR scenarios but functionally little changes from lower scenarios.

Surrounding Land Use Profile

	Acres	Percent
Mixed Urban	0.3	3%
Industrial / Comm	0.2	2%
Open Wetlands	1.7	18%
Other/Idle	0.2	2%
Recreation	0.0	0%
Residential	4.2	43%
Transportation	2.9	30%
Water	0.2	2%

Estimated Impacts of closure due to SLR

Closure of High Street disrupts a primary access route to Hampton Beach and NH 1A. Traffic (current volumes between 5,600-8,900 vehicles per day) is redirected north onto Woodland Avenue and North Shore Road and south to Winnacunnet Road as alternate routes between the interior and the coast. This traffic shift onto those roadways grows larger under higher SLR conditions as few options for accessing the coast are available due to inundation and the traffic is concentrated onto those roadways that remain viable.

High Street was not explicitly studied as part of the Meadow Pond Flood Mitigation Analysis for the Town of Hampton, however some of the adaptation options developed as part of that assessment are applicable or have an impact on the roadway.

Adaptation Options

Site 16	NH 27 (High Street) in Hampton [Meadow Pond Analysis linked below] https://www.hamptonnh.gov/DocumentCenter/View/4137/Final-Report-Meadow-Pond_SLR
Accommodate	• Different materials: The pavement at this location could be redesigned and reconstructed with materials (e.g. coarser gravels) that are not as susceptible to changes in moisture levels, allowing the traffic carrying capacity of the roadway to be maintained while the underlying layers are at a range of saturation levels. These modifications would accommodate SLR up to the level of pavement surface inundation while maintaining the existing roadway elevation. • A causeway or bridge along the impacted stretch is a viable option. • In the near future, regular detours with permanent signage are a viable option at these sites due to multiple alternate routes.
Resist	• The roadway can be redesigned and rebuilt to raise the elevation of the pavement surface above expected SLR levels. This would necessitate increased shoulder area and/or embankments, which may impact adjacent wetlands. • The Meadow Pond Flood Analysis indicates that berms around Gentian Road may protect that area along Kings Highway without adversely impacting flooding levels elsewhere.
Retreat	• Retreat is not a desired option due to the homes and businesses along the roadway but may be necessary at some point. • Managed retreat is considered a viable option in the Meadow Pond Flood Mitigation analysis and may provide positive benefits to inundation on High Street as well.

Municipality: Hampton

Location: Winnacunnet Road (NH 101E)

Cross Streets: NH 1A, Viking Street, Kings Highway

Impacts Begin:	**4.0 Foot sea-level rise**
Tolerance for Flood Risk (High, Medium, Low, Very Low):	Low
Plan for Sea-level Rise Impacts by:	2080
State or Local Roads:	State Road (Urban Compact)
Current Traffic Volume (Average Annual/Peak):	4,800 AADT 7,200 Peak
Pavement Condition:	Good/Very Poor
Infrastructure at Site:	Tidal Crossing 14 (bridge)
Water/Sewer Infrastructure:	Water and Sewer
Known Site Contamination:	Yes
Existing Tidal Wetland Types (Upstream/ Downstream):	High Marsh/ High Freshwater/ Saltwater
Invasive Species Present:	Yes
FEMA Floodplain Category:	AO, AE, VE
Average Ground Elevation:	8ft
Design Flood Elevation:	11-12ft (2050) 14.3-15.3ft (2100)
Projected Groundwater Rise:	2.2-4.2ft (2050) 4.2-8.2ft (2100)
Depth to Future Groundwater:	Data Needed
Projected Precipitation Estimates for 10-year 24-hour storm:	4.98 inches – 20% increase volume from present day

Site Description:

Winnacunnet Road (NH 101E) connects Hampton town center to NH 1A (Ocean Boulevard) and passes through the Meadow Pond marsh area near the connection to NH 1A. Development along Winnacunnet Road is primarily residential with housing bordering the wetland area along the length of the roadway in this area.

Anticipated Site Impacts from Sea-Level Rise

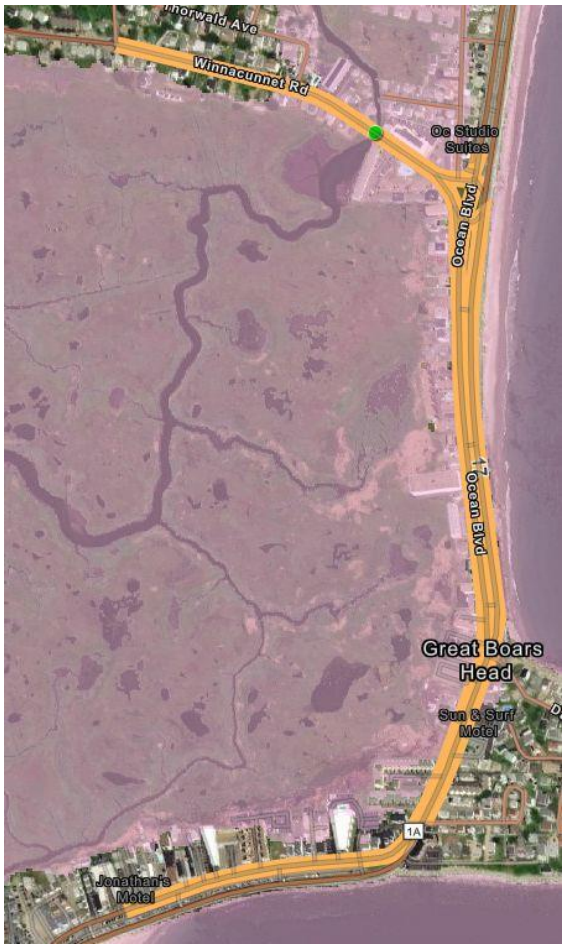
At 4.0 feet of SLR Winnacunnet Road is inundated between Viking Street and the intersection with NH 1A making much of the development in that area inaccessible. At this level of flooding, everything along Winnacunnet Road from NH 1A to Viking Street is inaccessible. Flooding touches on NH 1A at the intersection with Winnacunnet Road and potentially eliminates southbound travel between there and Great Boars Head. By 4.0 feet SLR, water is expected to be entirely over NH 1A near Great Boar's Head restricting travel in both directions and restricting access to that neighborhood.

Surrounding Land Use Profile

	Acres	Percent
Mixed Urban	0.0	0%
Industrial / Comm	2.3	7%
Open Wetlands	0.3	1%
Other/Idle	3.5	10%
Recreation	0.0	0%
Residential	14.7	43%
Transportation	12.8	38%
Water	0.2	1%

Estimated Impacts of closure due to SLR

At lower levels of SLR, Winnacunnet road would be the recipient of much of traffic diverted from the NH 101 and High Street corridors and would expect to see substantial increases in traffic volume. At 4.0 feet SLR Winnacunnet Road itself becomes impacted disrupting the last remaining primary access route to Hampton Beach and NH 1A in the town of Hampton. Traffic would be redirected north onto Woodland Avenue and North Shore Road as the only remaining alternate routes between the interior and the coast in the area. The impacts on NH 1A south of Winnacunnet Road would limit north-south travel between Hampton Beach and North Beach.



Winnacunnet Road was examined as part of the Meadow Pond Flood Mitigation Analysis (link below) for the Town of Hampton and adaptation options that were developed as part of that assessment can be applicable.

Adaptation Options

Site 17	Winnacunnet Road (NH 101E) in Hampton [Meadow Pond analysis linked below] https://www.hamptonnh.gov/DocumentCenter/View/4137/Final-Report-Meadow-Pond_SLR
Accommodate	• Different materials: The pavement at this location could be redesigned and reconstructed with materials (e.g. coarser gravels) that are not as susceptible to changes in moisture levels, allowing the traffic carrying capacity of the roadway to be maintained while the underlying layers are at a range of saturation levels. These modifications would accommodate SLR up to the level of pavement surface inundation while maintaining the existing roadway elevation. • Hydraulic modeling indicates that widening the bridge at this location will result in slightly decreased flooding downstream and increased flooding upstream • A causeway along the impacted stretch is a viable option. • Hydraulic analysis as part of the Meadow Pond study indicates that drainage improvements along Kings Highway, Gentian Road, Greene Street, and the other adjacent streets can reduce flooding north of Winnacunnet Road.
Resist	• The roadway can be redesigned and rebuilt to raise the elevation of the pavement surface above expected SLR levels. This would necessitate increased shoulder area and/or embankments, which may impact adjacent wetlands.
Retreat	• Retreat is not a desired option due to the homes and businesses along the roadway but may be necessary at some point.

18

Municipality: Hampton

Location: NH 101/ Highland Avenue, Church Street

Cross Streets: Brown Avenue

Impacts Begin:	**1.0 Foot sea-level rise**
Tolerance for Flood Risk (High, Medium, Low, Very Low):	Low
Plan for Sea-level Rise Impacts by:	2030
State or Local Roads:	State Road (Urban Compact)
Current Traffic Volume (Average Annual/Peak):	8,100 AADT 17,700 Peak
Pavement Condition:	Poor/Very Poor
Infrastructure at Site:	Tidal Crossing 8 Tidal Crossing 9 Tidal Crossing 10 Tidal Crossing 11 Tidal Crossing 12 Tidal Crossing 13
Water/Sewer Infrastructure:	Water and Sewer
Known Site Contamination:	No known site contamination
Existing Tidal Wetland Types (Upstream/ Downstream):	High Marsh/ High Freshwater/ Saltwater
Invasive Species Present:	Yes
FEMA Floodplain Category:	AO, AE, VE
Average Ground Elevation:	8ft
Design Flood Elevation:	11-12ft (2050) 14.3-15.3ft (2100)
Projected Groundwater Rise:	2.2-4.2ft (2050) 4.2-8.2ft (2100)
Depth to Future Groundwater:	Data Needed
Projected Precipitation Estimates for 10-year 24-hour storm:	4.98 inches – 20% increase volume from present day

Site Description:

Highland Avenue forms the eastbound connection of NH 101 to Ocean Boulevard and Hampton Beach. Church Street is the westbound pairing providing egress from the beach to NH 101. Brown avenue provides an alternative access to Hampton Beach via Ashworth Avenue in addition to providing access to the Hampton Beach Police and Fire Stations. NH 101 traverses a causeway through the Hampton-Seabrook Estuary and much of the development in the area is on slightly higher ground both within and adjacent to the marsh. Land use along this section is primarily residential with commercial uses concentrated along NH 1A.

Anticipated Site Impacts from Sea-Level Rise

Highland Avenue, the eastbound leg of NH 101, is inundated just east of Brown Avenue at 1.0 feet SLR. At 1.7 feet SLR the inundated area expands to include Church Street and Brown Avenue and at 4.0 feet SLR flooding inundates much of Brown Avenue and Church Street as well as about 50% of Highland Avenue. The density of development is high in this vicinity and there would be a substantial number of buildings with varying levels of inundation and access limitations.

Surrounding Land Use Profile

	Acres	Percent
Utilities	1.0	3%
Industrial / Comm	5.4	16%
Open Wetlands	5.3	16%
Other/Idle	0.0	0%
Recreation	0.0	0%
Residential	13.9	42%
Transportation	7.8	23%
Water	0.0	0%

Estimated Impacts of closure due to SLR

The closure of Highland Avenue at 1.0 feet SLR creates an early system disruption that can be adjusted for by additional use of Brown Avenue and Island Path for access to Hampton Beach. Inundation on Church Street and Brown Avenue at 1.7 feet SLR shift much of the traffic to Winnacunnet Road and NH 286 as alternate routes to Hampton Beach. Island Path would also remain open at that level of SLR and would be a routing option. At 4.0 feet SLR this route is fully inundated, and any traffic would be moved to North Shore Road as the only alternate route available in Hampton. At 4.0 feet Ashworth Avenue (Site 19) is also inundated.

This area was included in the Hampton Harbor Flooding Evaluation (link below) for the Town of Hampton and adaptation options that were developed as part of that assessment are applicable to the roadways in this area.

Adaptation Options

Site 18	NH 101 (Highland Avenue/Church Street/Brown Avenue) in Hampton [Hampton Harbor Flooding Evaluation linked below] https://www.hamptonnh.gov/DocumentCenter/View/4138/Final-Report-Harbor_HTA
Accommodate	• Different materials: The pavement at this location could be redesigned and reconstructed with materials (e.g. coarser gravels) that are not as susceptible to changes in moisture levels, allowing the traffic carrying capacity of the roadway to be maintained while the underlying layers are at a range of saturation levels. These modifications would accommodate SLR up to the level of pavement surface inundation while maintaining the existing roadway elevation. • A causeway along the impacted stretch is a viable option. • Hydraulic analysis as part of the Meadow Pond study indicates that drainage improvements along Kings Highway, Gentian Road, Greene Street, and the other adjacent streets can reduce flooding north of Winnacunnet Road.
Resist	• The roadway can be redesigned and rebuilt to raise the elevation of the pavement surface above expected SLR levels. This would necessitate increased shoulder area and/or embankments, which may impact adjacent wetlands. Elevating the roadways may serve as a barrier to protect some private property from flooding • Temporary or permanent berms/barriers may be an option in some locations according to the Hampton Harbor Flooding Evaluation. In some cases these would be adjacent to the roadways and in others would need to be on private property. Protecting the private property will protect the roadways as well.
Retreat	• Retreat is not a desired option due to the many homes and businesses in the vicinity of this site however it may be necessary in some areas to protect the larger community.

Municipality: Hampton

Location: NH 1A (Ashworth Ave)

Cross Streets: Island Path, Brown Ave, Letter Streets

Impacts Begin:	**4.0 Foot sea-level rise**
Tolerance for Flood Risk (High, Medium, Low, Very Low):	Low
Plan for Sea-level Rise Impacts by:	2080
State or Local Roads:	State & Local Roads
Current Traffic Volume (Average Annual/Peak):	3,400 AADT 8,400 Peak
Pavement Condition:	Fair/Poor
Infrastructure at Site:	None
Water/Sewer Infrastructure:	Water and Sewer
Known Site Contamination:	No known site contamination
Existing Tidal Wetland Types (Upstream/ Downstream):	High Salt Marsh tidal wetlands
Invasive Species Present:	Yes
FEMA Floodplain Category:	AE, VE
Average Ground Elevation:	8ft
Design Flood Elevation:	11ft (2050) 14.3ft (2100)
Projected Groundwater Rise:	3.2-4.2ft (2050) 7.2-8.2ft (2100)
Depth to Future Groundwater:	Data Needed
Projected Precipitation Estimates for 10-year 24-hour storm:	4.99 inches – 20% increase volume from present day

Site Description:

Ashworth Avenue is the southbound direction for NH 1A through Hampton Beach. The roadway primarily is residential and commercial uses although there are also several large parking lots adjacent to the road. The roadway is impacted at the 4' SLR scenario in several locations as water encroaches from the Hampton-Seabrook Estuary.

Anticipated Site Impacts from Sea-Level Rise

Ashworth Avenue is inundated in several locations between Island Path and Q Street. This eliminates southbound travel (current configuration) and inundates the extensive development to the west of the roadway as well as some between Ashworth and Ocean Blvd (NH 1A northbound).

Estimated Impacts of closure due to SLR

Closing this roadway would eliminate current southbound travel on NH 1A through Hampton Beach with no immediate alternative route available. When other closures at 4.0 feet of SLR are considered, this site contributes to much of Hampton Beach being inaccessible under this scenario.

Surrounding Land Use Profile

	Acres	Percent
Forested	0.0	0%
Industrial/Commercial	6.0	35%
Open Wetlands	0.0	0%
Mixed Urban	0.2	1%
Recreation	0.0	0%
Residential	6.2	36%
Transportation	4.9	28%
Water	0.0	0%

Municipality: Hampton

Location: US 1 (Lafayette Road)

Cross Streets: Across Hampton-Seabrook Estuary

Impacts Begin:	**4.0 Foot sea-level rise**
Tolerance for Flood Risk (High, Medium, Low, Very Low):	Very Low
Plan for Sea-level Rise Impacts by:	2075
State or Local Roads:	State Road
Current Traffic Volume (Average Annual/Peak):	20,600 AADT 26,700 Peak
Pavement Condition:	Good/Fair
Infrastructure at Site:	Tidal Crossing 22 (bridge)
Water/Sewer Infrastructure:	None
Known Site Contamination:	No known site contamination
Existing Tidal Wetland Types (Upstream/ Downstream):	High Marsh/ High Tidal Saltwater
Invasive Species Present:	Yes
FEMA Floodplain Category:	AE
Average Ground Elevation:	5ft
Design Flood Elevation:	11-12ft (2050) 14.3-15.3ft (2100)
Projected Groundwater Rise:	0.2-3.2ft (2050) 3.2-5.2ft (2100)
Depth to Future Groundwater:	Data Needed
Projected Extreme Precipitation Estimates for 10-year 24-hour storm:	4.98 inches – 20% increase volume from present day

Site Description:

US 1 sits on a causeway through the western portion of the Hampton-Seabrook Estuary where a bridge passes over the Taylor River. US 1 is an important transportation facility that carries roughly 20,000 - 27,000 vehicles per day on average providing a surface connection between seacoast communities that parallels the coast between Interstate 95 and NH1A. Development along this section of US 1 is limited due to the presence of the marsh but is largely commercial in nature.

Anticipated Site Impacts from Sea-Level Rise

Inundation at this site on US 1 is anticipated to occur between 2.0 and 4.0 feet of sea-level rise and that once closed will sever an important arterial connection requiring detours for a large volume of traffic. There is some commercial and a small amount of residential development within the bounds of this site and flooding will impact some of that directly and reduce access to other locations.

Surrounding Land Use Profile

	Acres	Percent
Mixed Urban	0.0	0%
Industrial / Comm	1.3	12%
Open Wetlands	6.1	56%
Other/Idle	0.0	0%
Recreation	0.0	0%
Residential	0.6	6%
Transportation	2.6	24%
Water	0.2	2%

Estimated Impacts of closure due to SLR

The closure of US 1 through the Hampton-Seabrook Estuary shifts traffic to I-95 and a combination of NH 88 and local roads to maintain north-south travel. Model outputs indicate a substantial increase in traffic on NH 88 (96%) while Brown Road and Towle Farm Road increase by about 87 percent. In Hampton, the section of NH 27 between Towle Farm Road and US 1 increases 30%. I-95 shows a 6% volume increase between Exits 1 and 2 which translates to an additional 5,000 vehicles per day added to the current average (more during the summer) and increases on the Exit 2 ramps traffic by 43%-46% adding approximately 8,000 vehicles per day to those facilities.

Adaptation Options

Site 20	US 1 (Lafayette Road) in Hampton
Accommodate	• Different materials: The pavement at this location could be redesigned and reconstructed with materials (e.g. coarser gravels) that are not as susceptible to changes in moisture levels, allowing the traffic carrying capacity of the roadway to be maintained while the underlying layers are at a range of saturation levels. These modifications would accommodate SLR up to the level of pavement surface inundation while maintaining the existing roadway elevation. • Resizing culverts would not be an effective solution due to the geometry and site conditions. • A causeway or bridge along the impacted stretch is a viable option. There is already a bridge along this section of roadway. • Regular detours are not a viable option due to high traffic volume.
Resist	• The roadway can be redesigned and rebuilt to raise the elevation of the pavement surface above expected SLR levels. This would necessitate increased shoulder area and/or embankments, which may impact adjacent wetlands.
Retreat	• Retreat is not a desired option due to the high traffic volume.

Municipality: Seabrook

Location: South Main Street

Cross Streets: NH 286

Impacts Begin:	**4.0 Foot sea-level rise**
Tolerance for Flood Risk (High, Medium, Low, Very Low):	Low
Plan for Sea-level Rise Impacts by:	2080
State or Local Roads:	Local Roads
Current Traffic Volume (Average Annual/Peak):	1,200 AADT 1,600 Peak
Pavement Condition:	No Data
Infrastructure at Site:	Tidal Crossing 4 (bridge)
Water/Sewer Infrastructure:	Water and Sewer
Known Site Contamination:	No known site contamination
Existing Tidal Wetland Types (Upstream/ Downstream):	High Marsh/ High Tidal Saltwater
Invasive Species Present:	Yes
FEMA Floodplain Category:	X, AE
Average Ground Elevation:	12ft
Design Flood Elevation:	10-12ft (2050) 13.3-15.3ft (2100)
Projected Groundwater Rise:	0.2-3.2ft (2050) 0.7-4.2ft (2100)
Depth to Future Groundwater:	Data Needed
Projected Precipitation Estimates for 10-year 24-hour storm:	4.98 inches – 20% increase volume from present day

Site Description:

South Main Street is primarily a residential roadway in Seabrook near the border with Massachusetts. The roadway provides connection into Salisbury via Worthley Road. The impacted section is near the eastern end of the roadway and would likely impact a few adjacent properties in addition to the roadway itself.

Anticipated Site Impacts from Sea-Level Rise

The flooded location on South Main Street, approximately 0.2 miles west of the eastern intersection with NH 286, cuts that street into two segments. Much of South Main Street is accessible via the western connection to NH 286 while a small segment with a few homes and other properties is only accessible via the eastern connection to NH 286. The location of the inundation should not impact any homes directly but eliminates this roadway as a through road and a connection to Salisbury, MA.

Surrounding Land Use Profile

	Acres	Percent
Utilities	0.3	2%
Industrial / Comm	0.0	0%
Open Wetlands	1.3	7%
Other/Idle	0.5	3%
Recreation	0.0	0%
Residential	13.4	74%
Transportation	2.3	13%
Water	0.2	1%

Estimated Impacts of closure due to SLR

The network impacts of closing South Main Street are somewhat hard to categorize as the effects are lost to the more significant closures in the coastal area at 4.0 feet of sea-level rise. There certainly would be an impact on local residents who have to detour around the closure onto NH 286 and the closure will reduce the viability of South Main Street as an alternate route, particularly from Salisbury. At 4.0 feet of SLR, NH 286 will be inundated to the east of this location which will reduce the volume on that roadway significantly (70%) as all through traffic is rerouted which will also likely reduce traffic on South Main Street as well.

Adaptation Options

Site 21	South Main Street in Seabrook
Accommodate	• Different materials: The pavement at this location could be redesigned and reconstructed with materials (e.g. coarser gravels) that are not as susceptible to changes in moisture levels, allowing the traffic carrying capacity of the roadway to be maintained while the underlying layers are at a range of saturation levels. These modifications would accommodate SLR up to the level of pavement surface inundation while maintaining the existing roadway elevation. • Culvert at the site could be evaluated and potentially redesigned to increase capacity and prevent or decrease the level of flooding of the roadway as well as increase the rate of pavement drainage. • A causeway or bridge along the impacted stretch is not a viable option. • Regular detours with permanent signage are a viable option at these sites as access is available from each end of South Main Street and the distance is short.
Resist	• The roadway can be redesigned and rebuilt to raise the elevation of the pavement surface above expected SLR levels. This would necessitate increased shoulder area and/or embankments. • Berms would not be effective at this site because they would only shift the flooding elsewhere.
Retreat	• Retreat is a viable option at this site due to existing alternate routes.

Municipality: Seabrook

Location: NH 286

Cross Streets: NH 1A, Wrights Island Road

Impacts Begin:	**4.0 Foot sea-level rise**
Tolerance for Flood Risk (High, Medium, Low, Very Low):	Low
Plan for Sea-level Rise Impacts by:	2080
State or Local Roads:	State Roads
Current Traffic Volume (Average Annual/Peak):	14,300 AADT 18,600 Peak
Pavement Condition:	Good/Fair
Infrastructure at Site:	Tidal Crossing 1 (bridge) Tidal Crossing 3
Water/Sewer Infrastructure:	Water and Sewer
Known Site Contamination:	No known site contamination
Existing Tidal Wetland Types (Upstream/ Downstream):	High Marsh/ High Marsh Tidal Saltwater
Invasive Species Present:	Yes
FEMA Floodplain Category:	X, AE
Average Ground Elevation:	12ft
Design Flood Elevation:	10-12ft (2050) 13.3-15.3ft (2100)
Projected Groundwater Rise:	0.2-2.2ft (2050) 1.2-4.2ft (2100)
Depth to Future Groundwater:	Data Needed
Projected Precipitation Estimates for 10-year 24-hour storm:	4.99 inches – 20% increase volume from present day

Site Description:

NH 286 provides the southernmost connection to the New Hampshire Seacoast and connects between US 1 in Salisbury, MA and NH 1A in Seabrook. The impacted area is the portion of the corridor between Wrights Island Road and NH 1A where the roadway passes through the Hampton-Seabrook Estuary and over the Blackwater River. This area has residential development as well as retail and commercial uses which experience some flooding during high tide events. Wrights Island Road provides access to Seabrook's wastewater treatment plant.

Anticipated Site Impacts from Sea-Level Rise

NH 286 is inundated where the roadway passes over the Blackwater River and the Hampton-Seabrook Estuary. This closure, combined with those in Hampton, isolates the hundreds of houses and businesses along Seabrook beach in Hampton and Seabrook. Almost all the businesses between the Blackwater River and NH 1A face some inundation and water may reach as far as NH 1A just north of the intersection with NH 286.

Surrounding Land Use Profile

	Acres	Percent
Utilities	0.0	0%
Industrial / Comm	4.6	21%
Open Wetlands	5.2	24%
Other/Idle	2.1	9%
Recreation	0.0	0%
Residential	3.1	14%
Transportation	5.3	24%
Water	1.7	8%

Estimated Impacts of closure due to SLR

NH 286 is Seabrook's only east-west access to the coast and becomes inundated at 4.0 feet of SLR. This removes the connection to Seabrook Beach and the coast and cuts traffic on the roadway by about 70%. Traffic remains on the western portion of the roadway serving the residences and the businesses west of the closed area. This isolates the residences and businesses along NH 1A in Hampton and Seabrook south of the bridge over Hampton Harbor and combined with closures in Hampton, may eliminate access altogether to this area.

Adaptation Options

Site 22	NH 286 in Seabrook
Accommodate	• Different materials: The pavement at this location could be redesigned and reconstructed with materials (e.g. coarser gravels) that are not as susceptible to changes in moisture levels, allowing the traffic carrying capacity of the roadway to be maintained while the underlying layers are at a range of saturation levels. These modifications would accommodate SLR up to the level of pavement surface inundation while maintaining the existing roadway elevation. • Culvert at the site could be evaluated and potentially redesigned to increase capacity and prevent, or decrease, the level of flooding of the roadway as well as increase the rate of pavement drainage. • A causeway or bridge along the impacted stretch is a viable option due to geometry and site conditions. • Regular detours with permanent signage are not a viable option at due to limited alternate routes.
Resist	• The roadway can be redesigned and rebuilt to raise the elevation of the pavement surface above expected SLR levels. This would necessitate increased shoulder area and/or embankments. • Berms would not be effective at this site because they would only shift the flooding elsewhere.
Retreat	• Retreat is not a desired option because this is an evacuation route.

Municipality: Exeter

Location: NH 85 (Water Street)

Cross Streets: Summer Street, Swazey Pkwy

Impacts Begin:	**4.0 Foot sea-level rise**
Tolerance for Flood Risk (High, Medium, Low, Very Low):	Low
Plan for Sea-level Rise Impacts by:	2080
State or Local Roads:	Local and State Roads
Current Traffic Volume (Average Annual/Peak):	6,500 AADT 7,700 Peak
Pavement Condition:	Good/Fair
Infrastructure at Site:	Tidal Crossing 124
Water/Sewer Infrastructure:	Water and Sewer
Known Site Contamination:	No known site contamination
Existing Tidal Wetland Types (Upstream/ Downstream):	Brackish Riverbank Marsh/ Intertidal Habitat
Invasive Species Present:	Yes
FEMA Floodplain Category:	X, AE
Average Ground Elevation:	10ft
Design Flood Elevation:	11ft (2050) 14.3ft (2100)
Projected Groundwater Rise:	0.7-2.2ft (2050) 1.2-3.2ft (2100)
Depth to Future Groundwater:	Data Needed
Projected Precipitation Estimates for 10-year 24-hour storm:	4.91 inches – 20% increase volume from present day

Site Description:

This portion of water street is the southern terminus of NH 85 which connects from Exeter to NH 101 and through Newfields to NH 108. The roadway parallels the Squamscott River in this vicinity and at 4' SLR water from Norris Brook could impact the roadway. Use on this section of Water Street is primarily residential and recreational.

Anticipated Site Impacts from Sea-Level Rise

Water Street is inundated between Summer Street and the Swazey Parkway where the roadway crosses over Norris Brook. This divides the northern portion of this street from the southern and somewhat isolate a few houses, the public works facility, and the sewer treatment plant from the remainder of the downtown area and require vehicles to reroute using NH 101.

Estimated Impacts of closure due to SLR

Closing this roadway would result in a relatively small shift of traffic to alternative routes as this only impacts through traffic and access to a few homes directly. Most neighborhood access to downtown Exeter could continue as it does currently.

Surrounding Land Use Profile

	Acres	Percent
Forested	0.1	3%
Other/Idle	0.7	14%
Open Wetlands	0.0	0%
Mixed Urban	0.2	1%
Recreation	2.0	40%
Residential	1.4	27%
Transportation	0.8	15%
Water	0.0	0%

Municipality: Stratham

Location: Squamscott Road

Cross Streets: NH 108, NH 33

Impacts Begin:	**4.0 Foot sea-level rise**
Tolerance for Flood Risk (High, Medium, Low, Very Low):	Low
Plan for Sea-level Rise Impacts by:	2080
State or Local Roads:	Local Roads
Current Traffic Volume (Average Annual/Peak):	4,800 AADT estimated
Pavement Condition:	Good/Fair
Infrastructure at Site:	Tidal Crossing 113 Tidal Crossing 114 Tidal Crossing 115
Water/Sewer Infrastructure:	None
Known Site Contamination:	No known site contamination
Existing Tidal Wetland Types (Upstream/ Downstream):	Brackish Marsh/ Invasive Dominant/ High Salt Marsh
Invasive Species Present:	Yes
FEMA Floodplain Category:	X, AE
Average Ground Elevation:	40ft
Design Flood Elevation:	12ft (2050) 15.3ft (2100)
Projected Groundwater Rise:	1.2-2.2ft (2050) 2.2-4.2ft (2100)
Depth to Future Groundwater:	Data Needed
Projected Precipitation Estimates for 10-year 24-hour storm:	4.87 inches – 20% increase volume from present day

Site Description:

Squamscott Road provides a connection between NH 108 and NH 33 in Stratham that avoids Stratham Circle. The use along the roadway is primarily agricultural and residential. Jewel Hill Creek crosses under Squamscott Road just east of NH 108 where it feeds into the tidal marsh and the Squamscott River.

Anticipated Site Impacts from Sea-Level Rise

Squamscott Road is flooded where the roadway crosses Jewell Hill Brook just east of NH 108. This roadway is a popular bypass of the Stratham Circle for traffic moving between NH 108 to the north and NH 33 to the east. Closing the roadway at that location would have minimal direct impacts on residences or businesses but forces more traffic through Stratham Circle.

Estimated Impacts of closure due to SLR

Closing this roadway would result in greater utilization of Stratham Circle to transition between NH 108 southbound and NH 33 eastbound and may result in some capacity issues for some movements.

Surrounding Land Use Profile

	Acres	Percent
Forested	0.7	6%
Active Agricultural	4.1	32%
Open Wetlands	3.1	24%
Farmstead	1.0	8%
Recreation	0.0	0%
Residential	1.9	15%
Transportation	1.9	15%
Water	0.0	0%

Municipality: Portsmouth

Location: US Route 1

Cross Streets: Mirona Road, Greenleaf Ave

Impacts Begin:	**4.0 Foot sea-level rise**
Tolerance for Flood Risk (High, Medium, Low, Very Low):	Low
Plan for Sea-level Rise Impacts by:	2080
State or Local Roads:	Local and State Roads
Current Traffic Volume (Average Annual/Peak):	4,800 AADT estimated
Pavement Condition:	24,000 AADT 29,400 Peak
Infrastructure at Site:	Tidal Crossing 67 Bridge
Water/Sewer Infrastructure:	Sewer and Water
Known Site Contamination:	No known site contamination
Existing Tidal Wetland Types (Upstream/ Downstream):	High Salt Marsh/ High Salt Marsh
Invasive Species Present:	Yes
FEMA Floodplain Category:	X, AE
Average Ground Elevation:	40ft
Design Flood Elevation:	12ft (2050) 15.3ft (2100)
Projected Groundwater Rise:	0.7-2.2ft (2050) 1.2-4.2ft (2100)
Depth to Future Groundwater:	Data Needed
Projected Precipitation Estimates for 10-year 24-hour storm:	4.89 inches – 20% increase volume from present day

Site Description:

US 1 in this vicinity connects commercial and residential areas in Portsmouth to the communities to the south and to the US 1 Bypass. Land use along US 1 in this area is primarily retail, commercial, or industrial with some residential off US 1. The roadway passes over Sagamore Creek via a bridge.

Anticipated Site Impacts from Sea-Level Rise

The area currently sees frequent inundation of the adjacent businesses. At 4.0 feet of SLR this begins to impact US 1 and closes this segment requiring up to 25,000 vehicles per day to use alternate routes. Most development at this location is currently outside the flood zone and the area impacted is relatively small and primarily limited to the shopping center located southwest of the existing.

Estimated Impacts of closure due to SLR

Closing US 1 would redirect existing traffic to Greenleaf Avenue and Peverly Hill Road which would both experience more than 100% increases in volume and likely capacity and safety issues. Banfield Road and Sagamore Road would also experience additional traffic but not to the same extent.

Surrounding Land Use Profile

	Acres	Percent
Forested	0.5	6%
Industrial/Commercial	2.8	33%
Open Wetlands	0.8	9%
Other/Idle	0.3	3%
Utilities	0.3	3%
Residential	0.1	1%
Transportation	3.4	40%
Water	0.4	5%