An aerial photograph of a coastal road, likely Highway 101 in California, showing the road curving along the coastline. The ocean is on both sides, and there are some buildings and trees visible on the land. The entire image has a blue color overlay.

Seacoast Transportation Corridor Vulnerability Assessment

David Walker
Assistant Director/
Transportation Program
Manager

**Community Updates &
Engagement**

Fall, 2021



Agenda



Introductions

5 Minutes



Project Summary

15 Minutes



Transportation
Network Impacts

15 Minutes



Conceptual
Adaptation Options

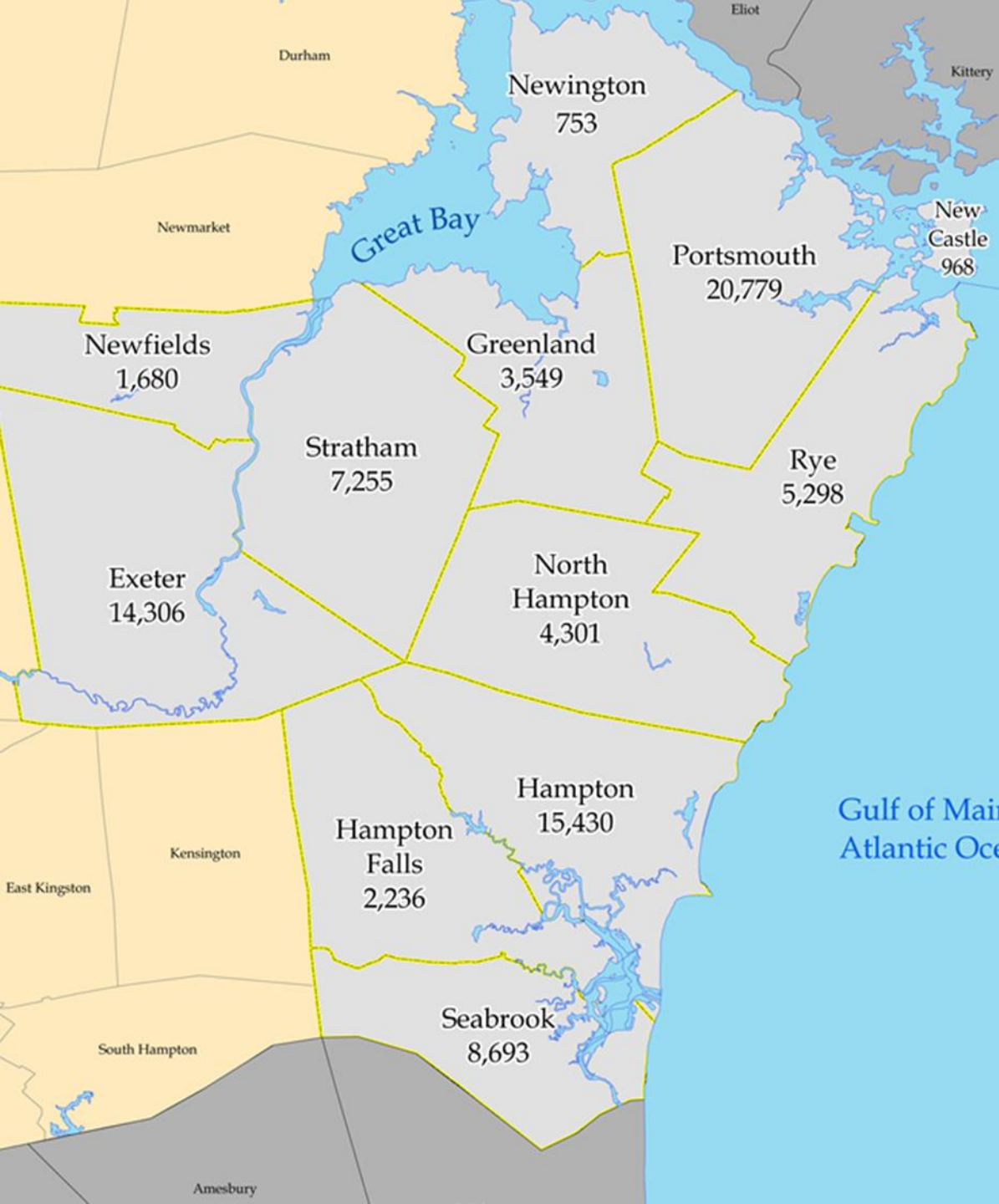
15 Minutes



Community Feedback

45 Minutes

Seacoast Transportation Corridor Vulnerability Assessment (STCVA)



- Funded as a 2019 NOAA Project of Special Merit
- A partnership between:
 - Rockingham Planning Commission
 - NH DES Coastal Program
 - NH Department of Transportation
 - University of New Hampshire
 - 10 NH coastal municipalities

This project was funded, in part, by NOAA's Office for Coastal Management under the Coastal Zone Management Act in conjunction with the New Hampshire Department of Environmental Services Coastal Program.





STCVA Goals

- Assess the impacts of projected sea-level rise on the seacoast transportation network (1', 1.7', 4', and 6.3' sea-level rise scenarios).
- Evaluate changes in traffic volume, travel patterns, road capacity, road conditions due to SLR
- Identify & prioritize sites impacted by flooding for further evaluation
- Identify adaptation and resilience strategies for priority sites
- Improve RPC/MPO decision making processes



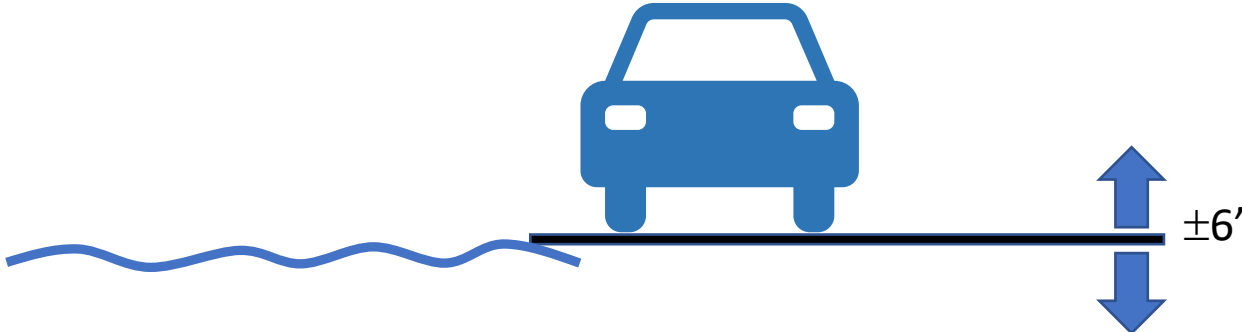
STCVA Transportation Planning Outcomes

- Enhanced understanding of risks to transportation network from climate change
- Critical links identified and impacts of closures on the transportation network assessed
- Improvement concepts and costs developed for priority locations to better understand scope and scale of building a more resilient system
- Improved resiliency factors for the general project selection process
- Data and analysis available for other planning and project development efforts.
- Policies defined that can facilitate a more resilient transportation system



Data Accuracy

- Based on Light Detection and Ranging (LIDAR) data from 2011
- LIDAR data has roughly $\pm 6''$ vertical accuracy
- Horizontal accuracy is roughly 13' – We know the point is somewhere within a 26' diameter circle



Identifying & Prioritizing Impacted Roadways

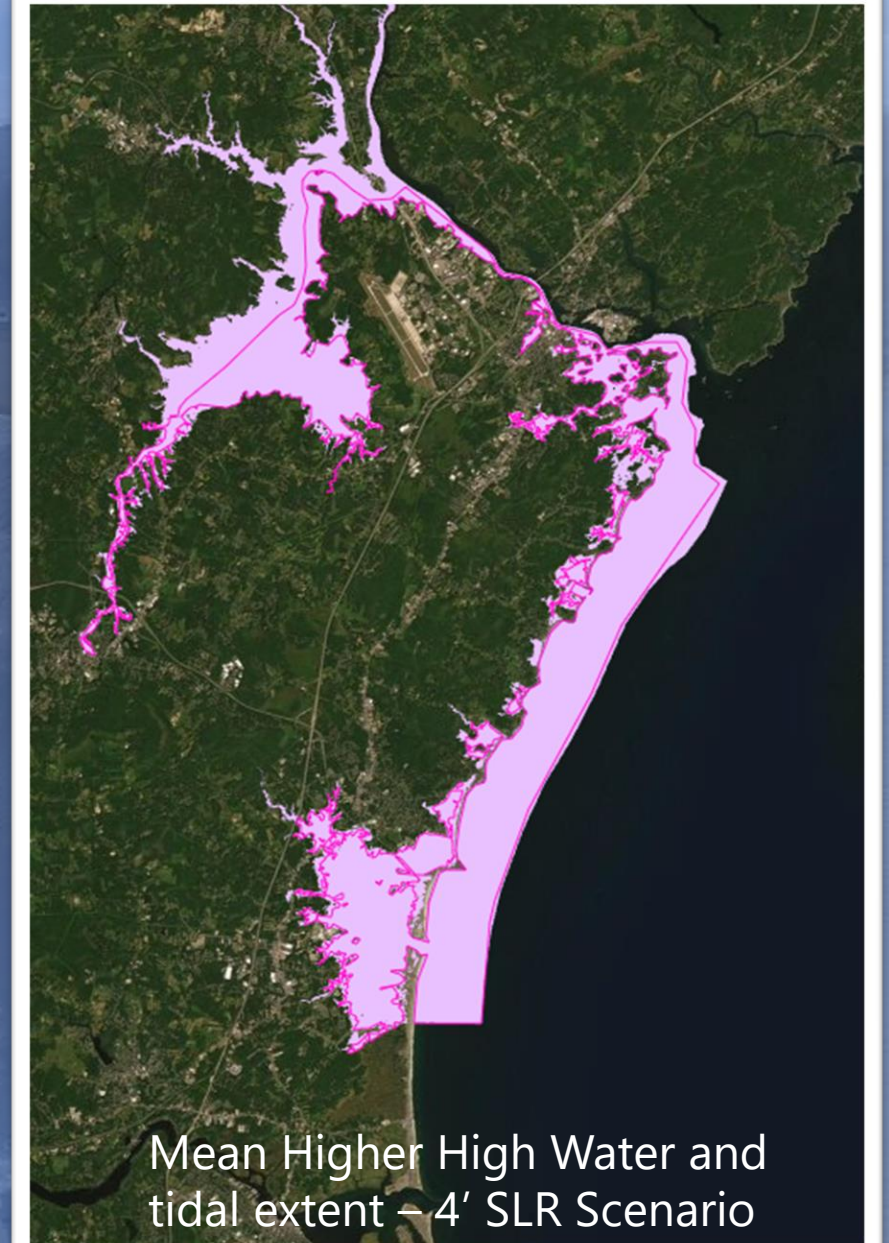
Previous Work on Sea Level Rise Impacts

- Tides to Storms
- Coastal Risks and Hazards Commission
- 2020 NH Science Summary

Regional Travel Demand Model

- Travel Patterns based on residential and employment distribution
- All State Roadways and many local Roads

Transportation System Impacts of Sea Level Rise



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Transportation System Impacts of Sea Level Rise



Identifying & Prioritizing Impacted Roadways

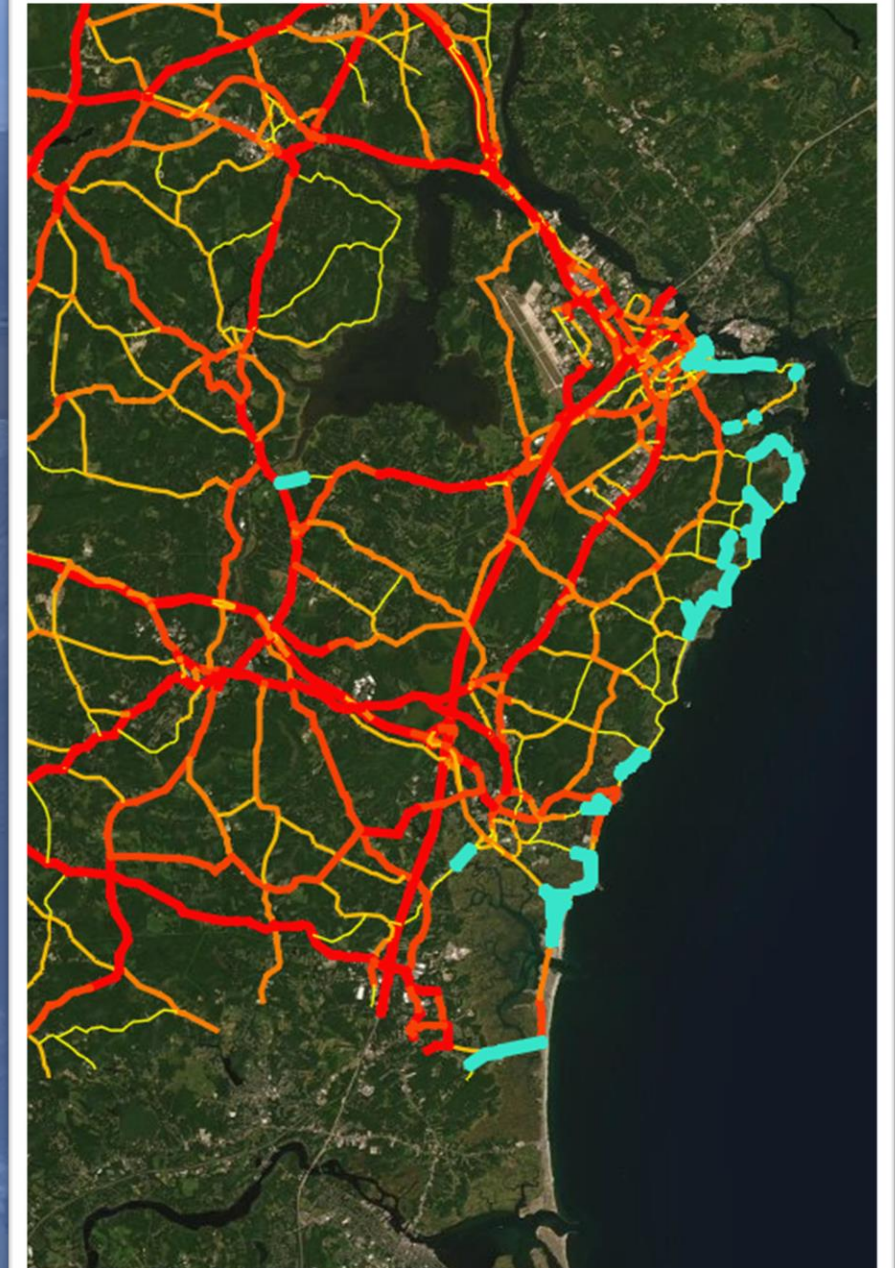
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Transportation System
Impacts of Sea Level Rise



Identify Segments Where Water and Roads intersect



Inundated model links at 4' SLR

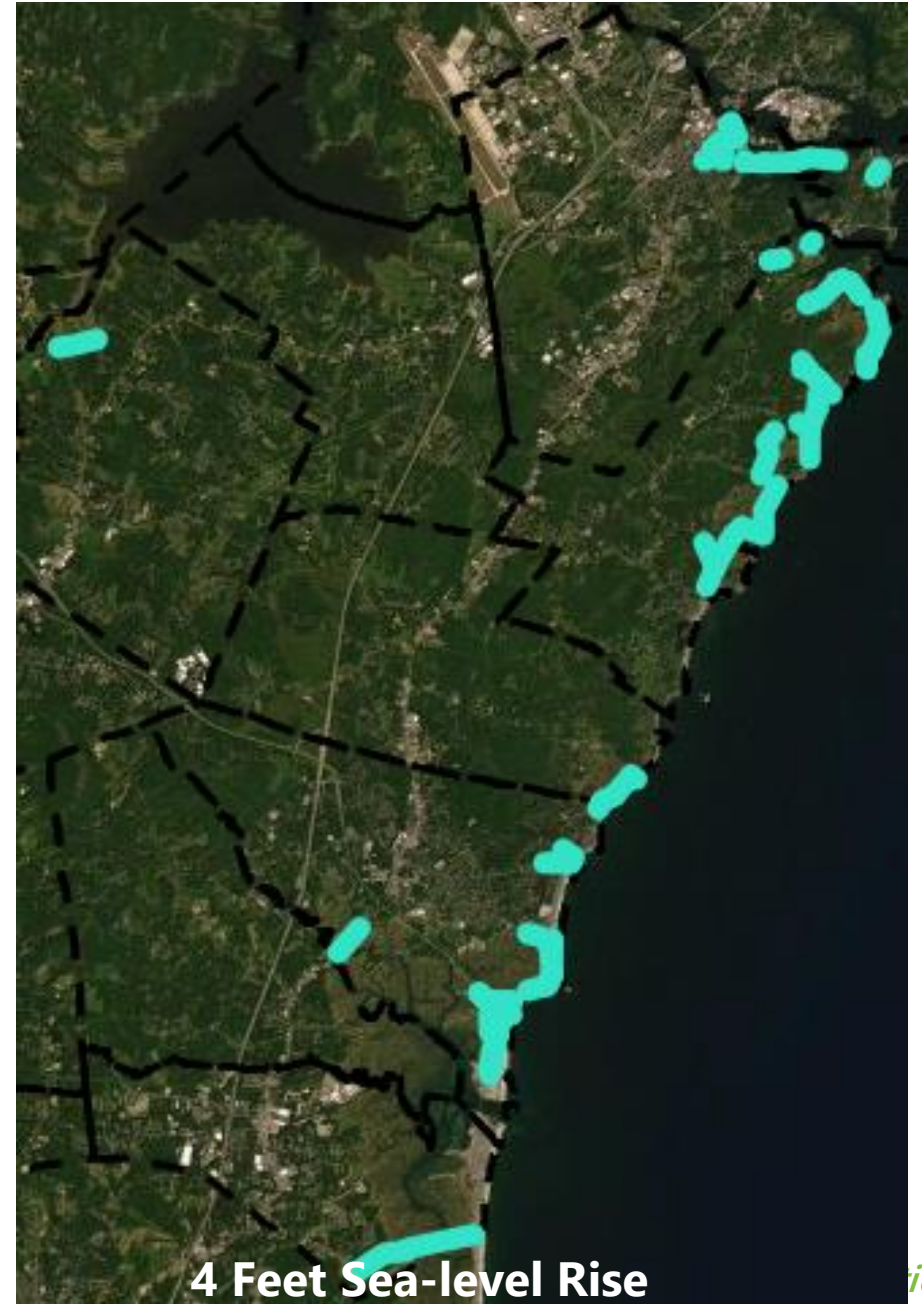
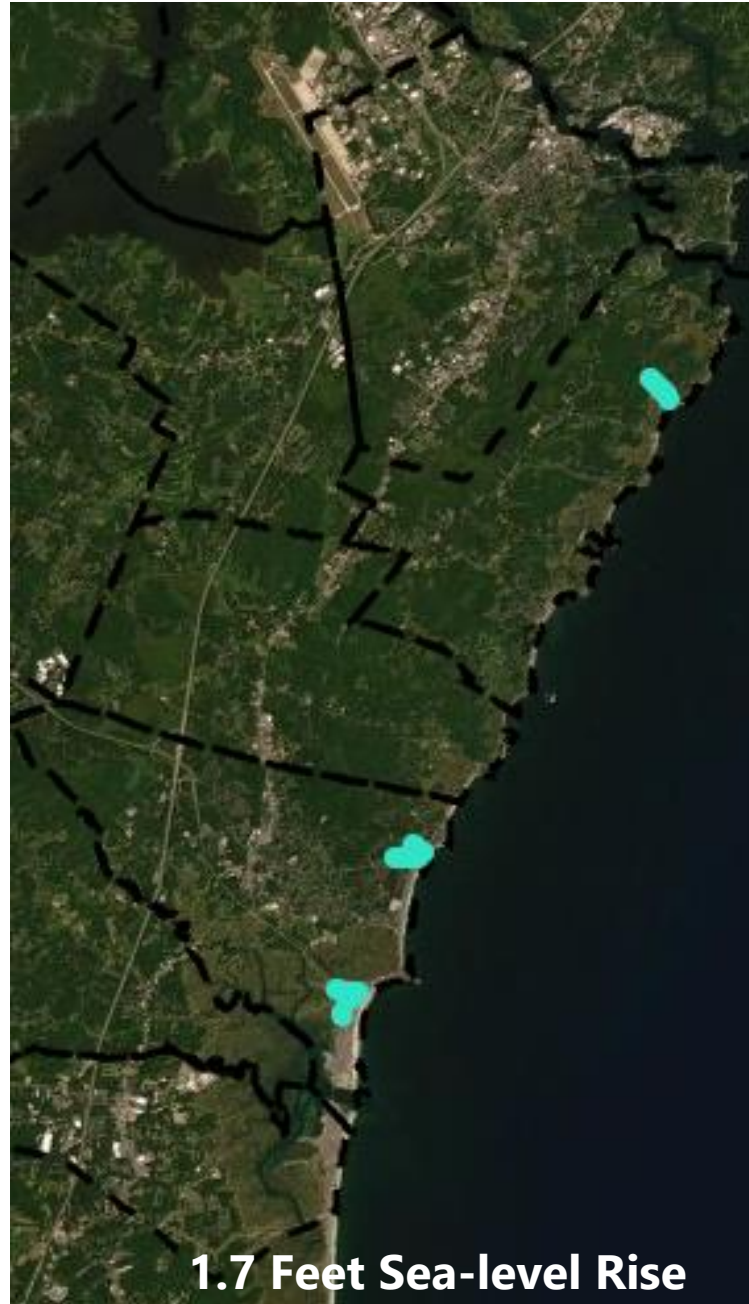
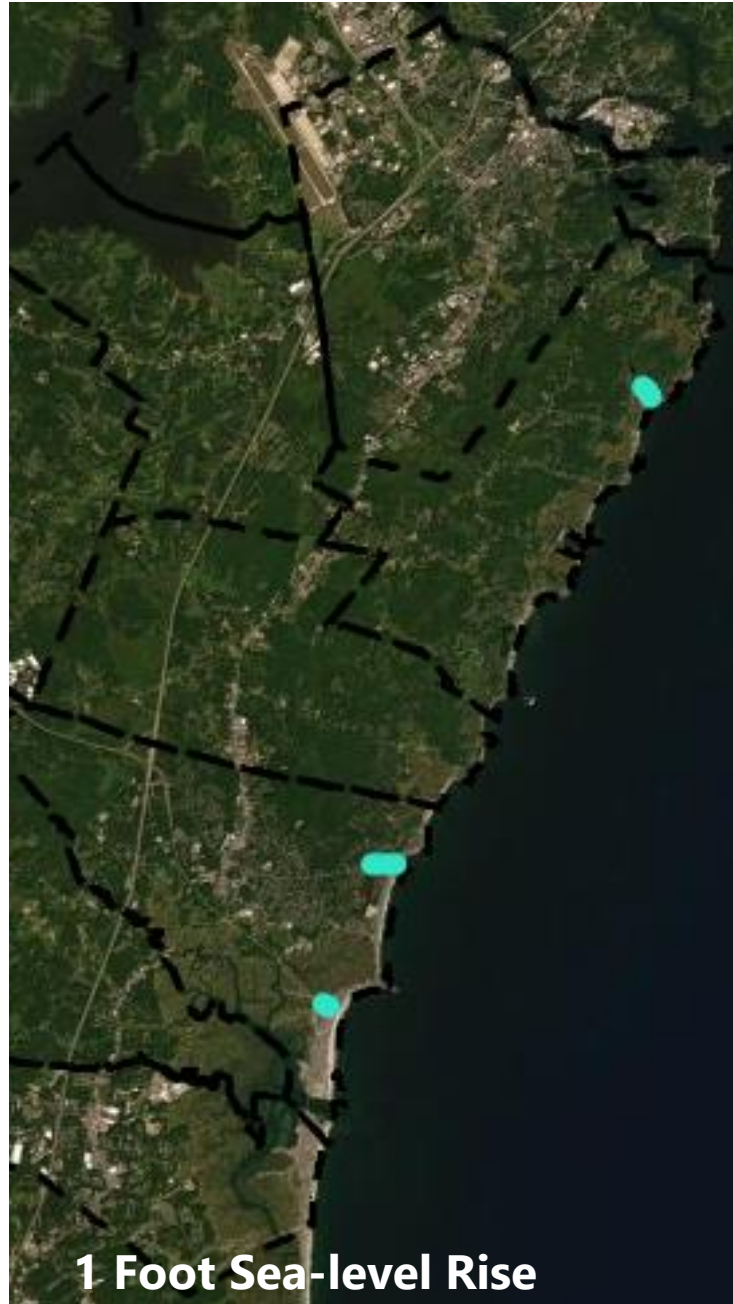
Scenario	Impacted Locations	Approx. Miles Impacted
1'	4 model links	0.5
1.7'	13 model links	1.0
4'	125 model links	16.8
6.3'	259 model links	28.0



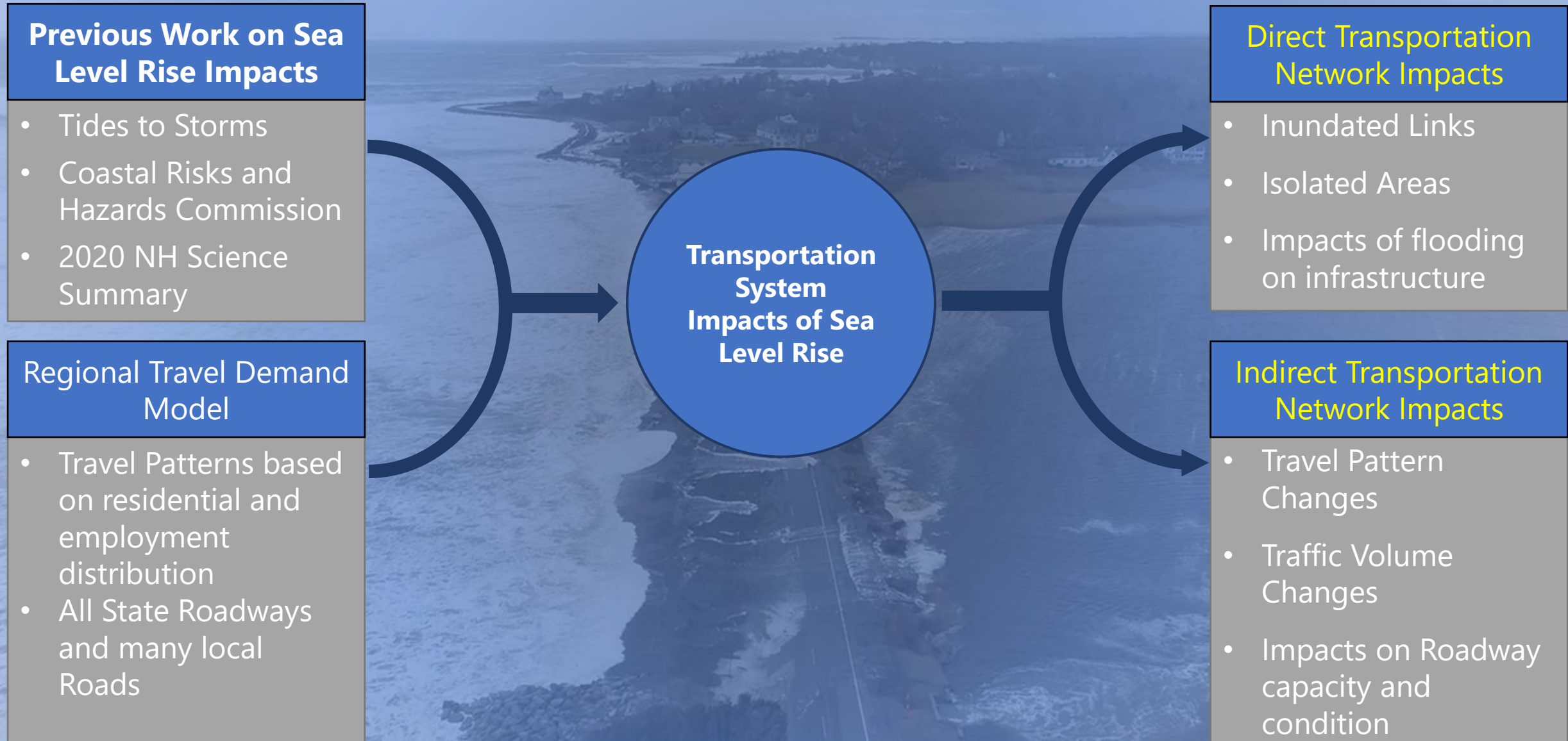
Group Adjacent Impacted Links into Sites

Scenario	Impacted Locations	Sites
1 Foot	4 model links	3
1.7 Feet	13 model links	5
4 Feet	125 model links	24

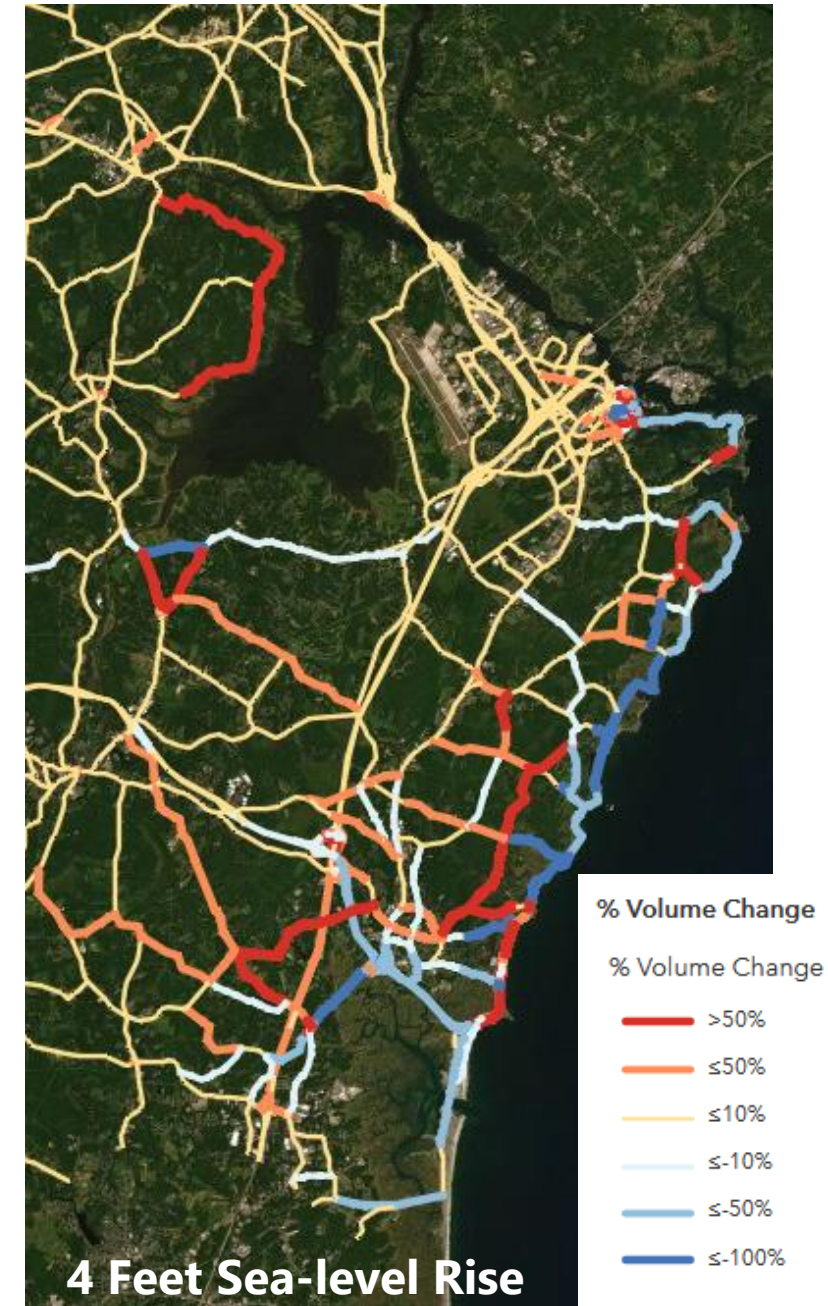
Areas of Anticipated Inundation

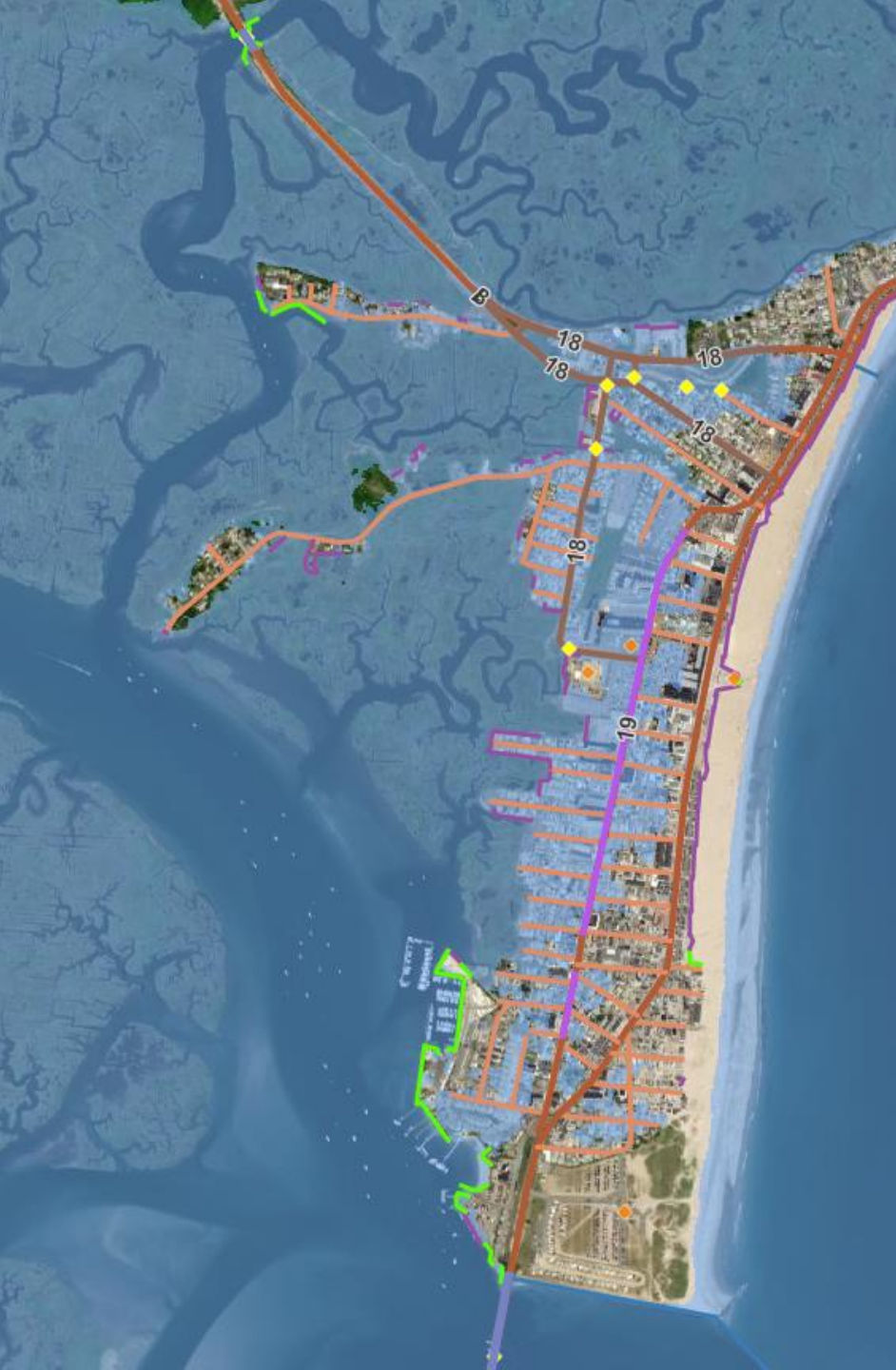


Identifying & Prioritizing Impacted Roadways



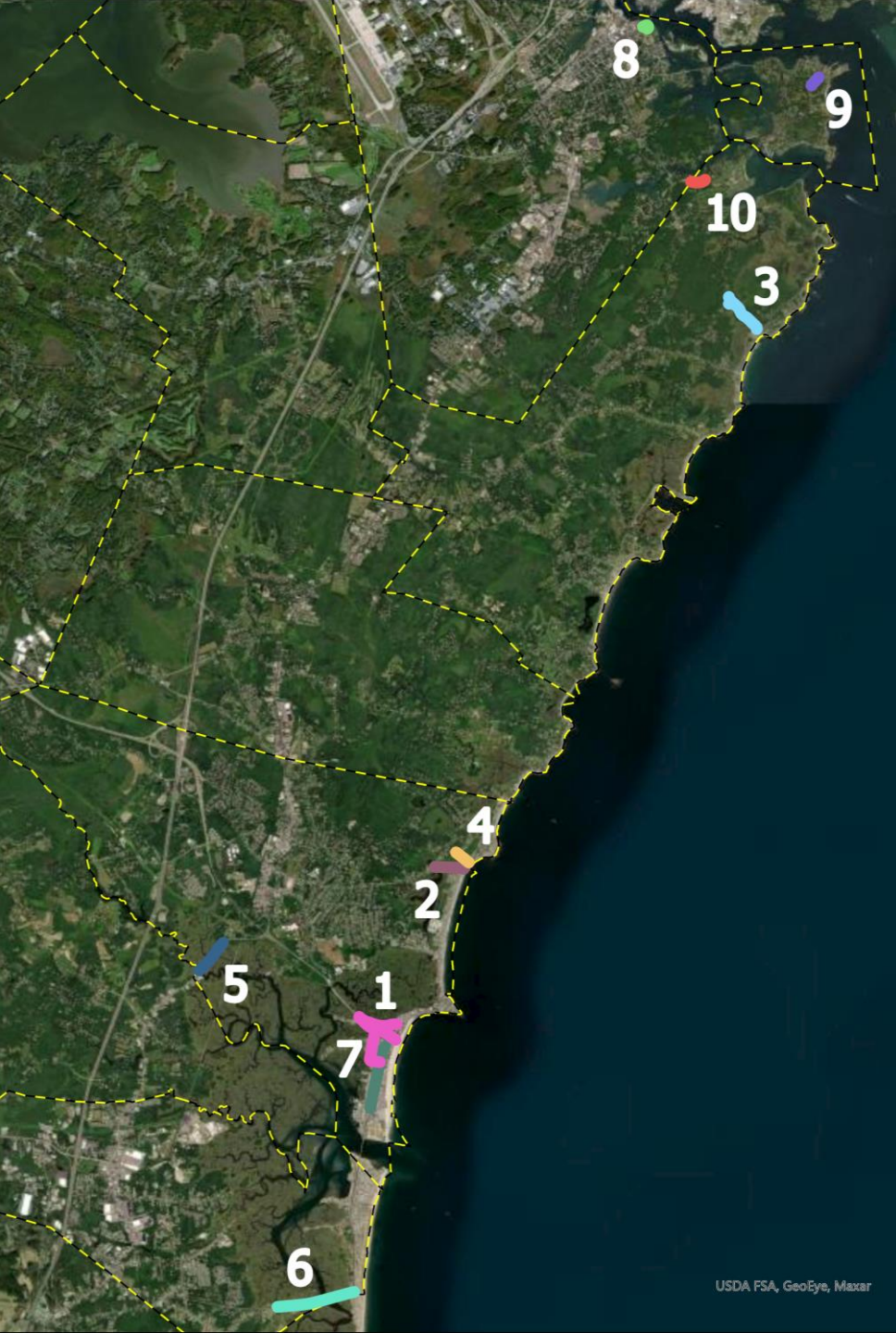
Estimate Traffic Impacts of Road Closures





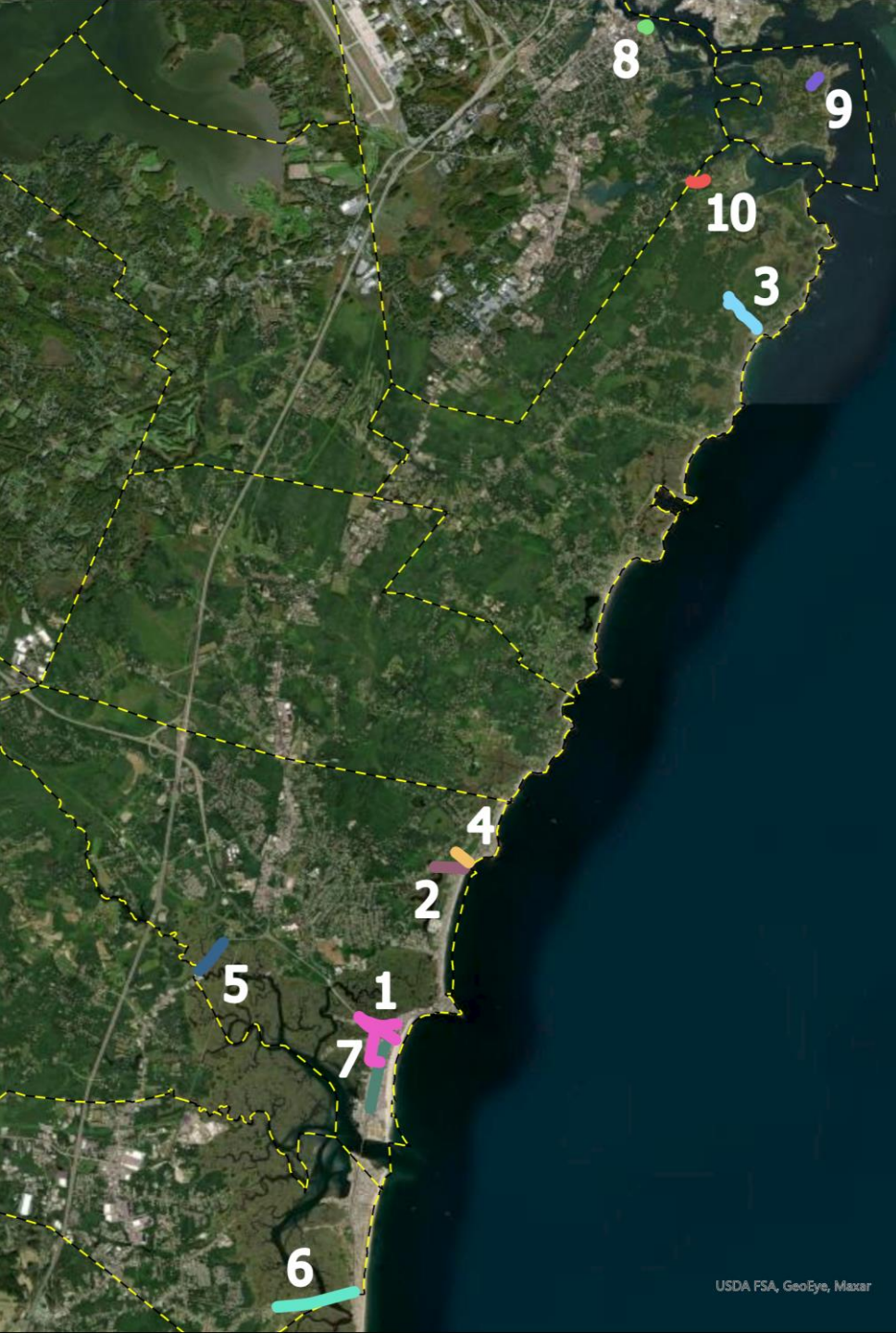
Score Sites Against Criteria to Determine Criticality

Criterion	Weight	
Functional Classification	20%	Operations
Average Daily Volume (AADT)	20%	
Distance to Emergency Services	15%	Health & Safety
Alternate Route Availability	15%	
Social Vulnerability Index (SVI)	10%	Socioeconomics
Distance to Community Facilities	10%	
Average Land Value per Acre	10%	



Identify Priority Sites for Evaluation

- Preliminary List of Priority Sites for further evaluation developed based on criteria
- List Sent to NHDOT and other partners for feedback
- 10 candidate sites Selected
 - Assemble site profiles
 - Assess types of impacts and potential adaptation measures
 - Develop conceptual design alternatives
 - Apply New Hampshire Coastal Flood Risk Guidance
- 2 sites selected for more detailed examination



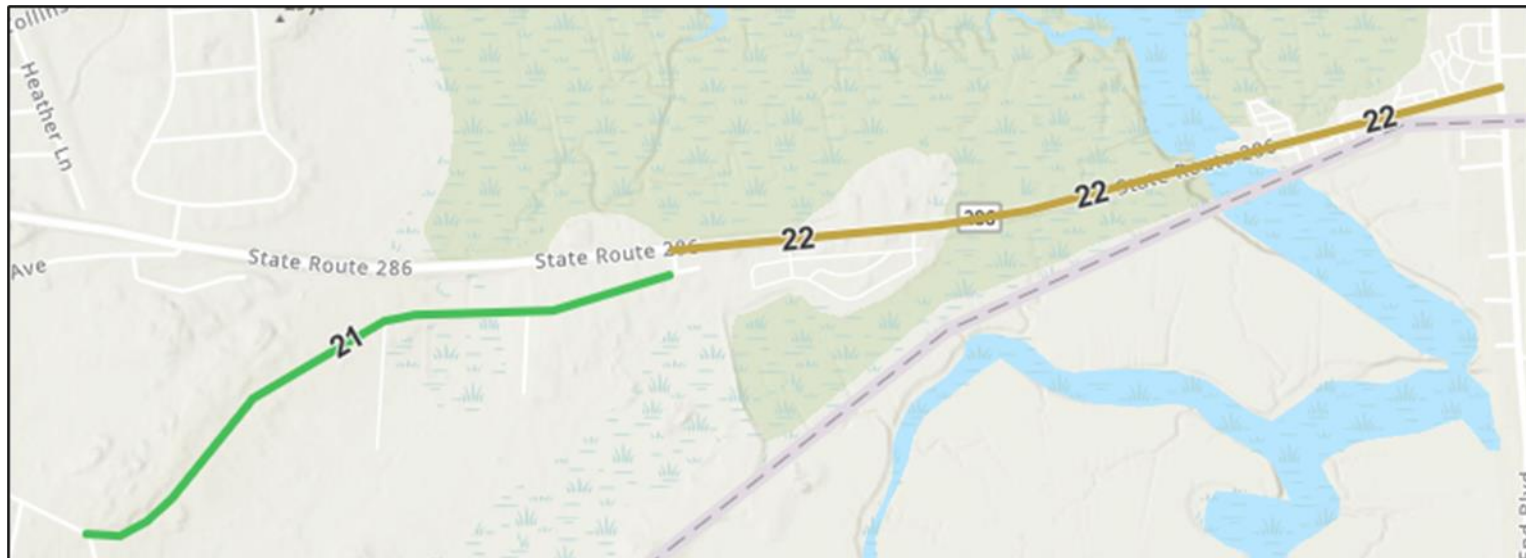
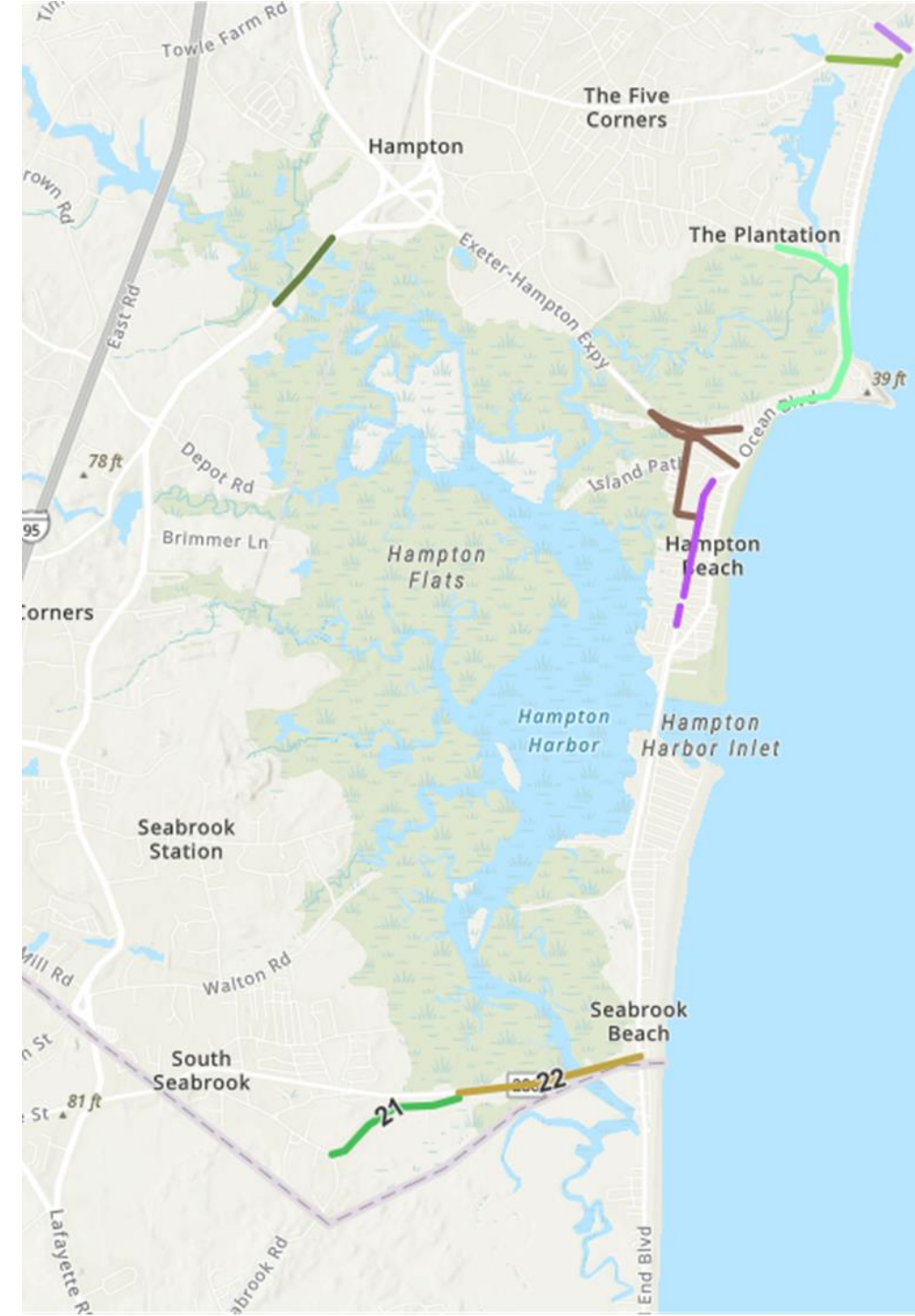
Priority Sites for Evaluation

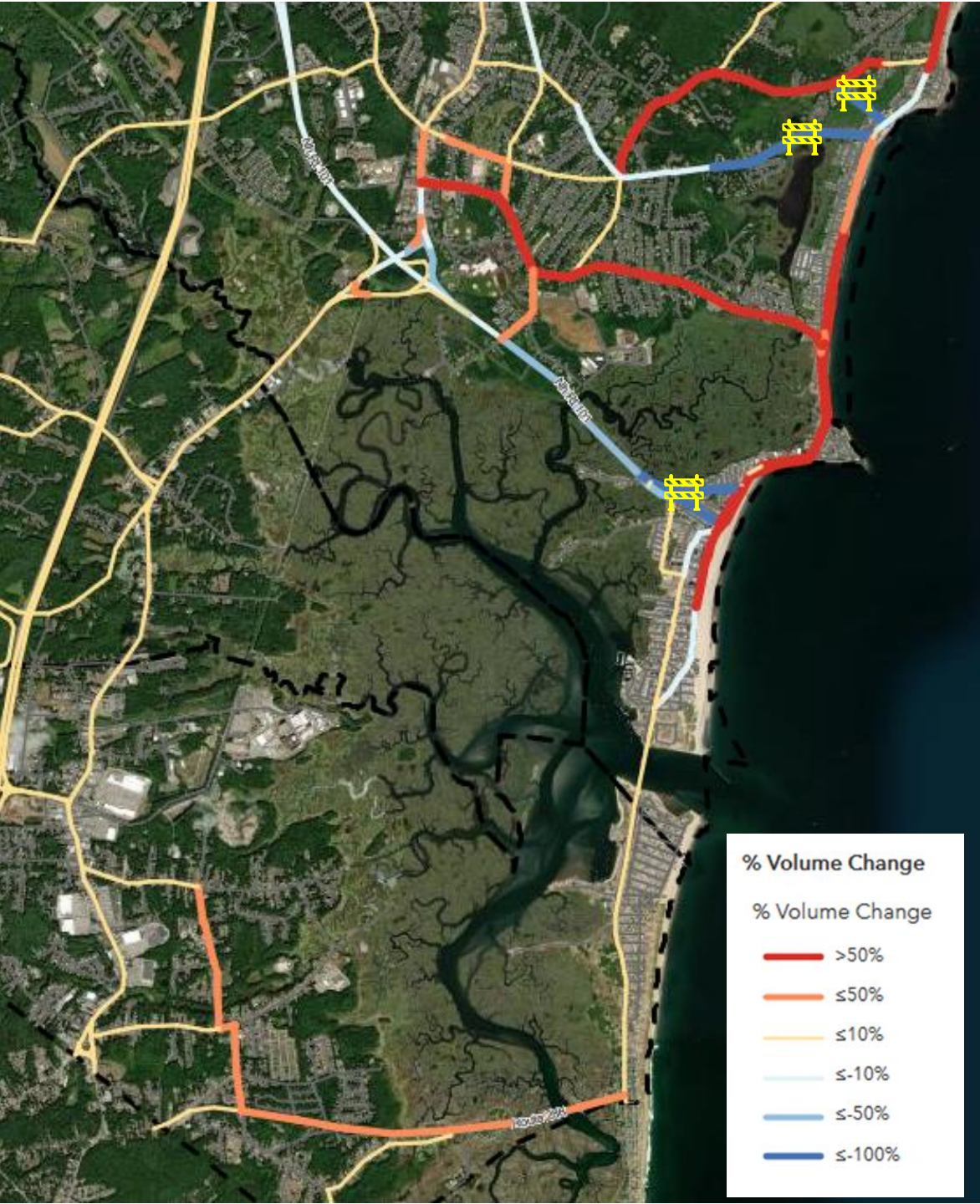
Town	Site	SLR Impact level
New Castle/ Rye	Wentworth Rd/NH 1B	4'
Rye	Marsh Rd, Parsons Rd	1'
Rye	Ocean Blvd, Wallis Rd	4'
Rye	Locke Rd, Ocean Blvd	4'
Hampton	Cusack Rd	1.7'
Hampton	High St	1'
Hampton	NH 1A SB On ramp, Ocean Blvd, Winnacunnet Rd	4'
Hampton	Brown Ave, Church St, Glade Path, Highland Ave, NH Rt 101	1'
Hampton	Lafayette Rd	4'
Seabrook	South Main St/ NH 286	4'

Seabrook Sites

- Both Seabrook sites impacted between 2 and 4 feet of SLR
- Impacts in Hampton at < 2 feet will begin to affect access to Hampton Beach and change traffic patterns

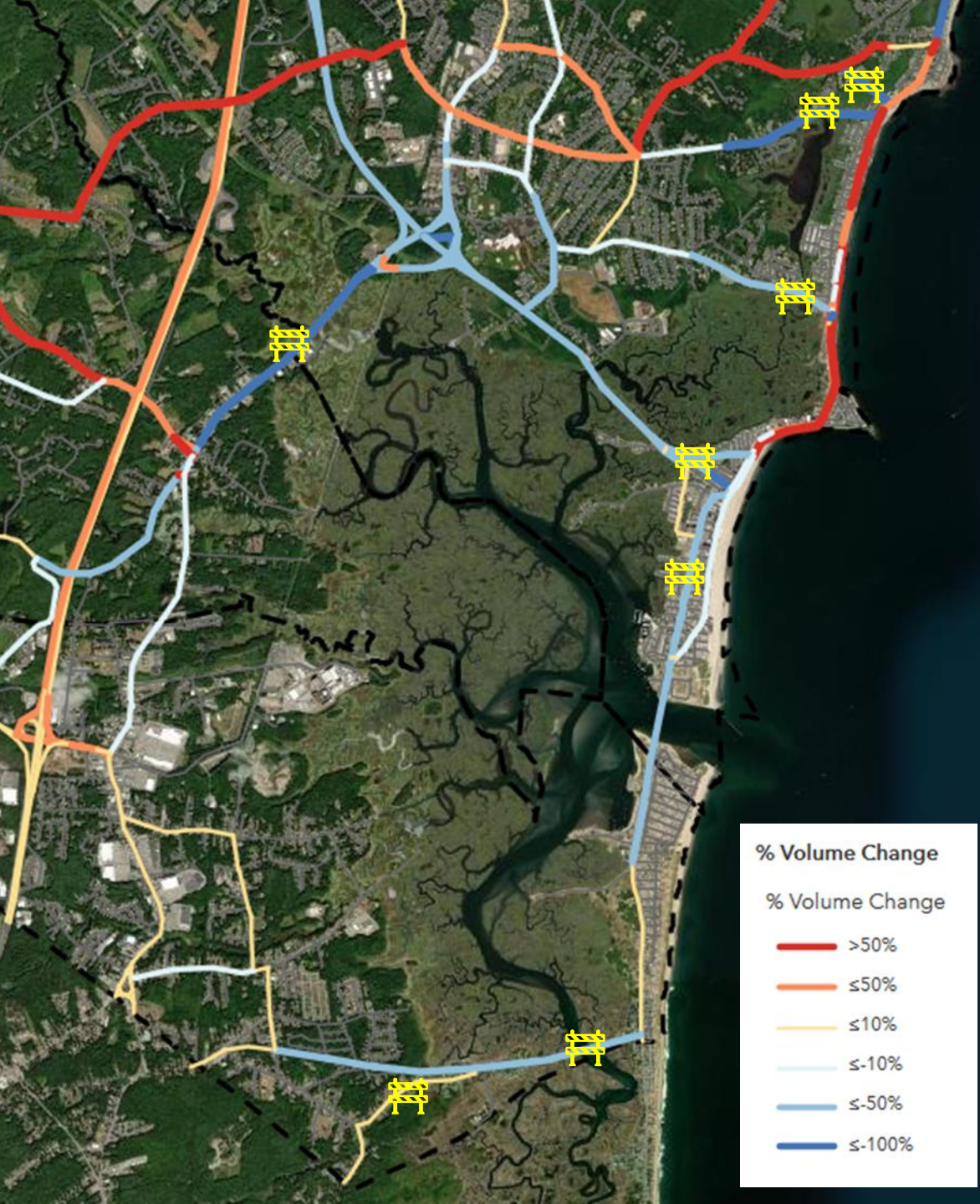
Town	Site	Map number	SLR Impact level
Seabrook	South Main St	21	4'
Seabrook	Route 286	22	4'





Traffic Impacts <2' SLR

- Seabrook traffic begins to see impacts at 1.7 feet of SLR
- Access to coast via NH 101 becomes limited.
- **Up to 50% increase in traffic volume on NH 286**
 - 2016 Volume = 16,000 vehicles per day
 - 2019 Volume = 14,275 vehicles per day
 - 21,000-24,000 vehicles per day
- Capacity on NH 286 would be a concern
- Access to driveways and side roads could be challenging



Traffic Impacts at 4' SLR

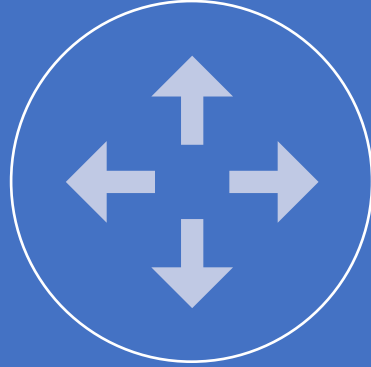
- 4' SLR impacts NH 286 and South Main Street directly.
- Access to coast via NH 286 becomes limited and local circulation only
- South Main Street access limited – may be split
- Coastal neighborhoods isolated from remainder of community – or inaccessible

Actions Considered



No Action

Do nothing



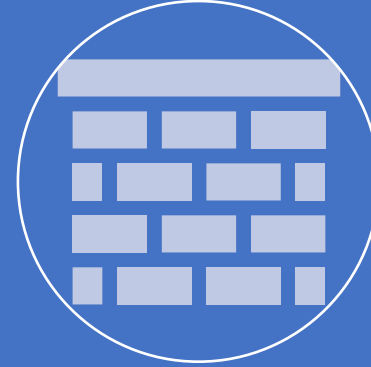
Avoid

Prioritize investment out of the water's way



Accommodate

Options that allow you to better live with the water



Resist

Options that keep the water away


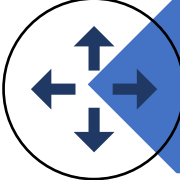

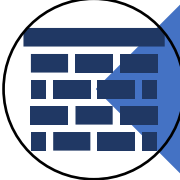
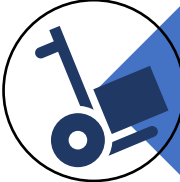


Relocate

Move assets of facilitate retreat away from the water



Actions - Based on Coastal Flood Risk Guidance

	<u>Level of Risk for Coastal Flooding</u>	<u>Tolerance for Flood Risk</u>
 <u>No Action</u>	Very Low to Low	High
 <u>Avoid</u>	Very Low	Medium to Very Low
 <u>Accommodate</u>	Moderate	Medium
 <u>Resist</u>	High	Low to Very Low
 <u>Relocate</u>	High	Low to Very Low

South Main Street

- **Accommodate**

- Reconstruct with materials less susceptible to changes in moisture levels. Accommodates SLR up to pavement surface
- Evaluate utility of larger culvert – Increased drainage capacity and potentially reduced flooding levels
- Causeway or Bridge – Not a viable option
- Detours – Limited alternate routes

- **Resist**

- Roadway could be raised above expected SLR levels. This would require increased shoulder area.
- Berms would shift flooding elsewhere

- **Retreat**

- Eastern end becomes a short section only accessible by NH 286



NH 286

- **Accommodate**

- Reconstruct with materials less susceptible to changes in moisture levels. Accommodates SLR up to pavement surface
- Evaluate utility of larger culvert – Increased drainage capacity and potentially reduced flooding levels
- Causeway or Bridge is a viable option
- Detours – Limited alternate routes – nearest options are also impacted

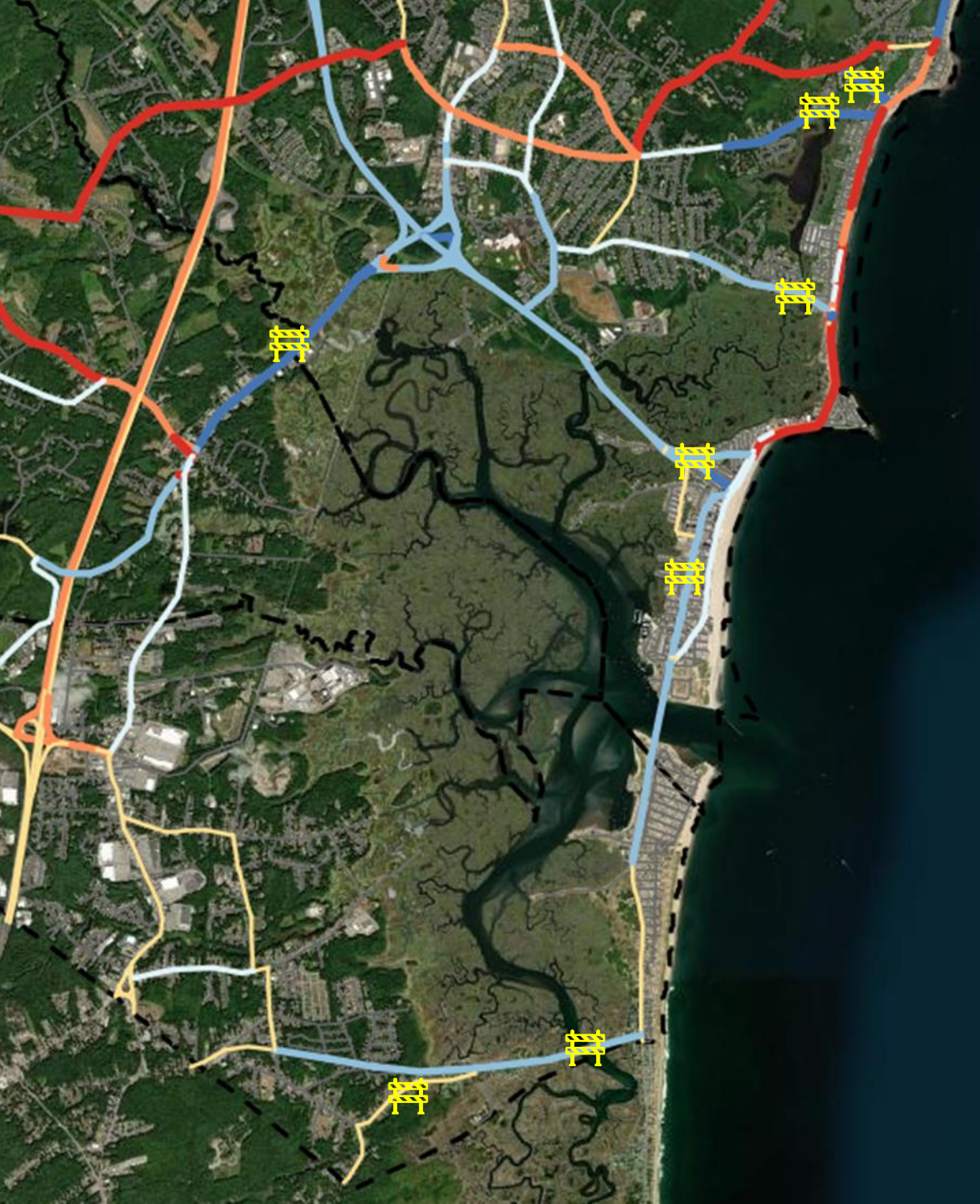
- **Resist**

- Roadway could be raised above expected SLR levels. This would require increased shoulder area and have impacts to adjacent land.
- Berms would shift flooding elsewhere

- **Retreat**

- Not desired – Evacuation route from coast





Feedback

- General thoughts on project?
- Something that we missed?
- Options for addressing concerns?
- Output that would be helpful for community?
- Ideas for further analysis?

[RPC Project Staff](#)

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For More Information

The screenshot shows the website for the Rockingham Planning Commission. The header includes the RPC logo, contact information (Phone: 603-778-0885, Fax: 603-778-9183), a 'Browse Our Document Library' button, and a search bar. The navigation menu includes Commission, Communities, Regional & Community Planning, Transportation, Environment, and Maps and Data. The breadcrumb trail is: Home >> Regional & Community Planning >> Climate Change >> Seacoast Transportation Corridor Vulnerability Assessment & Plan. The main content area features a sidebar with a list of links under 'Climate Change', including CRISE, High Water Mark Initiative, Setting Sail, Tides to Storms, State and Regional Efforts, and Exeter Stormwater. The main article is titled 'Seacoast Transportation Corridor Vulnerability Assessment & Plan' and includes an 'Issue' section with text about coastal storms and flooding. A photograph shows a road with a 'HIGH WATER' sign and a traffic cone. Below the article is an 'Area of Interest & Risk Summary' section.

Phone: 603-778-0885
Fax: 603-778-9183


Browse Our DOCUMENT LIBRARY

Search The Site:

Commission Communities Regional & Community Planning Transportation Environment Maps and Data


Home >> Regional & Community Planning >> Climate Change
>> Seacoast Transportation Corridor Vulnerability Assessment & Plan

Seacoast Transportation Corridor Vulnerability Assessment & Plan



Issue

Coastal storms and flooding already threaten state and local transportation infrastructure in New Hampshire's seacoast. These risks are expected to increase with sea-level rise, causing potential daily inundation of some transportation assets within the next 80 years. Sea-level rise and other climate change impacts will need to be considered as municipalities and NHDOT maintain or replace aging existing transportation assets and design and construct new systems. Effective adaptation to increasing coastal flood risks will depend upon coordination among transportation decision-makers, municipalities, regulators, and other authorities to share information and develop consistent (or complimentary) transparent methods to ensure a safe and functioning NH Seacoast Transportation Corridor (STC).



Area of Interest & Risk Summary

<https://www.therpc.org/STCVA>