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Agenda

- Project Summary 15 Minutes
- Transportation Network Impacts 15 Minutes
- Conceptual Adaptation Options 15 Minutes
- Community Feedback 45 Minutes

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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.



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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

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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

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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
- Important to recognize when examining edges and smaller sites

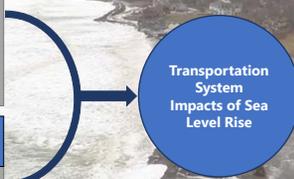
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Analysing 2019-2020 Impacted Roadways

Previous Work on Sea Level Rise Impacts

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



Transportation System Impacts of Sea Level Rise



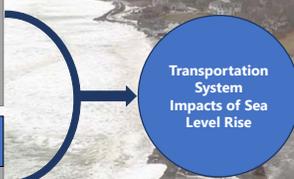
Mean Higher High Water and tidal extent – 4' SLR Scenario

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Analysing 2019-2020 Impacted Roadways

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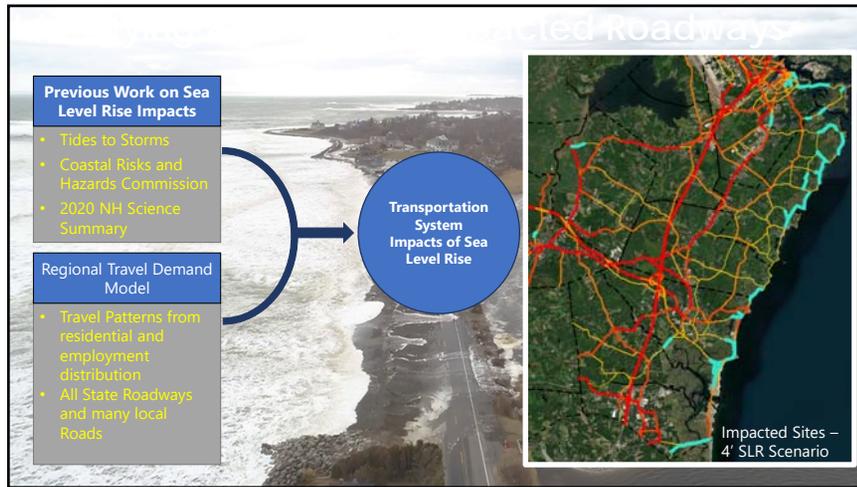


Transportation System Impacts of Sea Level Rise

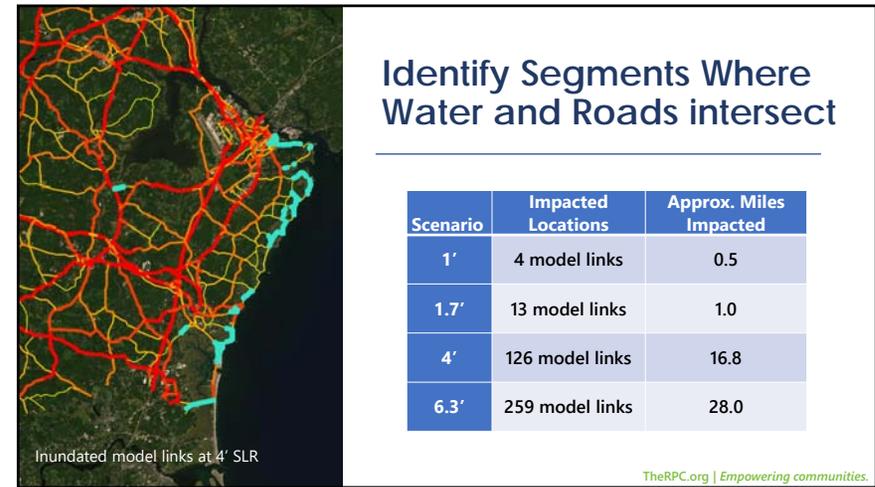


Travel Demand Model links – 4' SLR Scenario

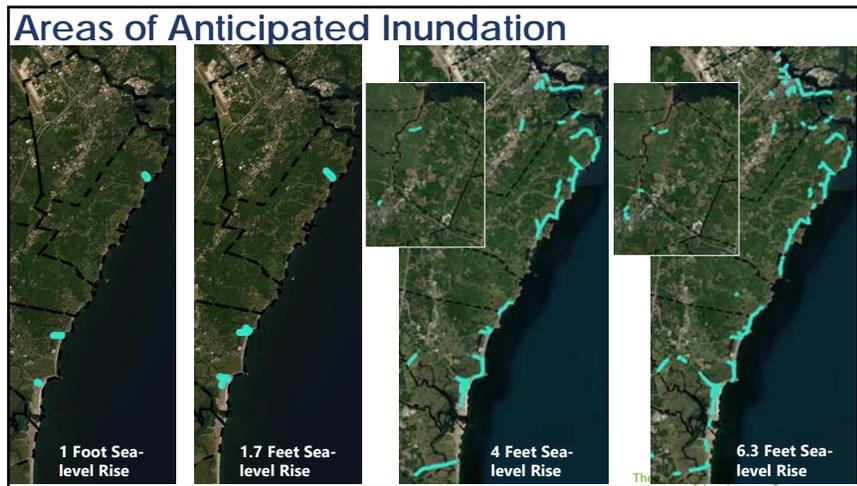
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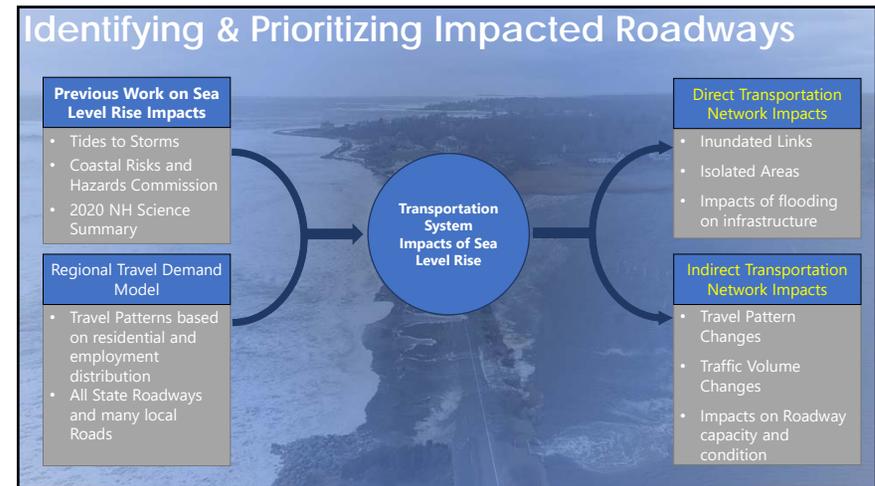
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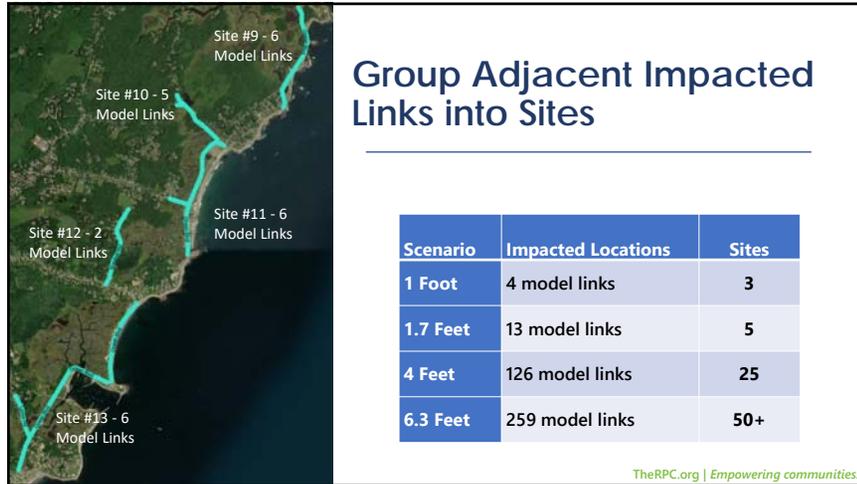
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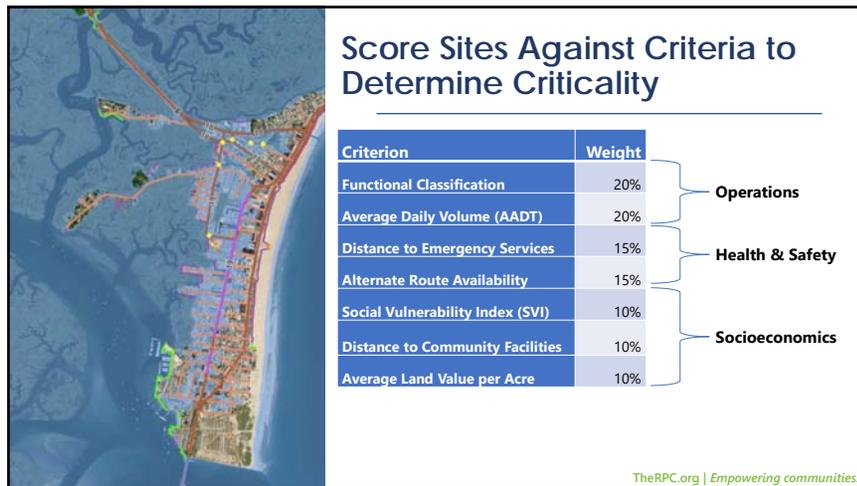
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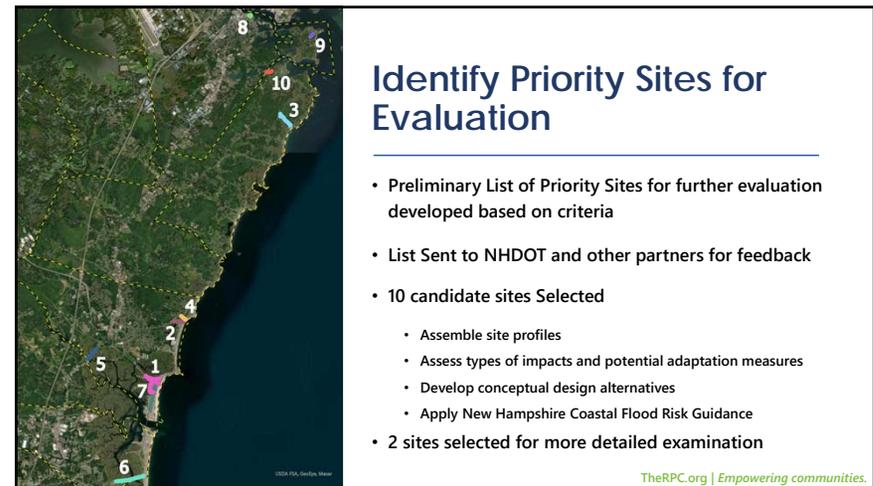
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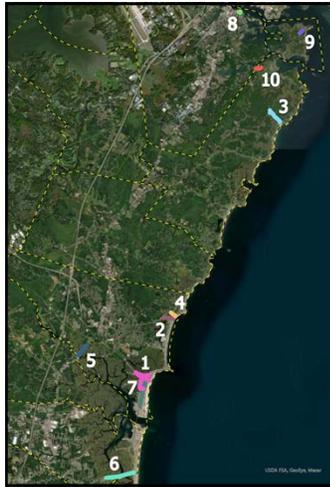
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Priority Sites for Evaluation

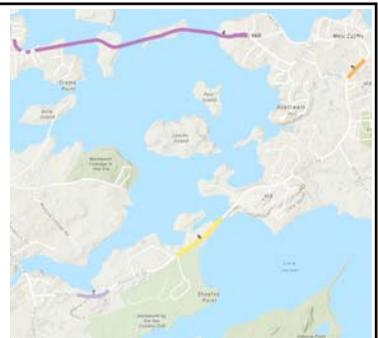
Town	Site	SLR Impact level
New Castle/ Rye	Wentworth Rd/NH 1B	4'
Rye	Marsh Rd, Parsons Rd	1'
Rye	Ocean Blvd, Wallis Rd	4'
Rye	Locke Rd, Ocean Blvd	4'
Hampton	Cusack Rd	1.7'
Hampton	High St	1'
Hampton	NH 1A SB On ramp, Ocean Blvd, Winnacunnet Rd	4'
Hampton	Brown Ave, Church St, Glade Path, Highland Ave,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

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New Castle Sites

- NH 1B impacted between 2 and 4 feet of SLR
- Impacts in Rye at < 2 feet don't appear to impact traffic on NH 1B
- 4' Sees disruption of traffic patterns
- Both access points onto island are impacted



Town	Site	Map number	SLR Impact level
New Castle/ Portsmouth	New Castle Ave/ Portsmouth Ave (NH 1B)	4	4'
New Castle	Wentworth Road (NH 1B)	5	4'
Rye	Wentworth Road (NH 1B)	6	4'
Rye	Wentworth Road (NH 1B)	7	4'

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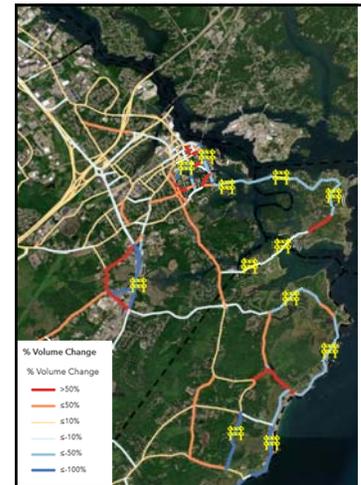


Traffic Impacts <2' SLR

- Marsh Road in Rye Impacted
- Shifts Traffic to alternate routes
- Minor impacts to Roads in Portsmouth (<10% change)
- 4% traffic volume increase on Sagamore Ave (NH 1A)
- 0.4 to 1% traffic volume increase on US 1

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Traffic Impacts at 4' SLR

- US 1 closed at Sagamore Creek Crossing
- ~20% increase in traffic volume on Sagamore Road
 - Current Volume = 5,900 vehicles per day
 - Estimated Volume = 7,100 vehicles per day
- NH 1B inundated at multiple locations
 - Potentially limited to local circulation only at high tides or permanently depending on depth of flooding
 - Access to New Castle Island becomes intermittent
 - Emergency Services impacts

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Actions - Based on Coastal Flood Risk Guidance

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

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New Castle/ Portsmouth Ave

- Accommodate**
 - Reconstruct with materials less susceptible to changes in moisture levels. Accommodates SLR up to pavement surface
 - Causeway or Bridge – Not a viable option given short distances impacted
 - Detours – Alternate route also impacted
- Resist**
 - Raising Causeway or Bridging
 - NHDOT evaluating causeway options (New Castle 29614)
- Retreat/Relocate**
 - Not desired – Evacuation Route for New Castle
 - Retreat may be necessary at higher SLR

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Wentworth Road (NH 1B)

- Accommodate**
 - Reconstruct with more resilient materials
 - Evaluate utility of larger culverts
 - Causeway or Bridge – Not a viable option given short distances impacted
 - Detours – No alternate routes
- Resist**
 - Roadway could be raised and rebuilt above expected SLR levels. This could require increased shoulder area – potential wetland impacts
 - Berms would simply shift the flooding elsewhere
- Retreat/Relocate**
 - Not Desired – At least one access way to New Castle is required
 - Retreat may be necessary at higher SLR

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Next Steps

- Complete community meetings
- Development of site profiles
- Continue to refine traffic analysis (Some discussion of 6' SLR Impacts)
- Refining analysis of ten selected locations
- Completing in-depth look at two sites
 - Lafayette Road in Hampton
 - Marsh Rd/Parsons Road/NH 1A in Rye
- Public Meetings this winter
- Finalize project report for March 2022

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Beyond the STCVA

- Integrate findings and potential transportation projects into Long Range Transportation Plan
- Refine resiliency criteria in project selection process
- Refine Travel Demand model to include more local roads in seacoast (Component of another study)
- Update and Integrate findings from State Hydrodynamic model after that is complete
- Look for additional grant opportunities to pursue further analysis, design, and engineering
 - Neil Pit Lane/Lavender Creek Culvert Analysis

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Feedback

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

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For More Information

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

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