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Overview of Initial Findings and Assessments

Climate Change Vulnerability Adaptation Engineering Assessment for Chappaquiddick Ferry Infrastructure

April 27, 2023

Introductions

Katherine Patch, PE
Senior Transportation Engineer
7 Years of Experience
- Complete Streets
- Roadway Design
- Traffic Management

Joseph Famely, MEM
Woods Hole Group
Senior Environmental Scientist, Woods Hole Group
20 Years of Experience
- Sustainability Planning
- Risk Management
- MVP Trainer

Nils Wiberg, PE, CFM
Associate, Chief Water Resource Engineer
25+ Years of Experience
- Climate Resilience
- Coastal Infrastructure Design/Construction
- Coastal Restoration

Eileen Gunn, AICP
Associate, Business Line Manager
30+ Years of Experience
- Climate Resilience
- Transportation/MassDOT
- Grant Funding

Joel Kubick, PE, PLS, CFM
Woods Hole Group
Civil/Coastal Engineer
23 Years of Experience
- Survey & Civil Engineering
- Coastal Modeling
- Construction Management

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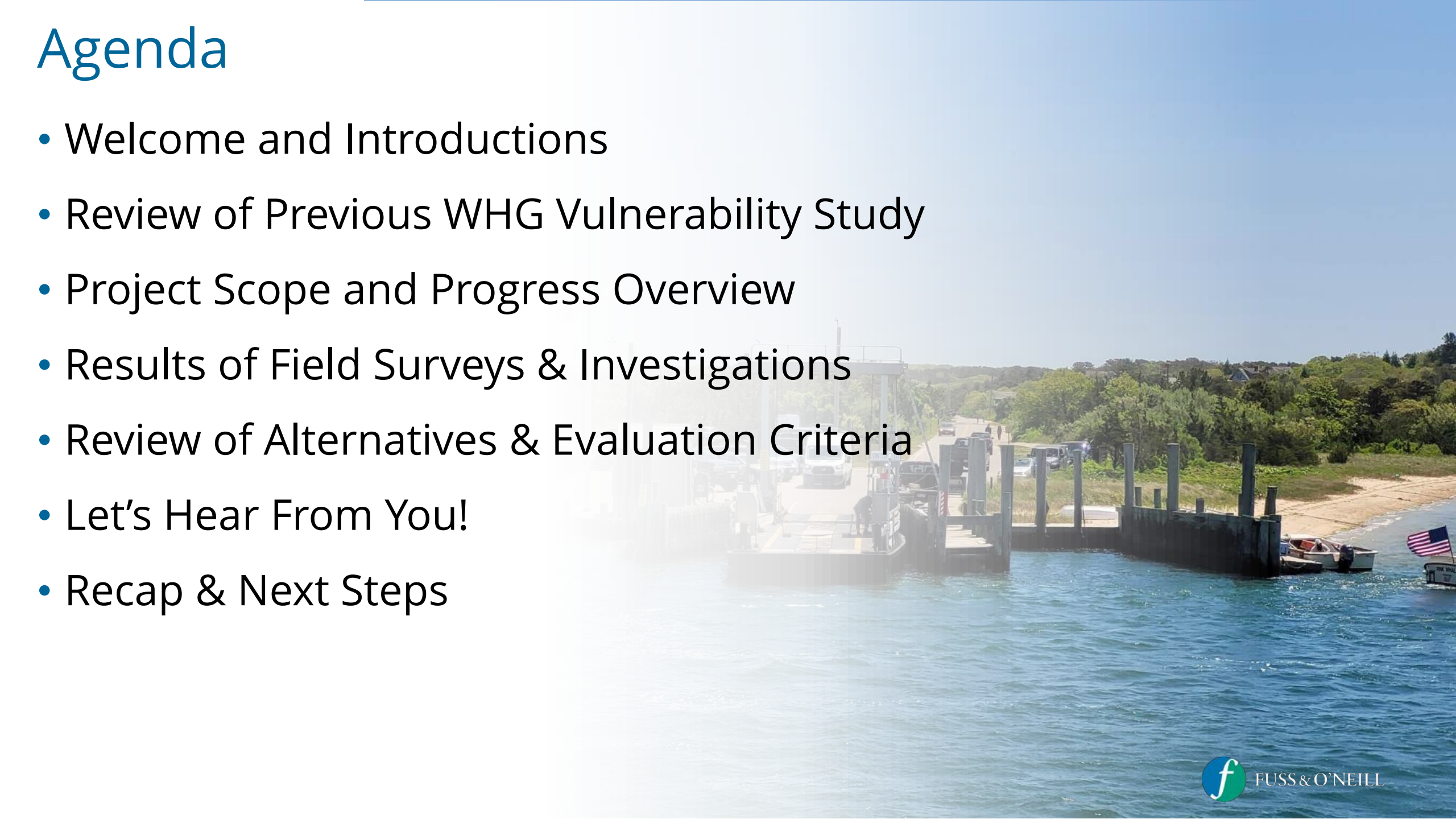
Agenda

- Welcome and Introductions
- Review of Previous WHG Vulnerability Study
- Project Scope and Progress Overview
- Results of Field Surveys & Investigations
- Review of Alternatives & Evaluation Criteria
- Let’s Hear From You!
- Recap & Next Steps



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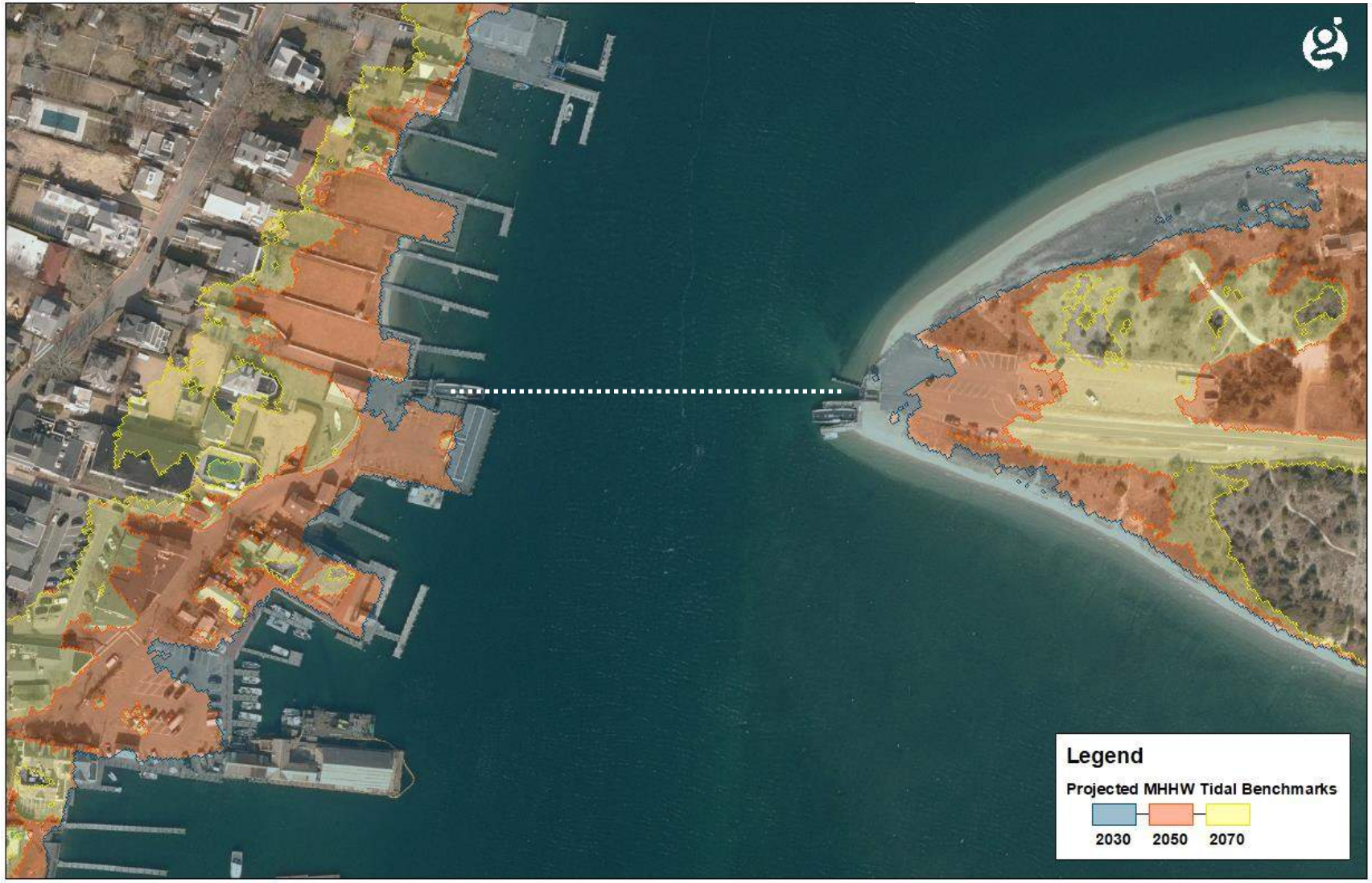
Local Tidal Datum Projections

MHHW Projections for Edgartown Harbor

	Present	2030	2050	2070
MLLW	-1.3	0.1	1.4	3.2
MLW	-1.1	0.3	1.6	3.4
MTL	0.0	1.4	2.7	4.5
MHW	1.1	2.4	3.7	5.5
MHHW	1.4	2.7	4.0	5.8



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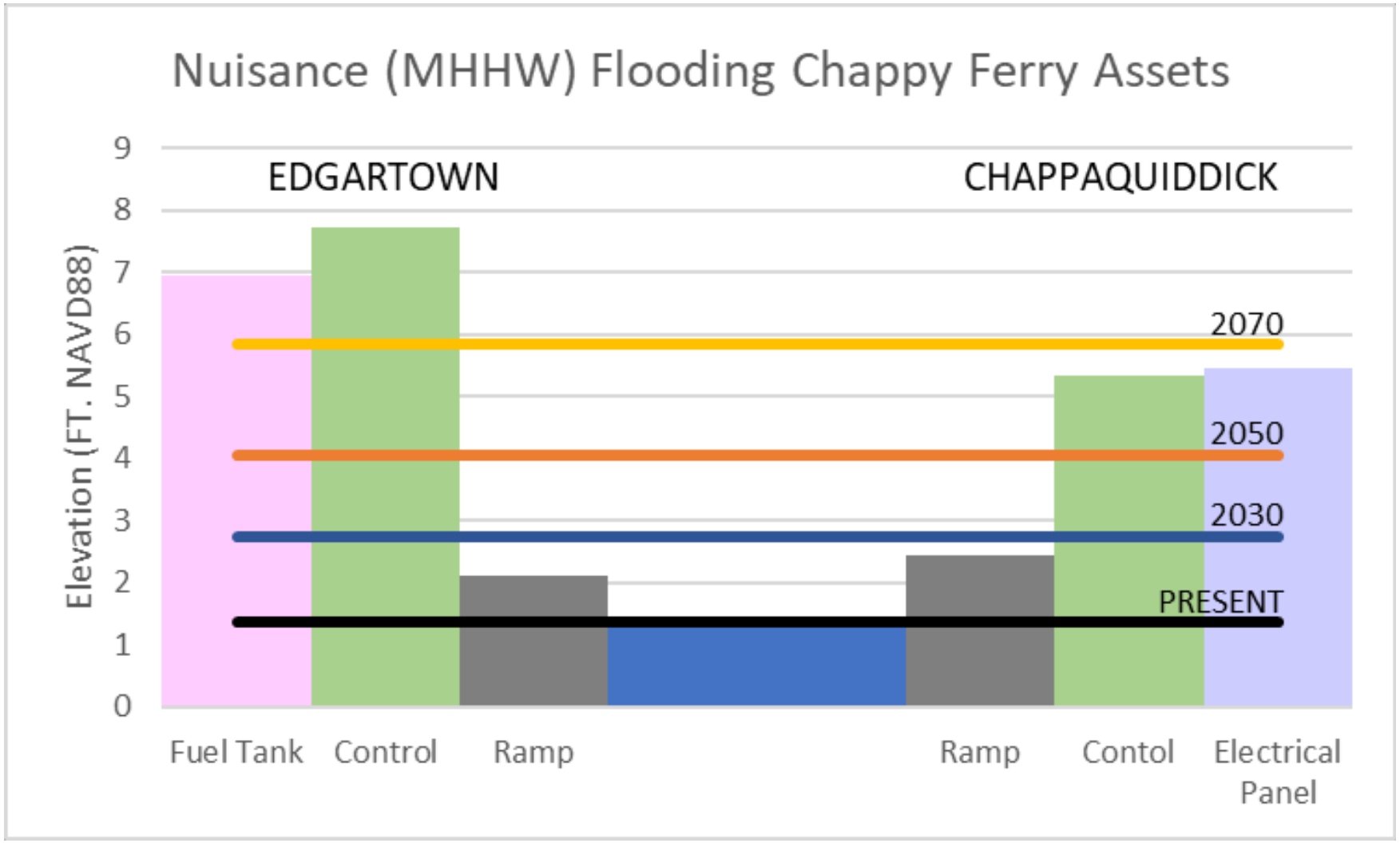
Vulnerability Assessment

MHHW Projections vs. Chappy Ferry Infrastructure



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Project Overview - Scope of Services

- Field Surveys and Investigations
  - Topographic and Bathymetric Surveys
  - Utility Assessment
  - Buildings and Structures Assessment
  - Cultural Resources Due Diligence Assessment
- Development and Evaluation of Alternatives
- Permitting/Compliance Strategy
- 40% Design Drawings and Construction Cost Estimate

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Project Overview - Scope of Services

- Alternatives Evaluation and Preliminary Design
  - Resilience and Adaptation Alternatives Development
  - Alternatives Evaluation Criteria
    - Alternatives Assessment and Technical Memorandum
    - Permitting/Regulatory Compliance Strategy
    - Preferred Resiliency Adaptation 40% Design Drawings and Costs

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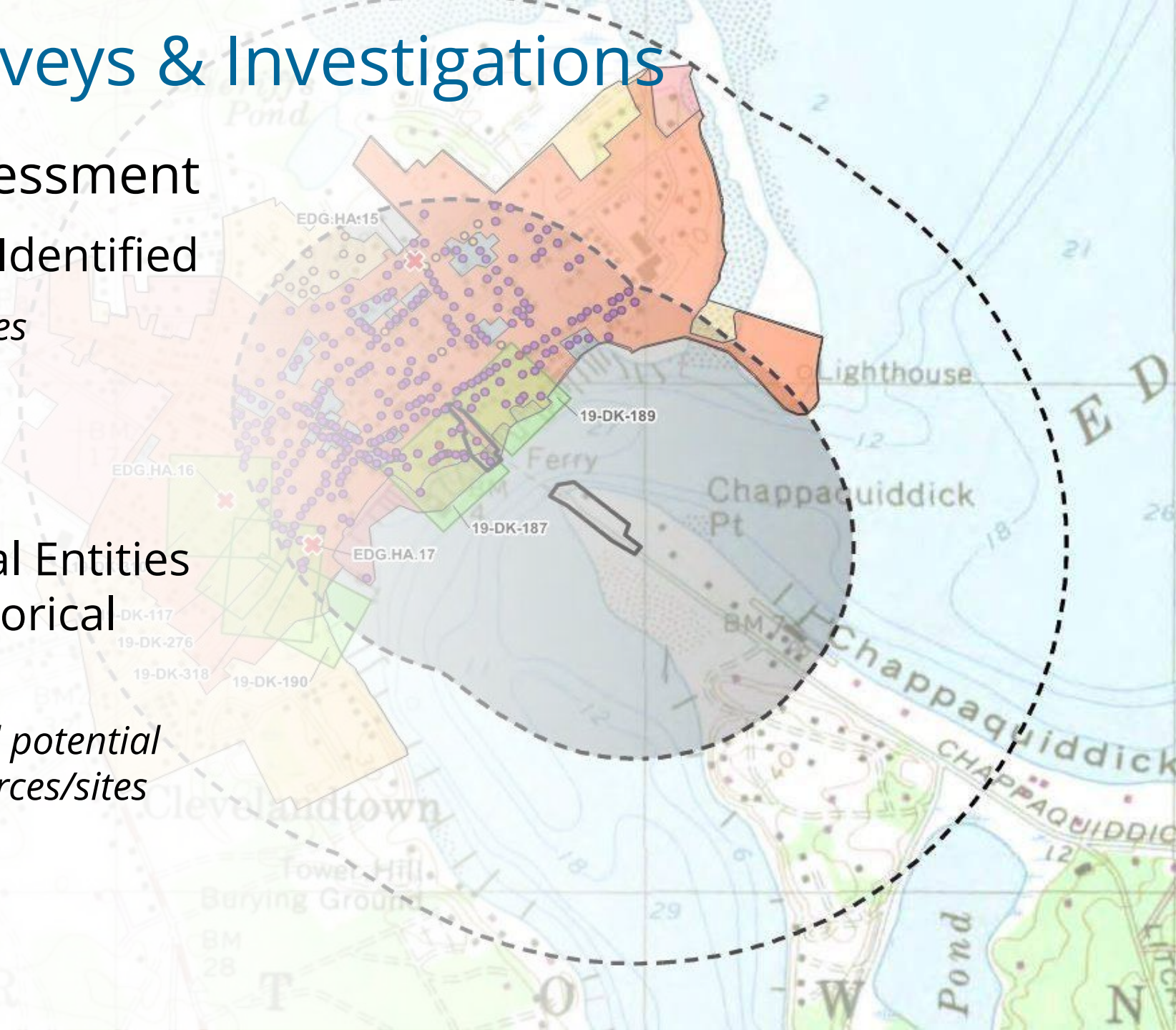
Field Surveys & Investigations

- Base Map – Topography & Bathymetry
- Buildings and Structures Assessment
  - Ferry Operations Building
  - Sculpin Gallery
- Vehicle and Pedestrian Use, Circulation and Safety Assessment

Results of Field Surveys & Investigations

- Cultural Resources Assessment
  - 320 Cultural Resources Identified
    - *310 aboveground resources*
    - *10 archaeological sites*
- Next Steps
  - Consultations with Tribal Entities and Massachusetts Historical Commission
    - *Review of alternatives and potential effects on identified resources/sites*



Any questions so far?

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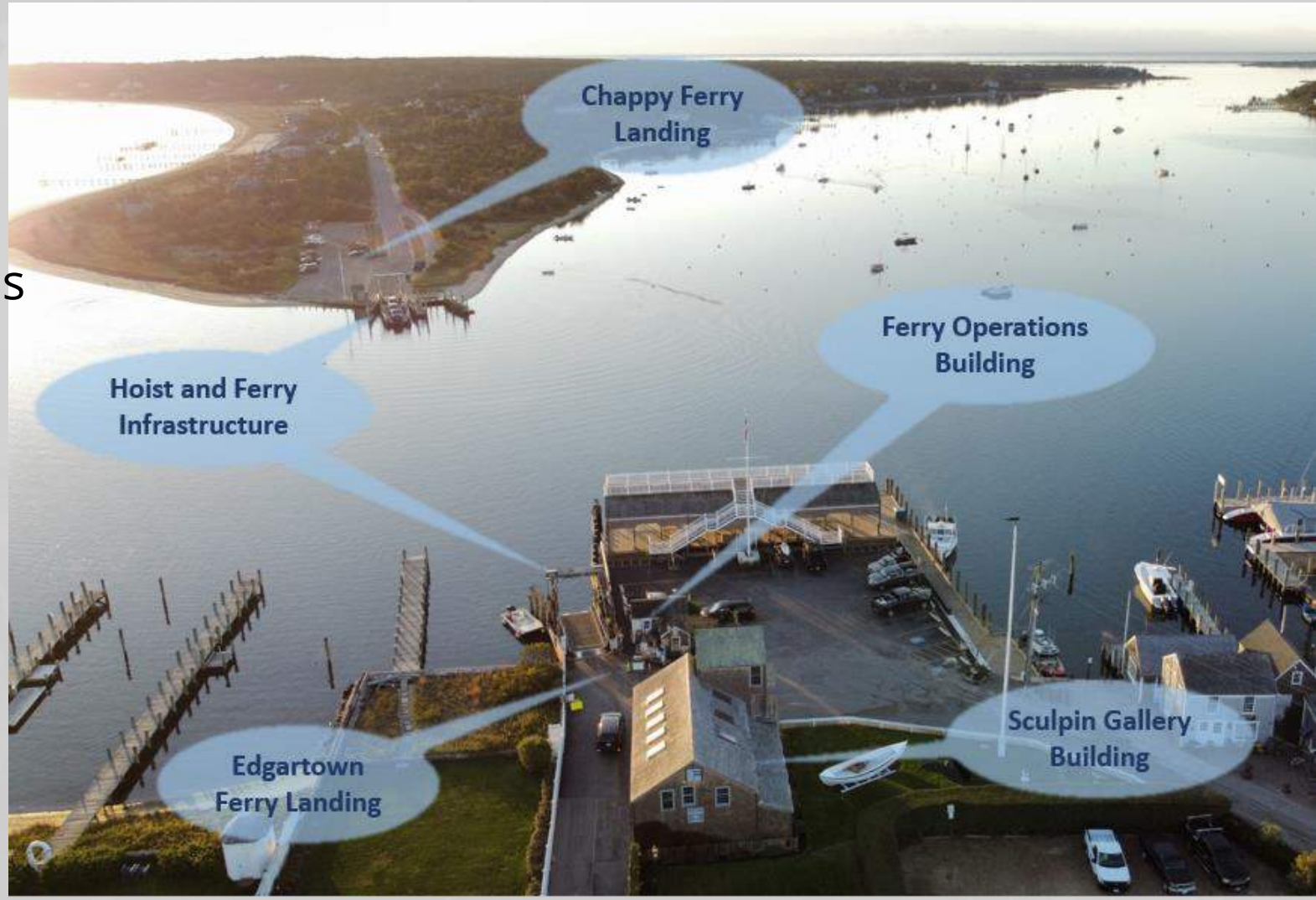
Overview of Infrastructure Alternatives Evaluated

- Adaptation Alternatives Grouped to Address Respective Vulnerable Infrastructure
  - Edgartown Ferry Landing, Memorial Wharf and portions of Dock/Daggett Streets
  - Chappy Ferry Landing, Parking Area and adjacent portion of Chappaquiddick Road
  - Ferries and Ferry Landing Hoist Infrastructure (both Edgartown and Chappy landings)
  - Chappy Ferry Operations Building
  - Sculpin Gallery Building



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Edgartown Ferry Landing Alternatives

1. Raise Edgartown Ferry Landing, Memorial Wharf and Portions of Dock and Daggett Streets
   A. Raise Infrastructure to Interim Phase 1 Elevation of 3.4 feet
   B. Raise Infrastructure to Higher Phase 2 Elevation of 5.8 feet

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Chappy Ferry Landing Alternatives

2. Raise Chappy Ferry Landing, Parking Area and a Portion of Chappaquiddick Road

   A. Raise Infrastructure to Interim Phase 1 Elevation of 3.4 feet

   B. Raise Infrastructure to Higher Phase 2 Elevation of 5.8 feet

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Ferry Landing Infrastructure Alternatives

3. Modify/Replace Ferry Landing Hoists or Replace Hoists with Double-Ended Ferry
   A. Modify/Replace Ferry Landing Hoist Infrastructure
   B. Remove Hoist Infrastructure and Replace Ferry Vessels with Double-Ended Ferries Equipped with Deployable Ramps

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Ferry Operations Building Alternatives

4. Raise Existing Chappy Ferry Operations Building or Construct New Raised Building
   A. Raise the Existing Building to Phase 1 or 2 Elevation
   B. Replace and Raise the Building to Phase 1 or 2 Elevation

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Sculpin Gallery Building Alternatives

5. Sculpin Gallery
   - A. Raise the Building at Existing Location
   - B. Raise and Move the Building 6-8 feet Southwest
   - C. Raise and Move the Building 6-8 feet Northwest

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Alternatives Evaluation Criteria

Site Compatibility and Natural Resource Criteria

- **Avoid/Minimize Impacts to Abutting Properties and Costs to Address Impacts**
- **Minimize Environmental Impacts and Permitting/ Regulatory/Code Compliance Barriers**
- **Maximize Public Safety and Accessibility**

Construction Phase Criteria

- **Minimize Construction Cost**
- **Maximize Ability to Secure Construction Phase Funding from Public Grant Sources**
- **Minimize Construction Duration and Associated Temporary Impacts**

Long-Term Resilience and Operation/Maintenance Criteria

- **Maximize Resilience to Climate Change** - *ability to recover from a storm/flood event*
- **Maximize Adaptability** - *ability to readily modify a project element to meet changes to anticipated future conditions*
- **Minimize Vulnerability to Damage from Climate Change Conditions** - *ability to prevent/minimize impacts to protected infrastructure*
- **Minimize Operation/ Maintenance, Repair and Future Replacement Costs**

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Sample Evaluation Matrix

Design Criteria		Site Compatibility/Natural Resources Criteria			Construction Phase Criteria			Long-Term Operation and Maintenance Criteria		
	Resiliency Alternative	Minimize Impacts to Abutting Properties	Minimize Environmental Impacts and Permitting	Maximize Public Safety and Accessibility	Minimize Construction Cost	Maximize Ability to Secure Public Grant Funding	Minimize Construction Duration	Maximize Resilience and Adaptability to Climate Change	Minimize Vulnerability to Damage from Climate Change Conditions	Minimize Operation/ Maintenance, Repair and Future Replacement Costs
Alternative #	Option A									
	Option B									

- Used as an aid to facilitating open/collaborative evaluation of relative advantages/ disadvantages between respective alternatives
- Numeric scores and criteria weighting allows sensitivity analysis of “robustness” of findings

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Questions or Comments?

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Recap

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Next Steps

- Feedback will be incorporated into a technical memorandum to be provided in late-July
- We will consult with the Town to identify potential funding sources for the project's next phases
- The Select Board will decide on the preferred alternative in August
- Preferred alternative will be advanced to 40% plans that will be developed in September/October

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Project Schedule

Task	Sep	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June	July	Aug	Sep
Monthly Project Conferences													
Community Outreach Materials													
Field Investigations and Assessment + Memo													
Town/CFSC Progress Workshop													
Alternatives Assessment + Memo													
Public Information Workshop													
40% Plans, Specifications, Opinion of Cost – Draft													
40% Plans, Specifications, Opinion of Cost – Final													

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Thank You!

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