

A coastal landscape featuring a paved path on the left, a dune covered in dry, golden-brown grasses and some dark, leafless shrubs in the middle ground, and the ocean in the background under a clear blue sky. The text is overlaid on the upper right portion of the image.

North Nantasket Beach Resilience

Dune Improvement Project for the Town of Hull, MA

The background image shows a coastal dune area. In the foreground, there is a sandy path leading up a dune covered in dry, yellowish-brown grasses. To the left, a wooden fence with vertical posts and a chain-link top is visible. In the background, a house with a grey roof and a brick chimney is situated on the dune. The sky is clear and blue, and the ocean is visible in the distance on the right side.

Tonight's Action Plan

- 1. Overview on how to participate**
 - Public will be muted until after presentation
 - During that time, please keep yourself muted unless talking
 - Use the 'Comment' Feature to ask questions
- 2. Presentation re: Nantasket Beach dune resilience**
 - The path so far
 - Project Overview
 - North Nantasket Beach Flood Risk
 - Benefits of a Resilient Continuous Dune
- 3. Open Discussion; Feedback and Questions**
- 4. Next Steps**

Project Partners



Massachusetts Office of
Coastal Zone Management



Thank you to the Massachusetts Office of Coastal Zone Management for funding this important project!

FEMA Insurance & Community Rating System

Hull has the **3rd highest number of repetitive loss** claims in the state.

Over **1/3 of Hull's claims are along Nantasket Beach** and on the nearby streets from Phipps to X Street.

These claims are **concentrated in areas affected by dune openings** and where the dune is not well established.



By improving the dune, the Town can **receive credit points** towards 15% savings on increasing flood insurance rates

Progress on Dune Management and Resiliency

The Path So Far...

2015

Climate Change Vulnerability Assessment & Adaptation Plan;

12/15 – Selectmen vote to close non-permitted openings when they are reported

2018

Beach Management Plan accepted by Board of Selectmen

2019

Community meetings on dune and beach resiliency improvements

2019

Design and Notice of Intent for dune restoration opposite 133-143 Beach Ave. (Coburn St.) parking lot

2020 Plan

June: Resiliency Project Charrettes

July: A St dune Crossing permitting process

August (September): Nantasket Beach dune improvements & closure of non-permitted crossings permitting process

2018

Hazard Mitigation Plan Update

2018

Storm damage to dunes repaired

2019

Inventory and assessment of all dune crossings

2019

Beach Access Plan accepted by the Conservation Commission

2019

Notice of Intent for resiliency improvements to Town-maintained dune crossings

Future Actions

- Permitting and sand source identification for beach nourishment

Project Area

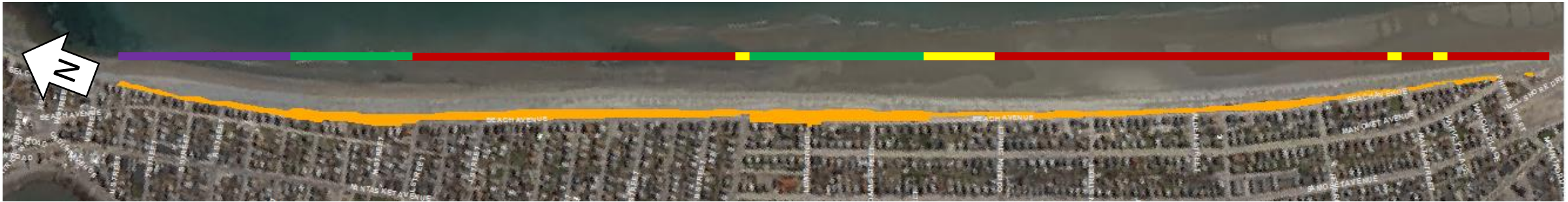


Northern 2 miles of coastline
Phipps Street – S Street

Existing Conditions

Primary Frontal Dune

Primary dune has been altered with hard surfaces such as parking, patios, or ramps



Cobble dune
(typically flat, semi-vegetated)

Wide, vegetated dune
(typically with a flattened crest)

Narrow, sparsely vegetated dune
(typically with a steeper crest)



Existing Conditions Dune Crossings

January 2019 Inventory

- 69 Crossings
- 32 (46%) Permitted, Town-Maintained
- ✘ 37 (54%) Non-Permitted Crossings



Permitted Town-maintained crossing

Non-permitted crossing

Accessible crossing



Dangers of a Non-Continuous Dune System

1. Flooding is a danger to life and property
2. Flood damage is costly to private property owners and to the Town
3. Non-permitted dune crossings violate the Wetlands Protection Act
4. Weakening the dune at crossings impacts the entire beach system, its function, sediment supply, and ecological systems.

“Simply walking on dunes can also lead to sand-landslides that can destabilize the area... reduce their natural resistance to erosion and decrease their value as a buffer to storms.”

<https://www.mass.gov/service-details/cz-tip-basics-of-building-beach-access-structures-that-protect-dunes-and-banks>

Dune Crossings Affect Coastal Flooding & Damage

Continuous dune with permitted, Town-maintained crossings

Altered dunes, non-permitted crossings



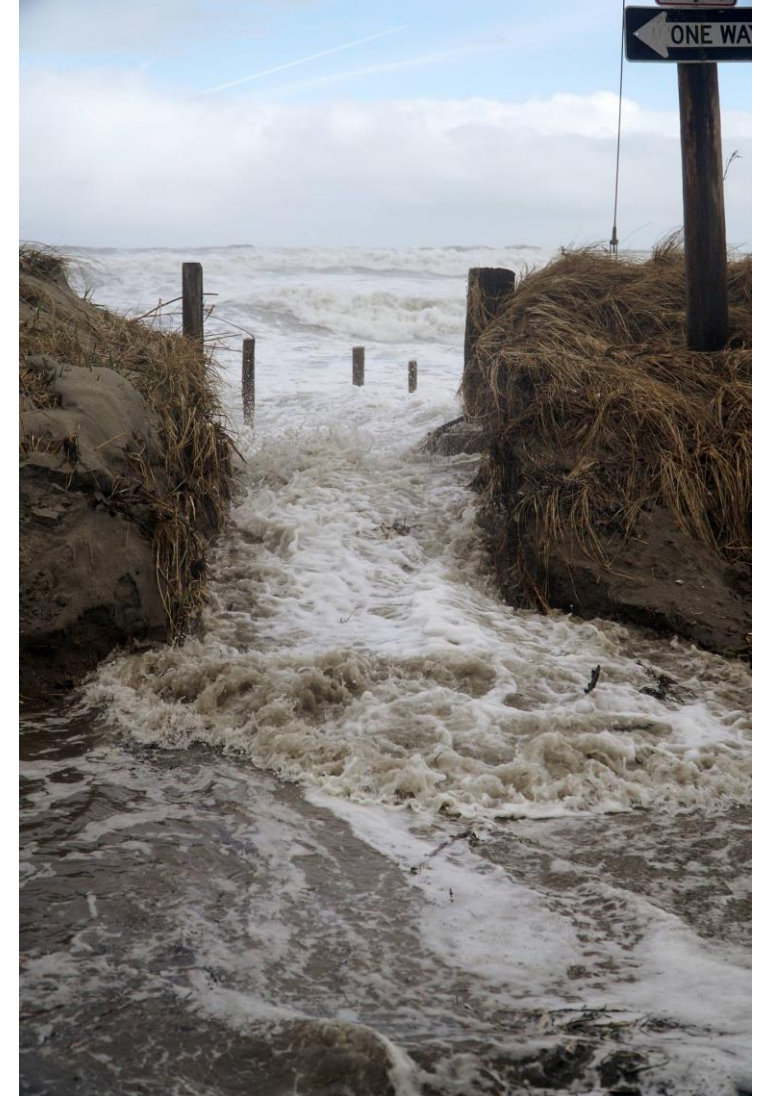
Dune Crossings Affect Coastal Flooding & Damage

Altered dunes, non-permitted crossings



Video of altered dune overtopping

Every crossing is a vulnerability



Existing Dune Level of Protection at Crossings

North Nantasket Beach Overview

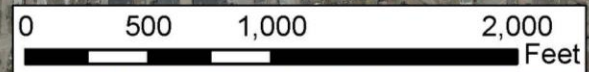
Dune Crossing Types

ProtLevel	Color	Return Period
2-yr	Red	2-yr
5-yr	Orange	5-yr
10-yr	Light Orange	10-yr
15-yr	Yellow	15-yr
25-yr	Light Green	25-yr
35-yr	Medium Green	35-yr
40-yr	Dark Green	40-yr
50-yr	Very Dark Green	50-yr

Today's Focus



Data source: Town of Hull
2011 LiDAR for the Northeast NAD 1983 Datum, NOAA CSC
Boston Harbor Flood Risk Model, MassDOT
Aerial imagery: ESRI, DigitalGlobe, GeoEye 2010



Existing Dune Protection

L – S Streets

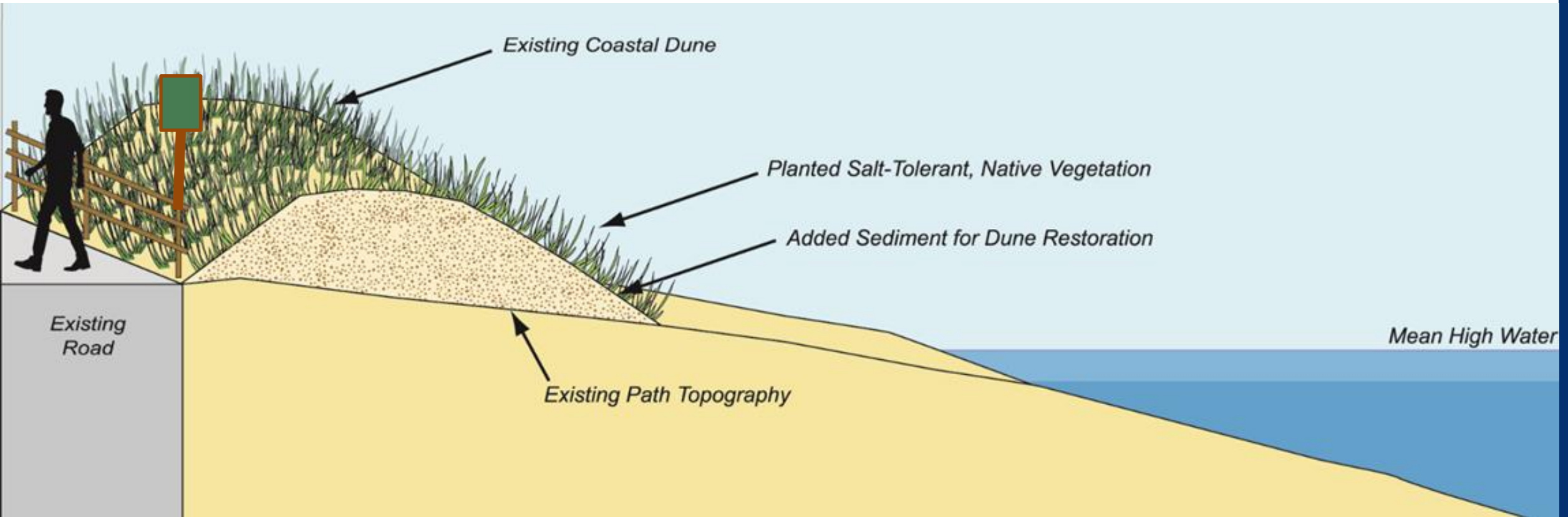
Dune Crossing Types

ProtLevel	10-yr	35-yr
2-yr	15-yr	40-yr
5-yr	25-yr	50-yr

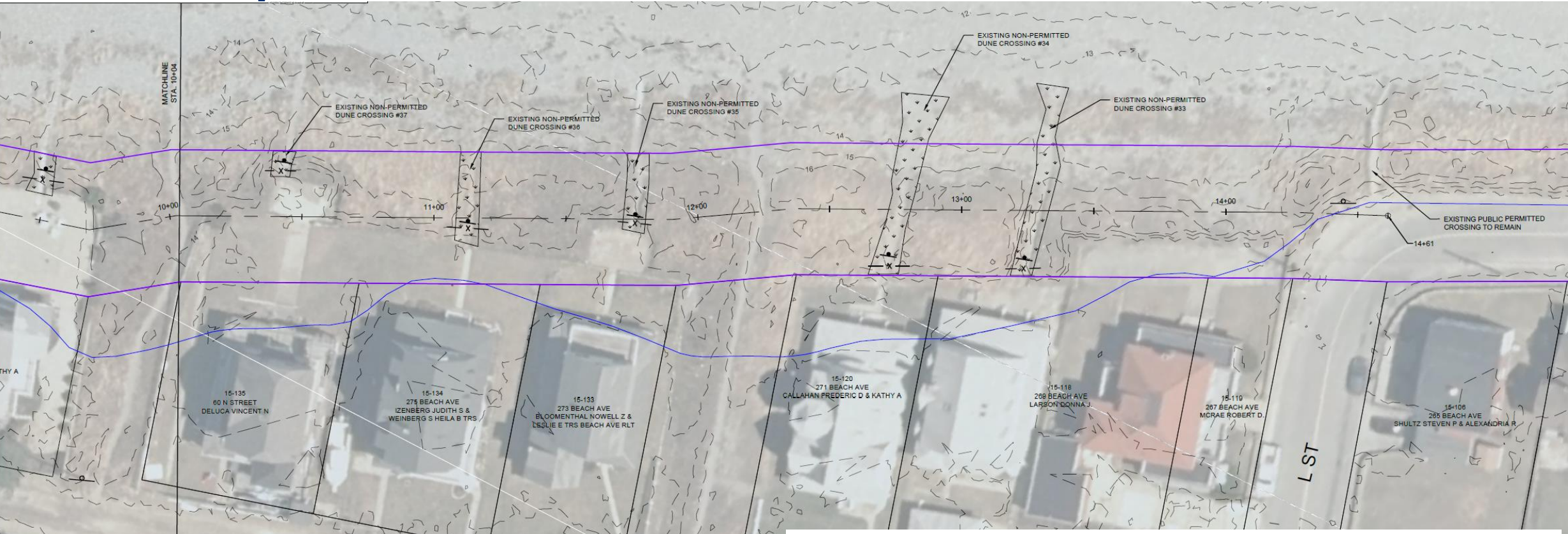


Dune Improvements Non-permitted Crossings

1. Add sediment volume
2. Build up crest elevations
3. Plant beach grass
4. Install sand fencing
5. Install educational signs



Dune Improvement Details L Street – N Street

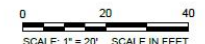


LEGEND

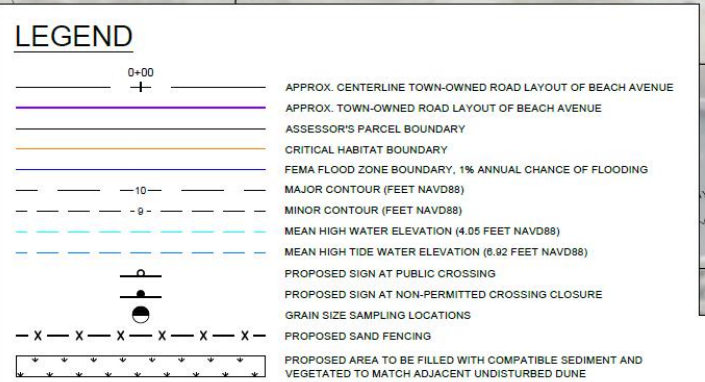
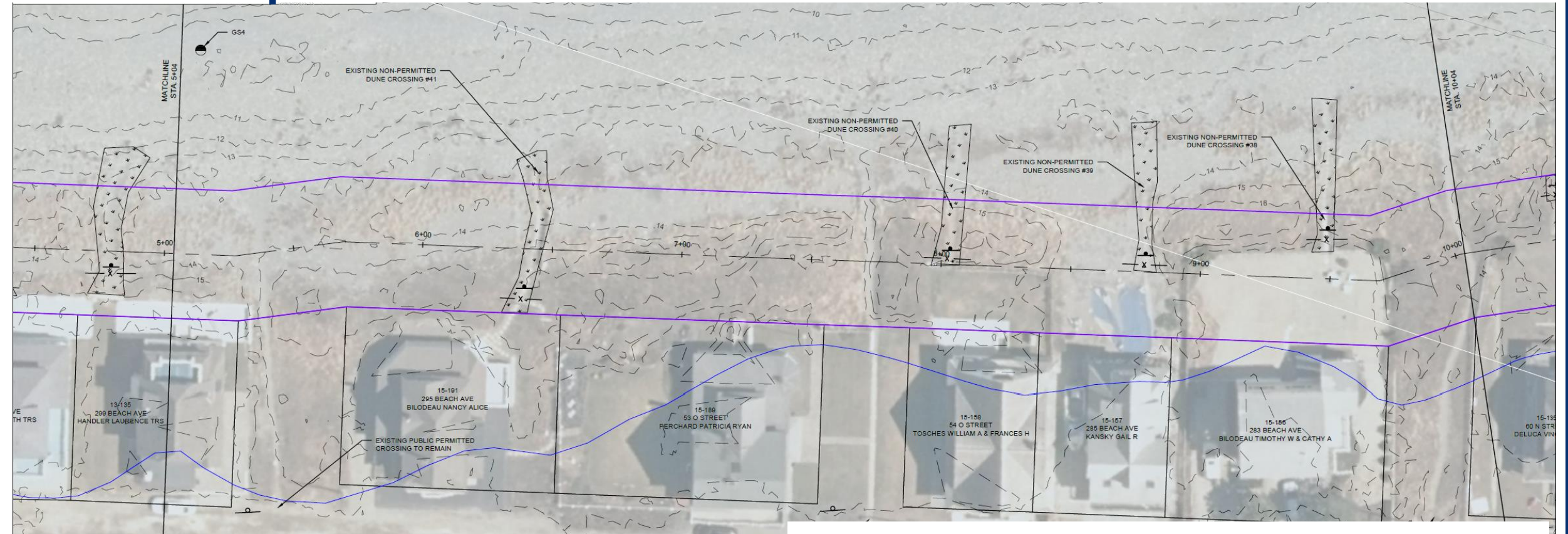
- 0+00 +
- APPROX. CENTERLINE TOWN-OWNED ROAD LAYOUT OF BEACH AVENUE
- APPROX. TOWN-OWNED ROAD LAYOUT OF BEACH AVENUE
- ASSESSOR'S PARCEL BOUNDARY
- CRITICAL HABITAT BOUNDARY
- FEMA FLOOD ZONE BOUNDARY, 1% ANNUAL CHANCE OF FLOODING
- MAJOR CONTOUR (FEET NAVD88)
- MINOR CONTOUR (FEET NAVD88)
- MEAN HIGH WATER ELEVATION (4.05 FEET NAVD88)
- MEAN HIGH TIDE WATER ELEVATION (6.92 FEET NAVD88)
- PROPOSED SIGN AT PUBLIC CROSSING
- PROPOSED SIGN AT NON-PERMITTED CROSSING CLOSURE
- GRAIN SIZE SAMPLING LOCATIONS
- PROPOSED SAND FENCING
- PROPOSED AREA TO BE FILLED WITH COMPATIBLE SEDIMENT AND VEGETATED TO MATCH ADJACENT UNDISTURBED DUNE

1. Restore dunes at non-permitted crossings using compatible sediment and vegetation
2. Install fencing along landward edge of dune to discourage inappropriate crossings
3. Install signs encouraging use of public crossings and discouraging use of non-permitted crossings

PLAN
SCALE: 1" = 20'

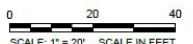


Dune Improvement Details N Street – P Street

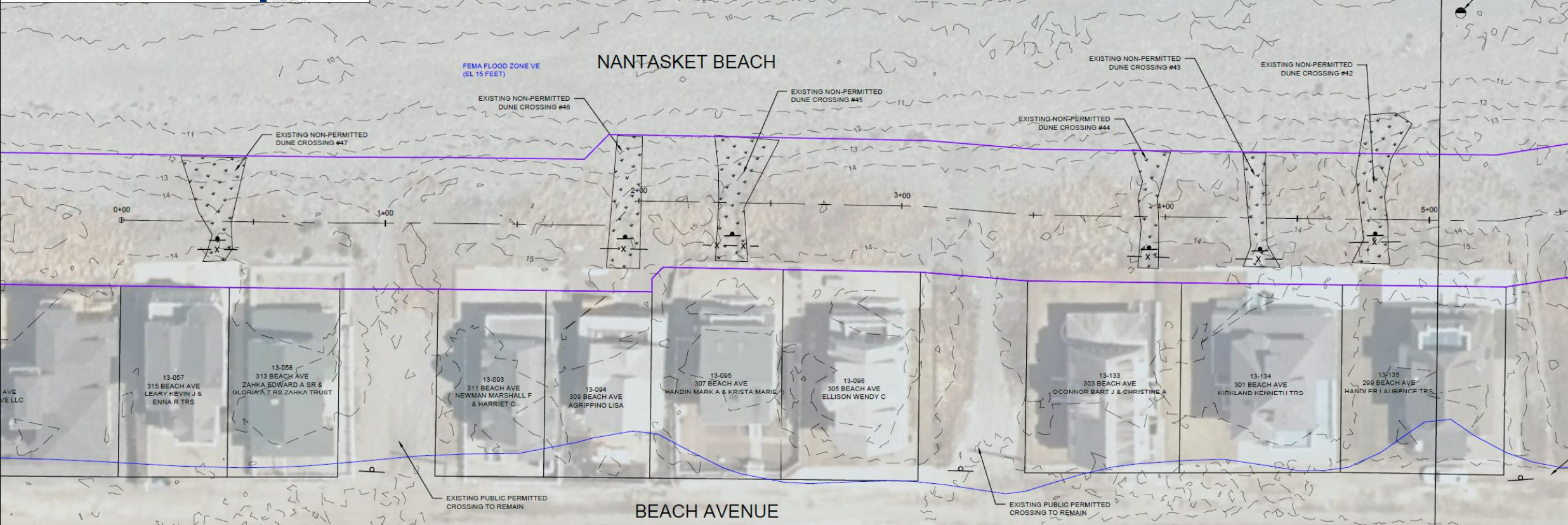


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PLAN
SCALE: 1" = 20'



Dune Improvement Details P Street – S Street



LEGEND

- 0+00
- APPROX. CENTERLINE TOWN-OWNED ROAD LAYOUT OF BEACH AVENUE
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0 20 40
SCALE: 1" = 20' SCALE IN FEET

You Can Help



Use designated Town crossings at street endings, follow new signage & respect closures of non-permitted crossings



Volunteer for annual beach grass planting and cleanups



Do not create new crossings or remove vegetation or sediment (sand, gravel, or cobble stones) from the dune



Communicate your support through the Conservation Commission with letters and public hearing comments

Feedback and Questions

Please submit your feedback and questions to:

Christian Krahforst, Conservation Administrator

Email: conservationemail@town.hull.ma.us

Phone: (781) 925-8102

Fax: (781) 925-8509

Mail: Conservation Department, Town of Hull, 253 Atlantic Avenue, Hull, MA 02045

The Town will post answers to questions on the project webpage:

<https://www.town.hull.ma.us/conservation-department/pages/north-nantasket-beach-resilience>

Thank you!

