Climate Resiliency and Decarbonization

Michele White, Cape Cod Commission

OCTOBER 8, 2024 | College of the Holy Cross

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COMMISSION

Cape Cod is vulnerable to a range of climate-related hazards

EROSION

Shoreline retreat may be 400 to 1,000 feet by 2100

FLOODING

More frequent and intense storms with increased rainfall rates are predicted

SEA LEVEL RISE

Sea level rise is projected to be 4.0 to 10.3 ft. by 2100

$16 Billion

Total assessed value of property in the SFHA

30%

of town-identified critical facilities are located in the floodplain

Over 1500

inventoried historic structures are in the SFHA

RESPONDING TO CLIMATE CHANGE INVOLVES TWO APPROACHES

ADAPTATION STRATEGIES

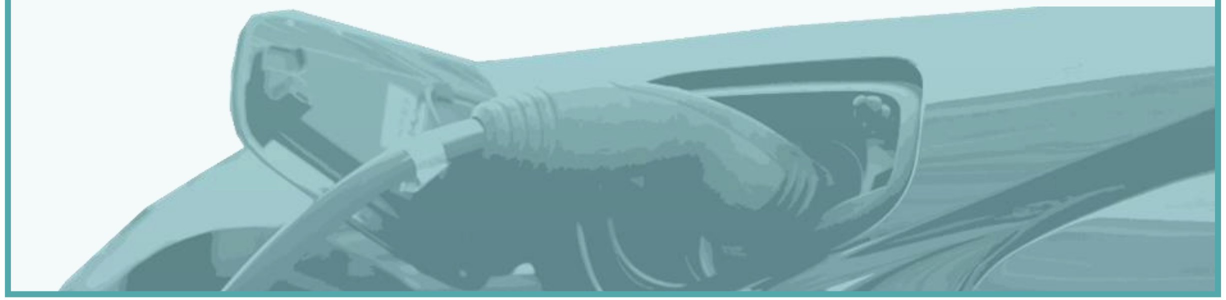
A mix of adaptation strategies will be needed to cost-effectively address losses from sea level rise and storm surge and impacts from flooded roads.

Siting can help address the cost-effectiveness of restoration efforts, while integrating regional solutions can help address other impacts to land and infrastructure.

MITIGATION STRATEGIES

A comprehensive and diverse set of strategies will be needed to meet emissions reduction goals.

- HEAT PUMPS
- RENEWABLE ENERGY
- ELECTRIC VEHICLES
- NET ZERO BUILDING



Regulatory Tools for Coastal Floodplain Resiliency

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COUNTY OF BARNSTABLE MASSACHUSETTS

Sea Grant WOODS HOLE OCEANOGRAPHIC INSTITUTION

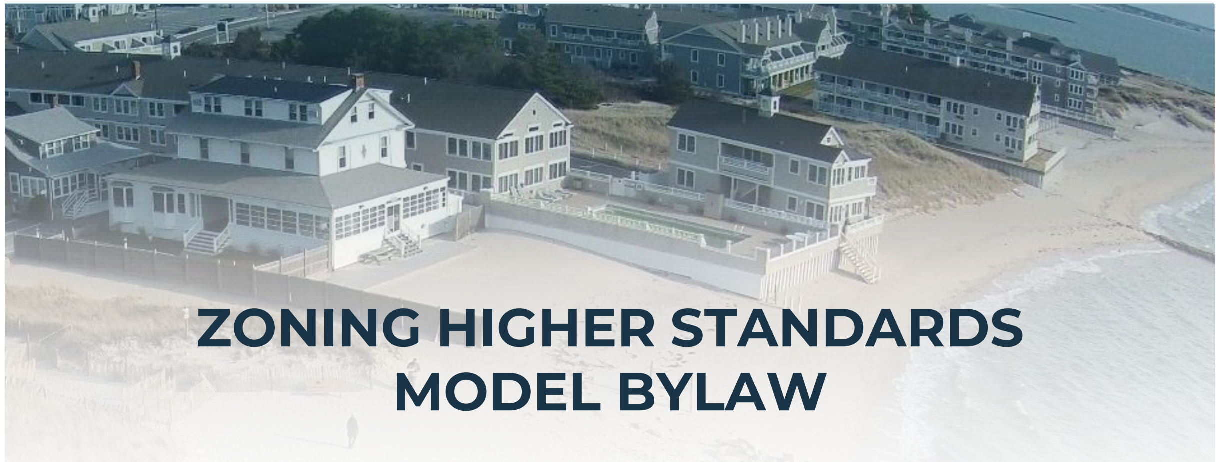
UMass Boston URBAN HARBORS INSTITUTE

NOBLE WICKERSHAM & HEART LLP

Funded by an Executive Office of Energy and Environmental Affairs Planning Assistance Grant

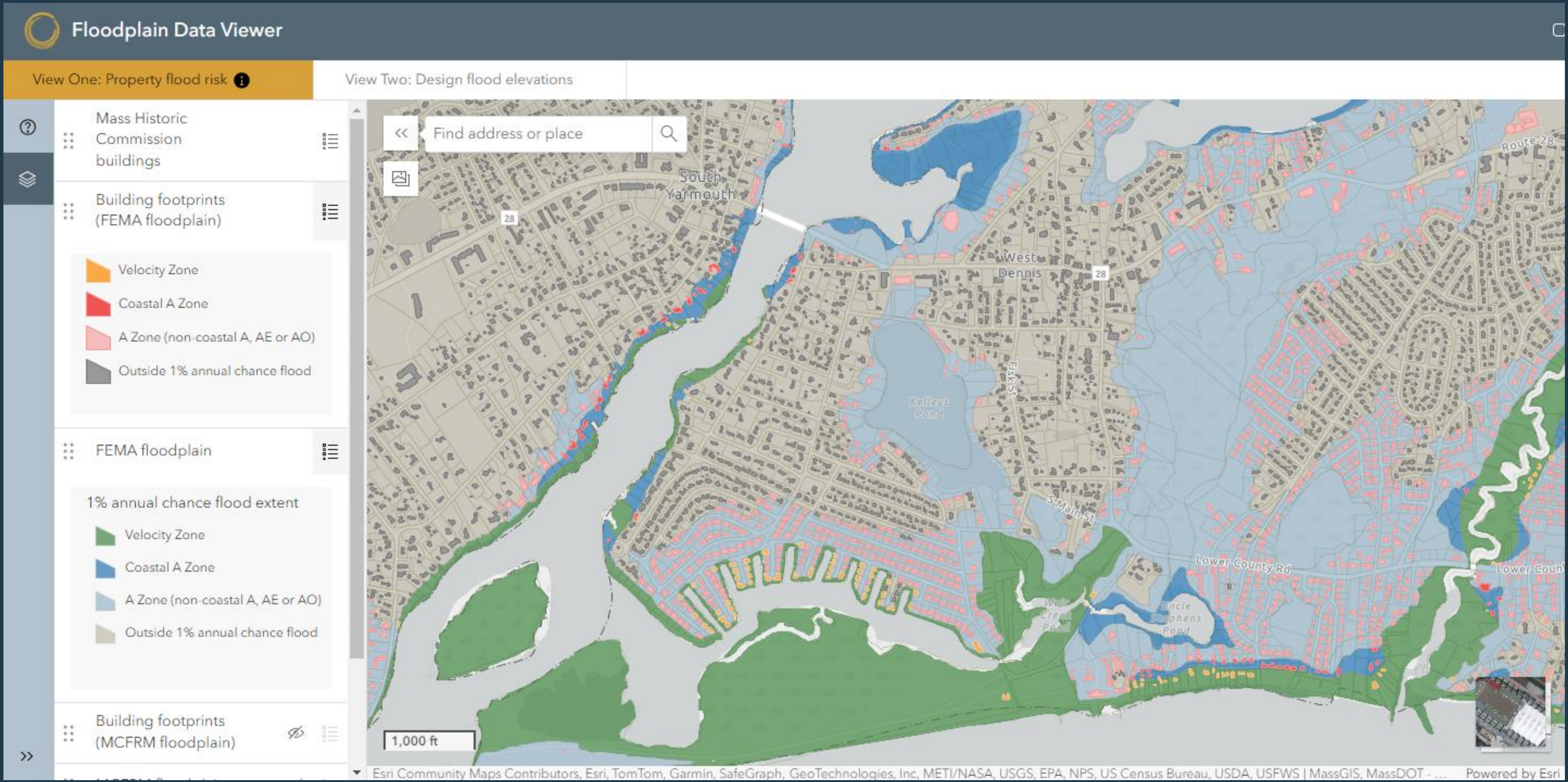
REGULATORY TOOLS FOR COASTAL FLOODPLAIN RESILIENCY

COASTAL RESILIENCE ZONE MODEL REGULATIONS



ZONING HIGHER STANDARDS MODEL BYLAW

- Increase protection of our coastal resources and environment
- Allow for natural resource migration
- Reduce environmental harm and damage
- Plan for future changes to the extents of coastal resource areas
- Give towns some consistency between regulations administered by different boards


Floodplain Data Viewer
View One: Property flood risk
View Two: Design flood elevations
Mass Historic Commission buildings
Building footprints (FEMA floodplain)
Velocity Zone
Coastal A Zone
A Zone (non-coastal A, AE or AO)
Outside 1% annual chance flood
FEMA floodplain
1% annual chance flood extent
Velocity Zone
Coastal A Zone
A Zone (non-coastal A, AE or AO)
Outside 1% annual chance flood
Building footprints (MCFRM floodplain)
Find address or place
South Yarmouth
West Dennis
Kelleys Pond
Fisk St
S Main St
Lower County Rd
Route 28
1,000 ft
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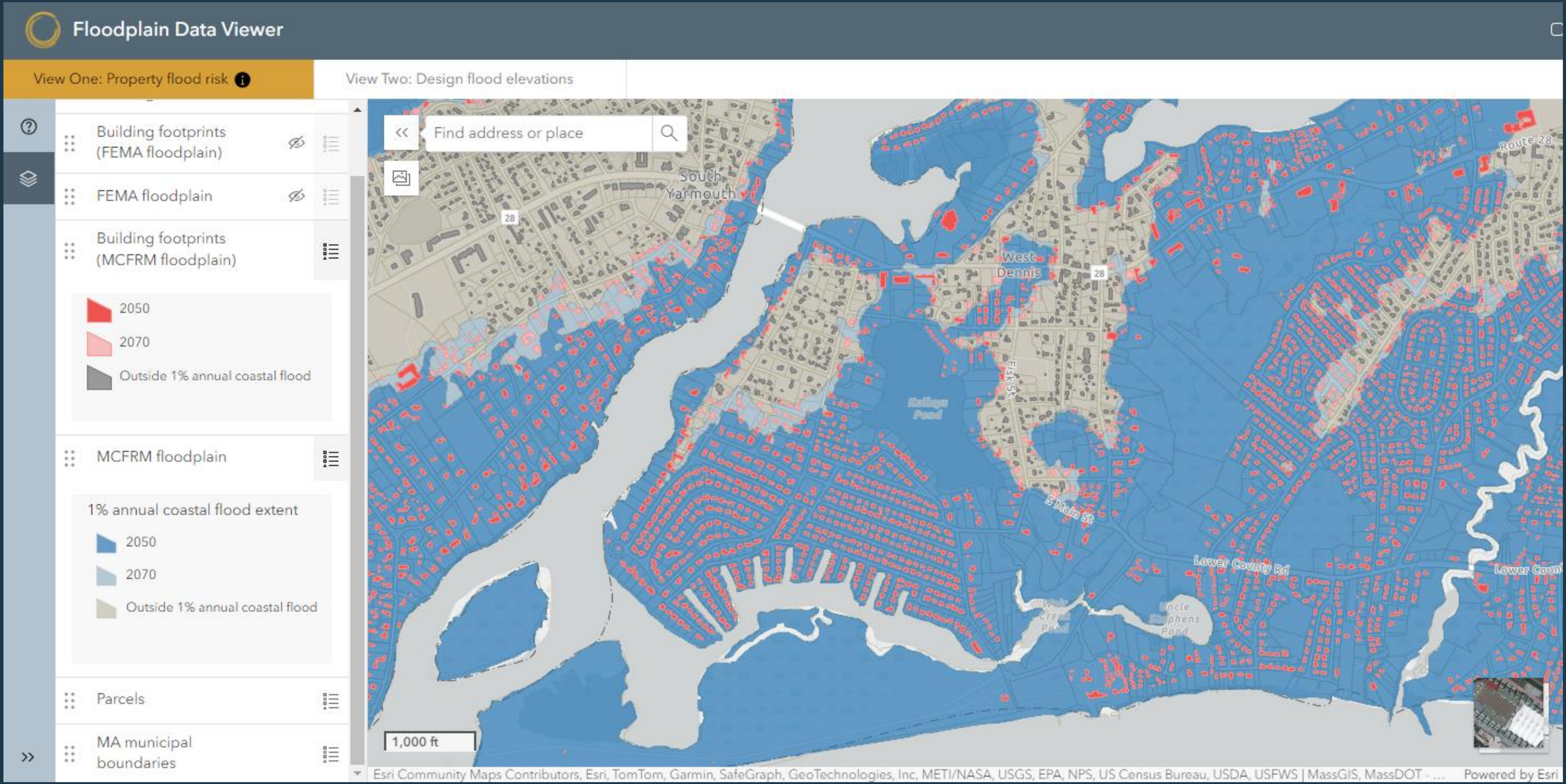

Floodplain Data Viewer
View One: Property flood risk
View Two: Design flood elevations
Building footprints (FEMA floodplain)
FEMA floodplain
Building footprints (MCFRM floodplain)
2050
2070
Outside 1% annual coastal flood
MCFRM floodplain
1% annual coastal flood extent
2050
2070
Outside 1% annual coastal flood
Parcels
MA municipal boundaries
Find address or place
South Yarmouth
West Dennis
28
Route 28
Fisk St
S Main St
Lower County Rd
1,000 ft
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Cape Cod Low Lying Roads

Project Elements

- Flooding vulnerability assessment of low-lying roads and transportation infrastructure
- Support municipal road segment prioritization
- Identify range of potential design solutions, costs

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A CLS COMPANY

EDA
U.S. ECONOMIC DEVELOPMENT ADMINISTRATION

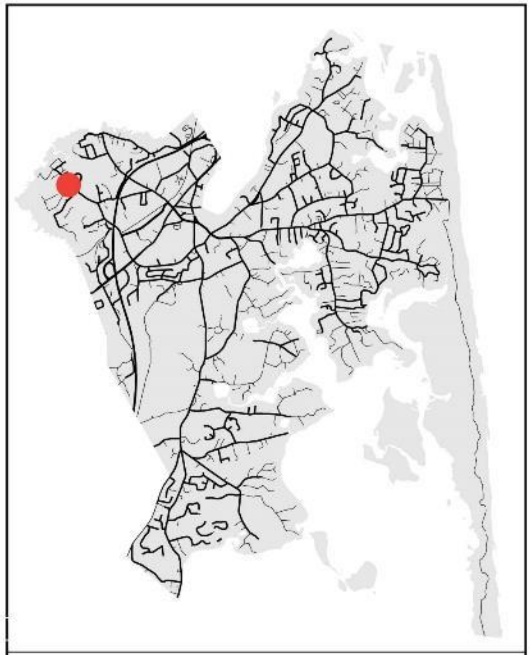
MVP
Municipal Vulnerability Preparedness

Adaptation Strategies

GRAY INFRASTRUCTURE
or Traditional Engineering Structures

GREEN INFRASTRUCTURE
or Nature-based Solutions

OTHER APPROACHES
Hybrid, Planned Relocation, Abandonment



Skaket Beach Road at Seabreeze Lane

ORLEANS

ALTERNATIVE 3: GREEN

A berm to 11.3 feet planted with native vegetation is constructed on the seaward side of the road, tying into Skaket Circle with a road table. The town-owned triangle is used for rain gardens and/or public open space.

Note: Project overlap with wetland areas, rights of way and property lines is approximate and needs confirmation with a site survey

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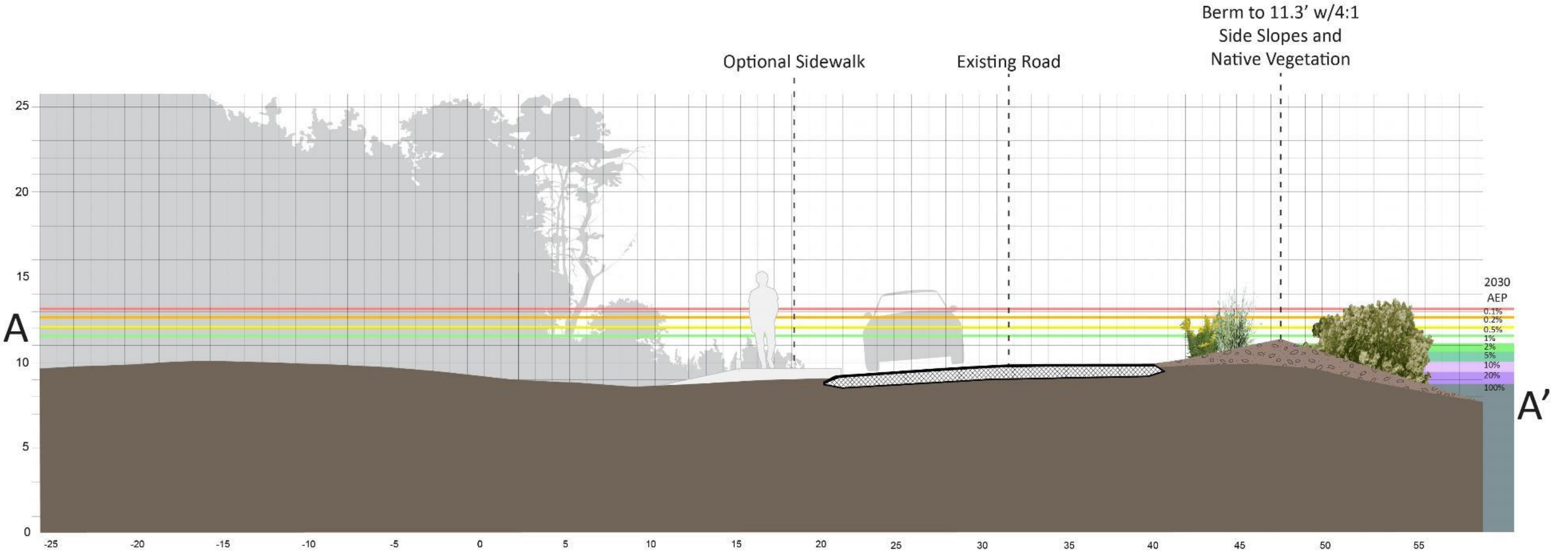
Skaket Beach Road at Seabreeze Lane



ALTERNATIVE 3: GREEN

Skaket Beach Road at Seabreeze Lane, Orleans

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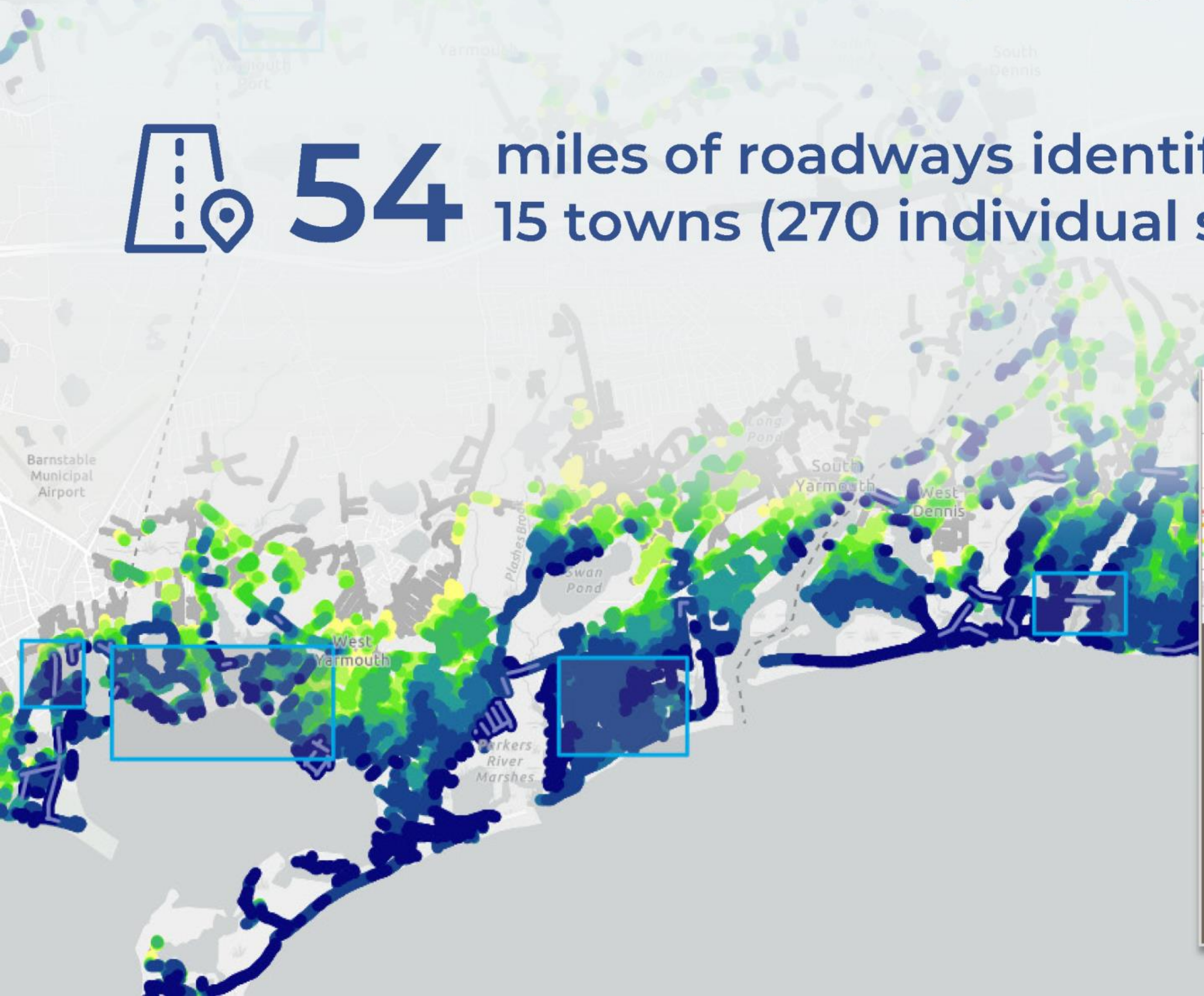
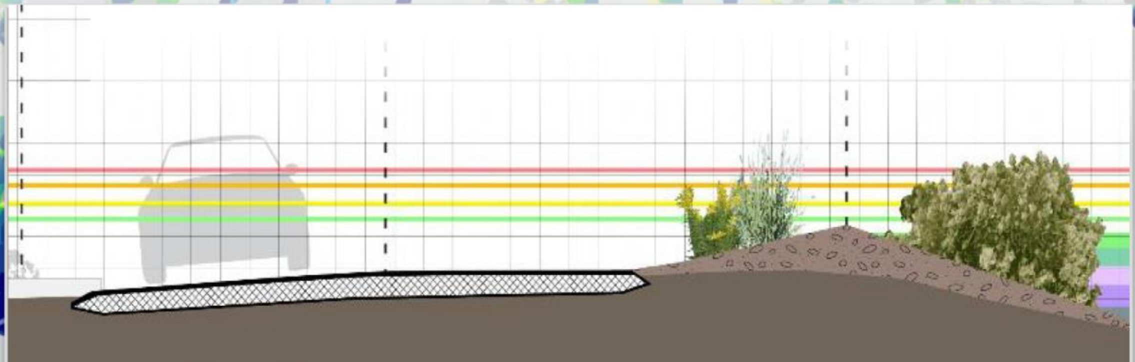
SUPPORTING LOCAL CLIMATE ACTION

Cape Cod Low Lying Roads

54 miles of roadways identified and prioritized across all 15 towns (270 individual segments)



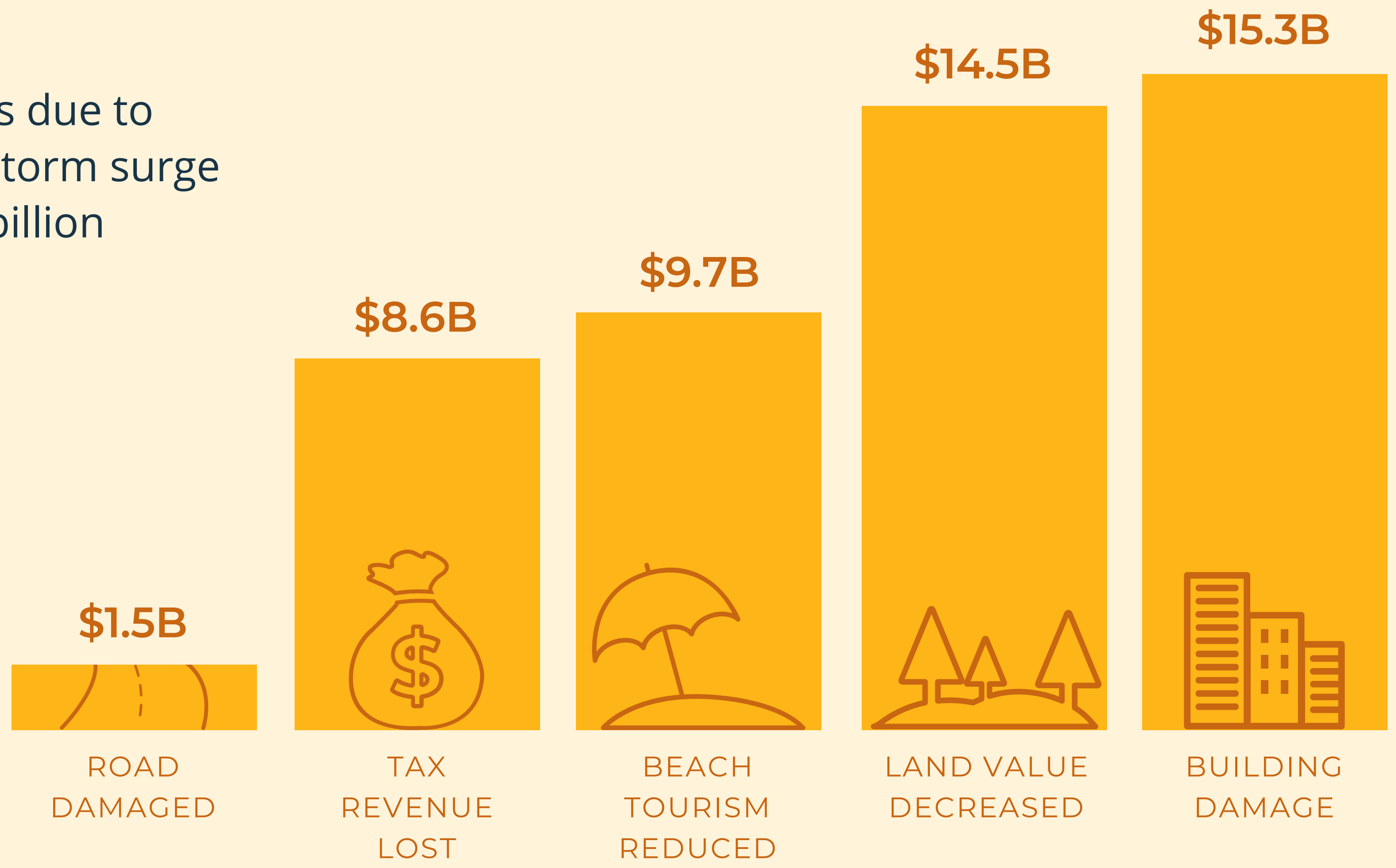


89 design adaptations for 34 road segments

THERE IS A COST OF DOING NOTHING

Damage and losses due to sea level rise and storm surge could exceed $50 billion through 2100

$50
BILLION



Economic Impacts of Climate Change on Cape Cod, Eastern Research Group, Inc., and Synapse Energy Economics, Inc.

Thank you!

www.capecodcommission.org/coastal-floodplain-resiliency

www.capecodcommission.org/our-work/low-lying-roads-project

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