



Building with BRICKs

FEMA'S NEWEST GRANT PROGRAM

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What is BRIC?

FEMA's NEWest Program!

2021: \$1 Billion

**BRIC: Building Resilient Infrastructure
and Communities**

Annual grant competition

Funds projects to advance community resilience



What does BRIC Fund?

**Hazard
mitigation
plans**

**Building
codes and
enforcement**

Partnerships

**Infrastructure
mitigation
projects**

Non-competitive funding

Competitive funding

90% of funding to competition



FEMA Lifelines



Safety and Security:
Public Safety Building



Food, Water, Shelter:
Water Treatment Plant



Health and Medical:
Hospital, Stormwater Park,
Nature-Based Solution



Energy:
Microgrids, Renewables



Communications:
Communication Updates



Transportation:
Airport Flood Control, Road Elevation



Hazardous Material:
DOT Landslide Mitigation, Fuel Farm
Mitigation



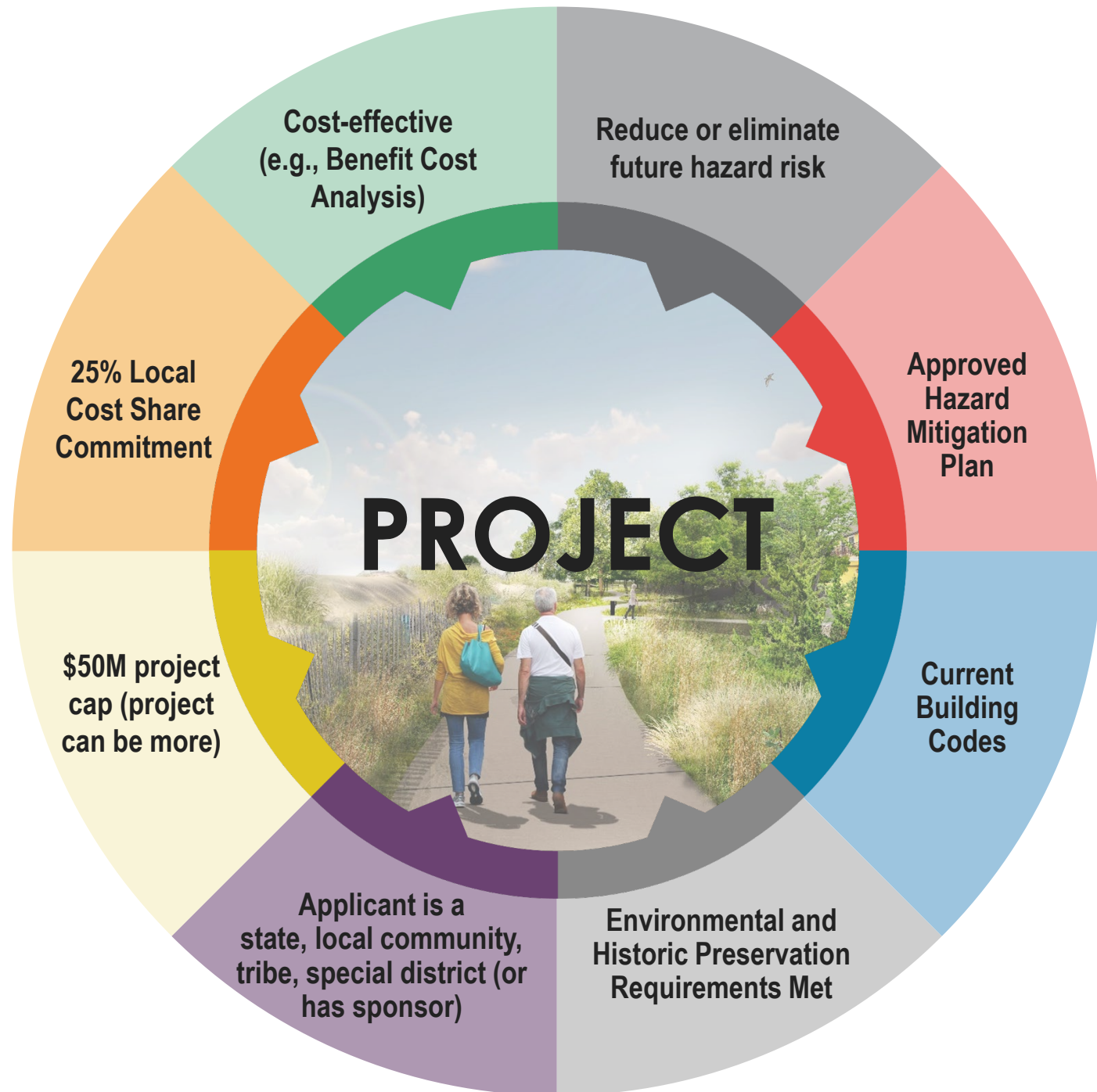
BRIC Project Eligibility

\$50M

federal share
cap on projects

25%

Local Cost
Share
Commitment

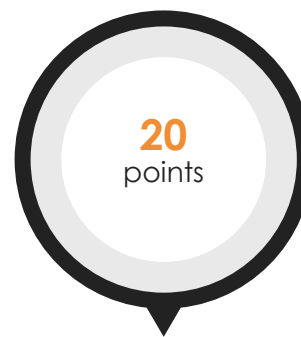




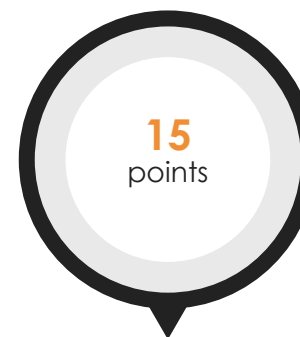
BRIC

It's a competition!

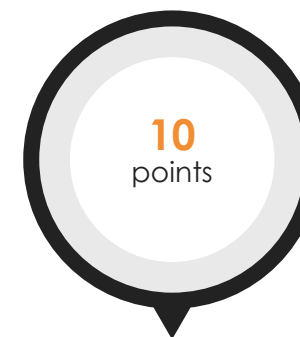
Technical Criteria



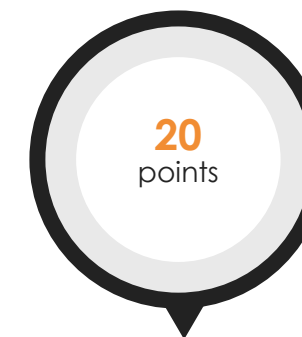
Infrastructure project



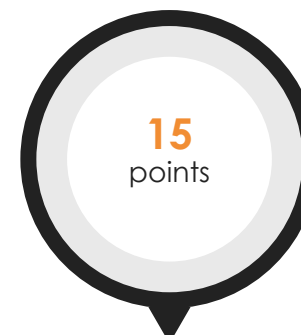
Mitigating risk to one or more lifelines



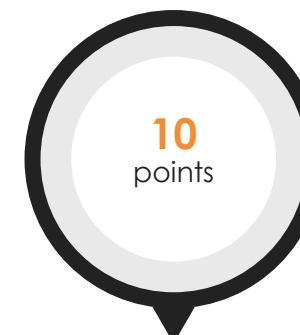
Incorporation of nature-based solutions



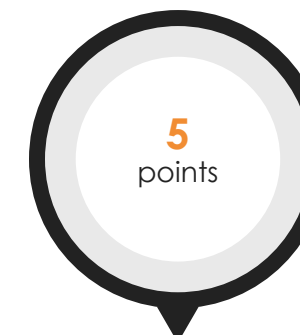
Application has mandatory building code adoption requirement
(2015 or 2018 versions of International Building Code and International Residential Code)



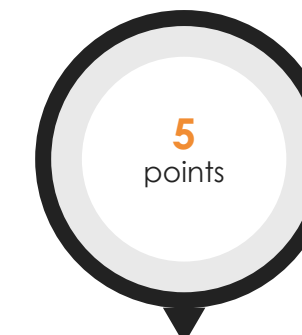
Building Code Effectiveness Grading Schedule Rating of 1 to 5



Application generated from a previous FEMA Hazard Mitigation Assistance Advance award



Increased non-federal cost share



Designation as a small impoverished community

BRIC: It's a competition!

Qualitative Criteria



2021 Anticipated Criteria

Climate change impacts

Social equity

Building codes



2020 BRIC Funding Results

Program results

- ~1,227 sub-applications
- ~ \$4B in funding requested

2020:
**\$500
million**
in funding

Award results

- **Innovation:** Large scale, complex infrastructure projects
- 22 **mitigation** projects (competition ~\$17.17M average)
- 18 of 22 projects included **Nature Based Solutions**
- **Capacity Building** – hazard plans, building codes assessments
 - ~ 80% selection rate



2020 BRIC Results by Project Type

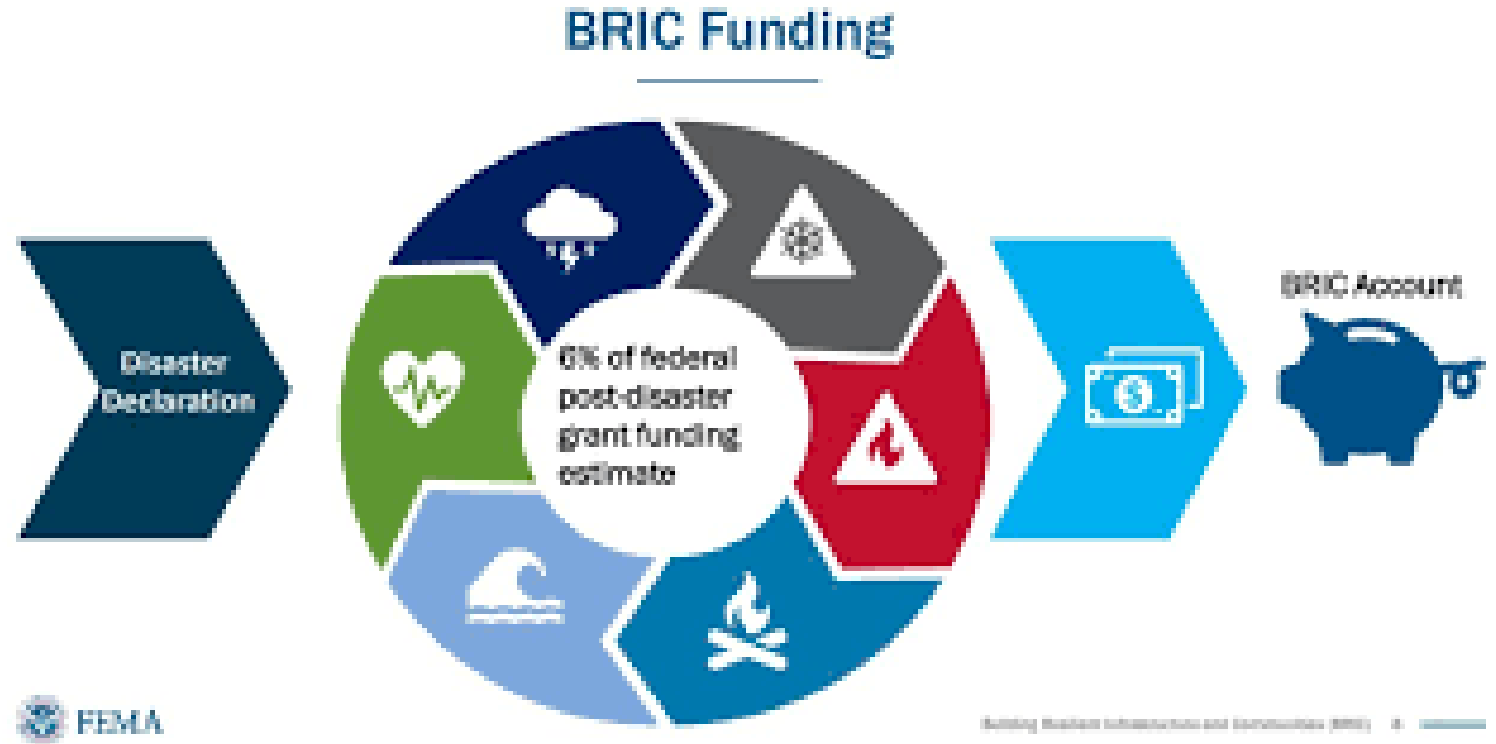
TOP 5 PROJECT TYPES BY TOTAL COST

1. Flood Control = **\$550M**
2. Utility/Infrastructure Protection = **\$91.3M**
3. Wildfire Management = **\$49.3M**
4. Relocation = **\$21.9M**
5. Saferoom/shelters = **\$15.2M**

Source: [Building Resilient Infrastructure and Communities FY 2020 Subapplication Status | FEMA.gov](#)

BRIC

- **Phased Projects Are Eligible!**
 - Detailed planning
 - Schematic design
 - Benefit-Cost Analysis
 - Prove Feasibility
 - Secure Lands
 - Secure Permits
- **IF.....**
 - Selected



Benefit Cost Ratio > 1.0 is Critical



BRIC Case Study

Tottenville Shoreline Protection Project

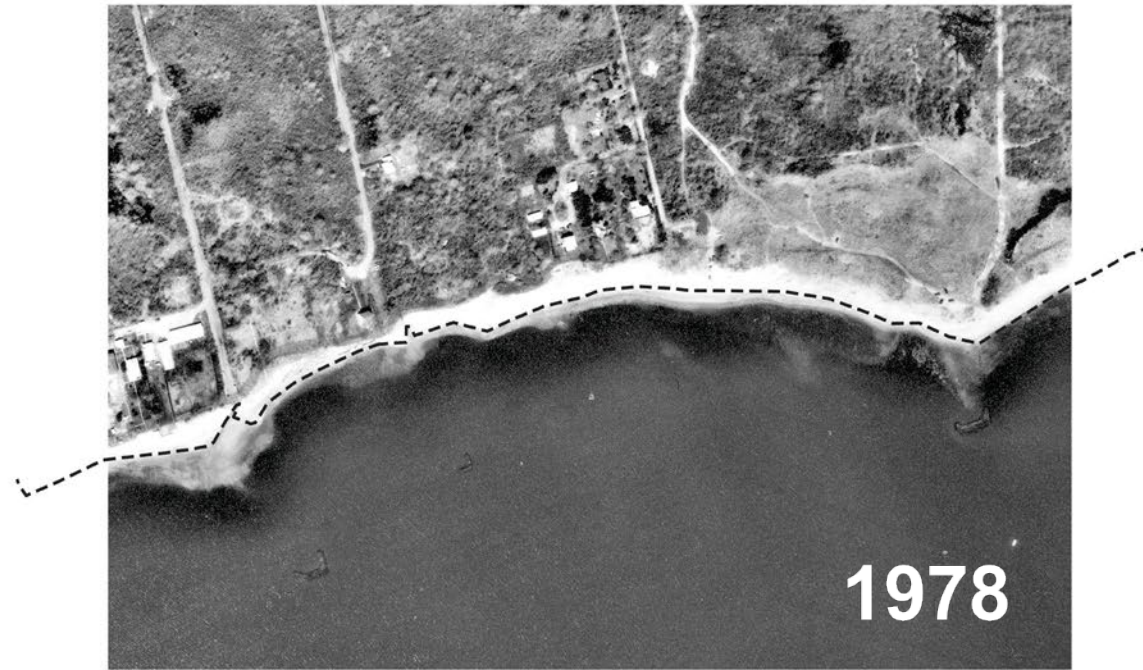


Tottenville Shoreline Protection



Living Breakwaters



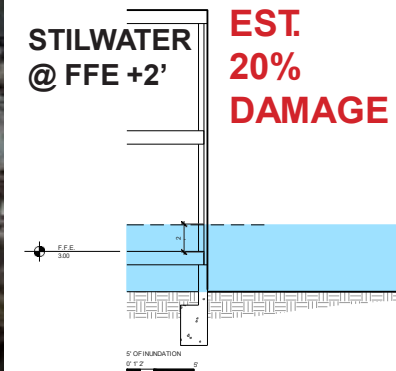
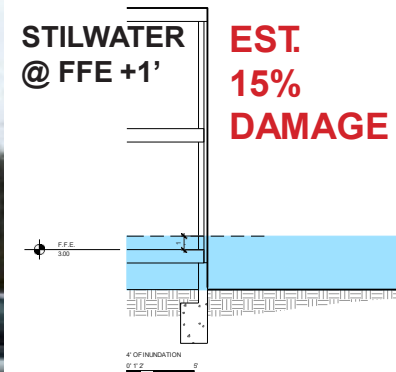


Hurricane Sandy: Why Attenuate Waves?



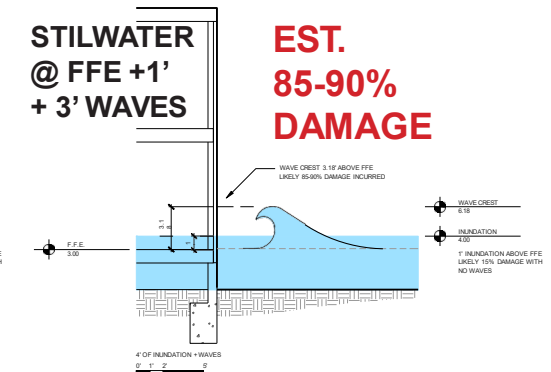
House Destroyed on Yetman Street, Tottenville Photo
Credit: C. Warga, NY Daily News

FLOODING ONLY



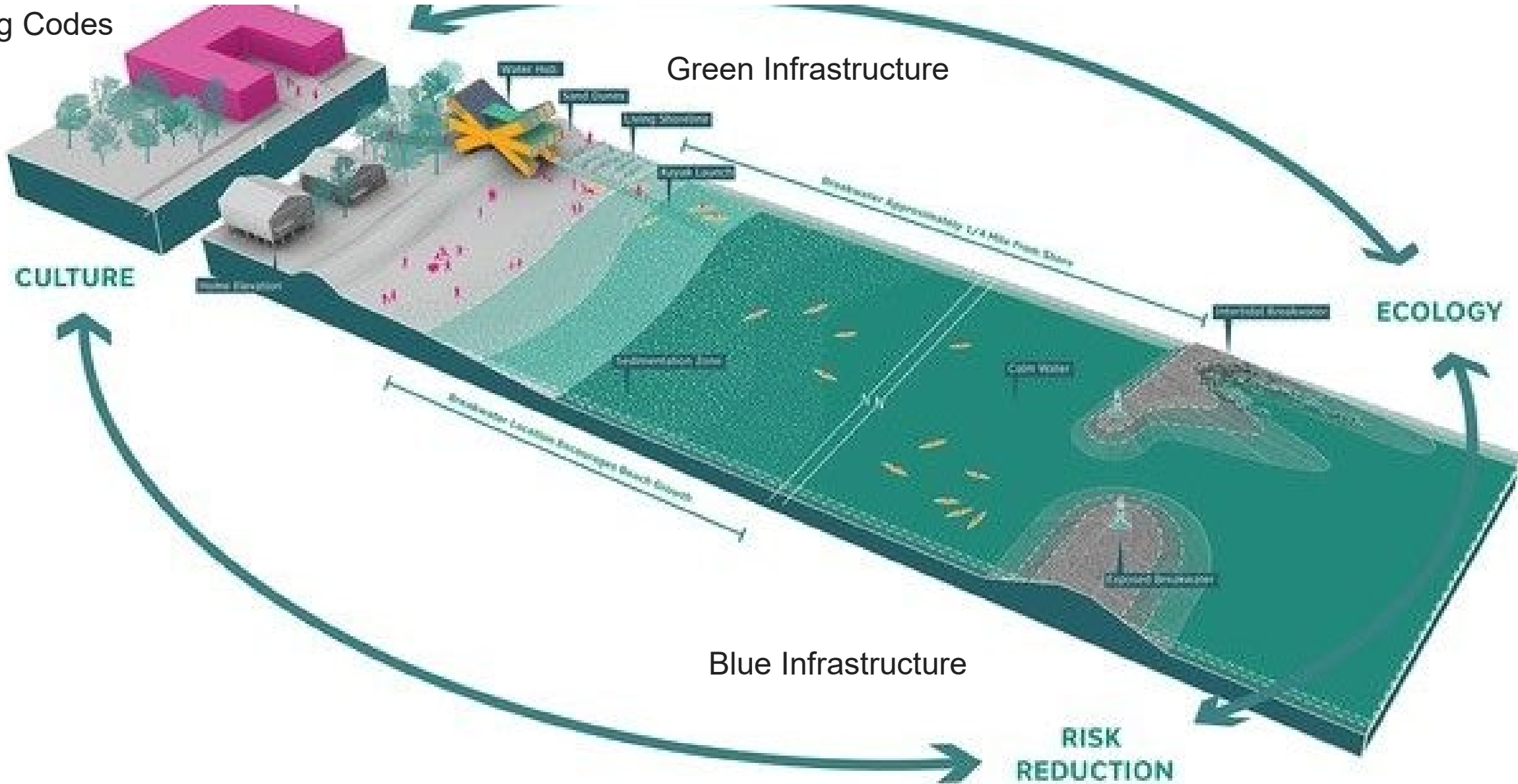
elevations given are height above existing grade.

FLOODING + WAVES



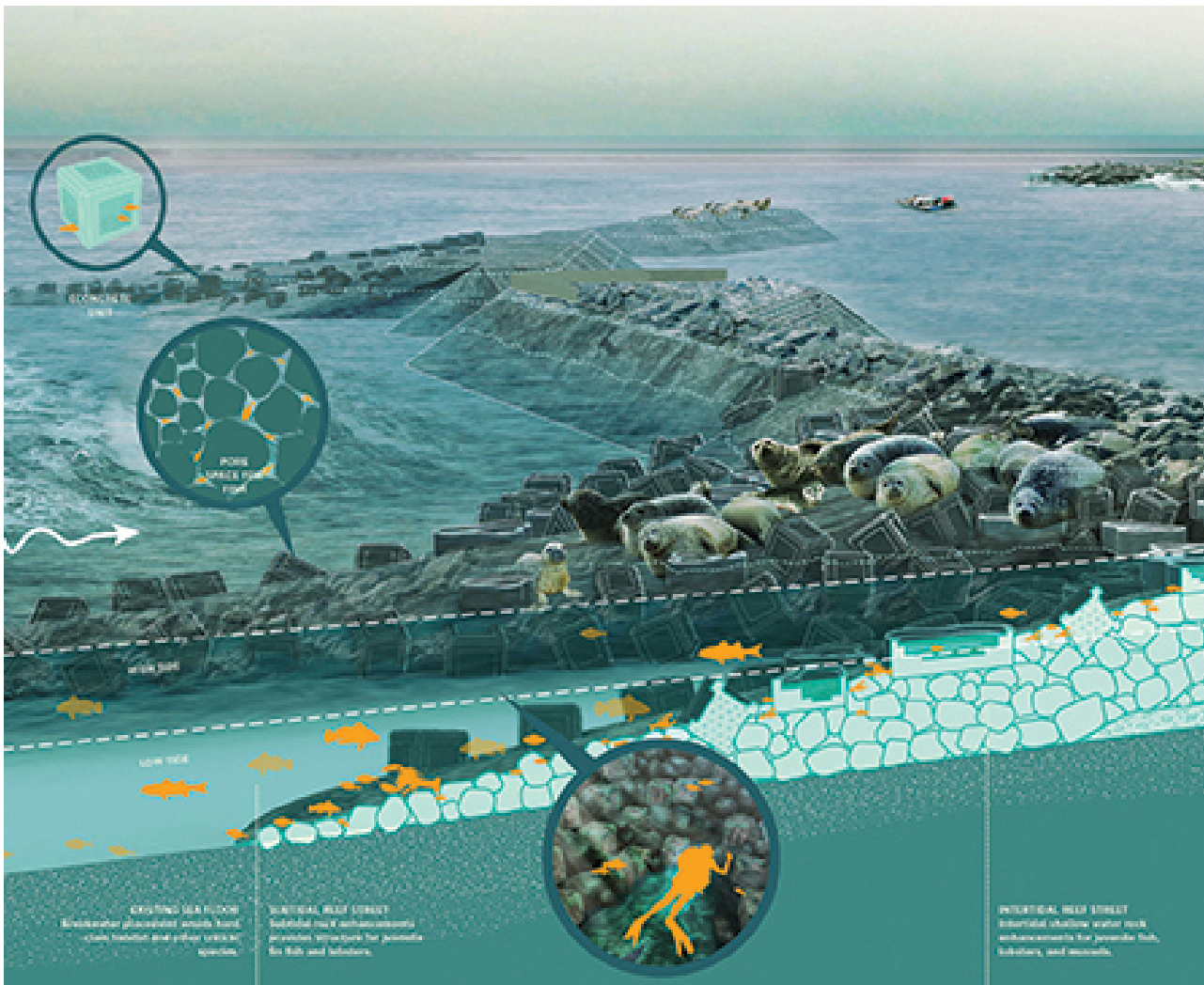
Proposed Solution: Layers of Resilience

Building Codes





Tottenville: Living Breakwaters Project

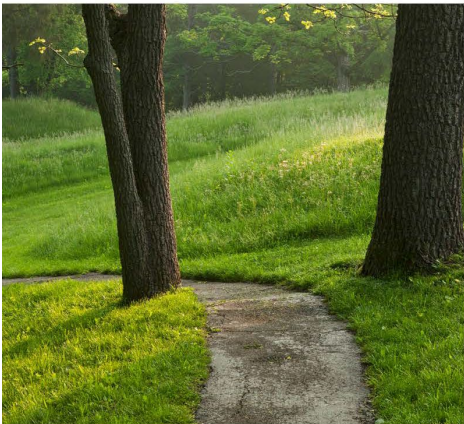


SCAPE

Tottenville: Shoreline Protection Project



Earthen Berm



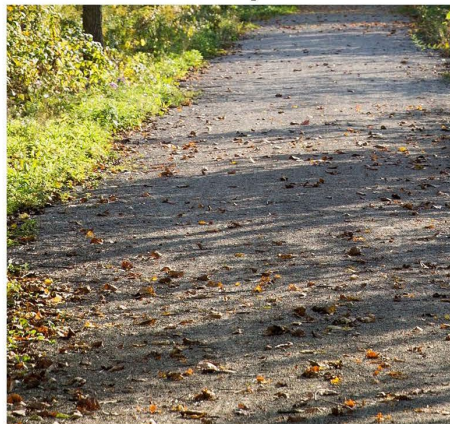
Dune System



Eco-Revetment

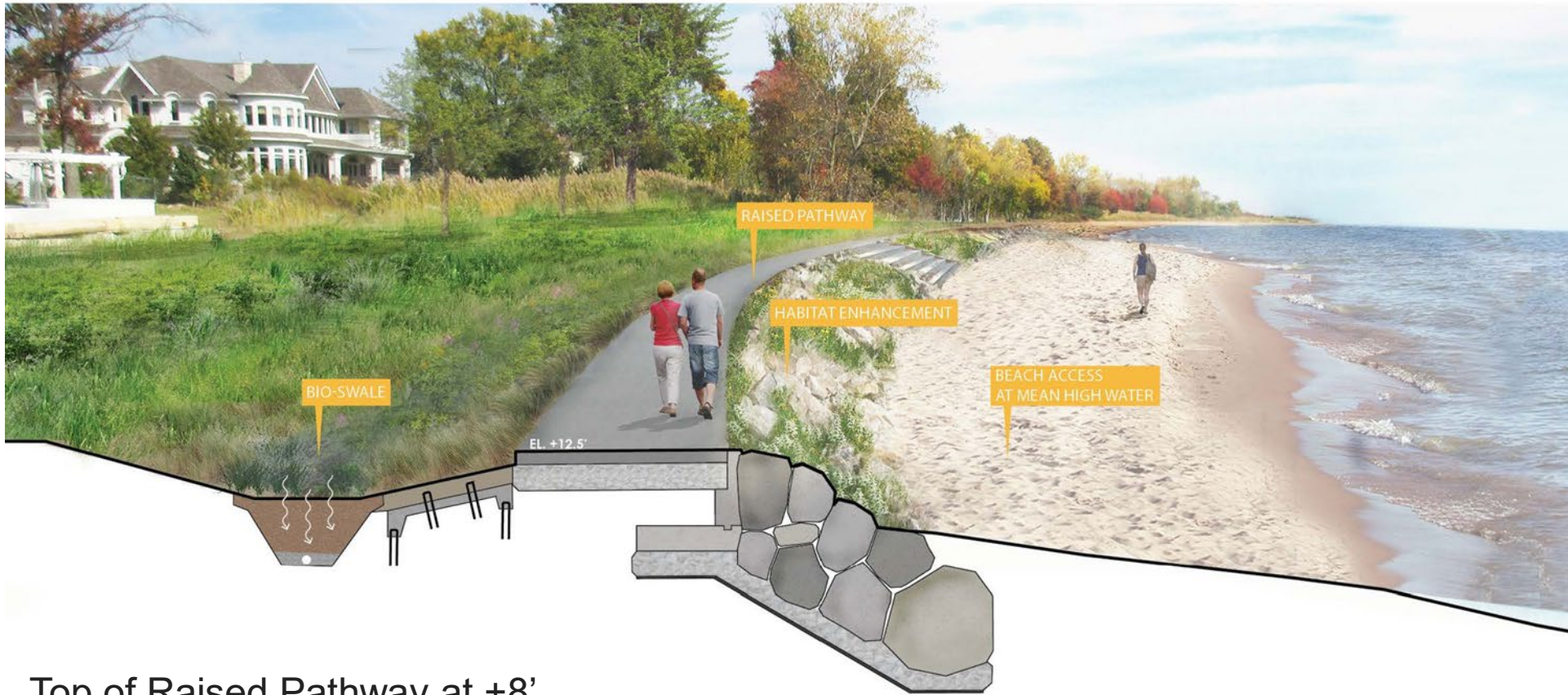


Raised Pathway





Tottenville: Shoreline Protection Project



- Top of Raised Pathway at +8'
- Green Infrastructure
- ADA Pathway and Maintenance Access
- Shoreline Stabilization

Wetlands / Earthen Berm



KEY MAP

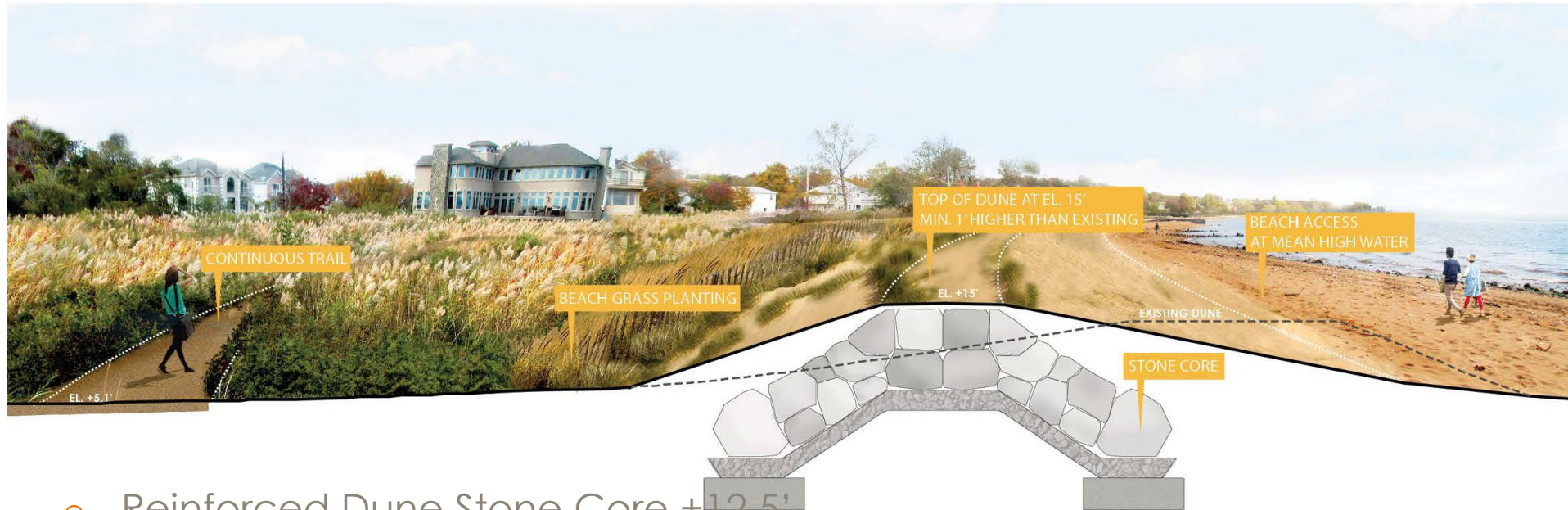


- Earthen Berm at +12.5'
- Wetland Restoration
- Continuous Trails and Park Access
- Ecological Planting and Restoration

Dune System: Natural / Reinforced



KEY MAP



- Reinforced Dune Stone Core +12.5'
- Reinforced Dune Sand +14.5'
- Beach Grass Planting
- Continuous Trails and Park Access

Eco-Revetment: Green Infrastructure



- Top of Eco-Revetment at +12.5'
- Green Infrastructure
- ADA Access Points and Gathering Spaces
- Incorporate ENVISION rating system
- Community buy-in state supported house raising program

Tottenville Benefit-Cost Analysis (BCA)

- Iterative
- Achieve at least .85 cost effective (out of 1.0 goal)
- Triggered additional resource
- Ultimately achieved BCA >1.0



Tottenville Benefit-Cost Analysis:

Triple Bottom-Line Analysis

- Operation and Maintenance
- Social
- Economic
- Environmental

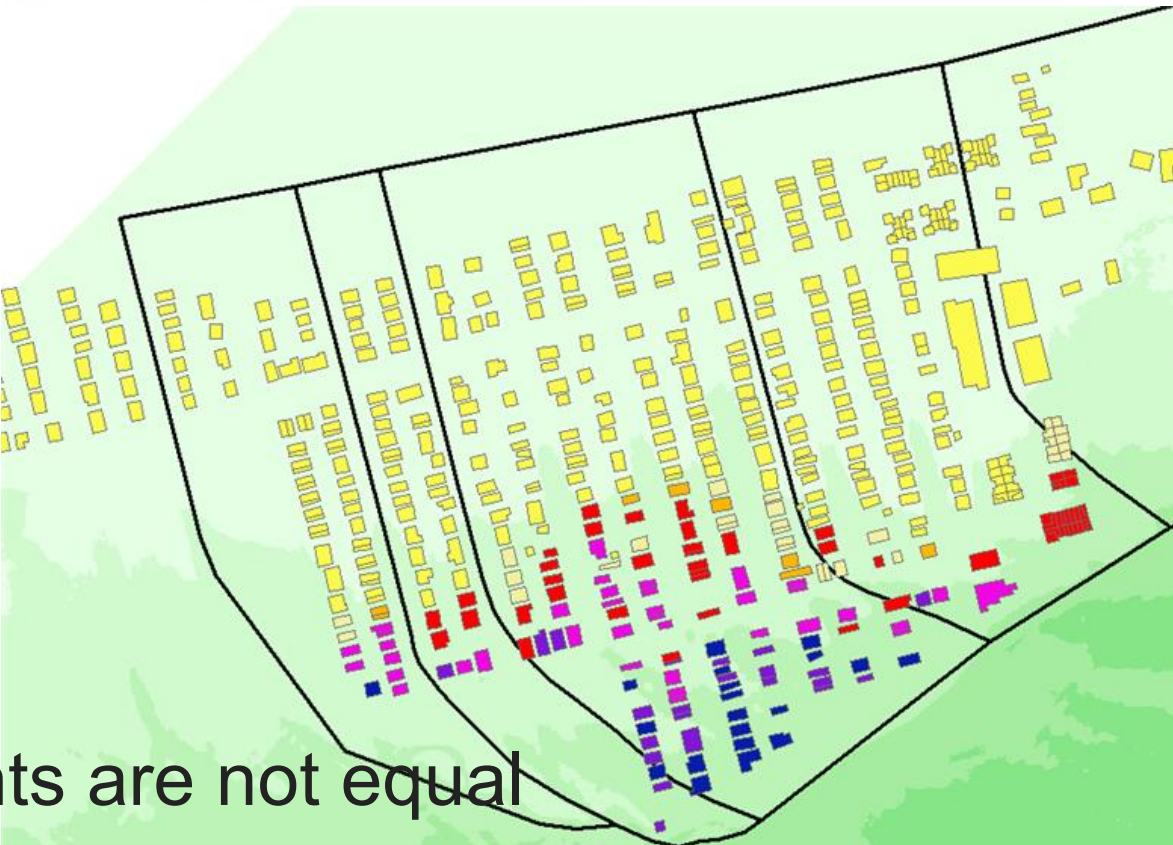
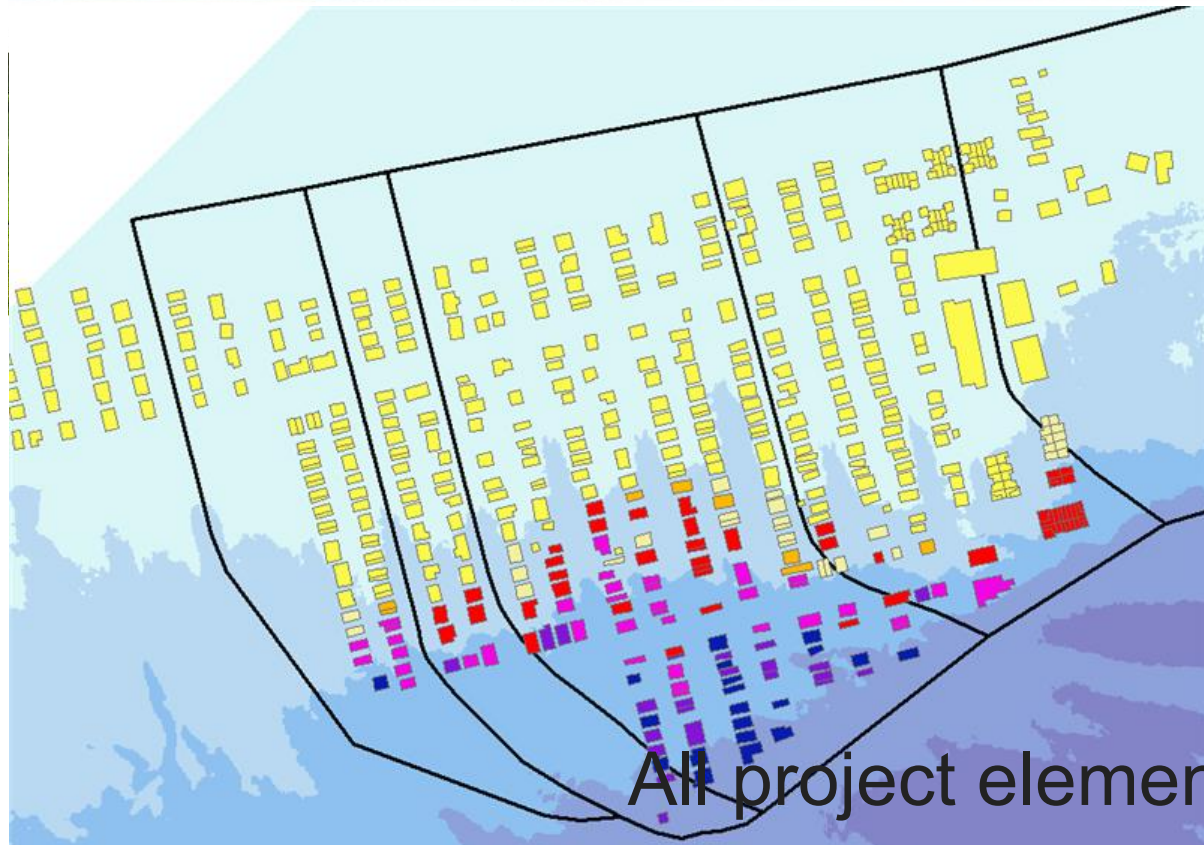
Impact Type	Cost/Benefit	Expected Value	95% Confidence Interval		
Financial	Capital Expenditures	-\$37,390,000	-\$37,390,000	to	-\$37,390,000
Financial	Operations and Maintenance	-\$13,756,000	-\$28,140,000	to	-\$3,432,000
Financial	Replacement Costs	-\$9,739,000	-\$11,071,000	to	-\$8,509,000
Financial	Residual Value of Assets	\$457,000	\$316,000	to	\$583,000
Social	Subsidence Road Impact	\$14,439,000	\$8,940,000	to	\$79,102,000
Social	Subsidence Property Impact	\$28,438,000	\$9,947,000	to	\$66,996,000
Social	Public Health (Exercise)	\$285,000	\$131,000	to	\$524,000
Social	Public Health (CVD)	\$64,000	\$0	to	\$224,000
Social	Property Value	\$38,403,000	\$30,221,000	to	\$45,080,000
Social	Flood Damage	\$62,681,000	\$47,212,000	to	\$78,150,000
Social	Stormwater Treatment	\$963,000	\$897,000	to	\$1,030,000
Social	Recreational Value	\$5,435,000	\$4,256,000	to	\$6,699,000
Social	Education	\$2,077,000	\$905,000	to	\$3,873,000
Social	Heat Island Effect	\$363,000	\$272,000	to	\$461,000
Environmental	Carbon Emission Sequestration	\$68,000	\$26,000	to	\$120,000
Environmental	Air Pollution Sequestration	\$310,000	\$208,000	to	\$406,000
Environmental	Value of Additional Trees	\$296,000	\$194,000	to	\$449,000
Environmental	Water Quality	\$1,794,000	\$1,794,000	to	\$1,794,000

Financial	Social	Environmental
-\$60,428,000	\$153,148,000	\$2,468,000

Triple Bottom Line NPV	\$27,580,600
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Tottenville Benefit-Cost Analysis (BCA)



All project elements are not equal



Key BRIC Program Takeaways

(Do your homework)

1. Competitive? Scorecard
2. Cost-Effective? BCA
3. Innovative?
4. Broad Benefits? Triple bottom-line
5. Future Conditions? 2100
6. Vulnerable Populations?
7. Social Equity?

Qualitative Criteria

	Tottenville Estimated Points	Possible Points
Risk Reduction	20	35
Future Conditions	15	15
Implementation	10	15
Population impacted	5	15
Outreach	5	5
Partnerships	15	15
TOTAL	70	100

Technical Criteria

	Estimated Points	
Infrastructure	20	20
Lifelines	15	15
Nature-based	10	10
Building codes	20	20
BCEGs	15	15
Pre-planning	0	10
Cost share	5	5
Impoverished	0	5
TOTAL	85	100



Funding Support for Community Resilience

\$1 BILLION
2021 BRIC funding

Tottenville 2020 BRIC
Award: **\$19,822,053**



Tottenville Final Numbers

Key Details	
Total Project Costs	\$47,000,000
Project Benefits	\$27,580,600
Grant Request	\$25,623,900
BRIC Grant Request (Federal share)	\$19,822,053
Community Cost Share	\$26%



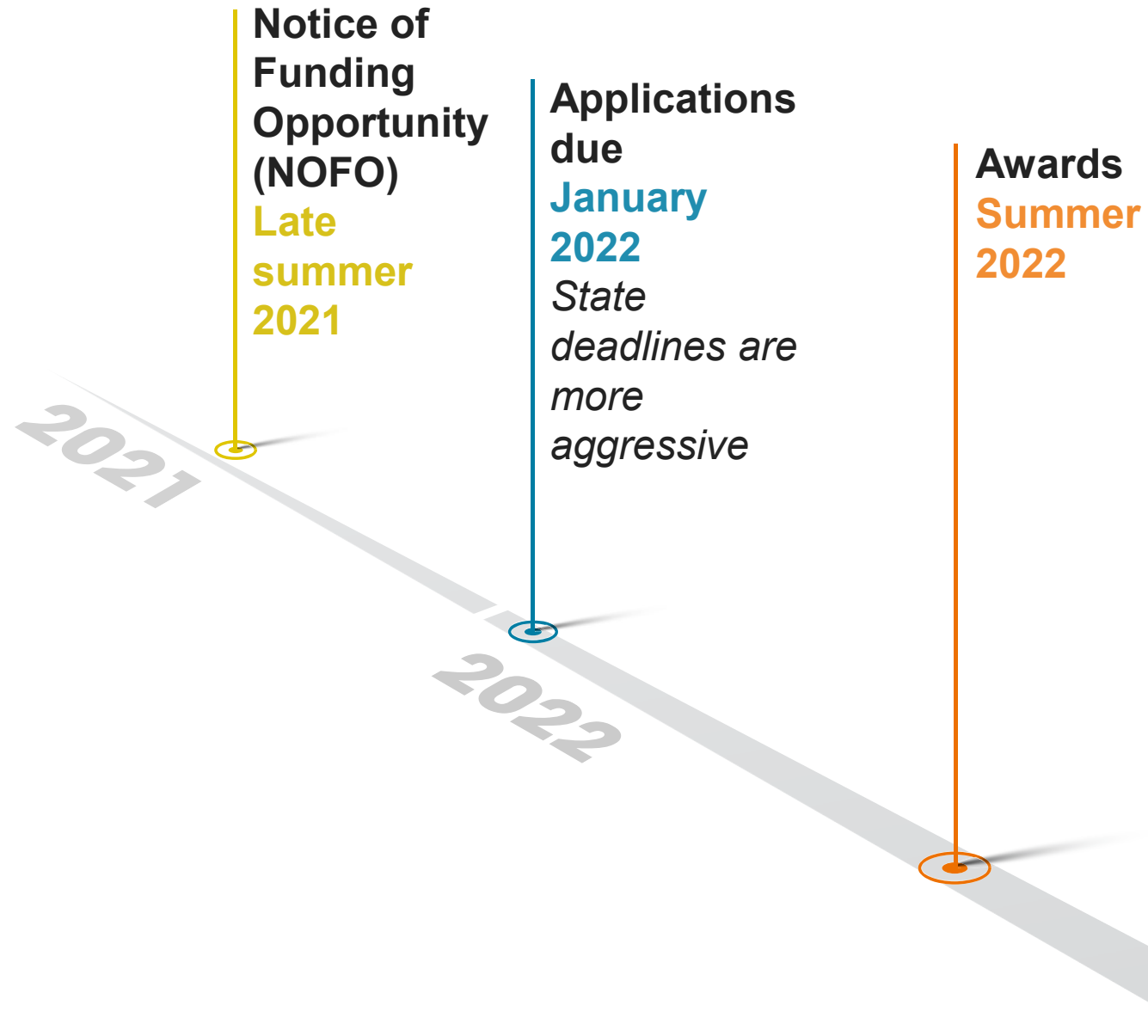
What's next?

BRIC

Notice of funding and application timeline



Timeline





Questions?

1:6

The National Institute of Building Sciences claims that for every **\$1** spent on hazard mitigation, the US can save **\$6** in future disaster recovery costs.

Mitigation is the **solution.**