

# Feasibility of Harbor-wide Barrier Systems

## Rebecca Herst

*Director, Sustainable Solutions Lab  
University of Massachusetts Boston*

# Feasibility of Harbor-wide Barrier Systems: Preliminary Analysis for Boston Harbor

Rebecca Herst, Executive Director

Sustainable Solutions Lab | University of Massachusetts Boston

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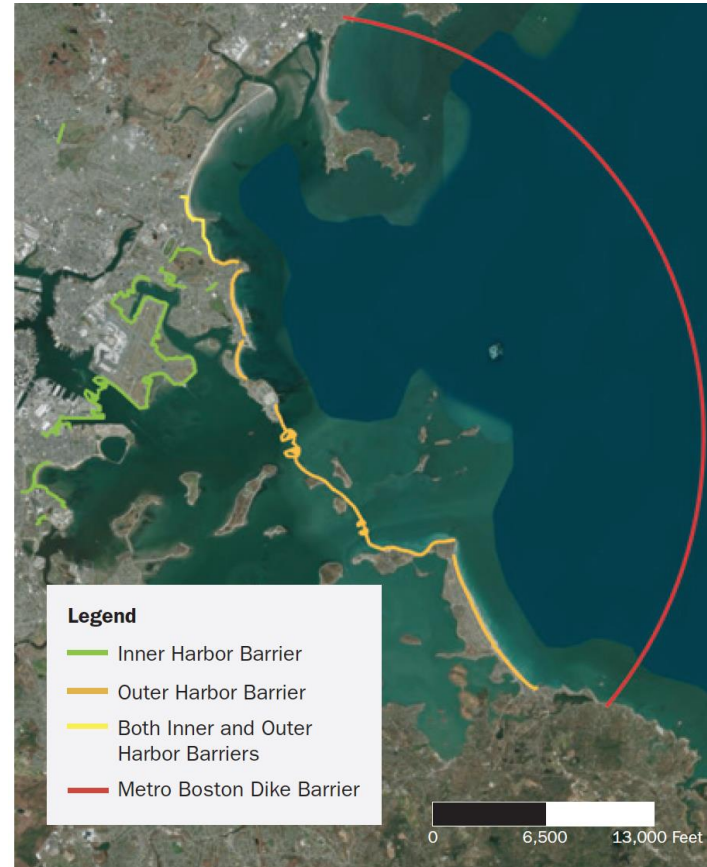
# Barrier Study Guiding Principles

- Protect people and the places where they live, work, and play
- Minimize interference with Boston's maritime economy and the thousands of jobs it supports
- Protect the environmental gains made over past decades through the Boston Harbor cleanup

# Introduction—Engineering & Cost

## Three Proposed Alignments

- Inner-Harbor 
- Outer-Harbor 
- Metro Boston Dike 



Sources: Arcadis, Esri World Imagery

# Typical Feature Assumptions—Gates

## Navigation

- Floating sector gate
- 1,500 or 650-foot



## Environmental Flow

- Vertical lift gate



## Present Value Analysis for Shore-Based Solutions and Construction Timeline Scenario 1 and Effectiveness of Shore-Based Solutions Scenario A (2050-2100)

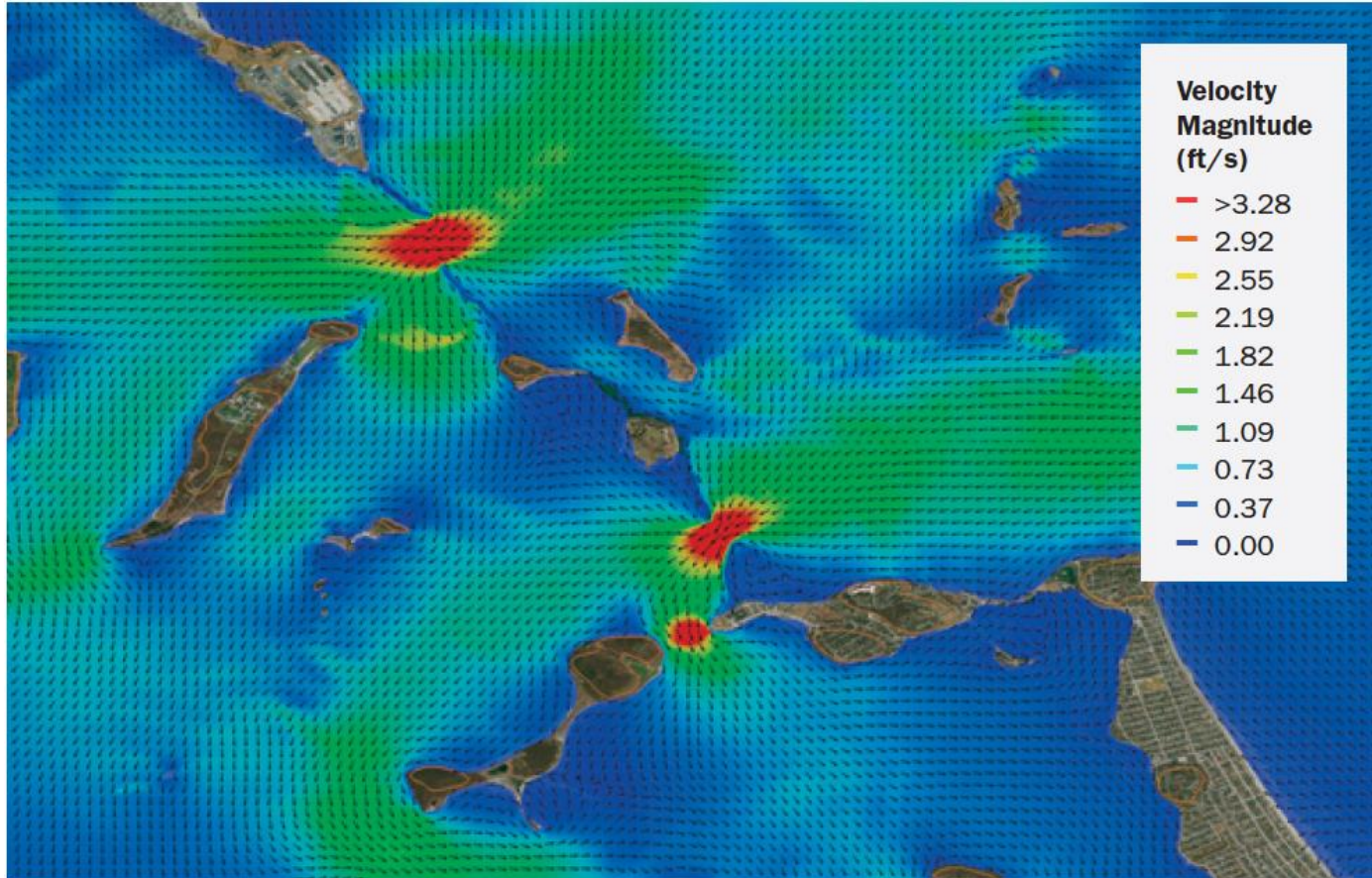
Barrier System	7 Percent Discount Rate					3 Percent Discount Rate			
	Cost Range	PV Costs	PV Benefits	Net PV	Benefit-Cost Ratio	PV Costs	PV Benefits	Net PV	Benefit-Cost Ratio
Outer Harbor Barrier	Low Estimate	\$2.0 bil	\$658 mil	-\$1.4 bil	.33	\$5.0 bil	\$8.4 bil	\$3.4 bil	1.69
	High Estimate	\$3.0 bil	\$658 mil	-\$2.3 bil	.22	\$7.3 bil	\$8.4 bil	\$1.1 bil	1.15
Inner Harbor Barrier	Low Estimate	\$1.6 bil	\$519 mil	-\$1.1 bil	.32	\$4.0 bil	\$6.6 bil	\$2.6 bil	1.65
	High Estimate	\$2.2 bil	\$519 mil	-\$1.7 bil	.24	\$5.4 bil	\$6.6 bil	\$1.2 bil	1.23

Note: The Present Value Analysis result for these eight planning scenarios assumes total effectiveness of shore-based solutions (incremental benefit of the Harbor Barrier) when flood elevations exceed the equivalent of 12 feet NAVD88 at the Boston Harbor tide gauge (4 flood event scenarios).

Source: Arcadis

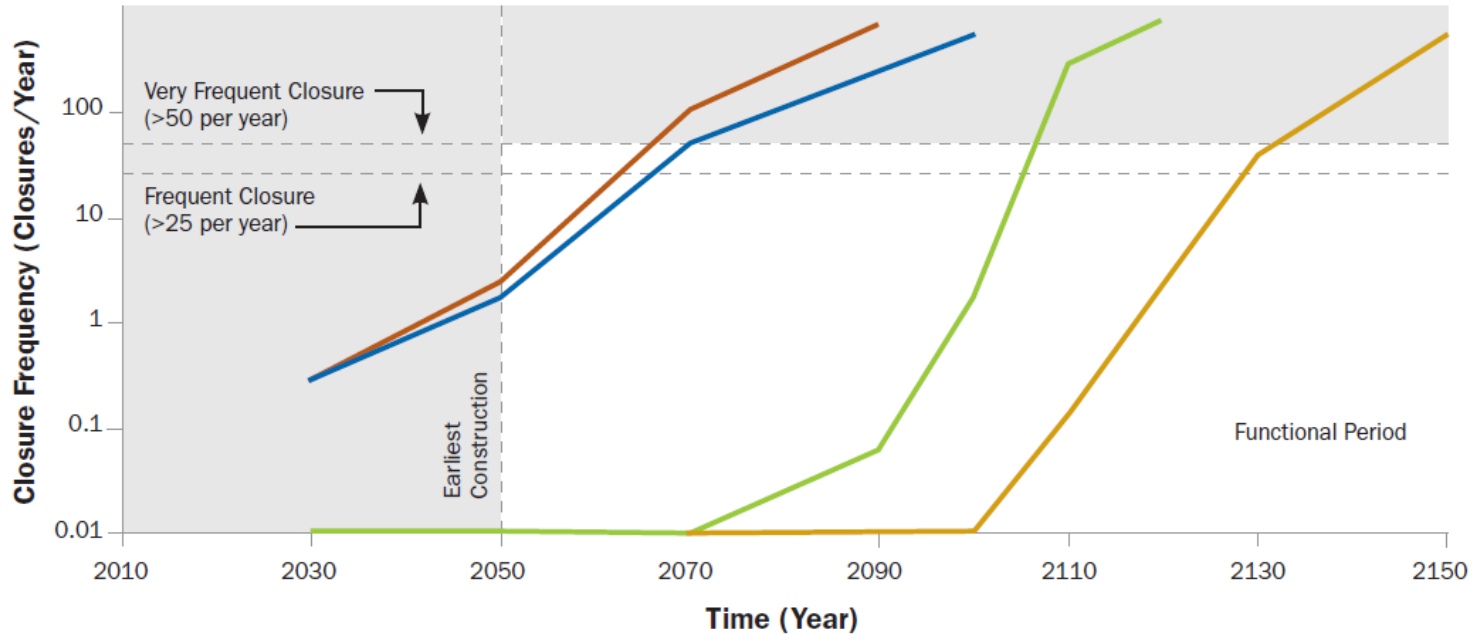


# Simulated Tidal Current During Peak Flood Tide with Barrier



Source: Woods Hole Group

# Timeline for Boston Harbor Barrier Functionality



## Legend

- RCP 4.5 (with District Solutions)
- RCP 8.5 (with District Solutions)
- RCP 4.5 (No District Solutions)
- RCP 8.5 (No District Solutions)

Source: Woods Hole Group