



San Francisco
Planning

Sea Level Rise Vulnerability and Consequences Assessment

May 2019

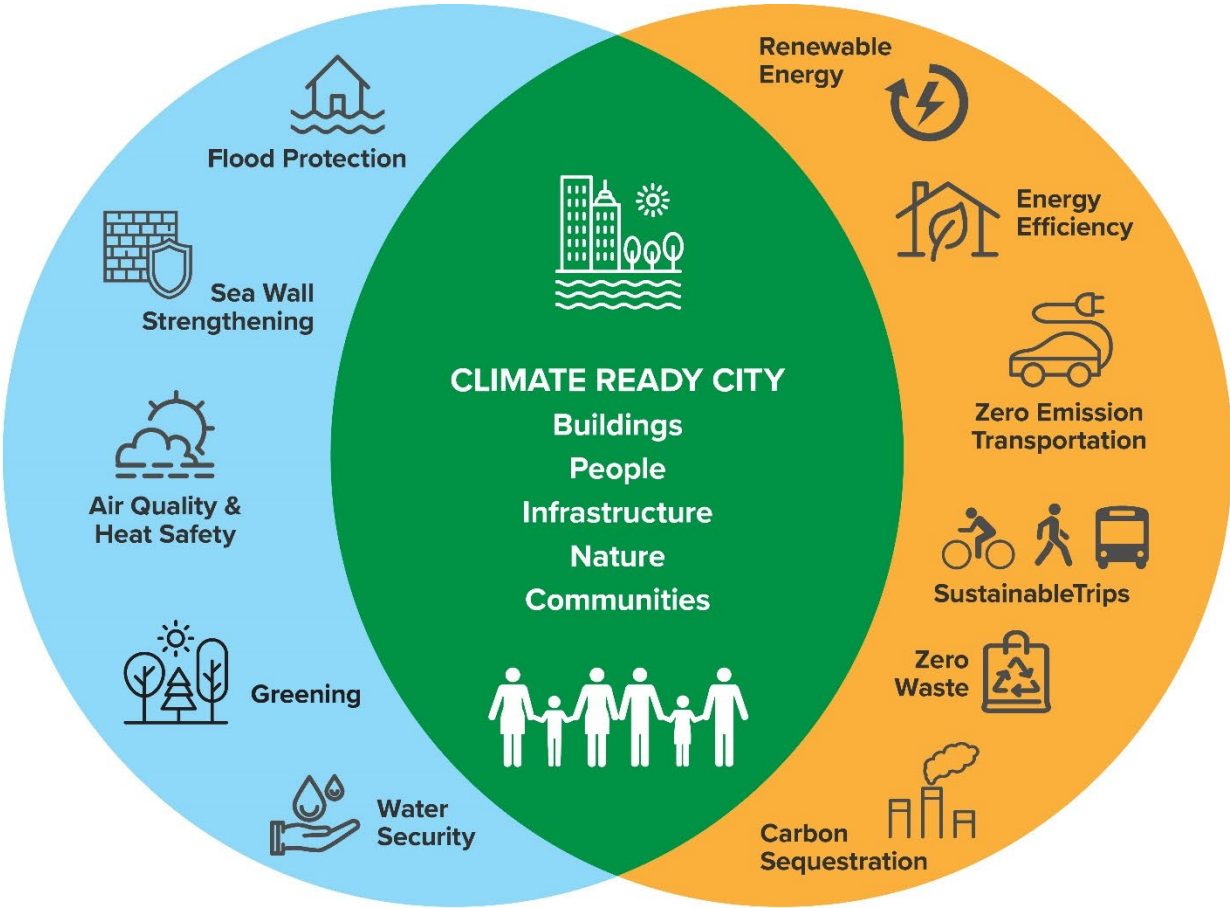
Photo: Dave R

Contents

- 1) Background
- 2) Methodology
- 3) Key Findings
- 4) Next Steps

Climate Resilience

CLIMATE ADAPTATION



CLIMATE MITIGATION

Sea Level Rise Coordinating Committee





CITY AND COUNTY
OF SAN FRANCISCO

SAN FRANCISCO SEA LEVEL RISE ACTION PLAN

WORKING TOGETHER TO BUILD SAN FRANCISCO'S RESILIENCE TO SEA LEVEL RISE | MAR 2016

VISION

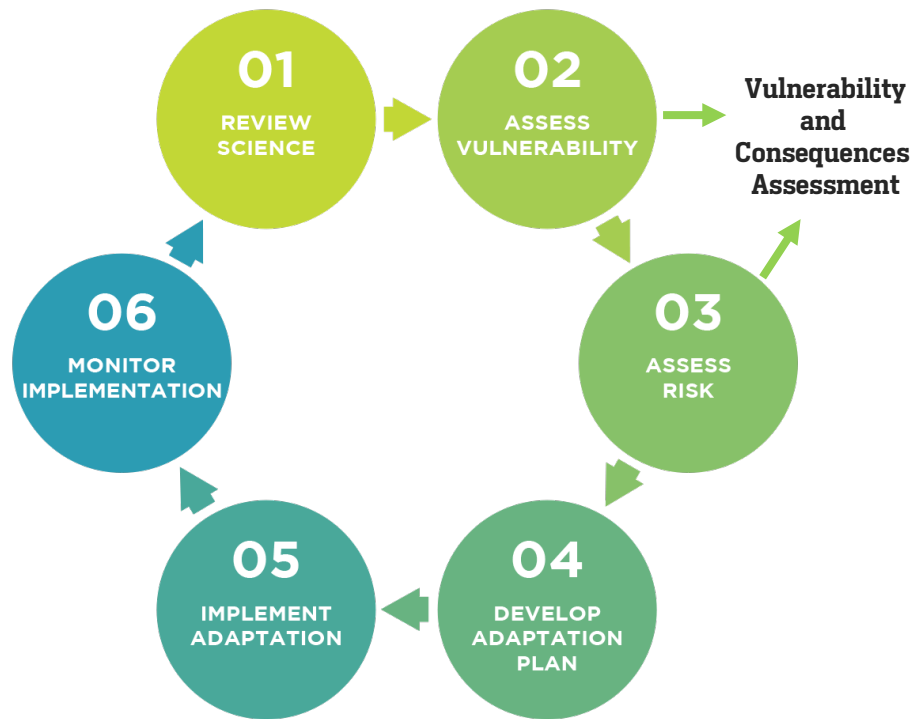
Make San Francisco a more resilient city in the face of immediate and long-term threats of sea level rise to the Bayshore and Pacific Coast, by taking measures to protect and enhance public and private assets, natural resources, and the quality of life for all.



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San Francisco SLR Projections



Year 2030

Year 2050

Year 2100

Most Likely

Capital Project Approvals *

6 in

11 in

36 in

Upper Range

Long-Range Planning *

12 in

24 in

66 in

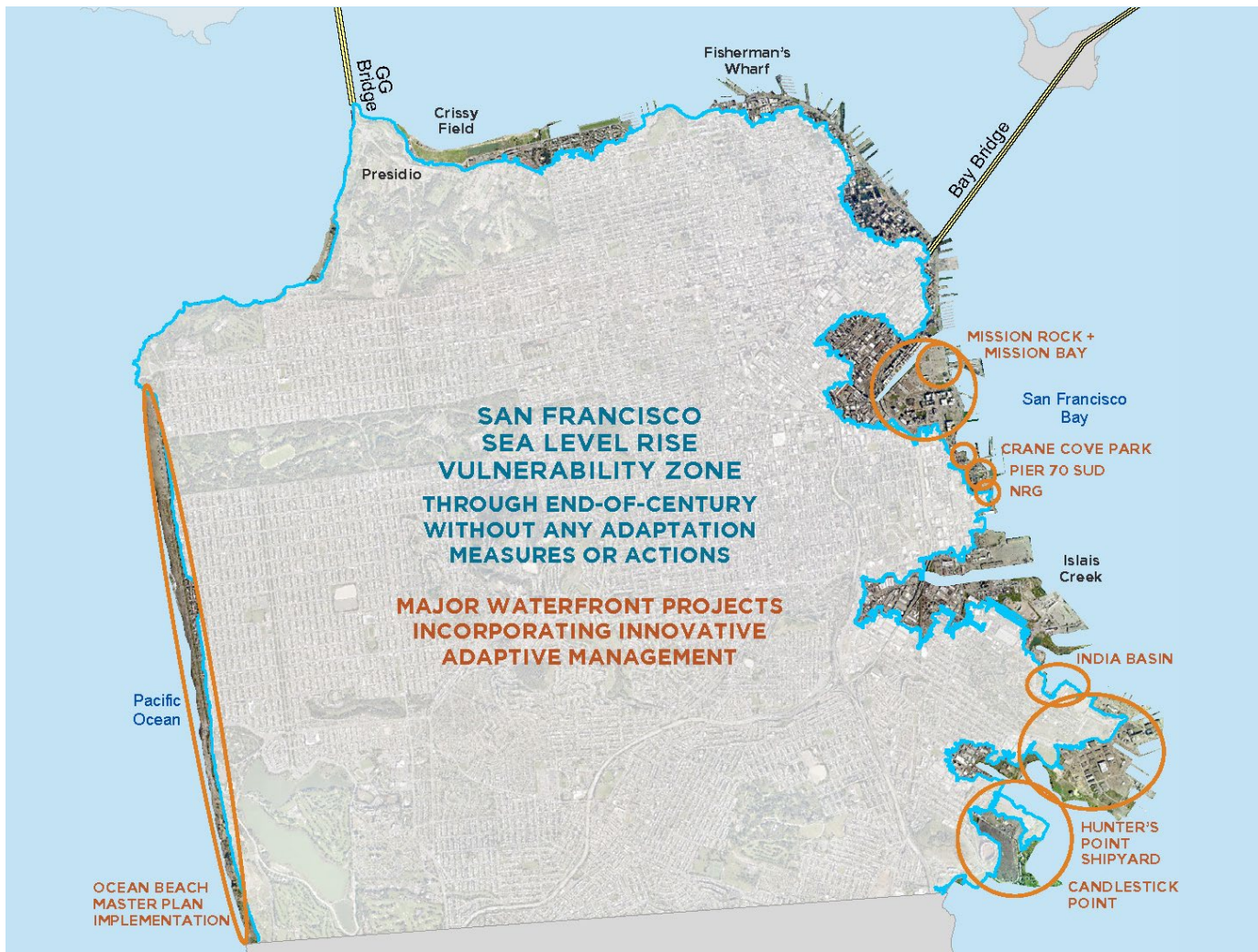
* The City uses the NRC's (National Research Council) most likely SLR projection of 36" for ongoing planning and development purposes related to environmental review and project approvals. The SLR Action Plan considers adaptive strategies to address the NRC's upper end estimate of 66" of SLR by 2100 in the event that future GHG emissions and land ice melting accelerates beyond current predictions.

NOTE: Storm Surge + King Tides add ~40" to SLR (108" in 2100)

Sea Level Rise Vulnerability Zone







Legend

Sea Level Rise Vulnerability Zone



Vulnerability and Consequences Assessment



		2030 SCENARIO	2050 SCENARIO	2100 SCENARIO
Residents		5,044	15,471	31,121
Jobs		10,243	49,287	168,058
Streets		20 miles	50 miles	91 miles
Open Space		232 acres	550 acres	684 acres
Public Land		442 acres	887 acres	1,490 acres
Schools		2	9	19

Vulnerability and Consequences Assessment

Exposure



Vulnerability: Sensitivity + Adaptive Capacity



Consequences for People, Economy and Environment



Vulnerability and Consequences Assessment

SECTORS



Water



Wastewater



Public Power



Public Safety



Mobility



**Recreation &
Open Space**



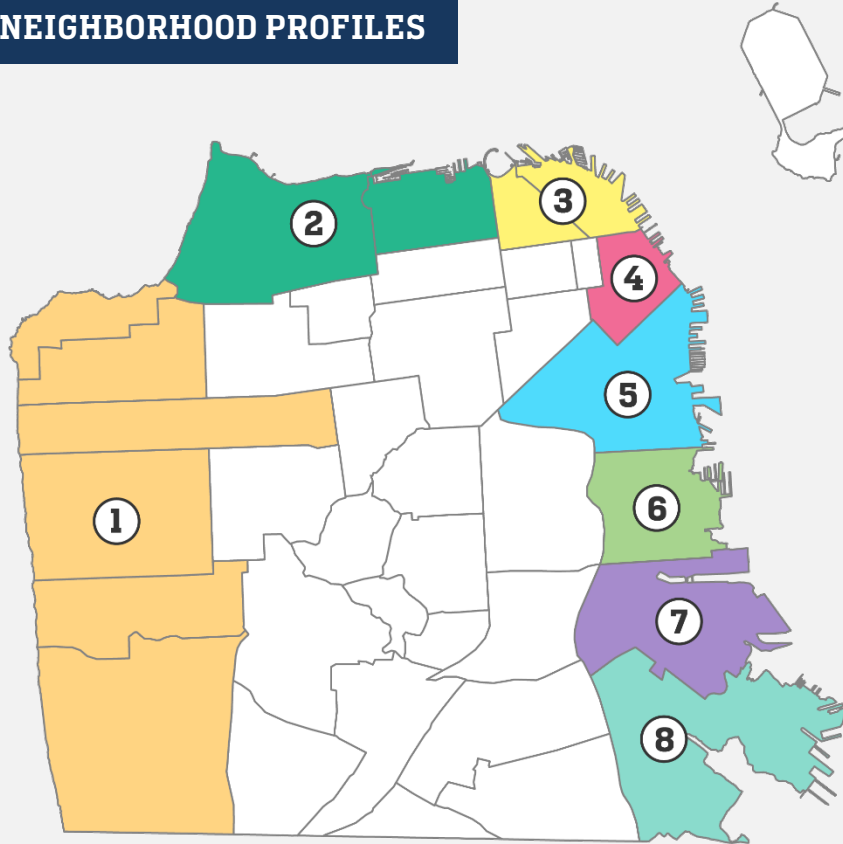
**Waterfront
Development**



**Port
Facilities**

Vulnerability and Consequences Assessment

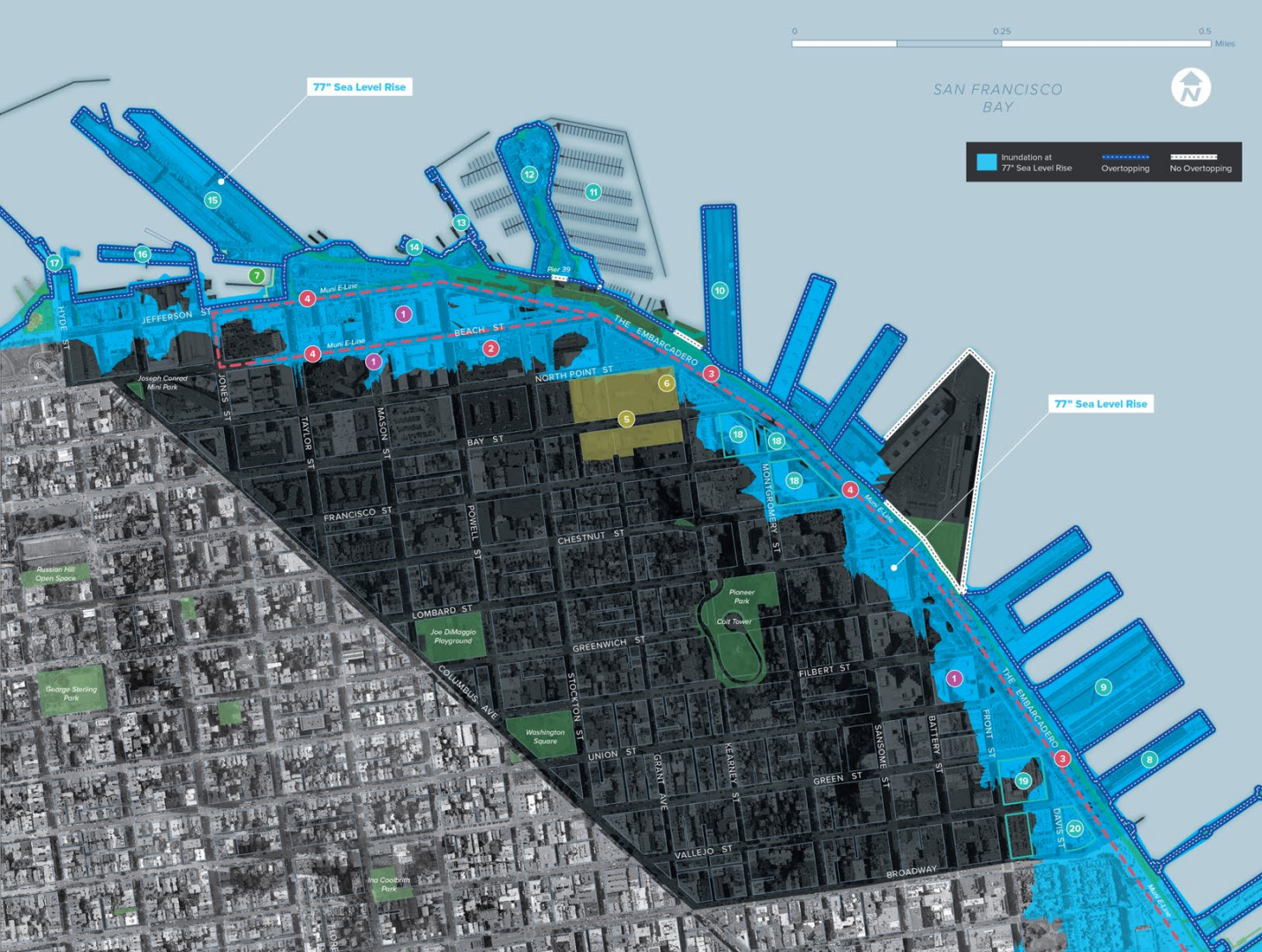
NEIGHBORHOOD PROFILES



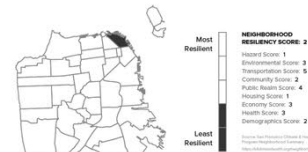
1. Westside/Ocean Beach
2. Marina/Presidio
3. Fisherman's Wharf/North Beach
4. Financial District
5. South of Market/Mission Creek
6. Dogpatch/Central Waterfront
7. Bayview North/Islands Creek
8. Bayview South/Hunters Point

Key Findings

	North Beach	Financial District	Mission Creek	Islais Creek	Hunters Point
Transportation Impacts	✓	✓	✓	✓	
Loss of Open Space	✓	✓		✓	
New Development			✓		✓
Joint Coastal and Precipitation Flood Risk			✓	✓	
Contamination and Liquefaction		✓	✓	✓	✓



North Beach Fishermans Wharf



PUBLIC SAFETY

- 1 Contaminated Land



MOBILITY

- 3 Kirkland Division
- 2 The Embarcadero
- 4 Streetcar (E-Line)



WASTE WATER

- 1 North Point Wet-Weather Treatment Plant
- 2 Northshore Major Pump Station



OPEN SPACE

- 1 Fisherman's Wharf



PORT

- 1 Pier 9: Offices, bar profits, WETA offices
- 2 Piers 15-17: Exploratorium, public spaces, offices, iconic
- 3 Pier 35: Cruise Ship terminal and public serving
- 4 Pier 39 Marina
- 5 Pier 39: Public serving, restaurants, retail, aquarium, iconic
- 6 Pier 41: Ferries, offices
- 7 Pier 43: Ferries
- 8 Pier 45: Public spaces, entertainment, fish processing
- 9 Pier 47: Restaurants, Fisherman's Wharf, retail, public serving
- 10 Hyde Street Harbor: Commercial fishing, fish processing, historic vessels, recreational boating, fuel dock
- 11 Seawall 315-317: Waterfront Plaza (offices and restaurants)
- 12 Seawall 322: 88 Broadway (future affordable housing)
- 13 Seawall 324: Hotel Teatro Zinzani and open space



Financial District



PUBLIC SAFETY

- 1 Fire Station #13
- 1 Contaminated Lands



MOBILITY

- 1 The Embarcadero
- 1 Streetcar (E-Line)
- 1 Embarcadero BART
- 1 Ferry Terminal
- 1 Cable Car
- 1 Regional bus routes (Temporary Transbay Terminal)



OPEN SPACE

- 1 Embarcadero Plaza
- 1 Ferry Park/Plaza
- 1 Harry Bridge's Plaza
- 1 Maritime Plaza

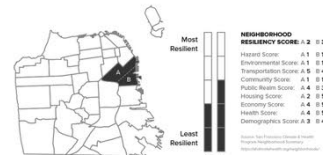


PORT

- 1 Pier 7: Public pier and fishing
- 1 Pier 3: Restaurants, offices, water taxi, Hornblower, parking (H)
- 1 Pier 1: Office (H)
- 1 Ferry Building: Offices, public serving, restaurants, retail, inconic (H)
- 1 Pier 14: Public pier and fishing
- 1 Embarcadero Promenade (Bay Trail)
- 1 WETA, Golden Gate Ferries



South of Market Mission Creek



PUBLIC SAFETY

- 1 Bureau of Fire Investigation
- 2 Southern District Fire Station
- 3 Fire Station #4
- 4 Public Safety Building
- 5 Fire Station #35 - Fireboat Headquarters
- 6 Fifth Street Homeless Center
- 7 Fire Station #8
- 8 Contaminated Land

MOBILITY

- 1 Lefty O'Doul Bridge
- 2 Fourth Street Bridge
- 3 Giants Stadium Ferry Terminal

WATER

- 1 Bay Bridge Pump Station

WASTE WATER

- 1 Merlin Morris Minor Pump Station
- 2 Berry Street Minor Pump Station
- 3 Harriet Lucerne Minor Pump Station
- 4 Channel Major Pump Station

OPEN SPACE

- 1 Pier 52
- 2 China Basin Park
- 3 Boat Launch
- 4 Rincon Park
- 5 Shoreline Park
- 6 Mission Creek Garden
- 7 South Beach Park
- 8 South Beach Harbor
- 9 Giant's Promenade
- 10 Brannan Street Wharf

PORT

- 1 South Beach Marina
- 2 Pier 62/McCovey Cove and China Basin
- 3 The Promenade
- 4 Seawall Lot 337 (48")
- 5 Mission Creek Marina
- 6 Giants Ballpark
- 7 Embarcadero Promenade (Bay Trail)
- 8 WETA, Golden Gate Ferries

Westside



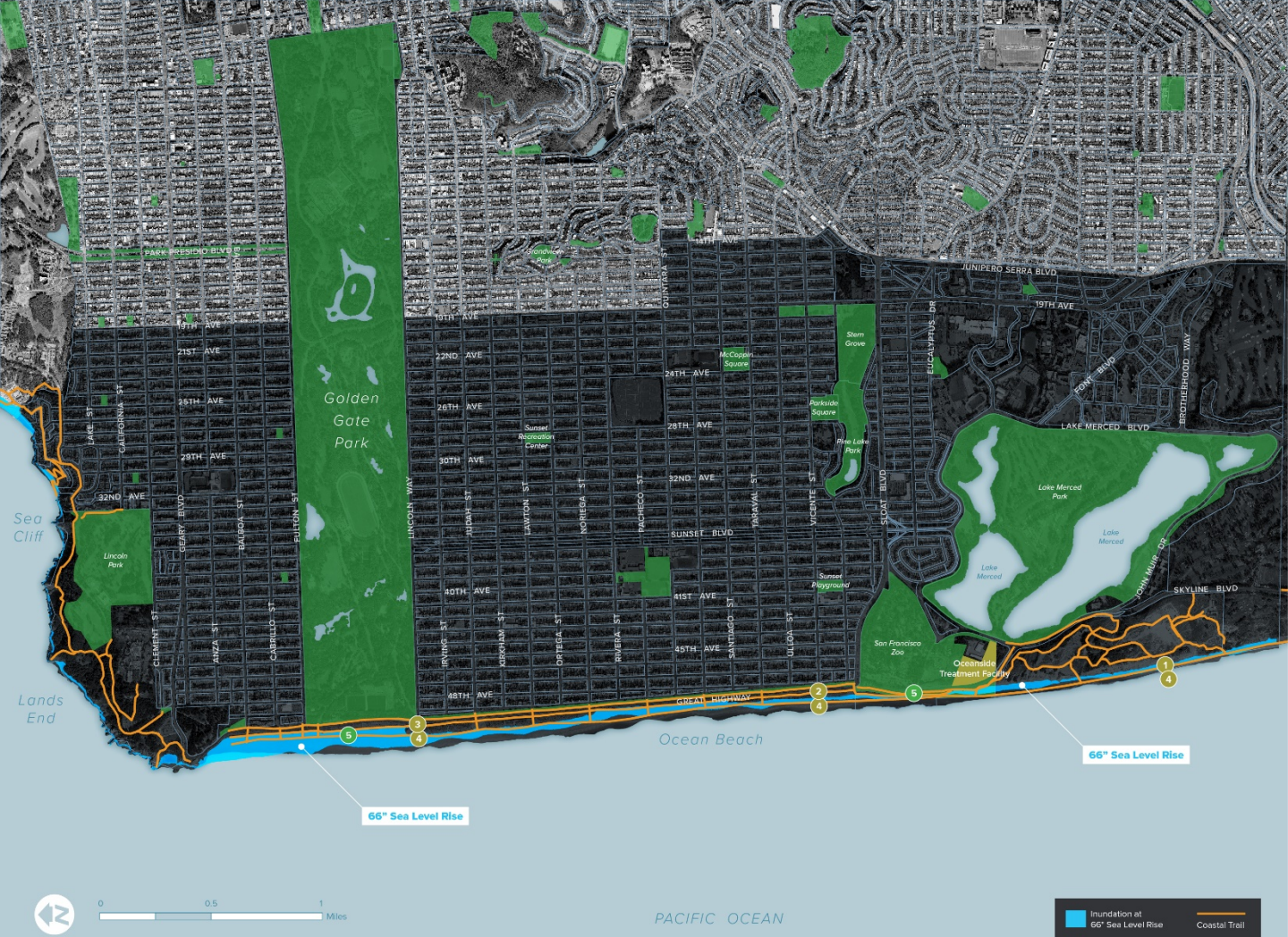
WASTE WATER

- 1 Lake Merced Transport/Storage Box
- 2 Vincente Transport/Storage Box
- 3 Lincoln Transport/Storage Box
- 4 Combined Sewer Discharge (CSD)



OPEN SPACE

- 5 Coastal Trail



0 0.5 1 Miles

PACIFIC OCEAN

Inundation at
66" Sea Level Rise

Coastal Trail

Project Adaptation



Mission Rock



Pier 70



Crane Cove Park

District-Scale Adaptation



Ocean Beach Long-Term Improvements Project

- Implements portions of Ocean Beach Master Plan
- Addresses erosion at Great Highway, and protects critical infrastructure
- Adds recreational amenities



Islais Creek/Southeast Mobility Adaptation Strategy

- Caltrans grant award of \$390,000; 2019 to 2021
- Long-range vision for Islais Creek basin, with a focus on securing transportation assets
- Youth engagement in Bayview



US Army Corps/Port Flood Study

- Approximately 3 to 5 year study of shoreline flood risk
- Assesses flood risk and identifies a preferred alternative
- Preferred project becomes eligible for Federal funding

Citywide Adaptation



Sea Level Rise Capital Planning Guidance

- 2019 update based on revised State guidance
- Applies to large capital projects in SLR exposure zone



Hazards and Climate Resilience Plan

- Assessment and Strategies for climate and other hazards
- Updates Local Hazard Mitigation Plan; incorporated into GP Safety Element
- Expected completion 2019, submitted to Cal OES and FEMA for review



Citywide Climate Resilience (Scope of Work TBD)

- Comprehensive capital planning for climate resilience
- Multi-hazard climate resilient codes and guidelines
- Funding, legislative, and governance strategies



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