



Port of San Francisco
Waterfront Plan Update

Emergency Preparedness and Disaster Recovery At the Port

Resilience Subcommittee | November 30, 2016



Port Emergency Preparedness and Disaster Recovery

Port of San Francisco Strategic Plan 2016-2021

Goal #4: Resiliency

Lead the City's efforts in addressing threats from earthquakes and flood risks through research and infrastructure improvements to the Seawall and Port property.





Existing Emergency Plans

- **Port of San Francisco Emergency Operations Plan, March 2016**
- **City and County of San Francisco Emergency Response Plan, December 2010**
- **Bay Area Earthquake Plan, September 2016**
California Governor's Office of Emergency Services (CalOES)
Federal Emergency Management Agency (FEMA)



The Port Response Priorities

Reopen Pier 1 and Pier 50 for response activities.



The Port Response Priorities

Restore maritime and ferry operations.



The Port Response Priorities

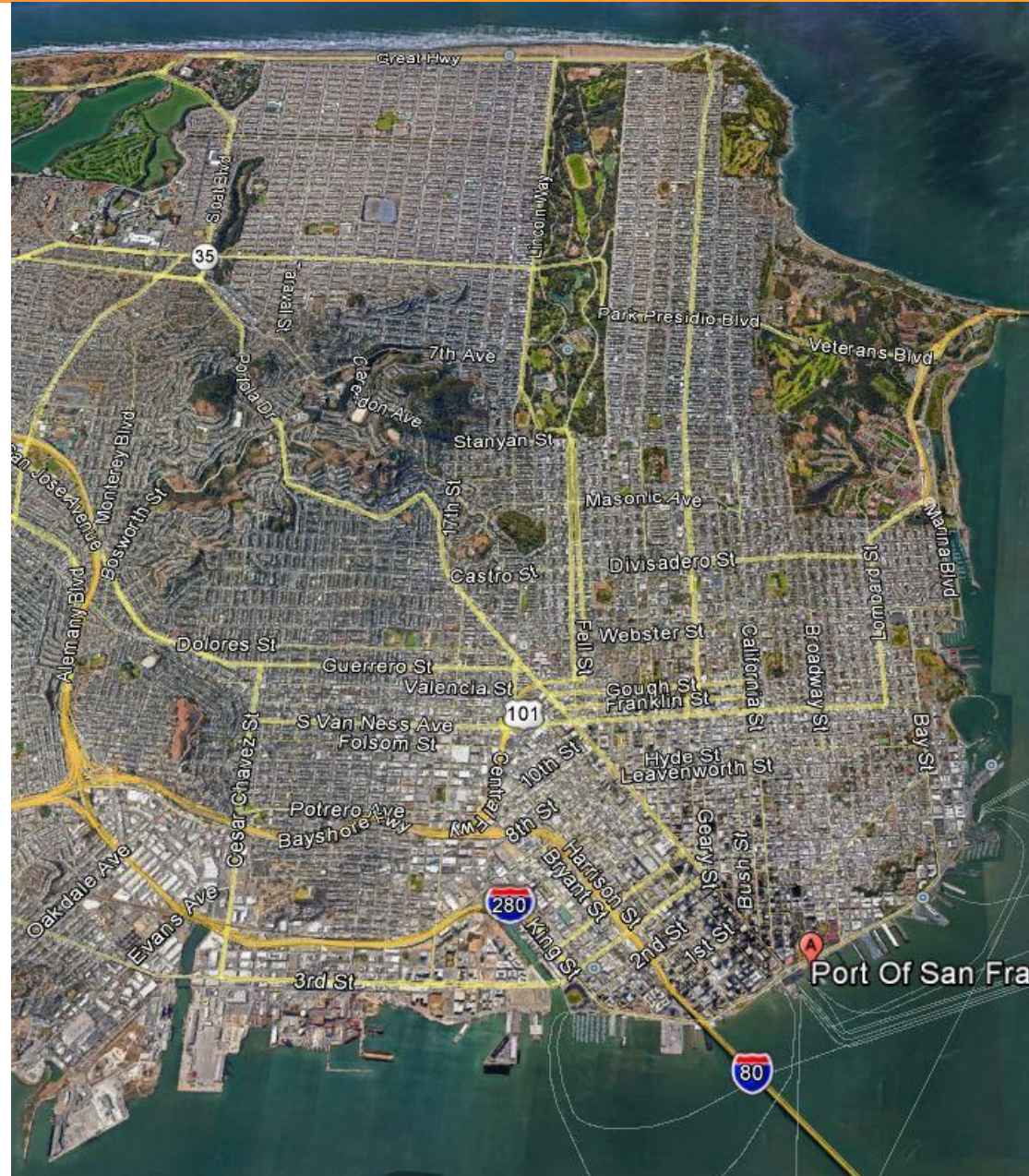
Begin response, recovery & restoration tasks on Port property.

- Provide damage assessment teams for building inspection and reoccupancy.
- Clear debris.
- Restore priority routes and bridges.
- Restore utilities.



Port Response Priorities

Support City response and recovery with Port properties as available.

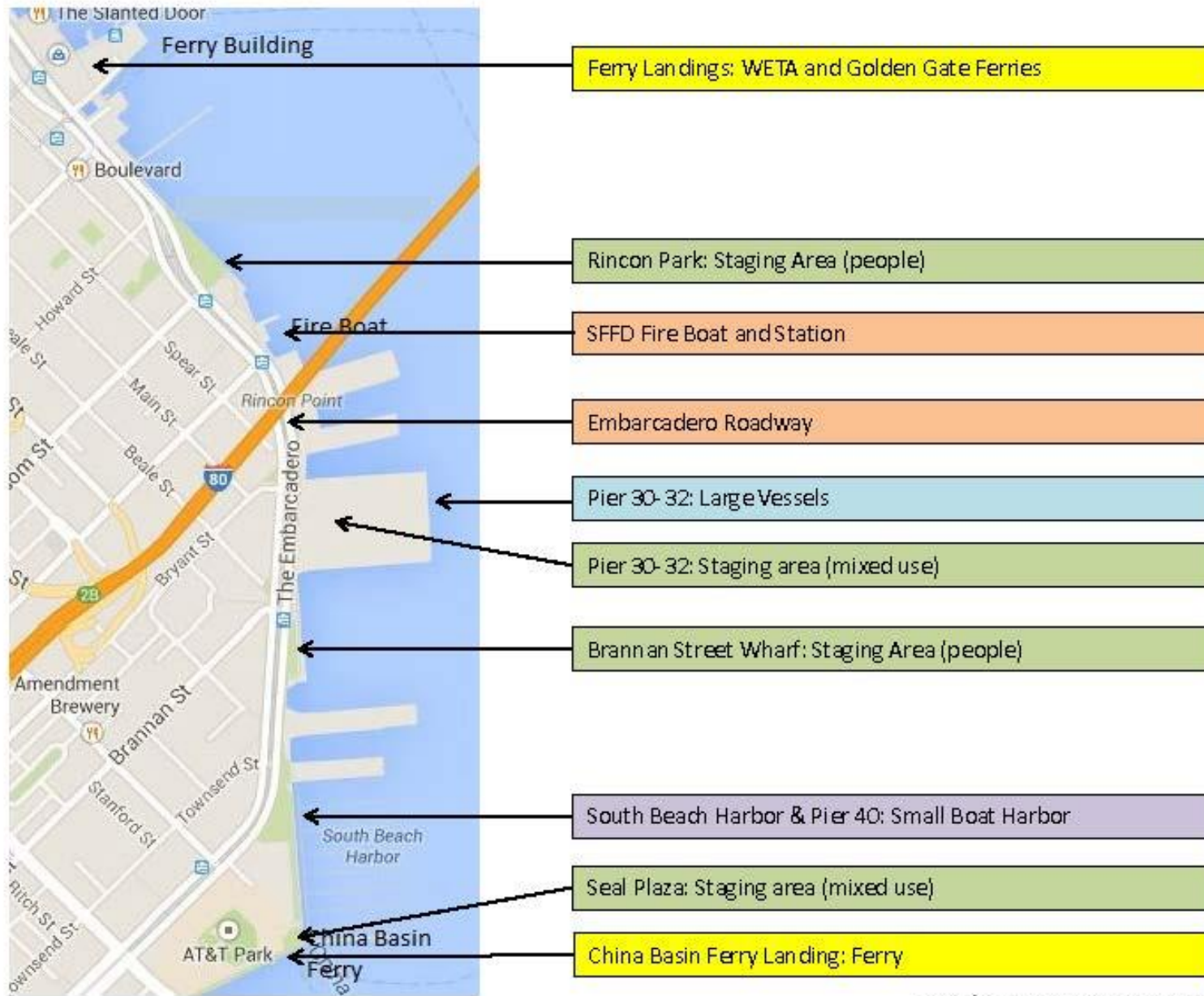




Emergency Response Map



Emergency Response Map



Emergency Response Map



Pier 50:

- Port Maintenance
- Primary Oil Spill response equipment storage
- MARAD Vessels
- Not structurally reinforced

Lot A: Staging Area (people)

Embarcadero Roadway

Mission Bay: Future Ferry Landing Site

Pier 80:

- Secure maritime facility with working cranes. FEMA Plan: unload here and move resources to Pier 94/96.
- Oil spill response equipment storage.
- Highly susceptible to liquefaction

Illinois Street Bridge

Pier 94/96: FEMA Planned staging area. (Goods)

Pier 94/96: DPW Planned debris removal site (Goods)

SF Bay Rail Road



Maritime Industry in Disaster Recovery

Maritime facilities & uses:

- Vessels & berths: MARAD
- Goods movement & debris removal: piers & rail
- Passenger movement: ferry landings & cruise facilities
- Harbor services: Westar, BayDelta, SF Bar Pilots

Non-Maritime properties:

- Embarcadero Roadway
- Parks & open spaces
- Parking lots
- The Backlands



The Issue

- What is Sea level Rise (SLR)?
- Warming + ice melt
- What do we know about SLR?
- 8" in 20th century (tide gages)
- Satellite measurement since 1993
- How will SLR evolve over 3 (2050) and 8 (2100) decades?



Services of the San Francisco Public Utilities Commission

Incorporating Sea Level Rise into Capital Planning

Overview of Draft Guidance City and County of San Francisco

**Coastal Hazards Adaptation Resiliency Group (CHARG)
July 24, 2014**

**David Behar
Climate Program Director, SFPUC
Chair, CCSF Sea Level Rise Committee**

**GUIDANCE FOR INCORPORATING SEA LEVEL RISE
INTO CAPITAL PLANNING IN SAN FRANCISCO:
ASSESSING VULNERABILITY AND RISK TO SUPPORT ADAPTATION**

Prepared by the City and County of San Francisco

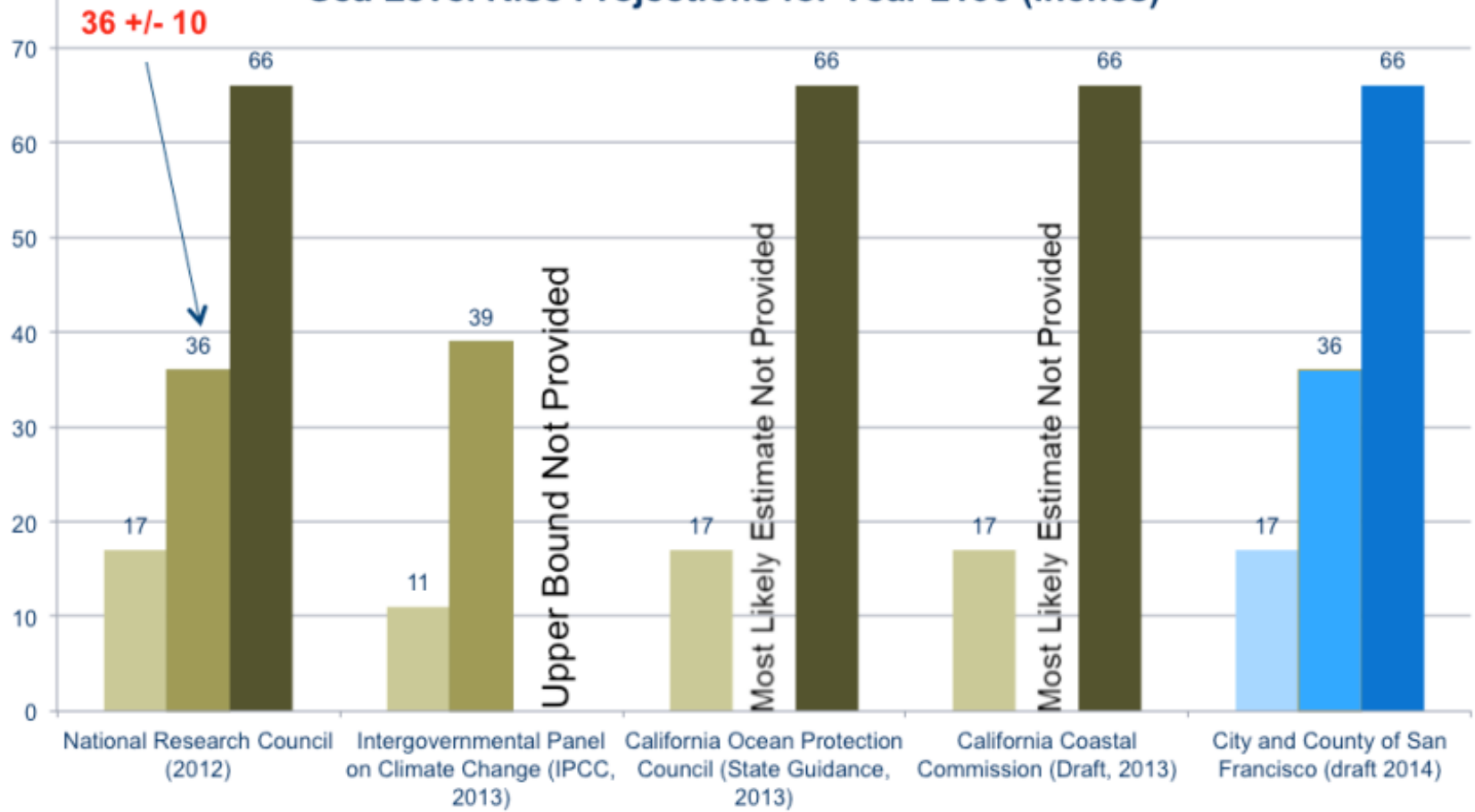
Sea Level Rise Committee for the San Francisco Capital Planning Committee

Adopted by the Capital Planning Committee September 22, 2014

Revision Adopted by Capital Planning Committee December 14, 2015

onesanfrancisco.org

Sea Level Rise Projections for Year 2100 (inches)



Sea Level Rise	Level above MHHW	Extreme Tide (Storm Surge) Levels						
		1-yr	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
0"	0	12	19	23	27	32	36	41
+6"	6	18	25	29	33	38	42	47
+12"	12	24	31	35	39	44	48	53
+18"	18	30	37	41	45	50	54	59
+24"	24	36	43	47	51	56	60	65
+30"	30	42	49	53	57	62	66	71
+36"	36	48	55	59	63	68	72	77
+42"	42	54	61	65	69	74	78	83
+48"	48	60	67	71	75	80	84	89
+54"	54	66	73	77	81	86	90	95
+60"	60	72	79	83	87	92	96	101
+66"	66	78	85	89	93	98	102	107

SAN FRANCISCO SEA LEVEL RISE ACTION PLAN

**Capital Planning Commission
March 14th, 2016**



SAN FRANCISCO SLR PROJECTIONS

Year	Most Likely Projection (CEQA/Project Approvals*)	Upper Range (Long-range Planning*)
2030	6 in	12 in
2050	11 in	24 in
2100	36 in	66 in

Reference: Sea level rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future (NRC 2012)

**Note: the City uses the National Research Council's (NRC) most likely SLR projection of 36" for ongoing planning and development purposes related to environmental review and project approvals. This 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.*

***With Storm Surge + King Tides: add ~ 40" (108" in 2100)**



**SAN FRANCISCO
SEA LEVEL RISE
VULNERABILITY ZONE
THROUGH END-OF-CENTURY
WITHOUT ANY ADAPTATION
MEASURES OR ACTIONS**

**MAJOR WATERFRONT PROJECTS
INCORPORATING INNOVATIVE
ADAPTIVE MANAGEMENT**

Legend

Sea Level Rise Vulnerability Zone

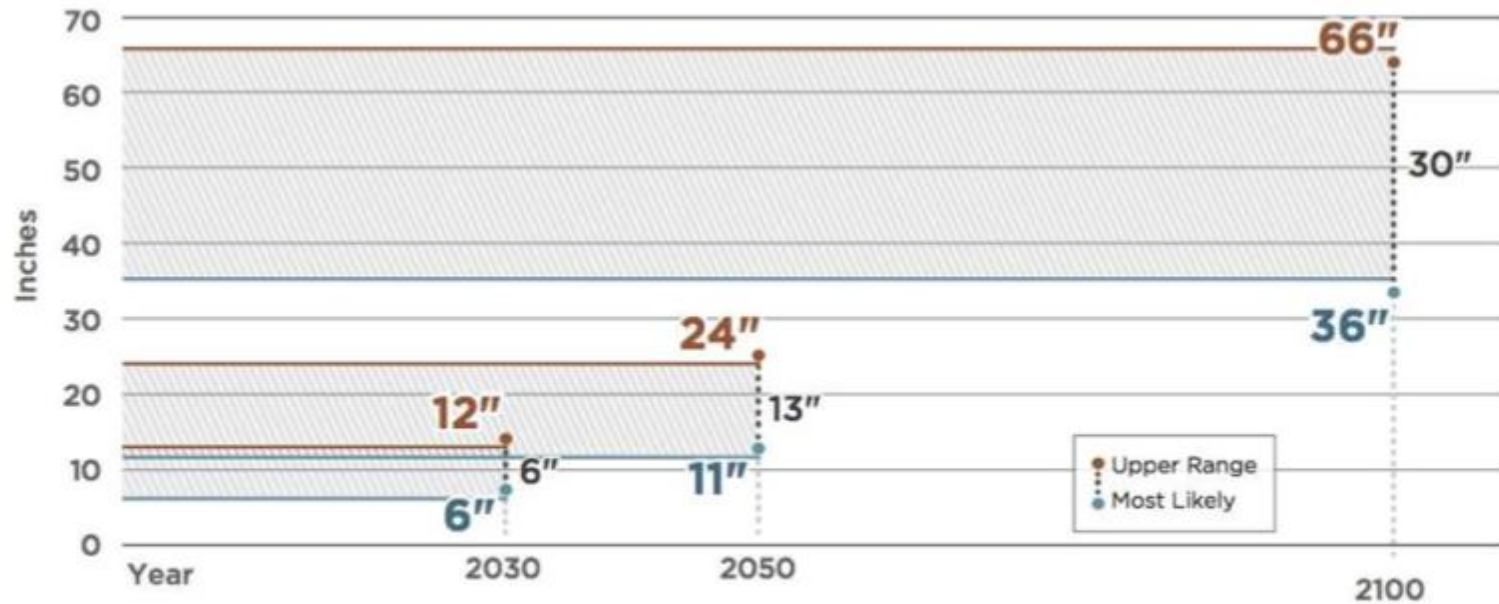


SLR Vulnerability Zone

(Note: blue line marks end of century, upper range projection with no action)

Figure 1: Range of Predicted Sea Level Rise through 2100

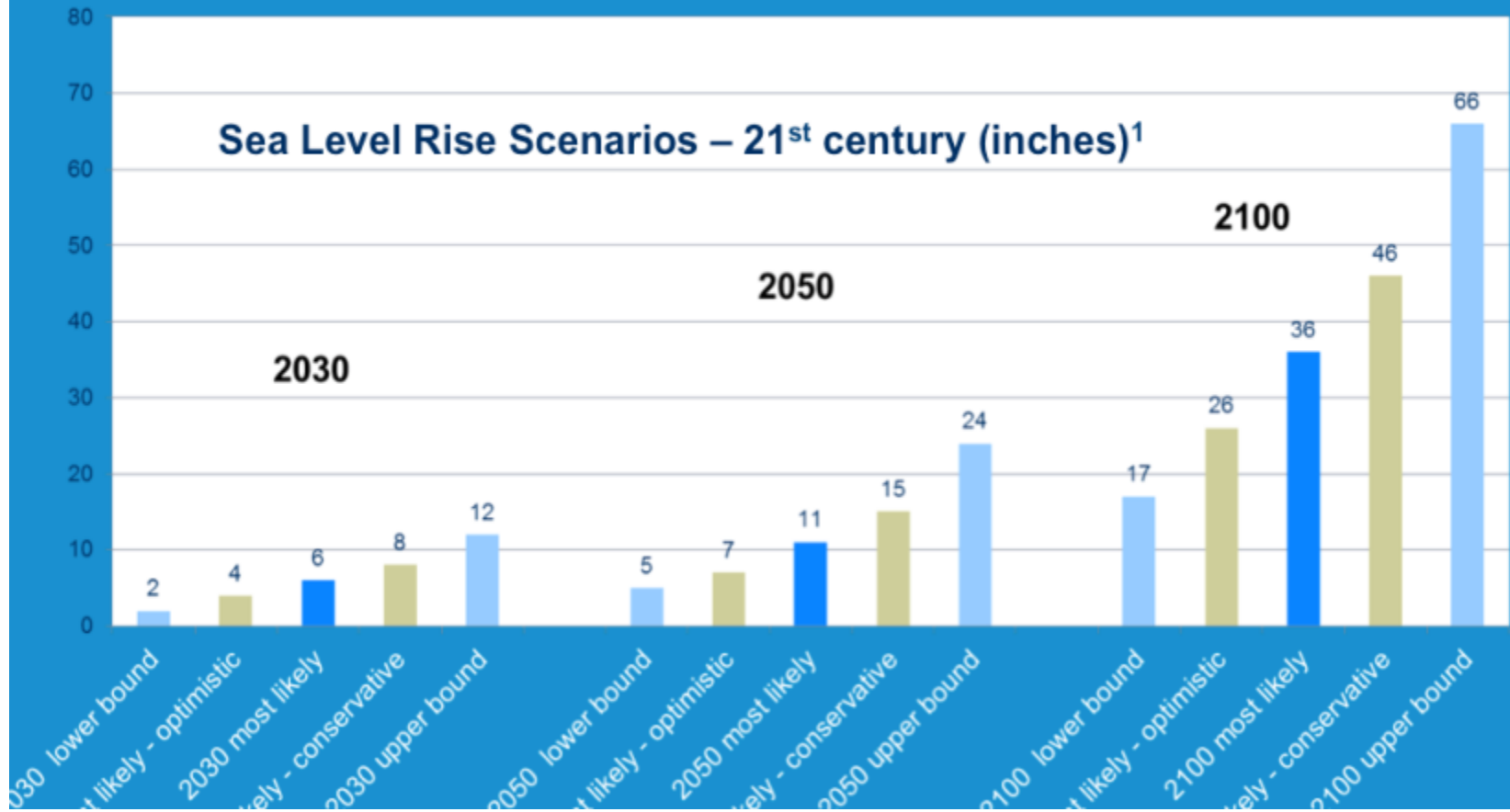
SEA LEVEL RISE PROJECTIONS FOR SAN FRANCISCO RELATIVE TO THE YEAR 2000



Source: NRC (2012). Lower range projections are excluded as they are not recommended for planning purposes.

NOTE: These SLR projections do not include extreme tides or coastal storms, which could add up to 42 inches of temporary flooding on top of rising sea levels, for a total of up to 108 inches above today's average high tide (*unlikely, but possible upper-range scenario*).

Sea Level Rise Scenarios – 21st century (inches)¹



MEMORANDUM

March 17, 2016

TO: MEMBERS, PORT COMMISSION
Hon. Willie Adams, President
Hon. Kimberly Brandon, Vice President
Hon. Leslie Katz
Hon. Eleni Kounalakis
Hon. Doreen Woo Ho

FROM: Elaine Forbes
Interim Executive Director

SUBJECT: San Francisco Sea Level Rise Action Plan

DIRECTOR'S RECOMMENDATION: Informational Item – No Action Requested

Resources for information on sea level rise

- sf-planning.org/sea-level-rise-action-plan
- [Projects.sfchronicle.com/2016/
sea-level-rise/part2](http://Projects.sfchronicle.com/2016/sea-level-rise/part2)
- onesf.org (capital planning info)

MAYOR EDWIN M. LEE

SLR COORDINATING COMMITTEE

Co-Chair: Byron Rhett, Port of San Francisco

Co-Chair: Diana Sokolove, San Francisco Planning Department

City Administrator's Office

San Francisco International Airport

San Francisco Public Utilities Commission

San Francisco Municipal Transportation Agency

Office of Economic and Workforce Development

Port of San Francisco

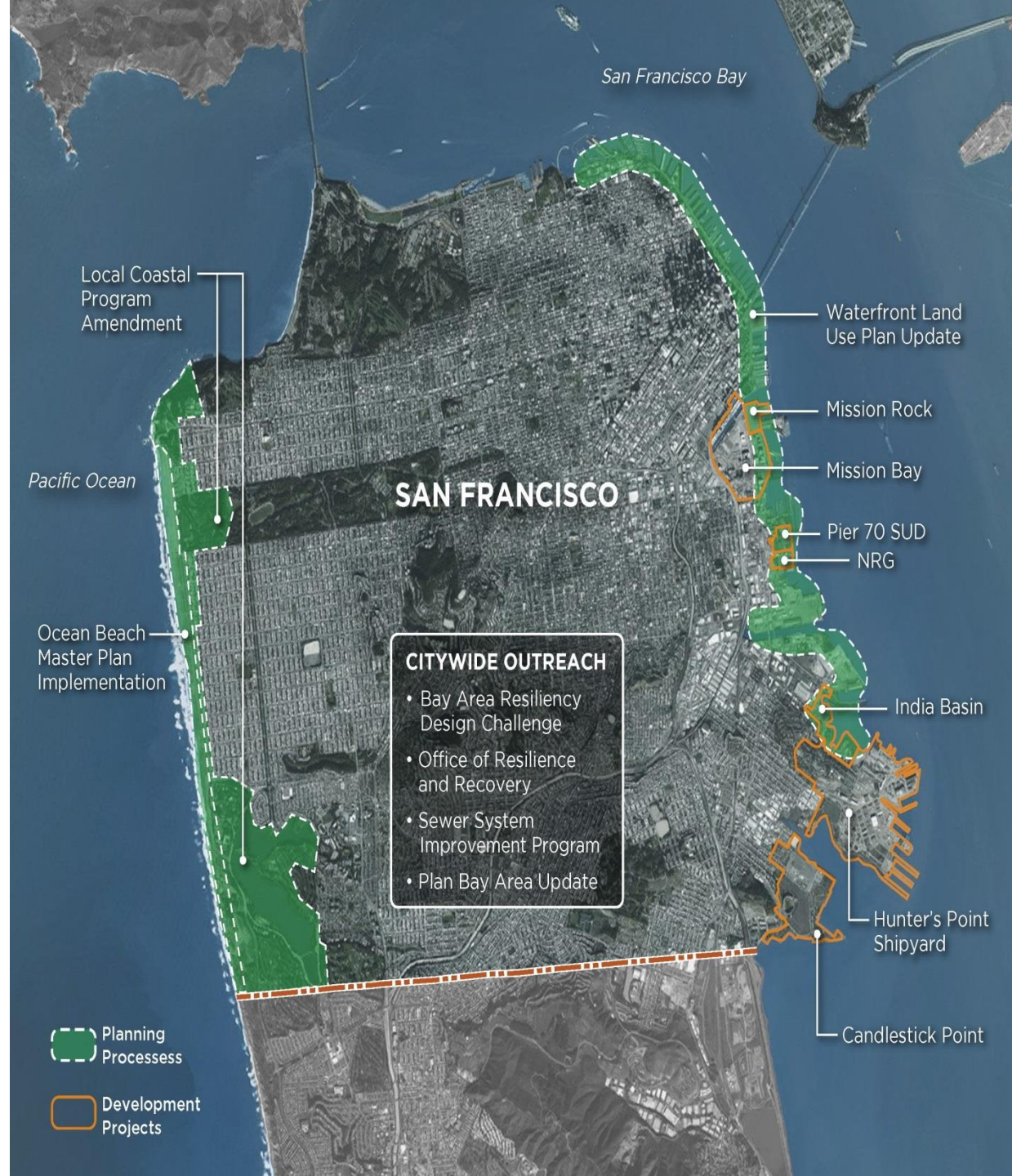
Office of Community Investment and Infrastructure

Department of Building Inspection

Capital Planning

PAST AND ONGOING OUTREACH AND ENGAGEMENT EFFORTS

(Note: dotted line marks end of century, upper range projection with no action)



VULNERABILITY AND RISK ASSESSMENTS

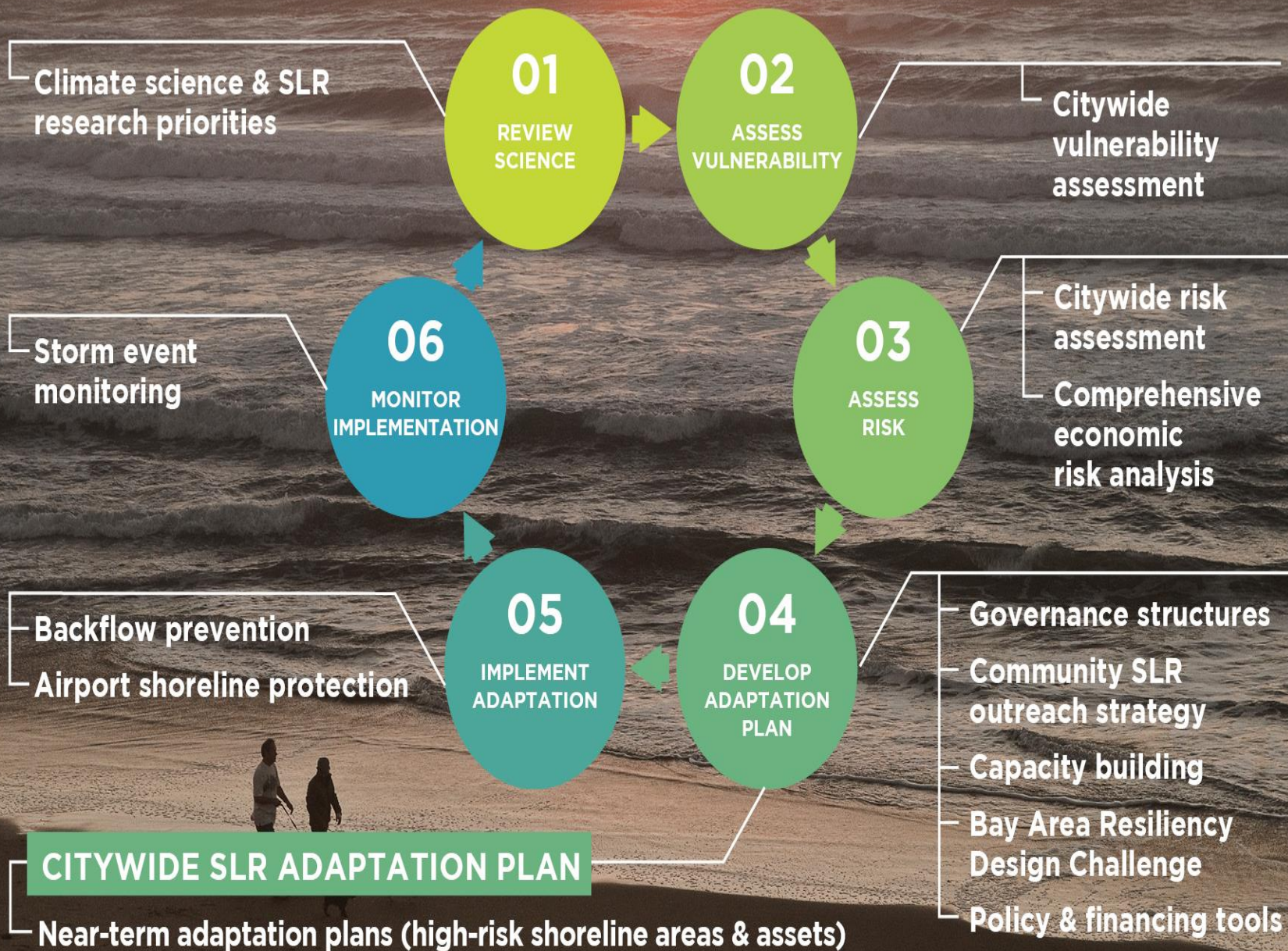
Completed

- Property/Assets
 - Port
 - SFO
 - SFPUC
- Vulnerable Communities

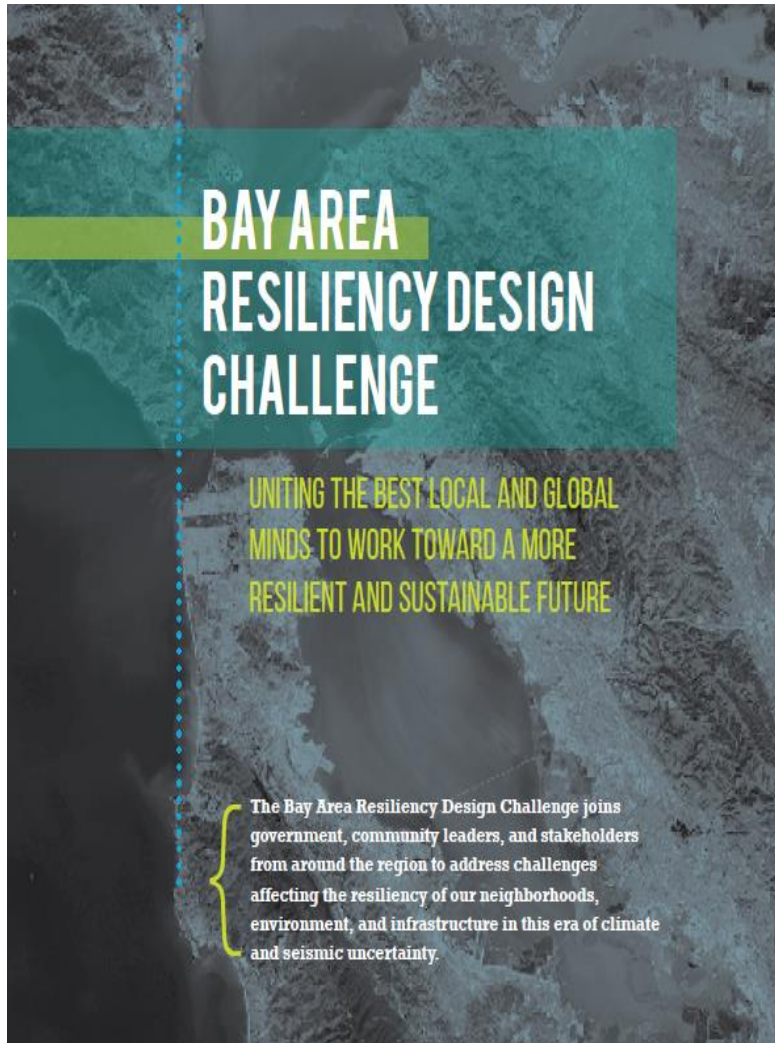
STILL needed

- SFMTA Property/Assets
- Other Buildings and Properties
- Energy, Waste Systems
- Parks/Open Space
- Communications

SEA LEVEL RISE PRIORITY ACTIONS [2016-2018]



RESILIENCE BY DESIGN CHALLENGE



- Equitable
- Collaborative and Interdisciplinary
- Replicable and Implementable
- Innovative and Inspiring
- Community and Design-driven



LOCAL AND REGIONAL COOPERATION

ON-GOING COORDINATION

Organization Chart

