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There's only one San Francisco. Let's take care of it.

California Seismic Safety Commission
Capital Planning & Seismic Resiliency in San Francisco

Brian Strong, Director of Capital Planning

October 9, 2014

SAN FRANCISCO SERVICES & INFRASTRUCTURE

San Francisco is responsible for a broad array of city, county, and regional services supported by a massive physical infrastructure.

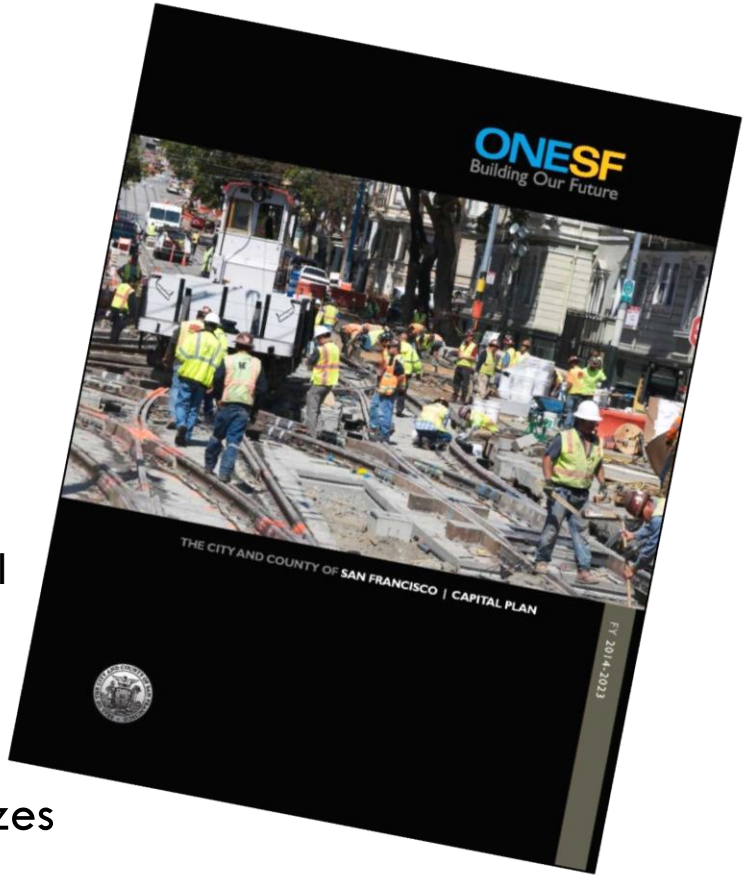
- **City Services** – Police and fire stations, roads and mass transit networks, parks and libraries, port and utility systems, convention facilities. Over 15 million square feet of facilities, 850 miles of streets, and transit infrastructure within two blocks of 90% of every location in the city.

- **County Services** – Two public hospitals, over a dozen clinics, county jails housing 2,000 prisoners, county welfare and public health programs.

- **Regional Services** – International airport and regional port; regional water and sewer system. Participation in regional transit networks (BART, Caltrain). Water system infrastructure from South Bay to Sierras, piers along the majority of San Francisco's north and east waterfronts.

TEN-YEAR CAPITAL PLAN

- Historic underinvestment in capital led to legislation creation of the City's first ten-year Capital Plan in 2006
- Goal: to develop and implement a sustainable plan for the long-term safety, accessibility and modernization of San Francisco's public infrastructure and facilities
- Capital Planning Committee (CPC)
  - Chaired by the City Administrator and includes all capital-intensive department heads as well as the President of the Board, the Planning Director, the Controller, and the Mayor's Budget Director
- Constrained long-term finance plan that prioritizes projects based on approved set of funding principals



RESILIENCY & CAPITAL PLANNING

- Over 50% of Citywide Investments Going Toward Seismic Safety
- Spent over $10b since Loma Preita
- Resiliency Chapter in the Plan
  - Provides overview of current/on-going initiatives related to resiliency & sustainability
    - Preparing for, responding to, and recovering from an earthquake or other disaster (Hazard Mitigation Plans, Energy Assurance Strategy and related)
    - Addressing issues related to climate change
  - Provides forum for interdepartmental and regional coordination
- Data Driven Studies Informing Prudent Use of Capital Funds

RESILIENCY & CAPITAL PLANNING INITIATIVES: Seismic Capital Programs – Previous 24 years

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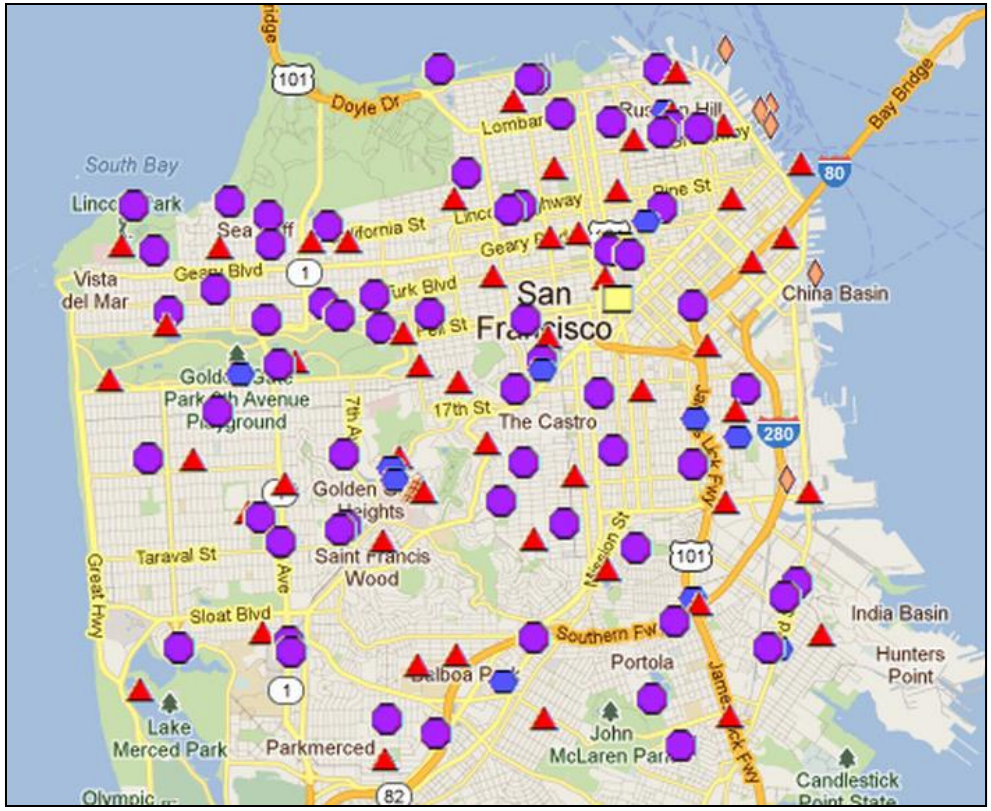
Major Seismic Programs

- Utility System Improvements
- Earthquake Safety and Emergency Response G.O. Bonds in 2010 & 2014
- Public Health Facilities: Laguna Honda and SF General Hospital G.O. Bonds
- Critical Civic/Cultural/Academic Facilities and Parks with G.O. and Revenue Bonds
- Key Regional Transportation Infrastructure (SFO & Doyle Drive) with Revenue Bond and Partnerships

200+ Seismic Projects since Loma Prieta



RESILIENCY & CAPITAL PLANNING INITIATIVES:
Seismic Studies & Prioritization

Prioritization Process

Analysis

City-owned Portfolio: 547 GF buildings

Hazus Analysis: 214 Priority Buildings

SHR | SHR | SHR

Capital Programs

Bond Programs

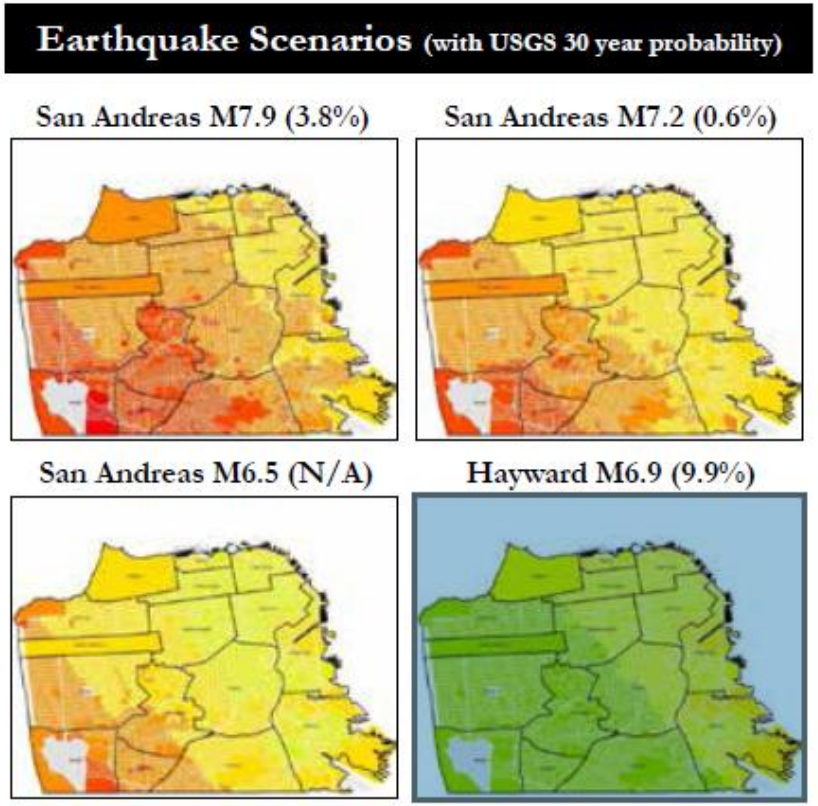
Other Sources

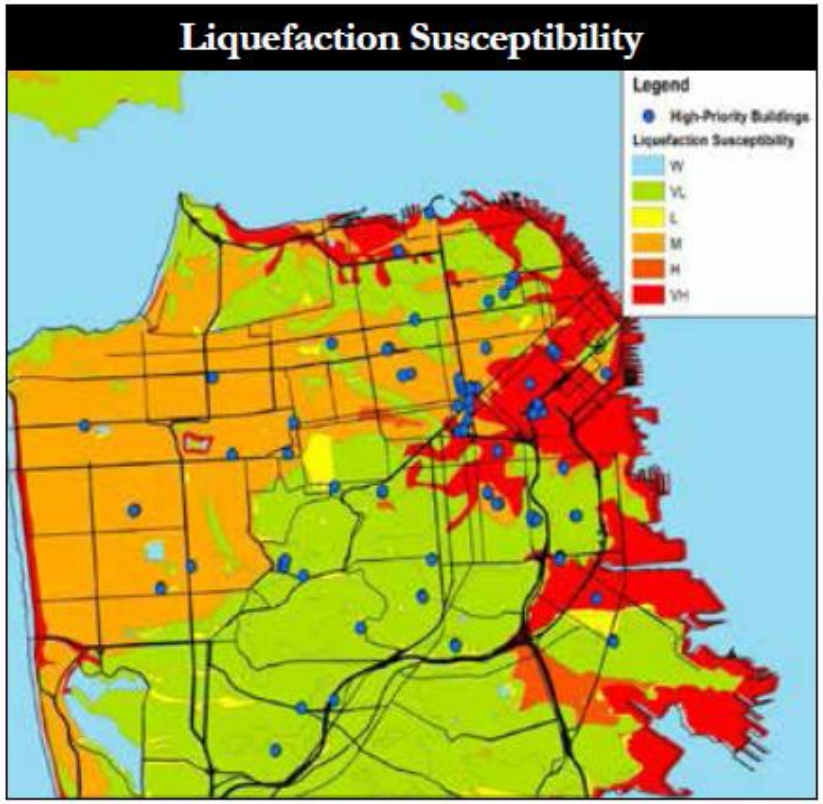
B.O.R.P Program

RESILIENCY & CAPITAL PLANNING INITIATIVES:
Seismic Studies and Prioritization

Hazus

- FEMA created geospatial tool that estimates individual building loses and in various earthquake scenarios
- Provides a relative risk review that is used to prioritize buildings for further analyis





RESILIENCY & CAPITAL PLANNING

Seismic Studies and Prioritization

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Hazus Estimated Economic Impacts

ALL LOSSES IN $ MILLIONS	Hayward M6.9	San Andreas M6.5	San Andreas M7.2	San Andreas M7.9
Structural Damage	85.2	111.4	183.0	313.3
Non-Structural Damage	306.8	440.6	727.9	1,324.7
Total Building Damage	*392.0*	*552.0*	*911.0*	*1,638.0*
Content Damage	80.9	217.9	295.1	447.6
Operational Losses, Rent, Relocation & Lost Income	94.3	119.8	197.5	318.3
Total Economic Impact	**567.1**	**889.6**	**1,403.6**	**2,403.9**

RESILIENCY & CAPITAL PLANNING

Seismic Studies and Prioritization

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Hazus Estimated Building Impacts

	Hayward M6.9	San Andreas M6.5	San Andreas M7.2	San Andreas M7.9
Mean building damage (% of building value)	8%	11%	19%	33%
Occupancy Tagging (Number of Buildings in Each Category)				
# Green Tagged	179	167	123	69
# Yellow Tagged	24	36	73	67
# Red Tagged	11	11	18	78
Total # Buildings	214	214	214	214
Collapse Probabilities (Number of Buildings in Each Category)				
<5%	210	210	198	142
5-10%	4	4	16	61
10-15%	0	0	0	11
Total # Buildings	214	214	214	214

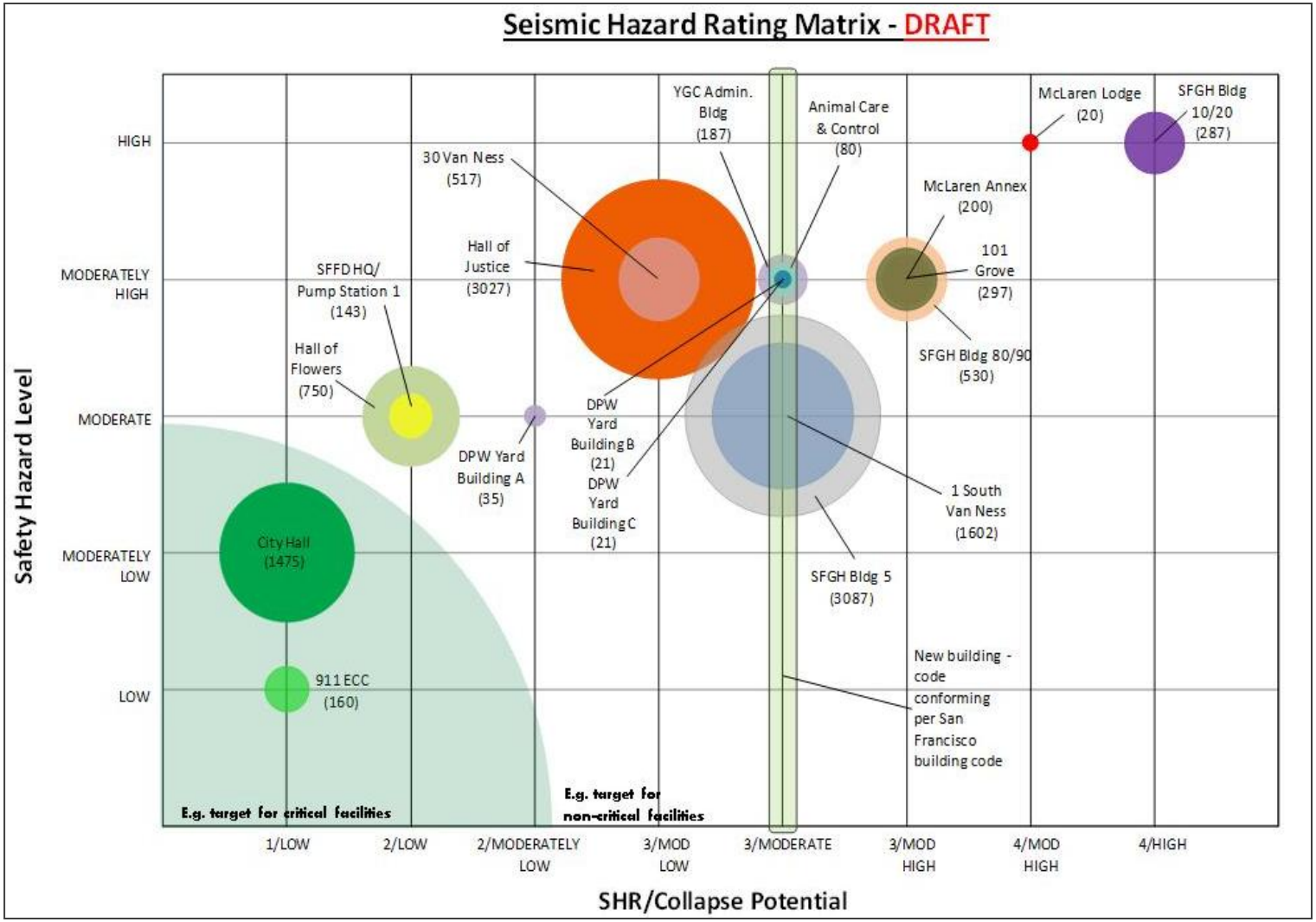
Casualties Estimated at Peak Occupancy

ALL CASUALTIES AT PEAK OCCUPANCY	Hayward M6.9	San Andreas M6.5	San Andreas M7.2	San Andreas M7.9
None Expected	151	130	102	64
10 or Fewer	48	66	88	107
11 to 25	11	11	11	22
26 to 50	3	3	4	9
51 to 100	0	0	4	3
101 or More	1	4	5	9

RESILIENCY & CAPITAL PLANNING INITIATIVES: Seismic Hazard Ratings (SHR)

SHR

- Structural evaluation of buildings in Basic Safey EQ (BSE-1)
- Analyzed 20+ high priority buildings to date
- Used for emergency management planning & funding prioritization

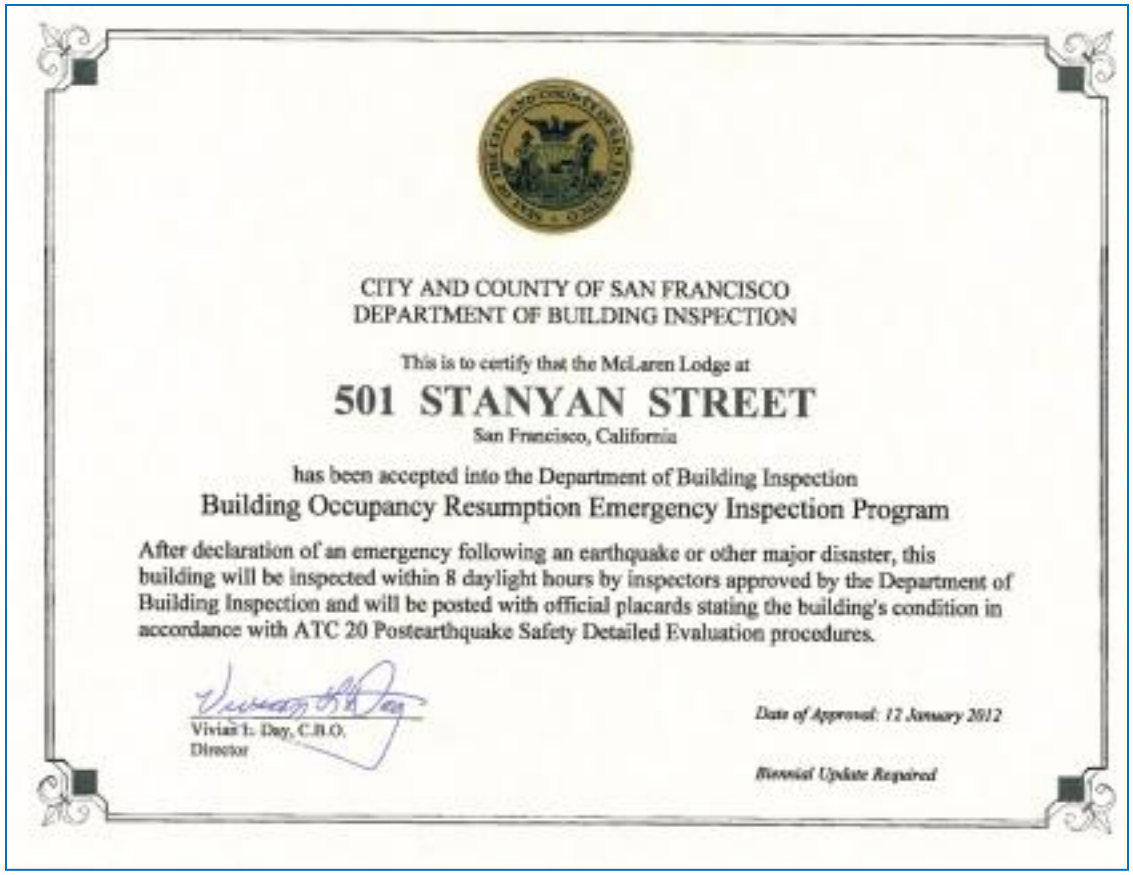


RESILIENCY & CAPITAL PLANNING

Seismic Studies and Prioritization

San Francisco Building Operation Resumption Program (BORP)

- Enables expedited post-disaster building inspection and occupancy determination
- 75 private and 13+ public buildings (City BORP) are participating in the program



CITY AND COUNTY OF SAN FRANCISCO
DEPARTMENT OF BUILDING INSPECTION

This is to certify that the McLaren Lodge at

501 STANYAN STREET

San Francisco, California

has been accepted into the Department of Building Inspection

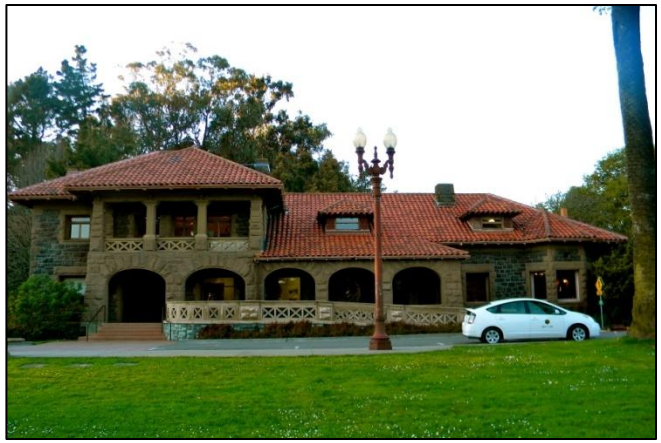
Building Occupancy Resumption Emergency Inspection Program

After declaration of an emergency following an earthquake or other major disaster, this building will be inspected within 8 daylight hours by inspectors approved by the Department of Building Inspection and will be posted with official placards stating the building's condition in accordance with ATC 20 Postearthquake Safety Detailed Evaluation procedures.

Vivian L. Day, C.B.O.
Director

Date of Approval: 12 January 2012

Biennial Update Required



Questions & Comments

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Brian Strong, Director of Capital Planning

RESILIENCY & CAPITAL PLANNING INITIATIVES: Other Resiliency Initiatives

- **Energy Assurance Planning (EAP) -** Energy assurance focuses on policies and capital programs to minimize energy interruptions during and after emergencies

- **Infrastructure Branch Working Group -** An interdepartmental group focused on the response and recovery plan for the City's publically-owned infrastructure after a major earthquake

- **Lifelines Council –** The Council works to develop and improve collaboration among various lifelines agencies, both within the City and across the region. Council includes more than 25 local and regional lifeline agencies including power, natural gas, water, telecommunications, transportation, debris management and emergency response.

- **Earthquake Safety Implementation Program (ESIP) –** A 30-year plan to implement the recommendations of the Community Action Plan for Seismic Safety (CAPSS) project, released in December 2010

IN CONSTRUCTION

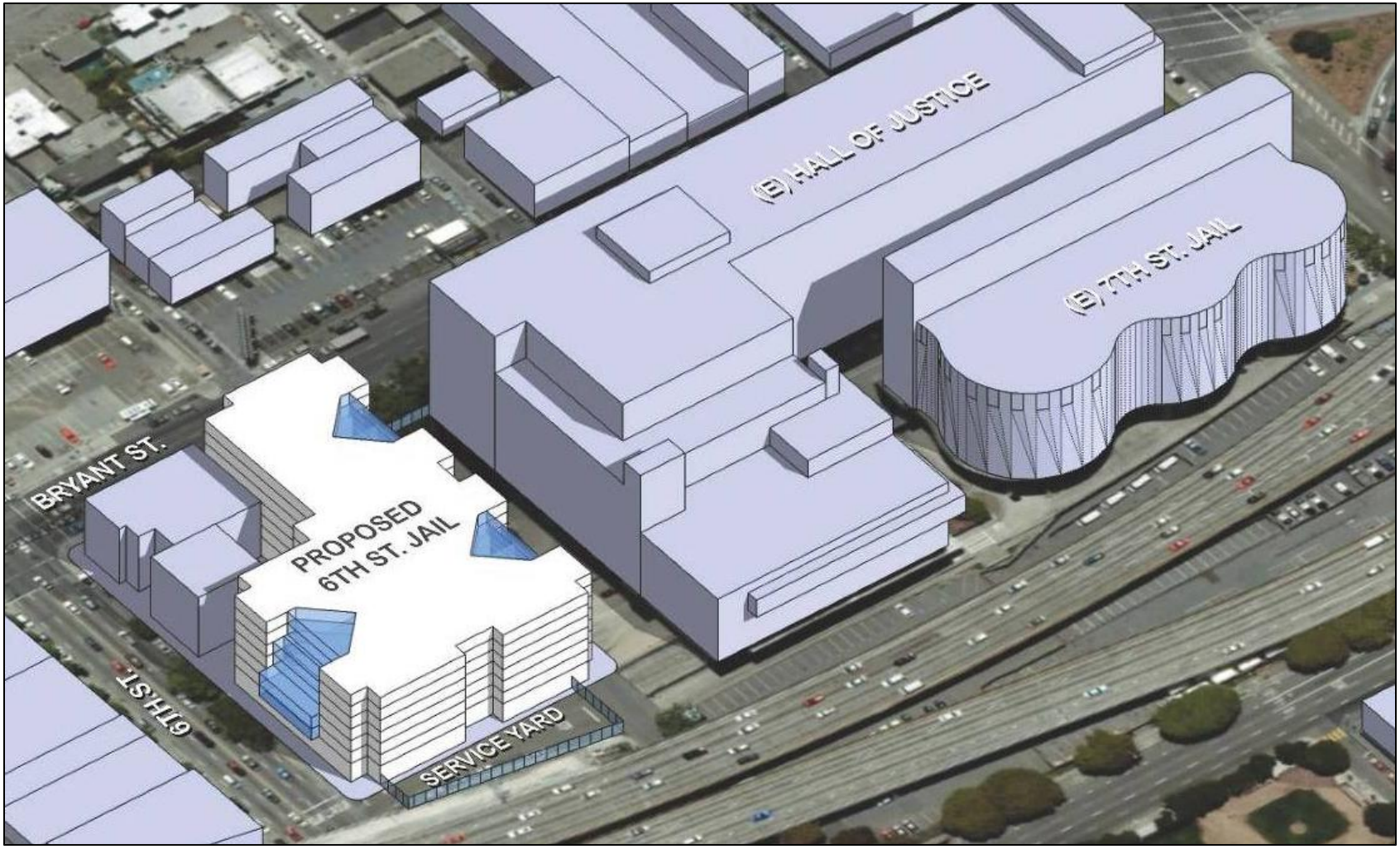
New Public Safety Building

Expected Completion 2014

New SF General Hospital

Expected Completion 2015

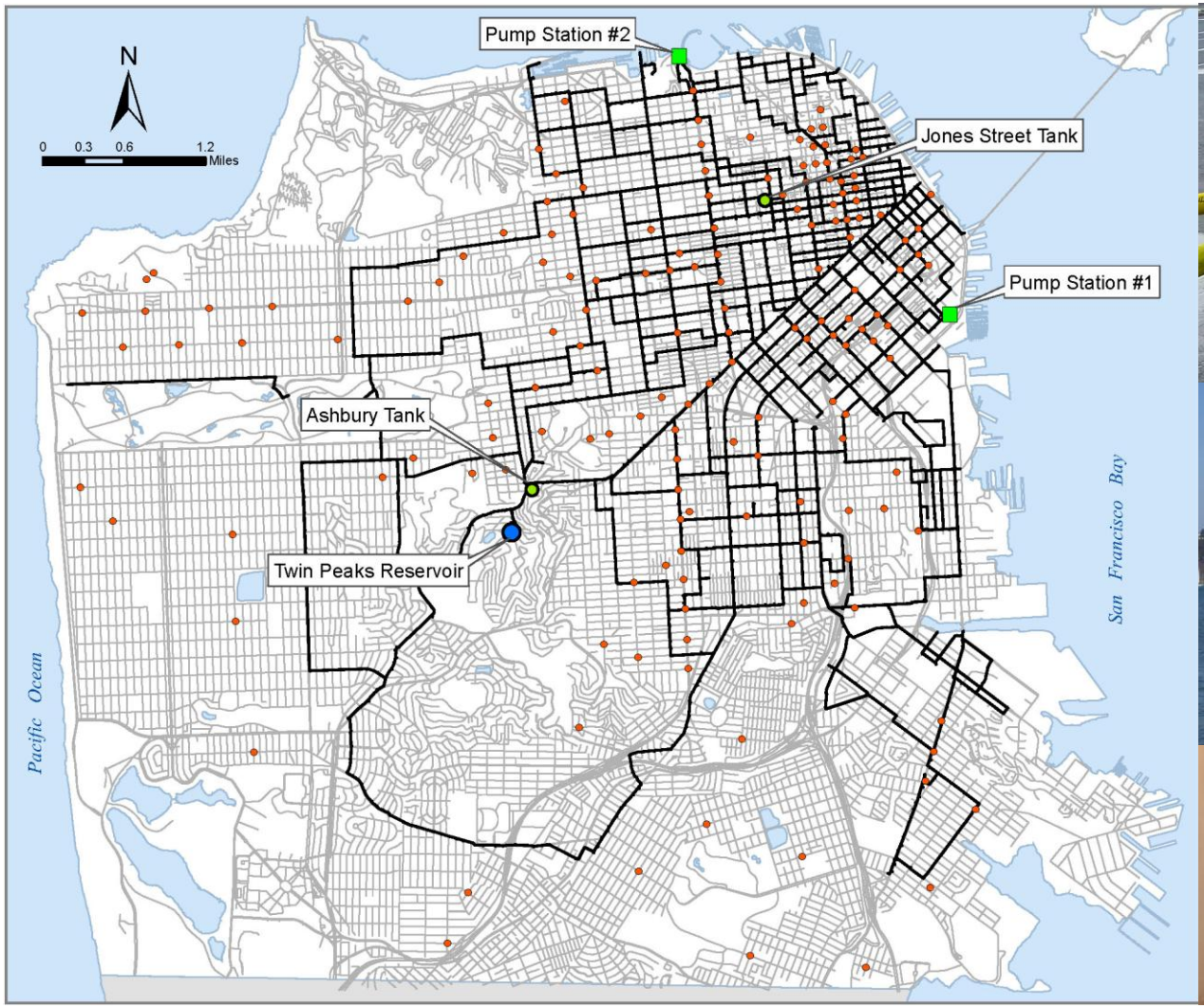
RESILIENCY & CAPITAL PLANNING INITIATIVES:
Seismic Capital Programs – Hall of Justice



Replacing the Hall of Justice: GO Bonds + Revenue Bonds

RESILIENCY & CAPITAL PLANNING INITIATIVES:

Seismic Capital Programs – Auxiliary Water Supply System



Backup Fire Hydrant System Built Largely Pre-1913

RECENT AND ONGOING

Neighborhood Fire Station Improvements

Fillmore Station 5
in design

Ingleside Station 15
in design & construction

Cow Hollow/Marina Station 16
in design

Station 26
in design & construction

Inner Richmond Station 31
in design & construction

Civic Center Station 36
in design

RECENT ACCOMPLISHMENTS

SFPUC Headquarters

Bayview
Public Library

The James R. Herman Cruise Terminal at Pier 27

FY2014 -23 CAPITAL PLAN OVERVIEW

Capital Plan Summary by Department Type

(Dollars in Millions)

	GF	Enterprise	External	Total
Public Safety	1,376			**1,376**
Health and Human Services	775		531	**1,306**
Infrastructure and Streets	1,343	7,335		**8,678**
Recreation, Culture, and Education	613		628	**1,241**
Economic and Neighborhood Development	541	1,163	2,447	**4,151**
Transportation		5,952	2,276	**8,228**
General Government	91			**91**
TOTAL	**4,740**	**14,450**	**5,882**	**25,072**

Plan's proposed investments support an estimated 23,000+ jobs over 10 years

FY 2014 -23 CAPITAL PLAN OVERVIEW: General Fund Departments

Capital Plan Summary GF Department Overview (Dollars in Millions)	Funded	Deferred
Renewal Investments	***1,629***	***1,025***
Enhancement Investments	***3,257***	***2,825***
Earthquake & Safety Improvements	***1,936***	***476***
Disability Access Transition Plan Improvements	*159*	-
Parks, Open Space & Greening Improvements	*310*	*18*
Street Infrastructure Improvements	*332*	*1,445*
Other Improvements	*520*	*885*
TOTAL	**4,886**	**3,850**

Resiliency in the Capital Plan

Continuity of Government & Resiliency

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Challenges to Resiliency

- Short-term memories & it is politically difficult
- Design measures emphasize saving lives not post-disaster usability
- Top down – engineers know best
- Emphasis on new buildings & infrastructure rather than existing
- Governments aren't good at maintaining or decommissioning infrastructure
- Polices to encourage private sector improvements and/or provide disaster insurance are difficult to implement
- It can be hard to weigh the risks
- Lack of performance measures & expected outcomes

Earthquake Type	Severity	Probability (50 years)	Deaths (2 AM / 2 PM)
Routine	5.0-5.5	70%	0
Expected	7.2	10%	287/430
Extreme	7.9	2%	658/1,489

Source: CCSF Dept of Building Inspections, Community Plan for Seismic Safety

Seismic Hazard Rating Building Performance

SHR	Description
SHR-1	**Minor damage** (good performance). Some structural or nonstructural damage and/or falling hazards may occur, but these would pose minimal life hazards to occupants. The damage can be repaired while the building is occupied and with minimum disruptions to functions.
SHR-2	**Moderate damage** (fair performance). Structural and nonstructural damage and/or falling hazards are anticipated which would pose low life hazards to occupants. The damage can be repaired while the building is occupied.
SHR-3	**Major damage** (poor performance). Structural and nonstructural damage are anticipated which would pose appreciable life hazards to occupants. The building has to be vacated during repairs, or possibly cannot be repaired due to the extent and/or economic considerations.
SHR-4	**Partial/total collapse** (very poor performance). Extensive structural and nonstructural damage, potential structural collapse and/or falling hazards are anticipated which would pose high life hazards to occupants. There is a good likelihood that damage repairs would not be feasible.

RECENT ACCOMPLISHMENTS

Neighborhood Park Renovations

Balboa Park

Hellen Diller Playground

Betty Ong Chinese Recreation Center

Before

After

RECENT AND ONGOING

Utility Improvements

Water System and Sewer System Improvement Programs: Revenue Bonds