

Seismic Safety in City-Owned Buildings

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Capital Planning Committee
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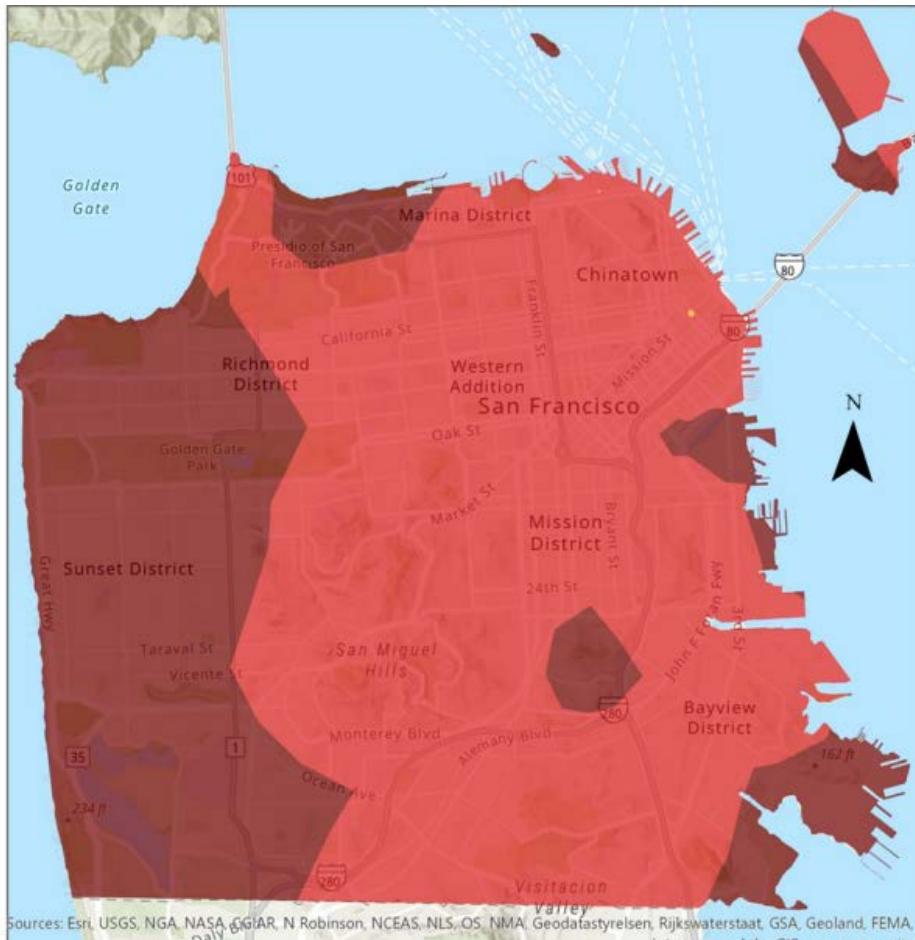
Presentation Outline

- Earthquake Risk in San Francisco
- Increasing the Seismic Safety of City-Owned Buildings
- Progress
- Upcoming Priorities
- Discussion

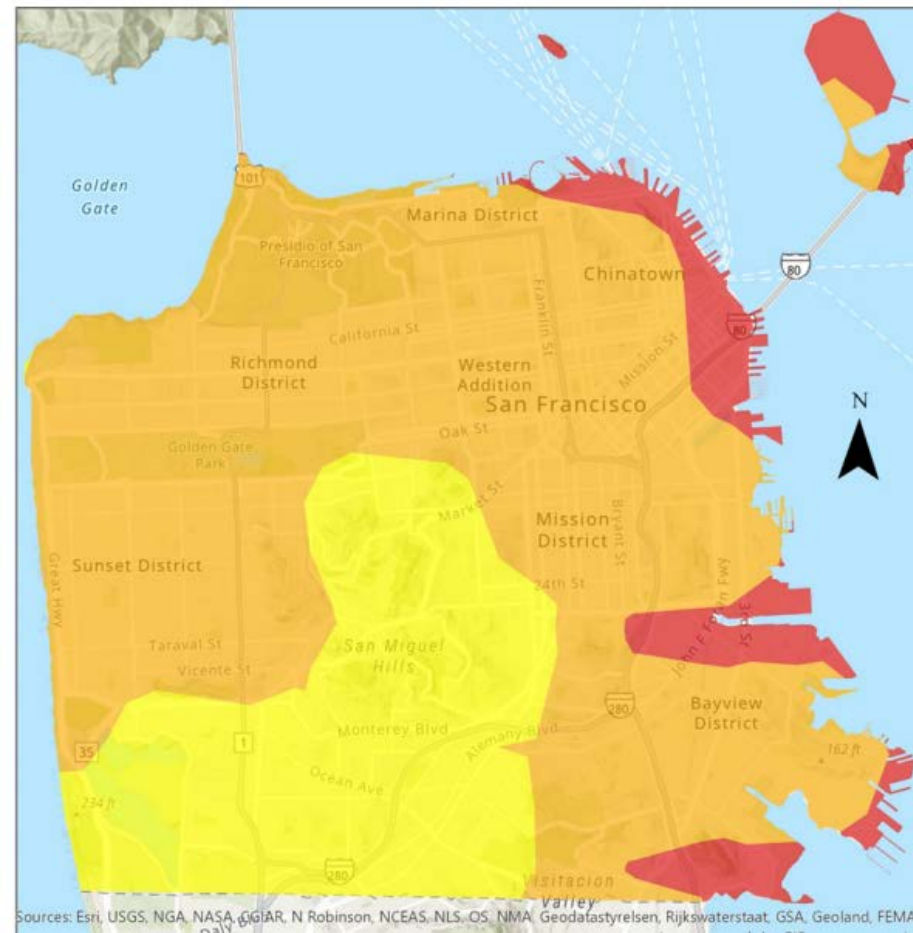
Earthquake Risk in San Francisco

Earthquake Hazard

M7.8 on the San Andreas Fault



M7.0 on the Hayward Fault



Modified Mercalli Intensity
(Shaking Scale)

- Light
- Moderate
- Strong
- Very Strong
- Violent

Earthquake Risk in San Francisco

City-Owned Buildings

HAZUS PROJECTED ECONOMIC IMPACT (LOSSES IN 2017 DOLLARS)

\$ in millions	Hayward M6.9	San Andreas M6.5	San Andreas M7.2	San Andreas M7.9
Structural Damage	107.2	133.4	212.3	353.1
Non-Structural Damage	398.3	545.4	859.7	1,489.3
Total Building Damage	505.5	678.8	1,072.0	1,842.4
Content Damage	130.1	426.7	523.6	714.3
Operational Losses; Rent, Relocation & Lost Income	154.8	191.9	314.7	527.2
Total Economic Impact	790.4	1,297.3	1,910.3	3,083.8

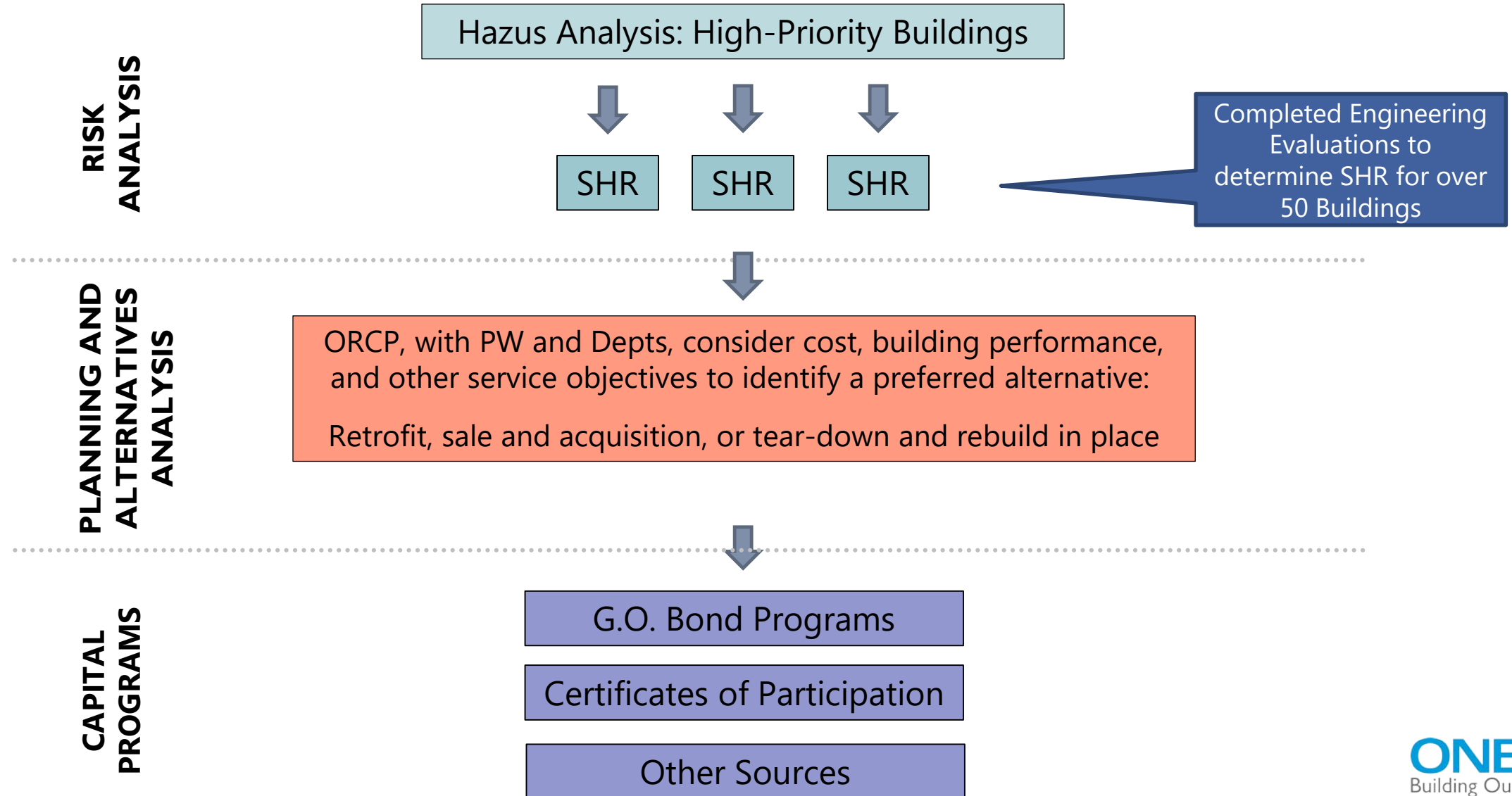
Citywide, it is estimated that 27,000 buildings will not be safe to occupy following a M7.2 on the San Andreas. Cost to repair/replace damaged buildings est. \$30 billion in 2010 dollars.

Source: ATC, 2010. "Potential Earthquake Impacts."

Based on 239 City-owned buildings

Increasing the Seismic Safety of City-Owned Buildings

Overview



Increasing the Seismic Safety of City-Owned Buildings

Seismic Hazard Rating (SHR) Analysis

SHR	Expected Performance	Description
1	Negligible damage <i>Very good performance</i>	Minimal to no disruption to the building's function. Damage is so minor or negligible, that repair is not necessary.
	Minor damage <i>Good performance</i>	Some structural or nonstructural damage and/or falling hazards may occur, but these would pose minimal life safety hazards to occupants. The damage can be repaired while the building is occupied and with minimum disruption to functions. Buildings and structures with this rating represent an acceptable level of earthquake safety, and funds need not be spent to improve their seismic resistance to gain greater life safety.
2	Moderate damage <i>Fair performance</i>	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. Buildings and structures with this rating will be given a low priority for expenditures to improve seismic performance and/or falling hazards to the "good performance" level.
3	Major damage <i>Poor performance</i>	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. Buildings and structures with this rating will be given a high priority for expenditures to improve seismic performance and/or falling hazards to the "good performance" level, or would be considered for other abatement programs such as reduction of occupancy.
4	Partial/total collapse <i>Very poor performance</i>	Extensive structural and nonstructural damage, potential structural collapse and/or falling hazards are anticipated which would pose high life safety hazards to occupants. There is a high likelihood that damage repairs would not be feasible. Buildings and structures with this rating will be given the highest priority for expenditures to improve seismic performance and/or falling hazards to the "good performance" level, or would be considered for other abatement programs such as reduction of occupancy or vacation.

Recently Completed Projects

Select Recently Completed Projects

Owner	Project Name	Year Complete	Improvement in seismic performance	Funding Source(s)
ACC	Animal Care and Control Relocation and Retrofit	2021	SHR 3 to SHR 1 (Existing building retrofitted for Risk Category IV occupancy)	Certificates of Participation (COP)
DPH	Maxine Hall Retrofit	2021	From SHR 4 to SHR 3	2016 Public Health and Safety Bond
DPH	Castro Mission Health Clinic Retrofit	2022	From high SHR 3 to low SHR 3	2016 Public Health and Safety Bond (PHS); FEMA
RED	Exit 30 South Van Ness to 49 South Van Ness	2020	From SHR 4 to SHR 2 (New building designed for Risk Category III occupancy)	Sale and land transfer, COP
SFFD	Fire Station 5 Replacement	2019	From SHR 3 to 1 (New building designed for Risk Category IV occupancy)	2010 Earthquake Safety and Emergency Response (ESER) Bond
SFFD	Fire Station 16 Replacement	2019	From SHR 3 to 1 (New building designed for Risk Category IV occupancy)	2010 ESER Bond
SFFD	Fire Station 49 (Ambulance Deployment Facility) Replacement	2021	SHR 1 (New building designed for Risk Category IV occupancy)	2016 PHS



Upcoming Priorities

Status of Remaining SHR 4s

Owner	Facility	Status	Funding Source(s)
ART	African American Arts and Cultural Center (AAACC)*	Green	General Fund and 2023 COP
ART	Mission Cultural Center for Latino Arts (MCCLA)*	Yellow	General Fund and 2023 COP
ART	SOMArts Cultural Center	Red	N/A
DPH	Chinatown Public Health Center	Green	2024 Public Health (proposed)
DPH	101 Grove Street Exit	Yellow	Various
DPH	ZSFG Bldg 10/20	Red	N/A
H.S.A.	170 Otis Exit	Yellow	2024 COP
HSH	1001 Polk Street Shelter	Green	2024 Public Health (proposed)
HSH	260 Golden Gate Shelter	Yellow	2024 Affordable Housing (proposed)
HSH	525 5th Street Shelter	Red	N/A
REC	McLaren Lodge	Red	N/A
SFFD	Fire Stations 2, 6, 7*, 11*, 15*, 21*, 38*, 40	Yellow	Future ESER
SFMTA	Presidio Division Building and Body Shop	Yellow	N/A
SFPD	Ingleside Police Station	Green	2020 ESER
SFPD	Taraval Police Station	Red	Future ESER
SFUSD	1235 Mission Street (Lease)	Red	N/A

*Potential non-ductile concrete based on building vintage

Key

Green	Plan in place, funding source identified
Yellow	Planning in progress, some challenges
Red	Planning not yet started or in very initial stages, funding not identified



Upcoming Priorities

SHR 3s with Critical Occupancies

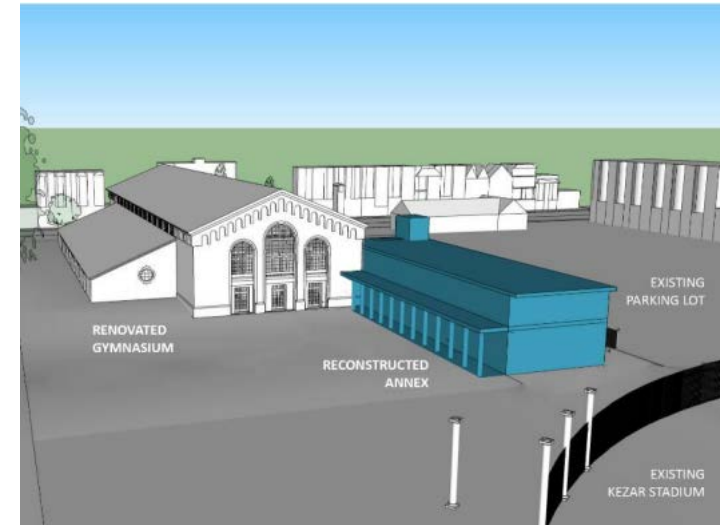
Select Planned and Deferred SHR 3 Seismic Projects

Owner	Facility	Status	Funding Source(s)
DPH	Silver Ave Health Clinic*		2024 Public Health (proposed)
DPH	City Clinic*		2024 Public Health (proposed)
DPH	ZSFG Building 80/90		N/A
DPW	Public Works Yard		N/A
FIR	Fire Stations 8, 9, 13		Future ESER
POL	Other Police stations*		Future ESER
RED	Hall of Justice* (on-going exit)		FY27, FY30 COPs
REC	Kezar Pavilion*		ESER 2020, 2020 Health and Recovery
SHF	425 7th St		N/A
RED	1 South Van Ness		N/A
MTA	1200 15 th Street*		N/A

*Potential non-ductile concrete based on building vintage

Key

	Plan in place, funding source identified
	Planning in progress, some challenges
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Upcoming Priorities

Concrete Building Safety Program

- ❑ Goal: Identify, evaluate, and retrofit the most vulnerable older public and private non-ductile concrete buildings to prevent major structural failure.
- ❑ Convened a working group of stakeholders to inform the concrete program
- ❑ Final stakeholder recommendations end of 2023, ordinance expected mid-2024



New Zealand, 2011

The Pyne Gould Corp. building collapsed when the magnitude 6.3 earthquake struck Christchurch, New Zealand. It was built in the 1960s, before the adoption of modern seismic standards for concrete buildings. (Hannah Johnston / Getty Images) - [Los Angeles Times](#)

Upcoming Priorities

Concrete Building Safety Program

- ❑ According to preliminary working draft inventory, ~3,900 non-ductile concrete buildings in San Francisco
- ❑ Other cities have passed non-ductile concrete retrofit ordinances:
 - ❑ Los Angeles (~1,300 buildings, 25-year timeline)
 - ❑ Santa Monica (~70 buildings, 10-year timeline)
 - ❑ West Hollywood (~60 buildings, 20 year timeline)
 - ❑ Los Angeles County ordinance pending (33 county-owned, unknown number privately-owned, 10-year timeline)
- ❑ San Francisco program timeline is not yet determined
- ❑ Retrofit of non-ductile concrete buildings is complicated and expensive

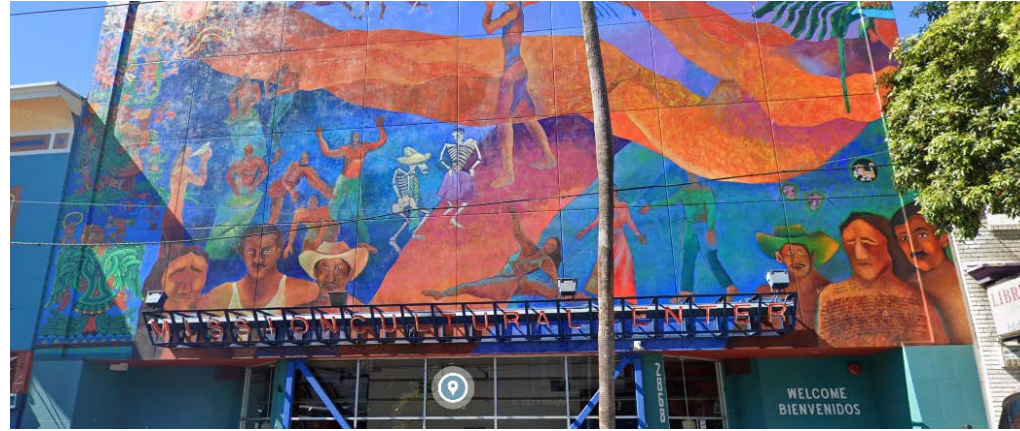


Source: SF Chronicle. This concrete building was recently retrofitted.

Upcoming Priorities

Concrete Building Safety Program – City-Owned Buildings

- ❑ The Concrete Building Safety Program (CBSP) will apply to City-owned buildings
- ❑ Approximately ~100 non-ductile concrete buildings owned by the City
- ❑ Based on an early draft outline of the program, the City could need to retrofit or show compliant ~50 buildings over a timeline to be determined



Discussion

- ❑ How to decide the trade-off between performance and costs?
 - ❑ Project budgets are challenged, but City buildings will play a critical role in recovery.
 - ❑ How to consider performance in light of acquisition and retrofits?
- ❑ How to increase our pace of retrofits? Especially in light of a potential future concrete building retrofit ordinance.
 - ❑ We are still working on complex exits: 101 Grove, 170 Otis, Hall of Justice
 - ❑ We are currently averaging about 2 retrofits per year. We still have ~22 SHR 4s and will potentially need to complete ~50 concrete building retrofits under a timeline that is TBD.