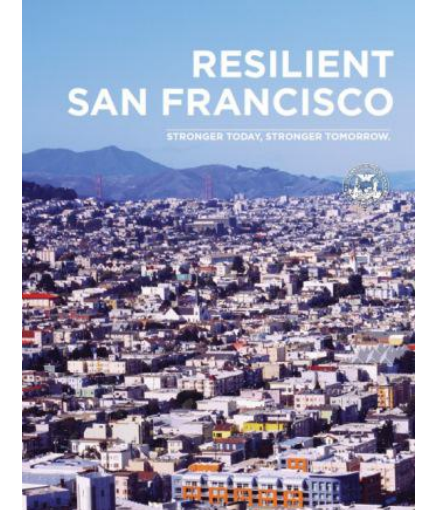
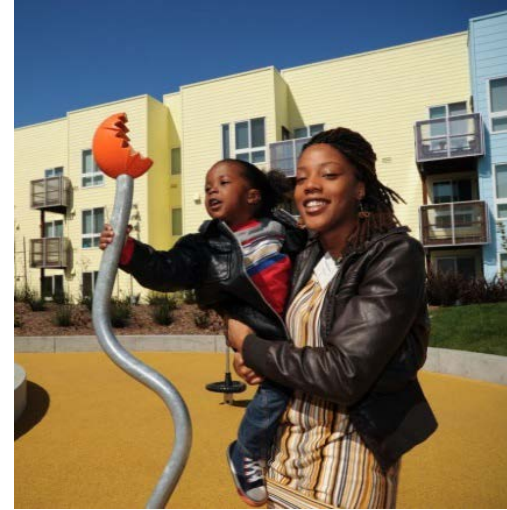


Concrete Building Safety Program

City and County of San Francisco
SPUR presentation
January 19, 2023

Office of Resilience and Capital Planning

- / Established 2016: Merged Office of Resilience and Recovery with Capital Planning Program
- / Promote Resilience: Shocks and Stressors
- / Responsible for Hazards and Climate Resilience Plan; Community Action Plan for Seismic Safety
- / Develop Capital Plan and Capital Budget



Earthquake Safety Implementation Program (ESIP)

- ▷ 30-year, 50 task strategy to improve seismic safety of buildings
- ▷ Developed out of 10-year CAPSS Program

Evaluation and Retrofit Program	1990	1995	2000	2005	2010	2015	2020 and beyond
Unreinforced masonry retrofit	★						
Soft-story retrofit					★		
Private schools evaluation					★		
Façade inspection and maintenance						★	
Concrete retrofit (proposed)							

★ date of ordinance

Wood Frame Soft Story Retrofit Program



- 4,405 retrofits complete – 89%
- Privately-owned wood frame soft story buildings, 5+ units. Owners were required to address the soft story condition.
- Final deadline to complete retrofit: September 15, 2021

Concrete Building Safety Program Goal

Identify, evaluate, and retrofit the most vulnerable older concrete and tilt-up buildings to **prevent major structural failure** in support of the City's seismic resilience and safety goals.



A Pressing Issue



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](#)



Mexico City, 2017

Non-ductile Concrete Partially Collapsed Structure on Verge of Total Collapse, Threatening Adjacent Residence. (Photo courtesy of Degenkolb Engineers) - [Structural Engineers Association of California](#)

The Concrete Building Safety Program will address two types of buildings



Concrete Tilt-up

(Rigid-Wall-Flexible-Diaphragm)



Non-ductile Concrete

Concrete **Tilt-up** Buildings

- ▷ Weak connection between roof and walls
- ▷ Typically grocery stores, warehouses, auto-body shops
- ▷ ~14 California cities have retrofit ordinances in place
- ▷ Retrofit relatively inexpensive and straightforward



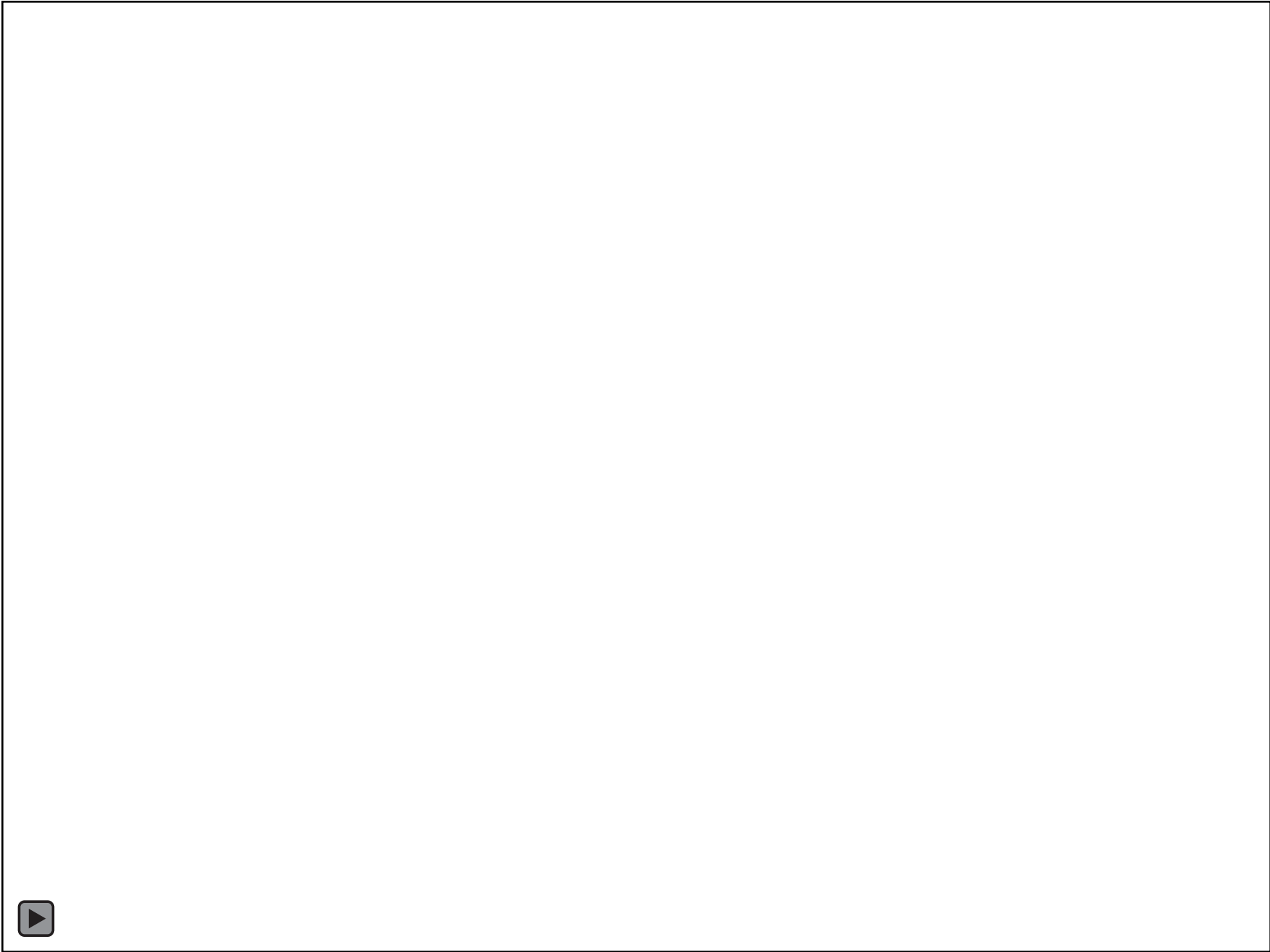
1994 Northridge (EERI in FEMA P-1026)

Non-Ductile Concrete Buildings

- ▷ Contain insufficient steel reinforcement or capacity to resist collapse
- ▷ Typically housing and offices
- ▷ Los Angeles and other cities have recently mandated retrofit for non-ductile concrete buildings
- ▷ Retrofit can be complicated and expensive



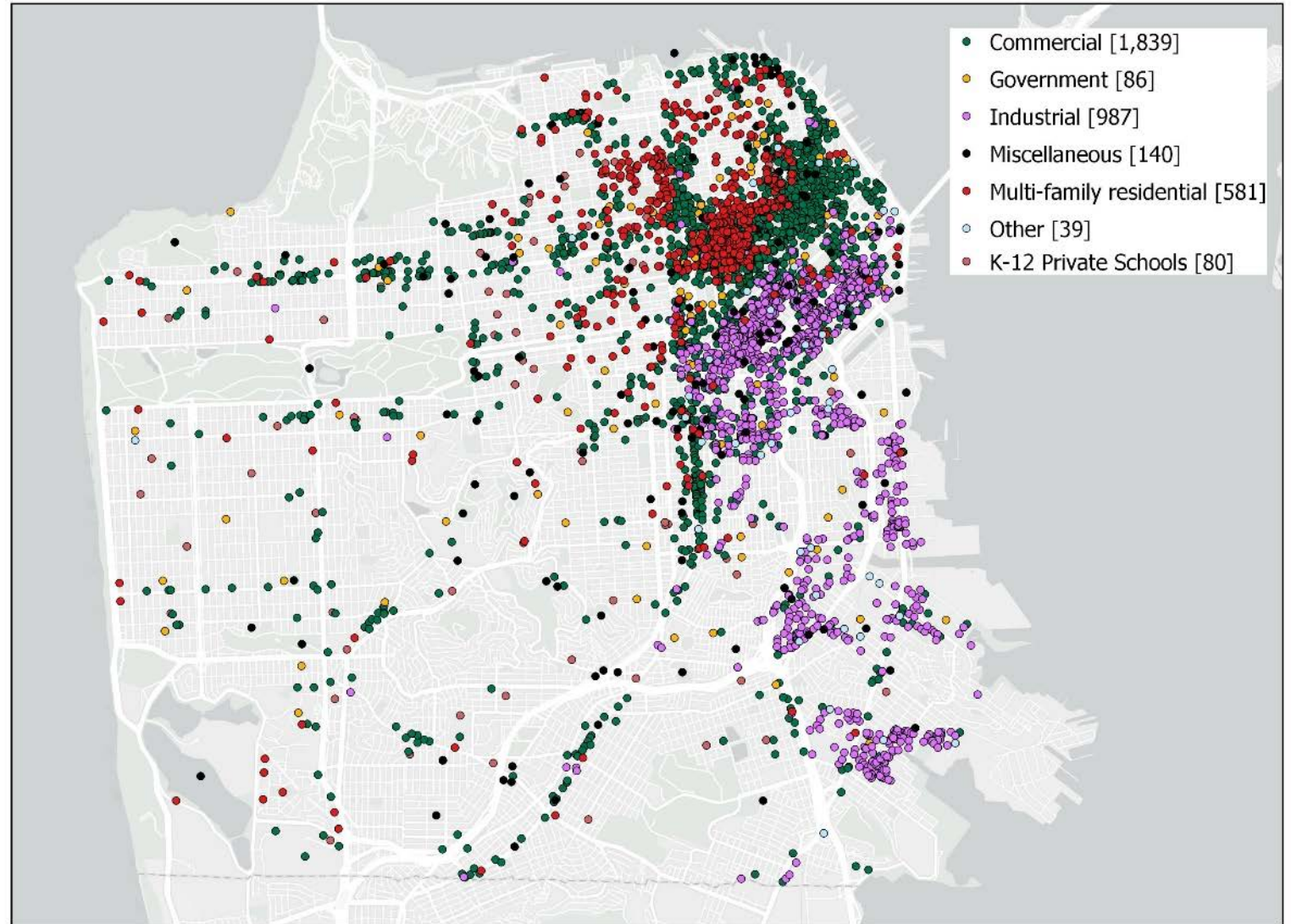
Damage to CTV building following Christchurch earthquake. Source: 1 NEWS



Draft Map of Concrete Buildings

By Use Type:

- Commercial [1,839]
- Government [86]
- Industrial [987]
- Miscellaneous [140]
- Multi-family residential [581]
- Other [39]
- K-12 Private Schools [80]



Concrete Buildings

Illustrated here are all concrete buildings in the city except: Post 1995 construction, public schools, colleges and universities, hospitals, SF Port Buildings, State and Federal Buildings and 1-4 unit residential buildings

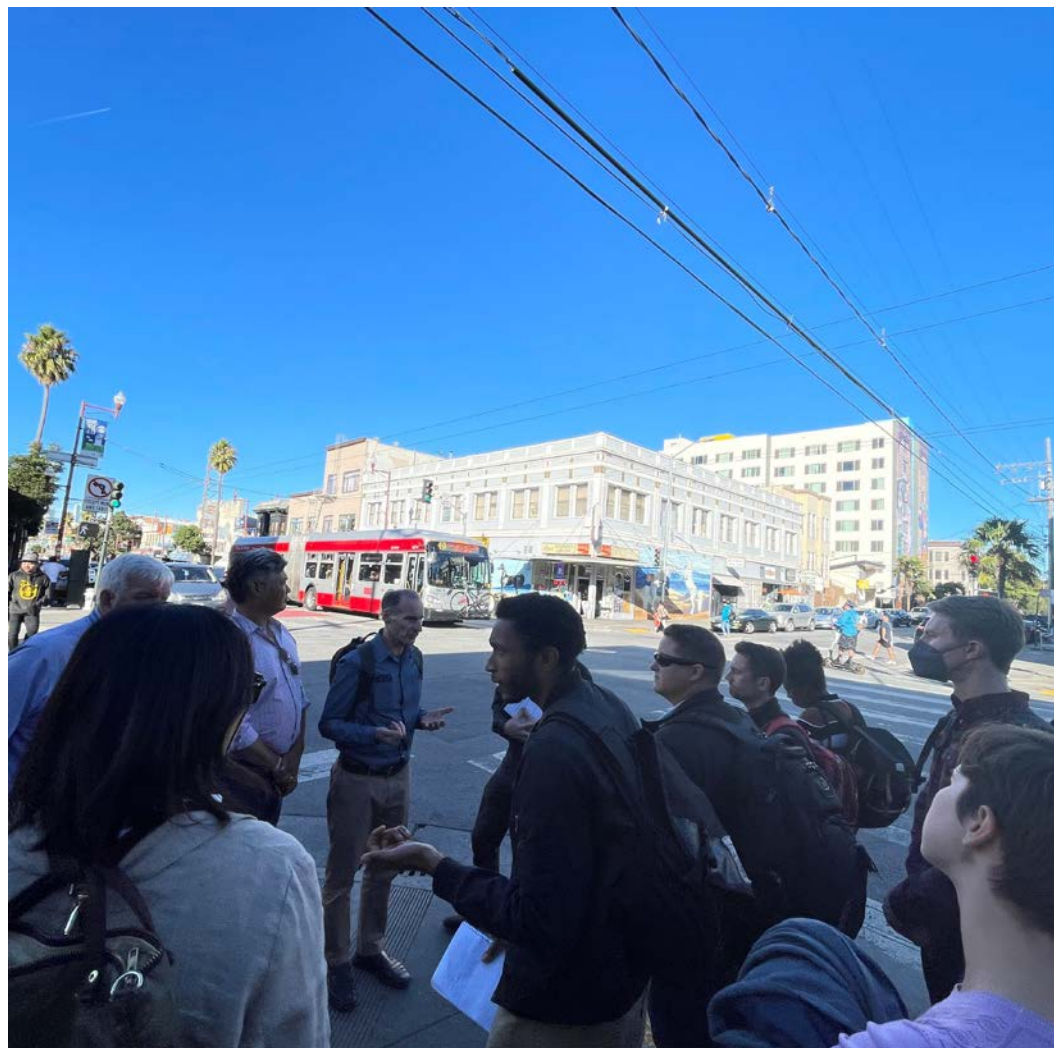
3,752 Buildings Total



Challenges and Questions

- ▷ City staff and engineering community capacity
- ▷ Temporary tenant relocation
- ▷ Displacement
- ▷ Social Equity
- ▷ Cost and financing
- ▷ Awareness and education
- ▷ Implications and opportunities for other building improvements

Process



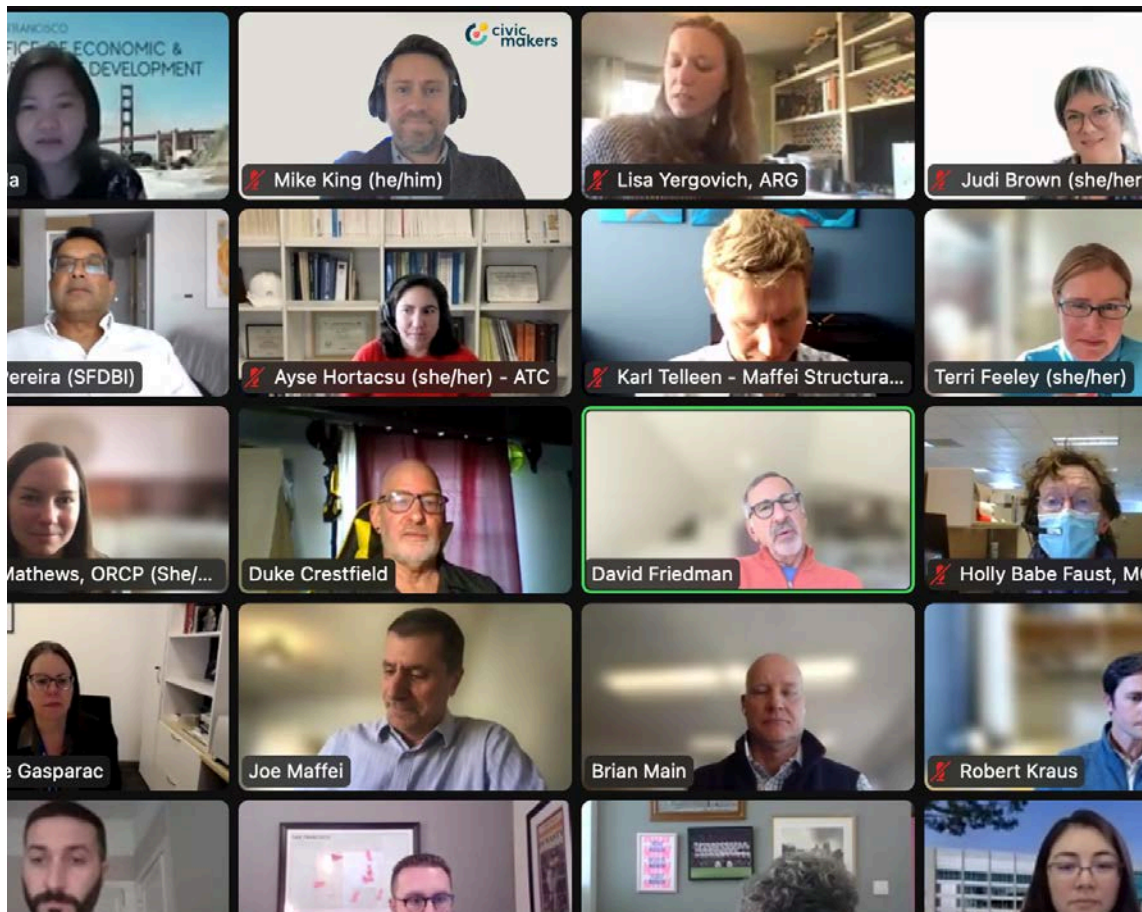
Executive Panel:

- ▷ Provide guidance and direction
- ▷ City Administrator, Building Inspection, Emergency Management, Econ. Development, Assessor, Public Works, Housing & Community Development

Stakeholder Working Group:

- ▷ Represent the concerns of stakeholders, including vulnerable communities
- ▷ Provide recommendations for program policy and design
- ▷ Ensure program products are usable

Stakeholder Working Group Composition



- ▷ City and County Staff
- ▷ Technical Experts
- ▷ Residential Building owners
- ▷ Commercial Building owners
- ▷ Tenant Representatives
- ▷ Business Representatives
- ▷ Labor Representatives
- ▷ Builders and Developers

Recap: Concrete Building Safety Program

Program goal	Building types affected	Who is involved
Identify, evaluate, and retrofit the most vulnerable concrete buildings to protect against major structural failure.	Concrete Tilt-up <i>(technical term: rigid-wall-flexible-diaphragm)</i> Non-Ductile Concrete	Project team <ul style="list-style-type: none">• SF Office of Resilience and Capital Planning• SF Department of Building Inspection• Applied Technology Council• Civicmakers Stakeholder Working Group Executive Panel

Thank you!



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