Unreinforced Masonry Building Policy

Jonna Papaefthimiou, PBEM | Amit Kumar, BDS | Shelly Haack, Prosper Portland

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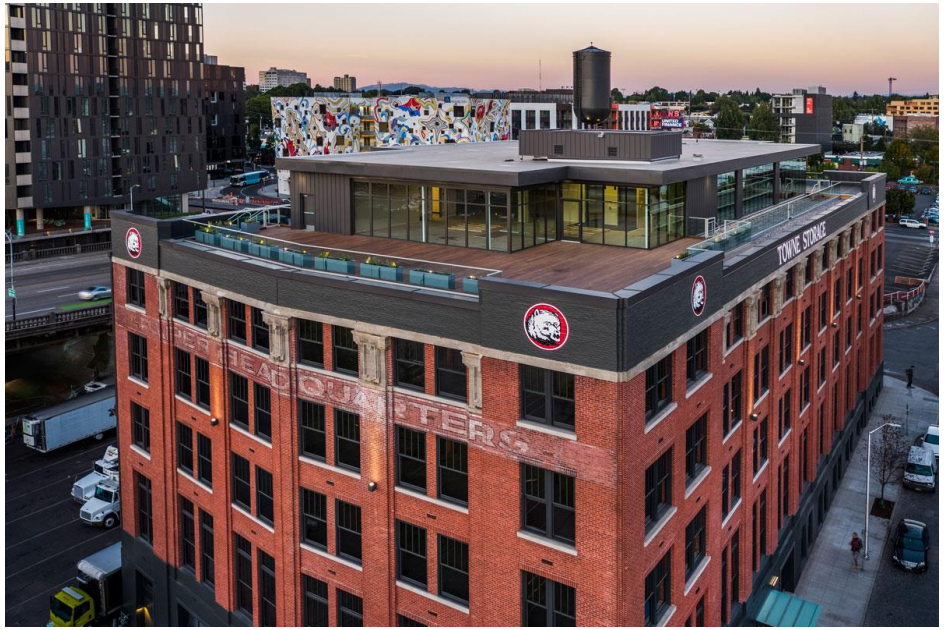
Earthquake Risk

- 22% chance of magnitude 9.0 earthquake in next 50 years.
- 37% chance in next 50 years for southern portion.

Definition of a URM

- A structure with at least one wall made of bricks or blocks joined by mortar, with no steel reinforcing bars.



Why focus on URMs?

Risk

Unreinforced masonry buildings, on average, perform very poorly in earthquakes. More than any other kind of construction, they can be singled out as being seismically vulnerable.

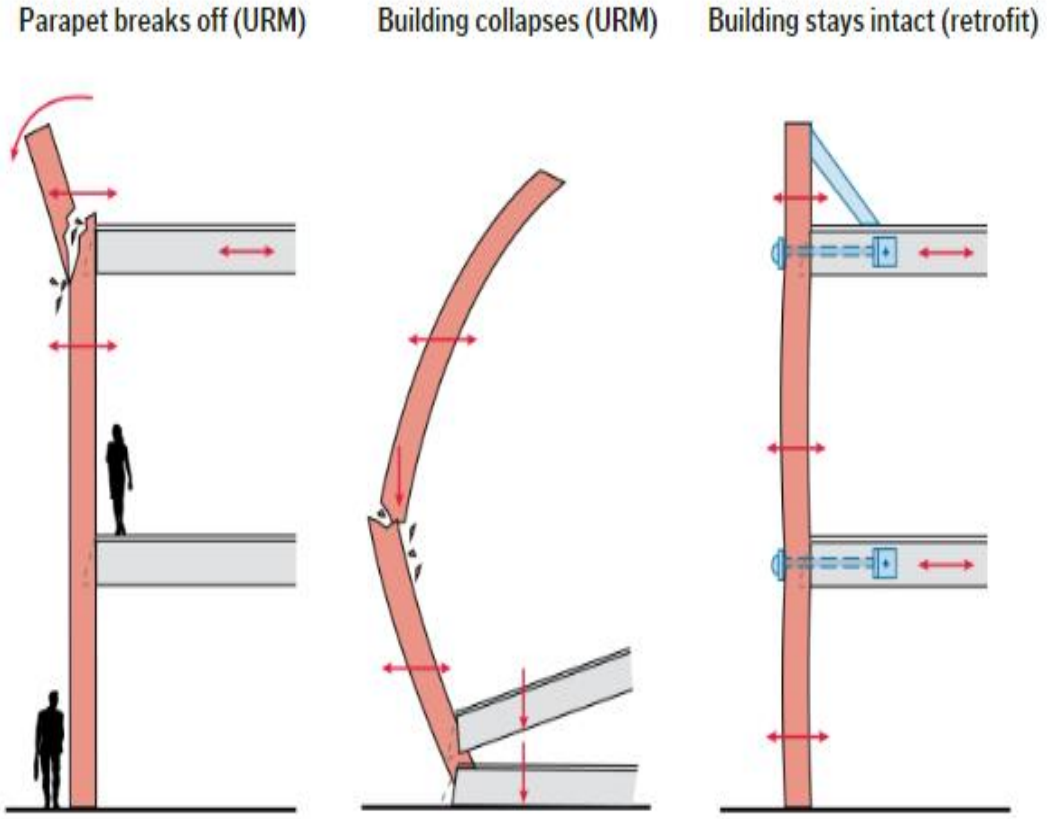
- Federal Emergency Management Agency (FEMA)

How URMs Fail

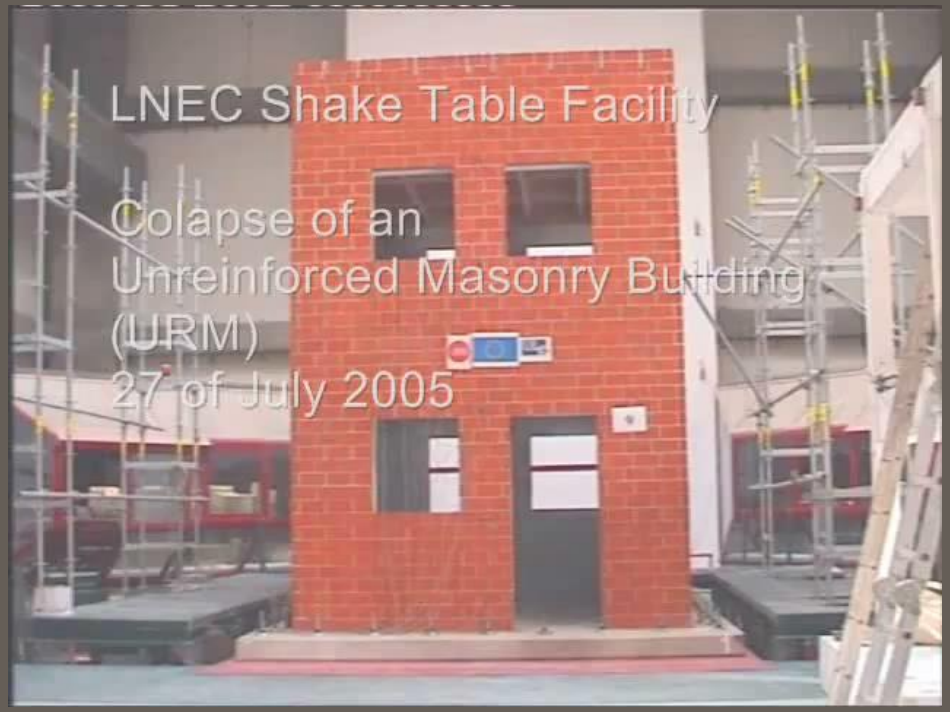
Risk

During an earthquake

Unreinforced masonry buildings are vulnerable because the walls and parapets aren't securely tied to the floors and roof. In an earthquake, parapets can break away, walls pull apart and the floors collapse. Retrofitting reduces the danger.



Wood Building vs. URM Building



URM Buildings in Portland

- About 1,650 URM buildings (9% of building stock)
- About 7,200 residential units
- About 40 URMs City-owned

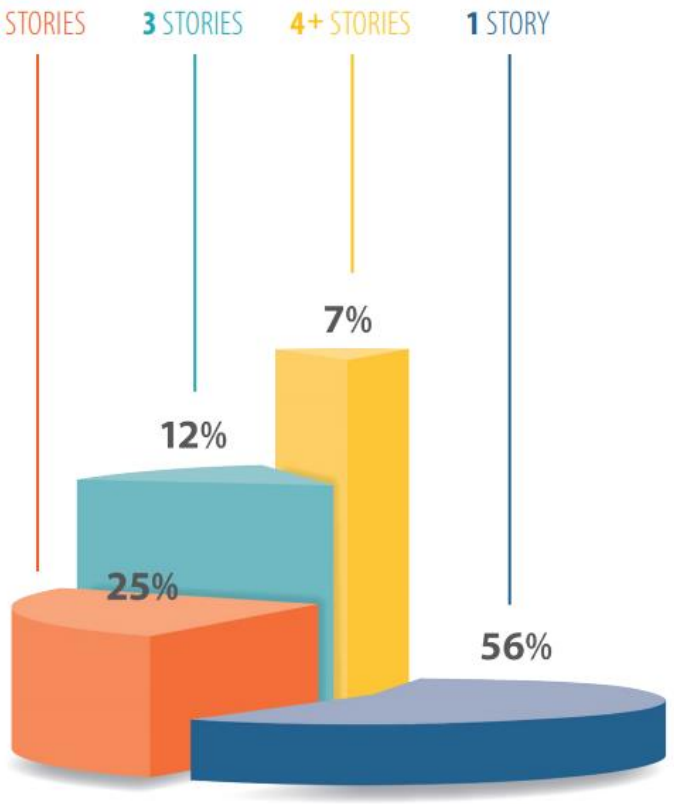
URM Buildings by Use

Commercial	1415
Multifamily	248
Schools and community centers	54
Other	14

URM Buildings in Portland

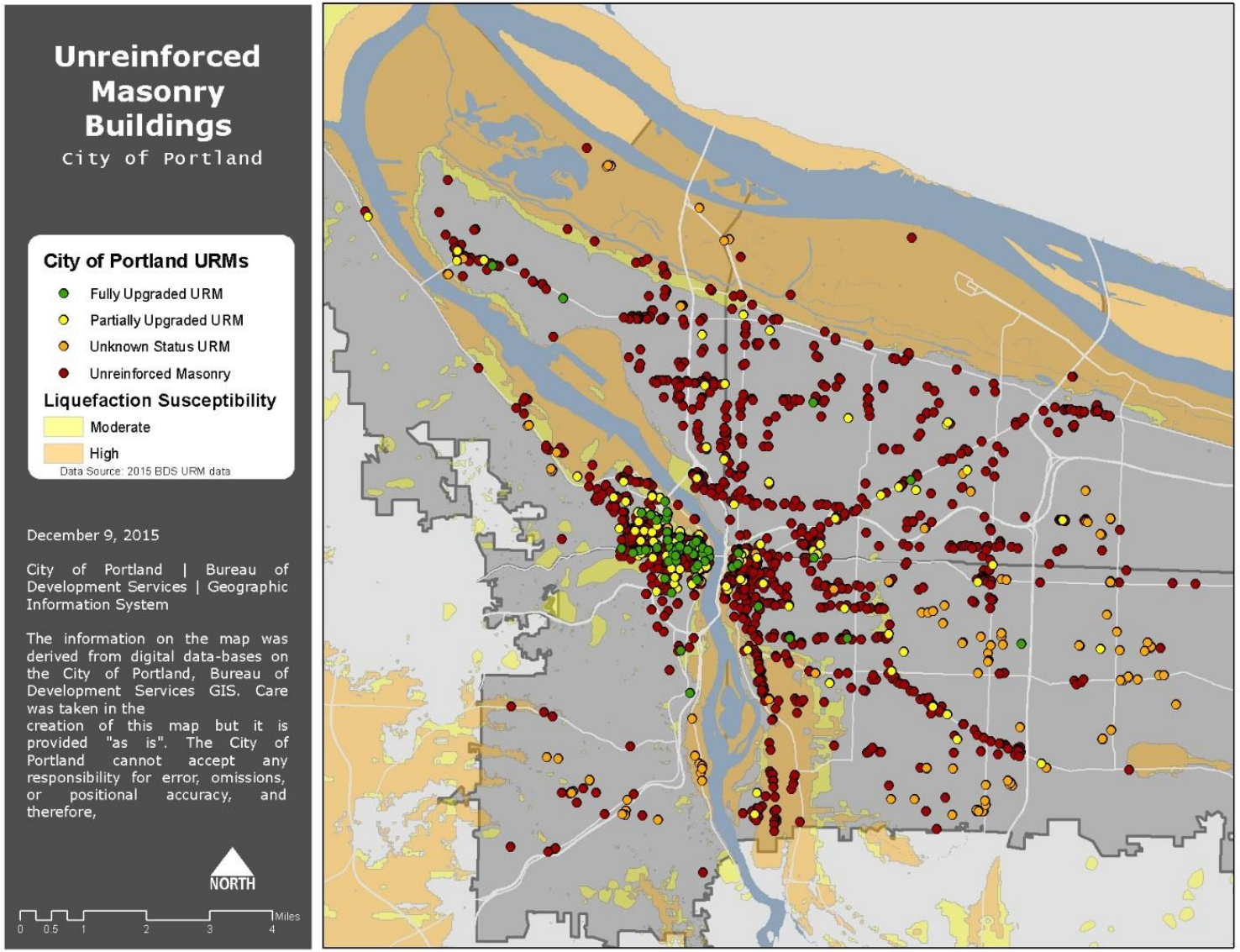
- Average age 89 years
- About 567 historic buildings
- More than half single-story

URM Buildings by Height

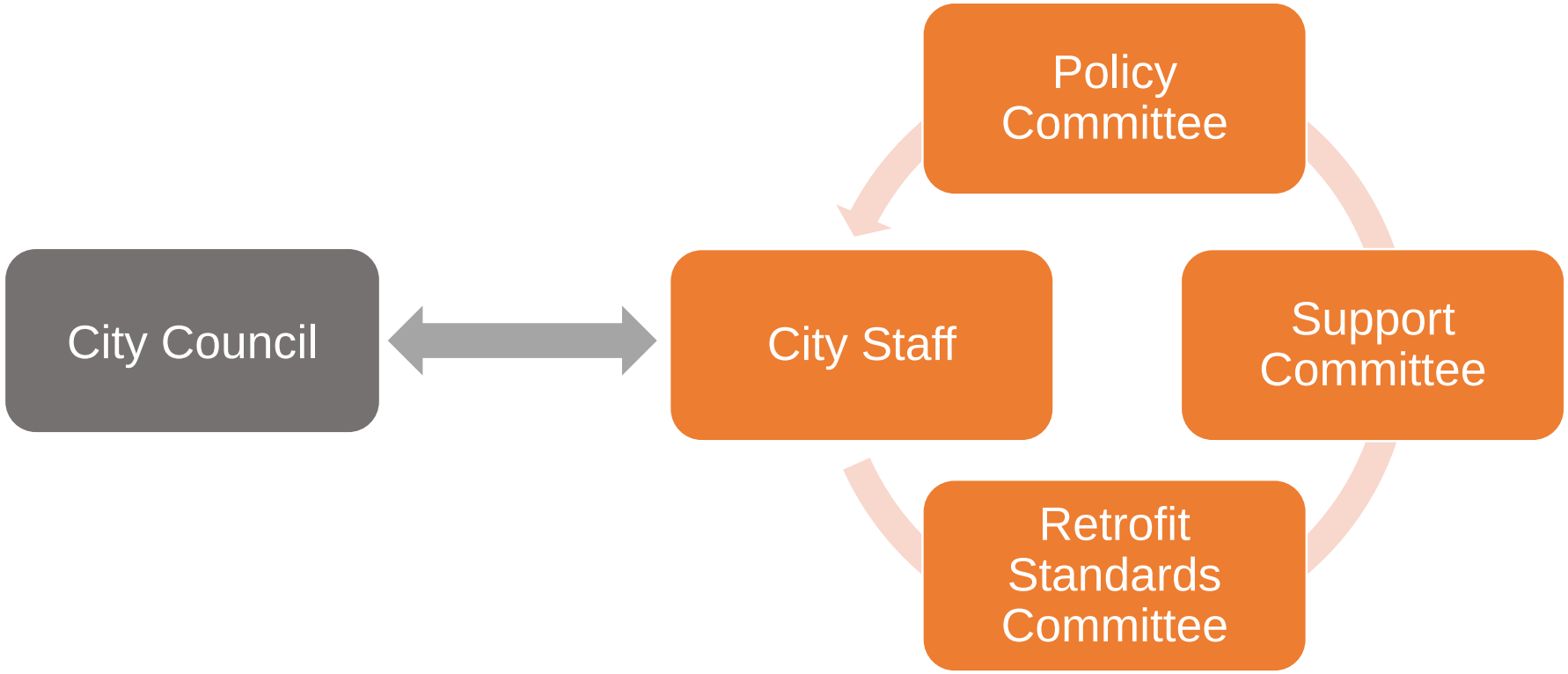


URM Building Locations

Inventory



Council Charge



Policy Development Process

Policy Committee

- Broad range of stakeholders worked on consensus basis.
- Subcommittees on affordable housing, non-profits, and historic buildings.
- Outreach to tenants and building owners: open house events, mailings, policy committee meetings.

Public Outreach

Policy Committee

- 40+ different items in local media
- 20+ community presentations, including:
  - Development Review Advisory Committee
  - Historic Landmarks Commission
  - Building Owners and Managers Association
  - Portland Business Alliance
  - Portland Downtown Neighborhood Association
  - Central Eastside Industrial Council Land Use Committee
  - SE Uplift Land Use Committee
  - Northeast Coalition of Neighbors
  - Pearl District Neighborhood Association
  - Portland Public Schools Board
  - American Institute of Architects
  - League of Women Voters

URM Retrofit Standards Committee (Jan – April 2015)

Standards Committee

David Bugni, P.E., S.E.
David Bugni and Associates

Brian Emerick, A.I.A.
Emerick Architects P.C. and Historic Landmarks Commission

Mike Hagerty, P.E., S.E.
Structural Engineer

Ian Madin, M.S., R.G.
Oregon Department of Geology and Mineral Industries

Mark Tobin, P.E., S.E.
KPFF Consulting Engineers

Reid Zimmerman, P.E.
KPFF Consulting Engineers and Structural Engineers Association of Oregon

URM Retrofit Support Committee (June – Nov 2015)

Support Committee

Jessica Engeman
Venerable Properties

John Tess
Heritage Consulting

Avi Ben-Zaken
Urban Development Partners

Kristen Conner
Capital Pacific Bank Finance
(now with Heritage Bank)

Colin Rowan
Malden Capital Finance

Walter McMonies
Masonry Building Owners of Oregon

Steve Rose
Bristol Equities

Tom Sjostrom
Building Owners and Managers Association

Mike Hagerty, P.E., S.E.
Structural Engineer

URM Retrofit Policy Committee (Jan 2016 - Nov 2017)

Policy Committee

Margaret Mahoney, Chair
Affordable Housing Consultant

Dennis Andersen*
St. James Lutheran Church

Hermann Colas
Colas Construction

Tom Carrollo
Beardsley Building Development

Jim Edwards
Portland First Christian Church

Matthew Eleazer
International Union of Bricklayers and Allied Crafts

Brian Emerick
Emerick Architects P.C. and Historic Landmarks Commission

Sean Hubert
Central City Concern

Matthew Illias
Norris, Beggs & Simpson

Jonathan Malsin*
Beam Development

Walter McMonies
Masonry Building Owners of Oregon

Javier Mena
Portland Housing Bureau

Peggy Moretti
Restore Oregon

Tom Sjostrom
Building Owners and Managers Association

Jen Sohm
Portland Public Schools

Stephanie Whitlock
Bosco-Milligan Foundation/Architectural Heritage Center

Reid Zimmerman
KPFF Consulting Engineers

* Left committee before final meeting.


FIRE LINE DO NOT CROSS


835
Flowers
Julia's
Gifts

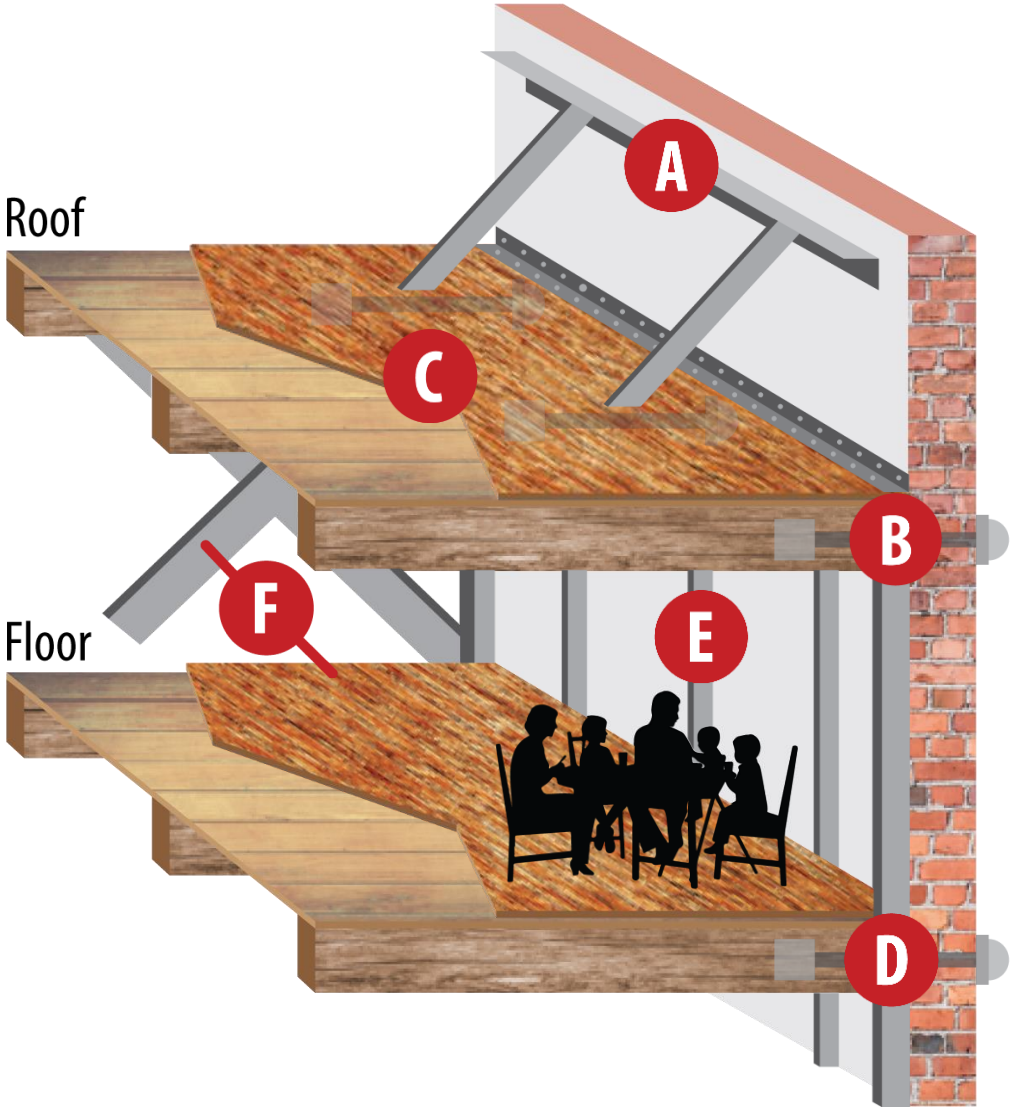
Current Code Requirements

Standards Committee

- Parapets braced and roof tied to walls when 50% + of roof replaced.
- Retrofits to life safety standard only in major renovation or change of use.
- Limited success. Since 1994:
  - 9% partially upgraded (roofs)
  - 5% fully upgraded.

Key Elements of a URM Retrofit

Proposed Standard



A Brace parapets

B Attach wall to roof

C In-place shear attachments and roof sheathing, ties and cross ties

D Attach wall to floor

E Out-of-place wall bracing

F Other upgrades as required

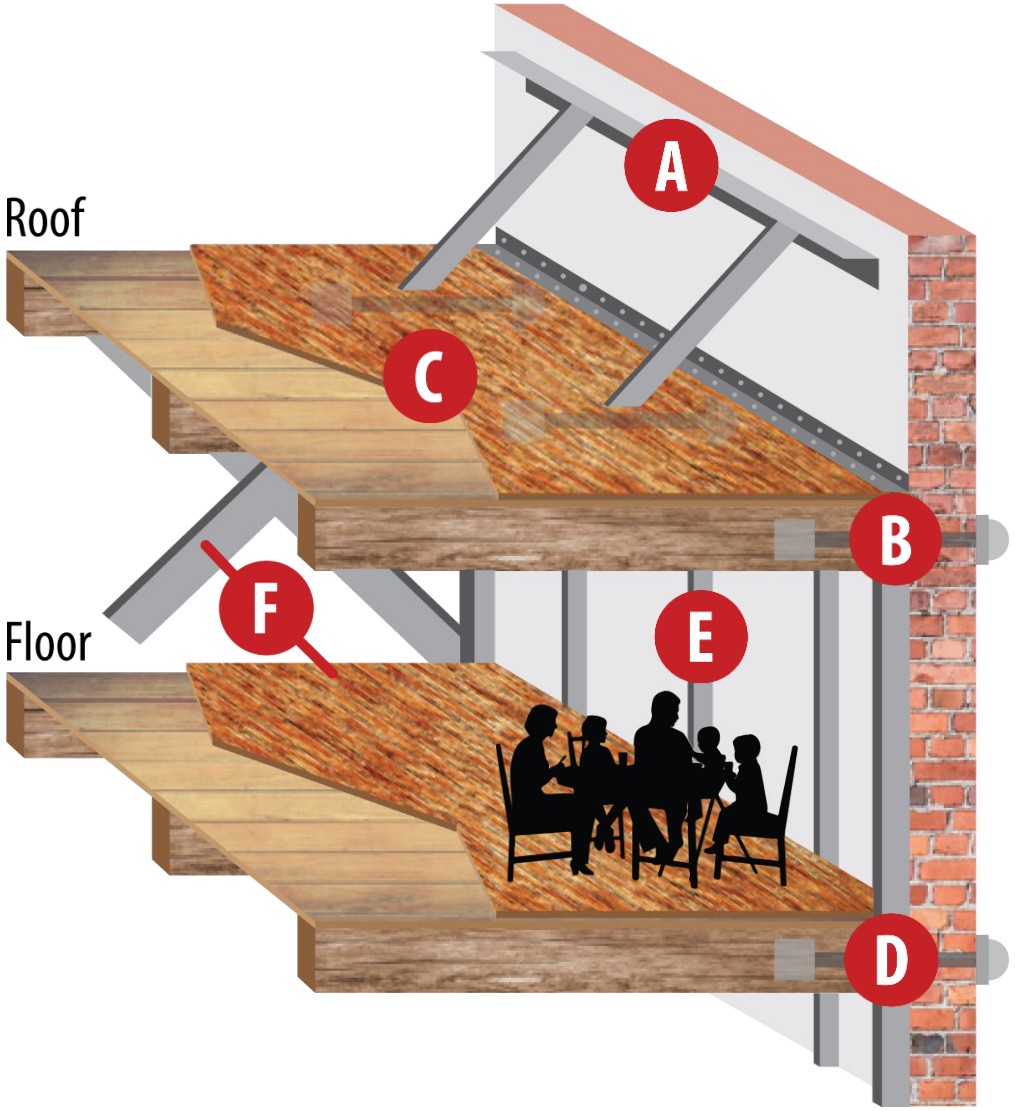
Levels of URM Retrofit

Proposed Standard

- **Immediate occupancy:** building can be immediately operational.
- **Damage control:** building is damaged and needs repairs, but can be occupied and function with minor repairs.
- **Life safety:** building is damaged but threat to life is minimal. *(Current standard a major remodel.)*
- **Collapse prevention:** building is severely damaged and will likely be demolished but does not collapse.

Key Elements of a URM Retrofit

Proposed Standard



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Levels of URM Retrofit

Proposed Standard

- **Collapse risk reduction:** prescriptive modifications mean the building is less likely to collapse. Modifications are not tailored to the building; it may still collapse.
- **Parapet bracing**: Prescriptive modifications mean that architectural elements are less likely to break off. Reduces risks to bystanders. Buildings 2+ stories still likely to collapse. *(Current standard at re-roofing.)*

Mandatory retrofits based on risk

Proposed Standard

Four-tier system based on:

- the function of the building both before and after an earthquake,
- the occupancy type and occupant load,
- the degree of risk posed by the building to the public.

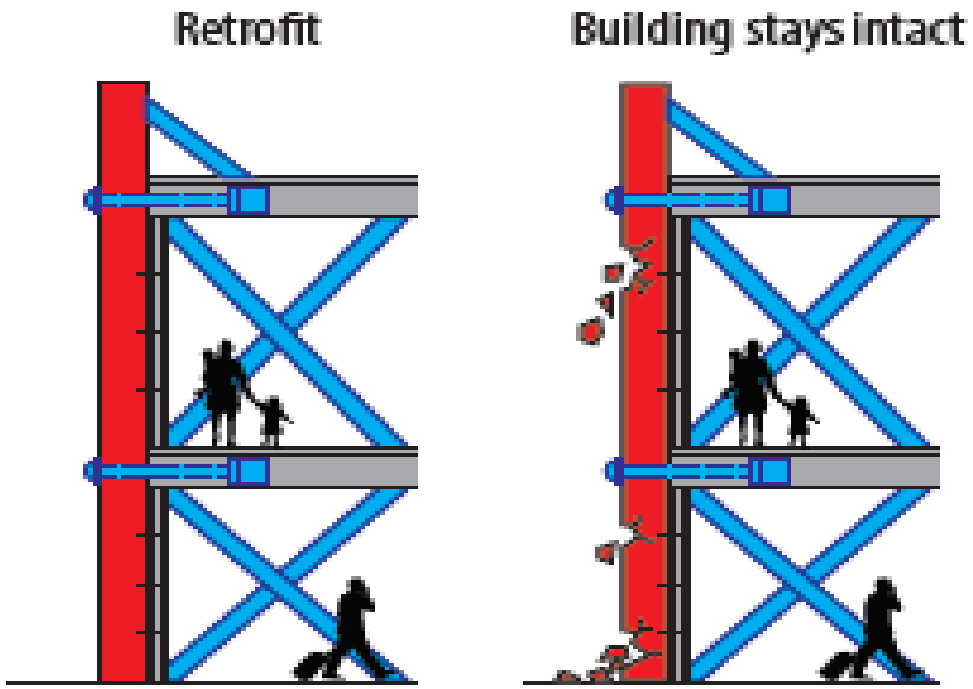
URM Building Classification

Proposed Standard

Building Classification	Approx. # of Buildings
Class 1: Critical Buildings and essential facilities	10
Class 2: Schools, community centers and other high occupancy structures	85 45 schools, 35 churches, 5 other
Class 3: All URM buildings not categorized as URM Class 1,2 or 4	1,360 Plus 35 churches and other buildings owned by non-profits (but not schools) may choose this standard.
Class 4: 1 and 2-story buildings with 0-10 occupants.	251

Class 1 and Class 2 buildings will last

Proposed Standard



- **Class 1** URMs achieve **immediate occupancy**
- **Class 2** URMs achieve **damage control**; can be repaired post-earthquake.
- All retrofit steps (A-F) completed if required to attain standard.

Class 1 and Class 2 buildings will last

Proposed Standard

Time Line for Class 1 and Class 2:

- **10 Years** for parapet bracing, wall to roof attachment (all)
- **10 Years** complete upgrade of Class 1
- **20 Years** for complete upgrade of Class 2

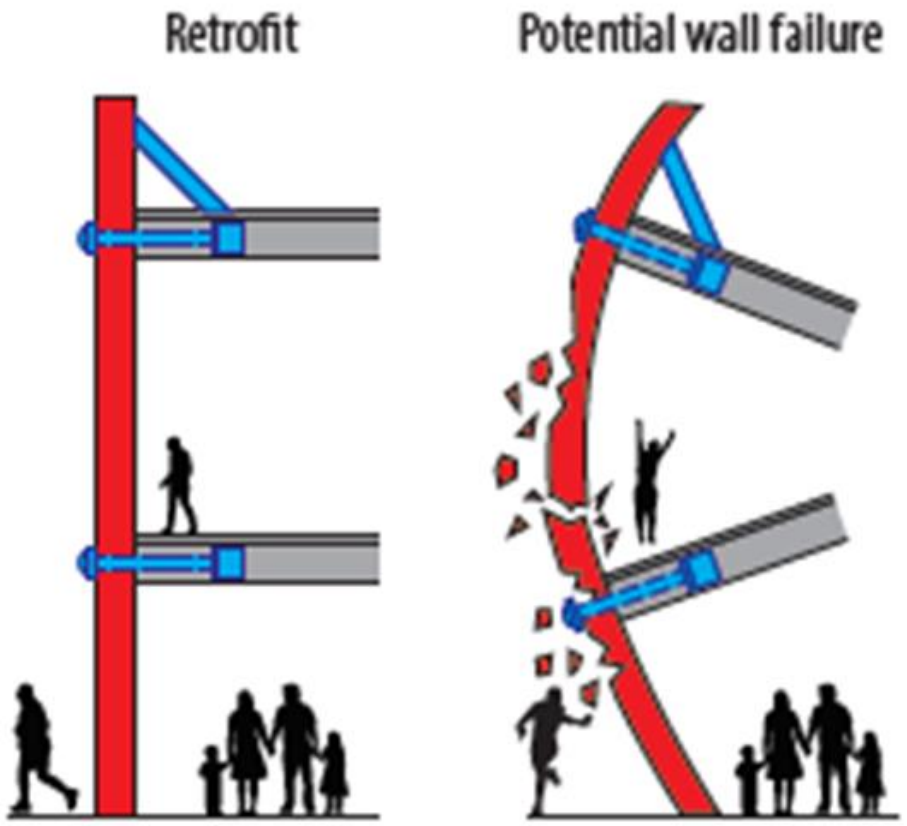
Collapse Risk Reduction for Most Buildings

Proposed Standard

- Most buildings (85%) are Class 3.
- Collapse risk reduction standard prescribes steps **A – D** only.
- Reduces risk.
- Much lower expected costs

Collapse Risk Reduction for Most Buildings

Proposed Standard



- Unbraced walls could still collapse.

Collapse Risk Reduction for Most Buildings

Proposed Standard

Time Line for Class 3:

- **10 Years** for parapet bracing, wall to roof attachment, roof sheathing
- **15 Years** for wall to floor attachment

Over 50% of URM buildings are just one story. Requirement for wall to floor attachment will not apply.

Phase 3 – Cost Summary

Cost Estimates

	COST RANGE PER SQUARE FOOT		
COST COMPONENT	Min	Max	Median
Existing Ownership Expense			
Re-roofing	$ 31	$ 36	$ 34
Existing Code Requirement			
Parapet Bracing	$ 1	$ 7	$ 2
Roof-to-wall attachment	$ 1	$ 8	$ 2
New Code Requirement			
Sheathing	$ 8	$ 9	$ 9
Floor-to-wall attachment*	$ 3	$ 5	$ 2
Total Estimated Cost Per SF	$ 43	$ 65	$ 48

Phase 3 – Notes

Cost Estimates

- Phase 3 cost estimates do not include:
  - Tenant Relocation Costs
  - Financing costs
  - Architect or Engineering Fees
- The hard costs to comply new elements of the proposed code range from:
  - $8-9 per square foot for single story buildings
  - $11-14 per square foot for multistory buildings

Minimal retrofits for small buildings

Proposed Standard

- URM buildings with less than ten occupants brace parapets and tie roof (current code).
- Ten years to complete.
- Will not prevent collapse of multi-story buildings.
- Reduces risk to bystanders.

Fairness in implementation

Proposed Standard

- Notice and opportunity to appeal URM building status.
- Timeline extension for class 3 and 4 with newer roof.

Strengthen existing triggers

Proposed Standard

Triggers in existing seismic regulations (Title 24.85):

- **Roof replacement** – removal of greater than 50% of total roof area within a ~~5~~ 15 year period requires wall anchorage for both in plane and out of plane forces and parapet bracing.
- **Costs of alterations or repair** - When costs associated with building alterations or repair in a ~~two~~ five year time period or fifteen year time period exceeds, entire building shall be improved to resist seismic forces to meet ASCE 31 41 criteria.

Independent Cost-Benefit Study

Support Committee

- Used simple costs and benefits: construction costs and fees versus property damage, injuries, and deaths.
- Used higher retrofit standard than now proposed.

Cost-benefit ratios 1:1.4 to 1:1.9.

Avoided death and injury are greatest benefit (55%).

URM Retrofit Assistance Tools

Support Tools

Technical Assistance

- Navigator positions at BDS and Prosper Portland

Legislative Policy

- Add State historic and seismic tax credits to City's legislative agenda

URM Retrofit Assistance Tools

Support Tools

- **Financial Assistance**
  - Create a suite of financial assistance tools to support the varied and complex needs of property owners
  - Design tools to incent early action
  - Invest public dollars where they leverage:
    - The most life/safety benefit
    - For the greatest number of buildings
    - At the least cost to the public

Progress on Financial Assistance Tools

Support Tools

- **In Place**
  - Federal historic tax credit
  - Permit fee waiver or reduction
  - PropertyFit (CPACE) Financing Program
  - URA funds in some areas
  - Private financing to the degree property and owner qualify

Progress on Financial Assistance Tools (cont.)

Support Tools

In Development

- Establish property tax exemption program authorized under SB-311

Progress on Financial Assistance Tools (cont.)

Idea for Consideration

- Establish a City and Privately capitalized revolving fund
- Provide multiple financial products
- Tools could include:
  - Term loans
  - Interest rate buy-downs
  - Matching grants for building assessments
  - Deferred payment, shared appreciation loans

Public Notification Recommendation #1

Proposed Policy

- Information will drive the market to greater retrofits.

Notify renters in the lease agreement if a URM is not retrofitted to Collapse Prevention.

Public Notification Recommendation #2

Proposed Policy

- Buildings retrofitted to a standard less than collapse prevention still pose a life-safety risk to the public.

Placard non-residential URM buildings not retrofitted to Collapse Prevention.


Earthquake Warning
This is an unreinforced masonry building.
You may not be safe inside or near unreinforced masonry buildings during an earthquake.

Resolution for Council

Next Steps

Return to Council within a year with:

- Building code to implement mandatory seismic retrofit program similar to Policy Committee's final report.
- Program to implement property tax exemption for URM building retrofits.
- Proposal for seismic retrofit revolving loan fund.
- Budget asks for staff to assist URM owners and for City to assess its URM buildings.
- Legislative agenda to support implementation.

Resolution for Council

Next Steps

- Ordinance for placarding of non-residential URM buildings not retrofitted to prevent collapse.
- Ordinance requiring URM building owners to disclose URM status to renters, for buildings not retrofitted to prevent collapse.