URM Retrofits

IMPROVING SAFETY FOR COMMUNITY AND BUSINESS RESILIENCE IN THE UNIVERSITY DISTRICT

City of Seattle
Department of Construction and Inspections
URM Retrofits

Improving Safety for Community & Business Resilience in the University District

Presenters:

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City of Seattle
Department of Construction and Inspections

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Structural Engineer

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URM's

WHAT ARE THEY? RISKS? HOW TO PREPARE?

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What is a URM?
What is a URM?

- “Red brick” buildings from early to mid 1900’s
- Brick structure carries the loads
- No steel grid in wall
- Generally minimal ties between walls and floors or roof

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URM Impacts

Christchurch 2011

Dangers of URMs
- Falling bricks
- Collapsing walls
- Injuries and loss of life
- No building access
- No access for whole blocks
- Traffic re-routes
- Disrupted services
- Disrupted businesses
Retrofits

WHAT IS INVOLVED? WHAT ARE THE IMPACTS? WHAT ARE THE BENEFITS?
Earthquake (Mis)Behavior

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Earthquake (Mis)Behavior
Retrofits – Bolt Wall to Floor/Roof
Retrofits - Add Braces/Walls

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URM Retrofit

Improve safety and resilience through URM retrofit preparedness.

WHAT CAN YOU DO?

- **OWNERS:** Retrofit your buildings
- **TENANTS:** Talk to your landlords, backup documents online, off-site storage, personal preparations
Retrofit - Owner Benefits

URM building retrofit provide benefits to building owners.

- Improve potential for business continuance
- Protect investor value/revenue
- Improve marketability at sale
- May lower earthquake insurance/hedge against rising insurance costs
- Hedge against future retrofit, repair and/or rebuilding costs (construction costs only go up…)
- Goodwill and community stewardship
- Maintain good tenant relations
Retrofit - Community Benefits

URM retrofits key part of resilient communities and improving safety:

- Less damage in Nisqually EQ
- Saved lives, did not always save buildings in Northridge EQ
- Preserved some buildings in multiple Darfield/Canterbury (Christchurch) EQ’s
- Helps maintain the aesthetic character of a neighborhood
- Ensure favorite shops, restaurants and other services remain in operation
- Businesses remaining in operation saves local jobs
Impacts of Retrofit

Owners:
- Costs of construction
- Coordinating logistics with tenants

Tenants:
- May be disruptive
- Could require short-term relocation
- Actual or perceived inconvenience for employees or customers

General Public:
- Actual or perceived inconvenience for employees or customers
- Neighborhood lives through construction phase

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U District

The Ave. Small Businesses. The UW.
U District Character

Most URMs are commercial or residential use; some are churches and buildings at the University of Washington.

Note: Not all these buildings are URM. They represent the character of the U District.
2016 Confirmed URM List

<table>
<thead>
<tr>
<th>Preliminary Risk Category</th>
<th>Neighborhood</th>
<th>Address</th>
<th>Year Built</th>
<th>Stories</th>
<th>Retrofit Level</th>
<th>Occupancy Type</th>
<th>Occupant Load</th>
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</table>

- 1150 identified URM buildings in the survey; average of 2 stories
- Majority of commercial uses in 1-story buildings; majority of residential uses in 4-story buildings
- Procedure for working with SDCI engineers to correct any inconsistencies in URM building designations

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U District URMs

3 most common URM building types in this neighborhood:

1. One and Two Story Commercial Buildings with Wood-Framed Roof (21)
2. Three and Four Story Residential Buildings with Wood-Framed Floors & Roof (15)
3. University of Washington Buildings (13)
City Strategies
URM POLICIES. RESOURCES.
Why Retrofit URMs?

- **Public Safety:** Brick Buildings with URM bearing walls building type most likely to collapse in an earthquake
- **Lessen Damage:** Retrofits help lessen earthquake damage, businesses reopen faster following a smaller earthquake
- **Resilience:** Retrofitting URMs long-standing city interest; part of city’s emergency and resilience planning
What have we learned from the past?

**Lesson:** The city responded to life safety issues by requiring regulations that had unintended consequences.

- In the 1970’s the city imposed retrofit standards that were revoked a few years later due to the cost of retrofits.

**Response:** This current policy development trying to address life safety and be reasonable and predictable:

- Exploring financial and program incentives for owners
- Developing tools for owners to understand the program
- Providing outreach and education on the value of preserving these buildings
Seattle not alone in URM retrofit planning
- CA, OR, WA and UT
- San Diego, San Francisco, Berkeley, Los Angeles, San Luis Obispo, Long Beach, Portland

Preliminary Determination of Epicenters
358,214 Events, 1963 - 1998
Current City Policy

Seismic upgrades triggered when doing work requiring permit:

- Parapets required to be braced with any permit
- Seismic report & retrofit required when doing major renovation ("substantial repair/alteration")
  - Substantial increase in occupant load in URM
  - Extending useful/economic life of building
  - Major damage from event
Post-Earthquake Policy

Code requirements for earthquake damage:

- SDCI evaluates building and determines if safe to re-occupy
- Seismic report required for repairs

Outcome: A damaged URM will be an emergency situation for an owner who will make a choice of repair, or demolition
Proactive Policy

Concept: URM policy development
- Reduce risk of damage with modern, proven, engineering solutions
- Lessen post earthquake repair
- Proactive retrofit less costly than repair to damaged building
- Reduce number of vacant or demolished buildings
- Help owners perform the retrofit.

Outcome: Life safety and community benefits realized prior to emergency increasing likelihood of saving lives and supporting economic recovery

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Policy Development

- Proposed Technical Seismic Retrofit Standard created
- URM Retrofit Policy Committee
- Outreach to Community Groups and benefit-cost analysis
- SDCI validated inventory removed non-URM buildings added additional buildings
- Policy Group to reconvene
- 2017 EARLIEST legislation to council (no firm date)
Seattle URM Policy

KEY POINTS

- **Current:**
  - Brace parapet, major renovation triggers seismic assessment and retrofit to existing building standards

- **Future:** (no sooner than 2017)
  - Require retrofit all URM s over 7-13 years, depending on use, size and location of building
“Bolts Plus” proposed standard minimum repairs for URM to improve performance in an earthquake

- Based on what’s been seen to fail in past events
- Might help building survive, not intended to preserve the building
- Intended to improve building performance, save lives and reduce injuries

Higher levels of retrofit recommended and encouraged.
U District URM\’s

1. **1-2 Story Commercial**
   Bolts Plus applies to about 75%

2. **3-4 Story Residential**
   Bolts Plus applies to about 75%

3. **UW Buildings**
   Typically a higher level of retrofit required, higher use intensity, greater need to continue operations, more complex structures

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Preliminary Risk Categories / Timelines

- **Critical-risk (C):** schools and critical facilities (hospitals, fire stations, etc.) – **7 years** to comply with a retrofit program
- **High-risk (H):** buildings greater than 3 stories on poor soil or URM with more than 100 occupants in assembly – **10 years** to comply with a retrofit program
- **Medium risk (M):** all other URM buildings – **13 years** to comply with a retrofit program

### Chart

- **Critical-risk (C):** 10
- **High-risk (H):** 7
- **Medium risk (M):** 57

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### Process for Compliance

**Milestones:**

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Critical Risk</th>
<th>High Risk</th>
<th>Medium Risk</th>
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<tbody>
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<td>Assessment</td>
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<td>Permit Application</td>
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<td>Permit Approval</td>
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<tr>
<td>Completion of Retrofit</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>7</strong></td>
<td><strong>10</strong></td>
<td><strong>13</strong></td>
</tr>
</tbody>
</table>

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Future Steps - URM Retrofits

Don’t have to wait for policy, can start now!

If you don’t have major renovation plans:

1. Perform assessment with structural engineer
2. Talk with contractor
3. Get cost estimate from contractor
4. Review incentives and financing options
5. Schedule construction and communicate with tenants
6. Make plans for tenant impacts during construction
7. Complete building retrofit

Considering major renovation? These steps can be part of that planning.

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Transfer of Development Potential

- Some URMs sending sites for TDPs
- Must be URM and on City historic resource inventory
- For more information: seattle.gov/dpd/udistrict

Dennis Meier
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dennis.meier@seattle.gov
Transfer of Development Potential

Unused development potential transferred to receiving site

Existing building retained

"Sending" site

Floor area added above current zoning limits through TDP from sending site

New development gains additional floor area

"Receiving" site

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Information on URM Policy Development

Seattle Department of Construction and Inspections URM web page
http://www.seattle.gov/dpd/urm

SDCI Contact:
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nancy.devine@seattle.gov
Questions?
Thank You for Your Help
Keep Seattle Communities Resilient and Safe