



# *EARTHQUAKES AT ALTITUDE*

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# Outline

- Introduction
- Utah Earthquake Risk
- *Wasatch Front Unreinforced Masonry (URM) Risk Reduction Strategy*
- Connection to Insurance



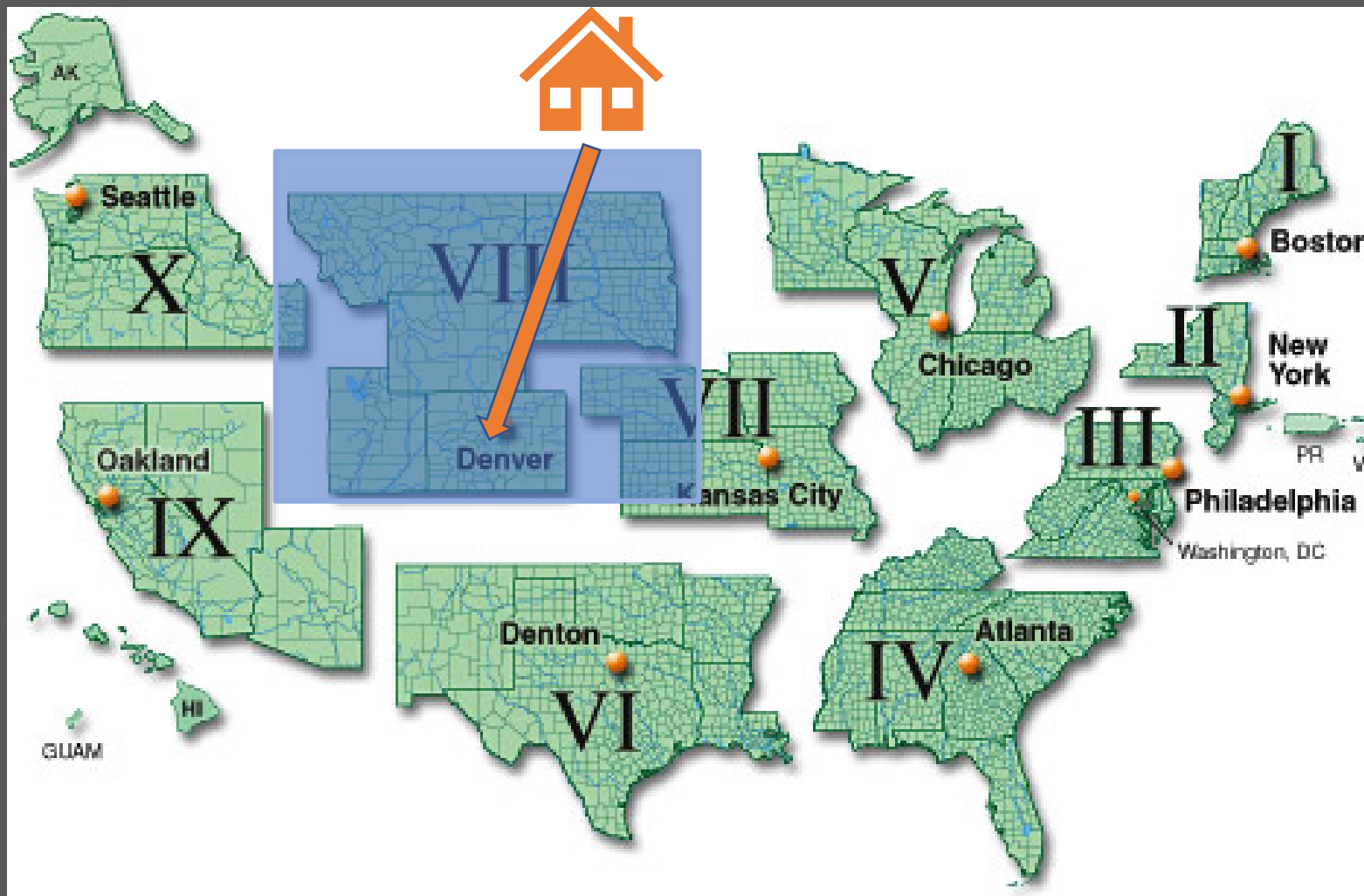
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# FEMA Region 8

## *America's Crumple Zone™*



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# No Geology Degree Required!



**Wasatch  
Fault**



Wasatch Fault Magnitude 6.75+ Next 50 Years

**~1 in 5 chance**

# Disaster Movie-level Losses

THURSDAY, MARCH 1, 2001

## Seattle Post-Intelligencer

A HEARST NEWSPAPER | WWW.SEATTLEPI.COM

KING, SNOHOMISH, PIERCE CO. & BAINBRIDGE  
ISLAND, KITSAP, THURSTON CO. 50¢ | ELSEWHERE 75¢

25¢

# 6.8 SHOCKER

► Strongest quake in half a century  
rumbles through the Northwest

► One dead, more than 200 hurt;  
damage could reach into billions



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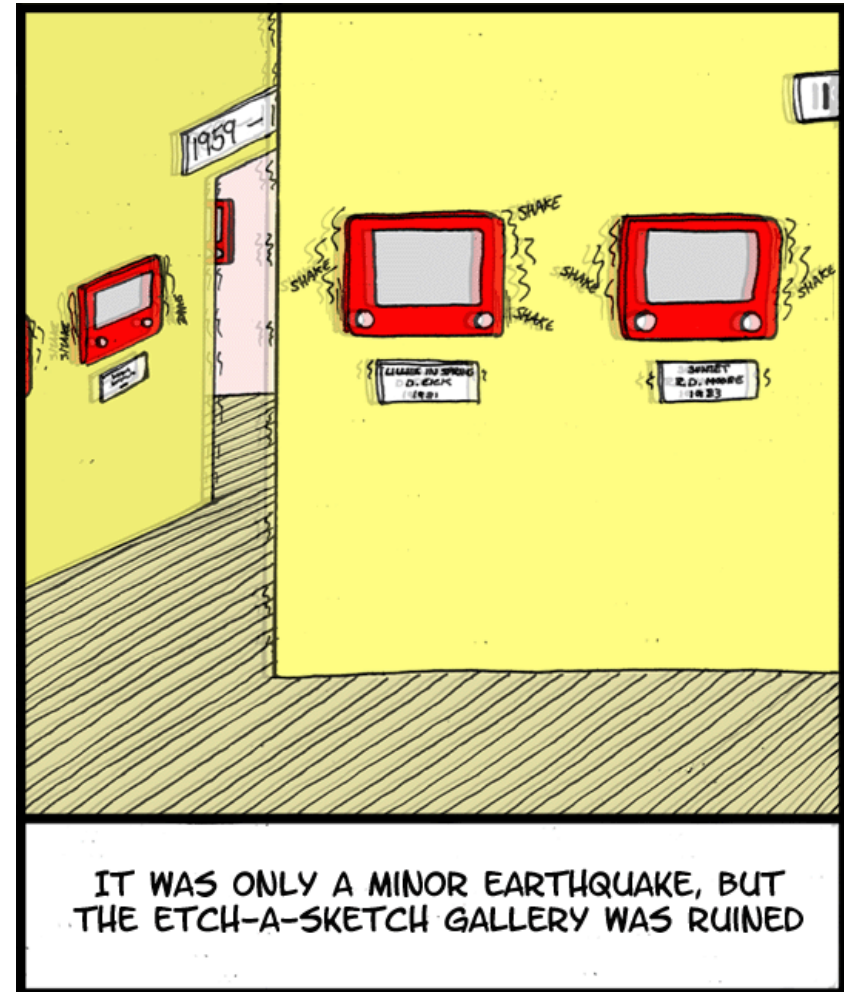




# Unreinforced Masonry

Unreinforced Masonry (URM) Buildings don't have any steel holding the brittle bricks together.

URMs experience **life-threatening damage** at **low levels of shaking**.



# URM Impacts on the Public

URM walls can often collapse outwards

Falling bricks are common killers during earthquakes

Endanger pedestrians and undamaged adjacent buildings

→ Makes a private risk a public one





# Utah's Killer Buildings



High concentration of URMs

- 30,000+ in Salt Lake City
- 147,000 in 12 county Wasatch Front

**~440k people at risk!**

# Economics

URMs persist because they are economically viable. Victorian, Tudor, Georgian, and brownstone style buildings are sought after as homes and workplaces.





# Solutions

Many of the deaths we expect during a Wasatch earthquake are preventable through a combination of solutions, some of which have been tested in other cities.



**POLICY**



**ECONOMIC**



**ENGINEERING**





# Recent Progress



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Building Resilient Infrastructure and Communities (BRIC): \$1 Billion in grants available





**THE BRICKS**

SALT LAKE CITY

**RE-ROOFING?**  
**REMODELING?**

It's the perfect opportunity to  
make seismic improvements.

FEMA grants offer 75%/25% cost sharing

- Uncle Sam provides \$0.75, you provide the last \$0.25
- Huge opportunity for innovative leadership
  - Private contributions
  - Capital funds
  - Philanthropic donations
  - In-kind contributions

# National Mitigation Investment Strategy

## Goal 1

### Show How Mitigation Investments Reduce Risk:

Objective: Prove mitigation investment protects what we value.

## Goal 2

### Coordinate Mitigation Investments to Reduce Risk:

Objective: Share risk info to support investment and incentive decisions; streamline funding access.

## Goal 3

### Make Mitigation Investment Standard Practice:

Objective: Facilitate mitigation activities (enhancing building codes) and access to risk transfer vehicles (like insurance!)



# Wasatch Front Unreinforced Masonry Risk Reduction Strategy



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# URM Strategy: 110 pages, 1 slide

- 20 authors & 27 reviewers: representing 22 agencies, companies, and nonprofits - 600+ reviewer comments
- Funding ideas – linking Federal/State grants
- Creative solutions: tax breaks, Historic Preservation credits, insurance premium reduction
- Engineering analysis of retrofit levels
- Examples of effective model ordinances
- Roadmap for public engagement and soliciting buy-in
- Pros/Cons of Voluntary and Mandatory programs
- Overcoming obstacles

...all of which leverages local expertise and input.



## Wasatch Front Unreinforced Masonry Risk Reduction Strategy

MARCH 2021

Released: March 18th



A photograph of the Utah State Capitol building, featuring a large dome and classical columns, with the Utah state flag flying in front. The image is partially obscured by a white curved line that separates it from the text on the right.

# URM Strategy: Goal 1

Establish a statewide URM risk reduction program

- Emphasis: leverage multiple existing Federal and State funding sources
- Identify new funding streams and program linkages - case studies from around the U.S.

# URM Strategy: Goal 2

## Protect schools

- Set aggressive dates to repurpose, retrofit, or demolish URM schools
- Technical support to local school districts - guide through (BRIC) grant application process

## West Lake Junior High

Image source: Deseret News





# URM Strategy: Goal 3

Retrofit or relocate government facilities

- Prioritize facilities needed for post-disaster short and long-term recovery
- Not just traditional “critical facilities”, but locations like building departments and job training centers

**Utah Geological Survey**





# Connection to Insurance



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# Connection to Insurance

## Education & Outreach

- Earthquake insurance penetration is extremely low nationally
- FEMA post-disaster grants to individuals are relatively small
- Can insurers be a conduit for mitigation-related steps to reduce risk (to homeowner and insurer?)

# Connection to Insurance

## New(ish) Ideas

- Parametric policies provide immediate benefit while capping potential payout
- Third-party certifications – do we need a definitive standard for earthquake resilience?



# Connection to Insurance



"A FORTIFIED designation may qualify you for **annual wind mitigation credit** that could lower your insurance premium."



Result: **\$44,769** vs. **\$4,660**



**10 times**  
more damage to  
"Common"  
than  
"Stronger"  
building

# Connection to Insurance

## Opportunities to align benefits?

- Incentivize retrofits with reduced premiums?
- Multi-peril retrofits: earthquake strengthening can help resist wind
- Rather than react (e.g., fire mitigation crews), can we better incentivize up-front mitigation?
- Would standardized State/Fed retrofit data help actuaries justify?

# What's Your Take?

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# 5 Goals

1. Establish a statewide URM risk reduction program
2. Protect schools: retrofit, repurpose, or demolish vulnerable schools.
3. Mitigate critical government facilities to facilitate recovery
4. Tighten existing building code loopholes at the state level
5. Empower local communities to enforce their existing retrofit requirements & enhance as locally appropriate.