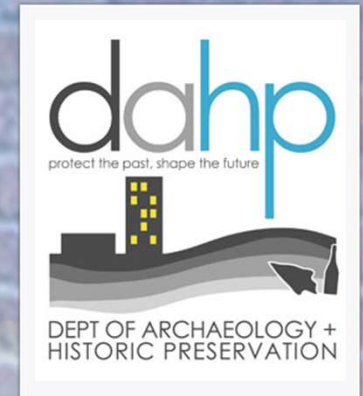
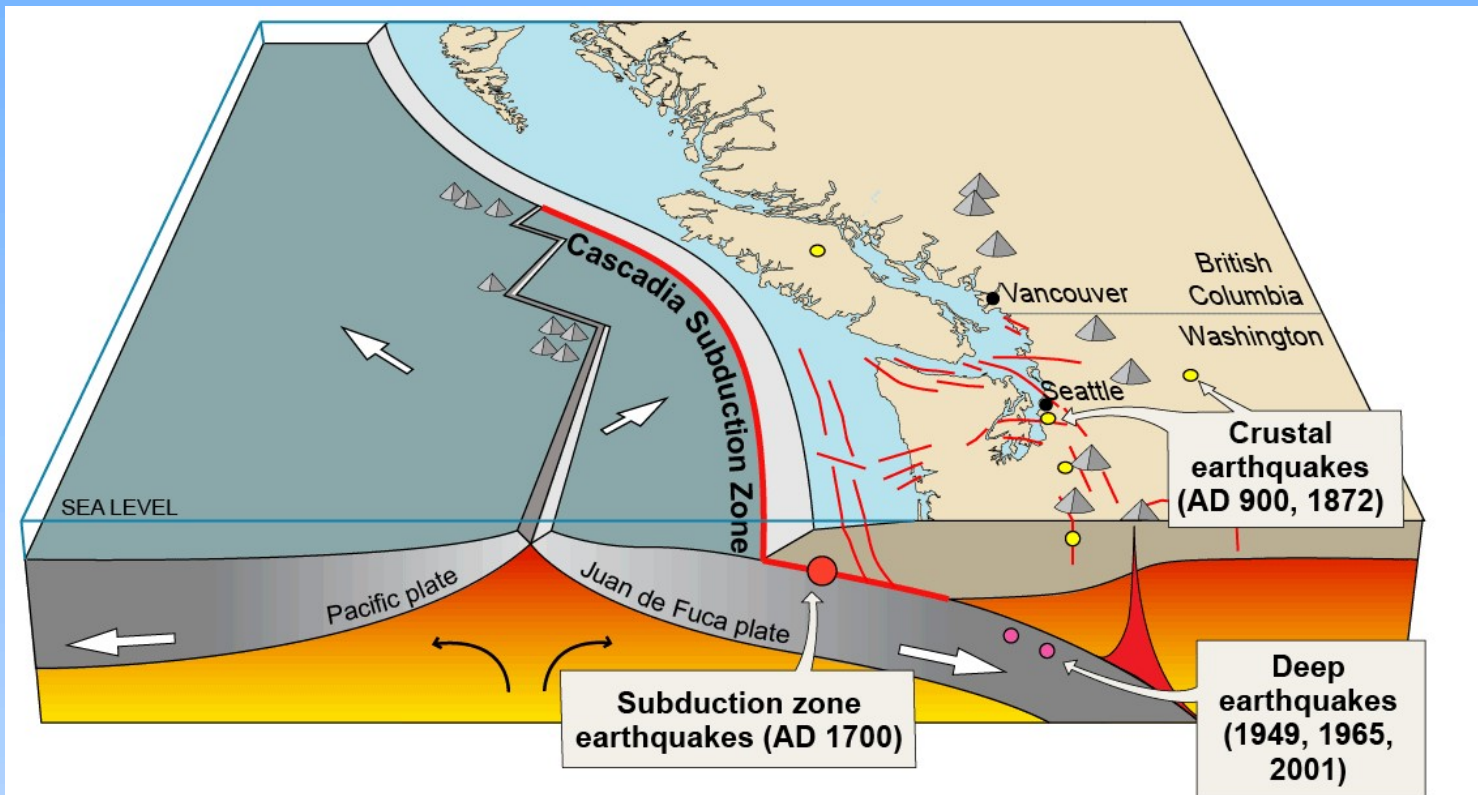


How to Inventory Unreinforced Masonry Buildings in Your Community and Guide Earthquake Risk Mitigation



Maximilian Dixon (WA Emergency Management Division)
Brian Terbush (WA Emergency Management Division)
Morgan McLemore (Department of Archaeology and Historic Preservation)

PIEPC, 2024



Source	Max. Size	Recurrence
● Subduction zone	M 9+	200–600 years
● Deep Juan de Fuca plate	M 7+	30–50 years
● Crustal faults	M 7+	Hundreds of years?

- ▲ Volcano
- Active crustal fault
- Active plate boundary fault

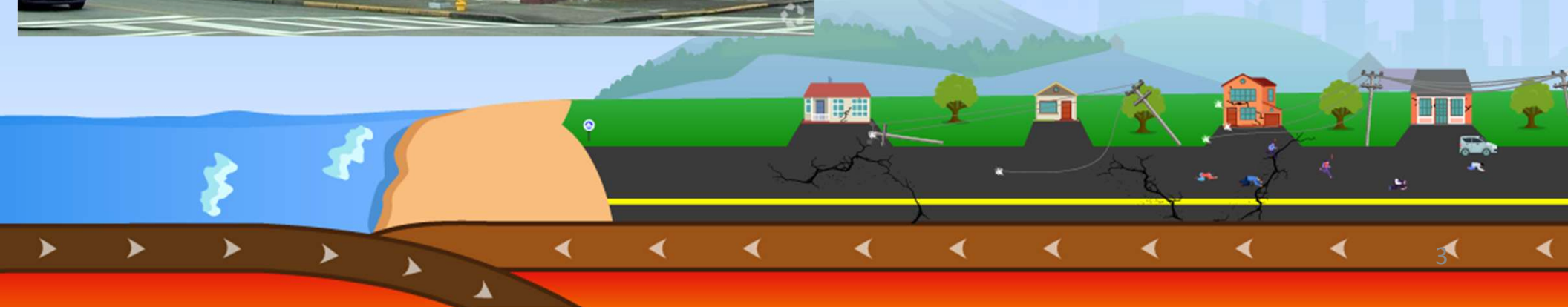
*figure modified from USGS Cascadia earthquake graphics at <http://geomaps.wr.usgs.gov/pacnw/pacnweq/index.html>

What's Been Done so Far?



At the close of the 2017-2018 legislative session, the Washington State Legislature directed DAHP to initiate an inventory of URM buildings in Washington state, excluding single-family housing.

Department of Commerce and DAHP convened a 28-member advisory committee and contracted for a seismic study of URM buildings.



Suspected Extent of the Problem



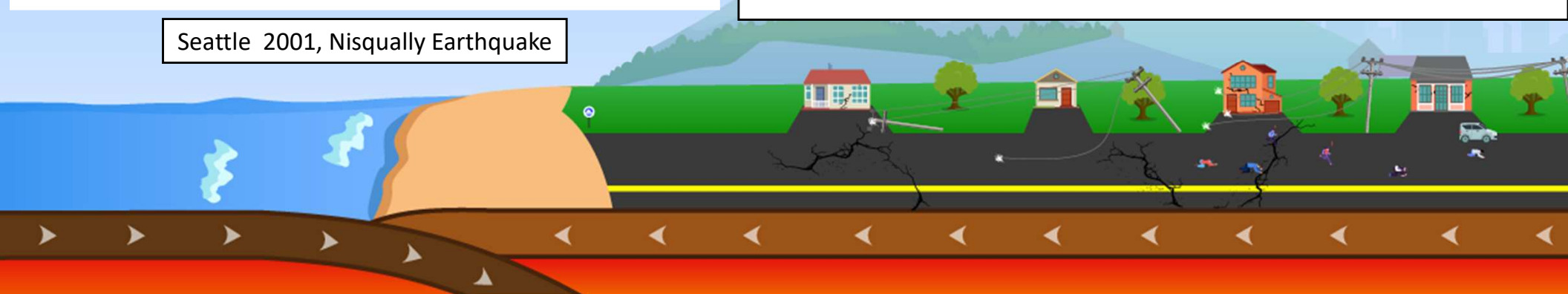
Seattle 2001, Nisqually Earthquake

Data collected in this effort yielded a database with a total of 15,200 buildings, of which:

- **3,137** were identified as “suspected URM” buildings;
- **1,176** were confirmed URM buildings; and,
- **2,241** building have an “unknown” URM building status.

Of the buildings confirmed to be URM:

- **170** are emergency facilities, including hospitals and fire stations; and
- **219** are school facilities



Last year's workshop:

You identified that many of the older, potentially URM buildings in your community were:

- Cultural/Historical
- Economic centers
- Critical Infrastructure
- Worth protecting

...But it will take some support from outside agencies to fix them.

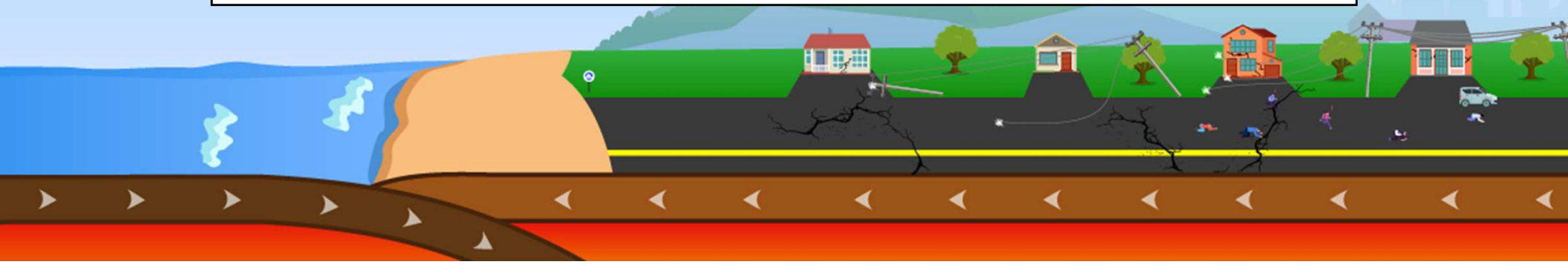


How to fill gaps: the way forward

URM Workgroup - Partnership with DAHP, Dept. Of Commerce, and other agencies

Need more site-specific details on communities

Continue the work of the Pilot Project in Everett, WA, and build on the lessons learned.

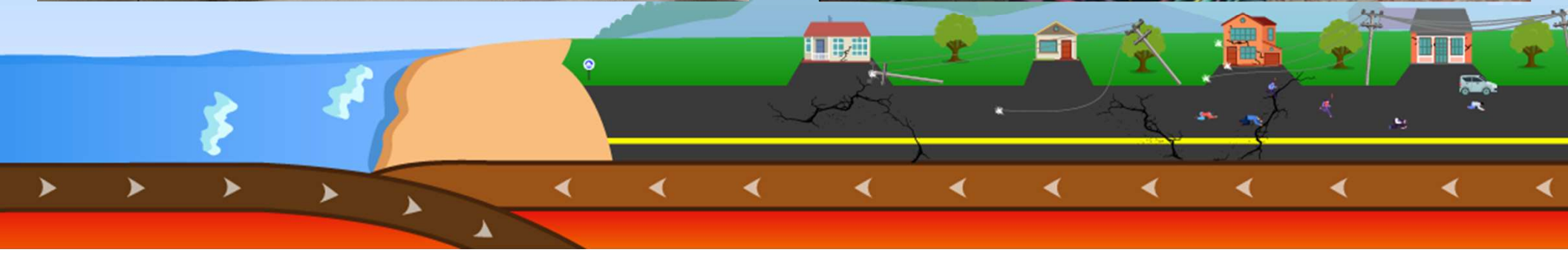


Today, at a glance:

1. **Quick Refresher:** What is a URM building, why are they dangerous, and what is the current situation in Washington State?
2. How did the Everett pilot survey go? What did we learn?
3. URM building database project, goals, URM portal proposed features and needs.
4. How your community can conduct a URM Inventory.
5. Q&A



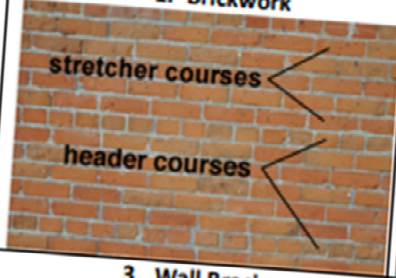
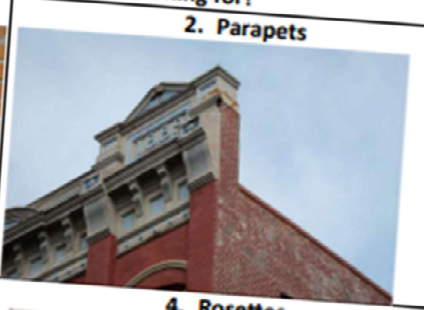
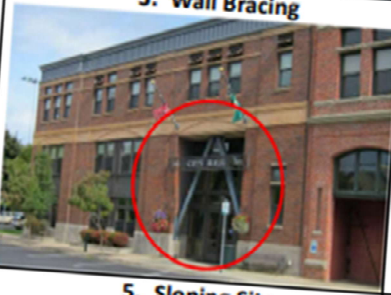
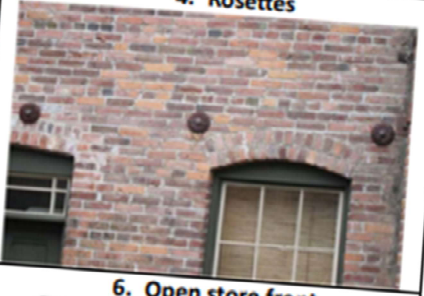
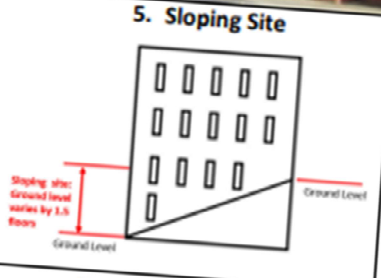
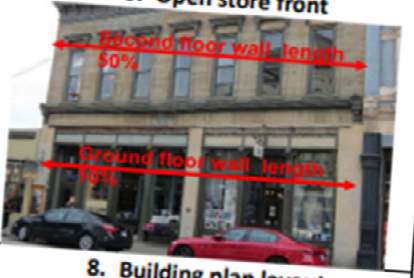
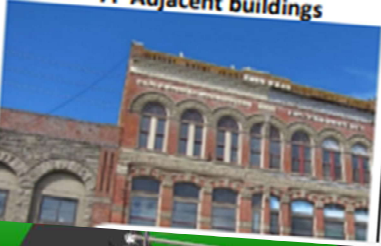

Is this a URM building??



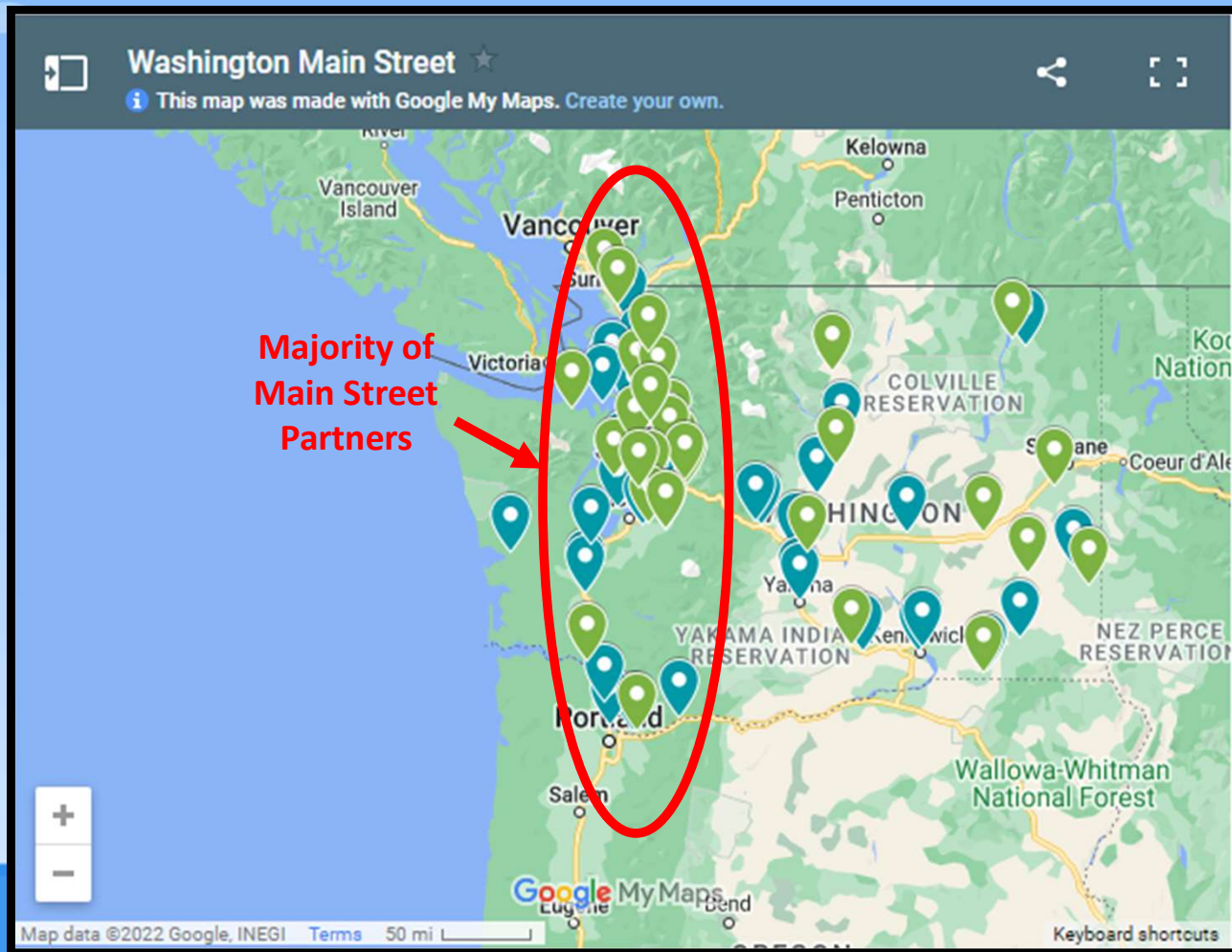
...That's exactly what we wanted a team of non-technical experts to be able to tell us by the end of the pilot project!

URM buildings - 8 Features List

What building features are we looking for?

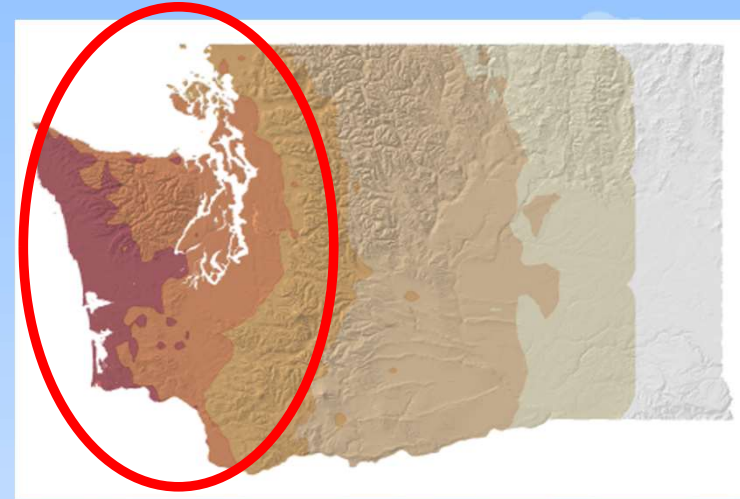
1. Brickwork 	2. Parapets 
3. Wall Bracing 	4. Rosettes 
5. Sloping Site 	6. Open store front 
7. Adjacent buildings 	8. Building plan layout Rectangular or square plan layout 

Main Street Partnership



Majority of
Main Street
Partners

Highest Seismic Hazard
Areas



Everett Pilot Project

URM Workgroup worked with the Main Streets program to identify a community that had:

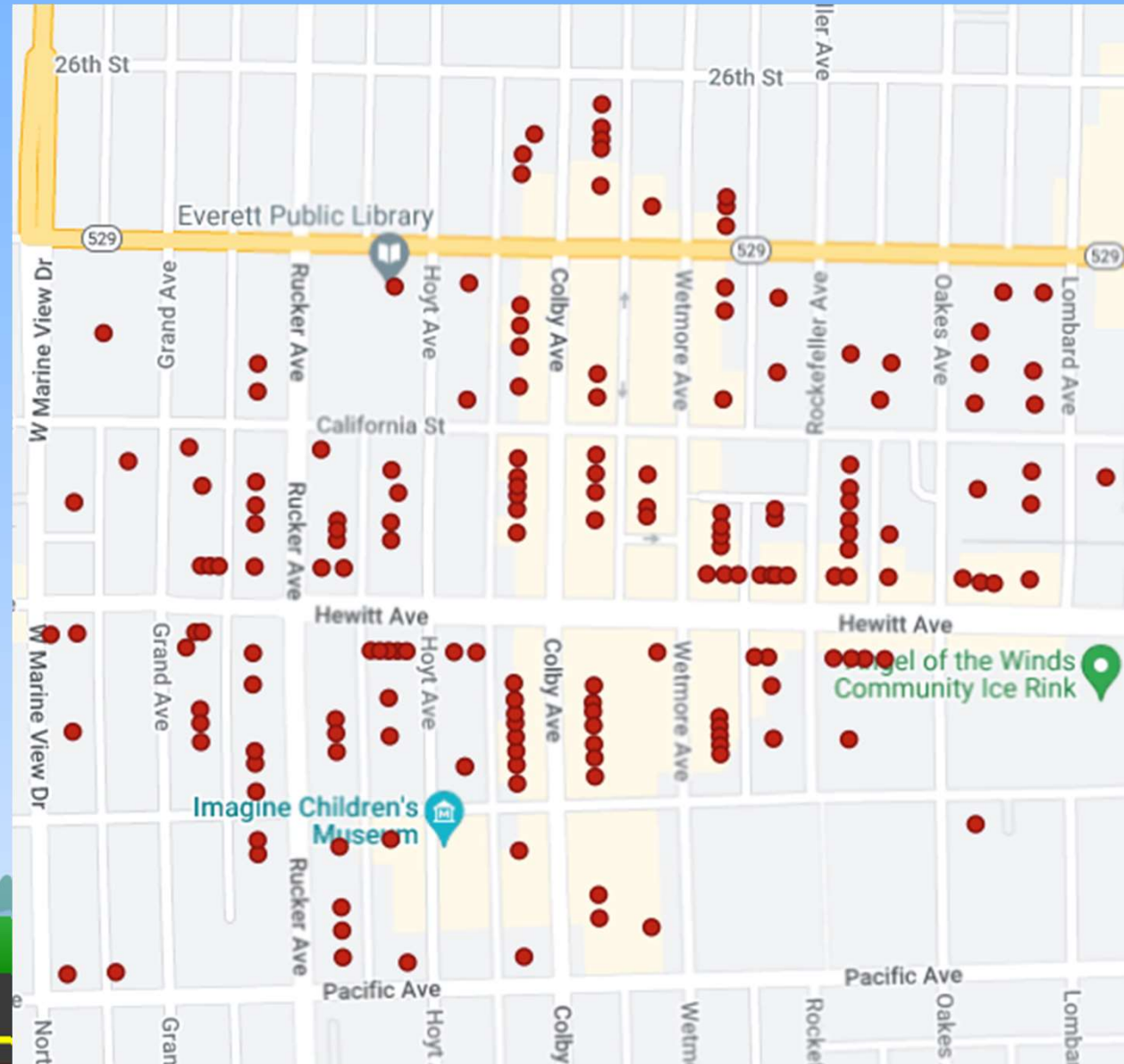
- A moderate number of potentially URM buildings
- A well-known group of active volunteers
- A strong Downtown Association
- Time and space available to support the effort

Huge thanks to Everett for being the Pilot!



Prep Work

- Define area to be surveyed
- Review existing database
 - Determine what is *needed vs. helpful*
 - Fill in missing information
 - Pre-screen buildings to remove non-masonry and/or post-1958 buildings



What we need from the community

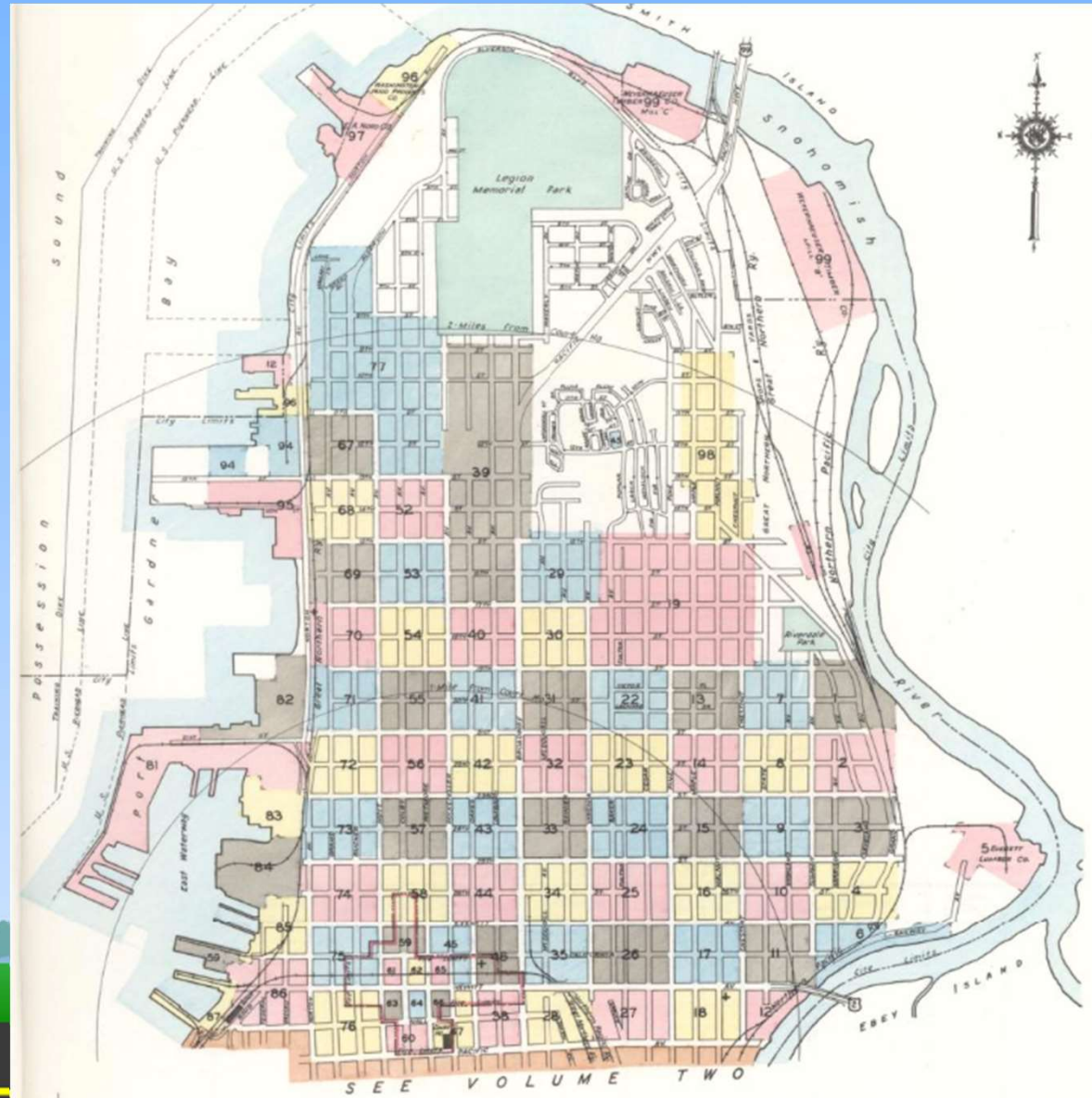
The Downtown Everett Association provided:

- Staff time, volunteers, contractors, etc.
- Location for training
- Snacks
- Printing
- Equipment
- *We're hoping to be able to support this more soon*



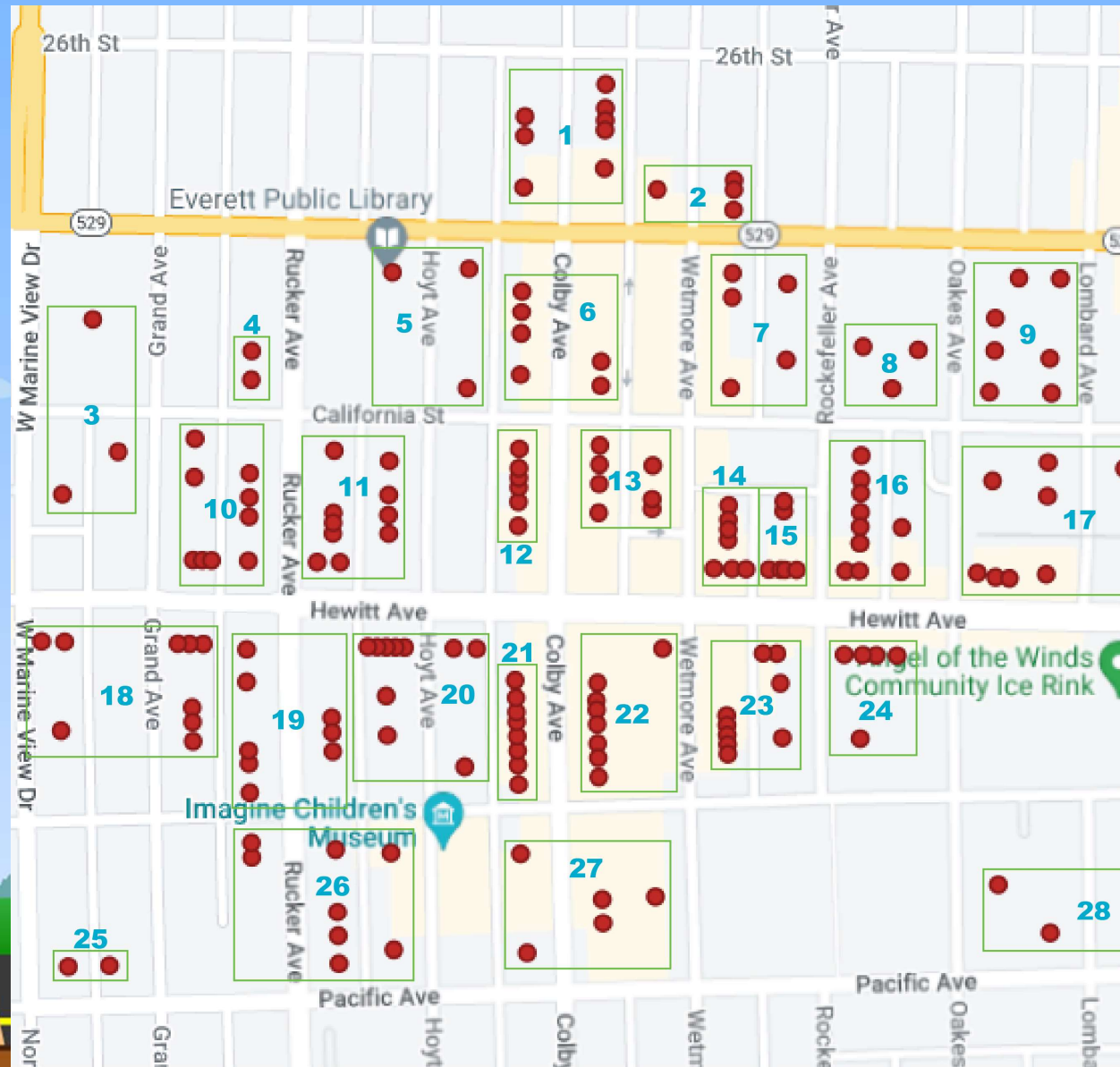
Planning Resources

- City Planning/Building Department
 - Existing database
 - Retrofitting permits
- Sanborn Fire Insurance Maps
- Historical Commission/societies



Additional prep work for a survey

- Divide survey area into sections, if needed
- Identify the number of volunteers needed
- Decide what info you'll provide to EMD vs. volunteers
- Notify property owners using multiple avenues (media, pamphlets, local networks)





Volunteer Recruitment

- City channels
- Emergency Management
- Newsletter
- Social Media
- Local blogs

Apr 15

Historic Preservation Field Survey

Join us for an exciting morning of learning about historic buildings and mapping our downtown built environment!

By **Downtown Everett Association**
73 followers

[Follow](#)

General Admission - 1 +

Free ⓘ


[Reserve a spot](#)



Prep work: EMD and DAHP

- **Packets created for volunteers**
 - Training and Safety information
 - Letters about the survey
- **Survey123 web application built by DAHP**
 - Paper backups
- **EMD training on identifying URMs and completing surveys**
- **Sample review in the field**

Unreinforced Masonry Survey



Date of Evaluation (Current Date)*

Data Source

Building Address*
Please provide this information from the handout.

Building Status
If Demolished or Single Family Residence, do not fill out the remainder of this form.

Existing

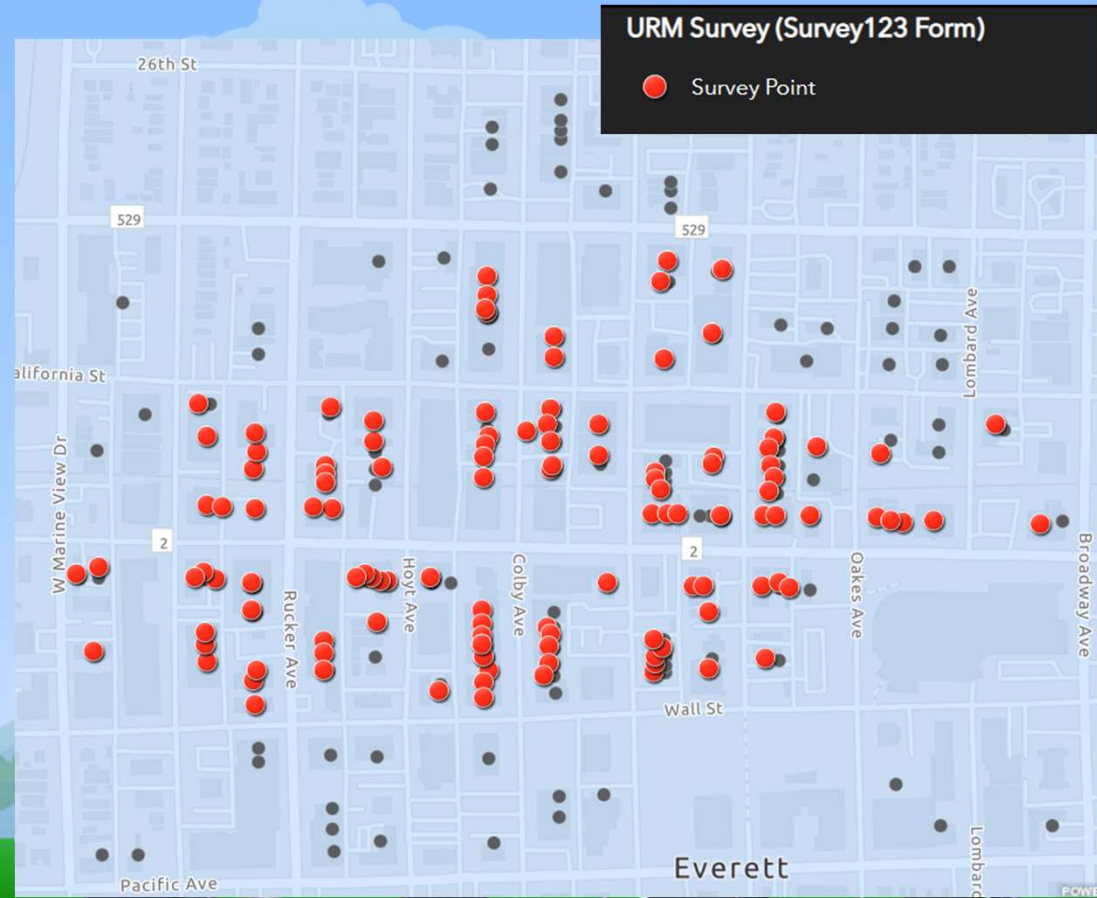
Pilot Survey Day

- EMD provided training on:
 - Identifying URMs
 - Using Survey 123
- Sample review in the field
 - Visit a URM and fill out Survey together
- Volunteers work in pairs to collect data based on training
- Follow-up Survey on event
- DAHP provided technical support for volunteers using the web application in the field.



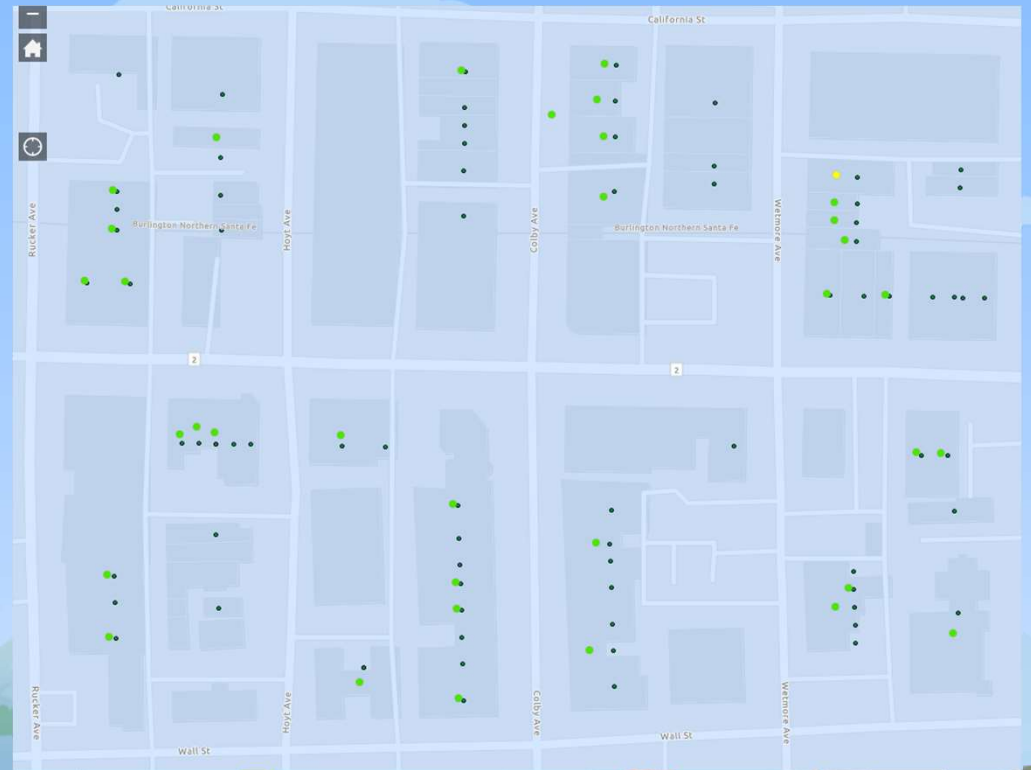
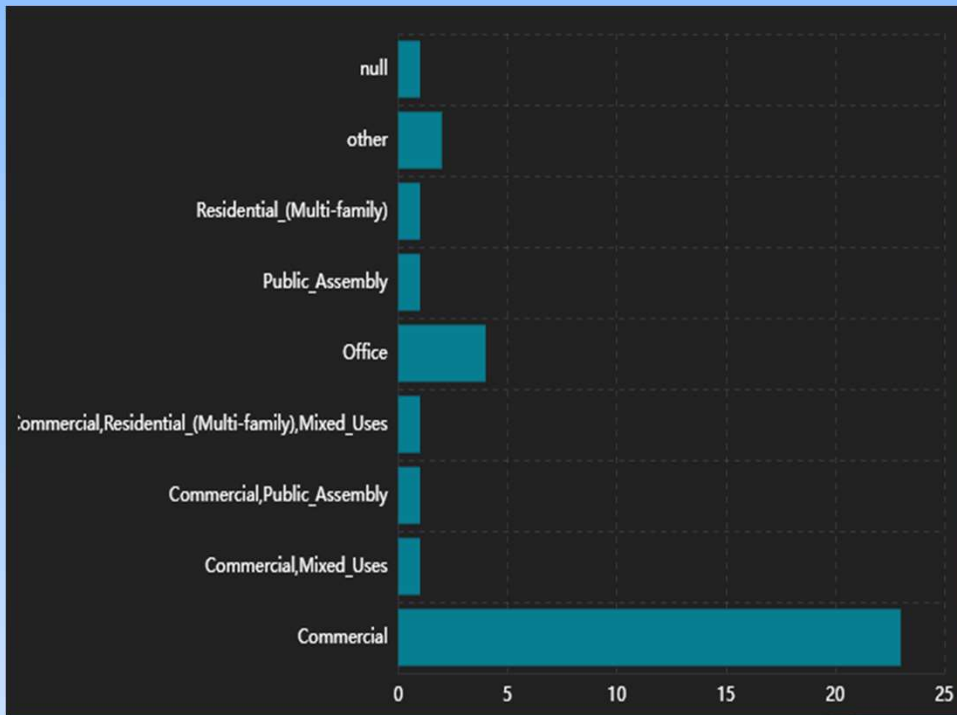
April 15 Everett URM Survey Results

- **131** survey points (red)
- **30+** volunteers
- **186** suspected URMS



Everett Survey Statistics - Occupancies

(Preliminary)



Data QA/QC

- Volunteer technical experts work with DAHP to review data and photos submitted during Pilot
- DAHP/EMD developed a “data dictionary” for these reviewers
- Data held by DAHP, waiting for database upgrades



Next steps for Database

- Update to allow URM building data to be included
- Building out interactive User Portal with the data
- Working with partners to ensure helpful data fields for building owners are included (some examples)
 - Extent of retrofits
 - Eligible grants
 - Etc.

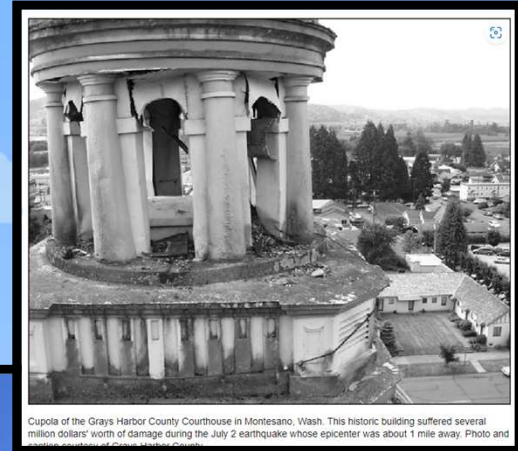


Using the results

- **Organize and present the survey data**
 - URM status, retrofit status
 - Occupancy
 - Geographic sub-area results
 - Profile success stories (retrofitted buildings)
- **Prioritize findings**
 - Areas, occupancies, risk to public
- **Profile success stories** (local retrofitted buildings and funding used)
 - *Example next slide*
- **Assess applicable mitigation funding (and eligibility)**
 - Assess parallel upgrades (historic preservation, energy upgrades, MPE systems)
- Communicate with local stakeholders
 - Agree on next steps
- Apply for mitigation and maintain the program
- “Best practices” for historic preservation of buildings

Example: Grays Harbor Co. Courthouse

- Damaged in 1999 Satsop earthquake (M5.8)
 - MMI V (moderate shaking)
- \$7.2M damage repairs
 - Completed in 2001
- 2001 Nisqually earthquake
 - MMI VI+ (strong shaking)
 - No Major damage
- Safety & history preserved



Cupola of the Grays Harbor County Courthouse in Montesano, Wash. This historic building suffered several million dollars' worth of damage during the July 2 earthquake whose epicenter was about 1 mile away. Photo and caption courtesy of Grays Harbor County.

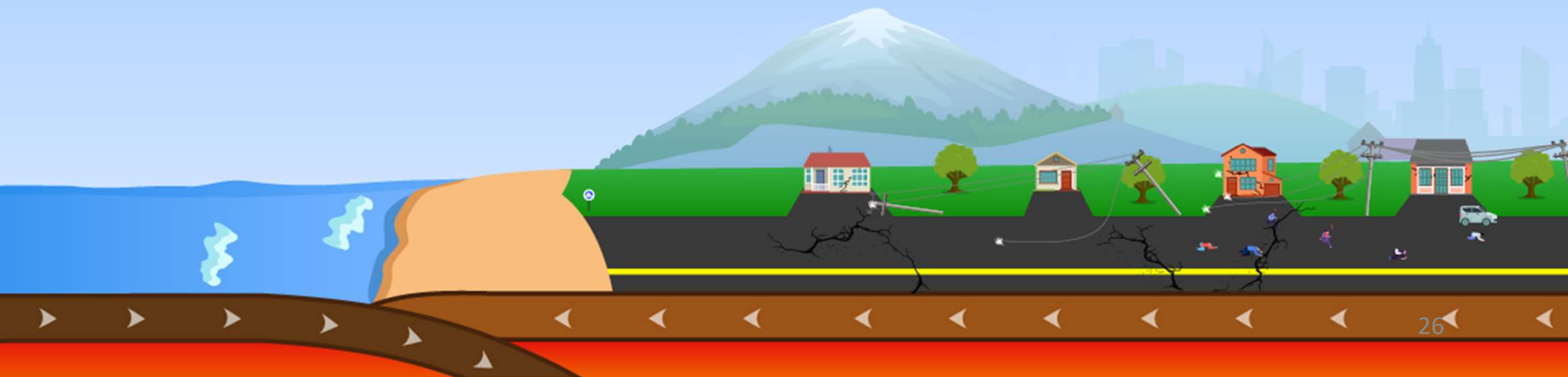


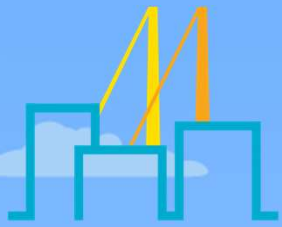
Next steps

- Hiring new coordinator - EMD
- Coordinating Workgroup - EMD
- Initial Database upgrade – DAHP
- Longer Term – Upgrade URM portal (DAHP)
- Continue identifying new retrofit funding options
- Identify next location for a survey – EMD, DAHP, and you

The *next* URM survey

- Partnership:
 - Will require time from the community
 - Will be supported (training, tech, QA/QC).
- Please reach out if you're interested! (contact information coming in a few slides)





downtown everett
association



WASHINGTON TRUST
FOR HISTORIC
PRESERVATION

This information will help mitigate earthquake hazards in Washington, and increase resilience, but there isn't one organization that can do it alone.



DEPT OF ARCHAEOLOGY +
HISTORIC PRESERVATION

Some resources



Certified Local Government Grants

Open January

Close April

Contact: Michelle Thompson

Michelle.Thompson@dahp.wa.gov

Some resources



FEMA Grant

Approved Hazard Mitigation Plan

Contact: Matt Lebens

Hazard Mitigation Program Supervisor

Emergency Management Division

(253) 433-5293

matthew.lebens@mil.wa.gov



Thank you!

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Additional URM workgroup contacts:

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Madison.Miller@downtowneverettwa.org

