City of Portland Unreinforced Masonry Data Cleanup

Methodology and Technology

Bureau of Development Services
FROM CONCEPT TO CONSTRUCTION

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Problem Scope

PBEM (Portland Bureau of Emergency Management) and BDS (Bureau of Development Services) were tasked with identifying commercial Unreinforced Masonry (URM) buildings within Portland's city limits.

An existing inventory from 1993 was available in spreadsheet form, however the data wasn't found to be accurate.

We wanted to connect the URM details to the existing GIS building footprint inventory.

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High-Level Solution

BDS structural engineers want to be able to research and identify URM buildings and see them on a map, interactively choosing what building URM details would be assigned to them.

Collect detailed URM relevant information for each building.

Incorporate owner survey results into the data.

Take advantage of modern web-based GIS mapping tools - implement with ArcGIS Server and Latitude Geographic's Geocortex Essentials HTML 5 viewer.

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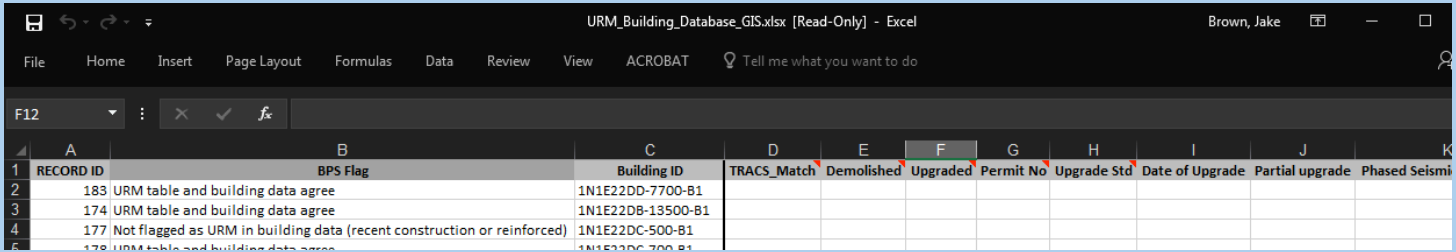
Please, please no more excel files

Excel is a powerful tool that's easy to get started with.



	A	B	C	D	E	F	G	H	I	J	K
1	RECORD ID	BPS Flag	Building ID	TRACS_Match	Demolished	Upgraded	Permit No	Upgrade Std	Date of Upgrade	Partial upgrade	Phased Seismi
2	183	URM table and building data agree	1N1E22DD-7700-B1								
3	174	URM table and building data agree	1N1E22DB-13500-B1								
4	177	Not flagged as URM in building data (recent construction or reinforced)	1N1E22DC-500-B1								

It's amazing how much good data there is laying around in excel files; get it into a database where it can really be leveraged!

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Design it to be mapped from the beginning

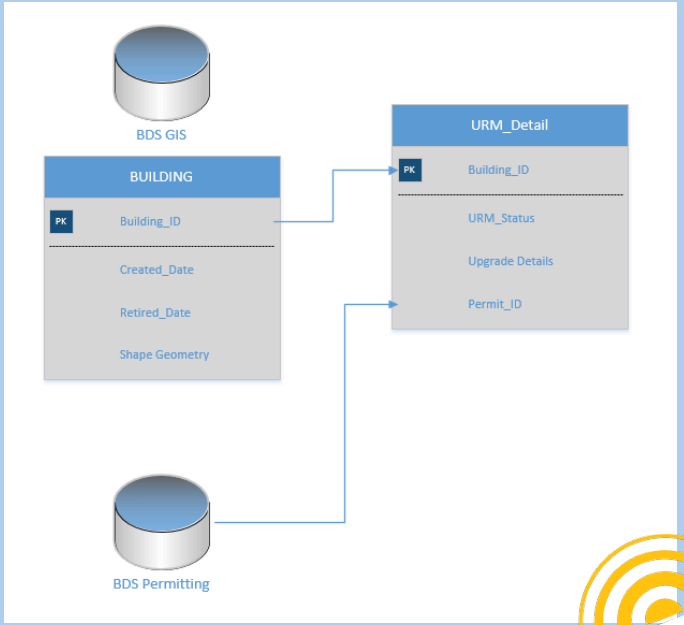
Unreinforced Masonry details are a decoration on our building footprint Christmas tree.

The building footprint shape and status information are maintained by other processes, allowing structural engineers to focus on URM details.

However, they're still forced to associate info with a specific existing building footprint.

Data is stored on SQL Server 2012 S





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What information do we want to capture?

PROPERTY_ID,SURVEY_ID,ORIGINAL_URM_ADDRESS,DATA_SOURCE,DEMOLISHED,TRACS_URM,UPGRADED,UPGRADE_DATE,UPGRADE_STANDARD,UPGRADE_PERMIT_NUMBER,UPGRADE_PERMIT_NOTES, ,PARTIAL_UPGRADE,PHASED_SEISMIC_AGREEMENT,QUARTER_SECTION,WALL_TYPE,BLDG_USE,PRIMARY_OCCUPANCY,OCCUPANCY_2ND,OCCUPANCY_3RD,OCCUPANCY_4TH,NUM_PEOPLE,NUM_STORIES,FLOOR_SQ_FT,YEAR_BUILT,VACANT,REVIEWED_BY,REVIEWED_DATE,VERIFIED_BY,VERIFIED_DATE,URM_BLDG,NOTES,REVIEW_PRIORITY,USE_CLASS,SQFT_CLASS,STORY_CLASS,OCCUPANCY_CLASS,VALUE_CLASS,LIQUEFACTION_RISK,PROPERTY_CODE_DESCRIPTION,BLDG_VALUE,UNITS,LEGACY_BLDG_USE,DEMO_PERMIT_NUMBER,BLDG_NAME,SITE_VISIT_NEEDED,OWNER_NAME_1,OWNER_NAME_2,OWNER_ADDRESS,OWNER_CITY,OWNER_STATE,OWNER_ZIP,SURVEY_RESPONSE,VALID_MAILING_ADDRESS,COMPANY_NAME_1,COMPANY_NAME_2,CITY_OWNED,BPS_BLDG_ID,REPORTED_DATE,REPORTED_BY,PROPKEY,ADDRESS,STATUS,URM_CLASS,CITY_FINANCED,CENTRAL_CITY,CITY_INTEREST,HISTORIC_BLDG_NAME,NEHRP_SITE_CLASS_O_13_06,NEHRP_VS30_O_13_06,DOGAMI_VS30_O_13_12,AMPLIFICATION,LATITUDE,LONGITUDE,HRI_RANK,HRI_NAME,CONSERVATION_DISTRICT,HISTORIC_DISTRICT,LOCAL_LANDMARK,CONSERVATION_STRUCTURE,CONTRIBUTING_STATUS,NATIONAL_LANDMARK,HISTORIC_STATUS

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Just kidding!!!

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Really - What information do we want to capture?

First and foremost we want to start off with the correct building. Using an interactive map we're able to zoom or search for the correct building footprint.

We then research the permit system to pull out relevant upgrade information, like whether there is a phased seismic agreement, wall type, etc.

Spatial context - is the building in a historic or conservation district?

How many estimated units does the building have?

Owner contact details.

Is the building city owned?

There are 132 separate values available per URM.

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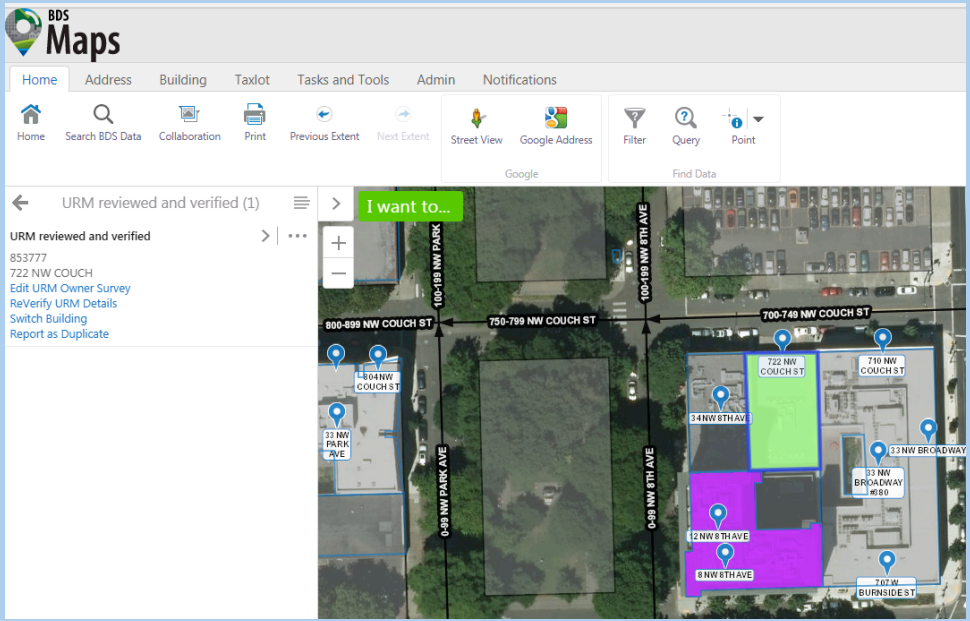
Data editing tools

Research is hard work, updating the database should be the easy part.

Data entry workflows were created to facilitate (for users with access) data updating.

Here is what that looks like:



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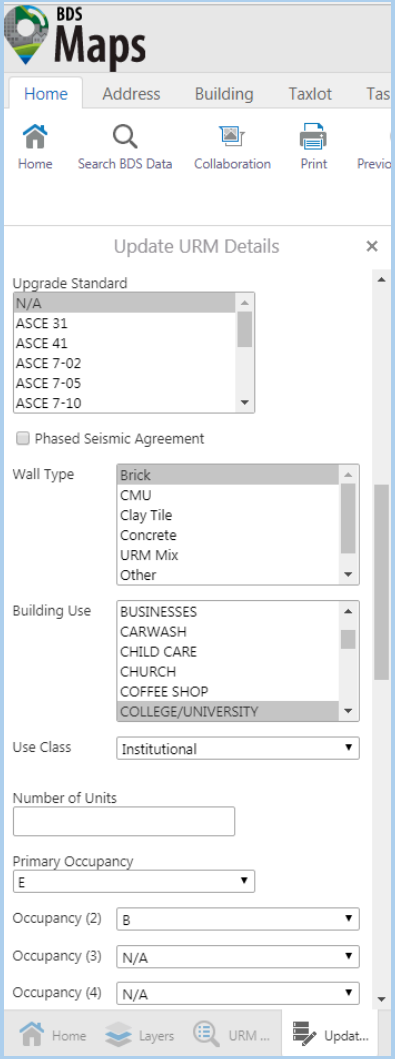
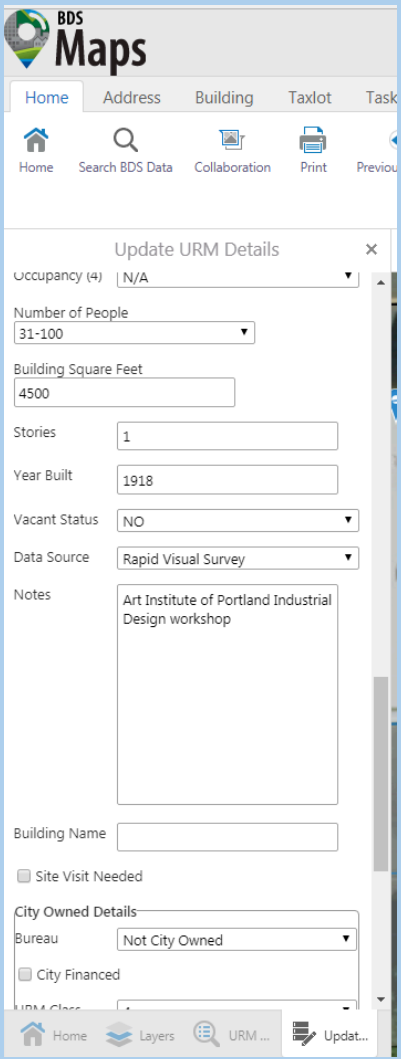
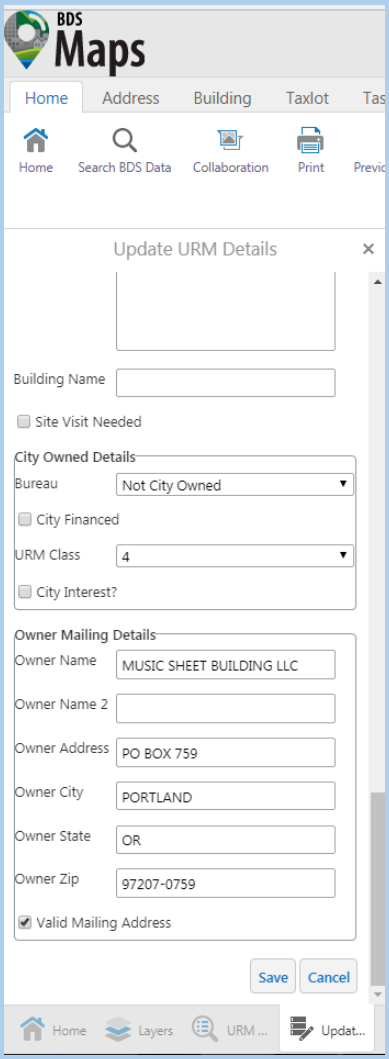
The image cannot be displayed. Your computer may not have enough memory to open the image, or the image may have been corrupted. Restart your computer, and then open the file again. If the red x still appears, you may have to delete the image and then insert it again.



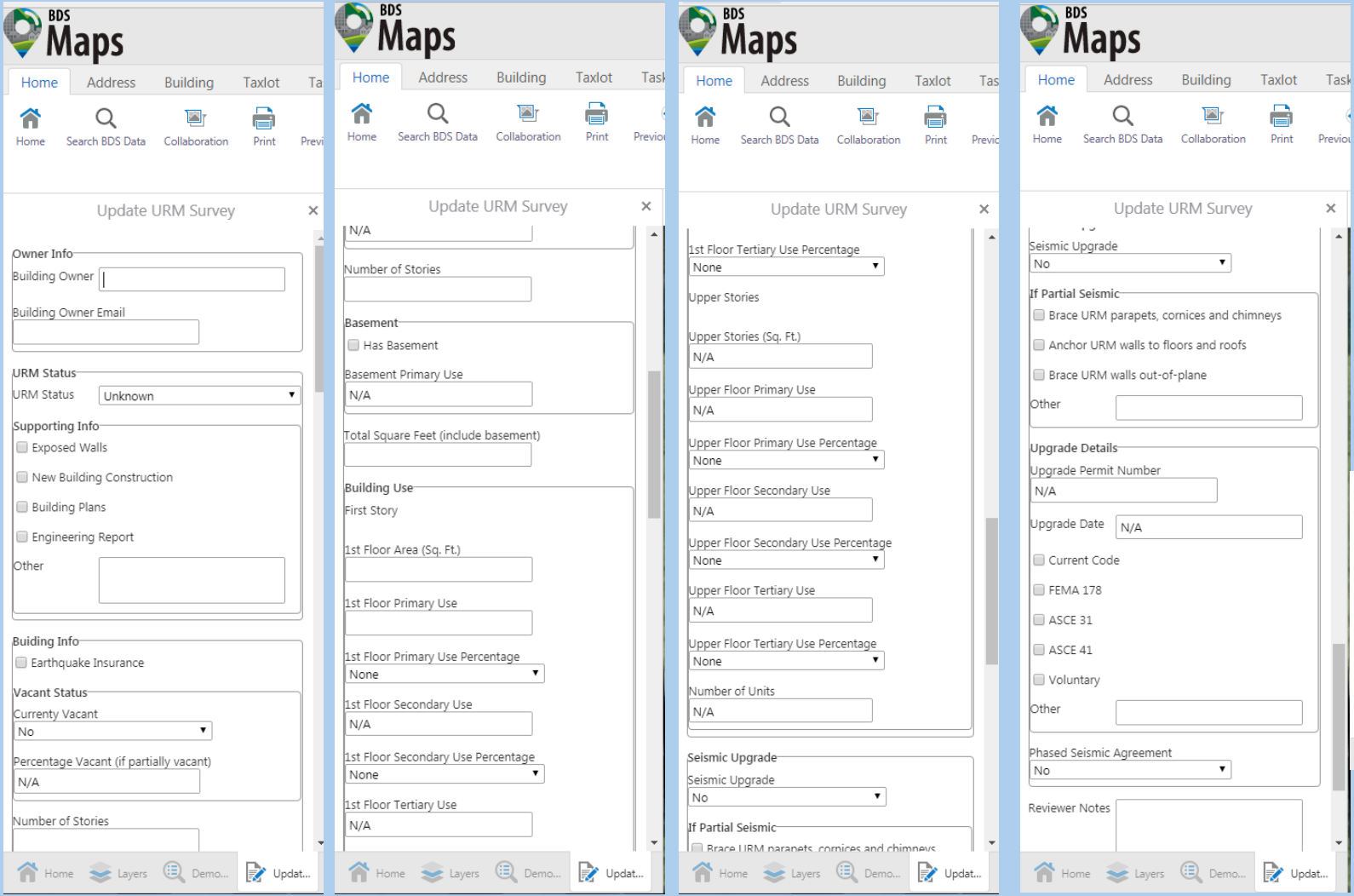




Integrate survey results

A paper mail survey was sent out to 1000+ URM owners with an optional survey monkey URL.

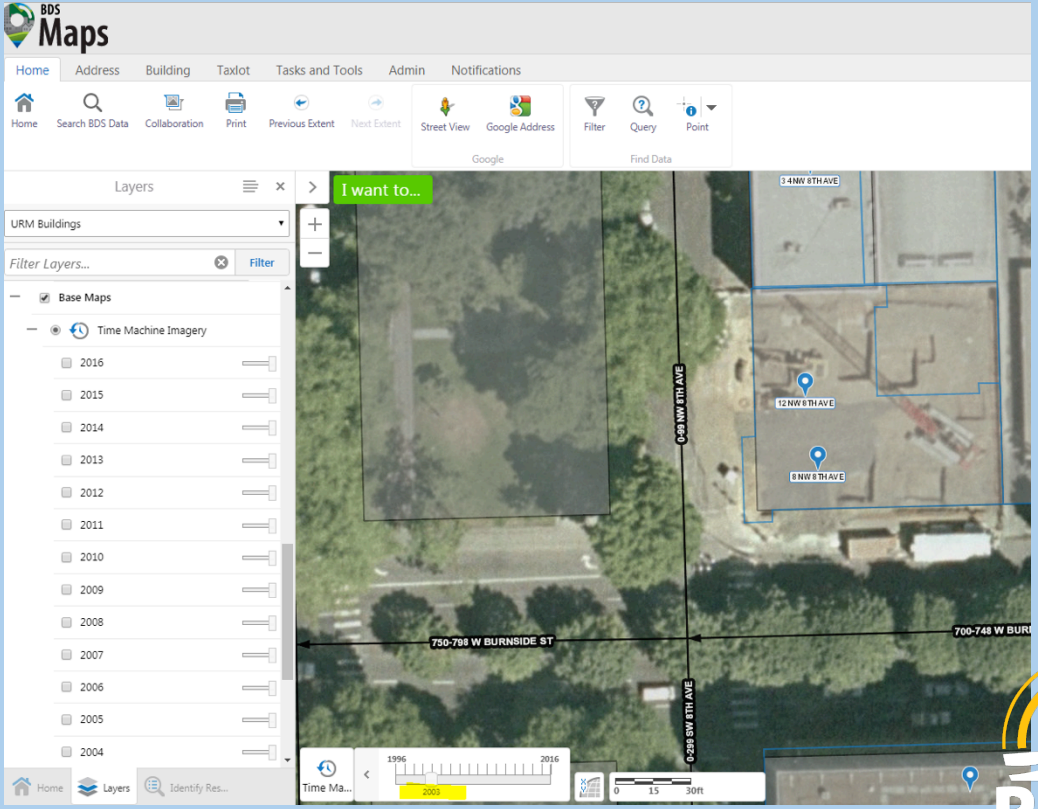
Out of that, 602 results have been processed - each associated with a building footprint.


BDS Maps
Home
Address
Building
Taxlot
Search BDS Data
Collaboration
Print
Update URM Survey
Owner Info
Building Owner
Building Owner Email
URM Status
URM Status
Unknown
Supporting Info
Exposed Walls
New Building Construction
Building Plans
Engineering Report
Other
Buiding Info
Earthquake Insurance
Vacant Status
Currenty Vacant
No
Percentage Vacant (if partially vacant)
N/A
Number of Stories
N/A
Number of Stories
Basement
Has Basement
Basement Primary Use
N/A
Total Square Feet (include basement)
Building Use
First Story
1st Floor Area (Sq. Ft.)
1st Floor Primary Use
1st Floor Primary Use Percentage
None
1st Floor Secondary Use
N/A
1st Floor Secondary Use Percentage
None
1st Floor Tertiary Use
N/A
1st Floor Tertiary Use Percentage
None
Upper Stories
Upper Stories (Sq. Ft.)
N/A
Upper Floor Primary Use
N/A
Upper Floor Primary Use Percentage
None
Upper Floor Secondary Use
N/A
Upper Floor Secondary Use Percentage
None
Upper Floor Tertiary Use
N/A
Upper Floor Tertiary Use Percentage
None
Number of Units
N/A
Seismic Upgrade
Seismic Upgrade
No
If Partial Seismic
Brace URM parapets, cornices and chimneys
Anchor URM walls to floors and roofs
Brace URM walls out-of-plane
Other
Upgrade Details
Upgrade Permit Number
N/A
Upgrade Date
N/A
Current Code
FEMA 178
ASCE 31
ASCE 41
Voluntary
Other
Phased Seismic Agreement
No
Reviewer Notes
Save
Cancel
Home
Layers
Demo...
Updat...

Required some speciality mapping tools...

We needed a way to take a “look back in time”.

Imagery slider tools allow researchers to easily scan back through years worth of imagery. This is handy for identifying URMs that have already been demolished.



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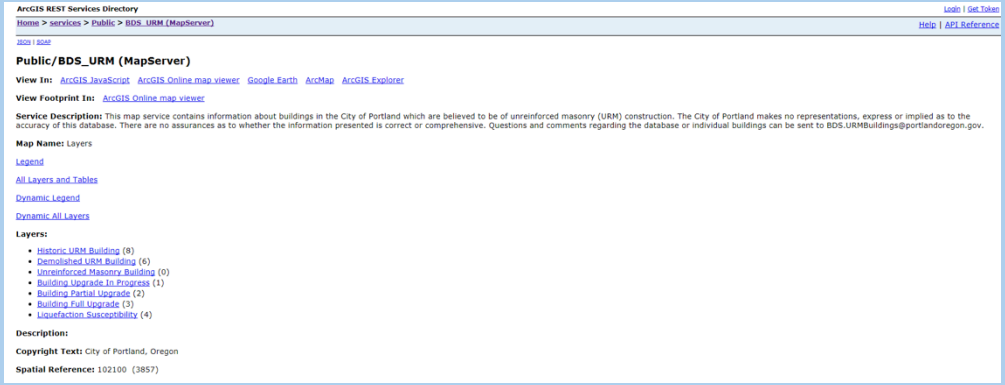
Publish Map Service

ArcMap used to publish map service to ArcGIS for Enterprise (Server)

New map service is tied URM table in database

Updates shown in real-time



ArcGIS REST Services Directory

Login | Get Token

Home > services > Public > BDS_URM (MapServer)

Help | API Reference

JSON | SOAP

Public/BDS_URM (MapServer)

View In: ArcGIS JavaScript ArcGIS Online map viewer Google Earth ArcMap ArcGIS Explorer

View Footprint In: ArcGIS Online map viewer

Service Description: This map service contains information about buildings in the City of Portland which are believed to be of unreinforced masonry (URM) construction. The City of Portland makes no representations, express or implied as to the accuracy of this database. There are no assurances as to whether the information presented is correct or comprehensive. Questions and comments regarding the database or individual buildings can be sent to BDS.URMBuildings@portlandoregon.gov.

Map Name: Layers

Legend

All Layers and Tables

Dynamic Legend

Dynamic All Layers

Layers:

- Historic URM Building (8)
- Demolished URM Building (6)
- Unreinforced Masonry Building (0)
- Building Upgrade In Progress (1)
- Building Partial Upgrade (2)
- Building Full Upgrade (3)
- Liquefaction Susceptibility (4)

Description:

Copyright Text: City of Portland, Oregon

Spatial Reference: 102100 (3857)

: https://www.portlandmaps.com/arcgis/rest/services/Public/BDS_URM/MapServer

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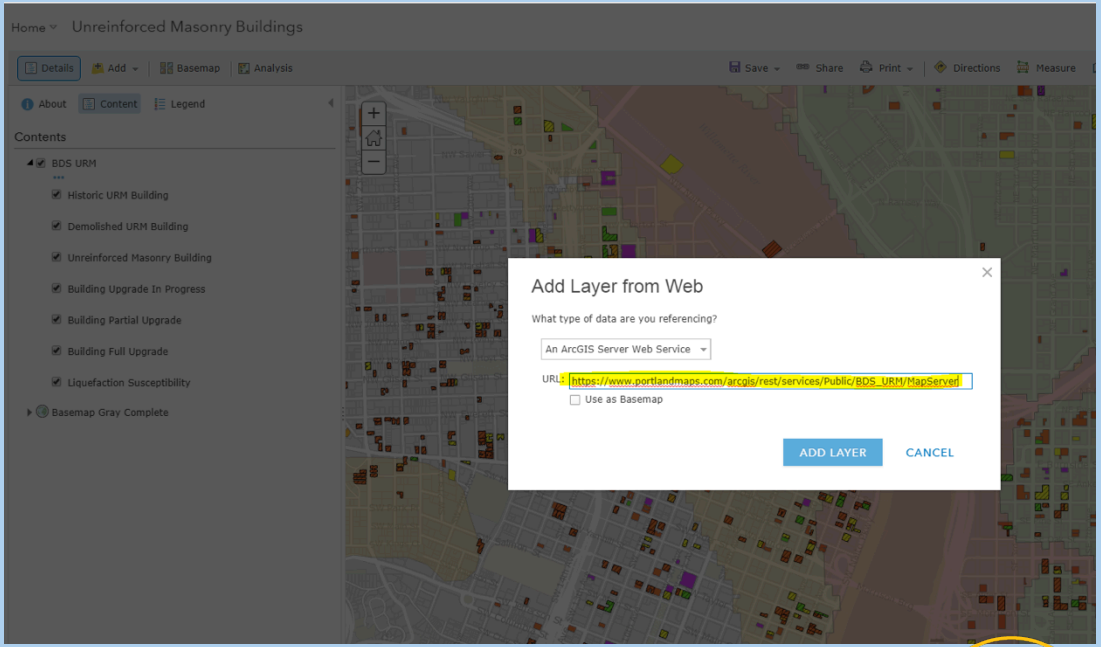
Configure ArcGIS Online MAP

Add layers from web service you host

Configure each layers “identify” pop-up detail

Set default map extent



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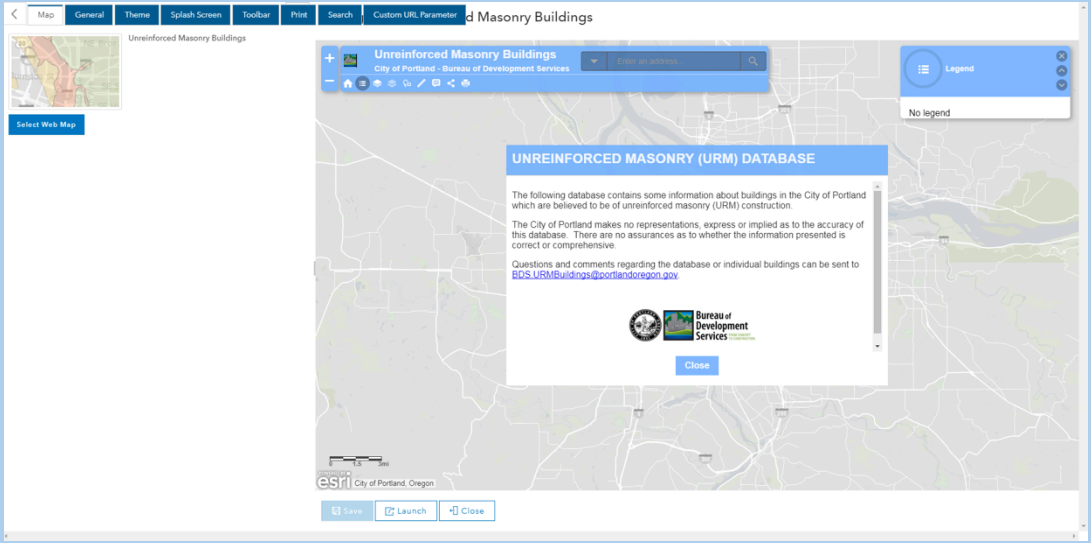
Configure ArcGIS Online APP

Pick what template you want to use, or use ESRI's web app builder tools.

Configure what features are included.

Brand your app with logos



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Publish Results

bit.ly/PortlandURM



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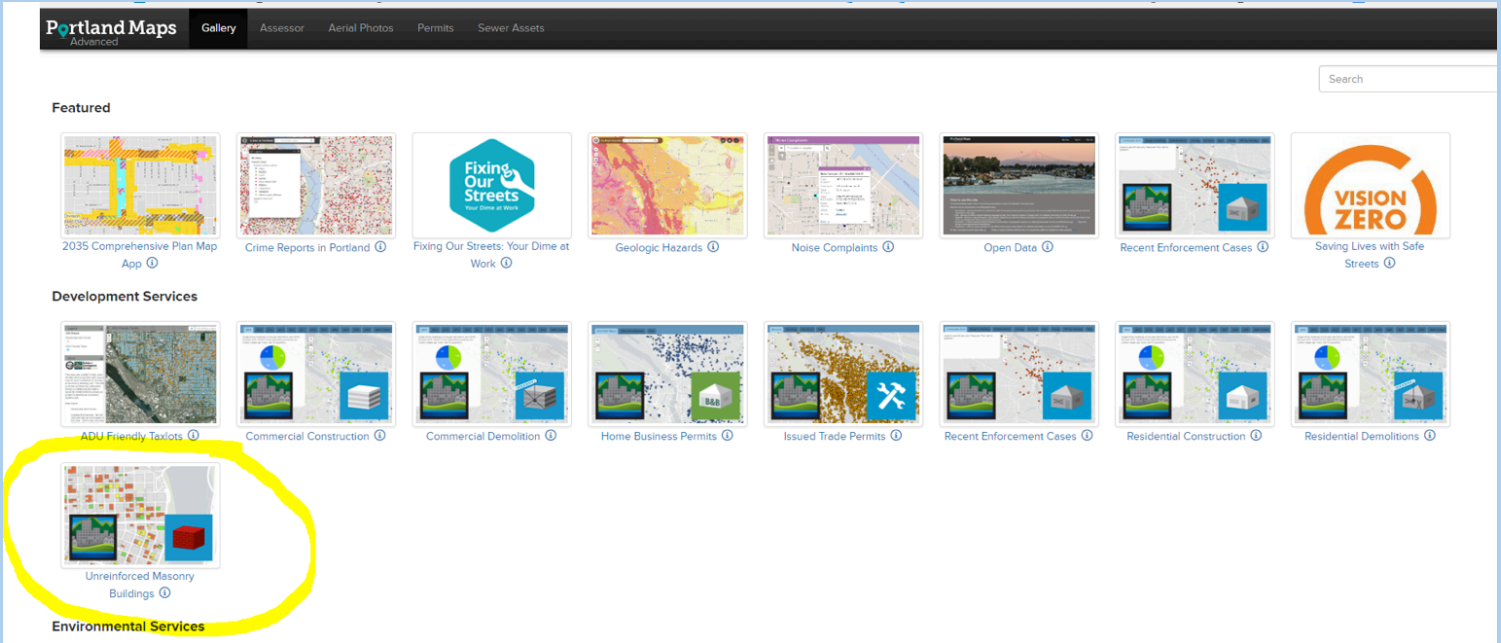
Include with other published maps in a Map Gallery



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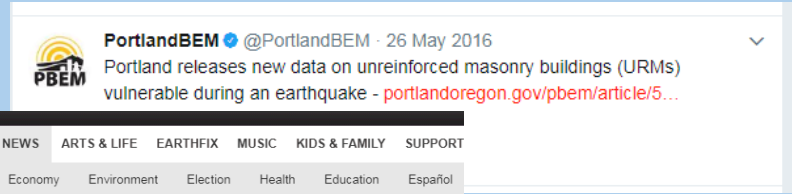
Get the word out!







The city just released a map **laying out Portland's largest death traps** when an earthquake hits. And guess what! The *Mercury*'s building is demarcated in bright, concerned red. And I am telecommuting in perpetuity.

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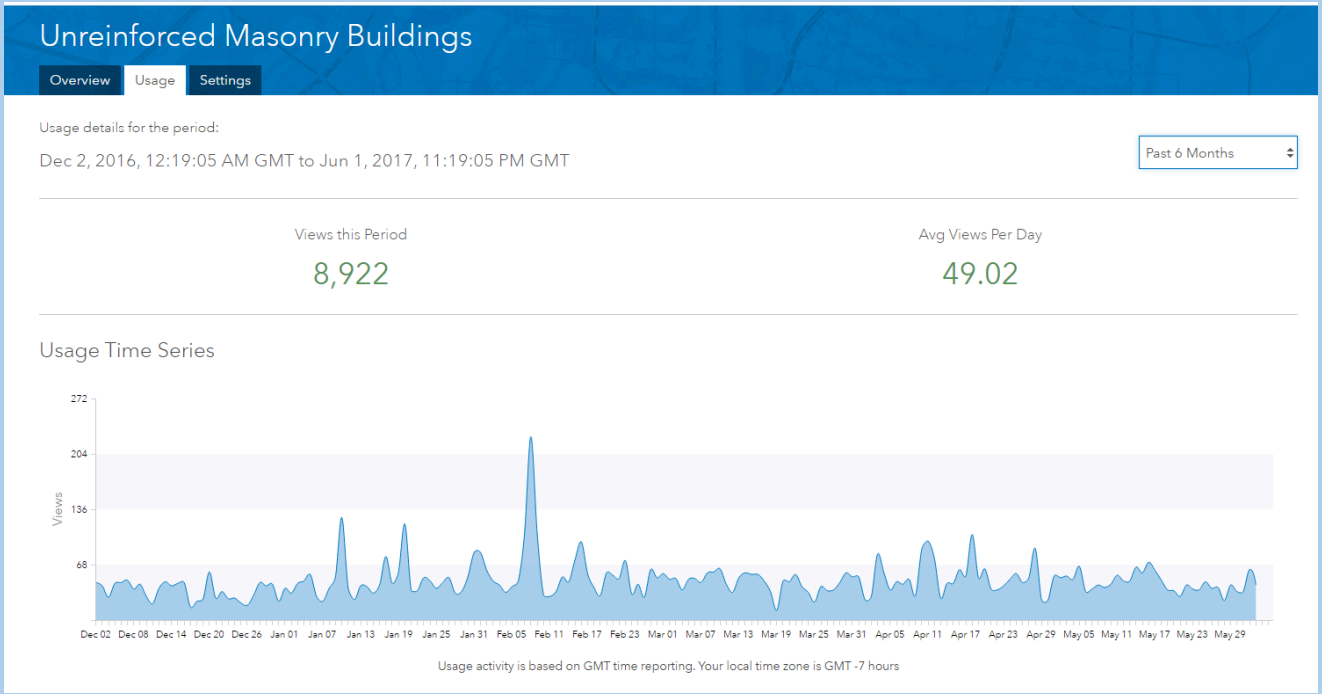
Usage



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Demo

Let’s kick the tires!

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Questions?

jake.brown@portlandoregon.gov

https://www.portlandoregon.gov/bds/gis

https://www.portlandmaps.com

http://bit.ly/PortlandURM

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