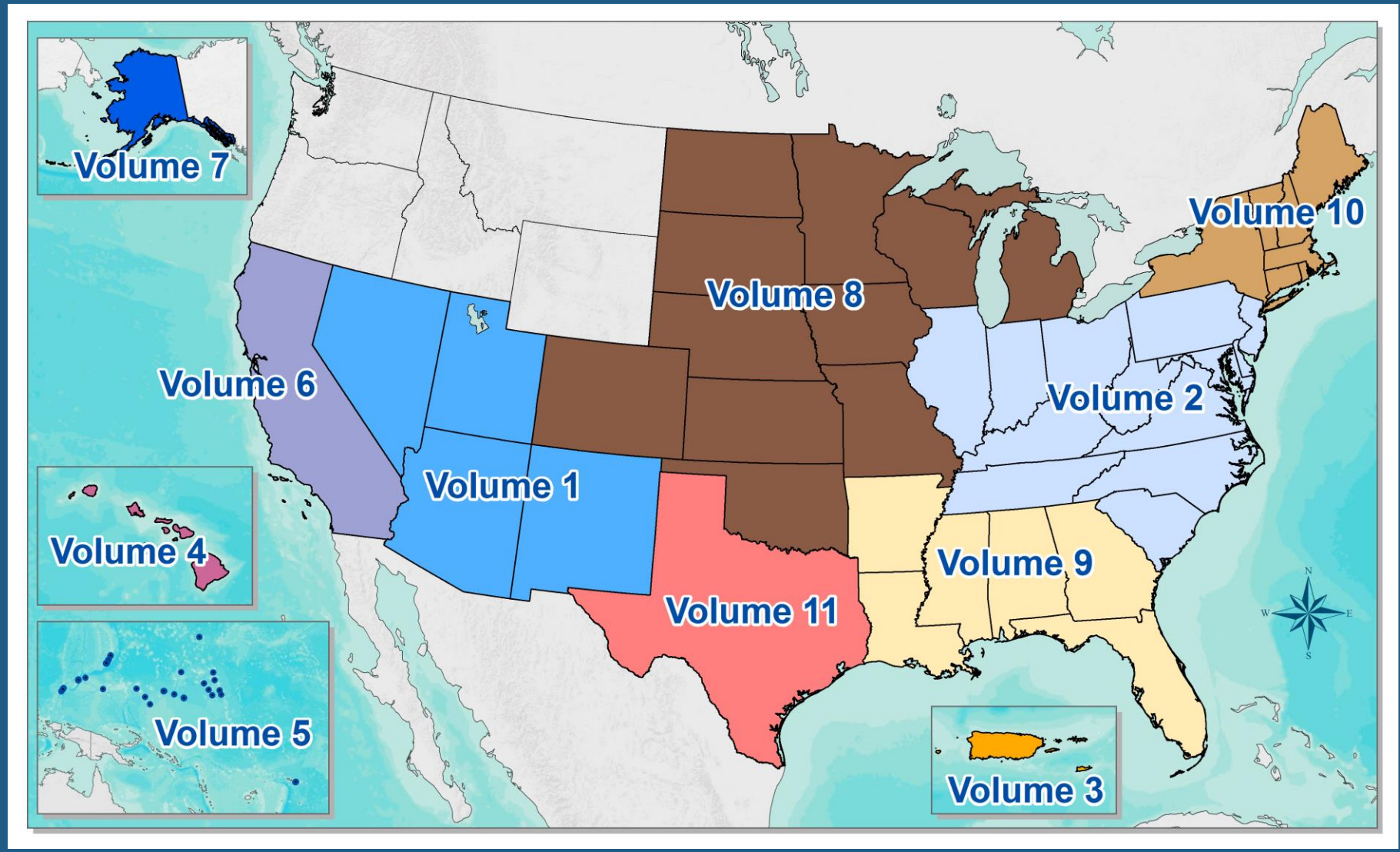
ATLAS 14: AUSTIN'S NEW UNDERSTANDING OF FLOOD RISK

Watershed Protection Department
Joint Sustainability Committee | June 26, 2019

WATERSHED PROTECTION

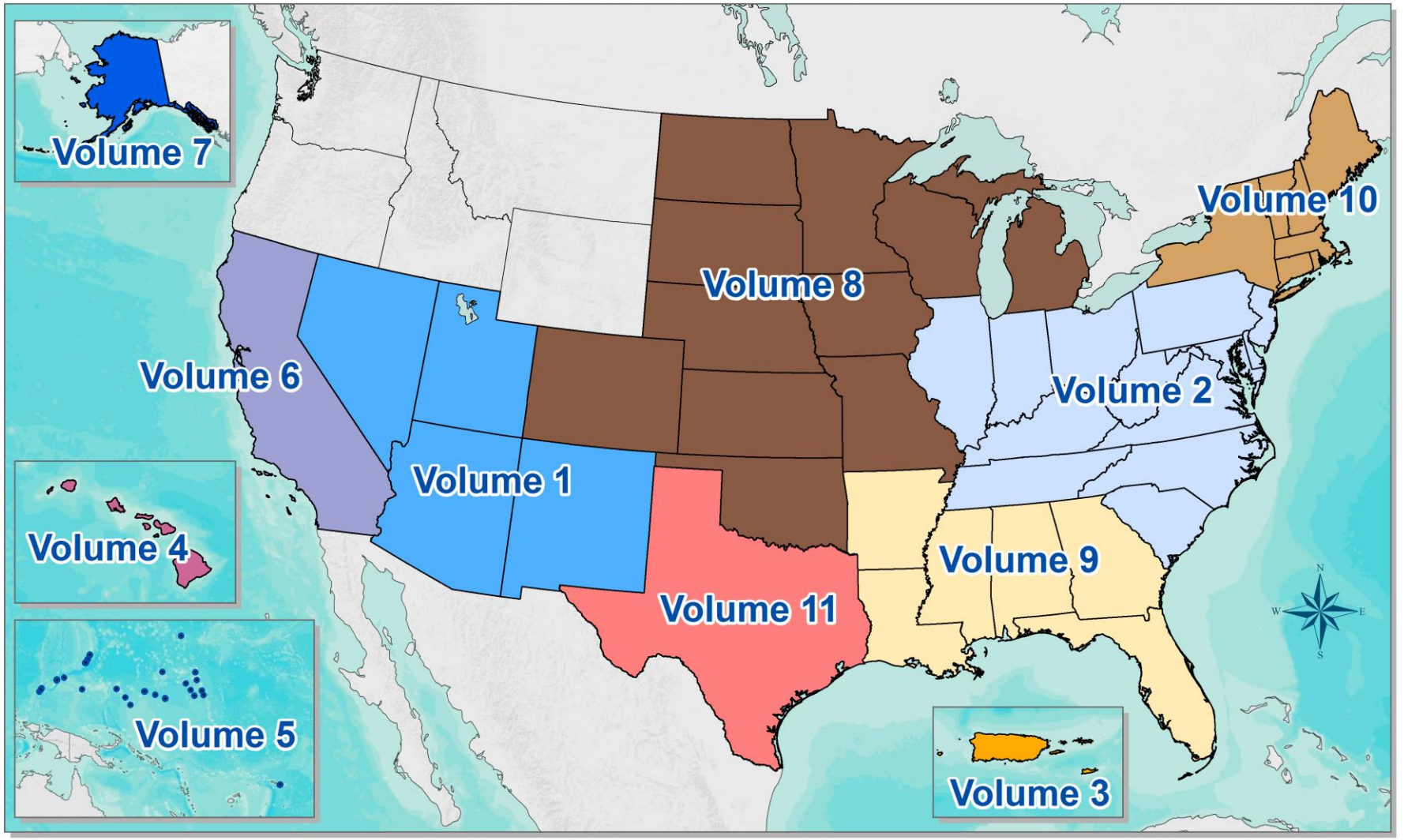
Atlas 14 Background

- Nationwide study of historic rainfall frequency estimates (How much rain to expect)
- Temporal distribution of rainfall (What pattern rain falls)
- Examines the effects of climate change as trends (Does the data indicate that future rainfall will be different)



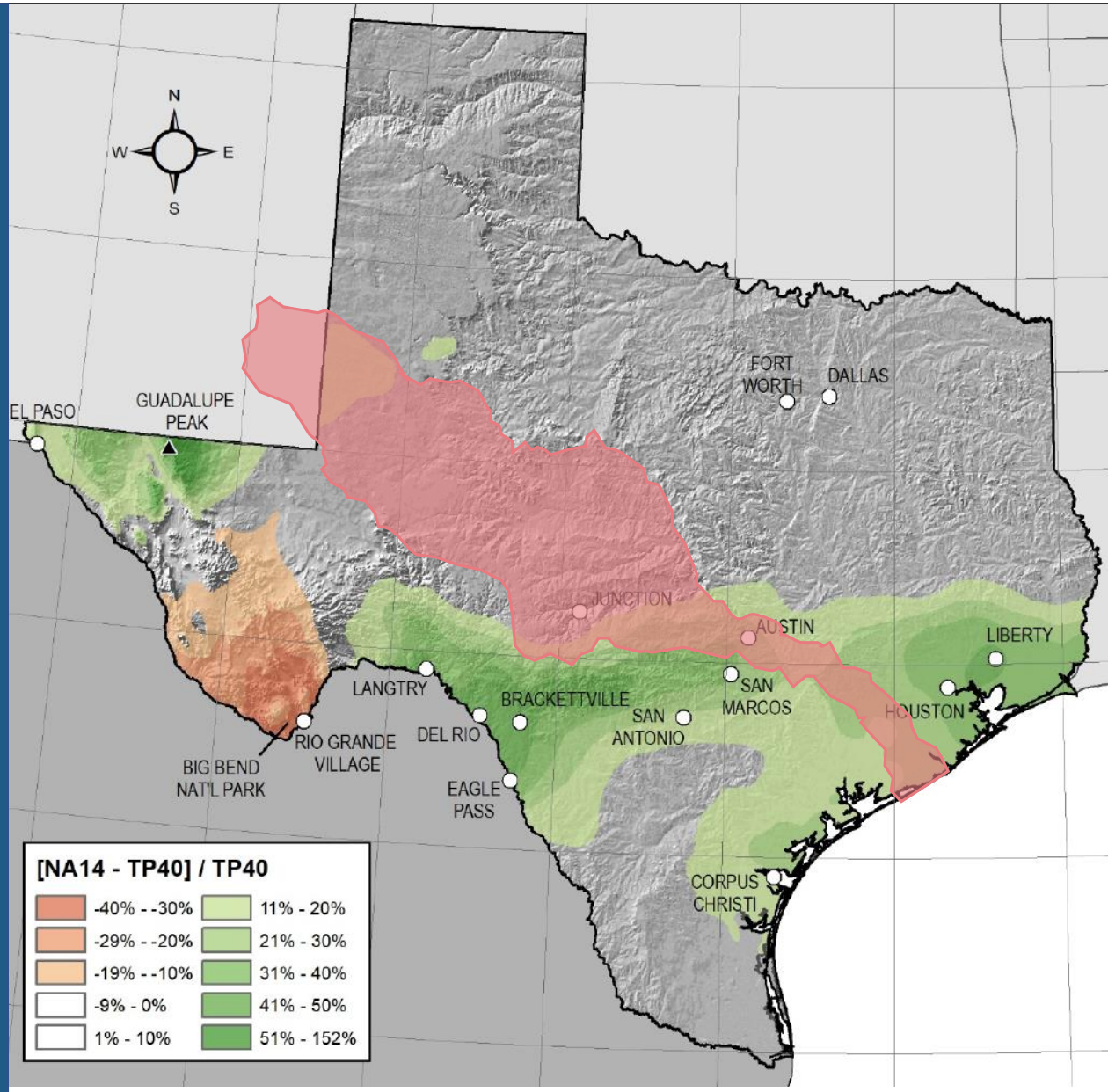
Partners

- **Federal** National Oceanic and Atmospheric Administration, National Weather Service, U.S. Army Corps of Engineers, Federal Highway Administration
- **State/Local** TxDOT, Harris County Flood Control District, City of Austin, et al.



Atlas 14 Rainfall Changes

- Adds data from 1961 – 2017
- Colorado River watershed not significantly impacted



Atlas 14 Rainfall Changes

- Rainfall data suggests revising the rainfall pattern used for floodplain studies and drainage infrastructure design
  - Benchmark testing indicates varied impacts to peak flow and detention volume
- “Because [statistical] tests…indicated no statistically significant trends in the data, the assumption of stationary [rainfall] was accepted for this project area and no adjustment to…the data was recommended.”
- “[NOAA] developed a modeling framework that allows non-stationary climate effects to be integrated into the NOAA Atlas 14 process and [NOAA is] testing the feasibility of incorporating future climate projections into precipitation frequency analysis.

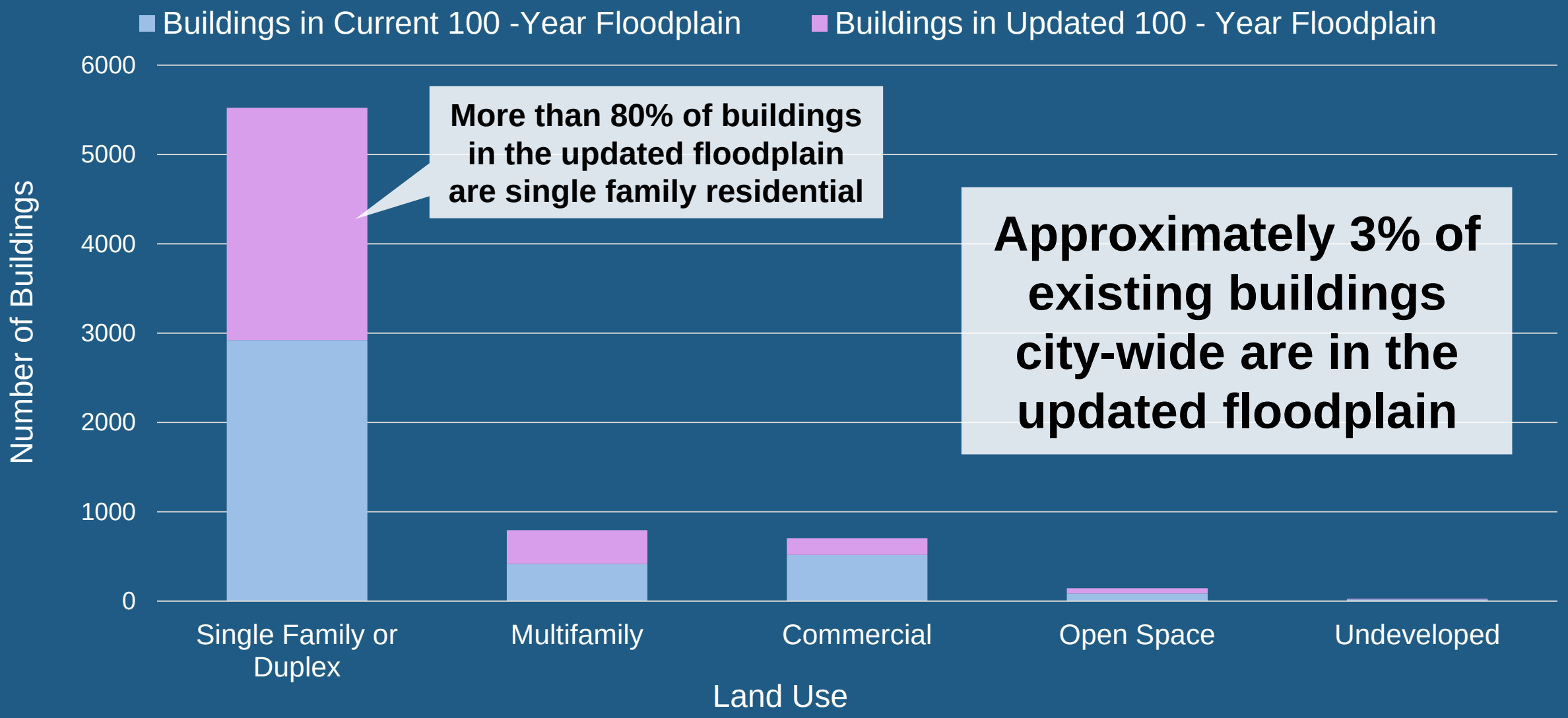
5

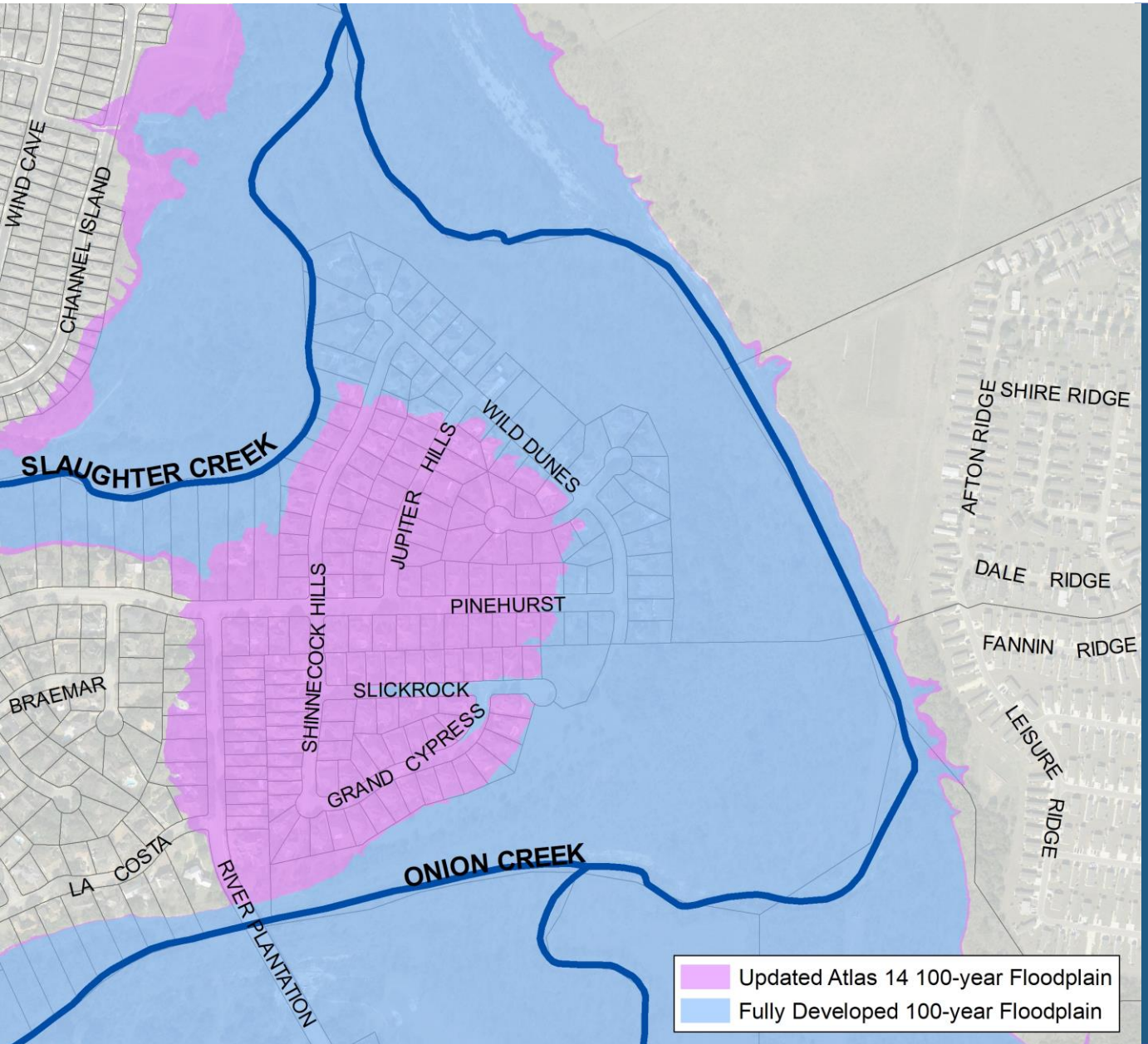
Key impacts of Atlas 14 updated rainfall data

Measure	Current	Updated	Percent Increase
100-year rainfall (24-hour)	10.2 inches	Up to 13+ inches	**30%**
Buildings in 100-year floodplain	4,000	7,200*	**80%**

**Excludes Colorado River floodplain and associated lakes*

Buildings in the Floodplain

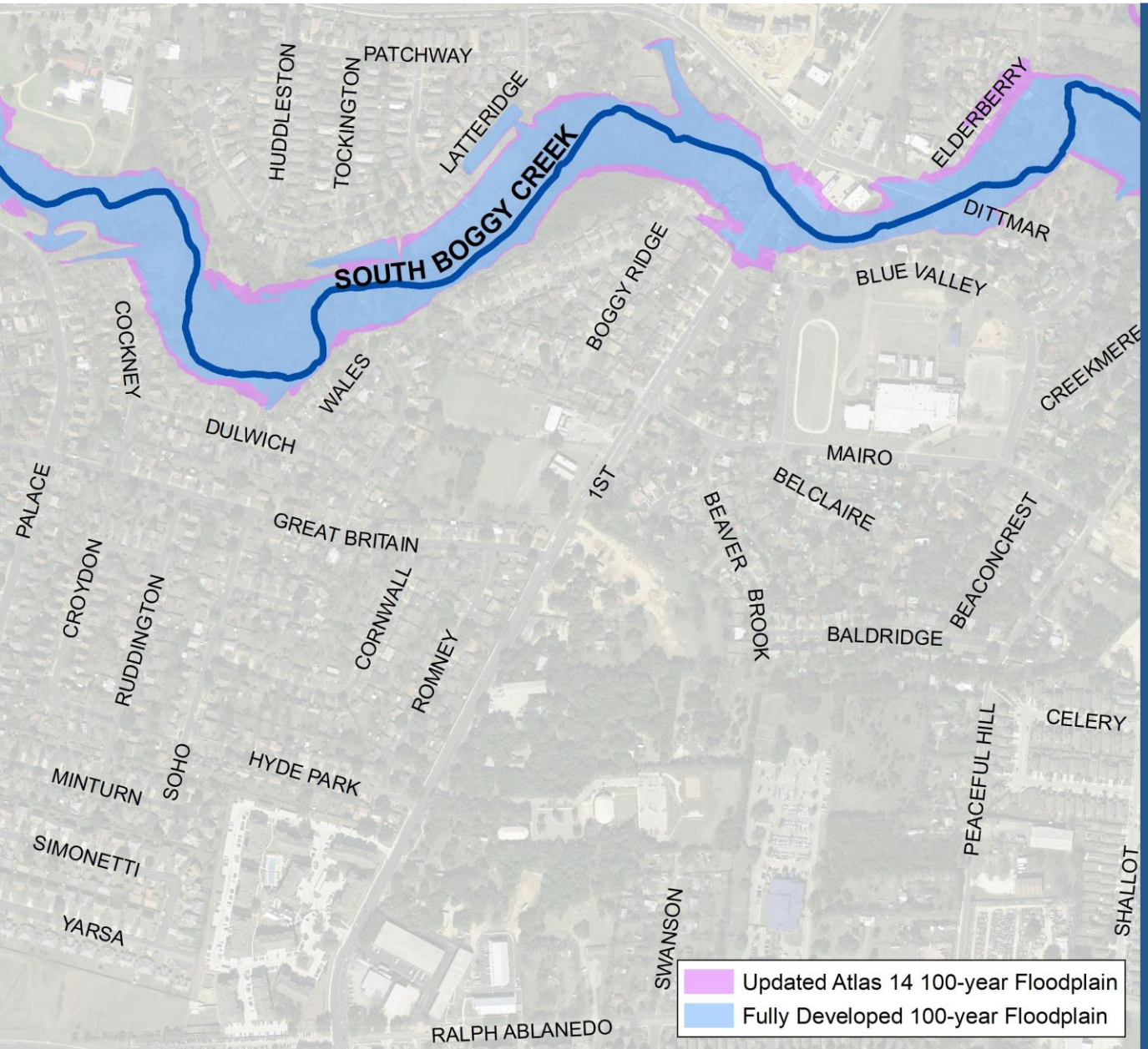




Austin's

Floodplains Will Expand

- More homes and businesses are at risk of flooding than previously thought.
- Affects ability to develop, remodel, or redevelop property.
- Affects the need for and the cost of flood insurance.
- Floodplains will need to be re-studied.
- See impacts at ATXfloodpro.com



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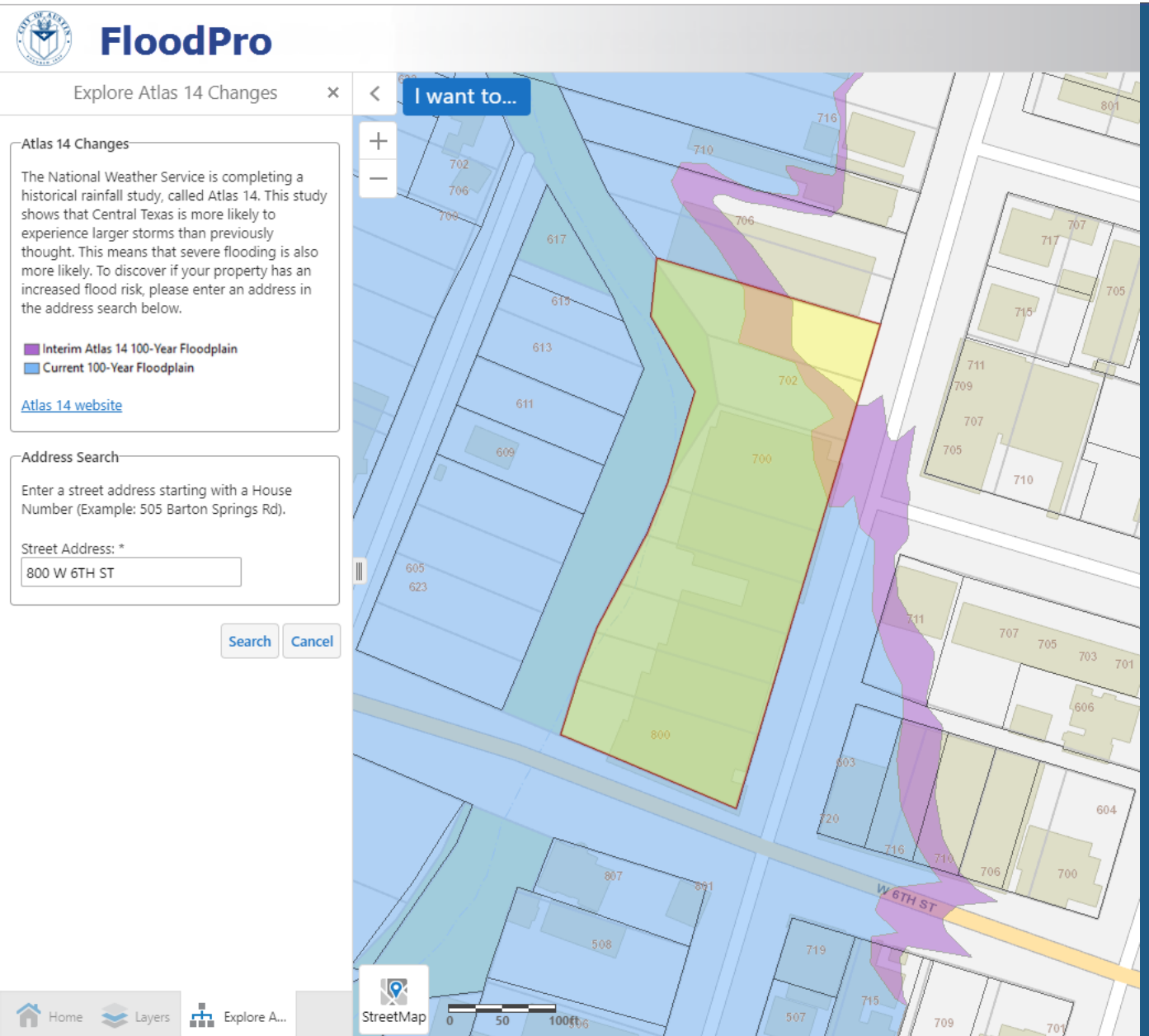


Using FloodPro

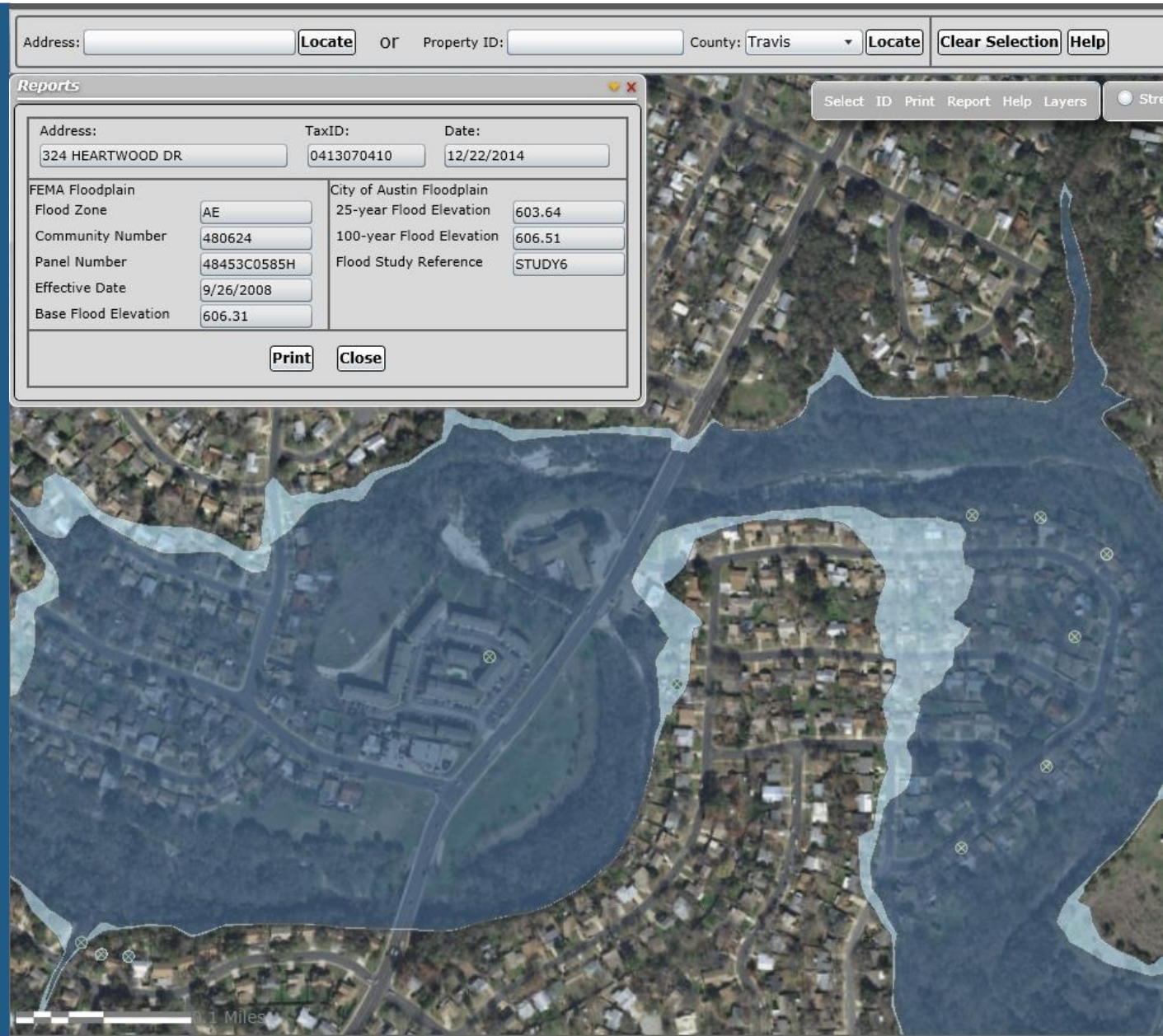
- Go to ATXfloodpro.com
- Click “I want to…”
- Click “Explore Atlas 14 Changes”
- Enter an address to search

Overview of

Flood Prevention Strategies

How do we ensure that ***new*** development minimizes its flood risk and the risk to others?

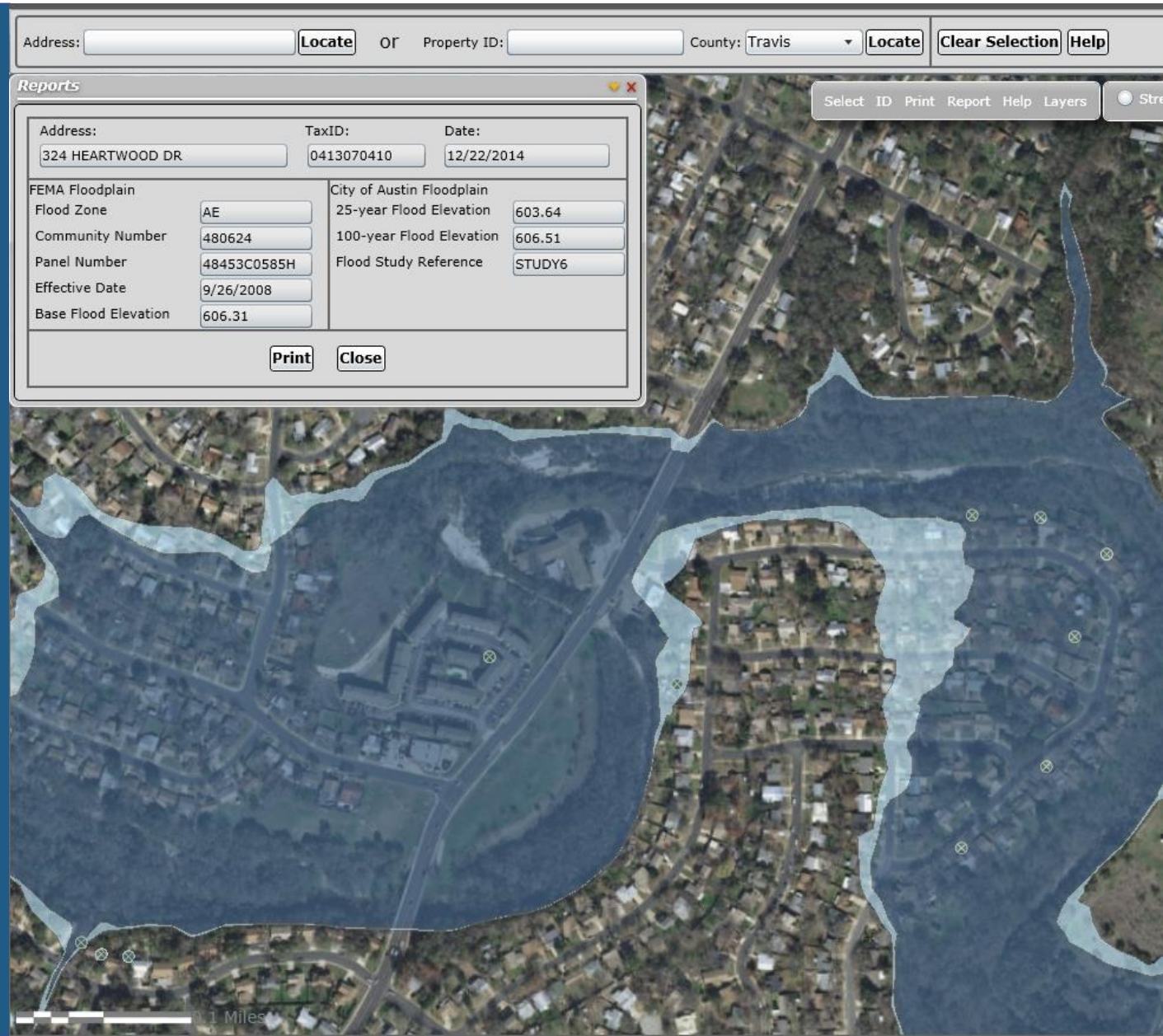
- Floodplain regulations
- Drainage regulations and criteria



Austin's

Floodplain Regulations

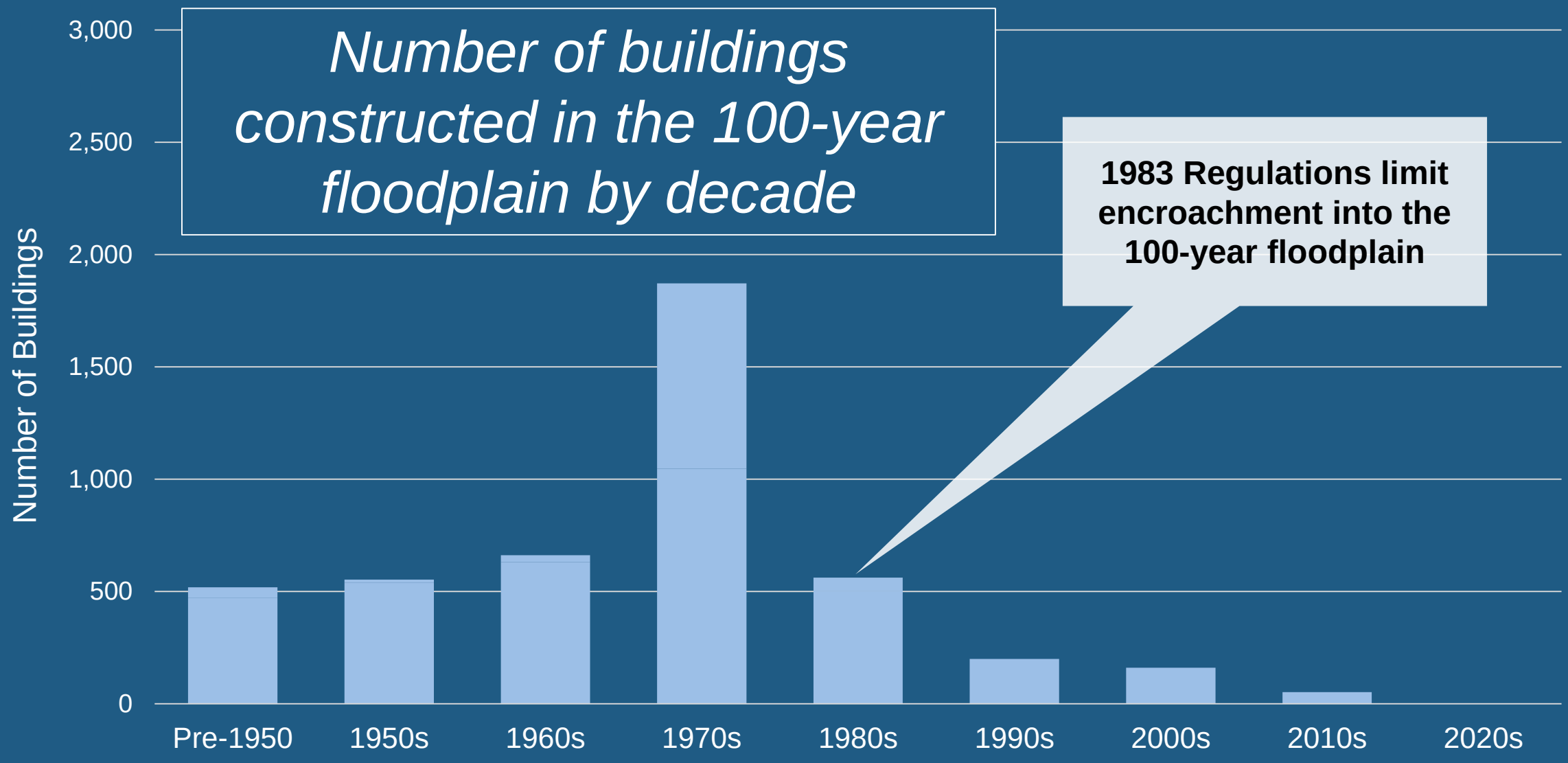
- No adverse impact
- Freeboard
- Safe access



City of Austin

Floodplain Regulation History

- 1975 – Entered FEMA emergency program; first floodplain maps and regulations
- 1983 – Entered full National Flood Insurance Program; updated maps and floodplain regulations
- 2003 – Amended regulations to include administrative variance process


Number of buildings constructed in the 100-year floodplain by decade
1983 Regulations limit encroachment into the 100-year floodplain
Number of Buildings
3,000
2,500
2,000
1,500
1,000
500
0
Pre-1950
1950s
1960s
1970s
1980s
1990s
2000s
2010s
2020s

Recommended Response

Step 1

Land Development Code amendments

Step 2

Drainage Criteria Manual revisions

Step 3

Floodplain Study and Mapping Updates

Step 1

Land Development Code amendments

- Revise floodplain definitions
- Create a redevelopment exception
- Expand the Colorado River exception
- Increase the freeboard requirement

Revise floodplain definitions

New 100-yr floodplain ==>> Current 500-yr floodplain

New 25-yr floodplain ==>> Current 100-yr floodplain

- Interim definitions until floodplains are re-mapped in 2 - 3 years
- No change to Colorado River floodplain

Storm Level	Current Rainfall Depth (24 hour storm)	Updated Rainfall Depth (24 hour storm)
25-year (4% chance)	7.6 inches	Up to 9 inches
100-year (1% chance)	10.2 inches	Up to 13+ inches
500-year (0.2% chance)	13.5 inches	Up to 19.5 inches

Revise floodplain definitions

New 100-yr floodplain ==>> Current 500-yr floodplain

New 25-yr floodplain ==>> Current 100-yr floodplain

- No change to Colorado River floodplain
- Interim definitions until floodplains are re-mapped in 2 - 3 years

Purpose

- Limit construction of new buildings in areas with known flood risk during re-mapping process
- Limit creating existing, non-conforming structures

Flood Risk Reduction Challenge

7,200 buildings in the 100-year floodplain

53* buildings with flood risk reduced each year

135+ years to reduce current risk

How can we increase the pace of flood risk reduction?

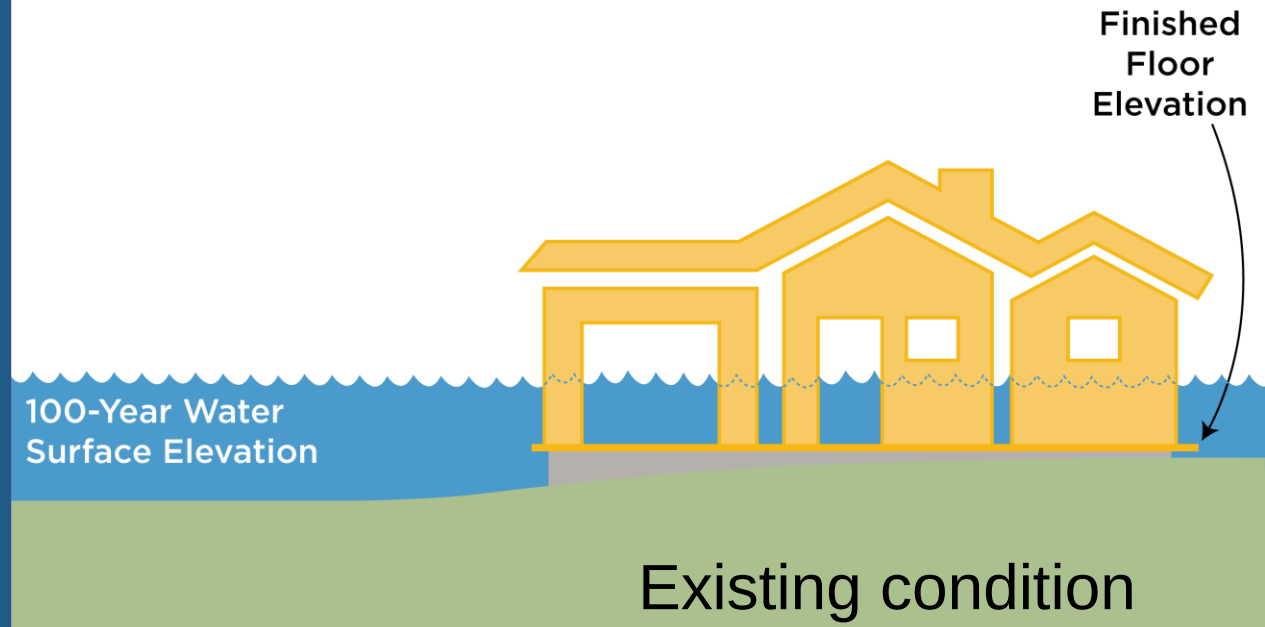
**Current 5 year forecast*

Create a redevelopment exception

Administrative approval process for a residential building in the floodplain if:

1. Replaces an existing residential building
2. Finished floor elevation is at least 2 feet above the 100-year floodplain
3. Does not increase number of dwelling units
4. No adverse flooding impact

If these 4 conditions are met, the safe access requirement is waived



Existing condition

Create a redevelopment exception

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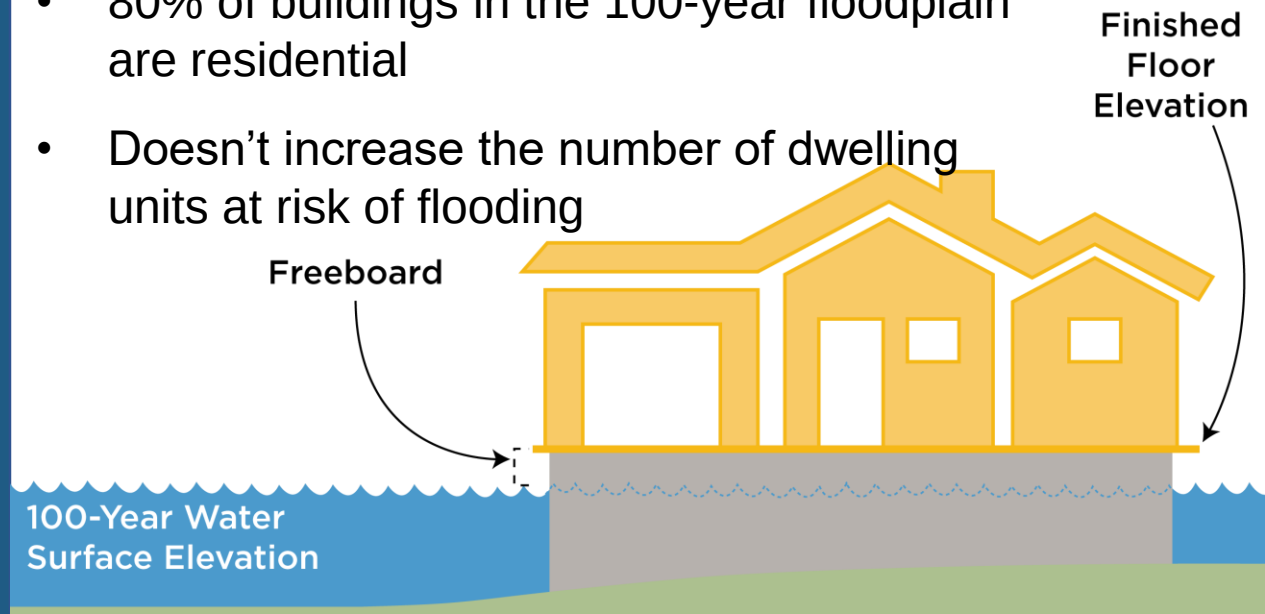
Purpose

- Incentivizes development that decreases flood risk
- 80% of buildings in the 100-year floodplain are residential
- Doesn't increase the number of dwelling units at risk of flooding



Re-developed condition

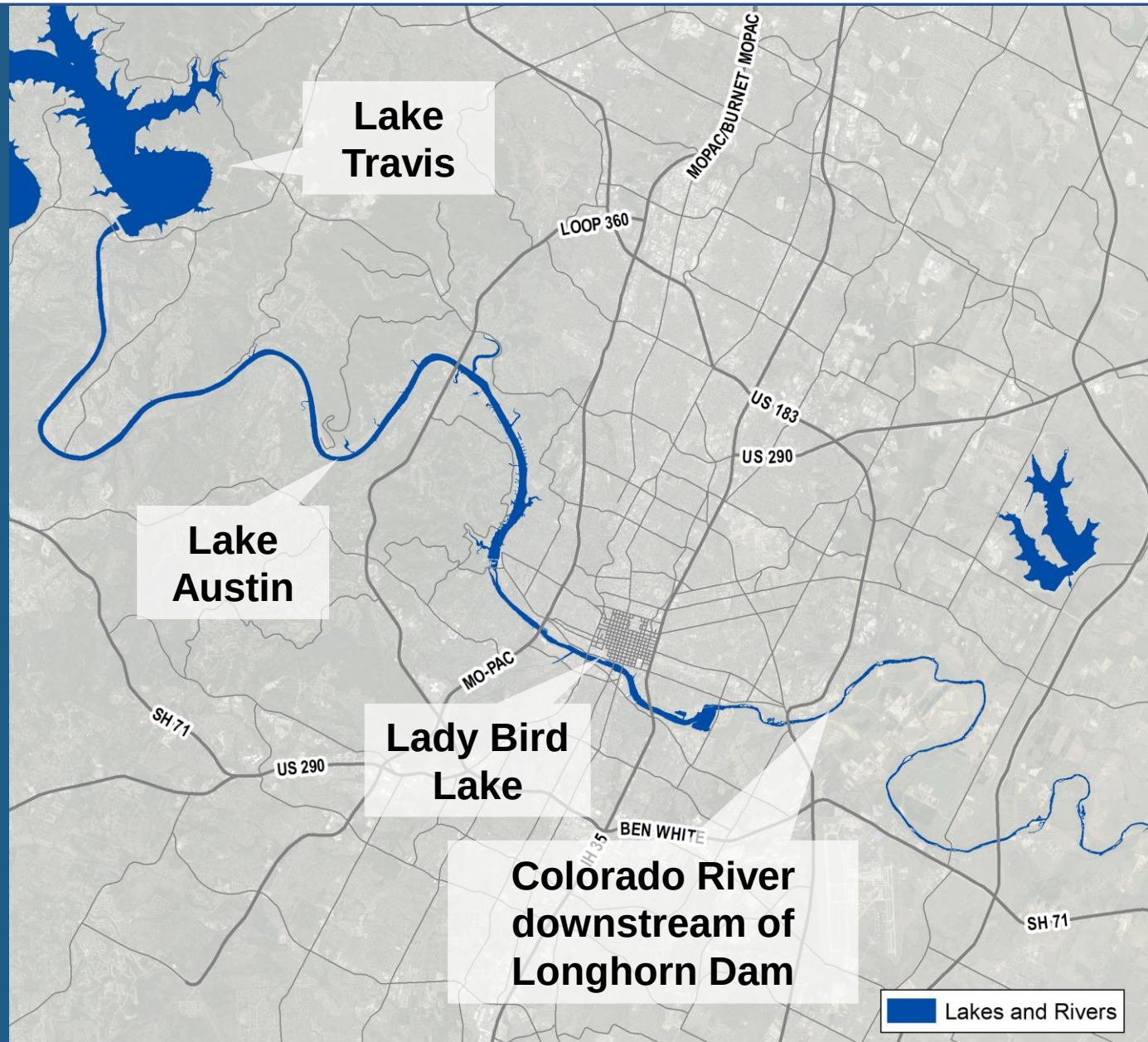
Expand the Colorado River exception

The existing exception allows for a building to encroach on the 100-year floodplain without safe access if it is:

- Downstream of Longhorn Dam
- Along Lady Bird Lake

WPD recommends expanding this exception to include:

- Lake Austin
- Lake Travis



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Purpose

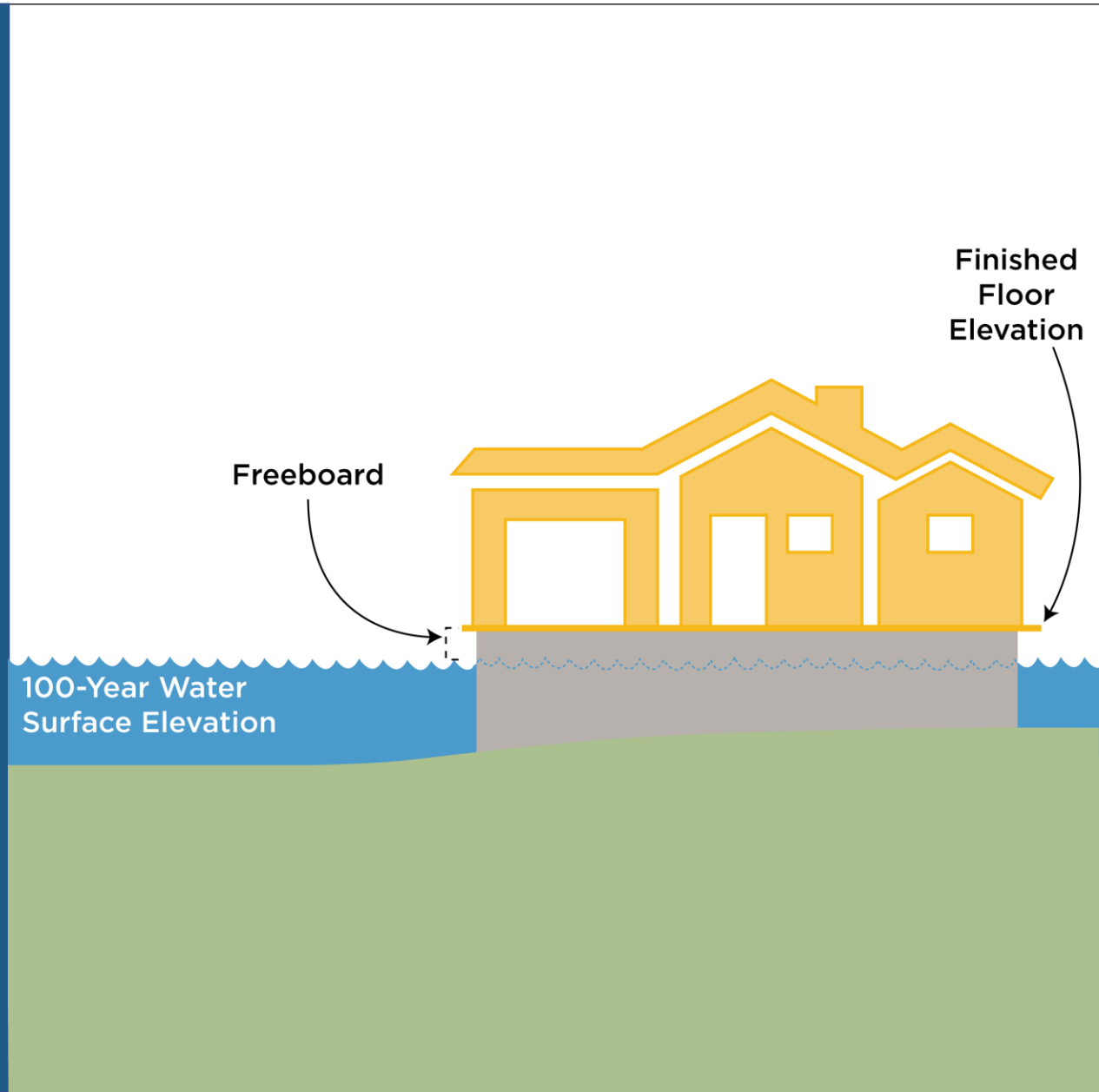
- Provide uniform regulations along Colorado River
- Colorado River flooding is not flash flooding like rest of City

Increase the freeboard requirement

Increase the minimum height between a building's finished floor and the 100-year floodplain from 1 ft to 2 ft

Purpose

- Freeboard is the single-most effective means for reducing flood risk to a building in the floodplain
- Reduce flood insurance premiums



Step 2 Drainage Criteria Manual revisions

- Atlas 14 updates rainfall rates that are used to determine:
  - Floodplain location
  - Size of storm drain pipes, inlets, and ditches
  - Detention pond size

Step 3 Floodplain Study and Mapping Updates

- Utilize consultants from rotation list to complete studies
- Process to take 2 - 3 years
- Once complete, will provide data to FEMA to update flood insurance maps

Next Steps

- **Currently –** WPD working on 2nd draft ordinance
- **Mid to late 2019 –** Public Hearings at Boards and Commissions and City Council
- **Late 2019 –** Drainage Criteria Manual updates (rules change process that includes stakeholder input)
- **2019 to 2021 –** Re-mapping of Austin floodplains
- **2022 –** FEMA map updates

Follow our progress

AustinTexas.gov/atlas14

Contact us

Atlas14@AustinTexas.gov

Floodplain Hotline 512-974-2843

View floodplains

ATXfloodpro.com