



CLEVELAND HEIGHTS

**Council Committee of the Whole
August 11, 2025
6:30 PM
City Hall – Council Chambers**

Agenda

- 1) Call to Order/Roll Call**
- 2) Charter Review Workshop**
Intro to Charter Amendments and Timeline for Next Steps
- 3) Resolution of Support for CHPD**
- 4) Joint Work Session with Shaker Heights City Council and Northeast Ohio Regional Sewer District (7:00 PM)**
 - a. Zoom Link:
This meeting is being held in person with an option to join the Zoom meeting online as a viewer or listener during the meeting from a PC, Mac, iPad, iPhone or Android device at <https://us06web.zoom.us/j/89308468178?pwd=LAXJIDCwQHgdKHH3ZGVvF-MTRGpJFh2p.thT9txT8yCetVRNi>, Password: 33553400; Description: Council Meeting; or join by phone at 833-548-0282 (toll free); Webinar ID: 893 0846 8178, Password: 33553400. International numbers available at <https://zoom.us/u/ahwKbeuA>.
Closed captioning is available but Zoom attendees must [turn on this feature](#) in their Zoom settings.
 - b. NEORSD Presentation
- 5) Other**
- 6) Adjourn**



**Northeast Ohio
Regional Sewer District**

Lower Lake Dam Recommendation

Agenda

- Update on Doan Brook Restoration at Horseshoe Park
- Doan Brook watershed challenges
- 2021 Stormwater Masterplan recommendations
- Updated information and analysis
- 2025 revised recommendation for Lower Lake Dam
- Costs and next steps



Regional Stormwater Management Program

Programmatic Purpose

Reduce flooding, streambank erosion & improve water quality



Doan Brook Restoration at Horseshoe Park

- 100% design plans submitted, moving through approvals
- Construction to start in early 2026
- Project includes plantings, trails, nature play area, sensory garden, outdoor classroom, overlooks
- Estimated Construction Costs:
 - NEORSD: \$23,964,782
 - Cities: \$7,198,110



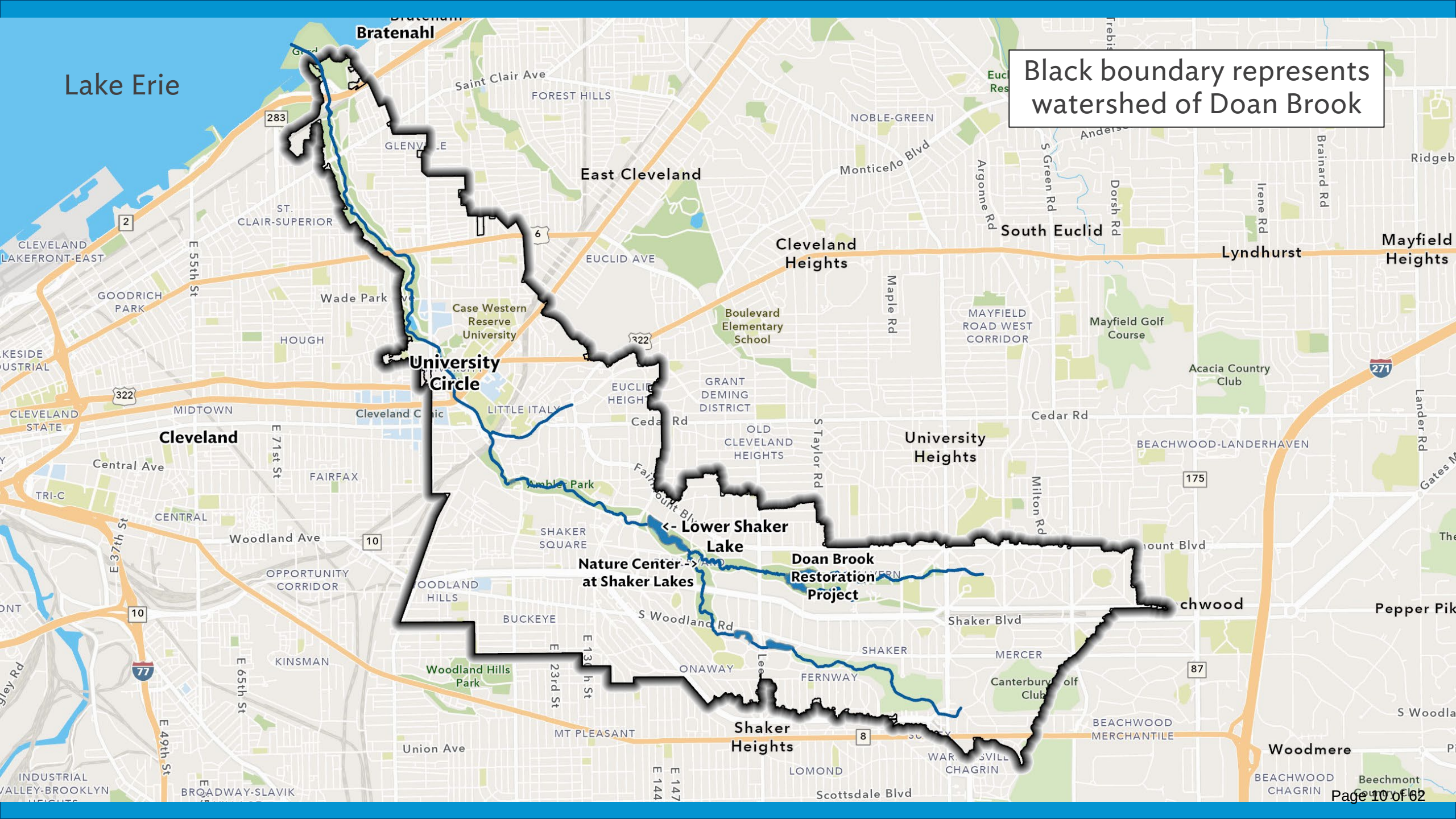




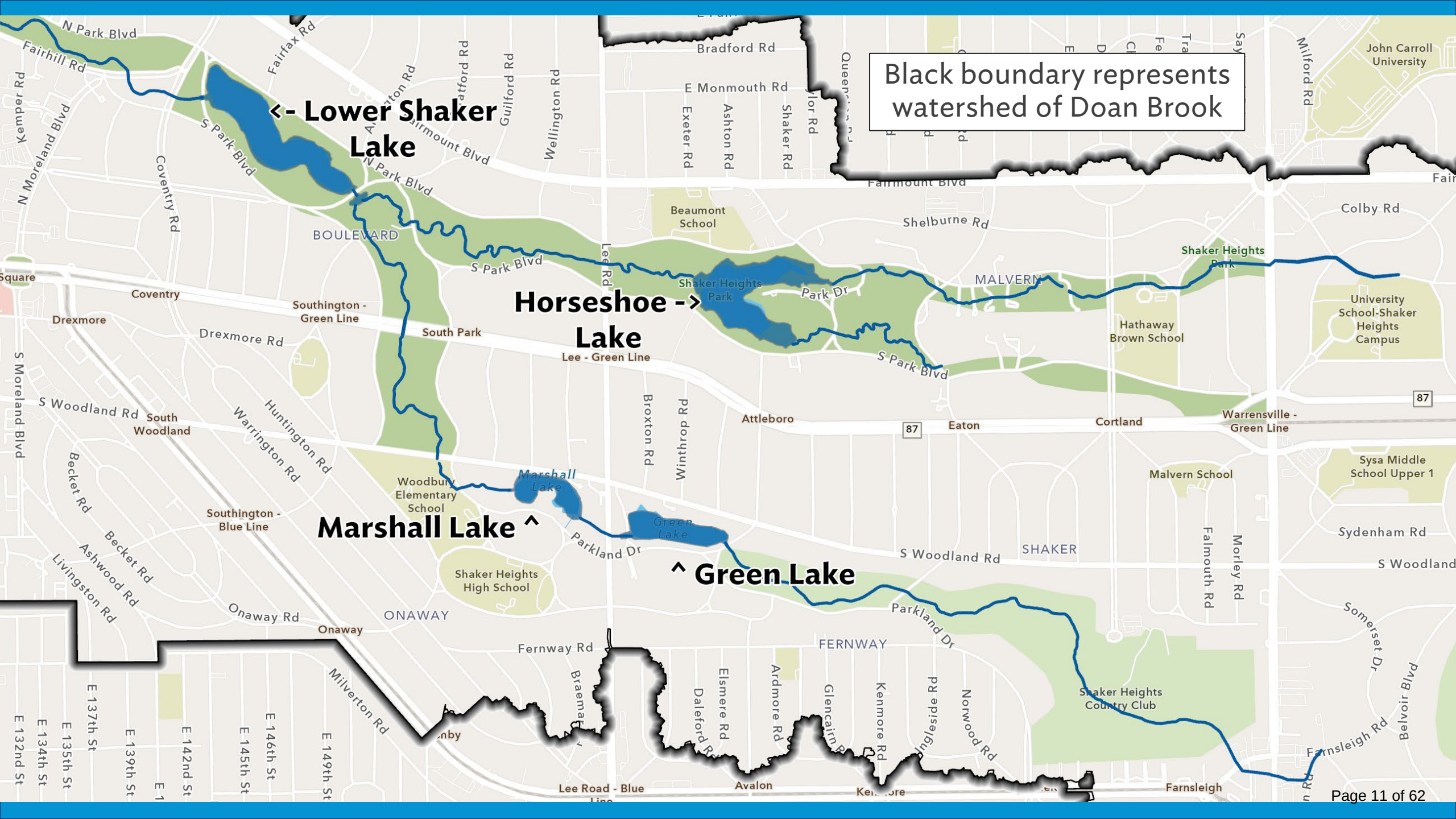
Doan Brook Watershed Concerns

- Lower Shaker Lake Class I dam is out of compliance
- Flooding in University Circle and at Lower Lake





Black boundary represents watershed of Doan Brook



Black boundary represents watershed of Doan Brook

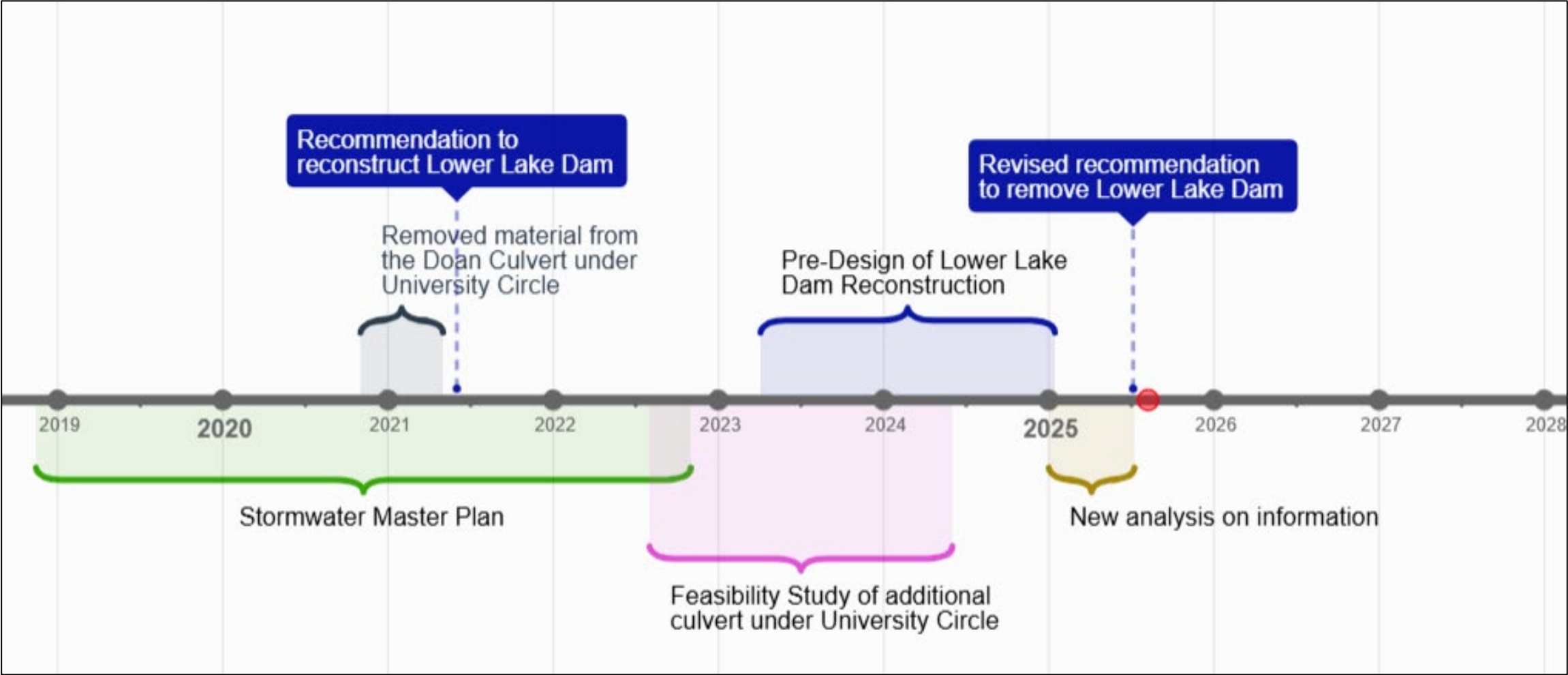
← Lower Shaker Lake

Horseshoe → Lake

Marshall Lake ^

^ Green Lake

Timeline on Lower Lake Dam



Lower Lake Class I Dam: Roles and Responsibilities*

- **Ohio Department of Natural Resources (ODNR):**
Assess, enforce State of Ohio dam compliance

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- **Shaker Heights and Cleveland Heights:** Dam operators;
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Assess, enforce State of Ohio dam compliance
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- **City of Cleveland:** Property owner; long-term lease to
Cities of Shaker Heights and Cleveland Heights



Lower Lake Class I Dam: Roles and Responsibilities*

- **Ohio Department of Natural Resources (ODNR):**
Assess, enforce State of Ohio dam compliance
- **Shaker Heights and Cleveland Heights:** Dam operators;
responsible to comply with ODNR standards
- **City of Cleveland:** Property owner; long-term lease to
Cities of Shaker Heights and Cleveland Heights
- **NEORSD:** Regional Stormwater Management Program



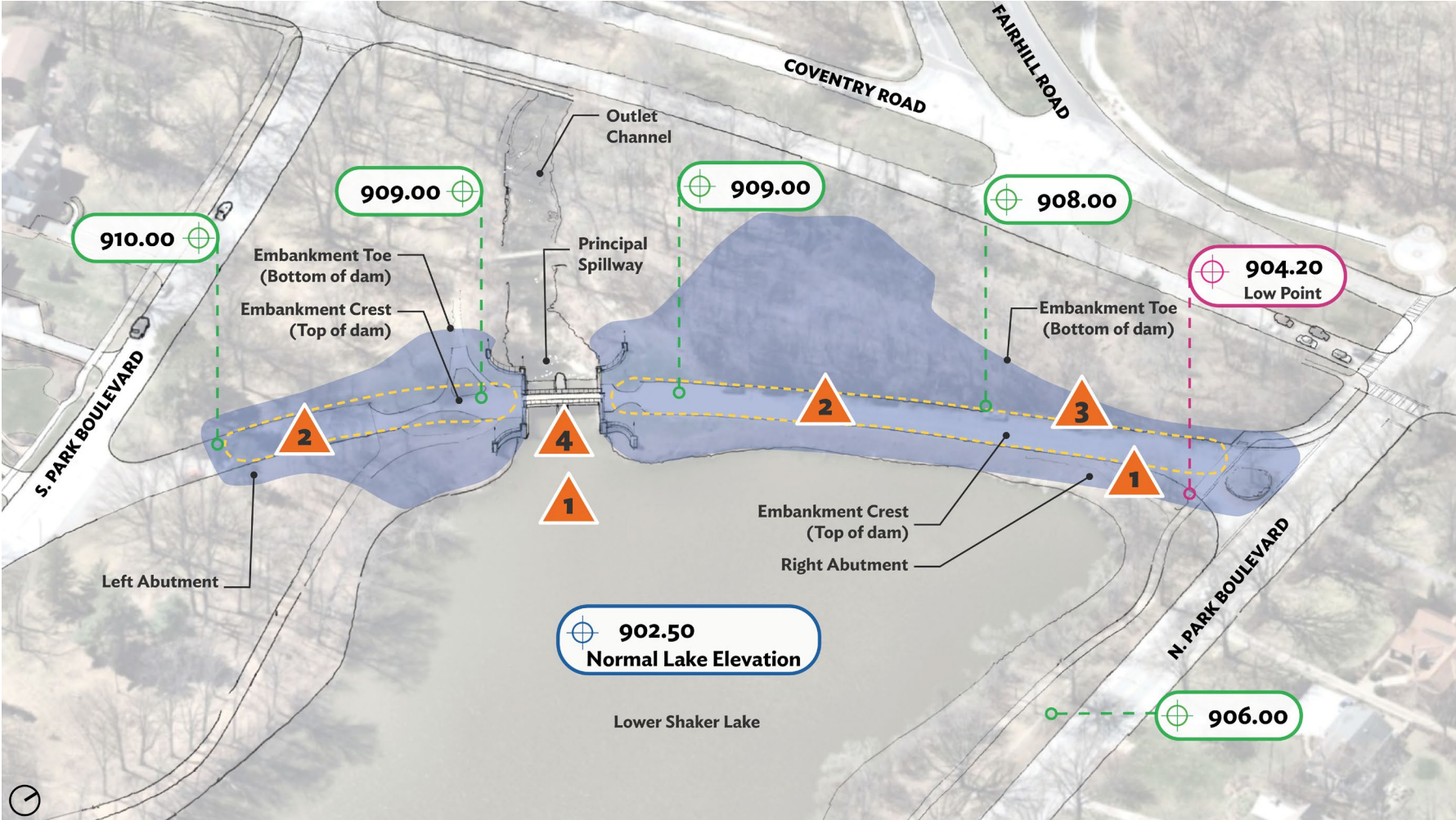
Lower Lake Class I Dam

Status – Non-compliance with State Regulations, ODNR Class I High Hazard Dam

- Not built to modern engineering standards
- Failure would result in probable loss of life and property damage
- Cannot pass Probable Maximum Flood
- Must reconstruct or remove, per ODNR



Lower Lake Class I Dam Safety Deficiencies*

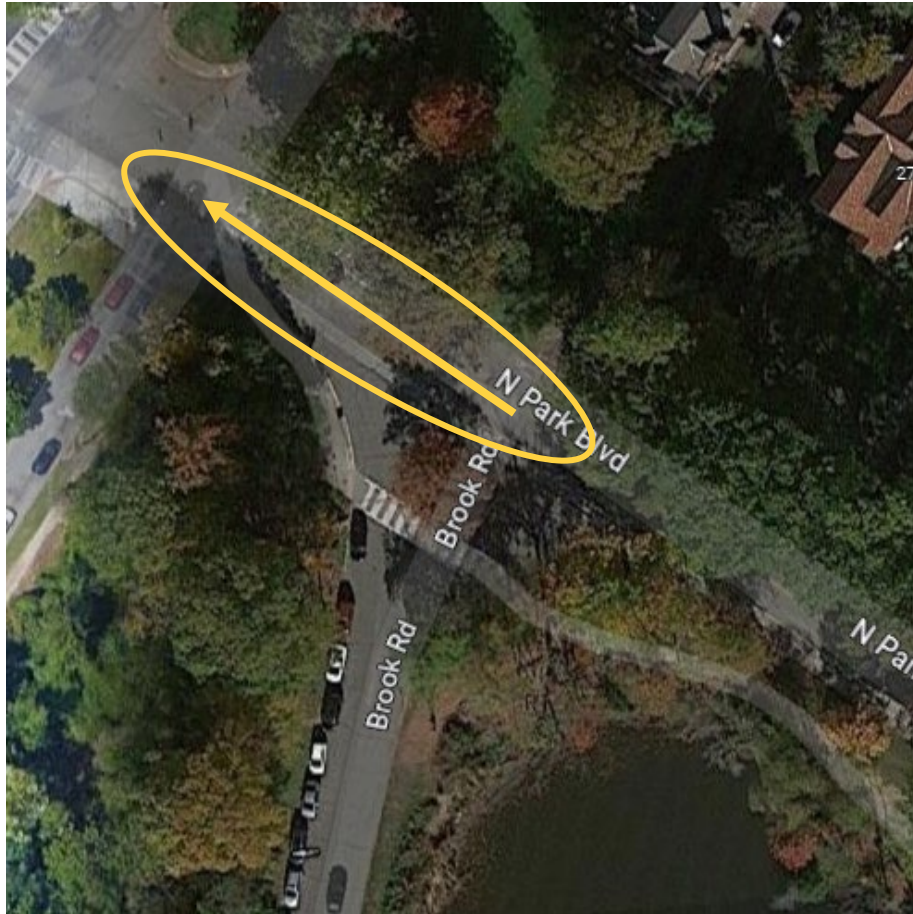


Dam Safety Deficiencies

- 1** Inadequate Spillway Capacity
- 2** Inadequate Embankment Protection & Uneven Crest Elevation
- 3** Inadequate Embankment Stability/Seepage
- 4** Inadequate Masonry Spillway Stability

Embankment Limits

Flooding at Lower Lake, North Park Overtops July 17, 2021*



S1: Existing without Horseshoe Dam 1-yr inundation

2-Dimensional Mesh Stormwater Modeling

Uses a grid-like structure to simulate how stormwater flows across a surface, accounting for two-dimensional flow patterns



S1: Existing without Horseshoe Dam 1-yr to 2-yr inundation

2-Dimensional Mesh Stormwater Modeling

Uses a grid-like structure to simulate how stormwater flows across a surface, accounting for two-dimensional flow patterns



S1: Existing without Horseshoe Dam 1-yr to 5-yr inundation

2-Dimensional Mesh Stormwater Modeling

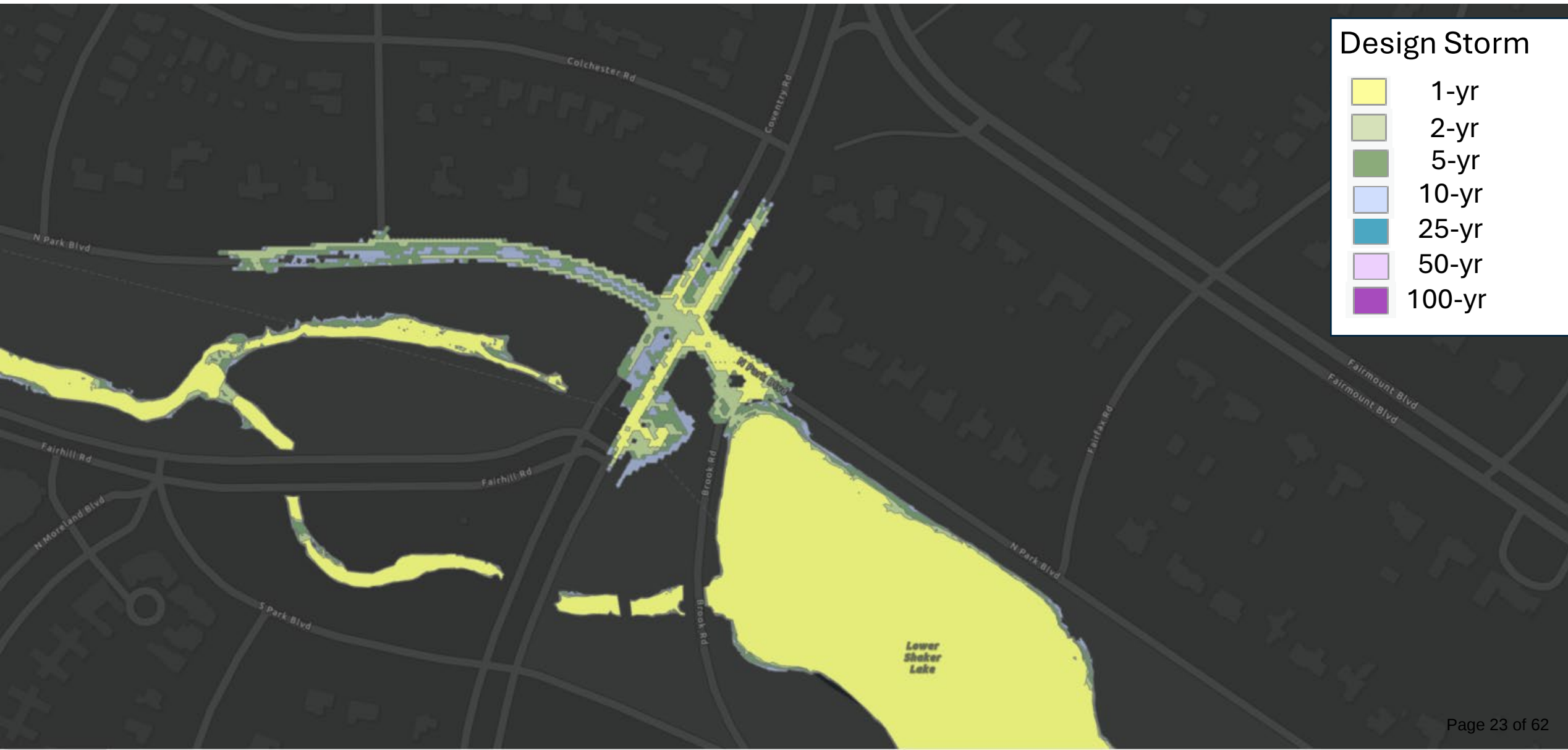
Uses a grid-like structure to simulate how stormwater flows across a surface, accounting for two-dimensional flow patterns



S1: Existing without Horseshoe Dam 1-yr to 10-yr inundation

2-Dimensional Mesh Stormwater Modeling

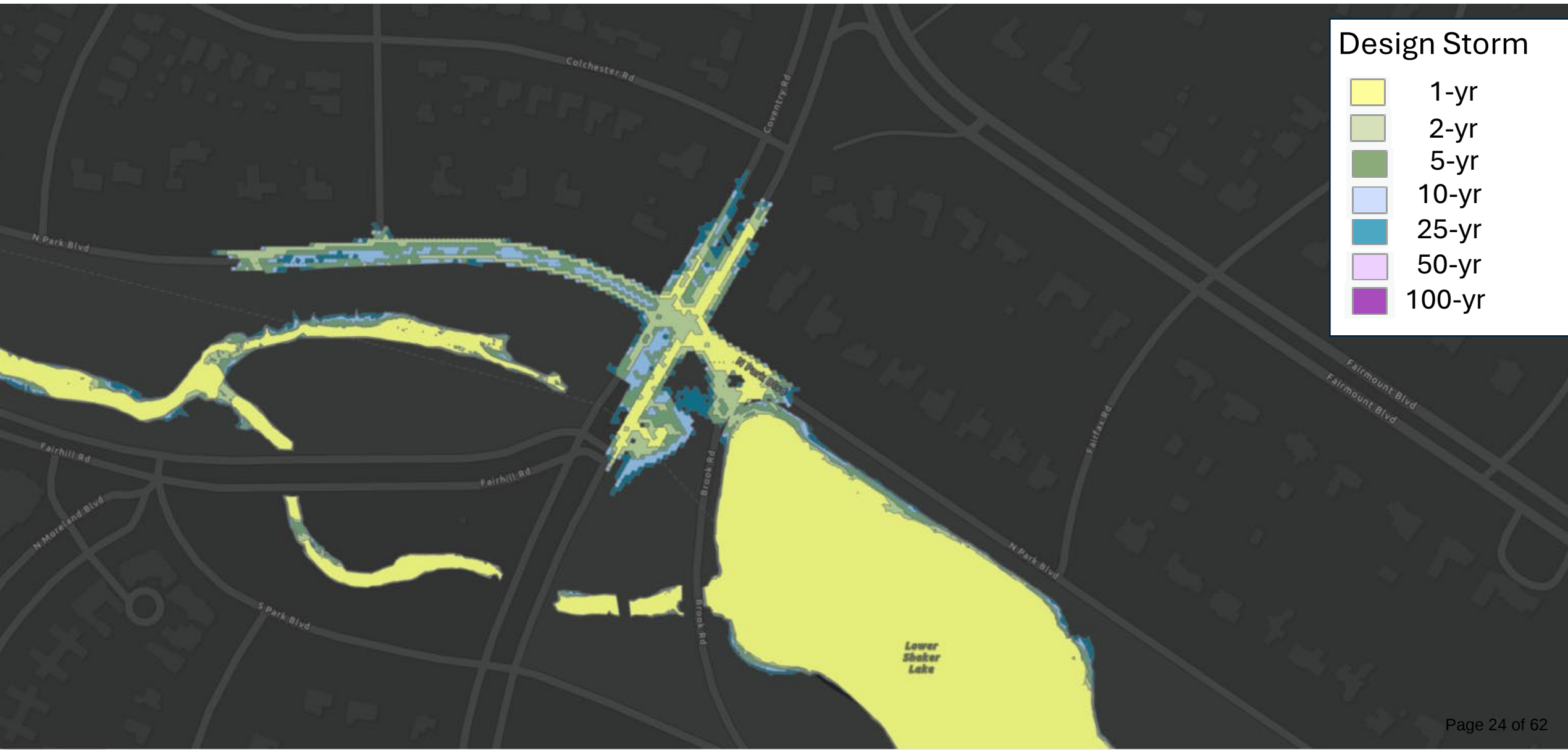
Uses a grid-like structure to simulate how stormwater flows across a surface, accounting for two-dimensional flow patterns



S1: Existing without Horseshoe Dam 1-yr to 25-yr inundation

2-Dimensional Mesh Stormwater Modeling

Uses a grid-like structure to simulate how stormwater flows across a surface, accounting for two-dimensional flow patterns



S1: Existing without Horseshoe Dam 1-yr to 50-yr inundation

2-Dimensional Mesh Stormwater Modeling

Uses a grid-like structure to simulate how stormwater flows across a surface, accounting for two-dimensional flow patterns



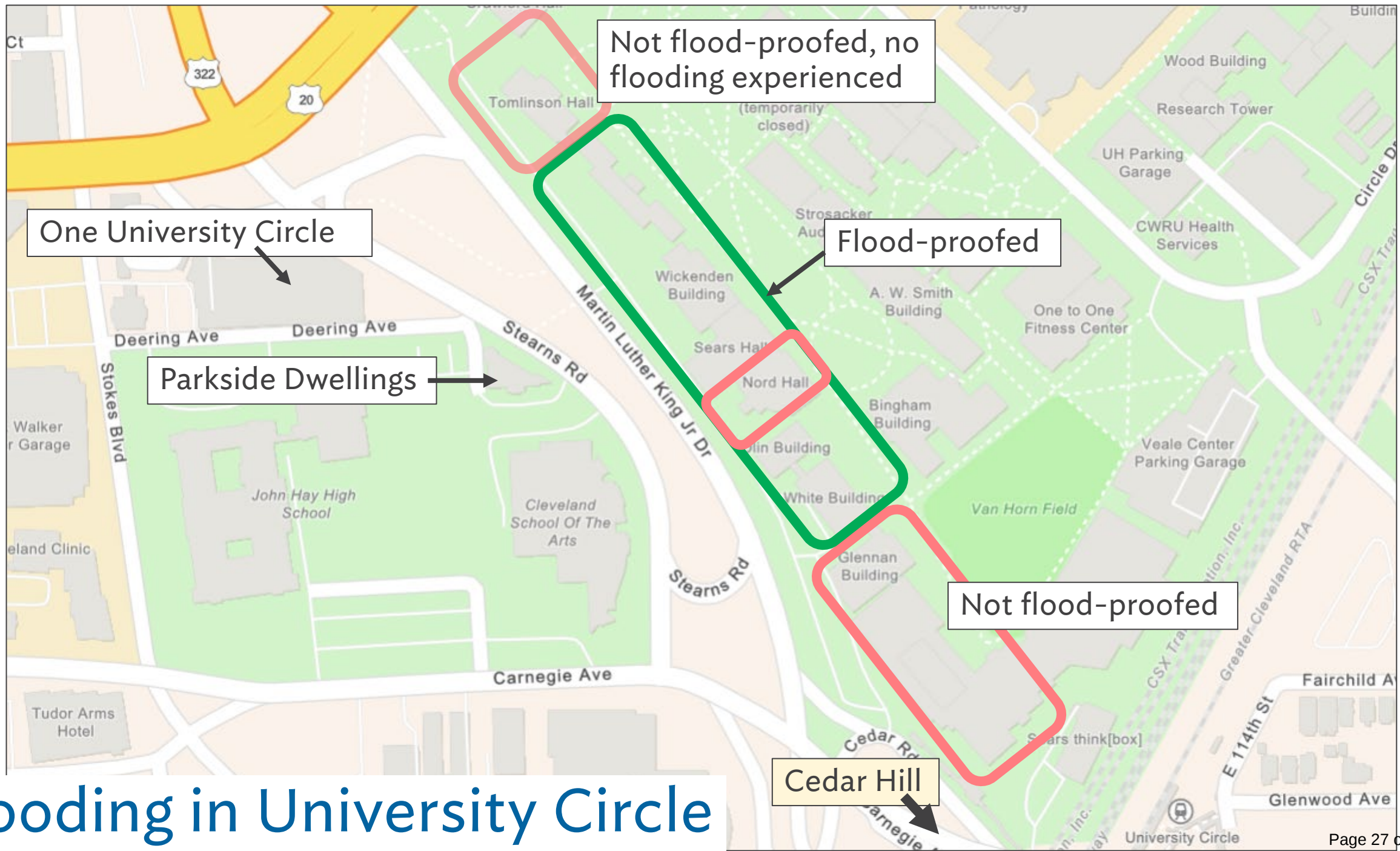
S1: Existing without Horseshoe Dam 1-yr to 100-yr inundation

2-Dimensional Mesh Stormwater Modeling

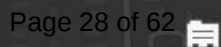
Uses a grid-like structure to simulate how stormwater flows across a surface, accounting for two-dimensional flow patterns



Flooding in University Circle



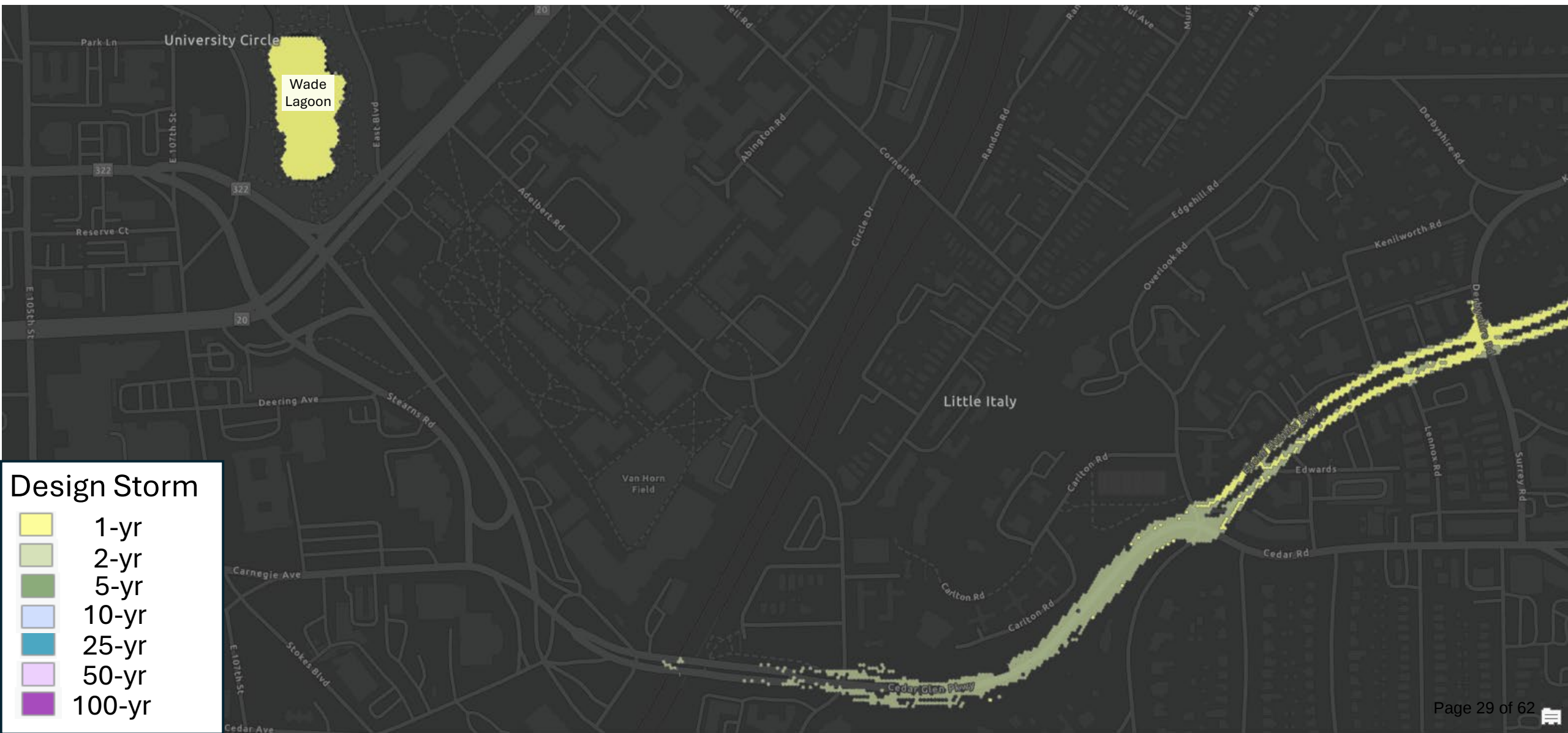
Uses a grid-like structure to simulate how stormwater flows across a surface, accounting for two-dimensional flow patterns



S1: Existing, current conditions without Horseshoe Dam
2-yr inundation (2.3" 24-hrs)

2-Dimensional Mesh Stormwater Modeling

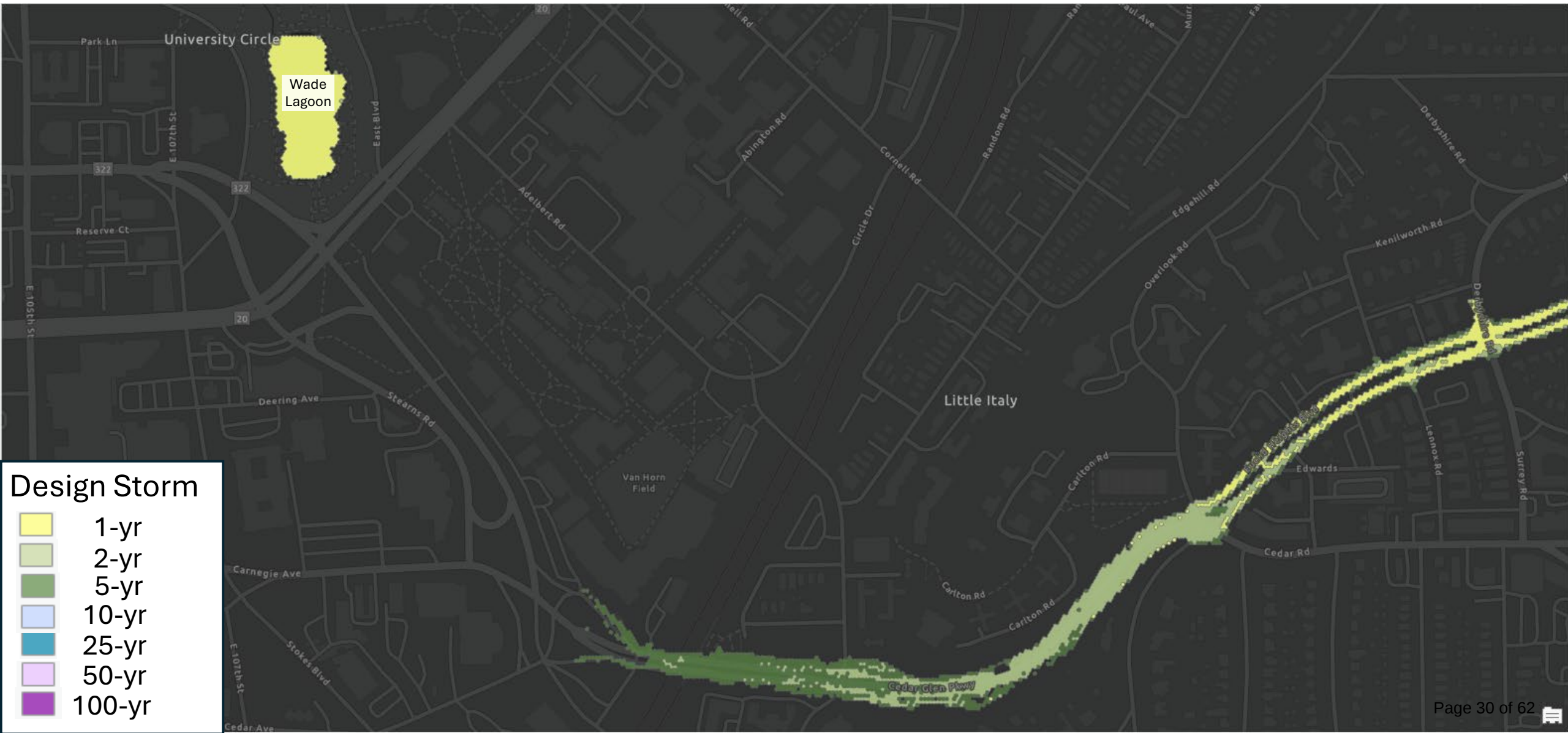
Uses a grid-like structure to simulate how stormwater flows across a surface, accounting for two-dimensional flow patterns



S1: Existing, current conditions without Horseshoe Dam
5-yr inundation (2.9" 24-hrs.)

2-Dimensional Mesh Stormwater Modeling

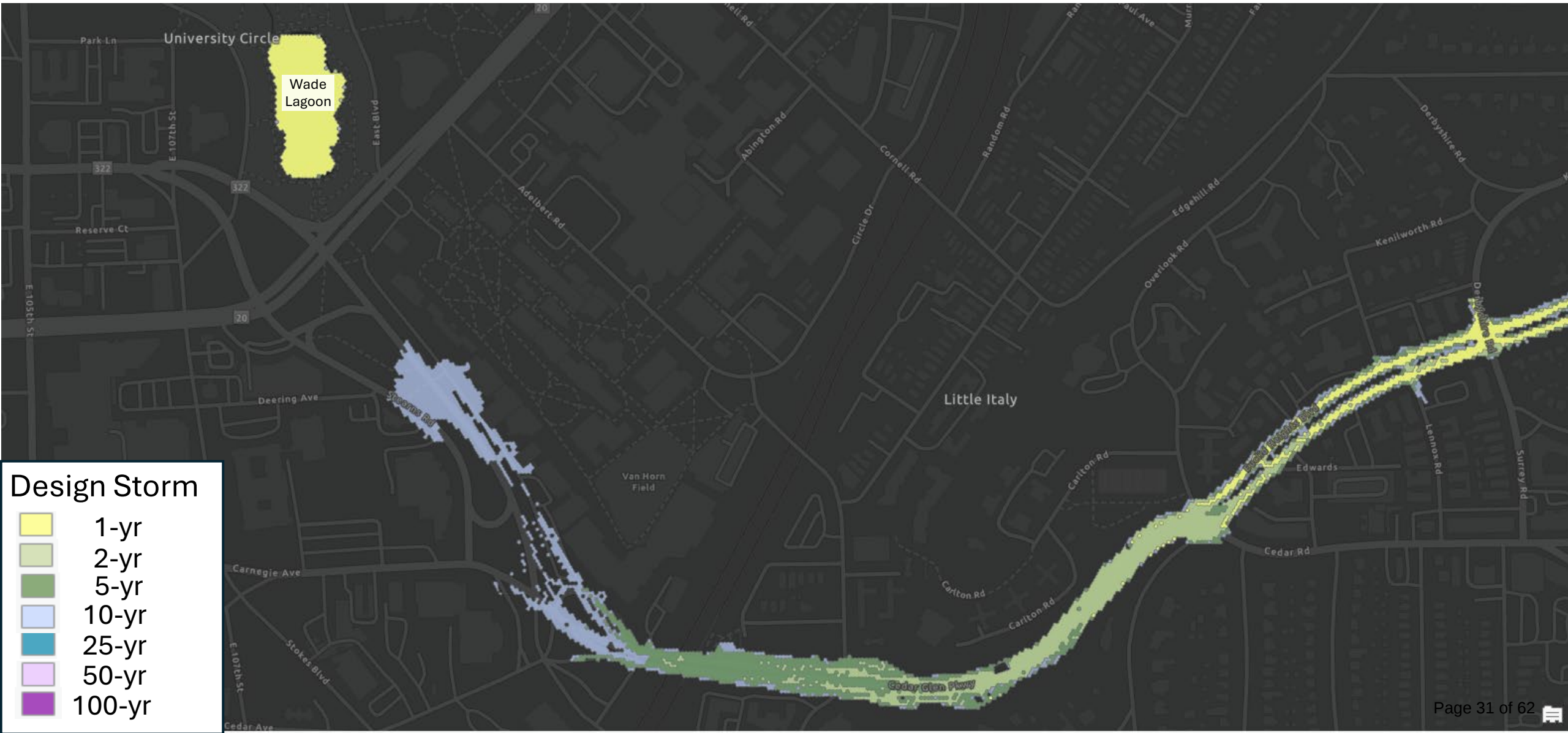
Uses a grid-like structure to simulate how stormwater flows across a surface, accounting for two-dimensional flow patterns



S1: Existing, current conditions without Horseshoe Dam
10-yr inundation (3.4" 24-hrs.)

2-Dimensional Mesh Stormwater Modeling

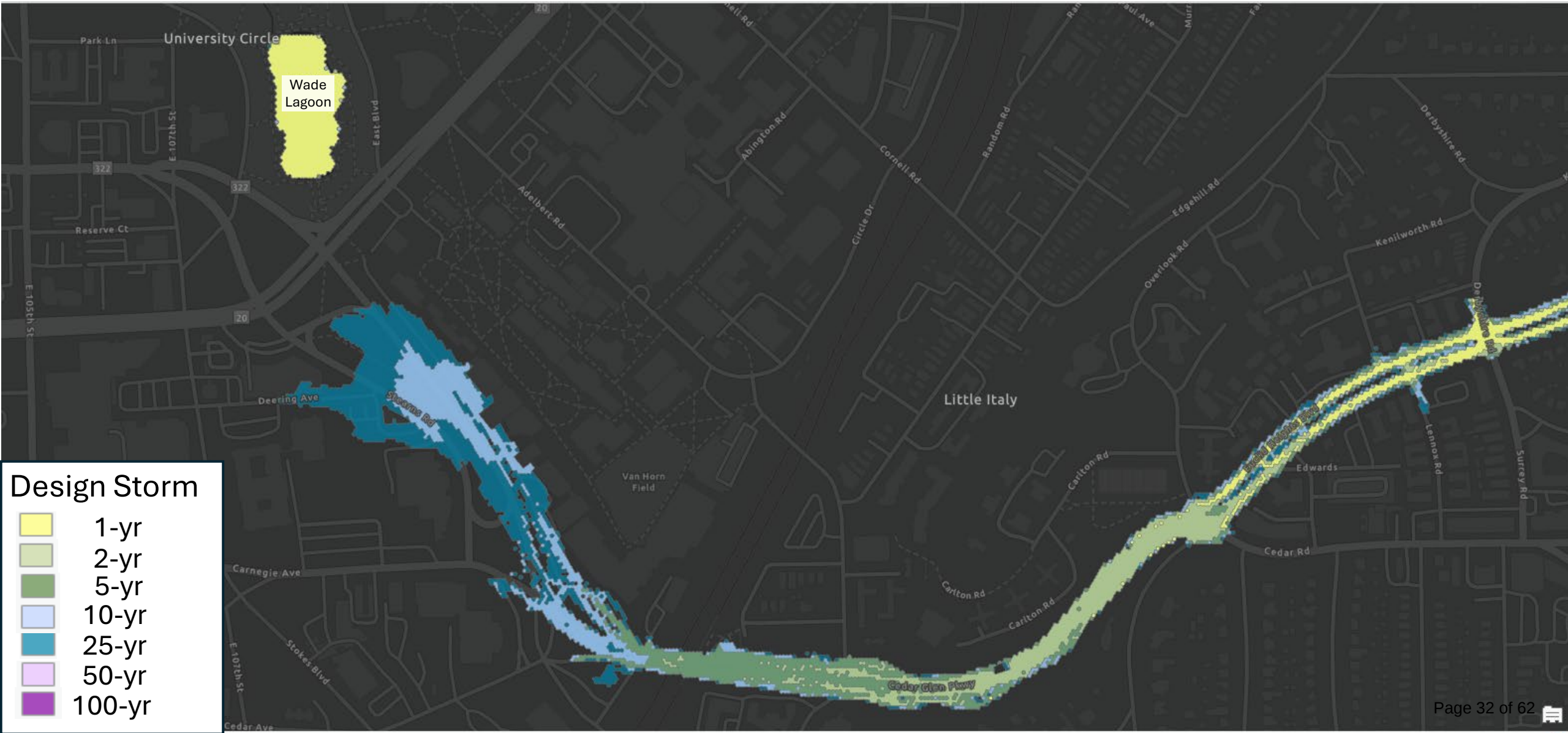
Uses a grid-like structure to simulate how stormwater flows across a surface, accounting for two-dimensional flow patterns



S1: Existing, current conditions without Horseshoe Dam
25-yr inundation (4.1" 24-hrs.)

2-Dimensional Mesh Stormwater Modeling

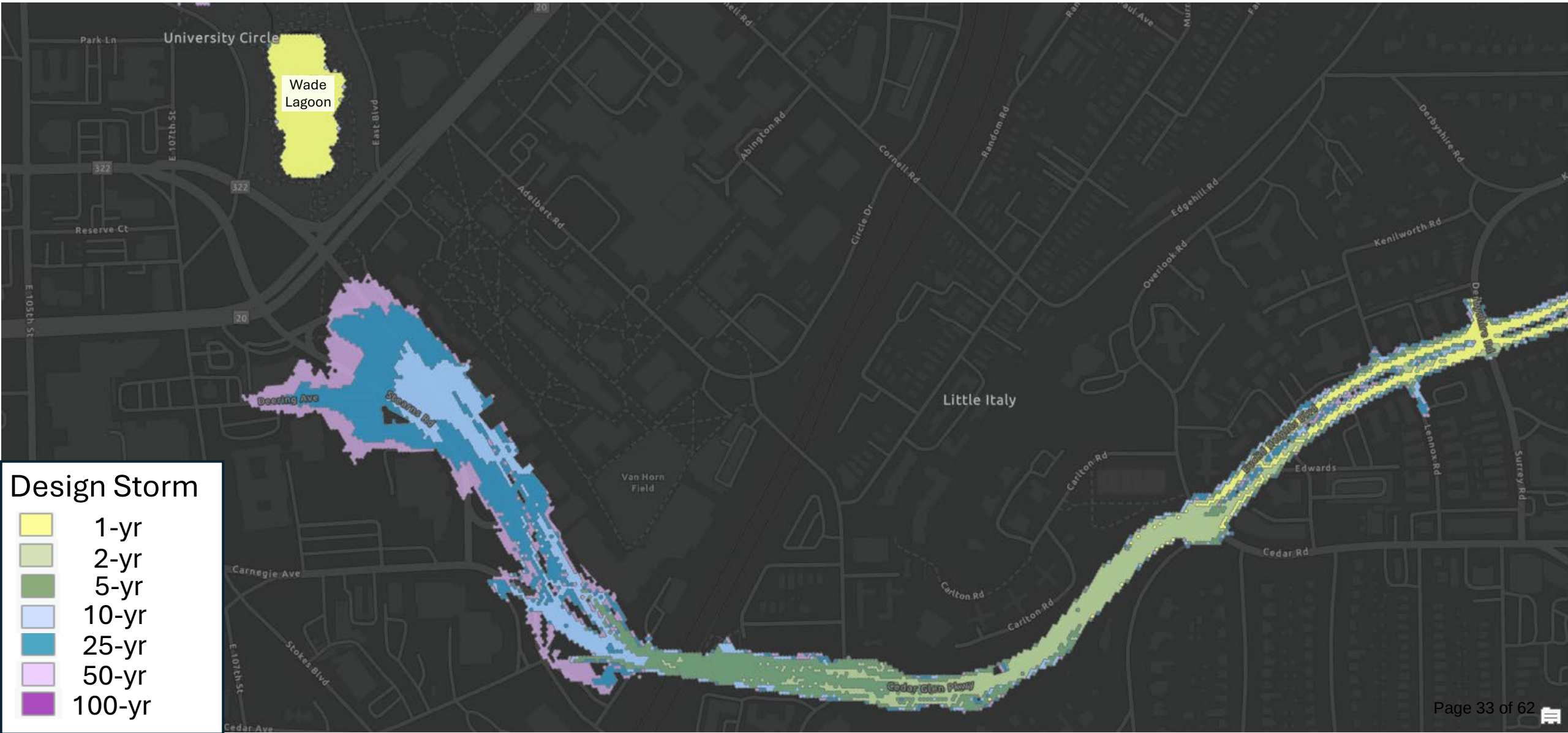
Uses a grid-like structure to simulate how stormwater flows across a surface, accounting for two-dimensional flow patterns



S1: Existing, current conditions without Horseshoe Dam
50-yr inundation (4.6” 24-hrs.)

2-Dimensional Mesh Stormwater Modeling

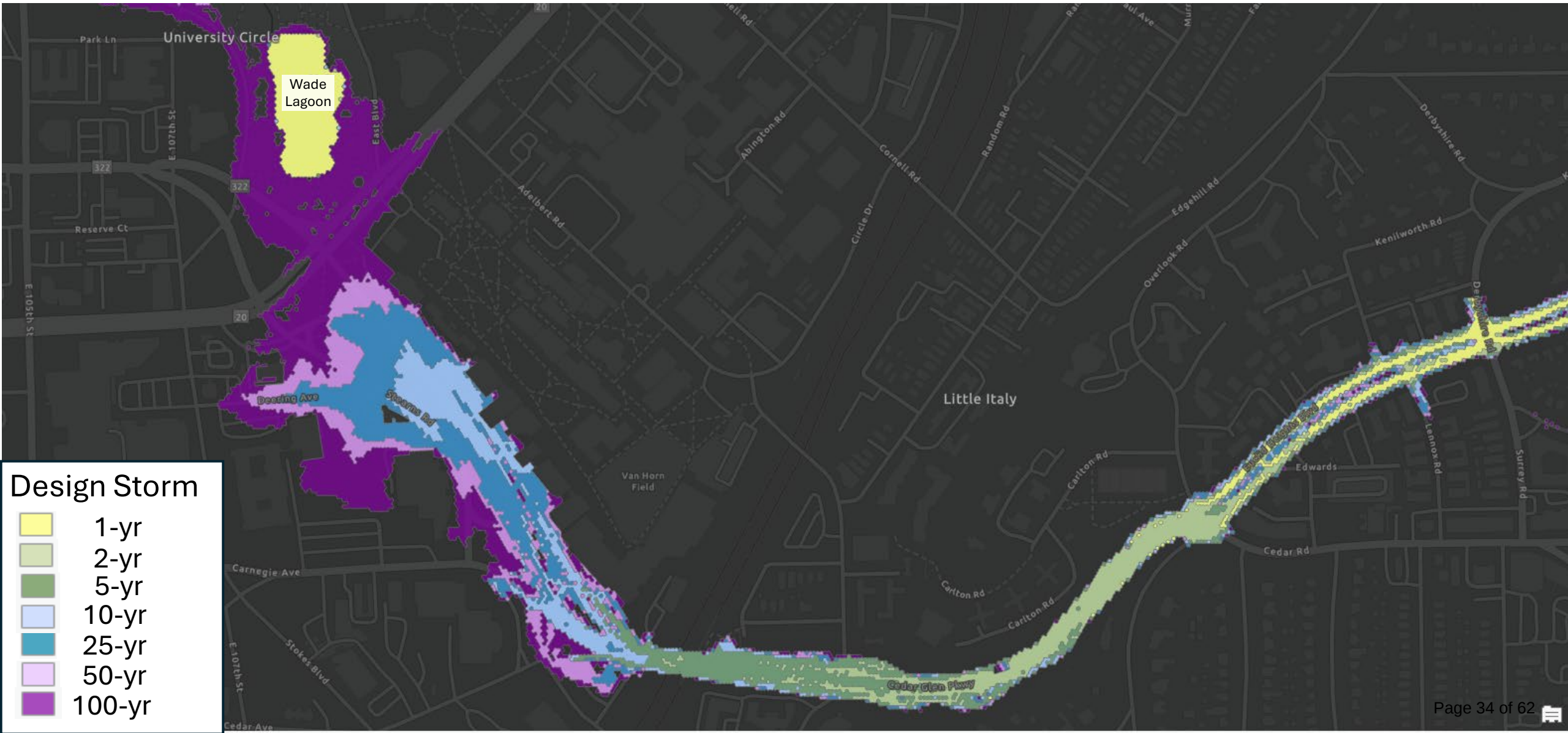
Uses a grid-like structure to simulate how stormwater flows across a surface, accounting for two-dimensional flow patterns



S1: Existing, current conditions without Horseshoe Dam
100-yr inundation (5.2” 24-hrs.)

2-Dimensional Mesh Stormwater Modeling

Uses a grid-like structure to simulate how stormwater flows across a surface, accounting for two-dimensional flow patterns



Lower Shaker Lake Dam

- District began pre-design in 2023 on Lower Lake Dam Reconstruction

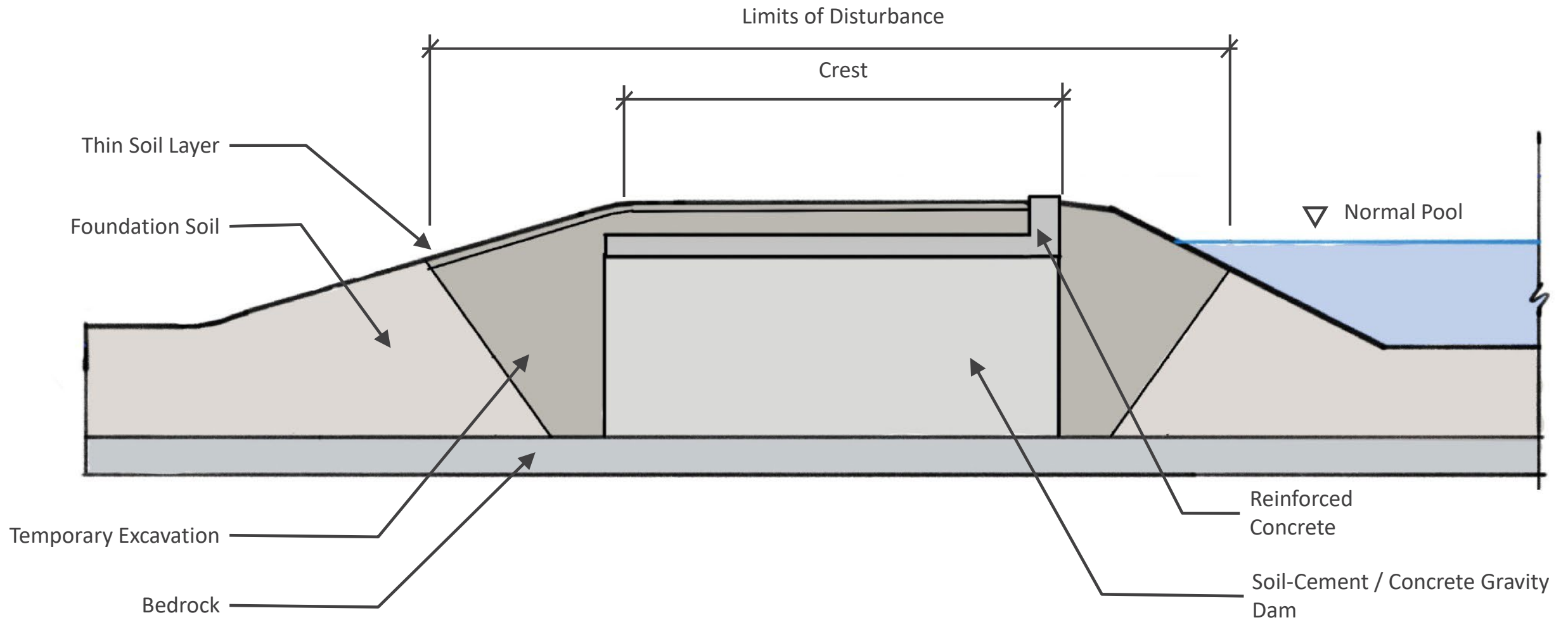


Lower Shaker Lake Dam

- District began pre-design in 2023 on Lower Lake Dam Reconstruction
- New design features to meet standards:
 - Concrete gravity dam



Concrete Gravity Dam*



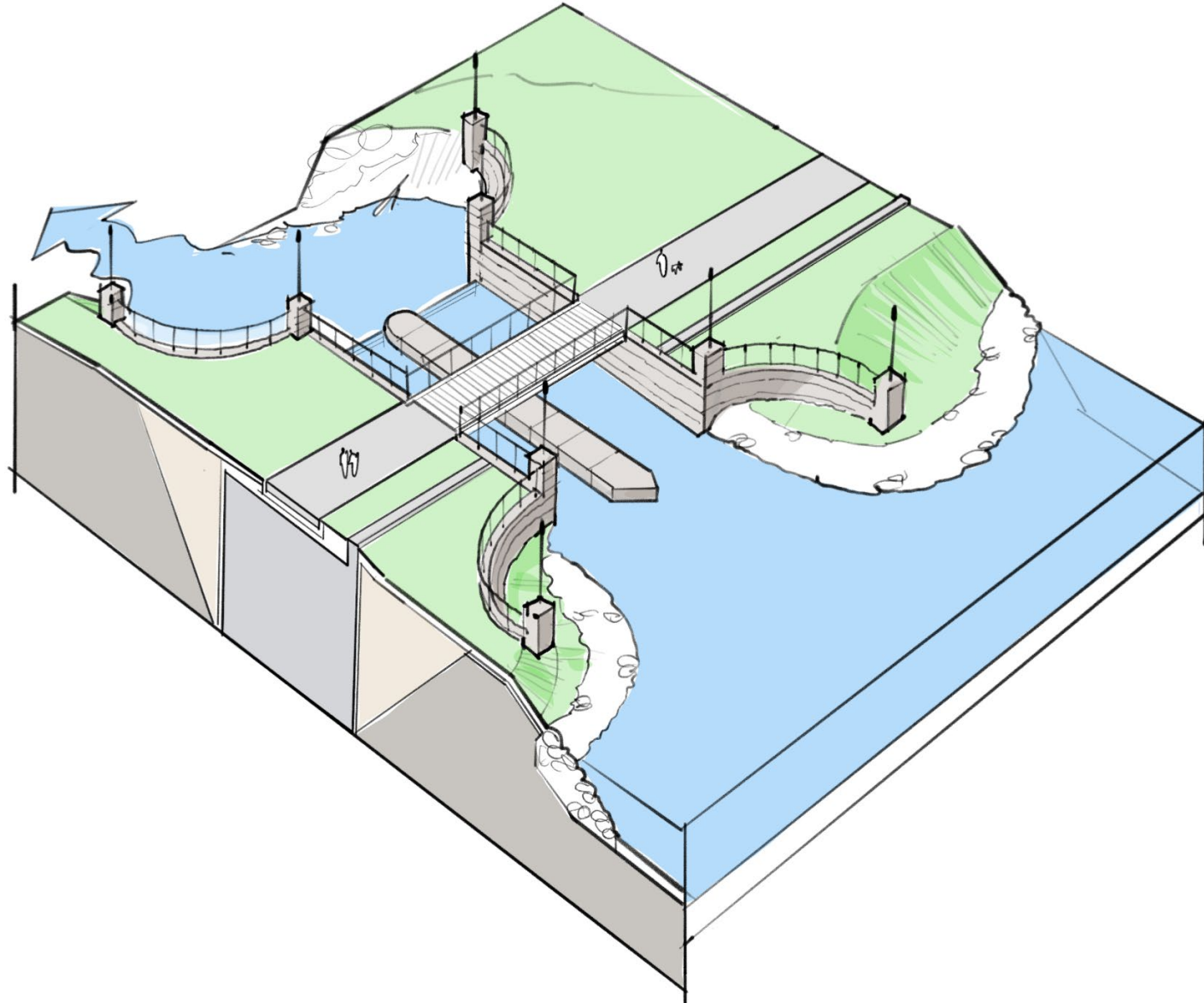
*PREVIOUSLY PRESENTED

Lower Shaker Lake Dam

- District began pre-design in 2023 on Lower Lake Dam Reconstruction
- New design features to meet standards:
 - Concrete gravity dam
 - Principal spillway rebuild



Reconstructed Principal Spillway



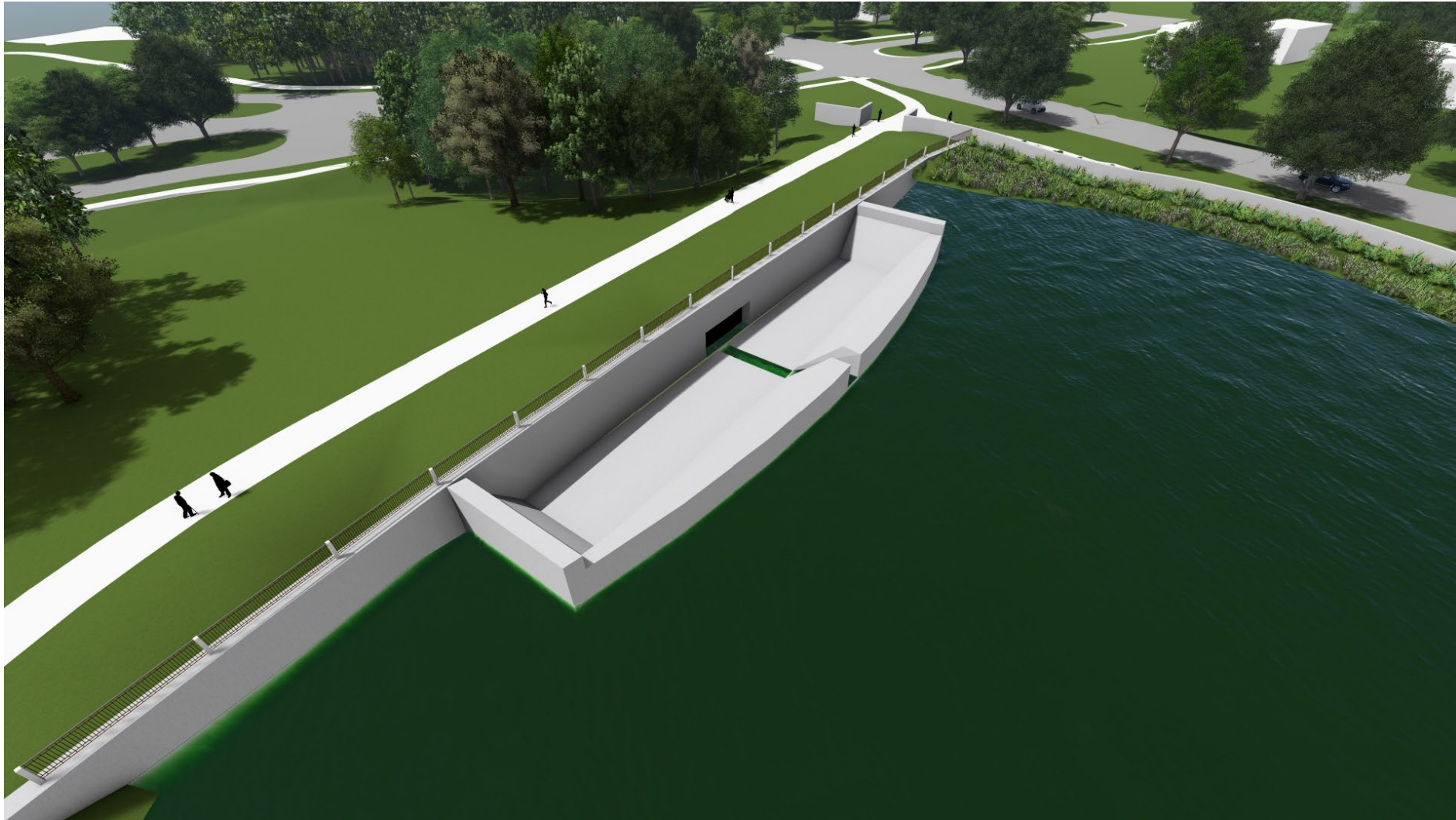
Lower Shaker Lake Dam

- District began pre-design in 2023 on Lower Lake Dam Reconstruction
- New design features to meet standards:
 - Concrete gravity dam
 - Principal spillway rebuild
 - Very large auxiliary spillway



Dam: What will it look like?

(slide from 2024 outreach)*



*PREVIOUSLY
PRESENTED

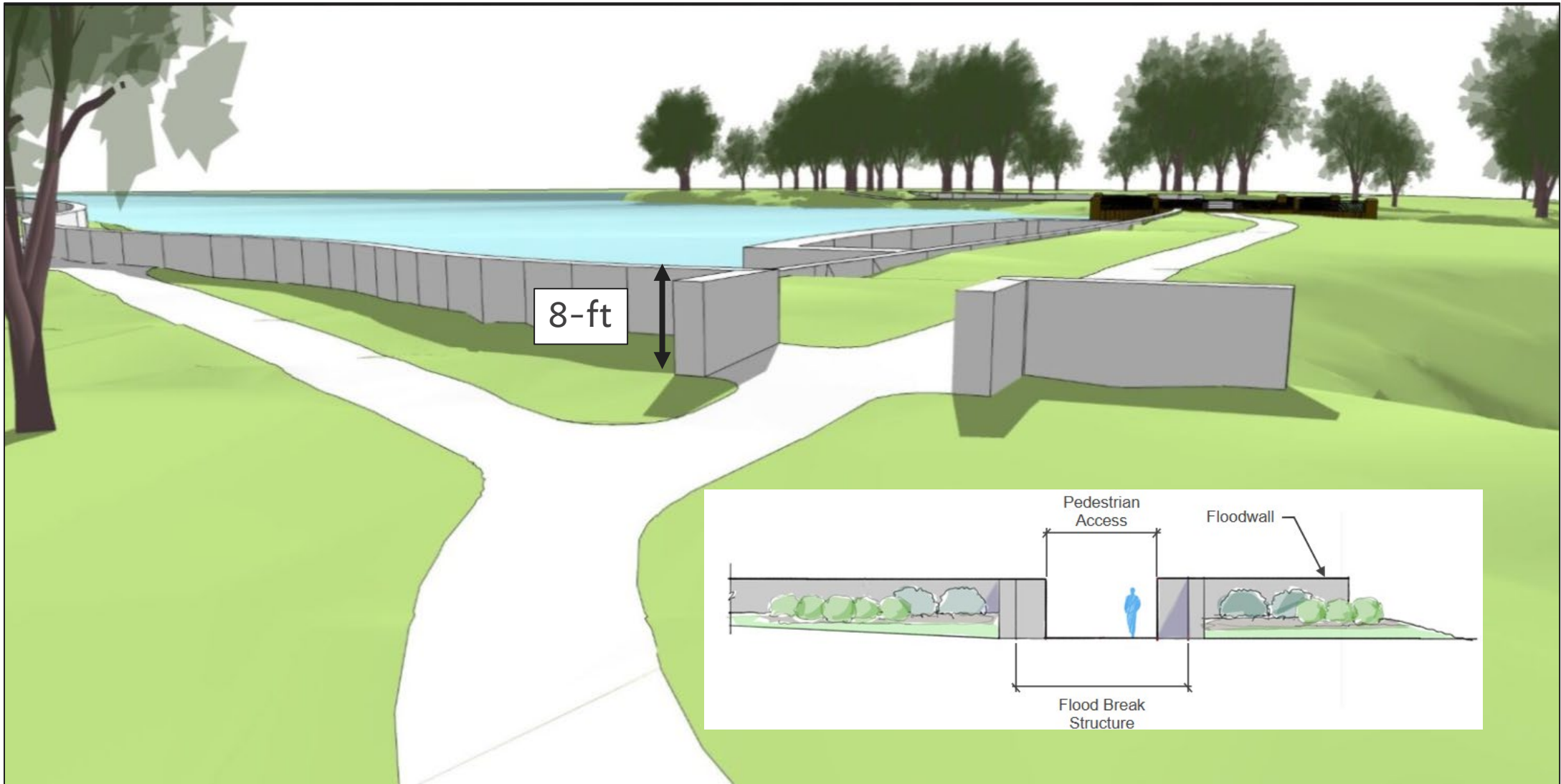
Lower Shaker Lake Dam

- District began pre-design in 2023 on Lower Lake Dam Reconstruction
- New design features to meet standards:
 - Gravity dam
 - Principal spillway rebuild
 - Very large auxiliary spillway
 - Floodwalls



Dam: What will it look like?

(draft rendering of flood control walls)



During pre-design, new information continued to be refined...

- Modeling updates, and more data analysis
- Capacity improvements downstream within University Circle culvert



Updated model

- Enhancements to model inputs
- More local storm sewers and connections added
- Used recent storms to calibrate revised model
- Additional stream flow monitors and level sensors

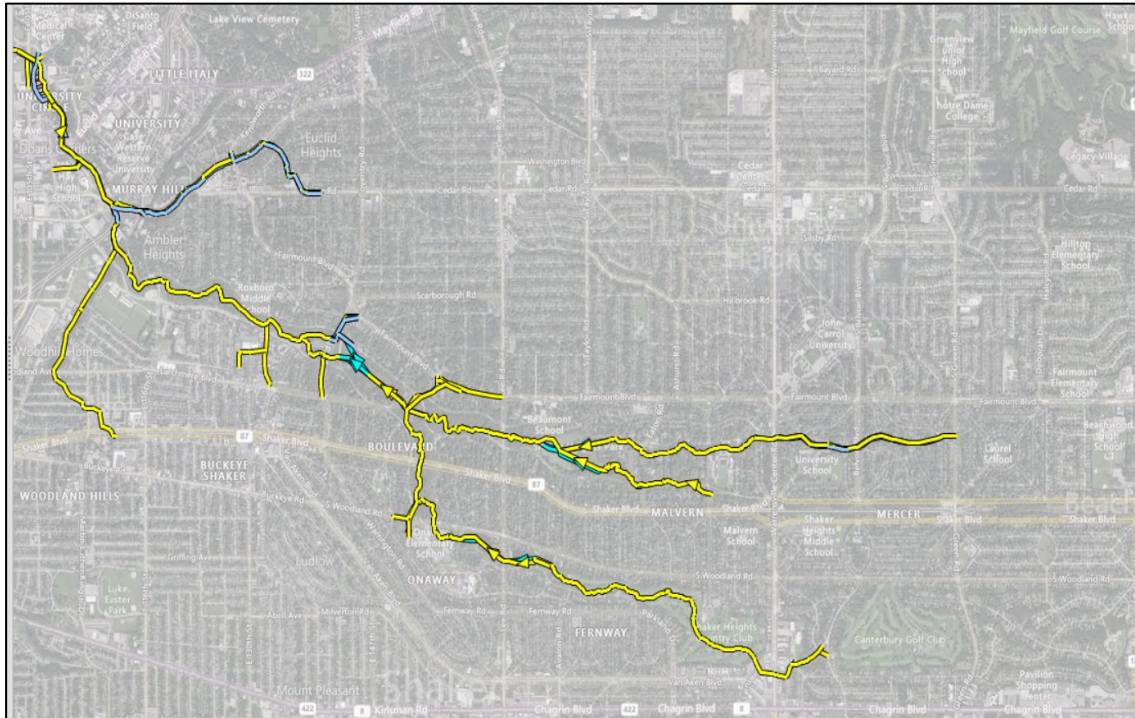
Level Monitor at South Woodland Road Crossing



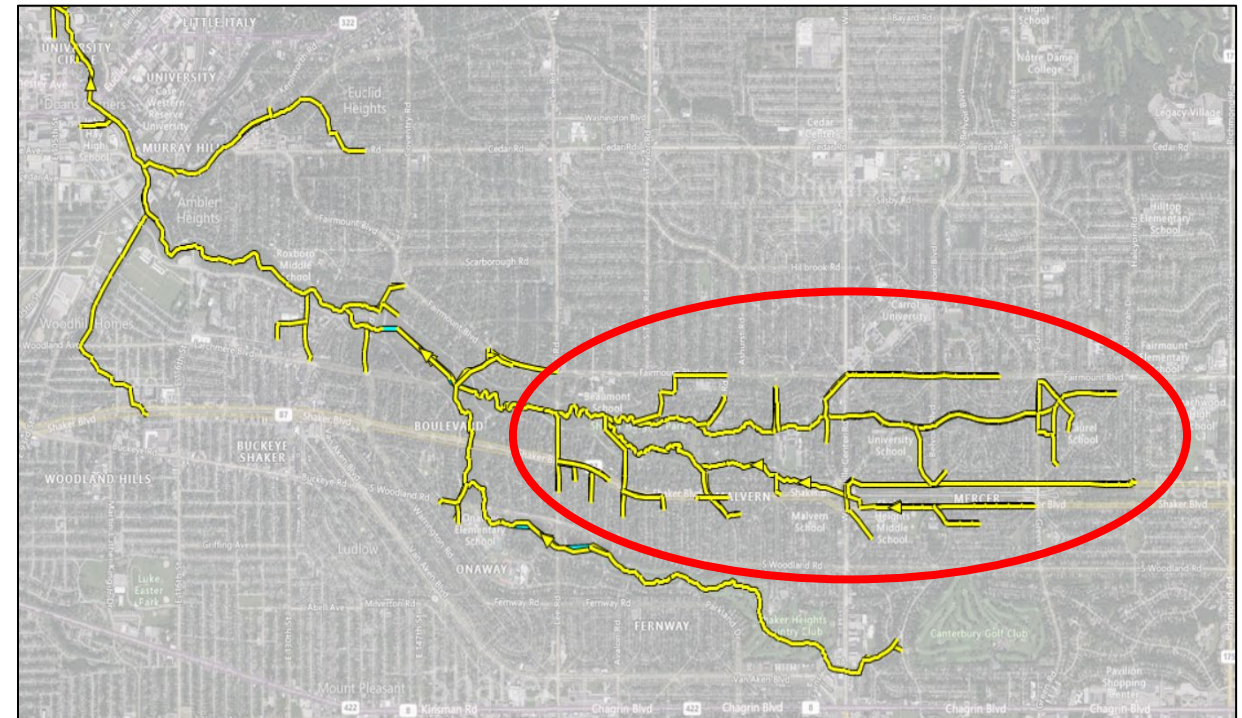
Doan Brook Channel



2021 modeled drainage network



2024-25 modeled drainage network



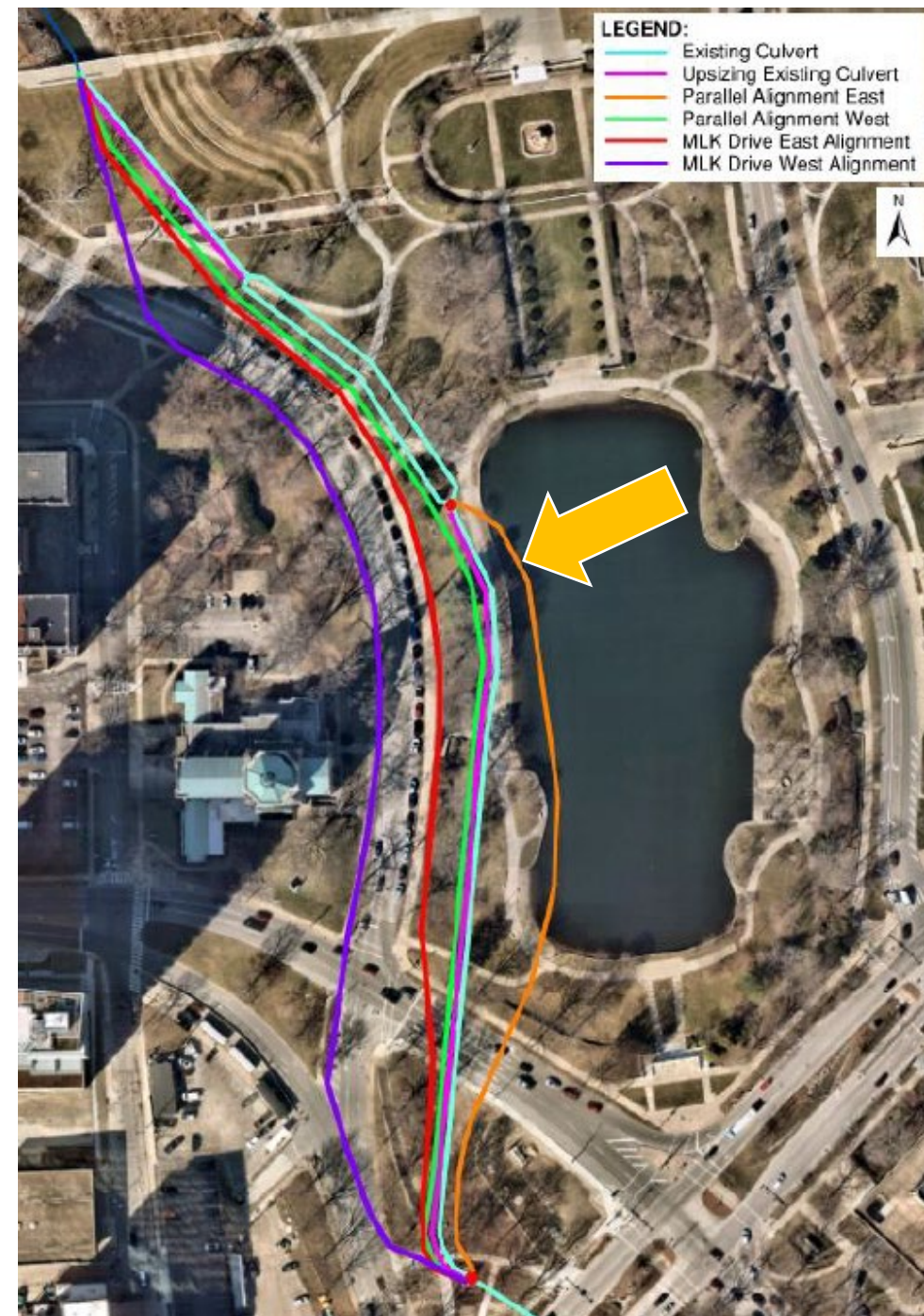
Updated model

- Upgraded our model inputs
 - More local sewers and connections added
 - Used recent storms to calibrate model
 - Additional flow monitors and level sensors
- Upgraded our model method (shown in earlier slides)
 - 2-Dimensional model- for detail on depth, direction, duration of flooding
 - Improves understanding of how and where the flooding happens



Feasibility Study: University Circle Culvert Conveyance

- Conducted a feasibility study for alignment of added conveyance, or culvert capacity (*image right*)
- Knew we needed this, did not see a clear way forward previously (2021)
- Opportunity arose with Cleveland Museum of Art (2024)
- No interaction with Wade Lagoon hydraulically



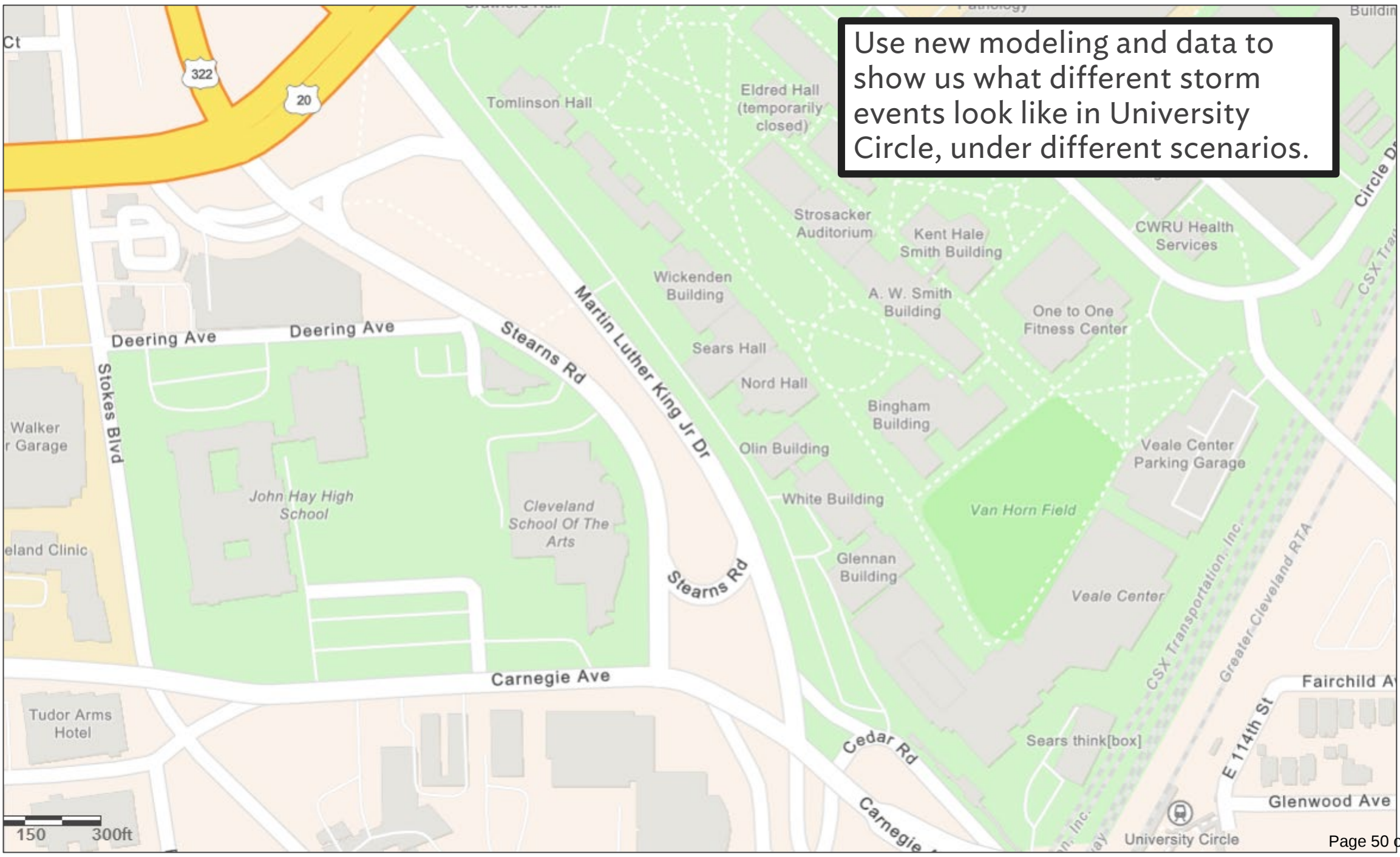
With this new information

- Ran the new, updated model with added University Circle culvert flow routing

We will now walk through that analysis.



Use new modeling and data to show us what different storm events look like in University Circle, under different scenarios.



150 300ft

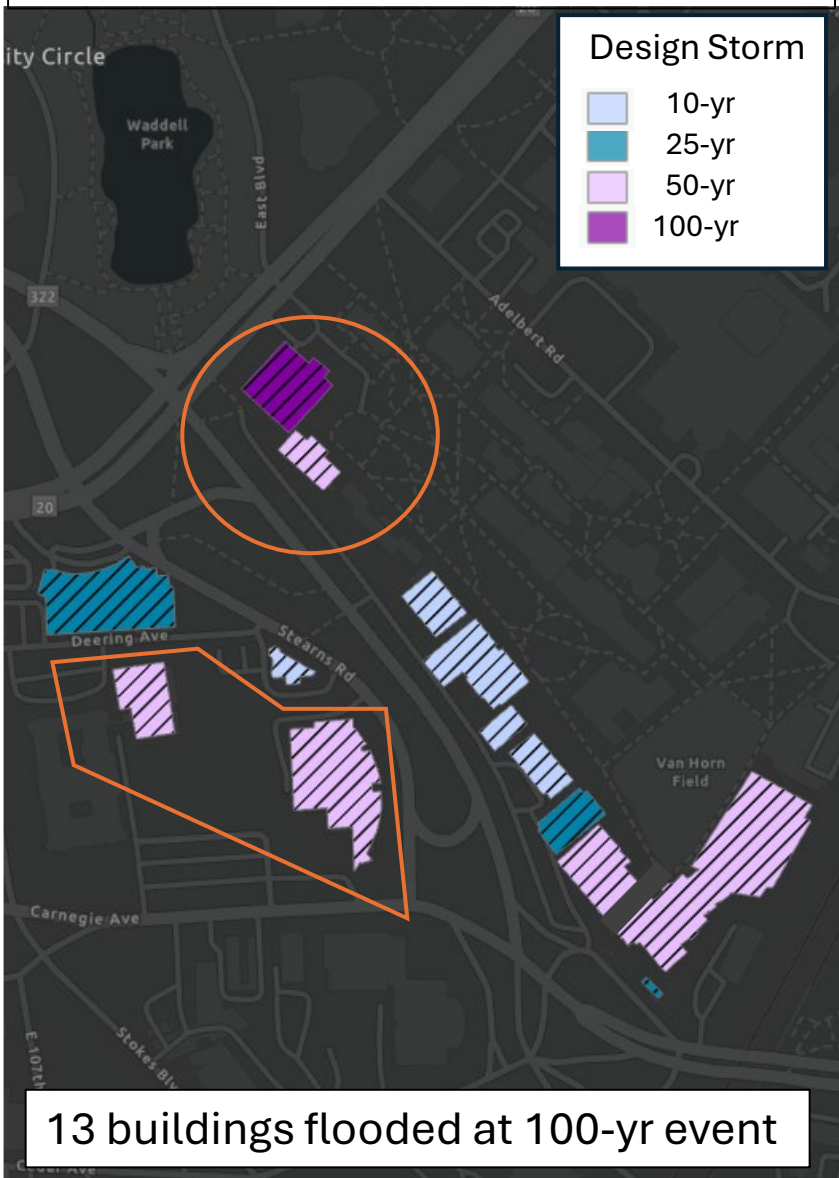
Three modeling scenarios

1. With existing Lower Lake Dam
2. With added University Circle culvert and new Lower Lake Dam (reconstructed)
3. With added University Circle culvert and no Lower Lake Dam

All scenarios assume no Horseshoe Lake Dam

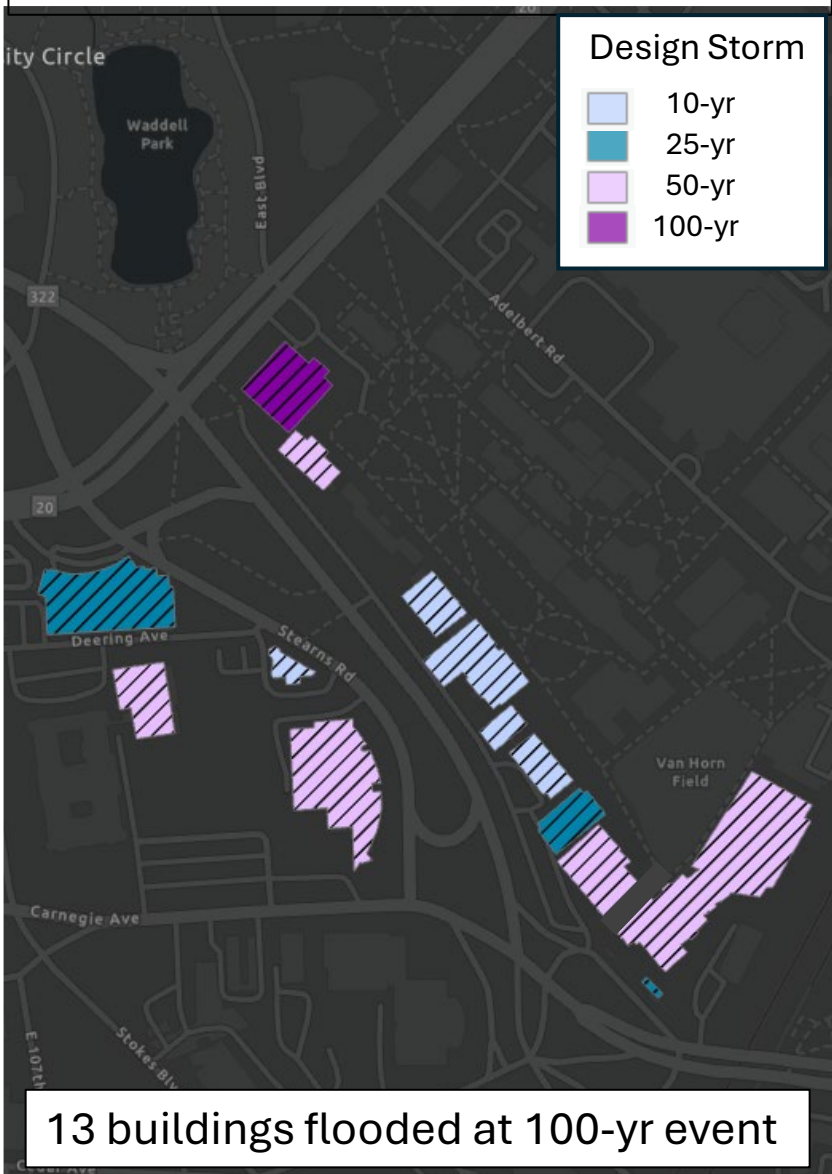


1: No University Circle conveyance,
Existing Lower Lake Dam

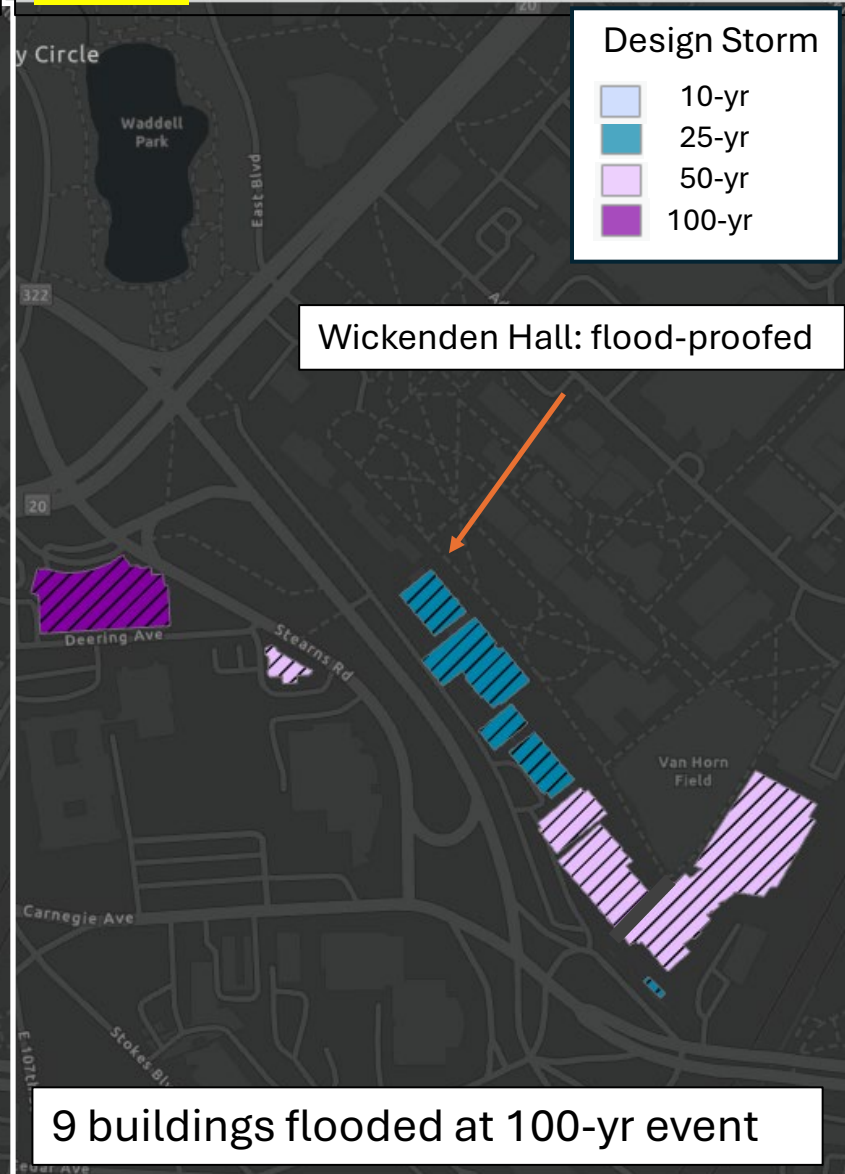


All scenarios assume Horseshoe Lake dam is removed

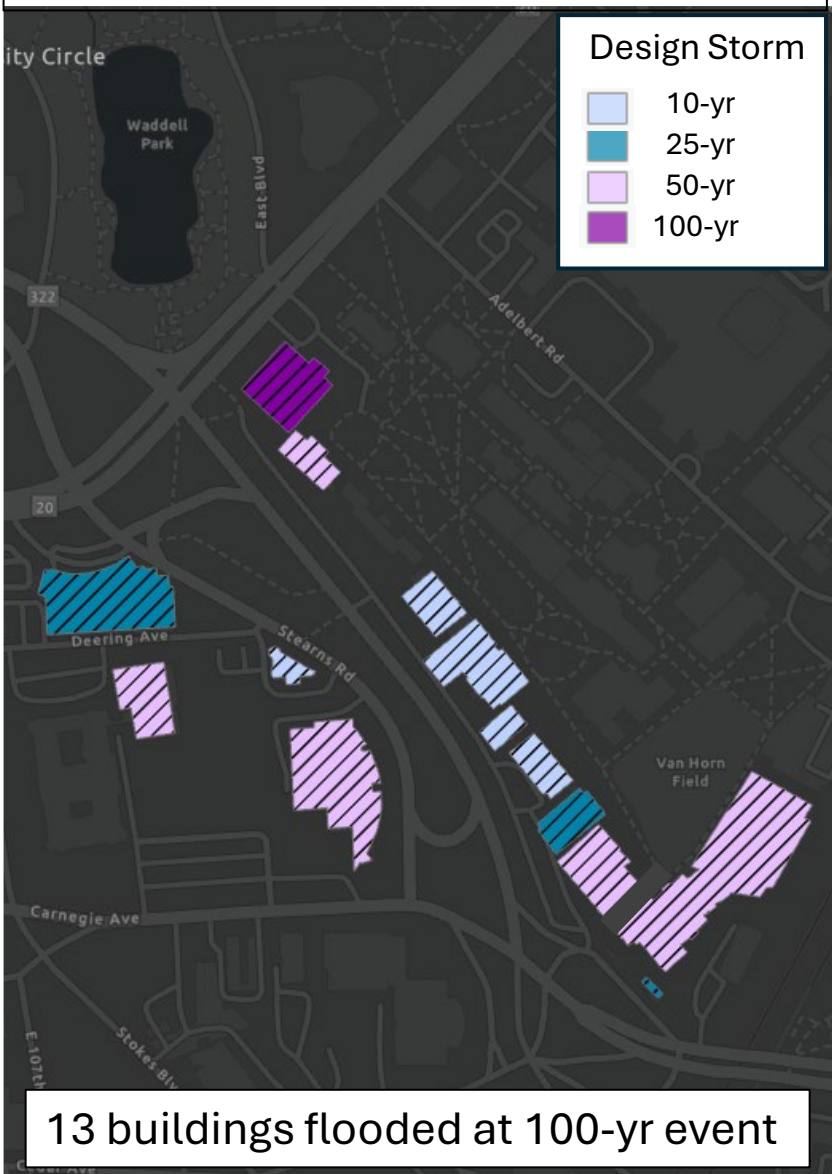
1: No University Circle conveyance,
Existing Lower Lake Dam



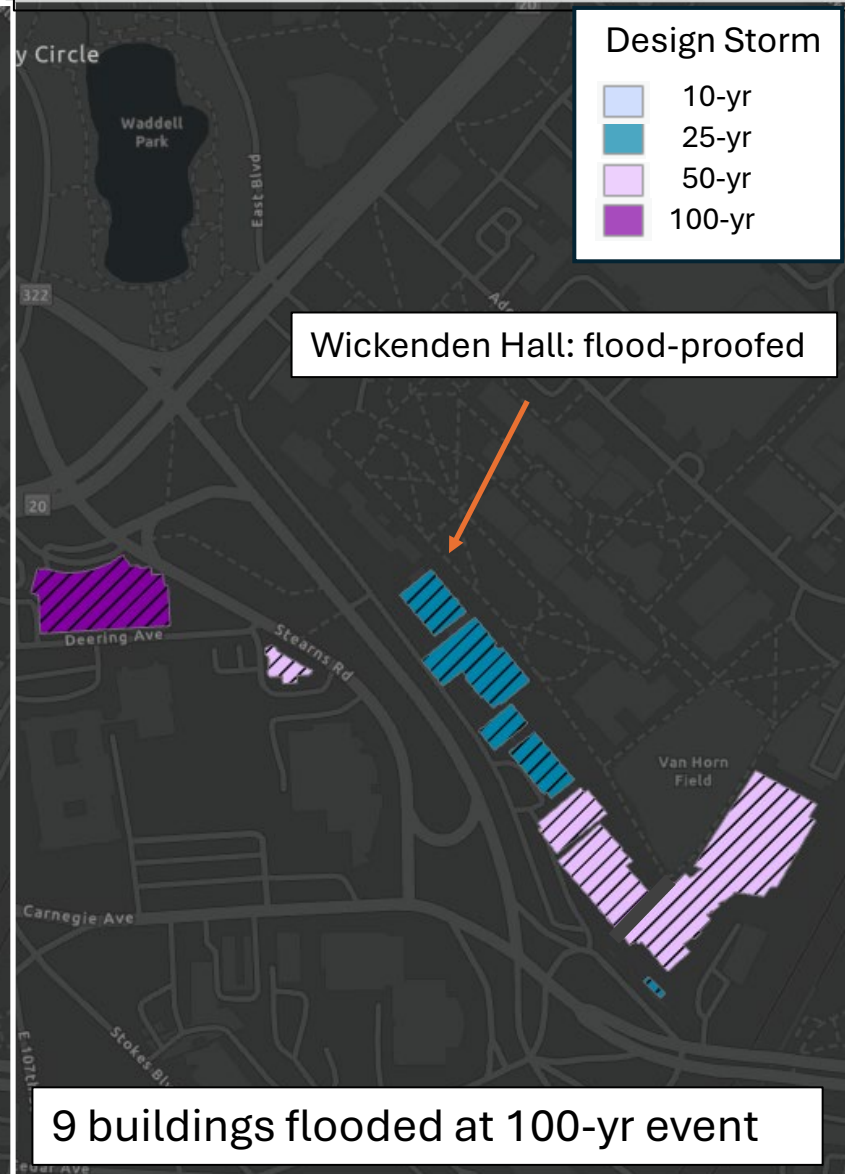
2: University Circle Conveyance
Without Class I Lower Lake Dam



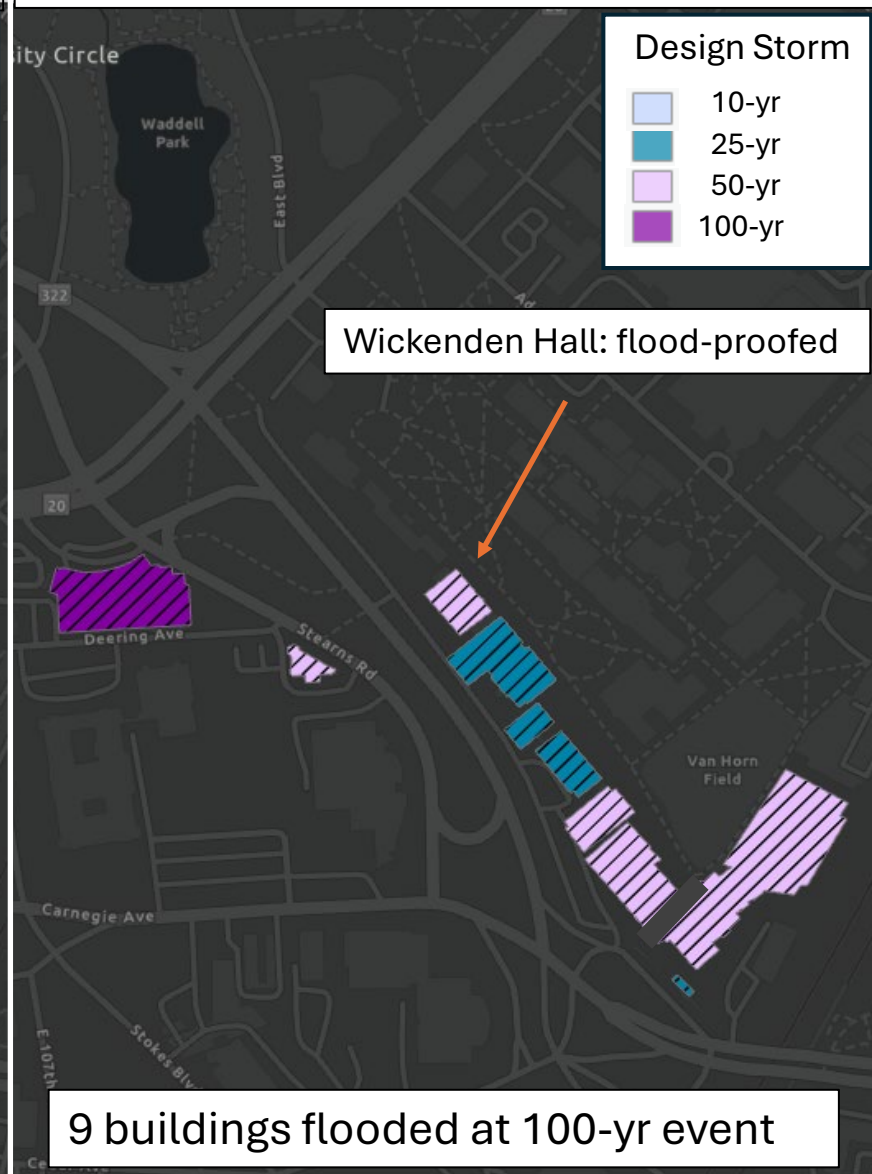
1: No University Circle conveyance,
Existing Lower Lake Dam



2: University Circle Conveyance
Without Class I Lower Lake Dam



3: University Circle Conveyance
With Class I Lower Lake Dam



All scenarios assume Horseshoe Lake dam is removed

Findings

Flooding in University Circle:

- Results indicate that the added University Circle culvert conveyance, not the Lower Lake Dam, is what improves University Circle flooding conditions

Findings

Flooding at Lower Lake:

- During 100-yr storm event, flooding near Lower Lake on North Park and Coventry Roads can be resolved with either a reconstructed Class I Dam or dam removal and restored stream channel



Additional Considerations

- Ecological impact of dams to water quality
- On-going maintenance and operation costs of Class 1 dam
- Insurance and liability of Cities as dam owner and operators

Cost Comparison – Dam Reconstruction vs. Dam Removal & Stream Restoration

	Dam Reconstruction	Dam Removal & Stream Restoration
Professional Design Services	\$8,700,000	\$6,000,000
BASE CONSTRUCTION ESTIMATE	\$21,195,122	\$19,494,384
Construction Contingencies & Escalation	\$13,468,000	\$12,368,992
SUB-TOTAL Project Costs	\$43,363,122	\$37,863,376
Sediment Removal in Lower Lake*	\$12,000,000	\$0
Improvements at Coventry and Fairhill crossings*	\$0	\$7,383,725
TOTAL PROJECT COSTS	\$55,363,122	\$45,247,101

Includes management of all sediment in lake.

Summary

- 2021 Stormwater Master Plan Recommendation
- 2023–2024 Culvert Feasibility Study
- 2024 Additional Culvert Alignment Confirmed
- 2025 Lower Lake Dam Reconstruction Pre-Design
- Current: Recommendation to remove Lower Lake Dam



Next Steps

- Continue outreach and discussion of Lower Lake Dam with cities and residents
- Continue University Circle culvert pre-design



PUBLIC EVENTS

Lower Shaker Lake Project

WEBINAR

August 19

6:00-7:30 p.m.

Registration required
at the link below:

IN-PERSON

August 20

11 a.m-1 p.m.

and 5-7 p.m.

Lee Road Library

neorsd.org/LowerLake



For more updates and information

- neorsd.org/LowerLake
- Main Contact:
 - Cisco Rivera, Watershed Team Leader,
RiveraF@neorsd.org