Lower Brandywine Flooding Study and Mitigation Strategy Open House

December 12, 2024

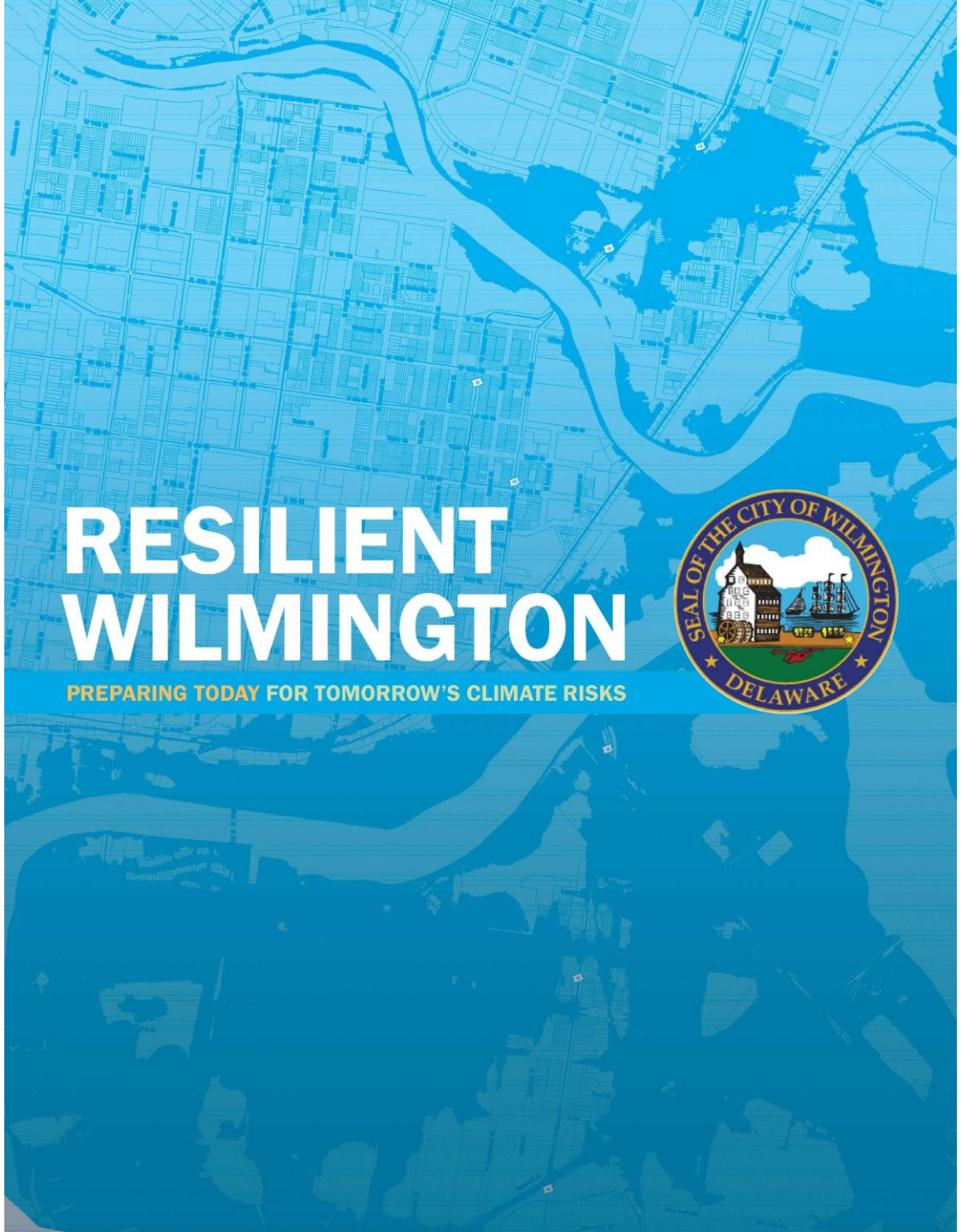
1. Welcome

Agenda

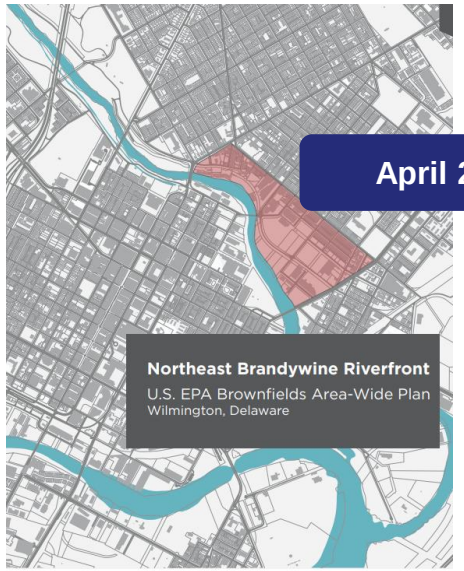
1. Welcome
2. Project Introduction
3. Engagement Efforts to Date
4. Flood Hazard Modeling
5. Flood Protection Alternatives
6. Open House

2. Project Introduction

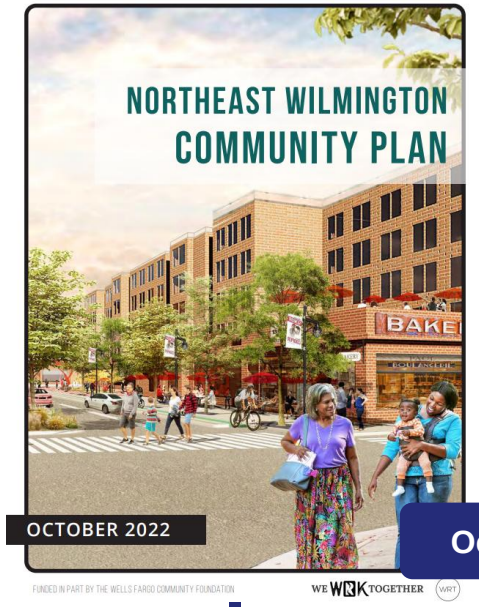
Resilient Wilmington



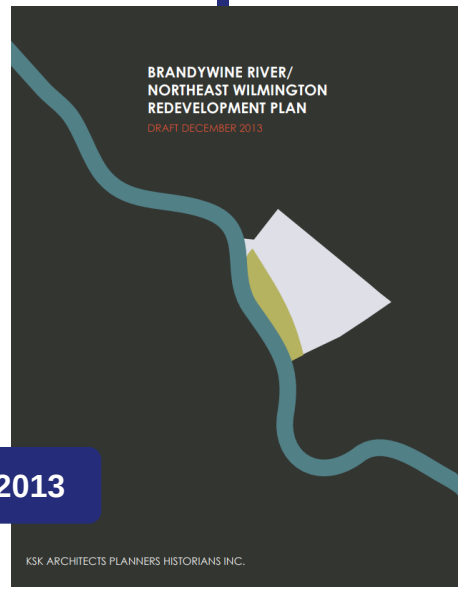
Previous Planning Efforts within Northeast Wilmington



April 2019



October 2022



December 2013

October 2019

Christina-Brandywine Rivers
Remediation, Restoration, Resilience
Initiative (CBR4)

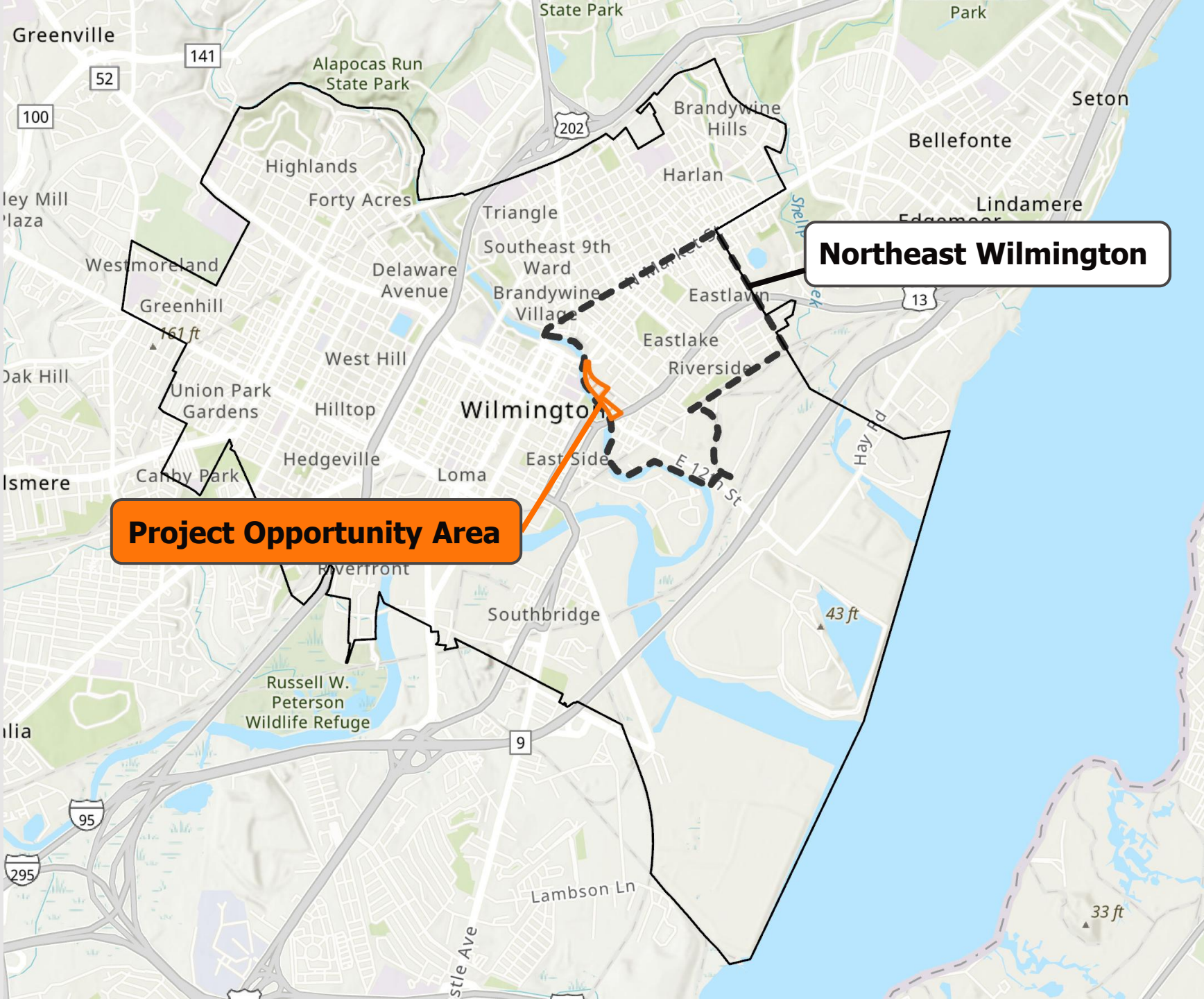
A Plan for Restoring
Wilmington's Rivers

February 2023

February 2023

Project Overview

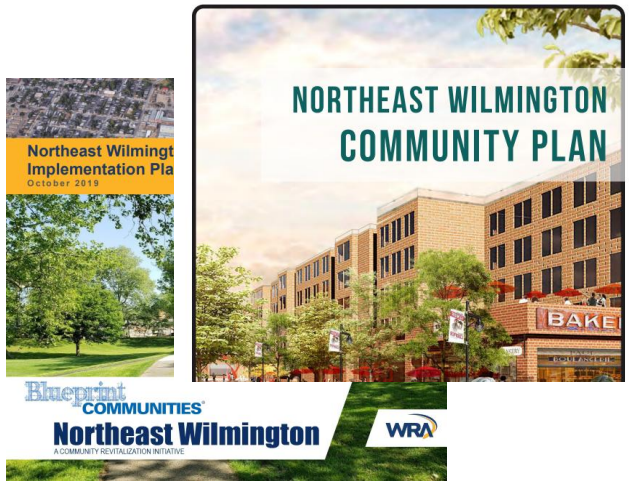
The project aims to develop a community-supported concept design for flood risk mitigation in Northeast Wilmington



Project Opportunity Area

Along the Brandywine Creek, this location provides the most opportunity to explore a solution that offers many benefits to the community.

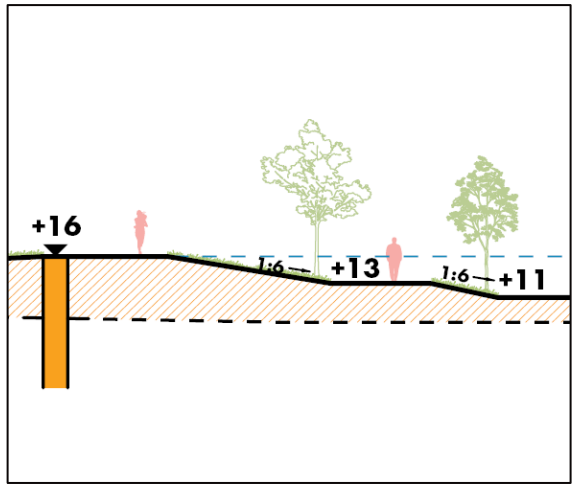
This project has four primary goals:



1. Incorporate best available data, including prior and ongoing plans and models, to inform decisions that reduce flood risk

2. Refine understanding of flood risk within the project area.

3. Engage project partners and community stakeholders.



4. Develop a concept design.

Project Team

This project is managed by the City of Wilmington Department of Public Works.

A multidisciplinary consulting team is leading the planning and design process, led by Arcadis, U.S. and supported by One Architecture, Connect the Dots, and Jacobs.

ARCADIS

Connect the Dots

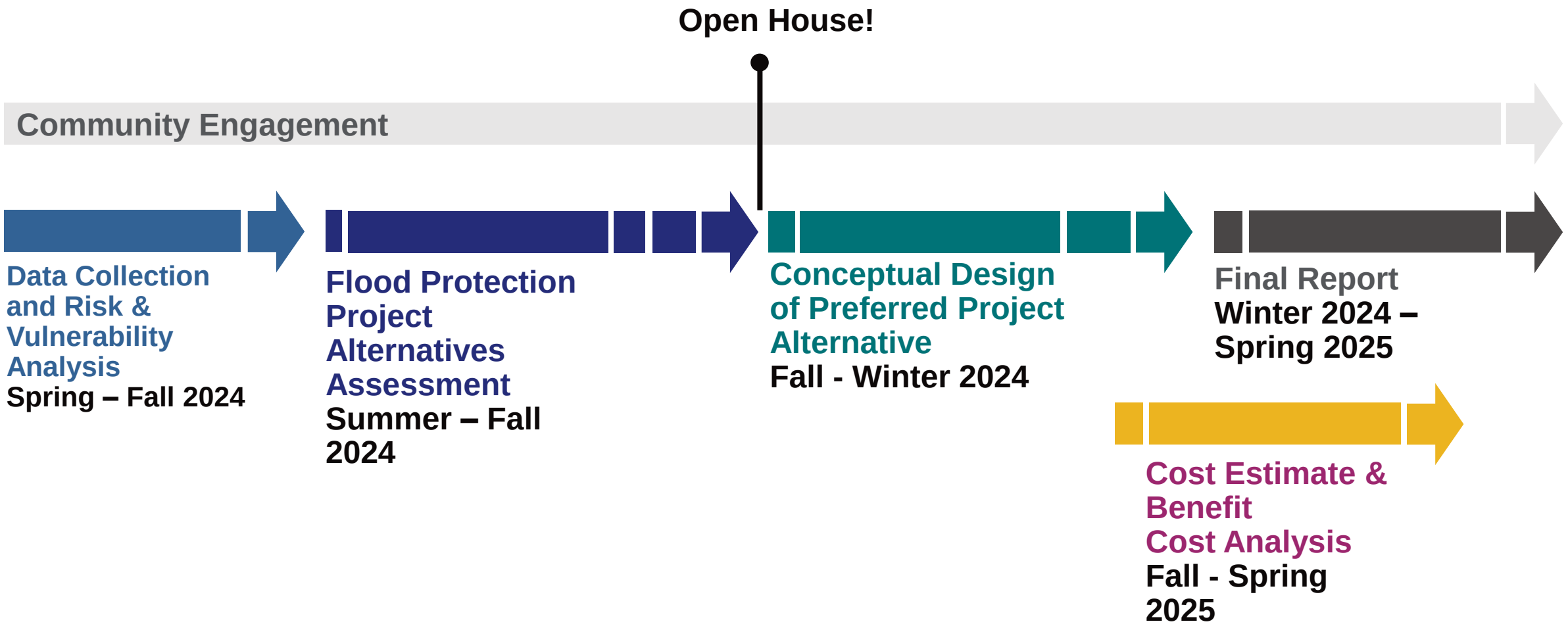
one architecture

Jacobs

Funding provided by:

FEMA

Where We Have Been, Where We Are Going



3. Engagement Efforts To Date

At the Pop-Up Events, We Asked...

Where do you live, work, worship, and play within your community?

August 21, 2024
Urban Artist Exchange Summer Series Concerts

What programming would you most enjoy?

August 14, 2024
Urban Artist Exchange Summer Series

What type of design features do you prefer?

September 7, 2024
Bowers Street Open Streets Day

What We've Heard So Far...

"Berm" and "floodwall" were the top two most popular landscape design features

August 21, 2024
Urban Artist Exchange Summer Series Concerts

Community members indicated they would like to enjoy fitness activities like kayaking, biking along the river, and jogging.

August 14, 2024
Urban Artist Exchange Summer Series

Participants preferred options that included paths/trails and river access.

Community members preferred a space that creates opportunities for spontaneous gatherings and regular events with neighbors.

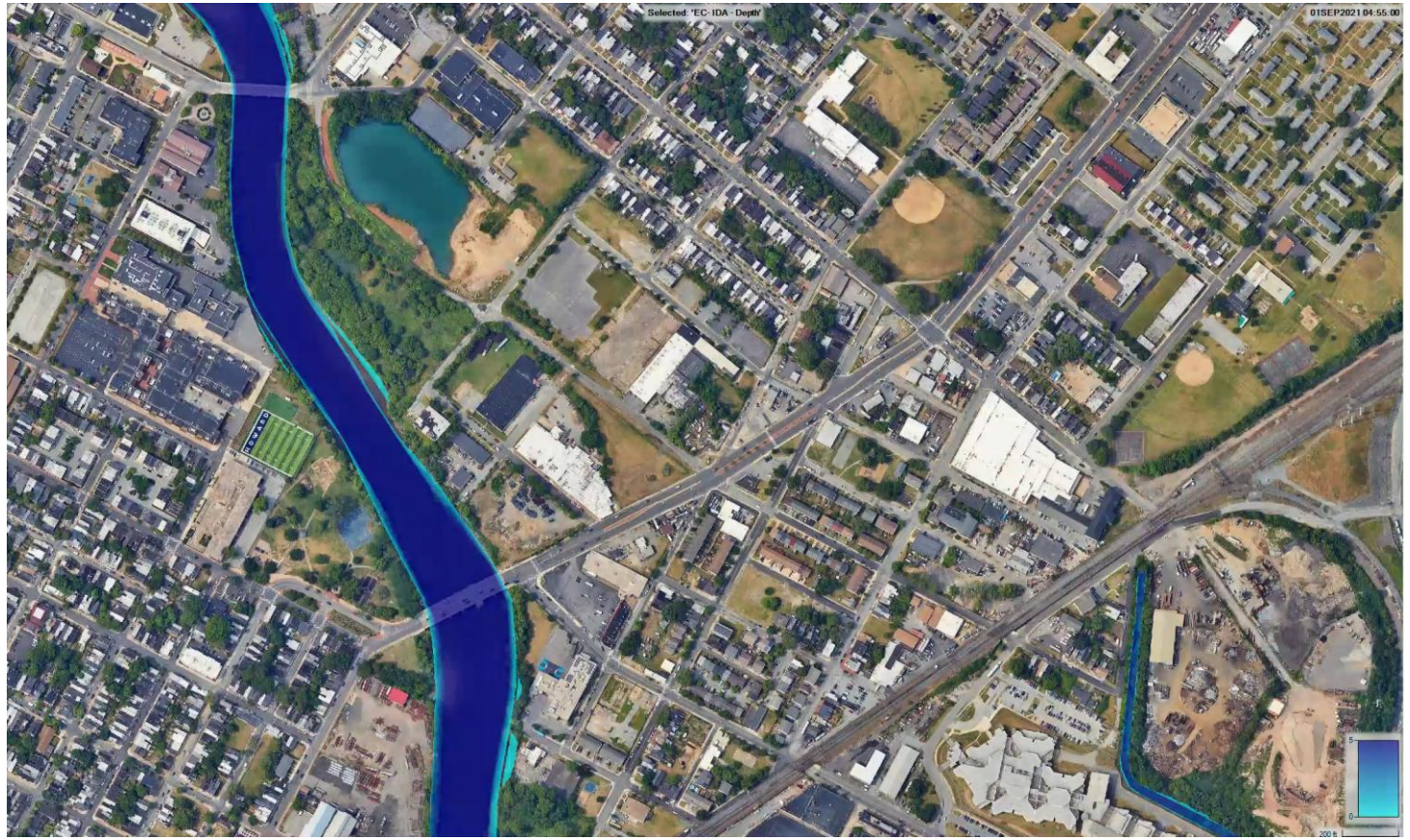
September 7, 2024
Bowers Street Open Streets Day

4. Flood Hazard Modeling

Why Model Flooding?

Computers are used to simulate and predict how water will flow and behave during a flood

- Floods vary in severity, duration, and impact
- Modeling helps prevent unintended consequences
- Captures changes over time to improve accuracy



Building upon previous modeling efforts

Brandywine Hydraulic Model

- From New Bridge Rd to N Market St bridge: University of Delaware HEC-RAS Model and the effective FEMA Model.

Shellpot Creek Hydraulic Model

- Effective FEMA HEC-RAS Model

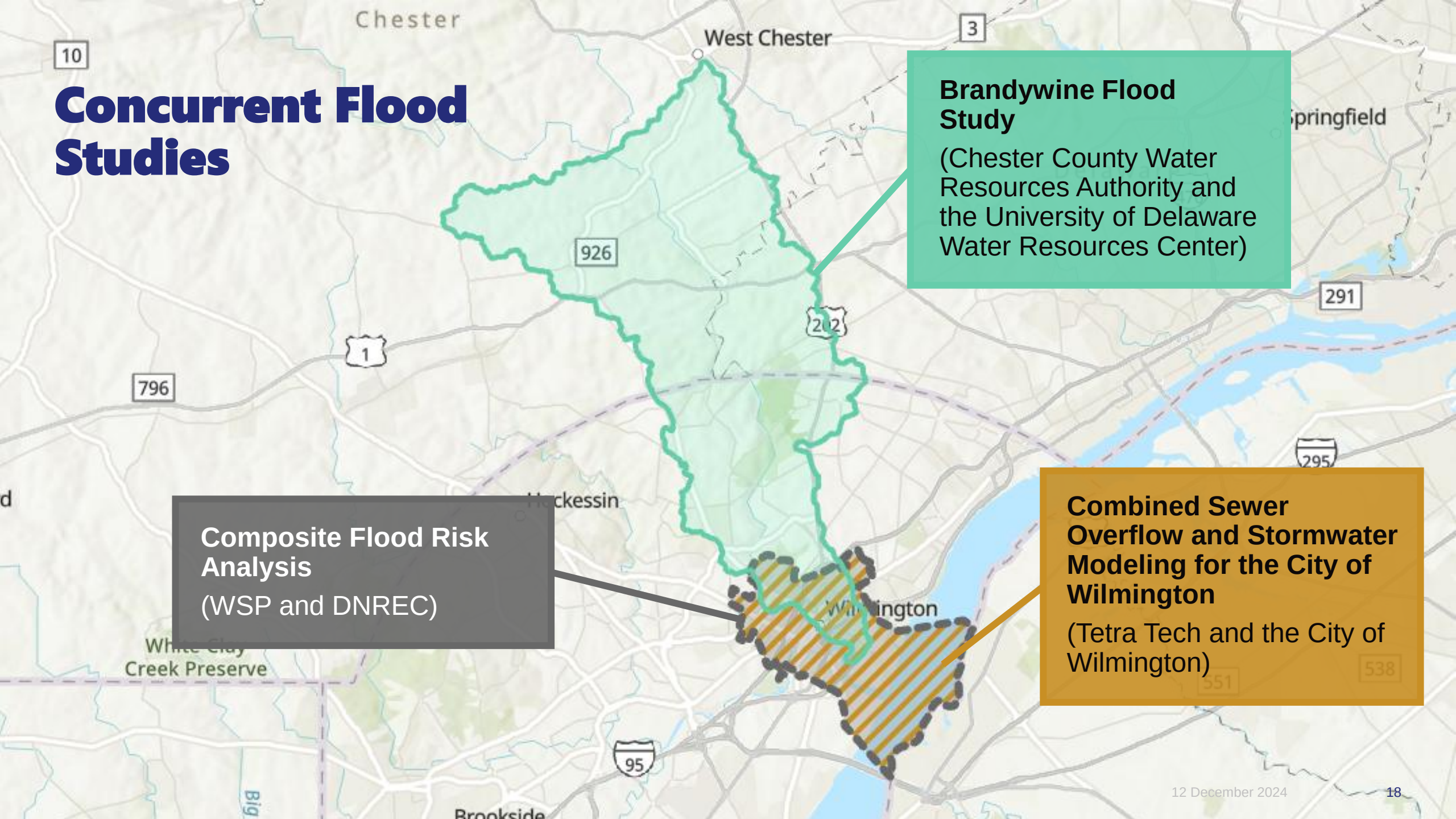
Christina River and Delaware River Boundary Condition

- FEMA Flood Insurance Study (FIS), Digital Flood Insurance Rate Map (DFIRM) and USGS Gauge

City of Wilmington PCSWMM Model by Tetra Tech

- Stormwater conduit, manholes and catch basins dataset

Concurrent Flood Studies



Brandywine Flood Study

(Chester County Water Resources Authority and the University of Delaware Water Resources Center)

Composite Flood Risk Analysis

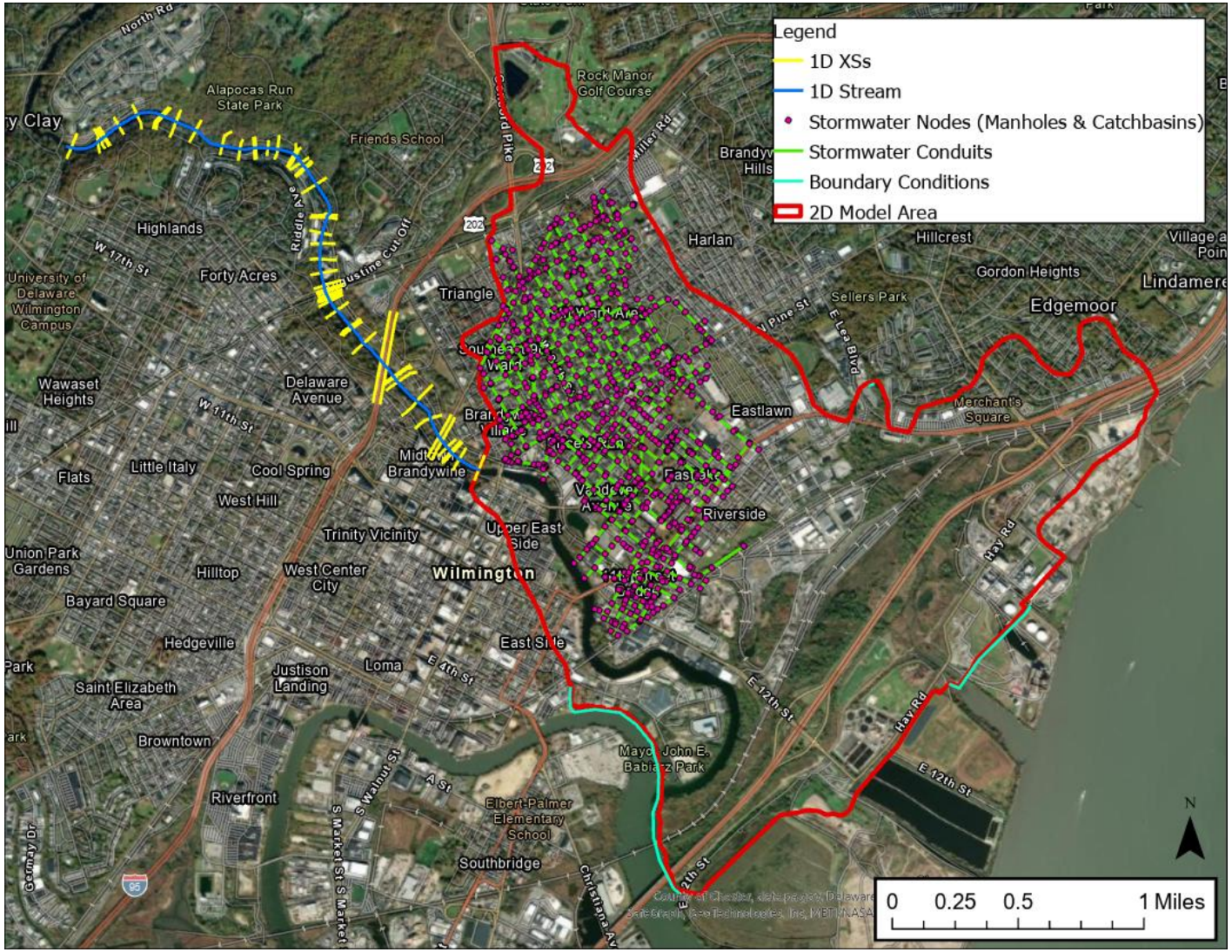
(WSP and DNREC)

Combined Sewer Overflow and Stormwater Modeling for the City of Wilmington

(Tetra Tech and the City of Wilmington)

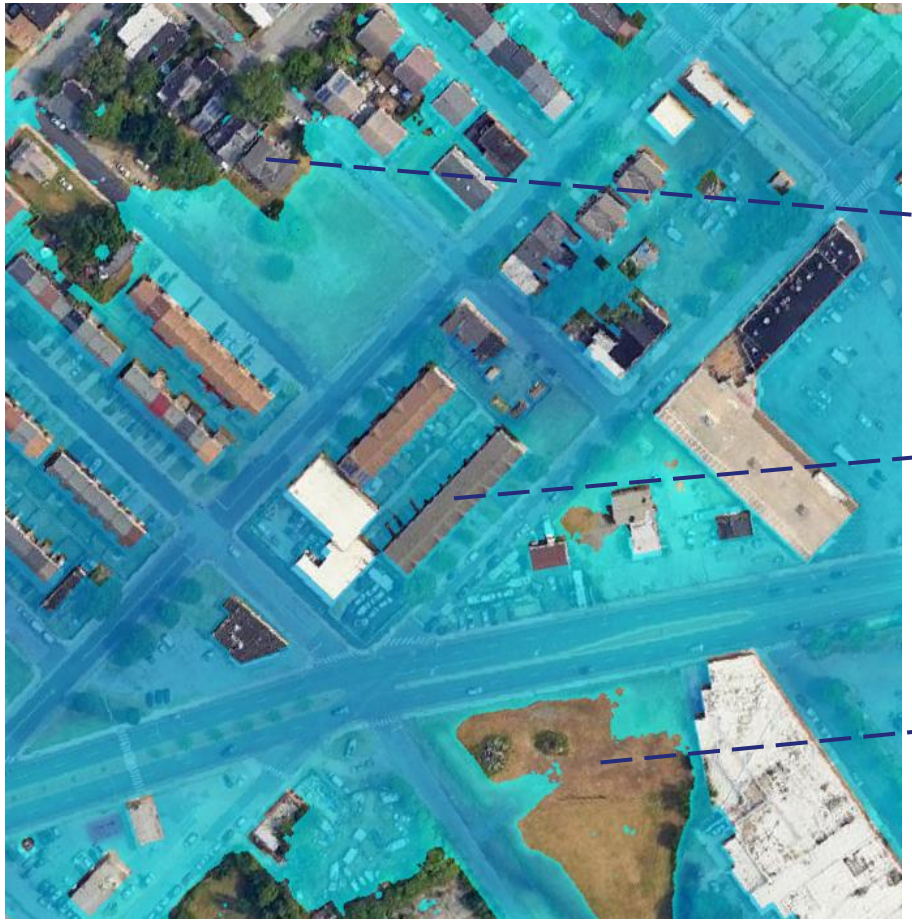
Model Features

- Hydrology and Hydraulic model using US Army Core of Engineers Modeling Software HEC-RAS
- Stormwater system
- Detailed terrain data
- Delaware River tidal influence
- Evaluate the impacts of different storm severities (5-yr, 100-yr, etc.)
- Examine how effective different mitigation designs could be



Hurricane Ida – Model Validation

Hydraulic Model Floodplain



Aerial Photography

Hurricane Ida – Model Validation

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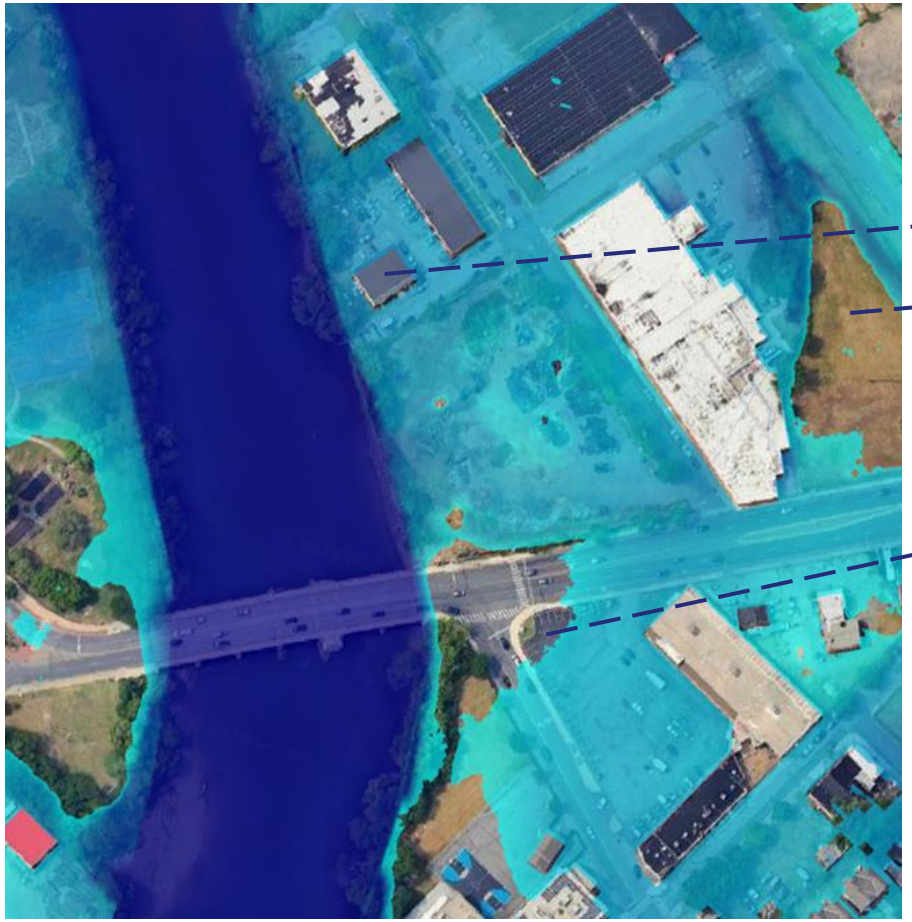
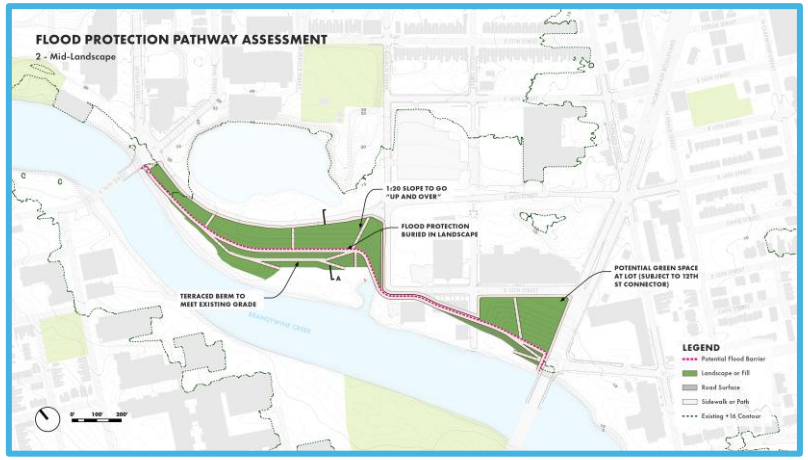


Aerial Photography

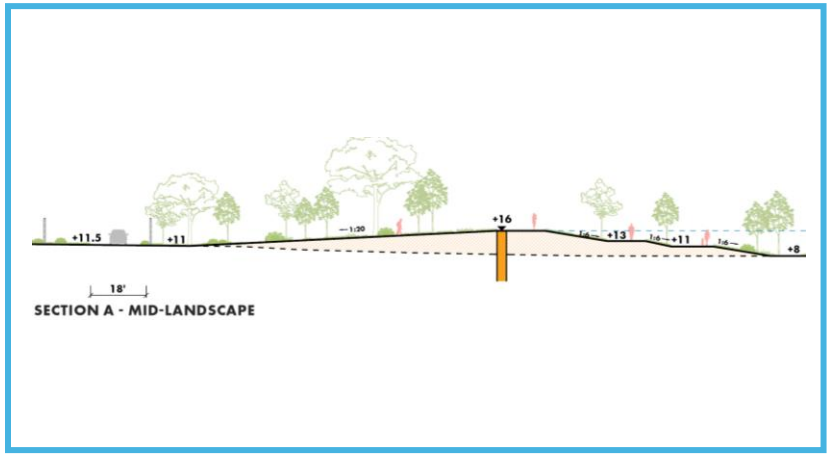
5. Flood Protection Alternatives

How do we get to a final design?

ALIGNMENT
Where is it?



APPROACH
What is it?



DESIGN
What does it look like?

Considered in this Assessment

Considered in Future Project Phases

Flood Protection Approaches

Berm

Raised earthen structures for flood protection.

Can include boardwalks, walkways, and bike paths

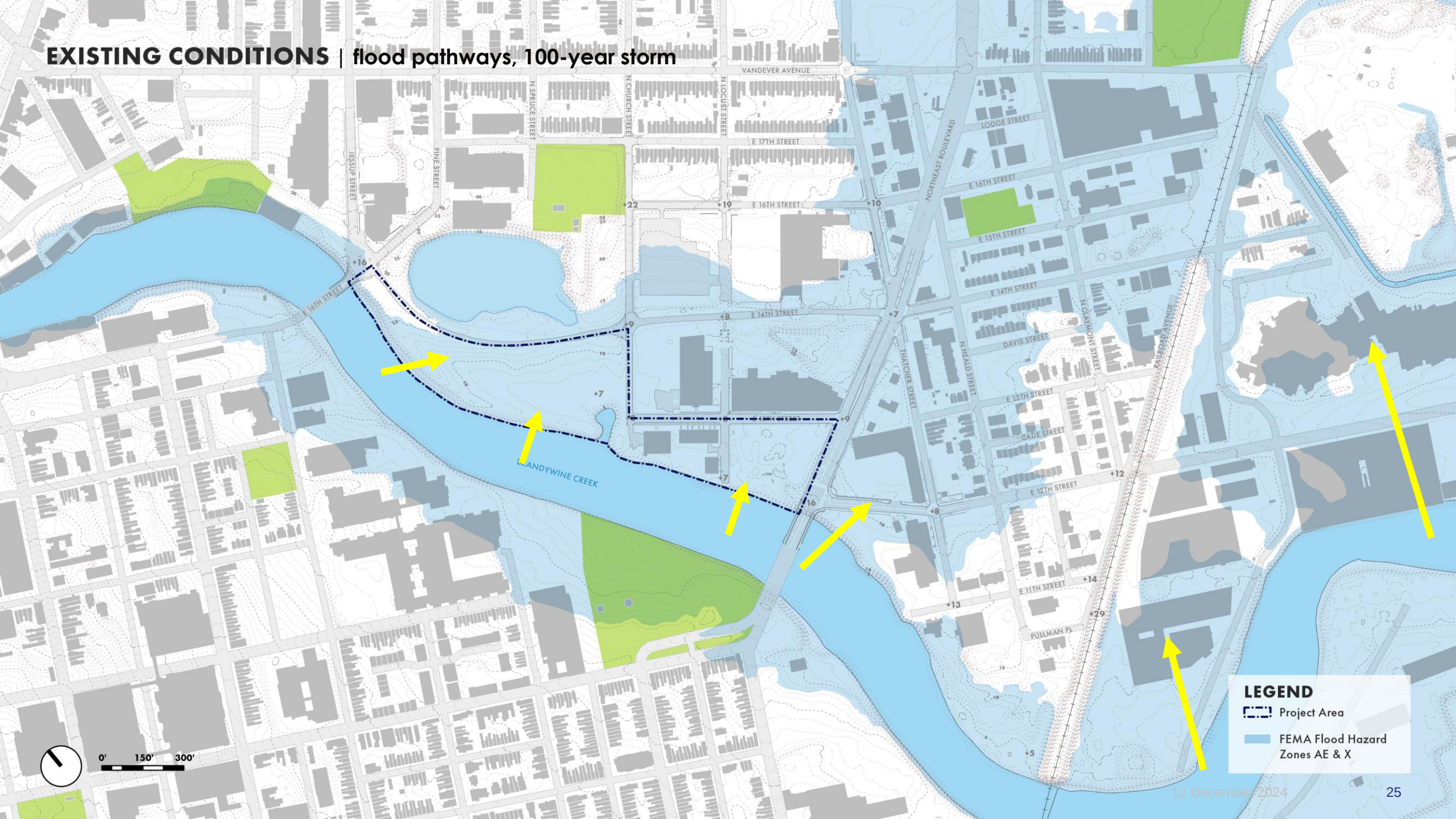
Floodwall

Concrete structures that block floodwaters

Floodgate

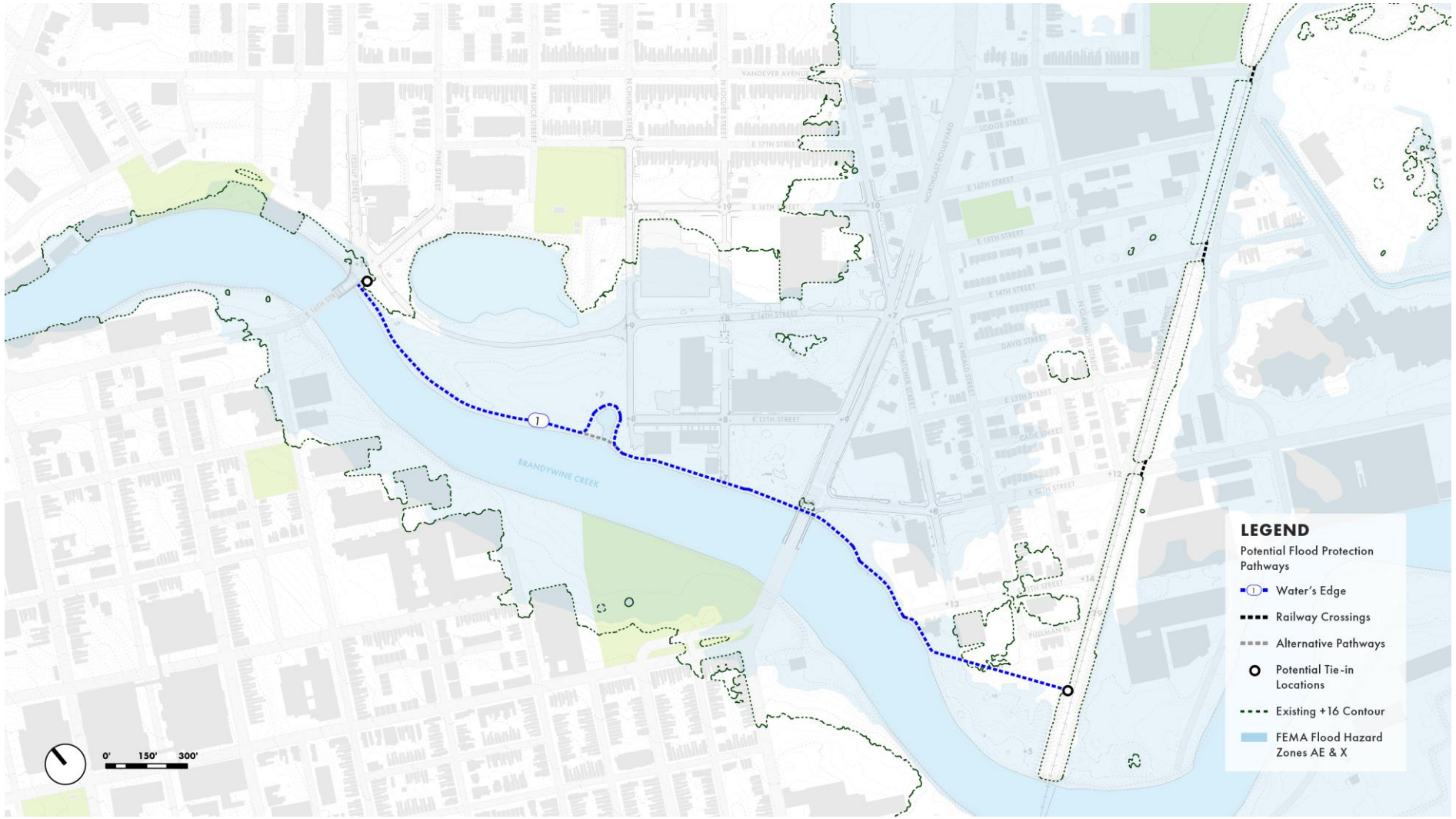
Solid barriers that close during floods to fill gaps

EXISTING CONDITIONS | flood pathways, 100-year storm



Flood Protection Locations | Water's Edge

Alternative 1 – Water's Edge:
- Protects the most existing land uses (+)
- Floodwall along the water's edge inhibits waterside access (-)
- Requires the highest floodwall (-)

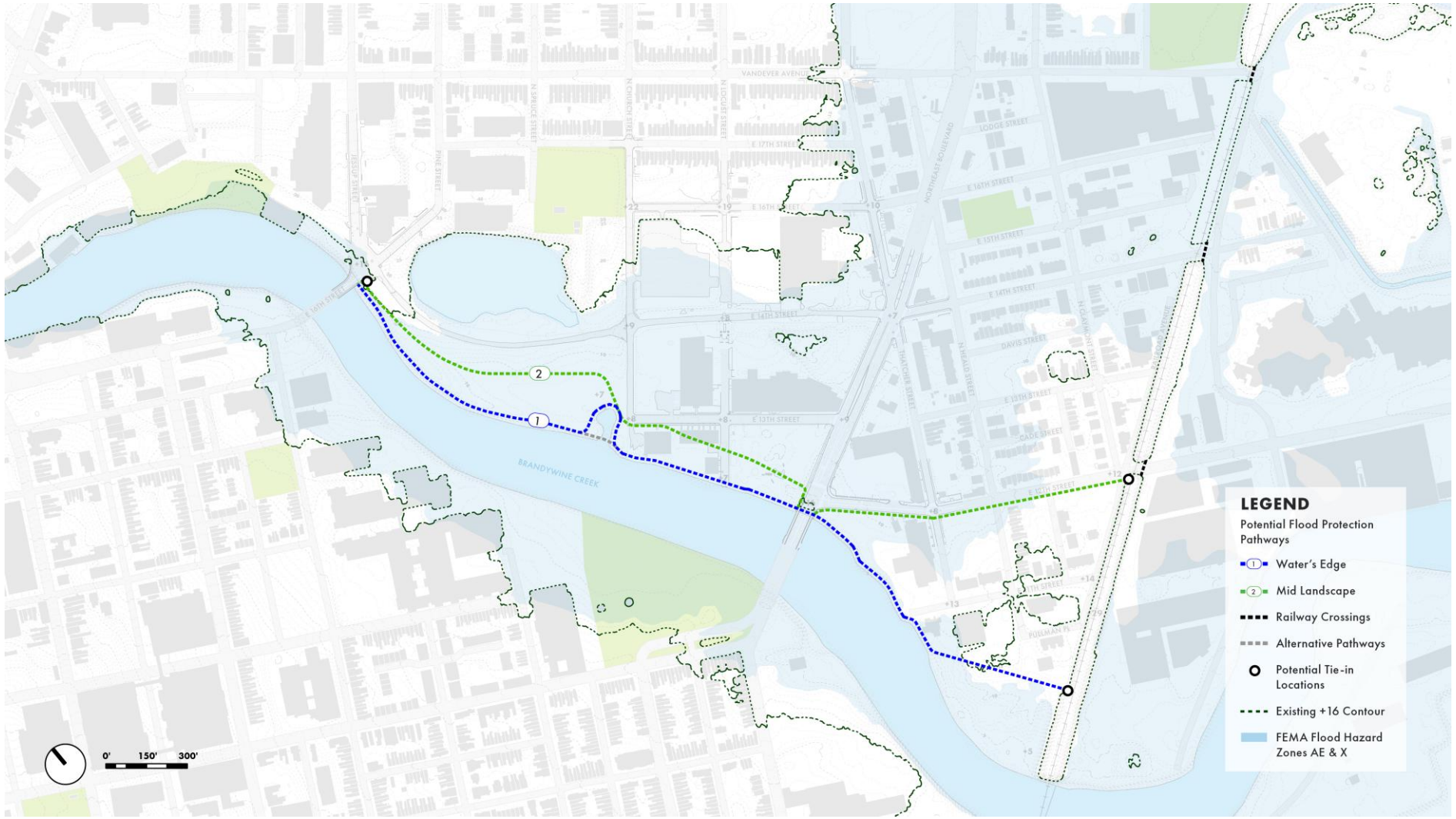


Elements of these flood protection pathways can be combined based on the feedback we receive today

Flood Protection Locations | Mid Landscape

Alternative 1 – Water's Edge:
- Protects the most existing land uses (+)
- Floodwall along the water's edge inhibits waterside access (-)
- Requires the highest floodwall (-)

Alternative 2 – Mid-landscape:
- Floodwall is mostly integrated into the landscape (+)
- Setback from water's edge allows waterside access (+)
- Mid-landscape protection pathway east of Northeast Boulevard leaves existing land uses unprotected (-)



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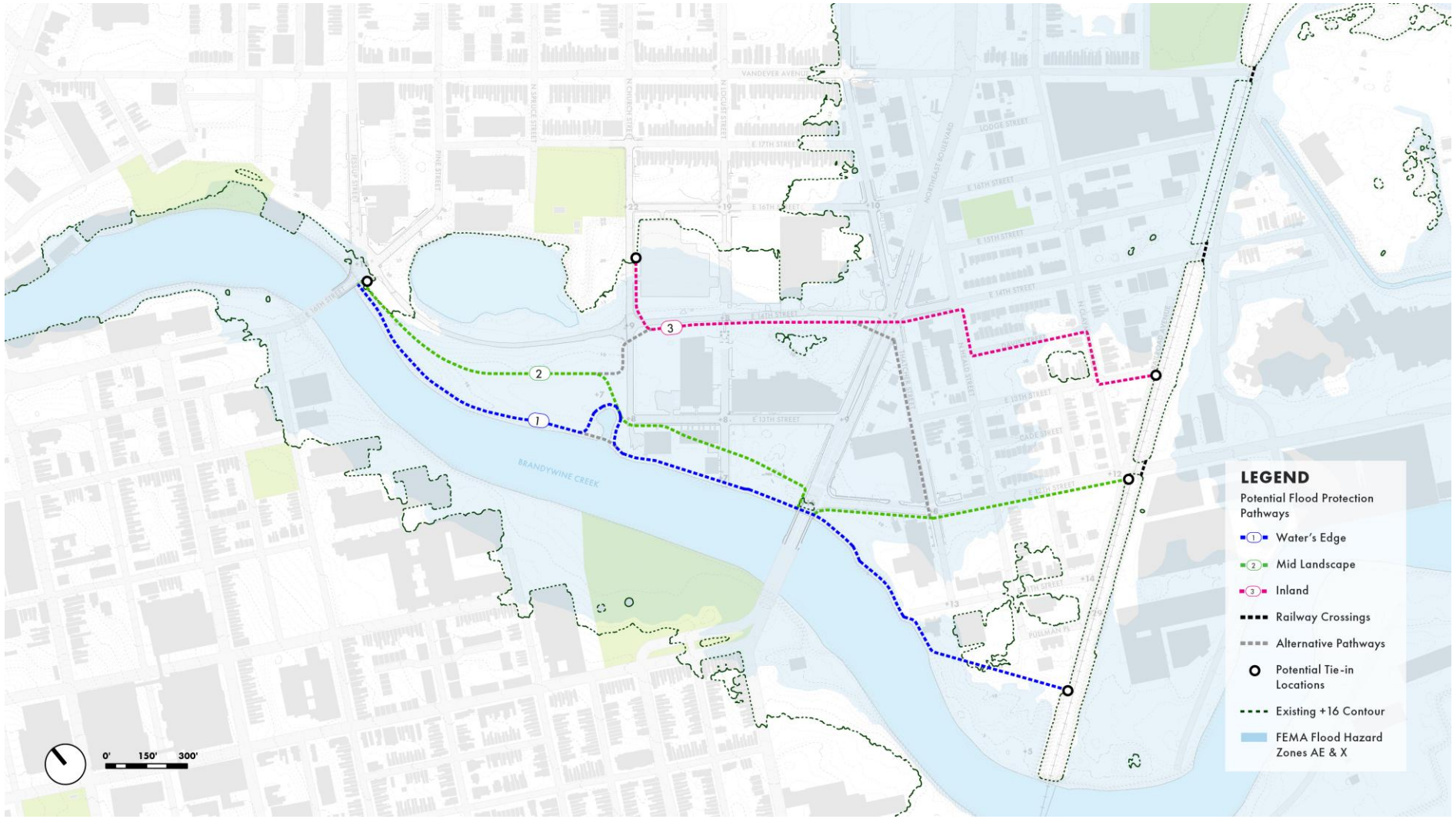
Flood Protection Locations | Inland

Alternative 1 – Water's Edge:
- Protects the most existing land uses (+)
- Floodwall along the water's edge inhibits waterside access (-)
- Requires the highest floodwall (-)

Alternative 2 – Mid-landscape:
- Floodwall is mostly integrated into the landscape (+)
- Setback from water's edge allows waterside access (+)
- Mid-landscape protection pathway east of Northeast Boulevard leaves existing land uses unprotected (-)

Alternative 3 – Inland:
- Leaves the most existing land uses unprotected (-)
- Requires additional flood gates at roadway crossings (-)



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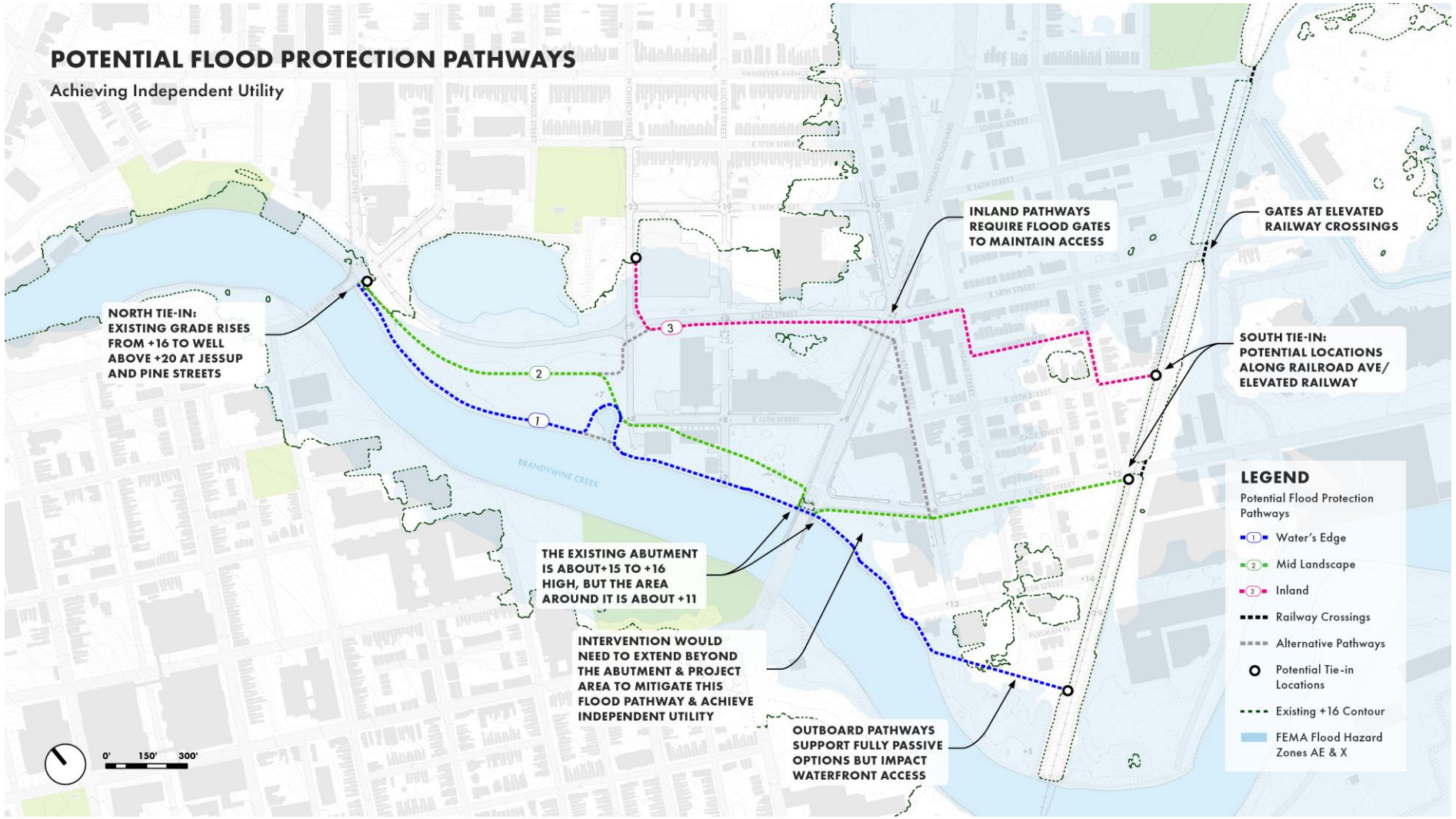

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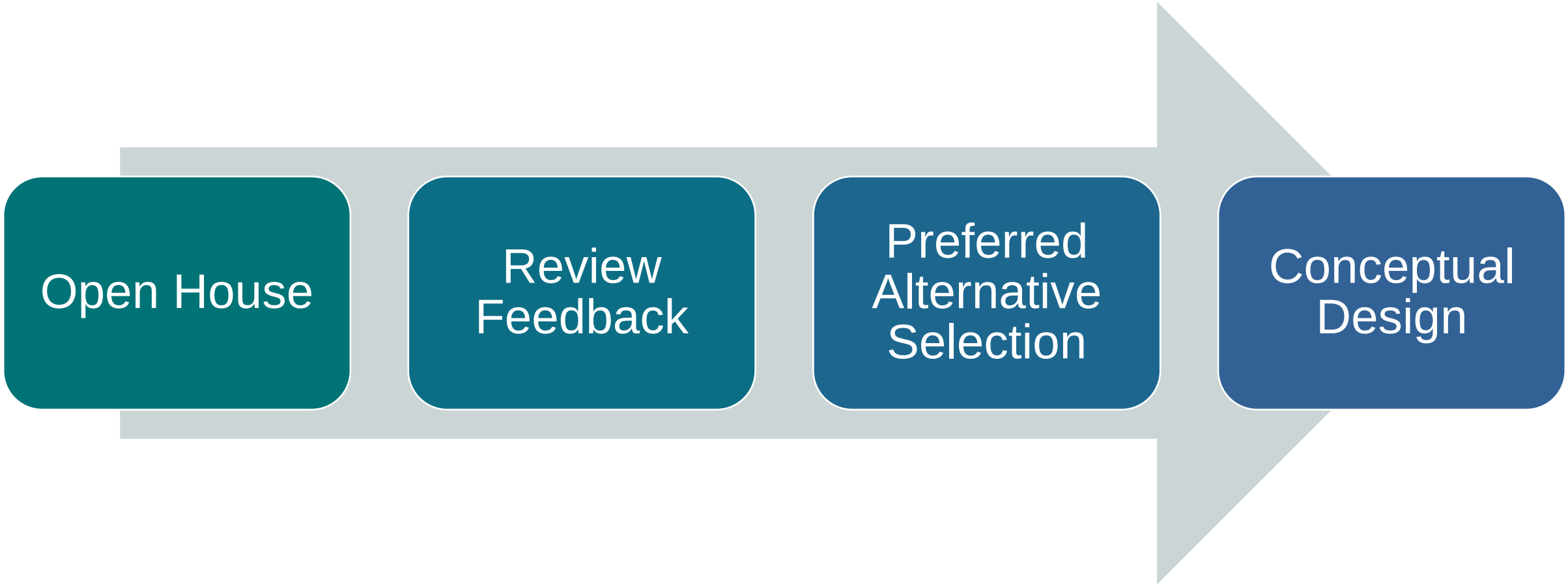
6. Open House

Incorporating Your Feedback



Incorporating Your Feedback

Key details of the proposed flood protection

Drawing of the flood protection strategy

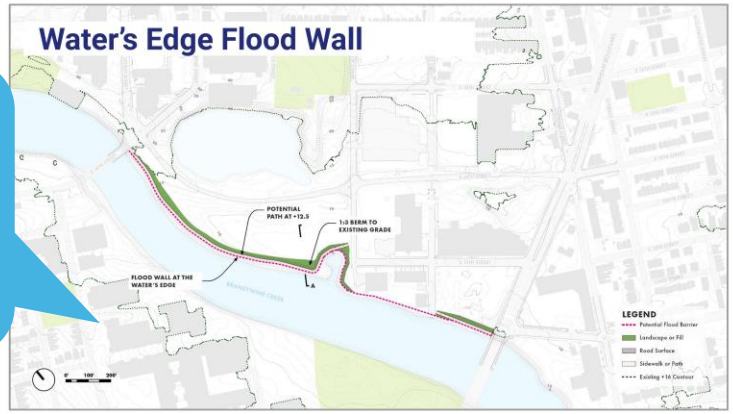
Space to place sticky notes of your feedback

Photos of similar flood protection strategies

Examples of possible programming

Flood Protection Alternative #1

Water's Edge Flood Wall



Water's Edge Flood Wall Section View

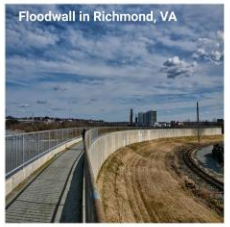
Protected Area

Highlights

- Protects the most existing land uses (+)
- Floodwall along the water's edge blocks waterside access (-)
- Requires the highest floodwall (-)
- Does not require flood protection that must be activated/flood gates (+)

The Water's Edge Flood Wall alternative creates a concrete wall along the water's edge. The wall is visible from the street level. The area behind the dotted red line is protected. There is potential for activation along the wall, in the form of pedestrian/cycling paths and art/landscaping. This option does NOT require floodgates.

Examples of Similar Flood Protection Strategies



Possible Future Programming Opportunities:

Murals

Pedestrian path

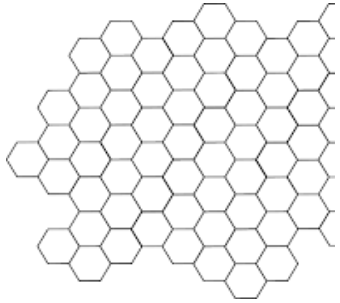
The City and the project team are interested in hearing how the community would like to use the space in the future.

How would you like to use the waterfront?

WHAT DO YOU LIKE ABOUT THIS OPTION?

WHAT DON'T YOU LIKE ABOUT THIS OPTION?

What Matters to You?



Protected Area	Co-Benefits	Integration	Fit for Funding	Ease of Implementation	Adaptability
How much of the neighborhood will the project protect?	*Does the project create opportunity for additional benefits, such as improved waterfront access, recreational space, or environmental benefits?*	*How well does the flood protection measure fit into the neighborhood and surrounding environment?*	*How competitive would the project be for grant opportunities?*	*How easily can the project be implemented based on design, permitting, cost, and construction?*	*How easily can the design be modified or adapted in the future due to increasing flood risks or to include additional co-benefits?*

Community Input Drives the Final Design

Questions to Think About

What are the key features of the proposed alternative?

How does this project fit with other community plans?

Will local businesses, parks, or homes be affected?

How will my feedback be used in the design?

How will this project affect traffic, parking, or safety?

Will this project help the environment?

Come talk with us!

Meet us over at the poster tables – we look forward to discussing these flood protection alternatives and hearing your feedback.