

4 MILE RUN WATERSHED GREEN INFRASTRUCTURE PRELIMINARY DESIGN UPDATE



phro•ne•sis

 **BURNS
McDONNELL**



OCTOBER 26, 2017

AGENDA

- > OVERVIEW + CONTEXT
- > TECHNICAL ANALYSIS
- > PRELIMINARY DESIGN PROCESS
- > STORMWATER + BUDGET OUTCOMES
- > CHANNEL DESIGN + TRAIL NODES
- > NEXT STEPS



ACCOMPLISH MASTER PLAN GOALS WITH GREEN INFRASTRUCTURE



2000 PLAN GOALS:

1. New Visitors Center
2. Park improvements related to Phipps Expansion
3. Junction Hollow Fields
4. Rehabilitation of The Oval
5. Comprehensive Traffic Study
6. Restore Schenley Plaza
7. East Entry Pedestrian Paths and Roundabout
8. Flagstaff Hill and Azalea Garden
9. Restore Panther Hollow, including Lake and Bridges



2011 PANTHER WATERSHED PLAN:

1. Improve watershed health by:
2. Reduce runoff from impervious surfaces
3. Increase baseflow to stream
4. Restore landscape
5. Gather community support
6. Install highly visible pilot projects and monitor results



2012 PLAN UPDATE GOALS:

1. Schenley Plaza enhancements
2. Green Schenley Bridge
3. Collaborate w/ Phipps on parking
4. Improve Azalea, Woodland Garden
5. Reinvent the golf course
6. Restore Panther Hollow Watershed
7. Better connect Park to Junction Hollow & adjacent neighborhoods
8. Provide stormwater management in Junction Hollow, connect to Monongahela River
9. Traffic and Pedestrian improvements-green streets and gateways

Community Engagement

Conceptual Design

11/15/16 – St. John Chrysostom, The Run, Greenfield

1/24/17 – Alumni Hall, Oakland

6/19/17 – Jewish Community Center, Squirrel Hill

On-site Walks

8/16/17 – Panther Hollow

9/6/17 – Junction Hollow

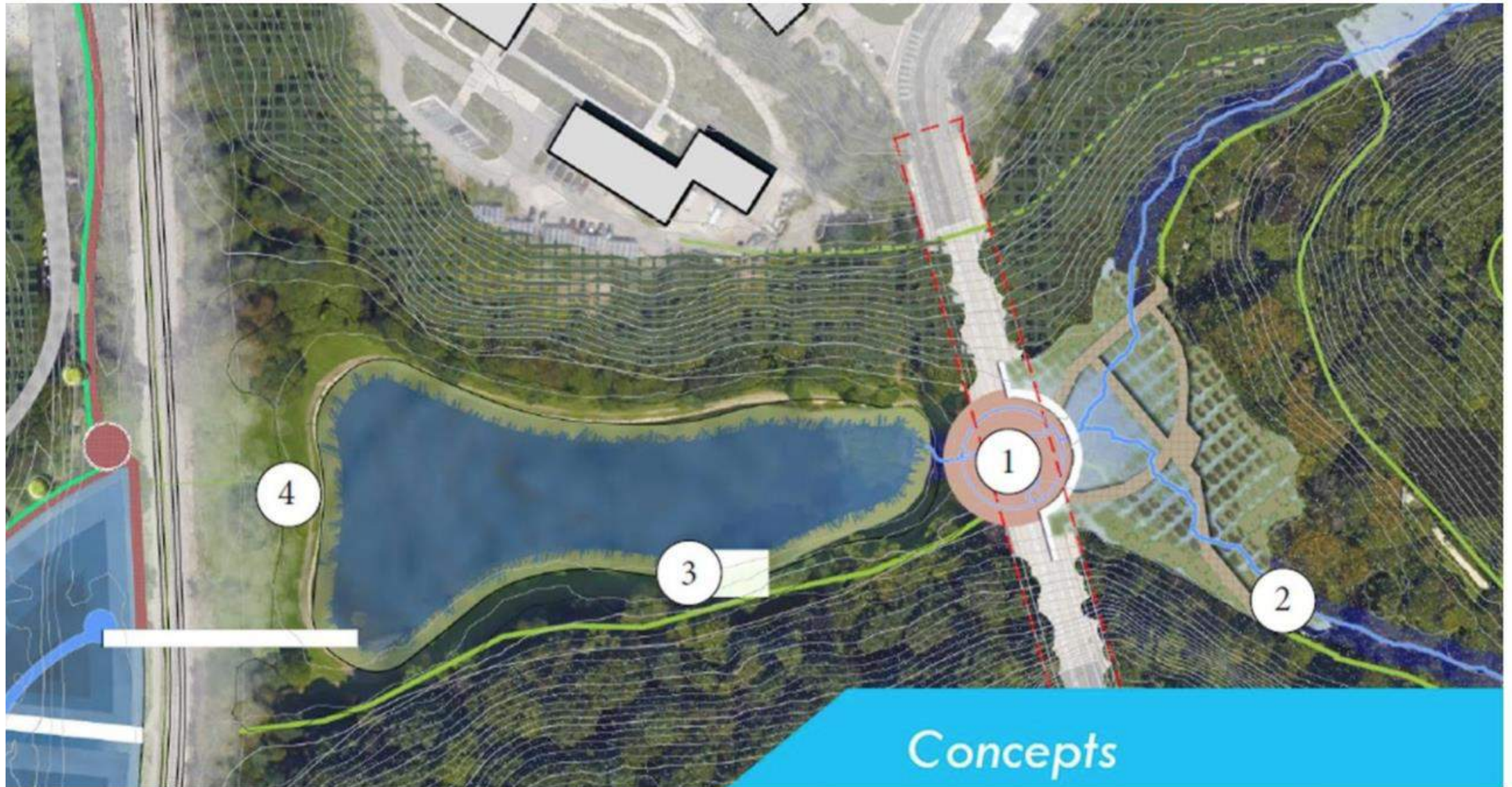
9/20/17 – Review Meeting, St. John Chrysostom

Online Survey

Preliminary Design

10/26/17 – HERE!

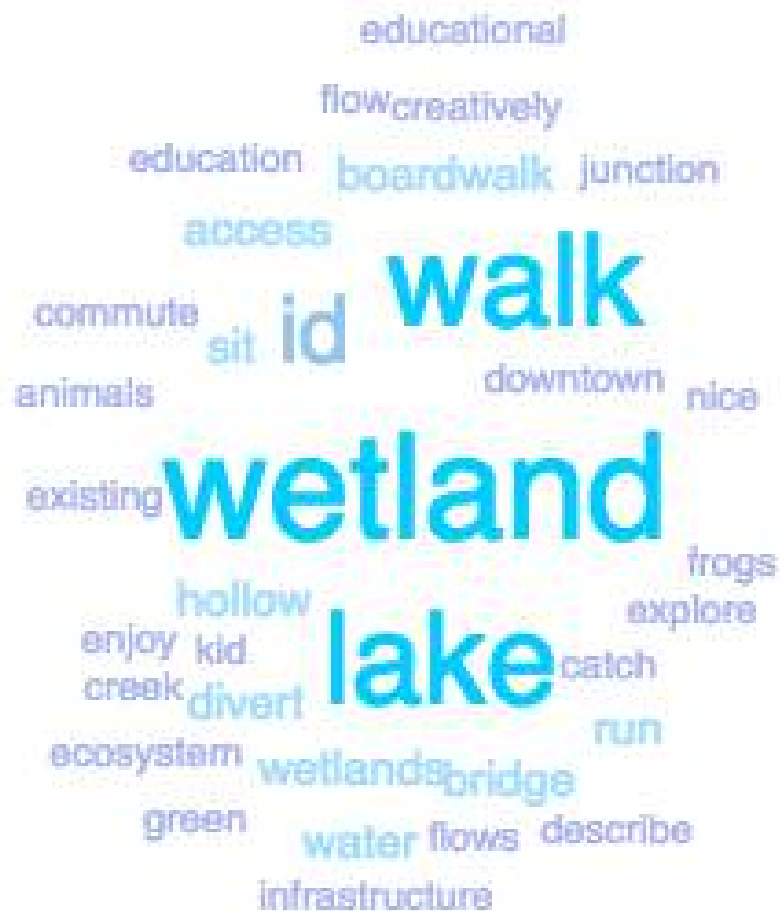
Panther Hollow Surveys



What would you like to do here?

1. Phipps and Panther Hollow Confluence

2. Panther Hollow Wetland and Streams



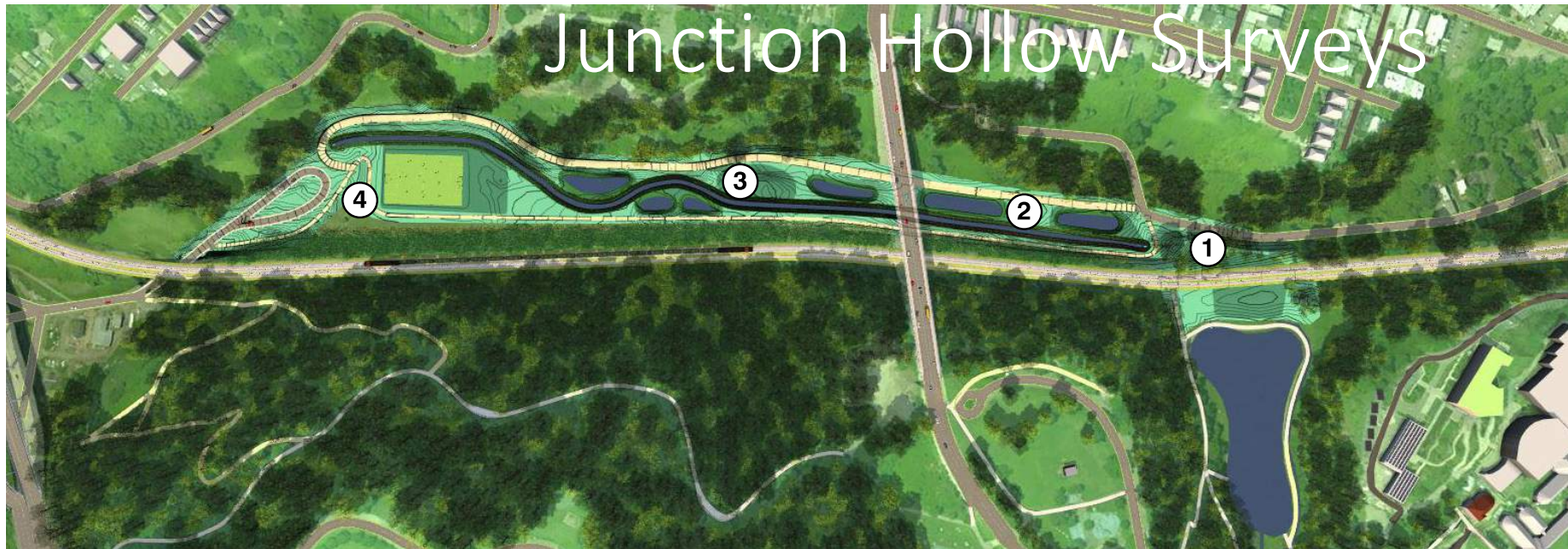
What would you like to do here?

3. Panther Hollow Lake



4. Lake Outlet





② OUTDOOR CLASSROOM / WETLAND



① JUNCTION HOLLOW STREAM TRAILHEAD

JUNCTION HOLLOW ACTIVITY NODES

SEPTEMBER 06, 2017

Station 4: Entrance from The Run

What kind of entrance would you like to be created for the park?

How do you currently recreate in Junction Hollow?



Online Survey

How do you use Panther Hollow (Schenley Park)?

What features of this area do you like?



Online Survey

What features of this area could be improved?

Other Comments:



*Humans are not the only residents of Pittsburgh.
Please consider wildlife in every design decision*

I have mobility issues, so one thing that is very important to me is that accessibility not be treated as an afterthought in planning, or disabled people given a token spot they can get to.

I would like to receive email updates or Facebook or something about this project as it goes on. I regularly commute through this area and will want to know about plans and closures.

Concept Image Feedback: Lake

SITE 3: Panther Hollow Lake



Concept images feedback: Panther Hollow Lake

One solution could include naturalized edges around the lake that absorb stormwater, with places and structures for people to approach the water's edge. What are your thoughts on the concept images above?

Concept Image Feedback: Lake

"I like the idea of being able to approach the water. Water is such a wonderful and calming substance."

"Stunning. While restoring the lake should be a priority and I support naturalized edges as part of that (with access), a better trail is a must. I understand if it needs to be offset further away from the lake."

Respondees: 359

Liked all three images: 158/359

Liked #1: 29

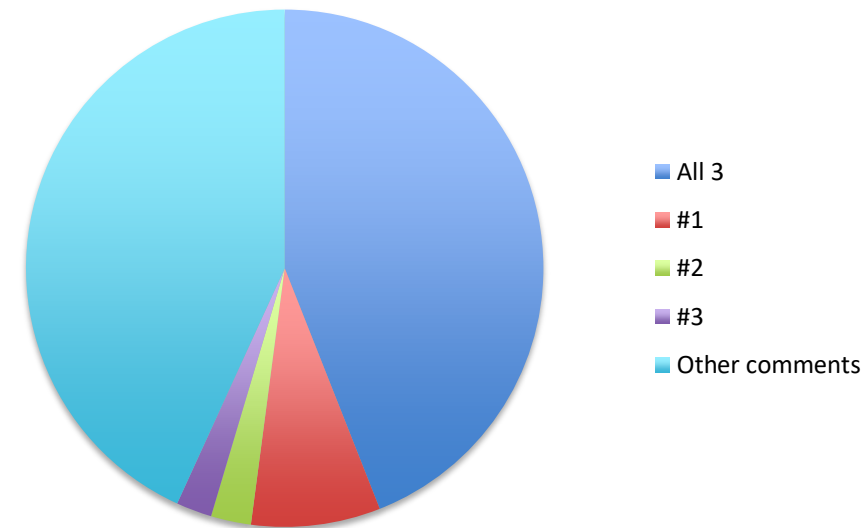
Liked #2: 9

Liked #3: 8

Want natural edges: 60

Want lake to be approachable: 52

Other notable comments: concerns about stagnation, maintenance; desire for fishing, boathouse or similar structure,



Site 3 – Junction Hollow waterways

What form(s) do you envision for Junction Hollow's waterways? How do you want to interact with water?

“Foremost: functional. Runoff is becoming a major issue for the run, and it would be best to mitigate that if we can.”

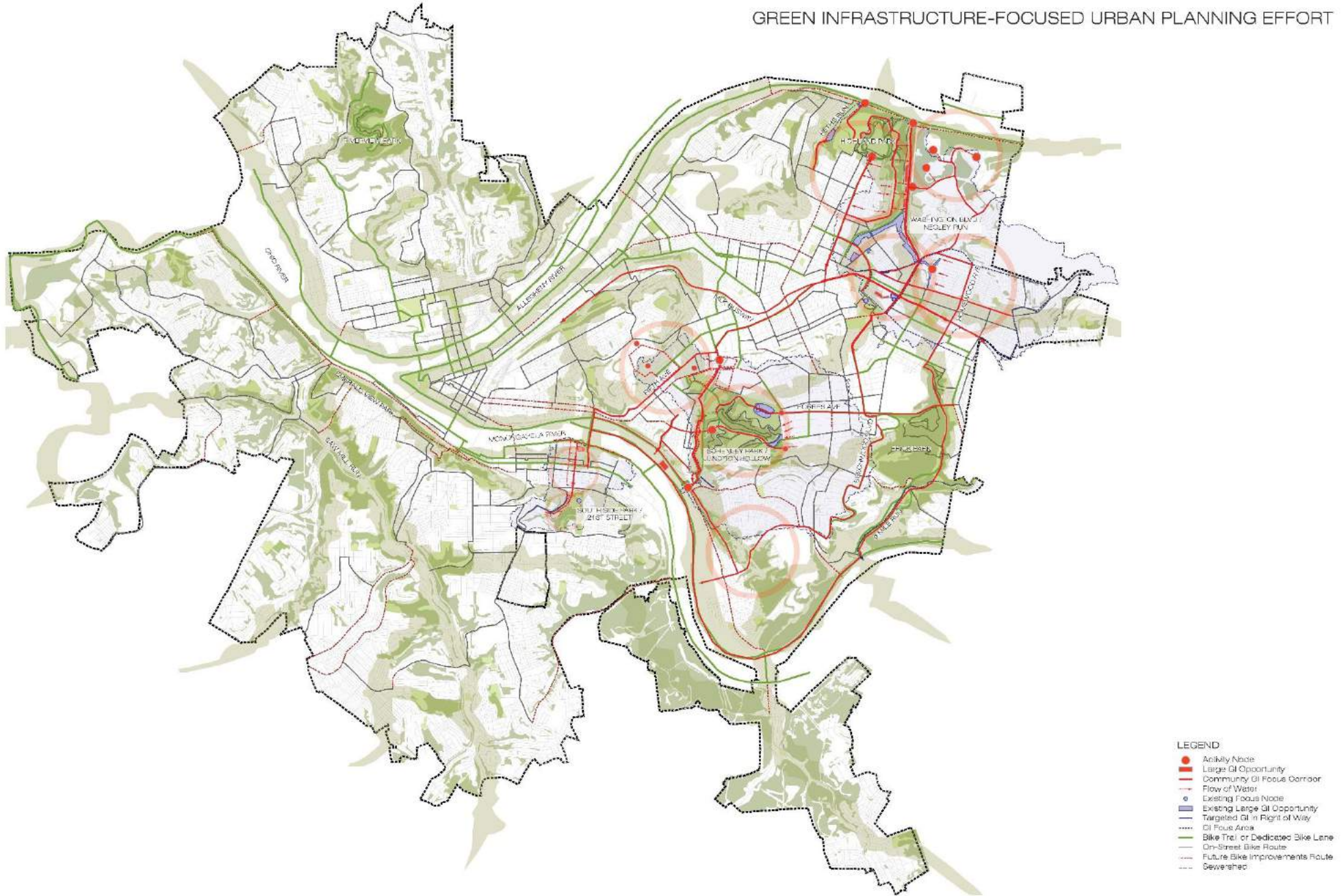
"I have seen some cities create art with their waterways, and seen videos of places where the water flowing over certain areas creates music. I think you could provide CMU (or another university) students to come up with a creative way to interact with water."

"I would prefer wetlands or streams. There is enough concrete in the city already."



GREEN INFRASTRUCTURE CITY WIDE ASSESSMENT

GREEN INFRASTRUCTURE-FOCUSED URBAN PLANNING EFFORT



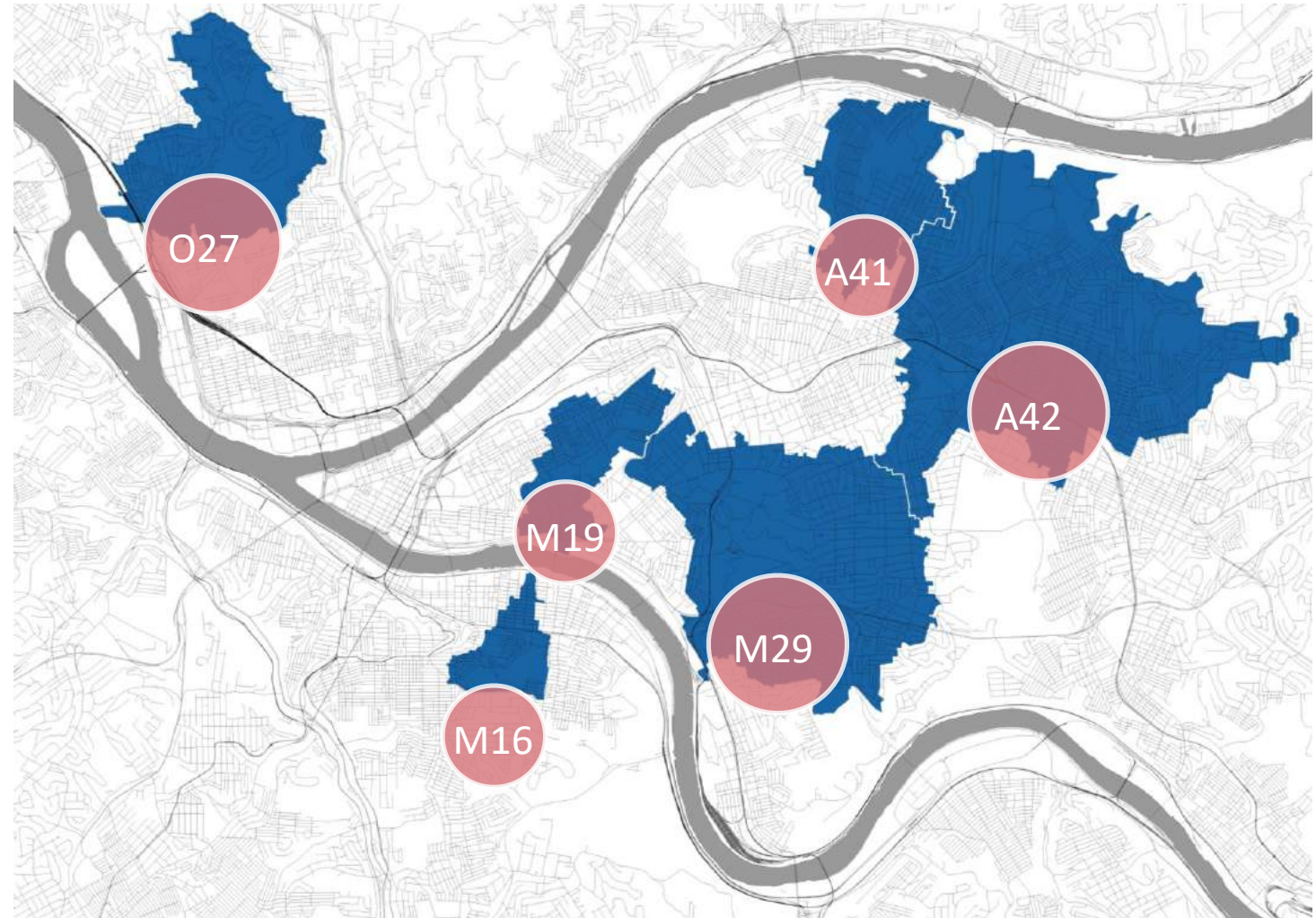
The Clean & Green plan is **ENGINEERED**

We need to keep rainwater out of the system. We can be most effective by focusing efforts on the sheds that contribute the most to the system.

We identified the **top 30 sheds** and overlaid other criteria:

RISK	LOWER RISK
OPPORTUNITY	EASY TO IMPLEMENT
DEVELOPMENT	HIGH ACTIVITY
SYNERGIES	MULTIPLE BENEFITS

and chose **6 priority sheds**



PRELIMINARY DESIGN - GUIDING PRINCIPLES

- > PUBLIC REALM INVESTMENTS = COST EFFECTIVE
- > WORKFORCE DEVELOPMENT OPPORTUNITIES
- > RE-ESTABLISH RIVERFRONT CONNECTIONS
- > COMPLETE STREETS APPROACH
- > FOCUS ON HEALTHY, WALKABLE COMMUNITIES
- > RESILIENT INFRASTRUCTURE

HISTORIC STREAMS IN 4 MILE RUN

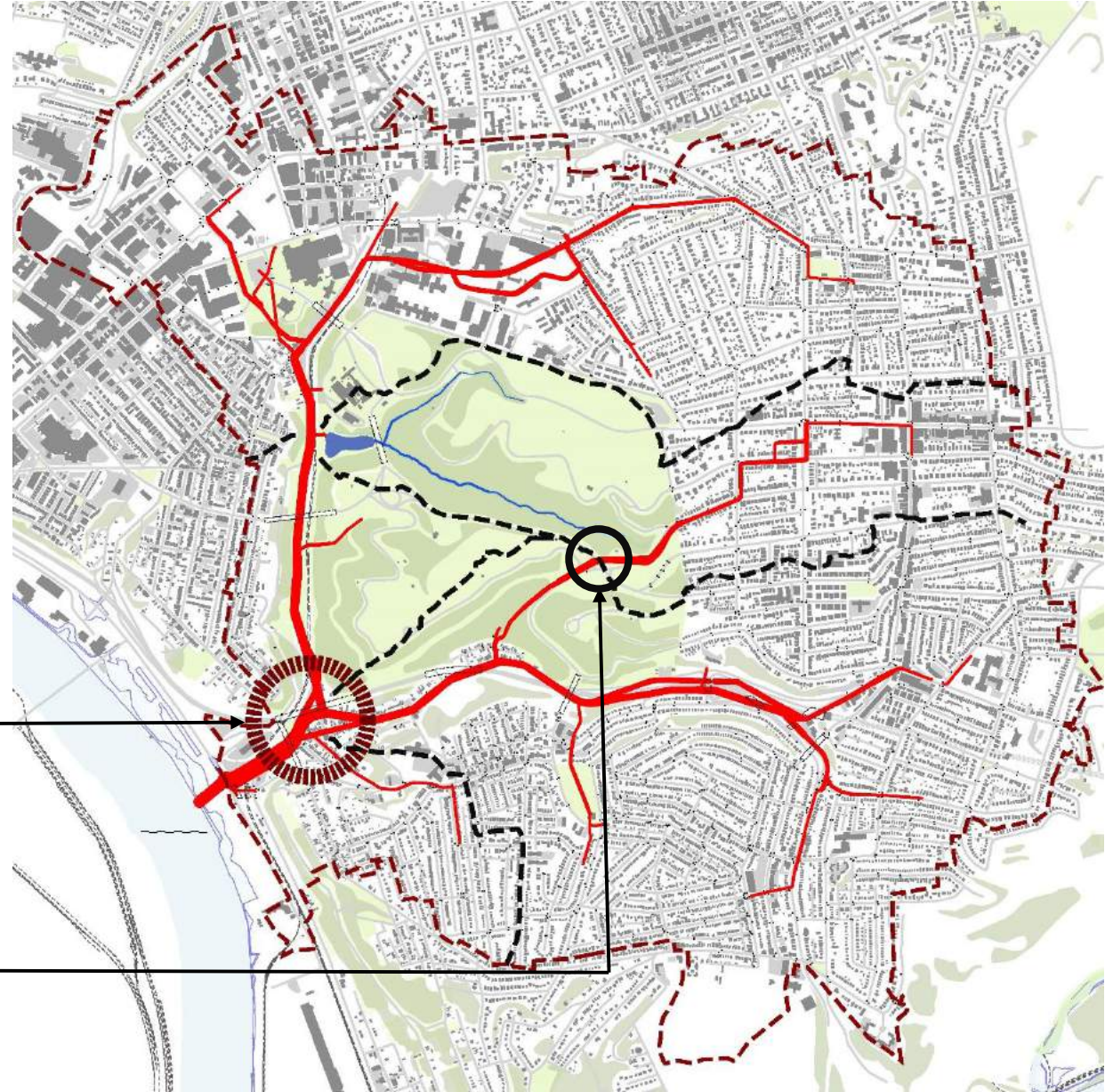


FLOODING ISSUES AT COMBINED SEWER JUNCTION



2 major combined sewers converge within the 100 year FEMA flood plain at the bottom of the 4 Mile Run watershed, contributing to significant flooding that impacts the residents and businesses nearby.

Much of the Squirrel Hill Neighborhood would normally drain through Panther Hollow, but gets rerouted through the combined sewer south.



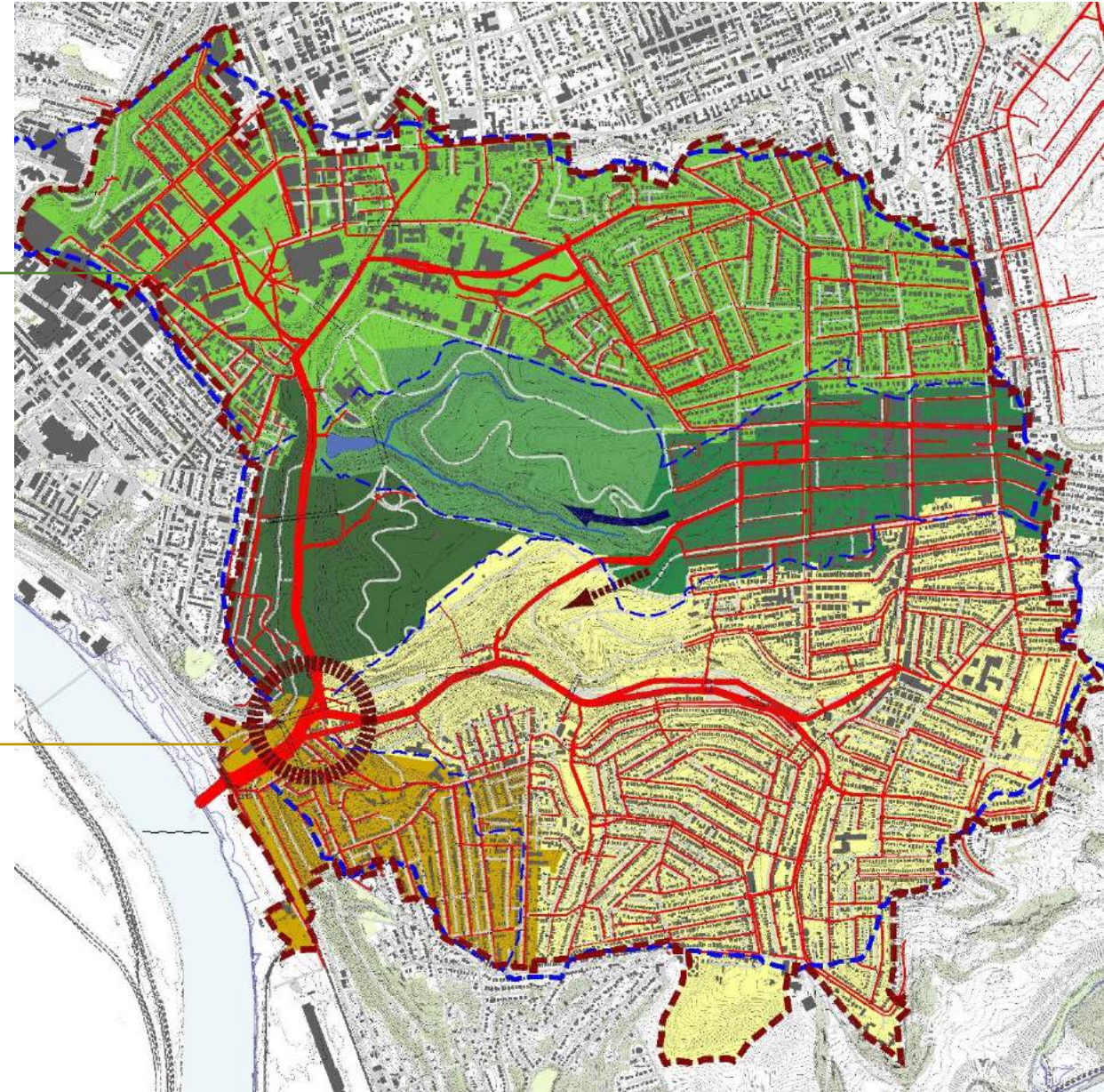
REVIVE FLOW TO PANTHER HOLLOW CREEK

JUNCTION HOLLOW SEWERSHED (Greens)

DIVERT UPPER PANTHER HOLLOW SEWERSHED
FLOW TO ORIGINAL PANTHER HOLLOW WATERSHED

Allow water to be slowed down, stored, and released
over time within the natural channel to alleviate
bottleneck flooding at the base of 4 Mile Run

SALINE RUN SEWERSHED (Yellows)





HARVEST RUNOFF FROM SCHENLEY DRIVE

This aerial map shows a city area with green overlays indicating runoff paths. Two red circles at the top mark the start of runoff from Schenley Drive and Squirrel Hill. A third red circle marks a connection point to an urban stream. The map also shows a river, a bridge, and various urban features like houses and fields.

HARVEST RUNOFF FROM SQUIRREL HILL

CONNECT TO RIVERFRONT W/ URBAN STREAM

PRELIMINARY DESIGN – FOCUS AREAS

PANTHER HOLLOW LAKE

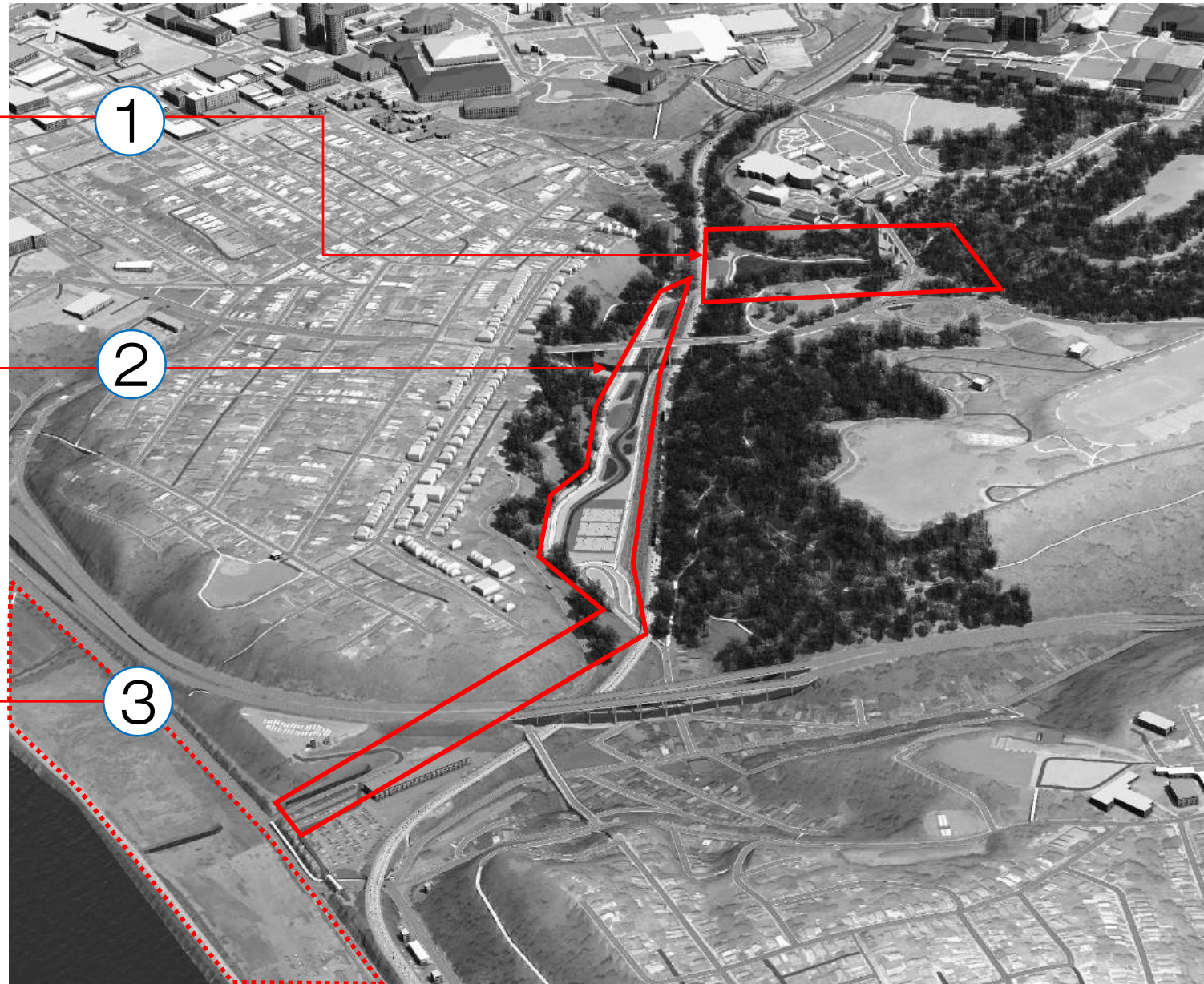
- Improve lake
- Wetland treatment
- Outdoor classrooms

JUNCTION HOLLOW

- Daylight stream
- Stormwater conveyance
- Trails
- Ecological restoration
- Recreation

HAZELWOOD GREEN

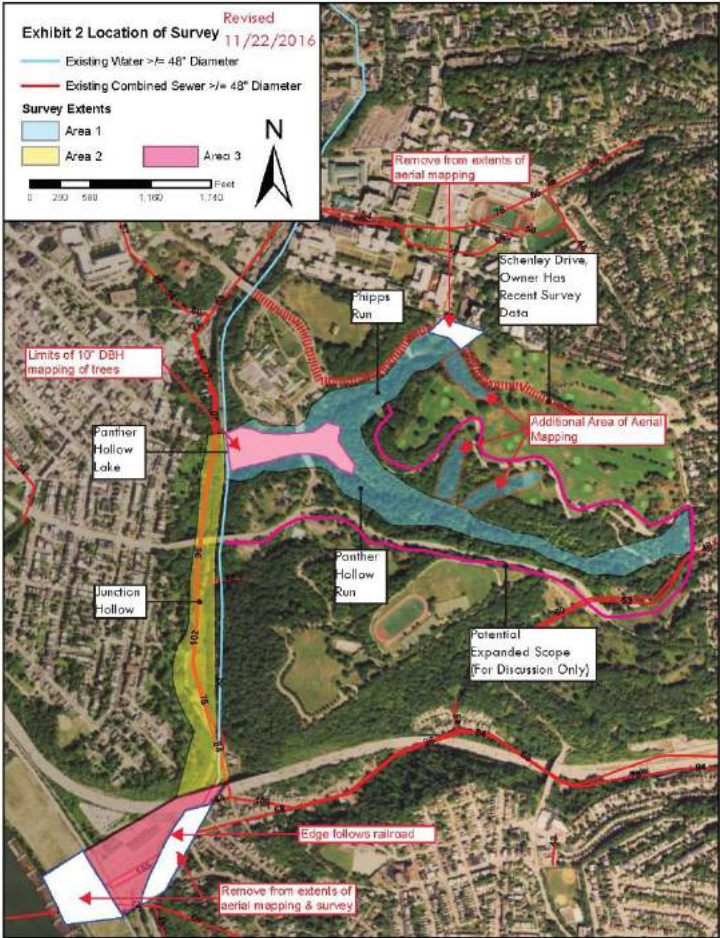
- Daylight stream
- Riverfront connection
- Coordinate with development



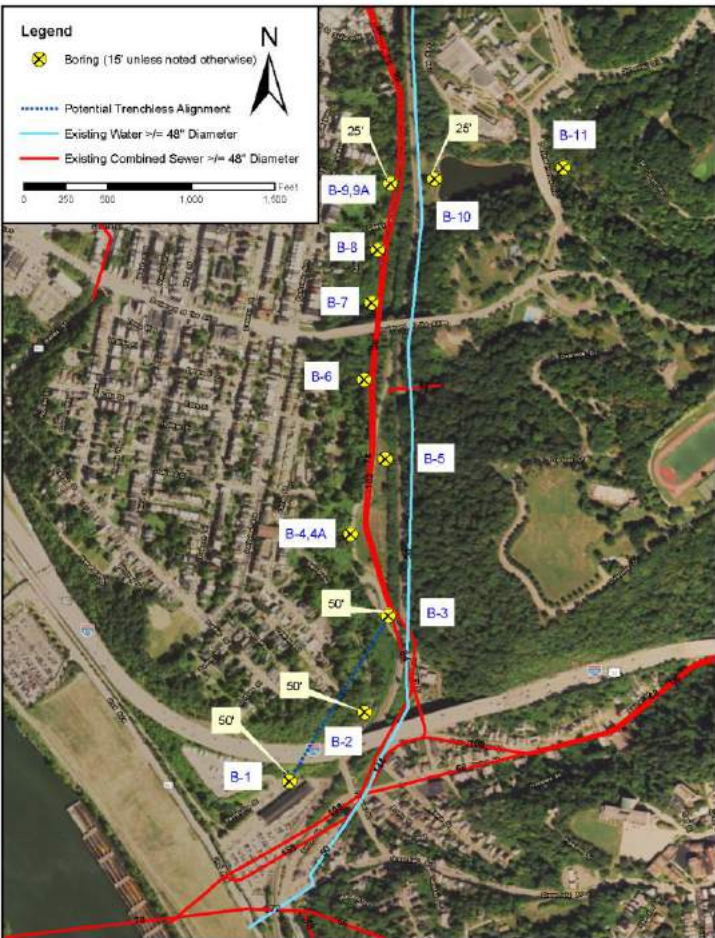
TECHNICAL ANALYSIS

- > SURVEY OF EXISTING CONDITIONS
- > GEOTECHNICAL BORINGS AND TEST PITS
- > LAKE SEDIMENT SAMPLING
- > STORMWATER ANALYSIS AND MODELING
- > SITE WALKS AND FIELD OBSERVATION
- > EXISTING UTILITIES AND SITE CONSTRAINTS

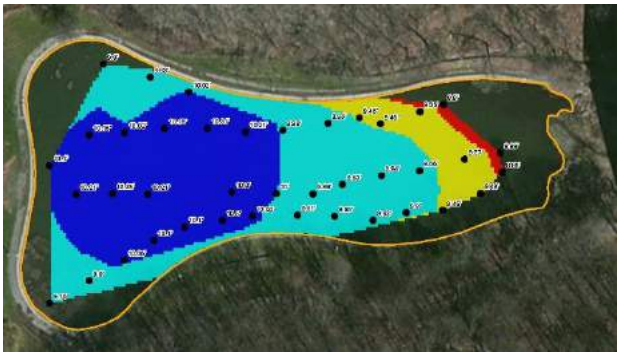
TECHNICAL ANALYSIS



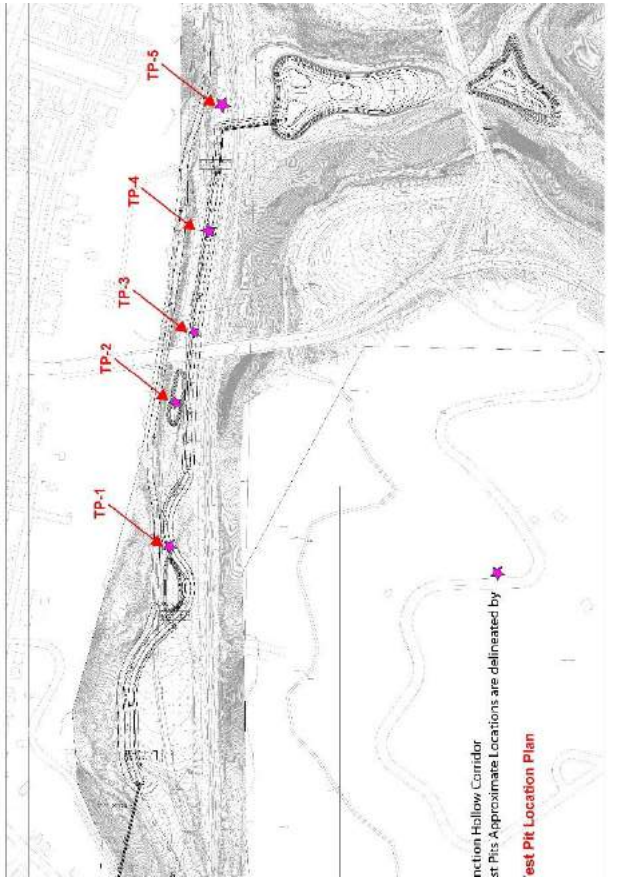
SURVEY



GEOTECH BORINGS

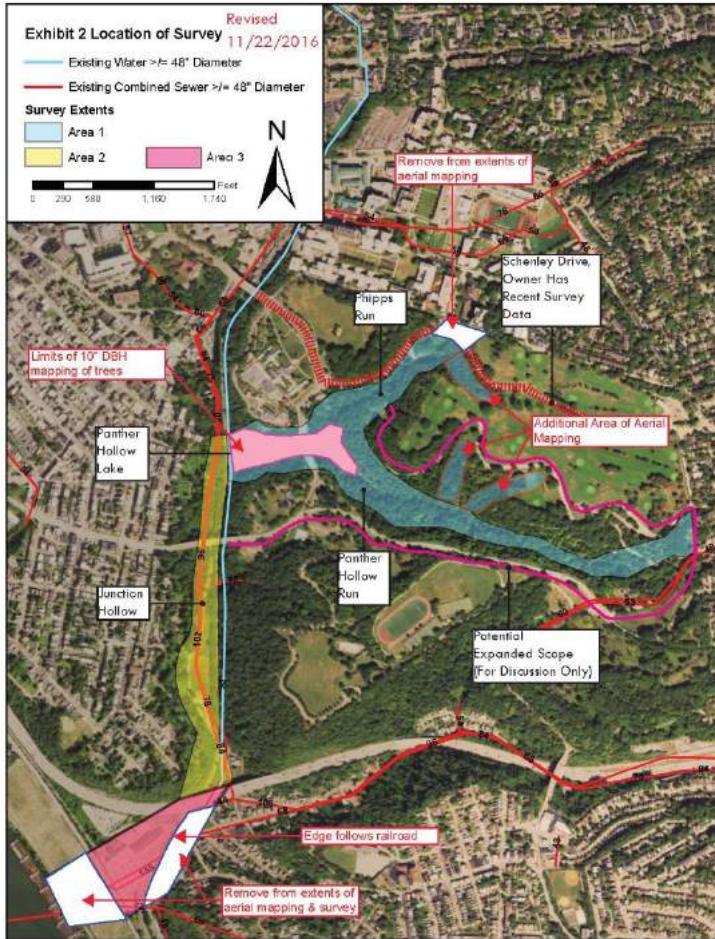


SEDIMENT SAMPLING

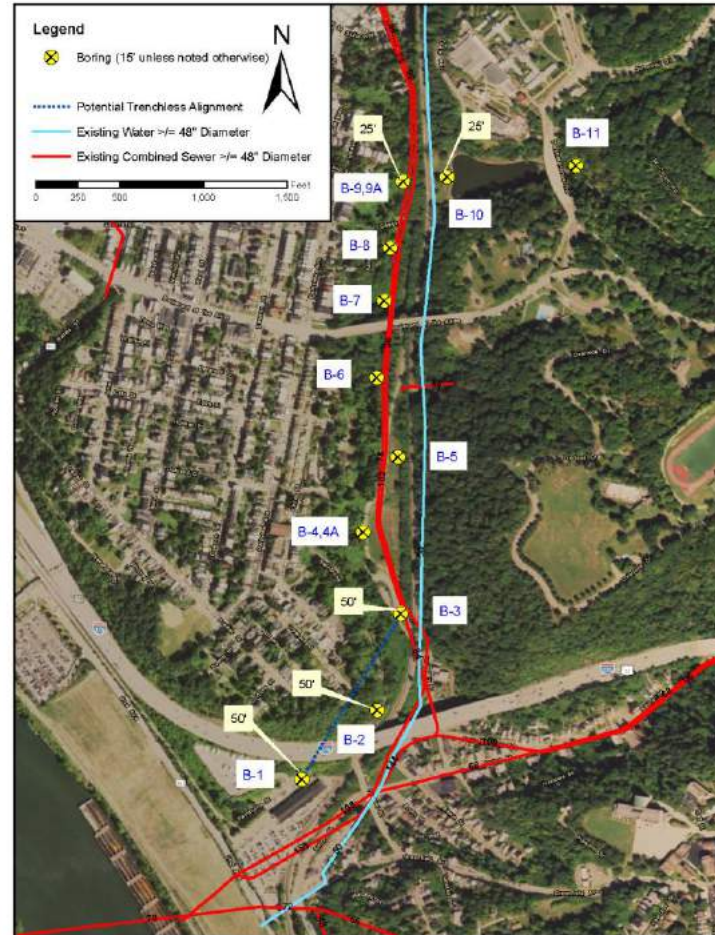


GEOTECH TEST PITS

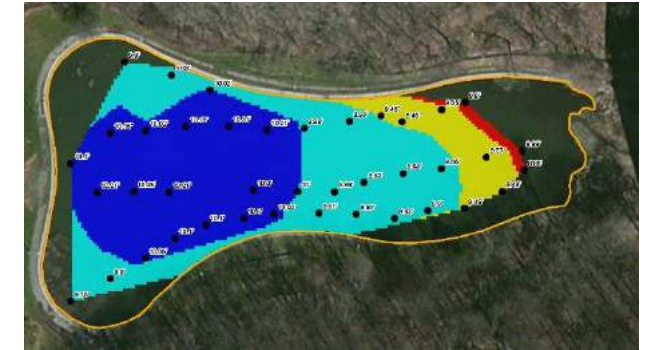
TECHNICAL ANALYSIS



SURVEY EXISTING CONDITIONS



GEOTECH BORINGS + TEST PITS



SEDIMENT SAMPLING

PRELIMINARY DESIGN STORMWATER CAPTURE

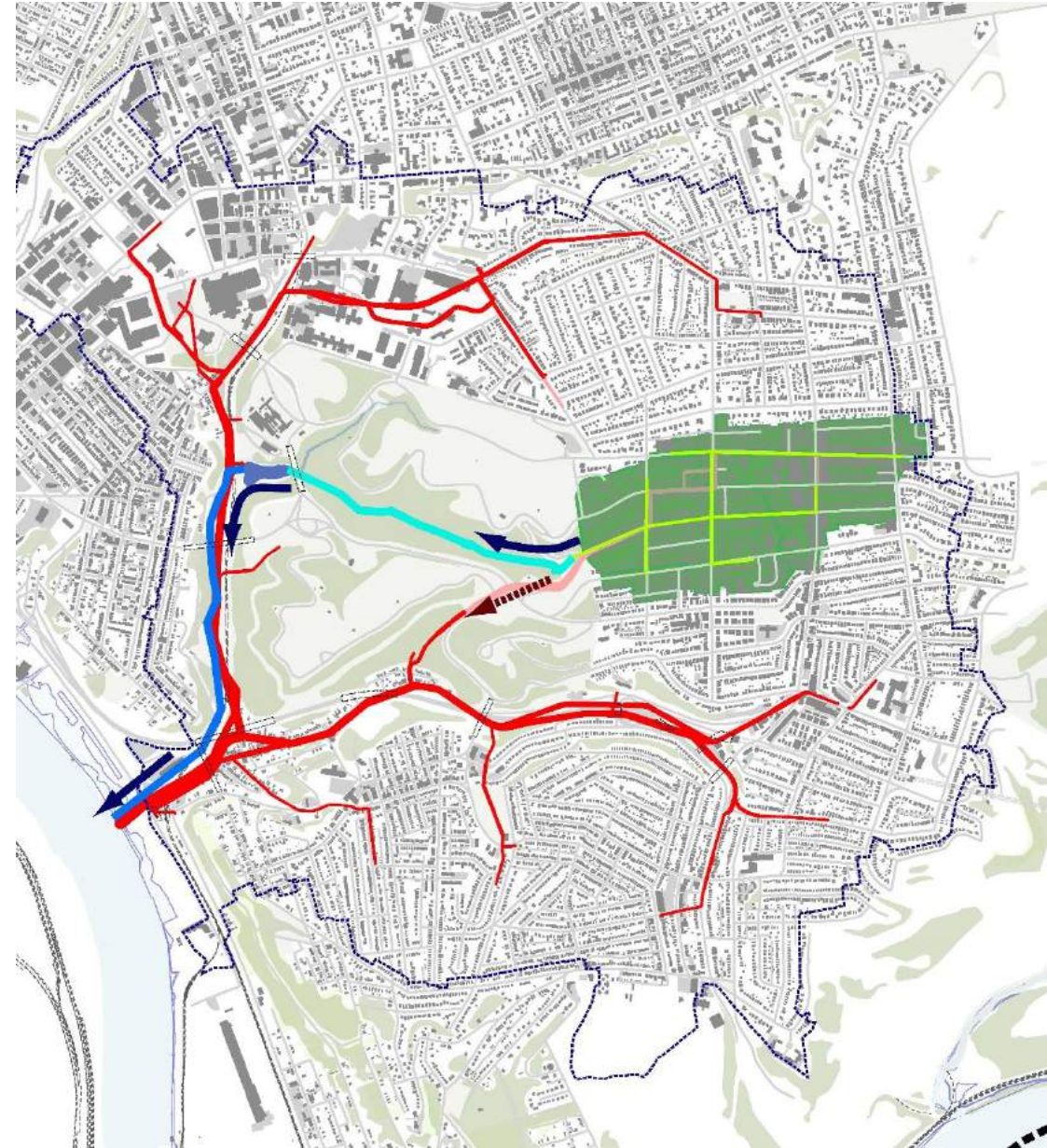


Technical

- Stormwater Capture:
 - 125,000,000 Gallons Removed Annually
 - Based on “monitored” data
 - Wet & Dry Weather Events
- CSO Reduction:
 - 31,900,000 Gallons Annually
 - Wet Weather Events
- Capture Area: 270 Acres
 - 176 Acres to Panther Hollow Lake
 - 94 Acres to Junction Hollow
- Total M-29 Drainage Area: 2,378 Acres
- Total CSO Volume: 423.5 MG
- Proposed CSO Reduction: 7.5%
- Additional Storage Capacity from the Upper Watershed

EXPLORATION OF FUTURE CAPACITY

- > Proposed Flows = 200 cfs
(no additional flows due to separation)
- > Compare Expansion of Squirrel Hill
- > Compare Expansion of Oakland



1. PANTHER HOLLOW LAKE RESTORATION

- > PRE-TREATMENT WETLAND
- > “SMART” LAKE CONTROLS
- > OUTDOOR CLASSROOM
- > NATURAL LAKE RESTORATION
- > RAILROAD CROSSING ?



2. JUNCTION HOLLOW: PROPOSED CHANNEL DESIGN

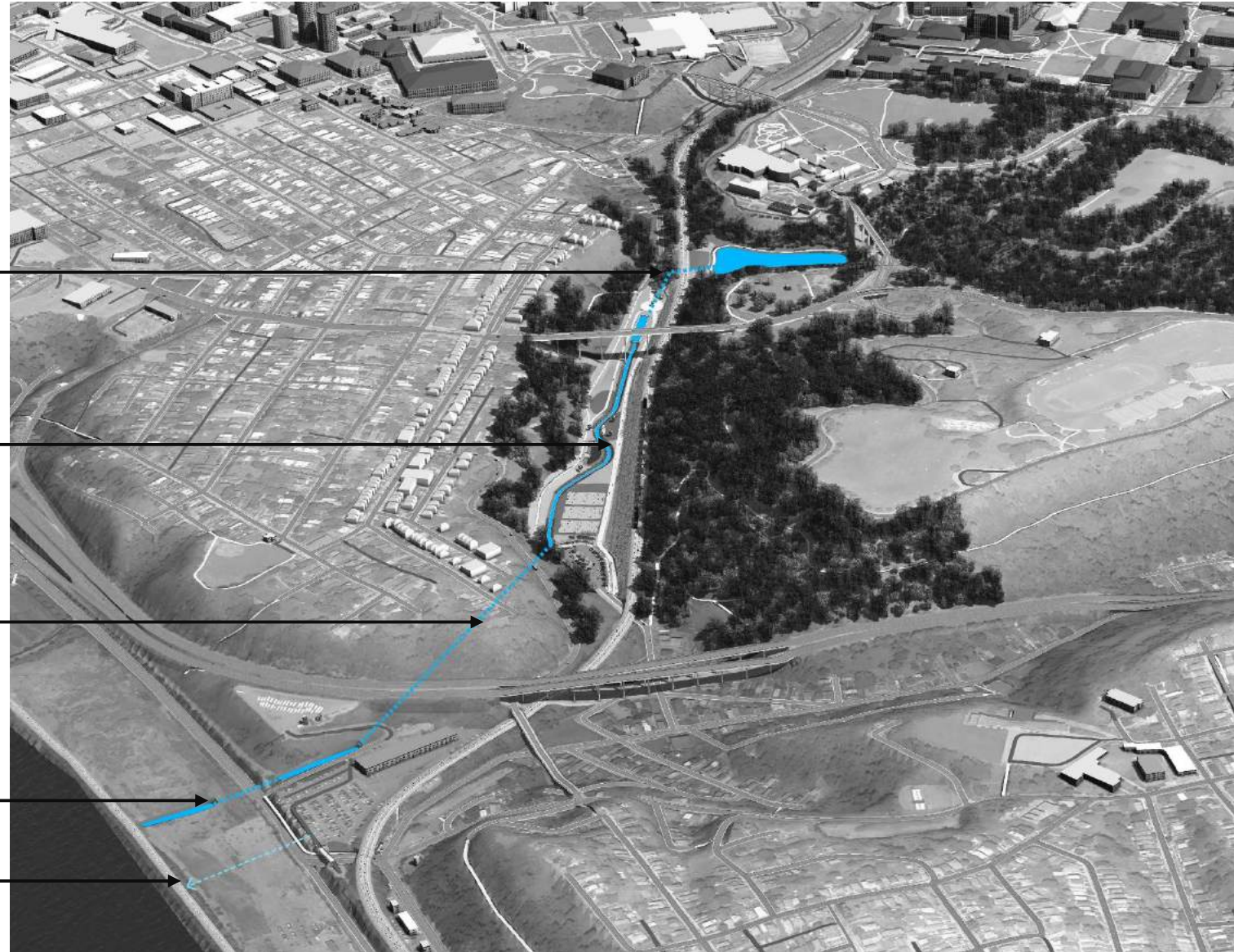
PIPED UNDER RAILROAD

OPEN CHANNEL

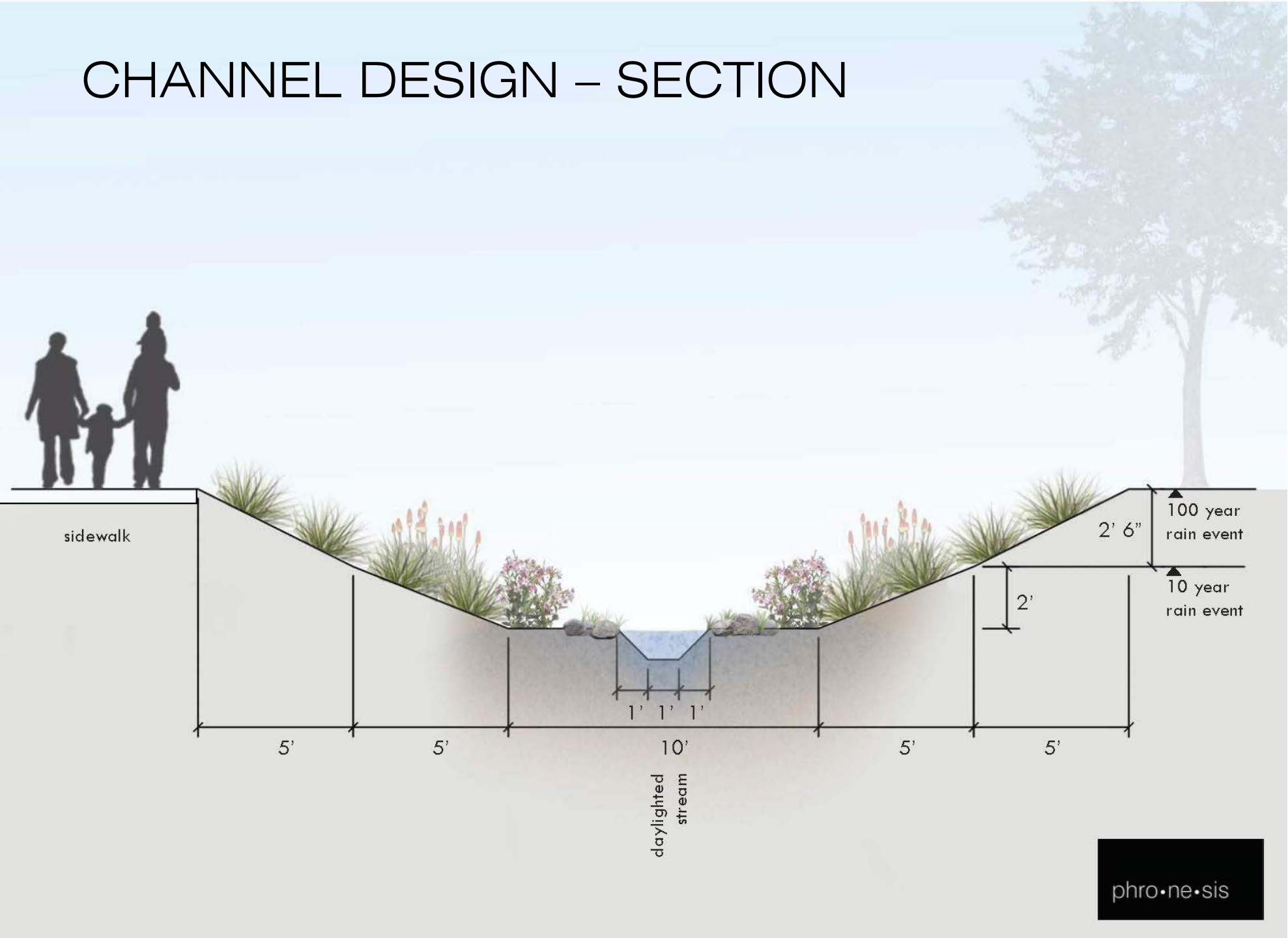
TRENCHLESS SEWER
“new pipe”

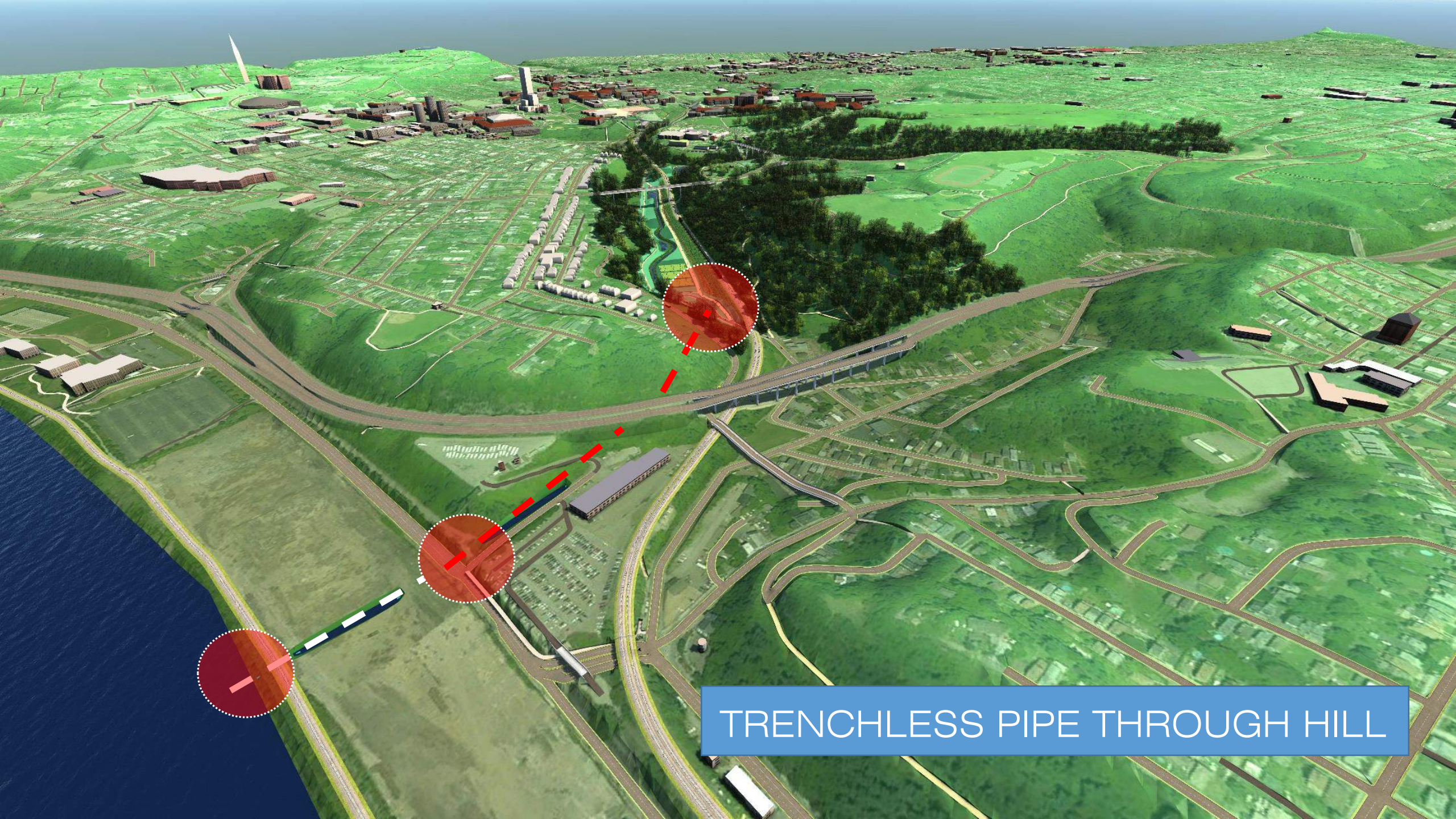
OPEN CHANNEL

EXISTING OUTFALL



CHANNEL DESIGN – SECTION

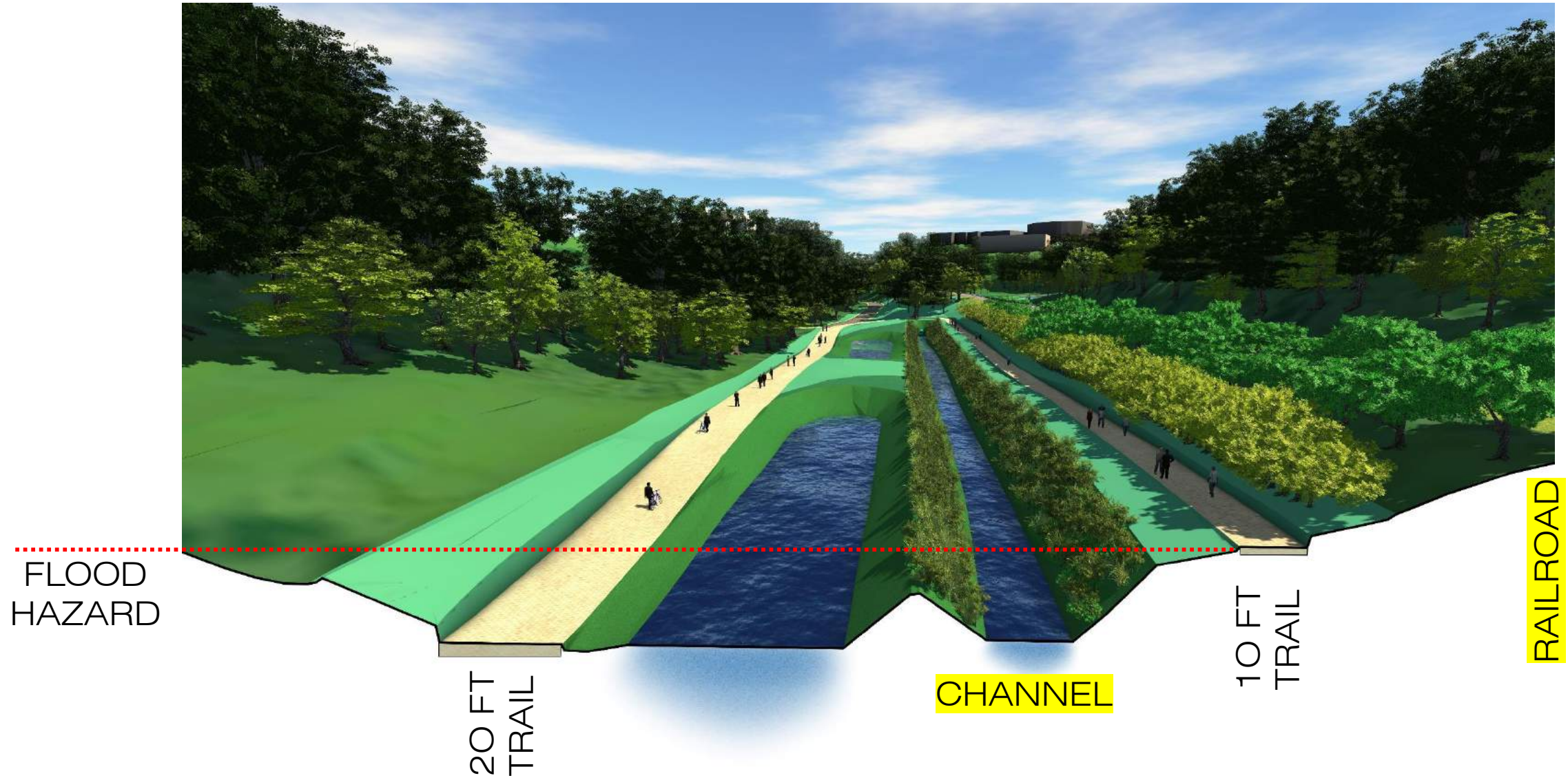




TRENCHLESS PIPE THROUGH HILL

TRAIL DESIGN

Step 1. Section



TRAIL DESIGN

Current Alignment

EXISTING RAILROAD

20 FT MULTIMODAL

- more active
- bikes
- turn around (north)

10 FT TRAIL

- passive
- Walking

6 FT TRAIL

- nature
- passive



PROPOSED TRAIL + NODES

WOODLAND TRAILS

MEADOW
CROSSING

WETLAND
BOARDWALK

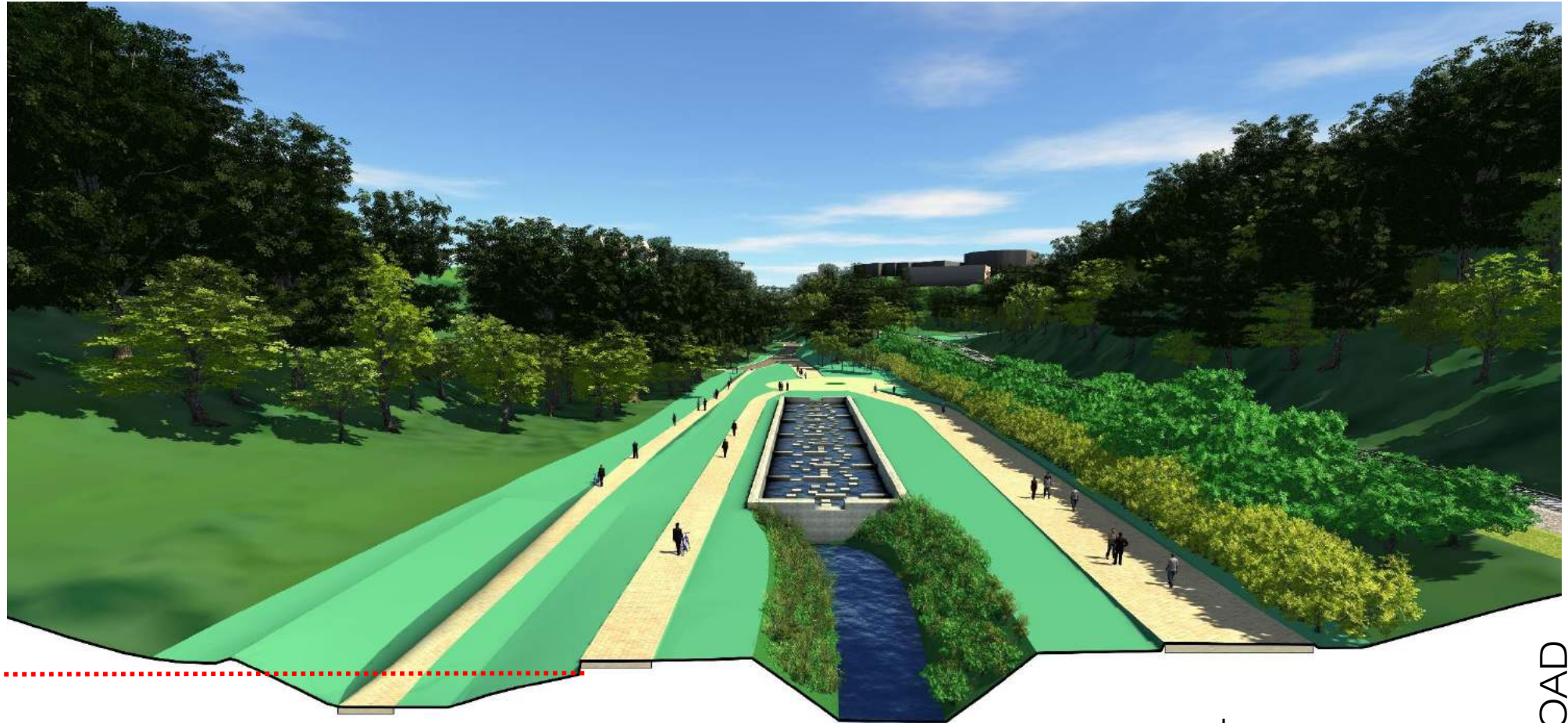
signage, formal
explore, natural

PUBLIC ART



TRAIL DESIGN

Open Channel Start



FLOOD
HAZARD

6 FT
TRAIL

10 FT
TRAIL

CHANNEL

20 FT
TRAIL

RAILROAD

NATURE + RESTORATION NODES SECTION



RECREATION NODES: ACTIVE vs. PASSIVE

RECREATION FIELDS

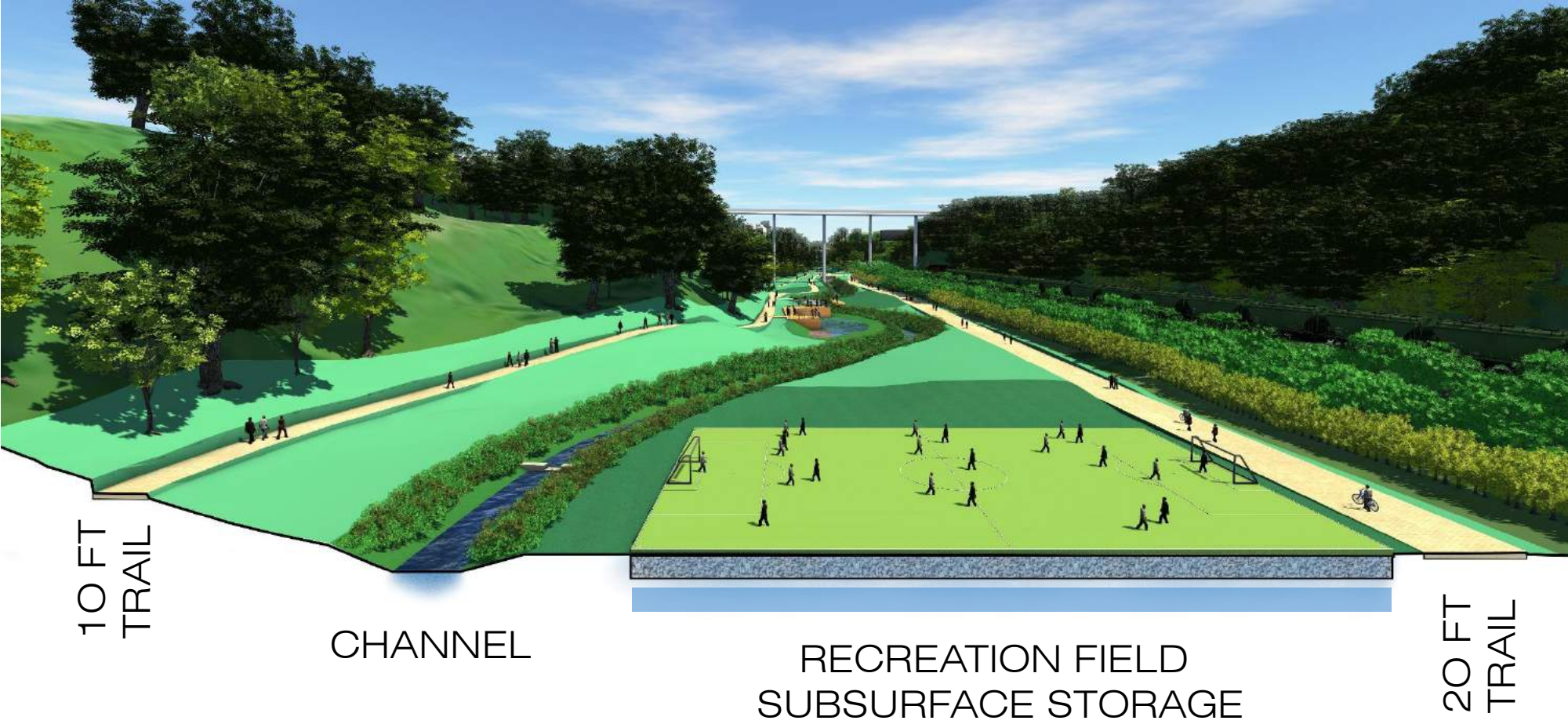
- > *formal field layout*
- > *versus flexible lawn*

GATEWAYS + TRAILHEAD

PARKING LOT IMPROVEMENTS



RECREATION FIELDS SECTION



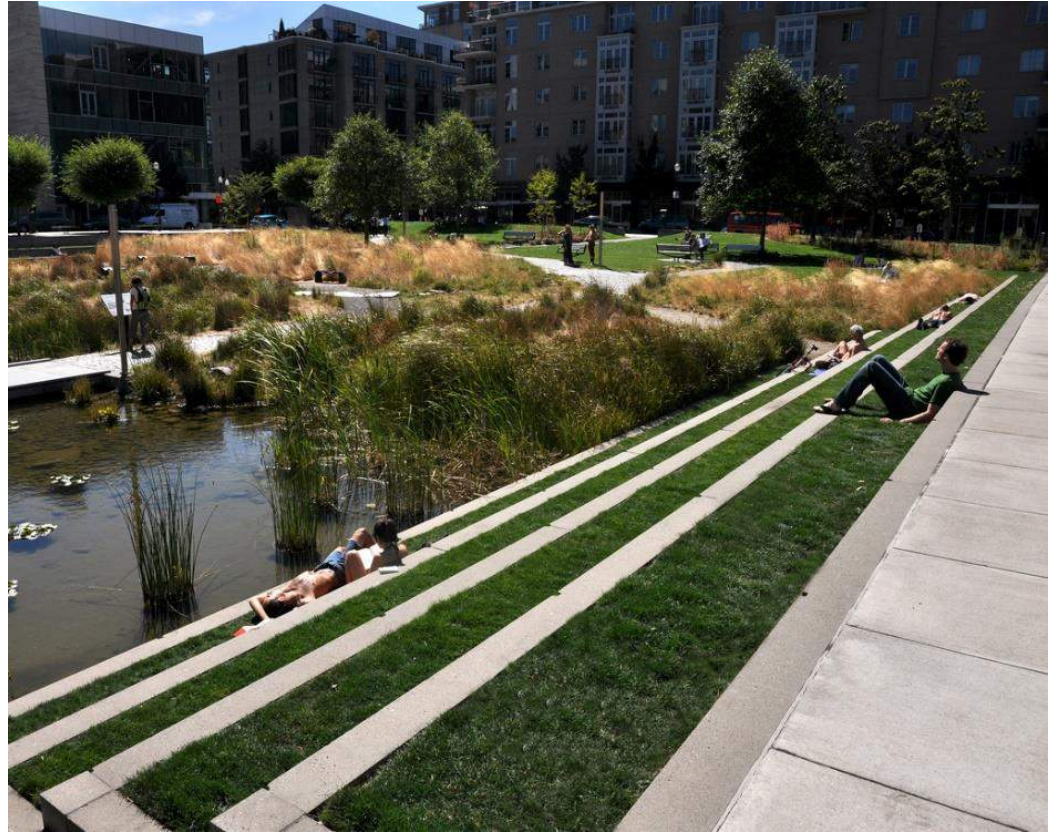
panther hollow lake
OUTDOOR CLASSROOM





panther hollow lake
WETLAND BOARDWALK





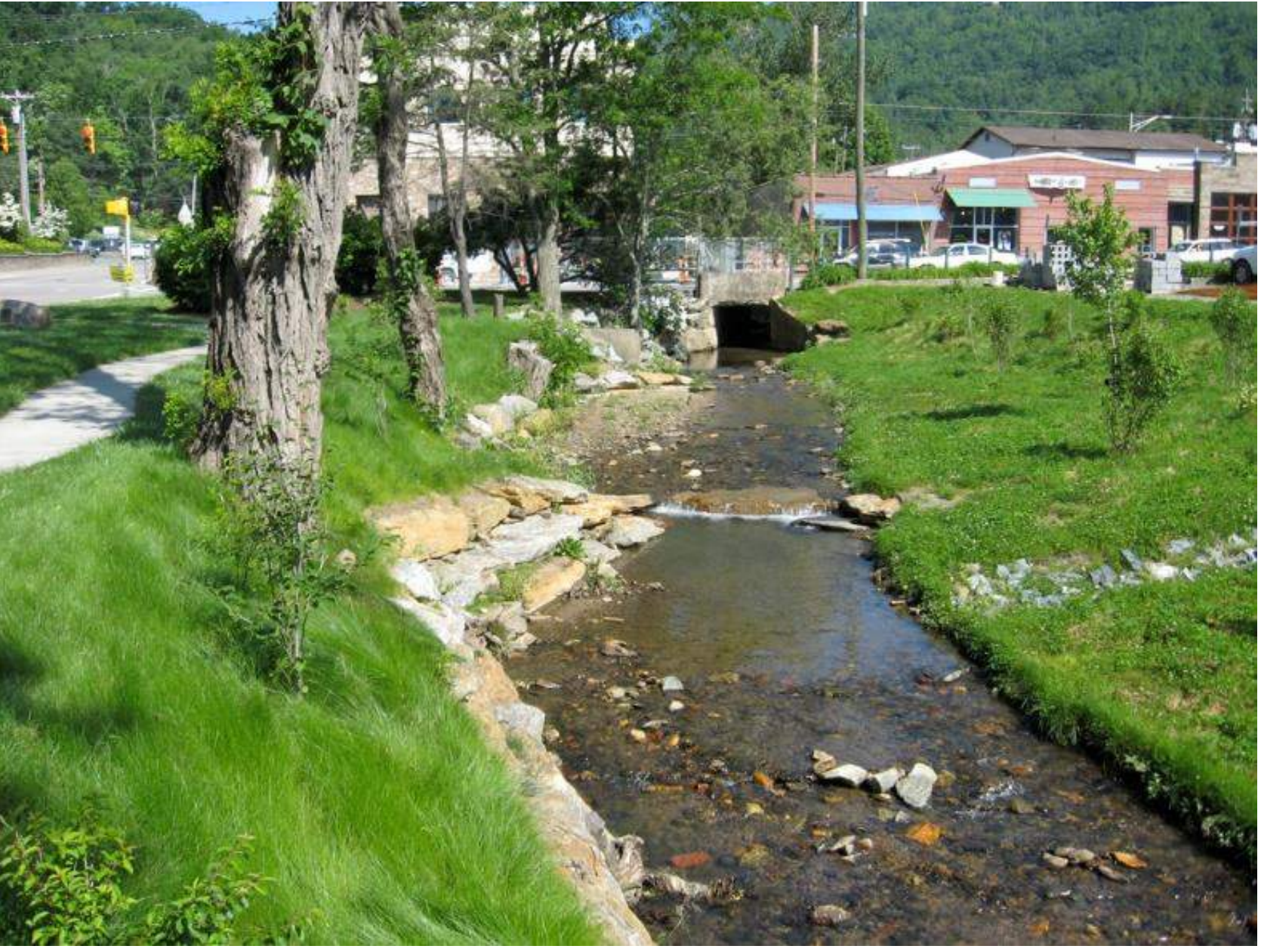


Green infrastructure
RAIN GARDENS



Green infrastructure

ECOLOGICAL RESTORATION



Green infrastructure

ECOLOGICAL RESTORATION



GREEN INFRASTRUCTURE AS COMMUNITY CATALYST

STORMWATER PARKS

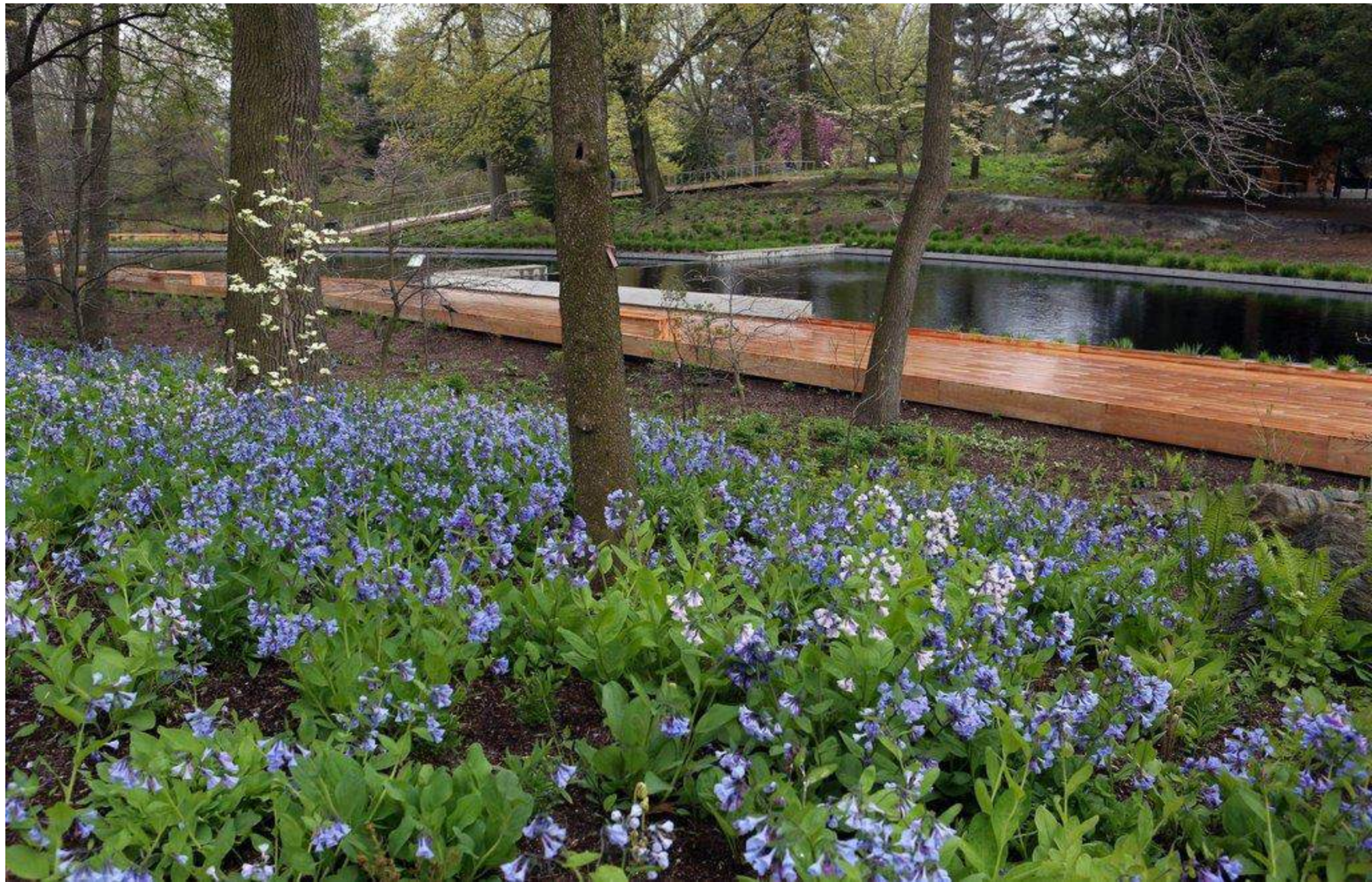


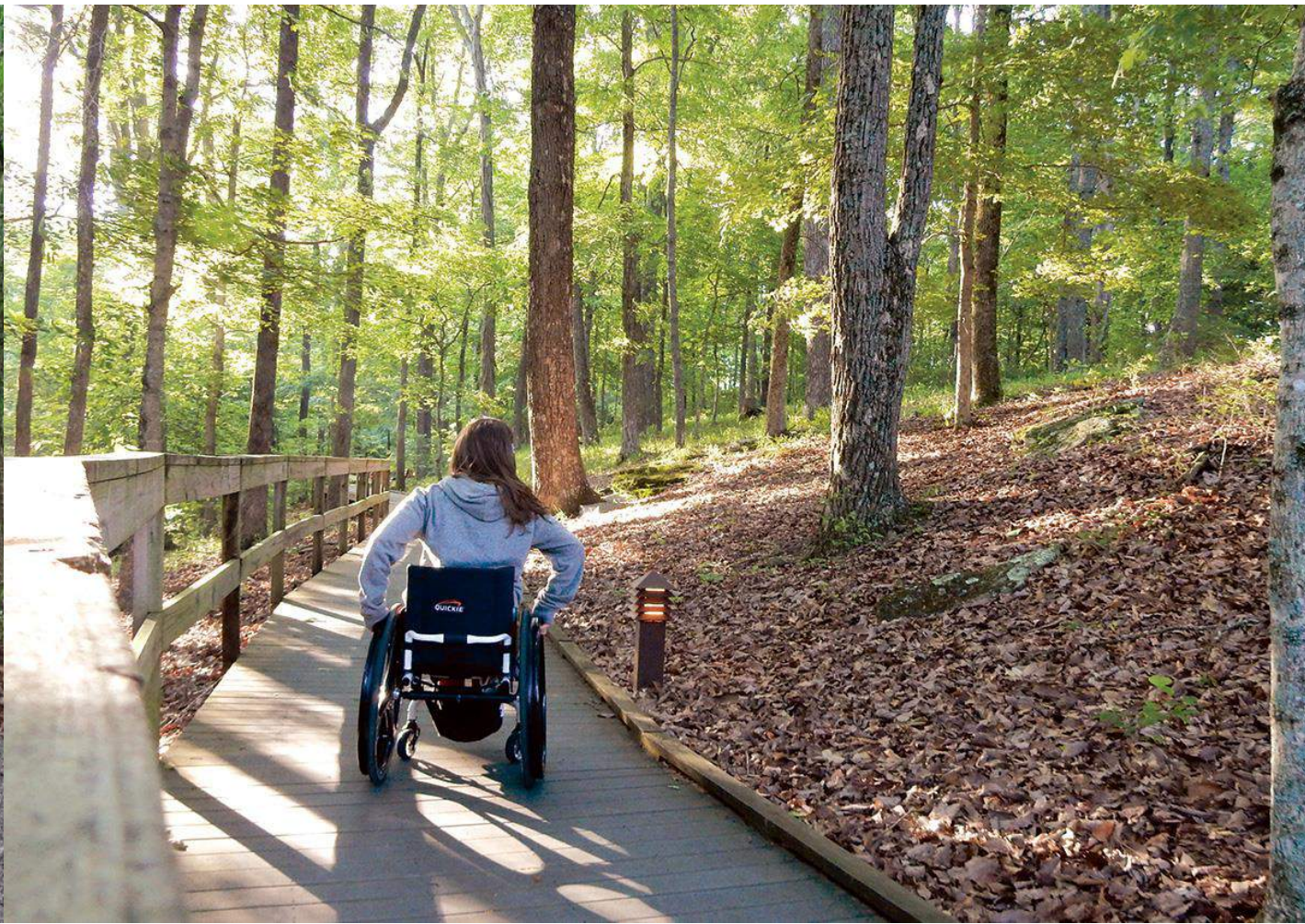
STREAM RESTORATION











recreation

TRAILS



panther hollow lake

SIGNAGE



panther hollow lake

HANDS ON EDUCATION



panther hollow lake

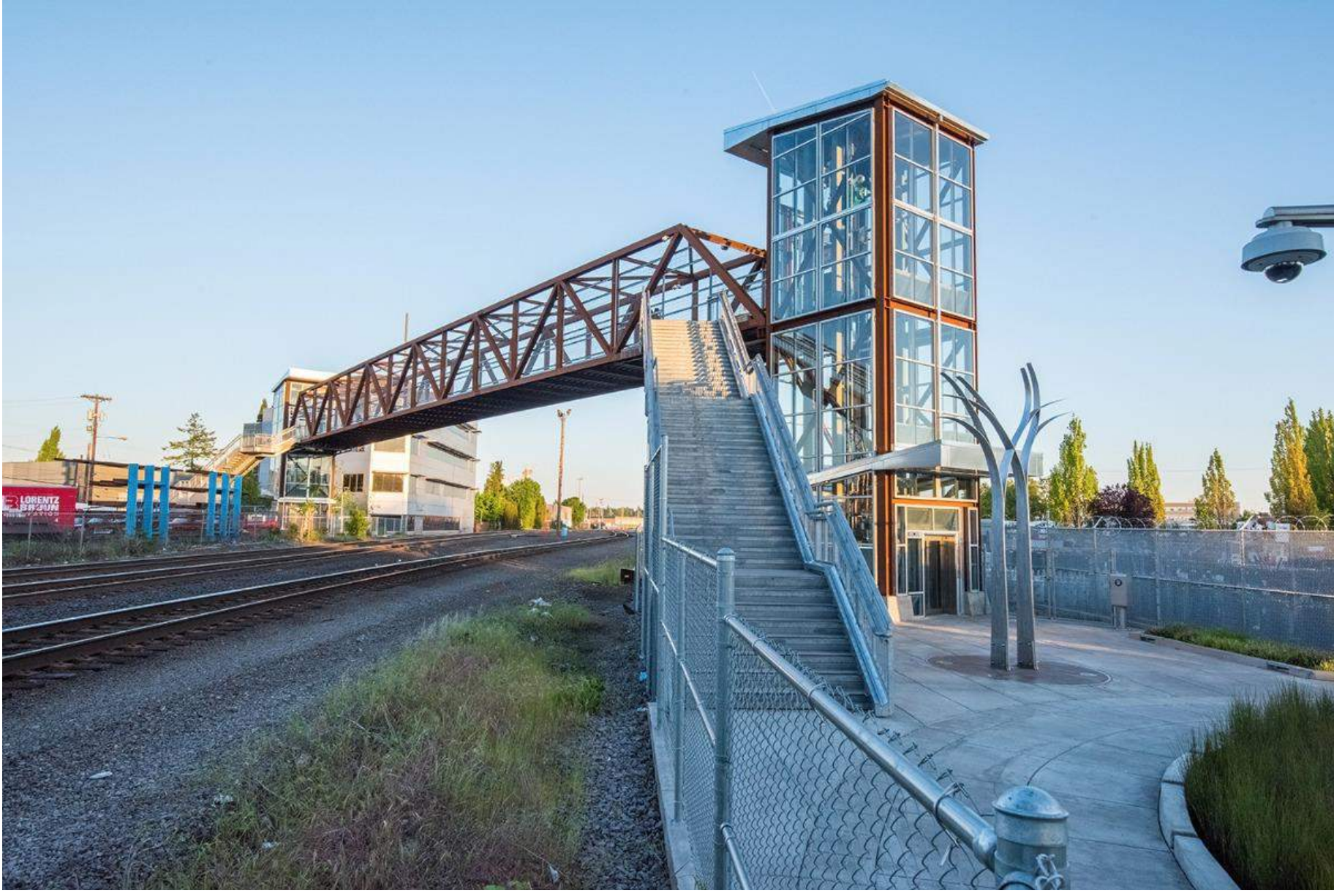
HANDS ON EDUCATION



LOVE OF NATURE

LOVE OF NATURE





LAND BRIDGE

LAND BRIDGE



LAND BRIDGE





LAND BRIDGE

LAND BRIDGE





1

2

3

4 MILE RUN WATERSHED GREEN INFRASTRUCTURE PRELIMINARY DESIGN UPDATE



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