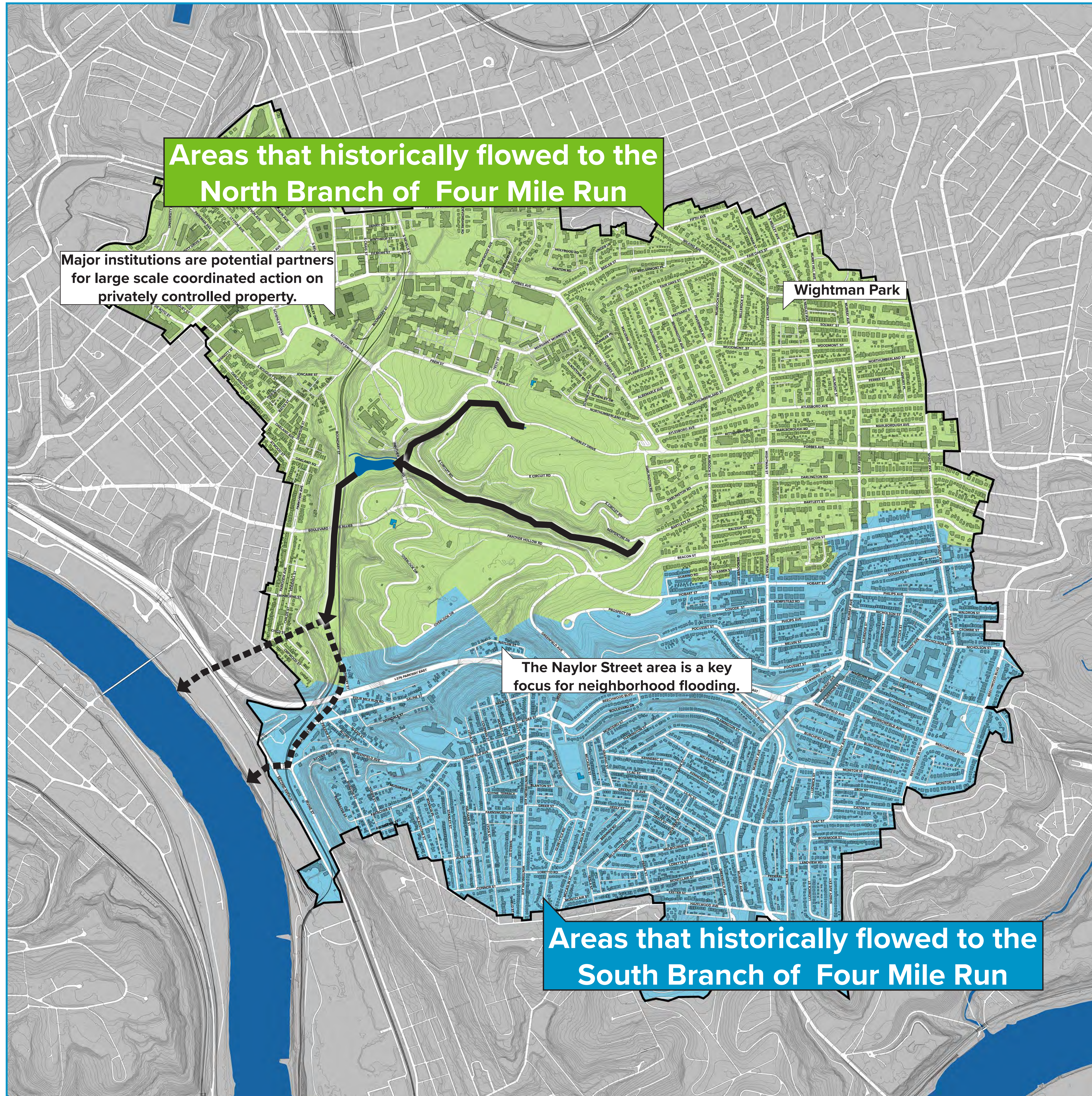




Four Mile Run Stormwater Improvement Project

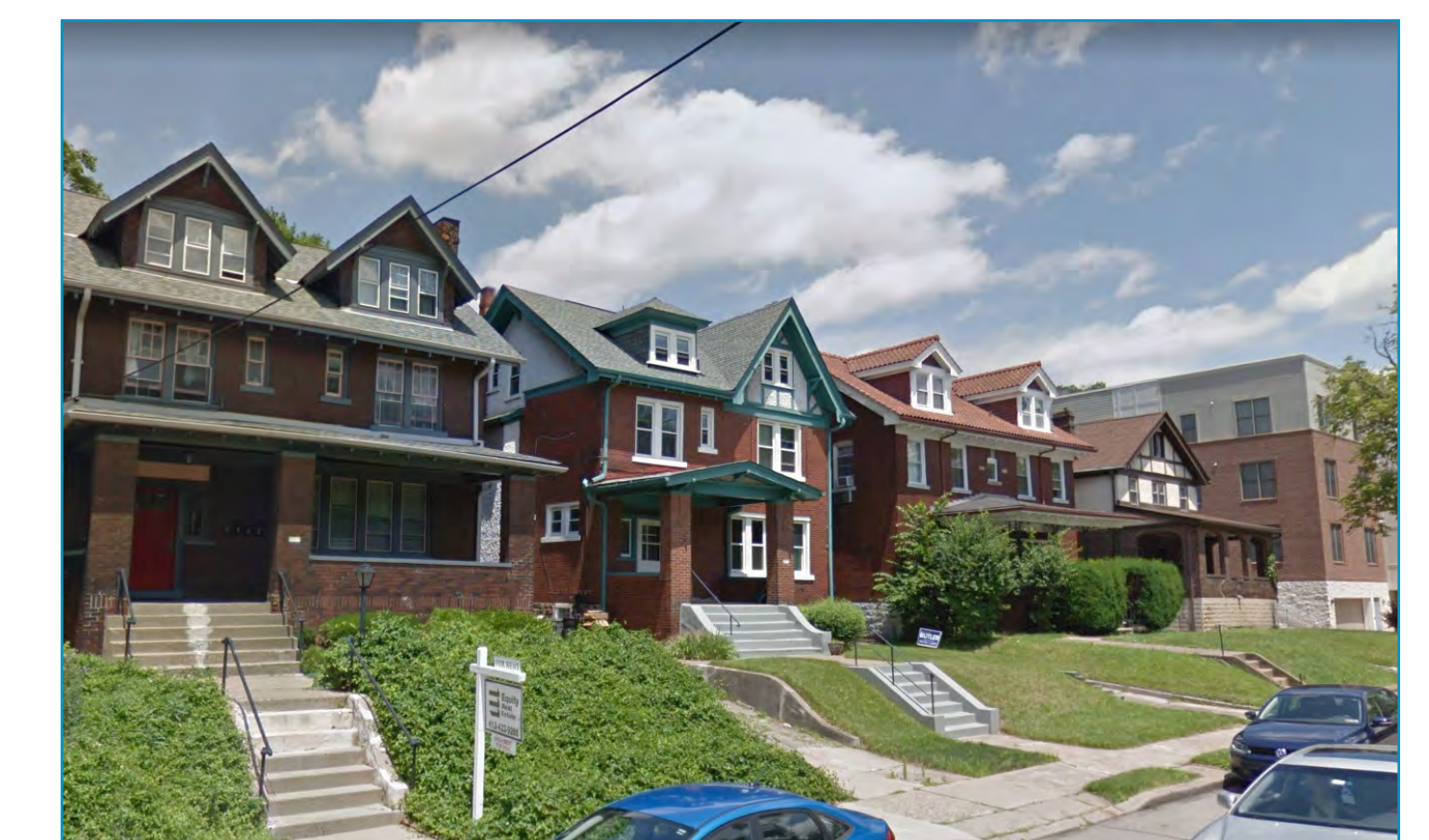


1/2 MILE

What's the plan?

The Four Mile Run Stormwater Improvement Project will allow for PWSA to incrementally redirect stormwater from the surrounding neighborhoods to the new stream system instead of entering the combined sewer system. PWSA is working to control flooding and improve water quality throughout the M29 sewershed.

Where does the majority of stormwater come from?



Most buildings shed their water to the combined sewer system



Streets and parking lots are also major contributors.



Neighborhood Network

Park Streams

Panther Hollow Lake

Junction Hollow

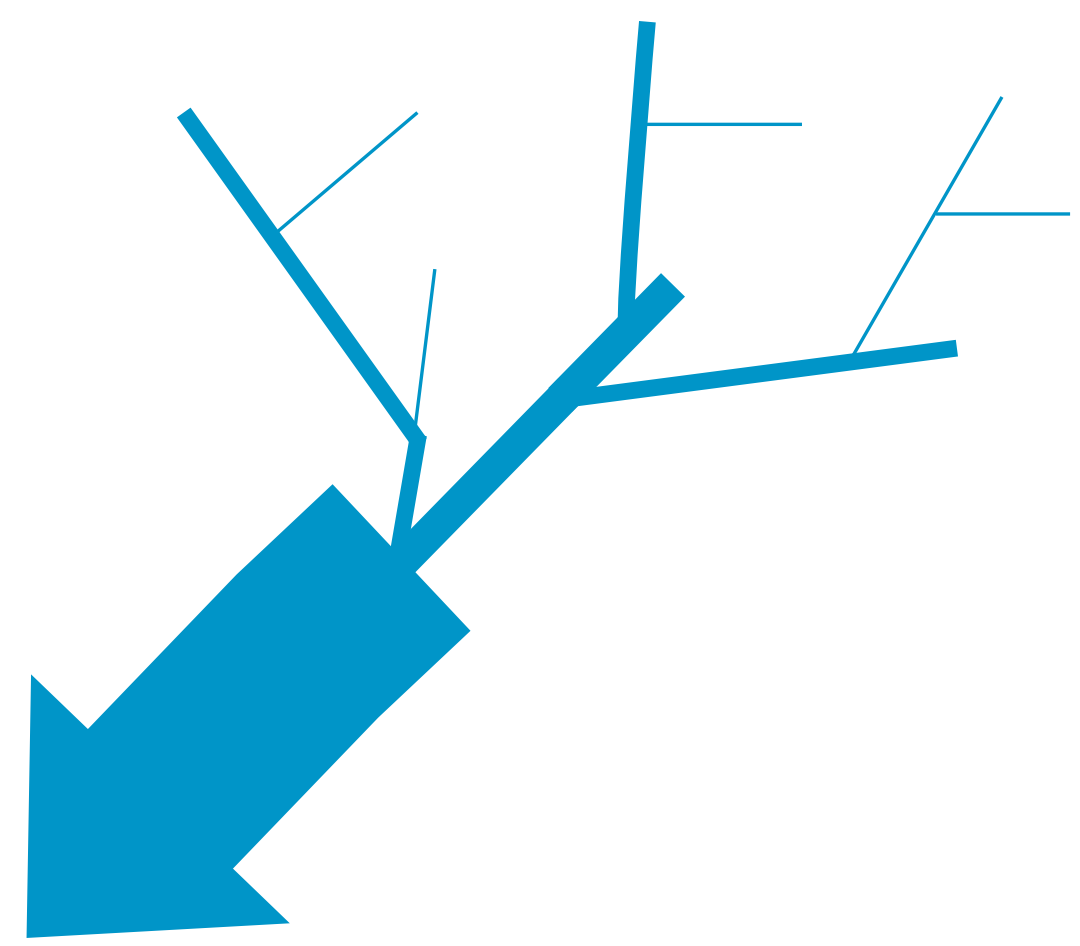
Connection to the River

Monongahela River

How is this being designed?

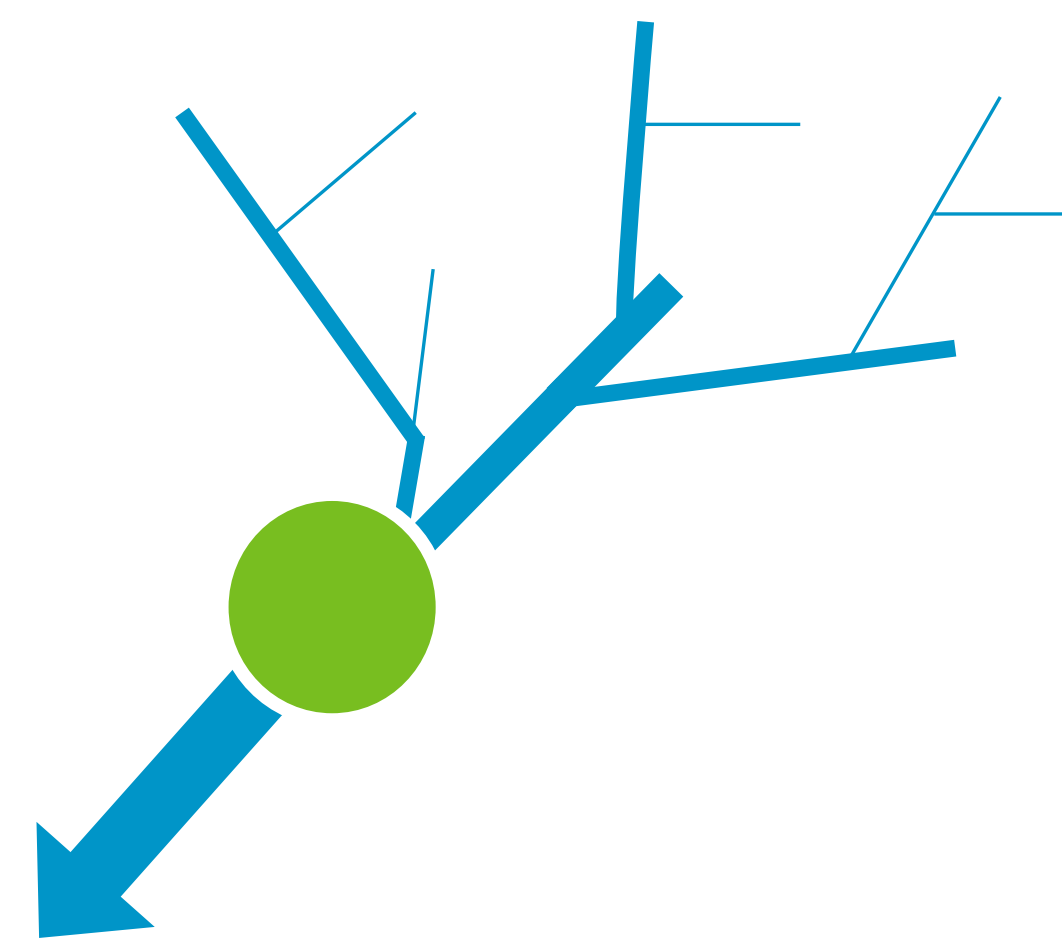
In our region, the clay soil and steep terrain makes it hard for most rainwater to seep into the water table. Because of that, there are two major approaches to managing stormwater. You can move or **CONVEY** stormwater through gutters, pipes, and streams. And you can hold or **DETAIN** the water in a bioswale, tank, or pond until a major storm passes and slowly release it.

At the neighborhood scale, this becomes a conveyance network and the form of that network is different depending on the type of neighborhood. The three forms of **CONVEYANCE** and **DETENTION** networks are:



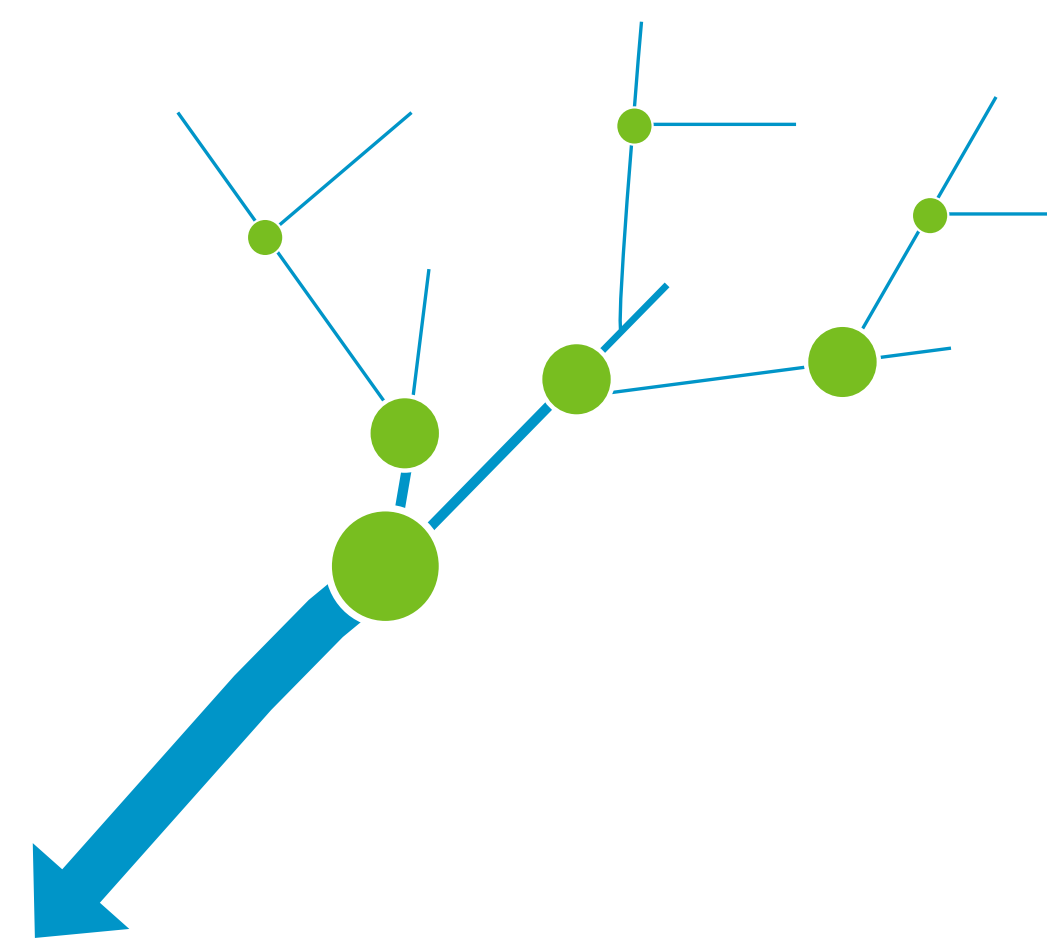
BIG CONVEYANCE

Manage the stormwater by building a giant pipe to **CONVEY** it further downstream.



BIG DETENTION

Manage stormwater at a confluence point by **DETAINING** it and releasing at a lower flow rate.



DISTRIBUTED DETENTION AND CONVEYANCE

Manage stormwater local to where it falls with smaller scale scattered **DETENTION** sites and curbside roadway **CONVEYANCE**.



Questions? Comments? Grab a post-it!



Look for more information and answers to your questions at 4MR.org!



Four Mile Run Stormwater Improvement Project

Neighborhood Network

Park Streams

Panther Hollow Lake

Junction Hollow

Connection to the River

Monongahela River



What's the plan?

PWSA is evaluating the conditions of Phipps Run and Panther Hollow Run in Schenley Park and is developing a restoration strategy to resolve the erosion and sedimentation problems in these streams. Resolving these problems will allow additional water to be conveyed from the neighborhoods. Stabilizing the stream banks would prevent further erosion of sediment entering the sewers and exacerbating flooding.

What are some of the problems?



Erosion of trails carries gravel to streams where it impedes flow.



Erosion can wash out trails and fill streams with gravel and debris.



Neighborhood Network

Park Streams

Panther Hollow Lake

Junction Hollow

Connection to the River

Monongahela River

How is this being designed?

Modern development patterns change the way rainwater flows across the landscape. Mown lawns such as the golf course, roadways, and buildings do not slow and absorb rainwater as well as a stable forest ecology can. Thus the rainwater moves quickly across the landscape and accumulates in much greater volumes. This leads to “flash” flooding events which are high in volume and velocity, leading to dramatic erosion. PWSA’s team is looking at strategies to slow the velocity of rainwater from contributing areas and to stabilize trails and stream banks within Schenley Park.

Issues PWSA is exploring include:

- Some existing culverts are broken, clogged, or undersized. This can divert rainwater onto gravel trails where it causes erosion and carries gravel into the streams.
- “Flashy” streams are more likely to flood, causing damage to park trails and amenities.
- Excessive erosion can destabilize stream-banks and hillsides, leading to small and large landslides within the park.
- Restoring the stream so it is slightly wider and not as deep would slow down the stream flow. This helps to reduce runoff, erosion, and the amount of sediment carried in the water.
- Redesigning existing drainage of park roads and trails with green infrastructure can reduce runoff and decrease erosion and sediment delivered to the stream.

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Four Mile Run Stormwater Improvement Project

Neighborhood Network

Park Streams

Panther Hollow Lake

Junction Hollow

Connection to the River

Monongahela River



What's the plan?

PWSA is redesigning and restoring Panther Hollow Lake to a more natural condition. The lake today has an unnatural concrete edge and drains directly into the combined sewer system. The concrete edge will be replaced with natural plantings and the lake will be a part of the Four Mile Run stream system. Water will flow into the lake from Phipps Run and Panther Hollow Run and then from the lake into Four Mile Run. The lake itself could be used to store volumes of water, controlling the volume and velocity of water entering Four Mile Run during major storm events.

What's there today?



The lake is a signature feature of the park but drains into the sewer.



The lake is at a local low point and could be an opportunity to store a lot of stormwater during a major storm event!



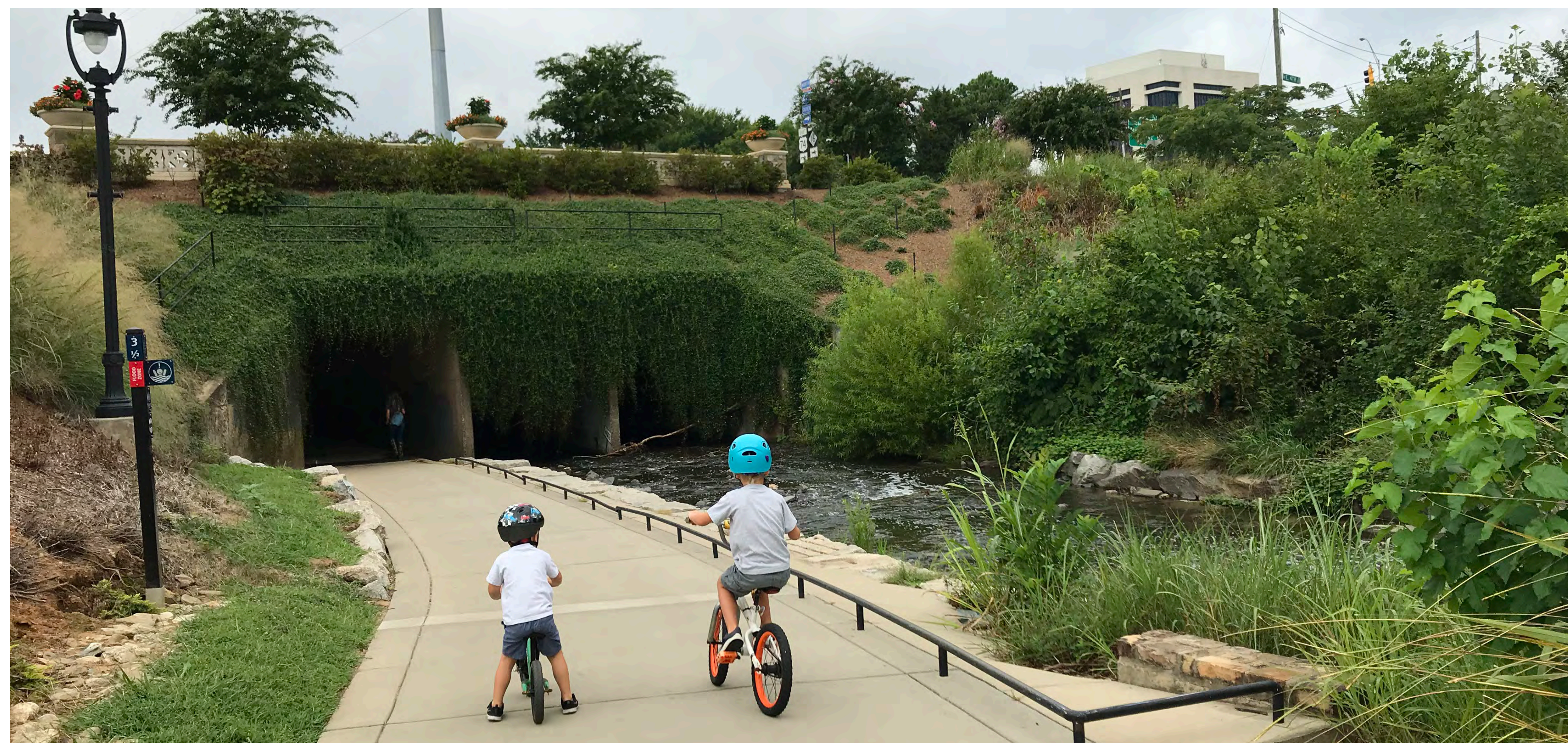
Four Mile Run Stormwater Improvement Project



How is this being designed?

In order for the lake to function as intended, water quality and upstream volumes must be carefully managed as it enters the lake. Too much sediment carried into the lake can fill the lake bottom, making it shallower and inhibiting a healthy aquatic ecosystem.

- Wetlands near where Phipps Run and Panther Hollow Run enter the lake can help to manage water quality and support a natural ecosystem.
- The concrete edge will be replaced with natural wetland plantings.
- Existing park features such as a walking trail around the lake would also be restored.
- Restoration of the lake can be used to leverage other planned improvements, coordination, and funding from other agencies such as the Pittsburgh Parks Conservancy and the Railroad.
- This project will establish a new stream connection from the lake to the Junction Hollow valley that could also serve as a trail connection for park users.
- The project team will conduct a design workshop with the public in November to discuss this project element.



A new connection for rainwater under the railroad tracks could also accommodate park users, connecting Schenley Park with the Four Mile Run valley. (ex: Charlotte, NC)

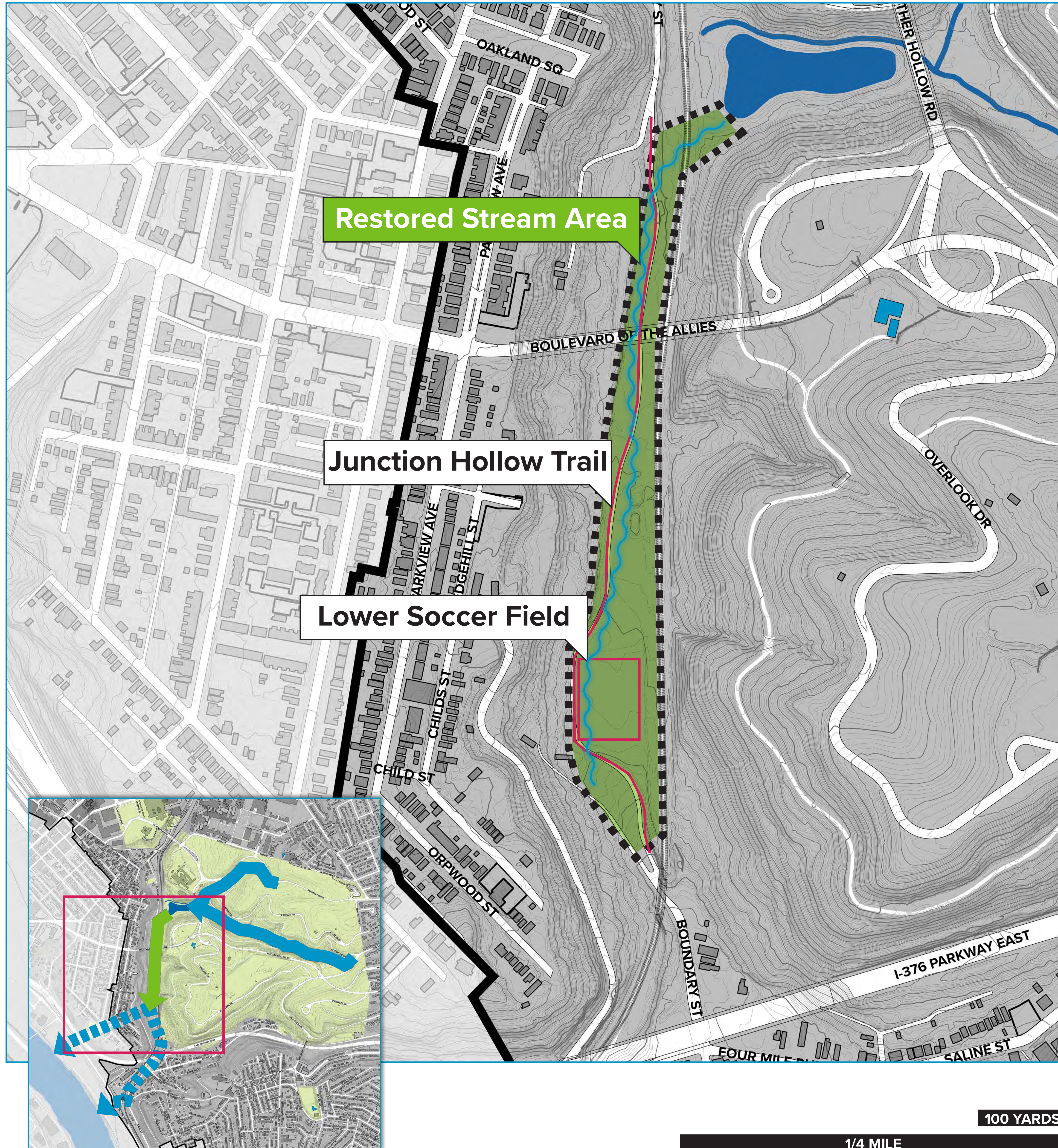
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Four Mile Run Stormwater Improvement Project

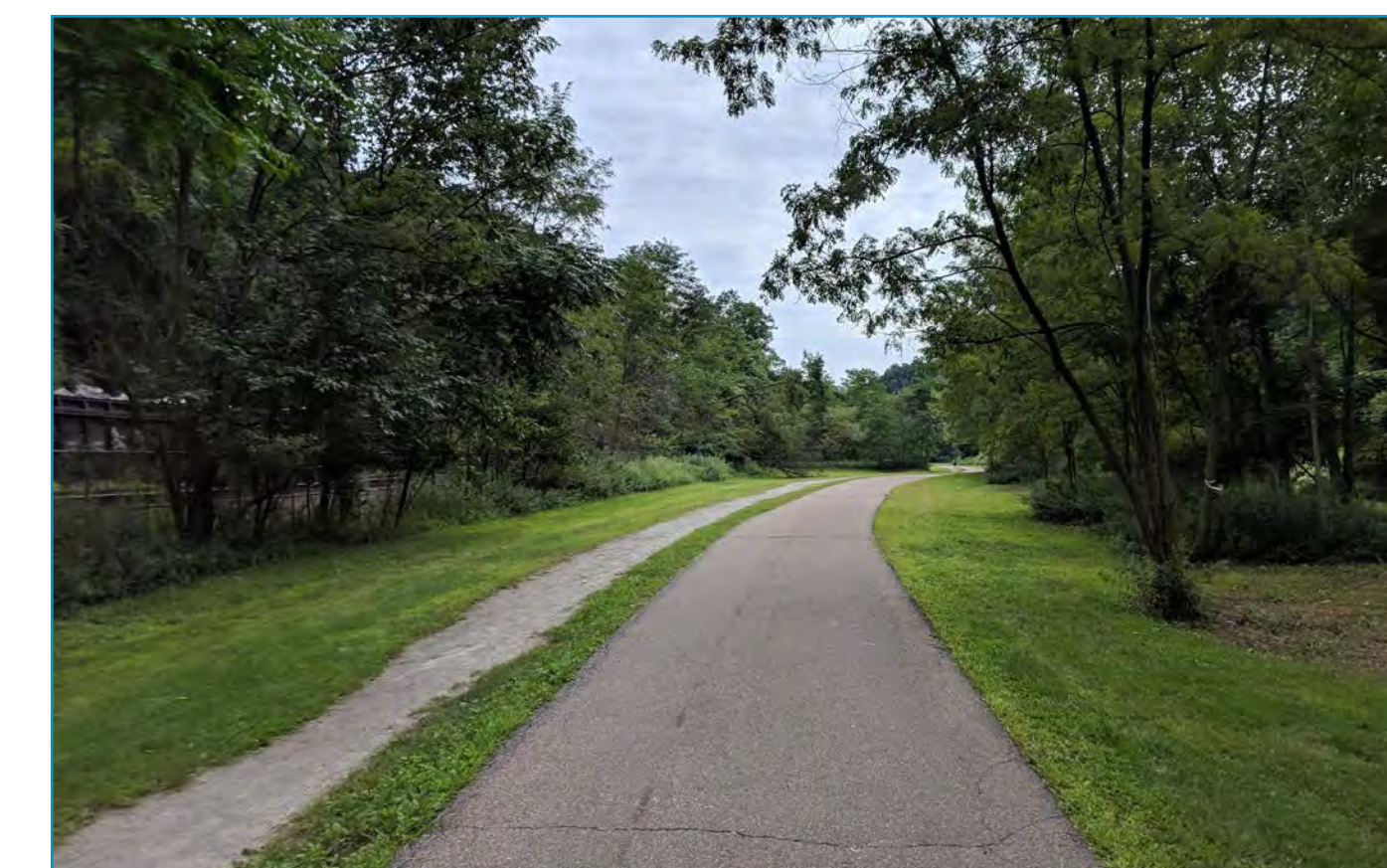


What's the plan?

PWSA, in coordination with City departments and the Pittsburgh Parks Conservancy, will construct a **natural stream channel** to carry rainwater from Panther Hollow Lake. Today this rainwater flows into the combined sewer system, causing overflows and flooding during wet weather.

This restored stream connection may enable rainwater from Squirrel Hill and Oakland to flow to the Monongahela without entering the combined sewer system.

What's there today?

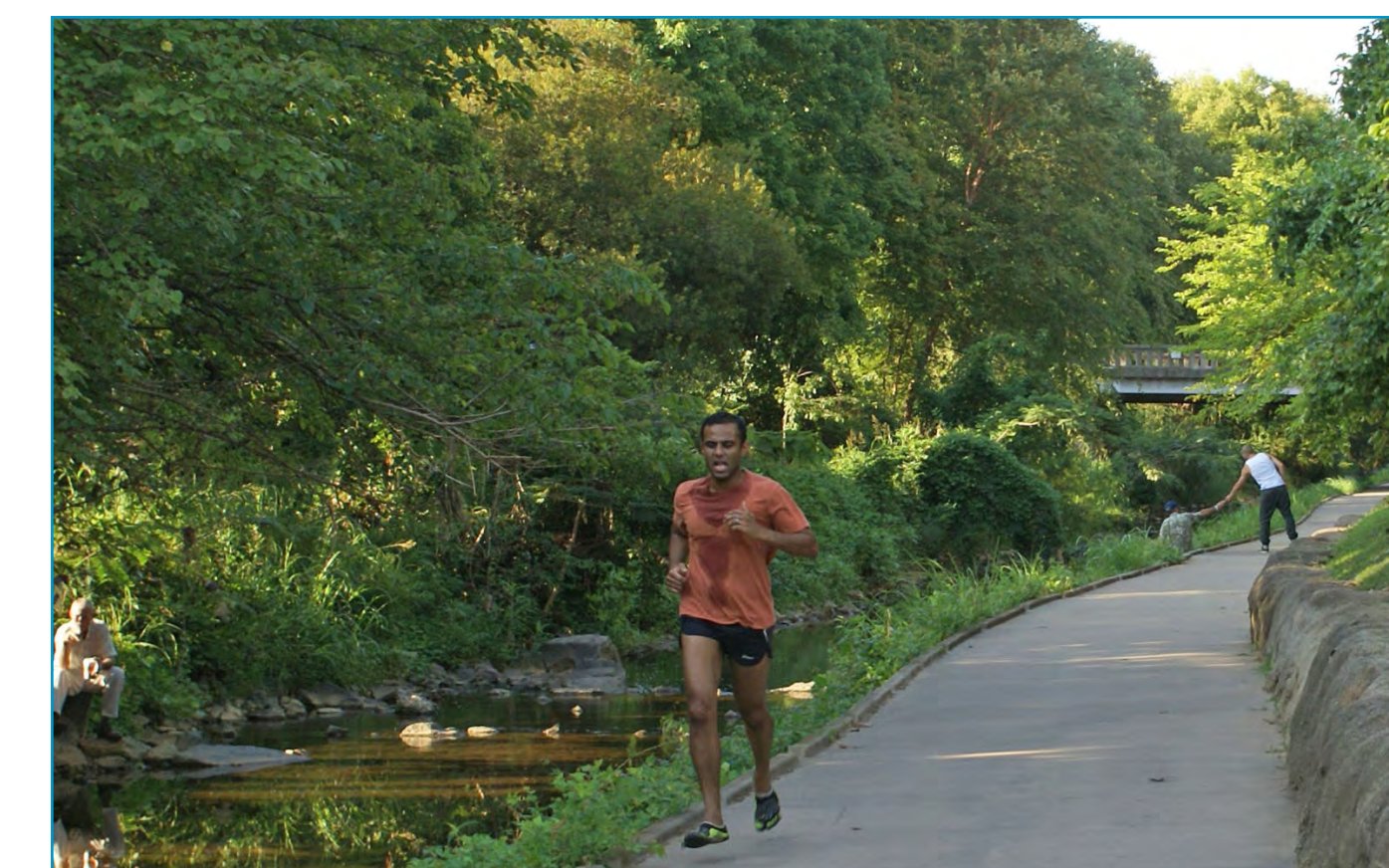


Junction Hollow Trail



Schenley Park Lower Soccer Field and Parking Lot

What could it look like?



Little Sugar Creek Greenway, Charlotte, NC



Stout's Run, Bridgeport, WV



Four Mile Run Stormwater Improvement Project



How is this being designed?

PWSA is working with a team of designers and engineers to gather information about the project site and produce the design.

- Geotechnical surveys provide information about soil structure and groundwater conditions. Drilled soil samples are analyzed in a lab to determine their consistency. This alerts designers to places where slope stability is a concern or where rainwater could be able to soak into the ground.
- Flow monitors throughout the sewershed keep track of how much rainwater flows into key locations of the valley. By strategically placing a few monitors throughout the project area, data can be extrapolated for areas that are not directly monitored.
- Stream designers will use the geotechnical and flow monitoring data to determine the size of the stream during dry weather, a typical rain event, and a high intensity rain event.
- Stream design includes design of the complete stream ecosystem, including a site-appropriate planting palette and carefully designed floodplains.
- Existing amenities such as the Junction Hollow Trail and Lower Soccer Field may need to be altered in order to accommodate the restored stream. The project team will conduct a design workshop with the public in November to discuss this project element.

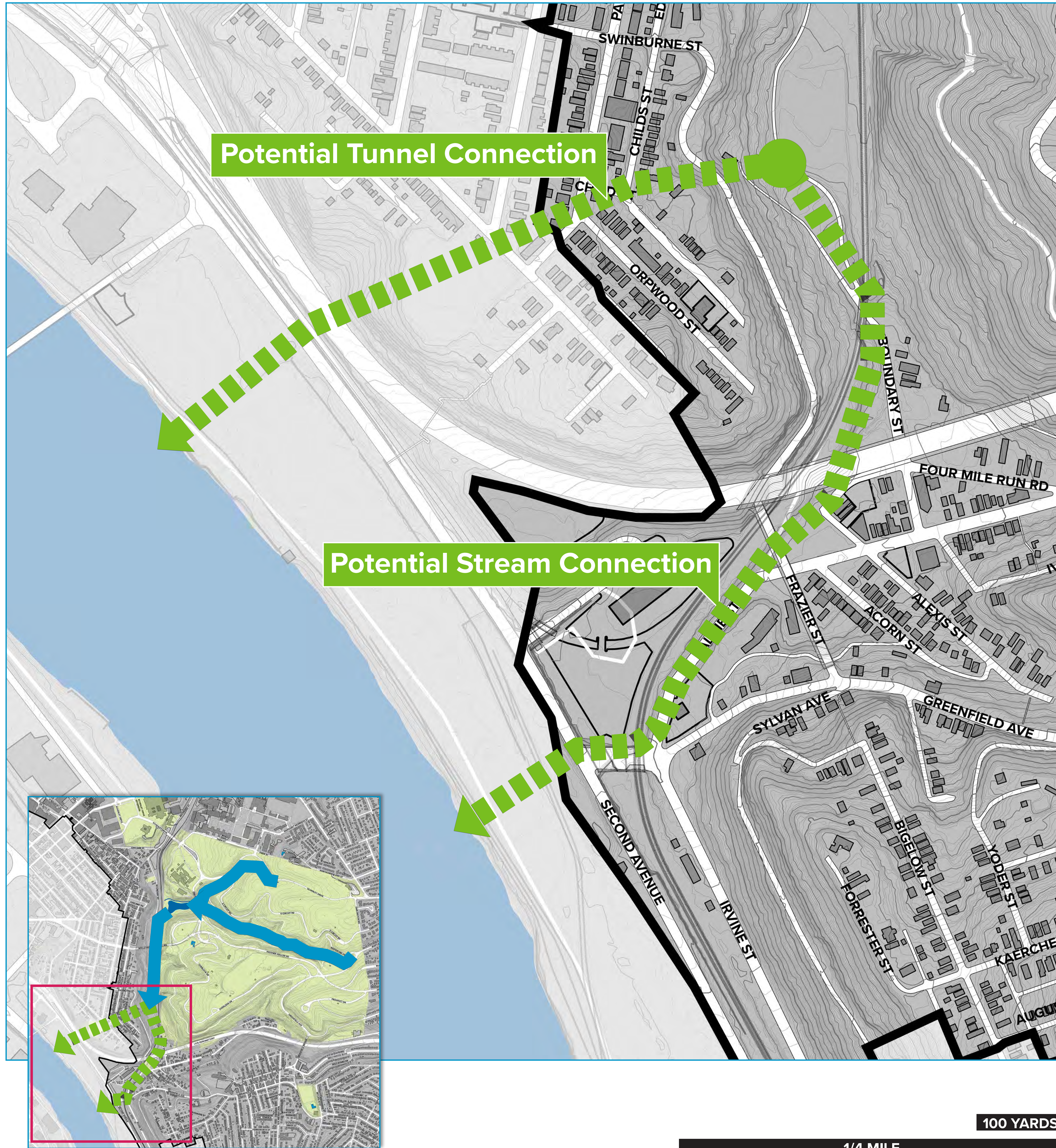
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Four Mile Run Stormwater Improvement Project

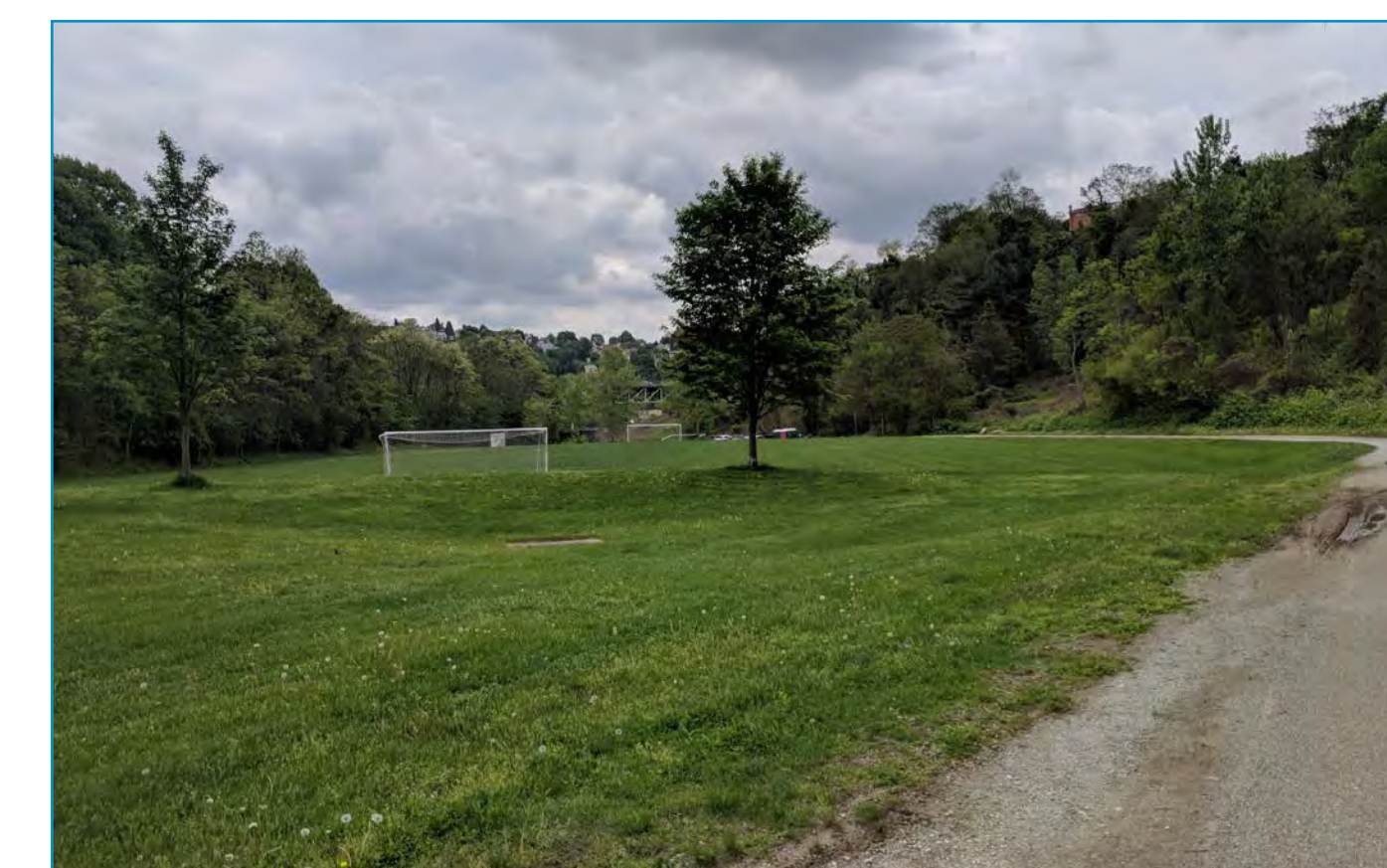


What's the plan?

PWSA is evaluating two techniques for connecting the restored Four Mile Run to the Monongahela River. The first technique is for a potential stream connection parallel to Boundary St, Saline St, and Greenfield Ave. The second technique is for a potential stormwater tunnel deep under South Oakland and Second Avenue.

This connection will potentially enable rainwater from Squirrel Hill, Oakland, Greenfield, and Schenley Park to flow to the Monongahela without entering the combined sewer system.

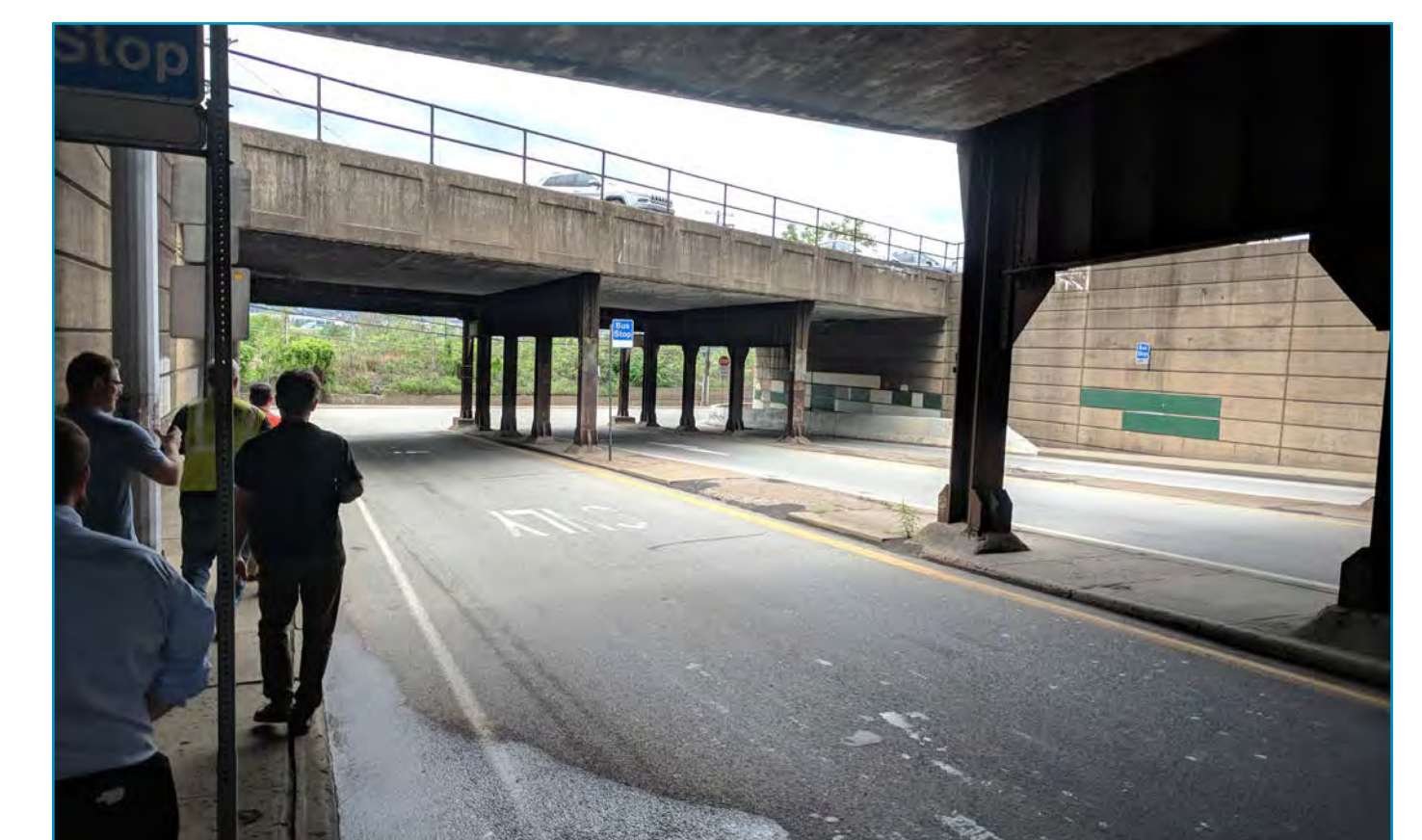
What's there today?



Schenley Park Lower Soccer Field and Parking Lot



Saline Street



Greenfield Avenue



Four Mile Run Stormwater Improvement Project

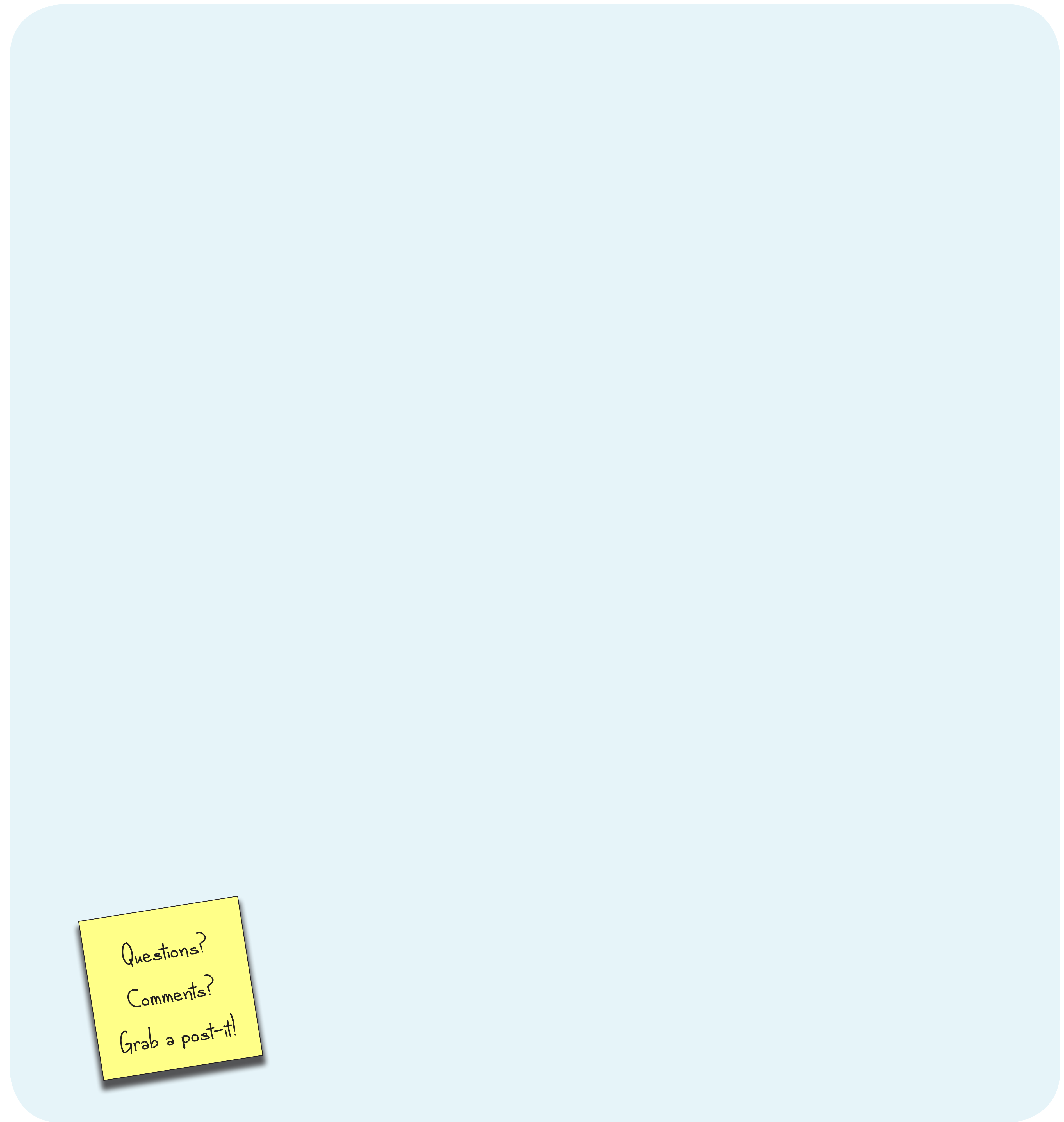


How is this being designed?

The design and engineering team must evaluate several variables to see which of the two connection techniques works the best. In either scenario, the team is seeking to minimize flooding and combined sewer overflows.

- The open stream and shallow culvert along Boundary Street, Saline Street, and Greenfield Avenue would be placed within or adjacent to the existing street and would need to avoid or possibly relocate some existing buried utilities. Within existing open spaces, the stream would be open and clearly visible. In other places it would flow inside in a large box culvert or pipe. The lack of steep drop-offs and a more open channel would promote ecological connectivity between the Monongahela River and Panther Hollow making Four Mile Run visible for most of the way to the Monongahela River.
- The potential tunnel connection under South Oakland would require a drop shaft near the existing parking lot to bring the water to a lower elevation. The tunnel would be very deep under the neighborhood and a specific path for a potential tunnel has not yet been determined. This would allow rainwater to flow to the river while bypassing The Run neighborhood and avoiding most utilities.

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