

## 6.2 M29 Four Mile Run

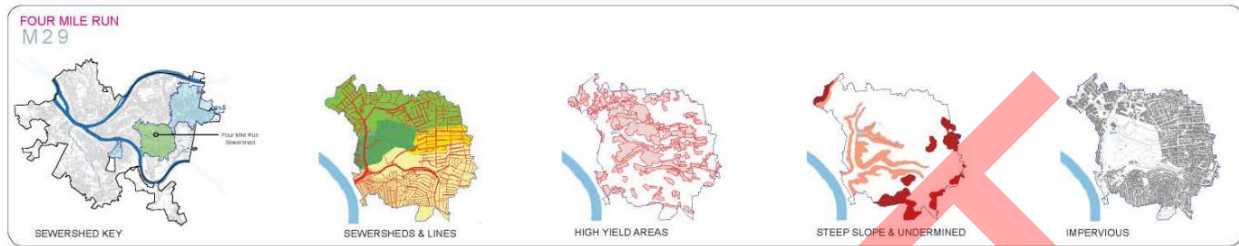


Figure 6-14

### 6.2.1 Sewershed Existing Conditions

Four Mile Run has several stormwater-related opportunities and constraints which include approximately 2,400 acres of diverse physical and social landscapes, including highly urbanized activity centers, multi-family and single-family neighborhoods, and large natural park areas. Flood Mitigation is an important public health and safety issue for the residents residing within the watershed neighborhoods. Two major combined sewer lines converge at the lower watershed zone, which regularly results in surface flooding and basement sewage backups during wet weather. In addition, steep slopes and high percentages of invasive vegetation are directly increasing sediment loads and erosive conditions along drainage corridors.

Schenley Park is well positioned to absorb stormwater and provide new amenities that park users have been requesting through an existing community dialogue process. Schenley Park makes up roughly 20% of the M-29 sewershed that mostly drains to Panther Hollow Lake and Junction Hollow. Panther Hollow Lake lies in the heart of Schenley Park and is a control point for stormwater runoff as well as a confluence of two spring fed streams that deposit approximately 68 million gallons of water, annually, into the combined sewer system. The lake however suffers from poor water quality and aging infrastructure. The Park is positioned well within the watershed to accept stormwater before it enters the combined sewer system via upland flows from the Squirrel Hill neighborhood. One benefit of diverting stormwater at this point in the system is that it reduces the bottleneck that occurs downstream in “The Run” where surcharging and flooding occurs.

Four Mile Run is well-suited to be an inaugural implementation and monitoring focus for green infrastructure in the City. The University of Pittsburgh and Carnegie Mellon University together represent 10% of the total sewershed and the densest, highly urbanized area of the sewershed. The majority of the remaining 70% of the sewershed is made up of urban neighborhoods, including Oakland, Greenfield, Squirrel Hill, and Hazelwood. The surrounding stakeholder community has well-organized, active groups that have provided support and interest in sustainability, green infrastructure solutions, and community development in the areas surrounding Four Mile Run.



Figure 6-15

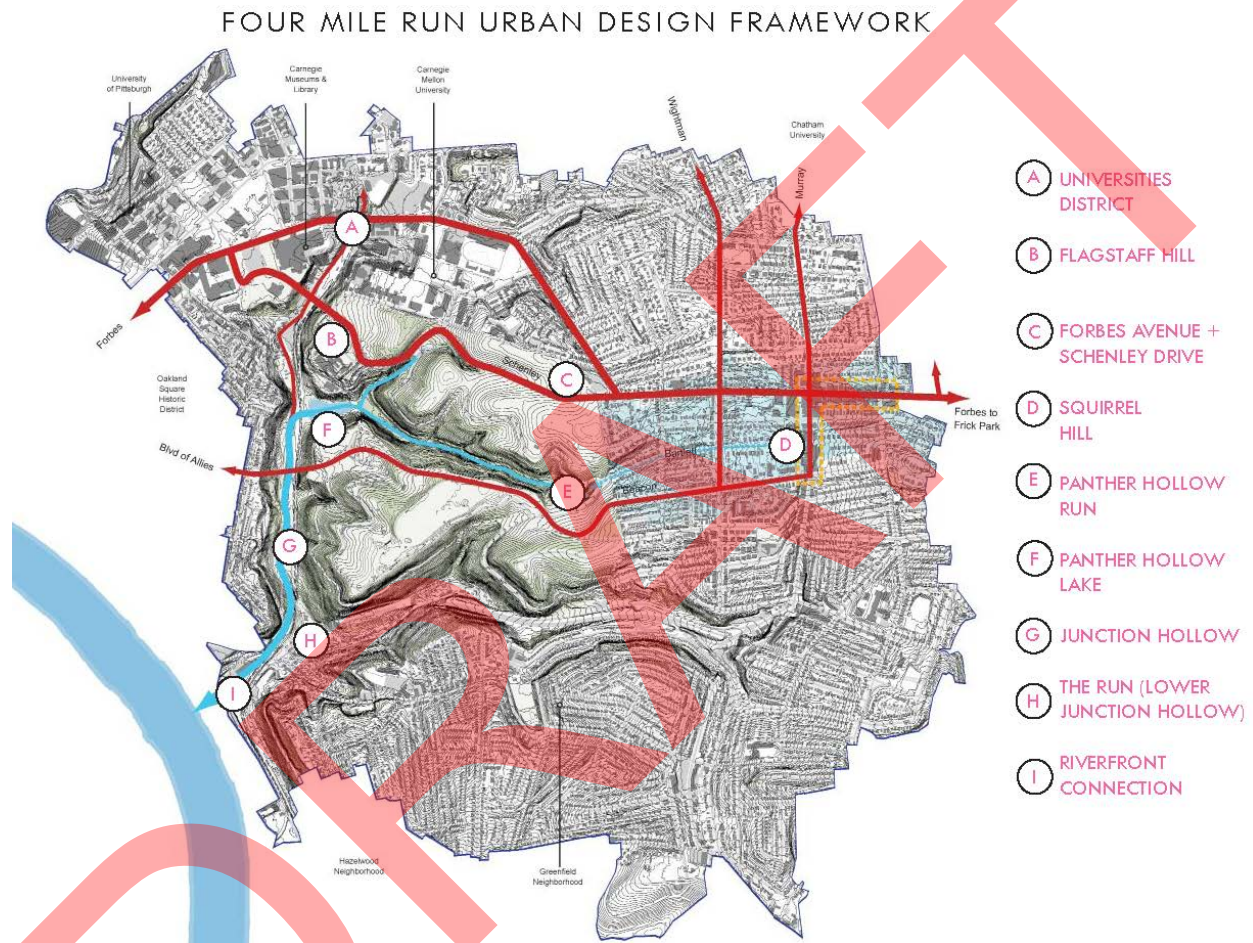
### 6.2.2 M29 Four Mile Run: Urban Design Framework Plan

**Schenley Park** offers a number of opportunities for green infrastructure in the Four Mile Run sewershed. The Park is well positioned within the sewershed to be an ecologically sensitive conveyance system of stormwater from the combined system in Squirrel Hill and Oakland. Corridors through and nearby the park are already being targeted as future Complete Streets. Junction Hollow could provide a high volume of capture and could accommodate a connection to the river.

**Flagstaff Hill** Institutions are well-suited to serve as partners for education and demonstration of green infrastructure at this highly-visible community node. The Phipps Conservatory and its Center for Sustainable Landscapes, Carnegie Mellon, University of Pittsburgh, and Pittsburgh Parks Conservancy each could find opportunities to participate in the development of green infrastructure strategies along Schenley Drive and Panther Hollow.

**Forbes Avenue and Schenley Drive** are important corridors and offer opportunities for highly visible Complete Streets projects. Together the two streets would be an excellent park-to-park corridor between Schenley and Frick Parks.

The vibrant business district in **Squirrel Hill** neighborhood along Forbes Avenue provides a great midpoint for the above mentioned park-to-park connection and the high volume of impervious area coincide with numerous high yield areas identified through modeling. Within the Squirrel Hill neighborhood, Murray Ave., Wightman St., and Bartlett St. are well suited to accommodate GI based on high yield areas and their generous right-of-way widths.



**Figure 6-16**

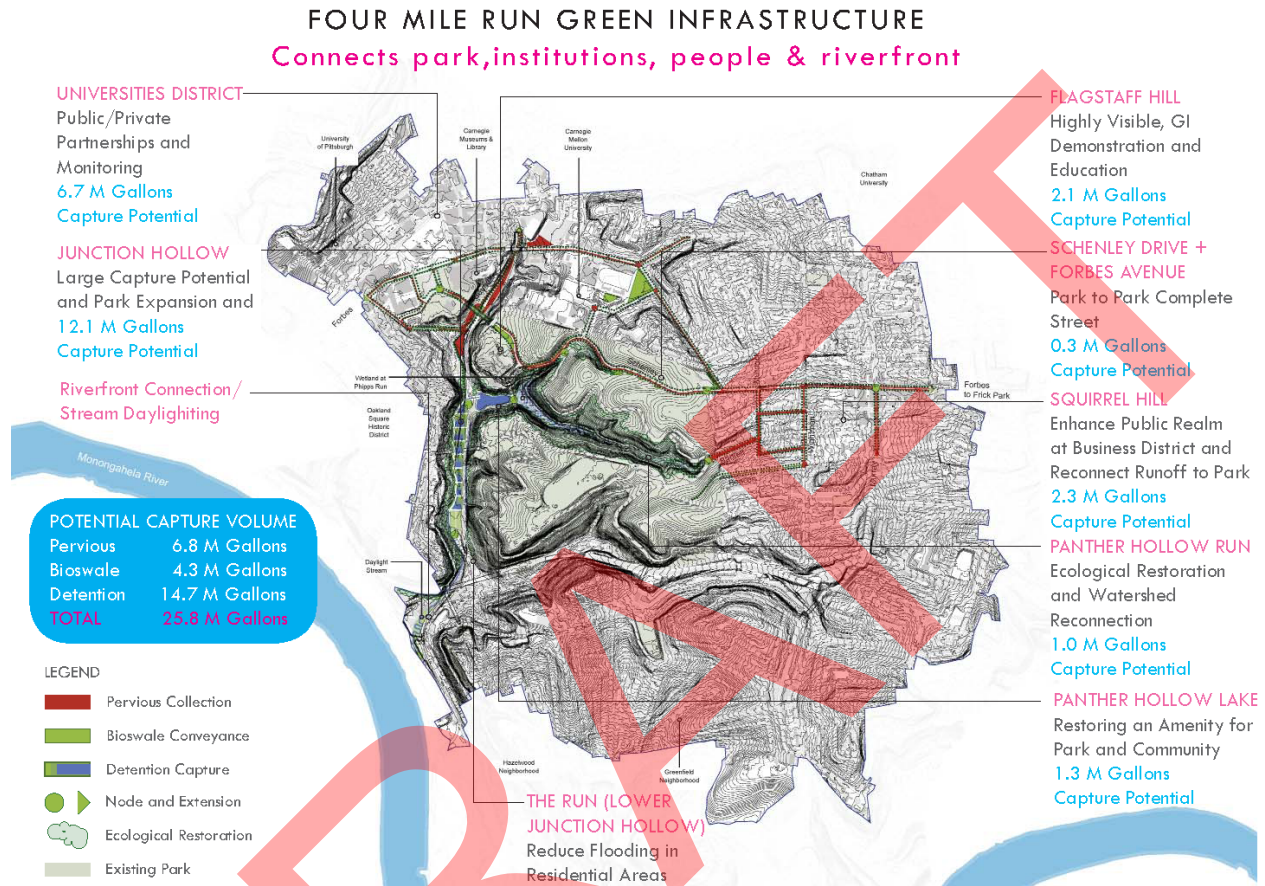
Within Schenley Park, **Panther Hollow Run** is the natural streambed that once accepted runoff from the Squirrel Hill neighborhood. Planned ecological restoration should be coordinated with green infrastructure stormwater management. The stream terminates into an existing poor-quality lowland wet forest at **Panther Hollow Lake**. Restoration would allow this area to serve as an effective wetland for filtering runoff to improve water quality as it reaches the lake. The community desires that the lake be restored as a usable recreational amenity; proper restoration of the Hollow above is paramount to achieving this goal.

**Junction Hollow** runs north-south connecting the Universities District, Schenley Park, and neighborhoods south of the park. Its relative low slopes, large area, and position at the lower end of the watershed combine to make it an effective location to capture runoff. In addition, it could serve to daylight the spring overflow from Panther Hollow Lake to remove stormwater from combined sewers and accommodate additional Park programmed space.

The above mentioned framework for the areas in Four Mile Run should reduce flooding in “**The Run**” at the south end of Junction Hollow. Between this area and the river is the area where the 3 Rivers Heritage Trail is located. These parcels are partially City-owned and provide opportunities to link the Park and Universities District to proposed riverfront redevelopment at Almono, and provide a new **riverfront connection** access point for citizens.

The Framework of corridors, key assets, and nodes for Four Mile Run provide clearly defined risks and opportunities for the most realistic green infrastructure solutions in this watershed. Taken as a whole system, they also provide a substantial opportunity to connect multiple neighborhoods to the Monongahela River, Three Rivers Heritage Trail, Schenley Park, and Frick Park through a system of green infrastructure-focused Complete Streets corridors.

### 6.2.3 M29 Four Mile Run: Green Infrastructure Concept Plan



**Figure 6-17**

This concept looks to redirect stormwater runoff from the Squirrel Hill neighborhood into Schenley Park while also making improvements to the public realm of the neighborhood: specifically, the business district at Squirrel Hill and the wide gateway boulevards leading to the park. Schenley Drive and the parking area around Phipps Conservatory can become a highly-visible green demonstration site and a Complete Street. Junction Hollow has a potential to capture large volumes of stormwater. In addition, daylighting this stream provides a great amenity connecting neighborhoods to parks and to the riverfront.



**Figure 6-18**

The **Universities District** in the upper portion of the sewershed is a dense urban area with high percentage of impervious area. Forbes Avenue offers a great opportunity for a Complete Street with GI. The Universities and Cultural Institutions offer partnerships for additional GI opportunities. More specifically, the recreation fields at Forbes Ave. and Beeler St. could provide capture potential. The research and monitoring opportunities offered by these institutions should be nurtured further. The runoff of these upland areas should be collected and conveyed to the upper end of Junction Hollow. Within this valley Boundary/Neville Street provides opportunity for capture and conveyance. Large surface parking lots in this area offer further opportunities for pervious pavement and subsurface capture. Public-private partnerships should be explored where lots are located on privately-owned land.



**Figure 6-19**

Schenley Drive at **Flagstaff Hill** has the opportunity to provide an expanded, highly visible demonstration and education project for GI that would provide opportunities to partner with adjacent institutions: Pittsburgh Parks Conservancy, Phipps Conservatory & the Center for Sustainable Landscapes, Carnegie Mellon University, and University of Pittsburgh. Pervious pavement and reduced pavement in Schenley Drive would enhance the entry and parking experience for visitors.



**Figure 6-20**

East of Flagstaff Hill on **Schenley Drive**, the addition of pervious pavement and reduction of pavement can be continued, increasing the capture and storage potential and continuing the work of the Schenley Drive Green Street Plan design effort. Paralleling this street, Phipps Run would benefit from ecological restoration and additional check dams and small wetland capture areas could be provided.



**Figure 6-21**

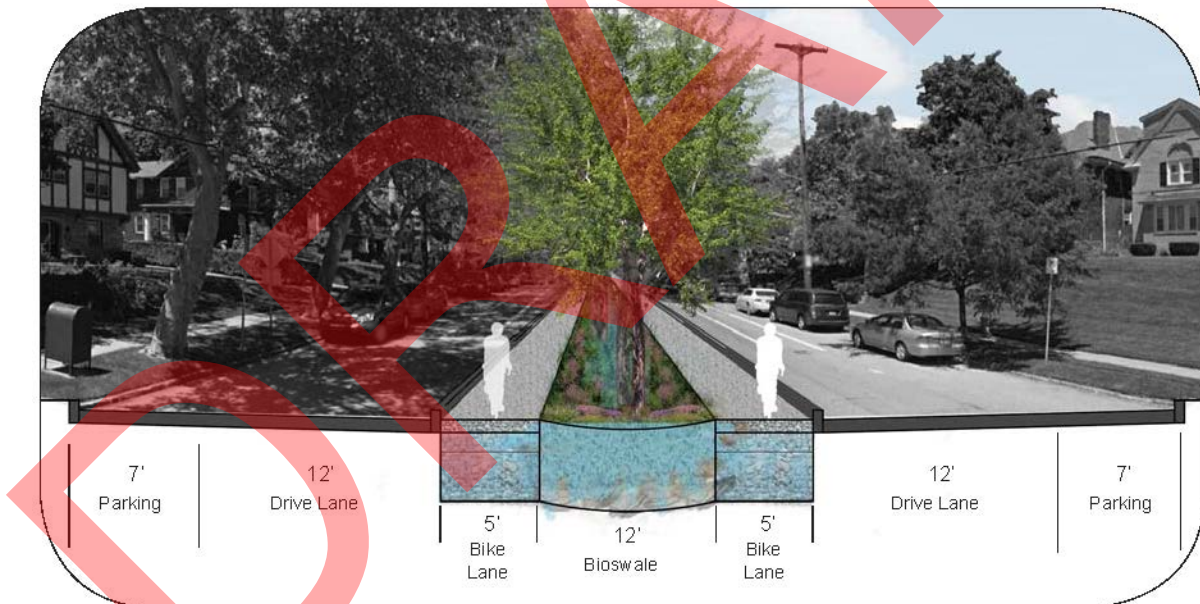
As Schenley Drive transitions into **Forbes Avenue**, a more urban approach can be taken with pervious pavement collecting and conveying runoff from the vibrant Squirrel Hill business district. In addition, the reduced CSO improvements to this streetscape would improve the pedestrian and biking experience, along with providing an enhanced park-to-park green street between Schenley and Frick Parks. The intersection of Murray and Forbes Avenues can be the nucleus of these improvements.

High-yield capture areas within the **Squirrel Hill** neighborhood are concentrated near the business-focused corridors of Forbes and Murray Ave. Runoff captured is conveyed from the business district through the neighborhood to Schenley Park's Panther Hollow Run. The pavement of Wightman Street could be reduced to accommodate a bioswale with adjacent bike lanes. Pervious streets like Murdoch St., with its existing stone cobbles, could further collect and convey runoff to Bartlett St. Bartlett St. is the low point of the existing valley and runoff from Squirrel Hill flows towards Panther Hollow Run.





**Figure 6-22: Existing Wightman Street**



**Figure 6-23: Proposed Wightman Street with Bioswale**



**Figure 6-24**

This runoff from Squirrel Hill would be reintroduced to **Panther Hollow** at Bartlett St., along the west edge of the park. Panther Hollow would benefit from ecological restoration and reintroducing runoff back into the system would be done carefully, overtime, as the valley is restored. Additional opportunities could include capturing and storing runoff for irrigation at the adjacent golf course. At the lower end of the Hollow an existing low slope area would make an ideal wetland for capture and cleaning runoff from both Phipps Run and Panther Hollow Run prior to entering Panther Hollow Lake.



**Figure 6-25**

Dredging **Panther Hollow Lake** would increase its storage potential and begin to restore the natural systems and diversity of the lake. Additional capture storage could be provided as “freeboard” above the normal lake level. Combined with efforts upstream, the goal would be to restore the lake as a usable amenity for park users. The estimated 68 million gallons of annual flow coming from Panther Hollow Lake can be diverted from the combined sewer system and brought to the surface to serve as baseflow for a daylight stream in an ecologically engineered channel.



**Figure 6-26**

This daylighted stream would run through **Junction Hollow**. Junction Hollow’s gentler slopes and broad profile offer large volumes of capture potential. North of Panther Hollow Lake there are large parking areas and streets that can store water beneath pervious pavement. South of Panther Hollow Lake capture is accomplished with storage sites and constructed wetlands. The character of storage can be defined from additional input from the community, providing opportunity for additional park programming. The recreation field at the lower end of Junction Hollow also offers capture potential.

In an effort to address an important City-Wide guiding principle seeking direct **riverfront connectivity**, a partnership with the Almono Development team would help overcome challenges to providing a daylight stream corridor from Junction Hollow Run to the Monongahela River. There is further opportunity to use the existing parcel and surface parking lots bounded by 2<sup>nd</sup> Street, Saline Street, and Interstate 376 in this effort.

The collective whole of the corridors, public open space, and Junction Hollow improve the connectivity between institutions, neighborhoods, and other assets surrounding the park. They also offer an enhanced connection to the riverfront.