



A GUIDE TO
**Riverfront
Development**

Connecting communities to the water

 **Riverlife**

YOUR CITY LIFE IS RIVERLIFE

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“Be home before dark and stay away from the rivers.”



So went the common advice given to Pittsburgh children by their parents for nearly a century as they ventured out to play on warm summer afternoons. The warning is telling in a number of ways, offering a glimpse into the hostile conditions along Pittsburgh’s urban riverfronts prior to 1990 and the public attitudes surrounding them.

People living in the Pittsburgh region prior to the city’s modern renaissance had good reason for concern. For generations the downtown riverfronts were largely invisible, cut off from neighborhoods by industrial yards, rail tracks and highways that took advantage of the riverfronts’ miles of flatness but created a tangle of barriers. If one was lucky enough to forge a path through scrap yards and private property to get to the water’s edge, what awaited was less than appealing: Pittsburgh’s three rivers had been polluted and eroded after years of industrial use with invasive weeds choking out the natural landscape. Very few opportunities for riverfront recreation and relaxation existed.

And yet, people were drawn to the rivers. They never gave up their dreams for the riverfronts, for swimming and cycling and picnicking along the waters of the Allegheny, Monongahela and Ohio. And so, use and interaction with the rivers of Southwestern Pennsylvania has been changing over the years as Pittsburgh recovered from the collapse of the steel industry in the 1980s and sought to reinvent itself through its natural assets. Formerly viewed as the backdoor to the city, Pittsburgh’s riverfronts are now embraced as the shining face of a new city, dotted with parks, residences, businesses, and industries that have brought over \$4 billion of adjacent development to the city since 1999.

What inspired such a dramatic shift? As riverfront land became available for development and recreation, a priority was given to considering the wants and needs of the community. As the new “front yard” for the community, riverfronts must now accommodate the routines of runners, strollers, anglers, boaters, and working barges, among other users.

Successful riverfront development doesn't have to start on a grand scale. Sometimes the smallest projects are the most potent. A small park, boat launch, stormwater landscape or fishing pier, created at the right time and embraced by the community, can have a catalytic effect and lead to bigger things down the road. A building with windows, pathways and terraces that connect to and celebrate the riverfront is a source of pleasure and pride, indoors and out.

Each new investment along the rivers encourages activity, unleashes vitality and increases land value, while providing places for people to enjoy.

Since 1999, Riverlife has worked to reclaim, restore and promote Pittsburgh's urban riverfronts. Formerly known as Riverlife Task Force, Riverlife was formed to conduct hundreds of public meetings, convene property owners, public officials and civic stakeholders and facilitate the creation of a master plan for developing Pittsburgh's downtown riverfronts. Ever since then, Riverlife has been thinking about strategies to reconnect people to the rivers. Pittsburgh can now point to dozens of projects of varying scale to demonstrate that reclaiming the riverfront advances economic development, transforms the environment and opens up recreational opportunities. We've learned valuable lessons and have created guidelines based on best practices for designing and developing riverfronts of all sizes. Here we have collected these resources for easy access and application across

Southwestern Pennsylvania to launch conversations about the opportunities for improvements in the many river communities throughout the region. We hope this document will serve as a useful resource for property owners, planners, developers, public agencies, and nonprofit organizations who want to seize moments of opportunity and maximize the potential of their riverfront assets.

This document is not intended to replace a community's existing zoning code, district plans, or ordinances, but rather establish optimal planning goals and to aid in enhancing and coordinating riverfront projects, large and small.

More detailed information can be found in the original documents, and the best results are often reached through consultation with professional designers.



RIVERLIFE RESOURCE DOCUMENTS

This information was compiled from seven resources that Riverlife has produced in the past. These resources, listed below, offer additional details on each aspect of riverfront development. An online version of this information also provides useful links and information: riverlifepgh.org/resources

A Vision Plan for Pittsburgh's Riverfronts

Three Rivers Park Design Guidelines

Connecting the Loop Plan

Three Rivers Park Lighting Strategy

Landscape Management Guidelines

Three Rivers Park Public Art Strategy

Stormwater Is the Communicator

PRINCIPLES FOR RIVERFRONT DEVELOPMENT

When planning a riverfront development, let these core principles lead the thinking:

- Feature the riverfront as the front door.
- Showcase the river's history.
- Activate the riverfront.
- Limit obstacles and connect to the river.
- Engage with the water.
- Connect seamlessly along the riverfront and into neighborhoods.
- Repair and enhance the environment.
- Employ high-quality architectural materials and sustainable engineering practices.

Read on to learn essential aspects of riverfront development.



Riverbanks, shorelines, riparian buffers, and river habitat are critically important when planning any riverfront project.



Natural

River Edges

DEFINITIONS

Riparian buffer

A permanent naturally vegetated area located adjacent to a stream, river, lake, pond or wetland.

Morphology

Deals with the form of living organisms, and with relationships between their structures.

Hydrology

Encompasses the occurrence, distribution, movement, and properties of the waters of the earth and their relationship with the environment within each phase of the hydrologic or water cycle.

Permaculture

A system of cultivation intended to maintain permanent agriculture or horticulture by relying on renewable resources and a self-sustaining ecosystem.

Intent

Riverbanks, shorelines, **riparian buffers**, and river habitats are critically important when planning any riverfront project. Other important components of ecosystem function that should be considered include geology, **morphology**, **hydrology**, and land cover. Along the river, there are many opportunities for integrated regenerative design, stormwater management, habitat restoration, public access, stewardship, and redevelopment.

Key Concepts

BUFFER TYPOLOGY 1

Dense Urban Development Buffer Zone

In a dense urban development, a buffer zone should include design and development techniques that will provide and enhance the following: integrated green infrastructure, stormwater management practices, improved trail access, improved habitat corridor with increased vegetative types such as meadows and transitional woodlands, as well as increased tree canopy, open space amenity, integrated design of waterfront access and hardscape elements, marina access, and provision of ecosystem services.

BUFFER TYPOLOGY 2

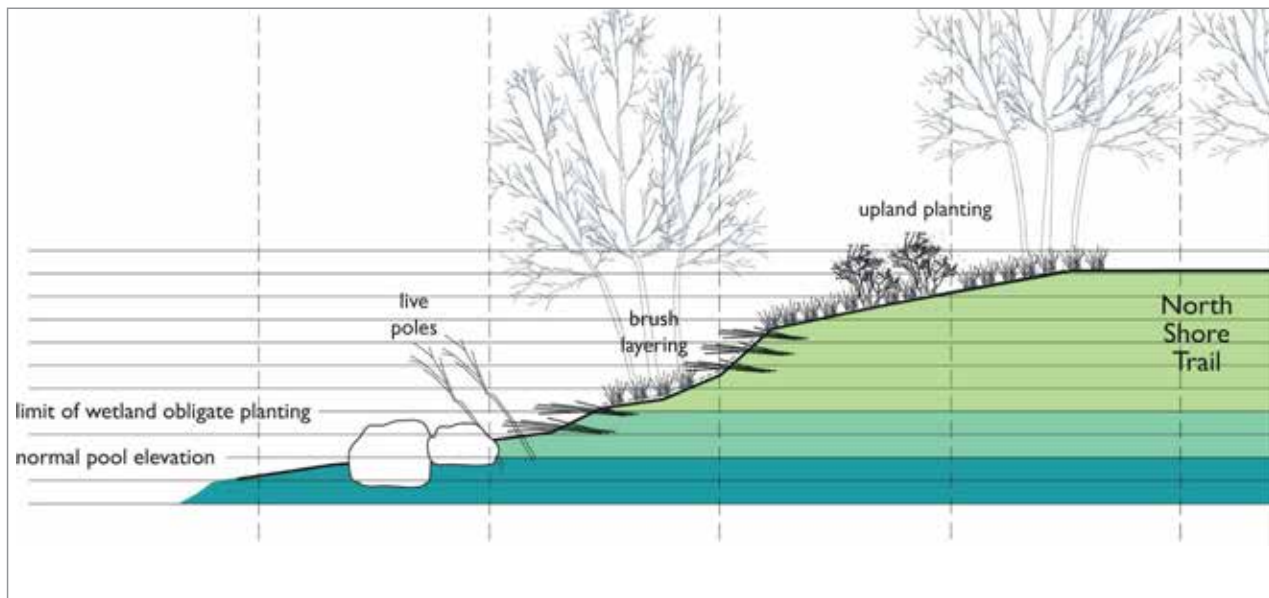
Mixed Industrial and Residential Buffer Zone

In a residential or mixed light industrial development, a buffer zone should include design and development techniques that will provide and enhance the following: provision of ecosystem services; integrated green infrastructure; ecological restoration; stormwater management practices; improved public trail access; improved and widened habitat corridors; open-space and recreational amenities, including low-impact water (kayak) access; environmental education opportunities integrated with neighborhoods and schools and **permaculture** and regenerative landscapes.

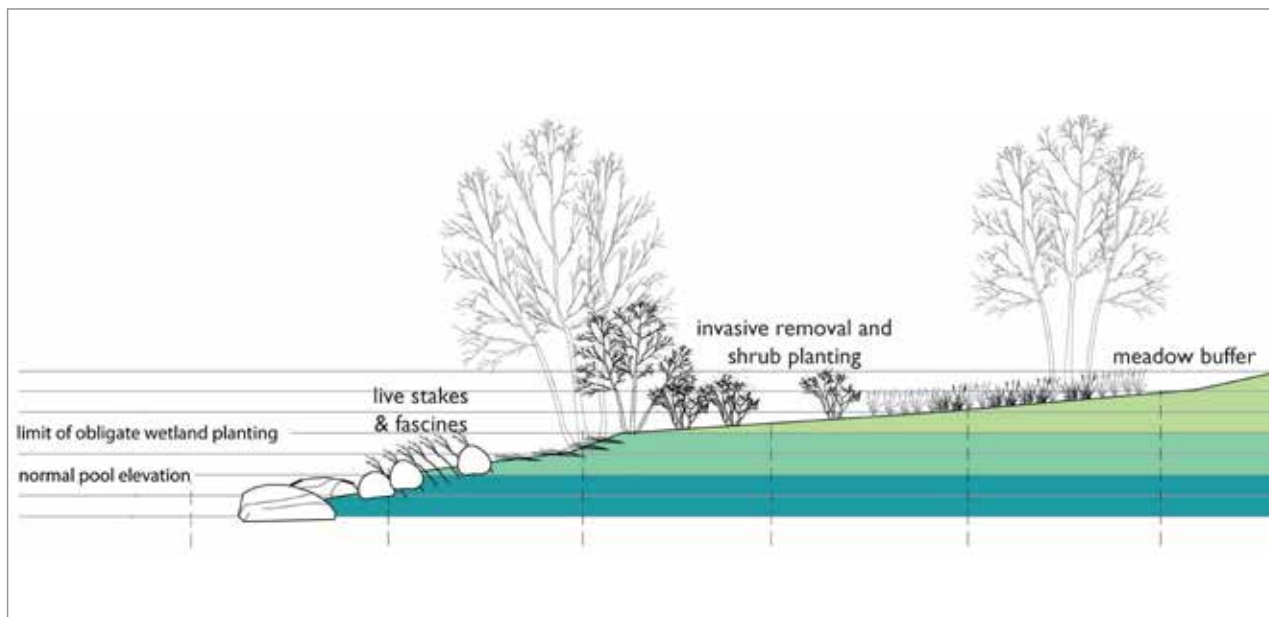


Ecological Conservation and Open-Space Buffer Zone

For open spaces along the river, a buffer zone should include design and development techniques that will provide and enhance the following: provision of ecosystem services, ecological restoration, conservation and improvement of biodiversity, increased habitat corridor potential, improved public trail access, open-space amenities, and environmental education.



Typical river section showing steep bank stabilization underneath fairly continuous layer of canopy trees. Andropogon 2006



Typical shallow bank stabilization with invasive management. Andropogon 2006

Guidelines

Recommended for Open-Space Buffer Typologies

Taken from: The Montgomery County, Pa., Guide for Riparian Corridor Conservation

DEFINITIONS:

Riparian buffer

A permanent naturally vegetated area located adjacent to a stream, river, lake, pond or wetland.

- 1.1 The wider the **riparian buffer**, the more benefits it provides in terms of wildlife habitat, water temperature modulation, protection from nonpoint sources of pollution, flood mitigation, sediment removal, and bank stabilization.
- 1.2 The **riparian buffer** should be no less than 75 feet at its narrowest, with three zones of buffer from the stream edge inland.
 - 1.2a The first zone should be undistributed forest to provide food, shade for the water body, and slope stability.
 - 1.2b The second zone should consist of managed woodland that allows for infiltration, filtration of sediment and nutrients and nutrient uptake by plants.
 - 1.2c The buffer area on the upland side should include a sheet flow of rainwater runoff to maximize vegetative and soil contact with the runoff.
- 1.3 The riparian corridor should be uninterrupted, helping to reduce the concentrated flows to the water body and providing continuous habitat for birds and other wildlife species that require undisturbed access to food, shelter and water.
- 1.4 Trees are the most important element in a riparian corridor for removing nutrients, stabilizing the soil, modifying water temperature and providing food for aquatic organisms.
- 1.5 Recreation in the buffer should be balanced with the effects this will have on existing features, especially in terms of excess nutrients, contaminants and chemicals, including pesticides, fertilizers, and herbicides.

FURTHER INFORMATION

Riparian Buffer Width, Vegetative Cover, and Nitrogen Removal Effectiveness: A Review of Current Science and Regulations

Riparian Buffers: What Are They and How Do They Work?

Riparian Buffer Issue Paper No. 2: Buffer Width

riverlifepgh.org/resources

In an urban setting, such as Buffer Typology 1, there are likely to be great variations on river edge condition that may prohibit developing deep buffers due to the topography and the slope of the site. A true riparian buffer in an urban environment will be costly and difficult to achieve. In these cases, it is recommended that natural systems are restored to the best possible state while incorporating recreational amenities along the rivers.



Public activities and events, such as sidewalk cafés, street fairs and vendors enliven connections.



Connections

To the Rivers



Intent

Perpendicular connections bring people to the riverfront. Sidewalks, public streets, pathways, and promenades provide safe and engaging passages and reinforce the riverfronts as the public realm. The following guidelines will help to ensure that all connections relate effectively to the surrounding context.

Key Concepts

- Perpendicular connections, every 400–600 feet, will extend the grid of the community into the park and natural systems, linking the urban grid to the natural forms of the waterscape and landscape.
- Connections from buildings and districts to the rivers should be publicly accessible, even where they run along private development.
- Public activities and events, such as sidewalk cafés, street fairs and vendors will enliven the connections, both as temporary and permanent installations.
- Major perpendicular connections should be designed as a continuous place, with the building wall and landscaping defining the character of the street.

Guidelines

Major Perpendicular Connections

Major perpendicular connections are those that provide connections between a community and a riverfront destination. These connections, ideally located every 400–600 feet, are most often public streets that provide both pedestrian and vehicular access to the river. These roads often provide connections to major attractions and other publicly oriented uses.

- 1.1 Major perpendicular connections should be wider than those on secondary streets, in order to fully accommodate the needs of pedestrians, bicyclists and green stormwater infrastructure, with the intent to elevate the public realm and create special spaces.
- 1.2 Streets should be designed with all transportation modes fully accommodated instead of being designed primarily for automobiles. In addition to being **multi-modal, complete street** design considers urban

DEFINITIONS

Multimodal

Characterized by several different modes of activity or occurrence

Complete streets

Designed and operated to enable safe access for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities



design, environmental goals, quality materials, the beauty of the landscaping, and stormwater management.

- 1.3 Locate publicly oriented uses in ground floors along major perpendicular connections, including retail shops and restaurants.
- 1.4 Maintain established build-to lines along major perpendicular connections. Where retail and restaurant uses will be located, provide for sidewalk café seating and arcaded ground floors where appropriate.
- 1.5 Program ground floors to accommodate retail, restaurant, and other public uses.
- 1.6 Minimize curb-cuts, and do not locate service entrances along major perpendicular connections.
- 1.7 Street trees, lighting, sidewalks, and curbs should comply with all municipal standards and guidelines.

Perpendicular Connections along Private Uses

In many cases, connections to a riverfront will be provided along the edges of or pass through private development that is not generally open to the public, such as residential and private office developments. In these cases, it is important to clearly define the connection as a public space.

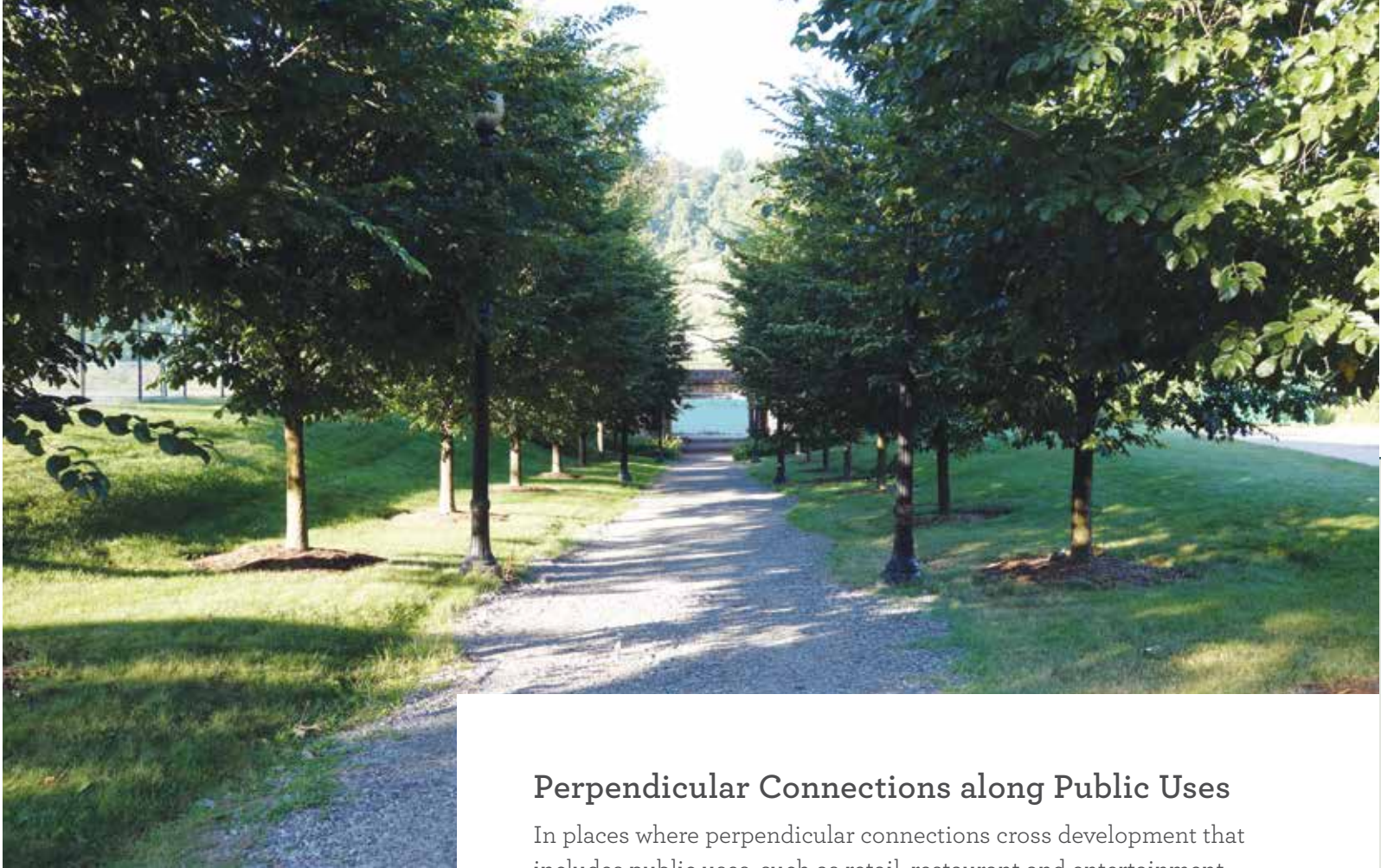
- 2.1 Provide a minimum walkway width of 12 feet for perpendicular connections to be maintained as an easement or public right-of-way. Provide a minimum **setback** for all structures, including fences, of 10 feet on either side of the connection.
- 2.2 Fences along private spaces that border connections should have a maximum opacity of 50 percent and a maximum height of 48 inches. Additional screening and enclosure should be achieved through the use of landscaping materials and changes in elevation.
- 2.3 In general, for private uses located along connections, elevate the first level of the building 18 to 30 inches above grade through the use of **terraces** and porches. This will provide some visual privacy between the private use and the public realm, as well as create new opportunities for “semi-public” spaces where the occupants of the building may enjoy living or working adjacent to the riverfront.
- 2.4 Provide a finished edge along the connection.
- 2.5 Design the surface of the connection to be consistent with the materials of the trail or promenade to which it connects. At minimum, provide a crushed limestone surface.
- 2.6 Provide pedestrian-scaled lights.
- 2.7 Provide pedestrian crosswalks where perpendicular connections meet a street.
- 2.8 If possible, locate public amenities, such as seating, maps, etc., at the ends of the connection to serve as a focal point, drawing attention to the riverfront and encouraging movement along the trail connection.

Setback

In land use, the distance a building or other structure is set back from a street or road, river, shore or flood plain or any other place deemed to need protection.

Terrace

A level paved area or platform next to a building



Perpendicular Connections along Public Uses

In places where perpendicular connections cross development that includes public uses, such as retail, restaurant and entertainment occupancies, the connections provide opportunities to enhance the development, create additional public open space and engage those adjacent uses. Perpendicular connections along public uses can be designed to serve as public plazas and gateways to the riverfront. They are encouraged to be inhabited spaces, providing amenities to both users and business owners.

- 3.1 Orient ground-floor uses to the connection and seek to engage the public.
- 3.2 Provide storefront glazing, extending from the ground to a minimum height of 12 feet. Wrap the storefront glazing around the corners of the buildings, to provide visual connections to the publicly oriented uses from all approaches.
- 3.3 Locate public entrances to ground floor uses along the perpendicular connection.
- 3.4 Sidewalk cafés are encouraged as uses along the perpendicular connection.
- 3.5 Where the perpendicular connection intersects a street, maintain wide pedestrian crossings that are on axis with the connection.
- 3.6 Provide curb-cuts at these crossings to accommodate people of all levels of mobility, but install removable **bollards** to control vehicular access.
- 3.7 Design the pattern of street lights and trees along the road that is intersected by a perpendicular connection to relate to the connection. Maintain views down the connection toward the rivers from the opposite side of the road and keep them uninterrupted by street trees and lights.

Bollard

Structures used to control pedestrian and vehicular traffic, protect critical infrastructure, provide perimeter highlights or define a pathway.

Perpendicular Connections across and Down to the River

Easily navigable pedestrian connections from the ends of the bridges to the riverfront trails, promenades and roadways are critical to the success of a riverfront. Bridges can provide unique experiences for a riverfront and may also provide many of the key views of a community and the riverfront. Access can be provided through a variety of vertical connections, including stairs, ramps, and paths.

- 4.1 Ensure vertical ramp connections are in place in key locations.
- 4.2 Preserve the architectural character and details of bridges, while seeking to provide universal accessibility at a minimum five percent grade.
- 4.3 Respect river views and site lines when designing new bridges. Railings and barriers should be designed with consideration of good views to the river.
- 4.4 Light bridges and vertical connections.
- 4.5 Accommodate users of different mobility levels on vertical connections in accordance with ADA requirements.
- 4.6 Clearly mark access points to vertical connections from trails and promenades using thoughtfully designed wayfinding signage consistent with park and trail standards.

FURTHER INFORMATION

For more information on connecting riverfronts along the riverbank and to and from a community, refer to the *Three Rivers Park Design Guidelines*.

riverlifepgh.org/resources



Connections

Along the River



Intent

Parallel connections along the river's edge serve many different users and connect neighborhoods and development sites to the water, providing public access, opening up views, and re-engaging the rivers as part of the **public realm**. This section is intended to provide guidance for designing riverfront trails, promenades, roads, and scenic drives, each of which addresses a key issue of access along the rivers.

DEFINITIONS

Public realm

Consists of the roadways, sidewalks, parks, plazas and other open spaces that comprise the arteries and focal points of a community's framework. It is a space where civic interaction occurs.

Key Concepts

- Connections should be accessible to the public even when they are adjacent to private development.
- Connections should vary in character, providing both quiet, reflective threads and lively, inhabited promenades.
- Promenades provide opportunities to experience the river from a different vantage point.
- Public activities and events, such as sidewalk cafés, street fairs and vendors, will enliven the connections, both as temporary and permanent installations.
- Connections should be usable year-round on a variety of scales, encouraging activity. In the summer, they will provide tranquil shade along the riverfronts, while in the winter the sun will penetrate to warm the surface of the trails and promenades for recreational users and pedestrians alike.
- Parallel connections between landings, including trails and river roads, will provide a soft, green foil to the urban density and activity.
- Riverfront trails should be simple and integrated with the landscape and defined by the vegetation of the park.
- Each stretch of trail provides unique conditions, needs, and opportunities. Solutions should be appropriate for each segment in order to plan for step-by-step implementation, one project at a time.

Guidelines

Riverfront Trails

Trails are riverfront connections that place emphasis on moving along the river for longer distances as a pedestrian, runner, cyclist or rollerblader. Trails place emphasis on providing riverfront connections for recreational uses, and as such should be designed with those users in mind.

When considering a development that includes riverfront trails, the following guidelines should be considered:

- 1.1 In general, contain the trail within a canopy of **deciduous trees**, providing shade in the summers and allowing sunlight to penetrate in cooler months. The trail should move in and out of the **tree canopy**, opening to provide views to the river and closing again to provide a sense of intimacy and enclosure.
- 1.2 Avoid planting trees in even rhythms such as those typically used in street tree plantings, unless it is desired to emphasize a specific architectural character. Instead, plant them in groups with varying densities.
- 1.3 On open sites, plant masses of dense canopy trees and understory trees and shrubs along the trail opposite the river to create a background of green along the riverfront setting. Provide filtered or framed views through the planting masses to significant elements along the trail to ensure visual connections for safety and transparency. Where dense canopy tree plantings are not possible or desired, provide a palette of native grasses and perennials to create naturalized meadows, as well as shrubs and small understory trees to provide a sense of enclosure along the riverfront.
- 1.4 On the river side of the trail, design the **tree canopy** to open and close, creating new views both to and from the trail. This will create views of the surrounding riverfront.
- 1.5 Avoid railings along trails wherever possible. Where they are provided for safety, railings should be designed that fit the materials identified for the riverfront and should be considered as opportunities to integrate public art.

DEFINITIONS

Deciduous trees

Trees that shed their leaves seasonally

Tree canopy

The layer of leaves, branches, and stems of trees that cover the ground when viewed from above.



Low-impact

Constructed to have minimal impact on the surrounding environment

- 1.6 Locate light fixtures, trashcans, signage, and other necessities discretely in the landscape of the trails. Provide drinking fountains, mileage markers, maps, and informational signage, integrating them with the landscape. Where appropriate, locate emergency call-boxes at frequent intervals to provide additional safety and security.
- 1.7 Wherever possible, provide a dual-surface trail with a crushed limestone surface for pedestrians and runners and a hard surface for bikers and rollerbladers.
- 1.8 Creative trail design, such as the development of **low-impact** techniques, like suspended boardwalks and permeable walkways, are encouraged in appropriate locations. Recommended applications include locations where such designs will minimize the disturbance of habitats.
- 1.9 Consider alternatives to asphalt as a surfacing material for connections in and to the riverfront park. Where the use of asphalt is dictated by the construction of temporary connections or budgetary constraints, use an asphalt material that will provide a light-colored surface, such as through the addition of limestone to the aggregate. Black asphalt is highly discouraged as a trail surface material.
- 1.10 Provide a durable, finished, clean edge along the connection such as stone or concrete.

Riverfront Promenades

Promenades are generally more pedestrian in character, rather than recreational. They provide opportunities to experience the river from a different vantage point. Promenades are places to see and to be seen. They can open up the views of the river and integrate the character of the community with the pastoral nature of a park. Promenades can occur where landings intersect connections along the riverfront park and where urban districts are adjacent to the riverfront.

- 2.1 Use higher-quality materials, such as stone paving, for promenades.
- 2.2 Consider alternative routes for cyclists along a promenade that may interrupt the established path of riverfront trails. Alternatives include the provision of a “high” promenade paved with stone, where pedestrians and shoppers might stroll, in conjunction with a “low” trail along the river, surfaced with concrete or crushed stone. Other recommendations include providing clear routing along adjacent streets using separated bicycle lanes if possible, marking access points that will rejoin the riverfront trail.
- 2.3 Promenades along a riverfront park should be considered part of the park.
- 2.4 Plant trees within 15 feet of the river edge of the promenade.
- 2.5 Plant dense landscaping below the front edge of promenades in order to frame views and give the user the sense of vantage point that comes from sitting above the trees.
- 2.6 Consider the issue of color for promenade surfaces. Warm-colored paving will seem warmer in the gray winters, while cool colors will seem cooler in

the summers. Use natural-colored, non-glare walking surfaces at landings or other points of interest where more focus is intended.

- 2.7 For buildings located along promenades, provide ground floor uses that are public in nature, including civic, cultural, retail, entertainment, restaurants, and public lobbies.

Riverfront Streets

Streets along a riverfront have the potential to be an exciting and different way to experience riverfront parks, and to create new opportunities for development adjacent to them. They can make the riverfront more public and open up all areas of the park for improved public safety and for persons with limited mobility. At the same time, care must be taken in designing and locating riverfront streets to ensure that access to the riverfront is not restricted by the presence of vehicular streets, and with pedestrians as a primary consideration. Riverfront streets should be perceived as an extension of the riverfront park.

- 3.1 Encourage residential uses along riverfront streets.
- 3.2 Locate primary addresses and entrances to buildings on the riverfront street.
- 3.3 Limit riverfront street width to no more than two lanes of traffic and one lane of on-street parking. The maximum width for riverfront streets should be 34 feet, including two lanes of traffic and one lane of on-street parking on the land side of the street. The preferred width is 30 feet.
- 3.4 For new streets along the riverfront, provide an appropriate setback that allows a natural slope and enough space for different desired activities along the river.
- 3.5 Provide a 7- to 8-foot sidewalk and 4- to 5-foot tree range. Where space is limited, the trail may substitute for the riverside sidewalk.
- 3.7 Orient riverfront streets to pedestrians and light traffic. Truck and delivery traffic are not appropriate on riverfront streets.
- 3.8 Post maximum speeds of 25 miles per hour on riverfront streets, with traffic-calming measures integrated in pedestrian districts at intervals of no more than 400 to 600 feet.
- 3.9 Provide pedestrian crossings not less than 600 feet apart. Provide a change of street paving that incorporates variations in texture and color at pedestrian crossings.
- 3.10 Plant riverfront streets with dense tree canopies, allowing views to the river below the canopies.
- 3.11 Streets should be designed with all transportation modes fully accommodated instead of being designed primarily for automobiles. In addition to being multimodal, complete street design considers—along with the urban design and environmental goals—thoughtful design and integration of materials, landscaping and stormwater management.

Scenic Drives

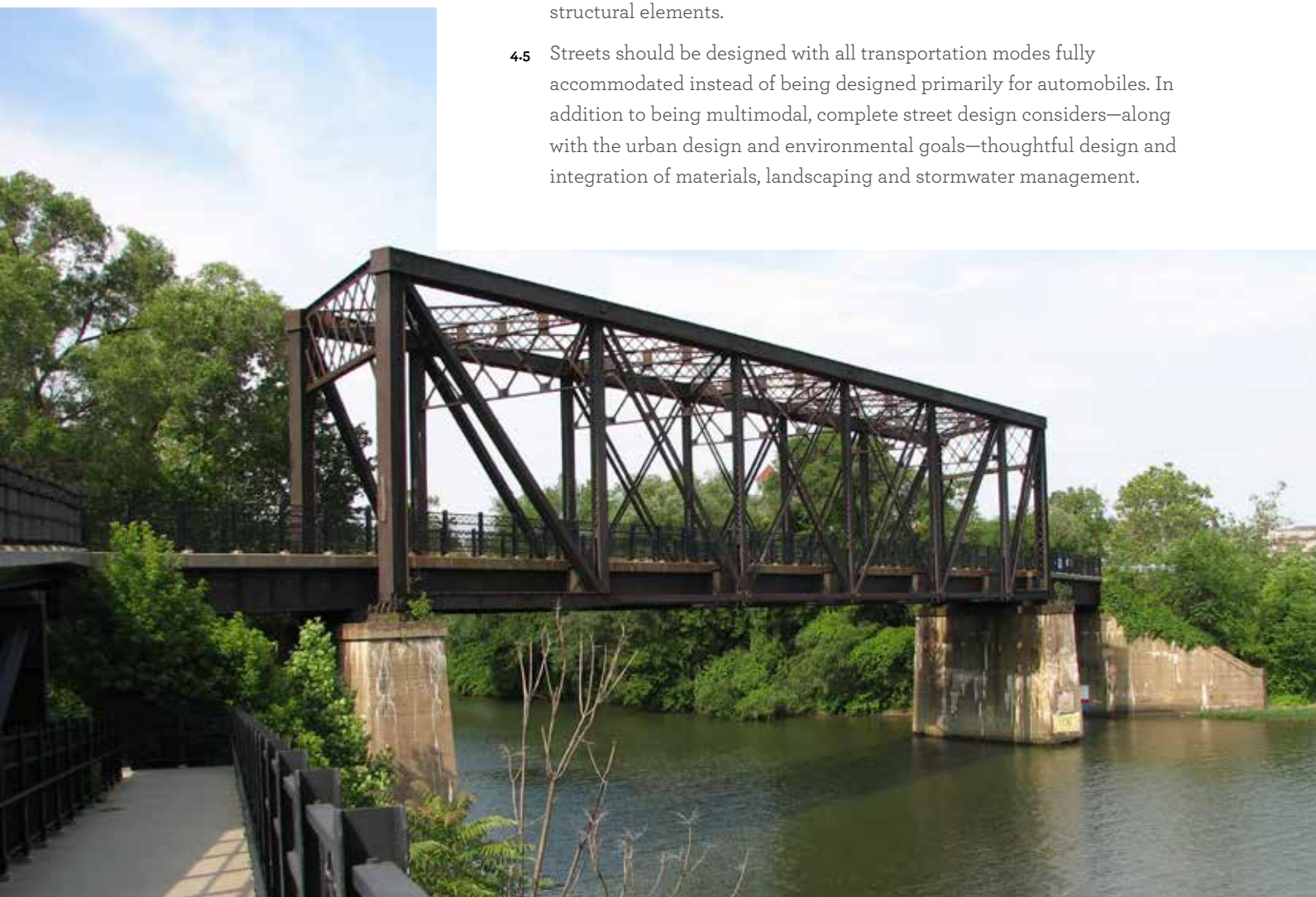
Scenic drives are riverfront streets, roads and parkways located along the riverfronts, which are primarily in a landscape setting, with views to the river and the surrounding landscape. These should be considered primary connections that preserve views of the river and scenic quality of the landscape and enhance the experience of driving, biking and walking along the riverfronts. Scenic drives have a special design quality that includes appropriately detailed cartways and features design elements such as signage, guardrails, lighting, plantings, bridges, elevated roads and other road features. Scenic drives can respond to the landscape vocabulary or setting where they are designed, and can be either formal or natural in character.

FURTHER INFORMATION

For more information on connecting riverfronts along the riverbank and to and from a community, refer to the *Three Rivers Park Design Guidelines*.

riverlifepgh.org/resources

- 4.1 Views should be maintained from scenic drives into the river valleys through the careful selection of structural elements, including barriers.
- 4.2 Provide landscaping and street trees for scenic drives in order to enhance the roads as green boulevards through the community.
- 4.3 Utilize high-quality materials for the reconstruction of scenic drives, including concrete sidewalks.
- 4.4 Consider the impact of reconstruction on views to and from the scenic drives. Considerations include the use of appropriately designed barriers, the selection of streetlights, and the design of retaining walls and other structural elements.
- 4.5 Streets should be designed with all transportation modes fully accommodated instead of being designed primarily for automobiles. In addition to being multimodal, complete street design considers—along with the urban design and environmental goals—thoughtful design and integration of materials, landscaping and stormwater management.



Connections

Landings

Intent

Landings occur where two or more park connections come together and provide focal points for activity and connection at the water's edge. Landings are intended to be the public places that people are drawn to for special events or activities and serve as destinations and landmarks. They can bring together transit systems and activity centers. They are places where people find distinctive experiences along the river's edge. Landings are intended to provide opportunities for design and physical intervention. Landings on the water are an opportunity for unique places where people, land and water meet.

Guidelines

- 1.1 Landings should be transitional and connective points between the river's edge, the riverfront park and the community, with access to the trails, esplanades, promenades and transit connections.
- 1.2 Landings should comprise a series of spaces that vary in size and purpose, and serve those who use the riverfront park daily or for an occasional or one-time visit.
- 1.3 Landings should be engaging and lively public places, with with uniqueness and character.
- 1.4 Landings should be well designed, with higher-quality materials, to serve as places of activity and offer contrast to the natural elements of the riverfront park.
- 1.5 Landings should provide opportunities for gathering and meeting spaces for daily use or special events.

FURTHER INFORMATION

More detailed information and building design guidelines can be found within the *Three Rivers Park Design Guidelines*.

riverlifepgh.org/resources



Connections



Districts

Intent

This section will provide guidance for larger-scale planning and development efforts at riverfront sites. Planning and development at the district scale can be transformational for communities and regions. Developers and planners should take the utmost care to make the most of these opportunities to improve both the built and natural environments.

Key Concepts

- Riverfront districts will offer the greatest opportunity to renew and reinforce the quality of places to live, work, and play because of the added value of being adjacent to a riverfront park.
- Districts provide opportunities to support and enhance the activities of a park as well as create destinations for visitors.
- The riverfront should serve as a front yard, with architecture-facing green space, pedestrian walkways, parks and water landings.
- Each riverfront district should be physically and functionally unique in character and sense of place.

Guidelines

Street and Grid Patterns

Today, it is rare to find streets that extend fully to the river's edge. As industrial uses have shifted away from our riverfronts and new patterns of development emerge in communities, there are opportunities not only to re-establish abandoned street grids, but to create new ones that connect landlocked neighborhoods to the rivers.

- 1.1 Seek to re-establish historic street grid patterns that once extended to the river.
- 1.2 In districts where streets did not extend to the river, establish new perpendicular connections to provide such access, with the scale of the grid pattern responding to adjacent neighborhood patterns. In general, extend perpendiculars to the river at regular intervals of 400–600 feet apart.
- 1.3 Establish street grids that respond to topography. For instance, grids should shift where necessary to open up views and change vantage points.

Views to and from Districts

- 2.1 Building configurations should maximize **view corridors**.
- 2.2 Where possible, maintain or maximize views to the river from individual buildings.

Transportation Planning

Developers and building owners are encouraged to provide amenities accommodating occupants who wish to use alternative transportation, including bicycles and public transit.

- 3.1 Consider future plans for water transportation as opportunities to make connections to water landings.
- 3.2 Provide secure bicycle storage, personal lockers, changing rooms, and showers to accommodate a minimum of 5 percent of the building's occupants.
- 3.3 Maximize on-street parking throughout districts.
- 3.4 Locate parking below-grade or in a structured garage where possible. When that is not possible, minimize visible parking, shield parking from view, or locate in the interior of the block.
- 3.5 Develop shared parking facilities with nearby development, located away from the riverfront. Explore carpool options and locate parking pools on-site to minimize the impact of parking along the rivers.
- 3.6 Ensure any new infrastructure is in compliance with regional and municipal comprehensive and transportation plans.

Site Planning

- 4.1 Locate public entrances to retail and commercial uses along the riverfront facade of the building. Create riverfront addresses, particularly with regard to publicly oriented uses.
- 4.2 In order to activate open-space connections, locate pedestrian-oriented uses on the ground floor of buildings and provide pedestrian amenities.
- 4.3 Utilize landscaping, rather than walls and fences, to create semipublic/private **buffers**.
- 4.4 Do not build surface parking lots adjacent to the riverfront.
- 4.5 Locate buildings using traditional urban build-to lines, occupying the majority of street frontages, and activating sidewalks and other connections.
- 4.6 Whenever possible, do not locate vehicular entrances to parking garages and building services along primary perpendicular connections. Minimize curb-cuts for vehicular access to development sites along primary perpendicular connections. Do not locate curb-cuts within 100 feet of a street corner.
- 4.7 Maximize the use of pervious materials and **green infrastructure**.
- 4.8 Reduce on-site heat gains by minimizing dark-colored surface areas, such as black asphalt. Acceptable alternatives include concrete paving, unit paving

DEFINITIONS

View corridors

Three-dimensional viewpoints that start from a fixed position, encompass a given visual range, and terminate at a particular object. They can be “narrow” or “wide” depending on the visual range. Identifying view corridors helps to protect views to iconic natural features or architectural landmarks.

Landscape buffers

Landscaping located along the perimeter of an area intended to screen or separate land uses either from one another or from a public street.

Green infrastructure

Uses vegetation, soils and natural processes to manage water and create healthier urban environments. It refers to stormwater management systems that mimic nature by soaking up and storing water.

Brownfield

Property where the expansion, redevelopment or reuse of may be complicated by the presence or potential presence of a hazardous substance, pollutant or contaminant.

Stormwater best management practices

Best practices to design, implement, and evaluate stormwater management efforts

Light pollution

Brightening of the night sky that inhibits the observation of stars and planets, caused by street lights and other man-made sources

Landscape swales

Refers to a wide and somewhat shallow depression on the ground that is commonly used as drainage for carrying water in landscaping.

FURTHER INFORMATION

More detailed information and building design guidelines can be found within the *Three Rivers Park Design Guidelines*.

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systems, light-colored asphalt products using limestone aggregates or colored sealants, and increasing areas of landscape and groundcovers.

- 4.9 Apply sustainable site planning practices, such as:
 - Erosion and sedimentation control,
 - Development densities that activate the environment,
 - Redevelopment of **brownfields**,
 - Stormwater best management practices**,
 - Use of native plantings,
 - Use of locally sourced materials,
 - Minimization of **light pollution**.
- 4.10 Bury all utilities in development sites.
- 4.11 Do not locate transformers and other above-grade utility structures along the park or perpendicular connections to the park.

Open-Space Planning and Design

- 5.1 When designing new open spaces, check plans for the surrounding community. Public open-space requirements should be met through the creation of riverfront promenades, additional perpendicular connections to the park and other spaces that complement the river park.
- 5.2 Design new open spaces to occur mid-block, not at corners, and in locations that are adjacent to the riverfront or perpendicular connections to the park.
- 5.3 Sidewalk cafés and similar uses are encouraged. Make open space accessible to the public 24 hours a day.
- 5.4 Activate open spaces by locating publicly oriented uses in the ground floors of adjacent buildings. Provide pedestrian amenities, including seating.





Built

Buildings

Intent

Buildings located along the riverfront establish the edge of the public realm, becoming a “face” to the individual districts in which they are located. Viewed from the waterscape and other vantage points, they become landmarks that orient visitors and inhabitants. Added together, buildings compose a district with distinctive forms and landmarks.

This section is intended to give guidance when designing buildings and creating master plans for new districts, to create a built edge to the riverfront that complements the natural setting and that in turn, activates and distinguishes the district.

Key Concepts

All building and site development should incorporate elements of green-building design. Developers and owners are encouraged to utilize the Leadership in Energy and Environmental Design (LEED) standards as established by the U.S. Green Building Council (USGBC).

Guidelines

Contextual Scale and Massing

- 1.1 In new districts, a master plan should outline the minimum and maximum requirements for building height and **massing**.
- 1.2 In dense urban areas, such as the City of Pittsburgh, construct buildings to a minimum of four stories and 60 feet high in districts adjacent to a river, with six to eight stories preferred.
- 1.3 Design building **massing** with consideration of maintaining views of rivers, key landmarks and architecture, and the vistas and spaces around them. Maximize light and air to open spaces and minimize shadows on adjacent properties and open spaces.
- 1.4 For individual building projects, identify the height patterns that are present in the district in which they are located. Relate the height of the new development to the height of the surrounding district, and reduce negative impacts on adjacent properties, such as blocking views, casting open spaces into shadow for a significant period of the day, etc. **Schematic illustrations** of the massing of the surrounding district will be required in order to review



DEFINITIONS

Massing

The volume and shape of a building

the proposal's compatibility with the established district and the overall design goals for the riverfront.

- 1.5 Due to the Pittsburgh area's varied topography and changing landscape, roofs of buildings in and adjacent to the riverfront are visible from multiple vantage points. Building tops become important landmarks within individual districts, such as the Golden Triangle. Pay careful attention to the design of building tops and roofs, giving a vertical emphasis to those building tops that are viewable from surrounding areas.

Setbacks and Build-to Lines

- 2.1 In general, build to the property line or an established build-to line of an existing district for all properties located along both perpendicular and parallel connections, with the intention to develop a consistent and continuous urban fabric within districts.
- 2.2 "Hold the corner" of buildings at intersections, except where open spaces are strategically located.
- 2.3 In new districts, an individual district master plan should outline the minimum and maximum requirements for building setbacks and build-to lines.
- 2.4 For individual building projects, identify the setback and build-to patterns that are present in the district in which they are located. The location of structures should work within the established pattern of the district unless this pattern has otherwise been deemed undesirable. **Schematic illustrations** of the massing of the surrounding district will be required in order to review the proposal's compatibility with an established district and overall design goals for the riverfront.
- 2.5 Development is encouraged to provide outdoor terraces and porches within setbacks as a means for providing semiprivate spaces for building occupants and encouraging use of the riverfront.

Ground-Floor Design

Buildings located in riverfront districts will accommodate a variety of different uses, ranging from public to private.

- 3.1 Activate the ground floor with different uses and make them adaptable over time.
- 3.2 Maximize glazing at least 60 percent.
- 3.3 While publicly oriented uses are generally encouraged along all district edges, there are also many opportunities to create residential communities adjacent to the park.
- 3.4 Where appropriate, promote **mixed-use districts** by providing a minimum first-floor height of 18 feet to accommodate a wide range of ground-floor uses.
- 3.5 Where buildings are located adjacent to riverfront roads, locate primary entrances and addresses on the riverfront road.

Schematic illustrations

Help to determine a concept and to present it in a form that achieves understanding and acceptance. Although the design is not entirely represented, the schematic drawings can demonstrate basic spaces, scale, and relationship of components.

Mixed-use districts

Blend a combination of residential, commercial, cultural, institutional, or industrial uses, where those functions are physically and functionally integrated, and that provide pedestrian connections.



Roof terraces and balconies

Outside spaces of a building used for the enjoyment of the occupants that offer views of the surrounding area.

Green roofs

Partially or completely covered with vegetation and a growing medium, planted over a waterproofing membrane. They may also include additional layers, such as a root barrier, and drainage and irrigation systems.

FURTHER INFORMATION

More detailed information and building design guidelines can be found within the *Three Rivers Park Design Guidelines*.

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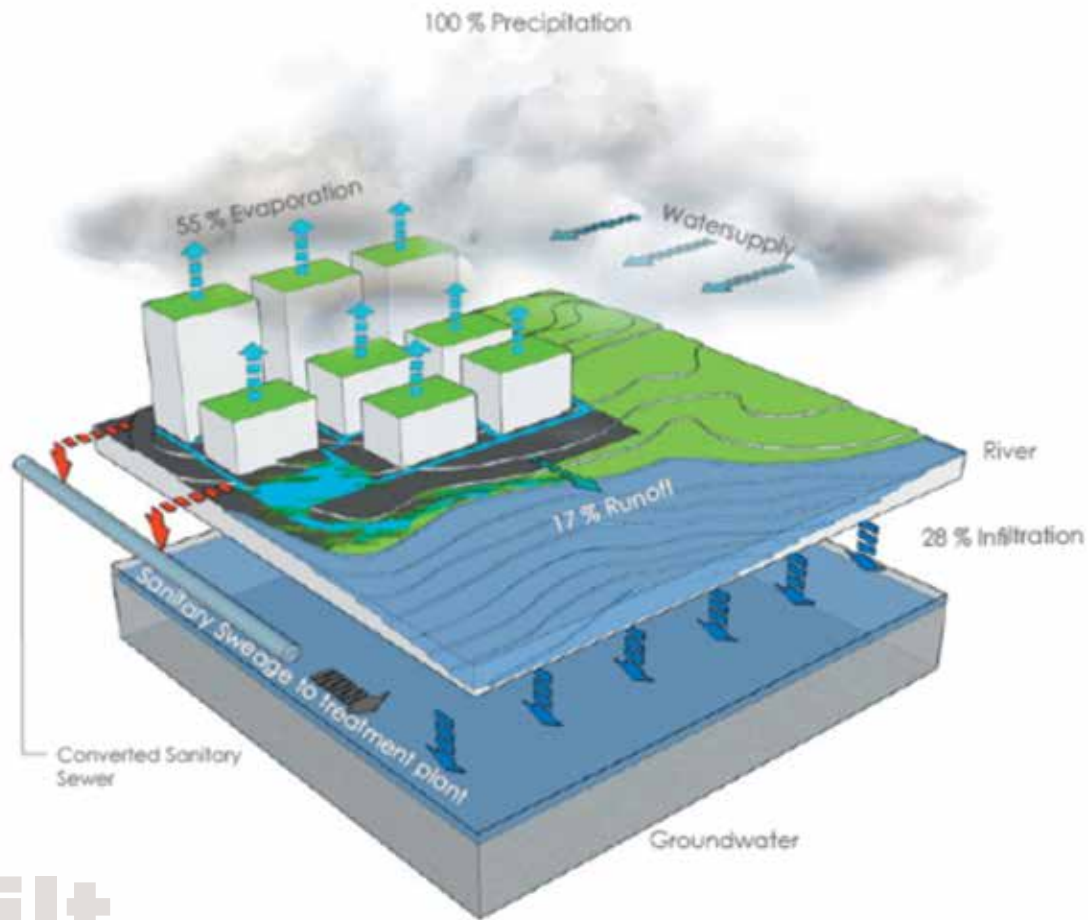
- 3.6 Locate service entrances away from the riverfront and primary connections to the park.
- 3.7 Where residential uses are located on the ground floor of a building, use terraces and elevation changes to provide semiprivate entrances and outdoor spaces for residents, without impinging on the public nature of the park.
- 3.8 Where privacy is required, create screening through changes in floor height, landscaped setbacks, or other devices, rather than dark or reflective glazing.

Building Materials

- 4.1 Compose buildings of materials with a “Pittsburgh palette” to enhance the quality of the riverfront. These materials can include stone, metal, brick, terra cotta, aluminum, glass, and steel, and can be locally sourced in order to meet green building targets. Other materials may be used for trim and detail, but are not encouraged as a primary building material.
- 4.2 Avoid the use of stucco, EIFS systems, wood and simulated wood products, one-way or mirror glass and spandrel glazing as primary building materials, except when used sparingly or as accent features.
- 4.3 Encourage the creative uses of materials in order to reflect the overall character of the park and the district.
- 4.4 Use transparent glazing with minimal tinting in order to provide views from and into buildings. Make ground-floor glazing 100 percent transparent, allowing clear views into and out of buildings.
- 4.5 Use green building products, as defined by the standards of the USGBC and similar rating systems, whenever possible.

Rooftop Design

- 5.1 Incorporate **roof terraces and balconies** overlooking the riverfront, for both public and private uses, in buildings located along the riverfront. Where appropriate, provide publicly oriented uses, such as restaurants and cafés, in these locations.
- 5.2 Create **rooftop gardens** to extend the landscape quality across new and unexpected places in the urban fabric.
- 5.3 Whenever possible, construct **green roofs** to reduce stormwater run-off, reduce heat island effects and add to the landscape quality of the riverfront.
- 5.4 Incorporate rooftop mechanical equipment into the building design, and shield it from view.



Built

Stormwater

Intent

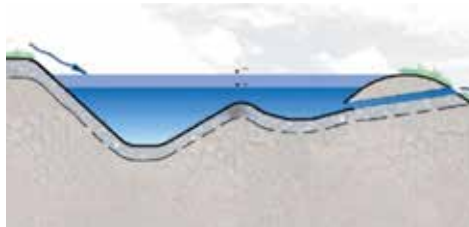
Simply put, stormwater management is the act of managing the quantity and quality of stormwater. When designed as part of landscapes, roadways, utilities, and rooftops, stormwater management systems can connect the urban environment to the natural environment. Proper stormwater management can aid in preventing myriad problems such as flooding, pollution and groundwater depletion, but in many urban regions only two out of every ten drops of water reach the soil and recharge the aquifer. Before stormwater reaches the ground, it is nearly unpolluted. After landing, it flows and takes in materials, in both dissolved and undissolved forms, from the surfaces on its flow path to the river or groundwater. To reduce these problems, stormwater should be allowed to be retained, cleansed and infiltrated before excess amounts overflow into streams and rivers. The following guidelines are intended to diminish the negative impacts of stormwater on the environment, while restoring the water quality and health of river ecosystems.

Key Concepts



Open Canal: These are used for surface stormwater drainage for roads and parking lots. They can be located on the side, in the center or halfway between

surfaces. Advantages include the visibility of the stormwater system, easy maintenance and aesthetic design options for the streetscape. Open canals need to be as shallow as possible to allow for convenient crossing by pedestrians or cyclists.



Sedimentation Basin:

These are used to improve stormwater quality and reduce sediment loads. They remove (by settling) coarse to medium-sized sediment from

water. Sedimentation basins can take various forms, as permanent systems or as temporary measures to control sediment discharge.

DEFINITIONS

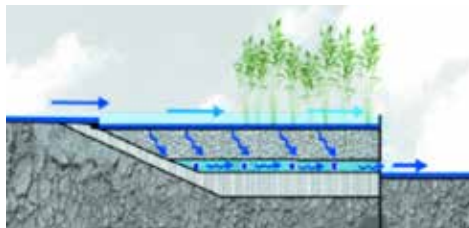
Retention

Water is retained permanently (in a cistern, basin, or wetland) either for later use or until it is dissipated through plant absorption, evaporation, or percolation into the ground.

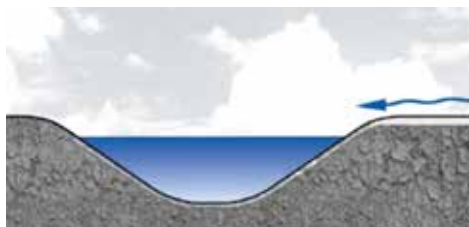
Detention

The temporary storing of rainwater in an on-site facility to release it intermittently later. The flow of water can also be slowed down through a variety of methods, such as draining it through vegetation, increasing the roughness and area, or decreasing the gradient of the runoff surface, etc.

Bioretention Swale: These are **retention** or **detention** basins with a vegetated (i.e., landscaped) surface. Runoff is cleansed as it percolates

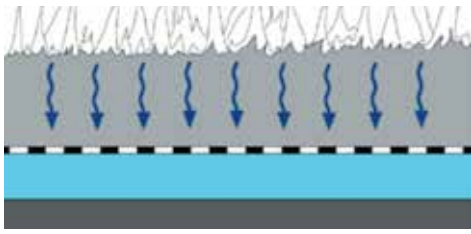


downward. Different construction elements can be used to direct the inflow of stormwater for cleansing and drainage to reduce the outlet and for emergency overflow.



Vegetated Swale: These are used to remove soil particles and move stormwater through buffer strips and bioretention systems. Swales utilize land flow and mild

slopes to convey water slowly downstream. They protect waterways from damage by erosive flows from frequent storm events.

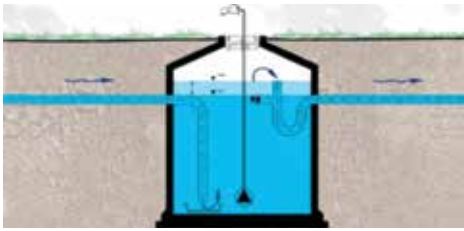


Green Roof: These can be planted partially or completely with vegetation and soil over a waterproofing membrane. Green roofs reduce **stormwater**

runoff, keep temperatures down and reduce heat loss and energy consumption in winter.

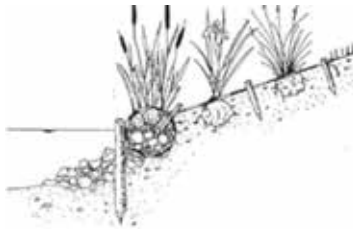


Underground Substrate Filter: These are box structures, built underground, containing compression-free material that helps to treat organic pollution.



Cistern: These function mainly as rainwater storage and secondly for stormwater detention. The basic storage volume depends on the demand of rainwater use for

toilet flushing, irrigation, climatization, or water features.



Bioengineering: Bioengineering seeks to harness the inherent qualities and capabilities of organic matter to replicate natural systems as closely as

possible, not only in the use of materials, but also in the methods of construction.

Guidelines

- 1.1 Stormwater collected from street surfaces and parking lots must be treated prior to its release in order to remove contaminants (heavy metals, fuel, dust, toxic elements, etc.) collected during rainfall. This can be accomplished with integrated stormwater and green infrastructure techniques.
- 1.2 The flow from combined sewers can be reduced over time if people apply strategies to reduce runoff along the waterfront, and carry that approach upstream throughout the watershed.
- 1.3 Rainfall runoff from project sites should be captured and held by **vegetative and soil-based systems**, especially for small, frequent rainfalls.

Stormwater runoff

Water from rain or melting snow that “runs off” across the land instead of seeping into the ground.

Vegetative and soil-based systems

Vegetative areas that have soils engineered in order to retain larger volumes of water for containment. These are sometimes referred to as mini reservoirs, which contain 4- to 8-foot deep swales and use soils to trap pollutants as water is filtered through the system. They use materials, such as lava rock, that have a high porosity to store water. These swales or Bio-Swales can be used in parking lots and other areas with low permeability as a green infrastructure alternative.

Infiltration

The process by which water seeps into the ground, recharging groundwater and aquifers. An added benefit is purification, because water is progressively cleansed as it percolates through layers of sand and soils.

Purification

The process of purifying water pollutants requires a different set of treatments, screening, sedimentation, adhesion, and filtration, biological uptake, and chemical treatment.

Conveyance

This refers to the measure by which runoff water is transported and directed from the point of initial rainfall to final discharge. This is necessary to ensure that water is brought along the right channels to ensure minimum contamination and maximize effective runoff.

- 1.4 Water should never be conveyed to the river in a pipe or concrete system without the opportunity for capture and treatment, ideally through the use of soil and sunlight.
- 1.5 When there is a need to convey water, it should happen in open soil and in vegetation systems that slow, absorb, **infiltrate** and clean the water. Water should not be “piped” through the project unless it is buried too deep to reach.
- 1.6 Open water may not be possible everywhere, but systems that allow water to seep into soils or planting areas can be used even in very structured areas.
- 1.7 Every opportunity, no matter how small, should be taken to manage stormwater visibly. If possible, people should be able to see and remember the rainfall runoff in a positive way. Even water that comes off roofs can be seen and heard for a moment. Many small things add up to a bigger change.
- 1.8 Changes away from solid materials and surfaces—green roofs and walls, porous pavements, the removal of pavement—should be encouraged.
- 1.9 Projects should look beyond their footprint to take the water from uphill—roads, other buildings and paved areas—and reconnect it to the soil and vegetation.
- 1.10 The path of the combined sewer system should be identified to remind people of where streams are buried and where they reach the river.

FURTHER INFORMATION

For more information on stormwater management, please refer to *Stormwater Is the Communicator*.

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Character

Landscape



Intent

Landscape encompasses the natural and built forms that help to define riverfronts. From riparian zones to landscaped trails and streets to gardens and parks, the landscape element has a critical role in stabilizing riverbanks, providing habitat, and creating enhanced open space. Landscape also forms special places by linking the rivers to the network of streets and buildings, often providing the defining characteristics of a place. Landscape provides the contrast between the strong forms of the built environment and the natural forms of its setting that are most memorable and inspiring. The following guidelines are intended for developments seeking to manage the delicate balance between the built and natural environment.

Key Concepts

- Riverbanks are a crucial interface for river hydrology, riparian support systems and waterfront activities. A range of riverbank conditions are represented in Southwestern Pennsylvania, from hard-edged conditions (seawalls, slag piles, bridge abutments, riprap) to soft edges (shallow banks with floodplain vegetation, steep banks with planted vegetation, mown and trampled earth banks with invasive vegetation).
- Hard river edges can be a significant concern because they disrupt the natural fluctuations of water that support a riparian plant environment. Commercial barge and recreational boat traffic contribute wave action against the shoreline, making it more difficult for young vegetation to establish at the immediate river edge.
- Invasive vegetation is a relatively recent problem for rivers. Japanese knotweed, Tree of Heaven, and other opportunistic plant species are multiplying on the river edges at a significantly greater rate than **native species**. This is resulting in decreased species richness, decreased biodiversity and less resilient ecosystems.
- Plant native or non-invasive species throughout the river corridors. Native species are preferred for the river-edge landscapes because of their adaptation to the local environment, response to flood conditions, and biodiversity enhancement.



DEFINITIONS

Native species

Its presence in a region or ecosystem is the result of only natural processes, with no human intervention

- With people living, working and playing closer to the rivers, there is a natural tendency toward removal of trees and vegetation in order to give better views of the river. The unintended consequences of this removal are the degrading of the riverfront ecology, a decrease in the effectiveness of stormwater management, and bank instability.

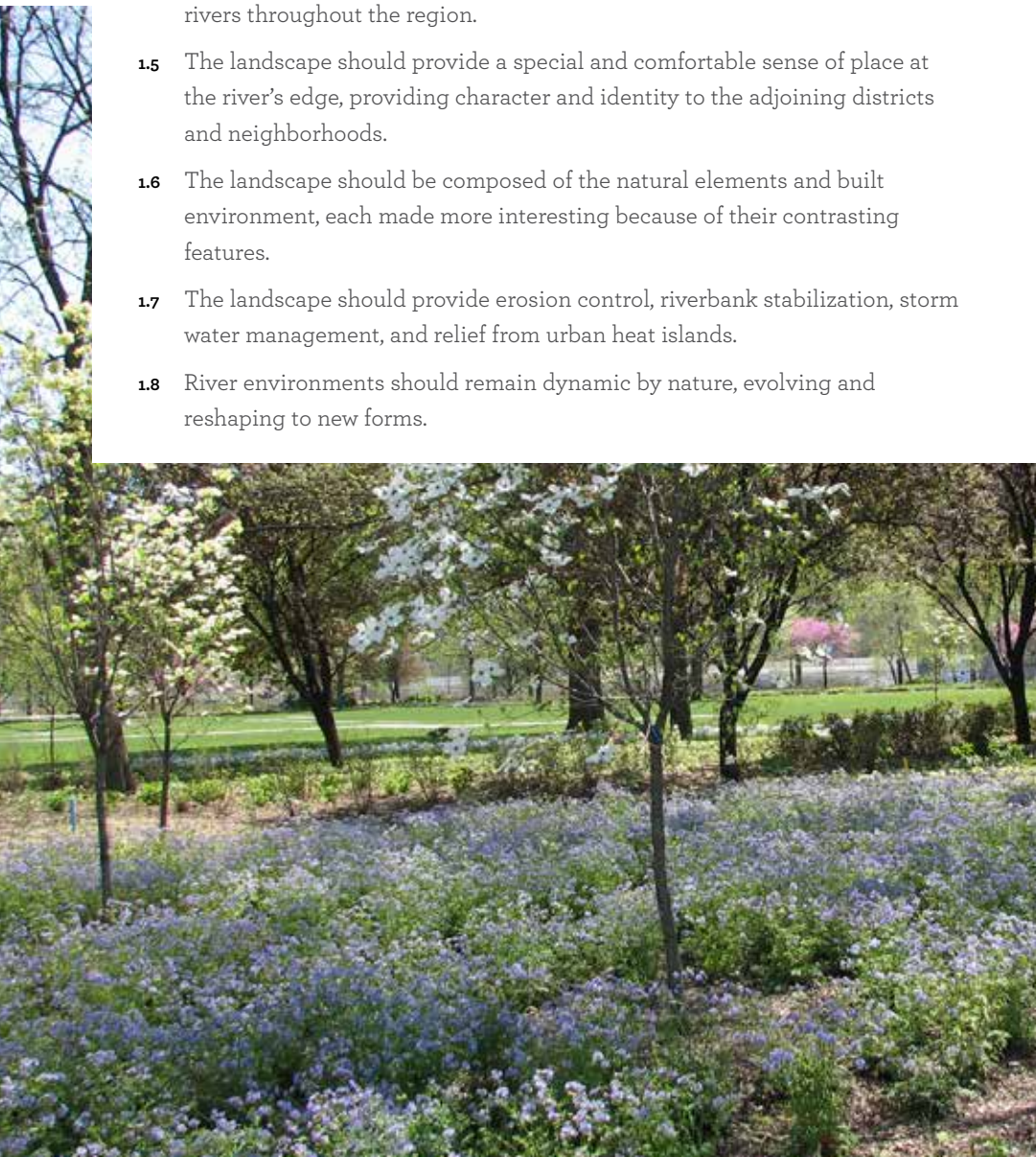
Guidelines

Landscape Goals

- 1.1 The landscape should be shaped by the topography that historically defined the natural and urban form.
- 1.2 The landscape should contribute to a **biologically diverse** network of open-space corridors to support and enhance the wildlife habitat and plant communities of Western Pennsylvania.
- 1.3 The landscape should consist of a primarily native species palette.
- 1.4 The landscape should build on the identity and visibility of the region's rivers and establish a coherent, recognizable system of places along the rivers throughout the region.
- 1.5 The landscape should provide a special and comfortable sense of place at the river's edge, providing character and identity to the adjoining districts and neighborhoods.
- 1.6 The landscape should be composed of the natural elements and built environment, each made more interesting because of their contrasting features.
- 1.7 The landscape should provide erosion control, riverbank stabilization, storm water management, and relief from urban heat islands.
- 1.8 River environments should remain dynamic by nature, evolving and reshaping to new forms.

Biological diversity

The diversity, or variety, of plants and animals and other living things in a particular area or region.



Project Guidelines

Stormwater runoff

Water from rain or melting snow that “runs off” across the land instead of seeping into the ground.

Green reinforced surface treatments

Planted treatments placed along hard surfaces. They may not have the complexity of a soil-based system to retain large volumes of water but, if extended over long distances adjacent to roadways and trails, will provide an accumulated stormwater capture and filtration benefit.

Turf reinforcement mats

Non-biodegradable materials that provide erosion protection and accelerate vegetative growth. Their open-weave construction allows for maximum root and stem entanglement, thereby increasing the vegetation’s ability to withstand higher flow velocities and shear stresses.

Canopy trees

Trees that are specifically grown for their canopy. A common term for canopy trees is shade trees. A canopy is the outer layer of the tree’s leaves, and shade trees have a dense canopy that blocks out the light.

- 2.1 Hire a landscape architect to help in determining how the river edge should be landscaped and designed.
- 2.2 Train landscapers to work with living systems. It is important that training rely on accurate field observation and data collecting. Training should also be comprehensive, incorporating horticulture and ecology.
- 2.3 On riverfronts, plantings should be directly related to the slope of the land; a slope of 2:1 needs to be 100 percent planted, a slope of 3:1 can handle a mix of plantings and open areas and a 4:1 slope is desired for establishment of native species plantings.
- 2.4 Replace paved surfaces and lawns with plants and porous materials—plants can play a significant role in decreasing **stormwater runoff** and improving water quality. Replacing lawns with native meadow, shrub, and tree plantings will decrease the amount of both runoff and pesticides. Plants along a riverbank not only reduce the velocity of surface runoff but also purify the groundwater before it reaches the river by absorbing nutrients.
- 2.5 If possible, address the condition of land adjacent to the riverfront, such as industrial sites, combined sewers overflows (CSOs), or impervious paving before committing to a full-scale planting effort along the banks.
- 2.6 Address structural conditions, such as collapsing banks, before planting. Where possible, use **green reinforced surface treatments**, rather than non-living materials.
- 2.7 Use lightweight, root-breathable bioengineered walls planted with seed, live stakes, and **turf reinforcement mats** to increase erosion resistance and encourage sediment deposition on banks
- 2.8 Accept the possibility of occasional damage by ice and flooding. Incorporate break-away and tie-in points to manage potential losses.
- 2.9 Maintain **canopy trees** along the entire riverbank to the fullest extent possible. Develop a diverse hierarchy of landscape cover types—forests are the preferred restoration target because they have the most biomass and therefore the greatest capacity to restore the environment.
- 2.10 Implement or strengthen landscape requirements in local zoning ordinances.
- 2.11 Ensure that river-edge management is adequately budgeted. Maintenance budgets need to incorporate all new and existing projects. Riverfront projects are susceptible to damage from flooding and commercial activities, as well as more typical wear and tear from public use.

Invasive Species Management

- Avoid use of invasive species in landscapes. Although many states list ornamental species as invasive plants, local nurseries might still sell them to the public.
- Minimize disturbance and revegetate disturbed areas. First and foremost, protect intact native plant communities.
- Plant canopy trees. By planting disturbed areas with native species quickly after a disturbance occurs, invasives can be kept in check more easily.
- Monitor the property regularly for invasive species, and when they do appear, remove them quickly before they have a chance to become established.
- Fertilize minimally—or not at all. Overfertilization increases weed numbers and increases nutrient loads in runoff.

Disturbance

A temporary change in average environmental conditions that causes a pronounced change in an ecosystem.

FURTHER INFORMATION

For more useful information about the creation and management of river landscapes, please read through the ***Landscape Management Guidelines***.

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Types of Landscape

Forest (>50 percent canopy cover)

Continuous canopy with layers—plant wherever possible; provides shade, recreation, riparian habitat, stormwater and erosion control, flood mitigation and water quality treatment

Woodland (<50 percent canopy cover)

Open canopy with tall grasses—plant wherever views are desired through trees; provides most benefits of forest and may be more acceptable in developed areas

Shrub Land

Mixed species of varying heights—plant to protect steep slopes and as natural fences for pedestrian/bicycle traffic control

Meadow

Warm season grasses and wildflowers—plant as a means of managing large open areas; provides riparian buffers and habitat for small mammals, insects and birds

Lawn

Plant on relatively flat slopes and active recreation zones only; separate lawns from river edges with riparian buffer

Character

Public Art

DEFINITIONS AND USEFUL TERMS

Expert review panel

Generally composed of no fewer than three and no more than five professionals selected on the basis of their expertise relative to the specific goals and objectives of the project

Intent

Public art has the power to connect people to the riverfront. Great public art enhances, energizes and defines its surroundings, generating civic pride and cultural identity. For public art to make a meaningful contribution, there must be a commitment to uncompromising standards of quality. The artwork must embody the vital identity and values of the riverfront, elevate the experience of the visitor, and bolster a distinctive sense of place.

Using a variety of media and textures, artists can create landmarks and visual experiences, distinguishing the viewpoints and drawing people to them. Public artwork should provide cohesiveness to the trails and pathways and expand opportunities for pedestrians to recognize, appreciate and celebrate the importance of the river. This section will provide guidance in developing strategies for artist selection, appropriate implementation of artwork into riverfront parks, and maintenance of public artwork.

The Pittsburgh Urban Redevelopment Authority published a document in 2010 that provides information about providing public art in developments. This resource should be consulted when adding public art to a riverfront project.

Key Concepts

Temporary Art

Programming temporary art provides a unique platform for the public to experience contemporary art. It allows for the realization of a diversity of experimental projects by both established and emerging artists that serve to advance the understanding and appreciation of the river. Temporary art invites a range of media, including digital, mechanical, musical, literary and performance art. Participatory community events such as, a floating parade and the Riverlife Festival are among the limitless possibilities.



Maintenance Considerations

Long-term survival of outdoor artworks along the river is affected not only by proximity to the water, but by climate, use of the site, adjacent buildings, trees, roads and sidewalks. It is important to determine who will use the area—pedestrians and pets, cyclists, skateboarders, etc.—and how it will be used.

The survival of outdoor artwork depends on the nature of its construction, the environment it is exposed to and the maintenance it receives. To anticipate and limit future maintenance needs, consult with professional curators whose technical understanding of materials and fabrication processes are invaluable during the artwork review process.

Guidelines

Project Management

Professional project management is critical to the successful implementation of public art projects. A project manager should:

- 1.1 Coordinate the interests and needs of a multitude of participants, including peer professionals, community members, and other stakeholders to ensure that the full potential of the public art project can be realized.
- 1.2 Facilitate the artist and artwork selection and approval processes, including the approvals of local regulatory and review bodies.
- 1.3 Manage the design, fabrication, and installation of public artwork.
- 1.4 Anticipate, plan for and implement the complex layers of competing schedules, information requirements, budgets and programmatic needs.
- 1.5 Negotiate agreements and develop consensus around highly complex issues and situations.
- 1.6 Oversee gifts of artwork and memorials for placement in parks.
- 1.7 Provide guidance on the incorporation of public art into development projects.

Expert Review

Expert review of public art projects should benefit the implementation of public art projects in the following ways:

- 2.1 Advocate for the inclusion of public art in all infrastructure projects.
- 2.2 Recommend a pool of potential artist selection panel members.
- 2.3 Act as a liaison to the individual artist selection panels.
- 2.4 Review and take action on the artist selection panel recommendations.
- 2.5 Review design milestones for any given project.

Open competition

Initiated by circulating an announcement with information about the project budget, site and other parameters for the desired artwork, and calling for artists to submit proposals. Any artist may apply.

Invitational competition

Frequently used as an alternative to an open competition.

Nomination process

Nominations of appropriate and qualified artists are solicited from a select number of expert and well-informed arts and design professionals.

Request for qualifications

Asks artists to send in qualifications to be reviewed by the selection panel but does not ask for a specific proposal to be submitted. The selection of an artist on the basis of a request for qualifications takes place when a project is in its earliest stage of design.

Request for Proposals

Asks artists to submit qualifications as well as a proposal for a specific site. The selection of artwork on the basis of a site-specific proposal is appropriate for existing sites, or when the design of a construction project has evolved to a point where there is adequate information to develop a responsible proposal. Various artists may respond to the stated project goals and specific conditions of the site. The selection panel weighs the artistic merits of several concepts, thoroughly exploring the questions of feasibility and budget.

FURTHER INFORMATION

More detailed information and building design guidelines can be found within the *Three Rivers Park Public Art Strategy*, and *Add Value Add Art* by the Urban Redevelopment Authority and the Office of Public Art.

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Maintenance Considerations

The maintenance needs of the artwork should be kept reasonable and should be adequately managed following these guidelines:

- 3.1 Prepare for ongoing maintenance requirements and cost.
- 3.2 If possible, make sure that there is provision for maintenance funds or a maintenance agreement by the donor.
- 3.3 Establish artwork installation and removal specifications.
- 3.4 Get written permission from the artist or artist's estate for a qualified conservator to conserve the artwork when necessary.

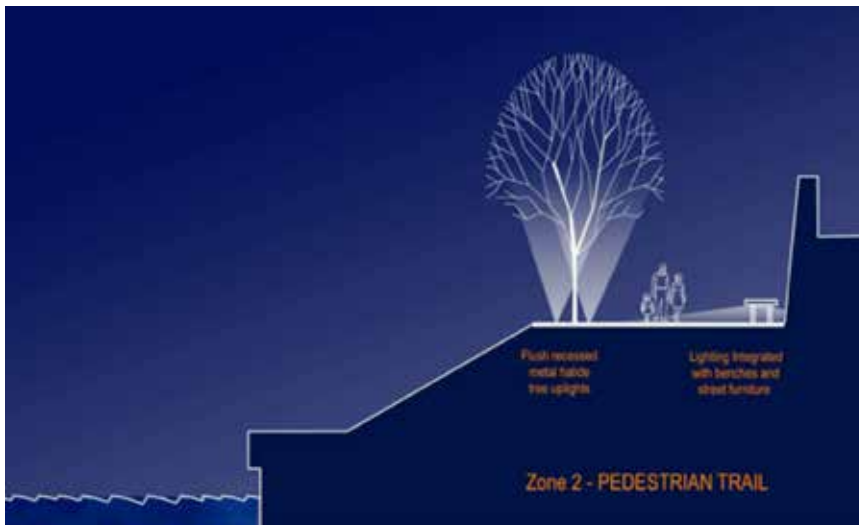


Character

Lighting

Intent

Lighting has the power to ensure that the public realm remains safe, comfortable and engaging after dark. Night lighting can help transform a foreboding space or a dark building into effective markers, ensuring that people feel comfortable moving through the park. Effective lighting will clearly identify a destination as well as exit and entry points from the river. This section is intended to provide guidance and concepts to create a successful lighting strategy for a district or for an individual project application.



DEFINITIONS AND USEFUL TERMS

Direct Energy Use

The use of optically efficient lighting that directs light onto the required area with minimal light spill is a part of good lighting practice.

Embodied energy of the installation

A life cycle assessment examines the total environmental impact of a material or product through every step of its life—from obtaining raw materials (for example, through mining or logging) all the way through manufacture, transport to a store, use in the home, and disposal or recycling.

Light spill and light pollution

The use of exterior artificial lighting can cause light pollution. Light pollution principally occurs as sky glow, light trespass, and glare. Direct upward light from exterior lighting installations causes sky glow. Glare is caused by the uncomfortable brightness of a light source viewed against a darker background. Light trespass is defined as light spilling beyond the boundary of a property or area to be illuminated.

Key Concepts

- **Brightness and Contrast:** Too much light is frequently projected onto buildings, destroying any appreciation of the architecture by washing out the details. Lower light levels can often be more revealing and sympathetic.
- **Environmental Effects:** There are a number of environmental factors that can be positively impacted by exterior lighting with regard to **direct energy use**, visual impact, **light spill and light pollution**, and effects on flora and fauna.
- **Visual Impact:** The appearance of lighting equipment during the daytime can be an unsightly obstacle and can have a significant impact on local views. Lighting equipment mounted on building facades without due consideration of the architecture can be unsightly.
- **Reducing Crime and Fear of Crime:** Carefully applied exterior lighting can have a positive actual and perceived effect on safety. Expenditure on good lighting in a public realm is a more effective means of increasing safety than an equal expenditure on electronic surveillance equipment.

Guidelines

Lighting Bridges

- 1.1 A detailed lighting design for a bridge should illuminate and enhance the essential character of the structure. To do this, all light sources must be concealed from view as much as is possible.
- 1.2 Avoid glare for pedestrians on the bridge and for those viewing the structure from a distance.
- 1.3 Dark painted bridges can be difficult to illuminate with projected light. In these instances, consider delineating the essential structural elements with lines of light.

Lighting Structures

- 2.1 Lighting should be considered at a very early stage in the project planning to ensure that exterior lighting schemes are designed as part and parcel of the new development, rather than as an afterthought.
- 2.2 Light only buildings and structures of sufficient merit or where lighting enhances the ambience of the immediate surroundings. Take into account the existing lighting of adjacent buildings and be considerate of the total lighting effect on an area. Do not illuminate buildings or structures where residential spaces will be compromised by intrusive lighting.
- 2.3 Ensure that exterior lighting installations avoid visual clutter without glare, are discreet, and do not compromise the architectural integrity of the structure.

- 2.4 Existing structures and buildings will require particular care in product selection to make sure that the illumination and fixtures are respectful of the building's architectural character while lit and during daylight.

Lighting Landscapes

- 3.1 Not all elements of the landscape need to be directly illuminated.
- 3.2 The lighting design should seek to strike a balance between light and shadow, creating a balanced overall composition and avoiding too much lighting (glare) and too little lighting (for safety considerations).
- 3.3 Lighting has the opportunity to enhance views and vistas and to reveal different perspectives for those experiencing the park as pedestrians, by car, or from the water.

Lighting Fountains and Water Features

- 4.1 Lighting design for water features and fountains is a specialized task, often undertaken by manufacturers or suppliers, who have practical experience creating lighting effects that are most compatible with different types of water displays.
- 4.2 All equipment must be watertight and fully submersible.
- 4.3 The location of the light fixtures in relation to water jets and cascades is critical. Light from underwater fixtures will be refracted or reflected depending on the angle of incidence of the light beam. Bubbles and particles in the water may also affect the light.

Lighting Art Installations

- 5.1 Art installations provide an opportunity to integrate lighting in a stand-alone project, on both large and small scales.
- 5.2 The lighting scheme for artwork should be approved by the artist and project managers to ensure that the lighting is appropriate and sensitive within the context of the park.
- 5.3 Operational costs should be considered as part of the artwork project scope.

Design

- 6.1 Provide adequate light, with even distribution and a suitable **color**, in order to enhance the form and character of the outdoor environment.
- 6.2 Utilize indirect lighting wherever possible.
- 6.3 Reveal hazards such as stairs and changes in level. Illuminate dark and potentially dangerous areas.
- 6.4 Accommodate opportunities for entertainment and leisure after dark. Often a small amount of light can fulfill these needs.
- 6.5 Effect lighting on a large scale, highlighting individual buildings and features. The best results may be achieved when individual schemes within a district are coordinated together by the same team of professionals.

Scale

Relates to perceived size of structures, buildings, and spaces relative to other forms and to people when viewed at night. The more diffuse and general the lighting is, the easier it will be to assess the relative scale of objects and structures.

Rhythm

The spacing of individual illuminated elements, lighting columns, and pools of light are perceived as rhythms. Wider spacings between fixtures and lit surfaces will elicit a subdued response from the viewer. An awareness of the rhythms created by artificial lighting should be considered during design development.

Emphasis

Selective lighting can enhance attractive features and conceal unattractive ones.

Color

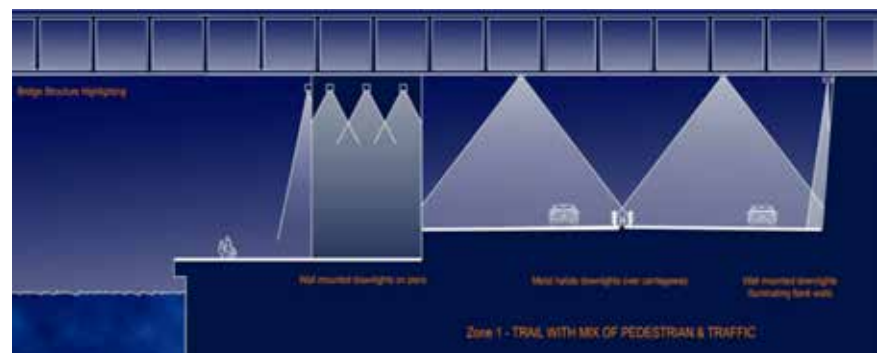
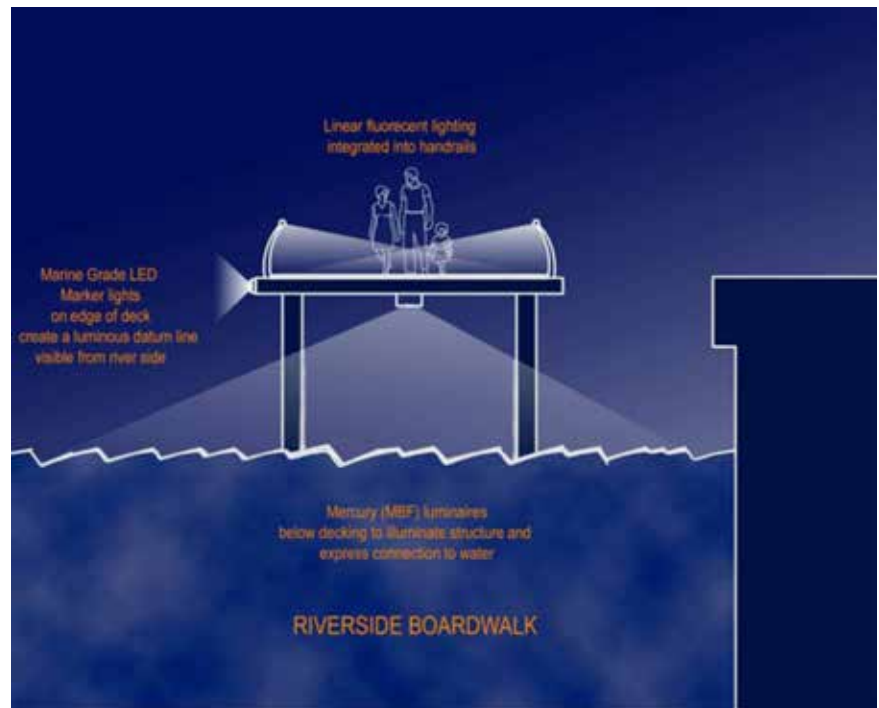
The color appearance of a light source or illuminated surface will be seen as either "warm" or "cool." Lamps with a low correlated color temperature are "warm" and those with a high correlated color temperature are "cool."

Sustainability

- 7.1 All fixtures should utilize energy-efficient technologies.
- 7.2 The environmental impact of exterior lighting needs to be considered at the very beginning of the design process to balance energy conservation with proper lighting for the highest possible efficiency.
- 7.3 Lighting efficiency maximizes sustainability and minimizes long-term costs, particularly for a large-scale project.

Build Quality

- 8.1 All exterior light fixtures need to be robust, particularly in the “marine” environment.
- 8.2 Working samples of proposed lighting types should always be tested and approved before equipment is finally chosen. Ideally, an on-site lighting trial should take place before any final decisions are made.
- 8.3 The number of light sources and types of fixtures available to lighting designers are constantly changing. Care should be taken to ensure that the most current and most efficient options on the market are considered.



Light Spill and Light Pollution

- 9.1 Ensure that all exterior lights are designed and installed so that light is emitted in a downward direction, rather than horizontally or upward.
- 9.2 Ensure that the correct amount of light is provided in order to avoid light pollution.
- 9.3 Make sure that exterior lighting is timed to shut off consistently when it is no longer needed.

Installation, Operation and Maintenance

- 10.1 The cost of most urban exterior lighting projects represents a low level of capital expenditure that results in a large return in terms of added value to property development, improved public realm spaces, and increased safety.
- 10.2 Factor in capital costs to include design fees, installation, fixtures, control equipment, meters and housing.
- 10.3 Factor in operating costs to include electricity, replacement lamps, routine maintenance and inspection, and installation and removal of temporary and seasonal lighting displays.

FURTHER INFORMATION

More detailed information and building design guidelines can be found within the *Three Rivers Park Lighting Strategy*.

riverlifepgh.org/resources

Five Factors to Consider When Selecting Light Sources:

Efficacy: The output of the lamp in relation to its energy usage, measured in lumens per watt. This is often the principal consideration for reasons of economy.

Lamp Life: The average life of a lamp in a large installation. The figures quoted by lamp manufacturers are to "50 percent failure." Lamp life has a significant impact on maintenance costs.

Color Appearance: An assessment of what the color of the light source appears to be. This is important in considering the overall effect of the lighting.

Color Rendering: The ability of the light source to render colors accurately. Although less important in exterior lighting, poor color rendering can have a deadening effect on an area. Good color rendering light sources have Ra >80 or below to Group 1A, 1B or 2A.

Lamp Shape and Coating: The shape of a light source will dictate much of the light design. A phosphor coating will change the quality of the light.

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Riverlife's Riverfront Design Committee

Consultants on previous Riverlife resource documents include the following:

A VISION PLAN FOR PITTSBURGH'S RIVERFRONTS (2001)

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Urban Instruments

Economic Research Associates

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THREE RIVERS PARK DESIGN GUIDELINES (2002)

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CONNECTING THE LOOP PLAN (2003)

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THREE RIVERS PARK LIGHTING STRATEGY (2004)

Art2Architecture

LANDSCAPE MANAGEMENT GUIDELINES (2006)

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THREE RIVERS PARK PUBLIC ART STRATEGY (2006)

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Along with countless others.



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