allegheny riverfront vision plan

technical report

february 2011

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Prepared for

Urban Redevelopment Authority of Pittsburgh
Office of Mayor Luke Ravenstahl
City of Pittsburgh Department of City Planning
Riverlife

Prepared by

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CH2M HILL
Viridian Landscape Studio
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GSP Consulting

http://alleghenyriverfront.pittsburghpa.gov

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Urban Redevelopment Authority of Pittsburgh
Office of Mayor Luke Ravenstahl
City of Pittsburgh Department of City Planning
Riverlife

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Residents and Business Communities of the Strip District and Lawrenceville
Pittsburgh Development Community
Pittsburgh Real Estate Community

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introduction

Just upriver from Pittsburgh's Golden Triangle several city neighborhoods line the banks of the Allegheny River. The river is alive with recreational boaters and paddlers of all types; fisherman try their luck in waters that have hosted fishing tournaments; adventurous swimmers brave the chilly river; and from the green banks one takes in vistas of Downtown, the opposite shore, and the river valley itself. But standing on almost any street corner in the Strip District or Lawrenceville—where you see older buildings, cars and trucks, parking lots, metal sheds, and perhaps brick row houses—you wouldn't guess that such a remarkable resource is not more than a few blocks away.

The Allegheny Riverfront Vision Plan presents a new vision for the banks of the Allegheny River and for the Strip District and Lawrenceville riverfront communities. It is a vision based on respecting fundamental ecological principles, employing smart strategies to increase resident and business connections, increasing the quality of urban living, and achieving a regenerative and sustainable market for long-term investment. Its recommendations address six miles of Pittsburgh's riverfronts, but its vision offers guidance for Pittsburgh as a riverfront city.

Allegheny Riverfront Vision Area

At the heart of the study is the Allegheny Riverfront between downtown Pittsburgh at 11th Street and the city boundary at Washington Boulevard in Highland Park, about 6.5 miles in length. The Allegheny Riverfront Vision Area encompasses 1,260-acres of Pittsburgh city land, including most of the watershed to the south and a short segment on the north bank opposite the Strip District. Two neighborhoods comprise most of the Vision Area: the Strip District and Lawrenceville, and they are the primary focus of the study. Three residential communities, Stanton Heights, Morningside, and Highland Park front the Allegheny Riverfront at its eastern end, complete the study area.

The Allegheny Riverfront's south bank is a long and narrow strip of flat land hemmed in by the river and its southern slopes and bluffs. The original study area included only properties along the riverfront edge, but as the study progressed the design team extended the boundary farther south to include the full Strip District and all of the Lawrenceville neighborhoods. Residents from Stanton Heights, Morningside, and Highland Park participated in the planning although the study area extended only from the river edge to the bluffs that separate these neighborhoods from the river.

The north bank of the study area is a small zone across from the Strip District bounded by Madison Avenue to the west and the H.J. Heinz plant to the east, which is mostly between the Veterans and 16th Street Bridges. It extends north to the railroad embankment, about three blocks from the riverbank.

Project Sponsors

Four organizations sponsored the project under the URA's leadership and funding:

- Urban Redevelopment Authority of Pittsburgh
- Mayor's Office
- Department of City Planning
- Riverlife

Design Team

Seven firms comprised the multi-disciplined design team:

- Perkins Eastman: Urban design and planning
- CH2M HILL: Stormwater management and environmental planning
- Viridian Landscape Studio: Landscape and environmental planning
- Continental Conservation: Ecological planning and restoration
- Clear View Strategies: Public transportation
- Trans Associates: Personal transportation
- GSP Consulting: Market and economics

Perkins Eastman served as the lead firm and spokesperson for the design team, managed the project, and led the civic engagement process with the URA's assistance.

Steering Committee

Under the leadership of the URA and with representatives of the other three sponsors, the Steering Committee provided advice and guidance throughout the planning and served as the primary "client group" for the design team's progress and recommendations. The individuals and organizations represented were selected with the intention that they take a leadership role in the Vision Plan's implementation: Army Corps of Engineers, The Buncher Company, Crane Building, Department of City Planning, Lawrenceville Corporation, Mayor's Office, Neighbors in the Strip, Pennsylvania Department of Community and Economic Development, Pennsylvania State Senate Jim Ferlo's Office, Regional Industrial Development Corporation, Riverlife, Rubinoff Company, and the Urban Redevelopment Authority.

Advisory Committee

Comprised of over 35 city-wide organizations and individuals who either have a direct interest in the Allegheny Riverfront or an interest in the future of Pittsburgh's riverfronts, the Advisory Committee met at key design milestones and included design charrettes that probed ideas and policies for development sites, the riverfront, trails, and open space. This committee provided invaluable experience, expertise, and insights for the design team.

Civic Engagement

Residents, businesses, and stakeholders were engaged in the planning and decision-making process. Over the course of the twelve-month planning process a number of community-building events took place. At community meetings, citizens worked with the Steering Committee and the design team to shape priorities and proposals. Many businesses and individuals were interviewed and several progress meetings were held with local community organizations, including design review meetings with the Lawrenceville design community. The URA conducted specific focus group sessions to gain insights into the local market and development issues specific to the Allegheny Riverfront. Social and recreational events took place between progress meetings and design charrettes that gave stakeholders an opportunity to explore the Allegheny Riverfront Area, get to know one another, and encourage more dialogue.

Community Meetings

Four community-wide meetings, open to area residents and anyone interested in the project, were held at strategic intervals for feedback to the Steering Committee and the design team.

Interviews: Land owners, community organizations, and professionals with knowledge of Allegheny Riverfront issues and long-range plans were interviewed throughout the project's tenure.

Progress Meetings with Community Organizations

Meetings were held with the boards of Neighbors in the Strip and the Lawrenceville Corporation and with the Lawrenceville Planning Team.

Design Review Meetings with the Lawrenceville Design Community

The design team met with design professionals from the Lawrenceville Planning Team, a consortium of Lawrenceville community organizations, area architects and design professionals, real estate representatives, and residents to review design scenarios for transformative development sites. Other meetings were held with residents and design professionals of Lower and Central Lawrenceville to discuss design concerns, future of landmark-quality buildings, and neighborhood traffic conflicts.

Updates

Key landowner stakeholders, including the Allegheny Valley Railroad, were interviewed at the beginning of the project and kept abreast of progress, including review of design scenarios for properties owned by them. Some were members on the Steering or Advisory Committees and many participated in the community meetings.

Focus Groups

Focus groups were conducted to gain the perspectives of specific interest groups, including landowners, the development community, and the commercial and housing real estate community to gain insights into the local market and development issues specific to the Allegheny Riverfront. Toward the end of the study representatives of housing developers and housing real estate professionals working in the Allegheny Riverfront met with the URA to better understand housing price points and where the City might spur residential development.

Design Workshops and Charrettes

Interactive and focused design sessions were invaluable in understanding community issues and developing design ideas, many of which are incorporated in the Vision Plan.

Fun Events

During the summer 2009 several fun activities were held with stakeholders and residents to see the Allegheny Riverfront from different perspectives. Events included a historical-themed bicycle tour through the Strip and Lawrenceville, dragon boating on the Allegheny River, a river kayak trip led by Venture Outdoors, and an ice cream social to learn about Heth's Run. The project team, including the Steering and Advisory Committees, conducted a riverfront tour aboard RiverQuest's Explorer to familiarize the full project team with the waterscape and edge conditions.

Website

An interactive website, www.alleghenyriverfrontvision.com, documented key meetings and events throughout the project and recorded citizen input. An electronic copy of the Allegheny Riverfront Vision Plan is available for download on the website http://alleghenyriverfront.pittsburghpa.gov.

Previous Plans

A number of planning studies have been prepared for specific neighborhood locations within the Allegheny Riverfront and for Downtown that are currently guiding development planning. Their careful attention to local concerns and community values, including adoption by their supporting organizations, provided a strong planning foundation and starting point for the Vision Plan. Below is a summary of key studies, including those with a wider influence:

General

The Vision Plan for Pittsburgh's Riverfronts prepared by Chan Krieger Associates for the Riverlife Task Force
Three Rivers Park Design Guidelines and Framework Plan prepared by Perkins Eastman, Sallyann Kluz, and Riverlife staff for the Riverlife Task Force
Three Rivers Park Landscape Management Guidelines prepared by Andropogon Associates for the Riverlife Task Force
Heth's Run Ecological and Recreational Restoration Project in progress led by the Mackin Engineering Company, based on the original concept prepared by LaQuatra Bonci Associates and Perkins Eastman for the Parks Conservancy and the Highland Park CDC.

Strip District

Neighbors in the Strip Position Paper prepared by the Neighbors in the Strip Board of Directors
Pittsburgh Public Market prepared by Pfaffmann and Associates for the Neighbors in the Strip
Pittsburgh Public Market prepared by Indovina Associates, Urban Design Associates, and Kolano Design for the Neighbors in the Strip
Strip Portal Concepts prepared by Pfaffmann and Associates for the Senator John Heinz Pittsburgh History Center

Lawrenceville

Lawrenceville Community Plan prepared by Pfaffmann and Associates for the Lawrenceville Corporation
The LoLa Plan prepared by the Studio for Spatial Practice for the Lawrenceville Corporation
Lawrenceville Elm Street RRG prepared for the Lawrenceville Corporation

The design team was encouraged by the common themes, values, and recommendations found throughout these and the many other plans and documents prepared for Pittsburgh's riverfronts, the Strip District, and Lawrenceville. Although the Strip District and Lawrenceville are separate communities, they share very similar concerns, desire similar outcomes, and strongly believe in a collaborative approach to improving their communities.

The Vision Plan builds on many of these plans and in some cases incorporates them without change. They were invaluable because of their detail and understanding of specific needs and community-expressed desires for particular areas and places within the Vision Area, allowing the design team to focus on the broader and common themes that knit the Allegheny Riverfront and its many plans together.

strengths to build on

It's Almost All Right

The Allegheny Riverfront Area is rich in resources: its people, land, community, history, and livability.

This extraordinary riverfront has a green edge along most of its banks, with views of Downtown to the west and a naturalized setting across the river along its north bank. Its river valley is bounded by green bluffs and hillsides and some of the most dramatic topography within the city limits. As the city's recreational river, the Allegheny is full of pleasure boats, kayaks, rowers, and fishermen most of the year and is the home of major water events, including the Three Rivers Regatta and the Head of the Ohio competition. As the city's cleanest river, it provides most of Pittsburgh's drinking water. Along its 6.5-mile length the riverfront transforms from a naturalistic environment at the foot of Highland Park to the edge of Downtown at the David L. Lawrence Convention Center.

Its six bridges provide good access to the north side and to the feeder arterials and highways leading to the Interstate system. Allegheny River Boulevard which becomes Butler Street and then Penn Avenue is the only continuous street in the city that extends from the city line to Downtown's Point State Park. The Allegheny Riverfront Area's streets are laid out in a simple grid that encourages a variety of building sizes and types with the potential for higher density.

Natural features, parks, and open space are significant amenities. The bluffs along the Martin Luther King East Busway, along Bigelow Boulevard, and the Morningside bluffs that stretch from Upper Lawrenceville to Highland Park are majestic southern boundaries at either end of the Allegheny Riverfront. Highland Park and the Pittsburgh Zoo extend the green parkland from the neighborhood down to the river. The historic Allegheny Cemetery, one of Pittsburgh's most noteworthy and beautiful cemeteries, sits between the Central and Upper Lawrenceville neighborhoods. Across the river to the north, the full length of the Allegheny River is bounded by green hillsides. Recreational trails run along the north bank and connect at the 16th and 31st Street bridges to the Allegheny Riverfront. South bank trails have been installed between 11th Street to 21rd Street, 24th to 25th Street, and from 36th to 43rd Streets. Although limited, street access to the river's edge occurs at 21st Street, 23rd through 27th Streets, 40th Street, 43rd Street, 51st Street, McCandless Street, and off Washington Boulevard at the Highland Park Lock & Dam 2 just west of the Highland Park Bridge. Three marinas are located on the south bank at 22nd Street, 55th Street, and at the foot of the 62nd Street Bridge.

The Allegheny Riverfront has strong anchors, landmarks, and is highly visible. The area is home to two regional destinations: the historic marketplace of the Strip District and the Pittsburgh Zoo. The growth of the Strip District as a regional market catering to the retail trade, a relatively new evolution from its wholesale and produce trade roots, is now a regional draw on the weekends and a must-see attraction for visitors. Stretching from around 16th Street to 40th Street, one can find all types of wholesale businesses ranging from dancer's toe shoes to kitchen equipment to industrial tools and building materials. Its wholesale produce and food trade, now a small remnant of its heyday years, supplies restaurants and catering businesses throughout the region. Colorful vendor displays contribute to a lively pedestrian environment along Penn Avenue in the heart of the Strip District. The Allegheny Riverfront's landmarks are numerous: historic bridges, the Convention Center, the former Penn Station, the Senator John Heinz History Center, the Produce Terminal and Auction House, the historic Penn Avenue retail/wholesale district, the Armstrong Cork Factory, the Cigar Lofts, Iron City Brewery, Doughboy Square, the historic Arsenal, Arsenal School, Allegheny Cemetery, the Teamsters Temple meeting hall, the new Children's Hospital of UPMC, the Pittsburgh Zoo, and the Highland Park Lock & Dam 2.

It contains a good variety of building stock, offering a range of building types, styles, materials, sizes, and scales from six-story warehouses to modest bungalows. Its inventory of industrial structures is one of the richest in the city, ranging from simple steel sheds that once housed steel fabrication shops to substantial masonry structures for warehousing and storage. Many of these have been converted to new residential uses that provide a richness and interest not seen in most neighborhoods. The housing stock varies from narrow brick row houses in Central Lawrenceville, to cheek-to-cheek frame houses on its slopes, to hip residential lofts and condominiums in former industrial buildings.

Recently there have been a number of significant investments that have pioneered the area's resurgence. The art and design community has made the Allegheny Riverfront its home: furniture and cabinet makers, professional design offices, product showrooms, art galleries, artist studios, the Pittsburgh Ballet, and the Pittsburgh Opera. In recognition, the Riverfront markets itself as the 16:62 Design Zone (16th to 62nd Streets). Oakland institutions have begun investing in the Allegheny Riverfront. Carnegie Mellon University opened the National Robotics Engineering Center (NREC) at 40th Street and the river, which now employs over 120 in robotics research and development. The opening of Children's Hospital atop Central Lawrenceville has brought bio-med research into Lawrenceville and has contributed to a doubling of residential land values in the immediate neighborhood. The hospital's research and development tower along with NREC are beginning to anchor Lawrenceville as a center for research. New green industry has also begun to locate in Lawrenceville and the Strip, encouraged by inexpensive rents and the "cool" factor of locating in a pioneering community.

New loft and high-end residential development between 21st and 31st Streets is marketed as "downtown living," anchored by the Cork Factory's renovation into 297 rental units. The area has attracted the interest of newly-arrived residents to Pittsburgh and empty nesters relocating from the suburbs. Doughboy Square, through the efforts of the Urban Redevelopment Authority, the Lawrenceville Corporation, and several business and land owners, is undergoing stabilization and investment. Butler Street is gaining a new reputation as new restaurants and boutique retail stores serving a city-wide market are beginning to cluster in two zones: from Doughboy Square up to 39th Street and in the low 40's to around 46th Street. Their success has led to some spillover as new restaurants and shops are beginning to appear east of 47th Street. New families are moving into the Morningside neighborhood which bodes well for businesses in Lawrenceville and the Strip, and the real estate community has noted the Upper Lawrenceville neighborhood as beginning to show signs of the next "hot" residential area.

Community groups are strong. Neighbors in the Strip, representing landowners and businesses in the Strip District, has organized the business and residential communities around issues of safety and future development. In Lawrenceville, three community organizations are active: the Lawrenceville Corporation, Lawrenceville United, and the Lawrenceville Stakeholders. Although working independently on community and development projects, they have teamed together as the Lawrenceville Planning Team for design review and communication. Active planning is continuous along most of the Allegheny Riverfront.

Much of the Allegheny Riverfront Area is all right, and not in need of intervention or transformation. The growth of the Strip District as a regional market catering to the retail trade, a relatively new evolution from its wholesale and produce trade roots, is not a regional draw on the weekend and a must-see attraction for visitors. New residents are buying into the Lawrenceville neighborhoods which is helping their stabilization and increasing their age diversity. Although economic progress is slow, it is steady and these areas are evolving on their own. Locations requiring stimulus to keep pace with the majority of the Allegheny Riverfront are along the riverfront, the vacant and large former industrial sites, and a few inboard locations where residential and neighborhood services would benefit from catalytic intervention.

Authenticity and Identity

Identity, character, and sense of place vary widely throughout the Allegheny Riverfront. The Strip District conjures an image in everyone's mind as a rough, gritty place. Historically, it came alive in the early morning hours when trucks, dollies, and teamsters hauled and distributed the city's food and produce. Today most recognize it as a busy and crowded, yet fun, market place along

Penn Avenue where vendors squeeze the sidewalk spaces hawking produce and merchandise and buildings line the avenue where you can buy the best cheese and specialty foods in town. Although the area of hustle and bustle is now relatively small, this image has become enlarged to now include all of the Strip District as far east as 40th Street.

Lawrenceville presents another, although similar, image: a community of hard-working residents who have spent their lives serving local industries and survived with little amenity. While not a wealthy community, it nonetheless attracts new residents because of its inexpensive housing, authentic character, convenient location, and image of a "Pittsburgh urban experience." Residents and businesspeople throughout the Allegheny Riverfront Area want to continue the mixture of people, uses, and buildings.

There is an area-wide authentic aesthetic that is alive and well. The buildings are simple forms with distinctive roofscapes. The older metal shed buildings have an architectural character that is clear in its functionality and massing. Many industrial and wholesale buildings are substantially built of masonry and concrete and worth redeveloping into other uses.

Strong and Diverse Neighborhoods

Overall, the Allegheny Riverfront neighborhoods are attractive. The Strip District, with its long flat blocks, is full of diverse uses—from food wholesaling to county offices to fashionable restaurants. It is walkable and has a strong, branded identity. Lower Lawrenceville is also walkable and has a substantial historic fabric. Central Lawrenceville has a strong residential base and active industrial uses. Upper Lawrenceville has good residential stock and the potential for a revived Butler Street. And the adjacent neighborhoods of Morningside, Stanton Heights, and Highland Park have affordable mixed-income housing and an emerging, if not already stable, residential base to help support activities in the Allegheny Riverfront Area.

Regional Draw

While retailers in Pittsburgh—both the city and the metropolitan area as a whole—depend on non-resident spending for their survival, the Strip District and retailing along Butler Street in Lawrenceville are well-positioned to benefit. The Strip District attracts the largest concentration of outside customers in the Allegheny Riverfront Area and, as a regional destination for shopping, has greater flexibility in adding retail that can be sustained by not-resident spending. Butler Street is beginning to distinguish itself as a city-wide, if not regional, draw with a wide diversity of restaurants, specialty retail stores, and entertainment venues.

Good Connections to Downtown and the North Side

The major streets through Lawrenceville and the Strip District provide good connections in and out of Downtown. They are also the primary neighborhood arterials. The bridges across the Allegheny link these streets to Route 28, I-279, and Ohio River Boulevard, which are especially important to trucking. The 16th, 31st, and 40th Street bridges are vital links between the East End and the North Side and North Hills. The Allegheny Riverfront Area is serviced relatively well by buses, though Pittsburgh is under-served by its transit system.

An Abundance of Vacant and Underutilized Land along the Riverfront

A large amount of vacant and underutilized land is apparent throughout the industrial zones. The 50-acre Buncher Company tract in the Strip District from 11th to 21st Streets is used for commuter parking until future development takes place. This tract represents perhaps the largest downtown riverfront site anywhere in the country. The City's two-block long former Tow Pound site just west of the 31st Street Bridge is available for redevelopment. The Heppenstall Site in Central Lawrenceville, owned by the Regional and Industrial Development Corporation, sits vacant between 43rd Street and 48th Street. The former Tippins International Steel site at 62nd Street, owned by the URA, has been vacant for some time. Many large private parcels, either along the river or just south of the

Allegheny Valley Railroad (AVRR) right-of-way, are parking lots for semi-trailers while others are rented for bus and maintenance vehicle parking. Numerous parcels are vacant.

While the situation is a major issue for the Allegheny Riverfront Area, it is also a tremendous opportunity. Vacant and underutilized land signifies potential for future development. Right now that land is unwanted and not valued because of its older industrial stigma, however if reconceived as desirable riverfront property with public amenity and good infrastructure points to a stronger future. The Allegheny Riverfront is one of the few areas in the city that can accommodate new industry, desirable riverfront residential development, supportive retail and commercial activities, and higher densities.

A Strategic Location in the City

The center of Lawrenceville is equidistant from Downtown and Oakland, forming an equilateral triangle of roughly 2-1/2 miles, which suggests the potential for these three destinations becoming interconnected and complementary. Each is a center of productivity and value creation for the city: Downtown is the center of finance and management; Oakland is the center for innovation and education; and the Allegheny Riverfront is well-suited as a center of service for both Downtown and Oakland. The Allegheny Riverfront has a vital role to play in this new triangle—a resource of people, business, and industry. The complementary productivity of all three suggests a new definition of Pittsburgh's Golden Triangle. No longer just the triangular shape of Pittsburgh's corporate downtown, this "New Golden Triangle" touches and links these three vital centers of productivity, resources, and value for the region and Pittsburgh's future.

As a resource, the Allegheny Riverfront has an economic infrastructure already in place. It is home to two regional destinations: the historic Penn Avenue marketplace and the Pittsburgh Zoo. The Strip District is transforming into a varied mixed-use community as residential conversions and retail uses grow and expand. Lawrenceville is becoming one of Pittsburgh's hot residential communities and is drawing new storefront retail uses that cater to city-wide customers. The Allegheny Riverfront has become a center for design, furniture, and art stretching from the Strip District east through all of Lawrenceville, which is acknowledged by its 16:62 Design Zone branding. Recently, the area has begun to add cultural activities to its roster of uses with the ballet's and opera's training and rehearsal facilities. Research & development has found a home in the Upper Strip and Lawrenceville, including the new research tower at Children's Hospital. Green industries will be further enhanced by the Green Innovations Center, which overlooks the Strip District. The Allegheny Riverfront continues to be the food center of the city and, although most of the produce wholesalers have located elsewhere, there remains an active food distribution network, numerous restaurant and kitchen supply businesses, and other food-related services.

conditions today

The historic development of the Allegheny Riverfront Vision Area provides insights into today's context.

Historic Timeline of the Allegheny Riverfront

The earliest human settlements at the confluence of the two mighty rivers some eight thousand years ago were drawn to this location by the waterways: corridors of trade, commerce and settlement. As European settlers ventured west from the Atlantic coastline into the wild western forests, the only means of travel were the water roads that connected the eastern settlements with the center of the continent and the mighty river that connected the northern and southern portions of this center. The land routes were few and far between. Pittsburgh evolved as the crossroads of this water transportation system, and became the first gateway to the unexplored west.

Central to this evolution was the river system, now augmented by a rail network that linked the waterways with inland rails that overcame the hydraulic limitations of water transport for bulk commodities. With the constant influx of raw materials, a skilled labor force and the capacity to process and manufacture, the riverfronts served as an important interconnection in this process, with the human settlement situated adjacent to and along the river set back from the riverbank. The dramatic change in grade formed by the local topography confined this pattern of land use to a fairly narrow corridor along the river valley within the city, and set the stage for the current patterns of land use we see at the beginning of the 21st century.

Lawrenceville, one of Pittsburgh's oldest communities, was first settled as an Indian village in the general vicinity of the Arsenal between 39th and 40th Streets to the river. After 1814 the area evolved into an industrial base and became a railroad-based economy, not a river-oriented economy as most Pittsburgh riverfronts. Along the river edge, land was filled, leveled, and stripped of its natural environment to support industry and reduce flooding. Large rail switching yards and tracks occupied the river's edge, eliminating connections to the riverfront. Worker housing was built next to industry within walking distance, but inland from the valuable industrial riverfront. Streets were narrow to serve local needs and conserve valuable land, while goods were transported mostly by rail and some by river. The Allegheny River was the sewage system to carry away the waste products of industry and its residential neighborhoods.

Allegheny Riverfront industry peaked in the mid-20th century and its industrial base has been declining since. Most traditional industry left the area for inexpensive highway-serviced greenfield sites. This industrial and commercial migration left behind a large amount of underutilized and vacant land along the riverfront. Since around 1990, the area has began to change as new residents and businesses with a different attitude and love for city living have been moving into the Strip District and Lawrenceville.

As riverfront land uses have declined and decayed, the human need has also changed. Current demands require that we reshape the form and infrastructure fabric of this disconnected series of neighborhoods, many of which have sat idle or served lesser functions for several decades after the loss of its traditional industrial base. The river has changed from a transportation corridor to a scenic background for those who live along the water's edge, and the riverfront has become the center of interest, rather than a place of commodity transfer between land and water. The connection to the river today is based on a new set of values about increasing the quality of urban living, smart growth principles, and the environmental restoration of both land and water to benefit the community's health and welfare and the need to create a sustainable environment for the future.

Ecological Conditions

Allegheny River Ecology of Yesterday

When European settlement began some 300 years ago, North America was 99% forested from the Atlantic shoreline to the prairies of the Great Plains. Today only fragments of that forest ecosystem remain. The pre-industrial Allegheny River Valley was no different, with floodplain forests interwoven with grasslands, created by the scouring action of river ice along the floodplain. The floodplains of the Allegheny to its confluence with the Monongahela were a mosaic of different native community types.

Flora

Big bluestem/Indian-grass River Grassland, Bluejoint/Reed Canary Grass River Grassland, Riverside Ice Scour Community where riverbanks are mostly boulders and rock, outcrops are Sycamore/Box-Elder floodplain forest (the variant without River Birch). Also, Silver Maple Floodplain Forest, Oxbow Community: Red Maple/ Elm/ Willow Floodplain Swamp, Buttonbush Wetlands, Sycamore Floodplain Scrub (the variant without River Birch), and Black Willow Shrub/Scrubland.
(*Source: "Classification, Assessment and Protection of Floodplain Wetlands of the Ohio River Basin" by Ephraim Zimmerman at Western Pennsylvania Conservancy for the U.S. EPA and Pennsylvania D.C.N.R.)*

Many of these plant communities can be found today along the Upper Allegheny and serve as reference communities for restoration landscapes.

Besides having a rich and diverse native flora, the historic lower Allegheny floodplains were hugely important for a variety of wildlife species, especially birds that nested abundantly—or in a few cases exclusively—along the river compared with other upland habitats.

Fauna

Bald Eagle, Osprey, Red-Shouldered Hawk, Great Blue Heron, Green Heron, Wood Duck, Mallard, Belted Kingfisher, Willow Flycatcher, Tree Swallow, Northern Rough-Winged Swallow, Bank Swallow, Yellow-Throated Vireo, Yellow-Throated Warbler, Cerulean Warbler, Kentucky Warbler and Baltimore Oriole.
(*Source: "Classification, Assessment and Protection of Floodplain Wetlands of the Ohio River Basin" by Ephraim Zimmerman at Western Pennsylvania Conservancy for the U.S. EPA and Pennsylvania D.C.N.R.)*

Many other species with broader habitat preferences would have nested along the river as well. Floodplains, especially oxbow swamps and ponds, were home to an exceptional variety and abundance of salamander, frog, toad, snake, and turtle species.

Allegheny River System

The Allegheny Plateau was carved over the millennia by water, creating the land form we see today. By the recession of the last glaciers in North America some 25,000 years ago, the two mighty rivers had combined to form the valleys draining from the north and south across the plateau to the confluence and headwaters of the Ohio. While these river valleys had been in the making for millions of years, it was the end of the last ice age that is largely responsible for the current land form.

The strip of land that forms the Allegheny Riverfront has always been part of a regional ecology, defined by the river valley and sustained by the river. Human occupation of the valley and use of the river had little impact on this ecology until the mid 19th century when the discharge of raw sewage and industrial waste began to pollute the river. The 20th century accelerated the pollution as development and the population expanded. Changing transportation modes resulted in covering the land surface with asphalt and concrete, and the natural land form was altered to allow better access to the river for commerce. Riverfront land was raised to its present level by filling in the natural flood plain with residual materials.

The Allegheny River drains a large watershed that reaches far into the wooded western reaches of Pennsylvania and New York, with few major communities settled over the past centuries, largely because the river was difficult to navigate until the construction of a series of locks and dams by the Army Corps of Engineers early in the 20th century. This allowed the river to become a significant part of the inland waterway system that moves bulk materials down river to the Ohio and Mississippi. This construction permanently altered the ecology of the river, changing it from a highly variable river to a series of long lakes. The Riverfront Vision Area sits on a portion of the lake created by Lock and Dam 2 in Emsworth, downstream of the confluence.

In the process of controlling the river, small islands situated along the riverfront were filled and became part of the upland community. This new "fast land" was quickly occupied and filled with structures and residences, so that by the early 20th century no evidence of islands or the original river edge remained. In addition, the Allegheny River had numerous surface water features draining across the hillsides down into the river valley. These streams—Heth's Run, Negley Run, the stream through the Allegheny Cemetery, and the stream exiting the East Busway ravine, among others—still exist though they have been piped and encased into the urban storm sewer system.

What Happened to the Plants?

With development, virtually all of the original vegetation was removed from the land. With it went all but the hardiest of fauna. Today with the exception of a few open spaces, vegetation consists of limited street trees and a few hardy species of trees and shrubs protected from removal by positions along the steep banks of the river. While some of the species found along the riverfront are likely direct genetic descendents of the trees and shrubs of the ancient Allegheny River Valley, there are many invasive species interwoven within that choke out the native species. Any reforestation effort should use the hardy genetic stock available and also look to reference communities along the Upper Allegheny.

Flooding and the Floodplain

The riverfront, although very steeply sloped and heavily embanked in much of the Vision Area, has experienced recent flooding. The most recent event occurred in September of 2004. Category 2 Hurricane Frances hit the Pittsburgh region and brought 3.60" of rainfall in a 24-hour period. This storm was followed a week later by Category 4 Hurricane Ivan, which brought 5.95" of rainfall in 24-hours. The remnants of these two storms caused widespread flooding and damage to the City of Pittsburgh. According to National Oceanic and Atmospheric Administration (NOAA) and National Weather Service (NWS) records, the floodwaters crested to 31' at the Point, and 22' at the gauge near the Highland Park Bridge. This flood brought the water up to an elevation of 725', one of the worst floods in recent history.

A portion of the Allegheny Riverfront (209 acres, or 16.5%) sits within the 100-year Federal Emergency Management Agency (FEMA) flood plain, as delineated in 1995 and updated in 2000. Section 906.02 of the City Ordinance created a Flood-Plain Overlay District, in accordance with the Pennsylvania Flood Plain Management Act and the National Flood Insurance Program. The ordinance states that proposed land development occurring in the flood plain is required to prove that the development would not result in any increase in flood levels during the occurrence of the base flood.

Hydrologic Cycle

A critical element in restoring the ecology of the riverfront is the simple notion of the hydrologic cycle. In its natural woodland form, a small amount of rainfall drains directly from the woodland to the river, while the majority of rain enters the soil mantle and drains slowly via groundwater pathways to the river. About half the rainfall returns to the atmosphere via evaporation and transpiration.

The Pittsburgh region receives approximately 38" of rainfall in an average year (NOAA). In undeveloped conditions, almost 55% of that rain is used by the vegetation and returned to the atmosphere by evapo-transpiration. Approximately 10.5" annually are infiltrated through the soil mantle and bedrock to ultimately recharge the groundwater system that feeds the Allegheny River.

In an urban environment in which the land surface has been developed with structures and pavement and other impervious surfaces covering the land, almost all of the annual rainfall is converted into runoff. Of the 38" of annual rainfall, 36" are converted into runoff from this landscape. Due to the lack of vegetated elements, only 2" are returned to the atmosphere.

Urban Sewer System

As stormwater runoff scours the land surface, it picks up pollutants, sediment, and trash and ultimately flows into the existing sewer system of gravity lines and interceptor sewers, entering though a series of inlets and catch basins. The drainage flow occurs within sewersheds, defined as a network of subsurface infrastructure elements that drain to a common outlet location. Because the City of Pittsburgh stormwater is piped, essentially the entire land surface in Pittsburgh drains into a sewershed. The Riverfront Vision Area contains over seven major sewersheds (with 30 sub-catchment drainage areas). The sewersheds in the Vision Area drain significant upland portions of the City, over 5,700 acres in total, by inheriting upstream runoff from the neighborhoods of Polish Hill, Shadyside, Lawrenceville, Oakland, Morningside, and others.

The sewer system was constructed over the past century, or more, in a traditional urban engineering manner similar to other cities across the nation: combining the sewer and stormwater drainage into one single pipe. In a combined sewer system (or CSS), wastewater is transported from homes, businesses and industry, along with stormwater from storm drains and roof leaders through a single-pipe system to a treatment facility. Almost the entire Allegheny Riverfront has a combined sewer system.

During dry weather, the sewer system functions as it was originally designed—to convey the sanitary sewage down to the wastewater treatment plant where it is treated to federal and state water standards before being discharged into the Ohio River. ALCOSAN owns and maintains the treatment plant, which serves the City of Pittsburgh and the other 82 municipalities within the County. During wet weather, however, the wastewater volume in the sewer system often exceeds its capacity. For this reason, the sewers were designed to overflow and discharge excess wastewater directly into nearby water bodies. The overflows, called combined sewer overflows (CSOs), contain stormwater along with untreated waste and debris. There are 37 stormwater outfalls located along the riverfront in the Vision Area. These outlet overflows are a significant problem to the health of the three rivers, and are one of the single greatest environmental issues facing the City with estimates in the billions of dollars to separate the piping systems.

Impervious Area

The land development and redevelopment process typically creates impervious surfaces and compacted soils. The majority of the 1,260 acre Allegheny Riverfront Vision Area is covered with impervious surfaces such as rooftops, roadways, sidewalks, parking lots and other paved features. The result of such a high amount of impervious cover includes some of the following:

- Compacted soils that filter less water
- Increased flooding events
- Decreased groundwater infiltration/recharge of aquifer
- Reduced biological diversity of both flora and fauna
- Higher ambient temperatures (urban heat island)

Existing Soil Quality

The original soil mantle, formed by the slow weathering of the bedrock, alluvial deposits, and millennia of vegetation growth and decay, remains only on those very limited portions of the Allegheny Riverfront that have not been built upon or cultivated over the past three centuries. The largest "open land" in the Vision Area is the cemetery, which of course has been filled with the remains of

our ancestors and underdrained by sewers, so it also is greatly altered. The river's edge has been filled with materials available at the time of land development, which may have included prior structures or upland soil, or even the residue of manufacturing processes, such as slag from steel furnaces. Whatever the Vision Plan anticipates for land uses on the surface, the existing sub-surface must be closely examined prior to development or re-development to confirm that no waste materials have been placed which might pose a health risk to future residents. All of the anticipated landscape planned for woodland planting must assure that a sufficient growth depth, probably on the order of four feet, is available as part of the final surface design.

Ecological Quality on the Riverfront

Most of the historic vegetation along the river has been wiped away by its heavy development, including the wholesale filling of the river floodplain. Native vegetation that exists is quite hardy and likely direct genetic descendents of the long-ago plants that inhabited the riverbanks. The great challenge of the Vision Plan is to restore the original ecology of the Allegheny Riverfront, particularly along the river, while continuing to meet the human needs of commerce and habitat.

Since the Allegheny Riverfront is not, and never will be, an isolated village or separate settlement, the essential elements of the original ecology should be integrated into the riverfront's future as a necessary component of a regenerative landscape.

Connections Conditions

Existing Situation

The south bank of the Allegheny is well-connected to the region's interstate highway system and the railroads. All of the area's bridges connect to Route 28 on the river's north bank: Route 28 connects to the interstate system to the west via the Parkway West and I-79, to the north via I-279 to I-80, and to the east and the Pennsylvania Turnpike linking west to Ohio and states to the east. The 10th Street bypass at the west end of the Allegheny Riverfront meets the Parkway West from the south riverfront. The Allegheny Riverfront is not currently served by light rail, however plans are underway to implement a commuter line linking New Kensington and Oakmont through the Vision Area to Downtown. The Allegheny Riverfront is served by local freight lines either owned or leased by the Allegheny Valley Railroad, who has the local distribution rights for the major railroad lines serving the Pittsburgh area. The freight line traverses the Allegheny Riverfront from its eastern end to 21st Street. This same freight line would also be used for the commuter line.

The east-west linear geography of the study area makes movement difficult in the north and south directions. Bridges are needed to travel north and they are spaced far apart, i.e. up to two miles. Steep slopes in the Strip District and east of the Allegheny Cemetery preclude good southern connections. The only good locations where the area reaches out are Central Lawrenceville and into Downtown. The street system was not designed for today's trucks and autos. Nor is it conducive for bicycle or pedestrian movement due to narrow streets and sidewalks. On the plus side, however, the narrow streets, sidewalks, and on-street parking serve as natural traffic calming devices that protect some of the local residential character and slow traffic naturally.

There are breaks in street connectivity particularly where Smallman Street does not extend to 40th Street and there is no street parallel to Butler Street east of 40th Street.

The Vision Area is auto dependent with little mass transit, however there is a lack of parking for both residents and businesses.

Traffic Volumes

Average daily traffic (ADT) volumes in the area range from 16,000 vehicles per day (vpd) on Liberty Avenue in the Strip District to 15,000 vpd along Butler Street in Lawrenceville and 13,000 vpd along Penn Avenue east of the 31st Street Bridge. There are 27,000

vehicles per day on the 40th Street Bridge; 13,000 vehicles per day on the 62nd Street Bridge; and 6,500 vehicles per day on the 31st Street Bridge. 43rd Street west of Butler Street has an ADT of 4,900 vehicles per day. These findings indicate that the urban arterial volumes are high as would be expected and that the river crossing volumes, particularly on the 40th Street Bridge, are very high as well. Accommodation of high through volumes in areas of high pedestrian, transit, and bicycle traffic can result, and in these cases do, in significant levels of conflict between all three. This situation produces delay and congestion for all modes and results in less than optimal safety conditions as well.

Street Widths

Street widths in the Allegheny Riverfront Vision Area are highly variable. Liberty Avenue, an arterial, is predominantly 38' wide with 4 lanes through the Strip District and 48' wide with two lanes and parking on either side as it enters Bloomfield. Penn Avenue is 36' wide in the Strip District, and is one-way with two inbound lanes (westbound) from 31st Street to 11th Street and two-way with one lane in either direction from 31st Street eastward into Bloomfield. Smallman Street varies from 40' between 11th Street and 16th Street, to 90' between 16th Street and 21st Street (this area was used for trucks and previously rail loading/unloading) to 36' from 21st Street to its terminus at 37th Street. These variations in roadway width can result in motorist confusion as to the operation of the roadway, location of lanes, and permissible movements. Areas of conflict arise from individual interpretations of the use of the street width, particularly at its widest points.

Truck Traffic

Industries that are reliant on truck traffic are moving out of the Strip District because it is not convenient for them to negotiate the narrow streets, small turning radii, on-street parking, and pedestrian and bicycle conflicts throughout the Strip District and Lawrenceville. Access is also poor to the Interstate highway system. Trucks must use the 10th Street Bypass, the 16th Street Bridge, or the 31st Street Bridge to access Route 28 to I-279. Wholesalers have abandoned truck docks on Liberty Avenue due to conflicts with automobile traffic. The truck volumes in the Strip District and Lawrenceville still continue, though, to represent a percentage of vehicles greater than that typically found on urban streets.

Allegheny Valley Railroad

The Allegheny Valley Railroad, an infrequently used freight corridor, runs on an exclusive right-of-way along the south side of the Allegheny River from Arnold/New Kensington through the Allegheny Riverfront to 21st Street in the Strip District. From 33rd Street to 21st Street the AVRR right-of-way is paved and shares space with truck and auto traffic. The street along this paved area is called Railroad Street, the ownership of which is currently unclear. Although AVRR's tracks end at 21st Street, the railroad has a permanent rail easement from 21st Street to 16th Street according to the Chief Executive Officer of Carload Express, operator of the AVRR. The AVRR splits near Allegheny River Boulevard and Washington Boulevard, and connects in East Liberty to Norfolk Southern, which runs parallel to the East Busway into downtown Pittsburgh. The AVRR also leases a line that has a north south connection from Gibsonia to Etna across the Allegheny River into Lawrenceville and points further south, such as Panther Hollow and Hazelwood, and ending in Uniontown.

Because the AVRR only operates two trips per night moving freight along the line down to 21st Street, it doesn't conflict significantly with other vehicle or pedestrian movements that currently occur at its crossings. But due to the type of rail crossings along the AVRR, the freight trains sound their horns at the more heavily populated crossing locations, which is an issue for the residential uses nearby. Street crossings along this line are infrequent due to the high costs of federally-mandated crossing requirements.

AVRR's right-of-way is 62' wide at its narrowest point and more than 100' wide at its widest point. The tracks are generally situated along the south side of the railroad's right-of-way.

The AVRR corridor has been the subject of several recent transportation studies that proposed commuter rail. The Westmoreland County Transit Authority's study, completed June 2009, proposed two routes for east-west rail service into Pittsburgh. One used the

Allegheny Riverfront corridor terminating at 21st Street at a bus transfer and the other using the Norfolk Southern's right-of-way along Washington Boulevard over to the East Busway and into downtown Pittsburgh. Estimated cost was more than $131 million. Norfolk Southern would not agree to the second route. In late 2008 Councilman Bill Peduto sponsored a study to assess the possibility of implementing a short-haul commuter rail connecting Lawrenceville with Hazelwood using the AVRR's leased lines that run north-south across Lawrenceville, through the AVRR tunnel below Neville Street and through Oakland, and over to Hazelwood. Estimated to cost $24 million, this would be a segment of a larger system linking the region. Although deemed feasible, the study progressed no further. Both studies showed that commuter rail is technically feasible utilizing existing rail lines, but did not address demand.

A private effort to introduce commuter rail service, led by the CEO of Carload Express, is currently underway. According to Carload Express, the company is in the process of transferring ownership of the AVRR's east-west line to a new 501(C)(4) Public Benefits Corporation to protect a permanent freight easement. The AVRR is also finalizing requirements by the Federal Rail Administration to achieve the ownership transfer. The intention is to operate this as a commuter rail line along the AVRR right-of-way from Greensburg/New Kensington and then consider a variety of options to connect to downtown Pittsburgh. Those options, according to AVRR's operator, include:

- Terminating the commuter rail line at a station in the vicinity of 21st Street (or 16th Street) and provide bus transfers into Downtown.
- Continuing the Port Authority of Allegheny County's (PAAC) Light Rail Transit (LRT) line underground from the Convention Center spur through the Strip District to 21st Street (or 16th Street) where it will interface with the commuter rail line.
- Continuing the AVRR's present alignment using 26th Street as a cross-over from Railroad Street to the East Busway, then running along the south side of the Busway into PAAC's Penn Station and Steel Plaza.

The commuter trains have been projected to run during only during weekday rush hours to avoid conflict with the freight traffic that operates at night. The AVRR's tracks are freight gauge and would require special, self-propelled commuter cars built specially for freight gauge.

Port Authority Bus Service

Transit service in the Vision Area is provided by buses only and is operated by the Port Authority of Allegheny County (PAAC). Bus routes travel east and west on Butler Street and Liberty and Penn Avenues through the Allegheny Riverfront. The frequency of bus service is some of the best in the region. The east-west bus routes—91A Butler Street, 86A East Hills, and 86B Frankstown—link the Allegheny Riverfront and points east with downtown Pittsburgh. These bus routes generally operate seven days a week, from 5 a.m. until 1 a.m., about every 15 minutes.

Conversely, north-south bus connections from the Allegheny Riverfront to other key activity centers like Oakland are not as abundant. The 54C North Side-Oakland-South Side connects the Liberty Avenue corridor between 16th and 32nd Streets in the Strip District with Bloomfield, Shadyside, Oakland, South Side, and North Side. It operates seven days a week from 5 a.m. until 2 a.m., about every 20 minutes. However, there are no direct cross connections linking Lower Lawrenceville to Children's Hospital on Penn Avenue or to Oakland, destinations that are vital to the growth of Lawrenceville.

Bus stops are located at nearly every block along Butler Street and Liberty and Penn Avenues. Bus stops in the Allegheny Riverfront Area are not integrated into the streetscape and do not typically incorporate customer amenities like bus pull-off areas, shelters, benches, or trash cans. Stop locations generally lack infrastructure and are unsafe.

In 2009, PAAC completed a Transportation Development Plan (TDP) called Connect 09, an effort to revise and improve its route structure and the way it delivers bus service in the region. An outcome of that effort was the development of two new bus routes that

provide additional north-south connections from the Allegheny Riverfront to other key activity centers. New PAAC routes impacting the Vision Area are:

- 64 Lawrenceville-Waterfront: This route is an expansion of PAAC's original 64A East Liberty-Homestead route that, as of April 4, 2010, originates at Butler Street at 39th Street in Lawrenceville. The route travels generally from Butler at 39th up 40th Street and serves Bloomfield, Friendship, Shadyside, and Squirrel Hill, culminating at the Waterfront in Homestead, a premier retail destination. The route runs every 30 minutes from 5:30 a.m. until 12:30 a.m., seven days a week.
- 93 Lawrenceville-Oakland: This route was developed as a brand new service that will connect Lawrenceville with Oakland, recognizing the need to link these two related activity centers. Route 93 will start on Butler Street at 56th Street and travel west on Butler to left on 40th Street. From there the route travels Penn Avenue to Main Street, across the Bloomfield Bridge to Bigelow and Craig Street into Oakland. This new bus route will provide insight into ridership demand between Lawrenceville and Oakland, and the opportunity to upgrade to an alternative mode like trolley or Light Rail Transit (LRT). For now, Route 93 is on hold and will not be implemented with the next round of PAAC route changes that will occur June 13, 2010.

Parallel to the Allegheny Riverfront is PAAC's Martin Luther King, Jr. East Busway, a 6.8 mile buses-only right-of-way that provides non-stop bus service from points east of the Allegheny Riverfront to downtown Pittsburgh. About 32 bus routes use the East Busway, carrying more than 24,000 riders each day according to PAAC's general statistics. The East Busway features a buses-only ramp at 26th Street which connects to Liberty Avenue. Express service between downtown Pittsburgh and Oakland is also available on the East Busway, accessing Oakland from a buses only ramp at Neville Avenue onto Craig Street. The East Busway is not accessible by pedestrians to and from the Allegheny Riverfront.

Water Taxi

The Pittsburgh Water Limo has been in operation since 1999. The water limo docks at Lockwall One Marina next to the Armstrong Cork Factory at 23rd and Railroad Streets in the Strip District. It operates on Pirate, Steeler, and Pitt Panther home game days, Friday and Saturday evenings, and by reservation. The water limo has docking privileges on the North Shore, at the Convention Center, and at Southside locations.

Trails

The riverfront trail system along the south bank of the Allegheny River is fragmented because of industrial properties using the river's bank for transporting materials, blocking access with fences to keep the public off private property, and the railroad blocking access to the trail system in Lower Lawrenceville. There is a wooden trestle along the riverfront from 33rd Street to 38th Street, which is posted no trespassing. Lighting along the trail is not provided in many sections. There is virtually no bicycle usage of the trail on the south shore whereas usage on the north shore is high. Many families drive over to Washington's Landing to use the North Side's trail system.

Segments of the trail along the south bank and their conditions are as follows:

- 11th to 21st Streets on an easement provided by The Buncher Company. The trail is paved but not
- well-maintained.
- 23rd to 24th Streets. In good condition at the Cork Factory.
- 36th to 43rd Streets. A gravel trail with some improved sections. Access to a kayak launch at 43rd
- Street.

The trail on the north shore has been in place for a number of years and connects Downtown to Washington's Landing at 31st Street, where it circles the island. Bicyclists cross over to Lawrenceville on the 31st Street Bridge.

Pedestrian and Bicycle Conditions

The sidewalk system is in poor condition throughout most of the Allegheny Riverfront Vision Area and discontinuous in places, particularly along Smallman Street. Pedestrian crossings are ill defined and in some places quite wide, such as 90' on Smallman Street at 21st Street. Pedestrians must dodge automobiles, trucks, and bicycles which are moving as well as trucks which are docked at various locations. These vehicles also act to disrupt the sight lines of pedestrians, bicyclists, and motorists.

Penn Avenue from 16th Street to 22nd Street is an active pedestrian street, particularly on weekends with many wholesalers and retailers in operation. Butler Street segments from 35th Street to 38th Street and from 40th Street to 45th Street are also busy pedestrian areas catering to Lawrenceville patrons. Due to the essentially flat topography, the area could be bicycle-friendly, however little or no accommodations have been provided.

Parking Conditions

Data shows that of the 3,800 plus spaces in off-street lots in the Lower and Central Strip District (11th to 21st Streets), 90% are used at peak on an average workday. At least two-thirds of that number of parkers are commuters destined for downtown Pittsburgh. In the Lower Strip District, over 5,000 auto trips per weekday enter in the morning and exit in the evening using the area only for parking.

TABLE 1
OFF-STREET PARKING ACCUMULATION SUMMARY
August 26, 2009
Allegheny Riverfront Vision
City of Pittsburgh, Pennsylvania

Parking Facility [8]	Estimated Parking Lot Capacity	Parking Accumulation (Number of Vehicles) [1]		
		Morning (approximately 9:20 AM)	Noon (approximately 11:30 AM)	PM (approximately 3:00 PM)
A	492	423	477	440
B	169	169	169	156
B1	104	104	104	98
C	1,315	1,156	1,156	1,146
D (north)	54	4	5	4
D (south)[4]	58	52	45	44
E (3)	660	528	627	594
F [2]	269	298	324	299
G	198	42	61	50
H	538	383	518	508
Total	**3857**	**3159**	**3486**	**3339**

Estimated Total Commuters Parkers: [5]	**3159**
Estimated Total Lunch Parkers: [6]	**147**
Estimated Total Shopping Parkers: [7]	**180**

(1) Parking accumulations were observed by John J. Clark & Associates. Data was analyzed by Trans Associates.
(2) Parking Lot is at 100% capacity or greater due to vehicles using stack parking or parking in unlined spaces.
(3) Parking lot estimated based on google earth measured length divided by 9 feet parking stall widths (1,490'/9'= 165 spaces).
(4) Parking lot is believed to have at least one more additional row of parking. However, this row is not visible on the video, and is not yet constructed in aerial images.
(5) Estimated total commuters are assumed to equal the morning total parking accumulation.
(6) Estimated total lunch parkers are assumed to equal the total noon parkers minus the shopping and commuter parkers.
(7) Estimated total shopping parkers are assumed to equal the total PM parkers minus the Morning Parkers.
(8) See Figure 1 for parking locations.

Analysis by: Trans Associates.

In this area, peak parking demand exceeds capacity. Of the 262 legal spaces along Smallman Street between 11th and 24th Streets, there are 285 vehicles parked during a peak (lunch) time on an average workday. This over-parking indicates the use of illegal spaces when legal spaces are full, an indicator of the parking demand in the area. This parking is essential to maintain local businesses and restaurants.

TABLE 2
ON-STREET PARKING ACCUMULATION SUMMARY
August 26, 2009
Allegheny Riverfront Vision
City of Pittsburgh, Pennsylvania

On-Street Parking Location	Estimated Legal Parking Capacity	Parking Accumulation (Number of Vehicles) [1]		
		Morning (Approximately 9:00 AM)	Noon (Approximately 11:30 AM)	PM (Approximately 3:00 PM)
Smallman Street North Side				
11th and 12th	0	0	0	0
12th and 13th	0	0	0	0
13th and 14th	0	0	0	0
14th and 15th	6	0	6	2
15th and 16th St Bridge	0	0	0	0
16th Bridge and 17th	48	15	43	39
17th and 18th	33	31	32	22
18th and 19th	15	11	12	9
19th and 20th	15	8	11	10
20th and 21st	21	16	18	14
21 st and 22nd	0	0	0	0
22nd and 23rd	0	3	4	3
23rd and 24th	0	2	4	1
Subtotal	**138**	**86**	**130**	**100**
Smallman Street South Side				
11th and 12th	8	7	7	5
12th and 13th	0	2	0	1
13th and 14th	0	0	0	0
14th and 15th	12	6	13	9
15th and 16th St Bridge	0	4	23	19
16th Bridge and 17th	36	2	29	13
17th and 18th	14	24	26	14
18th and 19th	10	2	12	5
19th and 20th	17	11	14	5
20th and 21st	23	20	25	12
21 st and 22nd	6	2	6	0
22nd and 23rd	0	0	0	0
23rd and 24th	0	0	0	0
Subtotal	**126**	**80**	**155**	**83**
Total	**264**	**166**	**285**	**183**

(1) Parking accumulations were observed by John J. Clark & Associates. Data was analyzed by Trans Associates.
(2) Estimated legal parking capacity does not include illegal parking or truck loading spaces. Parking capacities were estimated based on google street view.

Analysis by: Trans Associates.

Market Conditions

The Pittsburgh region passed through the Great Recession of 2008-2009 relatively unscathed. The lack of speculation in the regional housing market insulated Pittsburgh from the worst of the national recession. The volume of housing transactions has fallen, but homes have retained their value. Furthermore, thanks to the strong educational and healthcare sectors, regional income continued to grow, albeit slowly, in contrast to the trend in the rest of the U.S.

Hospitals and universities should continue their steady growth, and the region can expect more jobs from the expansion of nuclear activity at Westinghouse. With the development of the new Children's Hospital, the Allegheny Riverfront Area is experiencing some of the growth from the education and healthcare sectors. While hospitals can be a relatively self-contained economic generator because many of their "visitors" are less likely to engage in casual spending than other types of attractions, the economic impact of the larger and regionally-based Children's Hospital will restore and even increase the economic activity that was lost with the closing of the St. Francis Hospital facility. Given its connection to the University of Pittsburgh Medical Center (UPMC), the hospital will also fuel more research and related activity in the surrounding communities.

The transformations of the Strip District and Lawrenceville are picking up pace. The early pioneer stage of a few entertainment venues has given way to the beginnings of a more diversified commercial base and mid-scale housing development. Larger scale residential development has already occurred in the Strip District. Infill development is continuing along Butler Street and other areas as individuals and developers bring older homes and buildings up to present market standards. The Vision Area, however,

offers the kind of compact development that favors walkability and environmental sustainability—qualities that Americans and Pittsburghers are re-discovering.

These next sections explore the existing market conditions for housing, industrial, office, and retail.

Residential Market

Pittsburgh's housing market was not inflated by the prior housing boom and has not suffered as much as other cities from the current housing collapse. Nonetheless, the fundamentals of the Pittsburgh housing market are mixed at best. The city and the region have experienced decades of population loss due to out-migration and natural population declines. Recent data from 2008-2009 show that for the first time the region had a net gain of more than 1,100 United State's residents plus somewhere between 1,500 to 1,800 international migrants (based on annual averages through 2008) is a very positive sign, but not yet an established trend. Since these moves occurred near the beginning of the recession, we can expect at least another year or two of gains if this same dynamic holds (Briem, C. (2010, March 28). *High and Rising*. Retrieved March 28, 2010, from Null Space: http://nullspace2.blogspot.com/).

Jobs have been growing, and the time is approaching when either Pittsburgh's modest job growth will begin to attract new people, or the failure to attract new people will stunt job growth. The recent migration data cited above suggests that the region for at least one year did attract more people. Creating attractive places to live and work can help to prevent the latter from happening.

It is not clear that Pittsburgh can count on a reversal of decades of decline and assume that a rising market tide will absorb any new development. If we plan for a conservative market scenario and the actual results are better, then we have a better chance of getting spillover growth in other parts of the city. In the absence of demand from a growing population, the primary driver for the housing market in Pittsburgh has been the gaps in the mix of housing types and quality in the market. A significant portion of Pittsburgh's housing stock lacks the size, amenities, or configurations that current households desire. As a result, even though the population is declining and we have an overall surplus of housing stock, people have been buying and renting the new and renovated properties that have been developed.

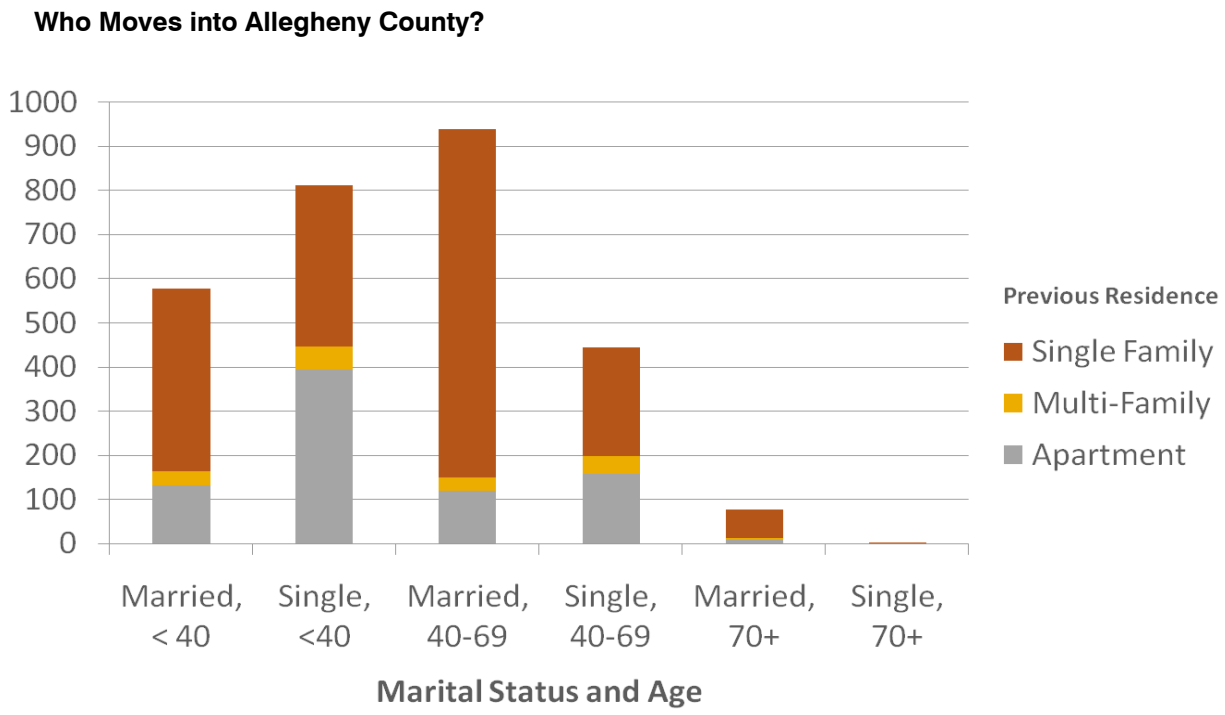
Any new development should carefully consider the product mix (rooms, amenities, price), but should also stage the development in expectation of a slow absorption rate. In fact, to put the 2008-2009 domestic migration uptick into perspective, it translates into less than 550 housing units, which can easily be absorbed into the region with no new construction.

Who Moves into the City?

Approximately 825 households move into Allegheny County in an average year, although the number ranges from 90 to 1,600. More than 300 of those households move into the City of Pittsburgh. In an average year, the city attracts approximately 100 singles or married couples in their 20s to their 60s making more than $100,000 per year and approximately 90 singles younger than 40 who make less than $50,000, with the remainder scattered across various demographics. These dominant categories of new residents also choose other locations in Allegheny County. The top locations for these demographics in the County are:

- Shadyside
- Squirrel Hill South
- Mount Lebanon
- Squirrel Hill North
- Pine

Downtown has attracted a growing share of this demographic, but currently ranks 16th of the top locations. The Strip District could capture more of this market with the right product.



Neighborhood Snapshots

The Strip has been gaining a diverse mix of residents in every income category from the very lowest up to $175,000 per year. The biggest gain in residents has been those making between $50,000 to $75,000. Most of the housing (condos, single and multi-family) has sold at prices below $40,000 with only a small percentage of units (13%) selling above $200,000.

Lower Lawrenceville has been gaining net new residents only in the income groups below $25,000 per year. This is not to say it has no residents earning more than $25,000 per year, but that the neighborhood is not attracting enough new higher earning residents to replace those that are leaving. Therefore, Lower Lawrenceville is trending towards a lower income population. Seven percent of the units sold in Lower Lawrenceville were above $200,000, but the majority of units have been selling for less than $40,000.

Central Lawrenceville had a net gain of residents in the $50,000 to $100,000 range and has been losing both higher and lower income residents. It appears Central Lawrenceville is trending toward the middle incomes but this is primarily due to out-migration of the lower and upper income groups. Fewer than one percent of the home sales were above $200,000, while the largest single area of activity is homes between $50,000 to $75,000.

Upper Lawrenceville has had a net loss of residents making between $25,000 to $50,000 and no significant gains in other any income groups. In terms of home sales there has been only one sale above $200,000 and the majority of homes are selling between $10,000 to $30,000.

Retail Market

Pittsburgh's retail sector is a study in contrasts. On the real estate side, retail vacancy rates are relatively low compared to other cities and regions with vacancy rates below 10% for the CBD and metropolitan area as a whole through the second quarter of 2009. Since the Pittsburgh economy has been generally healthier than the rest of the country, we expect to maintain vacancy rates that compare favorably to other regions in the U.S. What is more surprising is that vacancy decreased by 35,000 SF per year even

though the metropolitan area added an average of 350,000 SF of space per year from 2006 to Q2-2009. Furthermore, retail rents have been steady, except for declines in Monroeville and the Route 8 corridor. On the real estate side, the retail market has remained strong because vacant retail space is often converted into other uses, such as offices or storage.

Retail Vacancy Rates (2009-Q2)

	Downtown	Metro
St. Louis	10.8%	11.5%
Cincinnati	11.9%	13.1%
Seattle	NA	5.3%
Raleigh-Durham	21.2%	8.2%
Pittsburgh	9.3%	6.2%

(Source: Grubb and Ellis)

While the real estate side of retail has been strong, there are significant red flags on the fundamentals of retailing in the region. Retail is closely tied to population and its spending capacity. As noted earlier, except for a small gain in 2008-2009, the city and the region have consistently lost population (and retail spending power). Employment in the retail sector has been in a freefall, averaging declines of nearly 1,800 employees every year since 2000.

Retail Employment in the Pittsburgh MSA

Retailers in Pittsburgh depend on non-resident spending for their survival. Any new retail that is built will generally have to survive on the spending of non-resident consumers, but even then it is likely that it will be poaching market share from another area.

Consumer Spending and Retail Sales

	Consumer Spending	Retail Sales
Pittsburgh MSA	$ 23,947,808,000	$ 26,717,263,500
Pittsburgh City	$ 2,739,264,000	$ 4,265,732,000
Strip District	$ 2,328,733	$ 245,854,713
Lower Lawrenceville	$ 17,266,747	$ 146,070,192
Central Lawrenceville	$ 34,268,734	$ 85,306,547
Upper Lawrenceville	$ 17,223,553	$ 83,789,927

Neighborhoods within the Allegheny Riverfront Area are similarly dependent on non-resident spending to support their retail activity. The Strip District attracts the largest concentration of outside customers in the Allegheny Riverfront including a mix of "bulk" and "basket" shoppers. Bulk shoppers are those who make less frequent or irregular purchases while basket shoppers make frequent or regular purchases of the same "basket" of items. The Strip District is also a regional destination for shopping, so it has greater flexibility in adding retail that can be sustained by non-resident spending.

For the other neighborhoods, even though overall consumer spending falls short of local retail sales, there are still some sectors of retail activity that have potential if new residents and workers come into the Allegheny Riverfront Area (Table 4). Depending on the placement of the retail it can also draw spending from the other Allegheny Riverfront neighborhoods, but the potential for displacing existing retail cannot be ignored.

Retail Spending and Sales in Lower, Central and Upper Lawrenceville

	Local Spending	Local Sales	Consumers Needed
Groceries	$ 14,765	$ 32,311	5,532
Eating and Drinking Places	$ 8,662	$ 15,975	3,022
Housekeeping Supplies	$ 2,235	$ 2,973	664
Household furnishings and equipment	$ 5,082	$ 17,080	8,657
Apparel and services	$ 6,376	$ 18,266	6,806
Entertainment	$ 7,181	$ 24,969	7,920
Personal care products and services	$ 1,961	$ 14,060	25,260
Miscellaneous	$ 4,495	$ 29,494	22,182

Industrial Market

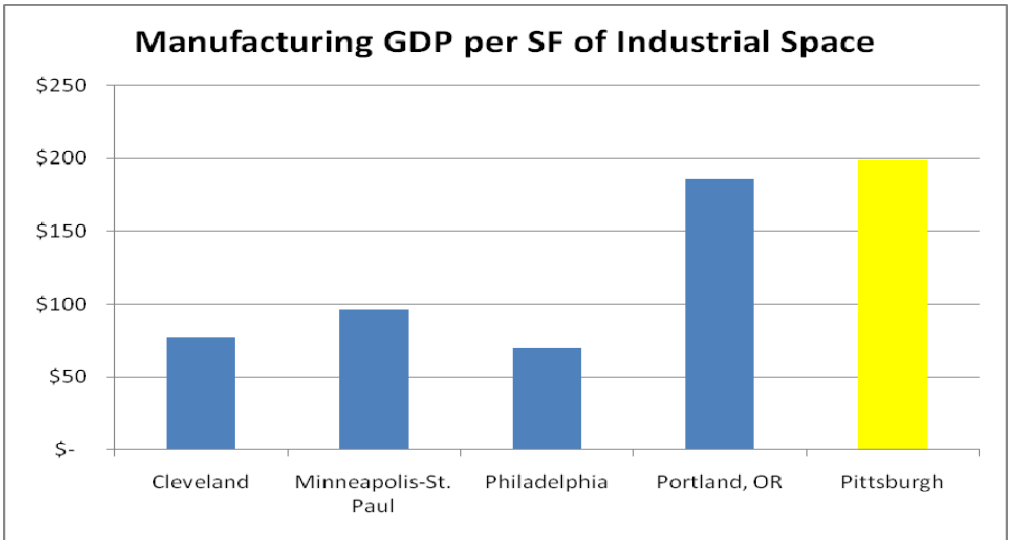
The U.S. industrial vacancy rate ended the first quarter of 2009 at 9.5 % with a negative net absorption of 40 million square feet, the largest quarterly decline of the decade. Pittsburgh's industrial vacancy rate of 8.4% is below the U.S. average and in the lowest third for a metropolitan area.

In 2009-Q2 the City of Pittsburgh had a positive net absorption of 30,000 SF but the metropolitan area added more than 219,000 SF to the total of 9.5M square feet of vacant space. "A significant amount of this increase is attributed to the closure of the 800,000 square foot GM Stamping Plant in West Mifflin." (Grubb & Ellis. Industrial Trends Report Pittsburgh. Second Quarter 2009. Available from http://www.grubb-ellis.com/Research/Reports.aspx.) Without this closure, the MSA would have absorbed more than 500,000 SF of space during one of the worst economic climates in decades. Nearly 745,000 SF is under construction, none of it in the city.

Manufacturing employment in the area is especially vulnerable to worsening U.S. and global conditions. Weak car sales in the U.S. have also reduced demand for steel, glass and coatings made by Pittsburgh industries. (https://www.pnc.com/webapp/unsec/Requester?resource=/wps/wcm/connect/e63706004e5c67d3851f87fc6d630ad7/Pittsburgh.pdf?MOD=AJPERES&CACHEID=e63706004e5c67d3851f87fc6d630ad7.)

The overall low rate of vacancy, the resilience of the Pittsburgh industrial economy, and the lack of space in the construction pipeline all suggest a positive outlook for the future. In the near term, however, the continuing slow economy could continue to frustrate the industrial revival and put more sublease space on the market, reducing rents. Furthermore, a portion of the vacant space is outdated or suffers from access issues that make it difficult to lease or sell. Much as the residential base needs to be right-sized, the industrial base also requires some right-sizing.

Comparison of Manufacturing Space and GSP



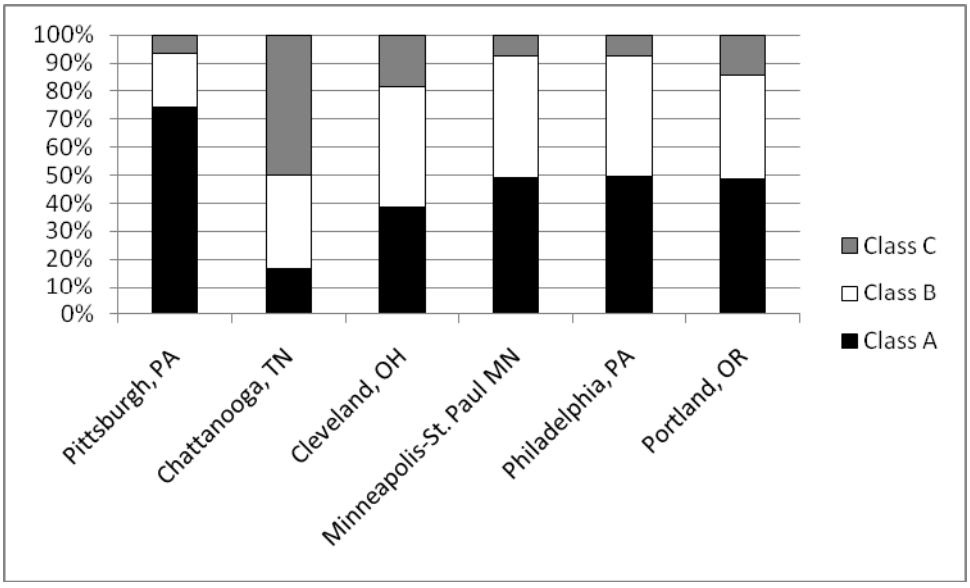
Compared to the peer cities, Pittsburgh has a much higher value of manufacturing GDP per square foot of occupied industrial space. With increasing automation, the need for manufacturing space is driven more by the level of output than the employment, but Pittsburgh is among the highest cities for that benchmark as well.

Office Market

Pittsburgh ranks 39th out of 62 MSAs in CBD office vacancy at 16.8%, which is understandable in the current climate but still higher than healthy vacancy rates. More troubling for the Pittsburgh office market is that the CBD is saturated with "Class A" space.

Pittsburgh has more office space per employee than any of the benchmark cities except Portland. In terms of Class A space, Pittsburgh has more than 70% of its portfolio in Class A space. BOMA guidelines define Class A space as prestigious buildings that compete for premier office users, but it is not clear that all of the space classified as Class A in Pittsburgh meets those criteria.

Office Market – Product Mix



Downtown space is well-suited for financial and legal services. The MSA has had some growth in financial, legal and professional services, but a lot of this growth has happened outside the city. Rising energy prices and transportation costs are renewing interest in living and working in cities, which has helped the CBD, but not exclusively. The South Side, East Liberty, and other city neighborhoods have benefited from the re-centralization. Working against Pittsburgh is the loss of headquarters status for some of the larger firms and the type of space that is located in many older buildings. Open floor plans and flexible space are harder to find in older buildings.

Most of the demand for office space, like the residential market, is likely to come from existing small firms upgrading their facilities rather than new firms. This demand is characterized by small amounts of space, whereas developers need a large anchor tenant to finance development. On an annual basis these numbers are likely to be small, so the scale and pace of development should be planned accordingly.

Square Footage Required	Share of Firms	Annual average of net new firms
275 - 1,100 SF	63%	59
750 - 3,000 SF	16%	13
1,750 -7,000 SF	12%	12
3,750 - 15,000 SF	4%	4
6,250 - 25,000 SF	4%	3
16,250 - 65,000 SF	1%	1
37,500 - 150,000 SF	< 1%	1

One of the intents of the Allegheny Riverfront Vision Plan is that new developments in the Strip specifically do not compete with the Central Business District. This may be difficult, if not impossible, given the nature of Downtown's older and small floor plates.

Urban Form Conditions

The geomorphology of Pittsburgh illustrates the settlement patterns of this region, with industry along the flatlands of the river plain and residential uses along the valley slopes and upper plateau. It also defines the neighborhood pattern of the city, with neighborhoods located on flatter areas separated by tributary ravines. This is also true of the Allegheny Riverfront where industry and commerce have located along the riverfront with the majority of residential properties located back from the riverfront and up onto the slopes. The geomorphology also shows that the watershed of about half the land mass of Pittsburgh's East End flows to the Allegheny River within the Allegheny Riverfront study area. Because of Pittsburgh's combined sewer system, the riverfront takes the brunt of stormwater overflow along its edge.

There is a strong linear quality to the Vision Area. The riverfront itself, a thin strip of land that varies from one parcel deep to several between the water and the railroad, extends from Downtown to Highland Park, although riverfront development effectively ends around 62th Street. The street grid and rail lines reinforce its linear character.

The Allegheny Riverfront's largest parcels are industrial sites along the riverfront. Medium-scaled and smaller-scaled parcels behind the riverfront provide warehousing and support industries, commerce, and housing. The typical residential parcel is 22' wide, similar to other worker housing neighborhoods of Pittsburgh yet considered small for today's city-oriented families. The parcel size differences and scales are apparent on a building and property map of the Vision Area where they appear as identifiable zones, or layers, from large to small the farther south from the riverfront.

Inboard of the riverfront are a few substantial masonry buildings built for heavy industry and warehousing that have architectural character. In the Strip District and parts of Upper Lawrenceville, buildings often sit alone on their parcels, set apart from other structures. The pattern changes to a fabric of smaller, attached buildings in the Central and Upper Lawrenceville neighborhoods. East of 62nd Street the grid disappears and Butler Street becomes a collection of scattered buildings to the zoo entrance.

Only the newer and recently renovated commercial and industrial structures exhibit ongoing maintenance. Residential upkeep is about average. A number of historic residential buildings in Lower Lawrenceville have been renovated and occupied, yet around half remain vacant or deteriorating.

Infrastructure along the riverfront is primitive, the minimum needed to support private development, and not to current city standards. Compared to other Pittsburgh neighborhoods, there are few public improvements and little public open space, parks, or trails. The largest open spaces in the Vision Area are the Allegheny Cemetery and the unimproved AVRR corridor's right-of-way. Arsenal Park between 39th and 40th Streets, Leslie Park and ballfield at 46th Street, and a small park next to the Sunoco tank farm farther up Butler Street are the only designated park spaces in the Allegheny Riverfront Vision Area.

There are three residential neighborhoods that comprise the Lawrenceville community: Lower, Central, and Upper Lawrenceville. The largest concentration of residents reside in Central Lawrenceville, which is fairly evenly distributed north and south of Butler Street, the neighborhood's main street. Strip District residences are scattered throughout the Strip District above mercantile stores, in recently converted industrial buildings, and small isolated pockets of attached two-story town homes. East of Upper Lawrenceville, the bluffs separate the neighborhoods of Stanton Heights, Morningside, and Highland Park from the riverfront except for scattered residences at the foot of the hillsides along Butler Street.

The Strip District and Central Lawrenceville are recognized places with strong characteristics and identities, yet much of the remaining Allegheny Riverfront Vision Area is unknown to most Pittsburghers. Lower Lawrenceville's street pattern is a triangulated clash of grids where the Penn-Liberty grid meets the Strip District grid. Doughboy Square, a triangular space and the acknowledged portal into Lawrenceville, is buried deep in the Lower Lawrenceville fabric and difficult to access from major arterials. Lower Lawrenceville's boundaries and edges are weak, the area seems to be in permanent transition, and it lacks identity. Similarly, the commercial and industrial sector east of the Allegheny Cemetery in Upper Lawrenceville has yet to establish its own character. Farther east along the Morningside bluffs, the residential and commercial buildings on Butler Street and on the hillsides are scattered with no identifiable sense of place or dominant use. Except for the Sunoco tank farm, a questionable landmark, the natural hillsides and cemetery are more distinctive than the built environment.

There are a number of missed opportunities throughout the Allegheny Riverfront. Streets end short of the river. Bridges become dividers because they penetrate so deeply into the narrow linear fabric. The riverfront is basically inaccessible to the public. The Allegheny Cemetery, a beautiful and peaceful place, is walled off from adjacent neighborhoods and has tight restrictions on use by the public. The Sunoco storage tanks along the river send the wrong message about the future utility of riverfront property, let alone the hidden environmental hazards of the riverfront's industrial land. Highland Park and Heth's Run have little connection to the river, although that is about to change with the rebuilding of the bridge and the zoo trail's extension to the railroad at the river's edge.

Zoning in most of the Vision Area reflects its industrial and residential roots. The UI District (Urban Industrial) zoning covers most of the flatlands area and R District (Residential) zoning reinforces the residential areas of Lawrenceville. The UI District encourages a mixture of uses, but not necessarily on the same parcel. Building heights are restricted to three stories, however the zoning does encourage residential development by allowing more residential bulk and height. Because of zoning's preference for development on single parcels, larger developments such as the Armstrong Cork Factory (Armstrong Court) with its parking and retail facility across Railroad Street, required variances and specialized zoning designation. The UI District requirement that all parking for new development be on-site has resulted in numerous surface lots throughout the Strip District and the commercially-oriented parts of

Lawrenceville. The effect is large patches of visually unappealing parking lots that tie up otherwise productive land, making it difficult for new development to compete with suburban locations where land is less expensive. A Riverfront Overlay District is part of the zoning code, however it is a text-only district and has not been applied to any riverfront location in the city. The Overlay District is described as 660' deep (1/8th mile) measured from the water's edge at normal water level. It is intended to regulate riverbank treatment by restricting vertical walls on opposite banks and regulates the spacing of floating structures. It contains other regulations pertaining to the riverbanks, but the overlay zoning does not regulate parcel or public realm development along and on the riverfront.

major issues

It's hard to get around the fact that the Allegheny Riverfront was designed and built for another time. The fabric is a clear documentation of 19th century community values and technology, where riverfront industry and commerce dominated the landscape. Movement of goods, essential for commerce, required an infrastructure of railroads and barge piers. The natural environment was sacrificed to provide as much land as possible; and the land, including its steep slopes, was stripped of trees and vegetation. Investment in infrastructure was kept to a minimum. Streets were for walking and horse-drawn traffic, not today's automobiles and large trucks. The quality of life was rough and frugal. Today the effects of those decisions are seen in traffic conflicts, empty warehouses, parking lots, and weeds—ironically in one of the most privileged locations in the city.

Disconnect Between the River and the Communities

The Allegheny Riverfront Area's largest parcels are the industrial sites along the riverfront. Most buildings are low, flat, and large. Some older buildings are steel sheds, remnants of steel industrial rolling mills but many date from the 1950's to 1960's era, with little architectural merit. Behind the mill sites are several blocks of small warehouses, industrial buildings, and retail establishments, with worker housing mixed in. On the riverfront itself, only one structure, the repurposed Armstrong Cork Factory, is devoted to residential uses. General Industrial (GI) and Urban Industrial (UI) District zoning are predominant along the riverfront. The zoning allows a mixture of uses including residential; however, it is clear the City's land use policies favor an industrialized riverfront.

From inside the Strip District and Lawrenceville neighborhoods, the river is nearly invisible. Except for residences atop the slopes, the river can't be seen because it lies 20' to 25' below the riverbank's steep edge. Many view corridors to the riverfront are blocked by buildings or tall towers that support electrical connecting one side of the river to the other. The street grid stops short of the river's edge to allow for the large industrial sites. Only two streets connect the Lawrenceville neighborhood to the river, 40th and 43rd Streets. Several in the more industrial and wholesale oriented Strip District east of 21st Street make it close to the river. While Lawrenceville is a more residential neighborhood than the Strip District, the industrial zone is deeper and a greater barrier to the river. The neighborhoods we see today did not grow as riverfront communities, but as (riverfront) industrial communities.

In addition to the industrial plants, railroad lines historically cut off neighborhoods from the river. Most of the rail yards are long gone and converted into warehousing banks and parking lots. On the remaining rail right-of-way and generally one parcel inboard of the riverfront, the Allegheny Valley Railroad serves industrial and produce uses from 21st Street to around 55th Street and continues past Highland Park to communities farther up the river.

Degraded Environment and a Non-Functional Ecology

The Allegheny River was difficult to navigate until the construction of a series of locks and dams by the United States Army Corps of Engineers early in the 20th century. This allowed the river to become a significant part of the inland waterway system that moves bulk materials down river to the Ohio and Mississippi. The construction permanently altered the ecology of the river, changing it from a highly variable river to a series of long lakes. In the process of controlling the river, small islands situated along the riverfront were filled with structures and residences, so that soon no evidence of islands or the original river edge remained. In addition, many streams, which still exist today, ran down the steep slopes into the river, though they have been piped and encased into the urban storm sewer system.

With development, virtually all of the original vegetation was removed from the land. With it went all but the hardiest of fauna. Today with the exception of a few open spaces, vegetation consists of trees planted along streets or clinging to the riverbanks. The remainder of land is hard packed soils or impervious surfaces. Consequently, the area's hydrology is generally non-functional. Of the region's 38" of annual rainfall, only 2" are returned to the atmosphere by its vegetation; very little infiltrates through the soil mantle; and as much as 36" is runoff from impervious surfaces. The rest (95%) of the rainfall is transported as untreated runoff water through the city's combined stormwater and sanitary sewers, much of it flowing into the river via the 37 combined sewer outlets (CSOs) along the Allegheny Riverfront during moderate and heavy storms.

Infrastructure along the riverfront is primitive, the minimum needed to support the industry of the 19th century. Compared to other Pittsburgh neighborhoods, there are few public improvements and little public open space, parks, or trails. The largest open spaces are the private Allegheny Cemetery and the unimproved Allegheny Valley Railroad's right-of-way between 33rd Street and Highland Park. Arsenal Park between 39th and 40th Streets, Leslie Park and ballfield at 46th Street, and a small park next to the Sunoco tank farm farther up Butler Street are the only designated park spaces in the Vision Area. Maintenance of the infrastructure is an on-going issue in Pittsburgh due to the City's perpetual financial difficulties and the neglect is evident in the Vision Area's streets, parks, and public spaces.

Poor Movement and Connections

The linear geography of the Riverfront Vision Area makes crosswise movement difficult. Bridges are needed to cross the river and they are spaced progressively farther apart, the farther they are from Downtown. Steep slopes in the Strip District and the Allegheny Cemetery in Lawrenceville preclude good connections to the near East End. There is a lack of transit cross connections to important destinations in Oakland.

The best street connections follow the river, but even so, travel by car or bus is often congested. Movement is restricted by narrow streets, an abundance of automobiles, and oversized trucks. Trucks, autos, pedestrians, bicycles, and freight rail all compete for street space. Parking is scarce for retail activities and businesses, while residential areas are beginning to feel the effects of two-car families. Between 33rd Street and Downtown there are several parallel streets providing choice, however east of 33rd Street only Butler Street is continuous through Lawrenceville. At 40th Street the only through street is Butler Street, requiring all movement to funnel to 40th Street and Butler, the area's most congested intersection. The other primary movement restriction is the Allegheny Cemetery which blocks all traffic between Butler Street and Penn Avenue. Pedestrian and bicycle traffic is relegated to the same streets as automobiles and trucks throughout the Allegheny Riverfront and the short segments of riverfront trail provide no relief alternative.

Not Perceived as a Place to Invest

The properties between the river and the AVRR corridor are underdeveloped and many are underutilized. The extensive truck and bus parking lots are a clear indication the riverfront has little real estate value. In the Upper Strip and Lower Lawrenceville there are numerous nondescript buildings, scrap yards, and parking lots. The sheer number of buildings creates the impression of activity, while a closer inspection reveals a number of vacant upper stories and vacant buildings. Lack of serious investment since the 1950s and 1960s in the Riverfront Vision Area, particularly between 11th and 40th Streets, contributes to the perception of the area as one of the city's "back yards." Many properties are used by City and County services, parking storage grounds for trucks and school buses, industrial service uses, and parking lots. Most new buildings are pre-engineered steel shed service or warehouse structures or flex buildings. These are all signs of little perceived value of property, low-valuation of investment, and even disinvestment where low-investment structures dilute nearby land values.

Generally, the Allegheny Riverfront Area is not perceived as a place to invest. The land along the riverfront is controlled by a relatively small number of landowners and, given the large parcel sizes and present market conditions, its redevelopment will be

slow. Even with the high number of vacancies, available properties are generally only for lease and few commercial and industrial properties are for sale. Although many talk of the great potential for the riverfront, recent riverfront investment has occurred only at the Cork Factory, the Crane Building next door, and distribution/flex facilities at 33rd and 51st Streets. Investment by The Buncher Company, the largest landowner along the riverfront, has generally been low-risk flex industrial/commercial buildings. Except for a few spots along Butler Street, the Allegheny Riverfront Area has yet to be seen as a safe and stable place to invest by the development community. Lower Lawrenceville and the Upper Strip District are such a mixture of uses they have yet to establish a clear identity, even with the conversion of former warehouse buildings into desirable residential and office uses.

This low level of investment in the Allegheny Riverfront Area creates a setting that is incompatible with better quality residential and commercial development. Example after example of best practices demonstrate that the combination of residential development, good transit, and good public space drives the market for commercial/retail activity, related business services, and eventually new jobs. Continuing to build risk-adverse, market-driven, low-cost space with little investment keeps values low, preventing higher appraisals that could raise the overall quality of investment. It is a self-perpetuating condition that will continue unless there is a concerted effort to invest in higher quality development and in making a more livable community. Given the present and foreseeable market, it will take several major transformative or catalytic projects through public-private partnership to break out of this present situation and forge a new investment climate.

Looking Toward the Future

What we see today—which is almost all right—is what remains of an economy and a society that has disappeared. Over the course of the 20th century, the Riverfront Vision Area lost its large-scaled industrial driver—its fundamental reason for being. The banality and neglect are the physical expression of the subsequent disinvestment and the failure of confidence and imagination. The best of what is there is an authentic legacy of that history and its optimistic view of the future.

community and vision goals

What We Heard from the Community at Large

The design team heard from a wide variety of interests who were very clear about what they like and what they don't want. The majority of comments came from area residents who took an active role during the planning process, however many who work in area businesses, merchants, and business owners who are also residents participated and expressed opinions.

What became apparent is that the riverfront is not a part of most people's daily lives. Most comments were geographically focused on the responders' immediate locales. The community desires improvements in localized places and for specific items, a very practical approach. Most are not interested in a lot of change and, in fact, are somewhat wary of change. There is a concern that change will "Disneyfy" the Allegheny Riverfront or turn it into another South Side Works (meaning a different character than the adjacent neighborhoods). Comments from both Lawrenceville and Strip District participants were very clear about this. Residents do not want to see gentrification of the neighborhoods (meaning chain stores similar to Shadyside's Walnut Street and an influx of only high income residents) for fear of removing the neighborhood character, but they do want to encourage the upgrading of residential buildings. The communities would like to see investment used to fill in the missing gaps, are not opposed to residential uses next to industrial uses, and desire a mixture of uses in the neighborhood. Community goals are mostly problem-solving in nature and localized in scale, such as fix the neighborhood, rather than longer-term, such as what could happen to transform the neighborhood. The Lawrenceville leadership would like to see improvements that increase the quality of life, such as interesting shops, good restaurants, and stable neighborhoods.

Lawrenceville Stakeholder Themes

Increase Livability

Many of these comments involved solving the auto and truck conflicts, better truck management usually expressed as removing trucks from the residential streets, and providing enough parking to meet residential and business needs. There is a strong desire to make Lawrenceville more pedestrian and bike friendly. Curiously, a number of comments raised the issue of increasing respect for residential neighborhoods, which the design team interpreted as a desire for more attention and investment centered on residential neighborhoods, rather than on industrial and commercial improvements.

Increase Connectivity

Rather than look for ways to make "one" Lawrenceville, a goal of Lawrenceville United, a number of respondents advocated for just making better connections between neighborhoods. Gaps between Upper and Central Lawrenceville and between Central and Lower Lawrenceville caused by barrier uses, discontinuous storefronts and fabric, and streets interrupted by the 40th Street Bridge or by the Allegheny Cemetery are larger problems than neighborhood perceptions.

Connect the River to the Neighborhoods

The river and riverfront are not part of Lawrenceville's daily life was heard from both residents and business people—very few streets actually connect to the riverfront. Provide access to the riverfront, provide for activities along the riverfront, and provide a continuous trail system were expressed by many. Some would be happy with just knowing a trial were there, whereas many needed a specific reason to make the trip.

Keep it Authentic

This comment, the most numerous of all, took many forms: build on the existing character, maintain a mixture of uses, keep it somewhat gritty, and develop in scale with the neighborhood fabric among others. These same comments were expressed by all interests, be they new residents or long-time landowners. Evolutionary change is okay, but don't change too much—we like what we have and want to maintain it.

Provide Neighborhood Resources

Lawrenceville residents were quite outspoken about not having the same services that other neighborhoods enjoy, such as a grocery store, dry cleaners, and pharmacies. The closing of the Giant Eagle grocery on 47th Street was bothersome, not only for the inconvenience of having to drive outside the neighborhood but also with the sense of hurt pride. A number of comments requested more family-oriented recreational space, a recognition that there are few amenities in the neighborhoods including walkable streets.

Strip District Stakeholder Themes

Retain the Strip District's Vitality and Uniqueness

This is probably the number one concern of Strip District business owners, land owners, and residents. Board members of the Neighbors in the Strip were articulate regarding maintaining a viable business climate, whereas area residents were more interested in creating livability amenities. We heard from a number of business and landowners that they are fine with the way things are and were concerned the Vision Plan would not allow the Strip, including the historic market along Penn Avenue, to evolve on its own. Merchants and community organization members expressed the need to retain interesting uses that cannot pay high rents, feeling that new development would increase land values and force out small businesses. Nearly everyone wants to continue the mix of uses and welcome people and shoppers from Downtown. Many residents and users of the Strip expressed the desire for more open space along the riverfront, a park or two, and an open space in front of St. Stanislaus. There is a desire for the area to become more bicycle-friendly by calming traffic and providing dedicated bike lanes, as well as making it more pedestrian-friendly by widening sidewalks and walkways. Businesses are concerned about crime safety, whereas residents and users are more concerned about traffic safety.

Increase Connectivity

Like Lawrenceville, connectivity also rated highly in responses. Introducing a loop shuttle service to encourage shopping is universally desired between 16th and 23rd Streets on Smallman Street and Penn Avenue. Frequency should be about every five minutes. Avid bicyclists and some residents advocated that the Strip (and Lawrenceville) should be pedestrian and bicycle dominant, which was not the general consensus however many voiced that pedestrian friendliness is lacking. Parking is a problem for just about everyone, particularly employees and shoppers. Several persons would like to see parking garages connected to the stores.

Manage Traffic

Truck conflict is a problem in the Strip District's emerging residential area from the Cork Factory east, although residents are more accepting of truck traffic than Lawrenceville residents. Many merchants and landowners were cautious about regulating trucks as they are part of the Strip's character. Safety concerns were raised about the speed of traffic in the area, particularly along Smallman Street up to 21st Street and along all of Liberty Avenue. Many feel that Liberty is dangerous for pedestrians and feel that east-bound bus stops are a car-into-pedestrian accident waiting to happen.

What We Heard from the Development and Real Estate Communities

Most of the comments came from focus group discussions and interviews with individual developers and landowners.

The residential market needs new product to move properties in the Strip and Lawrenceville as most new residents are not looking for starter homes or "fixer-uppers." Most Allegheny Riverfront residential stock fits the middle-income range, which is already in abundance throughout Pittsburgh, and this puts Lawrenceville somewhat at a disadvantage because the same dollar will buy more value elsewhere. Many residential properties are narrow and the structures are small, whereas new construction along the riverfront would be desirable. Currently the apartment rental market is stronger than the condominium market, although this will no doubt change back and forth over time. The development community felt that retail is not a major determinant of development, mainly because there is little demand for large-scale retail activity other than the Strip District. Given the current industrial market, flex space is about all that is warranted and many noted that it is quickly filled when constructed.

The development community's top priority is connecting the Allegheny Riverfront to Oakland, perceived by them as Pittsburgh's current economic engine. Current access is minimal, contorted, and not conducive to linking Vision Area businesses to the universities. Others commented that within the Allegheny Riverfront the business fabric is fragmented by the lack of good internal connections, citing a poor infrastructure and street conditions. Interestingly, these connection concerns match those of the residential communities. Some feel that the area is on the cusp of new things to happen—sort of an anticipation that the market is about to turn around and the area is about to "take off." Judging from the comments regarding the financial and economic issues and maybe because of the current poor economic climate in general or Pittsburgh's notorious differential between market rates and development costs, these representatives of the development and real estate communities were timid about risking investment in the Allegheny Riverfront until either the City commits to infrastructure investment or provides gap financing for projects.

Development and Real Estate Themes

Inadequate Infrastructure in the Allegheny Riverfront

A number of negatives confront the development and real estate communities: fragmentation (connections, market, investment) throughout the Vision Area, lack of strong anchors to support adjacent development, poor access to Oakland and to Downtown, congestion on the streets, and lack of public parking. Some cited that the zoning ordinance requires too much on-site parking, which raises development costs. Many felt that reduction of the fragmentation, better transit connections to Oakland, and provision of adequate public parking by the City would help reduce the risk. The idea of an urban circulator through the Strip District and eventually to Oakland met with unanimous approval.

Limited Residential Market

Most of the discussions involved increasing housing choices in the Allegheny Riverfront to draw new residents. The lower-middle and middle-income residential market is already well-served, but there is little product for the upper-middle and high income market. Several noted that new housing, whether new construction or adaptive reuse, has been successful even though market studies indicate there is little demand. Most new Strip District residents in new housing are from outside the Pittsburgh region and the others are typically empty nesters looking to be near Downtown's entertainment venues. Both demographic types are familiar with and desire urban living, want adequate parking, and are interested in public amenities and environmental issues more than the typical Pittsburgher. Private outdoor space, attached to the units, is in demand.

Uncertain Financing and Investment Climate

Creating certainty was desired by most of those participating, whether it was expressed in correcting physical problems, the City taking the first step by investing in infrastructure, or providing the financial bridges to make projects successful seemed to be a fundamental need. Creative financing, such as empowerment zones like Philadelphia's accelerated depreciation, tax credits related to energy, sustainability credits, assistance with lending such as that provided by the former Keystone Innovation Zone, and targeted local tax abatement were cited as ways for government to assist the development process.

Need for Public Incentives

Other ways to improve the investment climate generally involved suggestions that the City take direct development action. Constructing centrally-located public parking facilities or cleaning up environmental hazards that diminish marketability were two suggestions.

What We Heard from City Agencies

The City's interest is with broader issues: how the Allegheny Riverfront relates to the region, its place in the city, and how to spur economic development. The Allegheny Riverfront was selected for study because it is not shut off from the river by highways or railroads, has the opportunity to become a distinctive riverfront place, and represents a major opportunity to connect neighborhoods and people to the river. Underlying questions included: "What does this area have that other places in the city don't have?" and "How can a new amenity be created—something different that distinguishes the Strip District and Lawrenceville—that will draw new residents and businesses? Ground rules included: the vision needs to find a place for all that can co-exist while maintaining the character and mix that now exist; investments should be targeted and have catalytic qualities to create adjacent "spillover" economic development; and the vision needs to be practical.

City Agency Themes

Connect the River to the Communities (and the Communities to the City)

The Allegheny River is an asset that has not been accessible to Pittsburgh's riverfront communities or to the people of the region. How can access be improved both ways—from the river to the neighborhoods and the neighborhoods to the river? How can Lawrenceville be connected to the city's economic engine and participate more vigorously in its growth? Linkages need to be made physically and economically to Oakland. How can the relationship to Downtown be maintained and strengthened?

Provide for a New Industrial Base

The City's perception of the Allegheny Riverfront is that this is an untapped area for industrial growth. How might the Vision Plan lead to new jobs, create a workplace that has the amenities that attract employees, and how can the area attract "green" and design oriented businesses?

Provide Neighborhood and Regional Resources

Building on the strength of the Strip District's attraction, how can the Strip's regional experience be strengthened? With perceived growth of the area's residential communities and success of the Cork Factory, how can residential uses be encouraged along the riverfront and other locations to meet neighborhood infill and diversity needs.

Continue the Success of Downtown's Three Rivers Park

The economic and physical success of Three Rivers Park and the Three Rivers Heritage Trail should to be continued into the Allegheny Riverfront. The Vision Plan should extend the Design Guidelines and continue and expand the trail system to the city line in Highland Park.

Create Certainty

The public sector's role is to create certainty. Private investors need to know that people can get into and around the neighborhoods before they invest resources. How will the Vision Plan lead toward that certainty in the foreseeable future?

Design Team Agenda

The design team brought several ideas and lessons learned from prior riverfront planning experience, along with a curiosity and questioning of past planning practices, to the vision process. The team wanted to address how the Allegheny Riverfront can be brought into the 21st century where the community is accepting of the advances in planning for ecological restoration, progressive enough to desire a diversity of connections and the will to bring about that change, and open to new attitudes and values based on livability and health. Having witnessed the effects of "big bang" development and its draining effect on development opportunities of the private market, how might the vision be flexible over time so that change is a natural process when it is unknown what change will bring?

Is the vision a general framework whose purpose is to guide future direction or is it a vision that is capable of channeling current market trends and forces and thus very specific in its recommendations and implementation? Firmly believing in the former and a belief in the value of incremental change, the design team is conscious that uneven development, such as "big bang" projects, causes spikes in specific locations that can drain market demand for many years, but also believes that development must start where change is highly visible to be an effective catalyst.

The design team believes in creating and enhancing a strong sense of place that expresses an area's underlying character. Identity of place, of neighborhood, and of city is what makes Pittsburgh competitive in the broader national marketplace by attracting resources, growth, and new residents. The team also wanted to learn from the planning, particularly the patterns, models, and prototypes of a sustainable riverfront neighborhood and determine how these qualities could be brought to other riverfront neighborhoods throughout the city.

Design Team Agenda

Understand the Perspective of Pittsburgh's Larger Challenges

Pittsburgh faces significant challenges: the current pattern of disinvestment needs to be reversed; the consent decree on stormwater management has placed a significant financial burden on the City and its residents; public-sponsored economic development has a poor track record of investing monies where there will be secondary spinoff benefits or investing in an infrastructure that will incent private development. How can the Vision Plan suggest new directions to these challenges?

Create a New Definition of Urban Riverfront

Pittsburgh's downtown riverfront is highly successful as a commercial- and entertainment-centric hub of the region. Although immediately next door, the Allegheny Riverfront is not the commercial center of the region but a collection of industrial and residential neighborhoods similar to other Pittsburgh riverfronts. Can Downtown's success be transferred to the Allegheny Riverfront or is another model needed? How can this section of riverfront be simultaneously productive, sustainable, and livable?

Keep It Real

The design team understood from the beginning there is an authenticity to the Allegheny Riverfront that is inherent in its character and DNA. The challenge is to maintain that quality while encouraging growth and investment. Authenticity is not created by a single hand—it is evolutionary in its development. Sometimes it is best to leave things alone and let them naturally evolve.

Manage Change

The Strip District is going to change. It is the nature of business districts to change and for progression to happen elsewhere. As an example, Shadyside's Walnut Street went through several retail phases as it matured, which in turn allowed Ellsworth Avenue to develop as the "new" place. Now both coexist in relative proximity, both are successful, and both have created new markets. This is positive change that has beneficial economic consequences. This is an evolutionary process, not revolutionary. How to incent change to begin the process is a fundamental need of the Vision Plan.

It's Replicable

One of the underlying objectives of the design team is to understand how the Allegheny Riverfront could become a regional role model for urbanized riverfronts. What attributes give it the ability to be applied elsewhere?

Vision Goals

Six overall goals emerged during the first half the planning process to guide the vision planning. The "10 Principles of the Vision Plan for Pittsburgh's Riverfronts," which were accepted by the City Planning Commission as the guiding principles for Three Rivers Park, were the starting point. The design team began to merge what was learned from the context research, from interviews, and from community feedback recorded through community and project progress meetings, design charrettes, and focus discussions began to modify the 10 Principles from broad-based principals to goals specific to the Allegheny Riverfront's visioning. Several drafts were reviewed with the Steering Committee and presented at community meetings before they were generally accepted. These goals served as anchors of community concerns as well as guidelines for the design team through the remainder of the vision process and its recommendations.

Goal 1: Increase Economic Vitality

Maximize investment possibilities for long-term resilience and develop at sufficient density to support sustainable urban infrastructure and services, including viable public transportation. An economically healthy Allegheny Riverfront will provide the business climate and quality of life that continues to draw resources and people. This will not be achieved until there is a level confidence, particularly with regard to investment in real estate, that the Vision Area can and will be a stable environment for investment. The Allegheny Riverfront will need to continue its diverse mix of uses and diverse population to maximize investment possibilities. It will be important to maximize the influence, or "spillover," of investment on agent areas to increase each improvement's impact.

Goal 2: Improve Connections to the River and the City

Increase public access to the riverfront and the river, increase connections between riverfront neighborhoods, and make better connections to other centers of resources, particularly Oakland and Downtown, to improve the Allegheny Riverfront Area as a desired civic resource. Introduce new river-oriented neighborhood development to bring residential uses to the river's edge. Coordinate movement systems through the Vision Area to enhance vitality and the viability of both commercial and residential property. Reduce vehicle/pedestrian conflicts. Minimize industrial impediments at the river's edge.

Goal 3: Restore and Enhance Ecological Character and Quality

Recognize stormwater and vegetation as natural resources for a healthy ecology. Significantly lessen the quantity and quality impacts of stormwater from the Allegheny Riverfront watershed by engaging both private and public land in its capture and cleansing. Capture and reuse all rooftop and infiltrate/store/use all surface-generated runoff, with a goal of zero input to the combined sewer system. Foster native biodiversity through soil retrofit, invasive plant management, and plant bio-community reclamation. Evaluate potential brownfield constraints along the riverfront and work to minimize them. Retrofit soil to support vegetation and percolate water. Preserve local genotypes through available propagation methods. Connect the riverfront and upland communities through natural open spaces.

Goal 4: Develop Complementary Uses and Amenities

Enhance the experience of the river's edge with new recreational, commercial, residential, and cultural uses recognizing the need for compatibility. Encourage regenerative development and materials reuse.

Goal 5: Create Beautiful and Memorable Places Built upon Natural, Historical, and Present Resources

Give the city a new "front door" orientation toward the river and identify opportunities for authentic and distinctive "places" within the Allegheny Riverfront Area. Reveal and seek inspiration in the city's history. Enhance and protect the quality of the physical environment that defines such places. Recognize and celebrate distinctive features, including bridges, which contribute to Pittsburgh's identity. Create beautiful and memorable public places, particularly along the riverfront edge. Create mixed-use parks within a ten- to fifteen-minute walk of residential neighborhoods.

Goal 6: Plan for Sustainable Development

Plan for incremental and adaptive development to occur over space and time, build to sustainable standards that match or exceed LEED recommendations, and create a model for future riverfront development in the city and the region. Create a regenerative and green agenda to guide development. Engage stakeholders in catalytic interventions that will leverage future development and create strong and lasting partnerships among the stakeholders. Identify key areas for public and private investment. Identify roles and indicators of success for long-term development. Attend to the spillover effect.

vision approach

Other American cities have successfully, and unsuccessfully, developed neighborhoods and districts that share similar settings and heritage as the Allegheny Riverfront. These precedents are lessons in best management practices and serve as models for guiding riverfront planning and development.

Precedents

Pearl District
Portland, Oregon

Originally a wetland and lake that filtered water flowing from nearby hills into the Willamette River, Portland's Pearl District historically had been the city's warehouse and railroad yard district. Buildings and uses consisted of warehouses, light industrial activity, and a major rail center. Low rents, loft type spaces, and its proximity to the Downtown's core were attractive incentives to artists, and over the years they established a significant presence as warehouses became vacant. A strategic revitalization of a 34-acre railroad brownfield site began in the late 1990s.

Amenities

The Pearl District is within one-half mile of Downtown. It has mixed-use development, public open spaces, is walkable, and contains more than ten basic neighborhood services within a quarter-mile radius.

Anchors

Significant buildings and open space include: the Hoyt Street mixed-use development, Tanner Springs Park and Jamison Square, the North Park Blocks, the Brewery Blocks as adaptable reuse of historic buildings, and Powell's Book Store, a notable destination of many city residents.

Connections

The Portland streetcar connects the Pearl District to Northeast Portland, Downtown, and the South Waterfront. Originally begun as a two-mile loop system, this successful public/private urban circulator system has expanded to serve areas beyond the Pearl District. Pedestrian pathways connect to central city pathways and the Pearl District has designated bicycle paths.

Sustainability

The Sierra Club named the Pearl District "One of the Best New Developments in 2005." The Brewery Blocks achieved LEED Gold certification. A Stormwater Control Plan was instituted. The District's Sustainable Policy guides development: "The North Pearl and surrounding neighborhoods shall be developed to maximize livability, be socially and economically sustainable and promote eco system health, resulting as a model for carbon neutral and socially restorative community development."

Development Timeline

The three-phased process spanned over 30 years.

- Phase 1: 1970s: Artists move into the derelict warehouse neighborhood. 1980s-1990s: Galleries and conversions transition the area from industrial heritage to a residential neighborhood.
- Phase 2: 1994-2004: Developer purchases the 34-acre rail yard and begins a $600 million redevelopment. 1998: Pacific Northwest College of Art moves into a former warehouse. 1998: Conceptual plan is proposed for new parks and open spaces. 2000: Local developer purchases the 5-block brewery area for housing and retail at south end and renovates buildings for mixed use.
- Phase 3: 2001: Streetcar begins operating, an in-street rail system with car floor level matching curb height for efficient on-off access. 2002: Jamison Square built. 2005: Tanner Springs Park created.

Lessons

The original redevelopment started out small, but was strategic in its catalytic impact by building on the notoriety of Powell's Book Store and the Brewery Blocks. That success led other investor-developers to commit, and the spillover effect spread throughout the district in conjunction with the streetcar line. The success of the Pearl District is due in large part to the new streetcar line that linked the district to Downtown and, thus, access to new markets and resources. Its popularity and success resulted in expanding the line out to the university, which placed the Pearl District not at the end of the line but between two strong anchor destinations. The Pearl District is an excellent example of how a few strategic investments spurred the market to act on its own and a good demonstration how incremental development over thirty years has created an energized district. This natural expansion occurred within the existing 220' x 220' historic block pattern, a pattern that allows for both large and small development. Two of these blocks were designated as parks, which created a catalytic effect on revitalizing the surrounding blocks. With Portland's strong commitment to ecological restoration, new development incorporated green and sustainable features in the buildings and public spaces. Portland's success has become "the" model for warehouse district revitalization.

Riverfront District and Riverfront
Minneapolis, MN

This upper section of the Mississippi River riverfront adjacent to Downtown was formerly home to the flour milling industry. Their majestic large buildings fell into disuse and the land became blighted and unused by the 1970s. Plans for the area's revitalization began in the early 1970s when the City created the Water Front Plan for development of the river's edge as part of a larger comprehensive vision plan. The riverfronts' revitalization was evolutionary and incremental. Development began from pockets of strength in existing neighborhoods and spread to enjoin with others. Overlay zoning techniques were utilized to guide all development.

Amenities

St. Anthony's Falls, a picturesque setting across the river from Downtown, historic Main Street, and the Mills District with its tall grain elevators are area features along with reused historic buildings and good building stock. The District was simultaneously developed with integral parks and open space at each stage. A strong residential component increased densities. The entire are is pedestrian and bicycle friendly.

Anchors

Strong residential neighborhoods within a quarter-mile radius of amenities. Strong catalytic developments and anchors within one-half mile of one another. Mixed-use development was encouraged. The riverfront is in close proximity to Downtown.

Connections

Pedestrian and bicycle paths connect the anchors. A new pedestrian bridge links both sides of the river. Parking Overlay Districts were created with parking density bonuses.

Sustainability

The District developed incrementally by local area, but holistically, over time. Each local area development was "complete" with mixed uses, connections, and open space.

Development Timeline

Development was phased over 35 years.

- 1975-1980: Parks and development projects.
- 1981-1990: Parks, public infrastructure, and development projects.
- 1991-2000: Parks, public infrastructure, and development projects.
- 2001-2010: Parks, public infrastructure, and development projects.

Lessons

The Minneapolis riverfront is an excellent example of turning an industrial and left-over riverfront into a public amenity. One of the most important lessons from Minneapolis is the holistic structuring of each phase of the plan's implementation: at each stage, parks and public infrastructure accompanied development projects so that each section was complete within itself. This

not only provided a sense of accomplishment, but is a sustainable strategy that utilizes each completed section to anchor the next. The slow, deliberate, and evolutionary process allowed the introduction of new improvements to the plan as it progressed. Key to the area's success was a continued commitment to public investment over time by several municipal administrations. The redevelopment area included both sides of the riverfront, with the river and riverfront park forming the centerpiece of the effort.

Dockside Green
Victoria, BC

Dockside Green is the work of a single developer, like The Flats in Cleveland, however with different results. The site is a former shipyard and brownfield across the bay from downtown Victoria. The developer, Windmill West, began by first creating a comprehensive plan. The land was then rezoned and design guidelines established. The proposed development has a strong focus on ecology and a commitment to environmental restoration. The first of twelve phases was completed in 2009.

Amenities

The majority of uses are residentially-based. Dockside Green was designed as a walkable community. Excellent views of Downtown.

Anchors

Close proximity to downtown Victoria. Strong residential components planned as anchors of the development.

Connections

Direct connection to Downtown by BC Transit. Pedestrian and bicycle paths connect each phase of the development.

Sustainability

The development is mixed-use oriented. All stormwater is treated on-site. Parking is limited for residents to encourage the use of public transit. A vehicle-sharing program and mini-mass transit are planned for the future.

Development Timeline

Twelve phases in three neighborhoods identified.

Lessons

Dockside Green represents a different approach to redevelopment. A single developer had control of the site and master planned the entire development. Despite this unique circumstance, this is a good precedent for mixed use development based on sustainable design principles.

Northern Liberties
Philadelphia, PA

The waterfront was the source of jobs and the economy during Philadelphia's industrial era. Workers lived nearby and Delaware Avenue became the community's main street. As industry declined so did jobs and the area's vitality. The building of I-95 hastened the decline by dividing the waterfront from the Northern Liberties community. Northern Liberties is a story of the emergence of a waterfront community. The riverfront is now the location for large-scale casino and residential development while the inboard community is benefiting from infill and lower-scaled development. Its resurgence benefited from the extension of a commuter line through the community. The original streetcar line has been improved and provides convenient resident and business access to the center of Downtown.

Amenities

Adjacent proximity to Downtown. Mixed-use developments within a quarter-mile of one another. Penn Treaty Park. Northern Liberties is walkable and pedestrian friendly.

Anchors

Penn Treaty Residential Tower. Sugar House and Foxwood Casino along the riverfront.

Connections

Served by the Market Frankford light rail commuter line and the Girard Avenue Trolley, which connects to the Frankford Avenue Transportation Center, a multi-modal facility with light rail and buses. Pedestrian and bicycle pathways throughout the community.

Lessons

This benchmark precedent is important because it combines new large-scale development with associated infrastructure improvements along the riverfront, and numerous smaller-scale incremental investments within the existing neighborhood fabric.

Warehouse Row
Chattanooga, TN

This district revitalization did not involve the river and riverfront until late in the process. The original site was a series of railroad warehouses developed in the early 1900s. In the late 1980s, the historic area was transformed into an outlet shopping center, developed as part of the Prime Outlets family. This project was built at one time with a single-market focus. The outlet shopping center was not financially successful and the Warehouse Row's new developers broadened the mix of uses to include residential and office uses that now provide a 24-hour vibrancy. Its innovative electric bus service combines public access with revenue-generating infrastructure.

Amenities

Close proximity to Downtown. Adding residential and mixed-use development in its later incarnation along with access to waterfront activities revitalized the district.

Anchors

Warehouse Row Shopping Outlet. Chattanooga Convention Center.

Connections

Free electric shuttle bus service running the full length of the district and also connecting opposing riversides. Walnut Street pedestrian bridge. Highways isolated development from the riverfront and there are no pedestrian or bicycle paths in the district.

Lessons

The free bus shuttle is a key component to its limited success. Outlet patrons park in bus authority garages at either end of the development and are then transported to the shops and other features, including the riverfronts, as part of the experience. Bus patrons pay to park, but not to ride. Waiting lounges with retail stores are incorporated into the garages that contribute additional income. The bus service is self-supporting and the shopping patrons, used to paying for parking, appreciate the "free" bus service and use it many times throughout their shopping and sightseeing experience. Current redevelopment of the historic district is underway and includes converting some buildings to residential use. Its success has not been evaluated.

The Flats
Cleveland, OH

The Flats is a destination-oriented entertainment district located on the site of a large former industrial facility on a big bend of the downtown riverfront. The district became the largest concentration of bars in the mid-West and developed a "spring break" atmosphere of mostly young adults. Poor law enforcement led to a rise in crime. Original indifferent adherence to building and fire codes forced many bars to shut down. The Flats gained a crime reputation, while a competing adjacent area, the Warehouse District, drew away crowds. The original zoning was not changed for The Flats development, however planning and later redevelopment plans, led by The Waterfront District Plan, incorporate this area into a larger waterfront district.

Amenities

Adjacency to the riverfront. Power House, walking trails, and all amenities are along the West Bank, across the river from The Flats. There was a lack of public amenities within the central portion of The Flats. Affordable housing development is now included in the new plans.

Anchors

Lack of anchors and no linkage to downtown Cleveland. Aggregate of entertainment uses were assumed to be a strong anchor to draw patrons.

Connections

Lack of connections to the surrounding areas was deliberate as the developers were seeking to contain patron users. Inadequate parking provided. Difficult access to existing bicycle paths on a nearby bridge. Plans for pedestrian and bike trails are now part of The Waterfront District Plan.

Lessons

The Flats is a lesson in why developer-generated "big bang" projects are sustainably suspect. Investment in infrastructure to attract and serve a diverse clientele, such as families and different age groups, was not part of the original plan. The lack of connections between The Flats and other areas of downtown Cleveland hampered its visibility and overall relationship with the residents of Cleveland.

What We learned from the Precedents

Foremost with all the successful precedents was the active visioning and planning that took place before implementation. Those that employed comprehensive and strategic planning, involving interests of both public and private stakeholders, understood the dynamics of context and reacted accordingly. Government led the process by typically, but not always, providing the infrastructure for private investment. Infrastructure took the form of transit as well as new parks, streets, and utilities. Transit was often the key factor because of the access it provided to broader markets. Investment was often deliberately slowed to keep pace with market absorption and holistic in nature so that sections were fully completed before taking on new development. Minneapolis is the best example of this deliberate phasing, where parks and infrastructure were installed simultaneously with private development so that each phase was complete and immediately usable. An evolutionary approach also let different, often unforeseen, markets blossom in this and other successful precedents.

These are the major best practices gleaned from the precedent and other research:

Planned Approach

Planning that is transformative in its vision and has an overall concept or idea that is understandable by the public creates an enthusiasm and commitment for change and provides clear direction and guide to the future. Comprehensive planning identifies those places where change will make a difference. Patience and persistence are required, even mandatory, as the process is long and often deliberately slow. It is important to always keep the vision at the forefront of actions and continuously strive to nurture vital partnerships.

Measurable Objectives

Establish baselines and target measurements for gauging success.

Gain Buy-in by Stakeholders

Public buy-in to the vision is absolutely necessary. Private investment is important and necessary. Public-private partnerships are effective in developing transit and connections.

Residential is a Primary Generator

The residential component is usually the pioneering factor in an area's revitalization. Other uses, including retail, services, and business follow and serve residential development. Residents provide the spending resources to support businesses and are the basis for 24-hour activity. Residential uses are stable and sustainable over the long term.

Provide Choice

Plan for multi-use and interrelated development, including residential. Provide different uses, sizes, and amounts. Set reasonable development limits so as not to flood the market.

Provide Amenities

Provide parks, trails, and other key amenities within quarter mile of residents. Design good connections for pedestrians, bicycles, and transit.

Sustainable

Develop with sustainable practices, enhancing the quality of life. Lay the groundwork for future sustainability with practices tied to both public and private investment, an understanding of the public's role, and a commitment to public dollars where they will be most effective to spur initial private investment. "Big Bang" single-focused development constructed at one time is usually not sustainable.

Unique, but also Prototypical

Each place wants to be unique by recognizing its character, identity of context, and unique qualities. Build on historic resources and local character. Identify prototypical or model situations and elements for replication in other similar locations.

Catalytic

Create strategic developments that spur additional investment. Commit to public investment in infrastructure.

Open to Change

Plans need to be adjustable and adaptable, and be flexible so they are open to change and new markets. Respect the market and allow for incremental development.

Appropriate

Tie the vision and planning to the basics. Build from anchors and strengths. Fulfill infrastructure needs for today with an eye to the future.

Right Timing

Recognize the appropriateness of the right timing: a time of flux, perception and indication of things about to happen, and pent up anticipation by multiple stakeholders. Harness and control that anticipation to assist and enrich.

Evolutionary Revitalization

Thirty (30) years is a minimum timeframe for sustainable revitalization. It is important to recognize that it takes time for a vision to take hold and make a difference. Most successful precedents evolved over three recognizable stages, irrespective of the timeframe.

- Pioneer Stage: New residents move in because of low cost, desirable space, or enjoy being pioneers. Investment is spotty and unplanned. Usually tax incentives are the best mechanism to spur investment at this stage. The location is beginning to establish an identity and generate interest.
- Development Stage: Government and private industry partner to spur the market with key developments and infrastructure in a few locations to get the market excited.
- Sustainable Stage: Market self-sufficiency as development occurs on its own because the market has been established. City agencies act as a watchdog to maintain infrastructure and enforce guidelines and regulations.

The Timing is Right

The importance of timing cannot be stressed enough. Successful cities have understood that the right timing is critical and took advantage of the anticipation and sense of urgency among stakeholders that something is about to, or needs to, happen. Government seizes the moment, intervenes, and begins a planning process that builds consensus, sets direction, and commits to investing by providing tax or zoning incentives, purchases property for development, begins to install infrastructure, or some combination of these. Governmental actions typically occur late in the Pioneer Stage and lay the groundwork for the Development Stage. If the opportunity is missed, change will occur elsewhere where market interest is on the rise. The Allegheny Riverfront is near the end of its Pioneer Stage.

Vision Approach

There is momentum underway within the Allegheny Riverfront Area that is beginning to push for something to happen. Lawrenceville has been planning. The Strip District is already beginning to see it happen. There is cognition among the development community that the timing is right. The City is aware and has begun to take the first steps. This is a chance to redefine, enhance, and advance the Allegheny Riverfront Area to serve the future Pittsburgh and set an agenda for revitalizing the city's riverfronts. The approach is to create a "new" infrastructure from what's "all right" that recognizes 21st century values and the resurgence of city living as a desired alternative, to do so strategically, and to make it sustainable over the long term.

"The area needs the infrastructure (good bones) to allow the future to happen
and maybe the study's outcome should be a plan that lays out the ingredients of that good infrastructure
and let the market determine the highest and best uses."
Rob Stephany, Urban Redevelopment Authority

Regenerative Development

The concept of sustainable development, "meeting the needs of the present without compromising the ability of future generations to meet their own needs," has generally been interpreted in terms of greater efficiency and less waste. To create a sustainable society, though, we must do more than stretch our resources. Good stewardship in our use of energy, land, and materials is indeed highly beneficial but perpetuates the fundamental problem of turning (albeit more slowly) whatever resources we have into waste, whether landfills or pollution, which will ultimately compromise our quality of life.

Realizing that today we need a better model of sustainability, we are looking to natural ecosystems as models for solutions not only to environmental problems, but to social and economic issues as well. The fundamental characteristic of ecosystems is that they sustain themselves by continuous cyclical regenerative processes—processes that restore and renew their own sources of energy and matter. Ultimately, for human development to be sustainable, we have to figure out how to take part in these cyclical processes, since the alternative is progressive degradation.

This approach has informed all four components of the Allegheny Riverfront Vision Plan: ecology, connections, market, and urban form. In the ecological domain, we have focused on sustaining the quality of our natural resources, especially on the quality of water and our rivers. Our approach has been not to identify isolated problems, such as sewage overflows, but to examine the full hydrological cycle, understand why it's not working, and find ways to restore it. We take the same approach to our built environment, our infrastructure, and our systems of movement and production.

In the domain of "connections," we recognize that circulation systems are by nature continuous and cyclical, whether they exist to transport nutrients or people or freight. In the Riverfront Vision, we see movement systems as an integral element of a regenerative city: to create a well-functioning urban transportation system, we look to minimize the use of pollution-producing vehicles; to introduce new and better inter-modal connections; to improve access and accessibility; and to enhance the positive effects of both vehicles and rights-of-way on private property.

In terms of market, our approach is to build the resilience of a regenerative community by creating opportunities for an interactive mix of uses and by encouraging synergies among them. As is evident from existing conditions, a mix of uses in itself is not sufficient to ensure economic vitality and eliminate conflicts, such as truck traffic through residential neighborhoods, nor is it sufficient to generate a thriving economy. A regenerative community needs to sustain its own population base over time, with the resilience of diversity, social bonds, and investment in human development. Residential development fuels the economic metabolism of the community, but local businesses, better educational facilities, and community-supported services and

recreational amenities also have an integral role if they support and strengthen continuing investment. Lasting economic vitality can be developed only by creating a "cycle of reinvestment" in the community.

With regard to envisioning urban form, our goal is based not only on the principles of good urban design, but even more fundamentally on turning land and buildings into self-renewing resources which sustain their value over time. If we understand "waste" as the unwanted byproducts of any activity, natural or human, then in our urban environment it is the negative by-products of development that impact the property or public spaces surrounding it. In a regenerative environment, development must not only meet standards of quality of construction and design, but also contribute to the value of property around it (which of course protects its own value). Similarly, buildings will sustain their value over time only if they are well-built and can be converted from use to use.

We recognize that systems of movement, communication, and economic activity need to work at many different scales in the city. The Allegheny Riverfront is a small part of the city and region, and its well-being depends on building better linkages between the Vision Area and its metropolitan context. Our investigations in ecology, connections, economics, and urban form have all extended well beyond the boundaries of the study. We propose developing linkages of many types—new transit corridors, institutional connections to regional centers of research and innovation, residential development that draws on regional markets, and amenities that enhance the value of city living in any neighborhood. The concept of regenerative development, however, does not depend on regional-scale initiative or coordination. In fact, it's been shown to be most successful on a local scale. Starting small allows for less complex systems, which can become functional with less investment and in less time. Portland's Pearl District is a good demonstration of this approach. Successful "pilot projects" that emerge out of the Allegheny Riverfront Vision Plan can become prototypes for other regenerative development in the city.

Infrastructure

A city's infrastructure has traditionally been conceived as the system of utilities that handle the distribution of power services, such as electricity and gas, and the conveyance of water and sewage—basically the underground pipes and overhead wires. The streets and other public rights-of-way are also an important part of our public infrastructure and serve many purposes beyond moving traffic, including stormwater management, recreation (bicycling, jogging, and skating), economic activity (sidewalk markets and cafés), and social and cultural activities. Our approach to infrastructure is not only to recognize it as an essential element of the urban landscape, but a framework to shape development and an opportunity to introduce a new and synergistic vision of the city. This approach has two fundamental tenets.

The city's infrastructure should be addressed comprehensively. The design of neighborhood streets needs to be inclusive of more than traffic and parking: it should also consider the functional and economic benefits of street trees and the interests of pedestrians, bus riders, children on skates, commuters on bicycles, homeowners, and porch sitters. Increasing the permeability of public rights-of-way is an economical way to address the huge issue of managing water quality in the region. Rethinking the infrastructure to serve multiple purposes will result in not only a better investment of public resources, but also greater benefits to taxpayers and property owners.

Infrastructure should be designed to work with nature, not against it. We need to discard the present conventional, but short-sighted, approach of building massive systems of engineered public works to take the place of, or "improve on," the functions of the natural environment. Not only are they expensive to build and maintain, as is clear from the situation we face in Pittsburgh today, but they often disrupt the more effective workings of natural systems. Allowing precipitation to return directly into the soil not only reduces the need for sewage treatment, but is also beneficial to soil and vegetation and thereby to air quality. Based on the extensive research into the functioning of urban ecosystems, many new "best practices" have been developed that should be incorporated into building and rebuilding the infrastructure of the Allegheny Riverfront. Other concepts, such as small-scale power

production or sewage treatment facilities, once their feasibility has been demonstrated, can be integrated into this framework providing advantageous sites for development and a more sustainable way to use public resources.

Form-based Regulation

The high degree of mixed uses in the Allegheny Riverfront persists counter to conventional zoning practices, which typically separate uses into single-use districts. The UI District zoning acknowledges the mixed-use nature of the study area but uses an industrial designation as the mixed-use vehicle. While industrial uses will continue and always be a part of the Strip District and Lawrenceville, the Allegheny Riverfront's future lies in reconceiving these riverfront communities as thriving and active mixed-use communities where there is little distinction between industrial, residential, and business uses. More important than building uses are the physical design qualities imbedded in zoning where density and massing control building form and the buildings' collective relationship to the immediate context and the overall physical environment. Various uses can occupy the same building, which has demonstrated by the repositioning of many industrial and institutional buildings throughout the Strip District into residential apartments. In fact, buildings specifically designed for one use type are not easily converted to other uses, nor meet a regenerative or sustainable agenda. The future lies in designing and constructing buildings that are adaptable to many future uses or else easily deconstructed and recycled.

Form-based development acknowledges that many uses can occupy the same structure and therefore concentrates regulations on the structure's form and its contribution to the built environment. For example, walkable streets are those where there is a consistency and scale of the street façade, where the sidewalk is not broken by driveways and other obstructions, and where street trees and other amenities embellish the experience. Density, height, setbacks, and the creation of usable open space that improves the public realm are the ingredients that make desirable places and livable communities.

Strategic Interventions

The business and residential communities were quite outspoken that the best strategy is to leave alone what is already working and intervene only where needed. The majority of the Allegheny Riverfront is already "all right" and will evolve on its own without intervention. However, some public money is needed to stimulate the stagnant real estate market and assist the regeneration of the riverfront. This can best happen by government assisting with land acquisition, investing in new and needed infrastructure, and applying various tax and financial incentives. Within a context of fiscal stress it is important that governmental intervention be efficient and strategically applied, with the intention of spurring spillover effects that nudge the private market into self-sufficiency and on-going reinvestment. Building from existing assets and strengths is strategically the most effective method. Success is positively recognized when it incents adjacent development, whereas isolated success is not as effective and a poor investment of public dollars if there is no spillover.

The Vision Plan's approach to interventions is based on size and scale, current opportunities, and potential strategic affect. Some interventions entail new development on large sites that would be transformative to revitalize a neighborhood or create a market, whereas others are specific to individual sites where a change will make a catalytic difference and the spillover effect is localized. Other strategic interventions involve changes to zoning and subdivision controls that will slowly guide evolutionary development. Like the previous plans prepared for the Strip District and Lawrenceville, the Vision Plan recognizes that growth brings revitalization and change. The challenge is to effectively guide it toward positive outcomes while simultaneously instilling regenerative attributes that will assure its long-term sustainability.

allegheny riverfront vision plan

IMAGINE an Allegheny Riverfront where:

- Young families move because of the healthy, green environment and the affordable houses
- There is a wide variety of incomes and family types alongside new industries
- Residents can walk to restaurants, shops, and entertainment activities—which also draw people from all over the city
- Sense of community is strengthened by improved street linkages and new forms of public transit, which also connect Lawrenceville to Downtown and Oakland
- Pedestrians and cyclists are encouraged, and are separated from heavy vehicular traffic
- Public open spaces invite kids to ride their bicycles to the river and friends to take long walks, or sit and watch the boats pass by
- There is more river activity, from people taking their kayaks to work and water taxis, boating, and fishing
- There is a return of flora and fauna and a normal hydrological cycle, which no longer contributes to sewage overflow and pollution of the river or drinking water

Imagine an Allegheny Riverfront that is a model for Pittsburgh riverfront communities.

> "For decades, Pittsburgh's riverfronts were used as transportation corridors, for industrial production, and the land surrounding them did not connect to our communities. Today we recognize the riverfronts as our most treasured assets that have tremendous potential to improve our quality of life. We now have the opportunity to reconnect our neighborhoods, reclaim these waterways as amenities, and provide new venues for recreation."
>
> Mayor Luke Ravenstahl

Principles of the Vision Plan

Our approach was to analyze five dimensions of the Vision Area to understand it in greater depth. Overlaying them on each other, we find resonances and alignments that give rise to the overall vision. Spatial, Ecology, Connections, Market, and Urban Form frameworks form the foundation of the ideas and concepts of the Vision Plan. Each framework provides the basis for the recommendations that follow.

Spatial Framework

Industrial technology and the 19th century grid established an order of land uses and infrastructure that supported the area for well over 100 years. Today's ideas of urban living have changed, including new attitudes towards city living and the role of the river. The spatial framework recognizes that the Allegheny Riverfront is comprised of linear zones that parallel the river and separated by linear seams, such as major east-west arterials, which are divided into neighborhood sections by perpendicular seams, such as bridges. Urban fabric may be seen as a grid, or rather a series of grids, but it is also important to perceive it as a network of distinct zones that offer both order and flexibility. Streets that parallel the river mark distinct changes in density, scale, and stability. The new order, aligned with natural processes, is not a strictly defined hierarchy, but rather a dynamic balance. What seems like a lack of order is often a deeper and more resilient order.

Linear Zones

The 6.5 miles of riverfront is a long linear shape from Downtown to Highland Park that is comprised of strips or "ribbons" between the river and its southern edges. Five distinct linear zones—river, regenerative, transition, preservation, and service—provide a place-making structure. The "river" zone is the Allegheny River, the city's recreational river and source of its drinking water. The "regenerative" zone describes a new Pittsburgh riverfront, with an emphasis on mixed uses that are residentially compatible and amenities that appeal to workers and residents alike, built upon values intended to revitalize and enhance the riverfront. The "transition" zone, between the railroad and the major Allegheny Riverfront Area's arterials, recognizes the strong mixed use and authentic nature of this zone and its existing building stock—an asset of both the Strip District and Lawrenceville. The "preservation" zone are the residential areas of Lawrenceville. The "service" zone, the area south of Liberty Avenue, contains uses similar to the transition zone, yet is out of the mainstream and a good location for city services and other out-of-the-way service resources.

River Zone: The Allegheny River

The first ribbon is the Allegheny River. Almost all of the Allegheny Riverfront is within the Pittsburgh pool, formed by the system of locks and dams to control flooding, where it maintains a constant elevation of 711' at the Highland Park Lock & Dam 2 to 710' at the Point. The river's width is maintained at around 840', except for Washington's Landing island where it forms a secondary waterway. Although barely perceived from the flatlands along its banks, being on the river is an entirely different experience than viewing it from its banks. Its riparian edges form a continuous band of green that blends into the bluffs and hillsides of the river valley, blocking almost all views of buildings. While on the river one is entirely removed from the daily actions of Lawrenceville and the Strip District.

The Allegheny serves several roles as a public resource. It is part of the city's and region's recreational open space system of waterways and trails. River activities include boating, kayaking, canoeing, water skiing, and occasionally swimming. It serves commerce transportation and also serves to transport commuters. It provides the majority of Pittsburgh's drinking water, while at the same time serves as region's secondary sewer system when storms overwhelm the underground piped system. The Allegheny is part of an engineered flood control system, controlled by dams and locks to maintain a navigatable waterway and prevent serious flooding.

The River Zone is a public open space available for a variety of activities. Water-related activities need to be encouraged and reinforced, including boating, kayaking and canoeing, and marinas. Its banks should become fully accessible to the public like other Pittsburgh riverfronts, in the long-term by a continuous trail and in the short-term by street and intermittent trail portions, marinas, and water taxi stops. The river is intended to serve commerce as needed, as the multiple uses of the river are just as important to the Allegheny Riverfront's future as mixed uses are to the character of its riverfront communities.

The river's water is a public resource that needs to be protected and improved by lessening the impact of the CSO runoff from the immediate watershed. Properties that front on to the river have an obligation to maintain the highest levels of pollution and stormwater control so that only clean water enters the river.

Regenerative Zone: A New Riverfront Zone

The second ribbon is riverfront including the properties along its edge between the riverbank and the railroad right-of-way. This zone is narrow, at times only a single property deep and never more than several. Building footprints are larger in this ribbon than all the linear zones. The zone changes character as it transforms from an urban setting at the Convention Center to a natural setting at its eastern end beginning about 62nd Street.

The regenerative zone offers the greatest opportunity for change in all of the Allegheny Riverfront. Its large tracts of underutilized industrial land represent development potential, the most effective location to achieve ecological restitution, and

the ability to implement a full regenerative agenda. New, rehabilitated, and renovation development is proposed to be ecologically sustainable, multi-use, built to green standards, and with access to the riverfront along its length. It is prime land for residential and compatible industries that value riverfront amenities. Its edge along the river, the railroad right-of-way, and the streets that continue to the river are intended as part of the riverfront trail system. Because of its direct adjacency to river's large expanse of open space, this zone can support the highest densities of the Allegheny Riverfront Vision Area.

Regenerative Zone uses should be multi-use and diverse, while simultaneously orienting to the river and its inboard neighborhoods. Combining uses on the same property are encouraged as mixed occupancies increase diversity. Restaurants and entertainment venues are encouraged in buildings facing the river and, where appropriate, along the banks in the proposed ecological buffer.

Public access to the water and the river's bank should be required of all new, rehabilitated, and renovated riverfront properties, defined as those parcels with direct river frontage, for public egress and safety purposes. There are several legal mechanisms that can be employed, including easements.

All development should be residentially-compatible and high quality. To accomplish this, building facades need to exhibit a high degree of transparency between indoors and outdoors, with windows on all sides of the perimeter and large windows on the ground floor facing the river and riverfront trail and along paths leading to the river. Making these buildings residentially-compatible is intended to set a higher standard of quality for riverfront development in recognition of the riverfront's value as one of Pittsburgh's and the region's best assets. Green buildings and green site development should be mandatory for all new, rehabilitated, and renovation development. Surface parking should be discouraged in favor of quality open space. Building materials and design should meet the standards for development in Three Rivers Park.

Transition Zone: Mixed Building Zone

The third linear ribbon begins at the railroad right-of-way and extends to the edge of the residential fabric. The Transition Zone varies in width throughout the Vision Area: quite wide in the Strip District, narrowing in Central and Upper Lawrenceville, and almost non-existent east of Upper Lawrenceville. The zone contains a variety of building types, including industrial buildings in the Strip recently converted to apartments. Building footprints are not as large as those along the riverfront, but are larger than structures in the adjacent residential neighborhoods. The Transition Zone, which occupies most of the Strip District extending over to Liberty Avenue, has traditionally been a mixture of uses, including the historic Strip marketplace on Penn Avenue. This zone is also the source of the Allegheny Riverfront's authentic and gritty character.

Transition Zone uses should remain varied and diverse. Preferred uses are very similar to those recommended for the Regenerative Zone: residential; live/work; low-impact industrial; research & development; office; and commercial. Commercial uses are encouraged, such as regional retail and entertainment venues, along with neighborhood retail and service-commercial.

All development is encouraged to be residentially-compatible. Mixed use should continue to be encouraged as well as mixed-occupancy structures. Higher densities than presently allowed are recommended to increase job-generation and residential capacity. Green buildings and site development are recommended for all new, rehabilitated, and renovation development. As this zone contains a number of historic structures, restoring these buildings should be encourage and deserve high priority.

Preservation Zone: Established Neighborhoods

The fourth zone is the residential fabric of Lawrenceville, which is in two parts divided by the Allegheny Cemetery. Parcels and building footprints are the smallest in the Allegheny Riverfront. The Preservation Zone is the most stable of the linear ribbons and change occurs very slowly. Use segregation, however, has been occurring as former corner storefronts imbedded in the

residential fabric are converted to residential uses and new retail is encouraged along Butler Street—mixed use congregates on Butler Street while residential areas become more homogeneous.

Strong residential neighborhoods are the prime contributors to establishing and maintaining quality of life in the city. To that end, the residential neighborhoods of the Allegheny Riverfront should be the leaders in creating and maintaining a walkable, pedestrian-friendly environment. Butler Street, the Preservation Zone's main arterial, is evolving into a city-wide destination with its newer restaurants and specialty stores. As Butler Street's retail storefronts grow and multiply, the residential neighborhoods will increase in desirability because of their walkable adjacency and affordability. In the future, it will equally important to maintain the walkability of both Butler Street and the residential streets to achieve the desired quality of city life wanted by the residents of Lawrenceville.

The Preservation Zone can increase in density to accommodate a larger residential population, increase in size to merge with the Regenerative Zone along the riverfront, and/or integrate more fully with the Transition Zone depending on neighborhood preferences. Infill development and historic restoration should always be encouraged to strengthen both the residential and retail fabric. By encouraging a mixture of housing types and owner/renter choices at various price points, the residential neighborhoods will continue to offer the diversity and choice needed to maintain a sustainable equilibrium. At the same time, reinforcing and maintaining the neighborhoods' pedestrian-friendly and walkable qualities through stormwater landscape improvements and street tree plantings will increase their streetscape and pedestrian qualities.

Service Zone: The City's Backyard

The Service Zone is the strip of land along the south side of Liberty Avenue over to the East Busway and continues up the ravine valley at Herron Avenue. This is a sparsely populated area and virtually unseen from the arterials. Properties and buildings of many sizes and configurations are squeezed into this narrow zone. The Service Zone comprised of flex buildings and surface parking lots and very utilitarian in its appearance.

All cities need low-cost space for services and other land uses that are not appropriate for heavily trafficked areas, residential neighborhoods, and other prime real estate locations. Presently, many City and County services, along with bus and truck parking sites, are located in the Transition and Regenerative zones that take prime land off the market for future development. The Service Zone's land along the Busway is out of the way, generally not visible, and not pedestrian-oriented, yet is quite accessible and centrally located to the Allegheny Riverfront and other East End neighborhoods. It has good access to Liberty Avenue and the bridges making it an ideal location for these "back yard" activities.

Although the Service Zone is zoned mixed-use Urban Industrial (UI), City and County services, storage, distribution uses, and similar activities should be encouraged in the future. Both governmental bodies ought to consider relocation of their service activities to the Service Zone to free up their present sites for private market development.

As the Allegheny Riverfront prospers and access becomes more important, consideration should be given to providing pedestrian linkages from the East Busway to Lawrenceville at Herron Avenue and the Strip at 26th Street. The repositioning of the Iron City Brewery at Liberty and Herron has the potential to become a demonstration of how pedestrian and landscape improvements can be integrated to help advance these linkages. Likewise, the bus access ramp to the Busway at 26th Street is an opportunity to also provide a pedestrian linkage from the Busway to Strip District shopping.

Reconceiving the Allegheny Riverfront as layers of different characteristics and functions will begin the process of reinterpreting riverfront communities. The River Zone is a regional resource in need of public access, ecological restitution, and protection. The Regenerative Zone calls for the construction of a new fabric of buildings, infrastructure, and natural spaces. Conceived as a public amenity and model for future riverfronts, the intention of this zone is to remove the past's heavy industrial connotation and replace it

with the certainty of multiple land uses, infrastructure, and the zoning needed to encourage future investment. The Transition Zone requires more infill and adaptive reuse. It is also about maintaining and enhancing the Allegheny Riverfront's authenticity. In the stable Preservation Zone, the emphasis needs to be on preservation and affordability. These residential neighborhoods anchor the Allegheny Riverfront and are instrumental in achieving a higher quality of community life. The Service Zone can become a resource center for the city.

Linear Seams

The edges of the ribbons are seams that knit the ribbons together, such as Butler Street where it runs through Central Lawrenceville with neighborhood homes on either side, or places that divide one side from the other, where Butler Street in Upper Lawrenceville separates riverfront industrial uses from the residential neighborhood. Seams are also transitions from one environment to another, like the edge where water meets the land. In the Allegheny Riverfront seams are very important places.

The Riverbank

The riverbank is a steep 25 foot high, man-made bank now filled with native trees, shrubs, and invasives. At some industrial sites the bank was vertically bulkhead for materials handling and these features remain today. In several locations the riverbank widens where the filled edge has eroded to a more natural form and access to the water is possible. In the Allegheny Riverfront both banks of the river are the only ecological buffer between the water's edge and dense development.

The river's banks will continue to offer protection from flooding so long as development on flat land atop the bank retains its current elevation. The banks can be sculpted, though, for public water access, activities, and terracing to create landscape features. Banks closer to Downtown along both shores are expected be more fully developed with features for the public, while the south shore's bank should be left in its natural state farther east. The Plan for Pittsburgh Riverfronts recommends minimizing vertical bulkheads, particularly at locations where bulkheads may oppose one another across the river, to minimize river traffic wakes.

The riverbanks are public spaces and public resources. They need to be accessible and they need to be protected. The preferred use is a riparian edge—an ecological landscape of native trees, shrubs, grasses, and wetlands similar to the river's former ecologically-sustained landscape. Other appropriate uses include a riverfront trail and connecting pathways, boat launches, water taxi stations, fishing and swimming docks. Where appropriate, restaurants and entertainment venues could be sited along the bank or at the water level.

Railroad Right-of-Way

The next recognizable seam is the Allegheny Valley Railroad right-of-way. This slice of open space, ranging in width from 62' to over 100', begins as Railroad Street at 21st Street and progresses east through all of the Allegheny Riverfront to Oakmont, New Kensington, and Arnold, PA. At 33rd Street the paved Railroad Street becomes an unpaved open space weaving between buildings until it reaches the river's edge around 55th Street. The railroad serves industry and distribution facilities on both sides of the right-of-way.

Cargo Express, the owner of the Allegheny Valley Railroad, is in process of converting the AVRR into a combination freight and commuter line. The legal mechanism involves transferring ownership to a non-profit organization that will own and manage the right-of-way. The AVRR would retain rights to deliver freight during the night and run a light-rail commuter service during workday hours. Liability would transfer from Cargo Express to the non-profit with the intention that the non-profit improve the right-of-way as a complete (smart) street with safe crossings, trail and traffic uses, and ecological improvements. Since this process is underway and the ownership transfer appears to be likely, the Vision Plan proposes the right-of-way space become a major feature of the riverfront and the trail system, an alternative east-west connection for business access, and the main entrance for riverfront development.

A repurposed AVRR corridor would provide a second edge to the riverfront and a "front door" for the Regenerative Zone. It would serve as a secondary riverfront trail where the river edge trail is not possible or blocked by existing obstructions. It would also be an alternative to automobile and truck traffic on Butler and Smallman Streets for local area businesses that would help relieve truck conflicts, particularly east of 40th Street. Preferred uses include the freight/commuter rail line on a single track, with switching occurring east of 55th Street; a public trail; a local street for cars and light trucks; serve as the street address and main entrances to facilities on either side of the right-of-way; and become a green open space.

Butler Street and Penn Avenue

Butler Street, beginning at 34th Street in Doughboy Square extending to where it becomes Allegheny River Boulevard in Highland Park, is another seam marking the edge where the flatlands meet the slopes and bluffs. The western extension of Butler, where it merges with Penn Avenue at Doughboy Square and continues into Downtown as Penn Avenue, is an extension of the seam. Most of Lawrenceville's and the Strip's retail and commercial businesses front onto this seam. This is the Allegheny Riverfront's "main street," knitting together the built fabric with a common commercial street, and the center of activity for the neighborhoods along its path.

Butler Street should continue to strengthen its main street role while incorporating more pedestrian-friendly improvements, such as additional street trees, landscaping, and pedestrian crossings to increase its walkability and quality of place. Diverse and mixed uses should be encouraged, with neighborhood retail, service commercial, and regional retail specialty stores on the ground floor and residential units above. Penn Avenue should continue to evolve its regional focus as the historic marketplace in the heart of the Strip District and with regionally-based service and specialty firms closer to Lawrenceville.

These two main streets are developing well on their own, evolving as normal market forces incent change. Appropriate future actions would include infill development to strengthen the retail and commercial fabric, restoration of historic structures, and new or converted upper story spaces to residential units.

Liberty Avenue and the East Busway

The portion of Liberty and the Busway that runs parallel through the Strip District are also seams. The north side of Liberty Avenue is the industrial and wholesale fabric of the Strip District within the Transition Zone. The southern side of Liberty is the sparsely developed railroad and industrial properties make up the Service Zone. The Busway along the base of the Bigelow Bluff and Polish Hill forms the southern edge of the Service Zone.

Liberty Avenue is a heavily used principal arterial connecting the East End neighborhoods to Downtown. It will continue to be a feeder arterial to move people and goods. Preferred uses include mixed uses appropriate to the Transition Zone; parking facilities, with entrances off the side streets; and office and commercial uses. For ecological reasons as well as beautification purposes, dense street tree planting should continue along the sidewalks of Liberty, onto the southern properties that front Liberty Avenue, and also along the Busway's right-of-way.

The Bluffs: Edges of the River Valley

The southernmost series of seams are the bluffs that form the river valley: the Bigelow Bluff that parallels Liberty Avenue in the Strip District and the Morningside/Highland Park Bluff that forms the eastern end of the Allegheny Riverfront. These seams are the boundaries that separate the Allegheny Riverfront from the plateau neighborhoods. They are green buffers.
The bluffs should remain undeveloped and nurtured as a natural, riparian landscape. Most of their respective areas are designated Hillside (H) in the zoning ordinance, except for the toe of the Morningside Bluffs. Because of its beauty, the hillside landscape from Sawyer Street east to Highland Park should replace the few developed Butler Street properties and continue down to the river as a public asset.

Perpendicular Seams

Just as distinctive as the linear seams are the perpendicular seams. They connect the neighborhoods to the river and define their edges. These seams also connect the hillsides and the watershed drainage paths to the river. These perpendicular seams have a significant impact on the urban form of the Allegheny Riverfront:

Bridges

With their distinctive overhead presence and a reach that extends deep into the grid, these landmark structures have become distinctive transitions from one neighborhood to another. Bridges are connectors, however their imposing height and disengagement from surface streets also makes them boundaries and, in some cases, connectivity obstacles.

As extensions of the street and sidewalk system, bridges can also be extensions of the trail system. Pedestrian walkways and bicycle paths should be included as part of every bridge rehabilitation project. Pedestrian traffic on the 16th Street Bridge should be encouraged to link new development on the north bank to the Strip District, which can be improved by adding a stair/ramp and elevator at Smallman Street. The Fort Wayne railroad bridge could become part of the trail system by installing a pedestrian and bicycle paths on the lower level and adding a stair/ramp and elevator at the 11th Street pier.

Bridges are also portals into the Allegheny Riverfront. Their landings should be marked in creative ways. The 16th Street Bridge's landing at Penn Avenue is also the western portal into the Penn Avenue historic marketplace and this intersection should be acknowledged. Consider banning billboards that greet vehicles coming off the bridges—views of open space, landscape, trees, or buildings are preferable.

The space under bridges should be put to community use. A farmer's or open-air market below the16th Street Bridge would extend the Pittsburgh Public Market's presence to the river. Consider relocating the City and County service facilities below the 40th Street Bridge to the Service Zone or other location so that Central and Lower Lawrenceville can be joined by open space and the extension of Willow Street. The space below PennDOT and Federal bridges is restricted to non-occupiable uses, which would make parking garage facilities an ideal use below the Veterans Bridge.

33rd Street Trestle and Connecting Trestle Ramp

This overhead, two-track wide railroad trestle that runs above 33rd Street makes connections across the Allegheny River and north through the Route 8 corridor and south to Oakland, Hazelwood, and across the Monongahela River to Uniontown. The steel-structured trestle crosses above the east-west railroad line at 33rd Street and the AVRR right-of-way—the only place in the system where the north-south line crosses the east-west line. At this same point a connecting ramp that joins the two lines begins its assent at 35th Street along the river's edge. Because the ramp is wood construction, public access below and along the riverfront for two blocks is prohibited. A riverfront trail in this section would be required to come inboard of the river for these two blocks.

The 33rd Street trestle could become the future location of light rail commuter lines serving north and south destinations for a commuter rail line connecting north and south destinations, if there is a demonstrated demand for commuter traffic. Were to be the case, a commuter station between Smallman Street and Penn Avenue would be an ideal location to link with trolley and bus connections. Replacing the wooden connecting ramp with a steel structure would allow the riverfront trail to continue along the river.

The 33rd Street trestle is an Allegheny Riverfront landmark as well as a dramatic steel structure. Presently a visual blight in the vicinity of Penn and Liberty Avenues, the trestle should be painted, repurposed as a canvas for an artistic installation, or become a 'living wall."

Former Streams: The Original Green Seams

The Allegheny Riverfront's original watershed was connected to the Allegheny by streams, which today are covered and piped as part of the stormwater system. A stream connected the East Busway ravine to the river traveled from around 33rd Street at Liberty Avenue eastward along what is now 35th Street where it emptied into the river at the foot of an island that extended to 40th Street. A significant stream connected the upper plateau through today's Allegheny Cemetery and along 46th/47th Streets to the river. Heth's Run at the Pittsburgh Zoo drained the Highland Park area.

Plans for rebuilding the Heth's Run Bridge include converting parking lots to green playfields and extending a landscaped pathway to the river. This green extension of the former Heth's Run stream will set a precedent for acknowledging these former streams as important open space seams linking the Allegheny Riverfront's watershed to the river.

Man-Made Seams: Street Connections

Perpendicular streets that cut across the Allegheny Riverfront and its green slopes to East End neighborhoods are also significant seams. The most predominant is 40th Street that connects the North Side and Lawrenceville to Bloomfield. It divides Lower Lawrenceville from Central Lawrenceville. Stanton Avenue and the stone wall edge of the Allegheny Cemetery acknowledge the cemetery's separation of Upper Lawrenceville from Central Lawrenceville. McCandless Street, likewise, divides Upper Lawrenceville from Stanton Heights. All three of these streets connect to the river, similar to the connections made by former streams. These and other local streets that connect the green slopes to the river are good candidates as green street extensions linking the Allegheny Riverfront's plateaus and bluffs to the river.

Neighborhood Structure

The perpendicular seams divide the Vision Area into sections that correspond with the recognized neighborhoods of the Allegheny Riverfront. Each has its own character and unique qualities. Sections close to Downtown are about ten blocks apart, or roughly ½ mile and equivalent to a ten-minute walk, the acknowledged size definition of a walkable neighborhood. The sections elongate the farther east they extend from Downtown, the spacing of bridges becomes wider, and the landscape changes from an urban setting to a natural one.

The neighborhood sections all have familiar names:

Lower Strip: 11th Street to the 16th Street Bridge

The portion between 11th Street, the portal into the Strip District, and the Veterans Bridge is evolving as an extension of Downtown, which is acknowledged the Seagate Building and the Hampton Inn and supported by the commercial buildings along Penn Avenue and the Heinz History Center. The space between the Veterans Bridge and the 16th Street Bridge describes a second portion. The two bridges frame a large space that extends to both sides of the river. Restaurants and entertainment venues have begun to congregate here. Almost one-half of the Lower Strip is vacant land.

Middle Strip: 16th Street Bridge to 21st Street

The 16th Street Bridge begins the Strip District as it is popularly known and the St. Stanislaus cathedral at 21st and Smallman serves as its landmark terminus. This section houses the Produce Terminal and the Penn Avenue historic marketplace. The area behind the Produce Terminal, from 16th Street to 21st Street is developable vacant land. Significant places include the wide space of Smallman Street in front of the Produce Terminal and the Penn Avenue historic marketplace.

Upper Strip: 21st Street to 33st Street

21st Street begins the Strip District's industrial and warehouse zone that extends as far east as 40th Street along the riverfront, however the recognized Upper Strip neighborhood ends at the 33rd Street railroad trestle. Railroad Street is paved in this section, the only portion of the railroad right-of-way to be so. The Upper Strip is forming a residential neighborhood by repositioning former industrial buildings to residential uses, led by the former Armstrong Cork Building's conversion.

Lower Lawrenceville: 33rd Street to 40th Street and the 40th Street Bridge

This section is bounded by two bridge structures, the 33rd Street railroad trestle and the 40th Street Bridge and its extension as 40th Street. Although the grid is confusing in this section and it has not developed a recognizable identity as a neighborhood, there are several noteworthy places. Doughboy Square at 34th Street is the portal into the Lawrenceville community. About a block away is the landmark Iron City Brewery at the intersection of Herron and Liberty Avenues, one of the portals into Polish Hill and the East Busway. Both these places are on the verge of development that will significantly impact their future. The residential blocks north of Butler Street contain some of the oldest residential structures in Pittsburgh. The former Arsenal site, including Arsenal Middle School and Arsenal Park, is a strong anchor at Lower Lawrenceville's eastern edge.

Central Lawrenceville: 40th Street to 51st Street

The 40th Street Bridge and the Allegheny Cemetery are strong landmarks and edges to Lawrenceville's largest neighborhood. Central Lawrenceville is the only place in the Allegheny Riverfront where residential uses are located on both sides of Butler Street. This stable neighborhood is experiencing growth as new residents are buying into the area and rehabilitating the existing housing stock. With the closure and clearance of the Heppenstall facility, a large development site has opened up between the residential neighborhood and the industrial uses along the riverfront, suggesting the opportunity for extending this residential neighborhood to the river.

Upper Lawrenceville: 51st Street to the 62nd Street Bridge

The residential neighborhood is south of Butler Street in this section and is distinguished by a change in the street grid pattern. The street and alley grid runs parallel to Butler and the river, a common grid shift when residences are located on steeper slopes, but this is the only section like this in Lawrenceville. Industry is fairly well entrenched along the riverfront and is expected to remain. There are a few locations where riverfront access is possible.

Morningside Bluffs / Morningside: 62nd Street Bridge to Heth's Run and Zoo Entrance at Baker Street

Except for a few industrial buildings along the riverfront east of the 62nd Street Bridge and structures along Butler Street, this section of the Allegheny Riverfront remains mostly a steep wooded bluff and a riparian river edge. At Baker Street, the bluff turns south forming the western valley side of Heth's Run. There are few development opportunities in this section because of the steep slopes, yet this zone has the potential to become one of the most beautiful sections of the Allegheny Riverfront.

Highland Park Bluffs / Highland Park: Heth's Run to Washington Boulevard

This relatively short section of bluffs begins at Heth's Run and forms the eastern valley side of the Heth's Run plain. It continues along Butler Street to Washington Avenue where it defines the watershed valley of East Liberty. Except for the Pittsburgh Zoo, this section remains undeveloped hillside and will remain so. At the foot of Washington Boulevard sits the Highland Park Lock & Dam 2, a marina, and Pittsburgh Public Works property which was the city's former asphalt plant. The zoo entrance and the foot of Washington Boulevard along the riverfront are two potential sites for riverfront public open space.

Neighborhood identity is a strong feature of Pittsburgh, and the Allegheny Riverfront communities are no exception. Rather than steep slopes and ravines forming boundaries and edges like most Pittsburgh neighborhoods, the Strip District's and Lawrenceville's boundaries are defined by bridges, landmarks, and open space.

Where neighborhood identity is not apparent is along the riverfront's Regenerative Zone. Its industrial character overpowers the subtlety of the neighborhood-defining perpendicular seams. The bridges are high overhead and do not disrupt the strong industrial fabric below. Strengthening of neighborhood boundaries will begin to occur when mixed and residential uses extend to the river, but identifying the Regenerative Zone as a new and continuous riverfront "place" will do more for the city's riverfront image than linked, but separated, neighborhoods.

Spatial System as a Ladder …a Plaid …a Network

When diagrammed, the spatial system takes the form of a ladder. The ladder's rails are the linear zones and its seams, and the rungs are the perpendicular seams. Ladders with multiple rails and rungs of different widths and compositions describe a more

complex fabric—like that of a plaid. As a plaid's warps and wefts become more diverse, the pattern becomes richer in its visual appeal. It becomes more complex and diverse as color and texture are added, and its interpretations multiply, much like an urban network that is comprised of multiple uses, sizes, and diverse characteristics with many different places and environments.

The more the Allegheny Riverfront transforms as a network system, enriches it by acknowledging places and intensities, and celebrates its connectivity and diversity, the greater the opportunity for nurturing and implementing a regenerative agenda.

Spatial Principles

1. Differentiate development strategies and different form by zone

The five distinct zones—river, regenerative, transitional, preservation, and service—provide a place-making structure. Different development policies and strategies are called for in each zone.

- The "river" zone is a regional resource in need of public access, ecological restitution, and protection.
- The "regenerative" zone calls for the construction of a new fabric of buildings, infrastructure, and natural spaces. Conceived as a public amenity and model for future riverfronts, the intention of this zone is to remove the past's heavy industrial connotation and replace it with the certainty of multiple land uses, infrastructure, and the zoning needed to encourage future investment.
- The "transition" zone requires more infill and adaptive reuse.
- In the stable "preservation" zone, the emphasis needs to be on preservation and affordability.
- The "service" zone can become a resource center for the city.

2. Reinforce linkages

- The AVRR corridor extends almost the full length of the Allegheny Riverfront and has the potential to become the front door to riverfront development, a transit corridor, and a public and environmental amenity.
- Butler Street and Penn Avenue can be enhanced as the centers of community life and regional draw.
- Former streams and public open spaces should be acknowledged as extensions of the green hillsides linking the valley edges to the river.

Ecological Framework

Regenerative Ecology

The ecological vision is based on a regenerative framework of the riverfront ecology—a framework which strives to restore the natural water cycle and increase the urban canopy. These two goals are keystones of the Vision Plan and will set in motion a transformative reality in which the community is prosperous, healthy, and fulfilled.

Regenerative development means that the natural environment of land and water is reestablished to the greatest extent possible and serves as a beneficial setting to a new building. Beyond its footprint, the soil mantle may need to be augmented and cleaned, and vegetation reestablished to mitigate existing and new pollutants. The new building should maximize the use of natural lighting and ventilation, as well as incident solar radiation and rainfall. The rain that falls upon the parcel should be captured and utilized within the property and structure, not allowed to become a liability to the community.

Reintroducing an Ecology Framework

As noted previously, most of the natural landscape is missing from the Allegheny Riverfront. Through restoration, rehabilitation and redevelopment, the Vision Plan seeks to allow the rainfall to follow the natural pathways into the soil mantle that has been paved

over for the past century. These pathways will occur in every green island and tree corridor created, blending the form of the new communities with the varied functions they provide: commerce, habitat, and transit.

The infrastructure elements will change in form but the basic functions will continue. In terms of grey infrastructure, the existing sewer system will continue to carry storm and waste water to the regional treatment plant, but the influx of rainfall from the surface will be greatly reduced to the extent that the overflows to the river will be reduced in frequency and pollutant level. The roadways and alleys will be redesigned, with landscape and stormwater elements integrated in the right-of-way (i.e., green infrastructure). Development on parcels will expand to include contiguous lands and may be altered to complete new open space and recreational areas, whose functions will serve the community. Rail corridors will become green connectors in which the transit function remains, yet is coupled with a trail that allows greater community access to and appreciation of the riverfront. Along the river edge, clean rooftop runoff can be directly discharged to the river, or to landscape channels within a green corridor setback. As the distance from the river's edge increases, the use of porous pavements and rain gardens and other green infrastructure features that seek to restore the hydrologic cycle will increase. Restoring the hydrological cycle is most critical at the source of upland rainwater runoff.

The goal of this ecological planning is based on the fundamental ideal of restoration ecology: restore the hydrologic cycle by capturing the rain and restoring vegetative cover. The existing infrastructure of sewer pipes beneath the ground and the roadway network that sets the surface pattern of land use provide a framework for the community that will be interwoven with landscape elements forming the connection between the land and the water. If the goals set forth in the Vision Plan are met, the result will be an Allegheny Riverfront with green neighborhoods that provide clean water and healthy air while reducing carbon footprint and encouraging regenerative development.

Essential Ecological Principles as Guides

Throughout the development of the Vision Plan recommendations and actions some essential ecological principles have guided the process:

- First, stormwater in the urban environment must be managed on-site through one of the following methods: (1) capture and reuse; (2) infiltration; or (3) evapo-transpiration. These methods are fundamental components of the natural hydrologic cycle that we seek to restore.
- Second, ecologically-based solutions will vary based on distance from the river and opportunities that exist with the local topography and geography. At the river's edge, clean rooftop runoff has less water quality impact and can be discharged directly into the river. However, upland headwater communities, including small parcels with limited space as well as transportation features such as roadways and alleyways, have a different set of solutions.
- Third, vegetative elements must be integrated into stormwater management applications. Features such as urban reforestation, tree planting beds, green parking lots, green streets and green alleys, vegetated roofs, and river buffers must be incorporated, site-by-site and parcel-by-parcel, in order to provide an integrated ecological approach for restoration.
- Fourth, various combinations of green infrastructure measures will work; each site is different and will use a different mix of actions. Existing urban neighborhoods have retrofit opportunities that are different and more complex than the new land development opportunities that exist with some of the larger riverfront parcels in the Allegheny Riverfront.
- Fifth, land ownership is a key factor to implementation and public/private partnerships are critical to the successful outcome of the restorative vision.

Sustain the Water Cycle

The water cycle will be sustained by preventing the rain from entering the sewers wherever possible. Along the river edge, the clean rooftop runoff can be directly discharged to the river or to landscape channels within the green corridor setback. As the distance from the river's edge increases, the use of porous pavements and rain gardens will increase. As the distance from the river

increases even farther, vegetated roofs, constructed on all or most of the large commercial and industrial flat rooftops, will be the most effective design option. The performance of these elements will vary, but the overall goals will be the same.

Stormwater Metric Target

Throughout the entire Allegheny Riverfront Vision Area at least one inch of rainfall must be prevented from entering the sewer system. That amount will capture at least 95% of the annual rainfall and, in so doing, will eliminate any impact from the study area on the existing CSO outfalls.

When the historic rainfall patterns for Pittsburgh were analyzed, two observations stood out: First, the majority of the total annual rainfall occurs in rainfall events of 1" or less and 96% of rainstorms in an average annual year occur in events of 2" or less (NOAA). Second, if the first inch of runoff from impervious surfaces were managed via green infrastructure and held on-site, over 96% of the total annual runoff volume will have been captured. This is a critical means that will allow achievement of the restorative vision:

> All new development over 5,000 square feet must manage the first 1" of stormwater runoff from on-site impervious surfaces within the limits of earth disturbance.

The stormwater management metric, if implemented, will help to eliminate many CSO overflows and water quality impacts to the Allegheny Riverfront. If the balances of the sewershed inflows follow the same changes, the discharges will cease.

Green Infrastructure Areas

These distinct locations, called "green infrastructure areas," differ in terms of stormwater management opportunities based on redevelopment and land retrofit opportunities, surface topography, and distance from the river:

- Green Infrastructure Zone 1 River's edge to 200' in the Regenerative Zone
- Green Infrastructure Zone 2 200' to, and including, the AVRR right-of-way in the Regenerative Zone
- Green Infrastructure Zone 3 AVRR right-of-way to Penn Avenue/Butler Street/Liberty Avenue, basically the Transition Zone
- Green Infrastructure Zone 4 Penn Avenue/Butler Street/Liberty Avenue to upland drainage at the study area boundary in the Preservation and Service Zones

Any and all new pavements, from surface parking lots to sidewalks, patios, and some driveways, should be constructed of permeable materials underlain by a storage/infiltration bed comprised of stone or other storage media. Sites that will undergo the most substantial redevelopment offer the greatest potential for these designs. Permeable surfaces can be softscape, such as soil and landscaping, or hardscape meant for pedestrian and some automobile traffic. Successful planting areas require permeable surfaces that allow water to percolate and become absorbed by the soil material. Permeable soil usually requires at least a 3 foot depth to support plants and trees and provide cleansing and mitigation functions. Pervious pavement systems can be porous asphalt, concrete, or other paver material systems usually installed as public walkways, plazas and other open space, and low-weight automobile spaces, such as parking lots and parking lanes of public streets. These pavement systems come in a variety of colors, can be colored during installation, and can be installed as artistic installations. Permeable surfaces are not meant for high-weight or high-volume traffic rights-of-way.

Green Infrastructure Zone 1: From the River's Edge out 200'

Creation of a riverfront "buffer" or corridor along the water's edge is a critical foundation of the overall ecological strategy. The 200' measurement begins at the water's edge. By design, it must exclude vehicular movements and storage, but most certainly will provide a riverfront trail for recreation and river access.

Green infrastructure features of this zone include a 200' wide riparian buffer, a pervious pathway and trail network, river access and recreation locations, and riparian restoration and protection efforts.

Riparian Buffer

A 200' wide green open space along the riverfront throughout the Allegheny Riverfront Vision Area. The use of native meadow and woodland plantings, combined with forest restoration and invasive species removal, will provide an important level of stormwater management benefit in Zone 1. Preferred uses of the buffer are limited to preserve its natural qualities, but would include river access, a riverfront trail, passive recreation, limited concessions, and limited public facilities such as amphitheaters, performance space, and water features.

Trail Network

Any hardscape elements located in this zone should be designed and constructed of permeable materials underlain by a storage/infiltration bed comprised of stone or other storage media.

Green Infrastructure Zone 2: Riparian Buffer to the AVRR right-of-way

Green infrastructure within Zone 2 will be created with green space and land development opportunities which support the development of a green railway corridor. Green infrastructure features include a linear green space corridor along the railroad right-of-way; open space and recreation sites, including stormwater treatment and reuse as public space; and vegetated rooftops on new and retrofit development.

Vegetated Roofs

Vegetated roofs are landscaped roofs designed to capture and mitigate rain water. This definition also applies to vegetative terraces, canopies, and other flat surfaces on buildings and structures. Vegetated roofs also help with keeping buildings temperate by providing additional insulation. Green roof technology is rapidly evolving and now includes low-cost prefabricated systems in addition to custom designed systems. The application of green roof technology will have the greatest stormwater management impact when installed on existing buildings several blocks from the river, where the use of landscape elements has little opportunity for application within the street system.

Green Corridor

Redevelopment of the AVRR corridor as a green corridor will provide the region with a unique and beneficial connective feature.

Stormwater in Public Spaces

The riverfront is lacking in recreation and artistic elements that allow for public interaction and association with the river. Stormwater can be integrated into public spaces to provide a critical social and educational function along with stormwater management.

Green Infrastructure Zone 3: AVRR right-of-way east to Penn Avenue / Butler Street / Liberty Avenue

Green Infrastructure within Zone 3 will be implemented primarily within publicly owned right-of-ways, and will include elements such as green streets along major thoroughfare corridors (Penn Avenue, Butler Street, and Liberty Avenue) with vegetated curb extensions. Roadway and sidewalk land cover (i.e., public right-of-way) are together the largest contributor of runoff from publicly owned parcels in the Allegheny Riverfront. Street rehabilitation and sidewalk reconstruction activities are important opportunities for implementation of the green infrastructure recommendations described below.

Green Streets

Green streets are best suited for urban environments and can provide multiple benefits to the community. Often, street trees are planted in soil and rock filled trenches with stormwater infrastructure elements designed to capture and infiltrate rainwater during storms. The rain water and soil provides a robust growing media for the trees, which thrive to create an urban canopy.

Vegetated Curb Extensions/Medians

Curb extensions are vegetated extensions of the sidewalk system located in former or partial street parking lane and vegetated portions of corner "bump outs" at street intersections. When located at crosswalks and intersections, vegetated

curb extensions provide traffic calming benefits along with stormwater management and community greening benefits. Landscaped medians in the centers of streets perform similarly to vegetated curb extensions. These green infrastructure features capture roadway and sidewalk (i.e., right-of-way) runoff, which is designed to soak through the vegetated and soil media and be infiltrated below.

Green Infrastructure Zone 4: Penn Avenue / Butler Street to the edge of the Allegheny Riverfront upland drainage

The Allegheny Riverfront inherits runoff from upland neighborhoods, including Stanton Heights, Morningside, and Highland Park. Green infrastructure activities in Zone 4 and upland neighborhoods can be undertaken by private landowners, as well as in the public right-of-way. Green infrastructure features recommended include green alleyways modeled after the successful program in Chicago, neighborhood food gardens on publicly owned vacant lots, residential rain gardens, and street tree plantings.

Green Alleyways

In the more residential neighborhoods of Zone 4, small lots do not offer many stormwater solutions. Alleyways can be retrofit with a rock-filled trench below grade and inlets that direct rainwater into the trench. Alternatively, the surface can be paved with porous pavement or pavers, which will also direct stormwater into the green infrastructure application.

Urban Food Gardens

Urban lots that are in public ownership, or classified as vacant, can serve as community gardens providing food and nourishment for garden members, as well as stormwater and greening benefits.

Residential Rain Gardens

The form and design of rain gardens will vary throughout the area, but share a common design: the planting beds must infiltrate as well as support the vegetative system installed. Residential homeowners, even on small townhouse lots, can disconnect their downspouts allowing rainwater to flow into rain barrels for later watering or directly into depressed planting beds.

The Case for a 200' Riparian Buffer

Urban rivers have long suffered without buffers due to their industrial histories. For the first time in over one hundred years, many American cities have land available at the water's edge. This land is key to not only restoring ecology to urban rivers corridors, but also to provide a long list of amenities for the public that are difficult to quantify but are obvious to most of us. Cities across the country are grappling with not only buffer size, but also the kind of development permitted within them. Although specific studies are lacking in heavily urban environments, upstream river buffer science can guide buffer development.

Major mid-sized cities such as Kansas City, Missouri and Portland, Oregon have, or are in the process of developing, buffer setback ordinances. Pittsburgh is in the unique position to become a leader in urban stream renewal as it is poised to lead the country in buffer establishment. The Allegheny Riverfront Vision Plan proposes a 200' river buffer. Although the search for US rivers buffer precedents with a 200' setback was limited, establishing a large buffer presents the city with necessary opportunities to reach the 40% urban tree canopy goal, restore air quality, reduce CO2, and be a key component in the restoration of the hydrologic balance. A 200' buffer is also required to introduce the habitat necessary to support the return of valuable ecology and wildlife.

Buffer Precedents

Urban stream buffers range anywhere from 20' to 200' depending upon the current ecological characteristics of the stream, with a median of 100', according to a national survey of 36 stream buffer programs by the Metropolitan Washington Council of Governments. (Pittsburgh currently has a 50' riverfront easement requirement, in place since the mid-1980s, which sets aside riverfront land for later buffer improvements.) There are limited cities where a 200' river buffer has been imposed for protection as there are few urban areas where 200' of available land from river's edge to building face still exists.

- Kansas City, Missouri has approved a buffer setback ordinance which limits development 75' beyond the 100-year floodplain. Separating the riparian buffer into three zones, the ordinance calls for a 25' wide streamside zone, a middle

zone determined by the floodplain, and an outer zone which extends 75' past the flood line. Buffer widths can range from minimum 100' to a maximum width of 250'.
(*Riparian Buffer Benefits and Kansas City, Missouri's Stream Setback Ordinance — Scott A. Schulte, Patti Banks Associates, Kansas City, Missouri, Patricia A. Elbert Noll, City of Kansas City, Missouri, Jeffrey Henson, P.E., Black & Veatch Corporation, Kansas City, Missouri)*

- The state of New Jersey has implemented a 300' buffer on all major development adjacent to a waterway that is designated as a C1 waterway, waters which provide protection to drinking water supplies and provide high recreational value.
(*New Jersey Department of Environmental Protection Land Use Management)*
- Portland, Oregon's vision plan for the South Waterfront along the Willamette River calls for a minimum 100' buffer starting from the top of bank.
(*"Ecological Riverfront Design: Restoring Rivers, Connecting Communities" – Betsy Otto, Kathleen McCormick, and Michael Lecces)*

What will a 200' Buffer Look Like?

A river buffer is not a rigid wall blocking access to the waterfront. A river buffer must strike a balance between development opportunities and public access with ecological goals that enhance the natural system. Composed of varying degrees of vegetation density, the proposed buffer will actively maintain downstream and upstream views, provide public access to the water, and will act much like parkland—an amenity, not a detriment to development. A successful buffer would be comprised of heavily planted riparian zones at the water's edge, large canopy trees to preserve viewsheds, clumps of understory and shrubs at drainage points, wet meadows for stormwater infiltration, select lawn areas for passive recreational programs, and a recreational trail.

Urban Forests

If we are to solve the challenges of stormwater management and urban heat island effect, we must reintegrate vegetation—the Urban Forest—into all of our urban neighborhoods, from residential to industrial to parkland. This does not mean that all urban forests will look the same, rather they will represent a continuum of forest from formal street trees to naturalized parkland with varying degrees of wildness. In some places only single trees can be sustained, while in others a full community of plants can be achieved.

These forests should mimic natural conditions as closely as possible, with levels of complexity and layers from groundcover to shrubs to trees. The common elements they must share are soil and water. Soil must be a living medium that has appropriate structure and supports the necessary microbiology. Water must not only be able to reach the urban forests, but it also must be able to drain away in adequate time to prevent flooding of root systems.

Canopy Cover Zones

In reviewing on-going urban forest initiatives in the United States, including information from Friends of Pittsburgh Urban Forest and the American Forests, 40% is the target goal for an average urban tree canopy cover over the Allegheny Riverfront. Canopy cover represents green leaf cover as measured from high-resolution aerials. A 40% canopy cover does not mean that 40% of the ground area is utilized for tree plantings, but rather that 40% of the development area will be covered by an elevated canopy after 20 years. Nor does it mean that every block of the Allegheny Riverfront will have the same number of trees and amount of other vegetation. Zoning the Allegheny Riverfront allows varying percentage goals within different areas that take into consideration built infrastructure, redevelopment, and ecological opportunities. Design and construction practices that save and protect significant large, mature, and non-invasive trees are important to achieving the target goal, as new trees do not provide the needed coverage until 15-20 years after planting.

Canopy Cover zones, which directly overlap the Green Infrastructure Areas, and targets are as follows:

Zone	Area	Percentage
Zone 1	River's Edge to 100' and the AVRR right-of-way in the Regenerative Zone, and green open spaces	80%
Zone 2	100' to the AVRR right-of-way in the Regenerative Zone	60%
Zone 3	AVRR right-of-way to Penn Avenue/Butler Street/Liberty Avenue in, basically, the Transition Zone; and all of the Service Zone	40%
Zone 4	Penn Avenue/Butler Street/Liberty Avenue to upland drainage at Vision Area boundary in the Preservation Zone	25%

The 40% average canopy cover target can only be achieved by incorporating significant open/park/un-built green space in addition to a mandatory 200' riverfront buffer. Therefore, the buffer, park extension links, and major green streets become important components of the system. Canopy cover also includes street trees and trees on private property, as well as tree plantings utilized in stormwater management or green infrastructure.

Why a 40% Canopy Cover Target?

Canopy coverage benefits include: (Numbers are based on Pittsburgh's existing canopy cover)

Heat Island Reduction
Reduced use of electricity and gas from shading and climate effects: average savings per tree per year = $40.66
Stormwater Runoff Reduction
Trees intercept an average of 1,400 gallons of stormwater per tree per year for average annual benefit = $11.00
Air quality improvement
Provided by the removal and avoidance of air pollutants: average net benefit per tree per year = $8.53
Carbon offset
Reduce CO2 by a net of 5,303 tons: average net benefit per tree per year = $1.20
Reduced Crime and Quality of Life Enhancement
Total annual benefit associated with property value increases = to $19.33 per tree per year.

Each tree represents an average benefit of over $80 per year.
(Source - City of Pittsburgh, Pennsylvania Municipal Forest Resource Analysis, pg.iv & 32)

Dead Trees do not have Canopies (or, Why Soil is Critical to an Urban Forest)

There is no point in planting the hundreds of trees required for the urban forest if they die within 13 years of planting. Trees with this short of a lifespan are standard within urban environments. They never reach canopy maturity and therefore have limited ecological benefit. In fact, short-lived urban trees provide not only no ecological benefit, but actually contribute to the global carbon footprint. Therefore, the goal for all trees within the Allegheny Riverfront is life spans well in excess of 20 years. How can this be achieved? Only by appropriate soil type and volume, and water and air into and out of soil mass.

Soil volume targets are 800 cubic feet (cf) per single tree and 600 cf per tree in multiple plantings (groves). This amount will not only provide a tree lifespan of 15 years to 40 years +/-, but also creates a direct correlation between soil volume for trees and soil volume for stormwater management. Soil volume can be achieved in a variety of ways. As air and water can move into and out of the soil mass, these options can serve dual duty for tree growth and stormwater management.

As we reintroduce a natural stormwater cycle and rely on vegetation to provide the large-scale evapotranspiration functions of the original forested ecosystems, measures to protect soils from compaction and super-saturation must be implemented. Soil cannot

become overly compacted or super-saturated for long periods of time or the associated vegetation will die or suffer from inadequate growth.

Stormwater Benefits of a 40% Tree Canopy Goal

The Vision Plan seeks to establish a 40% tree canopy goal and a 1" rainwater capture goal for the City of Pittsburgh. How are the two related? The analysis below shows their relationship. The model assumes one acre of land is retrofitted with a combination of street trees and tree groves which have the following soil volumes:

- 800 cf per single tree
- 600 cf per tree for multiple trees/tree groves

1-Acre Model: 40% Canopy Target in Relation to Stormwater Mitigation	
Soil Volume (cf)	39,200
Storage Capacity of Soil[1] (cf)	7,840
Fraction of Soil Capacity Utilized	75%
Impervious Area Managed (sf)	70,560

(1-Based on industry standard of 20% water storage capacity in planting soil)

The average soil volume needed on one acre planted with 40% tree canopy is 39,200 cf. The water storage capacity of that amount of soil is approximately 7,840 cf. It is assumed that 75% of the soil capacity is utilized when that soil is used to manage runoff from impervious surfaces during a 1" storm event. The amount of impervious area that can be managed by this soil/tree planting is 70,560 square feet – over 1.6 acres.

Summary

One acre planted with 40% tree canopy can manage (through an engineered system with proper soil volume) 1.62 acres of impervious surfaces.

Impervious Area Managed (sf)	70,560
Rainfall on Impervious Area [2] (gal)	1,665,000
Average Annual Runoff Coefficient [3]	80%
Runoff from Impervious Area (gal)	1,332,000

(2-Based on long term average precipitation of 37.85"/year)
(3-Varies based on type of impervious cover, taken from CH2M HILL analysis prepared for East Liberty Development, Inc. for East Liberty neighborhood)

During an average year, 70,560 sf of impervious area will receive over 1.6 million gallons of rainfall. Assuming a runoff coefficient (the percentage of rainfall that becomes runoff) of 80%, the runoff from that impervious area is the equivalent of over 1.3 million gallons per year.

Summary

1.62 acres of impervious land generates 1.3 million gallons of runoff in an average year

Percent Runoff Capture [4]	95%
Runoff Captured (gal)	1,265,000
CSO Reduction: Runoff Reduction [5]	70%
CSO Reduction (gal)	886,000

(4-Based on CH2M HILL analysis prepared for East Liberty Development, Inc. for East Liberty neighborhood)
(5-The relationship of CSO reduction to runoff reduction. [i.e., not every gallon of stormwater captured equates to a full gallon of CSO reduction, since some runoff is conveyed to the treatment plant now.] Based on information from other CSO communities.)

Results from a CH2M HILL Rainfall-Runoff Capture Analysis performed for East Liberty show that approximately 95% of the annual runoff would be captured by systems with the 1" storage capacity. When this is applied to the total volume of runoff from the impervious area, 1.27 million gallons of runoff (95% of the total 1.3 mg) is captured through the use of green infrastructure. An assumption was made that every gallon of runoff removed from the sewer system results in 70% of a gallon being removed from combined sewer overflows. When that value is applied to the 1.27 million gallons, the CSO reduction can be estimated for an acre of land planted with 40% canopy and proper soil volumes.

Summary

One acre planted with 40% Tree Canopy with the recommended soil volume will capture over 1.2 million gallons of runoff per acre per year on average. This is estimated to result in approximately 886,000 gallons of CSO reduction per acre per year.

The above analysis shows the stormwater management connection to the tree canopy goal and demonstrates that green infrastructure can have manageable and quantifiable benefits to CSO overflows. The results are scalable across the CSO portion of the study area. For example, if 10 acres implement a 40% canopy goal with the appropriate soil volume, then the benefits are essentially 10 times greater. If 100 acres implement the 40% canopy goal, the benefits increase 100-fold.

Regulatory Conditions

Regulatory barriers can often impede green infrastructure implementation. Until recently, Allegheny County Plumbing, Building, and Drainage Codes (Chapter 11) did not recognize best management practices or green infrastructure as a method for stormwater drainage. The Allegheny County Health Department no longer requires connection to the public system, although this is not fully embraced as a standard agency practice.

A cursory review of the codes, regulations, and guidelines found within the City of Pittsburgh, County of Allegheny, Pittsburgh Water and Sewer Authority (PWSA), and Allegheny County Sanitary Authority (ALCOSAN), provided the following list of potential conflicts to immediate green infrastructure implementation in the Allegheny Riverfront Vision Area. For example, the County Health Department requires all stormwater lines be connected to a public system, whether it be combined or not, meaning that roof drainage lines cannot be disconnected and diverted to green infrastructure.

Pittsburgh Water and Sewer Authority (PWSA)

- PWSA Procedures Manual for Developers, February 2006
- PWSA Rules and Regulations
  - Section XV – Sewers – Usage and Connections
  - Section XVI – Pittsburgh Code Provision

City of Pittsburgh Department of Public Works (DPW)

- DPW Policy and Procedures for Work within the City Right-of-Way, February 2007
- Bureau of Transportation and Engineering regulations

City of Pittsburgh Code of Ordinances

Cursory review of City Codes, including:

- Title IV, Article I: Streets and Sidewalks
- Title IV, Article III: Sewers
- Title IV, Article XIII: Trees
- Title V, Land Operations Control and Stormwater Management
- Title X, Article III Overlay Districts
- Title IX, Article VI: Development Standards

Allegheny County Health Department Environmental Regulations

- Article 15, Plumbing and Building Drainage
    - Chapter 11: Storm Drainage

The Next Steps section of the Vision Plan calls for a detailed review of regulatory barriers to green infrastructure implementation.

Ecological Principles

The natural system of land and water that forms the waterfront ecology is bound together by three elements: rain, soil which holds the rain, and the vegetation that returns the rain to the atmosphere. Without any one component, the system fails to sustain life as we know it. Recognizing that a healthy ecological system is essential not only to our own health, but also to our prosperity and cultural development, it is an essential goal of developing the Vision Area.

1. Restore the hydrologic cycle by capturing stormwater from all 1" or less storm events

CSO sewage dumped into the Allegheny River with every rainfall flows downstream and ultimately harms those communities, large and small, who draw their water from the Ohio and other river systems that the Allegheny River feeds. This CSO overflow/water quality issue is the single greatest environmental issue facing the Pittsburgh region, and has no easy solution. This Vision Plan seeks to begin a process of change that could serve as a model for the Pittsburgh community: restore the hydrologic cycle and keep the rain out of the sewer system. This can be achieved when we capture and hold the 1" storm on-site with every new and redevelopment opportunity. If every project infiltrates, evapo-transpires, or captures/reuses the initial 1" of rainfall from the Vision Area, the issue of peak timing is mitigated by this volume control strategy.

2. Rebuild a healthy and functional tree canopy

Trees are powerful "machines" we need to put to work—the Vision Plan seeks to create a habitat that humans will live and work in during the next century that is healthy, safe, and sustainable – a Green City. The 40% canopy goal is based on the best science available required to restore air quality, reduce CO2, sustain the hydrologic balance, and provide a long list of amenities for humans that are difficult to quantify but are obvious to most of us. A Green City is just a much nicer place to live and work. Given the existing impervious footprint, the major opportunity for this new/old tree canopy is along the river's edge.

3. Create a riverfront riparian buffer along the Allegheny River

Creating a riverfront riparian buffer is directly interrelated with the canopy goal, because it is the portion of the Allegheny Riverfront that offers the greatest opportunity to re-establish tree cover in significant and continuous areas. No matter how much of the Allegheny Riverfront Area is available to rebuild over the next century, the existing residential communities will most likely remain intact, and while we may build street tree corridors and rain gardens in selected locations, the bulk of

available undeveloped land is along the riverfront. A 200' wide buffer is required to reintroduce the habitat necessary to support the return of such valuable ecology and wildlife.

The river's edge is the last opportunity to cleanse and infiltrate stormwater before it enters our source of drinking water. The list of who drinks the CSO sewage dumped into the Allegheny River with every rainfall is comprised of many communities, large and small, who draw their water from the Ohio and subsequently the Mississippi, all the way to the Big Easy. It is the single greatest environmental issue facing the Pittsburgh region, with no easy solution, but we have to start by not overloading our sewage system with almost-clean water.

4. Transform the AVRR corridor into a green corridor

The existing AVRR right-of-way has the opportunity to become a green space. The form and dimensions of this corridor will vary, depending on the existing structures that remain or are redeveloped, but the basic design elements should be consistent with the larger pattern of new vegetation throughout the riverfront.

5. Create a network of green streets and alleys

Seek to reduce overall imperviousness and encourage streets to be no wider than necessary to move traffic effectively. Construct driveways and parking spaces with pervious systems, revamp local street specifications to allow context-sensitive street design with narrower travel lanes without curb and gutter systems. Green infrastructure retrofit standards for streets and alleyways need to be adopted as public policies that require green infrastructure elements as standard roadway construction and retrofits.

6. Provide requirements and incentives for green infrastructure for stormwater management

Green infrastructure practices should be credited towards required controls for stormwater runoff. Legalize all types of green infrastructure, particularly for the use of water harvesting devices and downspout disconnection, including allowing clean roof drainage to enter the river directly. Where not possible, establish a payment-in-lieu fee for off-site stormwater management facilities. Technical specifications and design templates should be prepared for green infrastructure stormwater management techniques for land development retrofit.

Connections Framework

The Allegheny Riverfront Area's connections reflect the lineal nature of the physical environment with good connections in the east-west direction, particularly between the Strip District and Downtown, but poor connections between local residential areas, access to the riverfront, and between the Allegheny Riverfront and Oakland. The Connections Framework identifies a series of structural changes to overcome the grid's obstacles with new transit and pedestrian possibilities, classifying streets by preferred movement types, and introduces parking strategies to enhance business needs. It also suggests short- and long-term strategies to help resolve truck conflicts.

Smart growth concepts are applied to the movement of people and goods. Plans for transportation conditions moving into the future reflect a strategy that is less reliant on automobiles, incorporating more public transit use, bicycle use, and pedestrian access. Redundant street connections are needed so that traffic is not dependent on single pathway. Alternative travel pathways for trucks are identified and promoted for commercial truck traffic, resulting in improved travel conditions for the other modes of travel, i.e. public transit, bicycles, pedestrians and private passenger vehicles.

The mix of optimal transportation conditions vary throughout the study area. For example, in the Strip District the movement of vehicles is a two-edged sword: detrimental to the urban character that people want to see in the Strip District (pedestrian and bike friendly), but beneficial in that cars are necessary to infuse life into the street and business activity. Truck traffic is essential in this

area, but needs to be accommodated in a way that will not preclude the safe and easy movement of pedestrians, bicycles and passenger vehicles. In addition, vehicular traffic in the Strip District should be calmed to create a more pedestrian friendly environment.

Connections to the south and east are critical to the development of the Allegheny Riverfront. In order to maximize its possibilities, the study area must be well connected to the thriving areas of Oakland and Downtown.

Movement of Goods

Trucks and Truck Management

The Strip District strategy (11th to 40th Streets) for trucks acknowledges that accommodation of truck traffic in and through this area is vital to the survival of many of the local businesses in the Strip District. Trucks will access this area via the 16th Street and 31st Street Bridges and the 10th Street Bypass and are encouraged to use Smallman Street from 11th Street to 40th Street. To that end, an extension of Smallman Street to 40th Street with right-in/right-out access onto the 40th Street Bridge for circulation by truck and by trolley is proposed as part of the improvement program.

The Lawrenceville strategy (40th Street and to the east) for trucks acknowledges that this area is much more residential in character and should be protected as much as possible from heavy truck traffic. Trucks should be removed from Butler Street where possible.

Truck removals are likely to take the form of relocation of truck facilities to the east to the Tippins International site at the 62nd Street Bridge, where truck loads would be broken down into single-unit or "city-size" trucks. These city-size trucks would still be predominantly on Butler Street, but would present much less of a congestion problem due to their reduced number and size. The use of city-size trucks would also increase the ability to use narrow side streets that are virtually unusable by tractor trailer trucks (WB-67s or WB-50s). A long-term goal would be to eliminate tractor trailer trucks from using the roadways within the Allegheny Riverfront, with truck traffic limited to city-size trucks. Over time the relocation of truck terminals and truck-intensive businesses from the Strip District and Lawrenceville to the Tippins International site and other distribution sites nearby or across the river will help this change to city-size trucks occur naturally.

A new east-west connection using existing streets, without widening of roadways, removal of residential on-street parking, removal of buildings, etc. does not appear to be feasible as an alternative to the use of Smallman and Butler Streets.

Movement of People

People-oriented movement streets encourage transit, bicycle, and pedestrian traffic. Recommended people movement streets are Penn Avenue, Butler Street, and Railroad Street (the paved AVRR right-of-way from 33rd Street to 21st Street and the street's proposed extension to 11th Street). In the future, the entire AVRR/Railroad Street corridor could be developed as a complete street to encourage pedestrian, trail, and transit uses by giving them priority over autos and trucks.

People movement streets emphasize pedestrian infrastructure improvements, designated bicycle lanes, and green stormwater improvements. Where transit is located, bus/trolley station stops and pedestrian crossings need to be added. Bicycle facilities should also be added wherever possible to maximize intermodal opportunities.

Transit

The Allegheny Riverfront's stakeholders expressed their desire for an amenity-based lifestyle where quality of life is a high priority for individuals and families. To that end, transit infrastructure in the Allegheny Riverfront needs to be developed and integrated as a foundation that contributes to the urban lifestyle and strengthens investment and value in the community. The

overriding role and function of transit is to support this objective by complementing the economic and social regeneration of the area.

Transit in the Allegheny Riverfront consists of buses, which are part of the overall County-wide bus system that focuses primarily on travel to and from downtown Pittsburgh. Under this condition about 10 percent of the County population rides transit, a statistic that is a little higher for areas east of the city that have better transit services. Connections recommendations are based on creating scenarios in which people will be less reliant on automobiles and encouraged to use transit at a rate higher than the metric. As a result, recommendations focus primarily on increasing the prominence of transit in the Allegheny Riverfront and enhancing connections to economic activity centers other than downtown Pittsburgh, primarily Oakland.

Bus

Even though bus service from the Allegheny Riverfront to Downtown is among of the best in the region, it lacks north south cross connections. It is recommended that a balance between east west and north south transit connections is reached by implementing new bus services. The most essential of those north south connections is a link between Lawrenceville and Oakland, considered a key economic driver by many local government officials. To that end, Route 93 Lawrenceville-Oakland is a north south connection developed by PAAC but not yet implemented. Community officials should encourage PAAC to consider this route a priority in the agency's next round of service changes. This north south bus connection could serve as the first phase of linking Lawrenceville and Oakland permanently, with subsequent phases considering a fixed guideway alternative. The increase of cross connecting routes will help to create activity centers within the Allegheny Riverfront at locations where north south transit routes interface with east west routes.

Commuter Rail

The implementation of a commuter rail line from Westmoreland County to Pittsburgh utilizing the AVRR right-of-way could be significant to the Allegheny Riverfront. This line, if achieved, could provide the foundation of a regional rail system and Lawrenceville could serve as major transfer center and multi-modal hub. Efforts to advance the line are preliminary but at a good point for Allegheny Riverfront officials to form partnerships with the public and private entities that are advancing the commuter rail line initiative. Lawrenceville, because of its strategic location at the convergence of AVRR's rail lines at 33rd Street, should be positioned as a key station and cross connection center. Being involved in planning at the initial stages will ensure that the commuter line, its stations, and amenities are integrated commensurately with the Allegheny Riverfront's vision and development plans. That way, the commuter rail line will become an asset to the community rather than a barrier or a pass through like the East Busway.

Because the notion of a commuter rail line is preliminary, further study should be conducted to determine the most appropriate alignment between the Allegheny Riverfront and Downtown and the ways best to integrate the line into Allegheny Riverfront development and other modal movements.

Urban Circulator

The primary recommendation for transit in the Allegheny Riverfront is to establish an urban circulator system unique to the Strip District and the kinds of activities that occur there. A circulator system is a closed trolley (streetcar) loop serving a specific area. The overarching objective of this initiative is to encourage the use of a "people mover" mode and lessen reliance on automobile use within the Strip. The circulator should work well in the Strip District, an area that is heavily pedestrian and exhibits a demand for high frequency service, short trips, and frequent stops.

The urban circulator can be designed to serve all of the Strip District's constituencies. Residents of the Strip District that work in Downtown will be able to use the circulator as a commuting option. Visitors to the Strip District will be able to park their cars at a convenient location and use the circulator to make short "block hopping" trips within the District. Residents east of

the Strip District in Lawrenceville will be able access the circulator by walking to a stop or transferring from another bus route for a seamless and short ride into the District. And pedestrians and riders that pedal into the Strip District will be able to board the circulator at accessible and safe locations that are designed to interface appropriately with these modes.

An alignment from Downtown to 40th Street can serve as the urban circulator's first phase with the opportunity for subsequent phases that could link it with a cross connection to Oakland and extend the route farther east into Lawrenceville.

Although circulator systems can be achieved utilizing any of several different public transportation modes, the most popular mode – the trolley or streetcar - should be seriously considered for the urban circulator. National studies show that fixed rail alignments attract up to 40 percent more riders than busses. Trolleys are making a resurgence all over the country as evidenced by new projects either underway or planned in Madison, Detroit, Sacramento, Atlanta, and Boston. Like these cities, the Strip District is highly conducive to the implementation of a trolley circulator:

- The Strip District attracts tourists and occasional visitors, customers that are highly inclined to ride streetcars.
- The Strip is heavily pedestrian, the kind of environment that coincides with likely streetcar ridership.
- Visitors to the Strip District make short trips, moving in and out of stores every few blocks.
- Activity in the Strip District is bi-directional rather than in a single direction like a commuter rail service.
- The District has a variety of markets, demographics, and types of users.
- There is the opportunity to integrate the trolley with a broader network of transit services like PAAC's bus routes in the Allegheny Riverfront, the Light Rail Transit system in downtown Pittsburgh, the potential AVRR commuter rail line, and with bicycle and pedestrian networks throughout the Allegheny Riverfront.
- The geography is relatively flat with minimal turns and curvature movements.

Cities that have implemented urban circulators cite a variety of benefits that are unique to this particular mode. Private developers seem to be more interested in making investments in properties located in proximity to trolley lines. According to reports from the Portland project, their streetcar system has produced more than $3-billion in economic development, supporting the theory that initial public investment leverages private interest. Property values, according to information from the Portland system, increased about 40 percent along the circulator's route. This mode helps to alleviate traffic congestion because the circulator attracts more "choice" riders, getting people out of their cars and thereby exceeding the metric of "regular" transit ridership in most cases.

Perhaps as an initial stage, an alternative to the fixed rail trolley is a rubber tired bus-type system working as a "trolley system" to test feasibility of the longer-term fixed rail system. Utilizing a rubber-tired or shuttle bus is the fastest method because it requires the least capital investment and is a cost effective approach. The shuttle service could be operated by PAAC, the local transit agency, or it could be operated by a private entity if approved by PAAC. Usually these buses are small transit vehicles (STVs) that are branded with a logo and wrapped with a design unique to the District. The bus circulators, however, are not particularly attractive to riders.

Automobile

A major transportation goal for the Allegheny Riverfront will be to facilitate a paradigm shift away from automobile transportation to alternative modes of transportation including train, public transit (bus), trolley, bicycle, water taxi, and walking. Enhanced treatment of these other (non-auto) travel modes to increase their attractiveness, ease of use, and practicality will serve to increase their usage while decreasing the need for the automobile. This will improve the "human" experience of the Allegheny Riverfront and reinforce its unique character.

However, as a practical matter, autos will still need to be accommodated for shopping/dining/entertainment venues in the study area. In addition, automobiles will need to be accommodated as part of any residential development in the Allegheny

Riverfront in order to make the units marketable, although *less* parking than is typically included in such developments could be provided since there will be multiple alternative transportation methods available. For certain groups of potential residents of the area, the ability to live and work without needing to own an automobile will be extremely attractive.

Bicycle

On-street exclusive bike lanes are recommended for lower speed collectors such as Penn Avenue, while Share the Road signage and shared lanes are recommended for the arterials in the area. Bicycle routes should coincide with the routes being developed as part of the Department of City Planning's citywide bicycle study.

Bicycle facilities should include access to the system of trails proposed for the Allegheny Riverfront and connection to the regional bicycle trail system. Bicycle facilities must also accommodate transportation related to commuting and access to various city facilities such as shopping, entertainment, parks, and other destinations. These transportation needs will be met through appropriate designation, painting and signage of exclusive bike lanes and shared bike lanes. Bicycle movements will be most easily accommodated on the streets that will also be pedestrian-movement oriented, that is, Penn Avenue and Railroad Street.

Pedestrian

Pedestrian conditions that provide safe and efficient movement within the study area for residents, employees and visitors/patrons of the area are the goals for pedestrian movement. Pedestrian connections to the river should be enhanced with safety features provided, particularly at points of contact with heavy traffic and at the railroad crossings.

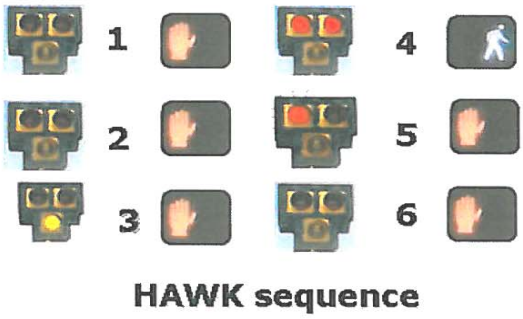
Pedestrian access into/out of parking garages should be on side streets with first floor retail and/or commercial uses linking them as they walk to the pedestrian-oriented streets, so pedestrians do not feel they are in a "nowhere place" for a block or two. The connecting streets should be lively and interesting and lead one down to Penn Avenue and then on down to the river in a pleasing and interesting way. Adequate lighting of streets and sidewalks, as well as other street furniture amenities, will enhance the pedestrian experience between garage locations and pedestrian destinations. A program of pedestrian-oriented destination signage is also highly desirable.

Pedestrian safety improvements should be provided at both signalized and unsignalized intersections. These improvements should be implemented as a program of improvements, which would be phased in over time as development and infrastructure changes are made. Sidewalks of sufficient width and street lights provide enhanced pedestrian conditions.

At intersections that are already signalized or at locations of new traffic signals that are installed, pedestrian amenities should be included, such as pedestrian countdown signals and audible traffic signals that assist vision-impaired individuals. It will be particularly important to install these improvements at signalized intersections along the pedestrian-oriented streets such as Penn Avenue and Railroad Street.

At unsignalized intersections that are anticipated to experience high pedestrian volumes, such as those streets that provide access to the river, additional pedestrian crosswalk treatments should be provided. These measures include the installation of curb extensions, also known as bump-outs, which reduce pedestrian crossing distances and provide safety amenities. Bump-outs are also appropriate at bus and streetcar stops when they are at least 15' wide. Textured crosswalks also provide a means to call the attention of motorists to the crosswalks and presence of pedestrians. Another option that is useful in high pedestrian locations which do not warrant standard traffic signal installation, but require more traffic control than simply a crosswalk, is the installation of a HAWK signal. This is a pedestrian-activated signal which stops traffic on the street only when a pedestrian has called for the crossing phase.

HAWK Pedestrian Signal



HAWK sequence

HAWK is an acronym for **H**igh intensity **A**ctivated cross**W**al**K**.

HAWK signals have been in use in Tucson, Arizona for over five years and are included in the new Federal Highway Administration Manual on Uniform Traffic Control Devices.

The HAWK signal will stay dark until a pedestrian pushes the button. Once pushed the signal turns on a flashing yellow indication to inform motorists to slow down and stop. The signal then displays the WALK indication for pedestrians and a double RED light for the motorists. The signal will proceed to an alternating RED indication during the flashing DON'T WALK interval, allowing motorists to proceed if a pedestrian is not present in the crosswalk. The signal finally goes dark again until the push button is pressed by other pedestrians.

Trails

A robust public trail system is strongly recommended throughout the Allegheny Riverfront. The long-term objective should be a continuous trail along the riverfront from Downtown to the city line and beyond on both sides of the river. While now fragmented, the riverfront trail on the south bank can be supplemented with a continuous inboard trail system that utilizes public streets to make the connections. Eventually the trail will be part of the riparian buffer and linked with the AVRR corridor and a system of green streets throughout the riverfront communities. Similarly, the existing riverfront trail on the north bank will be further improved as riverfront development occurs.

The riverfront trail in the Allegheny Riverfront is not conceived as a single trail along the banks of the river, but a trail network system serving riverfront communities on both sides of the river. On the south bank the proposed trail network would consist of the riverfront trail, an improved AVRR/Railroad Street corridor, Penn Avenue and Butler Street, and designated perpendicular green streets that interconnect with these green linear seams. Since sections of the riverfront trail will be installed at different times, the

idea of a trail network is to provide alternate trail routes when segments are blocked as well as provide alternate choices to its users who would like to take different paths. The network would act like a series of interconnected loops within the Strip District and Lawrenceville that is connected to the trail system along the north bank.

Riverfront Trail

The riverfront trail should be a continuous extension of the Three Rivers Park trail system along both sides of the Allegheny River to the city line as a walking, jogging, bicycle, and rollerblading trail, with accommodations for overlooks and sitting. In its more urban locations, integrating the trail with assembly spaces, water and other features, and sidewalk cafes and concessions will expand its appeal.

AVRR Corridor and Trail

If the AVRR right-of-way and Railroad Street, including its extension, can be converted for public use, there is space for a walking trail/sidewalk system and a separate bicycle and rollerblade trail. This is conceived as a sun-lit and tree-shaded pathway along the right-of-way's northern side, with vehicle lanes and the railroad on the southern portion.

Streets as Extensions of the Trail System

Designated green streets would serve as extensions of the public trail connecting the riverfront trail to the AVRR/Railroad Street corridor. These side street extensions will allow trail users to switch over to either public trail or to designated bicycle lanes along Penn Avenue and Butler Street.

Pathways through Riverfront Properties

The Riverlife Design Guidelines require public-accessible pathways across private property to a public street when exits off the riverfront trail are more than 300' apart. Their purpose is to provide safe exits from the trail and designed as pedestrian and bicycle friendly. These guidelines should also be applicable throughout the Allegheny Riverfront.

Streets

Complete Streets

Streets serve many functions beyond conveying vehicles from one point to another. They are locations for utilities, both below the pavement and overhead on poles. They serve as temporary surface parking lots. They contribute to the ecological well-being of communities with street trees and landscaping and provide directions and other way-finding information. They are also places for social interaction and can be places of architectural or urban significance that contribute to the identity and character of a neighborhood or community.

Realizing their contribution, designers and planners have identified "complete," or smart, streets as best practice and smart growth examples where streets perform multiple functions and holistically benefit the community. Complete streets can contain public transit, auto and truck traffic, sidewalks, a public trail, bicycle lane(s), landscaping and street trees, curb extensions, and pervious surfaces including pervious concrete systems for parking lanes, safe lighting, and way-finding signage. In other words, they combine all types of public transportation with an ecologically- and pedestrian-sensitive agenda. They significantly contribute to creating a pedestrian friendly and walkable urban setting.

Proposed east-west complete streets in the Allegheny Riverfront include the AVRR/Railroad Street corridor, Penn Avenue through the Strip District, and Butler Street through Lawrenceville. Complete streets also include the perpendicular green streets identified in the Ecology Framework because of their stormwater management improvements.

Roadway Network

A classified roadway hierarchy is strongly recommended for streets within the Allegheny Riverfront. As shown, the street system breaks down into three basic categories of roadways: arterials that move large volumes of traffic through the area; collectors which gather traffic from local roads within the area; and local roadways. The arterial roadways include Liberty Avenue, Penn Avenue, Butler Street, Route 28, and numerous bridges across the Allegheny River.

Typically, truck traffic originating outside the Allegheny Riverfront or destined for other places will move along arterials, which are designated to prioritize through movements. Trucks use collectors and local roads, which tend to move more slowly and experience more movement interference, in order to enter/exit truck facilities and make local deliveries. Collector and local streets provide connections between local land uses and other destinations, both in the study area and further away.

Street Types

Street types should be prioritized by function, not by width. The following priorities for street use are recommended:

- Liberty Avenue — Arterial: Autos, trucks, and bus transit
- Penn Avenue/Butler Street — Arterial/Complete Street: Pedestrians, bicycles, trolley and bus transit, with autos
- Smallman Street — Arterial: Autos, trucks, trolley and bus transit
- Railroad Street/AVRR right-of-way — Collector/Complete Street: Pedestrians, bicycles, commuter rail from 26th Street east, with autos and trucks

Smallman Street and Other Major Street Extensions

Extending Smallman Street east from the present terminus would serve to connect Smallman Street with Butler Street at 40th Street. This connection would keep traffic from migrating to Penn Avenue and/or Liberty Avenue between 31st and 38th Streets to then access Butler Street. Railroad Street should be extended from 21st Street to 11th Street. This extension would serve as the spine street through new mixed use and commercial development recommended for this portion of the Buncher properties. Extending Herron Avenue across Liberty to Penn Avenue just below Doughboy Square will help relieve the confusion of Lawrenceville access from the Liberty/Herron intersection and provide new access between Polish Hill, Bigelow Boulevard, and Lawrence. With this change, 34th Street could be closed and improved as a public park or developed with new structures.

Parking

Structured parking for shared uses like retail, commercial uses, and evening entertainment venues should be considered a priority. Shared parking is *not* a natural pairing with residential parking, since residential parking needs to be available 24/7 in order to make the units marketable. Some spaces could be reduced if bicycle parking facilities are provided per the latest amendment to the zoning ordinance.

Parking Strategy

The parking strategy should follow other infrastructure implementations as it is related to new transit service and the impact of new development. Parking will be removed and replaced in concert with development projects, and as the number of parking facilities increases green street improvements can begin in parking lanes. However it should be noted that part of the parking strategy will be not to replace commuter parking in the study area. The Port Authority and/or others could get involved in developing outlying commuter lots with the addition of transit service in selected locations to connect with the Allegheny Riverfront. Parking garages should be viewed as an opportunity to create intermodal transportation centers for cars, trolleys, buses, pedestrians, bicycles, and trails.

Parking Systems

Parking should be considered as an essential amenity to serve new development in the Allegheny Riverfront corridor, as well as to address the needs of residences, businesses, and restaurants that are already located in the area. The sizable parcels of land in the Strip District that are currently used to provide low cost fringe parking for Downtown should be considered to be a resource; cheap parking could be relocated elsewhere. Satellite parking in an outlying area would not only make the desirable land in the 11th Street to 21st Street Strip District area available, but would also serve as regional intercept parking reducing the number of vehicles entering the Strip and Downtown and thereby reducing congestion. Reduced congestion will reduce automobile emissions and improve movement conditions for transit vehicles, streetcars, pedestrians, and bicyclists.

With respect to new Strip District development, structured parking could be provided for new uses to maximize usable land for development and green space between 11th Street and 21st Street. A satellite lot or lots with shuttle service could be provided in lieu of on-site parking, thereby creating land that could be better used. One possible exception to this policy would likely be the provision of on-site parking adequate to serve residential units within a development.

Parking Locations

It is recommended that parking facilities are located at the edges of destination sites. Locating parking on the fringes will satisfy two objectives: reserving properties in high activity areas for development opportunities and encouraging parking users to walk past retail and other establishments on their way to destinations, thereby increasing economic activity. Structured parking facilities are desired for high density areas whereas parking decks and surface lots should be placed in secondary locations. Consideration should be given to shared facilities, whether in commercial office, retail/restaurant, or residential areas.

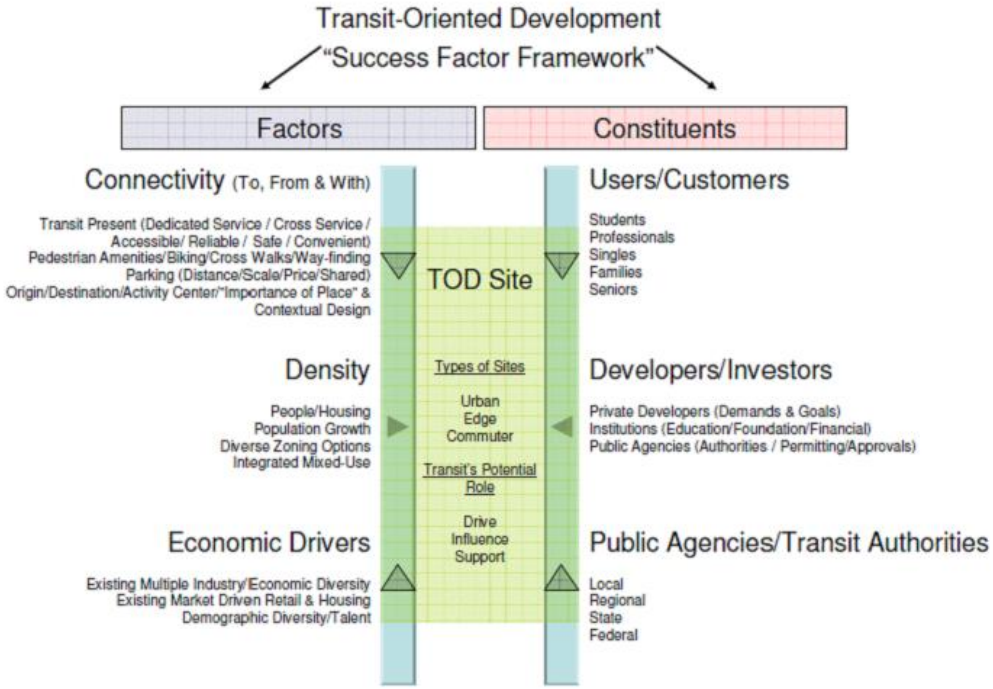
Transit Oriented Development

Multiple modes of transportation along with various land use mixes make the Allegheny Riverfront conducive to Transit Oriented Development (TOD). TOD is based on the principle of “life activity centers” which result from a mix of land uses including residential, retail, commercial, employment, transit, pedestrian, and parking.

When considering the area relative to the framework of successful TODs, the Strip District and the 40th Street Corridor in Lawrenceville exhibit the factors that are essential for transit oriented development. These areas have (or will have) various modes of transportation and the ability to improve cross connections to create more activity. The areas are densely populated with multiple and diverse zoning options facilitating a mix of land uses that are critical to TOD. There are local employers and connections to the region’s main economic employment center, downtown Pittsburgh. The potential to establish cross connections to the region’s second highest employment district, Oakland, also exists.

The Allegheny Riverfront has one of the most diverse customer and resident bases in the region with all demographic groups represented including students, professionals, families, and senior citizens. There has historically been public and private interest in the district as evidenced by the increase in residential development in the Strip District and housing and commercial reinvestment in Lawrenceville.

A study conducted for the Southwestern Pennsylvania Commission identified certain factors based on density that are critical to developing a successful TOD: connectivity, population, housing, employment, and zoning.



These factors along with ancillary features like a diverse user/customer base and public and private developer interest are present at both of these locations. It is therefore recommended that the advancement of development projects at these two key locations within the Allegheny Riverfront consider TOD.

Specific Roadway and Parking Improvements

Street Intersection Recommendations

Street intersection improvements recommended to be built over time to serve the changes in land use and activity within the Allegheny Riverfront in addition to those recently implemented include:

- Within the Strip District, the Smallman Street cross section is to be modified for improved pedestrian conditions, on-street parallel parking, and provision of a travel lane for the street cars. This will require lessening the wide cartway on Smallman Street between 16th Street and 21st Street. In addition, the intersection of Smallman Street and 21st Street should be evaluated for the installation of either a traffic signal with full pedestrian amenities or four-way stop sign control.
- At the easterly terminus of the Smallman Street extension, a right-in right-out intersection of Smallman Street on the 40th Street Bridge should be created, with stop control on the Smallman Street approach. Ideally, the Smallman Street approach should have the lanes separated by a concrete mountable curb channelization island.
- In the vicinity of the Tippins International site, access improvements along Butler Street should be made to accommodate automobile and truck traffic. These improvements should be developed as part of a detailed study of the site.

Parking Recommendations

Structured parking for shared retail, commercial use, evening venues, and others should be a primary goal in the provision of parking in the Allegheny Riverfront. In particular, there will be many opportunities in the Strip District for shared parking between daytime office/commercial uses and retail.

Based on minimum parking requirements for residential, office and retail, with reductions applied for transit usage, shared parking and bicycle facilities, the following number of required spaces would be needed:

- Strip District 2,291 to 2,921 spaces, total
  1,961 to 2,591 spaces
  Plus 330 lunch/shopper spaces
- Doughboy Square 895 to 969 spaces
- 40th Street/Butler Street Development 871 to 892 spaces

It is anticipated that this parking will be constructed gradually as the uses it will serve are constructed, with an emphasis on sharing reservoirs of parking to the maximum extent possible.

Parking Location Recommendations

See the figure indicating the developments and where parking should be placed, as shown in the Composite Additional Parking Diagram.

- Residential parking could be located underground in high density area or at grade in residential neighborhoods inside residential developments or courtyards, with access to this parking provided from side streets rather than main streets. This will serve to decrease the number of curb cuts on through streets, reducing vehicle/vehicle and vehicle/pedestrian conflicts.
- Satellite parking outside the study area is recommended as a replacement for the fringe commuter parking currently located in the Strip District.

Movement Principles

1. Introduce new commuter line and trolley services as alternatives to the automobile

A new multi-modal transit system will increase the Allegheny Riverfront Area's business and connections opportunities. Adding a light rail commuter line to the AVRR right-of-way and a new urban circulator trolley to the Vision Area's street system will have a profound transportation and economic impact, particularly in the Strip District. These connections to Downtown, with later extensions to Oakland, will position the Allegheny Riverfront as a major resource center and significant intermodal center of the region.

2. Prioritize the street system to facilitate either movement of goods or movement of people

Creating a movement hierarchy that clearly identifies those streets intended as connecting arterials will begin to sort truck traffic from everyday use of the local street system. The hierarchy identifies streets that prioritize pedestrian use and others that prioritize heavy vehicle use to coordinate intersection and other improvements that improve safety and walkability. Combined with the recommended framework of green streets, the Allegheny Riverfront Area will benefit from better traffic flow and a more attractive public realm.

3. Design bicycle and pedestrian paths integral with trails and rights-of-way

Anticipating the long-term implementation of a continuous trail system along the riverfront, a proposed trail network utilizes completed sections of the riverfront trail, the AVRR/Railroad Street corridor, and perpendicular green streets that link them. The result would be a loop network system that provides users with short-term excursions or a day trip that covers all of the Allegheny Riverfront Area. Integrating bicycle and pedestrian paths into the Allegheny Riverfront Area's street system connects users and visitors to centers of these riverfront communities.

4. Create shared parking facilities to support retailing and development

As an efficient use of land and resources, the proposed parking strategy recommends placing large parking facilities at development edges so that people will walk to destinations, rather than encourage parking within individual structures. The goal is to pool resources for mutual benefit. Shared residential parking on the fringes of residential neighborhoods and smaller shared community lots within residential blocks will help lessen the impact of increased residential density as well as more families with multiple cars. On-site residential parking below occupied structures is recommended, while waiving on-site parking requirements is suggested for most high density commercial development. Shared facilities are preferred over on-site parking for all uses.

5. Limit trucking-oriented land uses and eventually regulate truck size in neighborhoods

The proposed street system movement hierarchy will begin to sort vehicles and increase flows over the near term, but at some point regulating large truck traffic (semi-trucks) in dense urban settings will be needed. As other cities have already found, two-axle delivery vehicles are more appropriate. Likewise, City zoning regulations should consider limiting trucking-oriented land uses in locations where new and higher density job-producing and residential development is contemplated.

Market Framework

To know where you're going, you have to know where you've been. That means that while markets can change, what they are changing from will influence the scale, pace, and style of development. You can take a nearly abandoned low-income district and turn it into a high value destination if you have enough time, money, and luck—the reverse can also happen. But there is another dimension to the stickiness of markets and places. It is authenticity. People gravitate to places that feel authentic, but it is unfortunately difficult for new development to create a sense of authenticity, such as the South Side Works.

The Allegheny Riverfront is one of the last of the authentically cool neighborhoods in the City of Pittsburgh to be a focus for development. Unlike other areas that have been recently redeveloped like the South Side Works, Pittsburgh Technology Center, or Washington's Landing, the area along the Allegheny Riverfront has not been abandoned. It is an active, mixed use district. The Allegheny Riverfront is also different from other developments, such as East Side, that were repairing the mistakes of prior redevelopment efforts. All of these experiences need to guide the vision and implementation for the Allegheny Riverfront in order to maintain the authenticity that sets this riverfront apart and to enhance the native vibrancy of its communities.

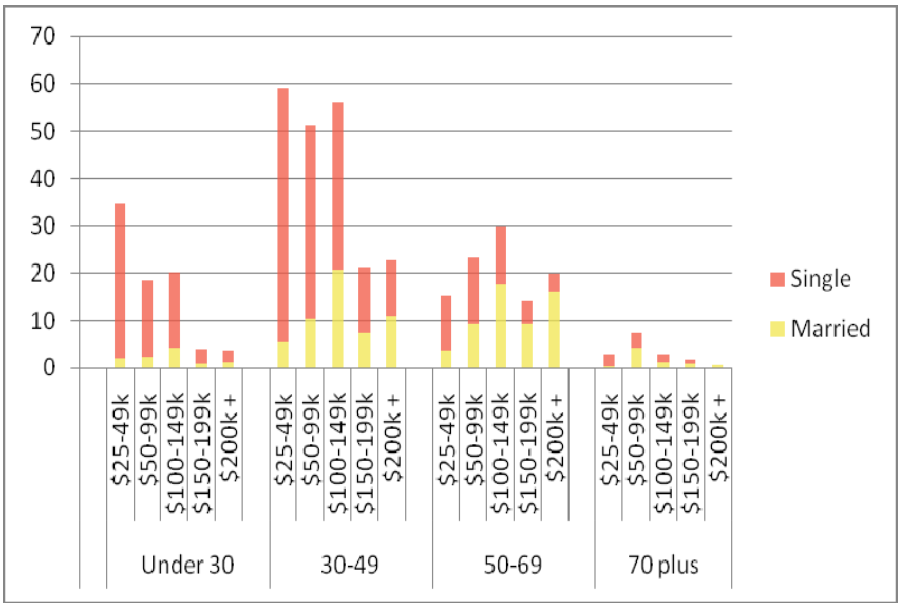
From a market perspective, the future of the Allegheny Riverfront is closely tied to the ever evolving innovation economy in the region. Institutional growth and the lack of developable real estate in Oakland have created spillover development pressures that are fueling growth and speculation in the contiguous neighborhoods (Uptown, Second Avenue, Hazelwood, Greenfield, Regent Square, and East Liberty), which in many cases is bypassing the traditional higher cost Oakland spillovers of Squirrel Hill and Shadyside. Other than Children's Hospital, which is a significant exception, the institutional growth is more likely to be channeled to the Second Avenue Corridor and the Baum/Center Corridor. The National Robotics Engineering Consortium is also located in the Allegheny Riverfront, but it might make more sense on the larger Almono site in Hazelwood where there is more space for testing autonomous vehicles and robots without interfering with residents and businesses.

The opportunity for the Allegheny Riverfront is to capture spillovers from university-related startups and innovation enterprises and the entrepreneurs and professionals who are creating them. Most of the undergraduate and graduate student housing will most likely continue to filter into Oakland, Squirrel Hill, Shadyside, East Liberty, the South Side, and Uptown. After college many of these former students aren't ready, willing, or able to buy a home or settle down in the more staid, suburbanesque East End communities and they still desire to be close to Oakland. South Side has captured some of the spillover recently, but this growth will always be limited by the rivers and bridges that cut off the South Side from Oakland. If Lawrenceville had more fluid and direct transit and transportation connections to Oakland, it would create a formidable third leg in an expanded Golden Triangle – Downtown, Oakland and the Allegheny Riverfront.

The Allegheny Riverfront also has the kind of housing mix to appeal to an urban-oriented professional class that is looking for apartments, lofts, condos, or small houses in a walkable and vibrant community.

Approximately 825 households move into Allegheny County in an average year although the number ranges from 90 to 1,600. More than 300 of those households move into the City of Pittsburgh. For most of the past 50 years, these new residents have been offset by a larger outflow of existing residents. New data for 2008 and 2009 show that the region (not the city) had a net gain of more than 1,100 residents. There is a market opportunity to capture more of the new residents moving into the region, which we can expect to at least average 300 households per year, but if the positive migration trend continues that number could be as high as 600 households. There is a larger market of households moving into the city from within the region, but Pittsburgh's focus has been on building the region.

The core population attracted to the City are generally singles aged 30-49 who make $25,000 to $99,000 per year and married couples aged 30-49 making $100,000 to $150,000. The Allegheny Riverfront provides an ideal place for singles and couples without children to find an urban style live-work-play community.



Integrating Business and Residents

In the study area, only 3% of the jobs are held by Allegheny Riverfront residents. Another way to look at it is that only one out of every 55 Allegheny Riverfront residents works and lives in the Allegheny Riverfront. In fact, there is only one Pittsburgh resident working in the Allegheny Riverfront for every three non-city residents. If the goal is to enhance job or live-work opportunities for area residents, there are three basic choices: (1) Bring in businesses that provide jobs for existing residents; (2) Create residential choices for workers currently employed in the Allegheny Riverfront; and (3) Import new resident-operators.

Profile of Jobs in the Allegheny Riverfront

Industry	Share of Jobs
Construction	8%
Manufacturing	8%
Wholesale Trade	12%
Retail Trade	8%
Transportation and Warehousing	7%

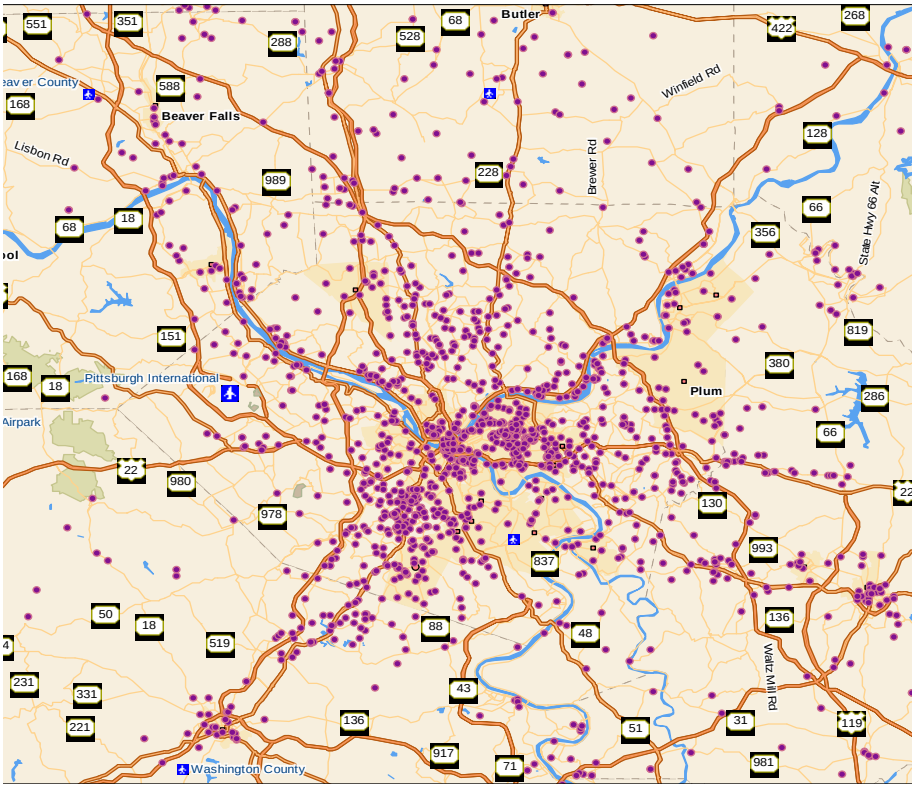
Information	3%
Finance and Insurance	7%
Real Estate and Rental and Leasing	2%
Professional, Scientific, and Technical Services	4%
Management of Companies and Enterprises	1%
Administration & Support, Waste Management and Remediation	3%
Educational Services	3%
Health Care and Social Assistance	20%
Arts, Entertainment, and Recreation	1%
Accommodation and Food Services	5%
Other Services (excluding Public Administration)	5%
Public Administration	2%

New Emerging Markets

Design Industry

Lawrenceville and the 16:62 Design Zone has developed a hub of design and creative industries with more than 75 firms ranging from architecture and design services to galleries and furniture stores. For the most part, there are at least 1,000 of these firms dispersed throughout Allegheny County with other small clusters around Mt. Lebanon, Downtown, the West End, and East Liberty. Lawrenceville's proximity to Oakland and to Downtown, as well as its potential to accommodate both design and production and offer live-work opportunities gives it advantages over the other competing locales.

Design Firm Locations in the Pittsburgh Area



Green Industry

The design and creative theme also merges well with green industries which are heavily design oriented. The emerging green industries in the region currently lack a geographic center. Part of the difficulty is that many firms in established industries are "greening" their products and processes, so the geography of this new industry reflects the current pattern of industrial location. The city has little in the way of sites to offer for larger, established firms, but it can create a core area for green startups.

The Allegheny Riverfront's proximity to Oakland, its proximity to the Connelly building under development by the Green Innovators, and the availability of mixed use space that includes industrial space offers numerous advantages for this emerging market. The ecological vision for the Allegheny Riverfront established in this plan means that these new firms would be able flourish and grow in a virtual laboratory for green products and services.

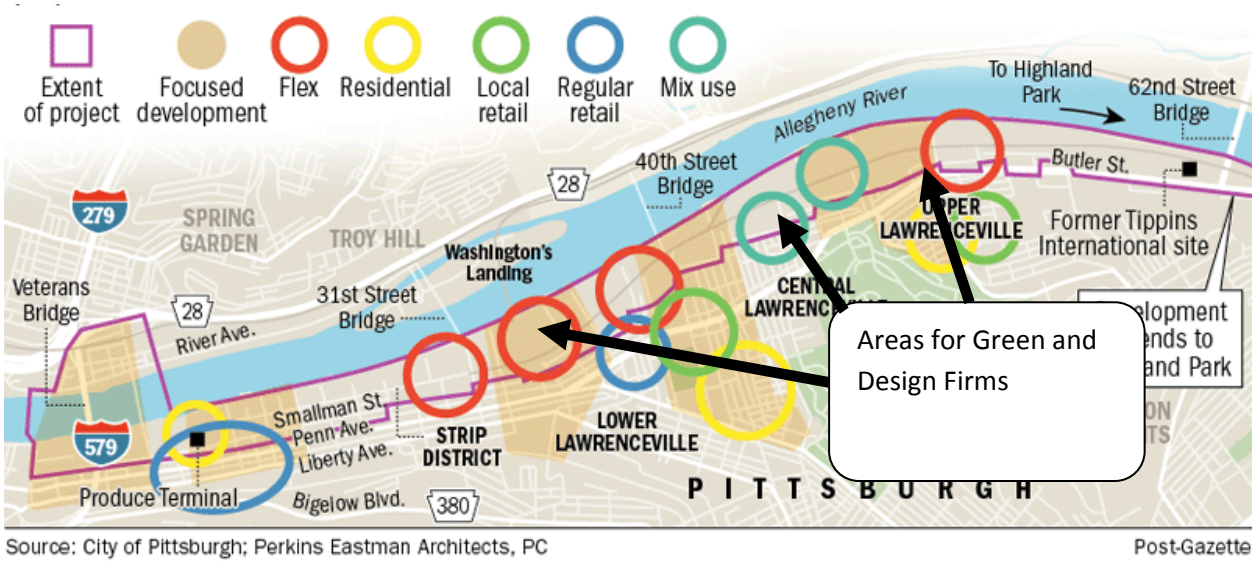
The Southwestern Pennsylvania Green Jobs Analysis and Action Plan estimated that the region has approximately 18,000 jobs in green industries that will grow to 29,500 by 2015.

	Green Jobs by 2015
Environmental Conservation	3,382
Green Products	6,259
Green Services	16,363
Renewable Energy	1,871
Grand Total	29,496

There are at least 20 occupations in which the demand will exceed the supply of individuals at the entry-level and mid-level occupational ranges for projected job opportunities between now and 2015. In addition, there are jobs such as sustainability coordinators that may be employed in industries that are not "green." There are an estimated 750 job openings in these "green occupations" each year, which would mean 3,750 of these workers from 2010 to 2015. The jobs in these green industries and occupations span a range of skills and education levels. One of the exciting elements of the growth of green jobs is the promise it holds for more equitable development and distribution of jobs.

The development of these jobs and industries can go hand in hand with the reinvigoration of the Allegheny Riverfront as a place to live, work, and shop. The infrastructure for walkability is already in place. With the addition of an ecological strategy to manage stormwater and reconnect the community to the rivers along with transit improvements to link the Allegheny Riverfront with Oakland and Downtown, the Allegheny Riverfront will provide a setting desired by these businesses.

It must be noted that the development of the Allegheny Riverfront as a center for design and green businesses is not a real estate-led activity. It requires focused business development activity to support the creation of new firms and expansion of existing firms, an activity for which the URA is not well equipped. Currently Innovation Works (IW) has a $10 Million fund for energy and green economy investments and has been working with the Green Building Alliance to integrate their Green Building Products Initiative with IW services and programs. Another critical actor in this area will be DSI Innovations and Three Rivers Clean Energy who are working with firms in the wind energy supply chain, primarily around drive trains and other aspects of production. Not all of these firms would be a good fit for the Allegheny Riverfront because of their space needs and shipping logistics, but some in the design and drive train portions could work. Innovation Works, The Green Building Products Initiative, DSI Innovations, and Three Rivers Clean Energy are the partners who could find them.

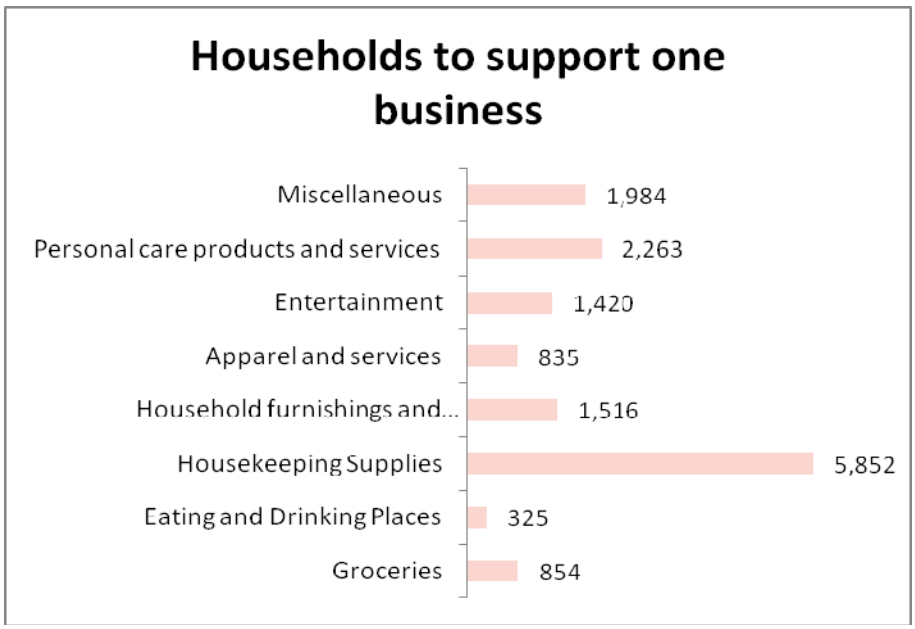


Source: City of Pittsburgh; Perkins Eastman Architects, PC

Post-Gazette

Meeting the Needs of Residents and Businesses

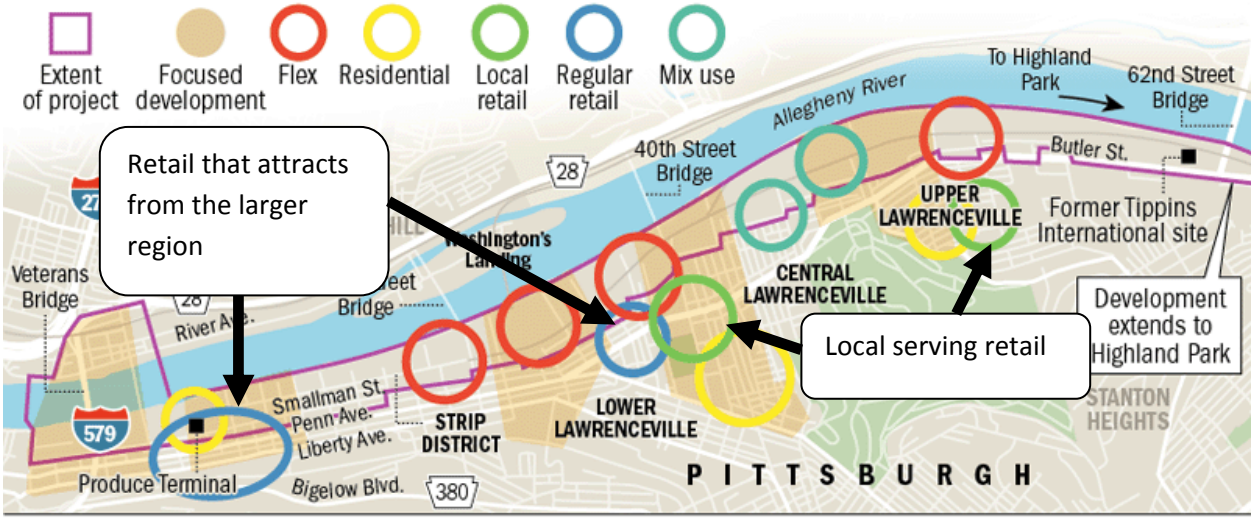
In almost every category, Pittsburgh as a whole has more retail activity than it needs to support its current residential base. Pittsburgh is a retail and consumer center for the region and it draws on and relies on consumers (commuters and tourists) coming in from outside the city. Retail in the city has been very successful in attracting those dollars – even though it has been losing some of its market share to suburban locations. What is true for the city as a whole is mostly true for its neighborhoods, except that you can find some neighborhoods that have specific gaps in their local services, or which are currently serving as regional retail and consumer hubs. Given the lack of significant retail service gaps, developers must carefully consider how a development will draw customers out of their existing shopping patterns that are based on current commuting or travel patterns, habit, or personal preferences.



As new developments increase the residential base or the local workforce, additional retail may be supported. The needs of specific businesses will vary in terms of the customer base and market capture they need to survive, but we can get some general targets based on average consumer expenditures and the sales of the average firm. For example, a new entertainment venue will need the annual spending of approximately 1,420 residents to sustain itself, while a restaurant may only require 325 households. Of course not every household spends all of its dollars in one place, but a business can also capture spending from workers and through traffic. However if a new development is not adding more than 325 households to an area, then any new restaurants added to that area will need to draw business from competitors.

Retailing is also undergoing fundamental changes that make it a difficult venture today. One trend is the rise of the all-purpose Big Box superstores typified by Wal-Mart that capture spending across a wide range of retail categories. Convenience stores attached to gas stations are no longer simply capturing impulse snack purchases but are offering more in the way of groceries and prepared foods. In clothing and apparel, the drive to superstores and online retailing is hurting traditional department stores and shopping malls. Specialized boutiques are surviving, although many of them are relying more on online sales, trunk sales, and other new retailing forms that are replacing traditional walk-in traffic.

The Strip District has a long history in wholesaling and there are many wholesalers who still call the Strip home. Wholesaling today has become a largely automated venture that is less and less suited to a location in the Strip District. Consumers Produce may be the only true wholesaler left. The rest are hybrid wholesale/retail operations. They may have a specialized focus or rely on a local customer base where they can tailor their services to the needs of the customer. Wholesaling as it is evolving will not remain in the Strip District, but that does not mean the hybrid firms already there cannot survive or even thrive. These firms are unique and cannot be treated like the new model of wholesaler, so it is critical to integrate these firms into the planning of their sites, whether the sites are new or existing locations.



Source: City of Pittsburgh; Perkins Eastman Architects, PC

Post-Gazette

Regional Draws

The Strip District is currently a regional draw and a unique experience that is authentically Pittsburgh. The Strip attracts a mix of bulk and basket shoppers. Bulk shoppers are occasional consumers that buy specific items on what may be a regular, but infrequent, basis (once per month or less). Basket shoppers are those who shop very frequently for daily or weekly needs. As the residential base in the area grows more of the demand is likely to come from basket shoppers.

The area around Butler Street in Lawrenceville is emerging as more of a regional draw with unique restaurants, bars, and theaters. This trend can be encouraged with the development of more flex space to bring in firms in design and the green economy and with the expansion of the local residential base.

The Pittsburgh Zoo is a regional attraction that draws a consistent audience throughout the year. Unfortunately, the Zoo contributes little to the economic health of the Allegheny Riverfront. Considering that zoo visitors usually make a half-day or full-day trip to the zoo, encouraging these visitors to also visit Butler Street restaurants and the Strip District marketplace could help build a stronger market for all regional Allegheny Riverfront destinations.

The riverfront can be an attractive location for new industry and residential development as it becomes more accessible and amenable to the general public. It would also be an attractive location for institutions, such as a university looking for an urban campus in a progressive setting. The NREC facility at 40th Street set a good example of combining educational and research & development activities with a highly-educated staff in a mixed-use neighborhood that benefits both the facility and the neighborhood. The riverfront would also be attractive to a Google or Microsoft interested in a campus setting with a riverfront trail and interesting local restaurants and attractions, similar to that foreseen by American Eagle at the South Side Works.

Development Opportunities

The Allegheny Riverfront is rife with vacant land in prime locations representing many development opportunities:

Strip District

The Lower and Middle Strip, with its abundance of vacant land under one ownership, is a prime location for creating a new place in the Strip District. The space between the Veterans Bridge and the 16th Street Bridge, on both sides of the river, has the potential to become a new destination center for the Strip that could compliment the historic market place on Penn Avenue. Likewise, the wide space in front of the Produce Terminal could develop into a public outdoor place that would extend the Penn Avenue pedestrian experience over another block and expand the historic marketplace into an identifiable "district" rather than a strip.

Tow Pound Site

The Tow Pound Site immediately west of the 31st Street Bridge is set between the water's edge and the AVRR right-of-way. It is almost two full city blocks in size and is easily accessible. Its riverfront location makes it an ideal location for an educational or research & development facility. Although not a prime residential location at the present time, as residential development creeps east from the Cork Factory it will not be long before the Tow Pound Site finds itself in the midst of this new residential neighborhood.

Doughboy Square/33rd Street Corridor

Linking the Iron City Brewery corner at Liberty and Herron to Doughboy Square will increase Lawrenceville's portal identity while acknowledging the historical path of the Busway ravine's watershed. It will also begin to link this inboard place to the riverfront. Conceiving the 33rd Street railroad trestle as "art" will distinguish this landmark.

40th Street Corridor

The landmarks along 40th Street; 40th Street's linkage to Bloomfield, Oakland, and Route 28; and the desire to link together the west and east sections of Butler Street's retail cores suggest that the intersection of 40th Street and Butler could become a new "civic center" of the Lawrenceville community. This crossing could extend in four directions and help link Lawrenceville to the river and communities beyond.

43rd to 48th Street Corridor

The Heppenstall Site is an ideal place for new residential development to integrate with the industrial fabric and begin to expand residential uses toward the riverfront. Creating a stronger public presence at the end of 43rd Street will help draw residents and the public to the riverfront. Recognizing the former stream linking the hillside cemetery site to the river with open space will visually extend the watershed and create a new neighborhood amenity. These improvements will help hasten the conversion of the Buncher flex building and 43rd Street Concrete along the riverfront into neighborhood uses such as new residences and open space along the riverfront.

Tippins International Site

The 22-acre former Tippins site at Butler and 62nd Street, now under planning as a distribution center, has the potential to redefine how new industrial buildings can be good stewards of the environment and make a positive contribution to the Regenerative Zone.

Market Principles

Market conditions in the Allegheny Riverfront Area reflect the city as a whole, yet there are new uses emerging that suggest potential new markets and development opportunities. Retailing in the Allegheny Riverfront Area has become more dependent on traffic from outside the local area and this has continued to grow despite the lack of a strong residential base to support local service needs. The Market Framework suggests increasing the residential base as a necessary component to the Allegheny Riverfront Area's sustainable future.

1. Increase the local residential population

Increasing the residential population is one of the most direct ways to support a more varied infrastructure of services and support and one of the most successful in building strong neighborhoods. In the long run, a stronger residential base in both the Strip District and Lawrenceville will benefit the Allegheny Riverfront Area with increased transit, development, and investment.

2. Encourage emerging innovation markets

With new opportunities emerging in the green and design fields, the Strip District and Lawrenceville are well-suited to capture and nurture a large share of these emerging industries. The building stock and mixed use nature of the Upper Strip and Lawrenceville, along with an industry infrastructure, are already in place for this happen. Partnering with the innovation-based economic development organizations in a concerted effort is a good near-term strategy while in the long term increasing the connectivity between Downtown and Oakland will help sustain and grow these emerging markets.

3. Create opportunities to support and expand existing markets

The retail and commercial market is growing slowly because of its reliance on outside visitors and abundance of adjacent Downtown space. However, the area's ability to continue to attract shoppers has reinforced its function as a retail destination that provides local benefits and enhances the Allegheny Riverfront Area's city and regional presence. Expanding the residential market will further support existing retail and commercial markets.

4. Increase the Allegheny Riverfront's regional draw

The Strip District is becoming more of a regional and tourist draw as more and more former wholesale businesses convert to hybrid firms also offering retailing services. Redeveloping the center of Lawrenceville by linking the retail activities of lower and upper Butler Street and installing a circulator trolley to 40th Street will transform the immediate area. This will begin to repurpose Lawrenceville's retail and commercial market that, in turn, will strengthen the area's draw as a good place to locate new industry, businesses, and residents.

5. Encourage land uses that strengthen economic development of the Allegheny Riverfront

As the Allegheny Riverfront Area evolves from a heavy industrial and wholesale economic base, the vacant and underutilized land and buildings provide opportunities for new markets, increased density, a higher quality of life, and an improved environment. Adopting an ecological agenda will reinforce the riverfront's attraction and begin to set a new direction for infrastructure and create a stronger draw for businesses and people seeking an urban lifestyle. The Buncher properties in the Strip District and the Heppenstall site in Central Lawrenceville are two opportunities to catalytically change markets. Retaining the existing stock of buildings with flex uses will continue to provide the job-generating base needed for the future. The Allegheny Riverfront Area presents a unique opportunity to demonstrate how urban redevelopment can restore ecological quality while providing economic development for long-term sustainability.

Urban Form Framework

The Urban Form framework aims to achieve a stronger sense of place, local identity, and physical improvements that will increase livability. In transforming the 19th century fabric into a 21st century city, the Allegheny Riverfront Vision will bring mixed-use developments, urban density, walkable communities, and natural amenities.

Link Neighborhoods to the River

Discussed previously, open space extensions from parks, the Allegheny Cemetery, and green hillsides; green streets extending to the riverfront; and a trail network that ties the riverfront into the neighborhoods are the primary means to physically link the river to neighboring areas. However, there are other linkages that should be considered.

Creating view corridors from higher ground to the river will create more awareness of the river's presence. The green streets that extend to the river's edge should be developed as the initial view corridors. With their street trees, curb extensions, and intersection improvements they would become synonymous with neighborhood paths to the riverfront. Other view corridor possibilities include the open space extensions that acknowledge former stream locations and the open space corridors constructed as more formal extensions to the river, such as the proposed open space corridor for 40th Street. Allowing buildings on large riverfront properties to block view corridors is not recommended. Where streets continue to the riverfront that end in the tall towers that carry overhead electrical lines from one side of the river to the other, consideration should be given to replacing them with under-river conduits.

The ends of streets and open space corridors are ideal locations for viewable riverfront destinations. Landscaped overlook destinations, art installations, public parks, and monuments that attract one's eye are appropriate street and open space corridor terminuses within the riparian buffer.

Walkability

Getting around on foot and bicycle has always been subservient to the Allegheny Riverfront's industries, businesses, and trucks and the situation has become more dangerous as more residents move into the area. The desire to move around easily by foot and bicycle has increased with the type of resident, particularly younger professionals, attracted to the Allegheny Riverfront. Pedestrian- and bicycle-friendly design elements are beginning to become a higher priority.

Walkability will increase as the trail and bicycle network becomes established, more street trees are planted and open space provided, and as the network of green and complete streets is implemented. Simply adding street trees to formerly barren streetscapes should encourage others to clean and repair sidewalks and improve facades. As the trees mature, these narrow streets will become walkable locations similar to the North Side's Mexican War Streets and the streets of Deutschtown. Creating green street linkages to the riverfront and greening the main east-west connector streets will provide destinations for walkers. Trails, street trees, green streets, and bicycle pathways are fundamental public realm infrastructure elements of a walkable community.

New development will also contribute to walkability. Higher densities around transit stations as part of transit oriented development agendas will bring activities of daily living within walking distances of residents and workers, alike, as dependence on the automobile is deliberately decreased. The circulator trolley, commuter rail, and bus connections to Downtown and Oakland will encourage residents to use transit over cars. Short walks to the station will encourage more businesses to recognize and cater to the pedestrian traffic.

Creating Memorable Places

The Allegheny Riverfront can excel in further distinguishing its neighborhoods and character of place by deliberately beginning to create new public spaces and destinations. Memorable places are specific locations that have assumed meaning beyond their spatial configuration as places of social, historical, or even aesthetic value that are generally acknowledged and respected.

These existing places have memorable qualities:

River Surface

While not exclusive to the Allegheny Riverfront, the experience of being on the river cannot be duplicated while standing on the bank. Increase the opportunities for river activities.

Riverfront Edge

Places where views of the Downtown skyline or the green river valley at the bank's edge should become public places. For example, the 40th Street boat launch area, already somewhat improved as a public space, has dramatic views of Downtown.

AVRR Right-of-Way

This 62' to 100' wide space beginning at 33rd Street carves its way east through the Allegheny Riverfront industrial fabric as a distinguished space.

St. Patrick's Church Courtyard at 17th Street and Liberty Avenue

This little garden courtyard is a "gem in the rough" and a hidden find of the Strip District. St. Patrick's was the first Catholic church in Pittsburgh.

Smallman Street between 16th and 21st Streets

This 90' wide space with a portal entrance below the 16th Street Bridge and a landmark church at its terminus has potential as a major urban space in the Strip District that complements the Penn Avenue marketplace.

St. Stanislaus Forecourt

While a part of the Smallman Street space, the street space in front of the church has symbolically substituted for a public plaza.

Penn Avenue Historic Marketplace from 16th Street to 22nd Street

Recognized throughout the region and a destination on most tourist's itineraries, this street space has public qualities unmatched in the city.

Below the 33rd Street Railroad Trestle

Although not seen by many, the space created by the trestle's structure is impressive, however it is not well maintained and is a visual blight particularly in the vicinity of Penn and Liberty Avenues.

Pittsburgh Brewery

The historic brick buildings on Liberty Avenue make a fine street facade, and the large open space between the brewery buildings and the railroad trestle have place-making possibilities.

Doughboy Square:

The bank building and statue in Doughboy Square anchor this triangular portal into Lawrenceville.

Butler Street Retail from 35th to 39th Streets:

Although fairly new, this "city place" is beginning to establish its own character with interesting boutique shops, restaurants, and entertainment venues that give it a regional appeal.

The Arsenal

The former Arsenal is now only in the history books, however remnants of its wall and one of the original structures remain. Recognizing its former outline would help reestablish its earlier presence and significance to Lawrenceville's history.

Arsenal School and Park

The imposing institutional school building and its magnificent public setting is a Lawrenceville landmark. The space it creates and occupies on Butler Street should be recognized and highlighted. The public park behind the school building brings the Central and Lawrenceville neighborhood together.

Butler Street Retail from 40th to 43rd Streets

This established "neighborhood place" is reminiscent of Pittsburgh many years ago.

Stephan Foster Community Center

This wonderful community building in the middle of Central Lawrenceville's slopes was the first cemetery in Lawrenceville (later moved to Allegheny Cemetery) and now is a focal point of the neighborhood.

Leslie Park

The community center, pool, and the ballfield at Butler and 46th Streets form an active gathering place in the Central Lawrenceville.

Allegheny Cemetery

This regional and historic asset has more presence along its Butler Street frontage than the vast area it occupies. While dividing the residential community, it nonetheless is an important destination and open space in the community.

With further nurturing and development, key locations can become memorable places. Creating walkable neighborhoods and improving the quality of life within the Allegheny Riverfront Vision Area demands that place-making have a role in the area's repositioning and revitalization. With all of the potential development and envisioned environmental improvements there will be plenty of new opportunities to create distinguished public and private places. These locations have the potential to become new memorable places:

Riverfront

The most dramatic place will be the riparian buffer and its riverfront trail—6.5 miles of ecologically-responsible open space. Within the buffer and close by are many possibilities for other memorable places. The History Center would like to acknowledge the history of the area between 11th Street and the Veterans Bridge with artifacts, exhibits, and linkages to broaden the public's and trail user's understanding of this location's importance to Pittsburgh's shipbuilding and manufacturing history. Between the Veterans Bridge and the 16th Street Bridge, the river's edge could be developed with a marina on the north bank and a land extension, or "spit," out into the river along the south bank for public access and a water taxi landing. As this section is meant to encourage active public use, restaurants at the river's edge are appropriate. At 40th Street, a more developed waterfront park with view corridors through the trees and possibly a boat house would acknowledge this location's wonderful view of the Downtown skyline. The terminus of 43rd Street should also become a public park and possibly a marina. Converting the Public Works property at Washington Boulevard into a public park would create a city-wide riverfront amenity at the foot of Highland Park.

Extension of Railroad Street from 21st Street to 11th Street

This portion of the Allegheny Riverfront Green Boulevard should be designed and implemented as a public place. Amenities could include a public plaza at 21st Street to acknowledge this green street's path to the river, a pervious pavement surfaced parking lot designed as a large public open space with street trees behind the Produce Terminal, a park between the Veterans

Bridge and 11th Street that defines a public place similar to Mellon Square in Downtown which also connects the History Center to the riverfront, and an entrance "portal" at 11th Street.

AVRR Right-of-Way as a Complete Street and Public Space

This right-of-way from 33rd Street to beyond 62nd Street and Railroad Street's extension to 11th Street, if conceived as a complete street, can become a major feature of the riverfront and trail system, an alternative east-west connection for business access, and a main entrance to riverfront development. It has the potential to become a Pittsburgh intermodal model for combining active rail use with pedestrians, cyclists, and vehicles.

Smallman Street "Piazza" between 16th and 21st Streets

Developing the 50' wide Produce Terminal space in the present street right-of-way as a public amenity with sidewalk cafes and sitting areas, transit corridor, and pedestrian-friendly sidewalk can turn this space into a "Piazza" and a destination for Strip District patrons and visitors.

33rd Street Railroad Trestle

The 33rd Street trestle is an Allegheny Riverfront landmark as well as a dramatic steel structure. Consider repainting the structure, repurposing it as a canvas for artistic installations, and/or converting portions of its structure to a "living wall."

Intersection at 40th and Butler Streets

This portal into Central Lawrenceville could be enhanced by strengthening the intersection's east corners with taller buildings that anchored the corners. The Arsenal School playground could become a green spatial forecourt to the intersection by judicious street tree plantings along Butler Street and along the inside face of the school yard fencing. Reconceiving the property between 39th and 40th Streets on the river side as a new center for Lawrenceville would unite Central and Lower Lawrenceville. This location has the potential to become a very public place and a landmark of the Lawrenceville community.

Bluff Scenic Byway

Consideration should be given to developing Butler Street and Allegheny River Boulevard as a "scenic byway" from 62nd Street to Washington Boulevard. This will also create a scenic entrance to the Pittsburgh Zoo traveling east on Butler Street.

River Overlook on Baker Street

The demolition of several buildings atop the Morningside Bluffs on Baker Street showed the potential for a scenic overlook in Morningside. The Morningside neighborhood should consider acquiring property along the bluff for an overlook with spectacular views of the Allegheny Riverfront and the river valley.

Zoo Entrance

The intersection of Butler and Baker Streets has potential as an open space and portal entrance to the zoo.

Highland Riverfront Park

Converting the Public Works space at the end of Washington Boulevard into a public riverfront park and improving the intersection at Washington and Allegheny River Boulevards as a portal entrance to the riverfront and park will create a new Pittsburgh asset.

Open Space

Open space is usually classified as designated parks, recreational fields, and uninhabited hillsides, but it plays an even more important role in creating public and social places, making linkages, and acknowledging the physical landscape. There is a very strong relationship between open space and the Ecological Framework, which serves as an important design guide for the Allegheny Riverfront's open space. With that in mind and where appropriate, open spaces are good locations for achieving an 80% tree canopy coverage and installation of pervious soil and surface systems to capture storm events within the public realm.

Designated Parks and Open Space

Arsenal Park, Leslie Field and Park, the Allegheny Cemetery, and the designated steep-slope Hillside District (H) zoning areas are the recognized open spaces in the Vision Area. These locations should be investigated for additional tree planting possibilities to increase tree coverage.

Riverfront as Public Open Space

The proposed riparian buffer will become a regional asset as a significant open space and passive recreation area available to the public. Ending the green streets and open space corridors with public installations at the riverfront will enhance these destinations. Converting the Public Works property at the foot of Washington Boulevard into a riverfront park, previously referred to as the Highland Riverfront Park, would demonstrate the buffer's public potential as a regional asset.

Stream Corridors to the River

The former stream, creek, and drainage paths from the higher plateaus and hills of Pittsburgh's East End flowed through the Allegheny Riverfront in distinct places. Now covered over, these locations are where the plateaus and ravines linked to the Allegheny River and where the topography still makes some acknowledgement of these former linkages. These paths should be reconstituted as ecological open spaces, "streamways," for stormwater capture and public enjoyment. They are important open spaces needed to meet tree canopy coverage and quantity of pervious surfaces to capture and dissipate storm water. They can also provide much needed public open space for active and passive recreation for Allegheny Riverfront residents, employees, and visitors. Primary locations are 33rd Street to 35th Street from the Busway to the river, 46th to 48th Streets from Allegheny Cemetery to the river, Heth's Run, and the Washington Boulevard valley to the river.

Bluffs to the River

Just as former streams and creeks fed the Allegheny, the river valley's walls remained as solid bluffs and steep slopes in a few places near the water's edge or eroded significantly to form the industrial flatlands and the residentially-populated lower slopes. The bluffs and the steep slopes of Morningside and Highland Park are important forested open spaces that contribute significantly to the ecological restoration and stabilization of the Allegheny Riverfront. They should remain undeveloped.

Green Street Extensions to the River

The Ecological Framework identifies some city streets as green streets for retrofit of stormwater infrastructure to improve the capture of storm events in the form of curb extensions, landscaped intersection bump-outs, and heavy street tree plantings. Green streets that connect through to the river are also open space extensions to the river. Some locations have the potential to accentuate their open space impact by extending the green open space onto public-owned and private property to create wider swaths of green for other civic purposes. Prime locations are 15th Street, where a center median could signal the entrance into a commercial/entertainment and mixed use center for the Strip District; along the east side of the 33rd Street railroad trestle symbolizing the former stream's path to the river; and along the west side of 40th Street from Penn Avenue to the river that links the Allegheny County Health Department grounds, Arsenal Park, Arsenal School, the urban circulator pathway, and the riverfront public space at the foot of 40th Street as a grand open space. Other streets east of 40th Street have

similar potential. The wider swaths are excellent locations for dense tree canopy, pervious surfaces, and recreational improvements such as walking paths, tot lot play areas, and other activities appropriate for passive park places.

Trail and Bike Systems

The trail and bicycle paths link the open space system. They connect the parks, Cemetery, bluffs, green streets, riverfront riparian buffer, the Allegheny Riverfront Green Boulevard, and the major east-west people movement street connectors into a network of open space throughout the Allegheny Riverfront. The trails and bicycle paths knit the river to the neighborhoods by bringing the river space into the neighborhoods and, conversely, by bringing the neighborhoods to the river.

Development Standards

As new development occurs, including renovation and rehabilitation projects, the Allegheny Riverfront would benefit by adopting sustainable development standards. These would not only reinforce the goals of the Vision Plan but serve as best practice examples of how riverfronts can become riverfront communities and models for city and county smart growth and regenerative policy.

Mix of Uses

The Vision Area has a history of mixing uses in its commercial and wholesale centers and its residential neighborhoods. Residents and business persons desire this mix to continue. Mixed use and the variety it encourages has become part of the local culture, is an attractive feature to new residents and businesses, and is memorialized in the UI District zoning that promotes mixed use within an urban industrial setting.

A mix of uses has several advantages. Mixed uses encourage 24-hour activity, with daytime commercial activity, evening entertainment, and nighttime residential uses. Mixed uses tend to level out peaks and valleys of high activity by lessening rush hour traffic and parking is more balanced. Mixed use areas and, particularly mixed-use occupancies, are generally able to weather economic cycles better than single occupancies as often not all uses are affected in economic downturns.

Although the tendency is to specialize and become more homogenous, a phenomenon observed in residential areas where market value increases result in protective actions, the Allegheny Riverfront would lose a lot of its character if mixed-use residential and business neighborhoods were not supported and encouraged.

Residential Compatibility

While “authentic,” mixing uses does not mean all buildings will be developed to the same level of investment or amenity—a flex building is not a high-end residential condominium. If they are to co-exist side-by-side, a level of compatibility is needed so one will not diminish the value of the other.

Uses and buildings that are residentially compatible maintain property values and encourage the intermixing of residential development with industrial and business uses. Residentially compatible translates into higher quality development of all uses and an acknowledgement that low-investment development is detrimental to the economic sustainability of the neighborhood and does not make a good neighbor. Residentially compatible development will help to regenerate the riverfront properties, raise land and market values that will increase investment opportunities, and produce desirable and livable communities whether they be residential or business focused.

Residential compatibility means investing in the building’s exterior envelope. The perimeter should maximize window openings, with window openings on all facades. Durable materials should be used to increase longevity and relate to the local context. Residentially compatible also means capable of regeneration and repurposing, with buildings adaptable for other future uses, be they residential apartments, professional offices, or a vocational school. Polluting uses are not residential

compatible. Uses that stream pollutants into the atmosphere, create loud noises or obnoxious smells that cannot be controlled within the property lines, or are so brightly lit that they keep neighbors awake at night are not appropriate.

Form-based Development

The high degree of mixed uses in the Allegheny Riverfront persists counter to most zoning practices, which typically separate uses into single-use districts. The UI District zoning acknowledges the mixed use nature of a portion of the Vision Area, but uses an industrial zoning designation as the mixed-use vehicle. Although it can be argued that the UI District is broad enough to encourage all types of mixed uses, it nonetheless codifies the Allegheny Riverfront as an industrial zone.

While industrial uses will continue and always be a part of the Strip District and Lawrenceville, the Allegheny Riverfront's future lies in reconceiving these riverfront communities as thriving and active mixed use communities where there is little distinction between industrial, residential, and business uses. What is more important than designating land uses are the physical design qualities of zoning where density and building massing control building form, the buildings' collective relationship to the immediate context, and the overall physical environment. Various uses can occupy the same building as demonstrated by the repositioning of many industrial and institutional buildings throughout the Strip District into residential apartments. In fact, buildings that are so specifically designed for one use type cannot be easily converted to other uses nor meet a regenerative or sustainable agenda. The future lies in designing and constructing buildings that are adaptable to many future uses or easily deconstructed and recycled.

Form-based development acknowledges that many uses can occupy the same structure and therefore concentrates on the structure's form and its contribution to the built environment and urban fabric. Density, height, setbacks, and the creation of usable open space that improves the public realm are the ingredients of creating a built environment that makes communities livable and desirable places. Other than a very general indication of desired uses, the economic marketplace will make fairly logical decisions about appropriate uses given the physical context. Given the Allegheny Riverfront's history, letting the marketplace determine land use patterns will continue its mixed-use nature and character.

Density

Density is a measurement of intensity in a specific area. Cities have been finding that added density often adds benefits, such as more services and choices. Denser neighborhoods are generally more walkable because larger populations often result in an increase in the variety of shops, neighborhood services, transportation services, and infrastructure improvements. It is much less costly for a city to concentrate its population rather than spread it out. Funding of transit oriented development is based on this principle, in addition to relieving automobile congestion. The Allegheny Riverfront has a finite amount of land so spreading out its population is not feasible; however concentrating density in key locations can incent other improvements to happen. Higher density can also serve to compensate development for infrastructure improvements.

Strong neighborhood character is often a benefit of density. Higher density usually offers more housing choices, more and varied businesses, and a more diverse population in terms of age, income levels, and ethnicity. With higher density the physical setting is often more defined as a result of economic valuation of land and usually its commercial core is stronger. Open spaces are more defined because private use of land is intensified and open space is valued more as an asset and amenity. All of these effects are regenerative elements that will help sustain a community.

Increasing density makes more sense when it can be relieved by amenities that temper the intensity of use. Good locations for higher densities include parcels adjacent to open space that is more than 100' in depth, on properties that front onto designated green streets because of their added street trees and landscaped space, along the riverfront where the open space of the river and the riparian buffer are mitigating factors, and at locations where mass transit stations and intermodal transportation facilities encourage walking. Density increases can be achieved by increasing building height.

Building Height

Higher density usually means taller buildings. If thoughtfully located, taller buildings identify locations of more intense activity which serves as a visual and orientation cue. Taller buildings can also signify where important community amenities are located. New York City is a good example of these relationships. In Manhattan tall buildings congregate in Lower Manhattan and Midtown, its two business cores; along the edges of Central Park; along the wide avenues; and along the riverfronts with their wide open spaces.

Allegheny Riverfront locations for potential building height increases includes parcels adjacent to open space that is 100' in depth or greater and for parcels fronting onto designated green and complete streets in concert with density recommendations. Riverfront parcels in the Regenerative Zone as far east as 40th Street should be given special consideration because of the Cork Factory precedent and the ability to construct taller and higher density residential buildings in UI Districts.

Building heights that seemed reasonable when conducting design studies of various Allegheny Riverfront locations included:

Strip District to 33rd Street

- Up to 8 stories along the riverfront* and 6 stories where development is encouraged
- Up to 8 stories between Penn Avenue and the riverfront between 11th Street and the 16th Street Bridge
- Up to 6 stories between Smallman Street and the Allegheny Riverfront Green Boulevard
- All other buildings in the Strip District per existing zoning heights

Lawrenceville from 33rd Street to 40th Street

- Up to 4 stories high along the riverfront and 4 stories where development is encouraged at the proposed 33rd Street Corridor** and the 40th Street Corridor***
- All other buildings in Lower Lawrenceville per existing zoning heights

Lawrenceville east of 40th Street

- Up to 4 stories high along the riverfront and 4 stories where development is encouraged
- All buildings per existing zoning heights

(* Up to 10 stories high along the riverfront between 11th Street and the Veterans Bridge.)
(** Consideration should be considered for 6-story heights in this immediate area, particularly for buildings adjacent to the 100' deep open space on the east side of the railroad trestle.)
(*** 4 stories maximum for buildings fronting both sides of 40th Street from Butler Street to the river.)

Setbacks

Most zoning codes require front, side, and rear yard setbacks so that buildings do not cast shadows onto other property depriving them of light or are built so close to one another so that air cannot circulate well. An unfortunate consequence of setbacks on all four sides, or even two sides, of a building is to place the building footprint toward the center of the parcel. Buildings then become separated, open space becomes ambiguous, and the built fabric loses its clarity.

Pittsburgh was generally built before modern zoning so most of its street frontages remain intact and its fabric remains clear and strong. In some city neighborhoods there are no frontage setbacks. Lawrenceville is one of these. When there is a tradition of no setbacks or uniform setbacks of the built environment, the 1998 zoning code revisions recognize this as contextual zoning and accommodations have been made to keep these streets intact. The Vision Plan endorses contextual zoning.

Building setbacks can, and do, provide public benefit in specific locations where a public amenity can be created. The Allegheny Riverfront has a few locations where mandatory setbacks are desired: to create the riparian buffer along the riverfront and to assure the Allegheny Riverfront Green Boulevard will be wide enough to accomplish an intermodal and complete street.

Green Design Standards

Creating long-term sustainability for the Allegheny Riverfront is not only a function of City agencies, street improvements, and new infrastructure, but also a commitment and maintenance of those who reside, utilize, and own private property. Without the participation of area stakeholders, environmental sustainability will not be possible. While it may be desirable to require all development to be sustainable, it is not practical. However there are opportunities where implementing green design standards are possible and in the best financial interests of property and business owners.

The riverfront's Regenerative Zone is the prime location for adopting green design standards for both building and site design. As new development occurs, structures should be designed to achieve the equivalent of LEED certification and the site designed to maximize green opportunities, including aggressive stormwater management, vegetative roofs, and riparian buffer landscaping. By setting new precedents as a model for future Pittsburgh riverfronts, this zone could also set the pace for new development throughout the city.

The Transition Zone is another location where green design practices should be followed with new and renovation construction, and new construction should follow the same practices as the Regenerative Zone. When renovated, the existing building stock should be strongly encouraged to be LEED certified. Green roofs need to be encouraged for all buildings, whether renovated or not, as an ecological contribution to better environmental sustainability.

In fact, all new and renovated development in the Allegheny Riverfront Vision Area would benefit by adopting green design standards. With everyone participating, the impact could be contagious and tremendously beneficial for the city.

Create New Utility Infrastructure

Infrastructure within the public realm has been referenced throughout the Vision Plan and takes many forms, from simple curb extensions, to sewers, to transit improvements, or to a network of trails and open spaces. The Ecological and Connections Frameworks covered stormwater management and transportation utilities in some depth, including new infrastructure recommendations. Infrastructure, as most people understand it, is the utilities that provide energy, water, and communications along with the removal of wastes. Most of these we take for granted because they are available and readily provided. Whether below or above ground, these are the utilities that run the city on a daily basis and have a profound effect on the environment and sustainability. The Allegheny Riverfront would be a good location for the city to consider renewable energy initiatives, whether for individual buildings or for groups of buildings. Consideration should also be given to creating new utility structures for that renewable energy, such as area- or district-wide grids that could serve either just a few or many properties.

Underground Utilities

While most utilities are underground and out of sight, many are conveyed by wires on poles that we often mentally block out of our visual field. Most precedent cities have confronted this same question and have chosen to keep them out of site and easily accessible. Pittsburgh has the opportunity in the Allegheny Riverfront to do the same.

All new development in the Regenerative Zone, the Allegheny Riverfront Green Boulevard, and all new master-planned development over 2 acres in size should bury all line power (electric) and communications (telephone, cable) utilities in easily-accessible trenches under sidewalks or within property lines. Water, gas, and sanitary lines should be planned for public realm locations undergoing stormwater management improvements, such as curb extensions and alongside street tree trenches. As discussed previously, roof drainage downspouts and impervious surface inlets should be disconnected from underground stormwater piping and the water diverted into ecological stormwater management infrastructure for mitigation.

ALCOSAN is addressing the CSO issue through grey infrastructure. If treatment facilities are proposed in the Allegheny Riverfront, their locations and design should not adversely affect development opportunities or the local environs. These

facilities would best be incorporated within the confines of other structures, such as basements or below grade levels of parking facilities, or in underground infrastructure, such as holding facilities, that can be developed as green open space on the surface.

District-Wide Renewable Energy Utilities

Because of the large amounts of vacant and underutilized land that now exists within the Allegheny Riverfront, and in particular the Regenerative Zone and along both sides of the railroad right-of-way, the timing is right to consider creating district-wide renewable energy grids and loops while the opportunity still exists.

Renewable energy comes in various forms: heat exchange systems such as geothermal, heat recovery systems from heat sources such as sewer lines, solar systems that provide electricity or heat, wind systems that generate electricity, and bio-mass and municipal wastes as fuels for power generation. Some energy systems can be charged with grey water as their distribution medium, such as excess stormwater. Because of its location central to where most new development is anticipated, the Allegheny Riverfront Green Boulevard should be considered for the main distribution lines.

These energy grids could be owned and operated as a public or public/private utility. Profits could be reinvested back into the infrastructure to pay for other improvements and/or used to maintain the new ecological infrastructure along the riverfront riparian buffer, the Allegheny Riverfront Green Boulevard, and the green streets and public open spaces.

One energy grid system that has particular promise is geothermal for heating and cooling of buildings. A geothermal system uses no-cost, deep-well ground water to temper constant-temperature coolant for on-site conversion to heat or chilled water at a significant cost savings over typical stand-alone HVAC systems. It can be small to service only a few adjacent buildings, grow larger and capable of servicing multiple buildings over several blocks, or larger still to cover a district-wide area. Basically, the system operates similarly to a heat pump loop system for multiple occupancies in a single building, where some tenants require heat while others need air conditioning thus balancing out the constant-temperature coolant. It is an efficient closed system, where the needs for heat and air conditioning off-set one another. On a larger scale, mixed use properties behave just like multiple occupancies that balance out the coolant for maximum efficiency.

The Allegheny Riverfront is a prime location for a geothermal system because underground water is abundant and readily available. With its high water table along the river flatlands, wells do not have to be sunk as deep as typical locations and could be larger sized because of the abundant underground water supply. For multiple properties, distribution piping could be run in accessible public realm locations, such as below sidewalks, in new open space extensions to the river including green and complete streets, and in the Allegheny Riverfront Green Boulevard right-of-way. These locations would not require ripping up streets to install and maintain the distribution lines.

Urban Form Principles

Technology and the 19th century grid established an order of land uses and infrastructure that supported the area's needs for well over 100 years. Today's needs and interpretations of urban living have changed, including new attitudes towards city living and the role of the river.

1. Develop key places to link neighborhoods to the river

There are a number of large vacant sites in the Allegheny Riverfront Area, such as the Buncher properties in the Strip, the Heppenstall site, and the Tippins International site, which can achieve transformative results and play significant and strategic roles along the riverfront. Other key locations link development and green open space extensions to the riverfront. 33rd Street from the Iron City Brewery to the riverfront could be reconceived as a green extension of a former creek bed. 40th Street has the

potential to link Penn Avenue and green spaces to the river. When Heth's Run is completed, it will extend the green watershed of Highland Park to the river. Converting the Public Works property at the foot of Washington Boulevard into a public park will encourage public use of the riverfront.

2. Accentuate and reinforce memorable places

Accentuating and creating memorable places will enhance the area's urban character and increase its livability. Identified key places range from quaint neighborhood gems to regional-quality assets. Place-making should be high on the agenda when developing the public realm and new development should be encouraged to "stretch" its design and place-making qualities to enrich these riverfront communities.

3. Maintain an authentic character

The Strip District and Lawrenceville share an authentic character that is becoming a much-cherished asset. It is what draws Pittsburghers and visitors alike and is a critical factor for Allegheny Riverfront Area residents. Fortunately, the Allegheny Riverfront Area now contains an abundant building stock of industrial, mixed use, and residential structures, but the retention by reuse of quality structures will need to be strongly encouraged rather than new construction if that character is to survive. Blending the new with the old will continually need to be a deliberate community agenda.

4. Increase density, but limit it

Higher densities for in-city redevelopment have provided the basis for expanded services and amenities in many cities and urban neighborhoods. Attracting today's businesses and workers is no longer a matter of available space, but a combination of factors that also include good transportation, a variety of restaurant and retail choices, and a physical environment that can only be achieved by increasing density.

5. Design for residential compatibility

The City has the opportunity to establish higher quality design and development standards for the Allegheny Riverfront Area that will set the tone for future riverfront development in Pittsburgh. High quality standards create value, which translates into a strong real estate market and long-term sustainability because of the desirability and demand it creates. At the core of higher standards is a very simple concept: design for residential compatibility. Adopting this policy will assure that mixed uses will proliferate throughout the Allegheny Riverfront Area and there will no longer be the worry of low-investment development driving down property values in amenity-rich neighborhoods.

6. Develop green communities

Green standards result in life-cycle returns much higher than traditional financial returns, longer-lasting and sustainable structures, and lower carbon footprints that benefit residents and businesses alike. The Regenerative Zone along the riverfront is intended as an all-green zone with the expectation that other areas in the Allegheny Riverfront will seek similar green benefits. Greening the Strip District and Lawrenceville will increase the livability in these communities for all who work, reside, and visit. A dual public and private effort will be needed to build the green infrastructure that will support green development, and the adoption of green development standards will assist the development and real estate industries to carry through with green buildings and site improvements.

7. Rebuild everyday utility infrastructure

Changing how new infrastructure can provide long-term benefits opens up possibilities of using renewable energy for public purposes. For example, a geothermal grid under public or public-private ownership could provide low-cost energy for heating and cooling throughout the Allegheny Riverfront Area and reinvest profits back into creating and maintaining green

infrastructure to offset the CSO problem. Providing underground utilities will help to further beautify the riverfront and, hopefully, begin a conversation about improving the quality of Pittsburgh's physical environment.

A Comprehensive Vision

The Vision Plan links the city back to the river. Moreover, it envisions that new relationships act as an impetus to creating the 21st century city. It introduces a sustainability agenda adapted to the character and challenges of the Riverfront Area. It is about an evolutionary change that will slowly, yet deliberately, build stronger, more livable, and more productive riverfront communities.

At the core of the Vision is the idea that riverfront communities encompass all of the land—every property and right-of-way. It all contributes to a livable environment. "Communities" in the 21st century city are more than 19th century neighborhoods. Traditional neighborhoods are the "livable" areas of the city, but today we are seeing greater urban vitality as people move into downtowns, warehouse districts, and the "fringes" between neighborhoods. Just as in nature, there are no residual or wasted areas, so the future city will encompass all aspects of life—residence, commerce, manufacture, and recreation—within livable communities. The segregation of "noxious uses" from congenial uses, characteristic of 19th century cities, cannot exist in a sustainable city going forward.

The Vision Plan supports the eventual re-establishment of the natural ecology, particularly hydrological, cycles in the city. The new fabric of the Riverfront Vision Area integrates urban buildings with generous green infrastructure. By keeping almost all of the annual rainwater out of the sewer system and achieving greater tree canopy coverage, the natural environment can clean and refresh itself without massive and costly engineering interventions. Not only will this bring a green landscape into the Allegheny Riverfront's urban areas but will also significantly contribute to making the Allegheny Riverfront an increasingly livable and more beautiful community.

The Regenerative Zone is where the most change will occur. As former industrial sites are developed, the space between the river's edge and the railroad will take on its former wooded character, trail segments will begin to connect and loop back into the neighborhood, new green and energy-efficient sites will absorb and reuse stormwater, and pathways to the river will be abundant and easily accessible. The riverfront will begin to come alive with a mixture of uses that encourage living and working nearby, along with walking, recreation, and river activities. The riverfront parcels will have a new "front door" along railroad right-of-way's new multi-functional Allegheny Riverfront Green Boulevard, which will offer sidewalks, a walking and bicycle trail, a commuter train, and a roadway for cars and trucks to serve the riverfront properties and provide an alternate east-west route for vehicles.

Development of the large vacant parcels will bring opportunities for linking the riverfront to its adjacent neighborhoods by introducing open space along green streets. These developments will also begin to link neighborhoods together by extending and introducing new streets and pedestrian pathways. These large sites will have transformative qualities that will stimulate the real estate market to further spillover development and eventually sustainable growth throughout the Allegheny Riverfront.

"We are creating the Petri dish for growth.
As the public sector we need to create infrastructure, connections, and other support
that need to exist in order for markets to function properly."
Rob Stephany, Urban Redevelopment Authority

Pittsburgh has the opportunity to create a riverfront that offers new places to live, new places for businesses, and communities that offer an authentic urban lifestyle. The Strip District and Lawrenceville have the inherent assets to make this happen and a community that shares a spirit for a more amenity-based quality of life. The better Pittsburgh can create the infrastructure for that to happen, the more successful will these riverfront communities become. A better infrastructure—a regenerative environment—holds the key to economic sustainability and the lifestyle these communities want. As other cities have demonstrated, the better the infrastructure, the stronger the private investment.

major features of the vision plan

Framework for Revitalization

The Spatial Principles describe a layered network of linear zones defining the different characteristics of built form from the river's edge to the upland slopes of the Vision Area. Each zone has its own identity, use types, and development potential. Likewise, the Ecological Principles describe linear areas defining appropriate green infrastructure types along with overlapping tree canopy coverage zones, while the Connections and Market Principles also make reference to the progressive layering in from the river's edge. Out of the analysis, there is a convergence in the structure of zones. The Vision Plan recognizes a framework of zones that integrates these concepts into a single set of five development zones.

River Zone: The Edge of the Allegheny River

The current river edge has been neglected, is overgrown, and is as much a barrier to the Riverfront Vision Area as the current industrial zone. The public, open space at the river's edge should be made more inviting, accessible, and habitable by including such amenities as landings, marinas, bulwarks, picnic sites, overlooks, rope swings, etc. In addition, properties that front the river have an obligation to maintain the highest levels of pollution and stormwater control so that only clean water enters the river.

Use Recommendations

- Water-related recreational activities on the river, such as boating, kayaking and canoeing, and water skiing.
- Preferred use of the riverbank is a riparian environment consisting of native trees, shrubs, and grasses.
- River edge activities appropriately located, such as water taxi stops, boat launches, fishing and swimming docks, marinas, view overlooks, access trails down to the water.
- Restaurants and entertainment venues where appropriate, either on the bank overlooking the water or on the water.
- Industrial uses for transfer of materials, without impeding the riverfront trail.

Regenerative Zone: A New Riverfront Zone

The Regenerative Zone includes the riverfront and the properties along its edge from the riverbank back to, and including, the railroad right-of-way. The zone extends past the railroad in a few instances where large industrial properties extend further into the neighborhoods. The Regenerative Zone offers the greatest opportunity for change, because its large tracts of underutilized industrial land make this the most effective location to implement a full regenerative agenda, and the most effective location to achieve ecological restitution. New, rehabilitated, and renovation development is proposed to be ecologically sustainable, multi-use, built to green standards, and with access to the riverfront along its length. It is prime land for high-density residential and compatible industry that value riverfront amenities.

Ecological sensitivity and expectations should be high because of the edge's direct environmental impact on the river and the ability of these large properties to accommodate restorative ecological needs. The 200' riparian buffer forms the river's edge of regenerative zone properties. The railroad right-of-way developed as a green corridor edges its southern boundary. Green streets providing public access to the riverfront punctuate the zone at fairly regular intervals to encourage public use of the riverfront.

Development expectations should also be high. Quality design and durable materials should be expected and required at the same level as Three Rivers Park in downtown Pittsburgh, and many of the design guidelines developed by Riverlife should be

extended throughout this zone. The equivalency of LEED certification should be expected of all new and rehabilitated development. Buildings and site improvements should be the best examples of riverfront development as this valuable land represents Pittsburgh's intentions for future riverfront communities and a new public riverfront.

Use Recommendations

- 200' riparian buffer and the Allegheny Riverfront Green Boulevard.
- Preferred building uses include residential; live/work; low-impact industry; research & development; office; institutional, such as education; restaurants and entertainment; and passive recreation.
- Combining uses on the same property are encouraged as mixed occupancies increase diversity.
- Restaurants and entertainment venues are encouraged in buildings facing the river.

Transition Zone: Mixed Building Zone

The Transition Zone extends from the AVRR corridor to the edge of the residential fabric. The zone contains a variety of building types and uses, including industrial buildings in the Strip recently converted to apartments. Building footprints are not as large as those along the riverfront, but are larger than in the adjacent residential neighborhoods. This zone is the source of the Allegheny Riverfront Area's authentic and gritty character. Mixed use is the dominant use type and should be further encouraged as well as mixed-occupancy structures. Higher densities than presently exist are recommended to increase job-generation and residential capacity. Green buildings and site development are desired for all new, rehabilitated, and renovation development. Green streets, which provide multiple ecological benefits, will provide linkages to the riverfront. As this zone contains a number of historic structures, restoring these buildings should have high priority.

Use Recommendations

- Maintain a variety of mixed uses.
- Preferred uses are similar to the Regenerative Zone, including residential; live/work; low-impact industry; research & development; office; and commercial.
- Commercial uses are encouraged, such as regional retail, entertainment venues, neighborhood retail, and neighborhood service-commercial.

Preservation Zone: Established Neighborhoods

The Preservation Zone is the residential fabric of Lawrenceville. Parcels and building footprints are the smallest in the Riverfront Vision Area and change occurs very slowly, making this zone the most stable of the five, but also the most difficult to infuse with new ecological and open space improvements. As new residences are developed and renovation and rehabilitation of older residential stock takes place, the residential neighborhoods will become more desirable and strengthen. Green strategies include green streets and alleyways, vacant lots used for gardens, and residential rain gardens.

Use Recommendations

- A mixture of housing types and owner/renter choices.
- Neighborhood retail and neighborhood service-commercial. A grocery store is highly desired.
- Restaurants and shops appealing to a city-wide clientele.

Service Zone: The City's Backyard

The Service Zone is the strip of land along the "slopes" of Liberty Avenue and the East Busway. Comprised of flex buildings and surface parking lots, this is an area that is sparsely populated and generally unseen where buildings and parcels of many sizes and configurations have been shaped into unexpected angles by the stream bed that used to drain the East End to the river. Storage and distribution activities are good uses for this zone. The City and County should consider relocation of

Allegheny Riverfront service activities to the Service Zone to free desirable sites closer to the river for the private market. The large surface lots provide greening opportunities, ranging from trees to pervious paving systems, and the large flat-roofed buildings are good candidates for vegetative roofs.

Use Recommendations

- Storage and distribution.
- City and County services.
- Commercial uses, such as front- and back-office uses.

Re-conceiving the Allegheny Riverfront Area as a series of layers of different characteristics and functions sets up a framework for revitalization. The river is a regional amenity and a public resource, yet it is fragile and requires protection. The River Zone, the open space at the river's edge, should be more inviting and habitable, with amenities for public use. The Regenerative Zone proscribes a new riverfront and development that recognizes the importance of the river as a public amenity. The Transition Zone is about building a mixed community that embraces variety, diversity, and choice as a transition between established neighborhoods and a repurposed riverfront. It is also about maintaining and enhancing the Allegheny Riverfront's authenticity. The Preservation Zone encompasses the residential neighborhoods that anchor the Allegheny Riverfront and are instrumental in achieving a higher quality of community life. The Service Zone is conceived as the area's support and services zone, the new back yard for the Allegheny Riverfront. Each zone is descriptive of a future that embodies the desires of the Allegheny Riverfront communities.

A New Ecological Infrastructure

As most of the natural landscape is missing from the Allegheny Riverfront Area, the ecological planning is approached as restoration ecology: restore the hydrologic cycle by capturing the rain and increasing vegetative cover. The pattern of underground sewer pipes and the roadway network that sets the surface pattern of land use can also become a network of natural spaces that will perform for us the work of cleaning air and water and enriching the soil. By allowing the rainfall to follow the natural pathways into the soil mantle that has been paved over for the past century, the Riverfront Vision Area will have regenerative neighborhoods that provide clean water and healthy air while reducing carbon footprint.

Stormwater infrastructure includes a variety of elements, from backyards to green streets to vegetative roofs. Though their design depends on the distance from the river's edge, in all locations, new pavements, including surface parking lots, sidewalks, patios, and some driveways, should be constructed of permeable materials underlain by a storage/infiltration bed.

- In the Regenerative Zone the clean rooftop runoff can be directly discharged to the river or to the green corridor of the riparian buffer. The railroad right-of-way provides another green corridor opportunity for landscape and permeable surfaces.
- The Transition Zone does not include as much open space, so creating a network of green streets assumes a higher priority, utilizing vegetated curb extensions, medians, and intersection bump-outs that capture the rainwater of the public realm. Vegetative roofs are the preferred green infrastructure on private property.
- In the residential neighborhoods of the Preservation Zone, infrastructure strategies include green alleyways, urban gardens, and residential rain gardens. While not always possible, vegetative roofs are encouraged when appropriate.
- The Service Zone is similar to the Transition Zone though it lacks a street network, but applying green street infrastructure strategies to the Service Zone's large surface parking lots the same results can be achieved. The large flat roofs of this zone's flex buildings are prime candidates for vegetative roofs.

Tree canopy coverage varies by linear zone:

- The target is 80% tree canopy coverage for the first 100' of the riparian buffer and for the AVRR green corridor, and 60% elsewhere in the Regenerative Zone.

- The Transition Zone target is 40%, the Preservation Zone 25%, and Service Zone 40%.
- With good soil volume, this tree coverage will provide the large scale evapo-transpiration functions of the original forested ecosystems.

Tree canopy coverage works hand-in-hand with the stormwater infrastructure and open space opportunities. Trees play a significant role in the hydrologic cycle by dispersing captured stormwater through transpiration as does the soil through permeation. The target for tree canopy coverage throughout the Allegheny Riverfront is an average of 40%, similar to the tree canopy coverage of the Squirrel Hill neighborhood. To accomplish this goal, the application of tree planting varies with the distance from the river's edge increases.

Infrastructure Elements Recommendations

- Riverfront riparian buffer
- AVRR right-of-way
- Green streets
- Green alleyways
- Vegetated curb extensions/medians
- Vegetated roofs
- Urban food gardens
- Residential rain gardens
- Open space
- Parks, ballfields, and playgrounds
- Trees and shrubs

(See Ecology Framework for descriptions of Infrastructure Elements)

Riparian Buffer

Other than the green steep slopes and bluffs, the riparian buffer will be the largest open space in the Riverfront Vision Area. It is an essential component of the natural stormwater management system.

Green infrastructure features of the buffer include a heavily-planted tree environment along the first 100' of the river's edge interspersed with meadows and wetlands, a pervious pathway and trail network, river access and recreation locations, and riparian restoration and protection efforts. The use of native meadow and woodland plantings, combined with forest restoration and invasive species removal, will provide an important level of stormwater management.

The proposed buffer is a 200' wide green open space along the riverbank throughout the Regenerative Zone. Green infrastructure features of the buffer include a heavily-planted tree environment along the first 100' of the river's edge interspersed with meadows and wetlands, and riparian restoration and protection efforts. The use of native meadow and woodland plantings, combined with forest restoration and invasive species removal, will relieve the need (and cost) of reconstructing the old engineered systems, which, as it turns outs, are a poor substitute for the more effective and sustainable natural systems. Preferred uses of the buffer would include river access, passive recreation, water features, and a riverfront trail, with limited concessions and limited public facilities such as amphitheaters and performance spaces.

A river buffer is necessary to ensure establishment of plants and roots needed to prevent unnatural erosion, ensure the ability of plants and soils to filter pollutants, maintain healthy habitats, and contribute to flood protection. The width of the buffer is necessary to remediate an affected, urban waterway with industrial adjacencies. A 200' buffer is critical to reaching the 40% urban tree canopy goal and will be instrumental to increasing air quality, reducing CO2, and a key component in the restoration of the hydrologic

balance. A 200' buffer is also required to reintroduce the habitat necessary to support the return of valuable wildlife and self-sustaining ecosystems. In addition, it will provide waterfront recreational opportunities currently lacking throughout the city and help to sustain a healthy drinking water supply.

Major mid-sized cities such as Kansas City and Portland have, or are in the process of developing, buffer set-back ordinances. Pittsburgh is in the unique position to become a leader in urban stream renewal as it is poised to lead the country in buffer establishment.

Use Recommendations

- Uses are limited to preserve the buffer's natural qualities, but include river access, the riverfront trail, passive recreation, limited concessions, limited public facilities such as amphitheaters, performance space, and water features.
- It is expected that more public-assembly type uses will occur closer to Downtown and more park-like uses beyond 21st Street, however river access points at the end of green streets and open space extensions are also good locations for assembly type uses.

Design Recommendations

- Limit the area of impervious surfaces and attempt to achieve 100% pervious surfaces.
- As stormwater in the buffer is assumed to be clean, drain all stormwater directly into the river. This can be handled by creating naturalized or artistically-designed watercourses when appropriate. Integrate areas for rainwater absorption into the ground that work in compacted, clay soil. Where needed, including any roof drainage captured in the buffer, design a natural filtration system in the landscape to clean water which drains into the river.
- Improve the soil mix to 50% void, 45% mineral, and 5% organic material in all planted areas qualifying as pervious systems. Generally provide 800 cf. of soil per tree to meet the tree coverage standard, or 600 cf. per tree when planted in adjoining beds. The existing soil may be suitable for most trees.
- Landscape with native plant material, including large and small trees, to achieve an 80% tree coverage for the first 100' and 60% for the remaining area. Conventional lawn-planting and chemical-intensive management is discouraged, but may be appropriate for public-assembly locations.
- Bury overhead utility lines in accessible trenches for safety, durability, and to eliminate conflicts with trees.

Allegheny Riverfront Green Boulevard

Assuming the AVRR right-of-way ownership will be transferred to a new 501(C)(4) Public Benefits Corporation or its equivalent to protect a permanent freight easement, the 62' to 100' wide right-of-way can be repurposed as a complete boulevard and public space for its full length through the Riverfront Vision Area. The term "complete" means that it contains multi-modal functions, ecological infrastructure, and elements that serve both public and private interests, including commuter rail transit, freight transit, vehicles, bicycles, pedestrians, utilities, and buildings on either side of the right-of-way.

A repurposed AVRR corridor would provide a second edge to the riverfront and a "front door" for the Regenerative Zone. It would serve as a secondary riverfront trail where the riverfront trail is not possible or blocked by existing obstructions. It would also be an alternative to automobile and truck traffic on Butler and Smallman Streets for local area businesses to help relieve truck conflicts, particularly east of 40th Street. The corridor can serve as a conduit for district-wide renewable energy distribution systems and for underground distribution of everyday utilities. By providing heavy tree canopy cover, pervious and landscape features for capture of stormwater, and needed public open space the Allegheny Riverfront Green Boulevard will significantly contribute to the Vision's green agenda.

Use Recommendations

- Commuter transit and freight rail
- Sidewalks along building frontages
- Public trail constructed for pedestrian and bicycle traffic
- A secondary, 2-lane wide local street for cars and light trucks from 11th Street to just past the development east of the 62nd Street Bridge, where it would continue up the slope to meet Butler Street.
- Street trees and landscaping
- Underground utilities

Allegheny Riverfront Green Boulevard Design Recommendations

- Locate Regenerative Zone and Transition Zone building main entrances along the right-of-way to strengthen use of the right-of-way as the riverfront's "front door" and to lessen traffic on side streets to the river for more pedestrian usage.
- Maximize street tree planting to achieve an overall 80% tree coverage.
- Provide 6' wide pedestrian sidewalk on north side of right-of-way at property line.
- Locate vegetated curb extensions/bump-outs at perpendicular street intersections when there is enough room for a parking lane on the north side of the vehicle movement lanes.
- Keep vehicle lanes at 11' wide to calm and slow traffic.
- Set back structures on the south side for sidewalks and street tree planting when the right-of-way is less than 70' wide.
- At widths exceeding 70' install a sidewalk and street trees along the south side of the right-of-way. When space permits, add pervious surface parking lanes to one or both sides of the vehicle lanes. Increase areas of street tree planting whenever possible.
- If street crossings are limited, install state-of-the-art railroad crossing safety equipment for pedestrians and vehicles. Locate these crossings on perpendicular green streets and where continuous riverfront trail access can be achieved (perpendicular streets provide an alternate trail to Railroad Street, the Green Boulevard, or Butler Street when the riverfront trail is blocked).
- Bury overhead utility lines in accessible trenches for safety, durability, and to eliminate conflicts with trees. Use right-of-way for underground district-wide renewable energy systems distribution.

Alternate Design Recommendations (Complete Boulevard not Possible)

If the ownership remains with Cargo Express and/or conversion of the right-of-way as a complete boulevard is not possible:

- Build as a complete boulevard between 11th Street and 21st Street, without the rail line.
- Relocate the rail line to the south side of the right-of-way between 21st Street and 33rd Street. Work with Cargo Express to modify this portion into as complete a boulevard as possible.
- Between 33rd Street and Washington Boulevard work with Cargo Express to achieve an overall 80% tree coverage using street trees. Explore the option of installing a public trail along the right-of-way.

Urban Circulator and Commuter Rail

Two new transit opportunities will significantly strengthen the Allegheny Riverfront.

Urban Circulator

The most significant transit recommendation is to establish a unique urban circulator system using fixed-rail trolley cars through the Strip District to Lawrenceville. The objective is to lessen reliance on automobile use while encouraging localized

mass transit. Experience in other cities suggests that a circulator trolley should work well in the Strip District, an area that is heavily pedestrian-oriented and exhibits a demand for high frequency service, short trips, and frequent stops.

The circulator trolley would incorporate frequent stops depending on the condition of the potential stop area. Stops should be at-grade with sidewalks and roadways except for along Smallman Street where stops would be incorporated into pedestrian islands. Major stops, station-like locations where the circulator can interface with other modes of transportation, could also be implemented at the eastern and western ends of the route, i.e. Downtown on 10th Street and at 40th Street in Lawrenceville. Stops at other key locations like 21st Street in the Strip District could include more intense infrastructure improvements like circulator pull-off areas, street furniture, and other rider amenities.

To serve markets that use the Strip District, the following routing is recommended for the urban circulator: Begin at the Convention Center along the covered 10th Street, continue east along Smallman Street and its extension to 40th Street, turn right along 40th Street to Butler Street, then right onto Butler and continue west to 21st Street, turn right onto 21st then left onto Smallman Street at the Produce Terminal, and continue west to the Convention Center terminating on 10th Street. (Alternate modifications to this route include extending the circulator farther into the Cultural District, extending the line over to Seventh Street in Downtown to capture more passengers, and bringing the route over to Willow Street in the 40th Street vicinity to pick up/discharge passengers from the proposed AVRR commuter line.)

The cost, estimated about $25 million a mile, is considerably less than a light rail commuter system running on a dedicated right-of-way. (The circulator from Downtown to 40th Street is about 5 miles round trip.) There are several vehicle types that could be utilized, from modern to vintage cars, and technology exists for electric power to be provided by “docking stations” along the route rather than continuous overhead power lines.

Later phases of the urban circulator could include extending the line farther into the Lawrenceville community and extending the line to Oakland. The path to Oakland would use 40th Street, Penn Avenue, Main Street, the Bloomfield Bridge, and Craig Street to reach the Oakland corridor. Once into Oakland it could loop the corridor on Fifth and Forbes Avenues then back to Craig Street. A similar system could link Oakland to Downtown. If successful, the urban circulator could become the preferred transit of the New Golden Triangle.

Design Recommendations

- Fixed-rail electric trolley system running on city streets, with tracks located level with the street surface.
- The technology exists for electric power to be provided by “docking stations” along the route rather than continuous overhead power lines. The trolley would engage overhead docking stations located at strategic stops to provide power to reach the next stop or beyond.
- Locate tracks on the right-hand side of the street in the direction of travel.
- Coordinate design of the trolley’s bed with the curb height to allow walk-on access for pedestrians and wheelchairs, similar to the Portland system.
- Provide intersection bump-out extensions for stops when there are parking lanes along the street so riders would not have to cross traffic lanes. Utilize median stops only between 16th Street and 21st Street where there is enough room to isolate the trolley tracks from traffic movement lanes.
- At 39th and 40th Streets provide dedicated circulator lanes beyond the street right-of-ways. 40th Street is a high-use arterial and sharing the right-of-way would conflict with vehicle traffic.

Commuter Rail

The implementation of a light-rail commuter line connecting New Kensington and Greensburg in Westmoreland County through Oakmont to downtown Pittsburgh on the AVRR right-of-way would provide the foundation of a regional rail system with Lawrenceville becoming a major transfer center and multi-modal hub.

The proposed east-west route uses the Allegheny Riverfront Green Corridor to 26th Street where it would run as a streetcar on 26th Street to the East Busway, then along the Busway to Penn Station and the US Steel building to interface with the "T" system. Proposed stops in Lawrenceville include the 40th Street Corridor, 33rd Street where it could interface with rail service to Oakland and Hazelwood, 26th Street at the Busway, and the Downtown stops. A self-propelled, light diesel-powered car, built for freight-gauge track, is contemplated that could be ganged in 2- or 4-car "trains."

The Allegheny Valley Railroad also leases a north-south line that runs up the Route 8 corridor north to New Castle and south across Lawrenceville on the 33rd Street trestle to Oakland, Hazelwood, and farther south to Uniontown. If that line could also be used for passenger transit, Lawrenceville would become the center of the rail system as both the east-west and north-south lines cross at 33rd Street and the Allegheny Riverfront Green Boulevard. Combined with the urban circulator with its stops on Smallman at 33rd and in Doughboy Square, suggests a major intermodal transfer hub in the middle of the Allegheny Riverfront.

Commuter Transit Design Recommendations

- Utilize light diesel and light-weight transit vehicles using freight rail gauge tracks that can run on local city streets like a trolley or streetcar.
- Relocate the rail line to the south side of the right-of-way to allow maximum light penetration for the public trail on the north side.
- Provide 20' wide (or less, if possible) railroad right-of-way. Maximize pervious surfaces.
- Turn at 26th Street and continue tracks in street bed to the East Busway ramp across Liberty Avenue. Either continue down the East Busway to the US Steel station to interface with the T System or transfer to East Busway buses at 26th Street to continue the commuter trip into Downtown.
- Locate station stops in the Allegheny Riverfront at the Pittsburgh Zoo (Heth's Run), at 40th Street to interface with the proposed urban circulator, and 26th Street at the East Busway. Provide a pedestrian connection along 24th Street to access the commuter station at 26th Street that safely crosses Liberty Avenue to the station stop. In the future if a commuter line is installed along the north-south AVRR rail line, provide a station stop at 33rd Street where the two commuter trains cross.

Open Space Linkages to the River

Open space connections, green streets extending to the riverfront, and a trail network that ties the riverfront to the neighborhoods are the primary physical linkages to the river.

"Streamways"

The former stream, creek, and drainage paths from the higher plateaus and hills of Pittsburgh's East End flowed through the Allegheny Riverfront Area. Now buried, they should be reconstituted as natural spaces for stormwater capture. They can also provide much needed public open space for active and passive recreation for residents, employees, and visitors. Primary locations are 33rd Street to 35th Street from the Busway ravine to the river; 46th to 48th Streets from Allegheny Cemetery to the river; Heth's Run; and Washington Boulevard and valley to the river.

Bluffs

The bluffs and the steep slopes are important forested open spaces that contribute significantly to the ecological restoration and stabilization of the Allegheny Riverfront. They should remain undeveloped. These steep slopes include the Morningside Bluffs from around 62nd Street to the zoo entrance at Baker Street and the Highland Park Bluffs from the zoo around to Washington Boulevard.

Green Streets

Green streets, public rights-of-way that serve both ecological and urban functions, are also open space extensions from the neighborhoods to the river. Along some streets, the landscape can extend beyond the street onto public-owned and private property to create wider swaths of open space. Prime locations are 15th Street where a center median could signal the entrance into a new mixed use center for the Strip District; along the east side of the 33rd Street railroad trestle; and along the west side of 40th Street from Penn Avenue to the river. The wider swaths are excellent locations for landscaping, dense street trees, landscaping, water features, and passive recreation activities.

Trail and Bike Systems

The trail and bicycle paths are the primary linkages of the open space system. They connect the parks, the cemetery, the bluffs, the green streets, the riverfront riparian buffer, the railroad Green Boulevard, and the major arterials into a network of open space throughout the Allegheny Riverfront. Instead of a single riverfront trail, the pedestrian and bicycle paths are intended to be more like a network offering many choices of paths and bringing the river space into the neighborhoods, the neighborhoods to the river, and knitting the neighborhoods together.

Use Recommendations

- Generally, passive activities in these park-like spaces
- Children play areas

Open Space Linkages Design Recommendations

- Setback as open space when on private property.
- Limit the area of impervious surfaces.
- Capture all stormwater runoff in the public realm from storm events of 1" or less and direct to detention or pervious systems. In park-like open spaces and medians attempt to achieve 100% pervious surfaces. On green streets maximize pervious surfaces in landscaped curb extensions and where not possible use pervious pavement for all parking lanes, whose cumulative size will equal at least 20% of the public realm (more is encouraged). Pervious systems include open space, walking and parking surfaces, as well as landscaped areas designed to infiltrate and cleanse stormwater. Integrate areas for rainwater absorption into the ground that work in compacted, clay soil. Design a natural filtration system in the landscape to clean water that is returned to the river. Plant street trees.
- Landscape with native plant material, including street trees, to achieve an 80% tree coverage over the entire open space or curb extensions (trees overlapping hardscape surfaces comply). Conventional lawn-planting and chemical-intensive management is discouraged.
- Improve the soil mix to 50% void, 45% mineral, and 5% organic material for all landscaped areas qualifying as pervious systems. Provide 800 cf. of soil per tree to meet the tree coverage standard, or 600 cf. per tree when planted in adjoining beds.
- Bury overhead utility lines in accessible trenches for safety, durability, and to eliminate conflicts with trees.
- 28th Street: Extension of West Penn Recreation Center and park in Polish Hill down 28th Street to Liberty Avenue, where 28th Street becomes a green street to the riverfront.

- 33rd Street Corridor: Beginning within the East Busway area this open space corridor follows the topography across Liberty Avenue to the north side of the 33rd Street AVRR trestle. From there it continues toward the riverfront as a 100' wide open space until it meets the riparian buffer at the river's edge.
- Allegheny Cemetery Corridor, including Leslie Park and Recreation Center: This proposed open space begins at Butler and 46th Streets and follows a "stepping stone" path to the AVRR corridor where it crosses over and proceeds diagonally as a center-street median towards the 43rd Street terminus at the riverfront in a public park.
- Heth's Run: Consider adding pedestrian trails from the river overlook up to Butler Street in both directions. These would link Butler Street to the Heth's Run trail, which runs beneath the bridge.

Riverfront Trail System

A robust public trail system is strongly recommended throughout the Allegheny Riverfront Area. The long-term objective is a continuous trail along the riverfront from Downtown to the city line and beyond along both sides of the river. While now fragmented, the riverfront trail in the Riverfront Vision Area can be supplemented with a continuous inboard trail system that utilizes public streets to make the connections. Eventually the trail will be part of the riparian buffer and linked with the Allegheny Riverfront Green Boulevard and a system of green streets throughout the riverfront communities. Similarly, the existing riverfront trail on the opposite bank will be further improved as riverfront development occurs.

Since sections of the riverfront trail will be installed at different times, the idea of a trail network is to provide alternate trail routes when segments are blocked as well as provide alternate choices to its users who would like to take different paths. The network would act like a series of interconnected loops within the Strip District and Lawrenceville that is connected to the trail system along the north bank.

Use Recommendations

- Designated walking and jogging trail.
- Sitting, resting, and river overlook areas adjacent to the trail.

Riverfront Trail System Design Recommendations

- Follow Riverlife design guidelines for Connections that describes design standards for the riverfront trail.
- Separate designated walking and jogging trail from bicycle and rollerblade trail when buildings are set back from the water's edge more than 50' and there is enough room to accommodate a dual trail. On perpendicular green streets and linear arterials, the pedestrian trail would be the street sidewalks and the bicycle path would be designated biking lanes on the street bed.
- When a single trail, split the trail to allow for a separate walking and jogging portion and a separate bicycle and rollerblading section. When dual trails, separate walking and jogging from biking and rollerblading.
- When located on green side streets and along Butler Street and Penn Avenue, provide designated bicycle lanes either by separate pathway or by marking bicycle lanes on the street pavement.
- Use only permeable surfaces. Use hardscape permeable surfaces where rollerblading is permitted.
    - Any hardscape permeable surface should be underlain by a storage/infiltration bed comprised of stone or other storage media.
- Lighting and accessories, such as benches, signage, and trash receptacles

Managing the Movement System

A classified roadway hierarchy is strongly recommended for streets within the Allegheny Riverfront in order to lessen the conflict between neighborhood movement and truck traffic. The current movement system breaks down into three basic categories of

roadways: arterials that move large volumes of traffic through the area; collectors which gather traffic from local roads within the area; and local roadways. Current arterial roadways include Liberty Avenue, Penn Avenue, Butler Street, Route 28, and numerous bridges across the Allegheny River.

The proposed hierarchy alternates east-west street types intended for the movement of goods from the movement of people. Arterials recommended for the movement of goods are Liberty Avenue and Smallman Street. Arterials for the movement of people are Butler Street/Penn Avenue and the Railroad Street/railroad Green Boulevard. People-oriented streets favor pedestrians and bicycles, although other means of transportation are allowed while trucks are discouraged. The alternating street type pattern interrelates with the parking strategy so that parking facilities are located just off the auto and truck routes for access, but far enough from people-oriented streets so that pedestrians will pass by stores and businesses on the way to their destination.

Residential Development: Highest Priority

Successful sustainable development in U.S. cities involves a wide mix of uses in a variety of settings, but what they have in common is that they are supported by residential growth. Without attracting people to live in the area, the impact of the development tends to be short-lived or even detrimental to property in the neighborhood. The development program for the Riverfront Vision Area should be predominantly housing, ranging from upscale condos to affordable rentals with specialized and innovative housing types for emerging markets. Existing neighborhood housing is an irreplaceable resource and needs to be preserved. Transformative development sites show a potential for over 3,000 new units; and that market could be significantly increased, drawing especially from outside the region.

New Urban Centers for the Strip and Lawrenceville

Two new centers are recommended for the Riverfront Vision Area that will have transformative landmark and market qualities. The vacant 50+ acres owned by The Buncher Company in the Strip District on both sides of the river would constitute one of the largest center city riverfront developments in the country. The underutilized properties between 39th and 40th Streets from Butler Street to the river could become a new "civic center" for Lawrenceville.

Strip District

The Strip District site, between 11th and 21st Streets, will create a new riverfront destination and residential neighborhood to complement the historic Penn Avenue marketplace and the repurposed Produce Terminal, and link the residential neighborhood forming around the Cork Factory. Because the site is so large, it is easier to understand it in sections: three sections on the south riverfront are divided by the Veterans Bridge and the16th Street Bridge and the fourth section is the land on the north side, which lies between the two bridges. Both sides of the river would be developed with the riparian buffer and riverfront trail system. Each of the four sections of the proposed concept plan would have different characteristics:

11th Street to the Veterans Bridge

Office, commercial, and some supportive retail uses as an extension of Downtown activities, but at a smaller scale.

Between the Veterans Bridge and the 16th Street Bridge

24-hour mixed-use entertainment zone, with riverfront restaurants, retail storefronts, and a publicly-accessible riverfront and water taxi stop. Mixed uses, such as offices and commercial activities and perhaps a hotel and residential uses, would complement the entertainment venues. This would be the highly-public portion of the development.

16th Street Bridge to 21st Street

A five-block long residential neighborhood along the riverfront, with some office and neighborhood service retail inboard of the river. Residential development is key here, since the Penn Avenue regional destination would be diluted if the retail shopping experience were expanded to the riverfront. The Produce Terminal, as part of the development, would be repurposed as a public marketplace, retail, showroom, and professional office location fronting onto a Smallman Street public space.

North Side from the Veterans Bridge to the H.J. Heinz plant

Primarily a residential development, with minor supportive neighborhood service retail and professional offices, this site could also be the location for a new marina and water taxi stop.

The concept plan recognizes the value of the Penn Avenue historic marketplace. Its present character should be preserved, while its functioning is improved. Proposed locations for parking garages are intended to encourage and reinforce public access to Penn Avenue as well as to the new development. The repurposed Produce Terminal is also intended to reinforce Penn Avenue by offering a distinctly different kind of marketplace and by creating a strong boundary for a new Smallman Street piazza.

Use Recommendations and Design Recommendations

- (See Transformative Development in the next section)

Lawrenceville

The proposed 40th Street Corridor design concept recognizes this location as the symbolic center of the Lawrenceville community, connects Penn Avenue to the river along 40th Street, and opens up cross traffic connections between Lower and Central Lawrenceville.

Smallman Street is aligned with Foster Street and connected to 40th Street at the foot of the bridge, and Willow Street is connected below the bridge. The circulator trolley continues up Smallman to 40th Street then circles back along Butler Street and Penn Avenue. The green, park-like grounds of the Allegheny County offices at Penn and 40th are expanded along 40th Street to the river, connecting Arsenal Park, the Arsenal School grounds, the trolley right-of-way, a proposed railroad Green Boulevard commuter rail stop, and the riverfront riparian buffer and public trail. A boat house is shown at the river's edge for river-oriented activities and a water taxi stop.

The 40th Street Corridor concept plan is more residentially-based than the Strip District center. Residential uses begin at Butler Street and continue down to the riverfront. Along Butler Street, neighborhood service retail uses are recommended for the ground floor, including a new grocery store, mixed-uses, and professional offices. The ground floor uses would fill the missing link of Butler Street's retail spine to link Upper and Central Lawrenceville. The site would also include a trolley station, public open space, and a larger park at the riverfront.

Use Recommendations and Design Recommendations

- (See Transformative Development in the next section)

Transit Oriented Development

The proposed new development in the Strip District, led by the concept plan proposed for the Buncher properties, and the proposed new civic center development in Lawrenceville, led by the concept plan for the 40th Street Corridor, qualify these locations for Transit Oriented Development funding. This Federal funding encourages the use of public transit by providing monetary incentives to construct multi-modal transit and adjacent development that relies heavily on its use.

A study conducted for the Southwestern Pennsylvania Commission identified certain factors based on density that are critical to developing a successful TOD: connectivity, population, housing, employment, and zoning. Both transformative areas rely on a combination of new development, built to higher density standards than presently exist, and spillover development of the surrounding neighborhoods, including infill and repurposing of existing buildings, to meet the TOD metrics. Two distance measurements are used for evaluating the criteria: ¼-mile distance (roughly a 600' radius measured from the multi-modal transit

station) is used to calculate walkability and population and housing density, and a 1-mile distance (a ½-mile radius) is used to calculate employment density. The Strip District benefits because of its close proximity to Downtown, however it needs new housing to quality. Lawrenceville benefits because of its high walkability and bus service, but it too requires new housing as well as new employment opportunities to qualify.

The Allegheny Riverfront's TOD factors and densities are included in the table below relative to the successful urban baseline TOD metrics:

TOD Success Factor Metrics

TOD SUCCESS METRICS	URBAN BASELINE	40th STREET	STRIP
Population Density Per Acre (1/4 mile)	16.7	20	21
Housing Density Per Acre (1/4 mile)	11	12.6	13
Travel Time to Pittsburgh	13 min	7 mins	3 mins
Transit Time to Pittsburgh	10 min	15 mins	7 mins
Employment Density (1 mile)	15,000	15,598	110,000+
Zoning (# of districts/applied districts)	11/15		
Walkability Score	89	94	82
Transit Availability	YES	YES	YES
Cross Route Connections	YES	NO	YES
Dedicated Fixed Guideway	YES	NO	YES
Cross Route Service Density (weekday roundtrips/ridership)	126/3,842	0 / 0	56 / 5,094
To Downtown Service Density (weekday roundtrips/ridership)	281/24,410	53 / 3,700	159 / 14,450

Memorable Places

Where the Riverfront Vision Area can excel in further distinguishing its neighborhoods and character of place is in deliberately creating new public spaces and destinations. Memorable places are specific locations that acquire meaning beyond their spatial configuration as places of social, historical, or even aesthetic values that are generally acknowledged and respected. These locations have the potential to become new memorable places:

Riverfront

Creation of the riverfront riparian buffer will clearly distinguish this place as a water-related regional asset. Within the buffer some locations have further public potential: acknowledge the shipbuilding and manufacturing history between 11th Street and the Veterans Bridge in conjunction with the History Center; develop the river's edge with a land extension for public access and water taxi landing between the Veterans Bridge and the 16th Street Bridge; and create a new regional park at the foot of Washington Boulevard on the Public Works property.

Allegheny Riverfront Green Boulevard as a Complete Street and Public Space

The spatial qualities of this 62' to 100' wide space cutting through the fabric of the Strip and Lawrenceville are not matched anywhere in the city.

Extension of Railroad Street from 21st Street to 11th Street

Public places could include a public plaza at 21st Street and a park between the Veterans Bridge and 11th Street that connects the History Center to the riverfront.

Smallman Street "Piazza" between 16th and 21st Streets

By improving the Produce Terminal's 50' wide "front yard" as a public amenity and transit corridor and creating a pedestrian-friendly sidewalk along it south face, this 90' wide space can become a public piazza and destination for Strip District patrons and visitors.

33rd Street Railroad Trestle

This dramatic steel structure and Allegheny Riverfront landmark could be given a new life by new paint or repurposing it as a canvas for an artistic installation, such as a "living wall."

Intersection at 40th and Butler Streets

This portal into Central Lawrenceville could be enhanced by strengthening its spatial qualities by new buildings that build to the property line, judicious street tree plantings, and reconceiving the privately-owned property between 39th and 40th Streets as a new center for Lawrenceville. The space this forms could become a very public place and a landmark of the Lawrenceville community.

Bluff Scenic Byway

Consideration should be given to designating Butler Street and Allegheny River Boulevard as a "scenic byway" from 62nd Street to Washington Boulevard. This will also create a scenic entrance to the Pittsburgh Zoo from the west.

River Overlook on Baker Street

Not available to the public until the buildings were demolished atop the Morningside Bluffs on Baker Street, this location should be improved as a scenic overlook with wonderful views of the river valley. Its importance to the Morningside neighborhood as a public asset should be enhanced and protected.

Pittsburgh Zoo Entrance

The intersection of Butler and Baker Streets has potential as an open space and portal entrance for the zoo.

Highland Riverfront Park

Converting the Public Works space at the end of Washington Boulevard into a public riverfront park and improving the intersection at Washington Boulevard and Allegheny River Boulevard as a portal entrance to the riverfront and park will create a new Pittsburgh asset.

Areas Left Alone—Continue with Current Plans

The business and residential communities were quite outspoken that the best strategy is to leave alone what is already working. Although it may seem the Vision Plan has improvement recommendations for almost every place in the Allegheny Riverfront, the great majority of properties and places are not cited for direct improvement or intervention. Many areas have development plans already in place, and except where the Vision Plan modifies them, they should continue with implementation.

The Transition, Preservation, and Service Zones which form the core of the Allegheny Riverfront are encouraged to grow in an evolutionary manner. Their growth would be boosted by green infrastructure improvements and smaller-scale investments. It is in the Regenerative Zone and very specific locations in the Transition Zone where the Vision Plan proposes large development interventions that are market changers.

The base for economic growth and sustainability in the established neighborhoods of the Allegheny Riverfront Area already exists. The market recommendations are all based on encouraging evolutionary growth. They recognize that the present building stock and mixed use nature of the Riverfront Vision Area is the infrastructure needed to make this happen. Other than along the riverfront, residential growth is encouraged to strengthen the neighborhoods by building on vacant and infill sites. Incremental growth of the historic market place on Penn Avenue and the Butler Street retail district is likely to have positive spillover effects that will help sustain the uses around them. The Transition Zone will support emerging industries and the growth of existing industry for some time to come.

recommendations for projects at different scales

The Vision Plan proposes improvements that involve various degrees of intervention over a broad range of scales. Some entail new development on large underutilized sites that would create a market for neighborhood property; others are specific to individual sites where an infill change will make a difference; and many will evolve on their own. They cover a range of scales from very large to small, yet each has a strategic purpose:

- Transformative Development
- Strategic Catalysts
- Repurposed Places
- Maintenance
- Conservation

Transformative Development

Redevelop Major Underutilized Sites

Large underutilized sites are located in key places where development could transform the landscape and create new opportunities. They would have a significant design and market impact, and exhibit catalytic qualities to help spur investment toward achieving sustained growth.

- Strip District from 11th Street to 21st Street between the riverfront and Smallman Street, including the North Side across the river between the Veterans and 16th Street Bridges
- 33rd Street Corridor/Doughboy Square from Liberty Avenue to the river
- 40th Street Corridor from Penn Avenue to the river
- Central Lawrenceville from 43rd Street to 48th Street along the riverfront, including the Heppenstall Site

Design studies were conducted for four of these sites as demonstrations and tests of the Vision Plan frameworks and infrastructure recommendations. The concept designs helped to confirm whether the Vision's recommendations can achieve the density recommendations needed for transportation funding, achieve stormwater management goals, provide a variety of open space opportunities, and create livable and walkable riverfront communities.

They represent a cross-section of conditions found throughout the Allegheny Riverfront, including large-, medium-, and small-sized parcels; various densities; a mixture of uses; a variety of open space types including those significant to meeting ecological objectives; different conditions along the riverfront; and a variety of connection situations including multi-modal possibilities. They were investigated from the ecological, connections, urban form, and market perspectives.

Strip District from 11th Street to 21st Street between the riverfront and Smallman Street, including the North Side across the river between the Veterans and 16th Street Bridges

This transformative site represents the largest vacant riverfront site in downtown Pittsburgh and encompasses land on both sides of the river.

The 50+ acres on the south side of the river, a former switching center for two railroads serving the wholesale operations of the Strip District, are owned by two entities: The Buncher Company, who controls the entire site except for the Produce Terminal, which is owned by the Urban Redevelopment Authority. The AVRR owns an easement to extend the Railroad Street tracks west to 16th Street. The Buncher Company built two structures several years ago: the Seagate Building, a rental office building at 12th Street and the riverfront, and the Hampton Inn hotel at 12th Street and Smallman. The remainder of the Buncher property is vacant and used for commuter parking. Buncher provided an easement for the riverfront trail between 11th Street and 21st Street as a public service. The company also installed separate stormwater piping throughout most of the Penn Avenue historic marketplace over to Smallman Street in anticipation of future development.

Two bridges cross the site. The six-lane Veterans Bridge, which is part of the Interstate highway system, flies over the site. PennDOT and Federal regulations will not allow any occupied uses, except for parking facilities, to be located beneath the bridge. The 16th Street Bridge connects the Strip District to the other Buncher-owned large tract of vacant land on the north side, also included in the concept plan. This largely vacant property is adjacent to the Heinz Company facilities and the residential Heinz Lofts. The south end of the 16th Street Bridge touches down at the foot of Penn Avenue, signaling entry into the Penn Avenue historic marketplace.

Because the site is so large, it is easier to understand in four sections. Each of the four sections of the proposed concept plan would have different characteristics. The three sections on the south riverfront are divided by the Veterans Bridge and 16th Street Bridge. The fourth section is the land on the north side, which lies between the two bridges.

11th Street to the Veterans Bridge

This is the historic section of the Buncher property. It was once home to ship building near today's Convention Center, an aqueduct of the Pennsylvania Canal System for that carried barge traffic between Downtown and the north side, and a former foundry on the Seagate Building site. This section has caught the interest of several parties. The John Heinz Pittsburgh History Center, which sits across the site on Smallman Street, sponsored a "portal" designation for 11th Street as the entrance into the Strip District and would like to see this section's historic nature recognized by placing industrial artifacts along the riverfront and pedestrian pathways. There were also plans for a public trail and lighting installation connecting the space between the Fort Wayne Bridge at 11th Street and the Buncher trail section that were never implemented. The Chan Krieger "Vision Plan for Pittsburgh's Riverfronts" proposed a public open space connecting the History Center to the riverfront. The Allegheny Riverfront community noted this section's historic and portal significance as important design features to carry forward, along with the desire that the trail be improved and the area become more bicycle and pedestrian friendly.

Between the Veterans Bridge and the 16th Street Bridge

Currently a surface parking lot, this section recently housed an entertainment venue on a barge that terminated 15th Street at the water. Restaurants face the site across Smallman Street. The two bridges frame the Buncher properties across the river. The community would like to see this section developed as a mixed-use "village" with a variety of uses and buildings that recognize the riverfront, entertainment, and public nature of this section. They also noted this section of Smallman Street is a speedway and requested that traffic be slowed to become more bicycle and pedestrian friendly.

16th Street Bridge to 21st Street

The largest section, stretching five city blocks, is cut off from the riverfront by the Produce Terminal. Access to the riverfront is only beneath the 16th Street Bridge and along 21st Street; there is no access through the Terminal. Since the City asphalted Smallman Street's former Belgium block surface, traffic speed has increased significantly in this wide section of Smallman.

The 100' by 1,520' Produce Terminal faces onto Smallman Street. The Terminal's property includes a 50' deep frontage or "front yard" along Smallman that is now used for parking, and space for truck docks at the rear. This single-story distribution

building, with a two-story Auction House at its eastern end, spans five blocks from 16th Street to 21st Street. The Terminal sits across Smallman from the historic marketplace district's northern extension of restaurants, nightclubs, and retail storefronts. Although primarily a wholesale facility, the Produce Terminal is a designated historic structure on the National Register. The Society for Contemporary Craft occupies the ground floor of the Auction building. Neighbors in the Strip manages the Pittsburgh Market, an open-stall vendor marketplace, at the Terminal's west end around 17th Street that now extends the Penn Avenue shopping experience across Smallman Street. Most of the remaining spaces are rented to a variety of wholesale operations that are not open to the public.

Pfaffmann and Associates' study of the Produce Terminal Marketplace for Neighbors in the Strip recommended a 40,000 square feet facility at the west end of the Terminal and proposed automobile access cuts through the Terminal at 17th and 19th Streets to the Buncher-owned riverfront property. The current installation by Indovina Associates is a smaller marketplace due to available space. Indovina Associates also recommended that NITS develop the parking lots and alleyways in the block between Smallman and Penn Avenue, opposite the Terminal, as public space with retailing activities to encourage shoppers over to Smallman Street. The Society for Contemporary Craft would like to see a public events space in the middle of 21st Street opposite the Auction House.

The community felt quite strongly about the need to retain the historic Produce Terminal and accommodate the present tenants. They also noted the intersection of Smallman and 21st Street as a "hub" and center of the Strip District that should be strengthened in future plans. They acknowledged the need to slow down traffic as a safety measure and make this section pedestrian and bicycle friendly. Several community members suggested a public open space be designed in front of St. Stanislaus Church as a terminus to this wide section of Smallman Street.

North Side from the Veterans Bridge to the H.J. Heinz Plant

This large site is mostly vacant save for a few structures. At one time The Buncher Company conceived this site for flex building development, laid out as several single-story distribution warehouse/office buildings, and later gave it consideration as a riverfront casino site. The site is hemmed in by an elevated railroad line on its northern edge, with tunnel access only at 16th Street, and by the Heinz plant and Heinz Lofts to the east. The community and City would like to see this site brought into the Strip District experience because of easy access across the 16th Street Bridge and its "framed view" from the south bank. Because of Buncher's ownership, planning could be contiguous with the south riverfront.

Design Description

The illustrated concept plan respects the uniqueness of the four sections, while recognizing there are linkages and infrastructure which are necessary to connect them.

All sections show the riparian buffer and public trail along the riverfront. The open space meets the proposed permeable surface and tree cover recommendations, with buildings shown set back 150' from the water's edge and the buffer extending further into the site to compensate for the buildings extending into the 200' buffer zone. The street grid is extended to the buffer and Railroad Street is continued to 11th Street. Green connections are made with open space and the greening of streets. Buildings are restricted in height so they do not compete with the form of Downtown's iconic massing that slopes upward to the US Steel Tower nor spike market demand with only one or two very tall structures. Tenant parking is assumed to be below all new buildings and public garage facilities are strategically located below the Veterans Bridge and east of 21st Street to encourage strolling and shopping on the way to destinations. No commuter parking is proposed. The urban circulator trolley line is shown along Smallman Street to serve all of the Strip District. Almost all of the proposed new development is within. or fronts onto, the Regenerative Zone.

The plan recognizes the need for the Penn Avenue historic marketplace to retain its present character and continue its natural evolution. The proposed locations for parking garages are sited to encourage and reinforce public access to Penn Avenue. The repurposed Produce Terminal is intended to reinforce Penn Avenue by not competing as a streetfront marketplace and by creating a strong northern boundary for the historic marketplace/retail zone. The Penn Avenue regional destination would be diluted if the retail shopping experience were expanded to the riverfront.

The proposed concept plan would qualify the Strip District for TOD funding.

Strip District Proposed Development Shown in Concept Plan

New Commercial 1,256,000 SF including retail
New Residential 1,020,000 SF equivalent to 1,020 units at 1,000 SF each
Infill Residential 352,000 SF equivalent to 352 units in existing structures
Parking 2,290 to 2920 total spaces
- Residential: 1 space per unit within building footprint
- Commercial: 750 to 1,250 spaces within building footprint and in garage facilities
- Retail: 190 to 320 spaces in garage facilities
- Replacement of displaced street parking: 330 spaces in garage facilities

STRIP DISTRICT DEVELOPMENT PARKING REQUIREMENTS
Allegheny Riverfront Vision Study
City of Pittsburgh, Pennsylvania

Development Component/Size	Minimum Parking Requirement Formula	Unadjusted Parking Requirement	Transit Reduction 20% - 40% (1)	Shared Parking Reduction 20%(1)	Bicycle Facilities Reduction 10%(1)	Parking Required, Spaces
Residential Units - 1,020 Units	1.0 spaces per unit	1,020	0	0	0	1,020
General Office - 1,256,400 s.f.	1.0 spaces per 500 s.f. over 2,400 s.f.	2,508	-502 to -1,004	-502	-251	751 to 1,253
Retail - 321,600 s.f.	1.0 spaces per 500 s.f. over 2,400 s.f.	638	-128 to -256	-128	-64	190 to 318
Subtotals	--	**4,166**	**-630 to -1,260**	**-630**	**-315**	**1.961 to 2,591**
Replacement Lunch/Shopper Parking	--	330	--	--	-315	330
Totals	--	**4,496**	**-630 to -1,260**	**-630**	**-315**	**2,291 to 2,921**

(1) Not applicable to residential uses.

North Side Proposed Development Shown in Concept Plan

New Commercial 112,000 SF
New Retail 26,000 SF
New Residential 876,000 SF equivalent to 876 units at 1,000 SF each
Parking 890 to 945 total spaces
- Residential: 1 space per unit within building footprint
- Commercial: 10 to 55 spaces within building footprint
- Retail: 3 to 12 spaces within building footprint

General Use Recommendations

- Continuation of the riparian buffer and trail network
- 11th Street to the Veterans Bridge: Office, commercial, and retail uses, similar to Downtown; public park

- Between the Veterans Bridge and the 16th Street Bridge: 24-hour mixed-use entertainment zone with riverfront restaurants and retail storefronts; office; commercial; hotel; residential; water taxi stop
- 16th Street Bridge to 21st Street: Residential along the riverfront, with some office and neighborhood service retail; retail, entertainment, showroom, and professional office use of the Produce Terminal
- North Side from the Veterans Bridge to the H.J. Heinz plant: Residential, with supportive neighborhood service retail and professional offices; marina; water taxi stop

General Design Recommendations

- Development should be ecologically sustainable, multi-use, built to green standards, residentially compatible, with access to the riverfront along its length.
- Establish the riparian buffer, street grid, rights-of-way, and infrastructure to support future high-density development along the riverfront.
- Rebuild the public trail along the riverfront and continue the complete Allegheny Riverfront Green Boulevard as an extension of Railroad Street to 11th Street.
- Utilize Railroad Street as the front door to riverfront buildings.
- Control building heights to maintain Downtown's iconic image.
- Do not incent change of the historic retail/wholesale nature of Penn Avenue and established sites in the Strip District, but allow change to occur as an evolutionary process.
- Provide parking facilities to support the public use of the area's amenities but discourage commuter parking.
- Follow Regenerative Zone recommendations for private site and building design and design of the public realm.

11th Street to the Veterans Bridge Design Recommendations

11th Street to the Veterans Bridge is proposed as an extension of Downtown uses with commercial buildings, a public park open space along Railroad Street, and an open space connecting the History Center to the riverfront. Smallman Street would continue as a multi-modal street for movement of goods and people.

- Encourage the design of 11th Street as a portal into the Strip District.
- Recognize the History Center and its relationship to the riverfront as this section's anchor facility.
- Recognize this section's past historic activities (shipbuilding and foundry) with artifacts and educational installations in public spaces.
- Encourage a stronger linkage to the Convention Center, including its parking facilities, with an 11th Street pedestrian passageway (underground or sky bridge) and parking garage entrance into the Center.
- Limit building heights to generally that of the Seagate and Hampton Inn buildings and not higher than 10 stories.
- Locate publicly-accessible parking garage facilities below the Veterans Bridge.

Veterans Bridge to the 16th Street Bridge Design Recommendations

The space between the Veterans and 16th Street Bridges is proposed as an active, 24-hour entertainment and mixed-use zone and destination site to encourage public riverfront access. Uses would include riverfront restaurants and retail storefronts along a widened and landscaped 15th Street connecting Smallman Street to the river; restaurants and retail storefronts along Smallman; and a mix of office, hotel, and residential uses above the ground floor. Retail uses should be unique and cater to year-around activity. The riverbank is shown reconfigured for public access out into the river and for sheltered water taxi and pleasure boat docking. Restaurants are encouraged along the bank or facing the bank across the riparian buffer. This would be an appropriate location to sculpt the riverbank as an amphitheater with access to the water's edge, similar to river's edge at the Rivers Casino. An open-air public market is proposed below the 16th Street Bridge from Smallman to the river.

- Encourage development as a 24-hour mixed-use destination site with unique, diverse, and entertainment uses.
- Limit building heights to 8 stories to distinguish this area from the Downtown-oriented section to the west.

- Utilize 15th Street as a green street link from the river to Penn Avenue.
- Encourage public access of the riverfront and the water's edge, including a water taxi stop and a public street along the inboard edge of the riparian buffer.
- Calm Smallman Street traffic with public-oriented and pedestrian-friendly uses.

16th Street Bridge to 21st Street Design Recommendations

The riverfront behind the Produce Terminal is illustrated as a 1,000 unit residential neighborhood with open space connections to the trail and riparian buffer. A permeable surfaced parking lot with small accessory buildings for neighborhood services is shown between the Terminal and the residential blocks. Installing a public street along the edge of the riparian buffer is not recommended, as this section of the Strip District is intended to be a residential neighborhood. 21st Street is intended as a green street connector to the riverfront with park-like open space and buildings acknowledging the public nature of this access. A public parking garage is located beyond 21st Street between Smallman and Liberty Avenue to accommodate shopper needs.

The Produce Terminal is shown with two pedestrian connections through the building providing access to parking and the residential units along the riverfront. The Produce Terminal is assumed to be historically renovated and developed as a professional center with a mixture of tenants, from restaurants to showrooms to professional offices. Remove the diagonal truck docks off the back of the Terminal and side load/unload in the future. The Pittsburgh Public Market anchors the western end of the Terminal so it can manage the proposed open-air market below the bridge and serve as a transition to the entertainment section on the other side of the bridge. The Society for Contemporary Craft is shown anchoring the eastern end. These two public-oriented, non-profit organizations will help assure the attraction and quality level of this historic structure.

The wide space of Smallman between the 16th Street Bridge and 21st Street is proposed as a public piazza. The 50 foot "front yard" of the Produce Terminal is proposed as a landscaped public space for outdoor extensions of Terminal uses and sitting and walking spaces for pedestrians. The trolley would stop along its edge, occupying the space adjacent to the vehicle right-of-way. St. Stanislaus Church would be recognized by a public space at 21st Street.

- Strengthen the historic market district along Penn Avenue and the south side of Smallman Street by providing supportive infrastructure, such as customer parking and pedestrian-friendly street improvements.
- Encourage residential uses along the riverfront with public access to the riverfront between the buildings.
- Limit building heights to 8 stories, similar to the Cork Factory.
- Develop the Produce Terminal as an anchor facility between riverfront activities, Penn Avenue shopping, new development between the bridges, and new development clustered around the Cork Factory.
- Turn Smallman Street between 16th and 21st Streets into a public "piazza" utilizing the Terminal's frontage space as pedestrian-friendly outdoor space and relocating traffic to the south side of Smallman Street.
- Convert 21st Street into a green street with access to the river and with public spaces adjacent to the Produce Terminal and St. Stanislaus.

North Side Design Recommendations

The north side site is shown as high-density housing with some mixed-development along 16th Street. Riverfront uses include a potential restaurant along the bank and a marina. There appears to be little market demand for other uses.

- Establish a street grid appropriate for high-density residential development.
- Develop as a residential neighborhood, with mixed uses along 16th Street and possible restaurant use(s) along the riverfront.
- Limit building heights to 6 stories.

- Extend the north shore Three Rivers Park public trail through the riparian buffer.
- Encourage river activities, such as a marina and water taxi stop.

33rd Street Corridor/Doughboy Square from Liberty Avenue to the River

The two new transit system recommendations suggest the 33rd Street Corridor as a transformative site in Lawrenceville. Should the AVRR commuter line and the urban circulator become realities, the corridor is well-suited as a multi-modal transportation hub. In addition to the Allegheny Riverfront Green Boulevard's commuter line, the AVRR's other line that uses the 33rd Street trestle to cross Lawrenceville from the north shore connects to Oakland, Hazelwood, and sites farther south. These two lines cross at 33rd Street and the Allegheny Riverfront Green Boulevard. The urban circulator crosses below the trestle at Smallman Street and at Penn Avenue. Within the distance of a few blocks three transit routes will cross one another, interface with bus routes, and interface with designated bicycle lanes. In addition, the intersection at Liberty Avenue and Herron is the center point between the Strip District, Lawrenceville, and Polish Hill. If Liberty could connect to Doughboy Square in a more logical manner, these three communities would be better connected and Lawrenceville would gain a stronger portal entrance.

The Corridor is also the location of a former stream, suggesting an open space "streamway" linkage to the river. The stream's path crossed Liberty Avenue at the Iron City Brewery site and continued to Penn Avenue before veering east to join the river around 37th Street. Today the railroad trestle symbolizes the stream by connecting the Busway ravine to the river.

The trestle is the dominant feature of the Corridor. From below, it is a magnificent steel structure. But it is also an eyesore, particularly where it crosses over both Liberty and Penn Avenues. Nearby buildings are a mixture of types and sizes, including scrap yards and historic residential buildings, with none dominant.

The LoLa Plan recommended a key change that would benefit this area's revitalization: the continuation of retail and commercial infill development from 40th Street to Doughboy Square that would help build market demand in the Corridor area. Recent developer interest in new housing around 34th Street is beginning to realize this area's potential. New buildings on the north side of Butler Street would define this edge of the Square and link to the commercial uses beginning at 35th Street.

The community expressed interest in encouraging more housing down to 33rd Street in Lower Lawrenceville and would like to see the Iron City Brewery at Liberty and Herron developed into an active use. The community was also intrigued by the mass transit connection possibilities should the transit lines go ahead.

Design Description

Design studies investigated how to connect Liberty Avenue to Doughboy Square, how the green open space of the Busway could make its way to the riverfront, and the site's multi-modal potential from crossings of mass transit lines. Development is dependent on transit improvements. Either the circulator trolley or commuter rail could jump start development.

Herron Avenue (and Polish Hill) and Liberty Avenue are connected to Doughboy Square by extending Herron across Liberty to Penn Avenue. This change would replace traffic now traveling from Liberty onto Ligonier Street before turning onto 34th Street to enter the Square. With the Herron extension, 34th Street between Ligonier and Penn would be closed and developed either a public park space or with a building fronting Doughboy Square. This change will return Ligonier Street to a local neighborhood residential street.

A 100' wide green open space acknowledging the former stream's path is shown parallel to the east side of the 33rd Street railroad trestle extending from the Iron City Brewery property to the river. An elevated transit station is shown between Penn Avenue and Smallman to connect the AVRR east-west commuter line to the AVRR north-south line, the

circulator trolley, and local bus lines. By setting buildings back 100' from the trestle, its beauty can be recognized and perhaps transformed into a community asset.

Recognition of this area as a multi-modal transfer site is demonstrated in the concept design by taller, mixed-use buildings. Liberty Avenue is proposed to be more commercial in nature with residential and mixed-use buildings along Penn and Smallman. Buildings around Doughboy Square are recommended for infill with three-story high structures that strengthen the outline of the Square. Taller buildings are suggested at Liberty and near the trestle.

Proposed Development Shown in Concept Design

Commercial 40,000 SF
Retail 150,000 SF
New Residential 785,000 SF equivalent to 785 units at 1,000 SF each
Parking 900 to 970 total spaces
Residential: 1 space per unit within building footprint
Commercial: 25 to 40 spaces within building footprint
Retail: 90 to 150 spaces

DOUGHBOY SQUARE DEVELOPMENT PARKING REQUIREMENTS
Allegheny Riverfront Vision Study
City of Pittsburgh, Pennsylvania

Development Component/Size	Minimum Parking Requirement Formula	Unadjusted Parking Requirement	Transit Reduction 20% - 40%(1)	Shared Parking Reduction 20%(1)	Bicycle Facilities Reduction 10%(1)	Parking Required, Spaces
Residential Units - 785 Units	1.0 spaces per unit	785	0	0	0	785
General Office - 40,000 s.f.	1.0 spaces per 500 s.f. over 2,400 s.f.	75	-15 to -30	-15	-8	22 to 37
Retail - 150,000 s.f.	1.0 spaces per 500 s.f. over 2,400 s.f.	295	-59 to -118	-59	-30	88 to 147
Totals	--	**1,155**	**-74 to -148**	**-74**	**-38**	**895 to 969**

(1) Not applicable to residential uses.

Use Recommendations

Generally, the 33rd Street Corridor should become a mixed-use hub with some ground floor retail activity.

- Residential
- Office and commercial
- Neighborhood service retail
- Multi-modal transit station
- Open space as public park and transit station entrances

Design Recommendations

- Develop as a mixed-use and transit-oriented hub with some ground floor retail activity.
- Follow Transition Zone recommendations, including stormwater management, soil, and planting recommendations.
- Allow higher densities because of the open space and transit opportunities. Increase building heights to 6 to 7 stories in the vicinity of the Iron City Brewery and the 33rd Street railroad trestle. Maintain 3-story heights at Doughboy Square.
- Connect Herron Avenue to Doughboy Square by extending Herron perpendicular to Penn Avenue.

- Install a 100' wide open space along the east side of the trestle from the Busway to the river where it would meet the riparian buffer. Use the open space to capture stormwater from the adjacent public realm and plant with trees to achieve an 80% tree canopy coverage.
- Transform the trestle with an art installation, such as a "living green wall" or urban graphic.

40th Street Corridor from Penn Avenue to the River

The 40th Street Corridor recognizes a new civic center for the Lawrenceville community, connects Penn Avenue to the river along 40th Street, and creates new connections between Lower and Central Lawrenceville.

40th and Butler is the center of Lawrenceville. From this single intersection arterial streets radiate to Oakland, the North Side, Oakmont, and Downtown. The intersection is equidistant from the Cathedral of Learning in Oakland and Mellon Square in Downtown, and easily accessed by the majority of Lawrenceville residents. Presently, the intersection is occupied by a fast food restaurant, a gas station, the Arsenal School, and a pharmacy with a parking lot along Butler Street. Except for the public school, none acknowledge this location's importance. If there were to be center of the Lawrenceville community, this would be the location.

There are a number of obstacles that keep the Lower and Central Lawrenceville neighborhoods apart. Vehicle connections between Lower Lawrenceville and Central Lawrenceville, except for Butler Street and Penn Avenue, are blocked: the school and Arsenal Park block cross traffic south of Butler Street, a single large parcel occupies the west 40th Street frontage from Butler Street to the AVRR corridor, and the space below the 40th Street Bridge is occupied by County and City services. Only 40th Street and the AVRR right-of-way connect these two neighborhoods.

The intersection at 40th and Butler has developed little urban context and form. Butler Street between 39th and 40th Streets has little building presence: the school playground fronts onto Butler and the pharmacy's front parking lot is directly across the street. Along 40th Street the building wall from the bridge to Butler is broken by the fast food restaurant and the gas station at Butler Street intersection. Fortunately, the portal opening at Butler into Central Lawrenceville is maintained by the buildings adjacent to the intersection, which are built to the Butler Street sidewalk line.

The neighborhoods on either side of 40th Street have developed differently. The Lower Lawrenceville side is generally residential between Butler to the AVRR right-of-way, with almost all of the industrial uses located along the riverfront. A number of residential buildings on 38th and 39th Streets are historic. At the river bank below the bridge the view of Downtown is spectacular and the water is accessible. In Central Lawrenceville, the residential and industrial uses are more mixed due to the location of the Heppenstall site where industrial uses filter into the residential neighborhood.

Community interests are different on either side of 40th Street. Lower Lawrenceville neighbors are very concerned with preservation of the historic housing stock and the remnants of the former Arsenal. An extension of Smallman Street to 40th Street needs to be sensitive to the neighborhood's historic qualities and the disruption, including vibration, from heavy traffic and construction. Central Lawrenceville residents would like residential uses to extend to the riverfront, yet still retain the gritty, industrial feel of the setting. Although preferring the intermixing of residential and industrial uses, the residents' preference is for mixed and industrial uses to congregate closer to 40th Street on the west and around 48th Street on the east so they don't block access to the river. Both neighborhoods are not opposed to truck traffic, although residents prefer that trucks use Butler Street for access, whereas Butler Street merchants and industrial land owners would like to see trucks access directly off 40th Street into the residential neighborhoods.

Design Description

The proposed design concept recognizes this location as the symbolic center of Lawrenceville.

Smallman Street is shown connected to 40th Street at the foot of the 40th Street Bridge and aligning with Foster Street. The circulator trolley continues up Smallman to 40th Street then loops back along Penn Avenue. The green, park-like grounds of the Allegheny County offices at Penn and 40th continue north as a green space along the western side of 40th Street to the river, connecting Arsenal Park, the Arsenal School grounds, the trolley right-of-way, the proposed Allegheny Riverfront Green Boulevard commuter rail stop, and the riverfront riparian buffer and public trail. A boat house is shown at river's edge for river-oriented activities and the bank is a prime location for a water taxi stop.

The key site for development is the large single parcel bounded by 39th and 40th Streets between Butler and Willow Streets, which is shown as two development blocks in the proposed design. As the proposed "civic center" of the community, this site could become a multi-modal center where trolley service, mainline and cross connection bus service, auto, bicycle, pedestrian, and commuter rail all interface. It is at the mid-point of the retail corridor connecting Central Lawrenceville to Lower Lawrenceville and the ideal location for a new Lawrenceville grocery store. Retail uses on the ground floor, including a grocery store, are shown along the Butler Street property line continuing the east-west retail spine. Office uses are illustrated above the retail spaces, although residential uses are also appropriate. Residential uses are shown on the rest of the site and fronting onto the Smallman Street extension. Parking on two deck levels is shown for the retail uses (the site slopes down toward the river allowing dual level access from the street) and surface parking for the residential uses in the middle of the blocks, with access off 39th Street, Smallman Street, and perhaps Butler Street. The historic Arsenal structures are retained as are the remnants of the Arsenal's wall.

Demographic information from the 2000 Census shows the Lawrenceville neighborhood could support a 30,000 square foot grocery store doing $500 per square foot sales and a pharmacy also supporting $500 per square foot sales at the 40th Street intersection. Buildings are all shown at 3- to 4-story height to maintain a neighborhood scale. The community requested that no retail uses occupy the ground floors of buildings fronting the Smallman Street extension so as not to dilute the retail market along Butler Street.

Residential uses are shown replacing one of the two Buncher Company flex buildings along the riverfront. Uses below the bridge are removed and Willow Street is continued below the bridge for use by cars and delivery trucks. The fast food restaurant and the gasoline station at the 40th and Butler intersection are shown being replaced with build-to-lot line buildings with ground floor retail, a more appropriate use of these properties and a continuation of the pedestrian-friendly storefront nature of Butler Street. The east side of 40th Street is expected to develop on its own without incentives. The proposed 40th Street Corridor and adjacent new development qualify for TOD funding.

Proposed Development Shown in Concept Design

New Retail	55,200 SF
New Residential	791,000 SF equivalent to 839 units at 1,200 SF average
Infill Residential	64 units at 1,200 SF average
Parking	870 to 890 total spaces
	Residential: 1.2 spaces per unit
	Retail: 32 to 55 spaces

40TH STREET/BUTLER STREET DEVELOPMENT PARKING REQUIREMENTS
Allegheny Riverfront Vision Study
City of Pittsburgh, Pennsylvania

Development Component/Size	Minimum Parking Requirement Formula	Unadjusted Parking Requirement	Transit Reduction 20%- 40%	Shared Parking Reduction 20%(1)	Bicycle Facilities Reduction 10%(1)	Parking Required, Spaces
Residential Units - 839 Units	1.0 spaces per unit	839	0	0	0	839
Retail - 55,200 s.f.	1.0 spaces per 500 s.f. over 2,400 s.f.	106	-21 to -42	-21	-11	32 to 53
Totals	--	**945**	**-21 to -42**	**-21**	**-11**	**871 to 892**

(1) Not applicable to residential uses.

Use Recommendations

- The 40th Street Corridor concept plan is residentially-based.
- Residential uses.
- Mixed-use along Butler Street, with residential and/or professional offices above the ground floor.
- Neighborhood service retail on the ground floor along Butler Street, including a new grocery.
- Urban circulator trolley station.
- Public open space and park.
- Continuation of the riparian buffer and trail network.

Design Recommendations

- Encourage development of the 40th and Butler location as Lawrenceville's civic center with mixed-use community-oriented retail and residential uses. The large parcel at 40th and Butler is critical to this area's future success and should be planned accordingly.
- Establish the riparian buffer, street extensions for Smallman and Willow Streets, rights of way, and infrastructure to support future higher-density development along the riverfront up to 40th Street.
- Encourage public access of the riverfront and the water's edge and encourage river activities, such as a marina and water taxi stop.
- Provide continuous retail storefront activity at the sidewalk property line along Butler Street.
- Use landscaped open space to connect Penn Avenue to the riverfront along the west side of 40th Street. Capture stormwater from adjacent streets and provide trees to achieve an 80% tree canopy coverage from the river to Penn Avenue.
- Provide decked parking facilities to support retail activities. Provide residential parking on-site in parking facilities below buildings, surface lots in the middle of the block, or shared parking facilities off-site. The 40th Street Corridor should not become a commuter park-and-ride location.
- Follow all Regenerative Zone (and Transition Zone) recommendations for private parcel site and building design and design of the public realm.

Central Lawrenceville from 43rd Street to 48th Street along the Riverfront, including the Heppenstall Site

Three properties are key to Central Lawrenceville's desire for riverfront residential development: the Heppenstall site owned by RIDC, the Buncher Company's flex building site between 43rd and 48th Streets along the riverfront, and 43rd Street Concrete at the terminus of 43rd Street and the river. RIDC has plans to develop 140,000 square feet of new industrial flex space and retain the large blue building with the Heppenstall sign, yet may be amenable to trading properties with the URA. The Buncher Company will option their flex building site as part of a three-parcel agreement with the URA. 43rd Street Concrete is amenable to relocating so long as a riverfront site is available to facilitate barge access. Complicating the situation is an AVRR rail spur that runs between the Buncher and 43rd Street Concrete properties to McConway & Torley's new shipping/receiving facility at 48th Street and the river. McConway

& Torley owns the riverfront from 47th to 53rd Streets. (McConway & Torley is a foundry operation that produces railroad wheel and truck assemblies. It is one of only two foundries of its kind in the country and ships product around the world.) All of these factors present obstacles to riverfront development.

43rd Street is Central Lawrenceville's only access to the riverfront and is the terminus of the public trail that begins at 38th Street. 43rd Street is one of two railroad crossings in the neighborhood; the other exclusively serves the McConway & Torley and Buncher properties at the end of 48th Street.

The community desires that residential uses continue to the riverfront. They feel that distribution and flex uses next to the riverfront are not appropriate because access is through residential streets and large truck access is disruptive. They prefer that RIDC's industrial development be located to the east and west sides of the Heppenstall site so that new residential uses could be located between them. The community likes the gritty industrial feel of the neighborhood and wants to see that atmosphere retained, yet most have serious concerns with truck traffic through the neighborhood. New residential development should be a mix of housing types with density matching the Lawrenceville scale. Their preference for new industrial development is that it be smaller-scaled like the Chocolate Factory or the Ice House.

Design Description

Residential uses occupy the riverfront between 43rd and 48th Street and also RIDC's Heppenstall site except for the blue building. The design assumes the properties will all become available and accessible.

Residential development south of the Allegheny Riverfront Green Boulevard continues the present street pattern across the Heppenstall site and utilizes a parcel size 22' in width. Structures would be limited to a 3-story height. Larger-scaled development was tested, however the community felt comfortable only with continuation of the existing pattern. Residential north of the Green Boulevard is shown slightly larger in scale at both 3- and 4-story heights, with an intermixing of apartment buildings and townhouses. Parking is assumed to be located below the apartment structures and within landscaped surface lots for the townhouses. Units average 1,200 square feet and parking is calculated at 1.2 cars per unit.

The riparian buffer continues along the riverfront with all structures shown at a 150' depth from the water. The Allegheny Cemetery open space is continued to the riverfront along a series of linked and landscaped open spaces that roughly follow the original drainage pattern to the river. Because of the property configuration of McConway & Torley at 48th Street, the open space continues along a landscaped median over to a park where 43rd Street meets the river. 43rd Street is shown as a green street along its full length between Butler and the river. Industrial uses are shown located along 48th Street from the former Giant Eagle grocery store site to McConway & Torley, with buildings fronting on the eastern side of the landscaped open spaces and parking behind.

Proposed Development Shown in Concept Design

New Residential	555,500 SF equivalent to 463 units at 1,200 SF average
Infill Residential	None
Parking	Residential: 1.2 spaces per unit to be located on respective sites

Use Recommendations

- Continue residential uses to the riverfront.
- Residentially-compatible industrial and commercial uses.
- Public open spaces and park.
- Continuation of the riparian buffer and trail network.

Design Recommendations

- Extend Central Lawrenceville residential uses to the riverfront.
- Adopt the Lawrenceville scale for all development and maintain the neighborhood's gritty character.
- Install a public park space at the foot of 43rd Street with access to the river.
- Relocate the rail spur to McConway & Torley so that residential uses occupy the 43rd Street Concrete and Buncher Company properties at the riverfront.
- Allow 4-story buildings along the riverfront and maintain existing building heights south of the railroad.
- Follow Regenerative and Transition Zone design recommendations for the public realm, parcel sites, and buildings.

Tippins International Site at the 62nd Street Bridge along the Riverfront

The Tippins site is slated for development as a distribution center to help relieve truck traffic in the Allegheny Riverfront and is expected to be the home of relocated businesses now located in the Buncher Company's flex building between 43rd and 48th Streets along the riverfront.

This 22-acre site sits between the Allegheny Riverfront Green Boulevard and Butler Street next to the 62nd Street Bridge. The site is one story below Butler Street, except where the Port Authority utilizes a pull-off space for bus queuing and operator rest stop. Access to the former Tippins facility is a narrow ramp located at the western edge of the property.

The site sits between the Sunoco tank farm on its west and several businesses located east of the 62nd Street Bridge. Access to those businesses is from an access ramp along the bridge's west side, which is also the eastern boundary of the Tippins Site. A marina and boat storage facility is located just to the west of the bridge in the space between the railroad and the river bank. The remainder of the riverfront space is undeveloped and retains its riparian character.

Access to the 62nd Street Bridge and the Highland Park Bridge makes this site ideal as a distribution center. It is isolated from residential neighborhoods and enjoys easy access. It sits within an industrial context yet retains a riparian buffer around 200' deep between the railroad and the river.

Design Description

This site should be a model demonstration of how future urban distribution centers could be designed and developed. It has excellent access to the Interstate highway system, is isolated from established residential neighborhoods, and has a protected and natural riverfront that will remain intact.

Development plans show single-story structures with a structural system capable of accepting additional stories. A railroad spur is anticipated to serve the buildings. The site entrance is planned to be at the property's west end and the Green Boulevard utilized as a cartway for access to the distribution and flex warehouses as well as the businesses east of the bridge. The access ramp next to the bridge would be removed to alleviate confusion at the bridge intersection. The bus queuing stop should be relocated so that the entire Butler Street frontage would be under site control.

Use Recommendations

- Flex industrial/commercial uses
- Marina and boat storage

Design Recommendations

Although design studies for the site were not reviewed by the community, the following recommendations are consistent with other riverfront properties within the Regenerative Zone:

- Develop the site and buildings following recommendations for the Regenerative Zone.

- Improve the AVRR right-of-way as the complete Allegheny Riverfront Green Boulevard. Continue the vehicle cartway past the businesses east of the bridge and connect it to Butler Street via a new ramp. The new Butler Street ramp will be the eastern access point to the Green Boulevard.
- Design the buildings for direct access from Butler Street and encourage design of the Butler Street frontage as a "front door."
- Install stormwater infrastructure consistent with the Regenerative Zone recommendations, including stepped curb extensions down the access ramp from Butler Street.
- Install street trees along the Butler Street frontage.
- Retain the riparian buffer in its natural state and consider locating the public trail within the Green Boulevard.

Zoo Entrance and Washington Boulevard Portals

With the investment in remaking the Pittsburgh Zoo into a regional destination, including the proposed parking master plan and rebuilding the Heth's Run Bridge that will connect the Zoo to the riverfront, the Zoo's entrance remains a work in process. The entrance is hidden from view off Baker Street, an entrance into the Morningside neighborhood. As a regional destination, the Zoo entrance does not have an adequate prominence nor does it meet wayfinding expectations. The debate over which street should dominate the entrance needs to be resolved: should the Zoo entrance remain off Baker Street or should Baker Street be off the Zoo entrance? Complicating the situation is the recent upgrading of the gas station adjacent to the Baker and Butler Street intersection, one of the logical locations for a redesigned entrance.

At the Washington Boulevard entrance into Highland Park, the intersection and adjacent open space seems an afterthought and an ambiguous leftover rather than a portal into Highland Park, Verona, and Oakmont via Allegheny River Boulevard. It should also be a portal to the riverfront. With deliberate landscaping and site design, this intersection could become an important entrance into the city.

These two entrances are linked by the Morningside Bluffs and the Highland Park Bluffs. Combining the recommendations for extending the Bluffs' green hillsides down to the riverfront with the following recommendations will transform the landscape and the Butler Street/Allegheny River Boulevard arterial into a regional asset.

Design Recommendations

Although design studies for these two portals were not reviewed by the community, the following recommendations are suggested for consideration.

Zoo Portal

- Create a new entry for both the Zoo and Baker Street that gives equal dominance to both.
- Purchase and clear all buildings on both sides of Butler Street near the Baker Street intersection and green the landscape to provide good viewing angles of the intersection and median, as well as improve its visual character as an important portal. (Note: the Morningside community prefers this intersection remain business oriented.)
- To further enhance the Heth's Run plan, provide an AVRR commuter line station for the Zoo at the terminus of the Heth's Run pedestrian walkway. Also consider connecting pedestrian walkways to Butler Street on both sides of the Heth's Run Bridge.

Washington Boulevard Portal

- Reframe the Highland Park entrance with landscaping and trees to focus attention on the intersection.
- Similarly, reframe the Allegheny River Boulevard portal.

- Develop the northern face of the intersection as an extension of Highland Park and riverfront portal at the end of Washington Boulevard. Acquire the properties along the northern side of Allegheny River Boulevard and regrade the land to provide a view corridor to the river from Washington Boulevard.
- Continue the public trail along the riverfront, utilizing the AVRR right-of-way or adjacent land as needed.
- As recommended previously, convert the Public Works property into a riverfront park.
- Work with the Army Corps of Engineers to enhance public access to the lock and dam and consider the development of an education facility near the foot of the dam.

Strategic Catalysts

Initial Projects to Spur Local Development

This intervention scale targets individual sites that could have a catalytic impact to either spur a localized market or be the first with infrastructure improvements so that others would follow. Many of these strategic catalysts are sites within the larger transformative development sites, yet a few others are not. They are first-step locations to achieving economic development.

Buncher Company Properties

- 21st Street at the river and/or 16th Street at the river: These two sites both within the Strip District transformative area, one at the end of 21st Street at the river's edge and the other just east of the 16th Street Bridge at the river's edge would signal the beginning of new riverfront development in the Strip District. The 21st Street site is more suited to mixed-use development, with office-type uses facing onto Consumers Produce and residential uses oriented toward the river. This site is the terminus of the 21st Street corridor, identified as a major location for public access to the riverfront and as a green street. Its development should be a demonstration of the public nature of sites fronting onto a public place. The 16th Street site would be ideal for residential occupancy adjacent to the outdoor market proposed for under the 16th Street Bridge.
- Between the Veterans Bridge and the 16th Street Bridge along the south bank of the River: This Strip District site has been identified as a new entertainment destination with restaurants fronting the river and public access to the water's edge. This location is intended to spur mixed uses as a counterpoint to similar development anchored around the Cork Factory.
- Flex Building Property between 43rd and 48th Streets: This property has been identified for moderate-scaled residential development and would be the first riverfront development in the Lawrenceville 43rd Street to 48th Street transformative area.

URA Properties

- Produce Terminal: Rehabilitation of this historic building will lead the revitalization of Smallman Street in the historic Strip District. Not intended to mimic the retail nature of Penn Avenue between 16th and 22st Streets, an adapted Produce Terminal anchored by The Society for Contemporary Craft at 21st Street and the Neighbors in the Strip's Pittsburgh Public Market at the 16th Street end will set the tone as an artistic and professional center of the Strip District's transformative area. Work on the Produce Terminal should also include public improvements to Smallman Street that will convert 50' of the street into an outdoor public "piazza" meant for dining, strolling, and catching the circulator trolley. This catalytic site is intended to have spillover effect to all properties on the south side of Smallman Street and the alleyways connecting Smallman to Penn Avenue.
- Tippins International Site: Redevelopment of this site into a distribution center is a strategic decision to locate distribution facilities where they have minimal impact on neighborhoods. It is also intended to absorb some distribution activities in the Strip District and those in the Buncher Company's flex buildings where other development is more appropriate.

- Various Infill Sites: The URA owns property in the Lawrenceville community along Hatfield Street and in Doughboy Square, among others. Encouraging residential and compatible uses of these sites should encourage additional residential investment.

City Property

- Tow Pound Site: Although there are no recommendations made for the eventual use of this site, it is strategically located in the Regenerative Zone making it ideal for mixed use activities. It could be one of the first sites to be developed as a regenerative demonstration. Its impact will spill over into the Upper Strip District and the 33rd Street/Doughboy Square Corridor.

RIDC Property

- Heppenstall Site: This catalytic site in the 43rd to 48th Street transformative area has a key role in the future of residential development. RIDC's proposed all-industrial use would block the extension of residential development to the riverfront and have a detrimental effect on the value of the riverfront. It would be in the community's interest to promote full residential development of this site. The Lawrenceville neighborhood has asked that industrial uses be located closer to 40th Street and to 48th Street for residential development of the property. Options for the property include: all residential uses, corridors of residential uses through the site, and/or intermix residential and light industrial uses on the property. With the narrow and restrictive residential fabric of this location, RIDC and the neighborhood would be better served by a compromise solution.

Other Strategic Properties

- 39th Street to 40th Street between Butler Street and Foster Street: This large property in single ownership is key to Lawrenceville's viability as a riverfront community. It occupies "the" strategic location in Lawrenceville. Although the site is presently not for sale, it would be a major loss to the community if it were to be sold to a big-box retailer with intentions of a supercenter with acres of parking along Butler Street or remain a lost opportunity if its current use remains for a long time.
- Wendy's and Get-Go sites at the intersection of Butler and 40th Streets: These two auto-oriented retail establishments break the retailing pattern of Butler Street, create a hazardous condition for pedestrian traffic, and do little to improve the visual quality of this important gateway location into Central Lawrenceville. Replacing them with taller mixed-use structures that hold the lot lines at the intersection will assist in linking Central to Lower Lawrenceville and improving the perception of Lawrenceville.
- 43rd Street Concrete: Relocating the concrete plant to another location in the Allegheny Riverfront would allow 43rd Street to develop as Lawrenceville's main access to the riverfront, allow for a new riverfront park to be installed, and contribute land for more riverfront residential development as the western anchor of the 43rd to 48th Street transformative area.
- Pitt-Ohio Property between 33rd and 35th Streets along the River: This is one of the larger sites along the riverfront that has the potential as a Regenerative Zone demonstration development. Located at the seam between the Upper Strip and Lower Lawrenceville this site could continue the open space corridor proposed for the 33rd Street/Doughboy Square Corridor and be a model of new development along the Green Boulevard.

Repurposed Places

Reuse Existing Buildings to Create Distinctive Places

The Strip District and Lawrenceville are full of substantially built structures that could have second and third lives as repurposed places. Renovation and adaptive-reuse not only helps to sustain a healthy revitalization and increase in quality of the neighborhood,

but also retains the structure's inherent value. Generally privately financed, these improvements are important and strategic to maintaining neighborhood character and should be encouraged wherever possible. The marketplace will determine their highest and best uses.

A number of buildings in the Upper Strip District provide good examples of reused and repurposed buildings. The conversion of the Armstrong Cork Building into apartments is the most notable example; however there have been a number of these conversions over the years involving many different uses that have helped revive the Upper Strip District and Lawrenceville:

- Chocolate Factory on 43rd Street as flex industrial
- Cigar Factory at 27th and Smallman as mixed use office
- Cork Factory at 23rd and Railroad Street as residential
- Crane Building at 24th and Railroad Street as mixed use
- Ferlo Building and others in the 35th Street vicinity of Butler Street as storefront retail and commercial
- Guardian Storage on Liberty Avenue at 29th Street as a storage facility
- Ice House on 43rd Street as artists' studios
- National Robotics Engineering Center (NREC) at the foot of 40th Street as robotics research
- Pittsburgh Ballet Academy at 29th Street on Liberty Avenue as rehearsal and office space
- Pittsburgh Opera on Liberty Avenue at 25th Street from industrial to rehearsal and office space
- Rycon Construction on Liberty Avenue at 26th Street as a contractor's headquarters
- The Brake House Lofts on Liberty Avenue at 25th Street as residential apartments
- The Midwife Center on Penn Avenue at 28th Street from offices to a birthing and healthcare center
- 31st Street Lofts on Smallman Street from industrial to residential

Upcoming repurposed buildings include:

- Otto Milk Condominiums on Smallman at 26th Street from industrial to residential condominiums
- Produce Terminal on Smallman Street between 16th and 21st Streets to a marketplace, boutique storefronts, and professional offices

Maintenance

Allow for Continued Evolution

The business and residential communities were quite outspoken that the best strategy is to leave alone what is already working. Although it may seem the Vision Plan has improvement recommendations for almost every place in the Allegheny Riverfront, the great majority of properties and places are not cited for direct improvement or intervention. The marketplace will determine their future.

The hearts of the Strip District and Lawrenceville have evolved on their own and will continue to do so in the future. Their evolution has been more dramatic lately as the Strip and Lawrenceville are beginning to come into their own. We've seen the increasing popularity of retailing along Penn Avenue in the historic market district; renovated storefronts along Butler Street as new uses, particularly restaurants, are changing this neighborhood street into a city-wide destination; the relocation of truck-oriented distributors to other locations outside the area; the populating of the Upper Strip with new residential development; and reinvestment in the residential neighborhoods as new residents renovate their homes.

These are the places where transformative and catalytic interventions are not needed because the market is working. The Vision Plan recommends the following notable locations for sustained maintenance:

- Historic Penn Avenue and Smallman Street market district between 16th and 22nd Streets
- Upper Strip District in the Transition Zone

- Butler Street retailing in Lower and Central Lawrenceville
- Central and Upper Lawrenceville residential neighborhoods

Evolutionary change is more acceptable to most people because incremental change is less threatening and less detrimental to its context. In commercial areas, change is more acceptable, and greater variety is often desirable. The Vision Plan's influence will be indirect, yet positive, in slowly raising the quality of life throughout the area.

Conservation

Preserve and Enhance Authentic and Significant Resources

Although the Riverfront Vision Area is comprised of some of Pittsburgh's earliest settlements, designated historic buildings in the Strip District and Lawrenceville are sparse. Fortunately, most of the bridges are designated historic structures and a good share of Lower and Central Lawrenceville is mapped as an historic district eligible for historic tax credits. Nonetheless, there remain significant buildings and streets that should be preserved either by designation actions or by community initiative to purchase and restore them. Repurposing older buildings contributes significantly to a conservation strategy.

Notable locations for conservation include:

- Market district on Penn Avenue and Smallman Street
- Doughboy Square area
- Residential buildings along 38th and 39th Streets in Lower Lawrenceville
- Remaining Arsenal structures, including remnants of the original wall where appropriate
- Catalyst Building in Lawrenceville
- Leslie Park
- Hillside bluffs from Stanton Heights to Washington Boulevard

recommendations for policies and systemic changes

Green Agenda

The ecological vision is based on a regenerative framework of the riverfront ecology – a framework which at its core strives to restore the natural water cycle and increase the urban canopy. These two critical goals are keystones of the Vision Plan and will set in motion a transformative reality in which the community is prosperous, healthy, and fulfilled. The green agenda for the Allegheny Riverfront recognizes that both the public realm and private property are needed to accomplish these goals.

The agenda is based on achieving two targets throughout the Allegheny Riverfront:

- Capture all rainwater from the first 1" of stormwater runoff
- Provide a 40% average tree canopy coverage

All of the green infrastructure recommendations are the means to reaching these targets. More opportunities occur along the riverfront where more open space and tree canopy can be provided than elsewhere. As the distance from the river increases, the types of green infrastructure change to improvements in the streets and alleyways and the creation of open space extensions to the river and public gardens.

On private property, regenerative development means that the natural environment of land and water is reestablished to the greatest extent possible and serves as the setting and benefit to a new building or structure. Beyond its footprint, the soil mantle may need to be augmented and cleaned and vegetation reestablished to mitigate existing and new pollutants produced. The rain that falls upon the parcel should be captured and utilized within the property and structure, not allowed to become a liability to the community. All development is encouraged to adopt the equivalent of LEED certification for building and site to make it environmentally responsible. Because development along the riverfront is critical to achieving the green agenda targets, green buildings and green site development should be mandatory for all new, rehabilitated, and renovation development.

Creating long-term sustainability for the Allegheny Riverfront is not just a function of City agencies, street improvements, and new infrastructure, but also a commitment and maintenance of those who reside, utilize, and own private property. Without the participation of area residents, businesses, and future developers and real estate interests, environmental sustainability will not be possible.

Zoning

The improvement of private property is equally as important as investment in the public realm. While governmental agencies are responsible for the public realm, the private sector has a similar responsibility to integrate with public infrastructure, maintain compatibility with adjacent properties, and take a strong interest and commitment to the overall quality of the Allegheny Riverfront. To assure that integration and compatibility, zoning, development standards, and building codes are the tools commonly used. It is in the interest of land owners and developers to encourage controls so that investments are maintained and sustainable. The Vision Plan's zoning recommendations create new value by encouraging a greater mix of uses, increasing densities, and allowing taller buildings than presently available as the means to incent investment and development.

Zoning in most of the Allegheny Riverfront reflects its industrial and residential roots. The UI (Urban Industrial) District and GI (General Industrial) zoning covers most of the flatlands area and R (Residential) District zoning reinforces the residential areas of Lawrenceville. The present zoning, while encouraging a mix of uses, is not conducive to achieving the recommendations of the Vision Plan in some locations. Density is restricted where intermodal transit is needed, building heights are restricted to three stories, parking requirements result in large surface parking lots, and large development projects require zoning changes. A Riverfront Overlay District is on the zoning books; however it is a text-only district and has not been applied to any riverfront location in the city. The Vision Plan recommends adapting the Riverfront Overlay District as the basic vehicle for new zoning, but with some major changes.

Mix of Uses

The Vision Area has a history of mixing uses in its commercial and wholesale centers and its residential neighborhoods. Residents and business persons desire this mix to continue. Mixed use and the variety it encourages has become part of the local culture, is an attractive feature to new residents and businesses, and is memorialized in the UI District zoning that promotes mixed use within an urban industrial setting.

A mix of uses has several advantages. Mixed uses encourage 24-hour activity, with daytime commercial activity, evening entertainment, and nighttime residential uses. Mixed uses tend to level out peaks and valleys of high activity by lessening rush hour traffic and parking is more balanced. Mixed use areas and, particularly mixed-use occupancies, are generally able to weather economic cycles better than single occupancies as often not all uses are affected in economic downturns.

Although the tendency is to specialize and become more homogenous, a phenomenon observed in residential areas where market value increases result in protective actions, the Allegheny Riverfront would lose a lot of its character if mixed-use residential and business neighborhoods were not supported and encouraged.

Form-based Development

The high degree of mixed uses in the Allegheny Riverfront persists counter to most zoning practices, which typically separate uses into single-use districts. The UI District zoning acknowledges the mixed use nature of a portion of the Vision Area, but uses an industrial zoning designation as the mixed-use vehicle. Although it can be argued that the UI District is broad enough to encourage all types of mixed uses, it nonetheless codifies the Allegheny Riverfront as an industrial zone.

While industrial uses will continue and always be a part of the Strip District and Lawrenceville, the Allegheny Riverfront's future lies in reconceiving these riverfront communities as thriving and active mixed use communities where there is little distinction between industrial, residential, and business uses. What is more important than designating land uses are the physical design qualities of zoning where density and building massing control building form, the buildings' collective relationship to the immediate context, and the overall physical environment. Various uses can occupy the same building as demonstrated by the repositioning of many industrial and institutional buildings throughout the Strip District into residential apartments. In fact, buildings that are specifically designed for one use type cannot be easily converted to other uses or meet a regenerative or sustainable agenda. The future lies in designing and constructing buildings that are adaptable to many future uses or easily deconstructed and recycled.

Form-based development acknowledges that many uses can occupy the same structure and therefore concentrates on the structure's form and its contribution to the built environment and urban fabric. Density, height, setbacks, and the creation of usable open space that improves the public realm are the ingredients of creating a built environment that makes communities livable and desirable places. Other than a very general indication of desired uses, the economic marketplace will make fairly logical decisions about appropriate uses given the physical context. Given the Allegheny Riverfront's history, letting the marketplace determine land use patterns will continue its mixed-use nature and character.

Density

Density is a measurement of intensity in a specific area. Cities have been finding that added density often adds benefits, such as more services and choices. Denser neighborhoods are generally more walkable because larger populations often result in an increase in the variety of shops, neighborhood services, transportation services, and infrastructure improvements. It is much less costly for a city to concentrate its population rather than spread it out. Funding of transit oriented development is based on this principle, in addition to relieving automobile congestion. The Allegheny Riverfront has a finite amount of land so spreading out its population is not feasible; however concentrating density in key locations can incent other improvements to happen. Higher density can also serve to compensate development for infrastructure improvements.

Strong neighborhood character is often a benefit of density. Higher density usually offers more housing choices, more and varied businesses, and a more diverse population in terms of age, income levels, and ethnicity. With higher density the physical setting is often more defined as a result of economic valuation of land and usually its commercial core is stronger. Open spaces are more defined because private use of land is intensified and open space is valued more as an asset and amenity. All of these effects are regenerative elements that will help sustain a community.

Increasing density makes more sense when it can be relieved by amenities that temper the intensity of use. Good locations for higher densities include parcels adjacent to open space that is more than 100' in depth, on properties that front onto designated green streets because of their added street trees and landscaped space, along the riverfront where the open space of the river and the riparian buffer are mitigating factors, and at locations where mass transit stations and intermodal transportation facilities encourage walking. Density increases can be achieved by increasing building height.

Building Height

Higher density usually means taller buildings. If thoughtfully located, taller buildings identify locations of more intense activity which serves as a visual and orientation cue. Taller buildings can also signify where important community amenities are located. New York City is a good example of these relationships. In Manhattan tall buildings congregate in Lower Manhattan and Midtown, its two business cores; along the edges of Central Park; along the wide avenues; and along the riverfronts with their wide open spaces.

Allegheny Riverfront locations for potential building height increases includes parcels adjacent to open space that is 100' in depth or greater and for parcels fronting onto designated green and complete streets in concert with density recommendations. Riverfront parcels in the Regenerative Zone as far east as 40th Street should be given special consideration because of the Cork Factory precedent and the ability to construct taller and higher density residential buildings in UI Districts.

Recommended heights in the Strip District to 33rd Street

- Up to 8 stories along the riverfront* and 6 stories where development is encouraged
  (* Up to 10 stories high along the riverfront between 11th Street and the Veterans Bridge.)
- All other buildings in the Strip District per existing zoning heights

Recommended heights in Lawrenceville from 33rd Street to 40th Street

- Up to 4 stories high in the Regenerative Zone and 4 stories where development is encouraged at the proposed 33rd Street Corridor** and the 40th Street Corridor***
  (** Consideration should be considered for 6-story heights in this immediate area, particularly for buildings adjacent to the 100' deep open space on the east side of the railroad trestle.)
  (*** 4 stories maximum for buildings fronting both sides of 40th Street from Butler Street to the river.)
- All other buildings in Lower Lawrenceville per existing zoning heights

Recommended heights in Lawrenceville east of 40th Street

- Up to 4 stories high in the Regenerative Zone
- All other buildings per existing zoning heights

Setbacks

Most zoning codes require front, side, and rear yard setbacks so that buildings do not cast shadows onto other property depriving them of light or are built so close to one another so that air cannot circulate well. An unfortunate consequence of setbacks on all four sides, or even two sides, of a building is to place the building footprint toward the center of the parcel. Buildings then become separated, open space becomes ambiguous, and the built fabric loses its clarity.

Pittsburgh was generally built before modern zoning so most of its street frontages remain intact and its fabric remains clear and strong. In some city neighborhoods there are no frontage setbacks. Lawrenceville is one of these. When there is a tradition of no setbacks or uniform setbacks of the built environment, the 1998 zoning code revisions recognize this as contextual zoning and accommodations have been made to keep these streets intact. The Vision Plan endorses contextual zoning.

Building setbacks can, and do, provide public benefit in specific locations where a public amenity can be created. The Allegheny Riverfront has a few locations where mandatory setbacks are desired:

Riverfront Riparian Buffer

The intention is to create a 200' wide ecological buffer along the length of the riverfront. A mandated 200' setback is recommended for all new structures, with no structure closer than 50' to the water's edge.* Development footprints within the 200' wide buffer should provide reciprocal buffer space and tree canopy coverage on a 1:1 square foot basis beyond the 200' buffer.

(* In approved locations, free-standing restaurants and entertainment venues at the river's edge would be allowed exceptions.)

Allegheny Riverfront Green Boulevard

Where the railroad right-of-way is less than 70' wide, structures need to be set back at least 15' on the right-of-way's south frontage to allow for a 6' wide sidewalk and a landscaping buffer between the sidewalk and the railroad tracks. Otherwise the right-of-way is too narrow for buildings on the south frontage to front onto the Green Boulevard.

Zoning Recommendations for the Regenerative Zone

Riverfront Definition

- The term "riverfront" pertains to all parcels in the Regenerative Zone.

Riparian Buffer

- Mandatory 200' riparian buffer measured from the water's edge recommended for all riverfront parcels.
- Minimum riparian buffer setback to remain at the present 50' for existing structures and for small riverfront parcels less than 200' deep.
- New development footprints within the 200' wide buffer should provide reciprocal buffer space and tree canopy coverage on a 1:1 square foot basis beyond the 200' buffer.

Lot Area

- Lot area includes the riparian buffer.

Density

- Consider increasing allowable densities for structures immediately adjacent to the riparian buffer or other designated open spaces at least 100' wide.

Height

- General uniformity of height should be the objective, rather than allow a few buildings to greatly exceed the height recommendations (such as tall towers).
- In the Strip District, riverfront building height is measured in relation to the Cork Factory building, not necessarily in terms of stories.
- Buildings between 11th Street and the Veterans Bridge between the river and Smallman Street will be an extension of Downtown and, therefore, should be taller than the Cork Factory but not as high as Downtown riverfront parcels: 10 stories would be appropriate.
- Riverfront building height from 16th Street to 33rd Street, including parcels between the Veterans and 16th Street Bridges and between the river and Smallman Street, should not be taller than the Cork Factory: 8 stories would be appropriate.
- Consideration should be given for particular circumstances where a greater height may be appropriate given the existing local context.
- The sloping plane of Downtown Golden Triangle Districts should not apply to the Allegheny Riverfront.
- Building height includes parking levels above grade.

Orientation

- For parcels with frontage on the Allegheny Riverfront Green Boulevard orient the entrance façade facing onto the Green Boulevard (AVRR right-of-way or its extension as Railroad Street, whichever is appropriate). Side entrances are also encouraged to enliven pathways to the riverfront.

Access

- Provide public access to the riverfront at 300' intervals for egress and safety purposes. Follow Riverlife guidelines for pathway design standards.

Parking and Loading

- Consider removing all requirements for on-site automobile parking to encourage use of public transit, zip cars, the construction of shared parking facilities, and a more efficient use of parcels.
- Any parking provided on-site should be within enclosed parking facilities that are located directly below or within occupied structures, not as free-standing adjacent structures. Surface lot parking should not be permitted except for minor ancillary use, such as a few spaces for service vehicles.
- Off-site parking should be within enclosed and publicly-shared parking facilities designed with commercial ground floors to encourage an active street environment, with mid-block locations preferred.
- Orient entrances to parking and loading facilities on streets perpendicular to the river.

Sustainable Design

- Consider offering incentives for sustainable design practices, including LEED certification. Incentives could be in the form of an increase in allowable height similar to the sustainable design amendment of the Golden Triangle District regulations and/or an increase in density.

Stormwater Infrastructure

- Consider offering incentives for the private development of stormwater infrastructure, including permeable surfaced open space, built in the public realm for the capture and cleansing of public realm generated stormwater. Incentives could be in the form of an increase in allowable height and/or an increase in density.

Transfer of Development Rights

- To encourage compliance of smaller parcels with the design recommendations, consider allowing the transfer of development rights to other properties within the Regenerative Zone.

Zoning Recommendations for the Allegheny Riverfront Green Boulevard

Setback

- When the Allegheny Riverfront Green Boulevard is 70' wide or less, require all new structures on the south side of the right-of-way to set back 15' to provide space for a sidewalk and street tree planting bed. Size sidewalk at 6' width.

Zoning Recommendations for the Transition and Service Zones

Density

- Consideration should be given to increasing densities in the Transition Zone and the Service Zone. Higher densities will result in more efficient structures and a larger population that can support transit, other civic services, and local retail.
- Consider increasing allowable densities for structures immediately adjacent to any 100' wide open space corridor to the river.

Height

- Consider 6-story building heights in the Service Zone. Because of its location, building height in this area will have little impact on the Strip District.

Orientation

- For parcels with frontage on the Allegheny Riverfront Green Boulevard orient the entrance façade facing onto the Green Boulevard (AVRR right-of-way or its extension as Railroad Street, whichever is appropriate). Side entrances are also encouraged to enliven pathways to the riverfront.

Parking and Loading

- Consideration should be given to removing or lowering on-site parking requirements in the Transition and Service Zones to encourage use of public transit, zip cars, the construction of shared parking facilities, and a more efficient use of parcels.
- Any parking provided on-site should be within enclosed parking facilities that are located directly below or within occupied structures, not as free-standing adjacent structures.
- Off-site parking should be within enclosed and publicly-shared parking facilities designed with commercial ground floors to encourage an active street environment, with mid-block locations preferred.
- Orient entrances to parking and loading facilities on streets perpendicular to the river in the Transition Zone.

Sustainable Design

- Consider offering incentives for sustainable design practices, including LEED certification. Incentives could be in the form of an increase in allowable height similar to that of the Golden Triangle District regulations, and/or an increase in density.

Stormwater Infrastructure

- Consider offering incentives for the private development of stormwater infrastructure built in the public realm, including permeable surfaced open space and parks, for the capture and cleansing of public realm generated stormwater. Incentives could be in the form of an increase in allowable height and/or an increase in density.

Transfer of Development Rights

- Consideration should be given to allowing the transfer of development rights within the Transition Zone for properties in locations recommended for public open space.

Zoning Recommendations for Residential Uses in Allegheny Riverfront UI Districts

Residential Uses

- Consider easing the requirements for residential uses in UI Districts, however residential buildings over 6 stories high, including residential buildings with ground floor mixed uses, should be discouraged except where noted in the Regenerative Zone.

Zoning Recommendations for the Urban Circulator

Transit Stops

- Encourage private development to incorporate sheltered waiting areas for urban circulator stops within the property line, particularly where street widths are narrow and sheltered queuing areas would conflict with pedestrian movement.

Zoning Recommendations for the Strip District

Extension of Regenerative Zone

- Follow zoning recommendations for the Regenerative Zone and extend over to Smallman Street between 11th Street and the 16th Street Bridge.

Uses Below Bridges

- Allow only parking facility uses directly below the Veteran's Bridge.
- Discourage buildings below the 16th Street Bridge and designate the space for open space uses, including an outdoor public market.

Development Master Plan

- Require a Development Master Plan process and approval for all development between 11th and 21st Streets from Smallman Street to the river, including development below the Veterans Bridge to Penn Avenue, before new development occurs.

Zoning Recommendations for the 40th Street Corridor

Extension of Regenerative Zone

- Follow zoning recommendations for the Regenerative Zone and extend over to Butler Street between 39th and 40th Streets.

Height

- Limit heights to 6 to 7 stories in the Regenerative Zone and 3 to 4 stories in the Transition Zone.

Development Master Plan

- Require a Development Master Plan process and approval for development between 39th and 40th Streets from Butler to the river before new development occurs.

Zoning Recommendations for the Heppenstall Site in Central Lawrenceville

Transition Zone

- Follow Transition Zone zoning recommendations except as noted below.

Density

- Consider increasing density to that of the adjacent Regenerative Zone.

Parking

- On-site parking for multi-family residential uses should be within enclosed parking facilities that are located directly below or within occupied structures, not as free-standing adjacent structures. Off-site parking for multi-family residential uses should be within enclosed and publicly-shared parking facilities, with mid-block locations preferred to lessen their impact.
- On-site parking for single-unit townhouses/townhomes should be within occupied structures, within garages, or in shared surface lots, with pervious surfaces, located behind buildings. Off-site parking for single-unit townhouses/townhomes should be within enclosed and publicly-shared parking facilities or in community surface lots, with mid-block locations preferred to lessen their impact. Surface lots should have pervious surfaces.

Infrastructure

New infrastructure is needed throughout the Allegheny Riverfront Vision Area to meet 21st century development and urban living needs. Infrastructure provides the foundation for guiding and incenting private economic investment and the growth of the city's riverfronts. Recommendations in the Vision Plan take many forms to meet a variety of needs.

Stormwater Management

To restore the hydrologic cycle while tackling the CSO outfall problem, a variety of new public and private infrastructure is need. Clean roof drainage from structures along the riverfront can empty directly into the river. The riparian buffer and the railroad Green Boulevard are critical to providing enough space for trees to return water to the atmosphere while good soil provides permeation. Permeable pavements, landscaped open space and parks, vegetative curb extensions, intersection bump-outs, green alleyways, and urban gardens are recommended for the public realm. Private property owners can contribute by providing vegetative roofs, rain barrels, rain gardens, good soils, and good landscaping with trees.

Street Trees

Street trees are instrumental infrastructure elements for rain water transpiration and one of the more critical design features responsible for creating and maintaining livable and walkable communities. Particularly relevant to designated green streets, street trees should be installed throughout the Allegheny Riverfront on every possible street and open space opportunity.

Transit and Street Network

Increasing transportation choices through new public transit has proven to be one of the most beneficial infrastructure improvements to incent private investment. The proposed commuter line and urban circulator will bring about dynamic and dramatic revitalization to the Allegheny Riverfront and position it as a viable resource center to Oakland and Downtown. Street movement designations, street extensions, intersection improvements, and thoughtful pedestrian- and bicycle-friendly infrastructure will help with traffic management in the Vision Area while increasing public safety.

Utilities

Rethinking how everyday utilities are provided and distributed can benefit the visual environment and open opportunities for renewable energy.

Underground Utilities

The riverfronts should be Pittsburgh's pride and joy yet we continue to permit visual blight with overhead lines and telephone poles. Most cities cited as precedents for the Allegheny Riverfront have confronted this same issue and have opted for keeping these utilities out of sight and easily accessible. If there is a place to begin underground distribution, it is along the riverfront properties.

- All new development in the Regenerative Zone and all new development over 2 acres should bury all line power (electric) and communications (telephone, cable) utilities in easily-accessible trenches under sidewalks or within property lines.
- Water, gas, and sanitary sewer lines should be planned for public realm locations undergoing stormwater management improvements, such as curb extensions and alongside street tree trenches.

Area-Wide Renewable Energy

The large industrial parcels and other properties in the Regenerative Zone, the riparian buffer, the proposed Allegheny Riverfront Green Boulevard, Transition Zone properties, and the inboard transformative development areas are candidates for renewable energy systems, such as a geothermal grid providing low-cost energy for heating and cooling for on-site

and adjacent properties. If developed under public or public-private ownership, profits could be returned to the community for public realm maintenance and additional public realm infrastructure.

- Examples of renewable energy for district-wide distribution include: heat exchange systems such as geothermal; cogeneration; heat recovery systems from heat sources such as sewer lines or solar heat collection, including heat collected through pavement; solar systems that provide electricity; wind systems that generate electricity; and biomass, waste pellets, methane gas, and municipal wastes as fuels for power generation.
- For multiple properties, underground distribution could be run in accessible public realm locations, such as below sidewalks, in new open space extensions to the river, in green streets connecting to the river, and along the Allegheny Riverfront Green Boulevard.

Design Recommendations

- Limit the area of impervious surfaces and attempt to achieve 100% pervious surfaces.
- Capture all stormwater runoff from storm events of 1" or less and direct to detention or pervious systems. Pervious systems include open space, walking and parking surfaces, as well as landscaped areas designed to infiltrate and cleanse stormwater. Integrate areas for rainwater absorption into the ground that work in compacted, clay soil. Design a natural filtration system in the landscape to clean water that is returned to the river. Plant street trees.
- Improve the soil mix to 50% void, 45% mineral, and 5% organic material for vegetated areas qualifying as pervious systems. Provide 800 cf. of soil per tree to meet the tree coverage standard, or 600 cf. per tree when planted in adjoining beds.
- Landscape with native plant material, including street trees, to achieve tree coverage goals listed elsewhere on private parcels and vegetated areas in the public realm. Trees overlapping buildings and hardscape surfaces comply. Conventional lawn-planting and chemical-intensive management is discouraged.
- Bury overhead utility lines in accessible trenches for safety, durability, and to eliminate conflicts with trees.
- Investigate renewable energy production/transfer/management via district-wide systems to provide energy to private property and uses within the public realm. Investigate whether this could provide sufficient maintenance funds for the riparian buffer and other stormwater management infrastructure in the Allegheny Riverfront.

Vehicle Management

Separating the movement of goods from the movement of people, extending some streets to facilitate the flow of traffic, improving street intersections, and a parking strategy that encourages sidewalk shopping are the primary recommendations for resolving movement conflict.

Roadway Network

Truck traffic originating outside the Allegheny Riverfront or destined for other places would move along arterials, which are designated to prioritize through-movements. Only in order to enter/exit truck facilities and make local deliveries, trucks would use collectors and local roads, which tend to move more slowly and experience more movement interference.

Major Street Categories for the Allegheny Riverfront

Street types should be prioritized by function, not by width. The following priorities for street use are recommended:

Liberty Avenue	Arterial	Goods: Autos, trucks, and bus transit
Penn Avenue/Butler Street	Arterial/Complete Street	People: Pedestrians, bicycles, trolley and bus transit, with autos
Smallman Street	Arterial	Goods: Autos, trucks, trolley and bus transit
Railroad Street/Green Boulevard	Collector/Complete Street	People: Pedestrians, bicycles, commuter rail from 26th Street east, with autos and trucks

Wherever transit is located, bus and trolley station stops and pedestrian crossings need to be added. Bicycle parking facilities are recommended at major stops to maximize intermodal opportunities.

Smallman Street and Other Major Street Extensions

Extending Smallman Street east from the present terminus would serve to connect Smallman Street with Butler Street at 40th Street. This connection would help keep truck traffic from migrating to Butler Street, Penn Avenue, and/or Liberty Avenue between 31st and 38th Streets. Railroad Street should be extended from 21st Street to 11th Street as a segment of the Allegheny Riverfront Green Boulevard, without the commuter line. This extension would serve as the spine street through new mixed use and commercial development recommended for this portion of the Buncher properties. Extending Herron Avenue across Liberty to Penn Avenue just below Doughboy Square will help relieve the confusion of Lawrenceville access from the Liberty/Herron intersection and provide new access between Polish Hill, Bigelow Boulevard, and Lawrenceville. With this change, 34th Street could be closed and improved as a public park or developed with new structures.

Street Intersection Recommendations

Street intersection improvements recommended to be built over time to serve the anticipated changes in use and activity within the Allegheny Riverfront, in addition to those recently implemented, include:

- The Smallman Street cross section, within the Strip District, should be modified for improved pedestrian conditions, on-street parallel parking, and provision of a travel lane for the circulator trolley.
- At the 40th Street terminus of the Smallman Street extension, a right-in right-out intersection of Smallman Street on the 40th Street Bridge should be created, with stop control on the Smallman Street approach.
- In the vicinity of the Tippins International site, access improvements along Butler Street should be made to accommodate automobile and truck traffic.

Parking Recommendations

Structured parking for shared retail, commercial use, evening venues, and others should be a parking goal throughout the Allegheny Riverfront Area. In particular, there will be many opportunities in the Strip District for shared parking between daytime office/commercial uses, retail, and entertainment activities.

Based on minimum parking requirements for residential, office and retail, with reductions applied for transit usage, shared parking and bicycle facilities, the following number of required spaces would be needed:

- Strip District 1,961 to 2,591 spaces
  Plus 330 lunch/shopper spaces
  (Total: 2,291 to 2,921 spaces)
- Doughboy Square 895 to 969 spaces
- 40th Street/Butler Street Corridor 871 to 892 spaces

It is anticipated that this parking will be constructed gradually as the uses it will serve are constructed, with an emphasis on sharing reservoirs of parking to the maximum extent possible.

Parking Location Recommendations

Parking needs to be easily accessible yet strategically placed to support nearby uses.

- In the Strip District parking is recommended beneath the Veterans Bridge and east of 21st Street with access from Liberty Avenue and Smallman Street. These peripheral locations to Penn Avenue's historic market place will perform similar to department store anchors in shopping centers that help support the smaller shops in-between, while servicing adjacent commercial uses.
- Residential parking could be located underground in high density areas or at grade in residential neighborhoods inside residential developments or courtyards, with access provided from side streets rather than main streets. This will serve to decrease the number of curb cuts on through streets, reducing vehicle/vehicle and vehicle/pedestrian conflicts.
- Satellite parking outside the study area is recommended as a replacement for the fringe commuter parking currently located in the Strip District.

Development Standards

As new development occurs, including renovation and rehabilitation projects, the Allegheny Riverfront would benefit by adopting sustainable development standards. These would not only reinforce the goals of the Allegheny Riverfront Vision Plan, but serve as best practice examples of how riverfronts can become riverfront communities and models for City and County smart growth and regenerative policy.

Residential Compatibility

Uses and buildings that are residentially compatible maintain property values and encourage the intermixing of residential development with industrial and business uses. Residentially compatible translates into higher quality development of all uses and an acknowledgement that low-investment development is detrimental to the economic sustainability of the neighborhood and does not make a good neighbor. Residentially compatible development will help to regenerate the riverfront properties, raise land and market values that will increase investment opportunities, and produce desirable and livable communities whether they are residential or business focused.

Residential compatibility means investing in the building's exterior envelope. The perimeter should maximize window openings, with window openings on all facades. Durable materials should be used to increase longevity and relate to the local context. Residentially compatible also means capable of regeneration and repurposing, with buildings adaptable for other future uses, be they residential apartments, professional offices, or a vocational school. Polluting uses are not residential compatible. Uses that stream pollutants into the atmosphere, create loud noises or obnoxious smells that cannot be controlled within the property lines, or are so brightly lit that they keep neighbors awake at night are not appropriate.

Green Design Standards

Creating long-term sustainability for the Allegheny Riverfront is not only a function of City agencies, street improvements, and new infrastructure, but also a commitment and maintenance of those who reside, utilize, and own private property. Without the participation of area stakeholders, environmental sustainability will not be possible. While it may be desirable to require all development to be sustainable, it is not practical. However there are opportunities where implementing green design standards are possible and in the best financial interests of property and business owners.

The riverfront's Regenerative Zone is the prime location for adopting green design standards for both building and site design. As new development occurs, structures should be designed to achieve the equivalent of LEED certification and the site designed to maximize green opportunities, including aggressive stormwater management, vegetative roofs, and riparian buffer landscaping. By setting new precedents as a model for future Pittsburgh riverfronts, this zone could also set the pace for new development throughout the city.

The Transition Zone is another location where green design practices should be followed with new and renovation construction, and new construction should follow the same practices as the Regenerative Zone. When renovated, the existing building stock should be strongly encouraged to be LEED certified. Green roofs need to be encouraged for all buildings, whether renovated or not, as an ecological contribution to better environmental sustainability.

In fact, all new and renovated development in the Allegheny Riverfront Vision Area would benefit by adopting green design standards. With everyone participating, the impact could be contagious and tremendously beneficial for the city.

Design Recommendations

Buildings should be built or renovated to meet best practices of sustainability. LEED equivalency requirements and residential compatibility standards should be required in the Regenerative Zone and are suggested for all development throughout the Allegheny Riverfront. The design recommendations are suggested for all structures and development in the Allegheny Riverfront as best practices.

- All development in the Regenerative Zone is to be residentially-compatible. Maximize window openings on the ground floor, or lowest occupied floor. Provide window openings on all facades.
- Regenerative Zone structures should be designed to achieve the equivalent of LEED certification and the site designed to maximize green opportunities, including aggressive stormwater management, vegetative roofs, and riparian buffer landscaping.
- Design for conversion to other uses or incorporate deconstructible fabrication.
- Maximize the efficiency of interior space to conserve energy.
- Favor an orientation that increases north-south exposure.
- Provide for seasonal sun and wind sheltering and for natural ventilation.
- Install vegetated roofs for water management, energy conservation, and roofing durability.
- Use durable materials for exterior construction in the Regenerative, Transition, and Service Zones because of their regenerative qualities and the desire to maintain these zones as mixed uses in the future. Follow Riverlife guidelines for material design standards. Encourage the use of locally produced materials with low embedded energy content (energy used in material processing).
- Provide a high-performance building envelope, including climate-mediating spaces at the perimeter.
- Use recyclable/recycled materials.
- Include provision for multi-stream recycling and composting.
- Utilize renewable energy generated on-site (geothermal, solar, and/or wind) and/or from other sources such as district-wide renewable energy systems.
- Design plumbing for the eventual use of gray water (separate from black water "waste lines"), both inside and outside.
- Minimize construction waste.

implementation and resources

Implementation should start by the URA and City Planning adopting the Vision Plan, modifying and adopting the Riverfront Overlay District zoning, and communicating to all stakeholders there is now a framework in which they can confidently invest. These actions will convey a sense of certainty that the City is serious about implementing the Vision Plan. Respective development plans will be needed for the large parcels identified as development opportunities for transformative intervention. The City will need to come forward and make a commitment to infrastructure—not only in the 1-3 year timeframe to support specific projects, but also in the 5-, 10-, 15-, 20-year timeframe segments needed to acquire City, State, and Federal monies. There will also be the need to coordinate efforts between the URA and City Planning with capital expenditure investments.

Investment in infrastructure, particularly for transportation and environmental improvements, is often the most important first step to revitalization.

Infrastructure Phasing

It became apparent the development community is hesitant to make large investments in the Allegheny Riverfront for a number of reasons, including the uncertainty of the area's future. Both the development and real estate communities are clearly looking for the City to make the first move and strongly expressed the need for public investment to precede private development.

Research of precedents uncovered that the most successful district-wide revitalization examples began with government intervention with infrastructure, usually in the form of transportation and environmental improvements, occurring during the late first stage of redevelopment after the pioneers had established a strong foothold. The Strip District and Lawrenceville are both at that stage. Development on a large scale will not happen until a better infrastructure is in place.

Recommendations

- URA and City invest in transportation and environmental improvements.
- Concentrate on connection improvements, such as the circulator trolley, the Allegheny Riverfront Green Boulevard, and extending Smallman Street to 40th Street.
- Include stormwater improvements as integral with connections improvements.

Incentives to Spur Private Development

The development community identified tax credits as the most useful form of direct subsidy. Historic tax credits are available and have been useful in spurring rehabilitation of historic structures, however their effect has been limited. Tax credits for other structure types should be considered. Revitalization of existing building stock through tax credits, along with a few new buildings identified in transformative locations, can spur development and demand. New development will come later as the demand is created.

Target areas include properties within the Lawrenceville historic district; properties fronting on the Allegheny Riverfront Green Boulevard, Smallman Street, Butler Street, and Penn Avenue west of 34th Street; and properties fronting on streets perpendicular to the river identified as green streets. Sites identified for initial development within transformation locations should also be considered. It is important that any tax credit program be of limited duration to spur enough initial redevelopment to create desirability and demand, and then pull back to let normal market forces generate further development.

Recommendations

- City, School District, and County initiate tax credit programs for targeted Regenerative and Transition Zone properties.
- Tax credits should be in addition to historic tax credits.
- Limit the time period for tax credit eligibility.

Hot Spots and Future Spots

Certain locations have a greater chance of early success, primarily because they are large tracts of undeveloped land under The Buncher Company's and the URA's ownership and where the URA has an interest in their immediate development. They are:

Produce Terminal between 16th Street and 21st Street on Smallman and the land between the Produce Terminal and the river

The URA, who owns the Produce Terminal, has entered into an agreement with the Buncher Company to renovate and manage this facility for a designated period with the intention of transferring ownership if the renovation and reuse of the building is a success. Part of that agreement entails creating passageways through the Terminal for access to Buncher's riverfront properties. The Buncher Company has indicated that at least one, if not two, of the riverfront parcels, prime candidates as new residential buildings, will be developed in the near future. The riverfront sites are within the Regeneration Zone and the Produce Terminal is within the Transition Zone.

Tippins International site at 62nd Street

This 22-acre URA-owned parcel is also under agreement with The Buncher Company for development as a distribution center. Strip District and Lawrenceville distribution facilities are intended to relocate to this site for easy Interstate access. The uses in the Buncher-owned flex building between 43rd and 48th Streets will be encouraged to relocate here. The Tippins site is within the Regenerative Zone.

The Buncher Company's flex building between 43rd and 48th Streets

This fully-occupied flex-space building is under an option purchase agreement with the URA for residential development. By also relocating 43rd Street Concrete, the riverfront between 43rd and 48th Streets would become prime residential property. The flex building site and concrete plant are within the Regenerative Zone.

Other large properties have hot spot potential:

Heppenstall Steel property between 44th and 48th Streets

This RIDC-owned property, now cleared of the former steel processing facility except for the large blue building at 44th Street, is being marketed by RIDC as prime flex development that is well-suited for up and coming high tech industries. Sitting directly inboard of the Buncher Company's flex building across the AVRR corridor, this large site is well-suited for residential development. The site is within the Transitional Zone.

Tow Pound site between 29th and 31st Streets along the riverfront

Owned by the City of Pittsburgh, this former auto impoundment site is now vacant except for the City's 911 call center. The site has potential as a Regenerative Zone development.

Properties between 11th Street and 16th Street

This vacant land now used for commuter parking is owned by The Buncher Company. Although not part of the Produce Terminal agreement, this prime Regenerative Zone land identified for mixed use and entertainment uses is ready for development.

Properties between 39th and 40th Streets from Butler Street to the river

These properties, which are owned by two parties and presently occupied, are not developed to their potential, are centrally located to Central and Lower Lawrenceville, and sit on the primary connector street to Oakland. This site has the potential to become the "civic center" of Lawrenceville. The circulator trolley is proposed to extend to 40th Street on the property, with the potential to also access Oakland. The site is located in the Transition Zone and its riverfront portion is in the Regenerative

Zone. The Vision Plan identifies this location for retail activity along Butler Street, including a new grocery store, and residential uses to the river.

Pitt-Ohio property between 33rd Street and 35th Street along the river

This large tract of land with a large single-story building is unoccupied. The grounds are being used for truck parking. The site is within the Regenerative Zone, however its full riverfront frontage is blocked by the AVRR's wooden trestle which is not publicly accessible.

Recommendations

- Concentrate on The Buncher Company and URA properties as first step to undertaking development and infrastructure improvements. Use these sites as demonstration projects.
- Encourage residential development along the riverfront as early-stage objectives.

Trading Parcels

The Buncher Company/URA agreement, involving three sites, suggests the potential for trading sites to achieve "right fit" development and ownership possibilities. A few other possible trades include:

Flex Building between 39th and 40th Streets at the riverfront

Trade for space at the Tippins International site or a Transition Zone location to allow the present industrial uses to be converted to riverfront residential uses.

Heppenstall Steel site

The Heppenstall site, which RIDC intends to develop for industrial uses, could be traded for other City-owned property, such as the Tow Pound site, URA-owned land elsewhere in the city where industrial-only uses are more appropriate and accessible, or with another private party to free up the site for neighborhood residential and/or mixed uses. If the Tow Pound site is involved, it should be developed per the Regenerative Zone recommendations.

Pitt-Ohio Property between 33rd and 35th Streets at the riverfront

This property could be traded for RIDC's Heppenstall Site as both are about the same size. The 33rd to 35th site could be a good candidate for relocating the 43rd Street Concrete operation as riverfront public access is prohibited. The remainder of the site, with its railroad access, could be a good location for produce purveyors now in the Produce Terminal or other purveyors in desirable Strip District locations. This site is within the Regenerative Zone and should be developed with a green agenda.

City- and County-owned properties

The City and the County own a number of properties in the Strip District and Lawrenceville for government functions. The City's sign shop on Liberty Avenue and the Public Works property along the Highland Park riverfront, and the County's land beneath the 40th Street Bridge are good examples of government property occupying desirable sites for other development. Relocating these services to the Service Zone or more appropriate locations should be considered.

Recommendations

- Government agencies work together to continue with land trading that matches up strategic properties with "right fit" ownership.
- Require that redevelopment activities begin within a limited time period for traded land within the Regenerative and Transition Zones.

Development Spillover

It is anticipated that once the revitalization program reaches the second and third stages the spillover effect will begin an infill process. The typical metric for spillover development are projects beyond 600' of a major development or transformation.

This secondary development should be presumed from prime development in the transformative locations, particularly those involving the Butler Street corridor. Butler Street is already showing signs of investment with new restaurants and boutique shops. The proposed scattered site development in and around Doughboy Square should result in more activity from Doughboy Square up to 39th Street.

Recommendations

- Strategize where early-stage development projects would have the maximum spillover effect and concentrate infrastructure and other subsidies on these locations.
- Limit subsidies and other incentives for spillover sites so that limited funds can be applied to catalytic and strategic development sites.

Letting the Market Take Over

At some point the stimulus will be felt beyond the development spillover effect. However, cities and markets are dynamic and growth is not predictable. This is where the regenerative agenda is most beneficial to long term sustainability. The second dimension of building for adaptability is to encourage development plans that adapt to changes in market needs and dynamics. The scale and pace of development needs to be phased according to availability of funding, sites under control, and current market needs without taking too much property out of private hands and off the tax rolls. This cannot be stressed enough for good intentions can easily produce the wrong effect.

Deliberate and continuous investment in the public realm infrastructure by government and the community, even when it can only be accomplished incrementally, will strengthen community's desirability and its attractiveness for private investment that will have a positive effect on the overall market. It has been shown in many studies there is a significant link between the value of a property and its proximity to green spaces, parks, and greenbelts.

Recommendations

- Continuously invest in public infrastructure to sustain private investment.
- Pace development plans to market conditions while conveying the community's agenda for sustained and regenerative development.

Value of Time

"Big bang" projects where heavy subsidies are concentrated on very few, but very large-scale, projects absorb the majority of market demand. The results are development spikes that, while they may result in exciting new projects, slow development elsewhere.

Instead, evolutionary development is more beneficial to the community by allowing neighborhoods and infrastructure to absorb change and make accommodations, allowing for multiple investors and investments, rather than all in one ownership and control. Development is spread over a larger area and is more responsive to opportunities. It is also a more democratic process for all stakeholders, as everyone in the community who has an interest becomes a "stakeholder."

The Transformative Development scale improvements shown in the concept plans and described as having significant design and market impact are not intended as "big bang" projects, but instead as master-planned developments intended to be phased over a period of time.

Recommendations

- Limit development subsidies and incentives to strategic and catalytic portions of larger development projects so that normal market forces can become the economic generators of a sustained development process.
- Spread, rather than concentrate, subsidies and incentives to multiple investor developers to encourage a more evolutionary process.

Funding Programs

There are a number of available grants, loans, tax credits, and real property tax exemptions available to facilitate development projects aligned with the Allegheny Riverfront Vision Plan. These include a diverse variety of incentive programs that seek to encourage investment and community revitalization. The list below is a generic overview of public financial assistance. Each funding source has specific requirements that have to be tailored to the final project and development group.

The Strip District and 40th Street Corridor transformation designs qualify under the Southwest Pennsylvania Commission's transit oriented development (TOD) criteria. The 33rd Street Corridor/Doughboy Square transformation design would also qualify if the commuter rail lines are implemented.

City of Pittsburgh

Tax Increment Financing (TIF)

Diversion of incremental real property tax revenue to facilitate redevelopment (usually 75%). Financing utilized for demolition, remediation, infrastructure, and other public improvements. No Act 202, 42, or LERTA exemptions are allowed within TIF Districts.

Pittsburgh Housing Construction Fund

Construction loan of up to 80% of development costs. Additional grants are available for funding gaps up to $40,000 for households at or below 80% of median area income. (Energy Star required).

Pittsburgh Rental Housing Development & Improvement Program

Loans up to $30,000 per residential unit or 50% of the total development costs.

Neighborhood Housing Fund

Deferred second mortgages and down payment assistance for qualified low/moderate income households.

Commercial LERTA (conversion)

5 year, 100% exemption of City real property taxes for rental residential projects on commercial, industrial, or vacant properties (up to $50,000 of assessed value). Benefit is enhanced for projects within the Strip District and the Uptown/Lower Hill District areas.

Residential LERTA (conversion)

10 year, declining exemption of City, School District, and County real property taxes for residential (rental or owner occupied) projects on commercial, industrial, or vacant properties (not to exceed maximum benefit). Four defined areas of the City including portions of the Allegheny Riverfront.

Act 42 Enhanced (defined areas)

10 year, 100% exemption of City and School District real property taxes for new residential construction (up to $250,000 of assessed value). 28 defined areas of the City including portions of the Allegheny riverfront.

Allegheny County

Act 202

3 year, 100% exemption of County real property taxes for new residential construction.

Allegheny Housing Development Fund

Deferred second mortgages for qualified low / moderate income households.

Commonwealth of Pennsylvania

PA Housing Finance Agency

Various loan programs and local administrator of LIHTC Program. Both construction and conventional loans for multifamily residential projects.

Growing Greener II

Grants for community development and residential reinvestment near commercial districts (typically up to $500,000).

Housing and Redevelopment Assistance

Grants for residential developments (typically up to $200,000).

Transit Revitalization Investment District Fund (TRID)

Diversion of incremental real property and other tax revenues to facilitate redevelopment. Financing utilized for demolition, remediation, construction, public infrastructure, and other transit improvements. No established funding mechanism currently exists.

TRID Fund

Possible development fund through PA DCED that will provide annual grants to cover debt service for TOD Projects. Would be created via HB 1133.

PA Economic Development Financing Authority

Tax exempt bond financing for multi-family and taxable bond financing for private development projects (no maximum loan size).

H2O PA

Single or multi-year grants for expansion or rehabilitation of water, sanitary sewer, or storm sewer projects (50% match required).

Infrastructure Development Program

Grants for public infrastructure and loans to private businesses for infrastructure and brownfield remediation (2:1 private to public match required; $25,000 cost per job to be created within five years or 10 new full-time equivalent jobs).

Federal and Other Programs

New Markets Tax Credits

Federal tax credit for qualified investment in designated Community Development Entity (CDE). CDE loans and equity investments available for real estate projects in eligible census tracts. Rental residential permitted where less than 80% of gross property revenue comes from residential units. (The Strip District to 33rd Street is eligible).

Transit Investments for Greenhouse Gas and Energy Reduction (TIGGER) Program

TIGGER grants are discretionary funds from the Federal Transit Administration (FTA) in the US Department of Transportation. There are two eligible purposes for TIGGER grants: (1) For capital investments that will assist in reducing the energy consumption of a transit system; or (2) For capital investments that will reduce greenhouse gas emissions of a public transportation system.

Federal Transit Administration

The FTA has several programs through which TRID/TOD developments could be facilitated, including the Urban Circulators Program, the Livability Bus Program, and the New Starts Program. The deadline for these programs passed on February of 2010. The status of future grants is uncertain as all transportation funding under SAFETEA-LU (Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users) has operated under an extension that expires September 30, 2010, which may push reauthorization into 2011.

Federal Appropriation/Earmark

Awarded through legislative initiatives.

Joint Federal programs for riverfronts and sustainability:

Department of Transportation's (DOT) Transportation Investment Generating Economic Recovery program (TIGER II)
Department of Housing and Urban Development (HUD) Community Challenge planning grants
EPA/FTA/HUD

- $3.5B loan fund for riverfront and water clean-up
- $4.0B livability and sustainability program

Proposed Incentives by the Development Community

A number of programs were suggested by the development community during focus group sessions and interviews. All are directed at minimizing development risk.

Targeted Local Tax Abatement

- City, School District, and County real property tax abatement for projects in transformative areas and other sites in the Allegheny Riverfront to incent development.
- City, School District, and County tax credits for targeted properties in the Regenerative and Transition Zones. Limit timeframe so that credits would expire after demand is established.

Assistance with Lending and Subsidies

- Develop a program similar to the Keystone Innovation Zone.

Assistance with Creative Financing

- Develop Empowerment Zones, similar to Philadelphia's, with accelerated depreciation.
- Develop credits related to energy.
- Develop credits related to sustainability.

Public Incentives

These programs would be undertaken by local government agencies to help mitigate risk.

- Construct centrally located public parking facilities.
- Clean up environmental hazards that diminish marketability of sites.

Sponsorship

Sponsorship of major initiatives and roles might be considered for:

Urban Redevelopment Authority of Pittsburgh

- Catalyst for development
  - Site acquisition
  - Site improvements
  - TIF and other incentive programs
- Investment in public realm infrastructure
- Land exchanges

City Planning

- Riverfront Overlay District or other zoning mechanism for the Allegheny Riverfront
- Development master plans
- Transportation planning

Riverlife

- Riparian buffer and stormwater infrastructure maintenance and funding program
- District-wide renewal energy planning
- Capital funding for long-range improvement programs (Federal and State)

Pittsburgh Water and Sewer Authority (PWSA)

City of Pittsburgh Department of Public Works (DPW)

City of Pittsburgh Code of Ordinances

Allegheny County Health Department Environmental Regulations

- Review and modify regulatory barriers to green infrastructure improvements and implementation

Pittsburgh City Council

- Tax credit and other financial incentive programs
- Zoning amendment approvals
- Development Master Plan approvals

measuring success for allegheny riverfront vitality

This section is a summary of specific improvements and change recommendations to be used as a tool for assessing implementation progress.

Creating a spreadsheet metric chart is a handy way to record progress. Improvements and change recommendations should be evaluated against 2050 year targets based on established metric baselines, usually measured in terms of existing quantities developed by survey and available information. If the baseline is a code or reference standard, it should be listed. Establishing annual program targets allows for frequent progress assessment and measurable accomplishments. A spreadsheet metric chart should contain:

- Recommendation (or goal)
- Code or reference standard
- Baseline
- 2050 target
- Annual program assessment

Ecological Metrics

Stormwater Management

- Capture first 1" of rainfall in the Allegheny Riverfront (1,260 acres) measured on a % of total acreage basis
  - Capture first 1" of rainfall for all new development >5,000 square feet measured on a quantity basis
  - Install vegetative roofs measured on a square footage basis
  - Install vegetative curb extensions measured on a square footage basis
  - Install vegetative street medians measured on a square footage basis
  - Install green alleyways measured on a lineal footage basis
  - Install urban food gardens >500 square feet measured on a quantity basis and a square footage basis
  - Install residential rain gardens >500 square feet measured on a quantity basis and a square footage basis

Tree Canopy Coverage

- Achieve 40% tree coverage average in the Allegheny Riverfront (1,260 acres) measured on a % of acreage basis
  - Achieve 80% tree coverage in the first 200' of the Regenerative Zone and the Allegheny Riverfront Green Corridor measured on a % of acreage basis
  - Achieve 60% tree coverage in the remainder of the Regenerative Zone and all of the Service Zone measured on a % of acreage basis
  - Achieve 40% tree coverage in the Transition and Preservation Zones up to Butler Street measured on a % of acreage basis
  - Achieve 25% tree coverage in the Preservation Zone south of Butler Street measured on a % of acreage basis

Landscape

- Install street trees measured on a quantity basis
- Install permeable soil volume of proper mixture of 800 cubic yards per tree or 600 cubic yards per multiple trees (grove) measured on a cubic yardage basis
- Install permeable soil volume of proper mixture equaling at least 39,200 cubic yards per acre average for trees to achieve 40% tree canopy coverage average measured on a cubic yardage per acre basis

Riverfront Riparian Buffer

- Install 200' wide riverfront riparian buffer measured on a % of the total riverfront acreage basis

Connections Metrics

Movement of Trucks

- Decrease truck volume measured on a quantity basis measured at key locations
- Decrease truck size measured on a % basis of all trucks
- Decrease the number of truck conflict locations measured on a quantity basis
- Decrease the number of trucking facilities measured on a quantity basis

Movement of Automobiles

- Decrease automobile traffic volume measured on a quantity basis measured at key locations

Bus Transit

- Increase the number of east-west bus lines measured on a quantity basis and frequency basis
- Increase the number of north-south buss lines measured on a quantity and frequency basis

Urban Circulator Trolley Transit

- Install the urban circulator from Downtown to 40th Street in Lawrenceville measured on a % completion basis
- Extend urban circulator from 40th Street to Fifth and Forbes in Oakland measured on a % completion basis

Light Rail Commuter Transit

- Install commuter light rail from New Kensington to Downtown measured on a % completion basis
- Install commuter light rail from Lawrenceville to Hazelwood measured on a % completion basis
- Install commuter light rail from Gibsonia to the South Hills through Lawrenceville measured on a % completion basis

Bicycle Improvements

- Designate bicycle lanes on city streets measured on a lineal footage basis
- Install bicycle facilities for bike storage measured on a quantity basis

Pedestrian Improvements

- Install designated pedestrian crossings measured on a quantity basis
- Install new traffic signaling measured on a per intersection quantity basis

- Install HAWK signals at railroad crossings measured on a per crossing quantity basis
- Measure walkable sidewalks on a lineal footage basis

Intersection Improvements

- Install intersection "bump outs" measured on a per intersection quantity basis
- Install complete intersections (crossings, bump outs, signaling) measured on a per intersection quantity basis

Trail Improvements

- Install riverfront trail measured on a lineal footage basis
- Install riverfront trail per Riverlife standards measured on a % completion basis
- Install Allegheny Riverfront Green Boulevard trail measured on a % completion basis
- Designate green street trails measured on a per block basis

Street Extensions

- Extend Smallman Street to 40th Street measured on a % completion basis
- Extend Willow Street to 39th Street measured on a % completion basis

Complete Streets

- Install Allegheny Riverfront Green Boulevard as a complete street from 11th Street connecting to Butler Street once past 62nd Street measured on a % completion basis
- Create complete streets measured on a per block quantity basis

Parking Facilities

- Provide parking garages available to the public measured on a quantity basis and number of public parking spaces basis. Exclude tenant parking.
- Create public parking spaces in parking garages measured on a quantity basis
- Install surface community parking lots in residential areas measured on a quantity basis and number of parking spaces basis. Exclude tenant parking for multiple-occupancy residential structures.

TOD Metrics of Strip District (measured from 15th Street/Smallman Street intersection)
TOD Metrics of Lawrenceville (measured from 40th Street/Butler Street intersection)

- Population of 16.7 persons per acre within a ¼-mile radius measured on a per acre basis
- Housing density of 11 units per acre within a ¼-mile radius measured on a per acre basis
- Travel time to Downtown measured in minutes
- Transit time to Downtown measured in minutes
- Employment density of at least 15,000 persons per acre within a 1-mile radius measured on a quantity basis
- Walkability score measured on basis of score achieved at www.walkscore.com
- Transit availability measured on a yes/no basis
- Cross route connections measured on a yes/no basis
- Dedicated fixed guideway measured on a yes/no basis
- Cross route service density measured on a weekly round trips/ridership basis
- To Downtown service density measured on a weekly round trips/ridership basis

Market Metrics

(Note: Use latest census year that applies to all census items listed or, if easily available, latest year information)

Track Census Changes

- Population measured on a quantity and % change basis
- Age distribution measured on a quantity and % change basis per category
- Education level measured on a quantity and % change basis per level
- Income level measured on a quantity and % change basis per category

Investment and Land Value

- Increase in investment measured on a quantity and % change basis
- Increase in assessed land value measured on a quantity and % change basis
- Increase in average home sale price measured on a % change basis

Businesses

- Number of business enterprises measured on a quantity basis
- Revenue generated from Allegheny Riverfront businesses measured on a quantity, % change, and per square foot basis
- Change in number of design-related businesses measured on a quantity, % change, and per square foot basis
- Change in number of green-related businesses measured on a quantity, % change, and per square foot basis
- Change in number of research & development businesses measured on a quantity, % change, and per square foot basis
- Change in number of retail businesses measured on a quantity, % change, and per square foot basis
- Change in number of wholesale businesses measured on a quantity, % change, and per square foot basis
- Change in number of institutional and non-profit businesses measured on a quantity, % change, and per square foot basis

Occupancy

- Increase in mixed-use occupancy measured on a quantity, % change, and per square foot basis
- Increase in mixed-use variety measured on a quantity, % change, and per square foot basis per mixed-use type
- Increase in number of residential units measured on a quantity, % change, and average per square foot basis

Development

- Increase in the amount of new development >5,000 square feet measured on a quantity and a square footage basis
- Increase in the amount of new renovation/repurposing development >5,000 square feet measured on a quantity and square footage basis
- Increase in the amount of restored historic structures measured on a quantity and square footage basis

Urban Form

Open Space

- Increase in designated park space measured on a square footage and acreage basis
- Create open space extensions to riverfront measured on a square footage and acreage basis

Density

- Increase in population measured by density on a per acre and % change basis
- Increase in job density measured on a per acre and % change basis
- Increase in residential density measured on a per acre and % change basis
- Increase in business square footage measured on a quantity and % change basis
- Increase in residential square footage measured on a quantity and % change basis

Height and Setback

- Increase in building height (stories) in Strip District to 40th Street measured on an averaged foot and % change basis
- Increase in setbacks to create riverfront riparian buffer measured on an averaged foot and % change basis

Development Standards

- Increase in the amount of residentially-compatible structures measured on a quantity basis
- Increase in the amount of LEED-certified buildings measured on a quantity basis
- Increase in the amount of sites meeting LEED Neighborhood Compatibility Standards measured on a quantity basis

Utilities

- Install buried line utilities in the public realm measured on a lineal foot basis
- Create district-wide renewal energy utilities measured on an acreage basis

Planning

- Establish capital budget for Allegheny Riverfront infrastructure improvements measured on a quantity, cumulative quantity, and % change basis

next steps

Actions that need further development to begin the implementation process.

General

- Land exchanges to match sites with development potentials
- Tax credit and other economic incentive programs

Planning

- Develop baseline metric information and annual programs
- Map and identify historic structures
- Riverfront Overlay District or other zoning mechanism for the Allegheny Riverfront
- Urban circulator trolley planning and funding
- AVRR commuter rail planning and funding
- Development master plans for specific sites
- TOD planning

Development Master Plans

- Mapping
  - Major redevelopment locations
  - Designate public right-of-way and easements
- Development Standards
  - Site and landscape design
    - Soil
    - Plant materials
    - Pervious systems
    - Building design
- Implementation Policies
  - Incentives for sustainability
  - Restrictions for conventional practices
- Soil Structure Plan
- Water Management Plan
- Transportation Plan
- District Energy
  - Location of utilities
  - Type of utility or combinations
- Waste Management Plan
  - Stormwater capture
  - Gray water recycling
  - Composting

Riverfront

- Implementation of the riparian buffer
- Reuse of the AVRR corridor
- Develop maintenance strategy and programs

Strip District

- Development Plan of The Buncher Company properties

Lawrenceville

- Development Plan of Buncher's flex building and 43rd Street Concrete properties
- Development Plan of RIDC's Heppenstall site
- Development Plan of the Tippins International site

Stormwater Management

- Stormwater management regulations review and modification to permit green infrastructure
- Street improvements program to capture and divert stormwater from combined sewers

Transportation

- Urban Circulator Trolley planning
- Light Rail Commuter Line planning
- Street Extensions
  - Smallman Street
  - Willow Street
  - Others
- Truck Management Plan
- TOD and TRID plans

appendix

Summaries of Current Planning Studies

A number of planning studies have been prepared for specific neighborhood locations within the Allegheny Riverfront by the neighborhoods and for Downtown that are currently guiding development planning. Below is a summary of key studies, including those with a wider influence:

General

The Vision Plan for Pittsburgh's Riverfronts prepared for the Riverlife Task Force

While most of the recommendations focus on Three Rivers Park, this vision plan has become the benchmark for planning along Pittsburgh's waterfronts. Its ten Guiding Principles are imbedded in the Allegheny Riverfront Vision Plan goals:

- Organize riverfront investment in relationship to the shared vision of Three Rivers Park as Pittsburgh's premier public domain
- Reinforce the power of place by revealing and seeking inspiration in history
- Enhance the shoreline experience and the range of uses encouraged to locate along the banks of the rivers
- Increase connections to the rivers especially from the neighborhoods, and endeavor to create new neighborhoods near the rivers
- Activate the water sheet itself by incorporating diverse uses while remaining cognizant of potential conflicts among them
- Celebrate the City of Bridges through lighting and pedestrian amenities and by incorporating them as part of the river trail system
- Improve regional connections and the continuity of public green space along the rivers' edge
- Consolidate transportation and minimize industrial impediments at the rivers' edge
- Incorporate the values of urban ecology and sustainability in the implementation of the plan

Three Rivers Park Design Guidelines and Framework Plan prepared for the Riverlife Task Force

The Design Guidelines, accepted by the Pittsburgh Planning Commission, define Riverlife's design and quality standards for development in Three Rivers Park. Many of these guidelines for buildings and connections apply to the Allegheny Riverfront, particularly those for riverfront properties.

Three Rivers Park Landscape Management Guidelines prepared for the Riverlife Task Force

The guidelines recommend the following:

- Strengthen the landscape requirements of the current Riverfront Zoning Overlay District
- Build on the identity and visibility of Three Rivers Park
- Maintain canopy trees along the entire riverbank to the fullest extent possible
- Plant native or non-invasive species throughout the river corridors
- Replace paved surfaces and lawn with plants and porous materials

These have all been further developed and expanded for the Allegheny Riverfront.

Heth's Run Ecological and Recreational Restoration prepared by the City of Pittsburgh

The vision has four main components:

- The replacement of the Heth's Run Bridge
- Parking expansion and entrance improvements for the zoo
- New trail connections from the neighborhoods to a new river overlook

- Construction of an athletic field and additional parkland

These have all been incorporated directly into the Vision Plan, with added trails from the overlook back up to Butler Street.

Strip District

Neighbors in the Strip Position Paper prepared by Neighbors in the Strip

Prepared for and by the Neighbors in the Strip board, this position paper documents policies and values that have been adopted by the board for all development and planning in the Strip District, including:

- Reinforce Strip District identity
- Address pedestrian and vehicular conflicts
- Preserve and enhance a mix of uses
- Develop key connections to the river and other areas
- Increase public space and access to green space

The Position Paper's policies and values parallel the goals and recommendations for the Allegheny Riverfront, including many which are applicable for Lawrenceville as well. This thoughtful document demonstrates how multiple interest groups, from residents to businesses to landowners, can partner for higher quality and livability in a diverse community.

Pittsburgh Public Market prepared by Pfaffmann and Associates for Neighbors in the Strip. (Initial study.)

Pittsburgh Public Market prepared by Indovina Associates, Urban Design Associates, and Kolano Design for Neighbors in the Strip

The goal of the Pittsburgh Public Market is to assert itself as a regional anchor, drawing visitors from around the city and subsequently contributing to the expansion of the Strip District as an essential retail destination. In order to accomplish this, strategies that address branding, signage and wayfinding, market integration, parking, and interior alterations are explored for the Produce Terminal. The Vision Plan recommends the Market as the western anchor of the Terminal, critical to its repositioning and continuation of retail/entertainment activities farther west toward Downtown.

Strip Portal Concepts prepared for the Senator John Heinz Pittsburgh History Center by Pfaffmann and Associates

This document began a design dialogue concerning the future of 11th Street as a portal into the Strip District. At the heart of its concepts are:

- Strong identity as part of the STRIP brand
- Flexible "kit of parts" solution
- Adaptable to future portal locations/installations
- Artful use of local metal, glass, and concrete
- Affordable in increments as funding is identified

Community and Advisory Committee meetings confirmed that 11th Street is commonly known as the Strip District portal and the Vision Plan recommends this idea be developed further.

Lawrenceville

The LoLa Plan prepared for the Lawrenceville Corporation by Studio for Spatial Practice

A common vision for Lower Lawrenceville emerged around three key principles: sustainability, river life, and entrepreneurial spirit. The six strategies included in this plan support this vision by addressing the following themes: development, public safety, greening, marketing and identity, parking, and movement. A three-phased strategy for implementing the district vision is proposed:

- Phase 1 recommends stabilizing the Butler Street corridor: adding new development, expanding parking capacity, and creating LoLa Park.
- Phase 2 strengthens the Butler Street corridor through infill development, building renovations, and pedestrian connections to an expanded trail and riverfront park.
- Phase 3 connects Lower and Central Lawrenceville with a mix of retail, civic, and residential uses along Butler Street and transforms the 40th Street gateway.

The Allegheny Riverfront Vision Plan incorporates many of the LoLa Plan's thoughtful recommendations, including extending Smallman Street to 40th Street and strengthening Butler Street retailing. Although more specific and in places more exuberant than the Vision Plan, the LoLa Plan provided the basis for the Vision Plan's exploration of the 40th Street Corridor area as a transformative development.

Lawrenceville Community Plan prepared for the Lawrenceville Corporation by Pfaffmann and Associates

The design priorities include:

- Provide traffic/streetscape improvements and development catalysts at Doughboy Square, Penn/Main, 40th Street, and 62nd Street Gateways.
- Identify new housing or retail corridors and candidates for retrofit or adaptive reuses within the industrial zone to connect neighborhoods to the river.
- Explore options for creating new bike routes, lanes, trails, and connections to Downtown.
- Explore transit oriented development (TOD) opportunities in conjunction with the Allegheny Valley Railroad and light rail transit proposals.
- Develop a master plan for housing which identifies areas for housing rehabilitation, new infill construction, and selective demolition.
- Revitalize parks and playgrounds and create new community gardens and public parks on vacant land.

This document served as a primer for the Vision Plan, reflecting Lawrenceville's desires, values, and aspirations. Many of the ideas within the Lawrenceville Community Plan are rooted in the Vision Plan.

Lawrenceville Elm Street RRG prepared for the Lawrenceville Corporation

The plan recommended:

- Build on the existing social and physical assets
- Improve the public realm
- Create opportunities for gathering
- Celebrate connections to the river
- Attract more residential uses
- Enhance gateways' identity and character

Like the Lawrenceville Community Plan, the Elm Street document laid out shared community goals and values. These were reinforced by community feedback at the Allegheny Riverfront's participatory venues and reflected in the Vision Plan's goals and recommendations.

Allegheny Valley Railroad Corridor Studies

The AVRR corridor has been the subject of several recent transportation studies:

Allegheny Valley Railroad and Norfolk Southern Commuter Rail Interim Study sponsored by Westmoreland County Transit Authority

The $500,000 study, completed in June 2009, developed and refined alternatives for proposed commuter rail service from Westmoreland County into Allegheny County and downtown Pittsburgh. One alternative identified in the Study utilizes the AVRR corridor through Lawrenceville and the Strip District and terminates at 21st Street, where a mode transfer would occur to get to downtown Pittsburgh. Another alignment uses the AVRR corridor to Washington Boulevard and then deviates to East Liberty/Shadyside where it connects with Norfolk Southern's right-of-way to downtown Pittsburgh. Regardless of alignment, the commuter rail service was projected to run on weekdays during rush hours only. Infrastructure costs required to implement the service, according to the Study, were estimated at more than $131 million. No one particular or preferred alignment was selected as part of this Study.

Commuter Rail Study sponsored by Councilman Bill Peduto

In December 2008, a $9,000 six month study was kicked off to assess the possibility of implementing a short haul commuter rail line connecting Lawrenceville with Hazelwood. The line would run on existing railroad right-of-way, which is leased by AVRR, essentially from Lawrenceville to Bloomfield, through the Baum-Centre corridor, Oakland, Carnegie Mellon University, Schenley Park to the Pittsburgh Technology Center. Rail cars would travel back and forth using the AVRR train tunnel below

Neville Street through Oakland. This commuter line, projected to cost $24 million according to the Study, would be a segment of a larger system linking the region.

Existing Bus Routes in the Allegheny Riverfront

In addition to the 91A, 86A, 86B and 54C, which are the most frequent routes in the Allegheny Riverfront, Table XX identifies all of PAAC's bus services in and around the Allegheny Riverfront.

EXISTING PORT AUTHORITY BUS SERVICE

BUS ROUTE	SERVICE AREA	SPAN OF SERVICE	FREQUENCY	RIDERSHIP
54C North Side-Oakland-South Side	Bon Air, Mt. Oliver, South Side, Oakland, Bloomfield, Lawrenceville, Polish Hill, Strip District, East Allegheny and North Side; does not serve downtown Pittsburgh; serves Penn Aveune inbound in study area; serves Liberty Avenue outbound in study area	Operates 7 days a week, 365 days a year	M-F every 20 minutes; SAT every 30 minutes; SUN-HOL every 40 minutes	5,094 per weekday
77F Morningside-Friendship	Baker and Butler streets in Lawrenceville area; Liberty Avenue in the Strip District	M-F only	about every 30 minutes during rush hour w/several mid-day trips	740 per weekday
77G Stanton Heights-Friendship	62nd and Butler streets in Lawrenceville area; Liberty Avenue in the Strip District	M-F only	7 inbound and outbound rush hour only trips	550 per weekday
86A East Hills	Liberty Avenue to Penn Avenue inbound through Strip District; Liberty Avenue outbound through Strip District	Operates 7 days a week, 365 days a year	M-F every 30 minutes; SAT every 35-45 minutes; SUN-HOL every 75-90 minutes	4,040 per weekday
86B Frankstown	Penn Avenue inbound through Lawrenceville and the Strip District; Liberty Avenue to Penn Avenue outbound through the Strip District and then through Lawrenceville	Operates 7 days a week, 365 days a year	M-F every 15-20 minutes; SAT every 20 minutes; SUN-HOL every minutes	6,800 per weekday
91A Butler Street	Butler Street between 62nd Street and Penn Avenue in Lawrenceville; inbound through the Strip District on Penn Avenue; outbound through the Strip District on Liberty to 32nd then to Penn Avenue	Operates 7 days a week, 365 days a year	M-F every 15-30 minutes; SAT every 30 minutes; every 45-50 minutes	3,700 per weekday
94A Stanton Heights	Serves East Liberty, Stanton Heights and Lawrenceville; Butler Street between 50th-56th streets; does not serve downtown	Operates 7 days a week, 365 days a year	M-F every 35 to 50 minutes; SAT every hour; SUN-HOL every hour	694 per weekday
94B Morningside	Serves East Liberty, Morningside and Highland Park; Butler Street in the area of the Zoo; does not serve downtown	Operates 7 days a week, 365 days a year	M-F every 45 minutes; SAT every 45 minutes; SUN-HOL every 90 minutes	910 per weekday
500 Highland Park-Bellevue	Serves Harmarville, Blawnox, Highland Park, East Liberty, Oakland, downtown, North Side, Brighton Heights, Bellevuew and West View; utilizes Butler Street in the Zoo area	Operates 7 days a week, 365 days a year	M-F every 20 minutes; SAT every 20 minutes; SUN-HOL every 30-40 minutes	8,000 per weekday

Sources:
http://www.portauthority.org/PAAC/Schedules/tabid/166/Default.aspx
http://tdp.portauthority.org/paac/RouteEvaluations/tabid/478/Default.aspx

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Website

http://alleghenyriverfront.pittsburghpa.gov