

CENTRAL CITY 2035 RIVER PLAN/CENTRAL REACH



EXISTING POLICIES AND CONDITIONS REPORT

April 2011



Bureau of Planning and Sustainability
Innovation. Collaboration. Practical Solutions.

City of Portland, Oregon
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CONTENTS

I. Introduction	1
Map 1. Aerial Photograph.....	3
II. Existing Policies	5
III. Existing Conditions	12
Historic Resources	12
Table 1. Willamette River Bridges	13
Table 2. Historic Landmarks	14
Map 2. Historic Resources	15
Zoning and Land Use.....	18
Table 3. Central Reach Base Zoning	18
Map 3. Current Zoning	19
Map 4. Overlay Zoning	21
Map 5. Land Use	23
Urban Design	26
Figure 1. River Cross Sections – Height and Visual Access	28
Map 6. Riverfront Areas of Change	29
Economic Activity	31
Table 4. Examples of Businesses within the Central Reach, by Subdistrict	32
Table 5. Property Owners within the Central Reach	34
Map 7. Ownership	35
Map 8. Contaminated Sites and Urban Renewal Areas	37
Transportation	39
Map 9. Transportation	41
Recreation and Public Access	43
Table 6. Tom McCall Waterfront Park and Eastbank Esplanade Events, 2010	45
Map 10. Access to River	47
Map 11. Water Recreation Opportunities	49
Watershed Health	51
Figure 2. Channel Depths of the Willamette River, Downtown Segment: 1881 and 2001	52
Map 12. Water-Related Features	53
Map 13. Vegetation and Steep Slopes	55
Map 14. Draft Natural Resource Inventory	57
Gray and Green Infrastructure	59
Map 15. Green Infrastructure	61

I. Introduction

The Willamette River plays a key role in the Central City. It stretches approximately four miles through the Central City and gives Portland much of its character. Views of the bridges and across the river are frequently used to identify Portland. It provides opportunities for recreational, industrial and commercial activities, and habitat for fish and wildlife. It is important not just as a focus for the City but also as a regional natural system. And though the Willamette is generally not yet safe enough to swim in, it is cleaner today than it has been in the past.

Several key planning efforts of the last few decades inform and guide land use and development along the Riverfront, including:

- Willamette Greenway Plan (1987)
- River Renaissance Vision (2001)
- River Renaissance Strategy (2004)
- Willamette River Conditions Report (2004)
- The River Concept (2006)
- Portland Watershed Management Plan (2006)

The River Plan is an update of the 1987 Willamette Greenway Plan. It is a comprehensive, multi-objective plan for the riverfront. The plan will address issues that affect the river and the land along the river, and will result in updates to policy, zoning, greenway regulations and design guidelines. The multi-year project is being carried out in three parts, each focusing on a different geographic segment or “reach” of the Willamette River. The reaches are interrelated, but distinct; each has a unique set of issues. The River Concept, adopted by the City Council in 2006, characterizes the Central Reach as the region’s gathering place:



The Central Reach will continue to be a highly urban regional center with a waterfront that serves as the city’s main civic space and as a regional attraction. Access to the river and public use of the waterfront will improve through new development and transportation improvements, eventually including changes to Interstate 5.

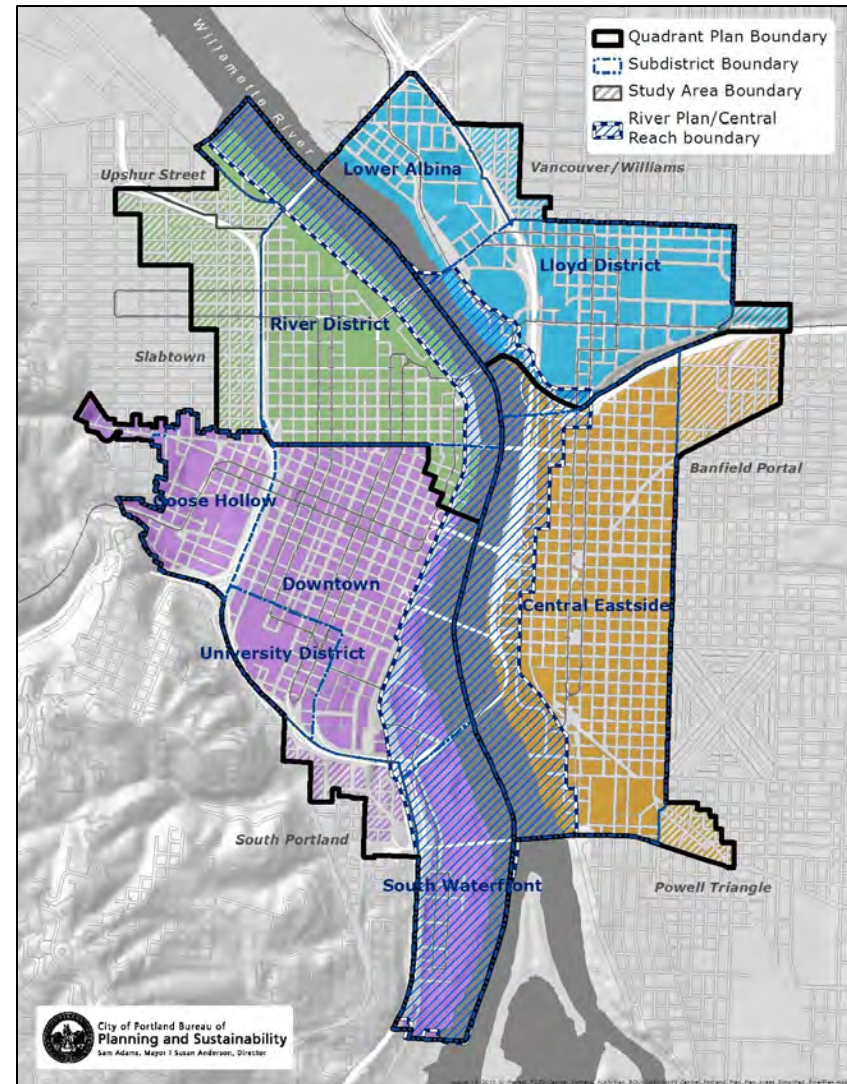
Planning for the Central Reach, which encompasses the Central City riverfront, is underway as part of Central City 2035 (CC2035), a new 25-year plan for the Central City. Phase I of CC2035 is to develop a new policy framework for the Central City to replace the policies of the 1988 Central City Plan and the 1987 Willamette Greenway Plan. The new policy framework will serve as a basis for updating the plans for the Central City’s subdistricts and

influence revisions to transportation, capital improvement, urban renewal plans, and the plan for the Willamette River. The second phase of CC2035 will focus on more specific geographies, including subdistricts and study areas, grouped into four quadrants. During development of the Quadrant Plans, the unique needs and characteristics of each subdistrict will be examined at a more detailed level.

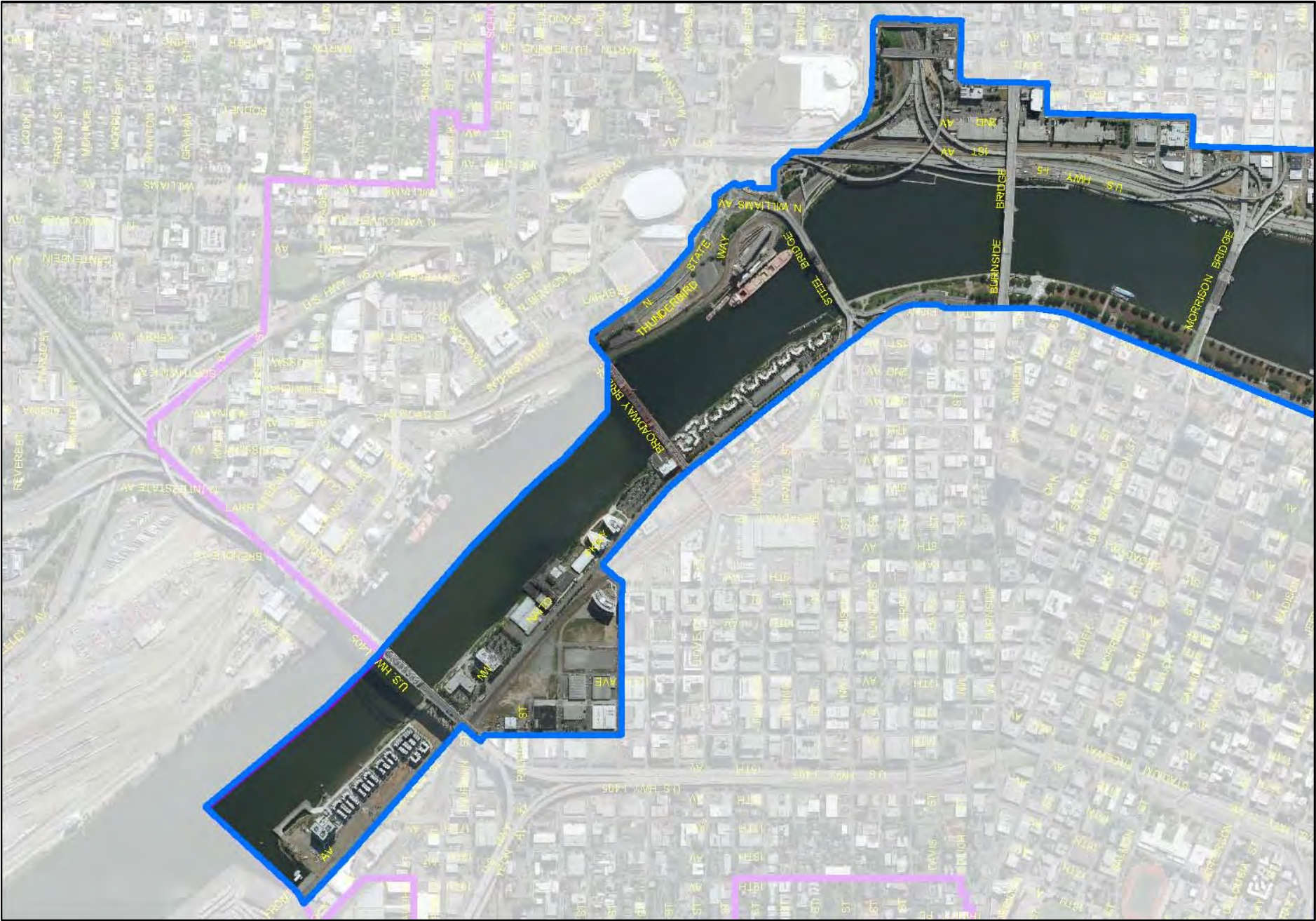
Since 1988 some of the vision, policies and objectives of the 1988 Central City Plan and the 1987 Greenway Plan have been realized, while others have not. Many segments of the Greenway Trail have been completed, but the vision of a trail running along both banks of the Willamette through the Central City is not yet reality. Physical and visual access to the river remains blocked in many locations, and there are few public attractions that connect people to the river. Water quality and air quality is improved over 1988 conditions, but we have not reached our goals regarding enhanced wildlife habitat in and along the river. The Central City plays a crucial and unique role in the health and well-being of the City of Portland and the region. New challenges now confront the Central City, challenges that will be addressed through the update of these plans.

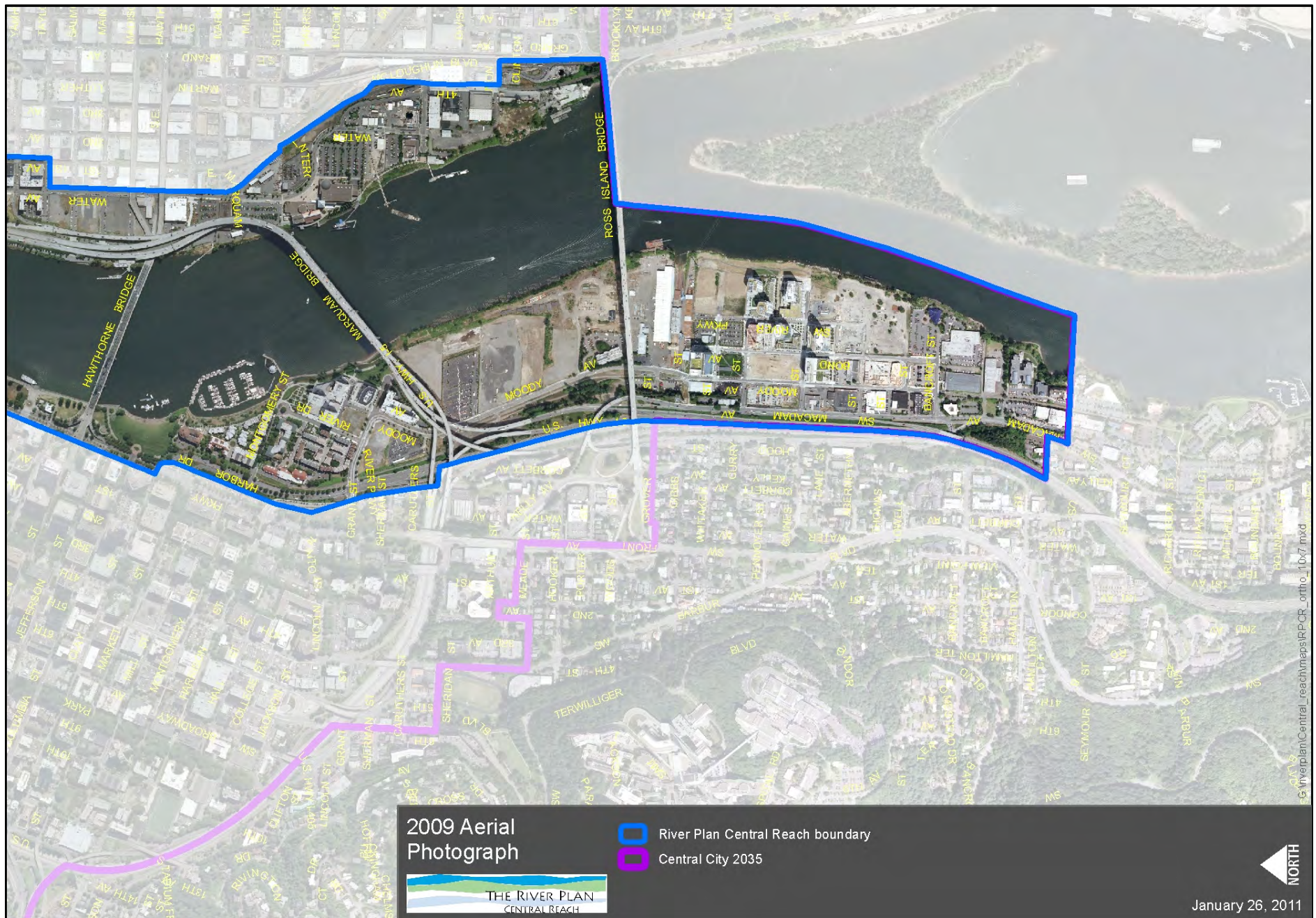
This report presents information about existing policies related to the Willamette River in the Central City and maps and data related to the current state of the Willamette River and adjacent lands to support the planning process throughout Phases I and II.

This report is a work in progress. It will be updated as necessary to support the planning process. For more existing conditions data for the Central City and Willamette River, please see Central City 2035 Subdistrict Profiles (May 2010) and the Willamette River Conditions Report (2004).



Map 1: Aerial Photograph





II. Existing Policies

Overview

In 1988 the City completed two major plans that have important and complementary visions for the Willamette River in the Central City—The Willamette Greenway Plan and the Central City Plan.

The major objectives of the Willamette Greenway Plan include

- restoring the Willamette River and its bank as a central axis and focus for the City and its neighborhoods and residents,
- increasing public access to and along the river, and
- conserving and enhancing remaining natural riverbanks and riparian habitat.

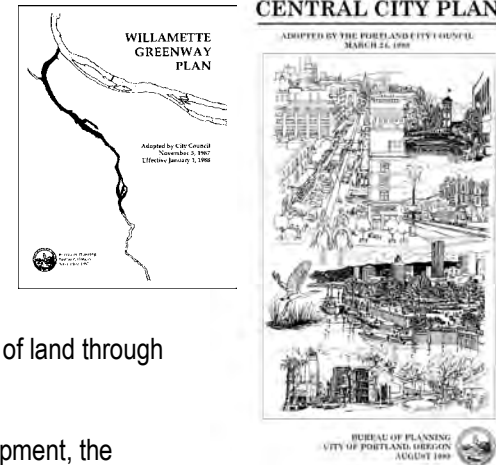
The Willamette Greenway Plan includes a greenway concept to provide direction on the future uses of land through land use allocation, public access, the greenway setback and public acquisition.

The Central City Plan included policies and objectives focused on issues including economic development, the Willamette riverfront, housing transportation, education, historic preservation, and urban design among others. The Central City Plan vision includes a statement specific to the river:

The air is fresh and the Willamette River is clean, inviting and accessible from both banks. Urban in nature, the riverfront is lined with a mixture of activities and open spaces. New buildings focus on the Willamette taking advantage of views of the waterfront's natural beauty and riverfront activities. Building heights step down to the river, preserving and enhancing views to and from the water. Access to the riverbank and the water's surface is available at frequent intervals. Along both sides of the Willamette public attractions offer cultural, educational and social opportunities to enjoy the City and the River. The water taxi system connects waterfront activities and attractions.

The Greenway Trail runs along the banks of the Willamette. This river trail loop ties the Central City to a larger system of walks that lead to surrounding districts and spaces which provide settings for wildlife and human activity.

The City's adopted Willamette Greenway Plan, Central City Plan, and Comprehensive Plan contain policies and objectives intended to guide decision making and investment along the river in the Central City. In addition, since 2000 much work has been done to update policies and aspirations for the Willamette River. Through projects such as the River Renaissance Vision and the River Renaissance Strategy, the City has engaged residents and stakeholders in envisioning the future of the Willamette River.



The 2001 City Council-endorsed River Renaissance Vision has five themes:

- ensure a clean and healthy river for fish, wildlife, and people;
- maintain and enhance the city's prosperous working harbor;
- embraces the river and its banks as Portland's front yard;
- create vibrant waterfront districts and neighborhoods; and
- promote partnerships, leadership and education.

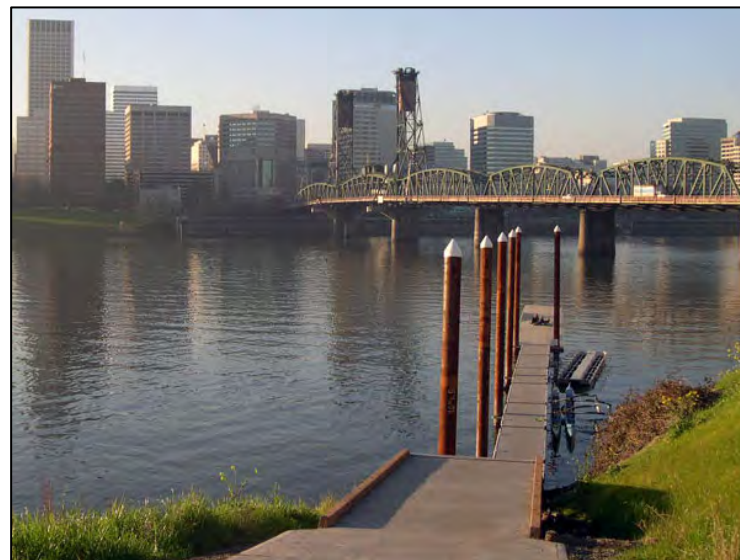
River Concept (2006)

In 2006, the City Council endorsed the River Concept, a synthesis of all of the policy direction for the Willamette River at that time.

Central Reach Vision

The Central Reach: The Region's Gathering Place

The Central Reach will continue to be a highly urban, regional center with a waterfront that is the city's main civic space and a regional attraction. Access to the river and public use of the waterfront will improve through new development and transportation improvements, eventually including changes to Interstate 5.



Objectives

Clean and Healthy River

- Opportunities to protect, conserve and restore fish and wildlife habitat will be explored and implemented through public and private actions. Mitigation required of public and private parties will improve habitat function.
- Stormwater quality and quantity will be managed at the source where practicable, using approaches that suit the site conditions and the type of development. In the Central City this is often achieved through landscaping, stormwater swales, pervious pavement, and roof gardens.
- Innovative bank treatments and plantings that allow for flood protection and fish and wildlife habitat will be achieved through public and private investment.
- Riverfront and watershed actions achieved through public and private investments will improve water quality and help make the river swimmable.

Prosperous Working Harbor

- Brownfields and unoccupied sites will be recycled into productive use through public and private investments and partnerships.
- Freeway congestion and at-grade rail crossings that hinder truck and rail movement will be addressed. In particular, the I-5 / I-84 interchange will be improved to operate efficiently.

- The Central Eastside will continue to evolve, through private development, into a center for employment that includes a successful and innovative mix of new urban industries that complement the other industrial and employment districts in the Central City.

Portland's Front Yard

- The reconfiguration of the I-5 / I-405 freeway loop to improve transportation functions and access for eastside businesses may provide the opportunity to create a signature civic space that better connects the east and west side waterfronts in the Central City. In the interim, short-term improvements will strengthen connections to the river and improve access and circulation in the adjacent industrial district.
- The Central Eastside waterfront will grow as a hub for water recreation activities as new land-water connections are established.
- The Centennial Mill riverfront will add to the waterfront park network. This may include redevelopment of the Centennial Mill buildings for public and/or private use.
- New pedestrian bridges over the rail line will connect the Pearl and Northwest Districts to the river.
- Pedestrian and bicycle routes through the Central Eastside, along with future Sullivan's Gulch Trail, will provide links among neighborhoods, the Eastbank Esplanade, Tom McCall Waterfront Park, and other parts of the Greenway Trail.
- Implementation of the Waterfront Park Master Plan will improve the park and result in better access to the waterfront from downtown.
- The gaps in the existing greenway trail system on both sides of the river will be filled, making this continuous loop one of the Central Reach's most distinctive features.
- The area long the river in the South Waterfront will have a unique combination of public parks and plazas, restored riverbanks for fish and wildlife, water recreation opportunities, and a riverfront trail. Connections between South Waterfront and neighborhoods to the west will be improved through a new pedestrian bridge over I-5 and other public investments.

Vibrant Waterfront Districts and Neighborhoods

- New commercial and residential uses will cluster around commercial corridors and bridgeheads in the Central Eastside.
- The reconfiguration of the I-5 / I-405 freeway loop to improve transportation functions and access for eastside businesses may create an opportunity to reclaim the east side waterfront for civic space and stimulate a new waterfront district in the Central City.
- South Waterfront will become one of Portland's most distinctive Central City neighborhoods with high density mixed-use towers, a riverfront trail in a wider greenway setback, green streets, and a possible river ferry stop.
- Public and private investments in housing development around Ankeny Plaza and strong connections to Waterfront Park will infuse Old Town with new life and character.
- The Rose Quarter waterfront will be redeveloped in a way that better connects adjacent neighborhoods to the river.



- The two sides of the river will be connected by a rich multi-modal transportation network, including auto, bus, streetcar, light rail, and pedestrian and bicycle links. A river ferry or taxi system would improve access between waterfront districts and neighborhoods.
- A cruise ship terminal in the Central City would enliven the downtown area and create new revenue for the city.
- Investing urban renewal funds into the rehabilitation of historic unreinforced masonry buildings in the district will allow for intensification of production and distribution activities in the industrial sanctuary, bringing more employees to the Central Eastside.

Partnerships, Leadership, and Education

- Relationships that foster positive change will be developed among property owners, businesses and business associations, neighborhood associations, environmental groups, recreation groups, cultural organizations, and agencies.
- The City will strive to make its regulations flexible, streamlined, and cost-effective and work with other agencies to simplify the overall river related regulatory process.
- The City will seek incentives, community partnerships, and facilitated development processes to encourage property owners and others to achieve the River Renaissance Vision.

Guidance for Central Reach Areas

Central City/Pearl

The riverfront will play a renewed role in the future of downtown and the Pearl District. New uses and development around Ankeny Plaza will inspire robust new residential and commercial activity. The Skidmore District, Ankeny Plaza, and Waterfront Park areas will be better integrated. In addition to hosting waterfront festivals, Tom McCall Waterfront Park will mature into the front yard for a growing number of downtown residents and employees.

North of Waterfront Park, redevelopment of the Centennial Mill riverfront will offer a new public space that completes the Central City waterfront park system. This may include redevelopment of the Centennial Mill buildings for public and/or private use. This revitalized area will serve as the Pearl and Northwest Districts' waterfront connection.

Throughout the Central City, new improvements to bridges, off-street trails, light rail, and streets will improve opportunities for walking, bicycling, and public transportation. Sustainable development practices will provide stormwater management and energy efficient design.



Central Eastside

Areas within the Central Reach will evolve to take advantage of the Rose Quarter Transit Center and commanding views of downtown and the west hills. The Rose Quarter area is expected to evolve from a destination for sports and entertainment into a place to live, work, and recreate near the river. The Rose Garden and Convention Center will serve as regional attractions anchoring this newly-invigorated area.

The Central Eastside will continue to support light industry while developing into a center for new urban industries that create jobs and provide products and services to the region. Capitalizing on the district's proximity to the river, cultural and recreational uses will add vitality to the area. Sustainable practices, including green streets and eco roofs, will be incorporated into new development. Improved urban design, landscaping, bicycle and pedestrian connections to the neighborhoods and street surfaces will allow for a more fluid movement of traffic and people. As the I-5/ 405 freeway loop exceeds capacity, it will need significant improvement and possible reconfiguration. If the eastbank freeway is buried, redevelopment of this land will provide opportunities for development and public spaces in the heart of Portland. However, waiting for future freeway improvements will not impede the immediate opportunities of improving connections to the river, riverfront development, riverfront activities or support for the industrial district.



South Waterfront

South Waterfront will grow into a vibrant Central City neighborhood that derives its character and identity from its relationship to the river and Ross Island, its striking skyline, its focus on sustainable development, and its aerial tram connection to Oregon Health and Science University.

South Waterfront will be connected to downtown with an extensive transportation network that includes the Portland Streetcar and the Willamette Greenway Trail. It will feature science and technology sector jobs, diverse housing options, a mix of retail, restaurants, a series of internal open spaces, and a waterfront designed to support fish and wildlife and provide people with a natural retreat from the urban environment.



Willamette Greenway Plan Goal and Objectives (1987)

The goal of the Willamette Greenway Plan is to protect, conserve, maintain, and enhance the scenic, natural, historical, economic, and recreational qualities of lands along the Willamette River. The Plan addresses the quality of the natural and human environment along the river. The Willamette River and the lands adjacent to it are a unique and valuable natural resource which requires special protection.

The primary objectives of the Willamette Greenway Plan are:

- To restore the Willamette River and its banks as a central axis and focus for the City and its neighborhoods and residents by coordinating public investment and private development and by establishing a program of land use, design and public access requirements that maximize public use and appreciation of this diverse urban waterway.
- To increase public access to and along the Willamette River. To achieve this, the Plan identifies a continuous recreational trail extending the full length on both sides of the Willamette River, but not necessarily adjacent to the river for the entire length. The Plan also identifies trail and river access points, viewpoints and view corridors, and provides direction as to their design. The purposes to be achieved by designating and requiring property owners to dedicate right-of-way or recreational trail easements include increasing recreational opportunities, providing emergency vehicle access, assisting in flood protection and control, providing connections to other transportation systems and helping to create a pleasant, aesthetically pleasing urban environment.
- To conserve and enhance the remaining natural riverbanks and riparian habitat along the river. To achieve this, the Plan identifies significant wildlife habitat along the river that is to be preserved and requires the conservation of wildlife habitat where practical. The Plan requires the development and restoration of riparian habitat and encourages the use of natural bank treatments, particularly in areas of low human use. The Plan encourages the use of native plants. The Plan requires landscape review, and provides direction on riverbank and landscape treatment.
- To provide an attractive quality environment along the Willamette River. To achieve this, the Plan includes design guidelines which require public and private developments to complement and enhance the riverbank area, particularly with regard to riverbank treatment, landscape enhancement, and the relationship of buildings to the Greenway Trail, access points, viewpoints, and view corridors.
- To maintain the economic viability of Portland's maritime shipping facilities based on the overall economic importance of deep-channel shipping to Portland's and Oregon's economy. To achieve this, the Plan provides an overlay zone reserved primarily for river-dependent and river-related industrial uses.
- To reserve land within the Greenway for river-dependent and river-related recreational uses. To achieve this, the Plan provides an overlay zone reserved primarily for river-dependent and river-related recreational uses.
- To meet the statutory requirements of Statewide Planning Goal 15 Willamette River Greenway.



Central City Plan Policies (1988)

The primary Central City Plan policies for the Willamette River are outlined below. Other Central City Plan policies also speak about the river including the Economic Development policy, the Transportation policy, and the policies for the River District, Lower Albina, Central Eastside, and South Waterfront.

Policy 2: The Willamette Riverfront: Enhance the Willamette River as the focal point for views, public activities, and development which knits the city together.

Objectives:

- Recapture the east bank of the Willamette Riverfront between the Marquam and Steel Bridges by expanding and enhancing the space available for non-vehicular uses.
- Locate a wide range of affordable and attractive public activities and attractions along the riverbank and create frequent pedestrian access to the water's edge.
- Encourage a mixture of land uses along the river, while protecting opportunities for water-dependent uses, especially north of the Broadway Bridge.
- Maintain and improve public views to and from the river.
- Improve the Central City's bridges for pedestrians and bicyclists and enhance the bridges' role as connections between the two sides of the Willamette.
- Encourage development of facilities that provide access to and from the water's surface throughout the Central City.
- Foster opportunities for touching and entering the Willamette River.
- Honor and celebrate the Willamette River for its importance to Portland. Promote development that creates a positive relationship with the urban river environment by insuring that development integrates with the river front in a manner that respects and enhances its significance.

Policy 7: Natural Environment: Improve the Central City's environment by reducing pollution, keeping the Central City clean and green, and providing opportunities to enjoy nature.

Objectives:

- Reduce air pollution in the Central City.
- Improve water quality in the Willamette River.
- Reduce noise and create areas of quiet in the Central City.
- Create programs which discourage littering and provide increased litter removal.
- Enhance urban wildlife habitat areas and create opportunities to enjoy them and to use them for educational purposes.



Policy 8: Parks and Open Spaces

Build a park and open space system of linked facilities that tie the Central City districts together and to the surrounding community.

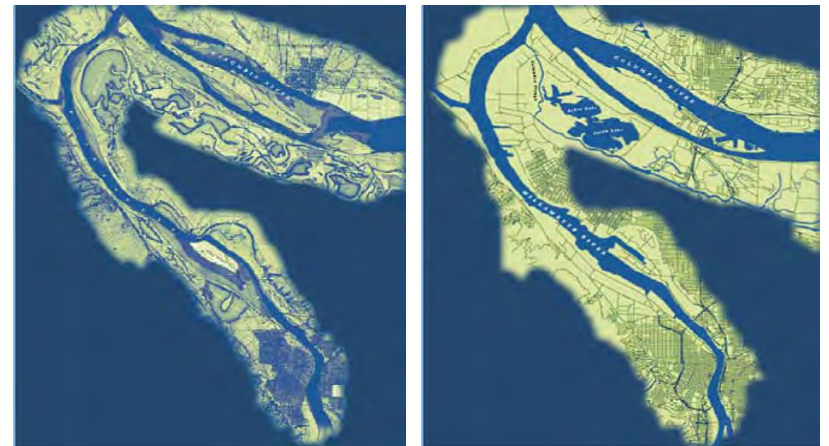
Objectives:

- Create greenbelts that tie existing open spaces together using street trees, plazas, bicycle and pedestrian ways, recreational trails and new parks.
- Meet the open space and recreation needs of each of the Central City districts.
- Establish public transportation connections among major recreational facilities on land and water.
- Ensure that a balance of passive and active parks and open space is provided.

III. Existing Conditions

Historic Resources

Prior to European-American settlement in the mid-19th century, the Willamette and Columbia rivers supported densely populated Native villages and fostered a vigorous trade network throughout the basin and beyond. Portland was founded in the 1840s because of its deep water moorage, location at the head of ocean-going navigation on the Willamette and direct link to the Pacific Ocean via the Columbia River. By the early 1900s, most of what is now the downtown waterfront was lined with pile-supported docks, wharves and warehouses. Settlers filled marshes and streams, removed snags and other debris and developed much of the floodplain, transforming the river into a more uniform channel as shown in the images to the right. Prior to 1887, when the first Morrison Bridge opened, Portlanders relied on ferries to cross the river. Several more bridges were built in the Central Reach over subsequent decades and by 1920, the current Hawthorne, Steel and Broadway bridges had been completed. In 1926, the second Burnside Bridge and the Ross Island Bridge opened. See Table 1, *Willamette River Bridges*, for a complete list of bridges.



1888 (left) and 2007 (right) Lower Willamette and Columbia River Confluence

Agricultural exports from fertile Pacific Northwest farmlands and forests and a boom in the shipbuilding industry during Word Wars I and II helped define the Willamette's role as a working river. But by the 1920s, Downtown waterfront industrial activity had declined. The westbank seawall was constructed for flood protection in 1926, removing aging waterfront industrial infrastructure. Harbor Drive was added in 1943 and that use dominated the west riverbank for over 30 years. In the 1970s, a thriving and growing urban core and a desire to reclaim the riverbanks led to the replacement of Harbor Freeway with Tom McCall Waterfront Park.



Willamette Riverfront,
circa 1890s.

Table 1: Willamette River Bridges	
Bridge	Year Built
Morrison Bridge No. 1	1887 (demolished)
Steel Bridge No. 1	1888 (demolished)
Madison Bridge No. 1	1891 (demolished)
Burnside Bridge No. 1	1894 (demolished)
Madison Bridge No. 2	1900 (demolished)
Morrison Bridge No. 2	1905 (demolished)
Hawthorne Bridge	1910
Steel Bridge No. 2	1912
Broadway Bridge	1913
Burnside Bridge No. 2	1926
Ross Island Bridge	1926
Morrison Bridge No. 3	1958
Marquam Bridge	1966
Fremont Bridge	1973



Steel Bridge No. 1

Map 2 displays three categories of historic resources located within the Central Reach that have been designated or evaluated for historic significance (Historic Landmarks, Historic Resources Inventory resources and Historic Districts as described below). Preservation zoning regulations and incentives may apply differently, depending on the designation. See the BPS Historic Resources web site for more information (<http://www.portlandonline.com/bps/historicresources>).

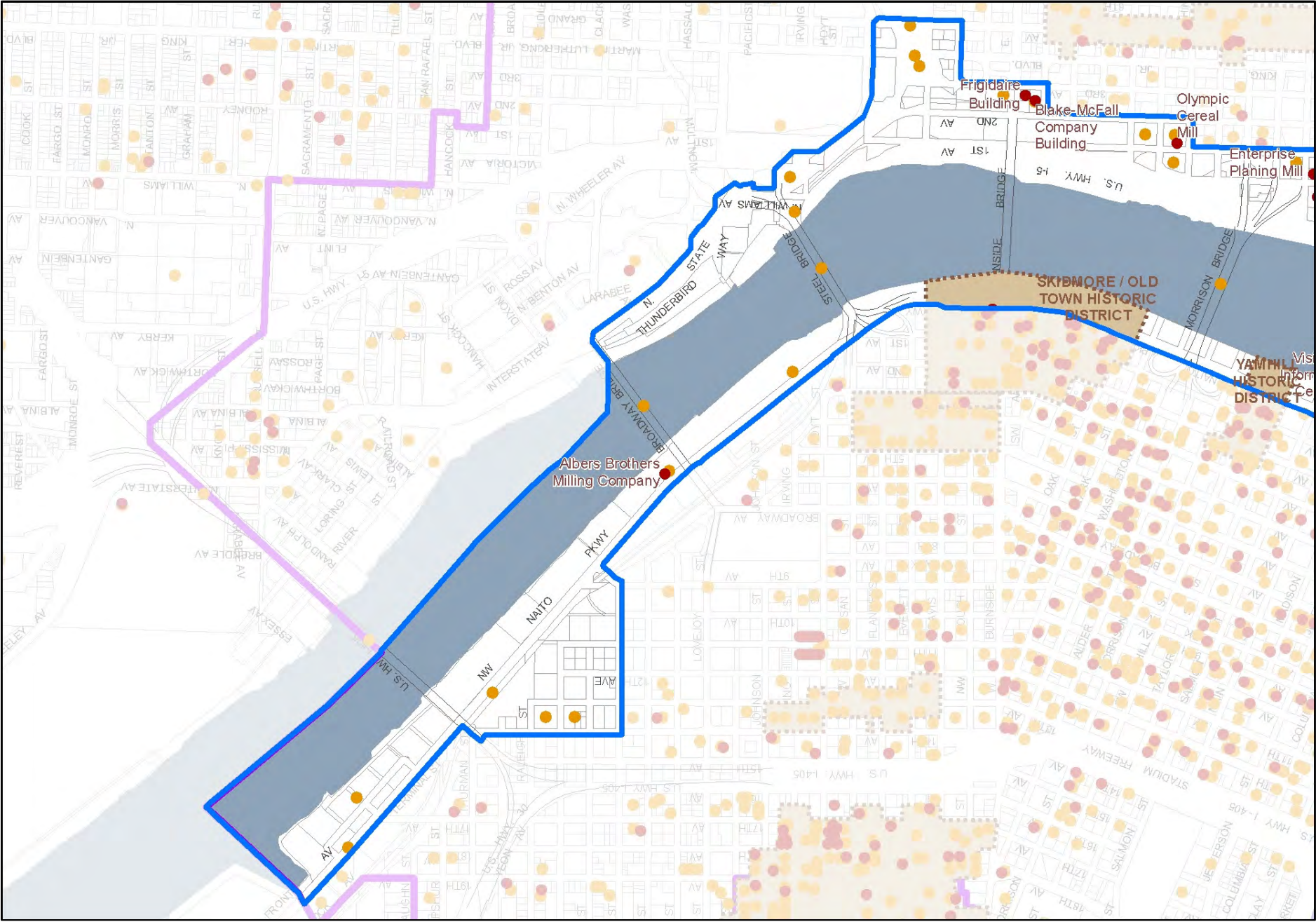
Historic Landmarks, also listed in Table 2, are individual resources, such as buildings, trees, statues or other objects that are significant for their historical, cultural, archaeological, or architectural merit. There are two types of historic landmarks: local and National Register. Local landmarks have been designated by the City of Portland because of their significance and for their role in helping create Portland's character. National Register landmarks are significant in American history, architecture, archaeology, engineering, and/or culture at the local, state, or national level. The program is administered by the Oregon State Historic Preservation Office. Both types of landmarks are generally treated the same in Portland's Zoning Code, except that demolition review is required for National Register-listed properties.

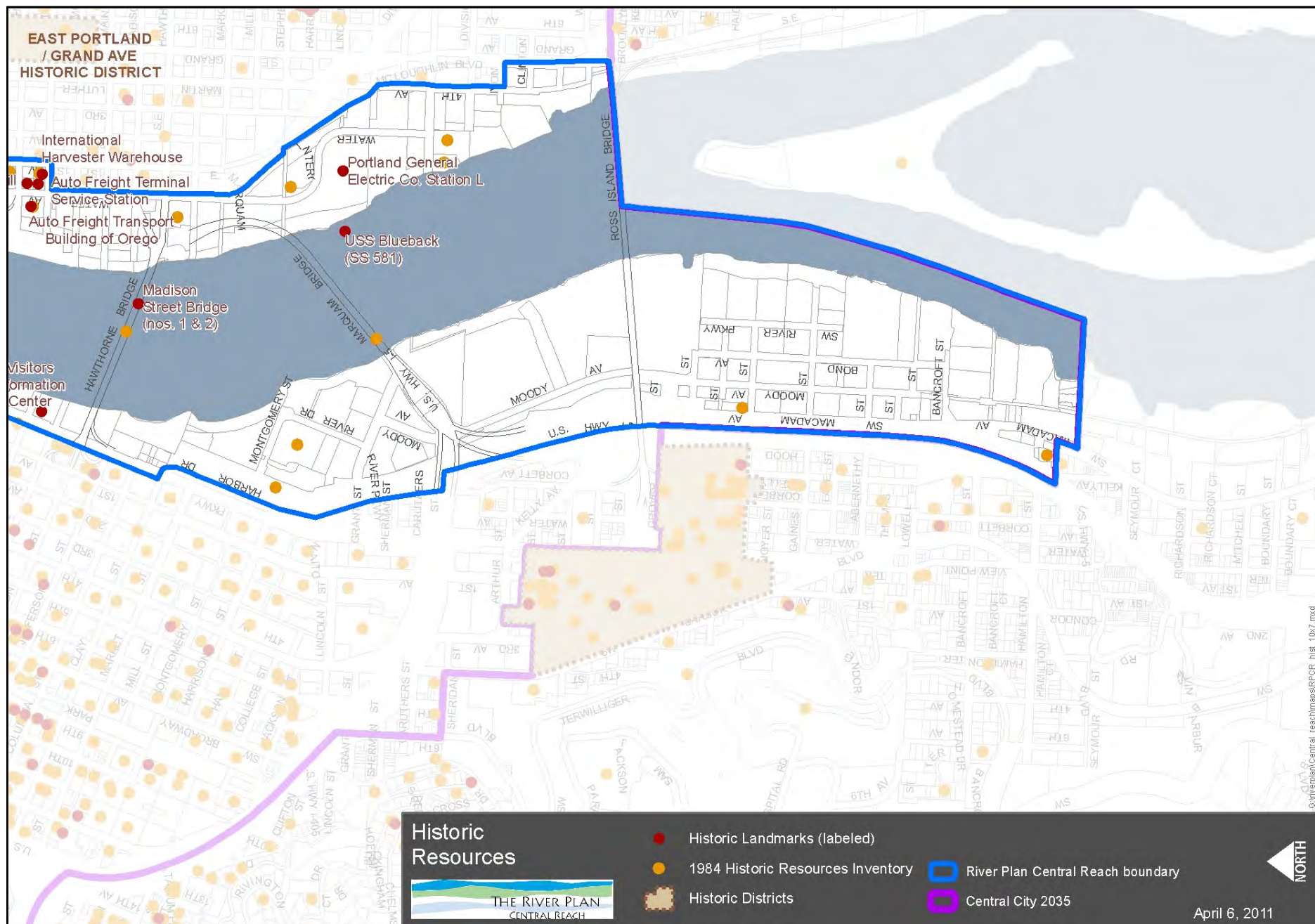
Historic Districts are geographic areas that have a concentration of thematically related historic resources. In general, historic districts have historic significance to the City of Portland and are usually also significant at the regional, statewide or national levels. Similar to landmarks, historic districts can be designated at the local level or by being listed in the National Register. The Skidmore/Old Town and Yamhill Historic Districts are adjacent to the west bank of the Willamette River and are both listed in the National Register. These two districts are significant for their early commercial architecture and historical associations with the growth of Portland as a river trading center and the largest nineteenth-century city in the Pacific Northwest. Skidmore/Old Town is recognized by the National Park Service as a National Landmark.

Historic Resources Inventory properties were identified in 1984, when the City completed and adopted a citywide inventory of more than 5,000 properties that were determined to have potential historical and architectural significance. The resources in this inventory do not necessarily have a true historic "designation" and the only zoning regulation that applies to the inventory properties is a 120-day demolition delay period. Although the inventory is over 25 years old, it remains a useful preservation planning and research tool.

Table 2: Historic Landmarks						
Historic Name	Common Name	Address	Year Built	Style	Landmark Type	
					Local	National Register
Olympic Cereal Mill	B & O Warehouse	107 SE Washington Street	1920	reinforced concrete utilitarian	Y	Y
International Harvester Warehouse	Southern Pacific Railroad Company Warehouse	79 SE Taylor Street	1912	industrial	Y	Y
Visitors Information Center (McCall Building)	-	1020 SW Front Avenue	1949	early modern	Y	
Albers Brothers Milling Company	-	1118 NW Front Avenue	1911	concrete utilitarian	Y	Y
Frigidaire Building	Templeton Building	230 E Burnside Street	1929	streetcar-era commercial	Y	Y
Blake-McFall Company Building	Emmett Building	17 SE 3rd Avenue	1915	brick utilitarian	Y	Y
Madison Street Bridge	Hawthorne Bridge	NA	1910	vertical lift bridge	Y	
Portland General Electric Company Station L	Lincoln Substation, Stephens Substation	1701 SE Water Avenue	1910	industrial		Y
Auto Freight Transport Building of Oregon	Eastbank Commerce Center	1001 SE Water Avenue	1924, 1929	commercial		Y
Auto Freight Terminal Service Station	-	1028-1036 SE Water Avenue	1924, 1929	commercial		Y
Enterprise Planning Mill	-	50 SE Yamhill Street	1915/1928	commercial		Y
USS Blueback (SS 581)	-	1945 SE Water Avenue	1959	submarine		Y

Map 2: Historic Resources







Zoning and Land Use

Zoning and land use along the riverfront in the Central City consists largely of Commercial and Open Space with a considerable amount of industrial land as noted on the chart and on Map 3, *Current Zoning*, and Map 5, *Land Use*.

Overlay zoning (Map 4) is used along the riverfront to accomplish specific goals contained in the Willamette Greenway Plan (1987) as well as scenic resource and design related goals. The following overlay zones are applied in the Central Reach:

River General – Allows for uses and development which are consistent with the base zoning, which allow for public use and enjoyment of the waterfront, and enhancement of the river's natural and scenic qualities.

River Recreation – Encourages river-dependent and river-related recreational uses that provide a variety of types of public access to and along the river.

River Water Quality –Protects the functional values of water quality resources by limiting or mitigating the impact of development in the setback.

River Natural – Protects, conserves, and enhances land of scenic quality or significant importance as wildlife habitat.

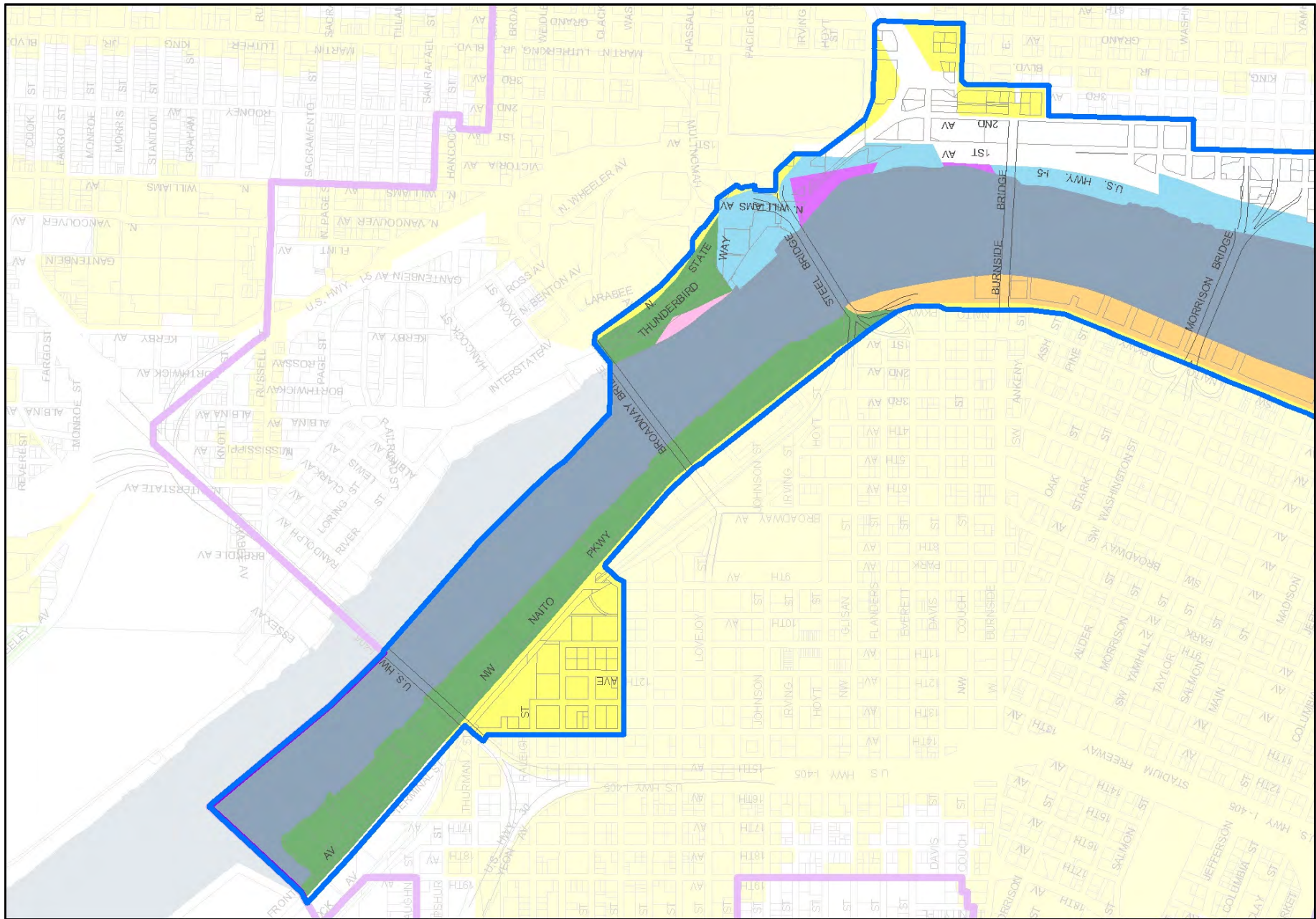
Scenic Resource – Intended to protect Portland's significant scenic resources; enhance the appearance of Portland to make it a better place to live and work; create attractive entrance ways to Portland and its district; improve Portland's economic vitality by enhancing the City's attractiveness to its citizens and visitors; and implement the scenic resource policies and objectives of the comprehensive plan. These purposes are achieved by establishing height limits within view corridors and establishing additional landscaping and screening standards.

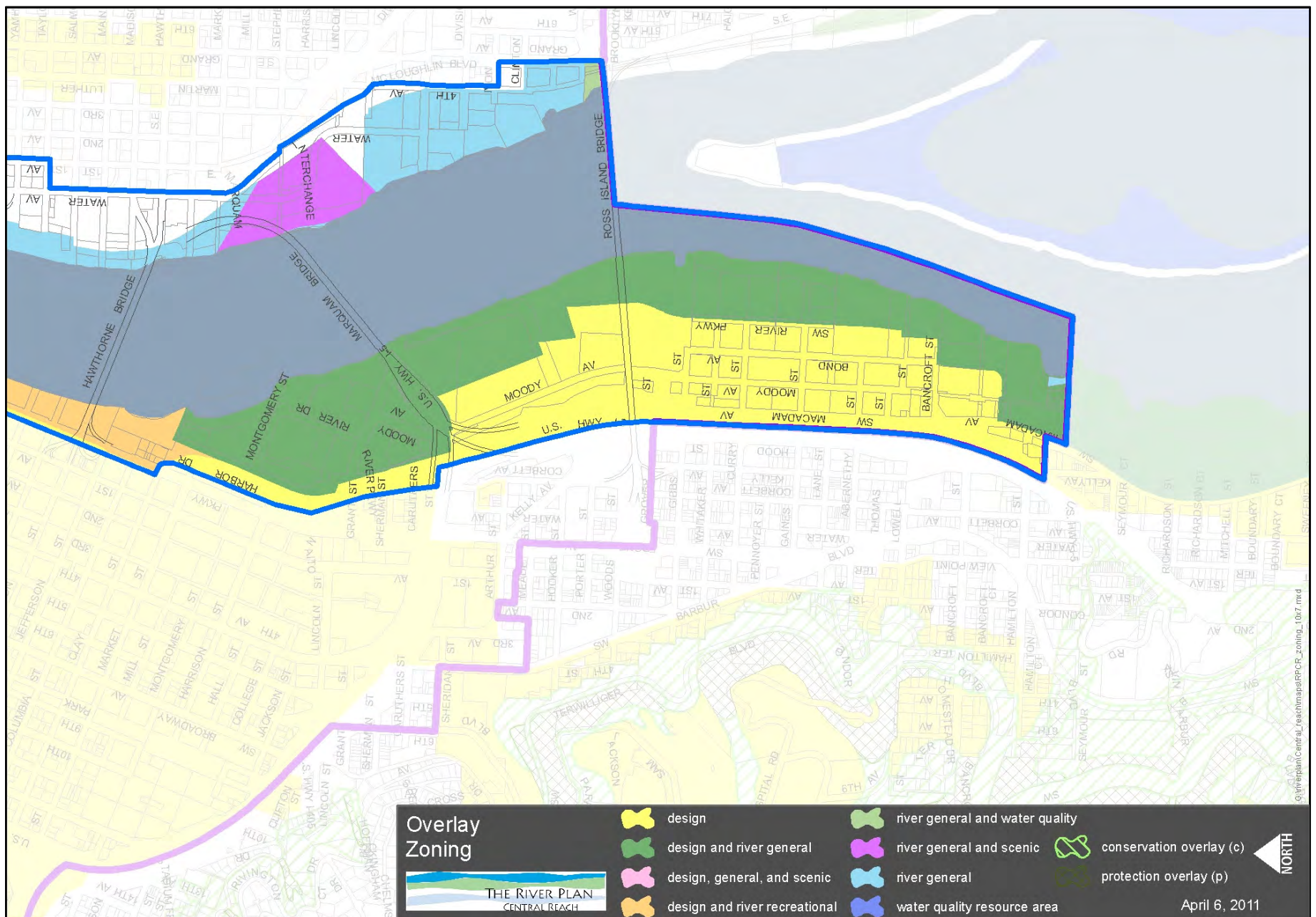
Design – Promotes the conservation, enhancement, and continued vitality of areas of the city with special scenic, architectural, or cultural value and quality high-density development adjacent to transit facilities. These purposes are achieved by applying design standards and/or requiring design review.

Table 3: Central Reach Base Zoning

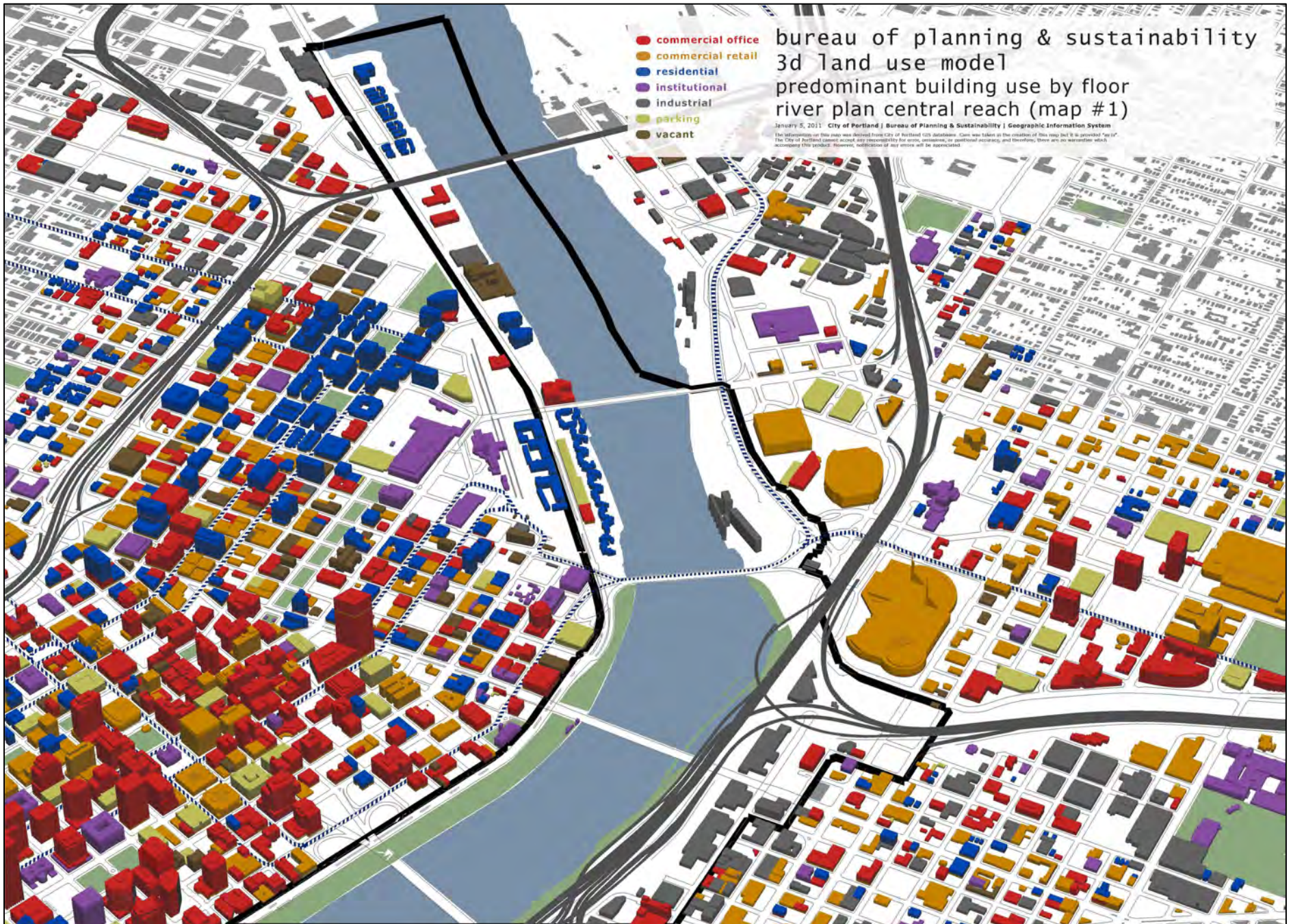
Base Zone	% of total area
Central Commercial (CX)	33
Open Space (OS)	27
General Industrial 1 (IG1)	12
Central Employment (EX)	11
Central Residential (RX)	9
Heavy Industrial (IH)	6
General Employment 2 (EG2)	1
General Employment 1 (EG1)	1

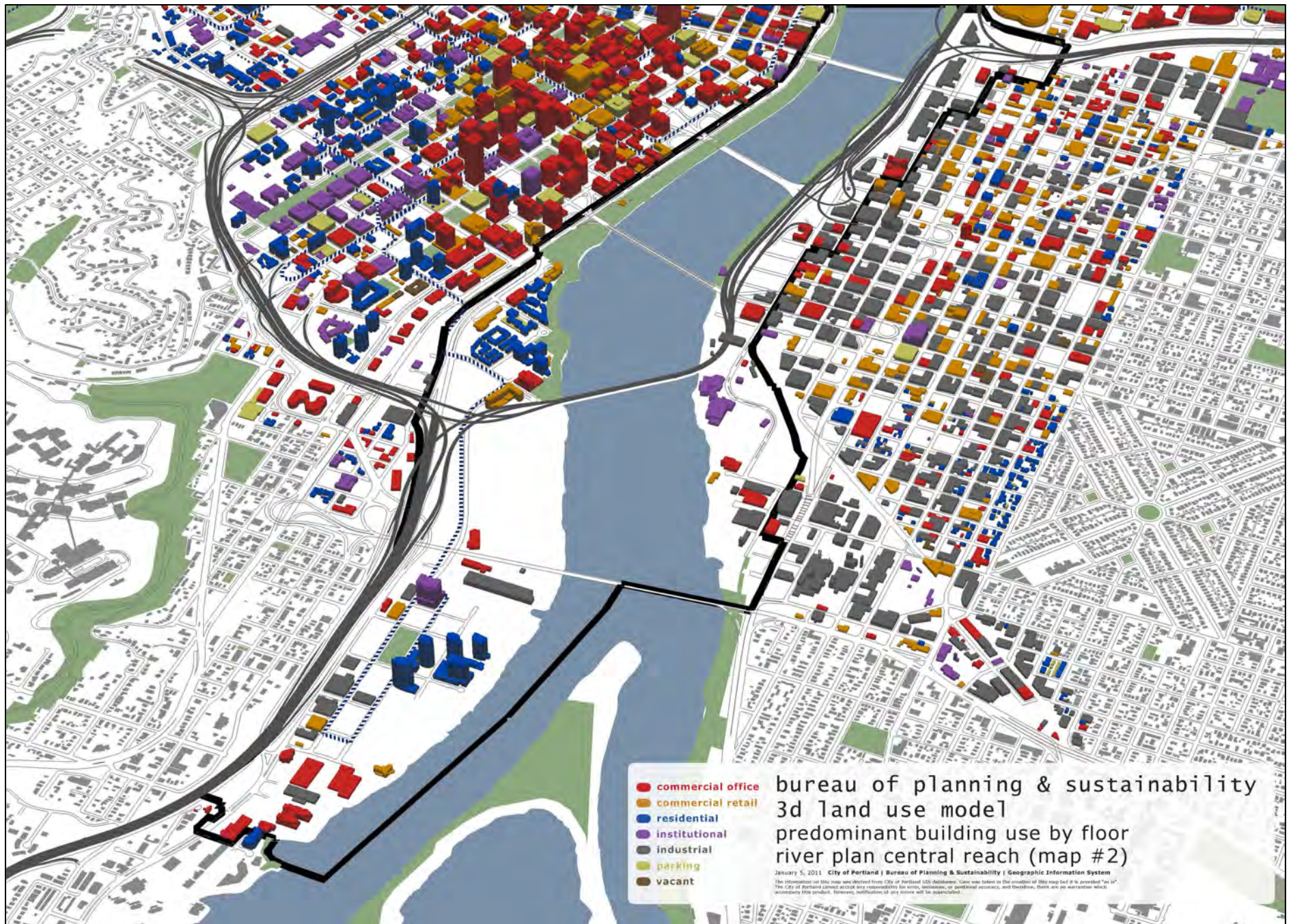
Map 4: Overlay Zoning

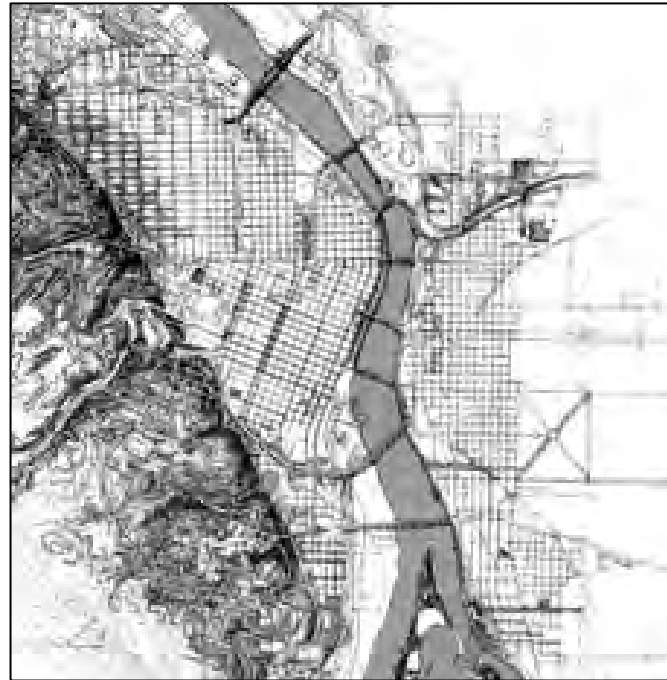




Map 5: Land Use







Central Reach Illustration (James Pettinari and Steve Durrant)

Urban Design

Central City Plan Policy 12, Urban Design, states “enhance the Central City as a livable, walkable area which focuses on the river and captures the glitter and excitement of city living.” This goal is implemented by the Central City Fundamental Design Guidelines (2003), which consider aspects of a development proposal such as building siting, landscaping and exterior materials. They are mandatory approval criteria for design review in all design zones of the Central City. Guideline A 1, Integrate the River, is directly related to the Willamette River:

A 1 Integrate the River

Orient architectural and landscape elements including, but not limited to, lobbies, entries, balconies, terraces, and outdoor areas to the Willamette River and greenway. Develop accessways for pedestrians that provide connections to the Willamette River and greenway.

Other fundamental guidelines may also guide development as it relates to the river, such as *C 1, Enhance View Opportunities*. Please see *Central City Fundamental Design Guidelines* in the publication library on the Bureau of Planning and Sustainability website for more information.

The Fundamental Design Guidelines are used in conjunction with location-specific design guidelines. These guidelines may add more specificity to Fundamental Guidelines A1 and C1, such as the River District’s A1-1, Link the River to the Community. Location-specific design guidelines along the river in the Central City include the following:

- River District Design Guidelines (2008)
- Special Design Guidelines for the Design Zone of the Lloyd District of the Central City Plan (1991)
- South Waterfront Design Guidelines and South Waterfront Greenway Design Guidelines (2010)
- Design Guidelines for the Yamhill Historic District (1987)
- Design Guidelines for the Skidmore / Old Town Historic District (1987)

In addition, the Willamette Greenway Plan includes design guidelines that apply to the area along the river and address a variety of topics, including the relationship of structures to the greenway setback area, public access to and along the river, natural riverbank and riparian habitat, riverbank stabilization and landscape treatments, the alignment of the Greenway Trail and viewpoints and corridors.



The Bureau of Planning and Sustainability's Urban Design Studio recently published *Design Central City, Volume I* (July, 2010) to support the Central City planning efforts currently underway. *Design Central City* highlights seven areas of challenge within the Willamette River urban design context today:

Watersheds: Watershed health has deteriorated in the Central City.

Visual Access: For most of the Central City, the river is not visible from several blocks away. Areas with the most visual access, such as the Rose Quarter, do not adequately reinforce the connection. See Figure 1 on the next page for cross sections of the river showing height and visual access.

Physical Access: Most of the Central City is cut off from physically touching the river, either by the seawall, freeway, or large industrial uses.

Edges: There are few vibrant urban places along the water's edge to enclose and frame Central City's largest natural feature.

Activity: The Central City offers few permanent water-based activities or features, especially along the river.

Orientation: Most of the Central City's largest corridors and built form are oriented parallel to the river, not toward it.

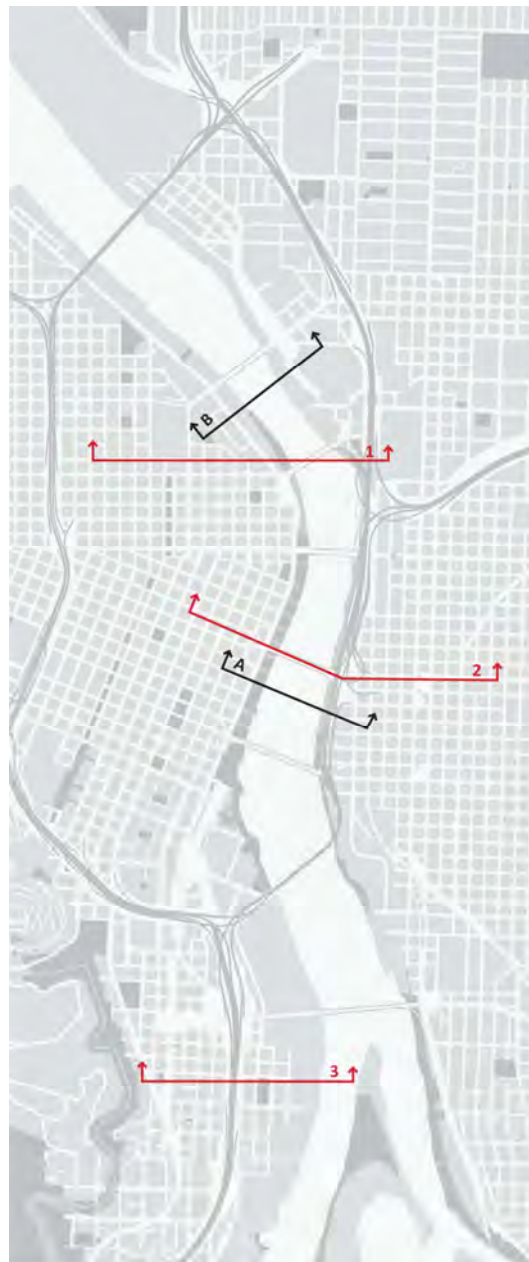
Bridgeheads: Many bridgeheads are underdeveloped, providing opportunities to create stronger connections to the water.

Please see the BPS Urban Design Studio website (www.portlandonline.com/bps/urbandesign) for the full report.

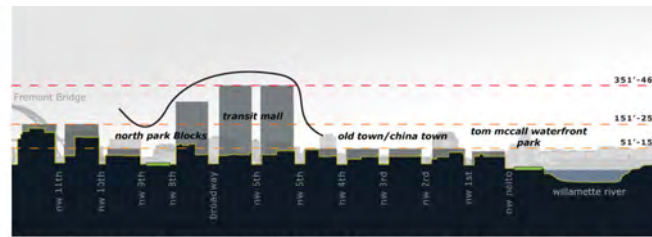
Map 6, *Riverfront Areas of Change*, displays potential redevelopment areas and areas that are not expected to change over the next 25 years. The identification of redevelopment sites was based on the availability of existing development rights, the value of the improvements on the parcel compared with the value of the land and known redevelopment sites. In general, industrial lands, designated historic sites and parks were not considered to be redevelopment areas (Central Portland Development Capacity Study, Portland Bureau of Planning, 2007).

These redevelopment sites provide opportunities to create new places that draw people to and enliven the riverfront. At the north and south ends of the Central Reach, there is the potential to create east-west synergy across the river, complementing the north-south connections that parallel to the Willamette River.

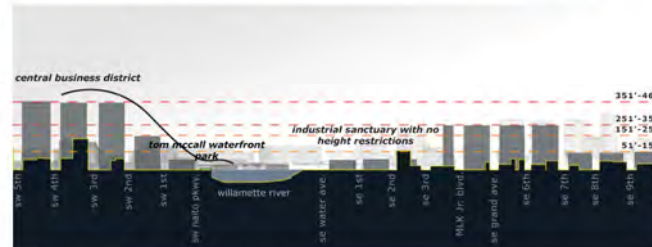
Figure 1: River Cross sections – Height and Visual Access



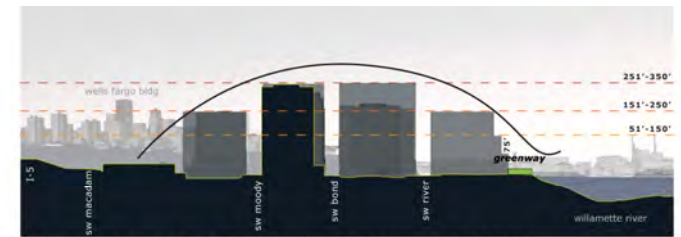
HEIGHT



1. Relationship with Historic District and the River (showing allowed heights)



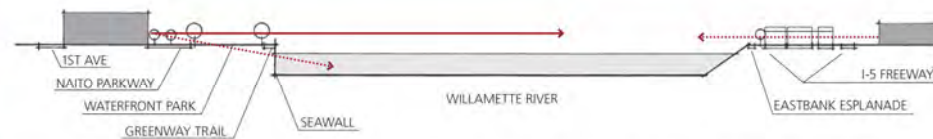
2. Relationship with River & Inner Eastside (showing allowed heights)



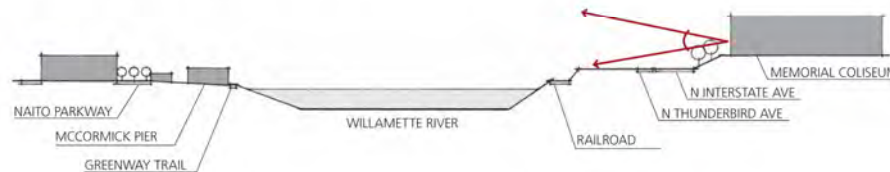
3. Relationship with the South Waterfront, Greenway and the River (showing allowed heights)

These sections are taken from Urban Design Assessment for the Central City (2007). Analysis focused on the implications of height. They show existing conditions adjacent to the river around the Central City with allowed heights.

VISUAL ACCESS



A: RETAIL CORE FACING NORTH. This section in downtown shows that views to the Willamette River are cut off by the presence of the seawall and 12 foot drop to the water. Views due east are dominated by the I-5 freeway on the Eastbank. From the east side, the I-5 Eastbank Freeway is a direct visual impediment to the Willamette River.



B: MEMORIAL COLISEUM FACING NORTH. This section shows the unique position of the Rose Quarter from the Memorial Coliseum. Located on a bluff, the area offers an opportunity to capture the views to downtown and the West Hills.

These sections are taken from Design Central City (2010). Analysis focused on river edges, with particular emphasis on lack of visual and physical access.

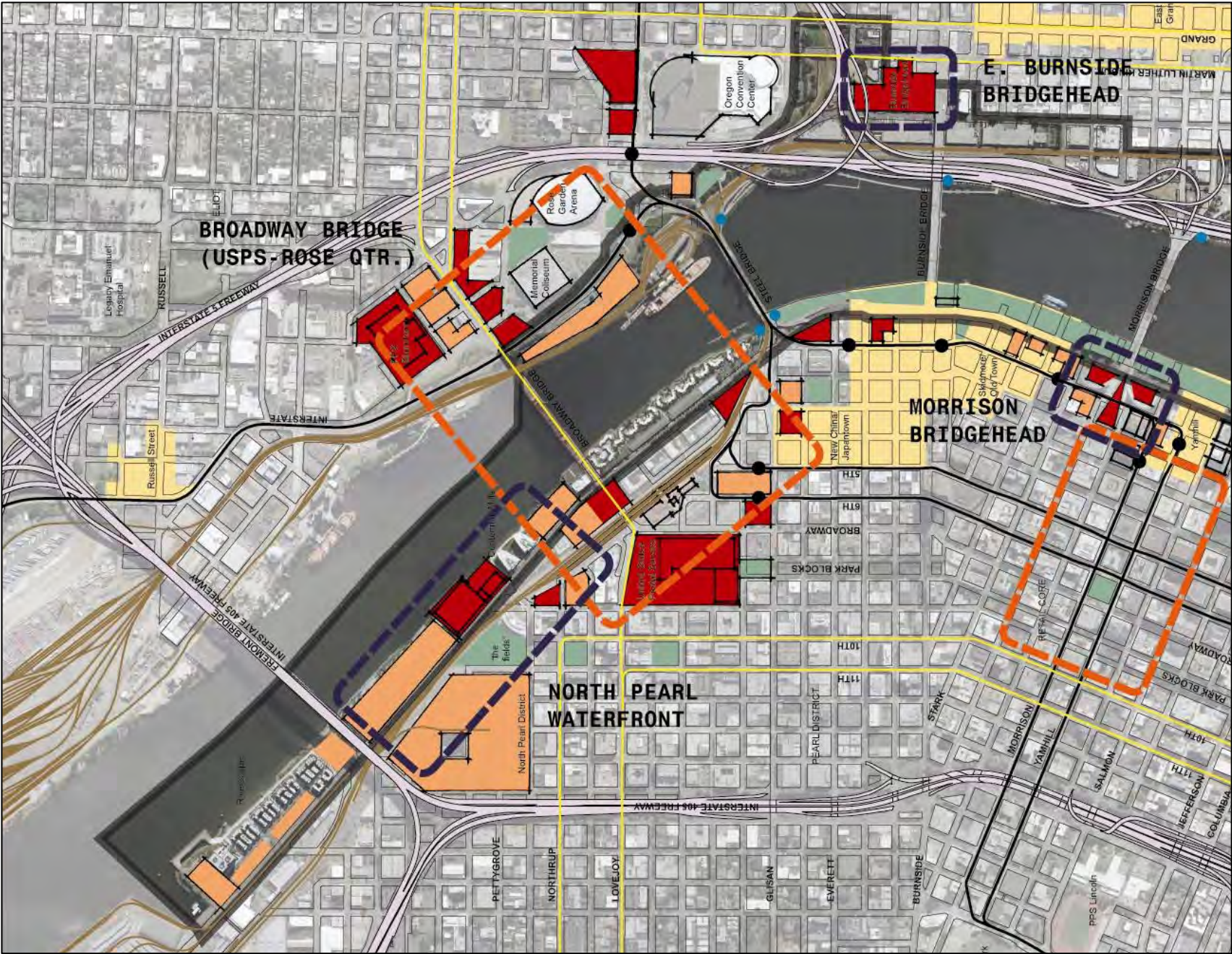


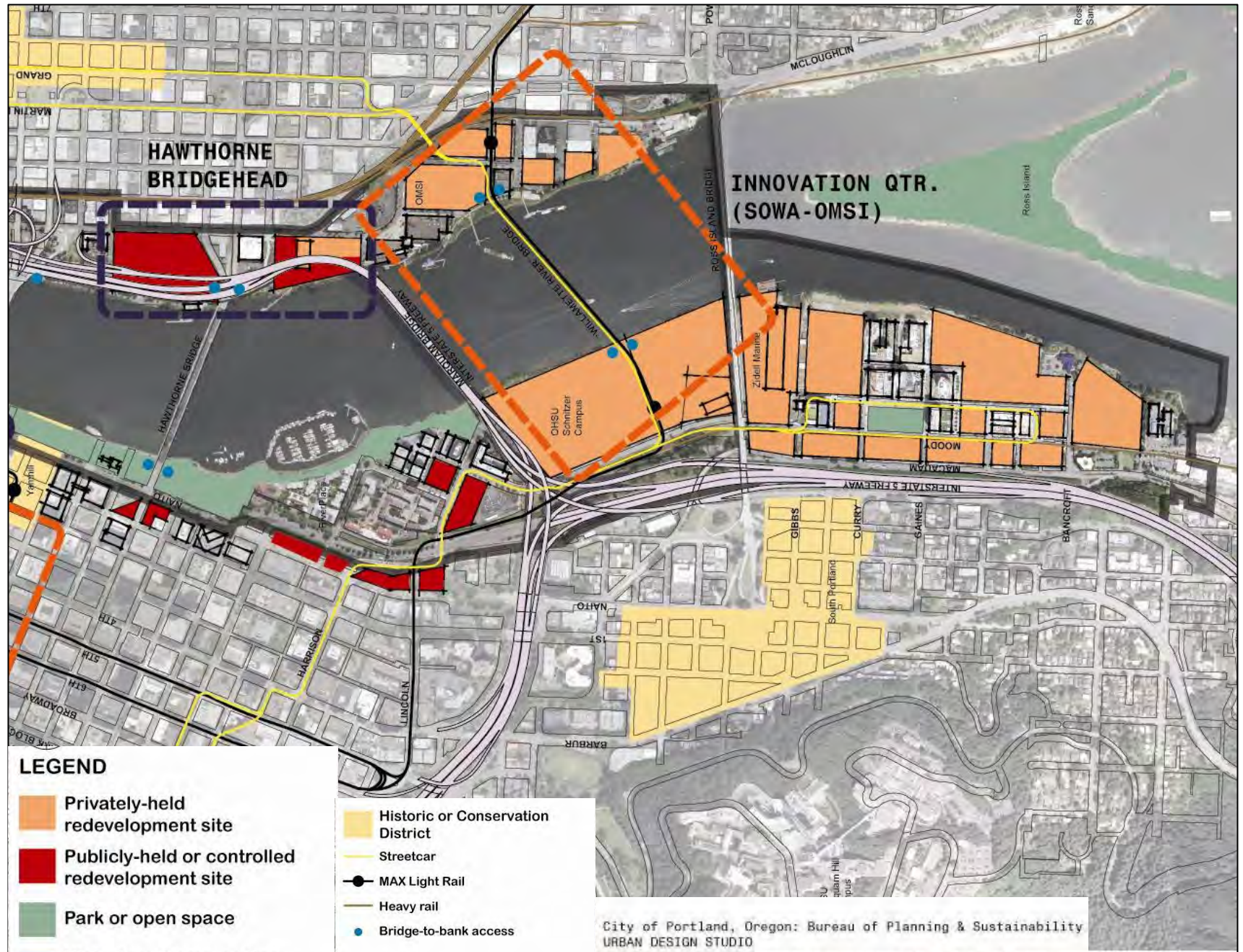
City of Portland Bureau of
Planning and Sustainability
Sam Adams, Mayor | Susan Anderson, Director



Central City: River Sections
February 2011

Map 6: Riverfront Areas of Change





Economic Activity

The river and adjacent land in the Central City supports a variety of economic activities and complements specialized development. Marine cargo and industrial manufacturing uses in South Waterfront and the Central Eastside have a strong job base, supported by access to the multimodal freight network in Portland's Central City. Businesses include Ross Island Sand and Gravel Co., Zidell Marine, and others, as listed in Table 4. Commercial businesses, such as the Portland Spirit, also contribute to the economic vitality of the Central Reach. Current property ownership in the Central Reach is displayed on Map 7, *Ownership*, and in Table 5.

Much of the Central City is currently included in the City's Urban Renewal Area (URA) districts, providing a funding source for capital improvement projects, business assistance, and commercial and housing development. Many of these URAs are set to expire in coming years. The City and the Portland Development Commission are currently evaluating the need to extend the life of these districts. See Map 8, *Contaminated Sites and Urban Renewal Areas*, for the current URAs along the Willamette River.

Contamination in upland sites and in the river sediments, displayed on Map 8, *Contaminated Sites and Urban Renewal Areas*, can constrain business activity and redevelopment.

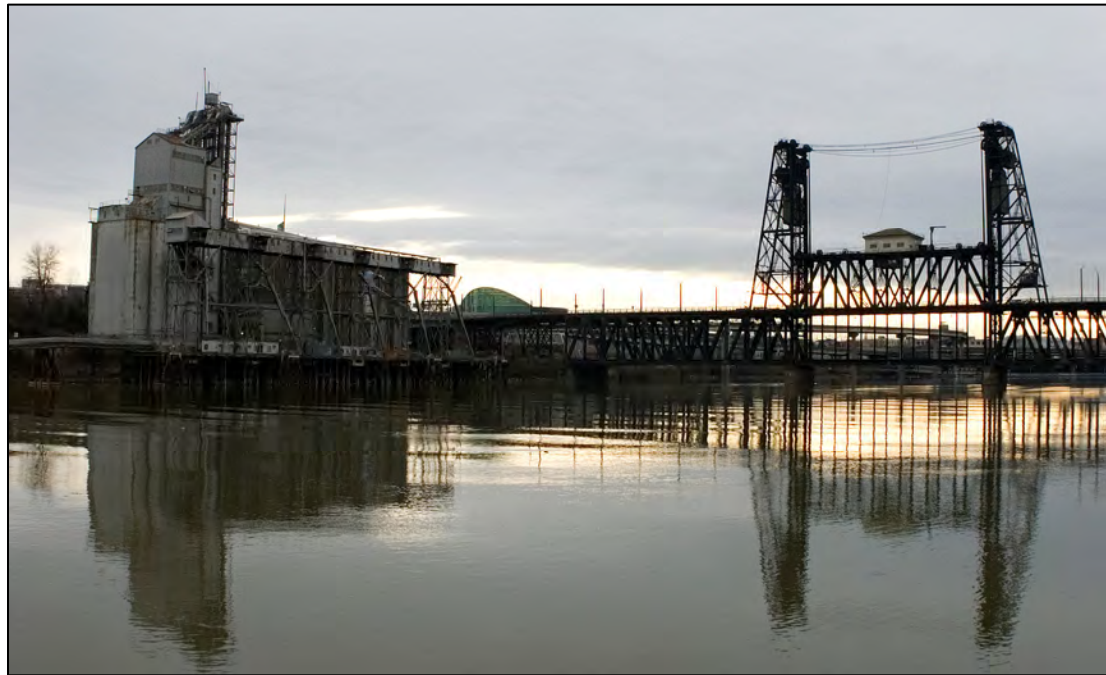


Table 4: Examples of businesses within the River Plan Central Reach, by Subdistrict

Business Name	Business Description (and how they use the river)
Downtown	
RiverPlace	10.5 acre, multiple-use development on the site of the former 4-lane freeway, Harbor Drive. Phased development of the area began in the mid-1980's and includes a marina, hotel, retail and residential uses. Includes McCormick and Schmick's Harborside Restaurant and the Pilsner Room.
Saturday Market	Over 250 small businesses and individuals artists from across the NW region gather each week from March - December for the Saturday/Sunday Market event.
River District	
Fremont Place I & II	121,500-square-foot office complex, constructed in the mid 1980's.
Albers Mill	Historic 6-story building constructed between 1909 and 1911 and originally served as a flour mill. Renovated into commercial office space and center for international commerce and trade.
Lloyd District	
Louis Dreyfus Elevator	Industrial facility receives and ships grain by barge. Grain elevator consists of 76 concrete silos and has storage capacity for 1,800,000 bushels. Railway connections at rear of elevators.
Central Eastside	
Eastbank Commerce Center	Industrial Office. Conversion of 80,000 square foot building from a mostly vacant furniture warehouse into a center for creative economy businesses.
Multnomah Coounty Maintenance Building	Bridge maintenance building.
City of Portland Fire Station	Fire Station 21- Lower Eastside. Includes Rescue Boat.
Oregon Museum of Science and Industry (OMSI)	Oregon Museum of Science and Industry (OMSI). In this location since 1992, OMSI serves over one million visitors at the museum and through off-site education programs.
Portland Opera	Portland Opera moved into the Hampton Opera Center in 2003. Music and staging rehearsals, coaching facilities, costume shop, administrative offices and 168-seat Portland Opera Studio Theater are all housed under one roof.
Portland Spirit (American Waterways)	River cruise operation. Fleet includes Portland Spirit, Willamette Star, Crystal Dolphin, and Outrageous Jetboat. Customers board from off-site locations.
Ross Island Sand & Gravel	Founded in 1926, Ross Island Sand & Gravel Co. manufactures ready-mixed and dry mix concrete, sells construction material such as sand, clays, dirt and soil, stone, limestone, basalt, pumice stone, gravel, and gypsum.
Olympic Mills Commerce Center	Renovated historic industrial building for mixed use creative / industrial office / flex-space developments.

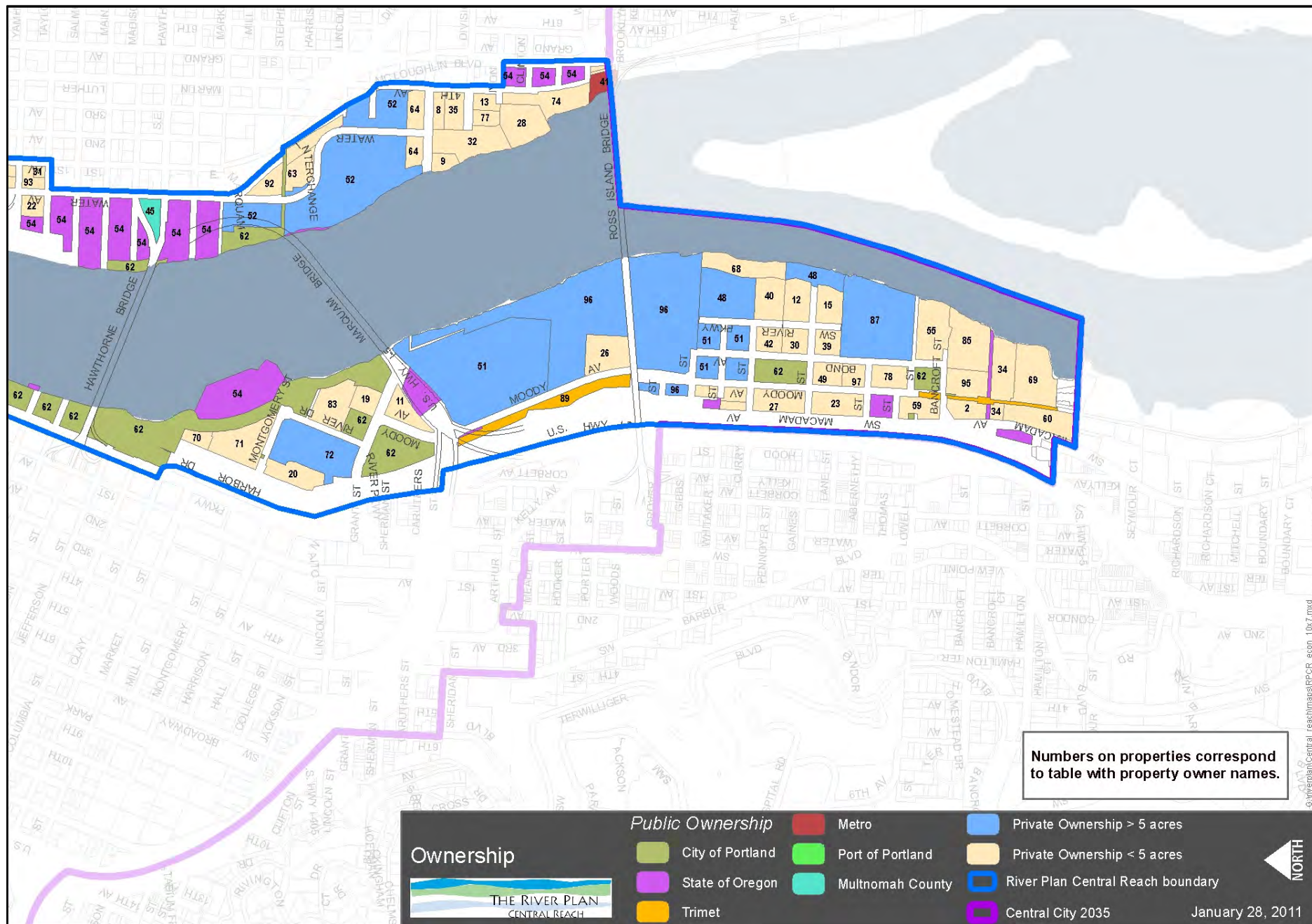
Pacific Coast Fruit	Started in 1977, the company is now one of the largest independent wholesale produce distributors on the West Coast.
South Waterfront	
Zidell Marine	The Zidell Companies are longtime family-owned businesses, based in Portland. Zidell Marine Corp. started in 1960 and builds steel barges for sale or lease.
The Old Spaghetti Factory	International restaurant company established in Portland in 1969.
River Forum I & II	Corporate office building complex.
Avalon Hotel & Spa	Luxury 99-room boutique hotel and spa. Includes Aquariva riverside dining venue.
Oregon Health and Sciences University (OHSU) Center for Health and Healing	16-story building includes physician practices, surgery and healing, health and wellness center, education and research facilities and ground level retail.

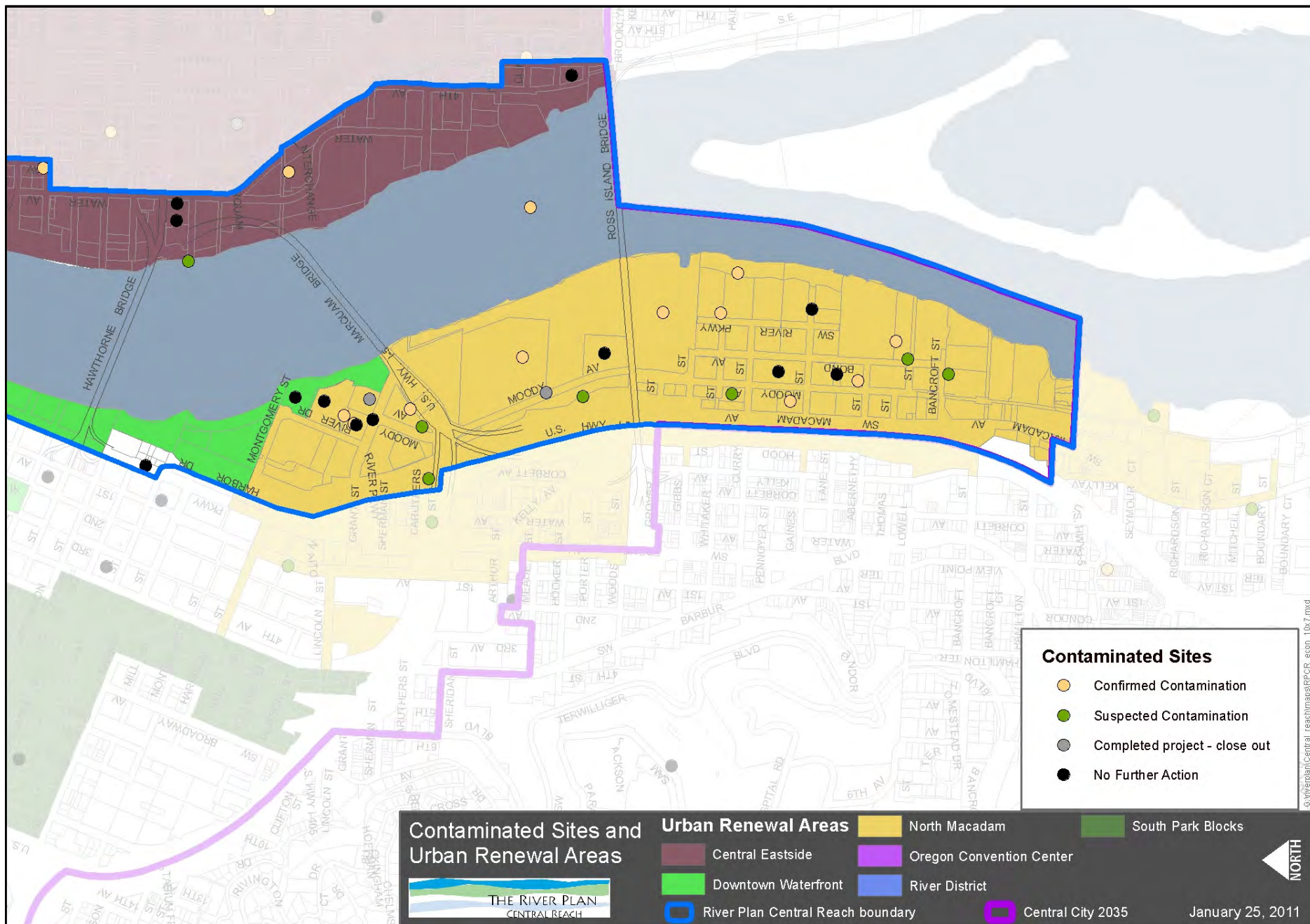


Table 5: Property Owners within the Central Reach

Map #	Owner	site size (sf)	Map #	Owner	site size (sf)
1	n/a	18,515	49	NW 101 South Waterfront	52,709
2	4310 Building LLC	54,146	50	Olympic Mills Warehouse LLC	40,000
3	66 SE Morrison LLC	32,301	51	Oregon Health & Science University	1,006,048
4	862 S Catalina Investments	8,224	52	Oregon Museum Of Science & Industry	871,329
5	Ackerley Communications Inc	7,036	53	Oregon Rail Heritage	55,645
6	Aegean Corporation	179,033	54	State of Oregon	1,296,571
7	Albers Mill Building LLC	139,119	55	Osf International Inc	146,442
8	Alexandra Properties LLC	33,300	56	Pacific Coast Fruit Co	95,832
9	American Waterways Inc	33,777	57	Pacific Power & Light Co	2,563
10	Apollo Development Inc	43,638	58	Pacifica At Riverscape	71,000
11	Apple Six Hospitality	69,175	59	Pascuzzi Investment LLC	65,260
12	Atwater Place Condominiums	85,969	60	Pkm Properties LLC	124,925
13	Richard J Bennett	32,429	61	Port Of Portland	24,924
14	Block 35 Investors LLC	682	62	City Of Portland	2,058,792
15	Block 37 Investors LLC	72,820	63	Portland General Electric Co	67,591
16	Burns Bros	10,206	64	Portland Opera Association Inc	91,272
17	Casco Investors	40,000	65	Produce Row LLC	196,928
18	Columbia River North LLC	212,748	66	Timothy Ralston	116,500
19	Cshv River Parkway LLC	52,007	67	Rich's / Angel LLC	34,999
20	D W Sivers Co	88,882	68	River Campus Investors LLC	111,654
21	Dealer Supply Co	3,989	69	River Forum LLC	179,999
22	Eastbank Commerce Center LLC	37,574	70	River Place Hotel LLC	32,812
23	Fava LLC	92,000	71	Riverplace Condominium No 1	154,507
24	Francis Development LLC	52,516	72	Riverplace Square LLC	260,732
25	Paul R Frisch, Et Al	20,000	73	RL & TL II LLC	20,000
26	Ghs LLC	120,675	74	Ross Island Sand & Gravel Co	125,582
27	Hans H Grunbaum	92,000	75	Schwiebing Family LLC	6,053
28	Peter A Haberfeld	128,957	76	Second Avenue Investments LLC	61,173
29	Margaret G Hager	9,000	77	Richard Shields	33,345
30	John Ross Condominiums	50,620	78	Shlp Block 46 LLC	63,535
31	Michael Kauth	10,000	79	Shoreline Condominiums	131,874
32	Wayne Kingsley	154,000	80	Stark's Inc	12,161
33	Mary Korek & Lucas Bitar Ltd	8,481	81	Corwin E Stevens	4,831
34	Lex Associates Inc	127,973	82	Dave Stoner	9,000
35	Lindquist Development Inc	57,443	83	Strand Condominiums Owners	118,989
36	Louis Dreyfus Corporation	137,786	84	Summit Properties Inc	108,143
37	Mc Cormick Pier Condominium	490,875	85	T & E Investments	170,006
38	Mc Dowell Family L L C	10,000	86	The Jeh Family Limited	17,250
39	Mept 3720 Portland LLC	50,640	87	The Landing At Macadam LLC	425,377
40	Meriwether Condominiums	97,043	88	Joseph P Toombs	4,500
41	Metro	118,887	89	Tri-County Metropolitan	170,716
42	Mirabella At South Waterfront	50,678	90	Union Pacific Railroad Co	591,276
43	Mire Fremont Place I	288,726	91	Wasington Street Building LLC	36,850
44	Moody Street Partners LLC	25,749	92	Water Avenue Association LLC	51,247
45	Multnomah County	41,523	93	Water Avenue Properties LLC	40,000
46	Nemarnik Family Properties LLC	8,716	94	Waterfront Pearl Condominium	110,401
47	David P Nemarnik	43,235	95	Wpc Bancroft LLC	86,654
48	North Macadam Investors LLC	274,556	96	Z R Z Realty Co	1,313,044
			97	Z V Company Inc	40,521

[illegible]





Transportation

The Central Reach is served by a robust multi-modal transportation network that moves people and goods to and through the reach. The network is made up of vehicular, transit, and bike/ped systems, heavy rail, and the Willamette River, as displayed on Map 9, *Transportation*.



Transit: The Central Reach is accessible to people, employees, residents and visitors by bus, light rail (MAX) and streetcar. A new streetcar line will connect across the Broadway Bridge at the north end of the district and along SE Martin Luther King Boulevard and Grand Avenue to form a complete loop around the Central City. A new MAX light rail line to Milwaukee will connect South Waterfront and the Central Eastside, providing expanded transportation options and catalyzing development to activate the riverfront.

Bicycle and Pedestrian: An extensive on-street and off-street network of trails, including the Eastbank Esplanade and the Springwater Corridor offers safe and convenient access for bikes and pedestrians to, along and across the Willamette River. The Central Reach trails are heavily utilized by commuters, workers, residents and tourists alike.

The Portland Milwaukie Light Rail Bridge, the first new bridge in Portland in nearly 50 years, will augment the existing transit and bike/ped network, and will be the first bridge in the country to be dedicated exclusively to streetcars, light rail, buses, pedestrians and bikes. The bridge will be located between the Marquam Bridge and the Ross Island Bridge near the south end of the Central City.

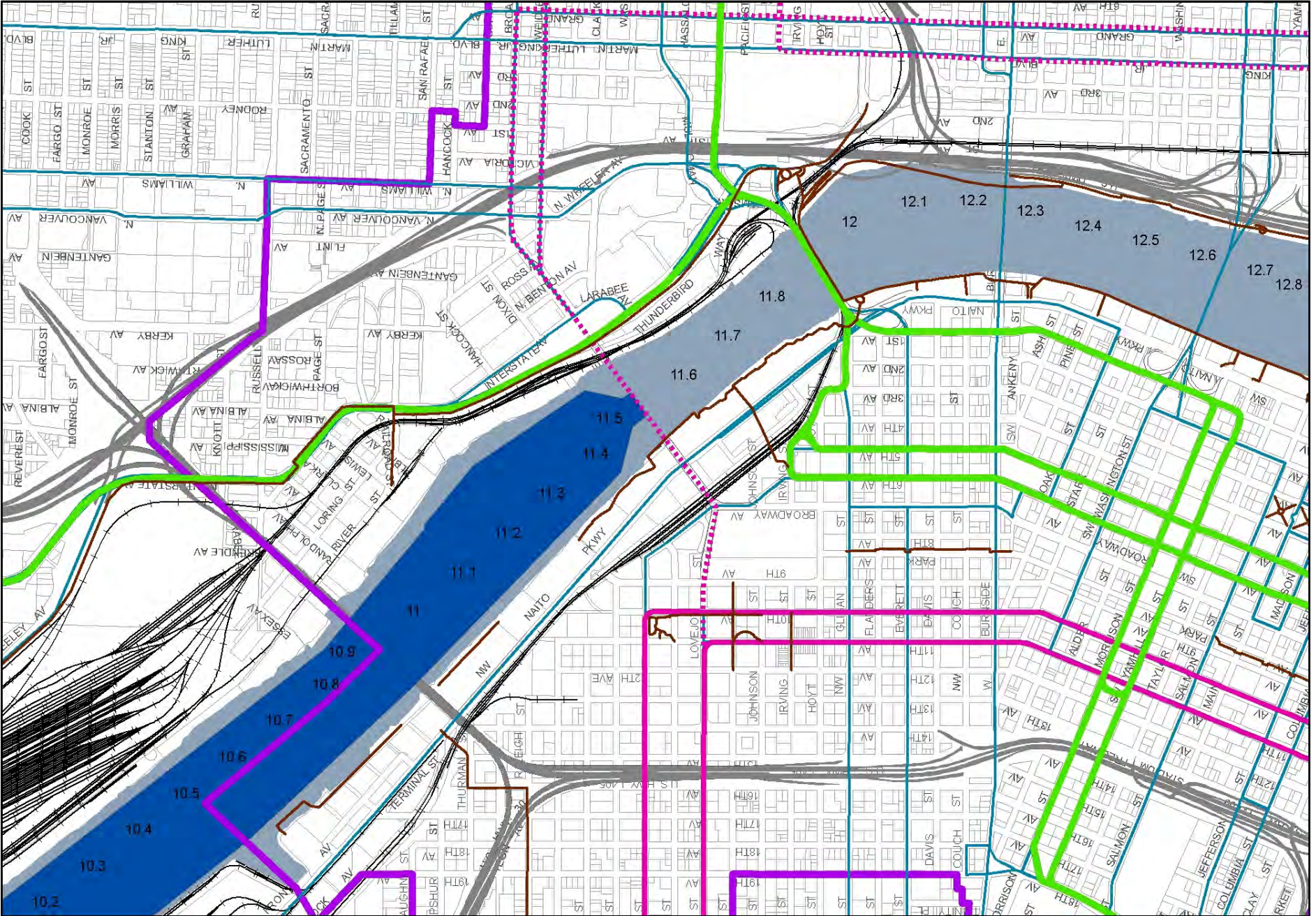


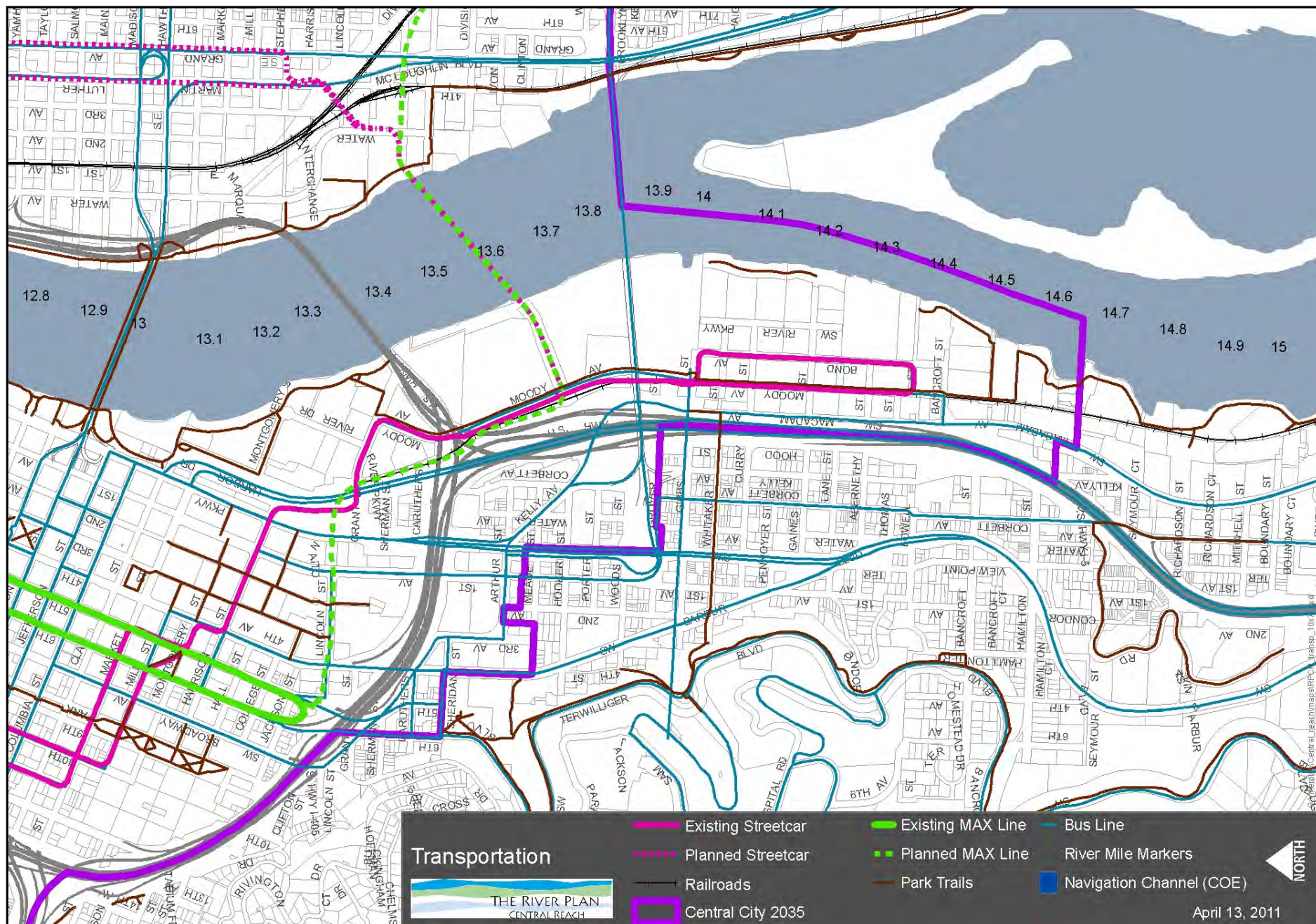
Heavy Rail: The Union Pacific Railroad main line parallels the Willamette River and bisects the Central Eastside. It serves the industrial and employment businesses located in the Central Eastside Industrial District, and carries Amtrak trains to and through Portland via Union Station.

The Willamette River: The federal navigation channel that serves the Portland Harbor terminates at the Broadway Bridge at the north end of the Central Reach. The channel is maintained by the US Army Corps of Engineers at a depth of 40 feet, supporting marine shipping activities in Lower Albina and the Lloyd District. Barges travel the rest of the river serving Ross Island Sand and Gravel Co. and businesses further upriver.



Map 9: Transportation





Recreation and Public Access

Parks and Open Space

The Central City's parks, open spaces, and multi-use trails provide a variety of year-round recreational opportunities and public access to the Willamette River. The following parks and open spaces are located along the riverfront in the Central City:

Tom McCall Waterfront Park is one of Portland's most recognizable park spaces stretching for 1.4 miles and encompassing 30-acres along the west bank of the river from SW Harrison Street to NW Glisan Street. The idea for this park came at the turn of the century when the 1903 Olmsted Report pointed out the need not only for parks within the City, but for a greenway scheme for the riverbanks to ensure their preservation for future generations. In the late 1920s, the seawall was built along the Willamette's west bank and the construction of Harbor Drive along the west bank in the 1940s continued the trend of isolating the public from the River. With the opening of the Eastbank Freeway, Harbor Drive became less important to the traffic flow of the City. In 1974, Harbor Drive was torn up and construction of a waterfront park began. The park was initially completed in 1978 and in 2003, Portland Parks & Recreation created an updated Master Plan to guide future development of the park. Visitors can enjoy pathways, several fountains, public art projects, gardens, memorials, open lawn areas and viewpoints, historical sites, and the seasonal Saturday Market. Waterfront Park also hosts festivals and other events throughout the year; see Table 6 for a list of events held in riverfront parks.



South Waterfront Park is a 4-acre riverfront park, with 1,000 feet of frontage along the west bank of the Willamette River. Unique along the downtown riverfront, South Waterfront Park provides direct public access to the river throughout the year. Developed primarily to anchor the commercial and residential property at RiverPlace built in the mid-1990s, the park also served to stem any further erosion of the river bank that occurred during the 1996 winter flood. Historically Portland's street grid extended directly to the river's edge to facilitate access and commerce. Today the city's block grid extends through South Waterfront Park to the water's edge via walkways leading to overlooks with views of the river, the city, Mt Hood, and Mt St Helens. The river's form is reflected in the park via the flowing forms of the site grading and planting, as well as a pair of boulder-lined pathways sculpted into the riverbank leading to a natural silty beach that is exposed during periods of low water.

The Vera Katz Eastbank Esplanade is a 1.5 mile long off-street path that extends north from the Hawthorne Bridge to the Steel Bridge, with connections to eastside neighborhoods and Tom McCall Waterfront Park. A major feature of the path is the 1,200 foot long floating walkway. The Esplanade has long been an important part of the vision for Central City to connect the east and west sides of the Central City around its central feature – the Willamette River. Construction of the Esplanade began in October 1998 and was completed in May 2001 with overlooks and viewpoints, a plaza, boat dock, floating walkway and public art. Future phases of the planned full build out of the Esplanade plan could further strengthen its role in celebrating the Willamette and providing additional opportunities for interaction with the River. In addition to the recreation and transportation functions of the Esplanade, it is a demonstration project for improved habitat areas for fish and wildlife and riverbank restoration. In places, the riverbank has been reshaped with grading that allows for shallow habitat.



South Waterfront Greenway is a planned park based on the South Waterfront Greenway Development Plan, approved by City Council in 2004, that provided a vision and concept plan for the entire South Waterfront Greenway. When developed, the Greenway will stretch from the Marquam Bridge south to the River Forum Building and will strive to balance the needs of the public and the health of the Willamette River. Portland Parks & Recreation is currently working to develop and implement a refinement plan for the Central District portion of the South Waterfront Greenway.

Table 6: Tom McCall Waterfront Park and Eastbank Esplanade Events, 2010

Date(s)	Event	Attendance*	Date(s)	Event	Attendance*
2/14	Valentine Fanconi Anemia 5KRun/Walk 2010	750	8/6 to 8/8	The Bite of Oregon	30,000
3/12 to 3/14	Shamrock Run	25,000	8/8	Providence Bridge Pedal	~18,000
3/21	World Water Day Walk 2010	500	8/14	Tour de Fat	2,500
4/11	Race for the Rose	800	8/22	Portland Triathlon/Riverfest	2,700
4/17	National MS Walk 2010	2000	8/27 to 8/28	Hood to Coast 2010	1,400
4/24	March of Dimes WalkAmerica 2010	3500	8/28	Salsa en la Calle	2,500
5/1 to 5/5	Cinco de Mayo	60,000	9/2	Oregon Symphony	12,000
5/15	Doggie Dash	2000	9/11 to 9/12	DragonSports Dragon Boat Races	5,000
5/22	Portland Metro Heart Walk 2010	5000	9/11	Walk and Roll for United Cerebral Palsy!	750
5/23	National Alliance on Mental Illness Northwest Walk 2010	2000	9/12	Pints to Pasta 2010	2,000
5/28 to 6/13	Rose Festival	150,000	9/19	Race for the Cure	45,000
6/19 to 6/20	Pride NW	55,000	9/25	City Repair - Firefly Community Lantern Walk	250
6/19	NW Walk/Run for Epilepsy	500	9/26	Portland Walk To D-Feet ALS 2010	3,000
6/26	American Tinnitus Walk	200	10/7	St Mary's Academy Blues Bridge Walk	700
7/2 to 7/5	Blues Festival	50,000	10/9	Leukemia and Lymphoma Society's Light the Night Walk	2,500
7/22 to 7/25	Brewers Fest	70,000	10/30	Rally to Restore Sanity	n/a

* Note: The attendance figure used is the predicted attendance listed on the permit.

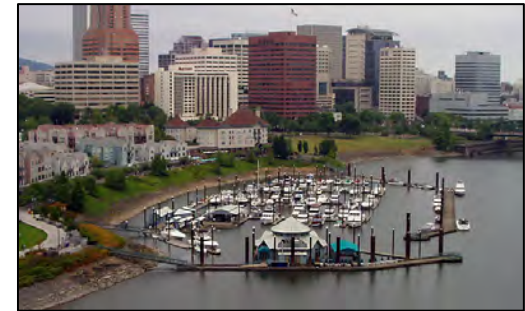
Greenway Trail



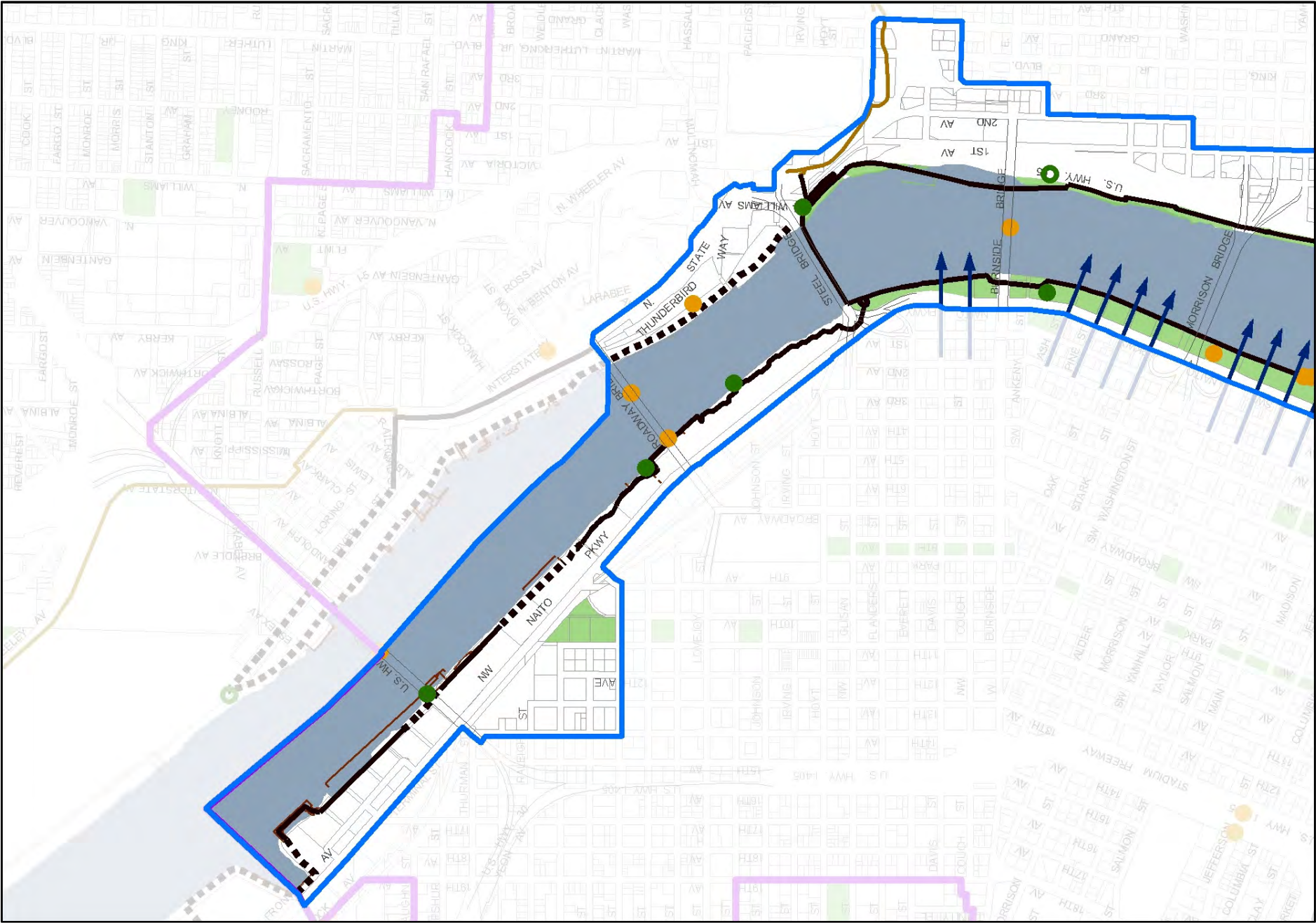
The Central City includes a greenway trail that is almost fully developed along both sides of the river. Ultimately, the planned greenway trail extends north and south on both sides of the Willamette – running through the entirety of the Central City area. On the east side of the river, the Eastbank Esplanade, an off-street path, parallels the River's edge for 1.5 miles, extending from the Steel Bridge to the Hawthorne Bridge. The off-street path continues along the river south of the Hawthorne Bridge to SW Caruthers Street, where on-street bike lanes connect the path to the Springwater Corridor trail. On the west side of the river the greenway trail is almost fully developed as an off-street path through Tom McCall Waterfront Park. Sections north of the Broadway Bridge and throughout the South Waterfront riverfront are not yet developed. See Map 10, *Access to River*, for the existing Greenway Trail alignment, including built and planned segments. The greenway trail is an important recreation and transportation connection, linking to other regional trails and parks and ensuring that residents and visitors are able to walk, bike, or jog along the entire length of the River through the Central City area.

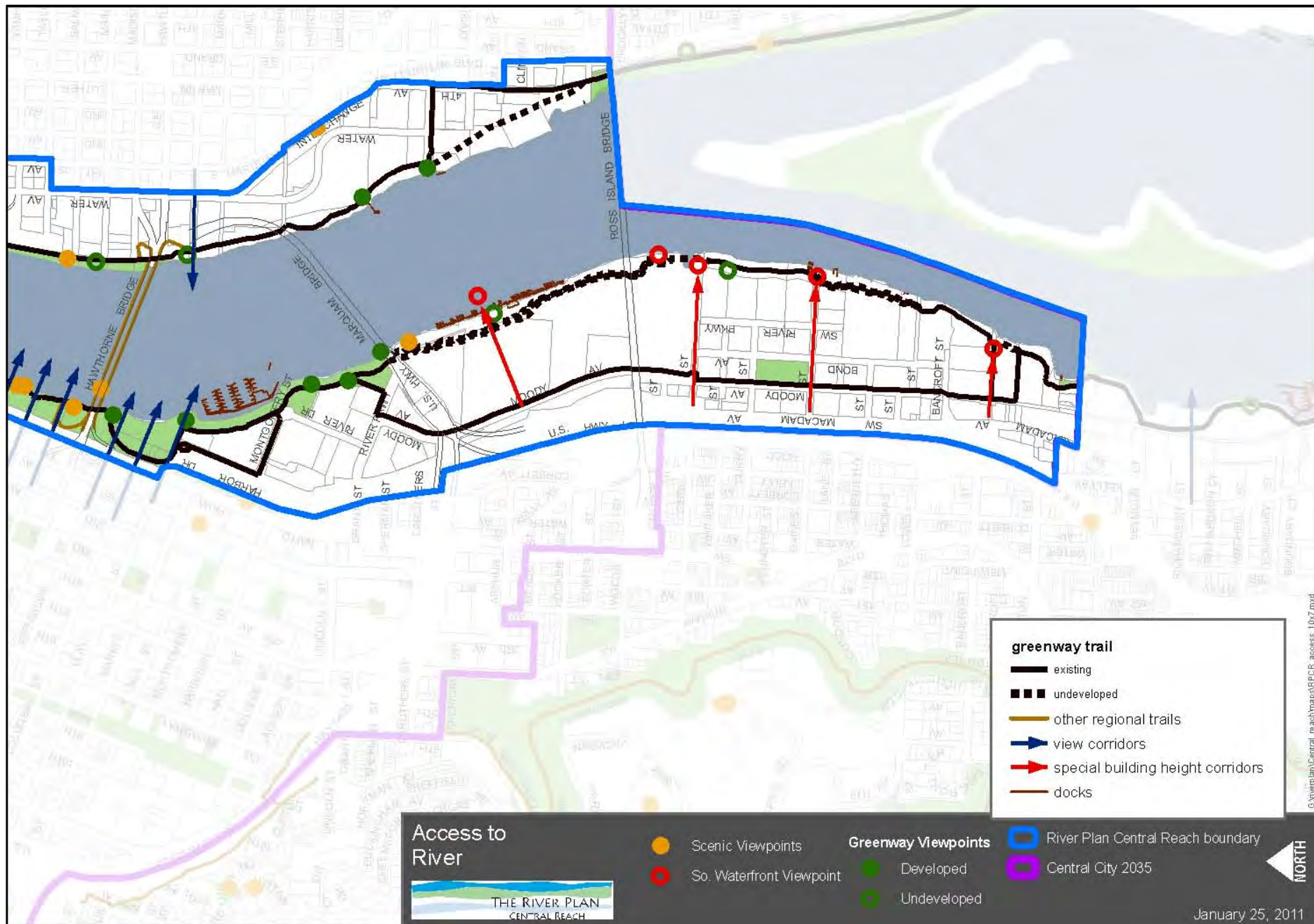
Water Recreation

Docks and other river access facilities support activity that adds to the vitality of the Central City, enhancing the riverfront experience for residents and visitors. The Central City area contains three public docks, one public light watercraft launch, and public river beach access at South Waterfront Park. In addition, several sites in the Central City have private or commercially-available river access. These access points are shown on Map 11, *Water Recreation Opportunities*. A wide variety of recreational uses occur on and in the river, including fishing, personal or light watercraft use, motor-boating, cruising, water-skiing, and more. The Portland Spirit, Willamette Jet Boat Excursions and the Sternwheeler Rose offer frequent commercial cruises on the Willamette River. The Oregon Maritime Museum is located on the Steamer Portland in Tom McCall Waterfront Park, providing an opportunity for visitors to learn about Portland's maritime history.

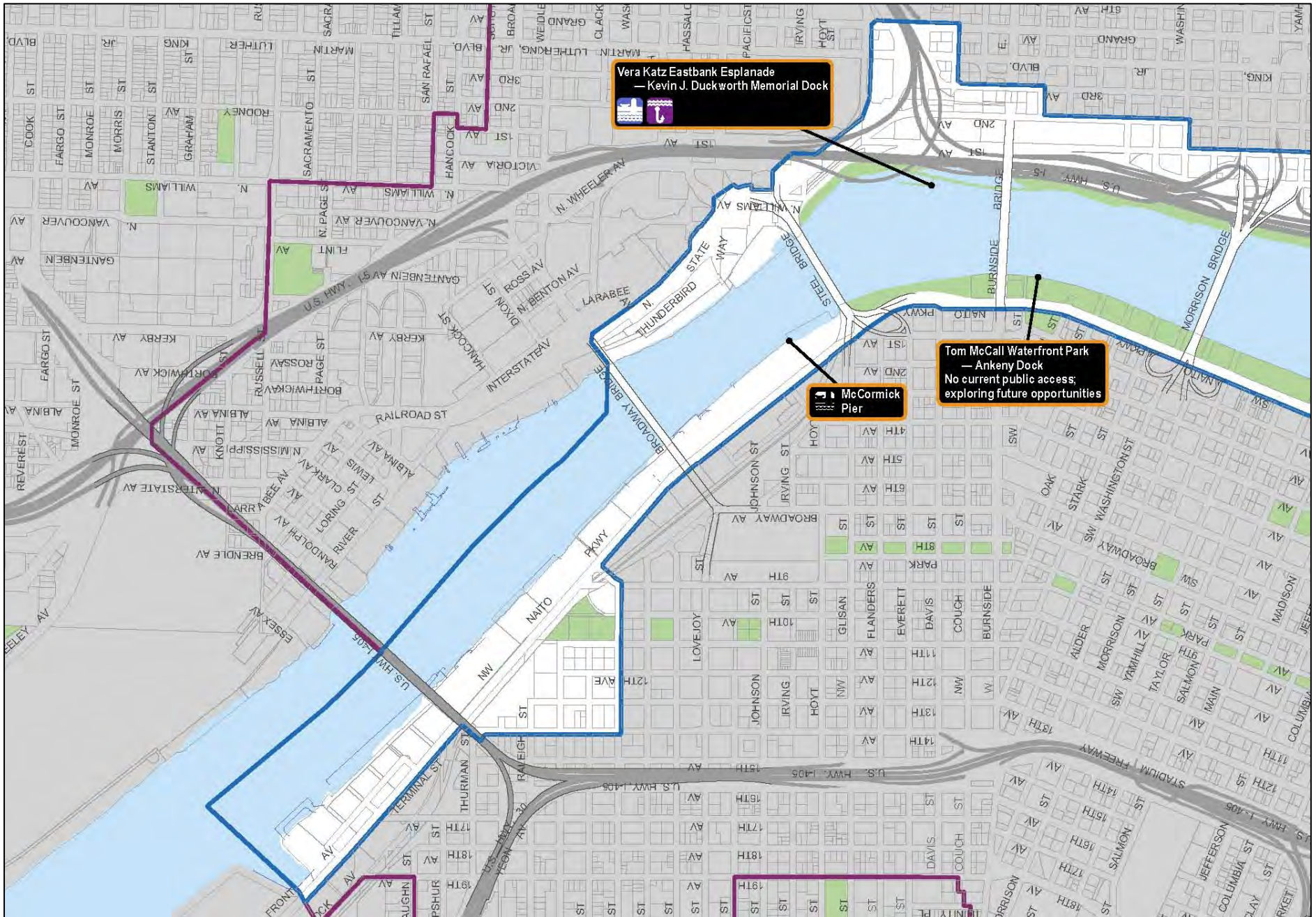


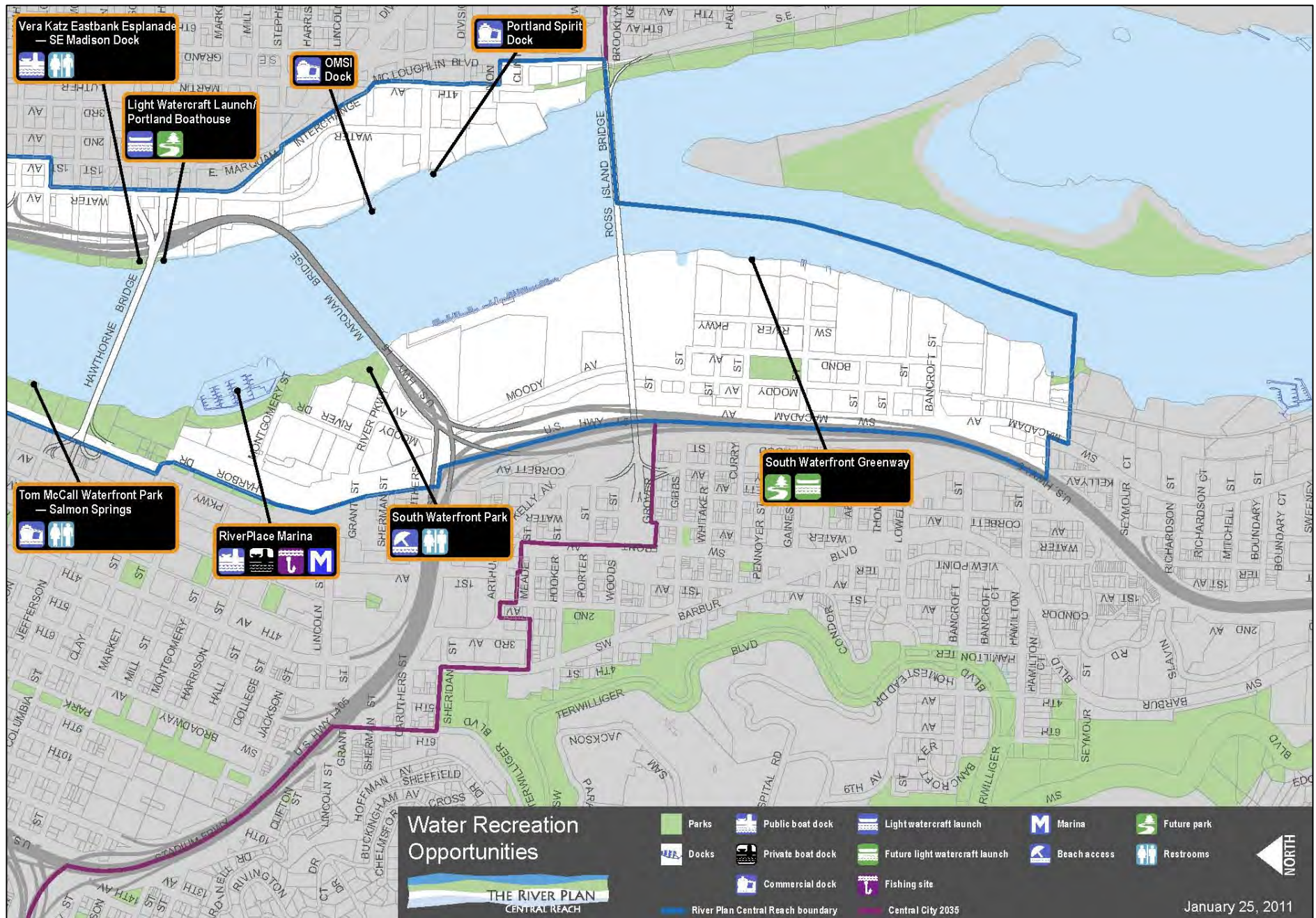
Map 10: Access to River





Map 11: Water Recreation Opportunities





Watershed Health

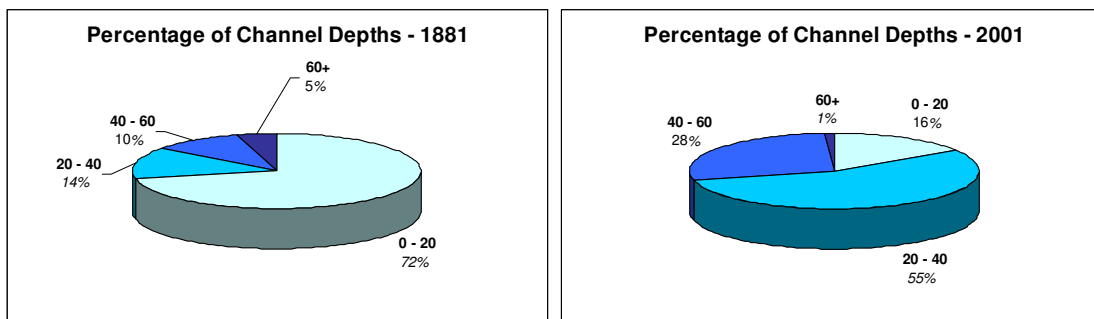
While the Central City is largely built-out, it still includes important natural resources, particularly along and including the Willamette River. Roughly four miles of the Willamette River channel, totaling about 450 acres, are located in the Central City. The Willamette River provides significant habitat for fish, river-dependent mammals, and amphibians. The Willamette River is also part of the Pacific Flyway, a major north-south route of travel for migratory birds in the Americas, and is utilized by more than 100 resident and migratory bird species.

The riverbank and land in close proximity to the river (riparian area) provides important natural resource functions. For example, trees that overhang the water provide shade that can create localized areas of cooler water, which is healthy for fish. Trees, shrubs and grasses along the river provide food sources and perching, nesting and resting areas for resident and migratory birds. Along the Central City portions of the Willamette River, the riparian area is approximately 49% impervious surfaces (e.g. roads, buildings, parking lots) and 17% vegetated with patches greater than 1/2-acre in size, with individual trees and landscaped areas that also contribute to natural resources functions. For more information about vegetation features in the Central Reach, see Map 13, *Vegetation and Steep Slopes*. Map 14, *Draft Natural Resource Inventory*, displays preliminary information about natural resources that receive a rank in the City's Natural Resource Inventory. The draft NRI will be verified through additional analysis and field work during the CC2035 planning process.



In the Central City, the flood area has largely been filled and developed in the past 100-plus years, with the existing flood area now confined to the Willamette River itself. There are a few locations of developed flood area, most of it in the South Waterfront. Wharves and piers extend into the river channel, and bulkheads (similar to retaining walls) and riprap (stones on the embankment slope to limit erosion) armor the riverbank. The seawall constructed along much of Central City's west Willamette bank has further altered the natural conditions of the waterfront. Active dredging has produced a uniform channel with little diversity. However, pockets of shallow water habitat and less hardened banks provide remnant fish and wildlife habitat areas. Figure 2 displays historic and current channel depths for the Willamette River. Historically 72% of the downtown segment of the river was shallow water, but in 2001 only 16% was shallow water, a change that creates poor conditions for salmon that need shallow water. For more information, see Map 12, *Water-Related Features*.

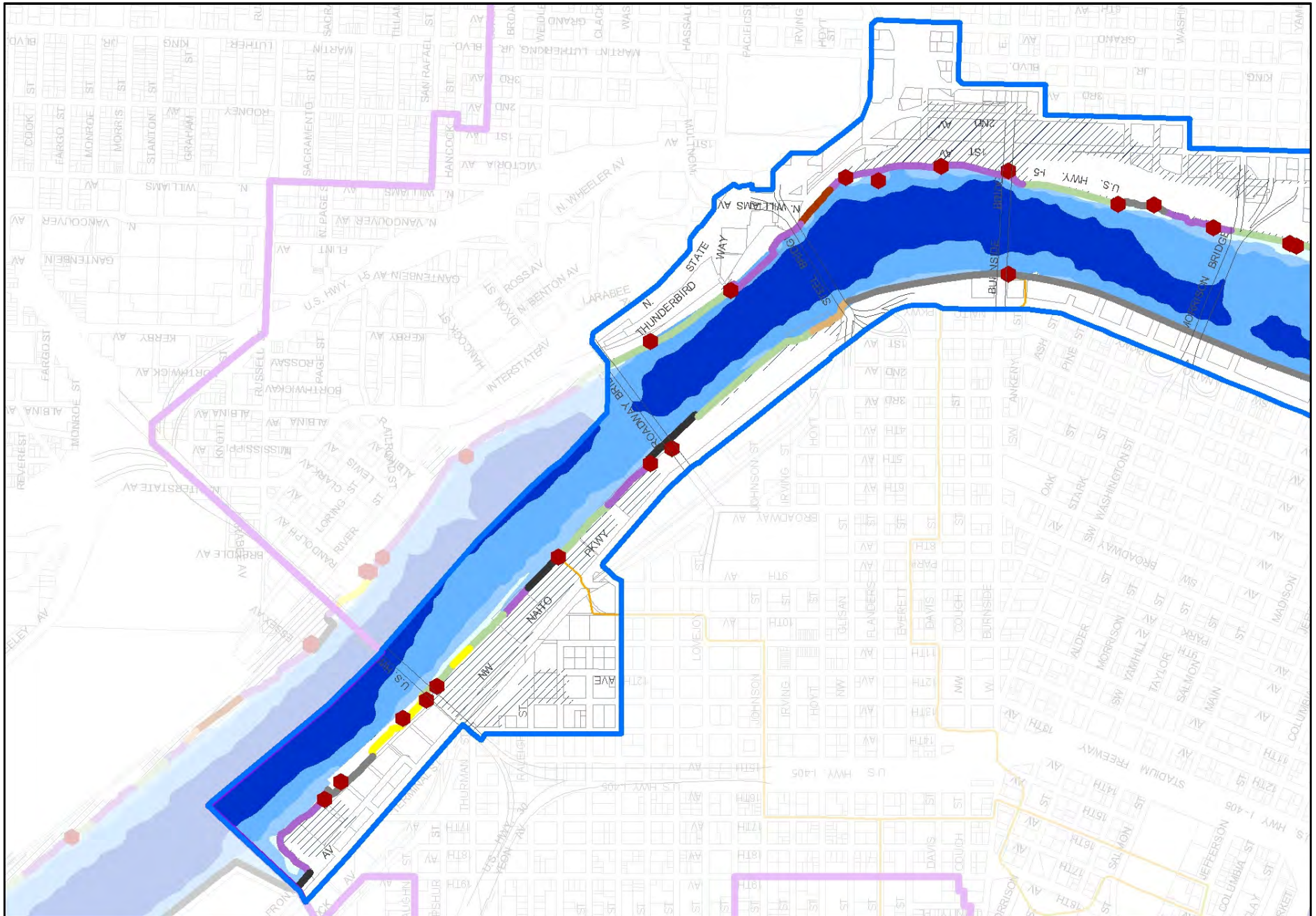
Figure 2: Channel Depths of the Willamette River, Downtown Segment: 1881 and 2001 (feet)



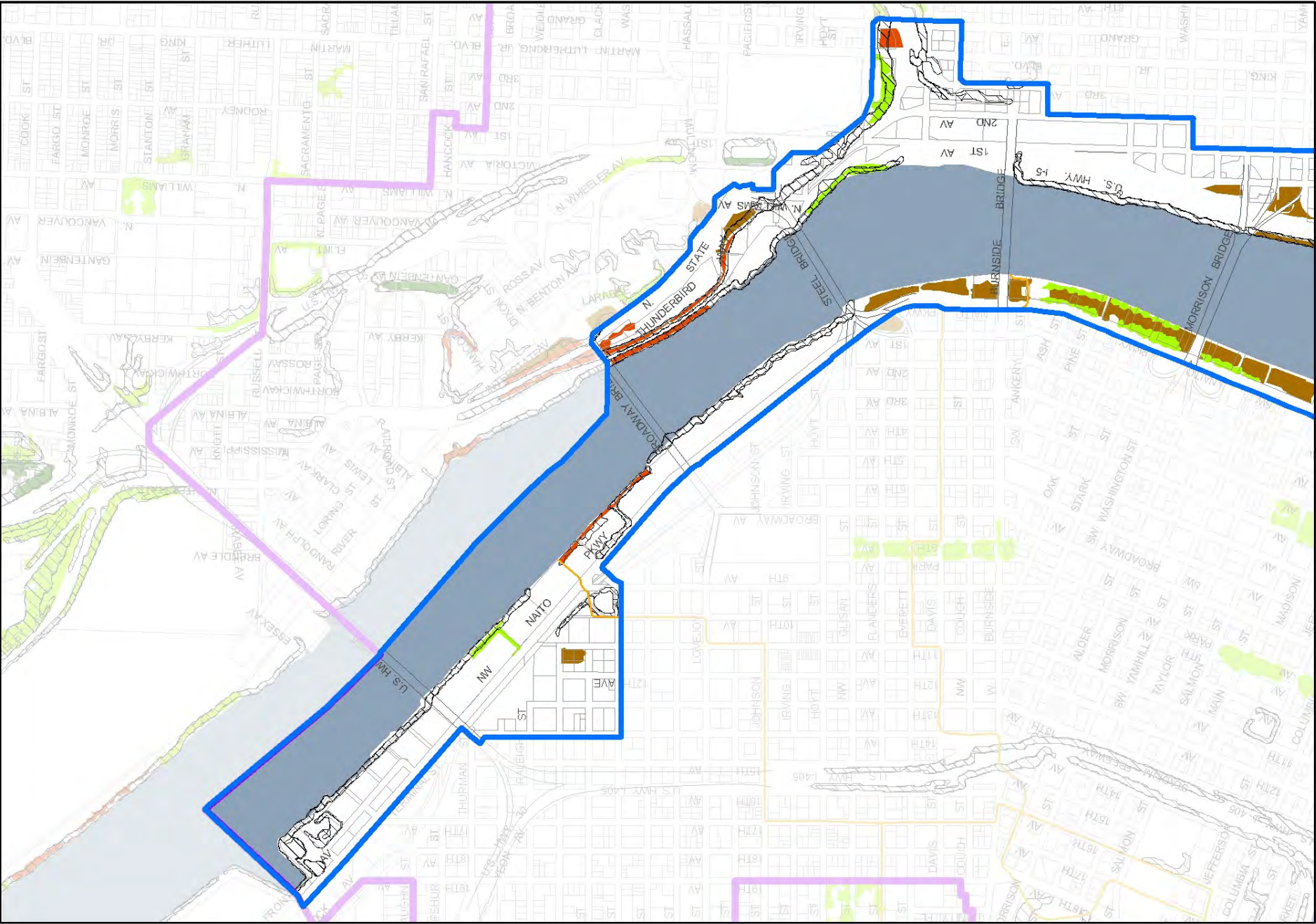
In the late 1990's Willamette River spring Chinook salmon and Steelhead trout were listed as threatened under the Endangered Species Act and then in 2005, Coho and Columbia River Chum salmon were added to the list. The Act prohibits harming these species or their habitat and calls for actions to restore populations to sustainable levels. Pacific lamprey is currently under review for listing.

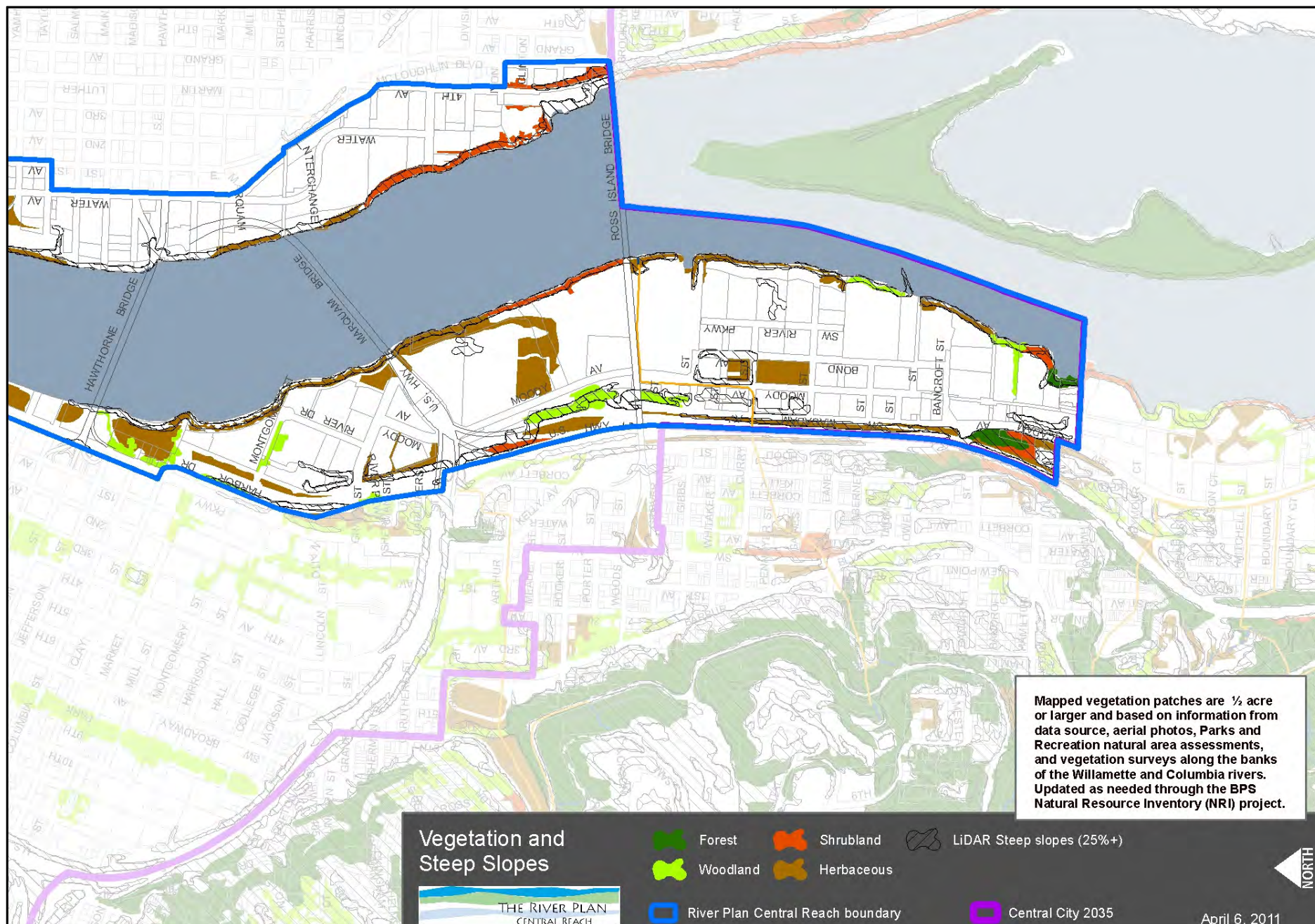
Currently, the Lower Willamette River does not meet water quality standards for bacteria, mercury, dioxin, and temperature. Many tributaries to the Lower Willamette do not meet standards for temperature and pollutants, both of which can affect many aquatic species. There is a fish advisory for the main stem of the River, indicating that contamination levels may be unsafe for human consumption. The Lower Willamette River also is generally deemed unsafe for swimming.

Map 12: Water-Related Features

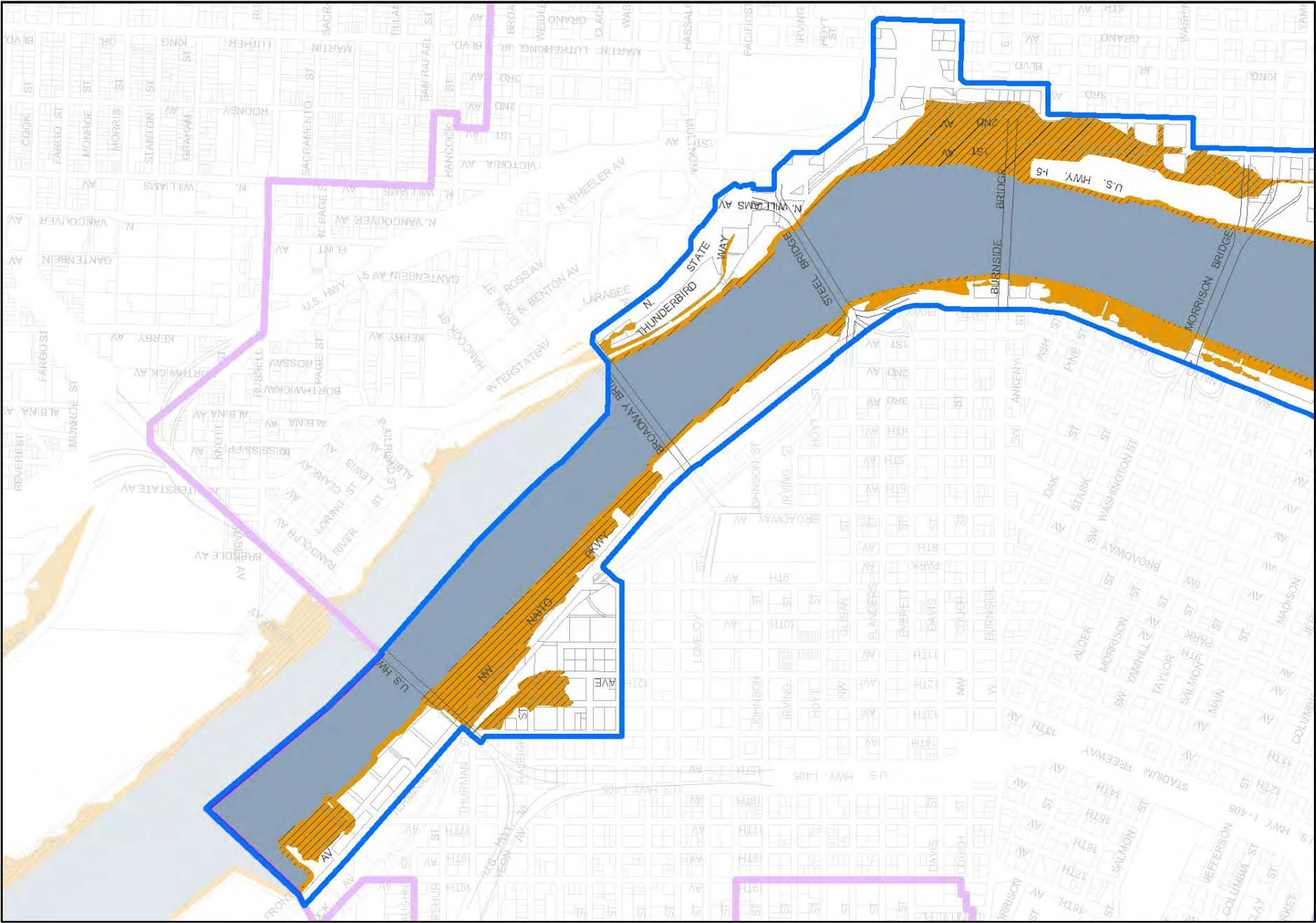


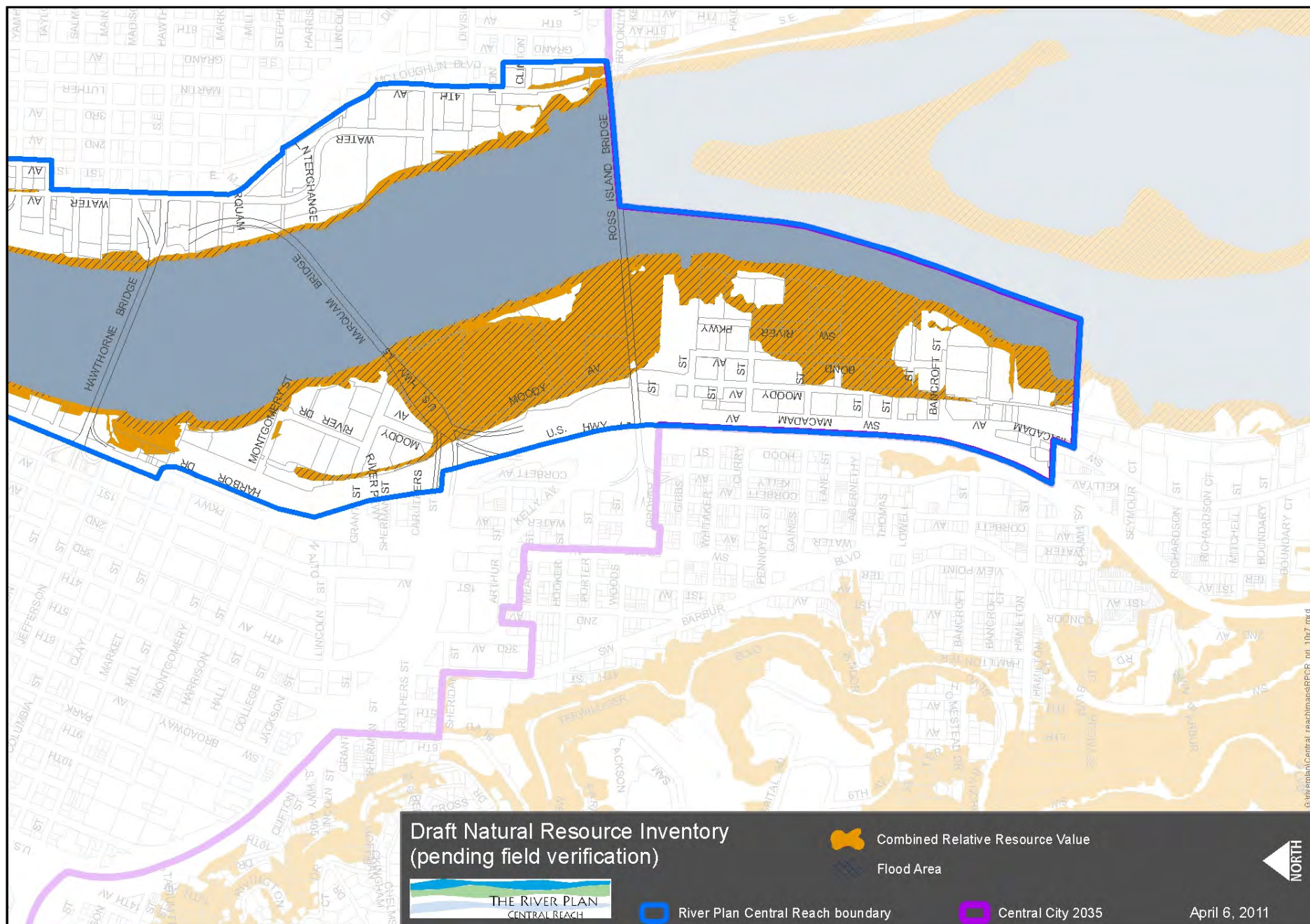
Map 13: Vegetation and Steep Slopes





Map 14: Draft Natural Resource Inventory





Gray and Green Infrastructure



The Central City has a combined sanitary and stormwater sewer system. This is an older system, where sanitary sewer effluent and stormwater runoff are all handled by a single pipe. Newer systems are typically separate. During rainstorms, the runoff exceeds the pipe capacity and the overflow is directed to pipes that discharge this overflow directly into the Willamette River. To meet Federal Clean Water Act requirements, the Combined Sewer Overflow (CSO) Project was initiated. This project constructed large capacity underground storage tanks and pipes to handle the overflow from storm events. The project is being constructed in two phases, the Westside CSO, (completed in 2006) and the Eastside CSO (to be completed in 2011).

Street and landscape trees, ecoroofs and other vegetated areas located throughout the Central City contribute to stormwater management by intercepting and filtering rainwater. Vegetated areas also cool the air, capture greenhouse gasses and improve overall air quality. The importance of this 'green infrastructure' has recently been acknowledged through the City's 'Grey to Green' initiative. Investments in tree preservation and plantings, and incentives for ecoroofs, have occurred. But additional green infrastructure projects would improve water and air quality in the Central City.

Stormwater management facilities present in the Central City include the following (see Map 15, *Green Infrastructure* for Central City facility locations):

Ecoroof (green roof)

A low-maintenance vegetated roof system typically consisting of waterproofing material, soil and vegetation used in place of or over the top of a conventional roof. Ecoroofs help capture, filter and evaporate rainfall.



Vegetated Swale (bioswale)

A gently sloping depression or channel planted with a variety of trees, shrubs and grasses. Stormwater runoff from rooftops, streets and parking lots is directed through the swale, where it is slowed and in some cases infiltrated, allowing pollutants to settle out.



Vegetated Infiltration Basin (rain garden)

A landscaped depression that is excavated or created with bermed side slopes to temporarily hold and infiltrate stormwater into the ground. The basin can be planted with a variety of trees, shrubs, grasses and ground covers. For examples of this facility in the Central City, visit the Buckman Heights Apartments at 430 NE 16th Avenue or the Oregon Convention Center at NE 1st Avenue and Lloyd Boulevard.

Structure or containers with impervious bottoms that do not infiltrate into the ground. These facilities are filled with gravel, soil and vegetation and temporarily store stormwater runoff on top of the soil. Flow-through planters can be placed directly next to a building and slow stormwater flow rates, volume and temperature. See examples of this facility type at the Pearl Court Apartments (920 NW Kearney Street) or the Stephen Epler Hall at Portland State University.

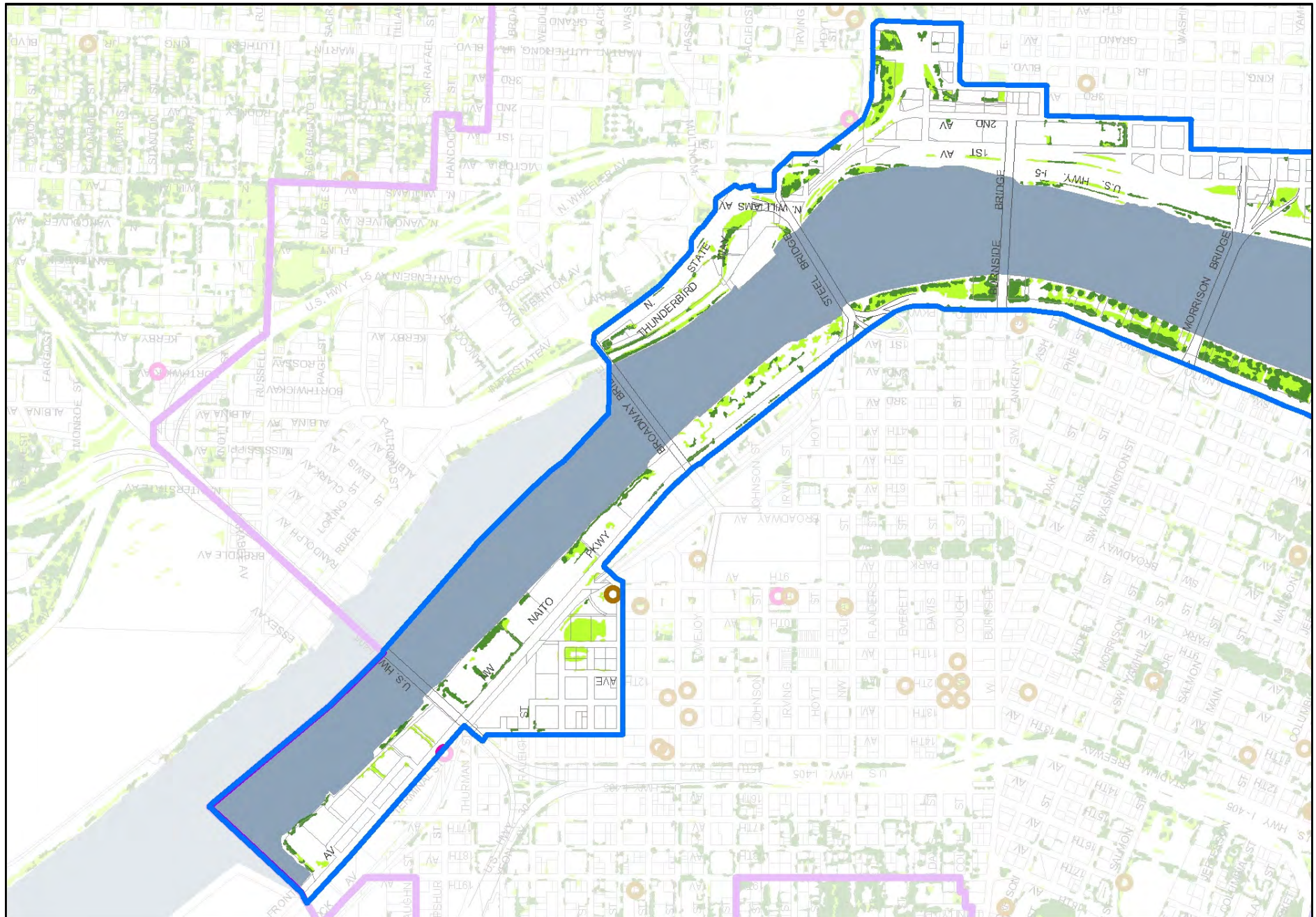
Flow-Through Planter

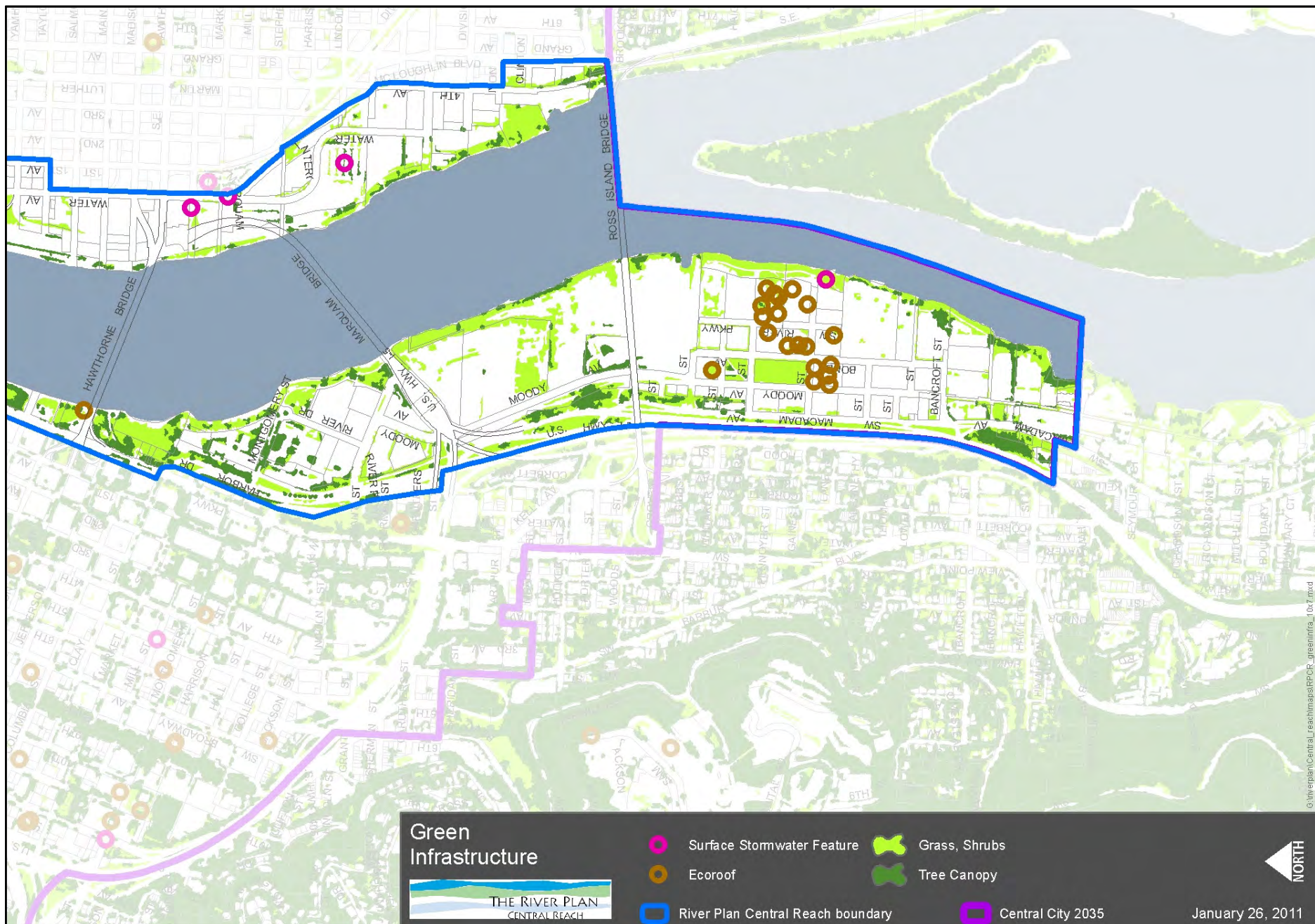


Tree canopy

Trees slow runoff flow and can decrease stormwater volume by 35% or more during small storms. Trees also improve water quality by filtering rainwater and holding soils in place, which is especially important along stream banks.

Map 15: Green Infrastructure







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