Brownfields/Green Neighborhoods: Integrating Riverfront Park with Pringle Creek

Spring 2011 • Architecture, Landscape Architecture

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UNIVERSITY OF OREGON

SCI

Sustainable Cities Initiative

Acknowledgements

The authors wish to acknowledge and thank the following individuals for their assistance with this project. Our work would not have been possible without their support.

City of Salem Staff
Bryce Bishop, Community Development, Planning Division

Mark Becktel, Parks and Transportation Services Manager

Keith Keever, Parks Superintendent

Courtney Knox, Senior Project Manager

Nitin Joshi, Water Resources Program Manager

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About SCI

The Sustainable Cities Initiative (SCI) is a cross-disciplinary organization at the University of Oregon that seeks to promote education, service, public outreach, and research on the design and development of sustainable cities. We are redefining higher education for the public good and catalyzing community change toward sustainability. Our work addresses sustainability at multiple scales and emerges from the conviction that creating the sustainable city cannot happen within any single discipline. SCI is grounded in cross-disciplinary engagement as the key strategy for solving community sustainability issues. We serve as a catalyst for expanded research and teaching, and market this expertise to scholars, policymakers, community leaders, and project partners. Our work connects student energy, faculty experience, and community needs to produce innovative, tangible solutions for the creation of a sustainable society.

About SCY

The Sustainable City Year (SCY) program is a year-long partnership between SCI and one city in Oregon, in which students and faculty in courses from across the university collaborate with the partner city on sustainability and livability projects. SCY faculty and students work in collaboration with staff from the partner city through a variety of studio projects and service-learning courses to provide students with real-world projects to investigate. Students bring energy, enthusiasm, and innovative approaches to difficult, persistent problems. SCY's primary value derives from collaborations resulting in on-the-ground impact and forward movement for a community ready to transition to a more sustainable and livable future. SCY 2010-11 includes courses in Architecture; Arts and Administration; Business Management; Interior Architecture; Journalism; Landscape Architecture; Law; Planning, Public Policy, and Management; Product Design; and Civil Engineering (at Portland State University).

About Salem, Oregon

Salem, the capital city of Oregon and its third largest city (population 157,000, with 383,000 residents in the metropolitan area), lies in the center of the lush Willamette River valley, 47 miles from Portland. Salem is located an hour from the Cascade mountains to the east and ocean beaches to the west. Thriving businesses abound in Salem and benefit from economic diversity. The downtown has been recognized as one of the region's most vital retail centers for a community of its size. Salem has retained its vital core and continues to be supported by strong and vibrant historic neighborhoods, the campus-like Capitol Mall, Salem Regional Hospital, and Willamette University. Salem offers a wide array of restaurants, hotels, and tourist attractions, ranging from historic sites and museums to events that appeal to a wide variety of interests. 1,869 acres of park land invite residents and visitors alike to enjoy the outdoors.

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Executive Summary

University of Oregon students in a combined architecture and landscape architecture studio worked together to research and develop ideas for integrating Riverfront Park with Pringle Creek and for the redevelopment of downtown Salem's South Waterfront. Working with City of Salem staff, students explored sustainable urban design-based approaches to the revitalization of the thirteen-acre riverfront site that included ecological restoration, riverfront access and transportation improvements, and community-oriented land use. Student recommendations drew from City of Salem goals for the South Waterfront Urban Renewal Area, which include daylighting Pringle Creek, improving bicycle and pedestrian access to the site and to Riverfront Park, and promoting profitable mixed-use development. During the Spring 2011 term, students worked to demonstrate ways in which principles of environmental design coupled with community-oriented land use would give the South Waterfront a productive role in Salem once again.

As a former industrial site separated from Salem's downtown by heavily trafficked streets, the South Waterfront presents a number of challenges for developers. In their initial evaluation of the South Waterfront site, students focused on downtown land use, city demographics and housing needs, brownfield conditions, wildlife habitat, hydrology, and area transportation. These analyses revealed site access, land ownership, and brownfield remediation as key variables to consider in any redevelopment plan for the South Waterfront. With these challenges in mind, and the city's goals as guidelines, three redevelopment approaches emerged: **Parks and Open Space, Transit Center/High-Density Development, and Education Hub**. For each of these programs, students generated multiple conceptual schemes exploring various future development plans for the South Waterfront. Above all, schemes propose sustainable, pedestrian-friendly environments that improve and protect the site's ecological health while supporting the city's social and economic needs.

Introduction

As part of the 2010-11 Sustainable City Year (SCY) program, 18 architecture and landscape architecture students in the Brownfields/Green Neighborhoods Studio at the University of Oregon (UO) collaborated with City of Salem staff to develop conceptual schemes for the redevelopment of the former Boise Cascade property. Led by Professor Roxi Thoren, students met with City of

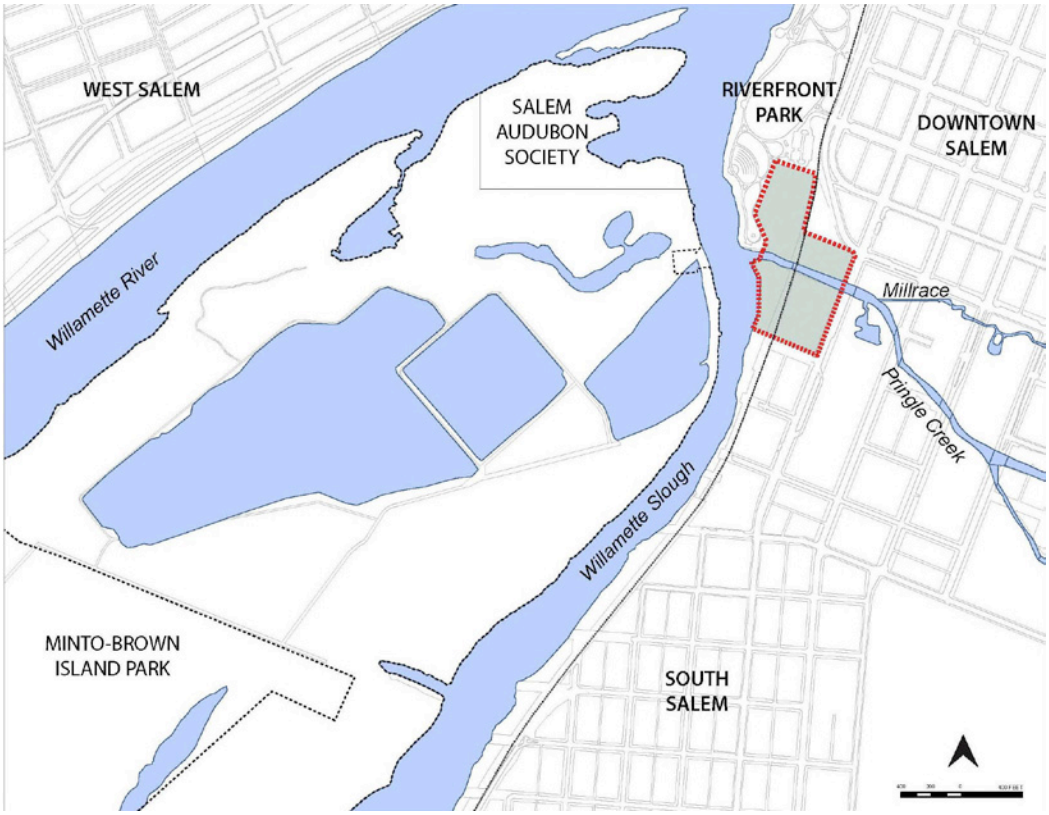


Figure 1: South Waterfront Site context map.

Salem planners and consultants to discuss project challenges and expectations, toured the property, analyzed the site in terms of its environmental, cultural, infrastructural, and economic characteristics, and presented their research and design goals to Salem planners, local designers, and UO faculty and guests. In 2007, the thirteen-acre site, along with 300 acres of Minto-Brown Island and about 55 acres south of the site, was included in the new South Waterfront Urban Renewal Area. At that time, the city also initiated a zoning change from predominantly industrial to mixed-use, with the aim of daylighting Pringle Creek, providing public access to the Willamette River and Minto-Brown Island, improving transportation and pedestrian pathways, and promoting profitable community development. The site plans and programs proposed by UO students support the city's goals and promote sustainable, environmentally responsible land use that will meet the future needs of the Salem community.

Site History

Known locally as the Boise Cascade site, the South Waterfront is located southwest of Salem's historic downtown at the confluence of Pringle Creek and the Willamette Slough. These natural conditions were essential for the site's first development for industrial operations that required waterpower and proximity to the Willamette River for the transportation of natural resources and manufactured products. A millrace, constructed in the 1860s, diverted water from the North Santiam watershed to Mill and Pringle Creeks, providing a dependable flow of water for year-round millwork (Duniway 1985).

The natural conditions of the site were essential for the site's first development for industrial operations.

Following the dismantling of the Kalapuya winter camp at the riverfront in the 1850s, the South Waterfront was developed for lumber and flour mills. An 1867 photograph shows the Salem Flouring Mills (1865 – 1915) along the north bank of Pringle Creek, harnessing water from the millrace to power its machinery and transporting flour via a sternwheeler pulled up at a loading dock at the creek's junction with the slough. Producing 400 barrels of flour daily, the Salem Flouring Mills was the largest of its kind in Oregon, serving both domestic and international markets. Capital Lumbering Company (1866 – 1909) also operated a sawmill on the riverfront adjacent to the Salem Flouring Mills. The Willamette River was used to power the mill, store and clean felled logs, and easily maneuver logs onto a lift to the saw. In 1909, the sawmill was purchased by Charles K. Spaulding and became the Spaulding Logging Company (1909 – 1955). While the railroad was used principally for the company's transportation needs, the sawmill continued to use the river for many of its operations. In the early twentieth century, Spaulding Logging manufactured over 25 million board feet of dimensioned lumber annually and was the principal supplier of building materials in Salem (Costic 2010). Utilizing the South Waterfront's natural resources, these early flour and lumber mills helped to advance Salem's manufacturing and commercial success.

Figure 2: Salem Flouring Mills,1867. Source: Oregon Historic Photographs Collection, Salem Public Library.

Figure 3: Spaulding Logging Company, ca. 1920s. Oregon Pulp & Paper power plant in foreground. Source: The Oregon Companion: A Historical Gazetteer of the Useful, the Curious, and the Arcane.

Even after the South Waterfront industries no longer harnessed water for energy, Pringle Creek and the Willamette River continued to play a role in the process of pulp and paper manufacturing. Water supply is an essential factor in determining the site of any pulp and paper mill, as large quantities of water are used in its operations. In 1919, Charles K. Spaulding

and Joseph Kastor purchased the former Salem Flouring Mills property and water rights to establish the Oregon Pulp and Paper Factory. The pulp and paper mill adjoined Spaulding's sawmill, cutting off access to the river on Trade Street. Three electric centrifugal pumps extracted river water for nearly all the mill's operations. Salem Water Works also provided water. Felled logs were brought to the mill by truck and train, or were rafted on the Willamette River and stored along the riverbank. The proximity of Minto-Brown Island, which was undeveloped at the time, afforded a place for purification lagoons in the 1960s, when the state government began to regulate the amount of waste discharged into the Willamette. Before closing in 1955, the mill produced 100 tons of paper daily and was the largest private employer in Salem, with 600 employees (Costic 2010).

Figure 4: Oregon Pulp and Paper Plant discharging pollution into air and Willamette Slough, ca. 1955. Source: Oregon Historical Photograph Collections, Salem Public Library.

In 1962, Boise Cascade purchased the Oregon Pulp and Paper Factory and former Spaulding sawmill, becoming the dominant property owner on the Salem riverfront. Boise Cascade Mill manufactured pulp for the production of 310 tons of paper per day. To accommodate this paper production, Boise Cascade extended the mill south of Pringle Creek, adding a 90,000 square-foot warehouse in the 1960s. To abate its water pollution, Boise Cascade constructed purification lagoons on Minto-Brown Island in the 1960s. The mill dumped 150,000 gallons of sulfite waste into the river daily, and clouds of malodorous emissions prompted much public complaint (Gleeson and Merryfield 1939). In 1972, the State of Oregon imposed regulations on Boise Cascade to further limit its pollution. Spending over $10 million on pollution abatement, the pulp and paper mill reduced is water pollution by 90% and its sulfur dioxide emissions by 80%. During an economic downturn in the early 1980s, Boise Cascade closed its pulp and paper mill and moved its cardboard-container operations to Fairview Industrial Park. The City of Salem purchased twenty-two acres of the mill's northwest riverfront property, while Boise Cascade retained its paper retail and distribution operations along Commercial Street. Boise Cascade closed all its operations on the downtown riverfront in 2007 (Costic 2010).

Beginning in the mid-1980s, the City of Salem began exploring redevelopment plans for twenty-two acres of the downtown riverfront. **The Salem community's decision to redevelop the riverfront into a park was influenced, in part, by the site's potential to directly link downtown to Minto-Brown Island, while also serving as a buffer between a high-density urban environment and a nature and wildlife reserve on the island.** Such a buffer, however, required a

Figure 5: Aerial view of Riverfront Park construction, 1996.

Figure 6: The Eco-Earth Globe.

thorough cleanup of the riverfront's industrial remnants and residual wastes. The former mill buildings located on the site were demolished, leaving a clean slate for greenswards, pedestrian and bike paths, an outdoor amphitheatre, playground, and carousel. Riverfront Park opened in 1996, after an eleven-year planning process. All remnants of the industrial past were erased, save for a ten-ton stainless steel tank once used to cook wood chips in sulfuric acid. Considered a "worthless eyesore," this acid-ball was encased in over 200 beautiful cartographic icons. The Eco-Earth Globe, or Eco-ball, as it is now called, embraces the environmental

conservation of the earth; its former industrial purpose as a container for toxic materials is entirely obscured (Costic 2010).

In 2006, the City of Salem, Boise Cascade, and the Strategic Economic Development Corporation (SEDCOR) invited the Urban Land Institute (ULI) to assemble an Advisory Services Program panel to evaluate development opportunities for the thirteen acres of the Boise Cascade property. The ULI advisory panel urged the city to change the property's current zoning from industrial to mixed-use, encouraging a variety of uses for the site. While the ULI study explored possibilities of adaptive reuse for the existing mill buildings, the advisory panel recommended the removal of the beater and machine buildings to daylight the Pringle Creek corridor. This would offer unprecedented views

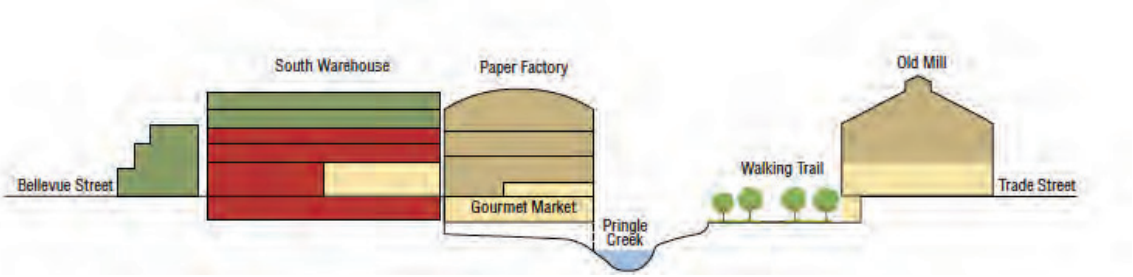


Figure 7: North-south cross-section of proposed adaptive reuse of Boise Cascade structures. Source: Urban Land Institute.

Figure 8: Map of the South Waterfront Urban Renewal Area. Source: City of Salem Urban Development Department.

of Minto-Brown Island. **The ULI advisory panel also recommended the adoption of an urban renewal plan, which would be needed to finance public improvements to the South Waterfront.** In September 2007, the South Waterfront Urban Renewal Area (SWURA) was created, encompassing approximately 369 acres, including the thirteen-acre Boise Cascade riverfront property and the northern part of Minto-Brown Island (see Figure 8). In the same year, developers Dan Berrey and Larry Tokarski purchased the South Waterfront site for $7.25 million, with plans to develop the property for retail shops, offices, a wellness/recreation center, and high-end condominiums. Their vision for the site included daylighting Pringle Creek and reuse of the south warehouse for a parking structure. During the summer of 2009, the former mill buildings were demolished. In opting for a new design that introduces more creative-commercial architectural forms that take advantage of views of the Willamette River, the developer's prerogative is marketability, which stresses the unique natural qualities of the site – its waterways as well as access to downtown and Minto-Brown Island.

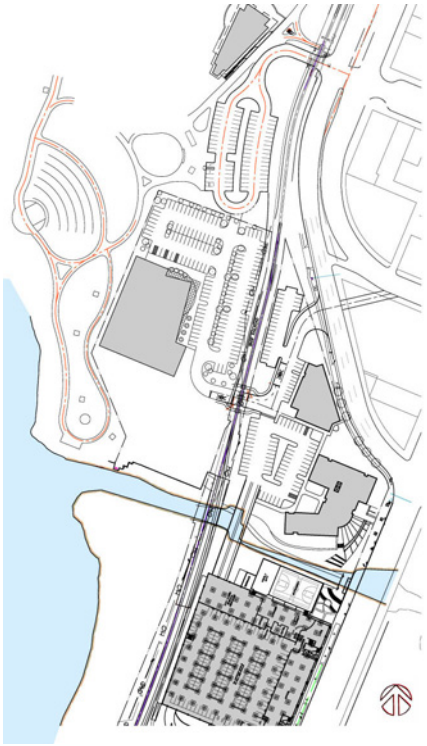


Figure 9: 2009 Conceptual site plan. Source: Arbuckle Costic Architects, Inc.

The recent and continuous redevelopment of the South Waterfront has presented Salem with the opportunity to address and begin to repair the negative ecological history of industry on the site. A landscape stressing new lifestyle possibilities that highlight downtown's proximity to nature and opportunities for outdoor recreation emerges. With the demolition of the former mill buildings, visible traces and interpretations of the Salem riverfront's industrial legacy are absent. Instead, new features such as pedestrian and bike paths, trees and vegetation, a carousel, playground, pavilion, and viewing decks have been introduced with the aim to enhance the riverfront's aesthetic and recreational value.

City Goals

The list below is a brief summary of the most important goals for the redevelopment of the South Waterfront property. These goals are discussed at length in the SWURA Plan adopted in September of 2007 (City of Salem 2007).

- Daylight Pringle Creek.
- Improve bicycle and pedestrian access to site and between parcels.
- Connect site to Riverfront Park.
- Encourage mixed-use community oriented development.

Figure 10: Student observing foundation of former building spanning Pringle Creek.

Currently, a large section of Pringle Creek is obscured by the remaining foundation of the former Boise Cascade machine building. Daylighting Pringle Creek will provide greater public access to the creek and the Willamette Slough. Earthwork along the creek banks will restore the habitats of endangered species, including the Chinook Salmon, Western Pond Turtles, and Dusky Canada Geese that call Pringle Creek home. It will also extend edge habitats for other species dependent on the confluence of the river, creek, and slough. Additionally, daylighting Pringle Creek will improve natural processes of stormwater management and the overall watershed system. When the building foundation slab is removed, concrete pilings will remain embedded in the creek. Removing these footings is an important consideration. On one hand, keeping the footings might help provide a more diverse habitat for local fish and birds, while serving as a visible reminder of the site's industrial history. On the other hand, there may be an ecological benefit to removing the pilings. Excavation will certainly disrupt the creek bed, unearth contaminants and require extensive amounts of remediation (a better understanding of this can be determined when the recently completed soil analysis findings discussed in the Brownfields section below are analyzed). Returning the creek to its natural state and removing manmade interventions such as concrete pilings may have aesthetic and environmental significance, if handled appropriately.

Access to and from the site and between the parcels for bicyclists and pedestrians is an important consideration in any design proposal for the site and a major city goal. There has been some discussion of extending the Millrace and Pringle Creek greenway and connecting Mirror Pond, located across Commercial Street, to the South Waterfront site. Schemes presented in the Salem Police Station Fall 2010 SCY Studio report (see http://sci.uoregon.edu) proposed extending bicycle and pedestrian pathways from the Civic Center through the South Waterfront property to Riverfront Park. Current bicycle and

pedestrian access to the South Waterfront from downtown requires multiple crosswalks, busy streets, and an indirect route. Plans for the upcoming Commercial Street Bridge replacement project include hangers under the bridge for a future bike/pedestrian path. The South Waterfront site itself, after the foundation slab is removed, is bisected on the east-west axis by the creek,

Figure 11: Current bike and pedestrian access to the site.

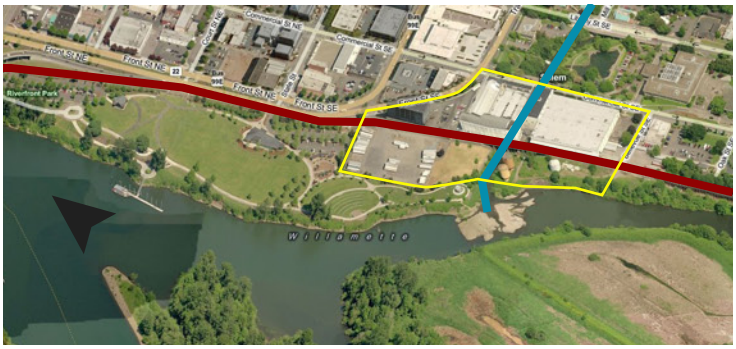


Figure 12: Pringle Creek and the railroad divide the site into four parcels.

and on the north-south axis by the railroad. Access rights for an at-grade railroad crossing were not transferred with the sale of the property, resulting in significant access issues. Access to the northwest and southwest parcels is a particular challenge due to the railroad. Students examined and proposed below-grade and above-grade railroad crossing schemes; these options raise significant engineering and cost questions and challenges.

Connecting the South Waterfront site to Riverfront Park is another city goal. The city proposes to build a bicycle and pedestrian bridge connecting Riverfront Park to Minto-Brown Island, which would greatly increase public access to the nature reserve and the extensive park trails on the island. (City of Salem 2011). However, the project has been halted pending resolution of a water rights issue presented by the Willamette Queen Sternwheeler, which has exclusive rights to the slough. Extending public access along the waterfront is an important factor in the success of new development on the property. Currently, a ten to twenty-foot retaining wall (the height above the creek depends on the water

Figure 13: Retaining wall.

level) stands on the north side of Pringle Creek, and the opposite bank is at a significantly lower elevation. Removing the retaining wall and relaxing the slope of the north creek bank is one possible option. The removal of the retaining wall has a number of ecological and experiential benefits, but it also presents challenges, as there are likely to be significant levels of contaminants in the retained soil that would need to be remediated before any new development could take place.

As stated in the South Waterfront Urban Renewal Plan, the zoning of this area was changed from industrial to mixed-use in order to allow for residential and commercial development on the riverfront. The City of Salem believes any new development on the site should include public access. Therefore, commercial

development that includes restaurants, retail, parks, community education, mass transit, a fitness center, hotel, and other amenities is encouraged. While the property owner's interest likely lies in office and residential development, and in supporting parking facilities, students in this studio believe that preserving and prioritizing public access to the river is paramount.

Variables

Access

As discussed in the previous section, access to the site and between parcels is a significant variable. The Portland & Western-operated rail line that runs north to south is the most significant access issue to consider. An at-grade public crossing is deemed impossible by Oregon Department of Transportation (ODOT) officials currently (unless the existing at-grade crossing at Riverfront Park is shifted south), as access rights for at-grade crossings did not transfer with the sale of the property. Therefore, above-grade and below-grade crossings were proposed in most schemes. Extending a bicycle and pedestrian path along Pringle Creek below the railroad line was the most common solution to the problem and is likely the most cost effective option. One issue to consider in that case is the location of the site within a floodplain. It is possible that in 100-year flood events, these pedestrian pathways would be underwater, and they could potentially be treacherous during the winter months; appropriate warning signage would be required. It is also likely that there would be less traffic on these paths during the winter months. Bridging Pringle Creek so that people could access both the north and south ends of the site is another important access issue to consider, and students explored variations on bridging Pringle Creek.

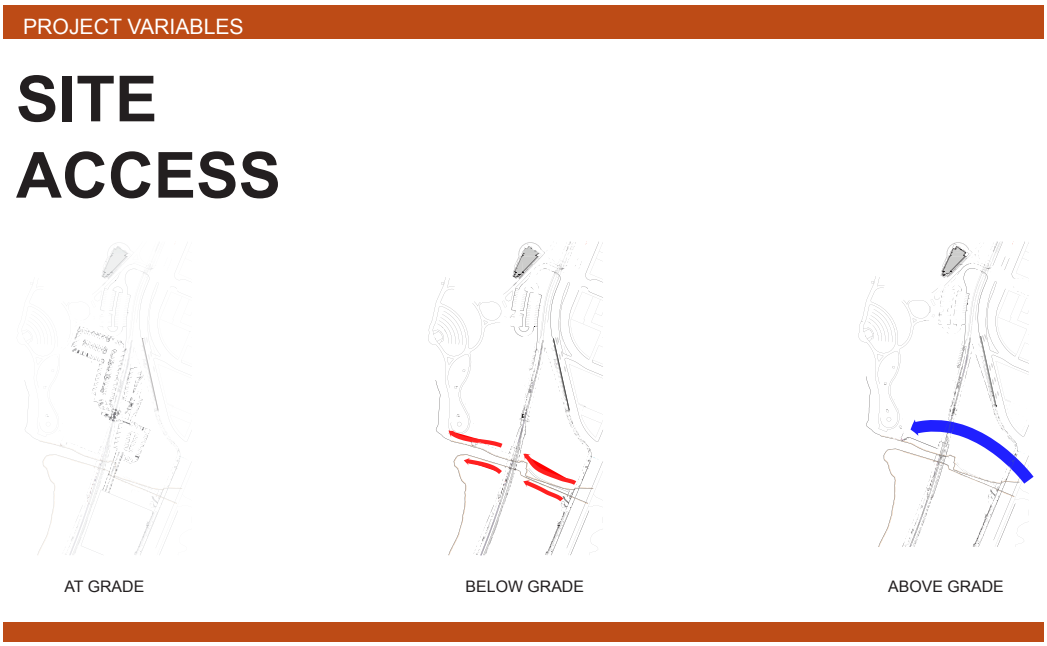


Figure 14: Site access.

Land Ownership

Currently, the site is fully owned by a private real estate investor. In light of the challenging economic times and access issues discussed above, one variation on the current land ownership situation is a public-private partnership in which the northwest and southwest parcels could be purchased by the city and developed for public use. Given the access issue presented by the railroad tracks and necessary addition of infrastructure to cross the railroad, this is a viable possibility. In this scenario, private development could occur on the northeast and southeast parcels. A third option would be for the city to purchase the entire thirteen-acre property from the developer resulting in full public ownership of the land. Proposals pursued in this studio primarily focused on public-private partnerships or full public ownership of the land.

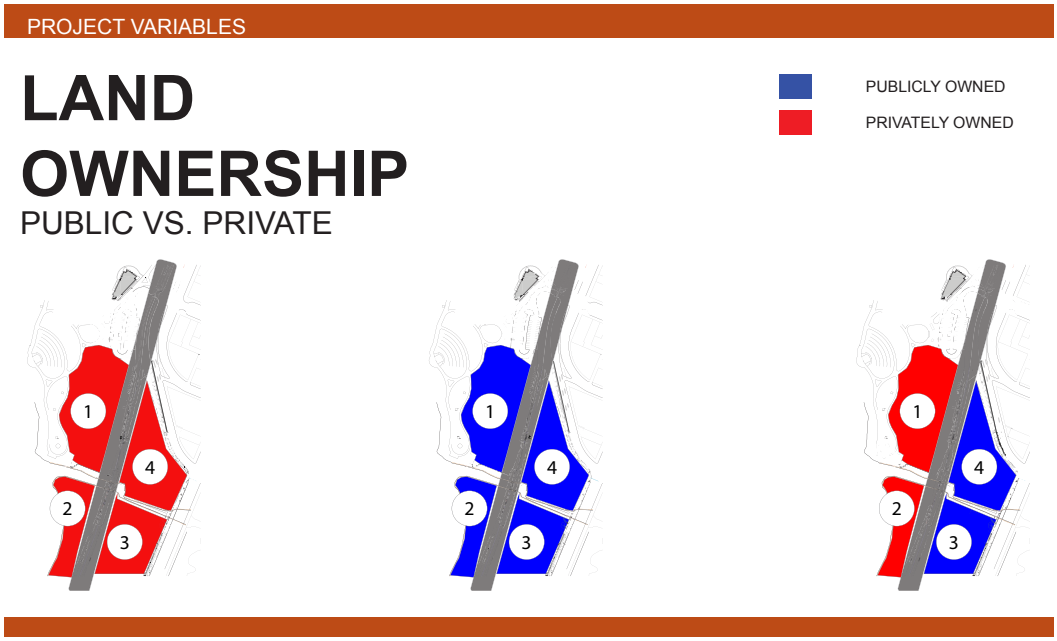


Figure 15: Land ownership scenarios.

Brownfield Remediation

The existence of various harmful contaminants in the soil on the site is widely suspected (Oregon DEQ 2011). As stated in the site history section, Boise Cascade was not required to comply with any environmental regulatory laws until the 1970s, resulting in contamination of soil and water on and around the site. Currently, new soil tests are being conducted to get a better idea of the type and prevalence of chemicals in the soil. Based on historical images of treatment tanks, available data, and conjecture, this studio identified the major “hotspots” of the site. Any built project on contaminated soil would require removal or remediation of the soil before construction could begin. For this reason, some

parts of the site may be less desirable than others to build on because of associated removal, bioremediation, or capping costs.

There are three main strategies for handling contaminated soil: capping and covering, removal, and bioremediation. Areas with higher concentrations of contaminated soil tend to be good candidates for cap and cover or removal as a general rule, while areas with smaller concentrations of contaminants can be remediated with plants and trees. The soil around the retaining wall is considered a highly contaminated area. Soil bordering Commercial Street on the east edge of the site is likely highly contaminated as well. Specific areas where holding tanks once sat might be good candidates for bioremediation or removal. Hotspot locations and viable management strategies for handling these pollutants were factored into design proposals.

PROJECT VARIABLES

BROWNFIELD REMEDIATION
& REMOVAL OF RETAINING WALL

1. REMEDIATE VS. CAP & COVER
2. REMEDIATION TECHNIQUES:
    A. BIO-REMEDIATION
    B. REMOVAL OF CONTAMINATED SOIL
    C. RE-PURPOSING CONTAMINATED SOIL
3. RETAINING WALL
    A. REMOVE AND TERRACE
    B. LEAVE IN PLACE

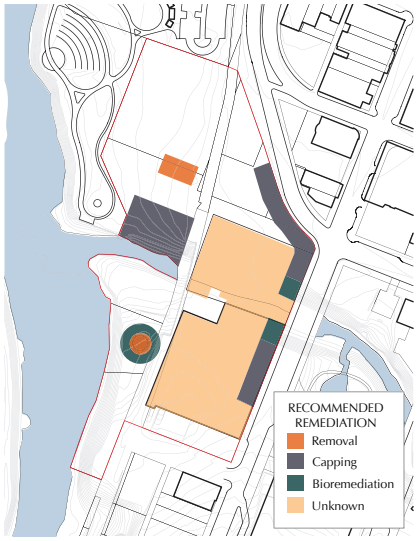


Figure 16: Predicted hotspots recommended for remediation.

Site Analysis and Context

Overview

The first four weeks of the term were devoted to in-depth research of the following site-related topics: land use, demographics, housing, brownfields, habitat, hydrology, power, and transportation. Small groups of 3-5 students performed careful studies and produced presentation materials covering each of these issues. This information was presented to reviewers at the midterm evaluation and refined for the final presentation. This research was made available to all students in the course to help inform design decisions during the final six weeks of the term.

EcoDistrict principles were initially discussed as a possible framework for moving forward with site planning. The intent was to develop holistic schemes integrating sustainability from the ground up. A resource frequently cited was the architecture and planning firm Mithun's EcoDistricts initiative:

> *A comprehensive strategy to accelerate sustainable development and activities at the neighborhood scale by integrating building and infrastructure projects with community programs and individual action. The assessment protocol is part of a toolkit for EcoDistricts to understand their current district performance, set targets, and develop district strategy recommendations in seven key performance areas. It is coordinated with a prototype system for collecting and visualizing relevant data, which is focused on informing decision-making and monitoring over time (Mithun 2010).*

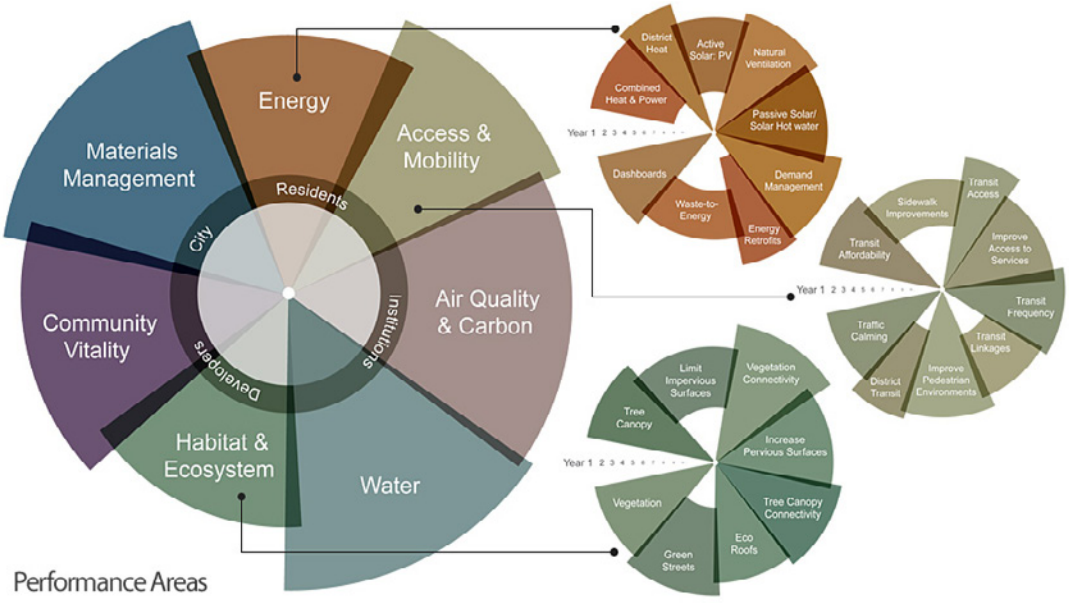


Figure 17: Mithun Ecodistricts. Source: Mithun website: http://mithun.com/projects/project_detail/ecodistricts_initiative/

Land Use

Within a one-mile radius of the South Waterfront are Salem's principal commercial, medical, governmental, cultural and educational institutions. Land use in this area is, for the most part, commercially oriented, including successful clothing retail stores. City and state government properties are also prominent. The nearest full grocery store – Safeway on 12th Street NE and Center Street – is more than a mile from the South Waterfront and other high-density housing developments downtown. During the summer, twice-weekly farmer's markets in the downtown area offer a limited range of food items. Currently, there is little

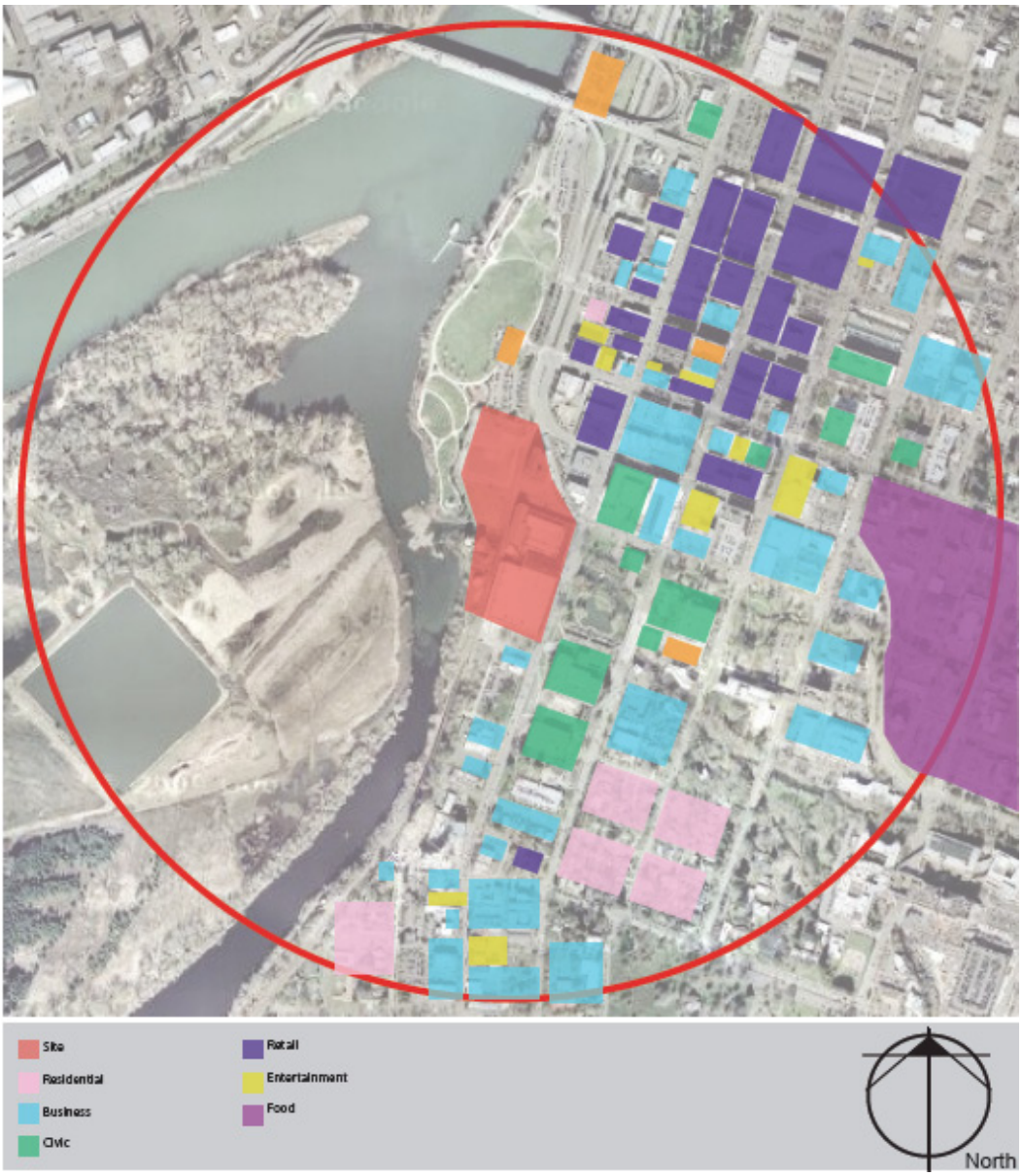


Figure 18: Land use with one mile of the South Waterfront.

nightlife in downtown Salem. Only a few downtown restaurants and bars are open for business in the late evening. Most of these are concentrated around the Elsinore Theatre on High Street. Riverfront Park and Minto-Brown Island Park provide ample green space for outdoor recreation. A mix of retail and residential uses on the South Waterfront as well as food and entertainment options will not only support existing commercial development in the area, but will also attract new businesses and visitors, increase local employment, and enable more sustainable urban living.

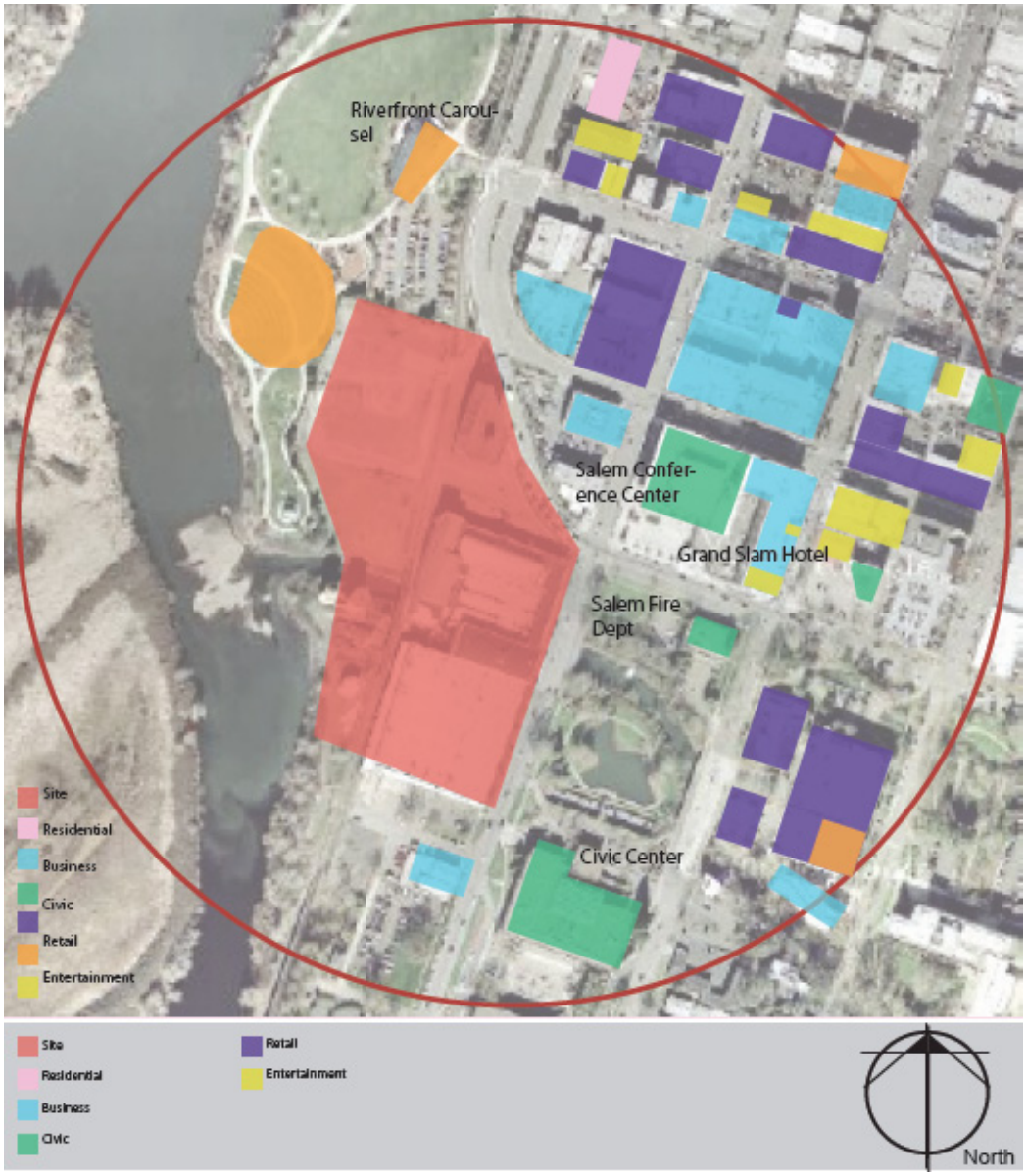


Figure 19: Land use within ½ mile of the South Waterfront Site.

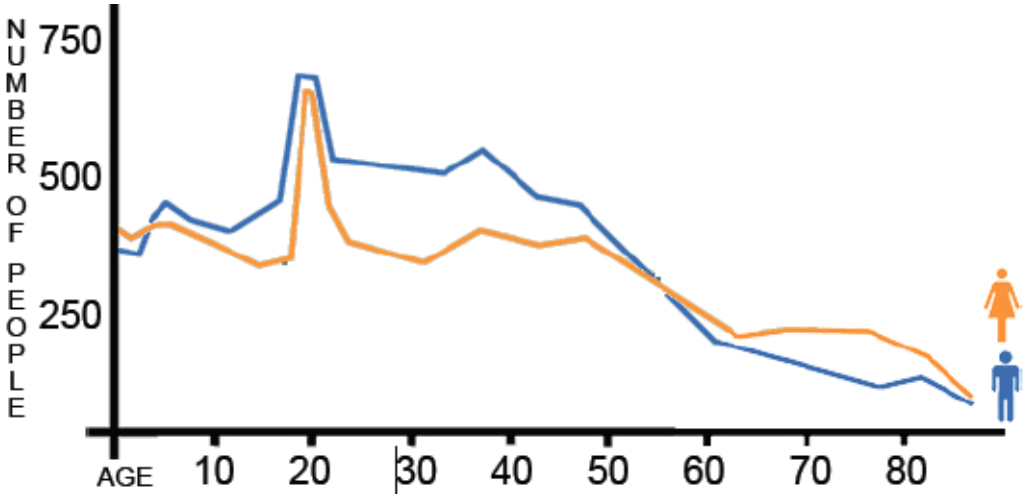


Figure 20: Age breakdown within the South Waterfront zip code.

Demographics

Salem is the third largest city in Oregon, and the state capital. The most recent census to gather ethnographic data reported 83% of respondents as Caucasian, 14% Latino, and the remaining 3% Black, American Indian or Asian (U.S. Census Bureau 2010). Salem's population is estimated to increase by 56 percent by 2050. To accommodate such growth without increasing Salem's density, the Salem-Keizer Urban Growth Boundary (UGB) would need to increase by 64 percent (see Figure 21). Keeping the existing UGB in place, the South Waterfront site would be proportionally responsible for 34 people. Salem's daytime population increases by seventeen percent with commuters, the majority of whom are from Portland and travel by car. Outside the state government, the top industries in Salem are education, health, and social services. Within the site's zip code (97301), the largest portion of the population is between nineteen and twenty-four years old (U.S. Census Bureau 2010). This is likely due to the presence of Willamette University.

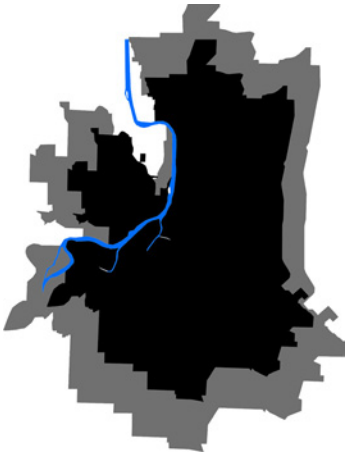


Figure 21: Projected urban growth based on predicted 2050 population in Salem.

Housing

Excluding campus housing, the most common dwelling units in South Waterfront's zip code are studios and two-bedroom apartments. Forty-three percent of Salem's population rents, while fifty-seven percent are homeowners. Opportunities for downtown living have recently become available in Salem with the construction of mixed-use high-end projects such as the Meridian, Rivers Condos, and 295 Church condos. Affordable housing downtown and throughout Salem is needed. The Riverfront-Downtown Urban Renewal Area (RDURA) and South Waterfront Urban Renewal Area (SWURA) plans include goals for

developing more housing options, as well as the amenities to support downtown living. A variety of attractive housing options on the South Waterfront, including affordable housing, would provide Salem residents with a wide range of income levels better access to urban amenities.

Figure 22: The Meridian is a recently constructed mixed-use project in the South Waterfront area.

Brownfields

In June 2007, the Oregon Department of Environmental Quality issued a "No Further Action Required" document to the Boise Cascade Corporation, stating that based on current and future land uses for the site (industrial, commercial, or urban residential), no further cleanup or remediation action was required (Oregon DEQ 2007). This conclusion was based on a Phase I Environmental Site Assessment (after soil testing) prepared by CH2M Hill in 2007:

> The results indicated (1) PCBs, metals, and dioxins are locally present in shallow soil but at concentrations below DEQ cleanup levels; (2) Oil is present in deep soil (about 25ft) and groundwater, however groundwater beneath the site is not used as a water supply and human contact with deep soil is unlikely; (3) Oil in groundwater does not appear to have migrated to surface waters and is not likely to migrate in the future; and (4) There are no current or potential future unacceptable risk[s] to human or wildlife from contaminants detected in soil and groundwater.

In this report, soil samples were not taken from under the foundations of buildings on the site or below the bunker C tank. Boise's investigations also found high levels of benzopyrene contamination at depths greater than 12 feet. This compound could pose serious health risks to construction workers undertaking excavation and foundation work (Oregon DEQ 2007).

The site's developer recently commissioned additional soil tests and is working to analyze the results to gain a better understanding of the types and concentrations of contaminants on the site. This information will provide the developer with the tools needed to move forward. **It should be noted that the following diagrams are based on student conjecture and reference to the NFA document and historical photographs; they do not incorporate data from the most recent soil tests.**

In terms of cleanup and moving forward, students recommended the actions described in Figure 25. However, some of these recommendations may be subject to change in light of the recently completed soil analysis.

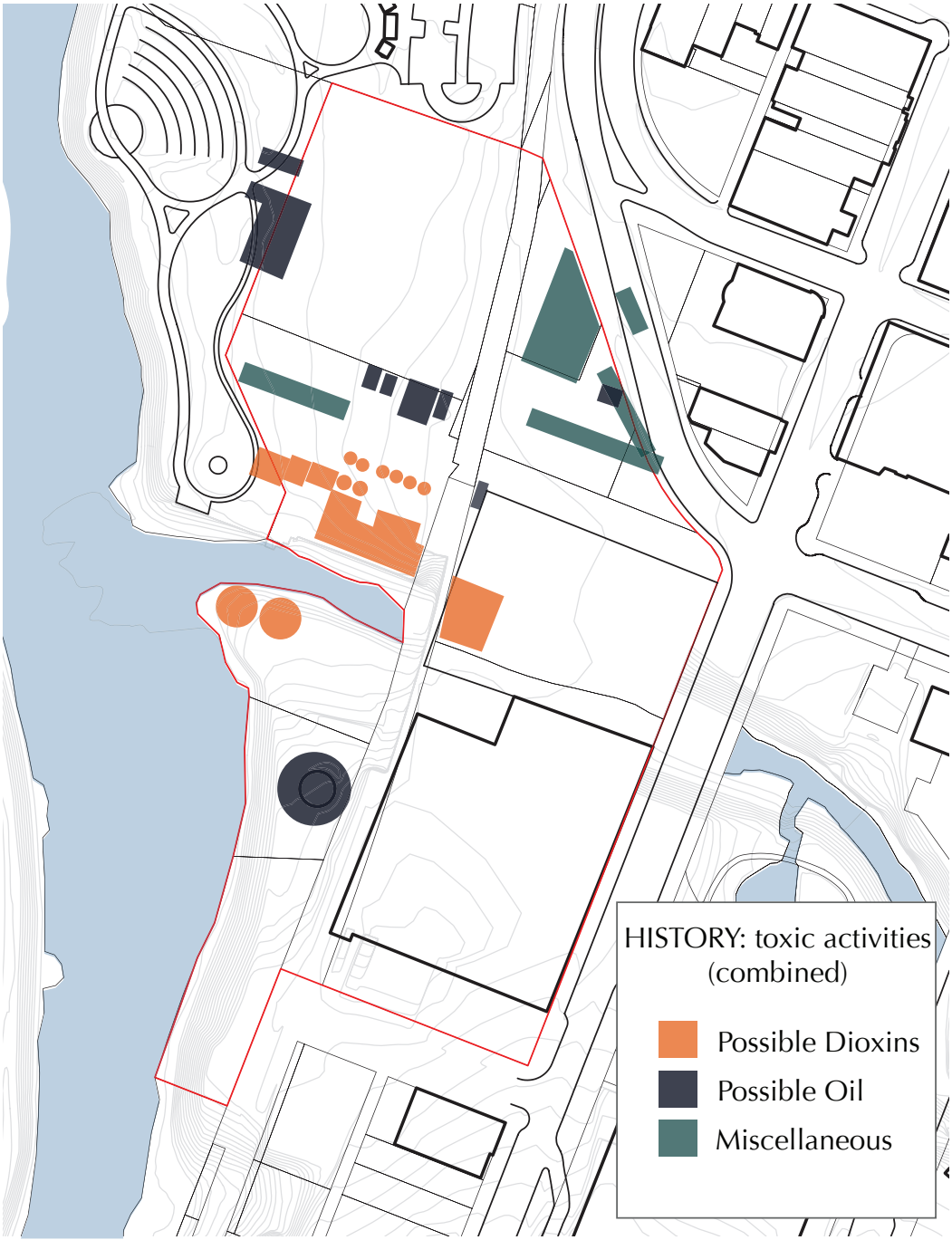


Figure 23: Historical analysis of contaminated areas.

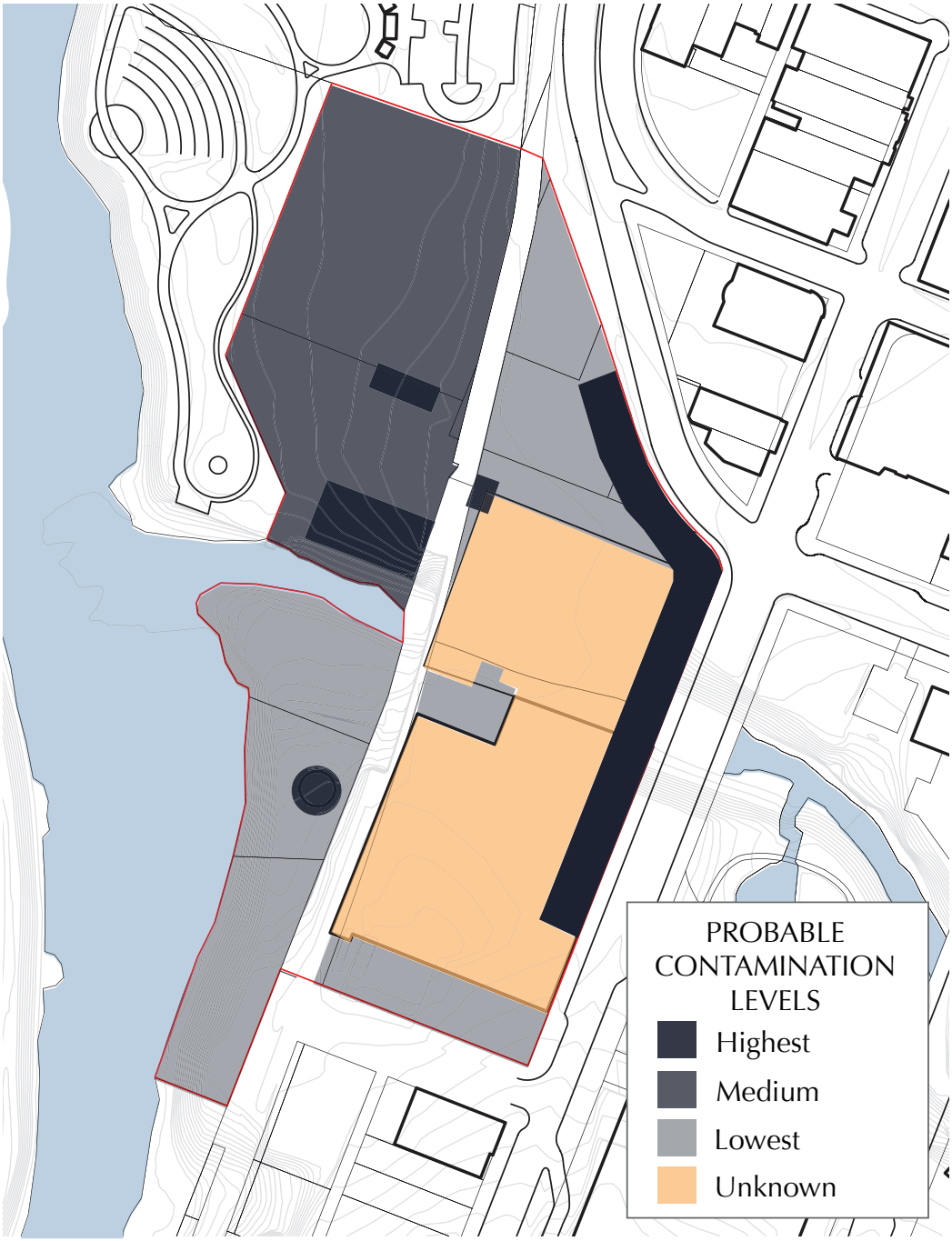


Figure 24: Probable contamination areas.

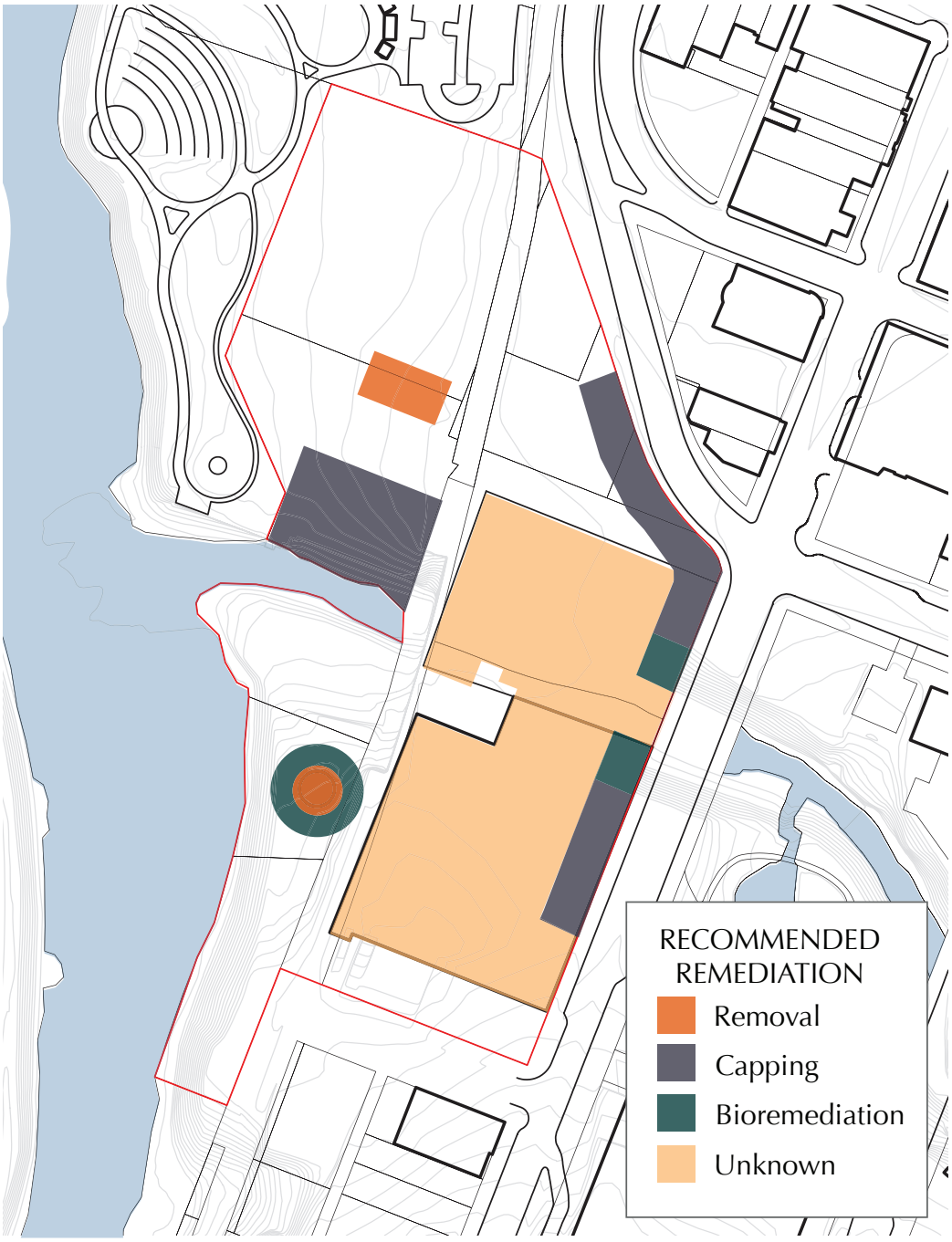


Figure 25: Recommended remediation.

Habitat

The South Waterfront is located in an urbanized watershed and is characterized by a degraded natural landscape consisting of invasive vegetation, contaminated soils, impervious surfaces, and abrupt habitat edges. The thirteen-acre site exhibits an unusual combination of wildlife habitat and industrially impacted locations. The non-native and weedy native plant species are tolerant of compacted soil, disturbance, or both, resulting in overall degradation of plant community quality. The banks of Pringle Creek and the Willamette Slough have been degraded by the influx of surface water containing fill and industrial effluents. Nonetheless, there appears to be great ecological potential for the South Waterfront as a transitional zone between dense urban development and the wetlands and wildlife refuge on Minto-Brown Island. As a

	HABITAT	NESTING	DIET	HUMAN TOLERANCE	MIGRATION
DUSKY CANADA GOOSE	Large, open areas near water, often farmland	Breed and nest in Alaska,only winter in the Willamette Valley	Grasses, grains, silt, aquatic plants, garbage	Yes, tolerate humans but can be harmed by them	Winter in the Willamette Valley from October 1st to April 30th
GREAT BLUE HERON	Grassy open areas near shallow water	In cottonwood and ash trees, near water, in colonies	Small fish, shrimp, rodents, aquatic insects	No, sensitive to human disturbance	Year-round resident
WESTERN POND TURTLE	Access to water large amounts of logs and boulders for basking	South-facing, open area of sand or hardpan within 90m of water	Insects, aquatic invertebrates, algae, lily pads, cattail roots	Somewhat, generally avoid close encounters	Year-round residents
SWALLOW	Low vegetation near water, avoid heavily wooded or densely urban areas	Build clay huts on building walls, or in tree cavities	Insects, no bees or wasps	Yes	Some species migrate
CHINOOK SALMON	Riparian vegetation, protective debris, shade, low water temperature (Pringle Creek is rearing habitat for juvenile salmon)	Nest in streams south of Pringle Creek	Insects, amphipods, and other crustaceans	Threatened by fishing, pollution, and habitat destruction	Migrate from spawning habitat to rearing habitat after a few weeks were they will stay for 6 months to a year before they migrate to the ocean

Figure 26: South Waterfront wildlife.

transitional area or ecotone, the South Waterfront contains a variety of species native to these habitat types. The site area is an important stopover location for migratory birds like Dusky Canada Geese and Swallows. The Great Blue Heron, a native bird, also forages along the Willamette Slough. The Western Pond Turtle has established a foraging and nesting ground here. Chinook Salmon migrate up Pringle Creek to reach spawning waters farther south. The redevelopment of the South Waterfront provides the opportunity to enhance and naturalize the banks of Pringle Creek and the slough, reintroduce native plant species, and protect the restored areas while encouraging public access.

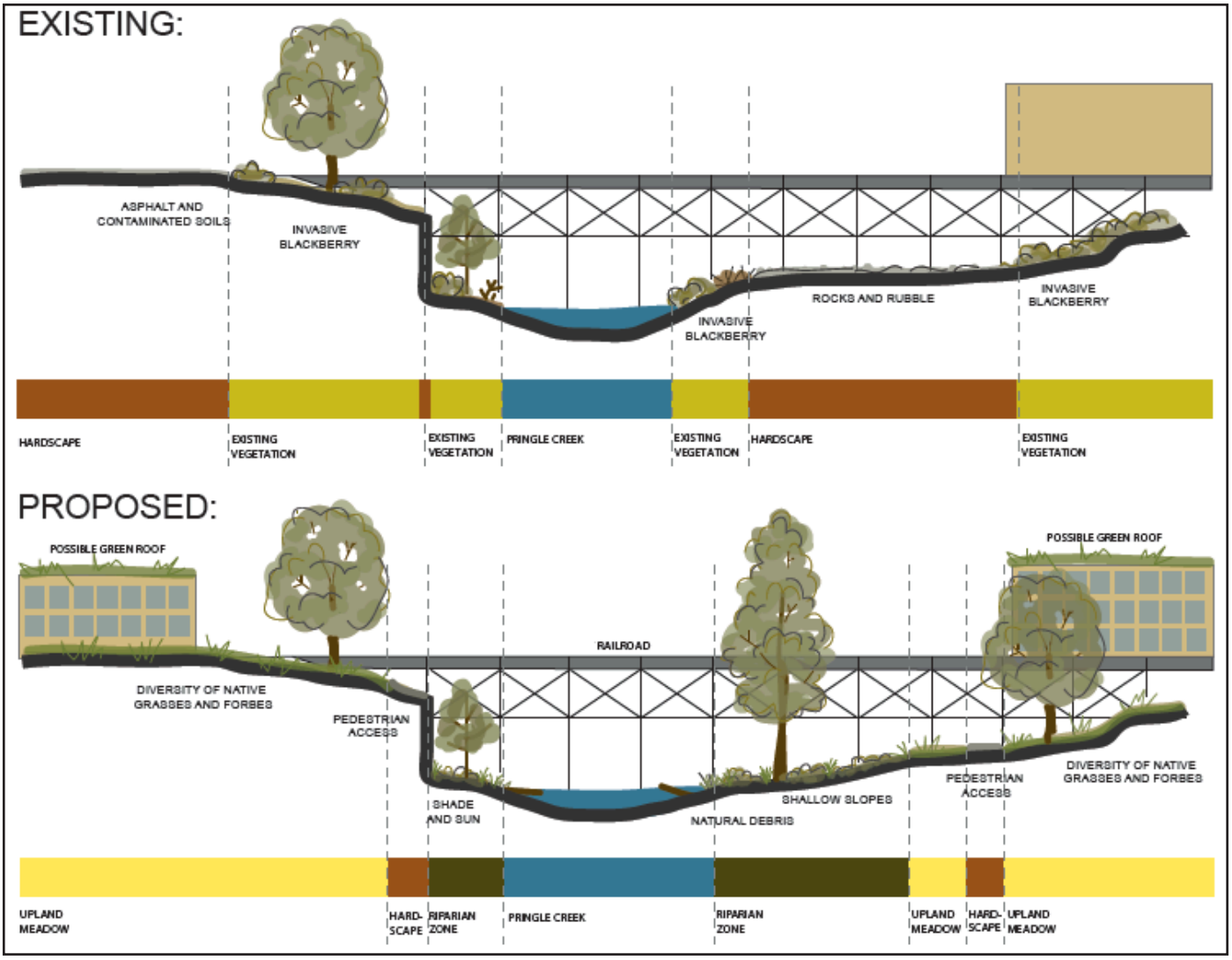


Figure 27: Proposed habitat improvements to the Pringle Creek corridor.

Figure 28: Retaining wall along the north bank of Pringle Creek.

Major obstacles to the habitat restoration of the South Waterfront are contaminated soils, the railroad tracks, the concrete slab foundation of the former Boise Cascade machine room, and the existing twenty-foot-high retaining wall along the north bank of Pringle Creek (see Figure 28). In studying the existing ecological conditions of the South Waterfront, UO students proposed four goals for incorporating environmental stewardship in the site's redevelopment, as well as suggestions for their attainment:

Create quality habitat for people and wildlife.

- Designate specific wildlife habitat areas versus recreation areas.
- Plant edible vegetation to benefit both people and animals.
- Encourage pollinators to benefit flora and agriculture in the area.
- Construct green roofs to provide additional habitat.

Restore the ecological function of the site.

- Daylight Pringle Creek.
- Replant the Willamette Slough in conjunction with Minto-Brown Island Park.

Connect the site to other habitat patches and corridors.

- Create large-scale connection to the wildlife refuge on Minto-Brown Island.
- Promote local connections to Mirror Pond and the millrace greenway.

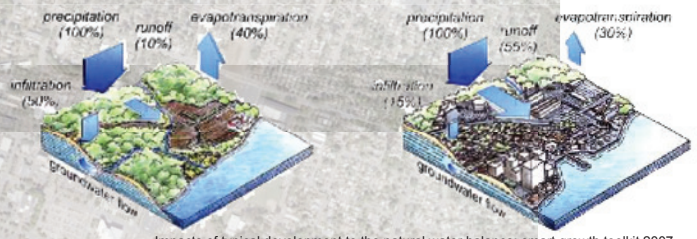
Educate the public about local habitat function and potential.

- Use signage to raise awareness of native species and ecosystems.
- Include an educational walkway, with artistic, kid-friendly signage.

The ecological restoration of the South Waterfront will significantly contribute to the City of Salem's economic and ecological goals. The ecological rehabilitation of the site's natural areas will leverage the benefits toward marketing a redeveloped area. Conducted as part of the overall redevelopment of the South Waterfront, habitat restoration and improvement, along with the additional aim of educating the community, will significantly benefit both local wildlife and the public.

Hydrology

It is useful to compare the historical condition of the site with the current conditions to best understand stormwater runoff challenges. Students considered the land area within a half-mile radius of the South Waterfront site (see Figure 29), extending east from the Willamette Slough and River. The average annual precipitation in this circular area is 294 million gallons. In predevelopment conditions, infiltration accounted for 147 million gallons, evapotranspiration for 117.6 million gallons, and runoff for 29.4 million gallons. In the site's current condition, in which many of the mill buildings have been demolished, infiltration accounts for 44.1 million gallons, evapotranspiration for 88.2 million gallons, and runoff for 161.7 million gallons. This circular area is approximately 80% impervious surfaces today.



Impacts of typical development to the natural water balance; smart growth toolkit 2007

Predevelopment Conditions

- Annual precipitation: 294 million gallons
- Infiltration: 147 million gallons
- Evapotranspiration: 117.6 million gallons
- Runoff: 29.4 million gallons

Existing Conditions*

- Annual precipitation: 294 million gallons
- Infiltration: 44.1 million gallons
- Evapotranspiration: 88.2 million gallons
- Runoff: 161.7 million gallons

*the district is approximately 80% Impervious Surfaces

Data pertain to the ***district***, referring to the land area within a half-mile radius of the site, on the east side of the Willamette Slough and River

Figure 29: Predevelopment and existing conditions.

Another consideration specific to the South Waterfront site is flooding. Salem experiences flooding annually, and these events range in severity. In the last 130 years, Salem has experienced 100-year flooding events four times. Two primary types of flooding occur in Salem. The first is riverine flooding, which refers to overbank flooding and is part of a natural process. The second is urban flooding, which results when fields and woodlands are converted to parking lots, roads, and other impermeable surfaces interfering with the natural ability of the land to absorb rainfall. Residents of the Pringle Creek watershed report an increase in the occurrence of flooding events. In addition to making streets impassable, these flooding events have caused damage to homes and businesses.

There is a large volume of stormwater runoff to be factored into in any development scheme for the South Waterfront. For the purposes of this course, three goals were established to responsibly manage stormwater in any development proposal:

- Manage stormwater onsite
- Reduce potable water demand
- Use the site as an educational model for stormwater management

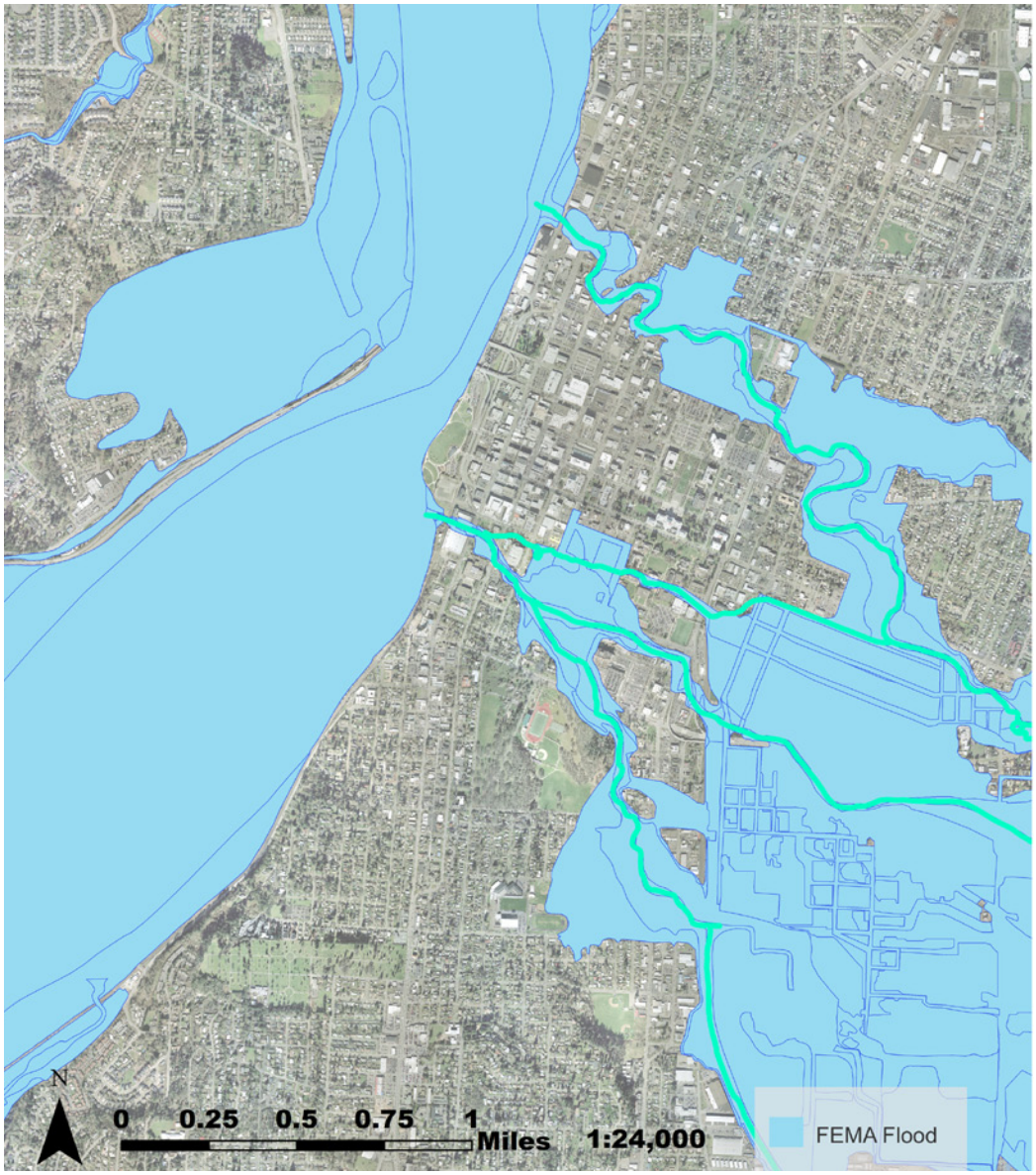


Figure 30: FEMA floodplains within two miles of the project site.

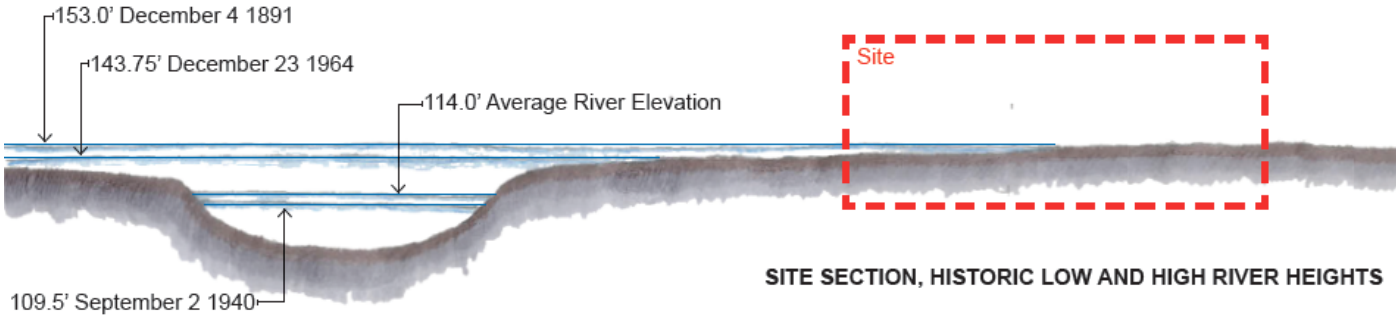


Figure 31: River highs and lows.

Managing Stormwater On-site

On-site stormwater management strategies include green roofs, bioswales, and rain gardens. Basic facts about each strategy follow:

Figure 32: Example of green roof, Chicago City Hall. Source: http://science.howstuffworks.com/environmental/green-science/urban-heat-island2.htm

Figure 33: Example of bioswale. Source: http://homemadewilderness.com/2010/03/19/plant-selections-for-bioswales-and-rain-gardens/

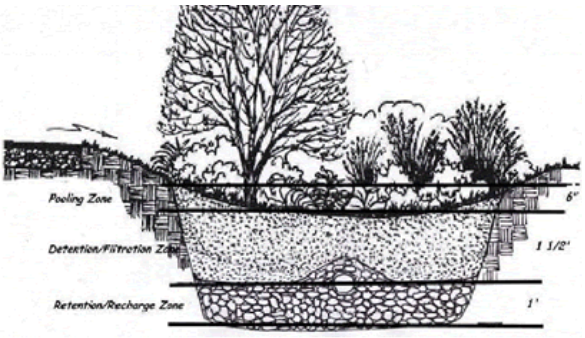


Figure 34: Rain garden cross-section. Source: http://www.landcareresearch.co.nz/research/built/liudd/Rain_gardens.asp

Green Roofs

The capacity of a green roof to retain stormwater and decrease outflow depends largely on the depth of its substrate.

Extensive green roofs have a mean rainwater retention rate of 40%–60%, while intensive green roofs have a deeper substrate and have a mean rainwater retention rate of 60%–90%.

Bioswales

Bioswales help to manage stormwater runoff from impermeable surfaces such as roads, parking lots, and paved paths.

Bioswales can be an attractive amenity in otherwise unappealing areas like parking lots.

Bioswales have the capacity to treat/remediate runoff polluted by oil or other ground traveling pollutants, but should not be overly depended upon for these purposes.

Rain Gardens

Rain gardens can be implemented at a variety of scales to help slow and filter rainwater into the ground, which reduces the amount of runoff from the total surface area of a site.

Integrating rain gardens throughout the landscape can increase community awareness about the stormwater management system.

Reduce the Need for Potable Water

Reducing the need for potable water is an important consideration in new construction projects. In western Oregon, where rain is abundant, collecting rainwater and treating and reusing greywater can aid in this endeavor. Generated from domestic activities such as laundry, dishwashing, and bathing, greywater can be recycled on-site for uses such as toilet flushing, landscape irrigation, and constructed wetlands. Oregon House Bill 2080, passed in 2008, allows greywater reuse for commercial and residential non-potable use. The bill permits greywater use for flushing toilets and urinals in commercial buildings but specifically prohibits greywater use in kitchen and bathroom sinks and dishwashers.

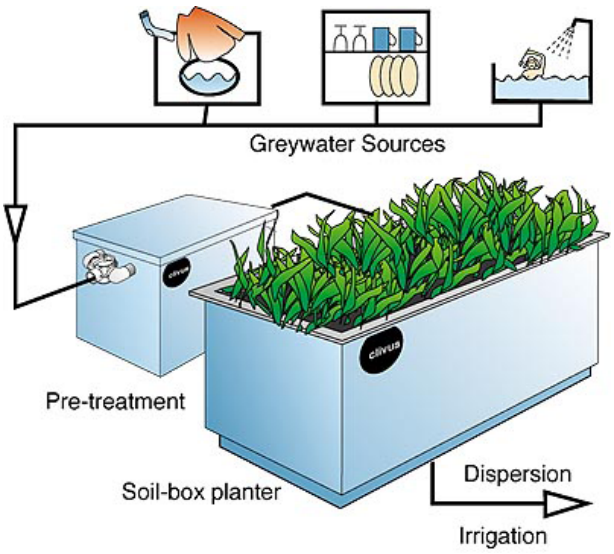


Figure 35: Greywater diagram. Source: http://www.greywater.com.

Rainwater harvesting refers to the collection and storage of rain, typically collected from rooftops and stored in catchment tanks. Systems can range from a simple barrel at the bottom of a downspout to multiple cisterns with pumps and controls. Rainwater catchment helps reduce stormwater runoff pollution. When rain falls, it is typically clean, but immediately picks up pollutants from rooftops and pavement. This pollution is carried into storm drains and then into streams. Collecting stormwater to be used for irrigation or flushing toilets decreases the volume and rate of runoff. To use harvested rainwater to flush toilets, water treatment with filters, ultraviolet sterilizers, and/or chlorine (usually a combination of the first two, and possibly all three) is required.

Figure 36: 5,600 gallon rainwater cistern for Denton Fire Station, TX. Source: flickr user user watercache.com

Figure 37: Sidwell Friends School campus. Source: http://www.kierantimberlake.com/featured_projects/sidwell_school_1.html

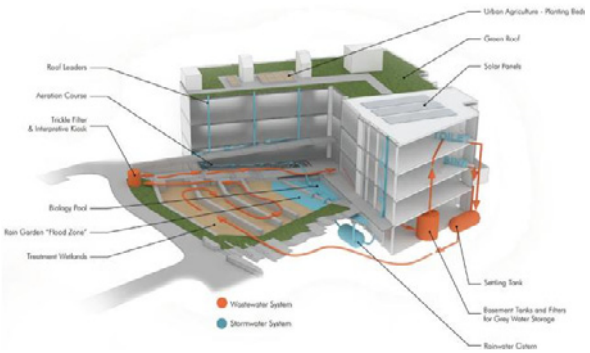


Figure 38: Sidwell Friends School diagram. Source: http://pruned.blogspot.com/2009/06/wetland-machine-of-sidwell.html

Site as Education

Educating the public about disruption of the stormwater management system caused by development and the environmental impact of impervious surfaces can often be achieved through example. Design elements including green roofs, bioswales, and rain gardens are powerful tools. Man-made experiential strategies that mimic natural systems and technologies can often communicate as effectively as signage, and can provide an aesthetically pleasing addition to public open space.

The Sidwell Friends School in Washington, D.C. provides a good example of integrated sustainable stormwater and wastewater management systems with an educational focus. The school uses natural systems as a functional model for stormwater and wastewater management and allows paths, play areas, and landscape to teach students about stormwater/runoff issues.

Transportation

Since the late 1950s, the South Waterfront has been effectively separated from downtown by Highway 22, which runs for several blocks along Front Street and connects to the Ferry/Trade Streets couplet, as well as by Commercial Street. These streets are principal thoroughfares intended to direct cars quickly through and around downtown. The daily traffic on Highway 22 exceeds 40,000 vehicles, while Front, Ferry, and Commercial Streets accommodate 12,000 to 22,000 cars per day. While painted bicycle lanes exist, for the most part, on these streets, the high volume of car traffic deters use. With continued population growth and more cars in Salem, traffic congestion will only increase on these streets, which already exceed Oregon Department of Transportation (ODOT) standards (ODOT 2011). Free public parking in the downtown area is provided on streets; between 9 a.m. and 5:30 p.m., however, these parking spaces are limited to two hours on the same block. Metered and free customer parking is also available in the Chemeketa, Liberty, Marion, and Pringle Parkades, which are all located within a half-mile radius of the South Waterfront.

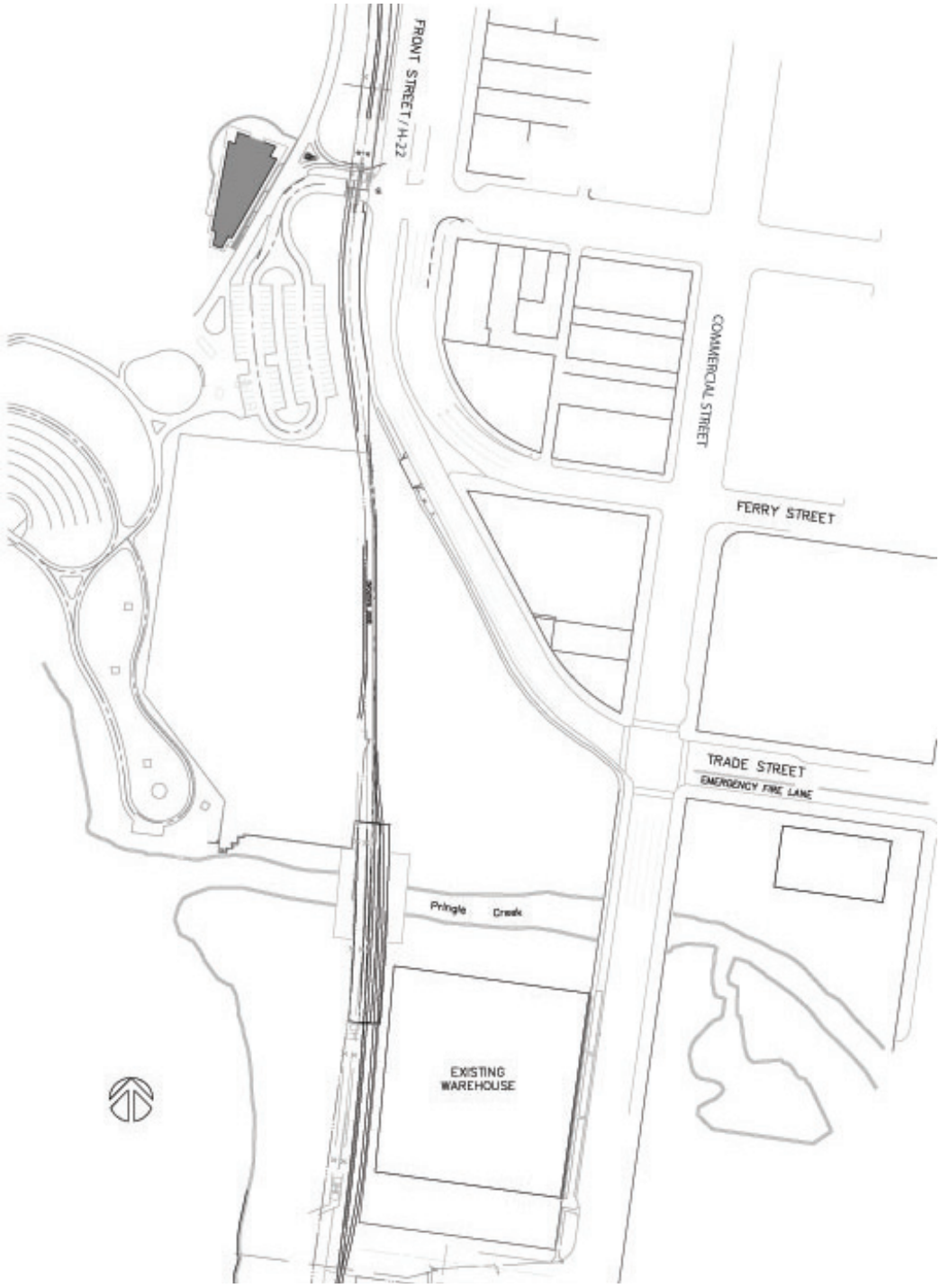


Figure 39: Street system adjacent to the South Waterfront.

Safe pedestrian and bicycle access to Riverfront Park is limited, but possible at two crosswalks on the Front Street section of Highway 22 – one at State Street and one at Court Street. Currently, these crosswalks entail long waits and regularly require pedestrians to wait on the median strip before reaching the other side of Front Street. A single crosswalk at the intersection of Front, Commercial, and Trade Streets provides the only safe pedestrian access to the South Waterfront at this time. The railroad tracks running north-south along the west side of Front Street create an additional barrier to vehicles and pedestrians. Cars can cross the railroad tracks at the State Street entrance to Riverfront Park, where there is a small parking lot. Another vehicle entrance is located at Union Street on the north end of the park, about half a mile from the South Waterfront property.

Public transportation is provided by the Salem-Keizer Transit District (aka Cherriots). Courthouse Square, Salem's main public transit station on the east side of downtown, has recently been vacated and closed due to structural problems. Cherriots buses line up on Church Street, between Court and Chemeketa Streets. In addition to the main downtown transit center, there are a number of bus stops within easy walking distance of the South Waterfront. For Salem commuters, Amtrak passenger trains and Cherriots shuttles are the main forms of public transit up and down the Willamette Valley, connecting Salem to Portland and south to Corvallis and beyond. Located on 13th Street SE adjacent to Willamette University, Salem's train depot is nearly a mile from the riverfront, with no clearly defined pedestrian or bicycle routes connecting it to downtown.

Transportation Improvements

Goal 1: Provide Car Access

With the redevelopment of the South Waterfront, the City of Salem and private developers have the opportunity to provide better car access to the riverfront. Taking into account ODOT policies restricting vehicle crossings over the railroad tracks, UO students identified three ways to improve car access to the riverfront and South Waterfront property:

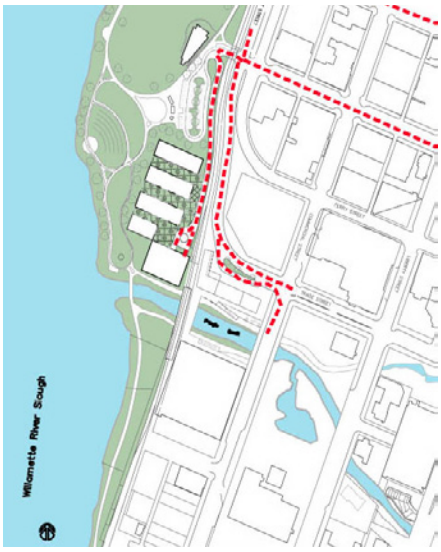


Figure 40: Suggested improvements for car access to the South Waterfront.

- Modify Court and State Streets for two-way traffic.
- Provide a frontage road from the existing State Street entrance to new development.
- Realign the intersection of Front, Trade, and Commercial Streets.

Providing two-way automotive traffic on Court and State Streets will make it easier for cars to access Front Street and the existing State Street entrance to the riverfront. Since current ODOT policy allows only one vehicle crossing over the railroad, a frontage road from the State Street entrance will use the existing infrastructure,

minimizing new construction. A frontage road separate from the existing parking lot will also provide access to new development without compromising the safety of families, particularly children, using the park playground and carousel. The realignment of the intersection of Front, Trade, and Commercial Streets will bring Front Street closer to the railroad, facilitating potential overhead, at-grade, or below-grade crossings. Moreover, by realigning this intersection, the north block between Front, Ferry, and Commercial Streets assumes a larger, more regular shape, which will provide better opportunities for development.

Goal 2: Provide Mass Transit

Once the historic gateway to Salem, the South Waterfront could again be the point at which regional commuters enter the city. The railroad tracks that run through the site could be converted from freight use to a commuter rail line. Because the Amtrak railroad (one mile east of the site) is required to cede priority to freight trains, current commuter service can be unreliable. A proposed commuter rail line along the Salem riverfront could connect to the Westside Express Service commuter rail in Wilsonville, which extends to Portland, and potentially continue south from Salem to Albany, Corvallis, and Eugene. The riverfront provides a central and scenic gateway to Salem. A multi-modal transit center on the South Waterfront site could connect regional commuters to pedestrian and bicycle paths, as well as to a streetcar/trolley system. A two-phase streetcar loop through Salem's core would offer a quick, more sustainable means for commuters and potential riverfront and downtown residents to get to work. Phase I of the streetcar system would connect the riverfront and downtown to Willamette University, the hospital, and state government buildings by extending east from the South Waterfront along

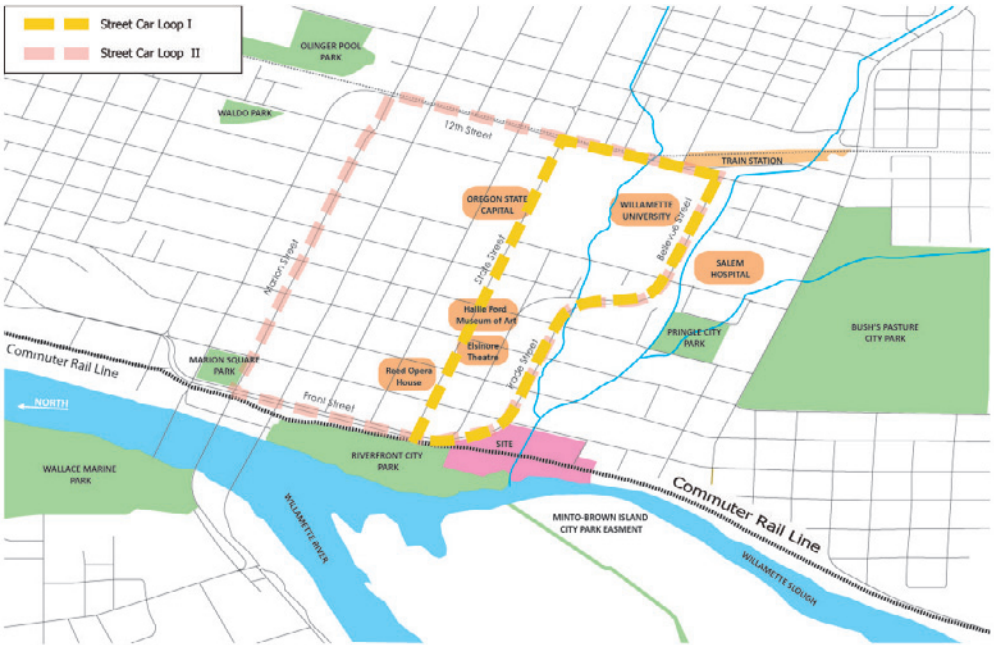


Figure 41: Proposed mass-transit improvements.

Figure 42: Willamette Valley Scenic Bikeway.

Trade Street to 12th Street, looping back to Front Street via State Street. Phase II would lengthen the streetcar line along 12th Street and return to Front Street via Marion Street. Transit connections to grocery stores like Safeway and the Salem Shopping Center are crucial to support residential use and a sustainable community on the South Waterfront.

Goal 3: Improve Bicycle and Pedestrian Access

To further encourage sustainable transportation options in Salem, the South Waterfront redevelopment can improve bicycle and pedestrian connections at both the regional and local scale. Salem is located on the Willamette Valley Scenic Bikeway, which extends from Champoeg State Heritage Area to Armitage Park, just north of Eugene (see Figure 42). The existing bikeway runs alongside heavy traffic on Front and Commercial Streets. By connecting Riverfront Park pathways to Minto-Brown Island and through the South Waterfront site, the scenic bikeway can be rerouted along the downtown riverfront, away from automotive traffic.

Pedestrian and bicycle access to the riverfront from downtown is available at Court and State Streets, and at the intersection of Front and Commercial Streets. While sidewalks provide adequate pedestrian access to these crossing points, downtown's heavily trafficked street network lacks bicycle lanes on some streets, discouraging cyclists who are uncomfortable in mixed traffic. Many of the streets surrounding the downtown core are more conducive to bicyclists, having designated bicycle lanes and low volume traffic. Painted bicycle lanes and signage could provide safer connectivity between the downtown riverfront and these more bicycle-friendly streets. With the redevelopment of the South Waterfront, the best opportunity for connective pedestrian and bicycle routes is along Pringle Creek and the existing millrace greenway. Creek-side pathways would provide a safe, experientially rich route by which pedestrians and bicyclists could access the

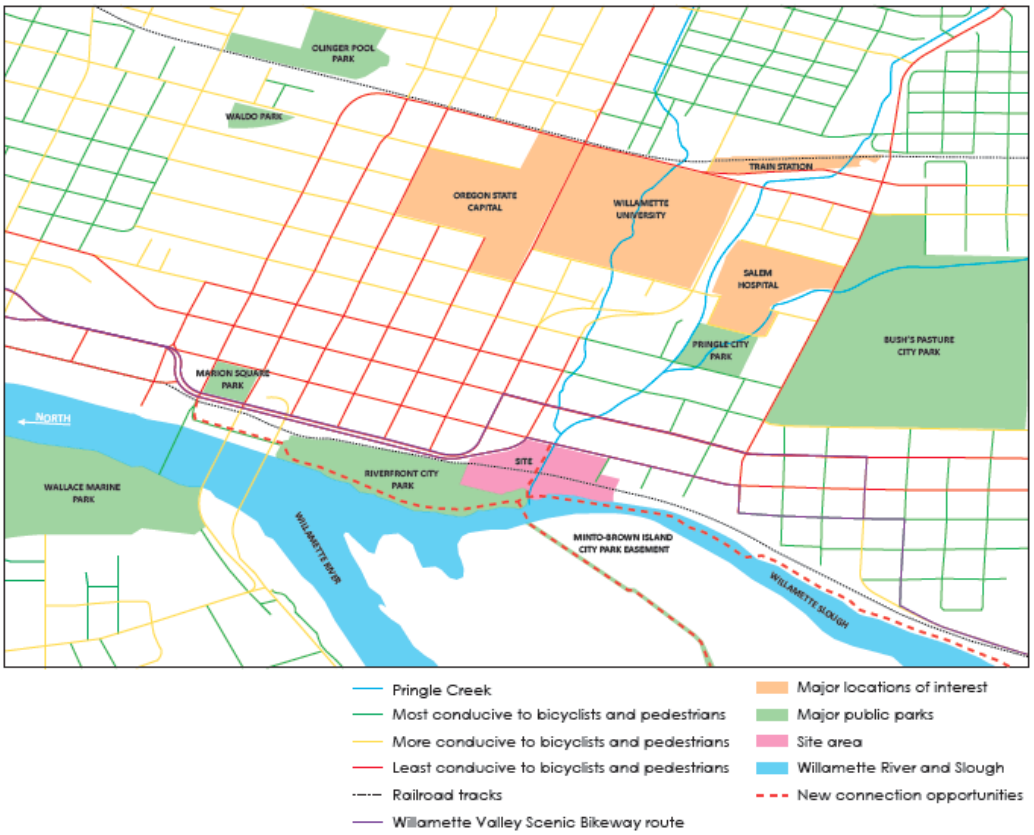
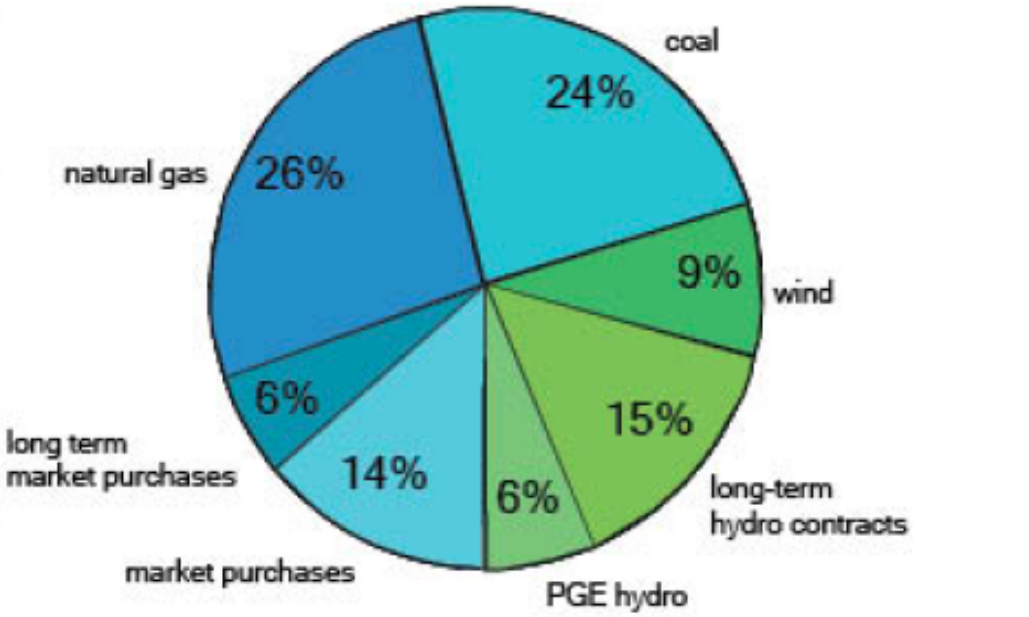


Figure 43: Bicycle routes to downtown Salem and the riverfront.

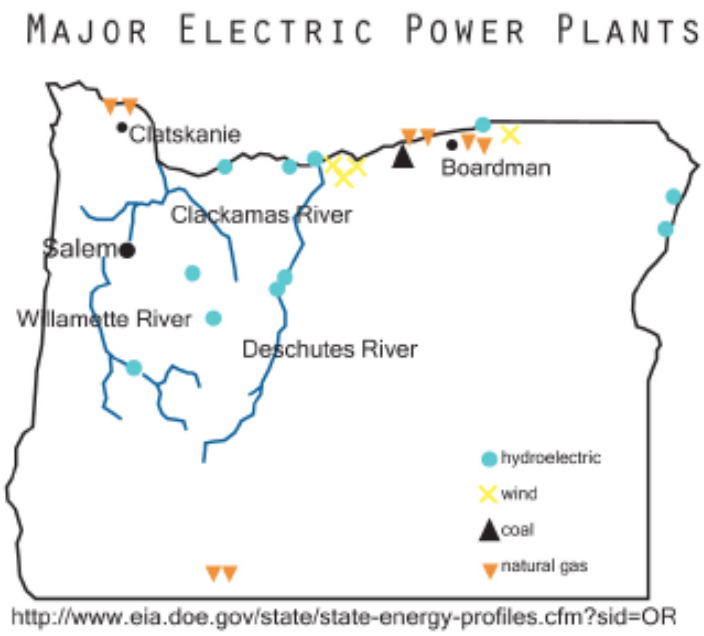
riverfront from south and east Salem, and reach other major destinations such as the hospital, Willamette University, and the Capitol Mall. By creating a safe and attractive pedestrian environment on the South Waterfront site with bike access and ample parking, riverfront residents and visitors will be encouraged to use healthier, more sustainable modes of transportation.

Energy

To meet the energy needs of new development on the South Waterfront and reconfigure current energy consumption in the riverfront vicinity, alternative, more sustainable energy sources could be considered. Energy in Salem is currently supplied using large, central power plants that transmit power across long distances (see Figure 44). Seventy percent of the electric power in Salem is provided by Portland General Electric (PGE), Pacific Power, and Idaho Power. The other thirty percent of electricity comes from consumer-owned utilities, which obtain power from the Bonneville Power Administration, a federal power-marketing agency. To reduce energy consumption and dependence on centralized utilities, the city and private developers can explore the use of renewable sources such as hydroelectric power, wind energy, biomass energy, geothermal energy and heat recovery systems.



http://www.portlandgeneral.com/our_company/corporate_info/how_we_generate_energy.aspx



http://www.eia.doe.gov/state/state-energy-profiles.cfm?sid=OR

Figure 44: Portland General Electric's electricity generation profile, and major electrical generation facilities in Oregon.

Hydroelectric Power

Just as past industries utilized Pringle Creek and the Willamette River for power, so, too, could new development on the South Waterfront. A one million gallon tank already exists on the north bank of Pringle Creek and could be used for water storage. Although a renewable energy source, hydropower can be inconsistent throughout the year and can pose a threat to water quality and fish populations.

Figure 45: In the late 19th century, Salem Flouring Mills used a turbine to power the mill on Pringle Creek.

Wind Power

The South Waterfront possesses some potential for wind energy harvesting. Wind turbines would need to be positioned at a considerable height to be effective. Wind power, while clean and renewable, would produce low amounts of energy in Salem and could only supplement other energy sources.

Figure 46: Architectural microturbines are easily scalable for the urban environment. Source: http://inhabitat.com/architectural-wind-modular-wind-turbines/

Biomass Energy

The South Waterfront is located within reasonable distance from biomass sources. Biomass power generation employs the byproducts of organic material processing and simultaneously produces heat and power. Biomass energy can therefore be used for both electricity and hot water. Nevertheless, there are some disadvantages. Biomass energy results in considerable water consumption and air pollution, which is often met with resident disapproval.

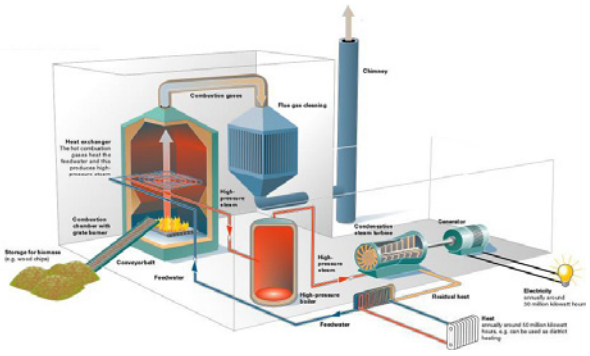


Figure 47: Converting biomass to energy. Source: http://cleangreenenergyzone.com/biomass/

Geothermal Energy

Clean and affordable, geothermal energy is available at a variety of scales. Like wind power, geothermal energy can serve as a supplemental source, since it is less useful in winter. Geothermal energy requires considerable land area, and the South Waterfront site's proximity to the creek and river will limit the availability of this energy source.

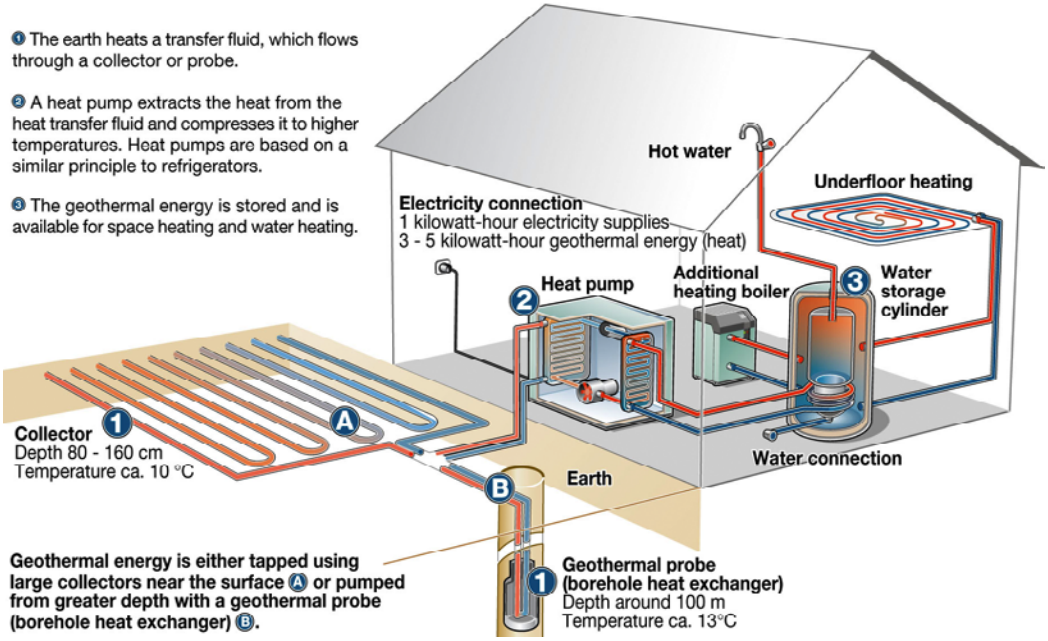


Figure 48: Heat from near-surface geothermal energy. Source: http://www.esm-corporation.com/

Figure 49: Harvesting the heat of sewer lines to supply the hot water and heating needs of Vancouver, B.C.'s Olympic Village. Source: http://kristophergrunert.tumblr.com/

Heat Recovery System

It is possible to recover heat from a building's ventilation, water, and waste systems and reuse it to preheat cold water or air. By capitalizing on existing infrastructure, heat recovery systems result in considerable cost and energy savings. However, there can be extensive up-front costs and a backup energy supply is usually required.

Design Proposals

Overview

After midterm review, the studio came together to brainstorm possible programs for the site. Students discussed ideas ranging from recreation fields and healing gardens to entertainment centers and breweries. Ultimately, three themes emerged: Parks and Open Space, Transit Center and High-Density Development, and Education Hub. The class split into three, roughly equal-sized groups to pursue design proposals within these themes, first as a larger team and ultimately as individuals or small teams. Each of the three larger groups developed a diagram that described their specific approach and developed an argument for why they believed their decision was a viable option for the redevelopment of the South Waterfront. Some groups chose to work together developing schemes in detail and dividing up presentation work, while others split into smaller teams within the group immediately and worked independently from there. Groups were encouraged to develop their own approach to producing final concepts and presentation drawings.

Parks and Open Space

Group Members: Daniel Frey, Dijon Jones, Wenyu Jiang, Leah Medina, Kelsey Ochs, Michael Weir

The overall approach of the Parks and Open Space group was to challenge mixed-use/high-density zoning for the site. Rather than privatize the South Waterfront property, this group of students prioritized public use, encouraging development that would provide greater bike and pedestrian access to the riverfront, as well as community recreational opportunities. All proposals assume public/private ownership of the land, with the city investing in the northwest and southwest parcels. Remediating brownfield areas to the maximum extent possible is considered a necessary ecological investment in the South Waterfront site.

The Willamette River courses through Oregon and is an important geographical part of Salem's history. River-oriented redevelopment on the South Waterfront will therefore enable the public to connect with nature and appreciate the abundant natural beauty of the state capital. Portland and Eugene have both invested heavily in public green space along the Willamette River, and these efforts have been successful in increasing the value of surrounding property and providing public recreation space. **Parks and Open Space proposals increase the property value for both developers and the city and adhere to the South Waterfront Urban Renewal Plan. Open public space is vital to Salem's downtown and is an essential component of community health**

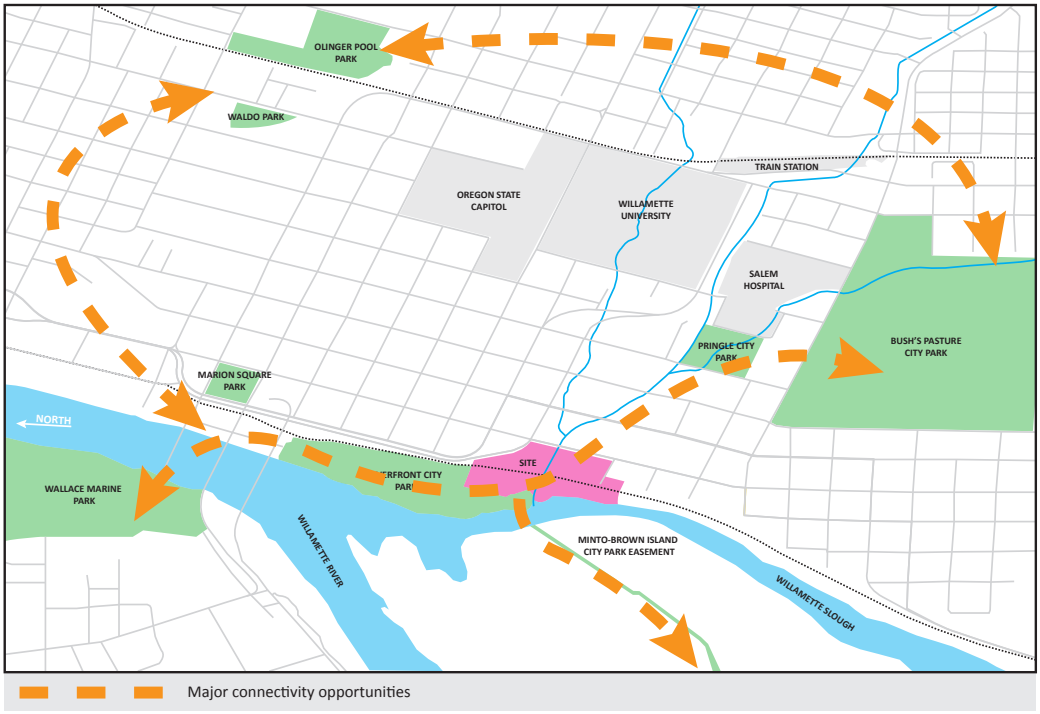


Figure 50: Parks connectivity diagram.

and happiness. Creating a link to other parks in the city will facilitate alternative modes of transportation by providing safe, scenic pathways. Riverfront Park is currently difficult to safely access as a cyclist or a pedestrian. Developing the riverfront immediately south of the park into publicly accessible green space would alleviate this problem. Furthermore, if more access points for bicyclists and pedestrians existed, the proposed bridge to Minto-Brown Island would be used more widely. To develop the above-stated ideas more clearly this group developed a wheel diagram (see Figure 51) to clearly explain their approach to the redevelopment of the South Waterfront.

This group split into three teams to develop final concepts. After developing the diagram in Figure 51, each team within the parks group then customized the diagram by filling in the outer bubbles corresponding to the strategies they were using in their particular schemes. Proposed schemes ranged from fairly developed to minimal development and included earth berms, elevated bridges, a building wedged into the landscape, earth sculptures, reforested areas, a boathouse, and a bird blind.

In Celebrating the Confluence (see Figure 54), Kelsey Ochs and Michael Weir proposed a bird blind, boathouse, and event space for the south slough parcel connected to the north park parcel by a bridge over Pringle Creek. The park parcel would be reforested with native plants, and an interpretive trail would lead to the Riverfront Park parking lot. A greenway running along the north and south banks of Pringle Creek would increase public access to the site for

bicycles and pedestrians and would add value to the northeast and southeast lots, which would remain privately owned. The boathouse and event space could be rented by the Willamette University crew team during the academic year and leased by a private entrepreneur interested in running a kayak or rowboat rental business during the summer months.

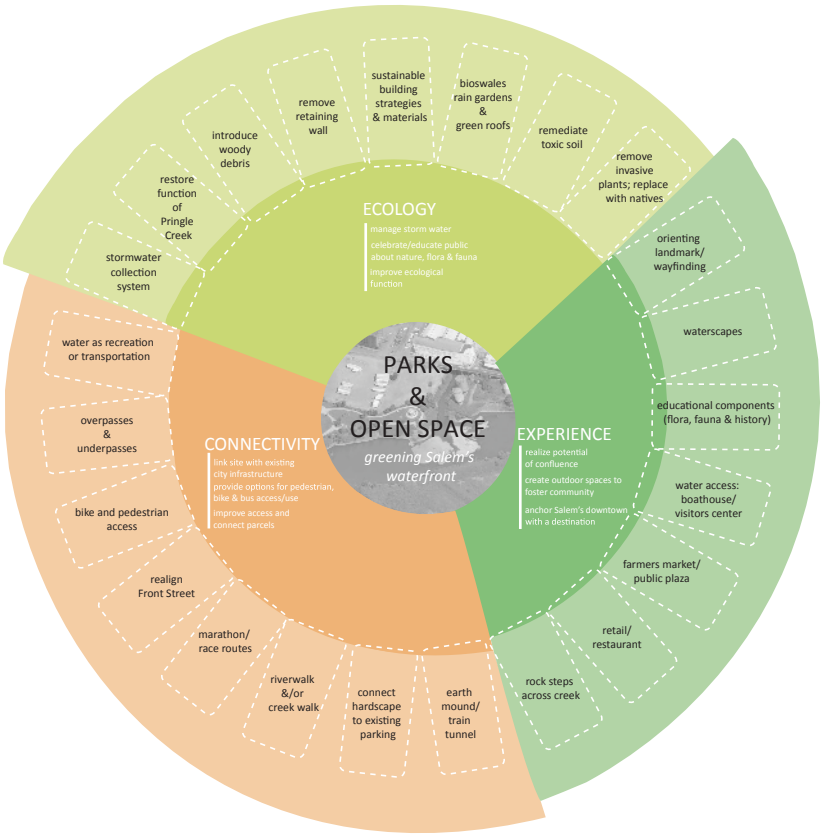


Figure 51: Parks and open space group diagram.

Figures 52 and 53: Pringle Creek at the Confluence, Michael Weir; Bird blind, Kelsey Ochs.

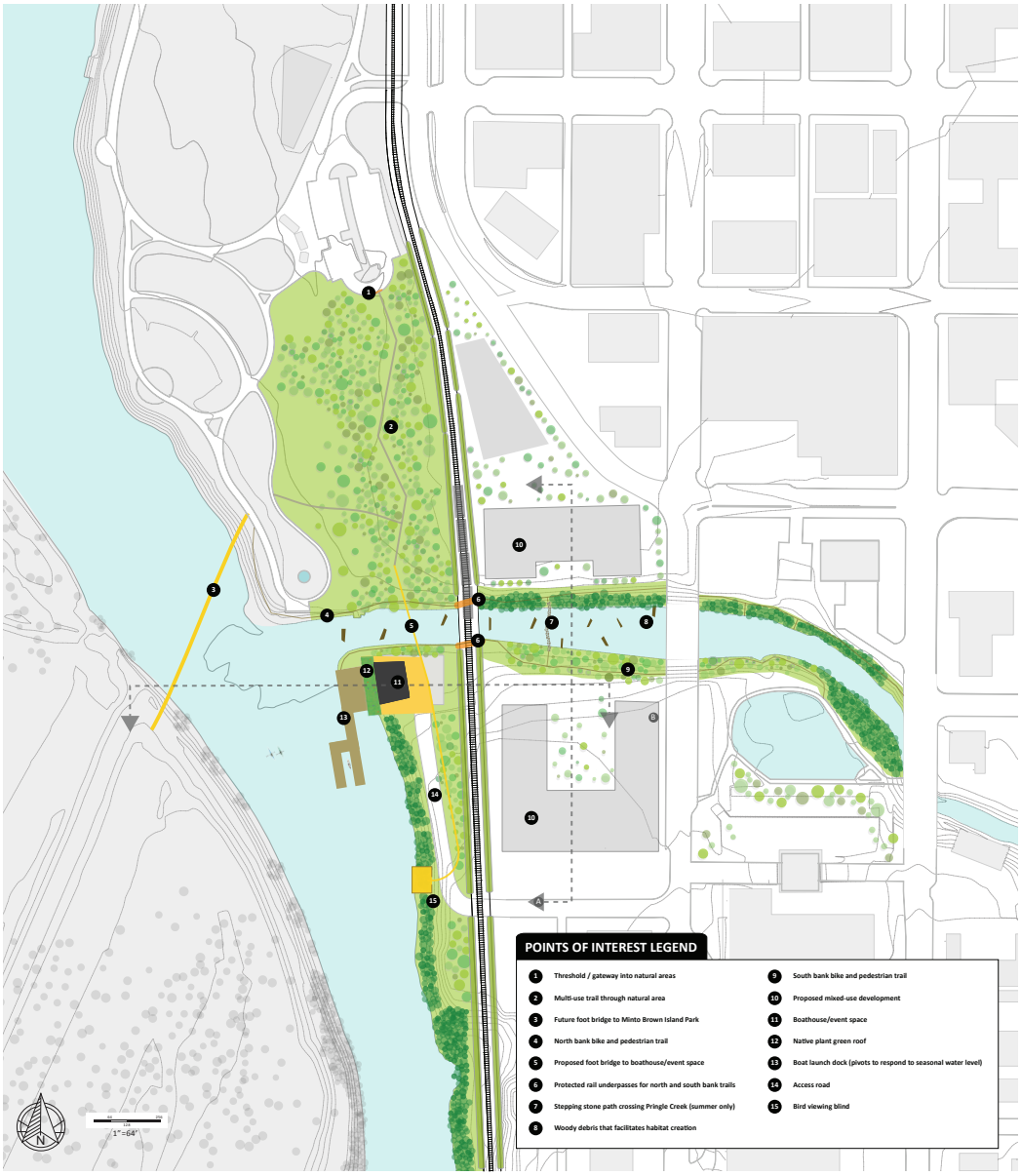


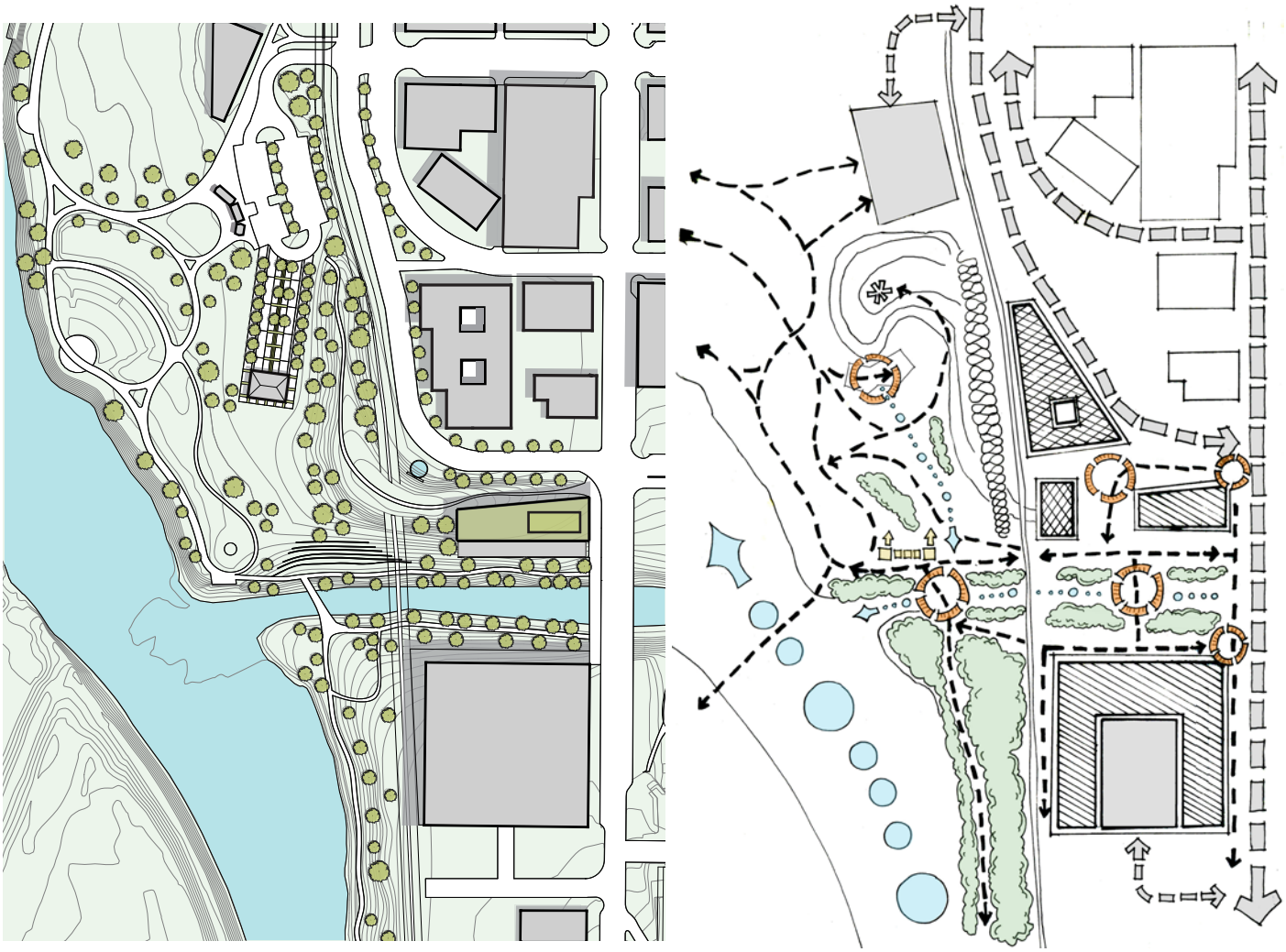
Figure 54: Site plan, Celebrating the Confluence, Kelsey Ochs and Michael Weir.

In Green Landform Links City to Park (see Figures 55, 57, and 59), and Urban Fabric Converges with Waterways (see Figures 56, 58, and 60), Leah Medina and Daniel Frey envisioned an urban edge transitioning into a more natural green space moving from east to west. Undulating landforms lead into carefully constructed outdoor rooms emphasizing the natural beauty of the site. Design goals included providing flexible public and community space, extending and unifying park infrastructure, creating energetic and experiential destinations, creating multiple and diverse park experiences, enabling natural water drainage, and connecting the city to abundant and rich natural resources.

In Invisible Track (see Figures 62 and 65) and Civic Bridge (see Figures 61, 63, and 64), Dijon Jones and Wenyu Jiang envision united parcels, a celebration of the river and the creek, and support of human activity through sustainable buildings on the more developed parcels. An intimacy between human activities and the riverfront environment is proposed, including large open spaces for sports and recreation, sweeping bridge forms to connect isolated parcels, and development of the northeast and southeast parcels.

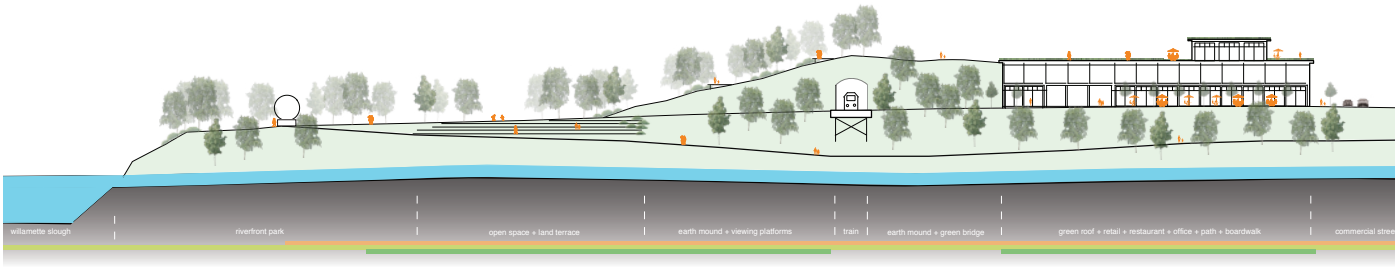
These schemes make the site a visible destination and anchor for the downtown and encourage the community of Salem to protect the environment as well as expand economic opportunities.

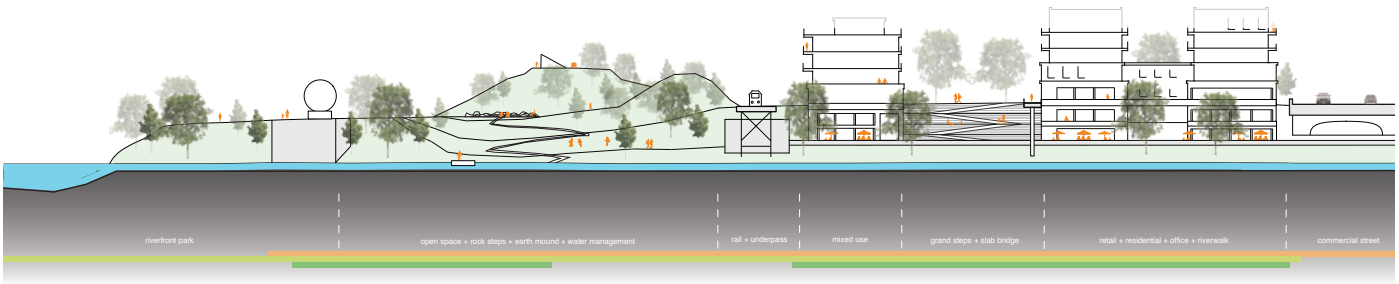
With public parks and open space as an emphasis, the city could greatly expand riverfront access and provide a strong recreational and experiential anchor for the downtown area, attracting business and people. Extending bicycle and pedestrian access will provide safer, more



Figures 55 and 56: Landform site plan, Leah Medina; Urban Fabric concept, Daniel Frey.

Figures 57 and 58: Green Landform, Leah Medina; Urban Fabric, Daniel Frey.





Figures 59 and 60: Green Landform cross-section, Leah Medina; Urban Fabric cross-section, Daniel Frey.

pleasant access to both parks and the downtown. If the city purchases the park and slough parcels for park infrastructure expansion, the Salem community could benefit from better connectivity between all the parks in the city's core. There are also some ecological benefits to planting trees and native plants to begin the remediation process immediately. Any major construction projects pose a certain amount of risk to workers depending on the level of contamination of the soil and would require careful monitoring as these areas are disturbed. Working to remediate the land is ultimately an ecological and human health necessity, but opening the space to minimal infrastructure development would allow that process to move forward in phases as budgets allow.

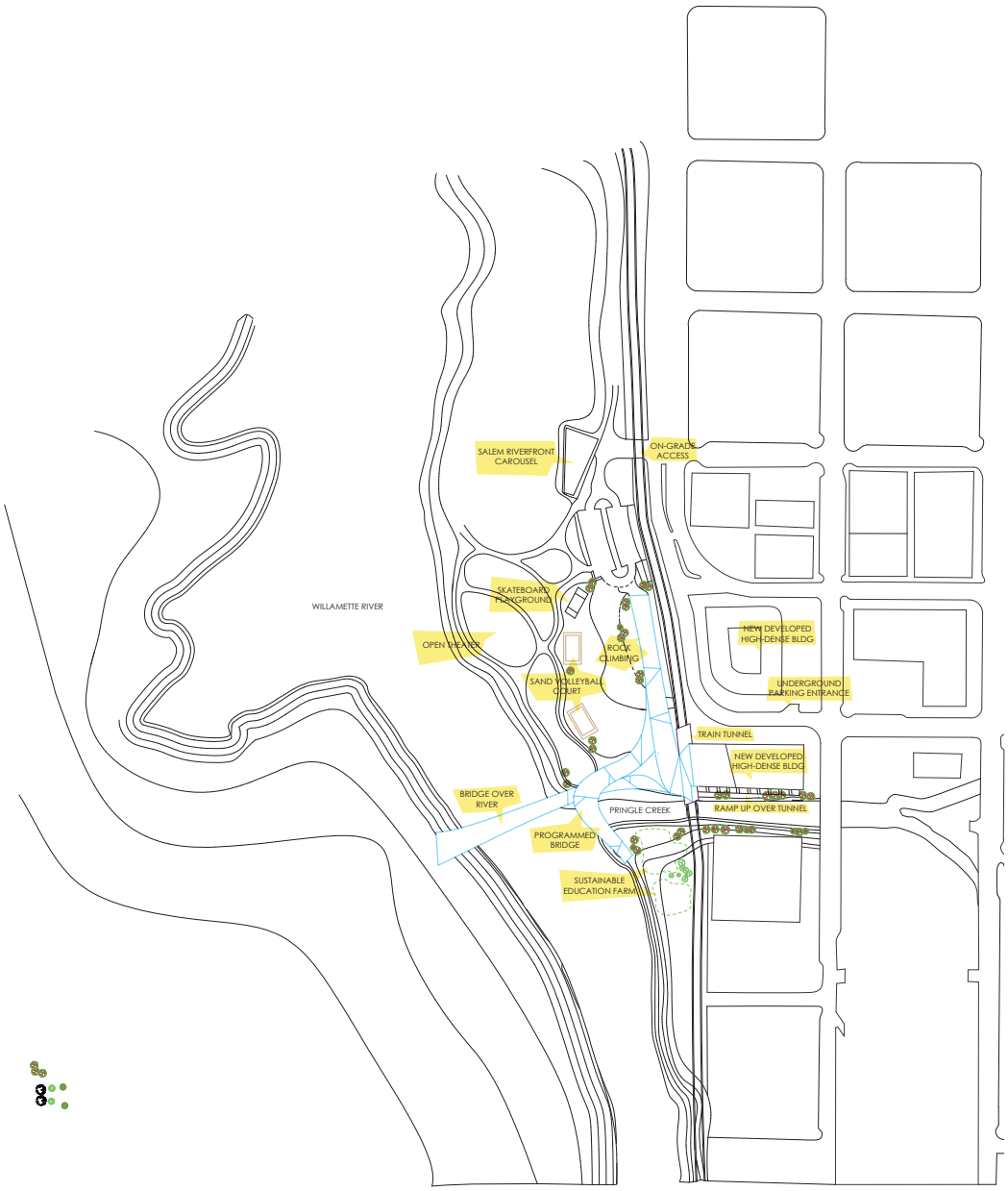


Figure 61: Civic Bridge site plan, Wenyu Jiang.

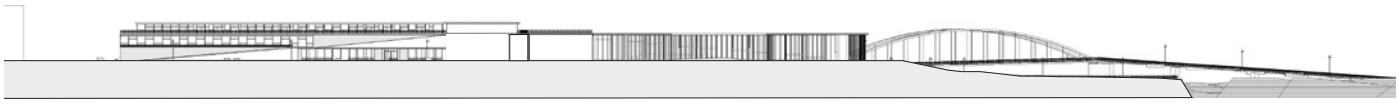


Figure 62: East-west cross-section of Invisible Track, Dijon Jones.

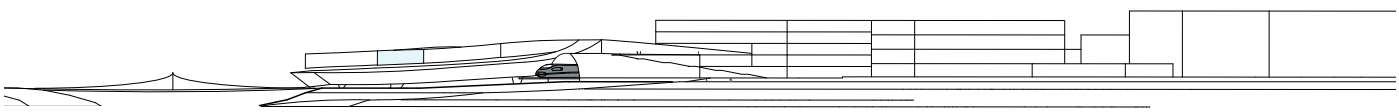
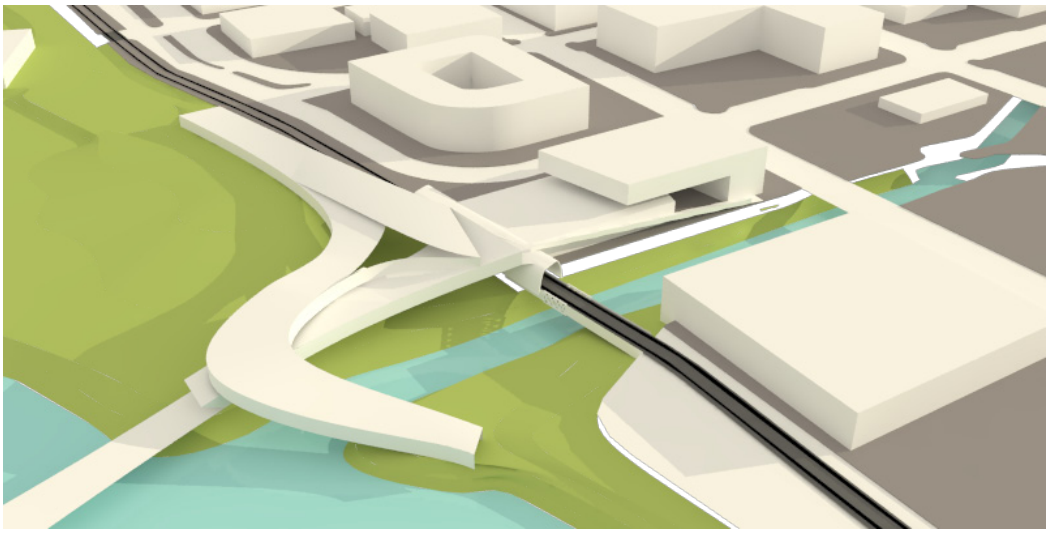
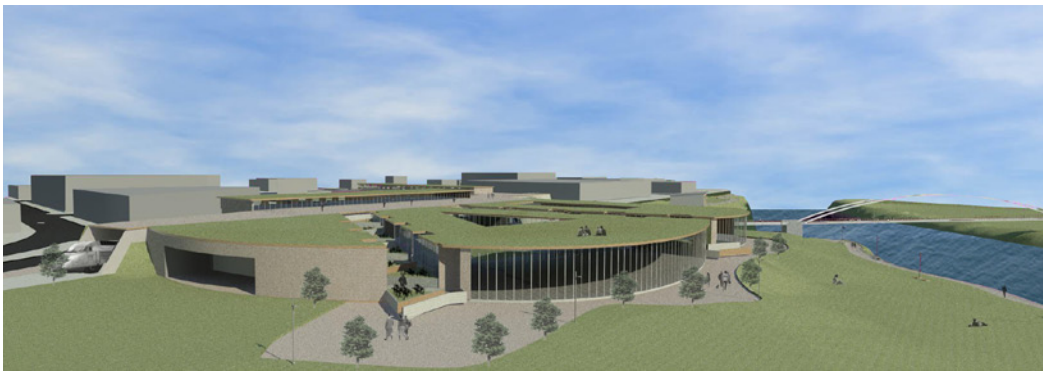


Figure 63: East-west cross-section of Civic Bridge, Wenyu Jiang.





Figures 64 and 65: Civic Bridge concept, Wenyu Jiang; Invisible Track, Dijon Jones.

Transit Center and High-Density Development

Misha Belyayev, Andrew Burgess, Alexandra Costic, Kim Hybel, Kate Laue, Guillaume Lynn, Vanessa Nevers

Consistent with the objectives of the SWURA Plan, this student group explored high-density development on the South Waterfront site with programs including a mix of mass transit, commercial retail, and residential uses. This group envisioned the South Waterfront as the ideal location for a landmark community and regional transit center that would establish the site as the new gateway to the city, a place where regional and local transit lines converge and pedestrians and cyclists thrive. The new transit center would not only link Salem with the Mid-Willamette Valley, but would also serve as a vital connection between downtown Salem and the beautiful waterfront amenities of Riverfront Park. The fresh influx of local and regional commuters would activate the South Waterfront and create viable opportunities for the development of an exciting new commercial retail and residential district where Salem residents would be able to work and live in proximity to downtown, Pringle Creek, and the Willamette River. This intersection of urban convenience, natural beauty, and innovative

transportation would be the perfect setting for Salem to initiate new standards of city living that support the social, economic, and recreational needs of the community without compromising the ecological health of the region for future residents.

Transit-oriented, high-density development schemes for the South Waterfront range from low impact on existing conditions (least expensive) to high impact (most expensive). Constant across all schemes are strategies for environmental restoration and management, bike and pedestrian paths along the Pringle Creek corridor, and a multi-phase streetcar line. The first phase of redevelopment reclaims the former industrial site as a zone of soil remediation, which will also include the removal of the concrete slab positioned above Pringle Creek as well as the retaining wall on the north creek bank. Earthwork is a major component of first-phase site restructuring. Pringle Creek would be widened and cut at strategic points to slow the flow of water and support wetland regrowth. Soil and building materials removed from the existing site would be used to create terraces planted with cover crops that add phosphates to the soil to stabilize contaminants left behind from heavy industry. These terraces would also serve to filter and connect stormwater and cleaned wastewater back into the creek and slough. At site access points, community members could contribute composting material for soil remediation, so that after a few seasons, the terraces could support community gardens. As the site develops, access points become pathways down to Pringle Creek and links to Riverfront Park and the millrace greenway.

The South Waterfront is the ideal location for a landmark community and regional transit center that will establish the site as the new gateway to the city.

For the second phase of redevelopment, a transit station (see Figure 66) would be constructed for a streetcar line that would

Figure 66: View of Transit Center, Kate Laue and Guillaume Lynn.

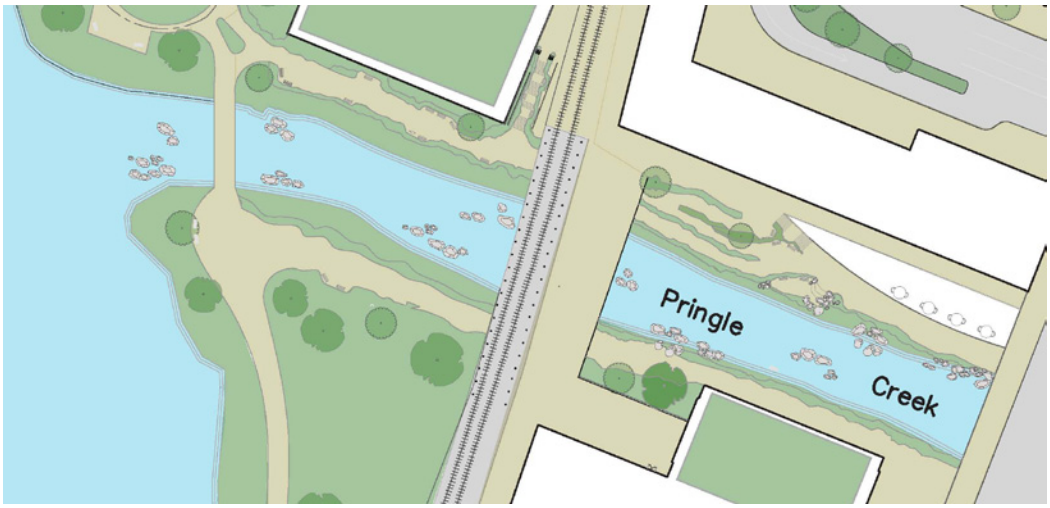


Figure 67: Restoration of Pringle Creek.

increase access to and from the riverfront and important destinations within the city center, including the hospital, Willamette University, the Capitol Mall, a grocery store, and the downtown shopping mall. Students Kate Laue and Guillaume Lynn developed a more conservative, low impact redevelopment plan in which **the streetcar and transit center would provide a catalyst for a less car dependent mixed-use community hub**. For this scheme, the program, for the most part, would consist of four residential buildings – three west of the railroad and one east of the railroad, set back from Highway 22. Two more buildings on the eastern portion of the South Waterfront site would support commercial and public uses. The orientation and arrangement of buildings on the site maximize daylighting as well as views to the river and creek from downtown and approaching vehicular traffic (see Figure 71). As a funding possibility, this scheme explores a partnership with Willamette University. With a streetcar system connecting the downtown riverfront to the university campus, graduate student housing could be included in the South Waterfront redevelopment.

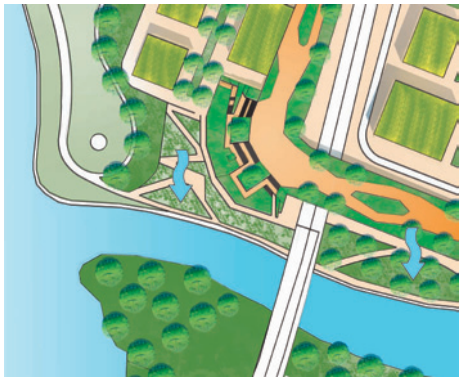


Figure 68: Planted terraces filter stormwater and connect pathways to the creek.

Misha Belyayev presented a transit-oriented scheme that includes a multi-mode transit center for both a streetcar and a commuter rail line, extending connections to the South Waterfront to the regional scale. A commuter rail line would run north to the Wilsonville station for the Westside Express Service and south to Albany, Corvallis, and Eugene. The rail line would provide quick and easy mass transit for Salem commuters and South Waterfront residents. **By making the downtown Salem riverfront a destination along a regional mass transit route, property values on and around the South Waterfront site would increase.** For this scheme, the railroad would divide the site into a

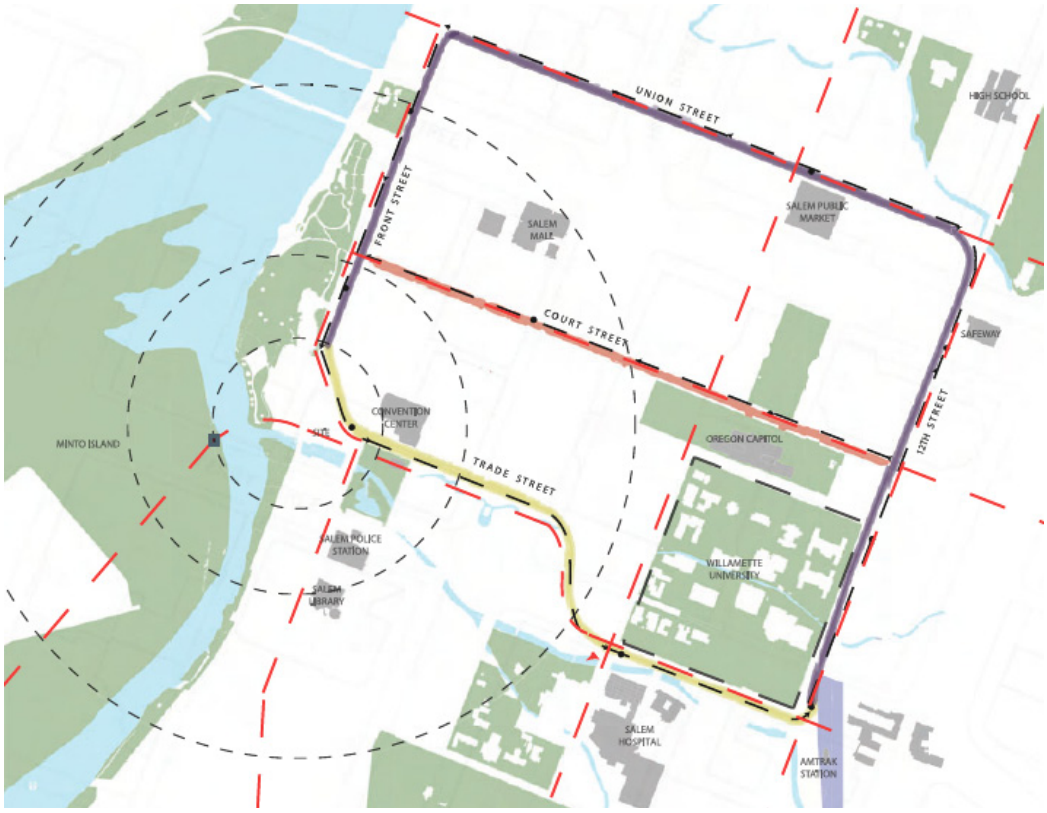


Figure 69: Proposed streetcar loop linking the South Waterfront to city center destinations, Kate Laue and Guillaume Lynn.

Figure 70: Low-impact redevelopment scheme, with a streetcar line, residences, frontage road, and limited retail. Plan by Kate Laue and Guillaume Lynn.

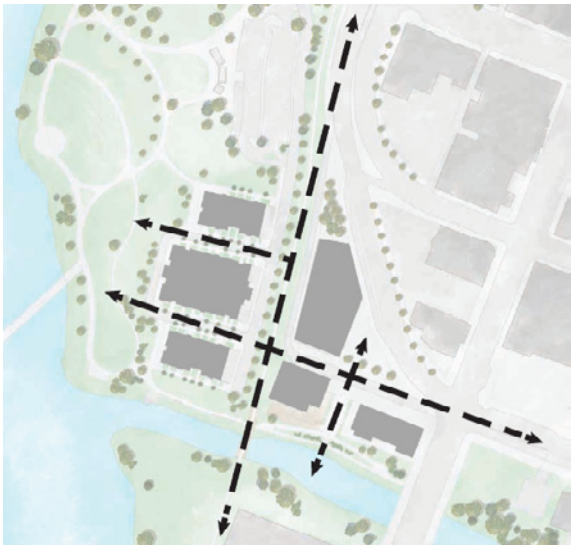


Figure 71: South Waterfront site view corridors.

quiet, family-oriented residential area adjacent to Riverfront Park and a mixed-use area geared towards retail and housing for young professionals located adjacent to Highway 22 and downtown. Walkability throughout the South Waterfront is ensured by a number of pathways connecting the development areas on the site, as well as access points to and from downtown. The east-west orientation of the residential buildings on the west portion of the South Waterfront maximize southern daylight and provide views and access to Riverfront Park.

Access to the riverfront from downtown is a major challenge for the South Waterfront redevelopment project; the railroad tracks and heavily trafficked Front Street are barriers to cars, bicycles, and pedestrians. In one concept plan, Vanessa Nevers considered closing the existing State Street entrance to the park and creating a new access point at Ferry Street. This solution provides car access to new development on the riverfront while reserving the

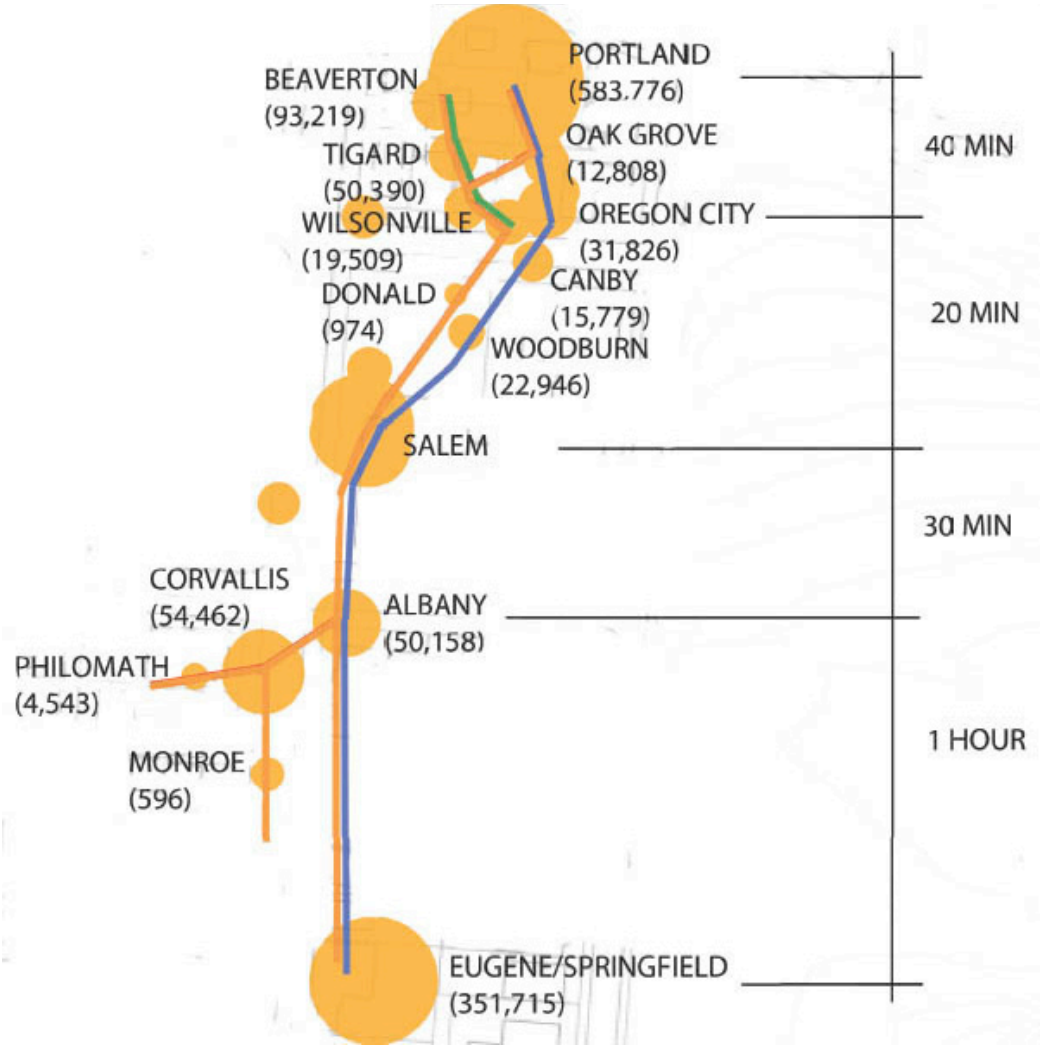


Figure 72: Proposed commuter rail line.

existing parking lot for playground and carousel visitors. For additional bike and pedestrian access over the railroad tracks, a pathway could be integrated with a green roof over the transit station, creating a rooftop park that simultaneously manages stormwater. To address the problem of access, Lexie Costic and Andrew Burgess explored the realignment of the intersection of Front Street and Commercial Street, which will enlarge the downtown block immediately to the north of the South Waterfront site. By bringing Front Street closer to the railroad tracks, a bike and pedestrian overpass could more easily span these barriers. Utilizing the enlarged north block, mixed-use development could occur on both sides of the overpass, transforming it into an elevated street aligned with the

Figure 73: Proposed redevelopment plan, including mixed-use and limited car access, Misha Belyayev.

Figure 74: Pedestrian-friendly residential corridors connecting new development to Riverfront Park, Misha Belyayev.

Figure 75: Proposed scheme moving riverfront access point from State Street to Ferry Street, Vanessa Nevers.

Figure 76: East-west cross-section of proposed development with a pathway on the transit center's green roof, Vanessa Nevers.

Conference Center plaza. If the city closed the adjacent Commercial Street block, the alignment of these open spaces could offer an open area for public gathering. A bike and pedestrian bridge would be a landmark, providing identification for the South Waterfront community and creating a gateway for vehicles traveling south on the Front Street portion of Highway 22 (see figure 77). **Initiating a community gateway at the South Waterfront would provide an opportunity to establish a sense of arrival for Salem residents and visitors, creating a unique sense of place.**

With transit as a catalyst, Salem's South Waterfront could become a landmark community as well as a new gateway to the city. High-density mixed-use development will support Salem's commercial core, giving residents the opportunity to work and live in proximity to downtown, Pringle Creek, and the Willamette River. By facilitating alternative modes of transit and creating a mixed-use, pedestrian-friendly environment, Salem can encourage a more sustainable way of life. Effective connections to Salem's natural and urban amenities will lead to revitalization models that address the transportation needs of local and regional residents as well as the economic, social, and recreational needs of the Salem community.

Figure 77: Front Street overpass creates a new city gateway and landmark for the South Waterfront community, Lexie Costic.

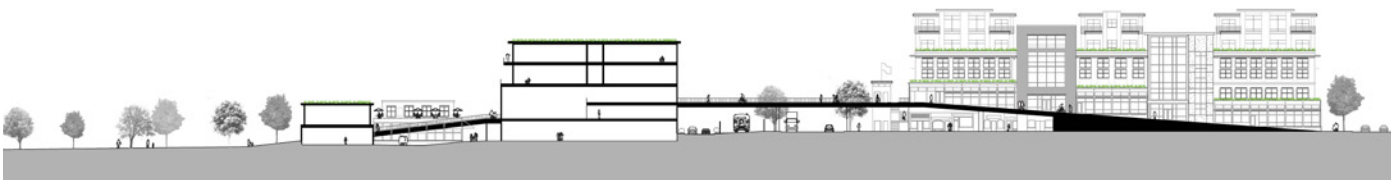


Figure 78: East-west cross-section showing a proposed bike and pedestrian bridge over Front Street and the railroad, Lexie Costic.

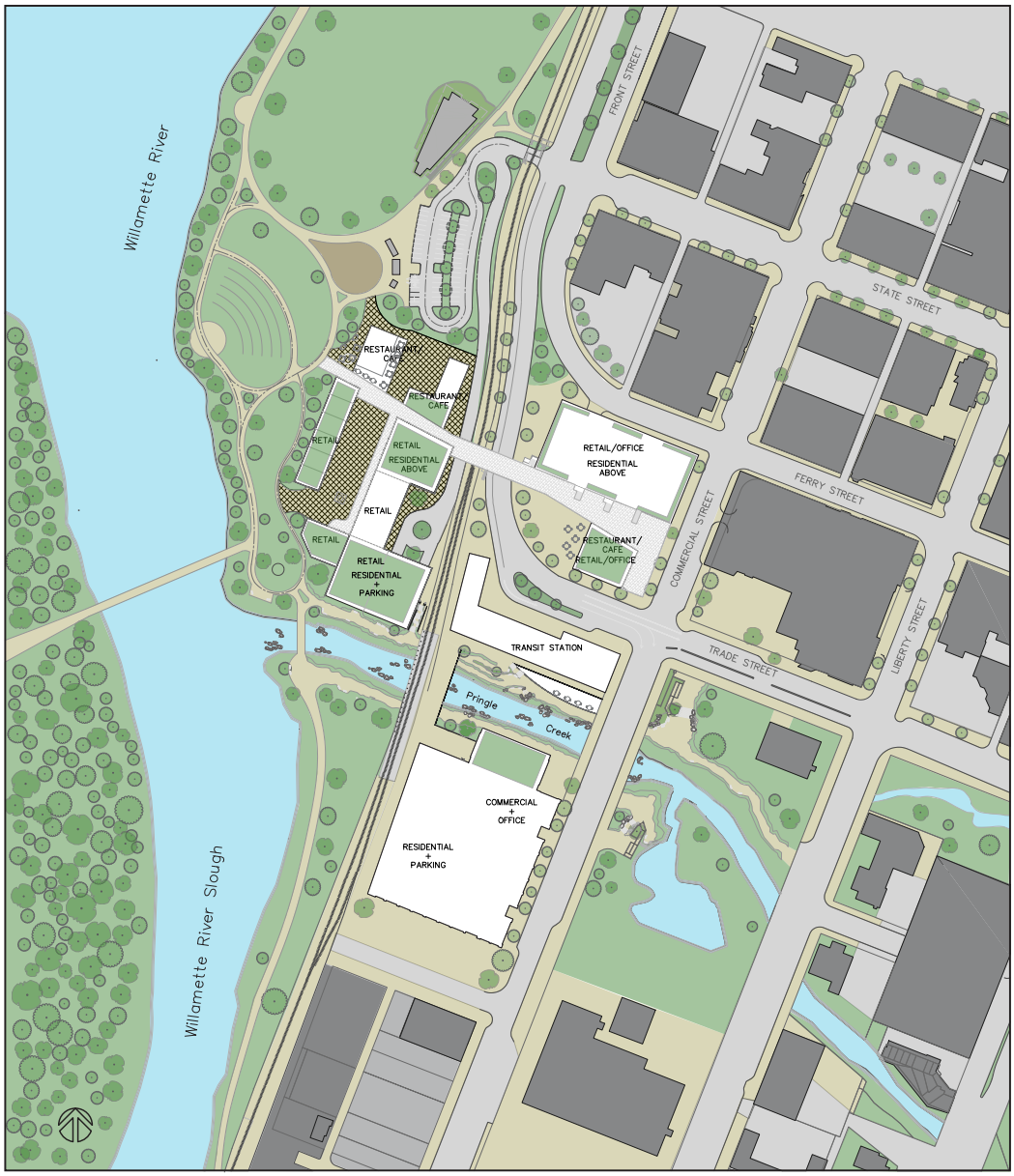


Figure 79: Proposed plan for the realignment of Front Street and the development of high-density commercial retail and residences, Lexie Costic.

Education Hub

Brigitte Huneke, Kohlton Kauffman, Sarah Lundy, Sarada Thomas, Brook Waldman

Given the South Waterfront's long industrial history and unique location at the confluence of three urban waterways – Pringle Creek, the Willamette Slough, and the Willamette River – and the rich habitat of the adjacent Minto-Brown Island, this group of students envisioned the site as an education hub for the Salem community. As an education hub, the South Waterfront would respect and celebrate the unique qualities of the site – its industrial history and environmental conditions – and would provide a place for ecological research and entrepreneurial activities. **Industrial heritage and ecological education can be valuable tools for community revitalization.** The redevelopment of the South Waterfront presents the opportunity to engage the site historically and in terms of its urban and environmental context, an opportunity that has been previously overlooked on Salem's riverfront.

Figure 80: Vision for the South Waterfront as an education hub.

The construction of Riverfront Park removed the negative ecological effects of past industrial use, enhancing the riverfront's aesthetic and recreational value. This kind of clean-slate redevelopment turns away from the site's industrial heritage as a tool for revitalization. For Riverfront Park, the site's history, instead, was regarded as something to be erased from memory, while the natural graces of the site, which brought industries there in the first place, are considered the riverfront's chief contribution to Salem's downtown revitalization. The transformation of the "acid-ball" into an "eco-ball" further asserts a new identity for the riverfront that emphasizes environmental stewardship. With the demolition of the old mill structures on the South Waterfront, it becomes more difficult to tell a moral tale about the site's history of water and land use, abuse, and eventual remediation. By providing learning experiences connected with the riverfront's past and current use and by cultivating recognition of how human actions affect the environments in which we live, the South Waterfront site will

Figure 81: Proposed site plan for the development of the Pringle Creek Ecological Education Center, Sarah Lundy.

help develop knowledgeable, responsible citizens who will act as stewards of both the built and natural landscape.

The proposed Pringle Creek Ecological Education Center creates an educational and recreational destination that connects the Pringle Creek corridor and Minto-Brown Island to downtown Salem. Educating the public on the site's history and the vital importance of environmental stewardship, the **Pringle Creek Ecological Education Center will not only help preserve precious habitat, but will also encourage the use and enjoyment of natural resources** within close proximity to Salem's urban center. Through exhibits, classes, interpretive signs, nature walks, demonstration gardens, and protected natural landscape, visitors to the South Waterfront would have the opportunity to experience a variety of wildlife habitats, from meadows to wetlands, learn about native plant and animal species, and understand processes of brownfield remediation.

As part of, or an alternative to, the Pringle Creek Ecological Education Center, Brook Waldman proposed a Climate and Water Research and Extension Center

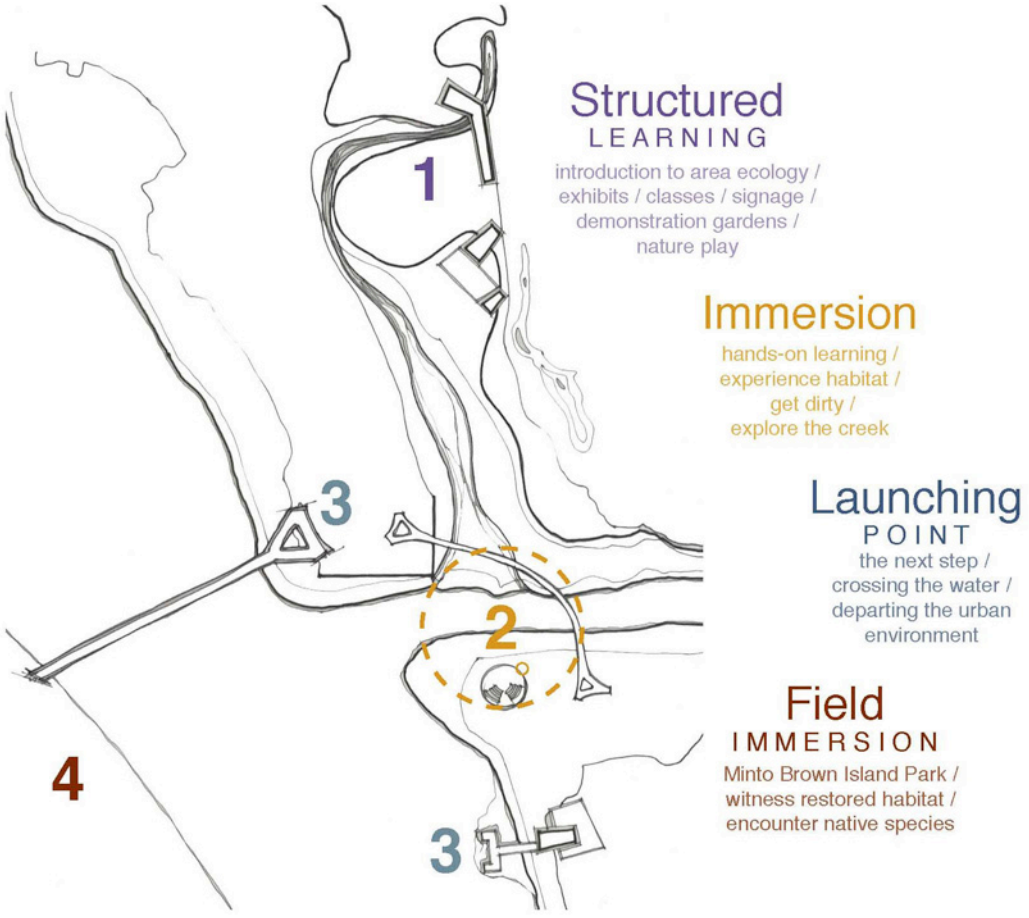


Figure 82: Pringle Creek Ecological Education Center goals, Sarah Lundy.

for the South Waterfront. Situated between Riverfront Park and the railroad tracks, the research center would include laboratories, offices, an interpretive center, and outdoor stormwater filtration systems. Using the landscape as a teaching device and creating human connections to Pringle Creek and the slough, this research center would give prominence to natural systems, which are often hidden away from urban residents with the help of modern engineering. To highlight links between the natural environment and human activity, visible water treatment and stormwater management systems, such as rainwater catchments and hydraulic infrastructure stub-outs, would teach visitors about brownfield remediation efforts as well as natural processes. These features help to establish human relationships with the South Waterfront's landscape, hydrological cycle, and watersheds, cultivating an understanding of place.

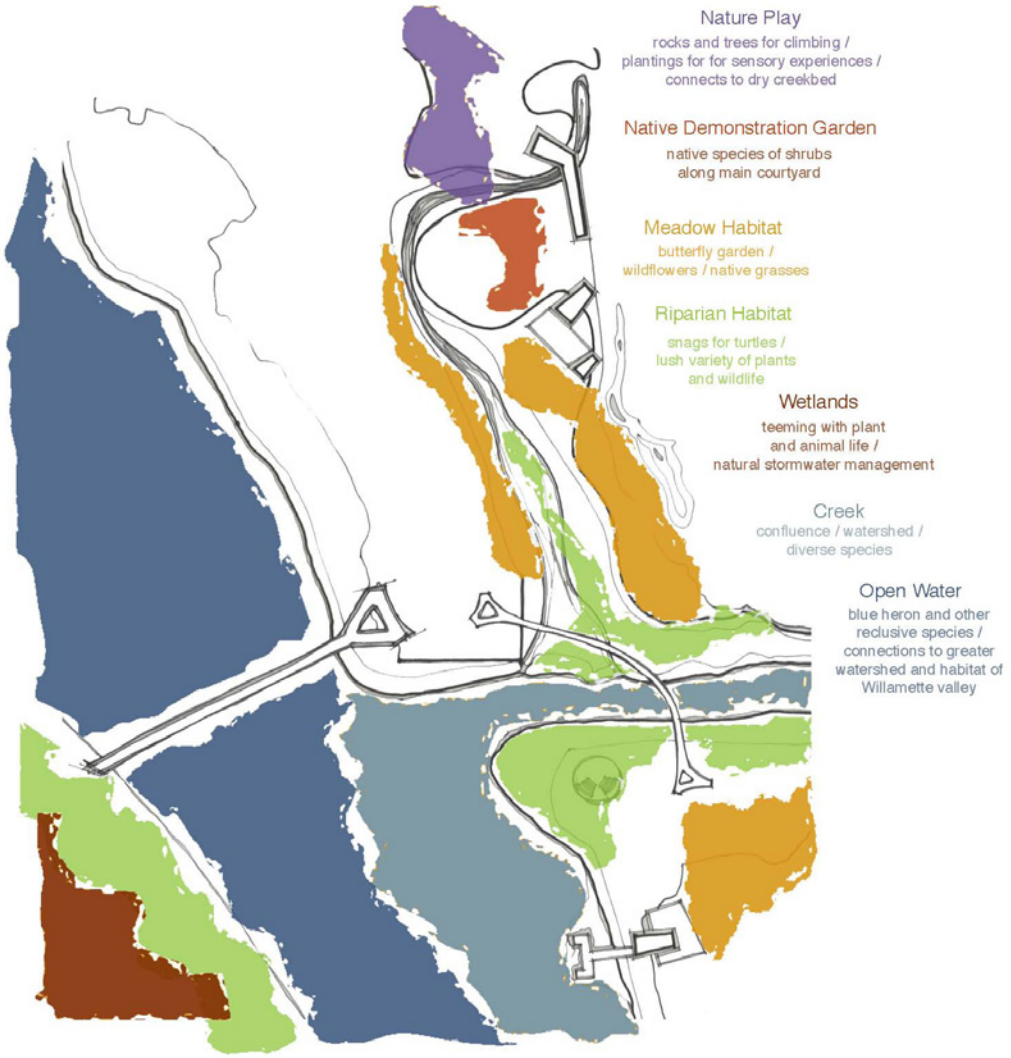


Figure 83: Pringle Creek Ecological Education Center program, Sarah Lundy.

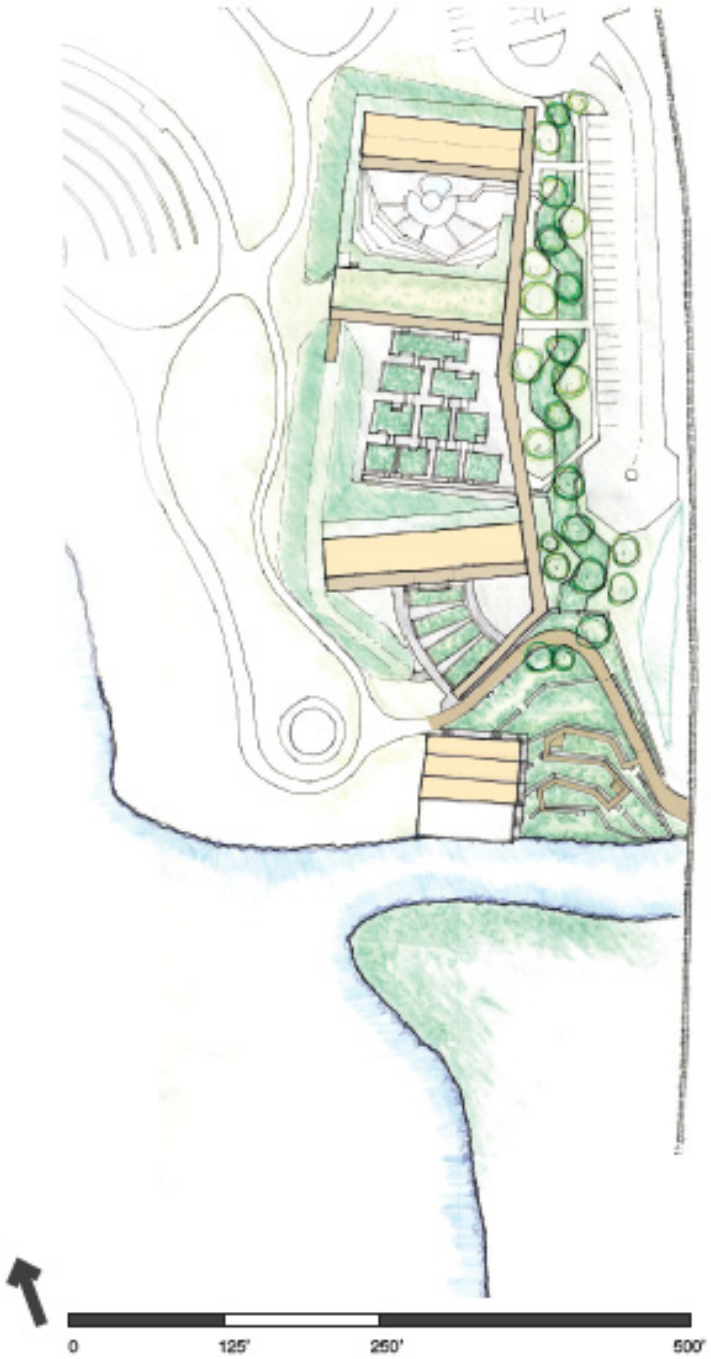
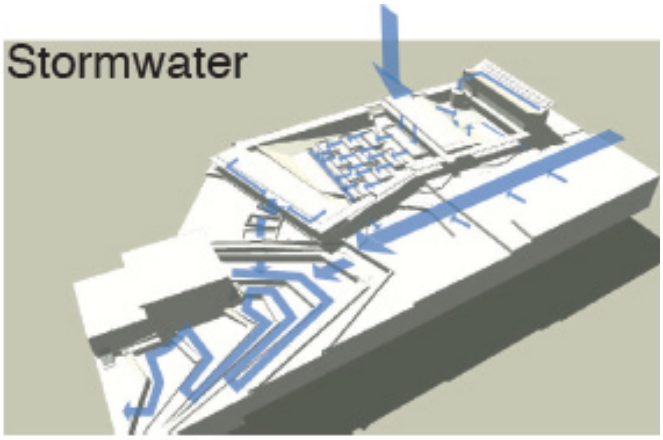
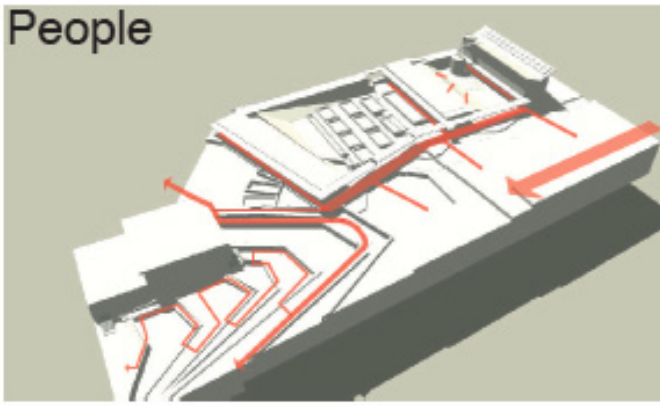


Figure 84: Site plan for the development of a Climate and Water Research and Extension Center, Brook Waldman.





Figures 85 and 86: Exposing natural processes and stormwater infrastructure, Brook Waldman.

Figure 87: Letting waterways breathe, as seen in Carlo Scarpa's Querini Stampalia in Venice, Italy.

As a center for education, the South Waterfront would enrich the Salem community by providing local college and university students first-hand experience in entrepreneurship. With Willamette University and Chemeketa Community College as potential partners, new development on the site would include businesses that would employ and be run by students. Located to the west of the railroad tracks and oriented towards Riverfront Park, these businesses would provide a mix of community services, stimulating the downtown economy. Brigitte Huneke's design scheme takes into account the existing context, so that the location and types of businesses would complement Riverfront Park. A coffee shop or bakery would serve families visiting the carousel or park playground, while an events or recreation center would encourage use of the outdoor amphitheatre. On the Willamette Slough, a boathouse would provide the Salem community with multiple water recreation options. Taking advantage of new scenic views of Pringle Creek, a restaurant and wine bar would give students direct experience in restaurant

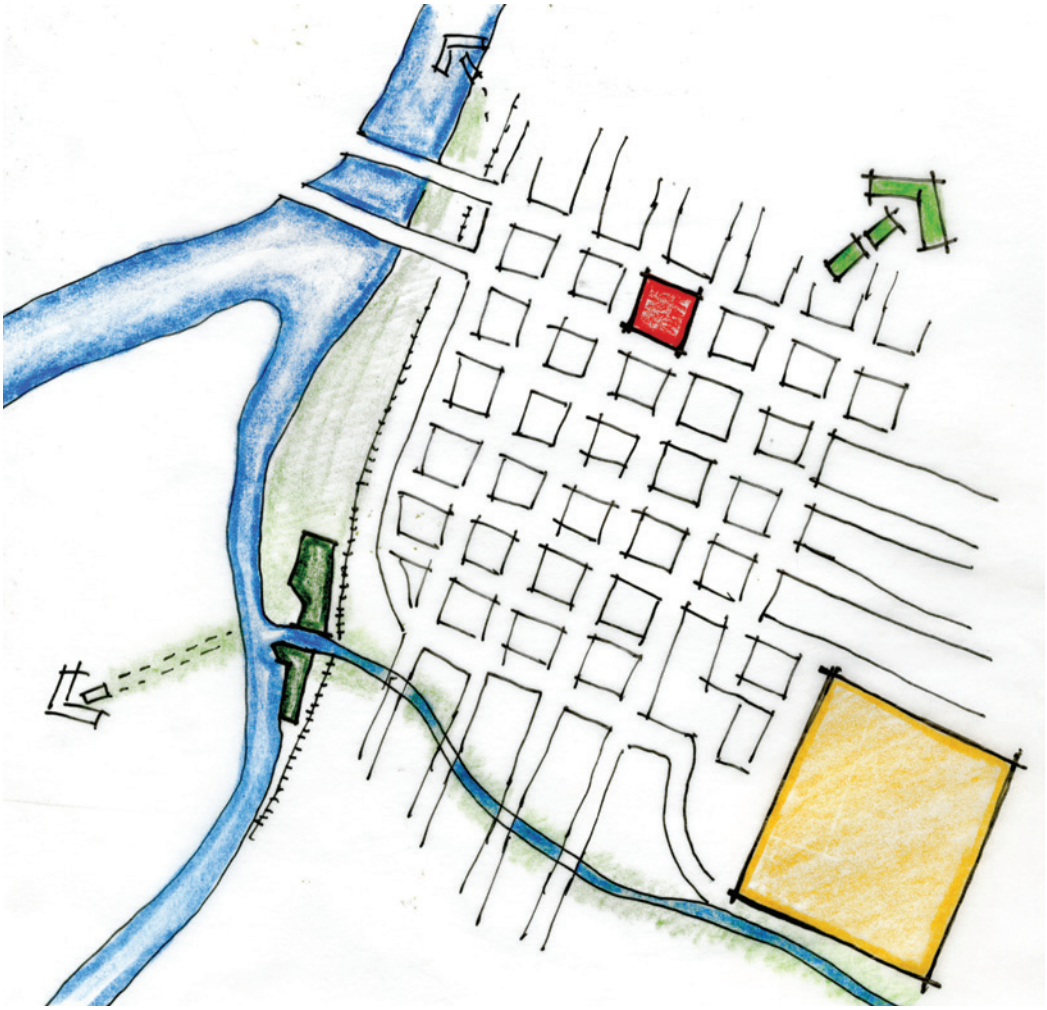


Figure 88: Connections between South Waterfront businesses and Salem schools.

management and professional food preparation, while also attracting people to the South Waterfront at night.

The South Waterfront can again play a productive role in Salem by helping community members constitute a politics of place, so that they can take on the challenge of contaminated sites and their own ecological relationship to the natural environment. It is precisely these histories and postindustrial landscapes that often resonate most deeply with people who are increasingly buffeted by the growing placelessness and homogenization of the modern world. Understanding and connecting to the history and environmental conditions of a site pave the way toward a more informed public involvement and stewardship of a place. By engaging the South Waterfront historically and environmentally and revealing the ecological conditions and history of the property, redevelopment can throw into higher profile Salem residents' own responsibilities as community members and citizens to both the past and the future.

Figure 89: Proposed site plan for businesses providing education in entrepreneurship, Brigitte Huneke.

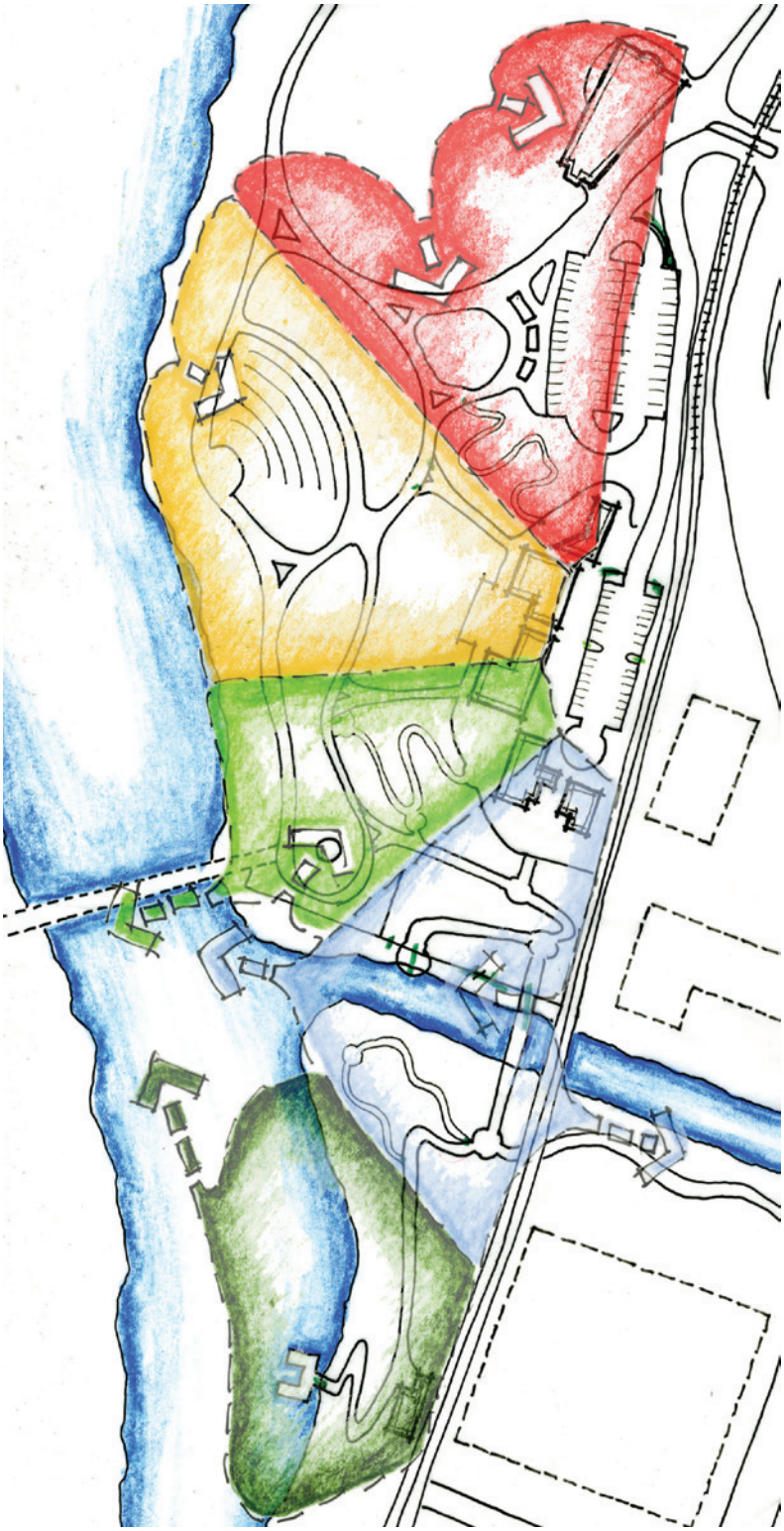


Figure 90: Proposed zoning for South Waterfront redevelopment, Brigitte Huneke.

Conclusion

Over the course of the Spring 2011 Brownfields/Green Neighborhoods studio, students explored site programs and redevelopment schemes that showcase the potential of the South Waterfront area. The proposed schemes encourage integrated sustainable design strategies and thoughtful decisions about the social and ecological future of our physical environment. Themes include recreational opportunities, expansion of public green space, public facilities, extended transit infrastructure and downtown restaurant options. Students envisioned a new ecological district with alternative modes of transit, education and recreation opportunities, and forms of placemaking that improve connections between people, nature, and urban amenities while reducing the negative environmental impacts associated with typical development methodologies. Conceptual schemes sought opportunities to mend the existing brownfield condition through an appropriate series of interventions so that Salem's South Waterfront may be adapted, improved, and reused by many generations to come.

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