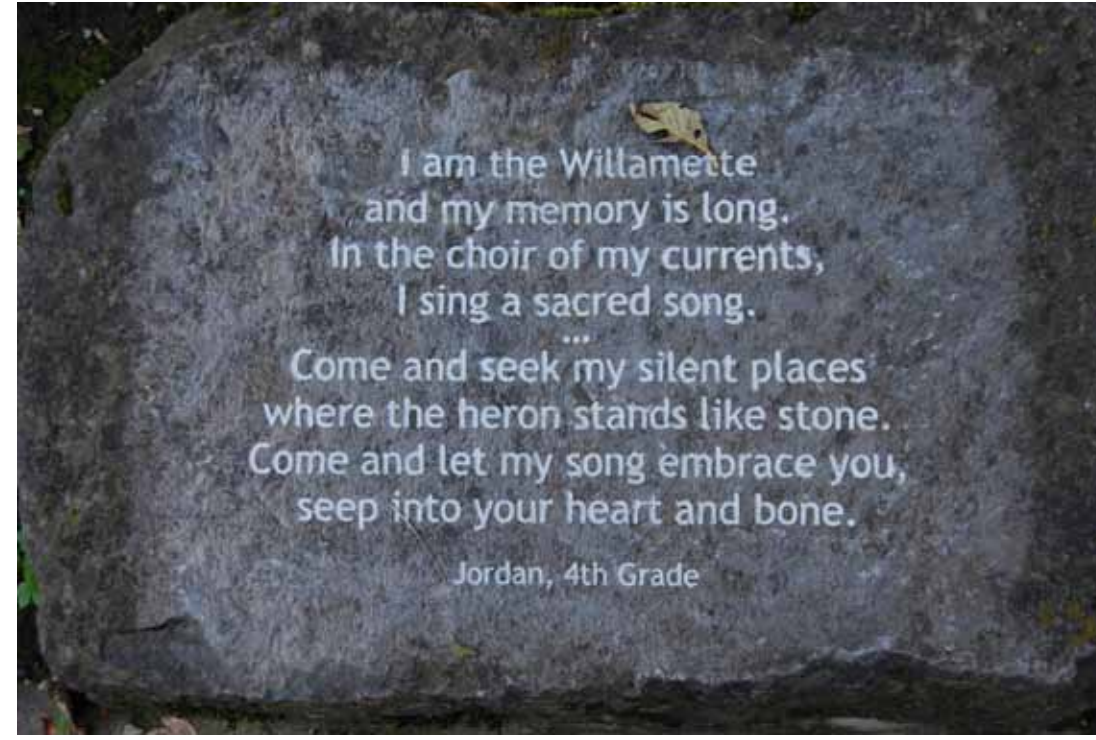
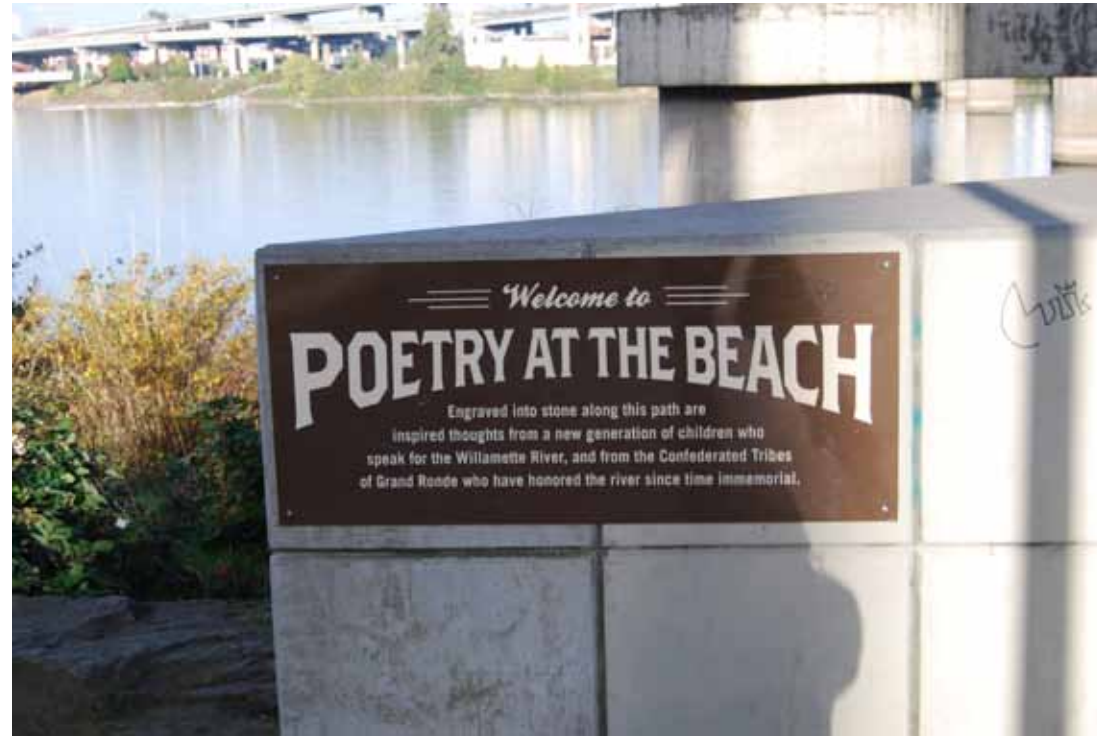


# CULLY PARK

Remediating the Willamette Waterfront of Portland

Kelsey Windrum  
Design Thesis Studio 572  
Primary Advisor: Jason Kost  
Secondary Advisor: Dominic Fischer

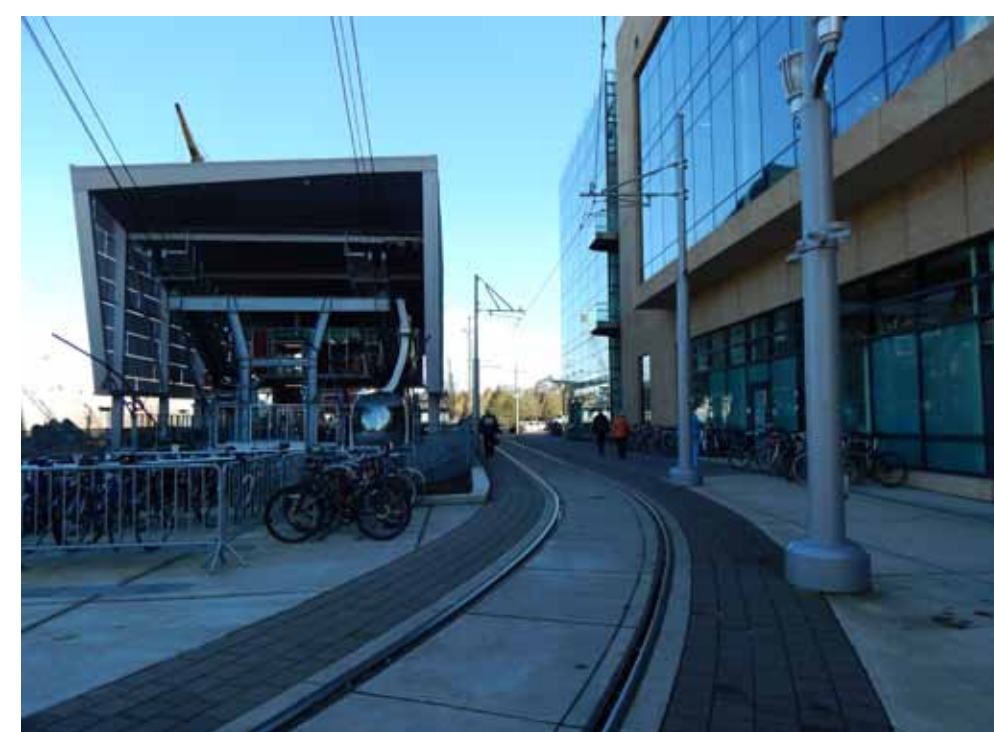
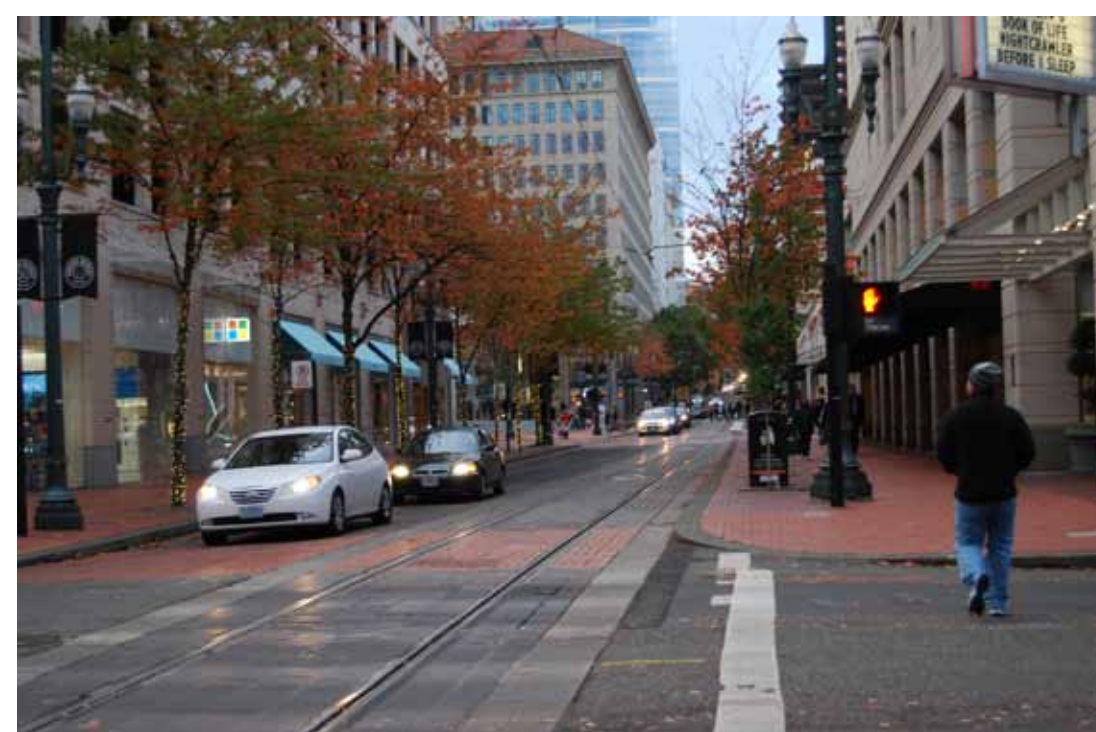
# PORTLAND IS:



ARTISTIC



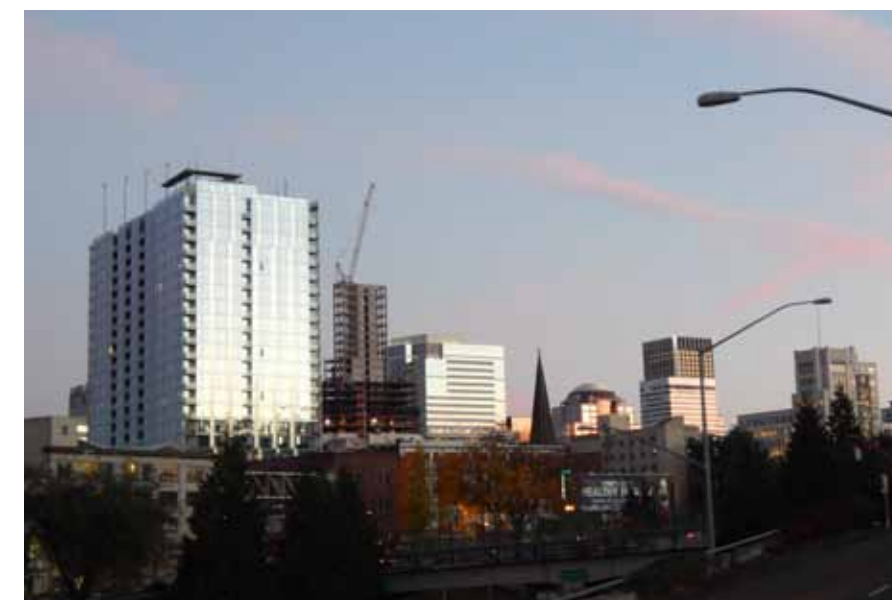
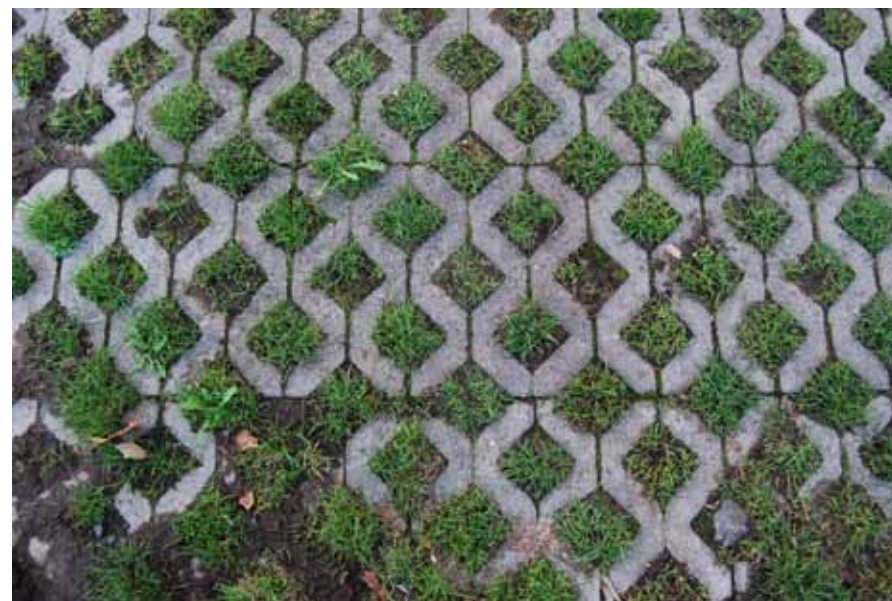
HISTORIC



URBAN



SUSTAINABLE fun MOLDED  
 RAPIDBRIGHT natural  
 NEIGHBORLY Civic SPIRITED  
 CULTURED populous  
 DENSE DIVERSE  
 appealing LIVELY  
 FLASHY ACTIVE hectic  
 refreshing WELCOMING



# WHY PORTLAND?



# Willamette River Remediation

Waterfront Heavy Metal Pollutants



# Portland's Go**GREEN** Initiative

Parks and Trails Systems

# Site Context:

Portland, Oregon



Thesis Site

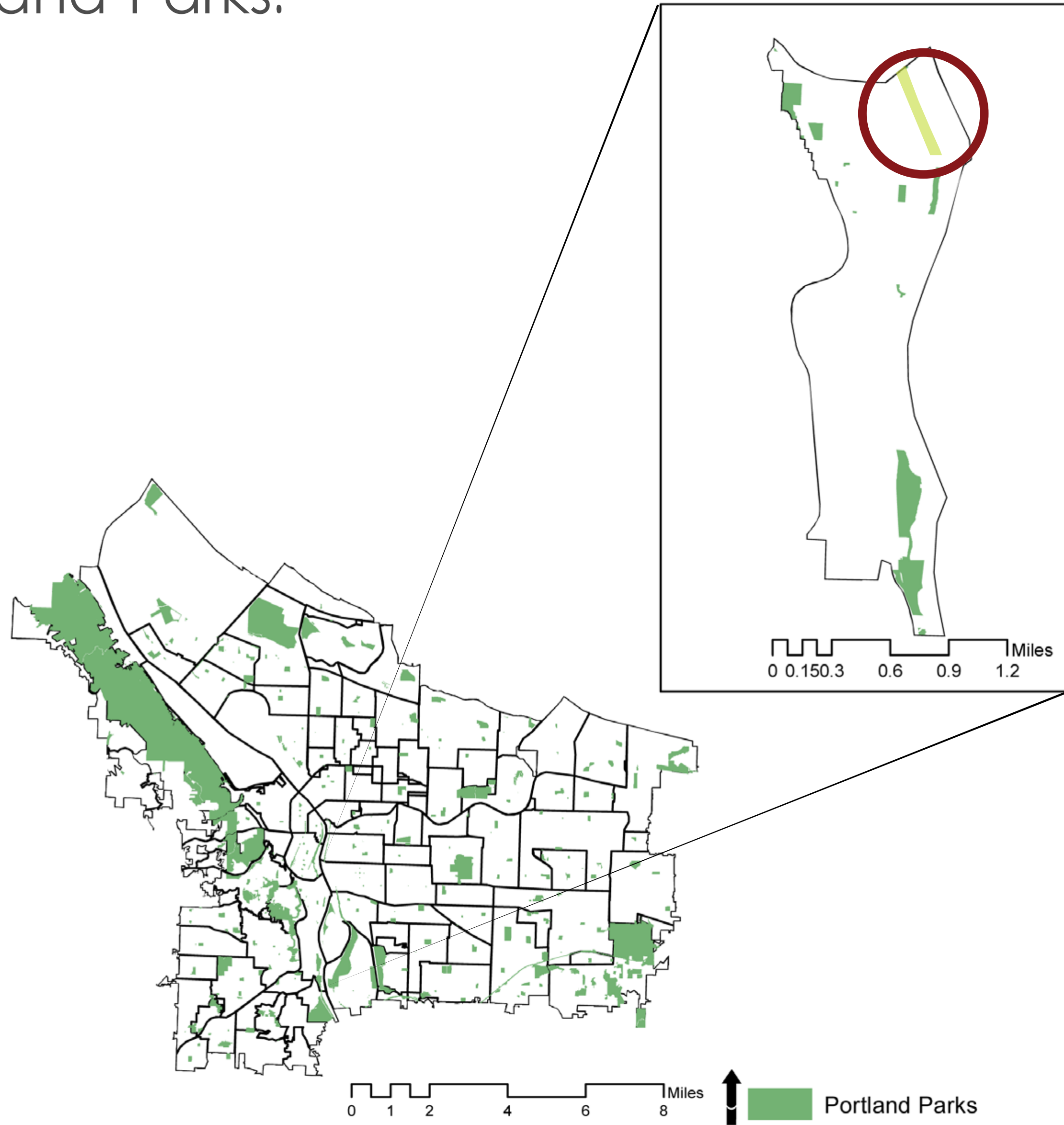




**How can this thesis project successfully become a destination in Portland and connect the gap in the existing park and trail systems while remediating the Willamette waterfront?**

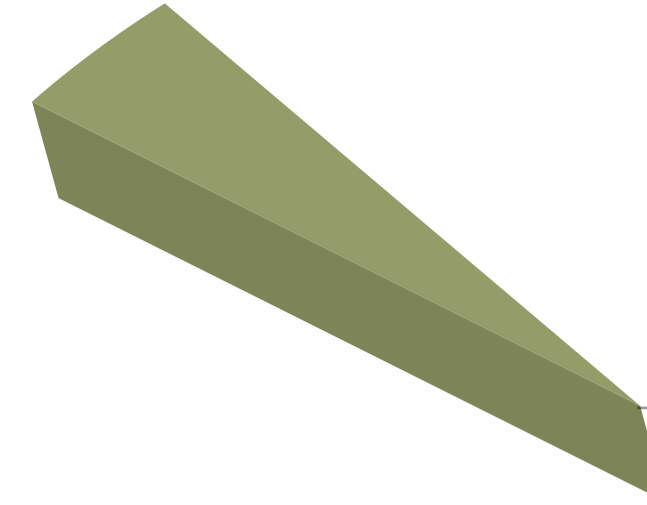
- 1 Ecological Movement: Water
- 2 Educating People on Remediation Practices
- 3 Linking Transportation Systems to Thesis Site

# Portland Parks:



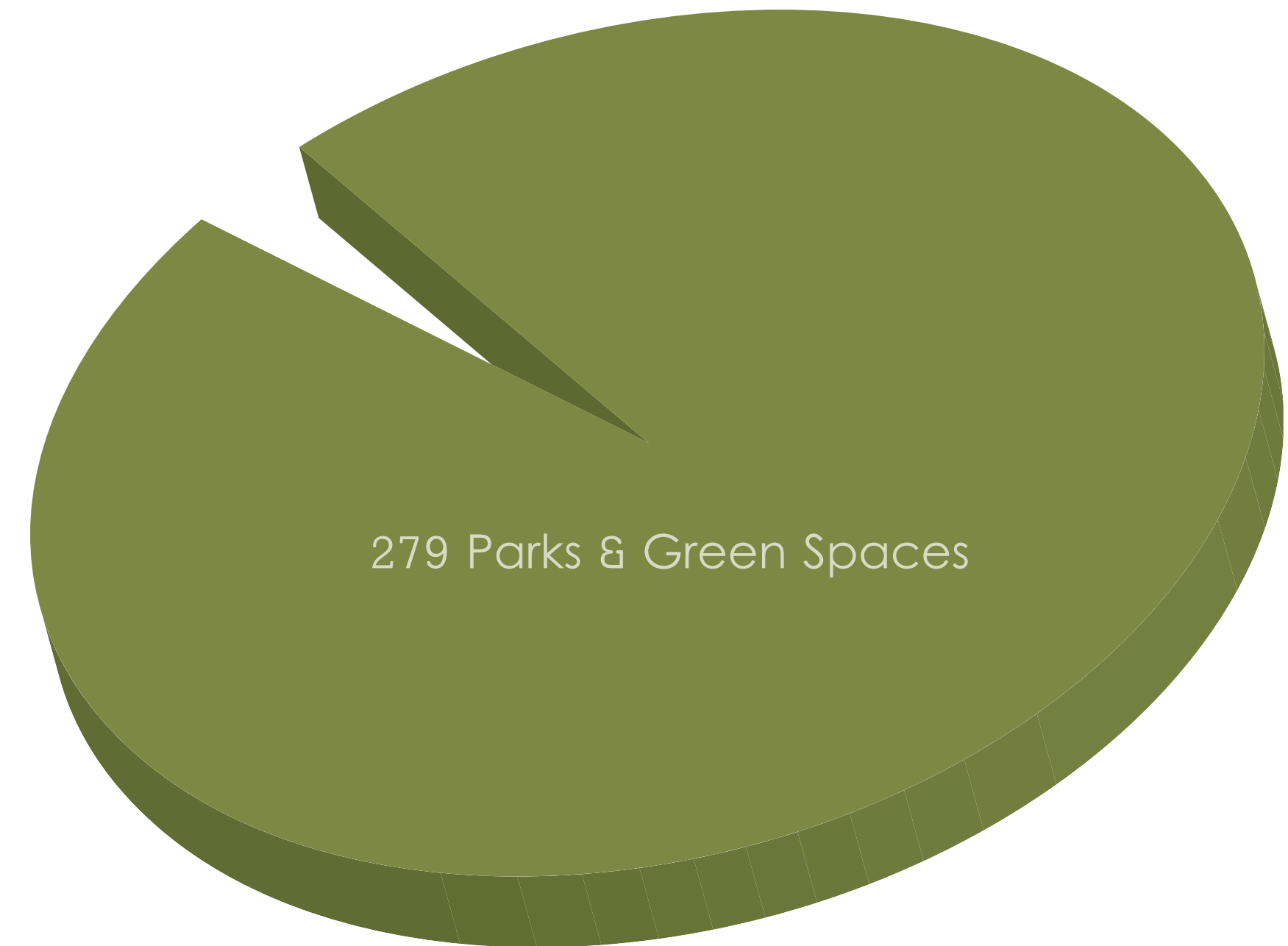
## South Waterfront District Parks: 9

South Waterfront District contains only 3% of the city limit's parks.



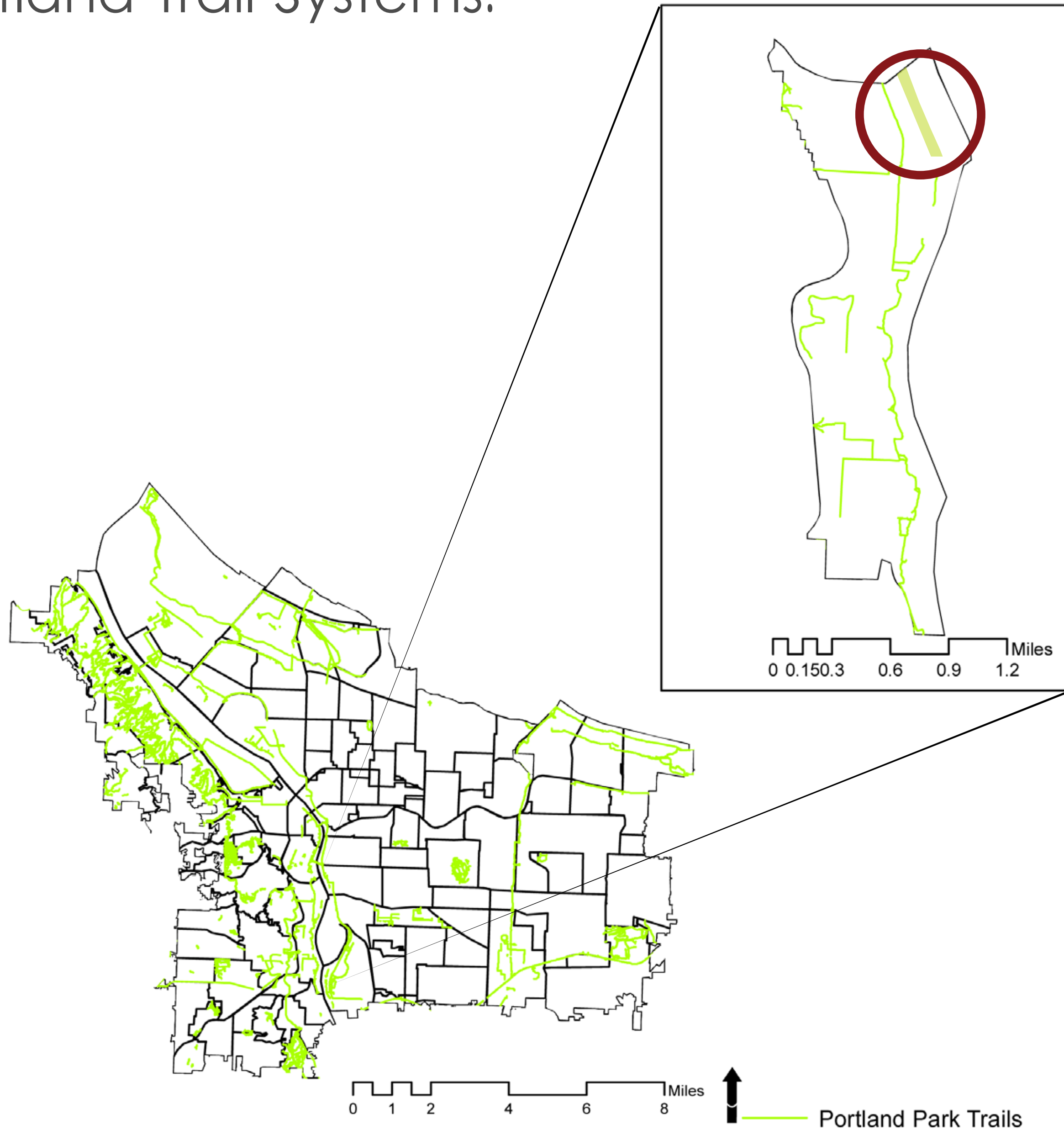
9 Parks & Green Spaces

## Portland, Oregon Parks: 279



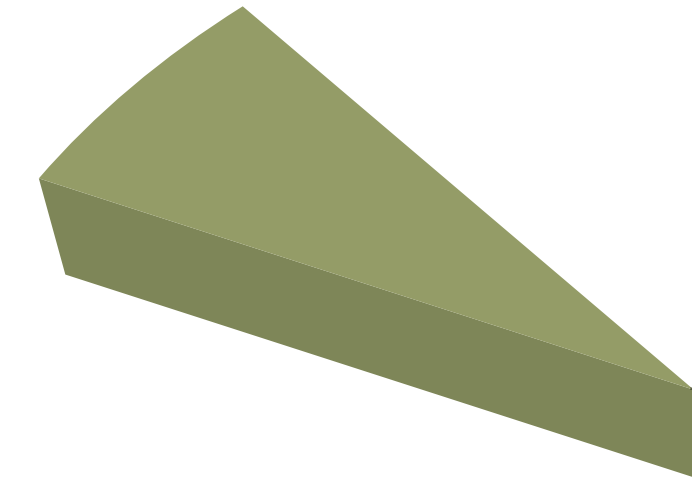
279 Parks & Green Spaces

# Portland Trail Systems:



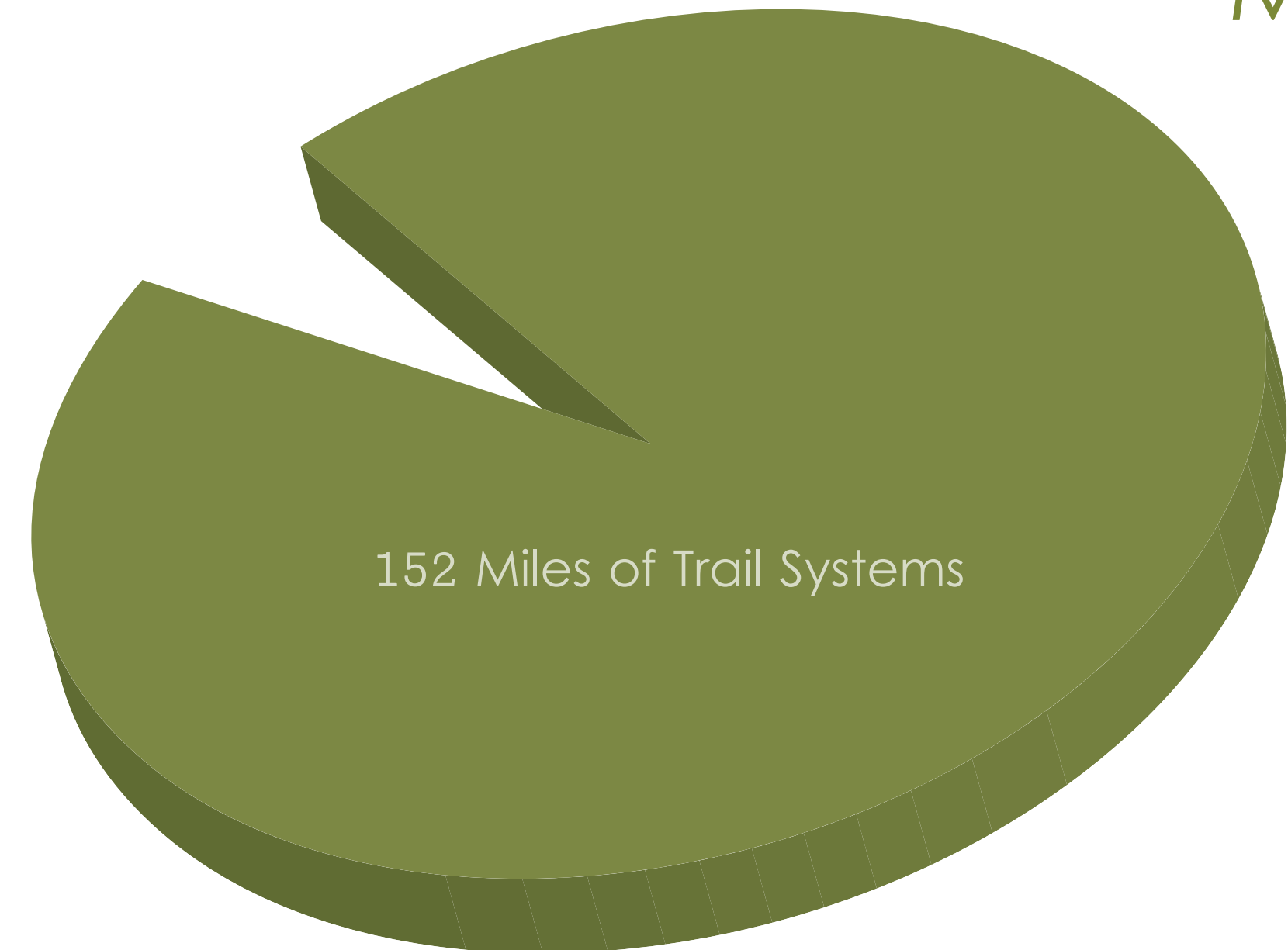
South Waterfront District Trails: **12 Miles**

South Waterfront District contains only 7.8% of the city limit's parks.



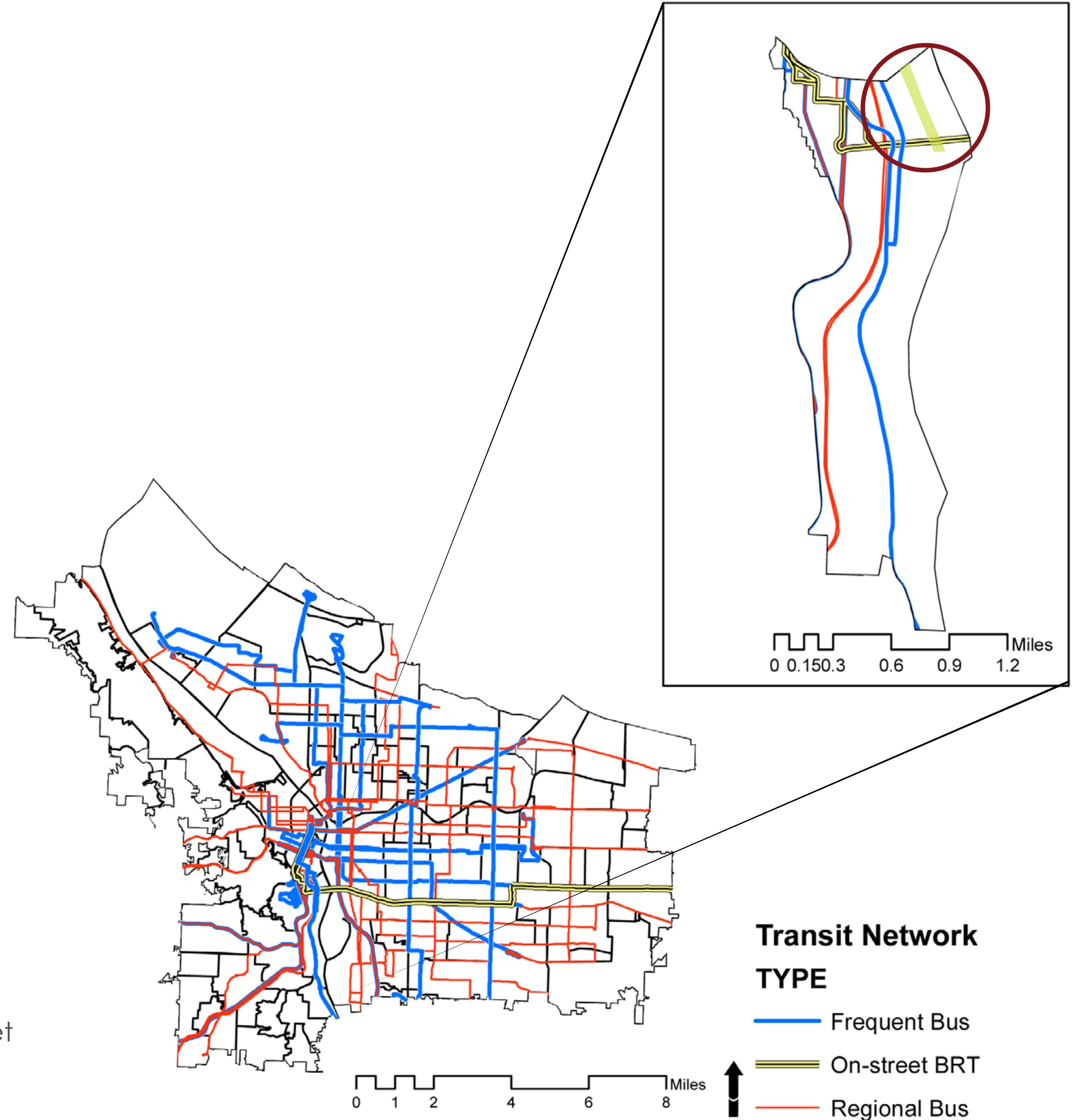
12 Miles of Trail Systems

Portland, Oregon Trails: **152 Miles**



152 Miles of Trail Systems

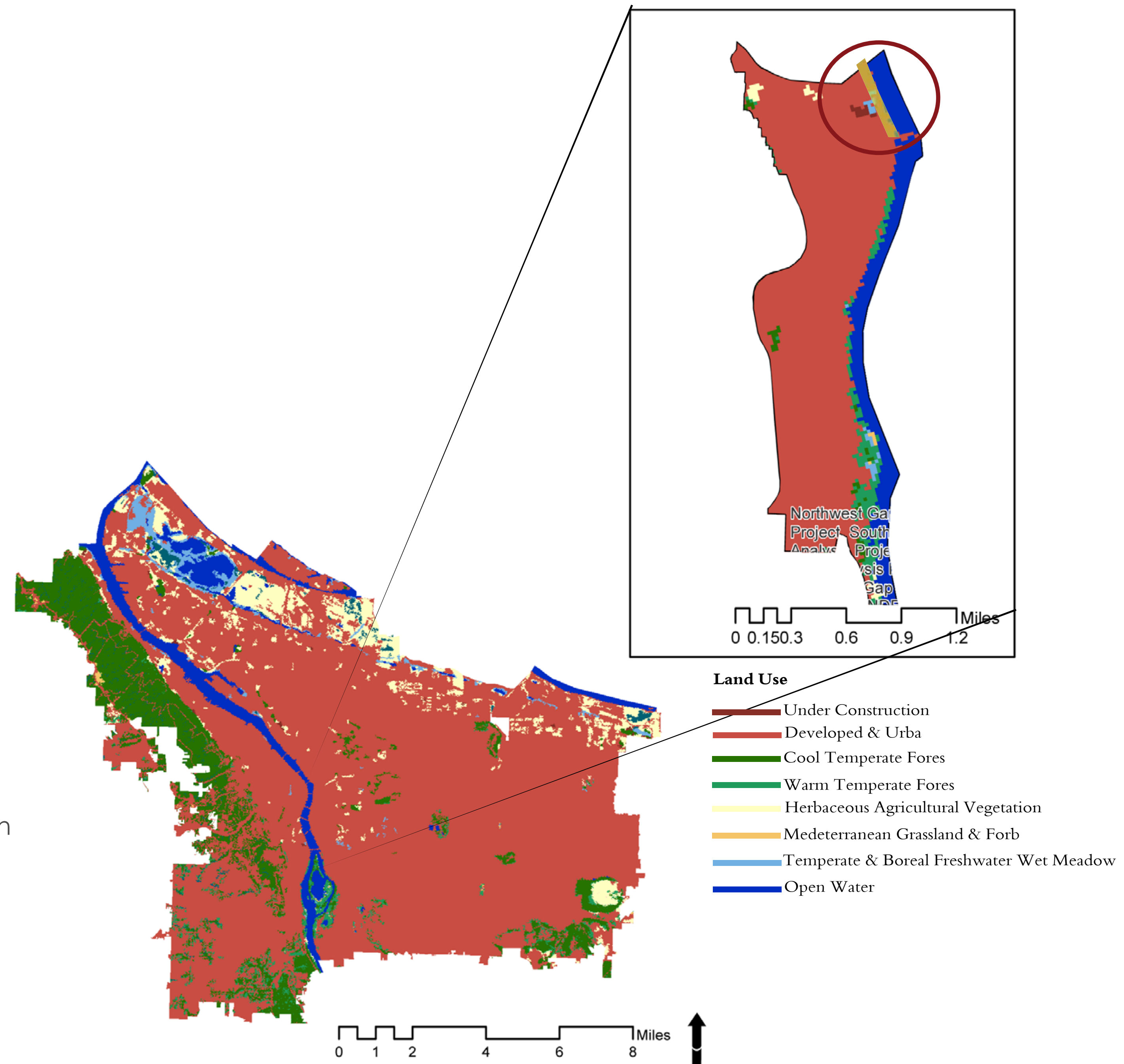
# Portland Transit Network:



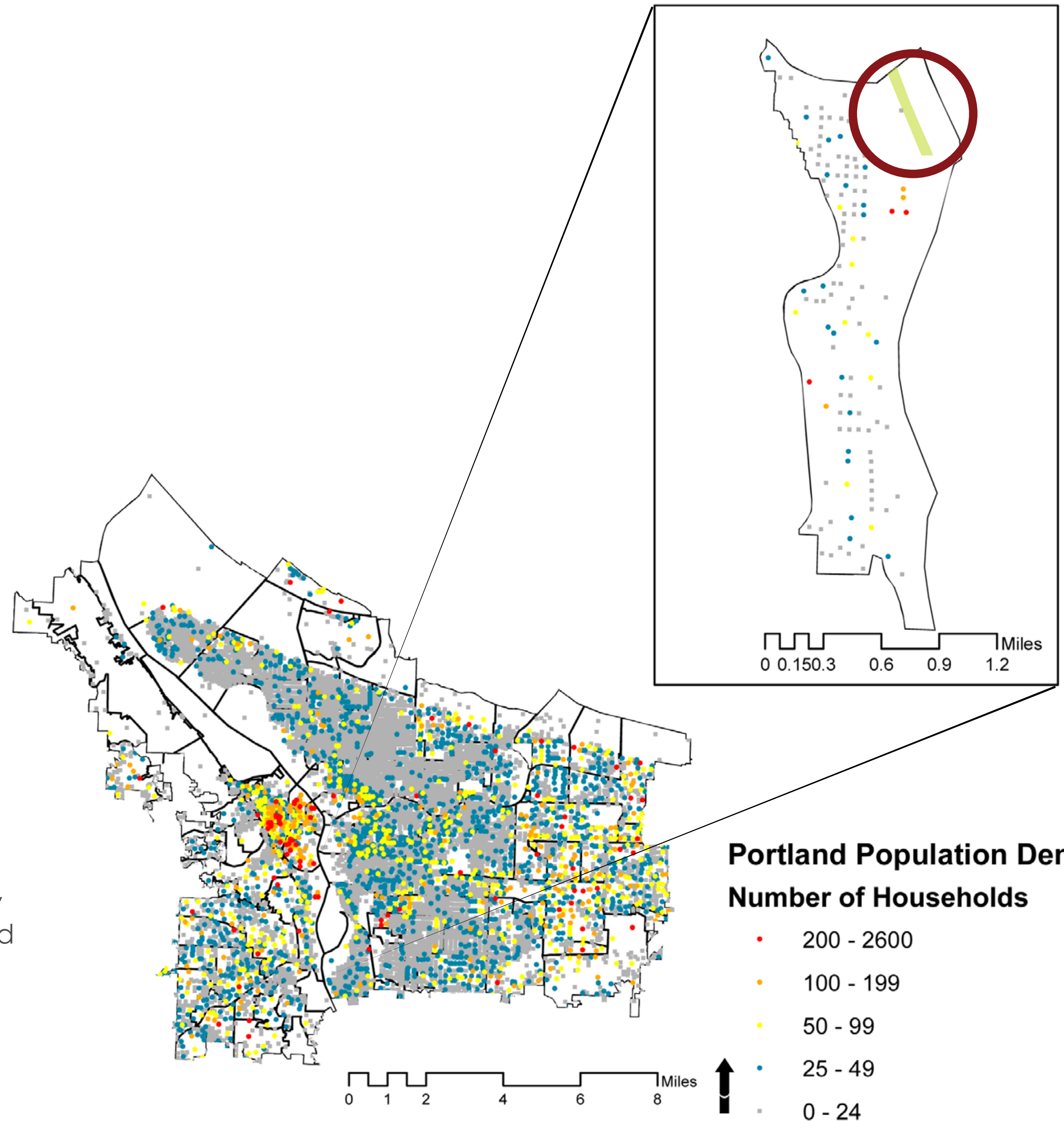
Public transportation in Portland is a very successful form for people to move quick and efficiently through the city. Portland has frequent and regional bus systems, on-street bus rapid transit, bike share, and taxis. This gets people out of their own vehicles and taking public transit and walking.

# Portland Land Use:

Portland is near completely developed and urban land use, with areas of cool temperate forests primarily on the western edge of the city. When zoomed into the extents of the South Waterfront District you can see a little more details with zoning. There is again, most developed and urban land, but there is also construction directly west to the site. This construction site is to add university buildings from the downtown campus. There are small green spaces with minimal herbaceous agricultural vegetation as well as open water which is the Willamette River.

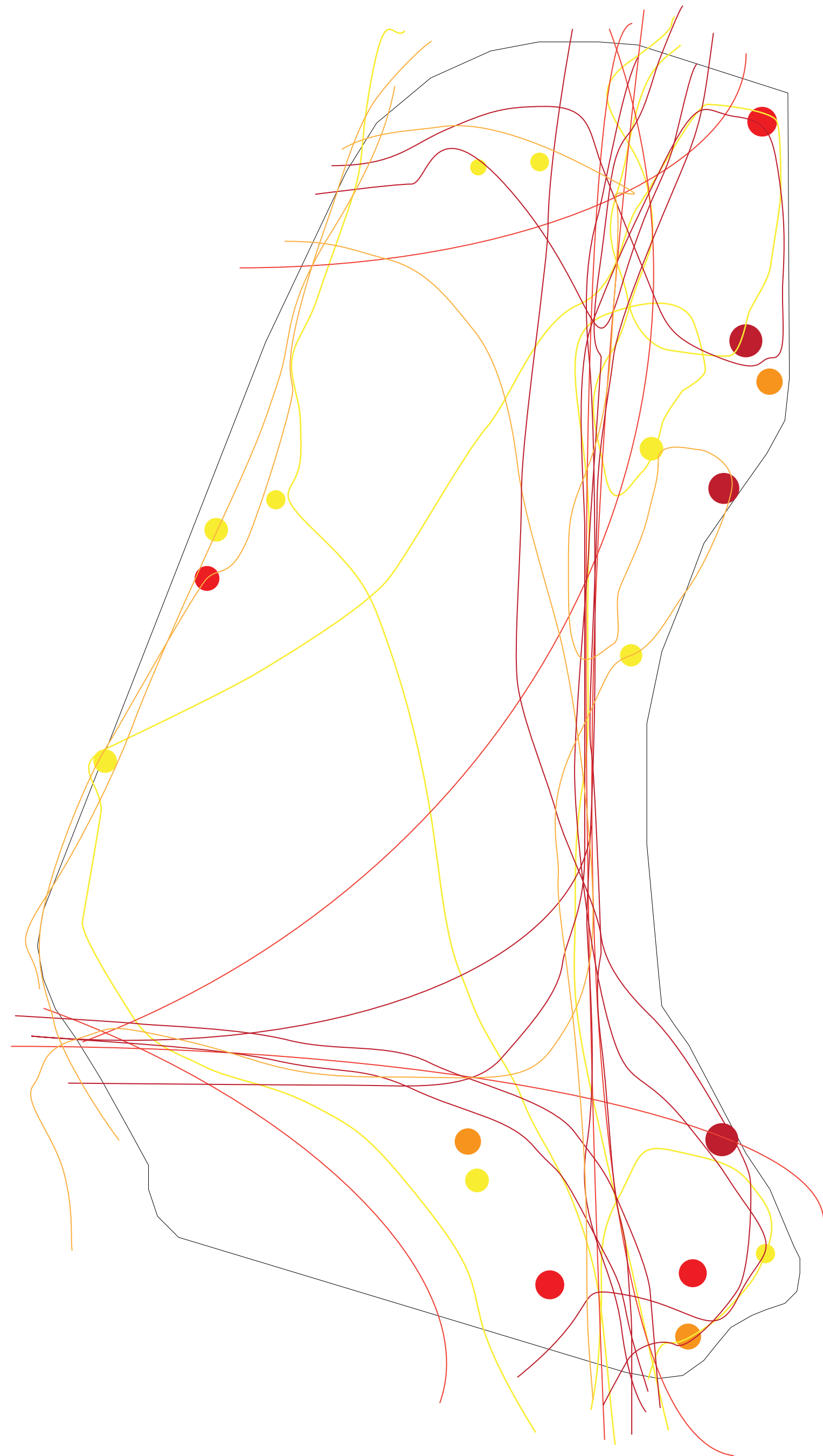


# Portland Population Density:



Portland's population is 609,456, the largest city population in Oregon. The maps to the right display the population density per number of households in the city. In areas of grey are suburbs of the city where it is less dense, while areas of red are dense housing, mostly located downtown.

In the South Waterfront District the housing is less dense the further south you are, but is the densest directly southwest of the site as shown in the South Waterfront District map above.








# Site One: Waterfront Park Trail, Portland

Site Size: 4 Acres





Observation Length: One Hour

## Amenities

-  18 Benches
-  11 Exterior Lights
-  9 Educational Signs
-  3 Trash Cans

 = 10 People/ Amenities

## Transportation

-  110 Pedestrians
-  29 Bicyclists
-  16 Joggers
-  1 Handicap



# Site Two: SW Naito Parkway & Waterfront Park Trail, Portland

Site Size: 3.4 Acres

Observation Length: One Hour


## Amenities

 14 Benches

 25 Exterior Lights

 7 Educational Signs

 5 Trash Cans

 = 10 People/ Amenities

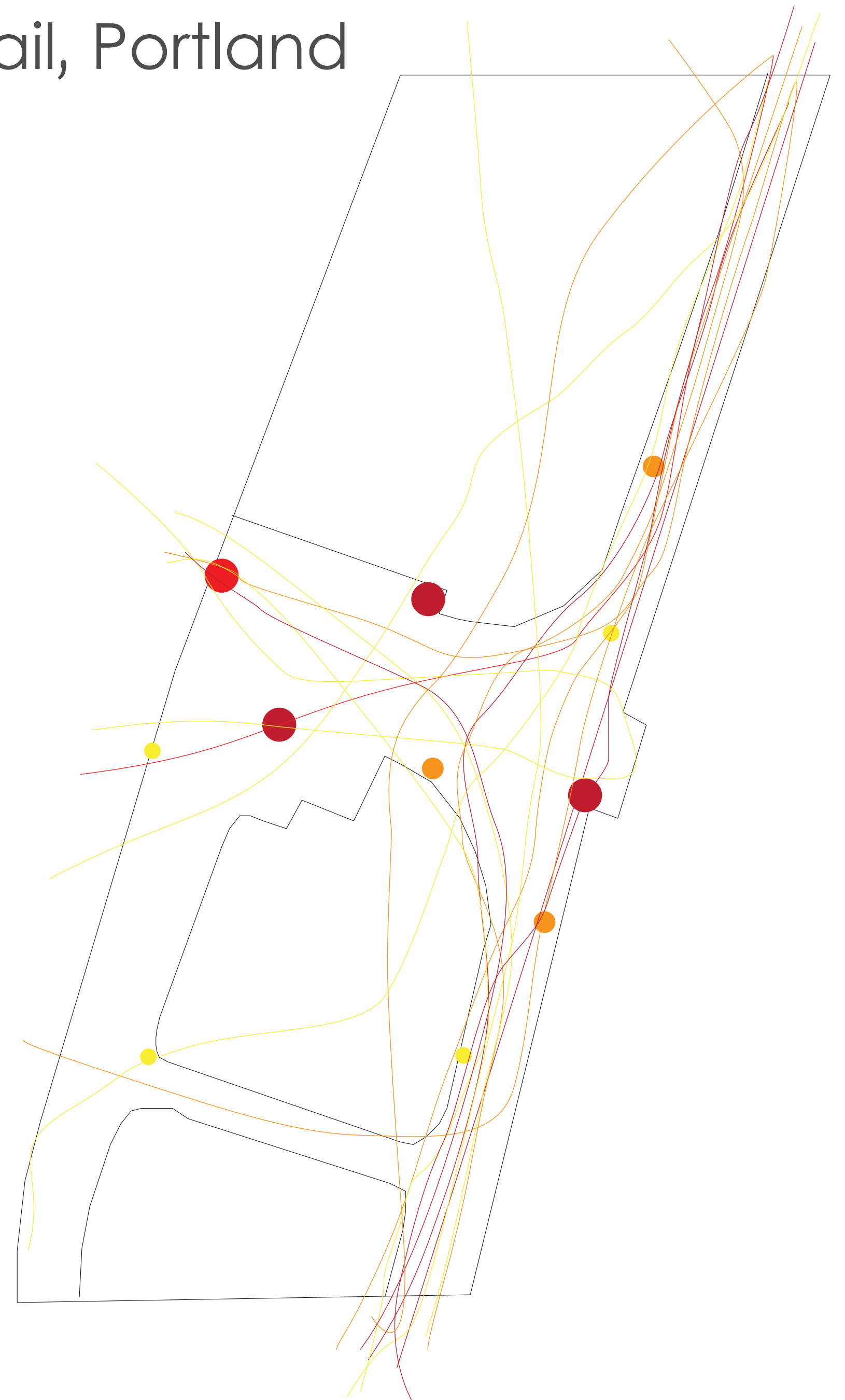
## Transportation

 63 Pedestrians

 15 Bicyclists

 16 Joggers

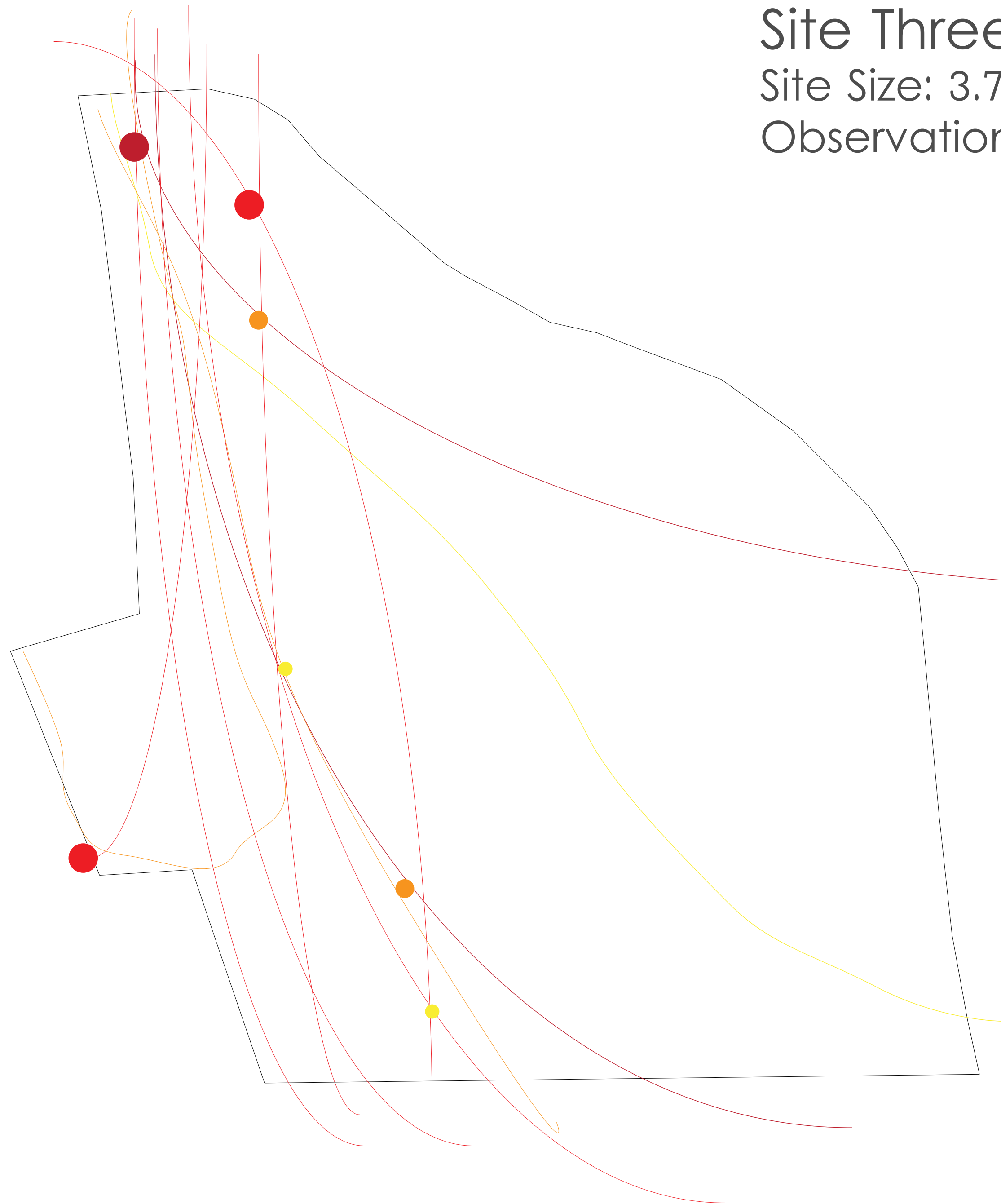
 1 Handicap






# Site Three: Sellwood Riverfront Park, Oak Grove


Site Size: 3.7 Acres

Observation Length: One Hour



## Amenities

-  10 Benches
-  9 Exterior Lights
-  8 Educational Signs
-  8 Trash Cans

 = 10 People/ Amenities

## Transportation

-  57 Pedestrians
-  5 Bicyclists
-  1 Joggers
-  5 Fishermen

Portland's bus systems, and light rails have two stops directly west and south of this thesis site. These transportation systems take up to thirty minutes to arrive during certain hours of the day. This leaves pedestrians with nothing to do but sit and wait.

# Transportation Analysis

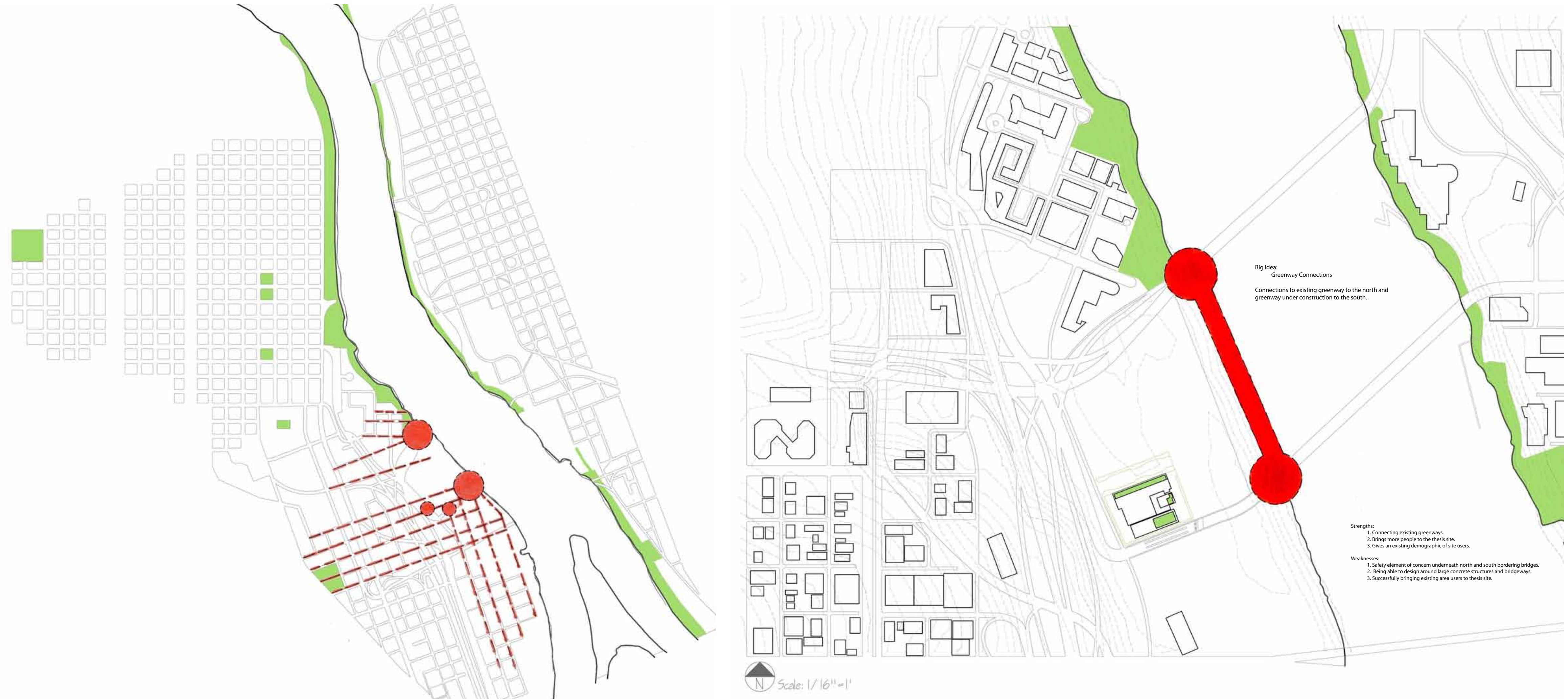
Creating connections from Cully Park to these bus stops is extremely important so that pedestrians can enjoy their time while they wait for their bus stop and think of their route as an after thought while they are meandering through the gardens.



Portland is designed off of a grid system, everywhere that is except for the three block radius around the thesis site. Because of this layout change, all blocks are pointed towards Cully Park. While they are all pushing people towards this site, there is a large disconnect between people and the park.

Creating connections and bringing these blocks through to the site will establish a destination for the community of the South Waterfront District as well as Downtown Portland.

# Connections Analysis



Oregon State University has a large presence in the South Waterfront District. The graphic on the bottom left highlights OSU's campus. While there are seventeen Oregon State buildings directly north of the site, there is one building on the thesis site as well. This building is Oregon State University's School of Dentistry building. This brings a large amount of student population to the area that is forced to walk around out on the street instead of a large pedestrian setting.

By creating a greenway connection and designing more OSU buildings on site, the student demographic will be welcomed with large, pedestrian walking spaces.



To create the design concepts shown below, I had to follow all of the information from my Portland visit, the inventory taken, and finally the analysis depicted from the inventory.

The graphics shown below separate out walking paths which are highlighted in purple, the remediation gardens and their different levels through the remediating process, which are shown in blues and greens, and finally the different buildings to extend the OSU campus.

# Design Concepts



Design Concept: Early February



Design Concept: Late February



Design Concept: Early March



Design Concept: Early March



Design Concept: Mid March

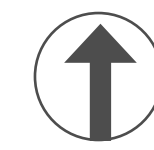


Design Concept: Mid March

# Master Plan Concept



- Open Lawn
- Fishing Pier
- Phytoremediation Planting Beds
- Seating Steps at Overlook
- Open Water (Phytoremediation Space)
- Water Settling & Precipitation Bed
- Pathogen Removal Bed
- Aeration & Purification Beds
- Nutrient Removal Bed
- Open Grass Drifts
- Water Quality Stabilization Bed
- Concrete Path to Pedestrian Bridge
- Waterfront Access from Terrace Steps
- Mass Natural Phytoremediation Plantings
- Main Concrete Path Connection to Existing Greenway



60' 120' 180'

# Master Plan



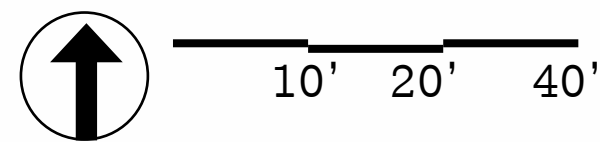
- Existing Oregon State University Multi-Use Building
- Intimate Boardwalk with Remediation Demonstration Planting Beds and Mixed Seating Spaces
- Western Red Cedar Boardwalk Waterfront Access & Fishing Pier in Willamette River
- Boardwalk Site Plan Bounding Box
- Western Red Cedar Boardwalk/Dock along Willamette River; Provides Kayak Tie-up Docking
- Proposed Multi-Use Building. Three Stories: First Floor Commercial use; Second & Third Floor Offices.
- Main Walk, Stamped Concrete with Viewing Space and Overlook to Willamette River and Step Seating for Long Term Stay
- Proposed Multi-Use Building
- Remediation Demonstration Terrace Garden Plantings
- Proposed High Rise Housing Building for OSU
- Harvest Gardens Bounding Box
- Phytoremediation Harvesting Gardens with Mass Plantings
- Proposed High Rise Housing Building for OSU
- Remediation Demonstration Planting Beds
- Poured Concrete Terrace Steps. Five Foot Width and One Foot Depth
- Western Red Cedar Boardwalk Ramp Leading Down to Waterfront Access
- Existing Oregon State University School of Dentistry Building



# Master Plan Birds-Eye Perspective

Overall view of Cully Park, shows the rising contours of the hills in Portland, as well as the surrounding metropolitan area and road networks.





## Boardwalk Site Plan

### Boardwalk Views to Willamette River

The southern side of the boardwalks contain open views to the Willamette River as well as the remediation demonstration terrace gardens.

The boardwalks meet the main poured concrete path at a contour level of twenty five feet and drop various amounts for each level ranging from two feet to eight feet. The drop off viewing distance from the boardwalk to the river starts at twenty five feet until meeting the waterfront access boardwalk that is level with the river.

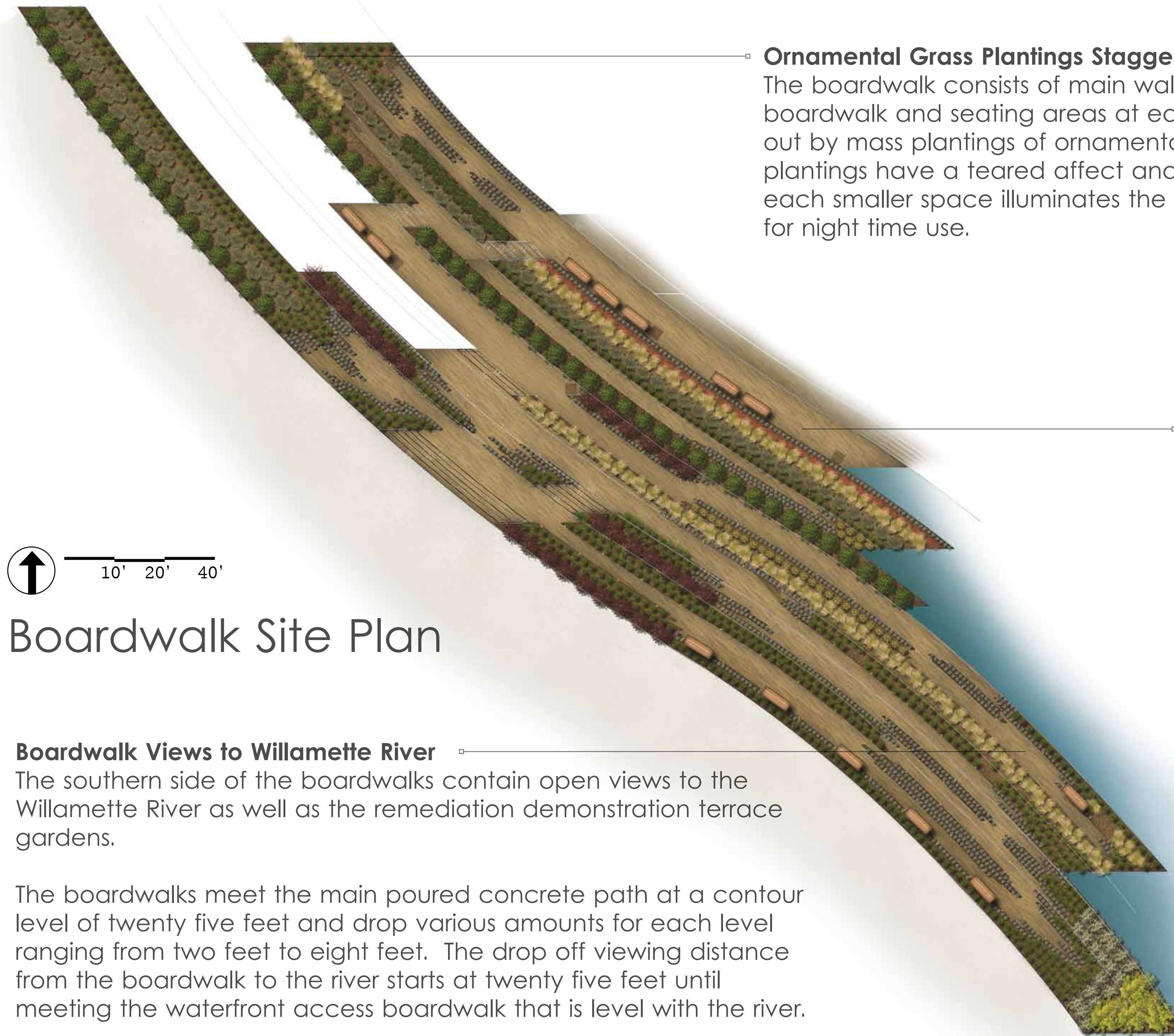
### Ornamental Grass Plantings Staggering Into Western Red Cedar Boardwalk

The boardwalk consists of main walking spaces that break off into smaller boardwalk and seating areas at each level. Each smaller space is then separated out by mass plantings of ornamental grasses, perennials, and shrubs. These plantings have a teared affect and get larger as they move back. Low lighting in each smaller space illuminates the boardwalk and plantings from the ground up for night time use.

### Western Red Cedar Main Boardwalk

The main boardwalks meander from the main poured concrete walking path down to the waterfront boardwalk. These boardwalks range from six feet wide to twenty feet wide for interesting variations at each separate level.

These main boardwalk paths have various bench sizes as well as trash cans for site visitors as well as stainless steel post railings with a six inch wide cedar railing tops. These railings have lighting installed to shine down at the boardwalk to help light the walking paths for site visitors.

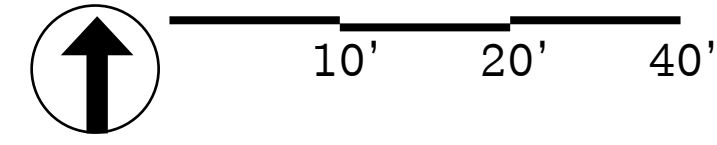


# Boardwalk Birds-Eye Perspective

Overall look of the boardwalk and plantings facing south towards the main concrete walking path and mass planting areas.



# Harvest Gardens Site Plan



## Remediation Demonstration Lighting

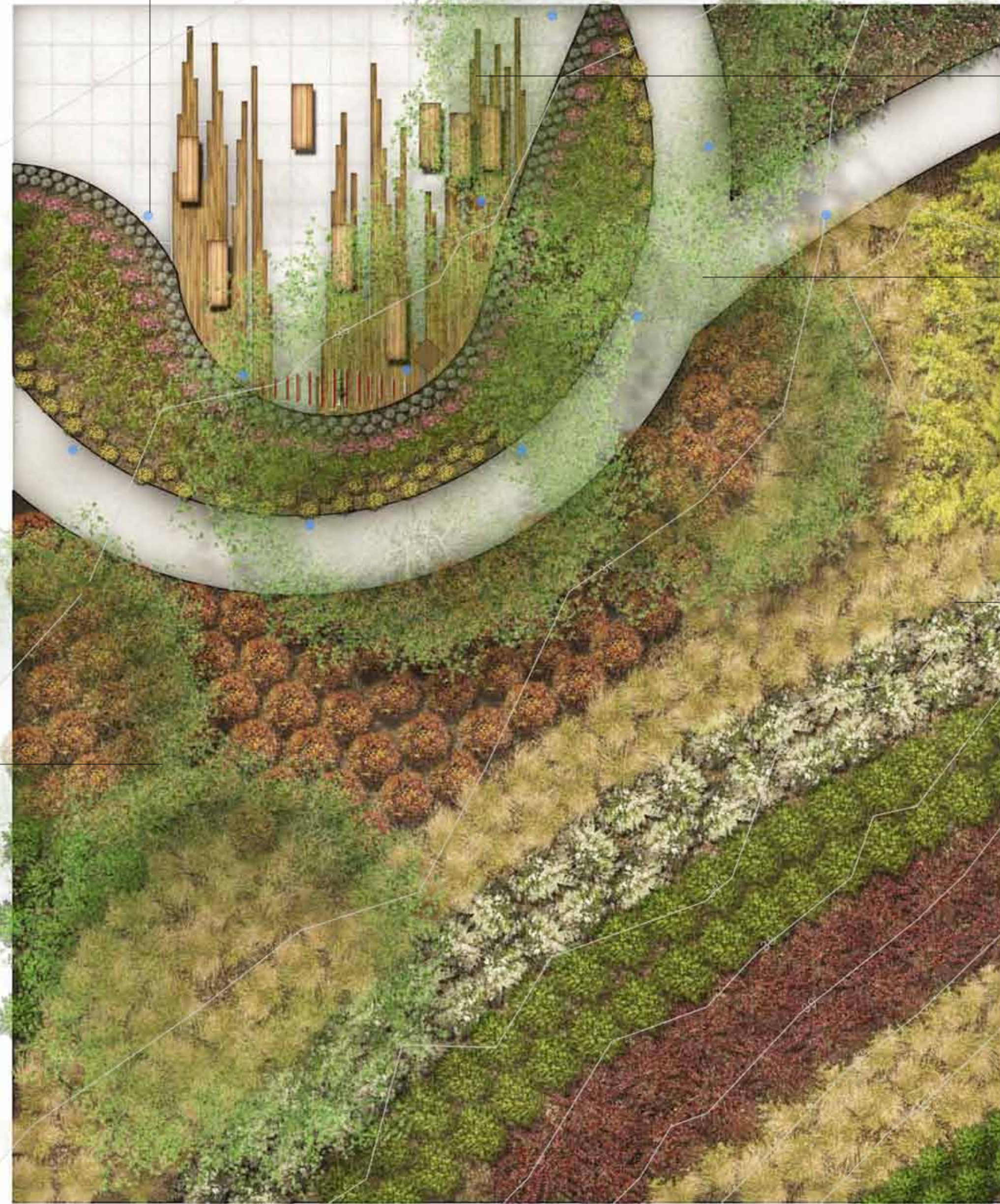
Each light is connected to indicator pipes that lead under ground beneath the phytoremediation harvesting gardens. These indicator pipes have specific indicators spaced ten feet apart so they are site specific.

Each light is ten feet tall and built out of stainless steel. The bottom four feet are whole stainless steel while the top four feet are the lights made out of plexiglass with stainless steel lining. The LED lights have different colors for each intimate seating breakout space. These different colors reflect the different contaminants that are being taken up by each harvesting section.

## Phytoremediation Harvesting Gardens

The harvesting gardens are separated into three sections that remediate the spaces of the selected heavy metals contaminants. These contaminants are as follows:

- Cadmium
- Copper
- Lead
- Nickel
- Zinc



## Western Red Cedar Wood Flooring

Six inches wide, staggering into poured concrete to intrigue site visitors to the intimate seating space

## Poured, Stamped Concrete Eight Foot Walking Path

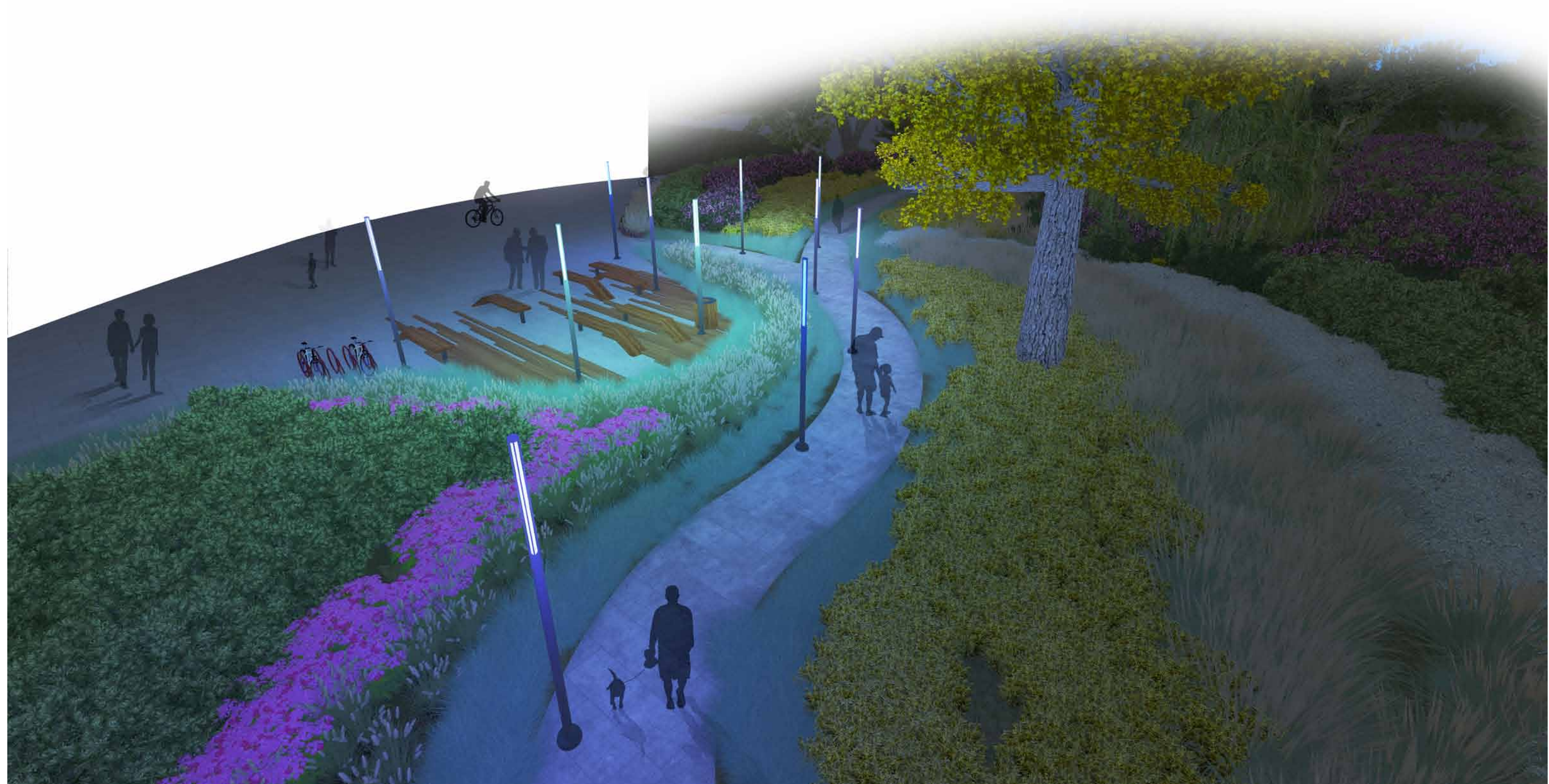
Small, intimate walking path carrying site visitors through the remediation demonstration gardens for quicker and quaint access to the waterfront and roadways.

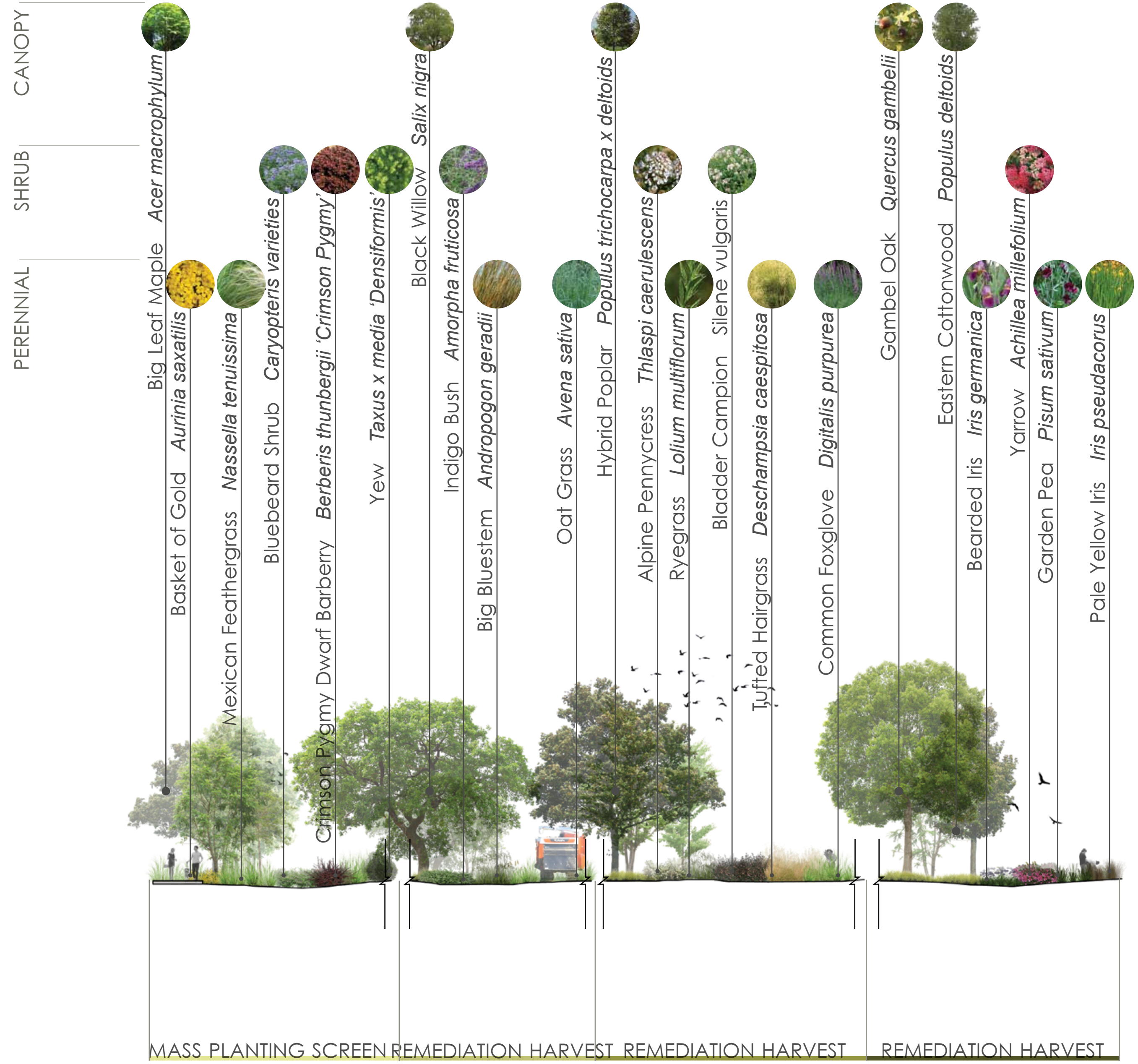
## Remediation Demonstration Gardens

These gardens keep a distance of at least thirty feet of plantings between pedestrian walkways and the phytoremediation harvesting gardens. Using plants hardy to Portland, they provide vivid colors and textures.

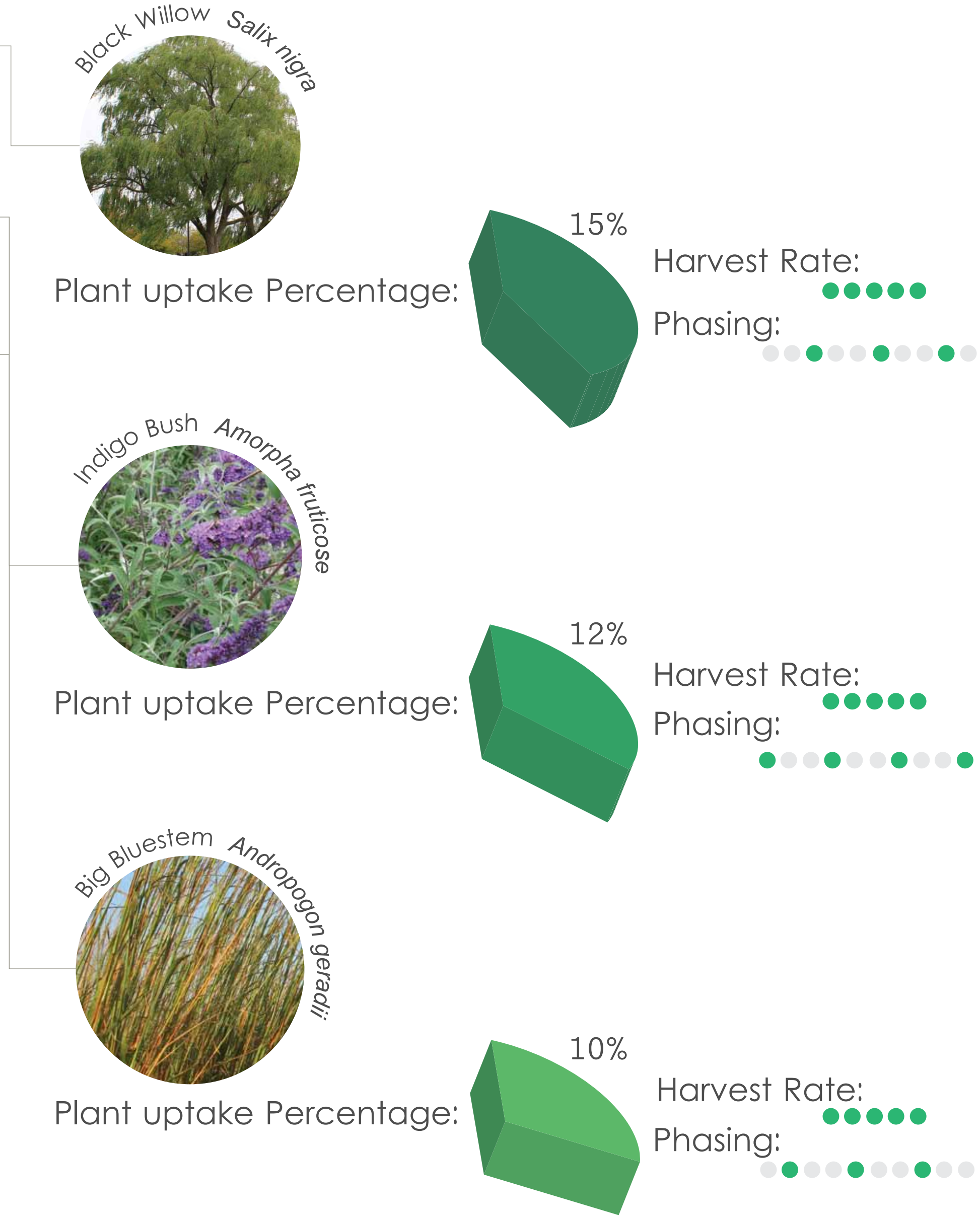
# Harvest Gardens Birds-Eye Perspective

Night time view of the educational lighting connected to contaminant levels of harvest gardens within the intimate walking path and seating area.





# Harvest Gardens Planting Plan

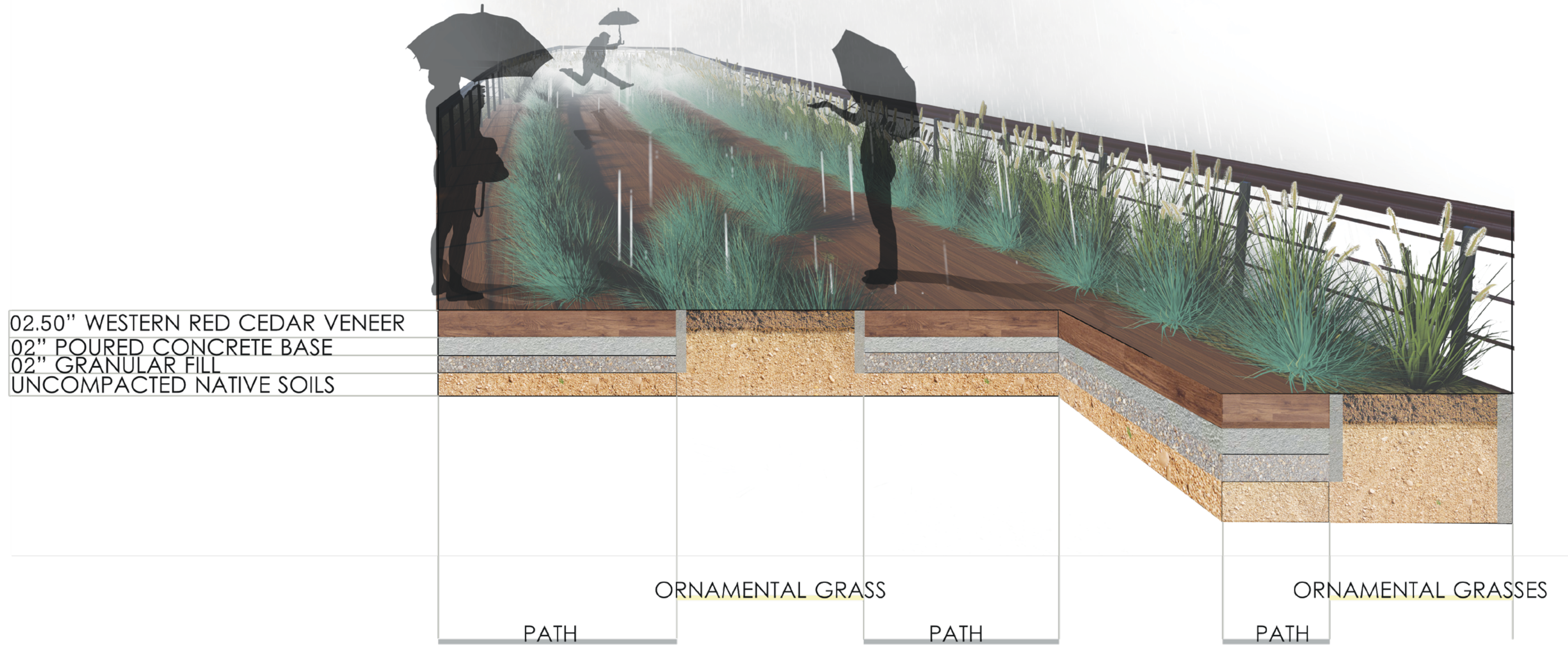


NICKEL	●●●●●	76,000 Years
LEAD	●●●●	22.20 Years
CADMIUM	●●●	13.6 Years
ZINC	●●	243.8 Days
COPPER	●	61.83 Hours

Recurring Contaminant  
● = One Year

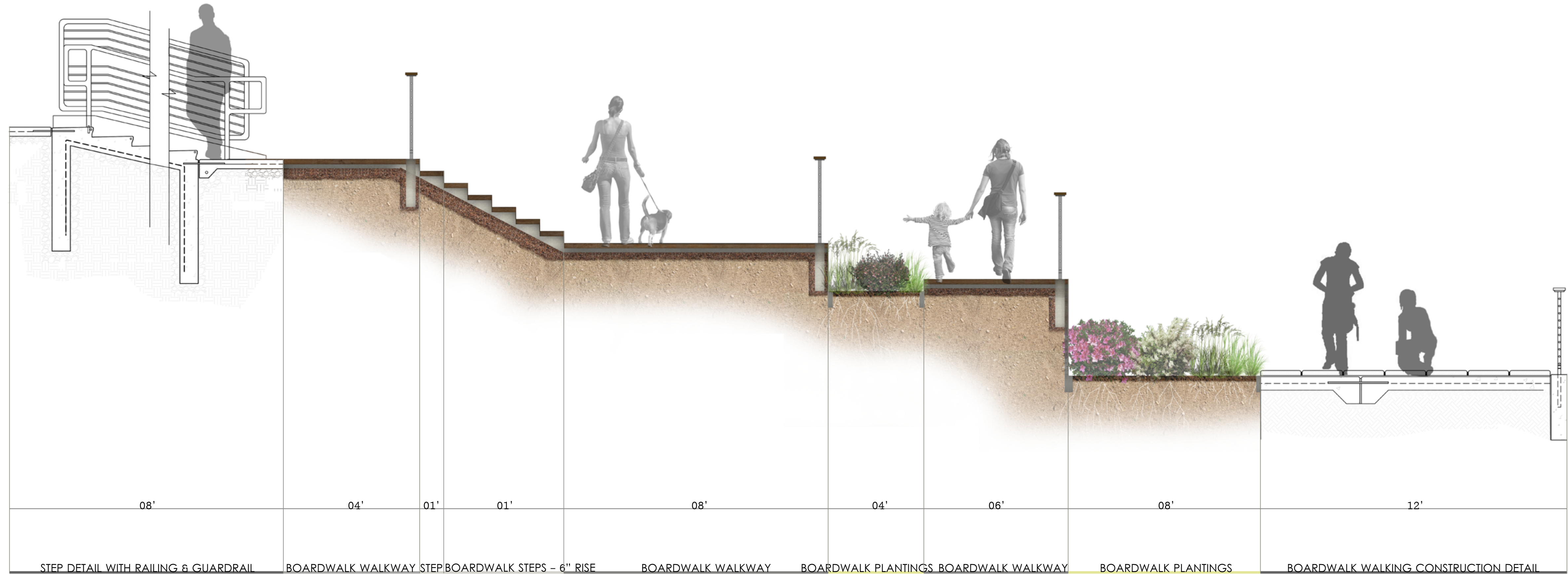
Phytoremediation Graphic

# Boardwalk Site Plan Detail



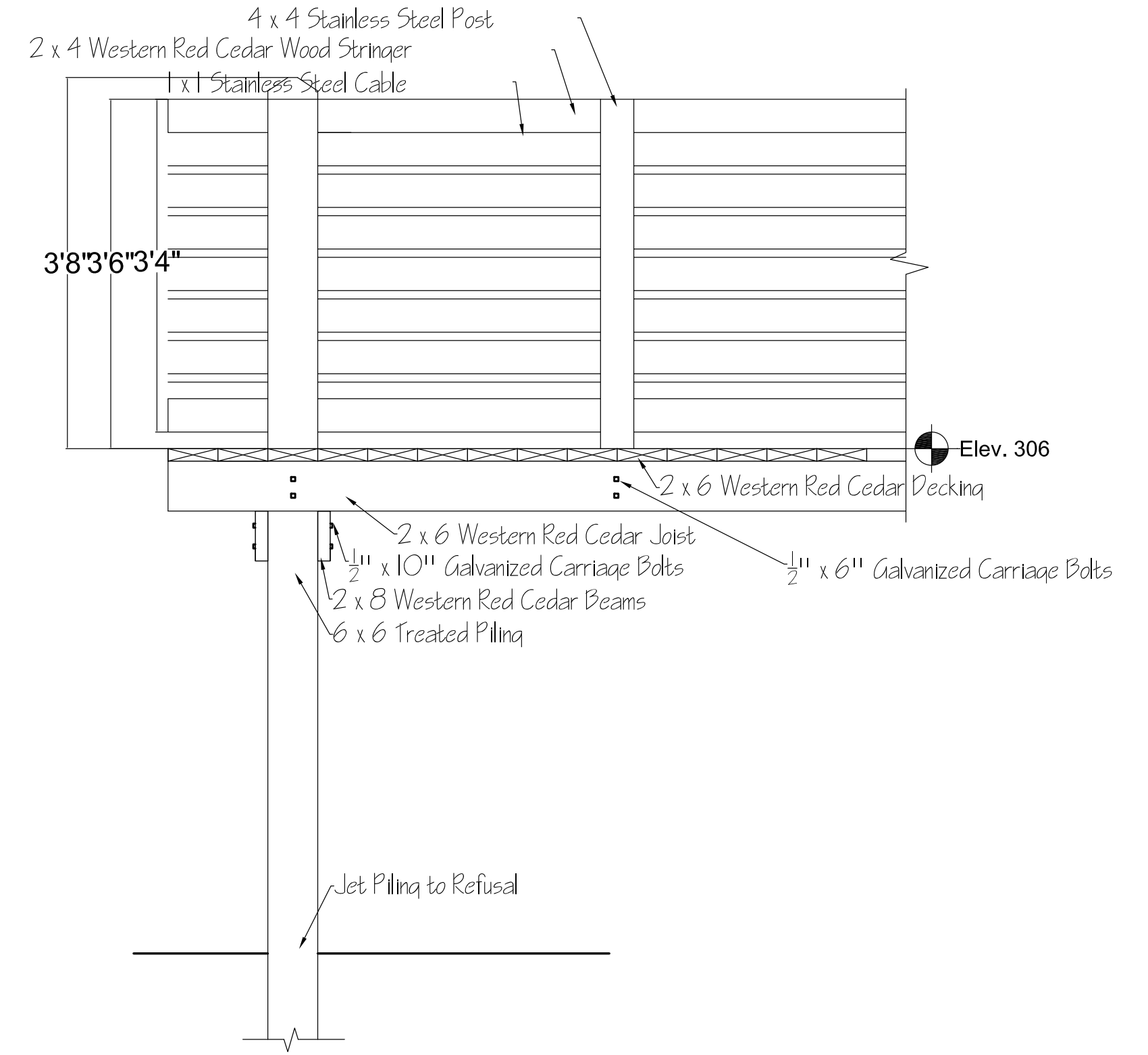
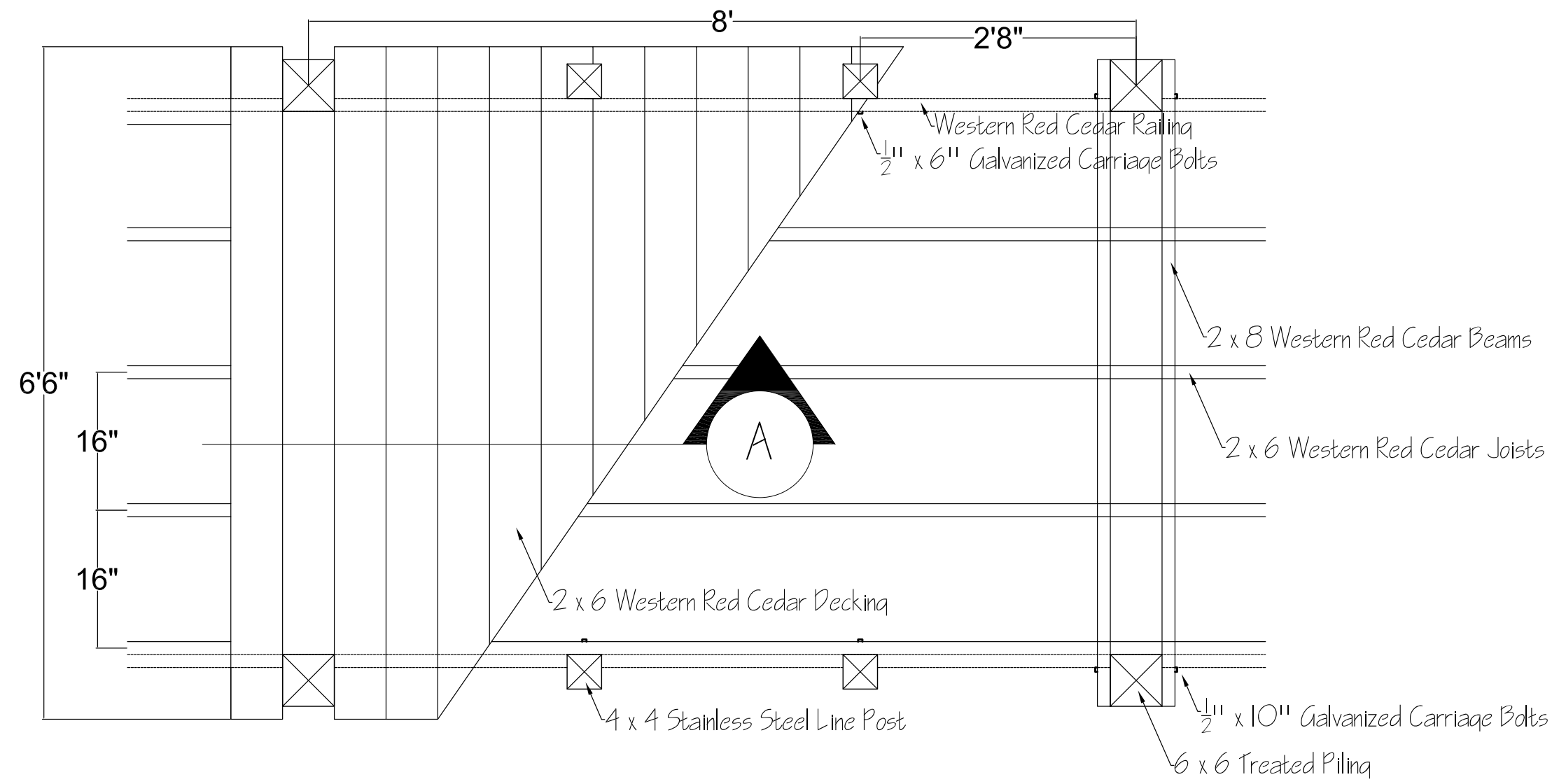


# Boardwalk Site Plan Section Cut



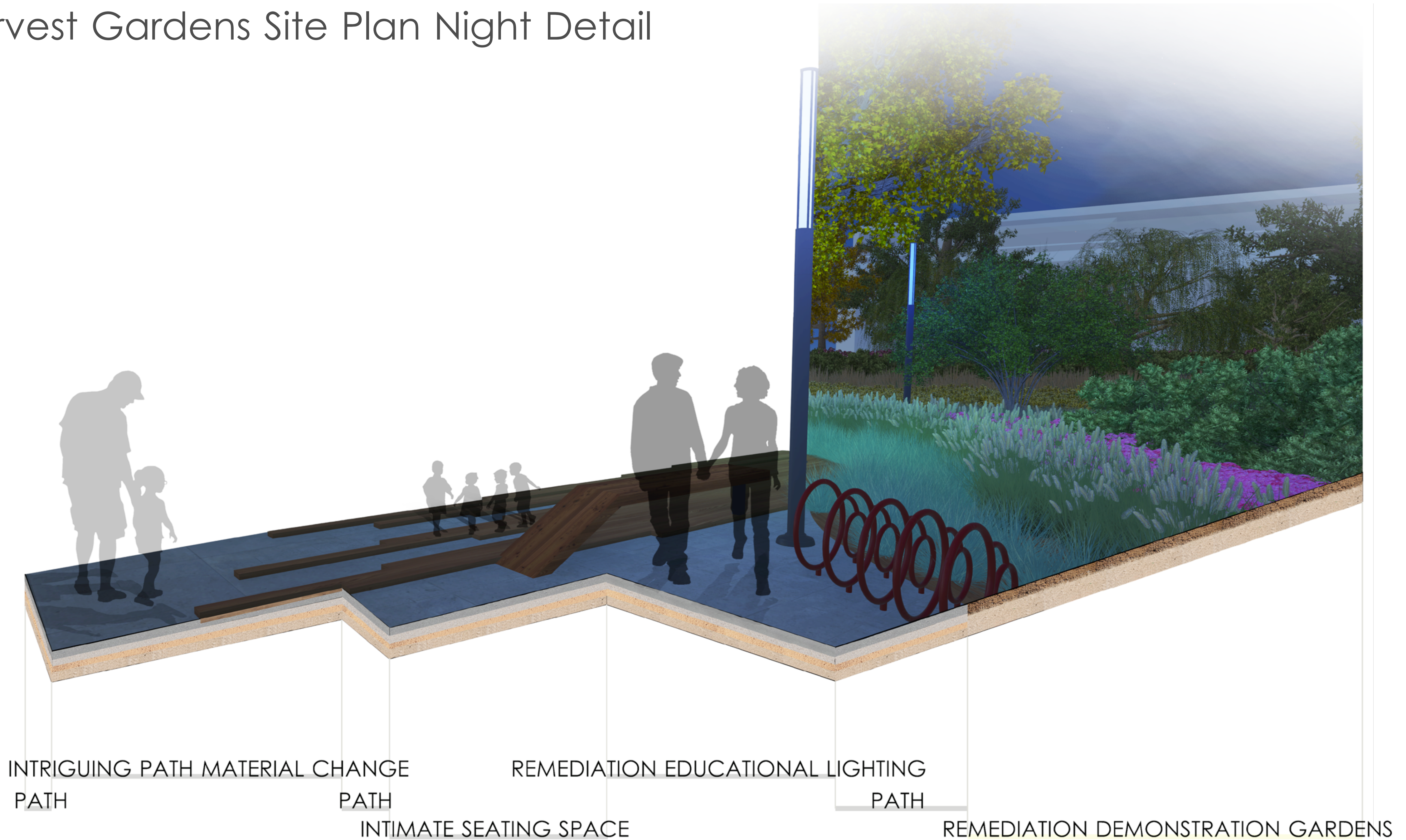
4" 8" 1'

# Boardwalk Site Plan Construction Detail

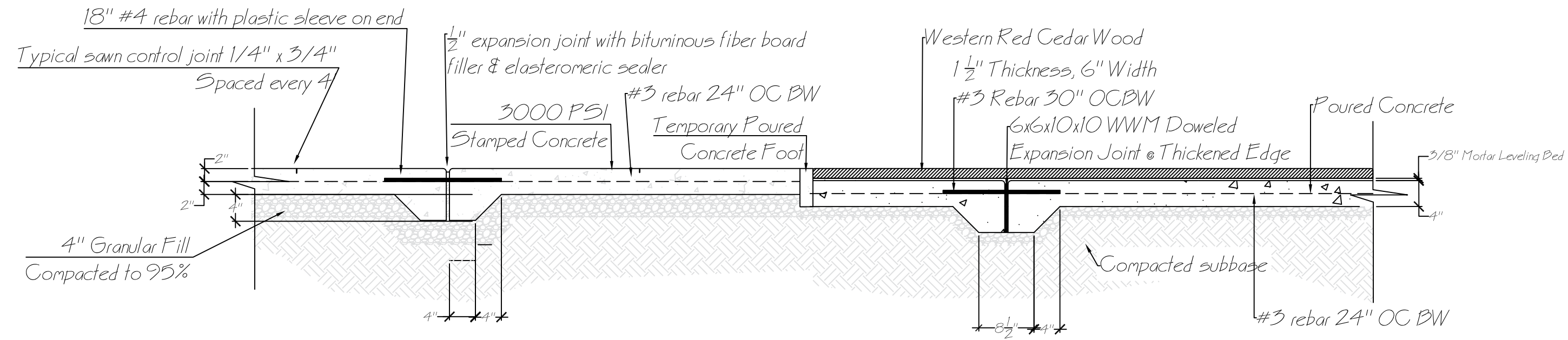


A Boardwalk Section  
Scale: 1 1/2" = 1'

# Harvest Gardens Site Plan Night Detail



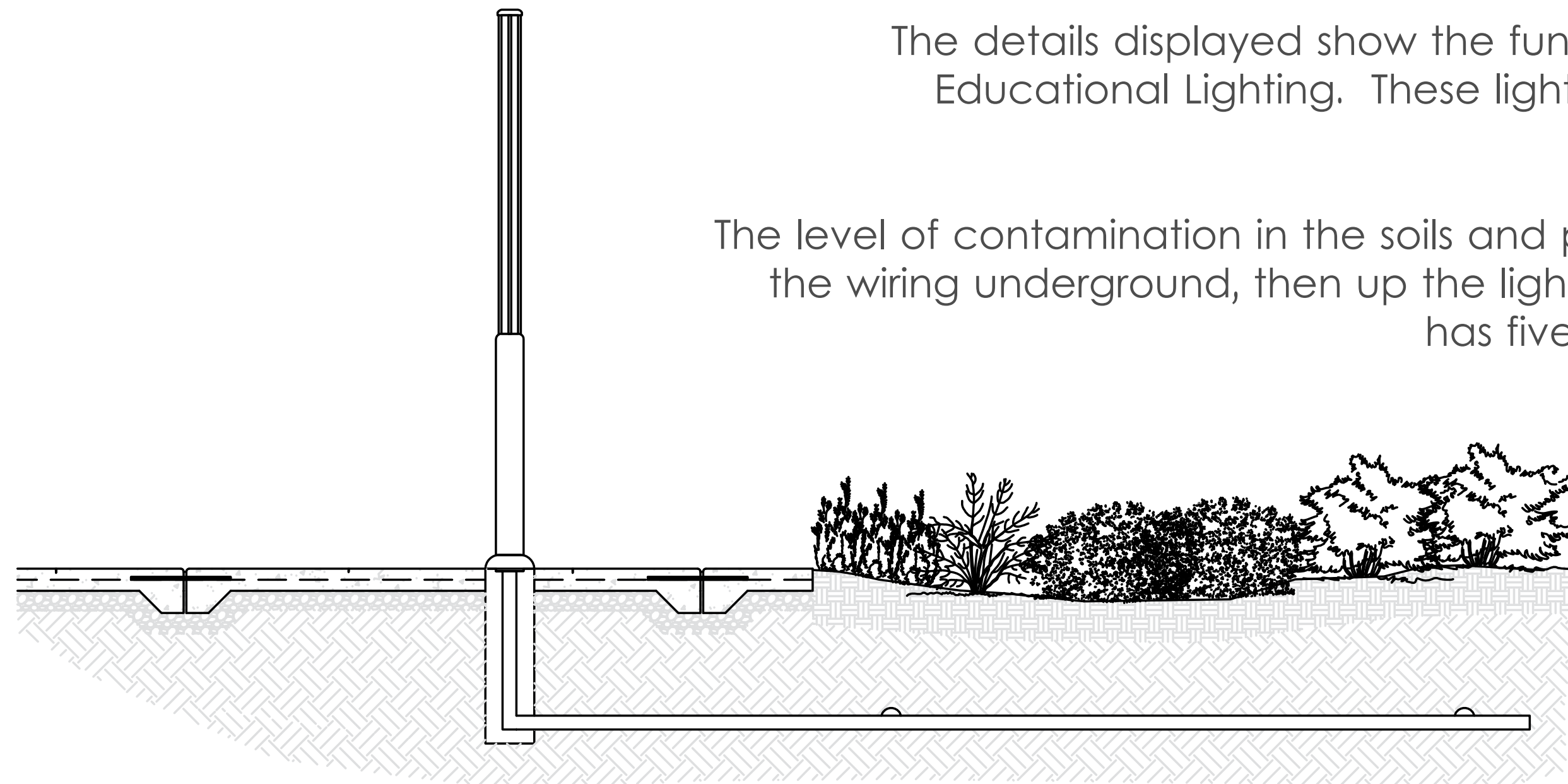
# Harvest Gardens Site Plan Construction Details



○ 4" CONCRETE PAVEMENT W/ DOWELED E. J. & WESTERN RED CEDAR VENEER  
Scale: 1/2" = 1'

The details displayed show the functionality of the detailed spaces. Below is a detail of the Remediation Educational Lighting. These lights have wiring systems that extend underground four feet and then run underneath each harvesting garden.

The level of contamination in the soils and plant roots are recorded by the light indicators which then run through the wiring underground, then up the lights and into the LED lights to determine their brightness level. Each light has five different levels of brightness per contamination level as shown below:



- Cadmium Lights: ● ● ● ● ●
- Copper Lights: ● ● ● ● ●
- Lead Lights: ● ● ● ● ●
- Nickel Lights: ● ● ● ● ●
- Zinc Lights: ● ● ● ● ●



# Harvest Gardens Site Plan Perspective Detail

CULLY PARK DESIGN DETAILS

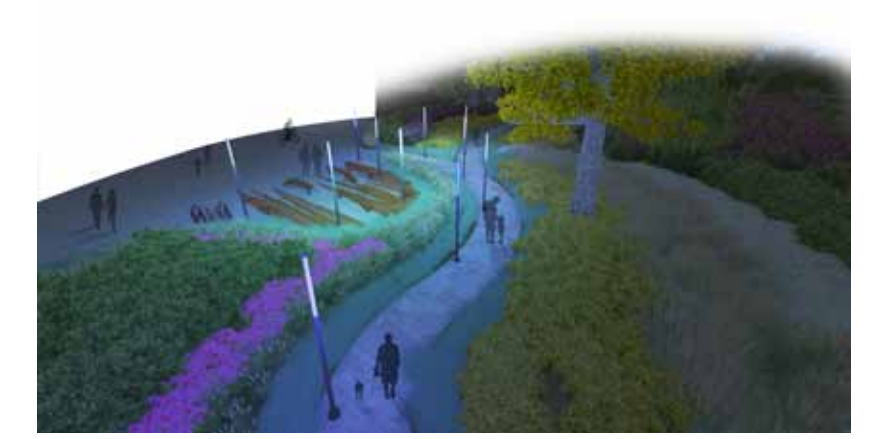
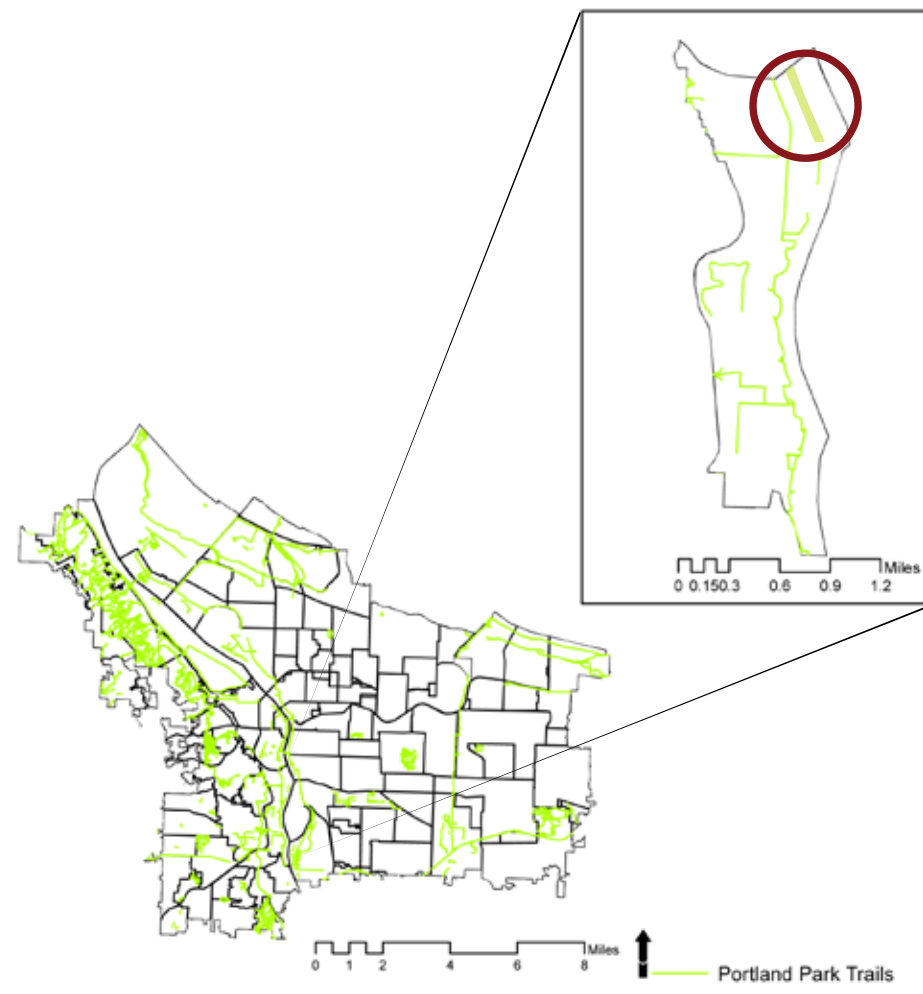


REMEDIATION DEMONSTRATION GARDENS

PATH CONCRETE WALKING PATH WITH INTIMATE BREAKOUT SPACES

INTIMATE SEATING SPACE

REMEDIATION DEMONSTRATION GARDENS



## Conclusion

Through evaluating Portland's trails and park systems, as well as pollutant levels along the Willamette Waterfront, designing a remediation greenway closes the gap between the South Waterfront District and Downtown Portland to establish a destination for People to go to and relax while being educated on phytoremediation practices.

# THANK YOU

*Kelsey M. Wick*

# Lumion Video Presentation