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Green Loop SWPDX Concept Plan: Alignment and Design Treatment Recommendations for the Southwest Green Loop


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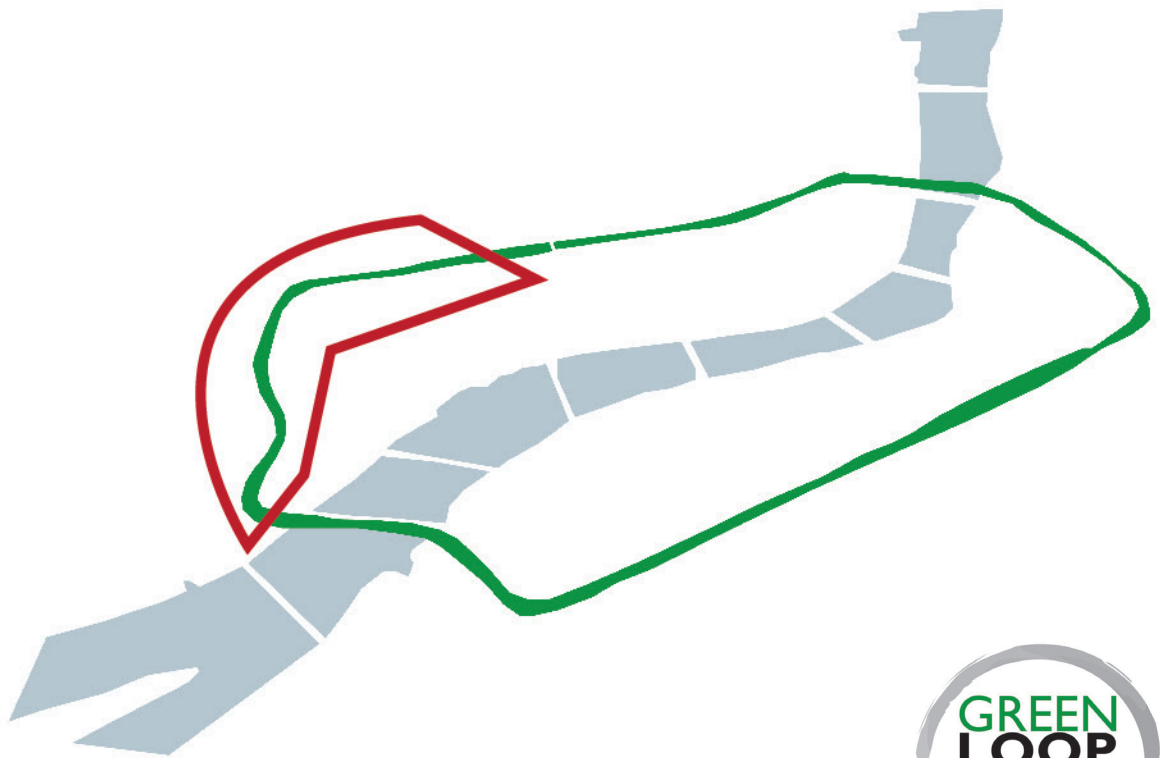
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Green Loop SWPDX Concept Plan

Alignment and Design Treatment
Recommendations for the
Southwest Green Loop

Prepared for the Bureau of Planning & Sustainability and
Portland State University by the Green Loop SWPDX team
June 2015



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The Team

The Green Loop SWPDX project was completed by a group of five Master of Urban and Regional Planning students at Portland State University for their final workshop.

Ashley Eaton

Role: Community Engagement Lead

Ashley's primary interests in the planning field include meaningful community engagement, neighborhood-driven community revitalization, and social equity issues. She was originally drawn to planning when the downtown of her hometown transformed before her eyes. In regards to the Green Loop project, she is interested in exploring the placemaking component and its ability to showcase the uniqueness of each district the loop will pass through.

Brian Gunn

Role: Innovation Month Lead

Brian received his BA in Environmental Studies and Planning from Sonoma State University. In addition to studying urban and regional planning, with a specialization in land use, he is pursuing a graduate certificate in real estate development at Portland State University. By understanding both planning and real estate development, he hopes to design communities that are healthy, economically successful, vibrant, and equitable.

Jake Adams

Role: Data Collection Lead

Jake's goal is to help others improve their lives by improving their built environment. He has always been interested in maps and plans and was exposed to real life development through his father's business building homes and master-planned developments in the mountains and valleys of Utah. An active transportation convert, he wants to improve the cycling environment for people who want to bike but don't feel comfortable riding on busy streets.

Kate Washington

Role: Team Leader, Graphic Design Lead

Kate found her way to urban planning through her father-in-law's urban planning work on Ft. Bliss in Texas. Kate is particularly drawn to urban design and public spaces and is keen to foster character in the built environment. She appreciates the placemaking component of the Green Loop project and envisions many ways public space can be incorporated into the Loop.

Mohd Meidiansyah

Role: GIS Lead, Data Analyst

Mohd Meidiansyah's interests in the planning field lie in learning how better infrastructure planning can be achieved through spatial analysis—especially using Geographic Information Systems (GIS) as a tool. He currently works as a civil servant in Aceh, Indonesia. He was originally drawn to planning when his hometown was devastated by an Indian Ocean tsunami in 2004. He is returning to Indonesia after graduation, where he plans to apply his planning knowledge to benefit the people in his hometown.



The team: Brian Gunn, Kate Washington, Jacob Adams, Ashley Eaton and Mohd Meidiansyah

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Executive Summary

The Project

The Green Loop SWPDX project is a Portland State University Master of Urban and Regional Planning (MURP) workshop project conducted by five students in partnership with the Portland Bureau of Planning & Sustainability Urban Design Studio and Portland State University's Campus Planning Office. It explores potential alignments and design treatments for Portland's Green Loop—specifically within the southwest downtown quadrant of the Central City.

This document reports on the results of a variety of research and makes recommendations for the alignment of the Green Loop and how it might be designed in ways that respect the distinct characteristics of its various segments. The report's intent is to facilitate conversations between the City and the public with regard to where the Green Loop might go, how it might be funded, what it might look like, and how it might be maintained.

Document Overview

Active transportation facilities are a growing trend in North America. This report introduces the concept of the Green Loop and explains why it will be a valuable addition to Portland's Central City. It then presents a series of case studies illustrating how other cities have conceived of similar paths. Next, it evaluates a series of alignment alternatives in order to recommend a route that best meets various goals. It further explores the recommended alignment in four smaller segments that have unique strengths and opportunities. Finally, the document discusses best practices for the Green Loop and makes additional recommendations regarding overall design and maintenance.

Process

During the months of February and March 2015, the team performed several analyses of the existing conditions around the Green Loop in order to understand the area and create a baseline for future evaluation of the Green Loop's impact. They examined demographic information, conducted walkability audits, performed bicycle and pedestrian counts, and inventoried business, parking, and transit in the area.

The team also conducted stakeholder interviews, distributed a visual preferences survey, and presented at local community meetings in order to learn more about the community's opinion of the Green Loop and what kinds of facilities the community would like to see provided on the Green Loop. This research was conducted early on in the process in order to inform later research on best practices for safety and design of the Green Loop. For more information about the Green Loop SWPDX process, please refer to the appendix.

Key Findings

Existing Conditions

The Green Loop will serve the greater Portland population; however, for the purposes of this project, the team analyzed the current conditions of the local area in order to understand how the southwest portion of the Green Loop may impact residents. Key findings from the existing conditions analysis include the following:

- The area is dominated by age groups that likely comprise students and retired people.
- Residents primarily walk, drive, or take public transit for their commutes while only a very small portion use bikes.
- While the park blocks enjoy the highest scores in the audits, the PSU Park Blocks have less active ground floors.
- The PSU Park Blocks experience high pedestrian traffic all week, but SW Moody sees high bicycle use.
- Aside from the PSU Park Blocks, secure bike parking is sparsely supplied.

Public Engagement

The community in this area is enthusiastic about the Green Loop, and cornerstone institutions understand the ways the Green Loop will improve Downtown. Key findings from public engagement include the following:

- The most consistent theme in these interactions was concern for both physical and personal safety.
- People want separated facilities for bicycles and pedestrians and secure bike parking. Additionally, they are concerned about antisocial behavior.
- Overall, people are comfortable doing a variety of activities downtown, but not bicycling.
- People also recognize that the Green Loop will require a great deal of coordination by the City and suggest that a stewardship program be designed for the facility.

Best Practices

A variety of best practices should inform the design and maintenance of the Green Loop in order to make it a world-class facility. Key findings from research on best practices research include the following:

- The Green Loop must address both personal safety—by creating a path where users feel secure—and physical safety—by creating facilities that separate use modes to avoid conflict.
- The facility should be comprehensively branded with wayfinding that orients users both on the route and to their surroundings and it should take advantage of opportunities to add green infrastructure and create public places.
- Finally, the Green Loop should have a strategy for funding and management in the short- and long-terms that includes criteria for evaluating its successes.

This document evaluates a great deal of research in order to make recommendations for the southwest section of the Green Loop. Each recommendation is made with the following goals in mind:



- **Safety.** Create a safe path for all users
- **Environment.** Improve the environment along the Green Loop
- **Efficiency.** Create a path that gets users to destinations efficiently
- **Identity.** Create an identity for the Green Loop that reflects local character

The icons associated with these goals are found next to recommendations throughout this report to indicate which goals each recommendation fulfills.

Summary of Recommendations

The following pages present a high level summary of the many recommendations made in this document. General recommendations are presented, followed by specific recommendations organized by the goals they fulfil for the Green Loop. Additional recommendations are made throughout this report.



General Recommendations

- Conduct focus groups with the “interested but concerned” population on the proposed alignment, both on foot and on bicycles, in order to observe their reactions
- Organize demonstration projects that will show people how the Green Loop could function
- Leverage redevelopment along the Green Loop in order to ensure an active pedestrian environment



Safety

- Use LED lighting along the whole facility with even, consistent coverage
- Post clearly understandable trail rules and expectations at entrances and along the facility
- Create physical separation of pedestrians, cyclists, and vehicles. For cyclists, a two-way cycle track with planters or flexiposts separating it from traffic should be provided. For pedestrians, a dedicated space unique from normal sidewalks with unified Green Loop-styled pavement is recommended.
- Design safe crossings at busy streets
- Provide adjacent controlled-access bike storage



Environment

- Where possible, retrofit the public right-of-way along the Green Loop to include stormwater planters
- Engage City agencies, property owners, community members, and local artists to design green infrastructure that is functional, visually attractive, and representative of the neighborhood
- Add trees where possible



Efficiency

- Develop comprehensive wayfinding for the entire Green Loop
- Design directional signage that is appropriate for all users
- Incorporate directional and educational signage at key points
- Develop a web- or app-based presence to engage users and promote the Green Loop, surrounding businesses, and attractions



Identity

- Involve the community in designing the Green Loop. This could include holding votes on furniture styles, sharing users' stories, hosting design bike rack competitions, or curating educational and artistic installations.
- Create an organization whose main objective is to oversee the continued success of the Green Loop. This organization should include community members and representatives of nearby institutions and the City
- Have criteria in place to determine how private events such as marathons will be managed
- Create a dedicated maintenance fund to maintain the Green Loop at the highest level
- Develop a comprehensive branding package for the entire Green Loop
- Add bike amenities such as a bike share program and a comprehensive controlled access facility with showers, lockers, storage and rentals

Alignment Recommendations

- Run the Green Loop along the South Park Blocks with a 2-way cycle track on SW Park Ave.
- Remove parking from the inner lanes along the Cultural Park Blocks and use freed up parking spaces on SW 9th Ave. to create a series of public spaces
- Create a mingle zone on the west side of the PSU Park Blocks
- Run the Green Loop along College through to the edge of the Halprin Sequence
- Connect the Halprin Sequence to the University Place redevelopment and run the Green Loop between the American Plaza condominiums and I-405
- Capitalize on City-owned land west of the International School to connect the Green Loop to SW Grant
- Connect SW Grant to SW Moody via improvements to an existing bike path that runs under the MAX Orange line
- Phase the Green Loop to connect with a freeway cap on I-405

Phase 1

On the ground as described

Phase 2

Build a pedestrian flyover from SW Naito to SW Moody

Phase 3

Connect the PSU Park Blocks and the pedestrian flyover via a freeway cap

- On the freeway cap, create both parks and developable land
- Avoid replicating amenities on the freeway cap that already exist in the Central City



Map I: Recommended phased alignment

Introduction

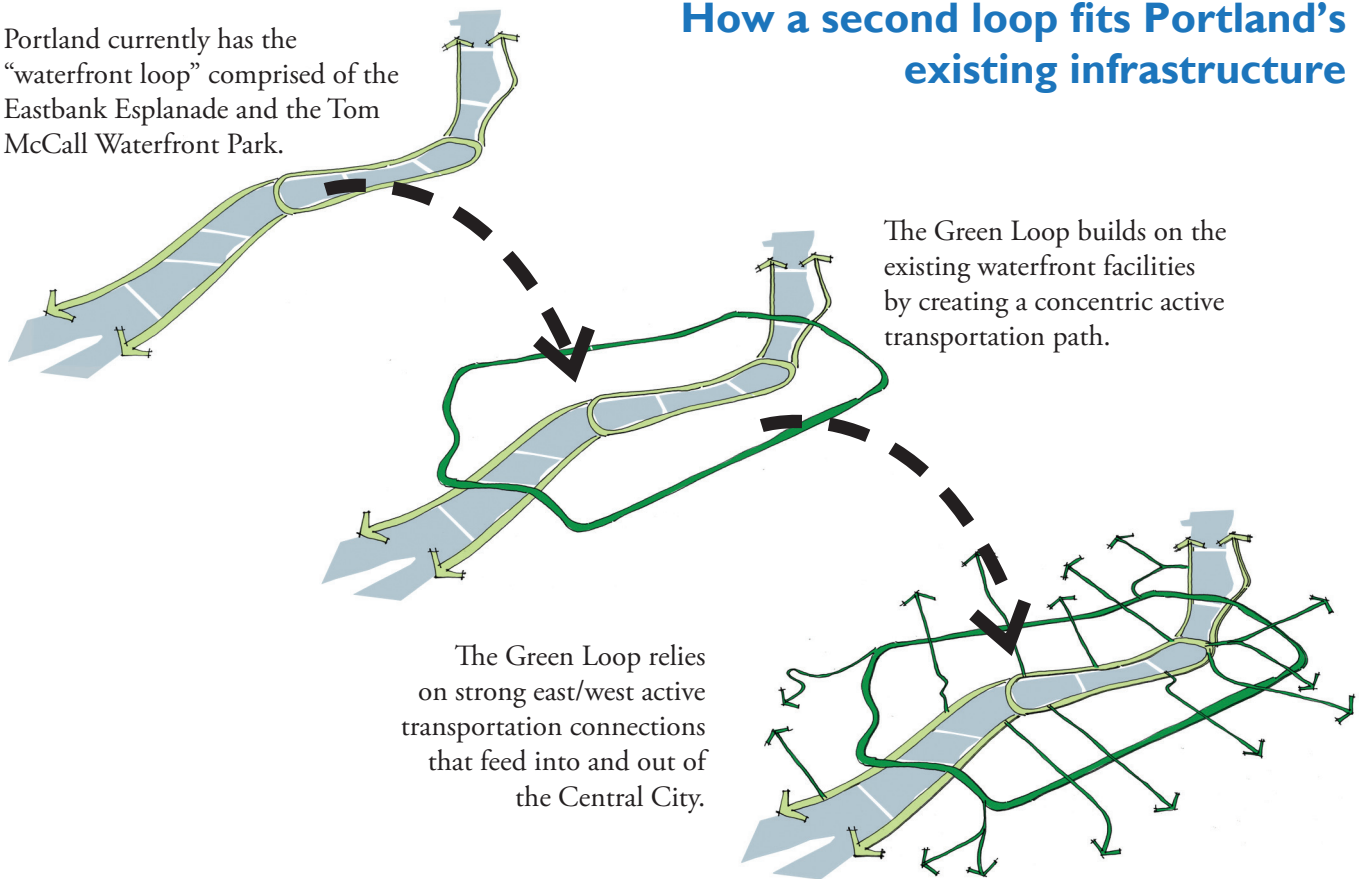
Green Loop SWPDX

The Bureau of Planning and Sustainability proposes the construction of the Green Loop, a 10-mile linear public open space that will further link the east and west sides of the Central City and create a ring of pedestrian and bicycle access (much like the East Bank Esplanade and Tom McCall Waterfront Park but further inland) that will draw activity to retail further from the river.

The southwest quadrant of the Green Loop links the South Park Blocks to the Tilikum Crossing, which is distinct in its lack of private automobile traffic. The Green Loop SWPDX project explores both large- and small-scale possibilities for creating a sense of safety and of place for cyclists and pedestrians in the Central City.

The purpose of the Green Loop SWPDX project is to explore alignment alternatives and design concepts that will create an identity for the Green Loop section between the Tilikum Bridge and the SW Salmon.

Portland currently has the “waterfront loop” comprised of the Eastbank Esplanade and the Tom McCall Waterfront Park.



Images courtesy of the Portland Bureau of Planning & Sustainability

The Case for the Green Loop

The Green Loop accomplishes several goals of the City of Portland and the metropolitan region. The primary arguments for building active transportation infrastructure are as follows:

- It reduces harmful impacts on the climate by reducing private vehicle use and greenhouse gas emissions.
- It improves health by fostering active lifestyles.
- It improves the economy around the new infrastructure by attracting investment and customers to the area.

Climate

Automobile use is a significant contributor to climate change. In fact, nearly a third of all greenhouse gas emissions in the United States come from cars. Given that about half of all car trips are less than five miles [1], many car trips can be replaced with active transportation such as walking, biking, and transit. Portland is creating policies, programs, and infrastructure to reduce short car trips and increase active transportation in order to lessen harmful emissions and climate impacts. The Green Loop is an excellent tool for that. Not only will the Green Loop reduce automobile use, its emphasis on adding green infrastructure will improve the quality of the natural environment in the Central City.

Health

Providing quality active transportation options is necessary to draw people from the convenience and comfort of their vehicles. The Green Loop will support healthy lifestyles in the Central City by linking people to a larger network of bike and pedestrian trails and providing them with a more comprehensive and attractive route selection, while connecting them to more destinations. If just 10% of U.S. adults started a consistent walking program, it would result in improved quality of life as well as a \$5.6 billion savings in health care costs [2].

Economy

The economic argument for the Green Loop is, by far, the most compelling. The Green Loop will generate economic impacts by attracting more businesses and replacing vehicle parking with bicycle parking, as outlined below.

Attracting Businesses

Increased foot and bike traffic along the Green Loop will spur development and investment in the nearby area by attracting businesses, creating jobs, and drawing tourism. Precedent for this is seen in Memphis, TN where business owners along Broad Avenue painted a bike lane through the Broad Avenue Arts District. Between 2006 and 2012, the district saw a decrease in vacancy rates, welcomed 16 new businesses, and underwent 29 significant renovations and new construction projects. Additionally, foot traffic increased dramatically and today over 40,000 people visit the district's art walk [3].

Replacing Vehicle Parking with Bicycle Parking

Many businesses fear that the removal of parking will inconvenience customers and cause a decrease in business. However, there is growing business support for bicycle infrastructure and a willingness to abandon some on-street parking. The increased or stabilized customer base that businesses report demonstrates that supporting bike and pedestrian infrastructure is good for business.

Additionally, current research indicates that there are measurable positive economic impacts from replacing parking with bicycle and pedestrian infrastructure. Compared to customers who arrive by vehicle, cyclists and pedestrians frequent local businesses more often, spend more per month [4, 5] and go out of their way to use safe infrastructure and secure bike facilities [6]. Therefore, local businesses will benefit from increased foot traffic by supporting the Green Loop.

The Goals of the Green Loop

The Green Loop will serve a variety of purposes for the City of Portland. It will build on Portland's existing success in connecting open spaces and institutions, helping people get to and from the bridges and linking the Central City's programs and projects. The Bureau of Planning & Sustainability outlines the following goals for the Green Loop:

- Improve health
- Connect parks
- Support businesses
- Increase trails
- Encourage riding
- Grow and build green

The Green Loop will...

Reduce vehicle use

The 2009 Climate Action Plan presents goals to cut carbon emissions by 40% by the year 2030. This requires more active transportation. Many Portlanders are interested in bicycling but concerned about high-speed traffic and congested paths, reinforcing the city's dependence on vehicles and contributing to carbon emissions.

Create a facility away from the waterfront

Apart from the waterfront facilities, downtown Portland has no easily identifiable path that is comfortable for cyclists and pedestrians of all levels and experience. The city would be benefitted by a path between the South Park Blocks and Tilikum Bridge. Additionally, the current bicycle and pedestrian flow is away from the retail core, depriving retail zones of potential activity, an issue that can again be addressed by the Green Loop.

Recognize the character of various districts

The proposed Green Loop will run through many physically and culturally unique areas. While continuity of a theme along the Green Loop is integral to its identity, the unique character of each district should be celebrated along the Green Loop.

Project Area

This project area covers the southwest portion of the proposed Green Loop that connects the new Tilikum bridge with the Cultural District. This area is located in the southwest quadrant of downtown Portland and aligns primarily with the South Park Blocks, I-405 and SW Moody.

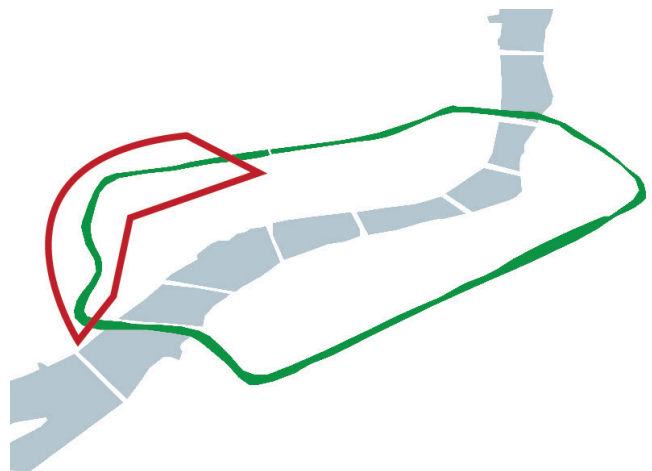


Image courtesy of the Portland Bureau of Planning & Sustainability

Planning Context

Planning happens within a larger context of plans. The Green Loop will be implemented primarily on land that belongs to the City; however, it will be serving local, regional, and state goals. This section briefly summarizes a variety of plans that will impact the Green Loop's design, implementation and success and how the Green Loop will fulfill their goals.

State

Oregon Statewide Goal 12: Transportation

Oregon's Goal 12 lays out guidelines for providing safe, convenient, and economic transportation system plans that are multi-modal, efficient, and equitable. The Green Loop meets these criteria and is part of Portland's future transportation system.

Region

Metro 2040 Growth Concept

The Metro 2040 Growth Concept identifies downtown Portland as the region's center for finance, commerce, government, retail, tourism, arts, and entertainment. The Green Loop is a catalytic project that will contribute to better connectivity and a healthier economy.

Regional Transportation Plan

The Regional Transportation Plan acts as a guide for future investments in regional transportation infrastructure based on growth forecasts for jobs, travel, and population, as well as budgets and potential funding. The Green Loop connects with regional transportation networks, providing people an active way to get around the Central City.

Climate Action Plan

The climate action sets the Portland metropolitan area's emissions reductions goals and outlines strategies for reducing harmful impacts on the environment. This plan first introduced the arguments for reducing car dependency and increasing active transportation that led to the conception of the Green Loop in the Central City 2035 Concept Plan.

Regional Active Transportation Plan

The Regional Active Transportation Plan envisions a seamless green network of on- and off-street pathways and identifies the policies and actions necessary to implement it. The Green Loop connects with local and regional active transportation networks, providing people a carless way to get around the Central City.

Portland Development Commission Strategic Plan

The goal of the PDC Strategic Plan is to achieve widely-shared prosperity among all residents of Portland via five goals: complete neighborhoods, access to high quality jobs, wealth creation, a sophisticated network of institutions, and sustainability. The Green Loop supports the PDC Strategic Plan by contributing to sustainability, complete neighborhoods, and placemaking.

City

2035 Comprehensive Plan Update

The Comprehensive Plan Update guides land use development and growth-related infrastructure investment decisions to make Portland healthier, more equitable, and more resilient. It calls for low-carbon communities, improved open space, and reliable and equitable transportation infrastructure—all of which are addressed for the Central City via the Green Loop concept.

Portland Economic Development Strategy

The strategy focuses on Portland's sustainable way of life as its greatest economic strength and emphasizes producing an innovative urban setting and stimulating economic activity in neighborhoods as ways to foster a sustainable economy. Both of these are accomplished by the Green Loop in the Central City.

Transportation System Plan

The Transportation System Plan addresses local needs for cost-effective transportation infrastructure improvements by providing transportation options for a variety of users. A more balanced transportation system, of which the Green Loop is one component, supports neighborhood livability and economic development.

Portland Bicycle Plan for 2030

A primary focus of the bike plan is attracting people who are not yet riding their bikes, but would like to. This requires not only providing education and outreach, but also safer and better quality bike infrastructure such as bike lanes, bike storage, and wayfinding, all of which are priorities in the creation of the Green Loop.

Downtown

Central City Fundamental Design Guidelines

The design guidelines aid designers and developers in understanding the city's urban design vision for Portland's Central City, which emphasizes a livable, walkable, urban community. All of these guidelines will apply to development along the Green Loop and inform its design.

West Quadrant Plan

The West Quadrant Plan is an interim step in preparing a new Central City plan. The West Quadrant Plan intends to preserve what Portlanders enjoy most about downtown, while making much-needed improvements and creating new places for Portlanders and visitors to experience the heart of the City. The Green Loop is one of the innovative ideas approved by the plan's adoption.

Central City 2035 Concept Plan

The Central City Concept Plan focuses heavily on the urban design of the Central City's public realm, addressing the lack of active recreation space and street homogeneity. It calls for low-carbon communities, improved open space, reliable and equitable transportation infrastructure, flexibility and resiliency, all of which are addressed for the Central City via the Green Loop concept.

University District Framework Plan

The University District Framework Plan outlines Portland State University's long-term development. The framework proposes three distinct development centers, one of which is the PSU Park Blocks. PSU envisions the blocks just west of the park as a student-centered hub that maintains a strong connection to the vision of blended uses, including an inviting pedestrian realm that is enhanced by the Green Loop.

SoMa EcoDistrict Roadmap

The SoMa EcoDistrict Roadmap guides development in and around the Portland State University campus, which has been designated as an ecodistrict that will be developed as a model of sustainability. The Green Loop concept meets the following roadmap sustainability goals: destination gathering spaces, connectivity, and green infrastructure.

South Waterfront Plan

As part of the North Macadam Urban Renewal Area, the South Waterfront Plan introduces a high-density, mixed-use vision for the 130-acre South Waterfront District that emphasizes Portland's relationship with the river and with sustainability. The implementation of the plan will create an increasing need for connectivity with the greater Portland region, which can be provided by the Green Loop.

Case Studies

This section contains case studies of facilities similar to the Green Loop paying particular attention to the context of the facilities. While the team received many great suggestions during the public engagement process about other facilities, many were not applicable in context because they were waterfront loops or trails that run through less densely populated areas as opposed to through an urban core. Among others, it was suggested the team look at The Intertwine in the Portland Metro region, The Beltline in Atlanta, and Flamengo Park in Rio de Janeiro, Brazil.

Facilities of this type—those that are more than a simple cycle track—that exist in a similar context to the Green Loop seem to be an emerging trend. There are plenty of examples of Rails-to-Trails and greenways, but the amenity-rich urban trail model is still a fairly new concept. This is reflected in our case studies. Many of the examples we found have just completed construction, are being built, or are in the design phase. This proved challenging in regards to quantifying the impacts that these facilities have had post-implementation.



Image 1: A variety of people take advantage of the Indianapolis Cultural Trail

Summary of Case Studies

Name	Location	Length	Cost	Status	Bike Share	Funding Mechanism	Stewardship Provision
Indianapolis Cultural Trail	Indianapolis, IN	8 miles	\$63M	Open 2013	Yes	-Private: \$27M -Public: \$35.5M \$20.5M TIGER grant	-Friends of the Trail -Maintenance endowment
Queens Plaza	New York, NY	7 miles	\$44.3M	Open 2012	Yes	-Public: \$37.7M Federal \$6.6M City funds	-NYCDOT and NYC Parks do maintenance
Connect Historic Boston Trail	Boston, MA	3 miles	\$74M Still trying to raise \$2M for additional amenities	Open 2015	Yes	-Public: \$56M CMAQ and bridge repair grant -Private: \$18M	-Partnership between Trust for Public Land and Friends of the Bloomingdale Trail -Intentional design to reduce costs
The 606	Chicago, IL	1.4 miles	\$23M	Construction starts 205; opens 2017	Yes	-Public: \$459,000 Transit in the Parks grant -Remainder City funds	-Partnership between BostonDOT and National Park Service
The Underline	Miami, FL	10 miles	Unknown	In design phase	Yes	-\$500,000 grant/public money for plan -Construction costs unknown -Expected 75% public & 25% private	-Friends of the Underline program -Intentional design to reduce costs

Key Takeaways from Case Studies

Public engagement early on is crucial. This early engagement gives people ownership of an idea, which can foster energy to propel the project forward.

Activate the interested crowd and leverage their energy. Using the power of human connections and social media can help build traction and excitement regarding an idea. This can be crucial during the implementation and funding phases.

Momentum is necessary. Momentum and acceleration regarding the project show commitment, which gives people the confidence to support the project at the times when support is most needed.

Projects that fill a market need are more implementable. If there is pent-up demand for a facility and people feel that they need it, they will be more likely to support it.

Bike share is a common theme. All of the cities that have implemented these facilities have bike share in place. This ensures that those that may be interested in biking but do not own a bike can also take advantage of the facility.

Public money will be necessary in funding this type of facility. In most cases, public money made up the majority of the funding. All of the projects, except for the Underline that has yet to secure funding, were able to secure federal grants to help construct the facility. Although private funding made up a portion of the funding in most examples, it was never a larger portion than public money.

Creating a “friends of the trail” program is common. In most cases, the facility has been treated as more than just an additional bike lane through the central city and instead given elevated status, with a separate entity being tasked with maintaining and programming it. This is the case for all of the examples except Queens Plaza, where the city treats it as an additional bike lane, and the Connect Boston Trail, where the National Park Service is a partner and is acting as part of the stewardship program.

Indianapolis Cultural Trail

Completed in 2013, the Indianapolis Cultural Trail (ICT) is a urban trail system that connects and highlights six cultural districts within Indianapolis. In addition to linking the cultural districts, the ICT connects to the expansive trail system in the city, linking up over 40 miles of trails. The project also integrates seven public art installations.

Location: Indianapolis, Indiana

Length: 8 miles

Status: Initiated 2006, opened 2013

Cost: \$63 million

Bikeshare: Yes

Funding Mechanism

The ICT's funding structure was unique in that it didn't use any local tax money to fund the trail. It instead used a mixture of private and federal funding. Private funding totaled \$27.5 million and was received from forty-five donors, which included a mix of businesses, individuals, and foundations. Donations ranged from \$20,000 to \$15 million, with the highest contribution—\$15 million—becoming Gene and Marilyn Glick's legacy project. The remaining cost was covered with public funding, which totaled \$35.5 million. A TIGER (Transportation Investments Generating Economic Recovery) grant totaling \$20.5 million was instrumental to the funding success.

Stewardship/Maintenance Plan

A Friends of our Trail program was established to oversee the maintenance of the facility. Friends pay an annual membership fee of \$100 dollars to pledge their support to maintaining the facility. The money is used to "ensure the Trail continues to exist as a beautiful and sought-after space." The annual membership fee also comes with a number of benefits including t-shirts, discounts to local business, and access to private events.

Additionally, the ICT leverages volunteers to help ensure the long-term success of the Trail. Volunteers fill a number of roles leading monthly trail tours, cleaning the path, and putting together materials for self-guided tours. The Beautify the Trail volunteers do weekly cleanups and local businesses can volunteer as part of a monthly trash collection contest.



Image 2: The Indianapolis Cultural Trail features separated facilities and illustrates the prioritization of slower modes

Impacts

Health

Initial surveying of trail users, done shortly after the facility opened, found that exercise and recreation was the primary use. It is also estimated that this number would be higher if those running and biking on the trail had been stopped and surveyed. At this time, there seems to be a lack of data beyond these initial surveys that could quantify other health impacts.

Economics

There has been an estimated economic impact of approximately \$864.5M and approximately 11,372 jobs created due to the trail's implementation. Businesses along the trail have reported an increase in customers (over 50%) and an increase in revenue (48%). Users of the trail (47%) indicated that they planned to spend money at local business while using the trail, likely leading to the aforementioned uptick in revenue. The increase in customers and revenue has led to businesses expanding their hours and hiring additional part- and full-time staff. There were also a few new businesses that opened in the area.

Climate

Five acres of new landscaping and 25,400 square feet of stormwater planters were installed along the ICT. These facilities help capture and divert stormwater from the combined sewer system, ensuring that overflow does not end up in the local river system during large rain storms. It is estimated that approximately 800 gallons of stormwater runoff are diverted annually. The additional tree coverage has also helped to reduce the heat island effect, which is saving about 14 kWh in energy for cooling annually.

Beyond the addition of plantings and green infrastructure, it is also estimated that the ICT has led to a reduction in automobile trips. A sampling of users on the ICT found that 45% of users reported making fewer automobile trips, translating into a reduction of carbon emissions. [7, 8, 9, 10]



Image 3: Artistic lighting along the Indianapolis Cultural Trail

Queens Plaza

The Queens Plaza and bike facility is located within the Long Island City Business Improvement District. This area of Queens has some of the largest redevelopment and development potential in the city. This facility takes the place of a former commuter parking lot and existing right of way on a street. The completion of this facility adds an additional 1.5 acres of open space in the city. Artist-commissioned benches were added to further add to the vibrancy of the space,

Funding Mechanism

Federal funding totaling \$37.7 million was used on the project. The remaining \$6.6 million was covered through the use of city capital funds.

Stewardship/Maintenance Plan

The facility does not have a specific organization established solely to provide stewardship. It is instead overseen and maintained by the NYC Department of Transportation and the NYC Parks Department.

Location: New York City, New York

Length: 7 miles

Status: Completed spring 2012

Cost: \$44.3 million

Bikeshare: Yes

Impacts

Economics

Prior to completion, the land surrounding the facility had been noted as having some of the highest capacity for accommodating the growth of affordable office space in the city. Since completion the area has been rezoned for high density mixed-use development. It is reported that significant redevelopment is underway around the facility.

Climate

Drought resistant plants, native plants, and almost 500 trees were added to the facility. This helps lower the heat island effect that is prominent in New York City and improves air quality. Additionally, porous pavers were used in the plaza segment of the facility diverting water from the sewer system and back into the groundwater system. [11, 12]



Image 4: Queens Plaza, New York City

Connect Historic Boston Trail

The Connect Historic Boston Trail is currently being undertaken through a partnership of the National Park Service (NPS) and City of Boston. The primary goal of the facility is to “make it easy to discover Boston’s downtown historic sites and have fun exploring the city’s past and present on foot, bike, and transit.” Seven streets within the downtown will be redesigned as shared streets or complete streets with cycle tracks. Wayfinding will also be key to the success of the trail, providing not only directional instructions but also educational insights. This is being done through signage, public art, and innovative initiatives like a guided scavenger hunt. It is also expected that the implementation of Connect Historic Boston will better leverage the city’s recent investment in bikeshare.

Funding Mechanism

The Connect Historic Boston work was prompted by a Transit in the Parks grant of \$459,000. The purpose of this grant was to encourage visitors to take alternative transportation to National Parks around the country. This inspired a larger discussion and was the catalyst for the city’s application for a TIGER grant, which was awarded in 2013. Boston secured \$15.5 million from that process and intends to fill the remaining funding gap with local public money.



Image 5: Map of the Connect Historic Boston Trail

Location: Boston, Massachusetts

Length: 1.4 miles

Status: Construction starts 2015, expected completion in 2017

Cost: \$23,043,700

Bikeshare: Yes

Stewardship/Maintenance Plan

There is not currently a maintenance plan in place. It is expected that the upkeep will happen through a partnership between the Boston Department of Transportation and NPS. They are also hoping to be able to set up some sort of endowment to ensure long-term success and programming.

Impacts

Because Connect Historic Boston has not yet been constructed, the impacts cannot be formally identified or assessed.

It is expected to make traveling between all Boston’s historic attractions substantially easier, which will positively impact the tourism industry. Furthermore, it is projected that the separated facility will inspire new individuals to bike and the increased access to the many of Boston’s parks should allow Bostonians and visitors alike to reap the benefits of an active lifestyle. It is also expected that the trail will increase both bike and pedestrian safety, a real concern given the narrow sidewalks and congested roadways of the historic downtown. [13, 14]

The 606

The 606 aims to transform an elevated railroad embankment that runs through an open space deficient segment of Chicago into a linear park system and alternative transportation trail. The completion of this project moves the City a step closer to its goal of ensuring that all children live within 10 minutes of a park or playground. Additionally, it will turn a community eyesore and barrier into an inviting place that reconnects the urban fabric and fosters community interactions.

Funding Mechanism

To date, The 606 has raised \$74 million dollars in funding. A federal Congestion Mitigation and Air Quality Improvement grant (CMAQ) and a state bridge repair grant made up \$56 million dollars of the funding. Private donations have made up \$18 million of the funding in the form of donations ranging from a single dollar to \$5 million dollars. Additionally, a local foundation supported a matching program, where they matched up to \$3 million in donations at a 3 to 1 ratio. The Trust for Public Land currently maintains control of the fundraising efforts and is working to raise an additional \$21 million to fund additional amenities along the trail.

Location: Chicago, Illinois

Length: 3 miles

Status: It will open June 6, 2015

Cost: Estimated \$95 million

Bikeshare: Yes

Stewardship/Maintenance Plan

During the planning process, material and plant selections were intentional in ensuring that the facility could be easily maintained in the future. The Trust for Public Land and the Friends of the Bloomingdale Trail will be working together to maintain the facility.

Impacts

Because The 606 has not yet opened to the public, the impacts cannot be formally identified nor assessed. [15]



Image 6: Rendering of how The 606 might look

The Underline

The Underline was started after a community member visited the Highline in New York City and was inspired to bring an amenity like that to Miami. University of Miami architecture students did initial concept plans and James Corner Field Operations, co-designer of the Highline, is currently working on the master plan. When built, The Underline will transform ten miles of underutilized transit right-of-way in to a linear park that will accommodate both bike and pedestrian traffic and will be the spine connecting over 250 miles of trails in the region.

Funding Mechanism

The initial \$500,000 to pay for the master plan of the facility came from the local government and four foundations. Construction of the Underline will be funded through a collection of small funding sources, as opposed to two or three large sources. This is partially due to the financial climate in Miami, which is characterized by low levels of philanthropic giving and an uncoordinated effort on the government's behalf to prioritize projects in competitive funding processes. Overall, they expect that 75% of the funding will come from public sources and the remaining 25% will come from private contributions.

Location: Miami, Florida

Length: 10 miles

Status: In the design stage

Cost: Unknown, the design contract totaled \$500,000

Bikeshare: Yes

Stewardship/Maintenance Plan

The Friends of the Underline has been responsible for all of the work done thus far and will continue to carry out that role in the stewardship and maintenance phases. They are being intentional in the design of the facility in order to reduce the need for extensive care in the long term. This includes picking plantings that will be able to tolerate Miami's warm climate without an irrigation system. This preventative work will be paired with a maintenance plan to ensure that the facility is pleasant and safe.

Impacts

Because The Underline has not been constructed, the impacts cannot be formally identified nor assessed. [16, 17, 18]



Image 7: Rendering of how The Underline might look

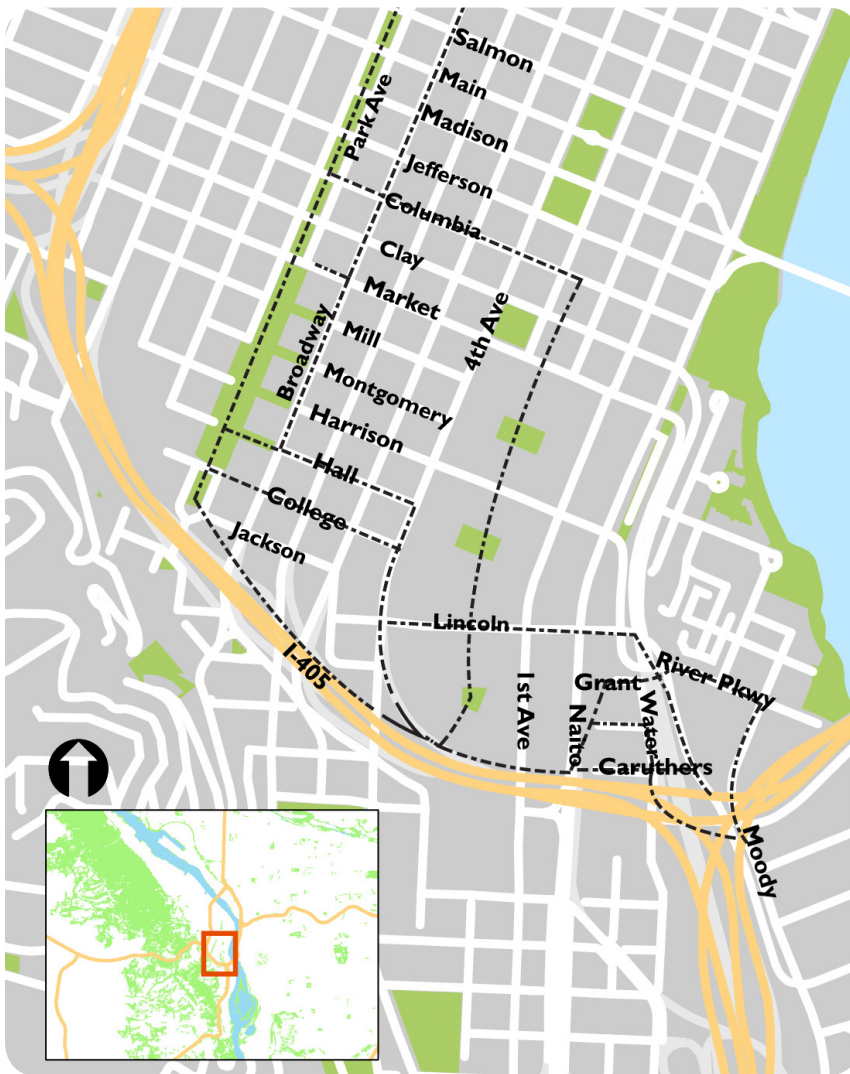
Potential Alignments

Introduction

While it is not the overall purpose of this plan to provide the exact alignment for the Green Loop between the South Park Blocks and the Tilikum Bridge, the team did identify many potential routes within each section of the project. Recommending an alignment is an important part of making design recommendations because they will vary depending which streets the Green Loop uses. Shorter segments of the recommended alignment are analyzed based on their strengths and weaknesses. The individual results and tables listing strengths and weaknesses can be found Appendix I.

These shorter sections were combined into three alignment alternatives (A, B, and C) that connect SW Moody and the northern end of the South Park Blocks (SW Salmon) based on our analysis of their strengths and weakness. These three alternatives were then compared with each other based on the project's goals of safety, environment, identity, and efficiency along with the relative time needed to implement each alternative.

The selection of a recommended alternative was based on a two-step process: First, the relative performance of each alternative for the four goals and the timeliness criterion was evaluated. Second, an implementation analysis taking into account potential barriers to implementation was performed. The phasing approach identified will allow the city to complete the Green Loop within 5 years while laying the groundwork for future implementation of a more ambitious alternative.



Map 2: A variety of streets were evaluated for their ability to best fulfill the Green Loop's goals

Evaluation of Alignment Alternatives

The relative merits of each alternative were evaluated for the identified goals, which are explained in the table below, using a scale from 0 to +++. The total number of +’s for each alternative were added up to provide a ranking of each alternative.

Alternative Alignment Scores

Alternative	Safety	Environment	Identity	Efficiency	Timeliness
A	0	+	+	+	+++
B	+	+	++	+	+
C	++	++	+++	++	0

- 0 Alignment does not substantially meet the goal
- + Alignment meets the goal with some limitations
- ++ Alignment substantially meets the goal
- +++ Alignment exceeds the goal



Map 3: Alternative A



Map 4: Alternative B



Map 5: Alternative C

Alternative A

This alignment is marked by the use of existing city-owned right-of-ways and is illustrated in Map 3. Of special note is the separation of the cycle track onto SW Broadway from the pedestrian portion of the Green Loop during the PSU Park Blocks, along with the San Francisco Lombard Street-style park on SW Caruthers Street.

Alternative A trades safety and identity for timeliness of implementation. The tracks in the pavement of SW Lincoln Street, along with the lack of physical separation of cyclists from traffic, decrease the physical safety of users while the stretch on SW Water and SW Sheridan Streets underneath the freeway ramps has very little natural surveillance and existing homeless activity.

Separating cyclists and pedestrians around the PSU Park Blocks limits this alternative's identity score. Similarly, the large number of turns limits its efficiency score as well. There is only limited opportunity for new green infrastructure and other environmental benefits beyond inducing more cycling and walking.

The biggest benefit to Alternative A is its timeliness. Because it would be implemented primarily on city-owned roads and does not require any large scale construction apart from Caruthers it would be relatively easy to build quickly.



Map 3: Alternative A

Alternative B

This alignment takes advantage of the opportunity to link the North and South Park Blocks with a two-way cycle track running the length of SW Park Ave. A pedestrian-speed mingle zone addresses concerns about pedestrian and cyclist conflicts in the PSU Park Blocks. Other prominent features are the section along the ODOT right-of-way behind the University Place site and the use of SW Grant and the existing infrastructure below the Orange Line ramp instead of SW Caruthers (see Map 4).

Alternative B is a compromise alternative that strives for good marks in all categories while still maintaining a reasonable implementation time frame. Safety is improved from Alternative A but is still in question around the PSU Park Blocks area. It has the same level of environmental opportunities of A but provides more opportunities for creating a strong identity, especially in the section parallel to SW Naito Street that connects with SW Grant Street.

While Alternative B does not have Alternative A's block-wide separation of cyclists and pedestrians on SW Broadway, it does have the mingle zone that will slow cyclists and thus hamper its efficiency score. This score is also impacted by the detour to use SW Grant and SW Naito to negotiate the grade change, but the trade off for personal safety is worth the extra length.

The need to work with more stakeholders and perform more significant construction work, especially behind the University Place site and on SW Grant, will lead to a longer implementation time for Alternative B than for Alternative A.



Map 4: Alternative B

Alternative C

The most ambitious of the alignments, Alternative C uses the same infrastructure on the Park Blocks as Alternative B but continues south onto a new cap over I-405, which it follows until after SW Naito Street. From here it uses a raised pathway above the ramps from I-5 to westbound I-405 to a spiral ramp or bike-pedestrian elevator (similar to the one connecting SW Gibbs Street to SW Moody Street) that lands next to SW Sheridan Street and the new trail underneath the MAX flyover (see Map 5).

Where Alternatives A and B make tradeoffs for quick implementation, Alternative C aims to create the most iconic route that best meets the project's four goals. It gets the highest marks for safety by taking the Green Loop completely off of streets for a large portion of the alignment, though the crossings of major streets limits it from getting full marks. The environmental impacts of such a major construction project likewise limits the environmental score despite great potential for new open space and trees on the cap, though they would be short-term impacts.

Alternative C gets full marks for identity by creating an iconic facility atop the freeway and addressing the grade change to SW Moody in an innovative way. The opportunity for Green Loop-related amenities atop the cap, such as an amphitheater or plaza, also increase its identity score. The freeway cap also provides the most direct link between SW Moody and the South Park Blocks, but in so doing it bypasses many businesses and so receives a slightly lower efficiency score.

The grand potential of Alternative C comes with the poorest marks for timeliness. Capping I-405 will require work with multiple stakeholders and major fundraising efforts that may take many years or decades to complete, and construction times are also far longer than the other alternatives.



Map 5: Alternative C

Implementation Analysis

Based on our matrix in the Alternative Alignment Scores table (page 26), Alternative A receives six +’s, Alternative B gets one more to reach seven +’s, and Alternative C leads the pack with nine +’s. Based on this analysis, we recommend the city pursue Alternative C, with Alternative B as a possible backup.

Despite best meeting all the project’s goals, there are several concerns with Alternative C that may hamper implementation. These include the aforementioned funding difficulties, political support, and impacts on regional transportation.

Alternatives A and B rely mainly on improvements to existing right-of-ways that, while significant, are within the financial scope of a general City-funded project. However, capping I-405 will require major engineering analysis and construction efforts, perhaps tied to a reconstruction of the freeway itself. Projects of this magnitude are under the guidance of ODOT and funded by a mix of regional, state, and federal money through the Metro and State Transportation Improvement Plans.

This reliance on funding sources outside the City’s control also removes control of the timeline from the City, which will make funding and building the other portions of the Green Loop more difficult. The section that runs along the freeway cap could become the weak link that makes the chain incomplete until the cap is finished, potentially halting any momentum the City has in building the Green Loop.

The City has discussed several proposals for capping I-405 over the years, but the lack of political support has kept it firmly in the planning stage. While the cap would provide an increase of developable land in a tight market, its completion is reliant on action by ODOT, which must spread its limited funding to an ever-growing number of needed projects.

The lack of action in the past indicates the support and push for such an ambitious project may be lacking. While the Green Loop may add an additional level of support, it is unlikely to be enough to get the project started.

There are relevant traffic-related concerns even once construction begins. The construction of the cap on I-405 could have a significant traffic impact on the regional highway system. This southernmost section of I-405 provides the main link between US 26, the main access route from northern Washington County, and eastbound I-84. Construction delays here could increase traffic on the few alternative routes such as Burnside, Oregon 217, and I-5.

Alignment Recommendation

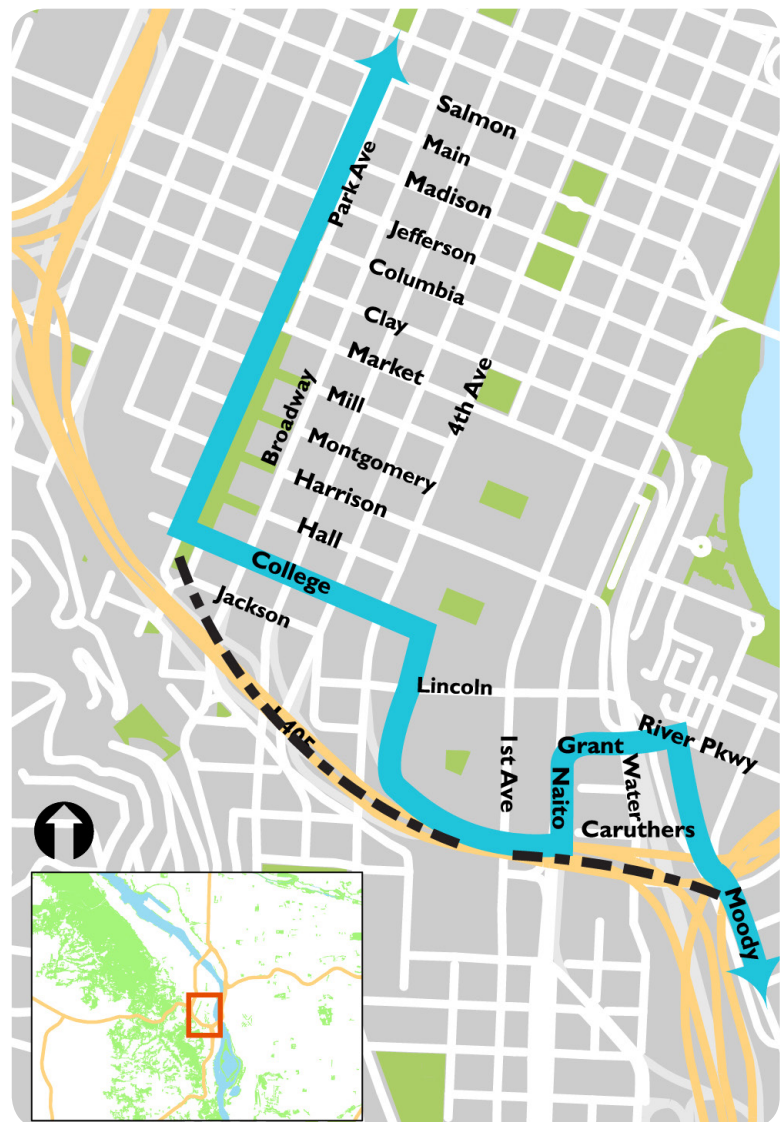
Given these significant obstacles to immediate implementation, we recommend the City take a staggered, three-phase approach to the Green Loop. This will allow the City to finish the Green Loop in the desired time frame and still look forward towards future improvements and enhancements.

The first phase would be the construction of Alternative B, completing the Green Loop quickly and taking advantage of the momentum from the opening of the Tilikum Bridge. This alternative provides a balanced approach to the project's goals.

Phase two would be the study and construction of a flyover and ramp or elevator between the future end of the freeway cap at SW Naito and the intersection of SW Sheridan and SW Moody. This stretch is primarily an engineering problem, and the solution can be implemented and added to the existing Alternative B alignment, removing the need for the detour to SW Grant.

Building on the groundwork from phase one, which would use the park blocks section as part of its implementation, and phase two, which would provide the link between the freeway cap and SW Moody, phase three would be the implementation of Alternative C once the freeway cap is in place. The city would also have the opportunity to review the current performance of the Green Loop and make any needed updates or changes.

This three-phase recommendation allows the City to get the timely benefits of Alternative B while planning for an even more iconic section over the freeway cap in the future. This approach creates the best balance of dreaming big while acknowledging the realities of ambitious projects. When the Green Loop is installed on the freeway cap, Portland will benefit from two complementary facilities.



Map 1: Recommended phased alignment

Segments

The recommended phased alignment can be envisioned in four distinct segments that have unique opportunities to improve the public realm along the Green Loop. The recommendations in this section illustrate the way great public places can be created in each alignment segment.

While not every block of the Green Loop is intended to be a plaza or destination, every block is public space with the potential to become a *place*. The public right-of-way is the ideal place for a city to provide quality public places. Traditionally, streets have been vital public places, teeming with activity, commerce, and connection. Today, streets are still ideal public places because they comprise a significant portion of any city's land. Since the city already controls the public right-of-way, it can more easily design streets as places. To do so, the Green Loop should cultivate an identity, blend uses and travel modes, and have attractions and destinations, active edges, seasonal strategies, a management organization, and diverse user groups.

Public places do not necessarily generate activity all on their own, and a certain amount of programming is to be expected for the Green Loop. This can be accomplished by organizing performances, markets, food carts, classes, or festivals. In addition to scheduled programming, public space should provide for small, daily uses. The top use for public places is people watching. Therefore, a successful public place has a variety of reasons for a variety of people to be in it. In the urban core, people also live a great deal of their daily lives away from home and in public, therefore, public space should be able to accommodate some necessary uses such as phone conversations, charging and using electronics, exercising, reading, working, studying, or eating.

The Power of 10: Any great place needs to offer at least 10 things to do or reasons to be there.
- The Project for Public Spaces

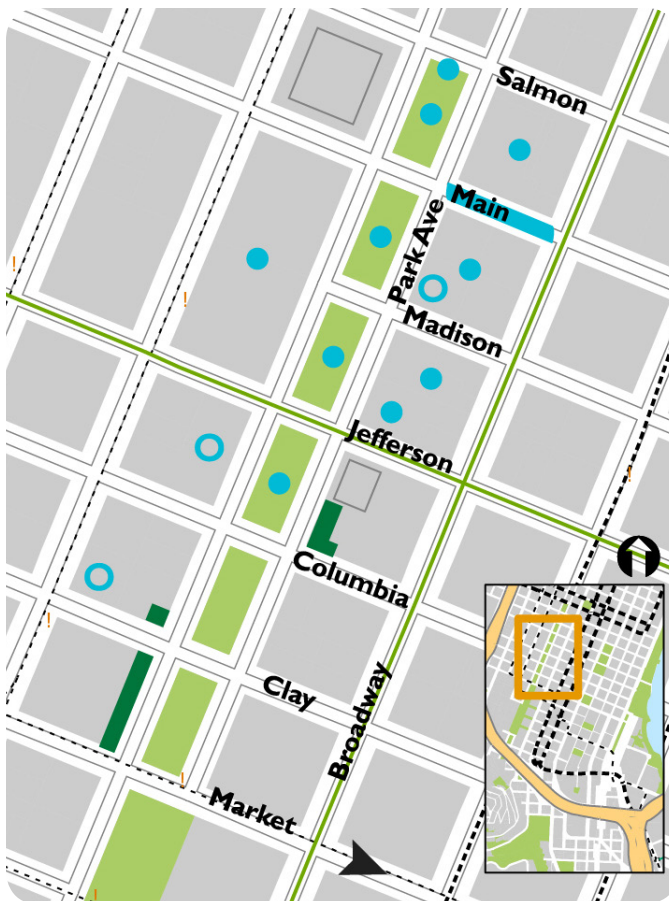


Image 8: Colorful seating and nature integrated in a plaza in Tianjin, China

Cultural Park Blocks

Context

For the purpose of our report, the Cultural Park Blocks segment is defined as the Park Blocks between SW Market Street and SW Salmon Street. This segment is home to a number of cultural institutions, several churches, and a variety of apartments and businesses. These institutions make this a great place to be and also ensure that there is a vested interest in the success of this area. This section is also filled with a lush tree canopy, colorful rose bushes, and public art. These blocks see fewer programmed events than the PSU segment; however, there is a weekly Farmer's Market.



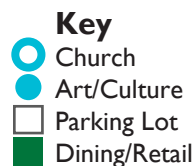
Map 6: Existing conditions along the Cultural Park Blocks

Strengths

- Cultural institutions are major attractors
- Streetcar stop at SW Market
- Mix of institutional, business, and residential uses makes this an active district at nearly all times of day
- Main Street and Shemanski Park provide spaces for events and programming
- Presence of rose bushes and art in the parks
- Low vehicle traffic volumes
- Presence of a Portland Loo

Weaknesses

- Concentration of anti-social behaviors including camping and alcohol and drug use
- Design of some of the public art and benches invites damage from skateboarding
- Inconsistent crossings create unpredictable conditions for all users
- Getting grass to grow is a challenge
- Park is slated for a historic designation nomination, which could stagnate improvements
- Presence of stop signs at every block and the use of these streets as a cut-through to the freeway during rush hour make this an unpleasant place to bike during peak traffic hours



Recommendations for Cultural Park Blocks



Remove parking on the interior of the Park Blocks

The current lanes of interior parking were added as a temporary remedy during the construction of the transit mall. The removal of these lanes would heighten the pedestrian environment and accommodate Green Loop facilities, while still maintaining a travel and parking/loading zone.



Implement consistent crossings paired with signalization at high traffic intersections

Implementation of predictable crossing and signals would add an extra level of safety and predictability for all users.



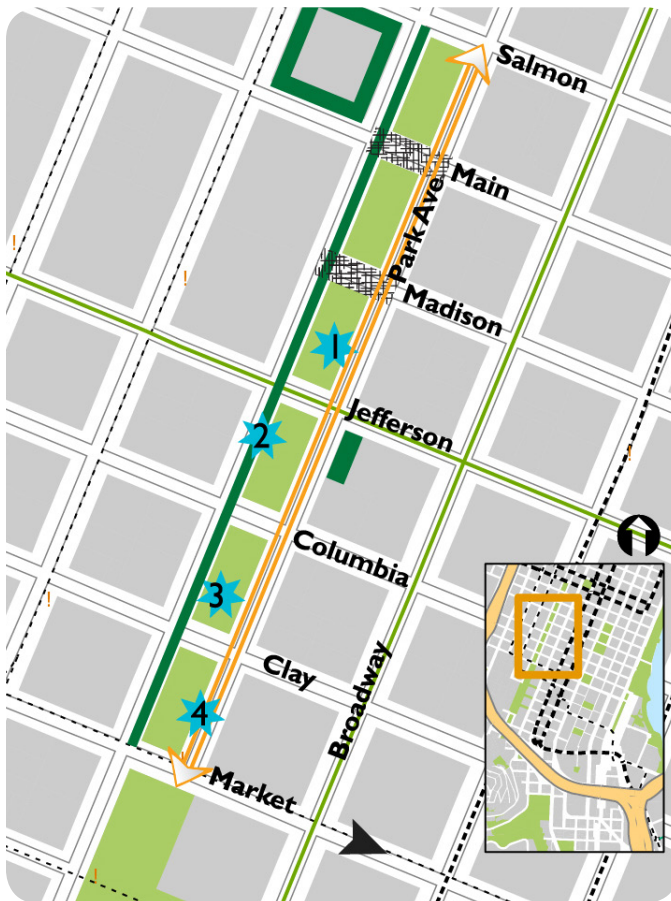
Use freed up parking spaces on 9th Avenue to create a series of public spaces

A creation of podiums within the reclaimed right of way could house a variety of public parklets, covered bike parking, and small pop-up retail and dining options (which could be folded up at night when not in use). These would create additional uses within the park, which may attract more visitors and may help curb some of current antisocial behavior.



Celebrate the trees

The integration of lighting and seating in and around the trees can draw people to the area and mark the trees as integral parts of this segment's pedestrian experience.










Map 7: Recommendations for the Cultural Park Blocks



Do not pursue historic designation status

Historic designation could hold the park blocks in their existing state in perpetuity. As the trees begin to die, the possibility of modernizing the park blocks could be significant and designation could limit these possibilities.

Key

-  2-way cycle track
-  Dining/Retail
-  Close road
-  1 Remove parking on inner lanes
-  2 Pop-up flex space
-  3 Integrate the trees
-  4 Charging stations

What could be here



Image 9: Bike seating with table in Japan

A variety of seating, including some with working surfaces, signals that people are invited to spend time in the space to eat, work or simply enjoy the area.



Image 10: Covered parklet in Olympia, WA

A series of parklets, pop up retail, and covered bike parking invites people to enjoy the Green Loop even during the rainy seasons that Portland experiences.



Image 11: The Promenade of Light in London

Integrating seating and tables around the trees invites people to appreciate the Park Blocks trees' presence even more. Proximity to the trees also provides shade and some shelter from the rain.

PSU Park Blocks

Context

The PSU Park Blocks segment extends along the South Park Blocks from SW Market Street south to the Freeway (I-405). This stretch of the park blocks runs through the heart of Portland State University. It is currently closed off to cars and because of its pedestrian friendly environment is often described as PSU's quad. Although it is filled with a lush tree canopy and a variety of events including the Portland Farmer's Market and live music on Thursdays, the span lacks both color other than green and brown and a variety of seating and things to do.



Map 8: Existing conditions for the PSU Park Blocks

Strengths

- Active pedestrian environment, which leads to increased natural surveillance and a prime people watching location
- Existing outdoor amphitheater, which is frequently used as an event space
- Presence of a playground at the southern end
- Presence of lush grass, a full tree canopy, and native species
- Presence of foodcarts

Weaknesses

- Popular place to hold events, like the Portland Farmer's Market, that limits ease of foot traffic
- High volume of pedestrian usage currently present could lead to bike/ped conflicts
- Current selection of art is not engaging, nor does it enhance the vibrancy of the park
- Ground floors of adjacent buildings are under activated

- Key**
- ▲ Amphitheater
 - Art/Culture
 - Recreation
 - Dining/Retail
 - Wayfinding

Recommendations for PSU Park Blocks



Implement a mingle zone

Separated facilities for bikes and pedestrians do not make sense here. It should instead be treated as a mingle zone, with intentional signage demarcating that this is a pedestrian-first environment. A mingle zone here will be best supported of facilities on parallel streets for faster cyclists.



Leverage redevelopment

As properties redevelop along this segment, their entrances should be designed to act as more of a gathering space than a thoroughfare.



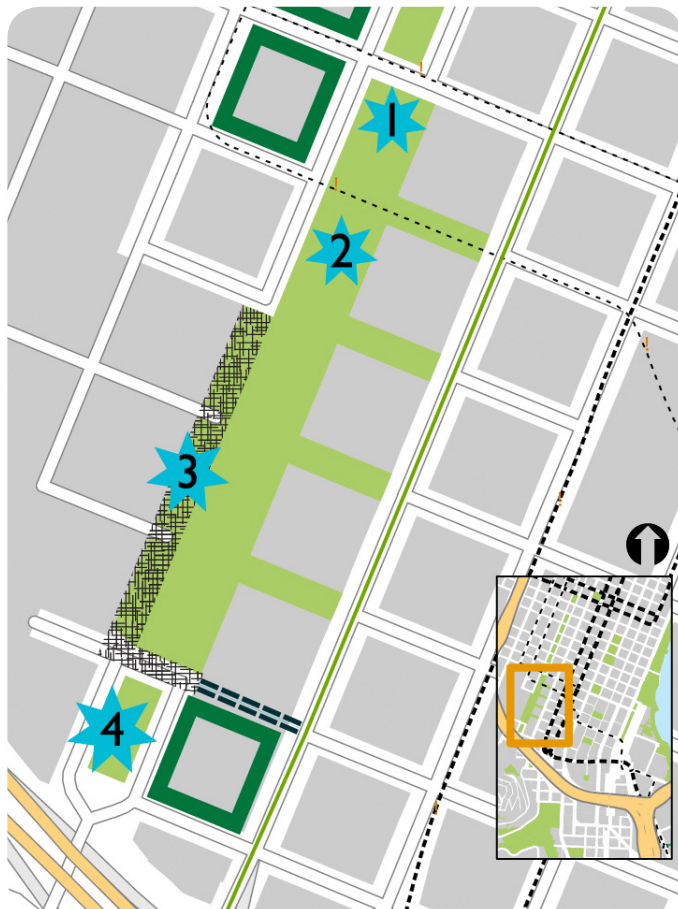
Site a Portland Loo

The presence of a playground and the large amount of people drawn to public events make this place a logical place to site a public restroom.



Introduce new color to the South Park Blocks

Introducing color could be done through the addition of new public art or creative seating and would add some vibrancy to the predominantly green and brown landscape.



Map 9: Recommendations for the PSU Park Blocks



Upgrade existing amenities

Both the playground and outdoor amphitheater would benefit from updates. The playground could be an interactive, multi-sensory experience and the amphitheater could provide a variety of seating.



Create a statement piece behind the Portland State University sign near SW Market Street

This could be a colorful piece of public art that integrates stormwater into the design to reaffirm PSU's commitment to sustainability. This highlight could be furthered though a student design contest.

Key

- Connect road
- Dining/Retail
- Mingle Zone
- 1 Stormwater demonstration
- 2 Improve amphitheater
- 3 Plaza in front of library
- 4 Improve playground

What could be here



Image 12: Colorful flower pot art in Seattle, WA

Public art can create unique statements about the area and can appeal to senses beyond sight. In this case, the movement of the flower pot can be both heard and felt.



Image 13: Swings as seating in Boston, MA

Public spaces can provide fun activities for all ages and not just children, as seen on the Lawn on D. Here, swings are often used by adults and lawn games invite people to stay after their workday is over. Similar features could appeal to the PSU student population.



Image 14: Chairs designed to look like tulips

Seating can be far more varied than basic benches and can also bring more color to a space. These unique tulip-shaped seats fold up when not in use, which protects them from rain and bird droppings.

PSU Park Blocks to SW Moody

Context

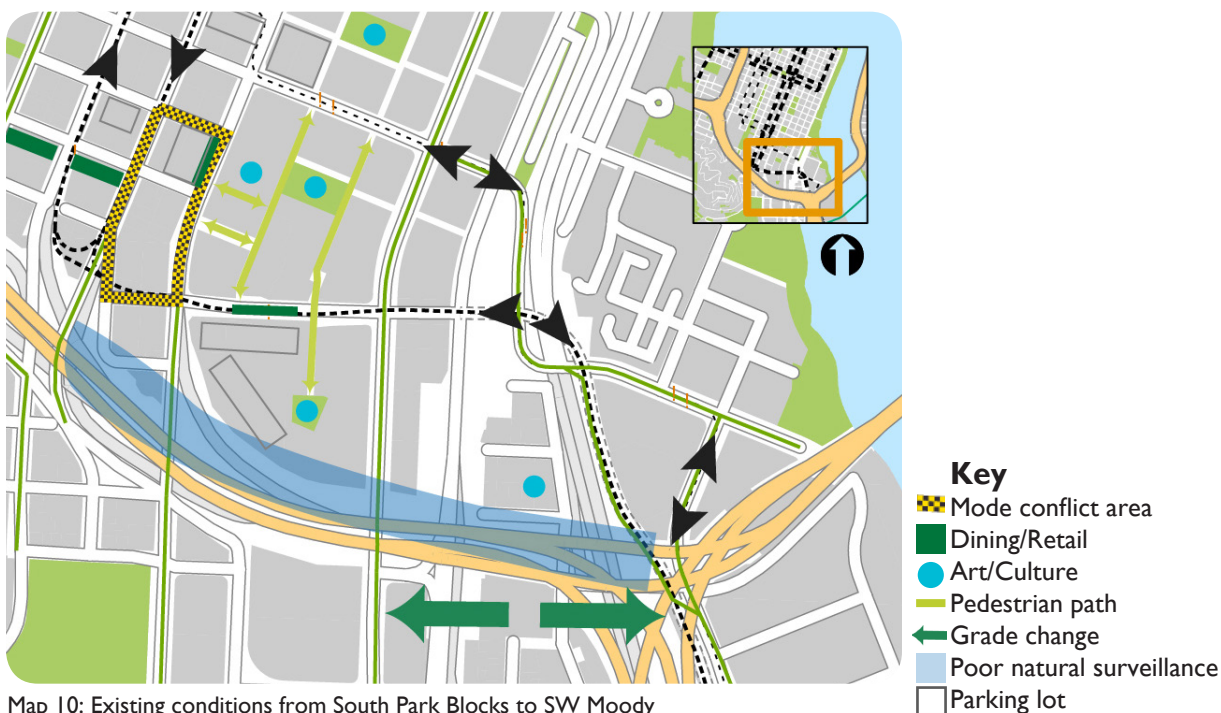
The segment from the PSU Park Blocks to SW Moody Street is characterized by residential buildings, tall office buildings, and the institutional presence of PSU. Many of the tall towers are not built along lot frontage and are surrounded by private plazas and parking lots, creating a less than inviting environment for pedestrians. The area has significant potential for redevelopment in the future and, with the opening of the Orange Line, will benefit from excellent transit access.

Strengths

- Variety of green infrastructure on display including the EcoGarden at Shattuck Hall, the Orange Line's new Green Tracks, and stormwater planters
- PSU Park Blocks to SW Lincoln Street has a variety of ground floor retail and a number of food carts
- Proximity to the Halprin Sequence
- Presence of SoMa Parklet
- Excellent transit access

Weaknesses

- Significant portion is unwelcoming to pedestrians
- Lack of consistent tree canopy
- Lack of natural surveillance, which could lead to the perception of an unsafe experience
- Substantial grade change from the Tilikum Crossing to Portland State University



Map 10: Existing conditions from South Park Blocks to SW Moody

Recommendations for PSU Park Blocks to Moody



Treat this span as a thoroughfare and design for safety

As redevelopment occurs, places can be transformed into destinations and an environment where people want to be.



Transform blank south wall on Portland State's Ondine building

An artistic mural or green space could enliven an otherwise uninspiring span of street. Implementation on this particular building would be easier given that it is owned by PSU, an interested party in the Green Loop.



Develop the tree canopy

A major component of the Green Loop is celebrating a consistent, lush tree canopy. In the South Park Blocks achieving this goal is rather easy; however, additional trees are needed elsewhere along the Green Loop.



Create a "place" directly west of the International School

This City-owned land has potential to be a gathering place. Additionally, an educational component should be integrated if possible to benefit the school children.



Map 11: Recommendations for South Park Blocks to SW Moody

What could be here



Image 15: Green wall in Mexico City, Mexico

Green walls ensure environmental benefits while creating a unique piece of art to appreciate.



Image 16: Director Park in Portland, OR

A great amenity for this segment of the Green Loop would be a place with a wide variety of things to do, similar to Director Park in the heart of Downtown.



Image 17: The Yume Tree mural in Washington D.C.

A mural that highlights the local community could be another excellent piece of art in areas where green walls are not feasible.

The Freeway Cap

Context

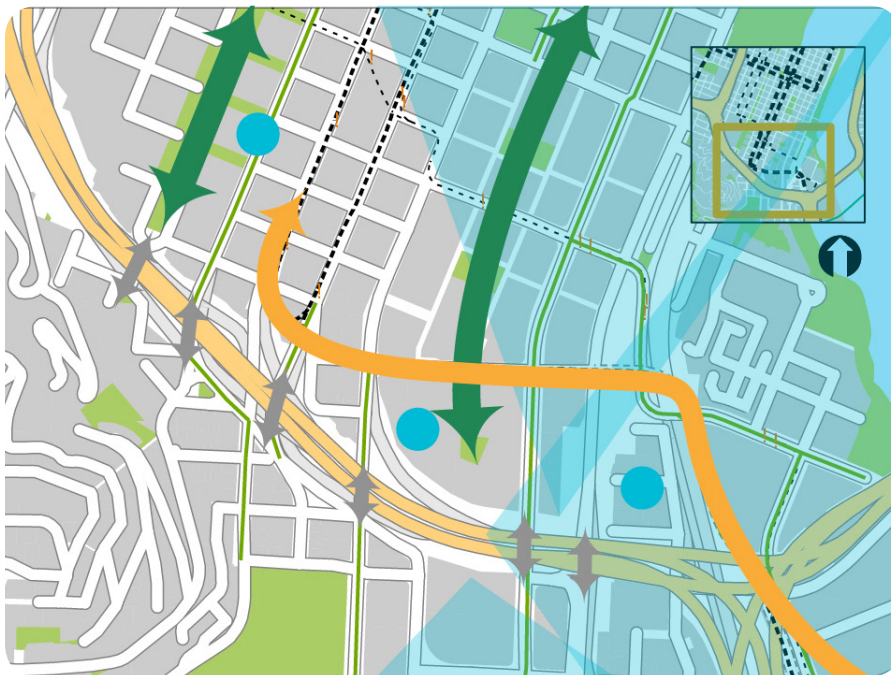
Interstate 405 currently acts a major barrier separating Downtown Portland from the rest of the south and western side of the City. This is clearly a perception issue since it is possible to cross the freeway by car, bicycle, and foot. Capping the freeway has been proposed for a number of decades in Portland and has been successfully carried out in a number of cities across the country. This concept, which could add additional green space and developable land to the Central City, would also complement the Green Loop concept. While capping is not possible in the near future, there should be plans in place to implement this concept when ODOT is ready to rebuild those segments of the freeway.

Strengths

- Would run predominantly through park land on this quadrant of the Green Loop
- Would preserve current right-of-way for transit and auto use
- Creation of new park land connects a number of existing parks, including the Halprin Sequence, the South Park Blocks and Duniway Park.
- Potential to be Portland's statement piece in the future
- Could create a better perception of safety as buildings would orient to the trail

Weaknesses

- Implementation of the Green Loop is expected to happen in a shorter time frame than capping the freeway would be feasible
- Capping freeways is incredibly expensive
- Need for a significant amount of political push and stamina to make this happen
- Construction would impact parts of the freeway for short amounts of time, creating temporary regional impacts
- Capping would create five at-grade crossings that would need to be accommodated



Map 12: Existing conditions for Freeway Cap

- Key**
- Park connections
 - MAX Orange Line
 - Art/Culture
 - Freeway crossing
 - Views

Recommendations for the Freeway Cap



Create mix of parks and development

A mix of parks and development ensures that revenue is generated to help pay for the investment. The presence of businesses will ensure that new parks attract the positive behaviors necessary to make them succeed.



Avoid replicating amenities

The cap will provide available space for large public amenities that do not fit within the downtown core. Avoiding replication could allow for things like an amphitheater to accommodate outdoor concerts, an exercise court, a garden oasis, and an educational stormwater infrastructure.



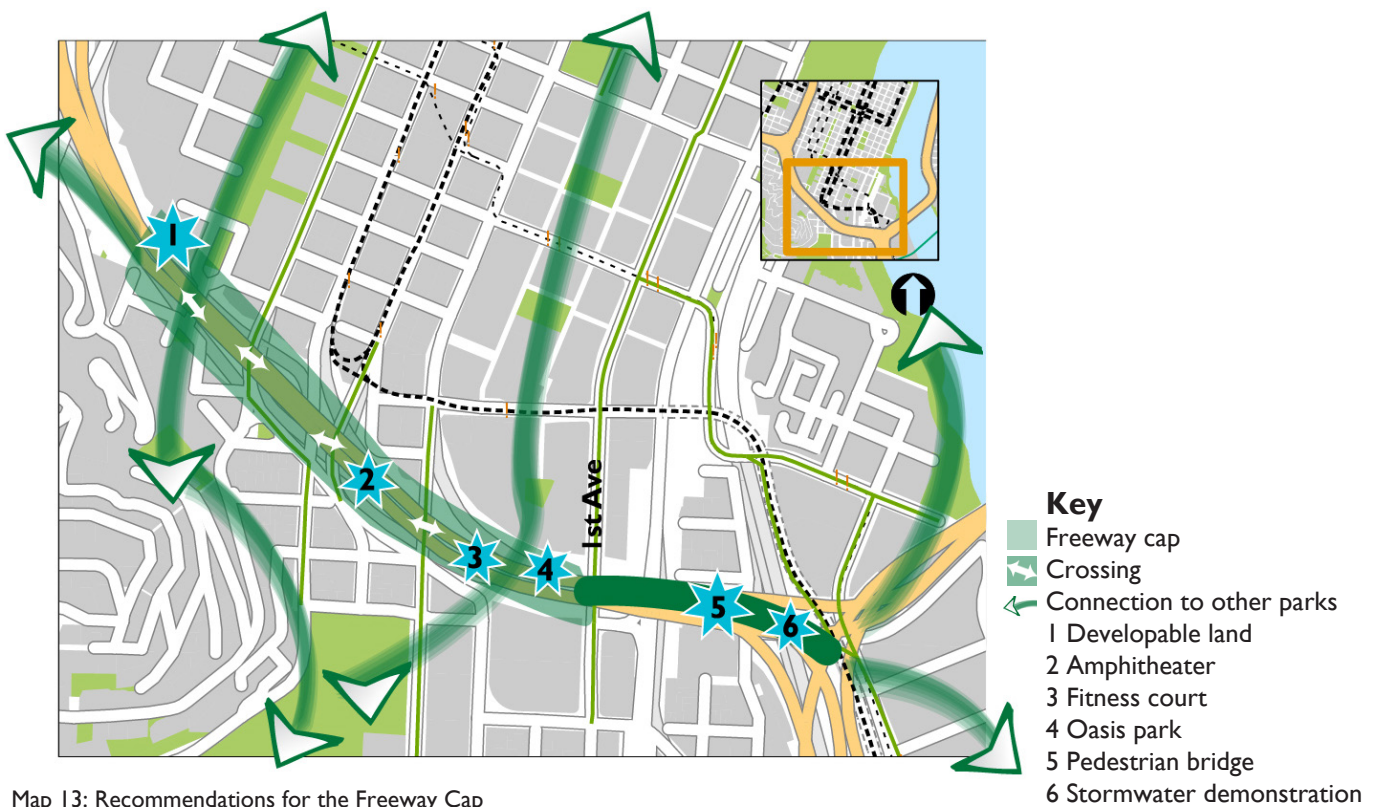
Focus on variety

It is important to vary the types of public space upon the cap. Plazas and seating should differ along the cap to ensure that they appeal to a wide range of people and create unique sense of place.



Implement creative lighting

Special attention has been given to creative and artistic lighting on the Tilikum Bridge. If feasible, this type of lighting display should be carried through the cap.



Map 13: Recommendations for the Freeway Cap

Freeway Park

Seattle, Washington

Seattle's Freeway Park was created to draw together city neighborhoods divided by I-5. The idea originated among civic-minded locals in the mid-1960s and was completed in 1976. When Freeway Park was completed in 1976, it was the first park to be built over a freeway and was hailed as a major architectural and engineering accomplishment, an unusual mixture of brutalist architecture and greenery. The park was designed by the world-renowned firm of Lawrence Halprin & Associates and developed with bond money, as well as county, state and federal funding.

Freeway Park provides a space where residents, shoppers, downtown office workers, hotel visitors, and the whole array of people from all backgrounds who make up the downtown population can come together to enjoy the social elements of a city park. Initially, the park was actively programmed with lunchtime and evening concerts. Over the years, however, as programming became more limited, the park fell into disuse. Today, though, the park is better maintained and well-used by office workers during the day. Due in part to its relatively small size (approximately 5 acres), park users are subject to a constant white noise caused by traffic below. [19, 20, 21]



Image 18: Freeway Park in Seattle, WA

Rose F. Kennedy Greenway

Boston, Massachusetts

Boston replaced its mid-town highway with a linear series of parks and gardens designed to re-connect some of Boston's oldest, most diverse, and vibrant neighborhoods. It consists of landscaped gardens, promenades, plazas, fountains, art, and specialty lighting systems that stretch over one mile through several neighborhoods. The overall project was initiated in 1991 and opened in 2008. The Greenway is managed by the Greenway Conservancy, which partners with cultural institutions and non-profit organizations to create events geared toward multi-generational and multi-cultural audiences.

Today, the 15 acre Greenway is a key feature of the modern reinvention of Boston, the Harbor, and the Waterfront. The park has become something of a people's park, a bustling urban refuge. Attractors to the park include events such as the Boston Local Food Fest, Boston-NY Food Truck Throwdown, and Berklee College of Music Concert Series. The Greenway drew over 800,000 visitors in 2013 with its 300 free annual events, Mobile Eats Program, free Wi-Fi, concerts, markets, and more. [22, 23]



Image 19: Rose F. Kennedy Greenway in Boston, MA

What could be here



Image 20: Outdoor fitness court in San Francisco, CA

An outdoor exercise facility on the freeway cap could attract people from the southern parts of Portland.



Image 21: Denver Plaza in Denver, CO

The freeway cap should have a variety of park spaces, including quiet oasis-like plazas where people can sit and enjoy the area.



Image 22: Riverfront Swings in Cincinnati, OH

Park spaces that draw people for active uses should incorporate a variety of seating that encourages activity and play.

Best Practices

A variety of best practices apply to the development and maintenance of the Green Loop as a world-class facility. This section summarizes several important practices for creating safe and attractive public spaces that are relevant to the Green Loop based on feedback from earlier public engagement efforts as well as data gathered through audits and inventories. This section also makes recommendations for applying these best practices to the Green Loop. These practices are gathered into the following six groups:

Personal Safety: the perception of safety along the Green Loop

Infrastructure & Facility Design: the organization of users and uses along the Green Loop

Branding & Wayfinding: the identity and navigation of the Green Loop and surrounding streets

Green Infrastructure: the inclusion of treatments that manage stormwater and add nature to the Green Loop

Maintenance & Stewardship: how the Green Loop will be managed over the long term

Evaluation: metrics to evaluate the success of the Green Loop



Image 23: Frome Bikeway wayfinding in Adelaide, Australia

Personal Safety

Summary of Recommendations

- Install LED lighting along the whole facility with even, consistent coverage
- Focus on creating active uses at ground level through zoning and placement of benches and activity areas
- Reinforce the territoriality of the Green Loop and surrounding areas with physical and symbolic barriers that don't impede natural surveillance
- Post clearly understandable trail rules at entrances and along the facility
- Use video surveillance only where other strategies fail to create a safe environment
- Actively maintain landscaping and other facility elements to ensure surveillance and provide a sense of ownership

Concerns

One of the most important factors influencing people's use of a facility is their perception of safety; even if actual crime is low, a perception of crime will deter people from using it. There are several measures the Green Loop can take to improve the personal safety, or exposure to crime and other uncomfortable or dangerous situations, of its users. The team's public engagement revealed many concerns about "antisocial behavior," a euphemism for homeless camping, loitering, and panhandling along with other more clearly illegal actions.

The Green Loop should use the precepts of Crime Prevention Through Environmental Design (CPTED) to increase perceptions of safety along the facility. These precepts will help provide the "eyes on the street" identified by surveys and stakeholder interviews as crucial for the Green Loop.

CPTED

While the design of an area cannot completely control people's actions or create an exact outcome, CPTED is based on the idea that specific design elements can reduce the opportunity and potential for criminal behavior and discourage other unwanted behaviors with very little active interaction by the police force. There are four main principles of CPTED: natural surveillance, territoriality, natural access control, and maintenance.

Four Principles of CPTED

Natural Surveillance

People tend to feel safer when they know others are aware of the situation and are watching.

Territoriality

The sense of uniqueness and identity that exists between the private and public realms creates a sense of private ownership for private spaces and group ownership for public spaces.

Natural Access Control

Natural access points clearly define where various groups of people belong in a space.

Maintenance

Proper maintenance communicates ownership and active stewardship of an area.

Specific Strategies

There are many different specific design elements and strategies that follow CPTED principles, and what is right for one area or facility may not be right for another. Presented below are several recommendations for the Green Loop, including both passive strategies that rely on simple design elements and active strategies that require use or intervention.

Crime Prevention Through Environmental Design Strategies

Lighting

Natural Surveillance

Barriers

Landscaping

Trail Signage & Rules

Emergency Boxes

Video Surveillance



Image 24: Lighting on PSU Park Blocks in Portland, OR

Haxton Way Trail

Lummi Nation, Washington

Since 1988, Haxton Way has been the scene of 16 car, pedestrian and cyclist deaths. In order to improve pedestrian safety along the route, the Lummi Nation installed the Haxton trail. The 2-mile trail has barriers on both sides and is raised above the ground to create a level, paved surface. Most notably, the trail is lined with solar powered LED lights that adjust to the brightness of the day and are linked to motion detectors so the lights will increase in intensity as someone approaches, then dim again after the person has passed. The route connects neighborhoods to the Silver Reef Casino, the largest employer in the area.

Since the installation of the trail and lights, the road has not had any pedestrian-related accidents or injuries. The trail has improved people's connection to jobs and to the convenience mart by being safe and accessible to all generations. To increase awareness, the Lummi Fitness Center hosts weekly Street Safe Walks along the path. The 30 to 150 participants increase visibility of the path and of pedestrians for drivers on Haxton Way. [24, 25]

Lighting

Lighting is the most important CPTED treatment available. It counters the innate fear of the dark, removes hiding places for criminals, and highlights potential obstacles along a path. Consistent lighting is more effective than a few widely-spaced intense lights that leave dark gaps. A local example of effective lighting is the PSU South Park Blocks area.

Natural Surveillance

Second only to lighting in importance are land uses and programming that provide the “eyes on the street” needed for natural surveillance. The Green Loop should focus on active ground-floor uses, where plenty of windows and people coming and going can keep the area well monitored. Organizing programming on the Green Loop itself or in surrounding areas, such as group rides or walks, art strolls, or the Farmer's Market would also bring people into the area.



Image 25: PSU Farmer's Market creates natural surveillance

Barriers

Barriers are crucial for defining different territories and creating a sense of territoriality for the Green Loop, and can also help limit access to the trail in more exposed areas. Fences, trees, and shrubbery can act as barriers, but should not limit visibility. Short ornamental fences or changes in pavement can provide symbolic barriers that do not prohibit movement but signal the movement from one territory to another. These should be used in areas where people are encouraged to mix with their surroundings; even if access is never meant to be restricted, it is still important for the territoriality of the Green Loop that its boundaries be well defined.



Image 26: Bollards create a symbolic barrier in Quebec, Canada

Trail Signage and Rules

The last of the passive treatments is clearly defined, highly visible trail signs and rules that reinforce the territoriality of the Green Loop and create a level of social expectation for the use of the trail. These can define access points, encourage ownership of the facility through self-enforcement, and provide a legal basis for discouraging antisocial behaviors in the area.

Video Surveillance

A high level of natural surveillance may not be possible in some areas of the Green Loop; therefore, close-circuit video cameras can be used where no other treatments suffice. While they may deter crime, they are expensive, do not provide immediate help to victims in need, and are burdened with privacy concerns. Despite these concerns, they have been used at TriMet MAX stations with little opposition.



Image 27: Video surveillance at TriMet bus stop in Portland, OR

Maintenance

Lastly, the Green Loop should have active maintenance of the trail to pick up litter, remove graffiti, and provide natural surveillance through its entire length. Landscaping should be well maintained; shrubs should be no taller than two feet, and trees branches should extend no lower than seven feet (though newly planted trees' immature canopies are exempt from this consideration). The Portland Business Alliance's Clean and Safe program is a good example of the positive impact a maintenance and safety program can have on an area.



Image 28: Clean and Safe worker in Downtown Portland

Recommendations for Personal Safety



Install LED lighting along the whole facility with even, consistent coverage

LED lights are recommended despite their higher per-unit cost compared to other sources because of their longevity and low energy consumption, which allows them to be powered by self-contained solar panels and batteries if needed.



Use video surveillance only where other strategies fail to create a safe environment

Some areas of the Green Loop will require greater assurances of safety due to lower activity. Video surveillance can provide that.



Focus on creating active uses at ground level through zoning and placement of benches and activity areas.

Benches along the path can provide places for people to sit and thereby indirectly increase natural surveillance.



Reinforce the territoriality of the Green Loop and surrounding areas with physical and symbolic barriers that don't impede natural surveillance

Barriers are crucial for defining different territories and creating a sense of territoriality for the Green Loop, and can also help limit access to the trail in more exposed areas.



Post clearly understandable trail rules at entrances and along the facility

Highly visible trail signs and rules reinforce the territoriality of the Green Loop and create a level of social expectation for the use of the trail.



Actively maintain landscaping and other facility elements to ensure surveillance and provide a sense of ownership

A clean trail encourages ownership and signals to users that it is a safe and enjoyable place to visit.

Infrastructure & Facility Design

Summary of Recommendations

- Physical separation of pedestrians, cyclists, and vehicles
- Install a two-way cycle track with planters or flexiposts separating it from traffic for cyclists
- Give pedestrians a dedicated space unique from normal sidewalks with unified Green Loop-styled pavement
- Use “green wave” dedicated signal crossings where possible, with HAWK or RRFB user-activated signals and intersection treatments at lower-traffic crossings
- Provide adjacent controlled-access bike storage

Concerns

Though the Green Loop plays many roles, its primary mission is to provide a safe and inviting route for people to walk and cycle through the Central City. Physical safety, or safety from accidents and conflicts with other users, was one of the main concerns identified in public engagement.

Recent research verifying Roger Geller’s classification of cyclists into the four separate groups of “strong and fearless,” “enthused and confident,” “interested but concerned,” and “no way, no how” cyclists has identified the distribution of the population into these categories at 4, 9, 56, and 31 percents respectively [26].

The interested but concerned group of cyclists are characterized by wanting to cycle but are limited by not feeling comfortable using existing infrastructure—they are less comfortable taking the lane or navigating a tricky intersection. The potential for capturing new ridership from among this large group through new infrastructure makes them the target for the recommendations for infrastructure on the Green Loop.

Separation of Pedestrians and Cyclists

One of the largest sources of conflicts in transportation is the mixing of different sizes and speeds of users on the same facility. For active transportation, this means having fast cyclists, slower cyclists, and pedestrians all sharing the same physical space. The Green Loop should physically separate these users to increase its actual and perceived safety.



Image 29: Flexiposts create vertical physical separation between bicycles and cars in Washington DC.

Pedestrian Facilities

In order to protect and separate users, pedestrian portions of the Green Loop should be given distinct design treatment. The actual path itself should be at least ten feet wide and buffered by two-foot-wide graded area as per the FHWA's guide for mixed-use paths [27], though this buffer may be combined with adjacent cyclist buffer zone.

Much has been said about the impact of various “Ds” on walkability—design, density, distance to transit, diversity, and so forth. While these factors are beyond the scope of the Green Loop itself, the City should support these other elements whenever possible through design overlays, zoning, and coordination with TriMet.



Image 30: Distinct pavers identify the Portland Transit Mall

Bicycle Facilities

Physical separation of cyclists from traffic through some form of vertical barrier is the key characteristic of all bicycle sections of the Green Loop, and is especially important for attracting the interested but concerned group [28]. While the research indicates flexiposts provide the same ridership increase benefits as more substantial barriers, this is an opportunity for planters to increase the amount of vegetation and color downtown.



Image 31: Dedicated signals for both cyclists and pedestrians

Crossings

Safe crossings are important to the continuity of the Green Loop, which is critical to its use by the interested but concerned category. The adage that “a chain is only as strong as its weakest link” is appropriate here, as a dangerous experience crossing a street may intimidate users from using the facility again.

Several treatments can make crossings safer for both pedestrians and cyclists. The surface treatment should continue through the intersection and should be slightly raised from the normal level of the street. Advanced stop bars should be placed in the street ten feet from the crossing to increase the visibility of pedestrians and cyclists, and bulb-outs should be used for crossings that are surrounded by on-street parking to bring users of the Green Loop right to the edge of the street prior to crossing.



Image 32: Green pavement should only indicate conflict zones

Bicycle Parking

Seldom do bikes get the same parking consideration and treatment as cars, but people will not use the Green Loop if they are afraid their bike will be stolen while they are visiting any of the nearby destinations. While bike cages are the preferred form of parking, it is imperative that at least some form of secure parking is provided.

The City of Portland has had great success with its bike corral and “staple” bike rack installation programs. The staples are the most prevalent type of pre-existing parking in the area and the bare minimum we recommend along the Green Loop. However, care should be taken to ensure that they cannot be defeated by removing the rack from the pavement.

The current gold standard of secure parking in Portland is the Go By Bike valet system at the base of the Portland Aerial Tram, which boasts zero thefts over the life of the program despite over 200 daily users. Users who work at OHSU can drop off and pick up their bikes during the facility’s operating hours at no cost, with operating costs being covered by OHSU. Other users pay a small fee. A similar funding source would have to be identified for any valet facility along the Green Loop.

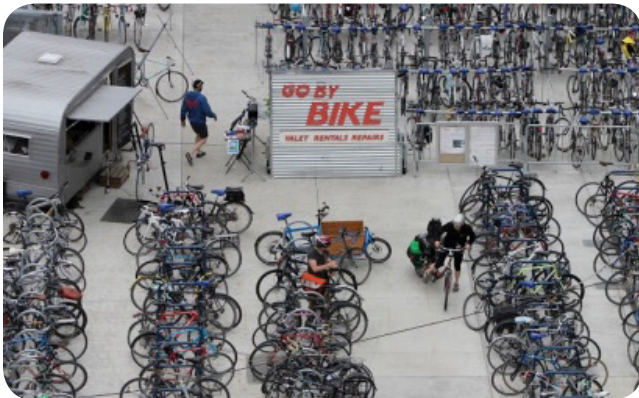


Image 33: Go By Bike valet bike parking in Portland, OR

Bike and Park—McDonald’s Cycle Center

Chicago, Illinois

This comprehensive facility is located within Millennium Park in downtown Chicago. It includes a number of services including secure bike parking, showers and lockers, bike repair, bike related retail, and bike rentals. The facility is also responsible for hosting bike education and encouragement programs and professional advice for new commuters. There is a fee associated with using this facility. These services and 24/7 access to the facility are available to members at a membership rate of \$35 a month or \$199 a year, which is cheaper than replacing a stolen bike. Those who don’t want to commit to an annual membership or only plan to come into the area occasionally can pay a \$3 daily drop-in fee and only have access to the facility during staffed business hours. The facility is centrally located and provides all of the amenities necessary to make commuting on bicycle a pleasant experience. [29]



Image 34: McDonald’s bike parking facility in Chicago, IL

Recommendations for Infrastructure & Facility Design



Physically separate cyclists and pedestrians whenever possible through separate yet adjacent facilities for both groups that clearly indicate the allowed use

A physical barrier or unique, easily identifiable pavement design can prevent the bike-pedestrian conflicts observed on the SW Moody cycle track due to uncertainty about the space's intended use.



Install a two-way cycle track with planters or flexiposts separating it from traffic

This should be 12 feet wide with an absolute minimum width of 8 feet in constrained areas as per the NACTO Urban Bikeway Design Guide [30]. An additional three feet of buffer space is used to implement the vertical barrier.



Give the pedestrian portion of the Green Loop its own treatment that is distinct from normal sidewalks

The surface should have a unique color similar to the Portland Transit Mall. The trail should be ADA compliant, including on ramps and grade changes. Apply a special surface treatment to the path at large that is similar in purpose, but unique in style, to the pedestrian surface treatment. If pavers are chosen, care should be taken to ensure they do not become uneven over time and create hazards for cyclists. "Bike lane green" is discouraged as a color theme for the general bike surface to avoid distraction from its meaning in hazardous bicycle-automobile conflict areas. This color should be used at conflict points such as driveways, however, along with other indicators like "shark's tooth" markings and signage to alert drivers to the presence of cyclists.



Use dedicated signalization along long, straight sections of the Green Loop timed to create a "green wave" that allows cyclists to pass through at normal speeds without stopping

Cyclists and pedestrians should be given their own signal similar to bike and walk signals already in use around the city. Similar signals should be used at high-traffic crossings that are not part of a "green wave" section. Other crossings on quieter streets should be signalized with user-activated signals such as HAWK (High intensity Activated crossWalk) beacons or Rectangular Rapid Flashing Beacons (RRFBs).



Install covered, secure comprehensive bike parking facilities

While the fee needed to maintain these facilities may deter people from using it, the protection from weather, controlled access, and video surveillance make this a much more attractive form of parking. Bike theft is a growing issue within the City. A comprehensive facility can provide safe bike parking, showers and storage, as well as complimentary retail.

Branding & Wayfinding

Summary of Recommendations

- Develop a comprehensive wayfinding and branding theme for the entire Green Loop
- Incorporate directional signage at key decision points
- Design directional signage that is appropriate for all users
- Display rules and expectations
- Incorporate educational signage at key points
- Develop a web or app-based presence to promote the Green Loop, surrounding businesses and attractions, as well as to engage users
- Avoid clutter

Through stakeholder interviews, surveys, and research, it is clear that there is a demand for clear and interesting wayfinding signage that holds a common theme throughout the entire Green Loop. The branding and wayfinding recommendations in this section are based on best practices from Streets Reconsidered, CPTED, and research findings.

Best Practices for Successful Wayfinding from Streets Reconsidered

Design wayfinding elements for people of all ages and abilities regardless of mode choice

Develop components that add successive layers of knowledge

Design wayfinding features that employ the use of a person's senses

Eliminate ambiguous, confusing, and redundant wayfinding elements

Develop design, color, and style palettes that are locally meaningful and universally appealing

Develop social media wayfinding applications for smart devices

Develop strategies to bridge the gap between digital and traditional wayfinding elements

Frome Bikeway Wayfinding

City of Adelaide, Australia

The Frome Bikeway was completed in 2014 to promote biking as an alternative mode of transit. In planning the bike route, the City devised a comprehensive branding and wayfinding approach that included legible and visually engaging language, signage, and branding to promote the route. Directional signage was strategically placed at consistent points and key decision points (e.g. intersections) so that bikes could anticipate upcoming changes and use signage to safely navigate the city. Cost effective materials were used, including surface decals and poles wrapped in stickers. [31]



Image 35: Frome Bikeway wayfinding in Adelaide, Australia

Recommendations for Branding & Wayfinding



Develop a comprehensive branding theme for the entire Green Loop

The Green Loop will benefit from the application of a comprehensive theme for the entire loop. This includes a common design, color, and style palette. Engage local community in the process to determine an appropriate design, color scheme, and logo.



Incorporate directional signage at key decision points

Directional signage should be strategically placed at key decision nodes, such as near business or retail districts, transit stops, cultural amenities, and other attractions. Such signage should include clear maps that incorporate walking radii and demonstrate distances in time. This will allow users to easily travel from the Green Loop to nearby establishments.



Design directional signage that is appropriate for all users

As a multimodal path, the Green Loop must have directional signage that is appropriate for pedestrians, cyclists, and people of differing abilities. Techniques such as ground decals or large print signage with arrows will enable cyclists to more easily use and know where to exit the Green Loop.



Display rules and expectations

Highly visible trails signs and rules should line the Green Loop to clearly delineate where users should be on the route, as well as provide social expectations regarding appropriate behavior, regulate cyclist speed limits, illustrate where skateboarding is not allowed, etc.



Incorporate educational signage at key points

Educational signage should be included at key destinations in order to encourage further exploration of the Green Loop and nearby neighborhoods. Such signage should coincide with tactile, visual, and audio elements to engage and educate Green Loop patrons about the neighborhood's history and culture, as well as sustainability measures used throughout the Green Loop.



Develop a web or app-based presence to promote the Green Loop, surrounding businesses and attractions, as well as to engage users

With rising technology use, many people have access to the internet and smartphones. This can not only engage users and promote surrounding businesses and attractions, but also expand upon information available on the wayfinding signage. Technology is better able to highlight elements of community that change more frequently than hard signage can. This strategy should include a partnership with Travel Portland.



Avoid clutter

Wayfinding along the Green Loop should not create visual clutter or be contradictory; rather it should be tasteful and placed in strategic locations in order to ensure user comprehension.



Image 36: Example of wayfinding app from Discover Ottawa

GRTagTour

Grand Rapids, Michigan

GRTagTour utilizes smartphone technology to promote destinations and engage visitors. By downloading the app, visitors gain access to an audio tour of Downtown Grand Rapids' major landmarks, gateways, and streets. At each stop along the route, there are scannable barcodes (QR codes) containing facts, history, and a gallery of visitor submitted photos. The app also provides a link to a downtown Grand Rapids mobile site as well as links to third party mobile check-in applications (e.g. Four square), a walking map, and directions. Anybody with a smartphone can download the app. For those who do not have a QR code reader or are unfamiliar with scanning QR codes, the app provides step-by-step instructions for where to download free QR code readers and how to use them. Lastly, visitors have the option to print hard copy maps from the GRTagTour website if they do not have a smartphone or prefer paper.

By providing an audio tour, GRTagTour utilizes technology to create an experience, engage the senses of its users, and educate them about the community's history and culture. It attracts visitors to key landmarks in downtown Grand Rapids and directs them to the appropriate resources to locate nearby businesses. In doing so, visitors can comfortably traverse Downtown and are incentivized to visit more businesses. [32, 33]

Green Infrastructure

Summary of Recommendations

- Retrofit the public-right-of way along the Green Loop to include stormwater planters
- Incentivize developers along the Green Loop to include green walls
- Engage City agencies, community members, and local artists to design green infrastructure that is functional, visually attractive, and representative of the neighborhood
- Use native plant species

Benefits of Green Infrastructure

Portland is already at the forefront of stormwater management through the use of green infrastructure and has a number of successful stormwater management plans, regulations, and incentives in place (e.g., Watershed Management Plan, Stormwater Rewards Program, Grey to Green Initiative, Tree Program, etc.) [34]. Connections and public spaces along the Green Loop will feature large canopy trees and state-of-the-art surface stormwater management facilities. New developments will be incentivized to earn LEED-type certifications, which will have the following benefits:

- Decrease impervious surfaces
- Decreasing the amount of toxins flowing into the Willamette River through natural filtration of stormwater runoff
- Increase natural habitat, thus creating more space for native species, birds, and pollinators, while improving human access to nature
- Result in energy and infrastructure cost savings
- Reduce the heat island effect
- Reduce the potential for urban flooding
- Decrease carbon emissions

In addition to these benefits, green infrastructure along the alignment will also provide the following opportunities:

- Teach users about the importance of watershed stewardship and climate change
- Demonstrate Portland's commitment to sustainability
- Celebrate and display Portland's climate and high-levels of annual rainfall in bike parking, transit stops, and covered seating areas along the loop

Dekum Bike Corral

Portland, Oregon

The Dekum Bike Corral was completed in 2012 and was a collaboration between the City's Bureau of Environmental Services, the Bureau of Transportation, the Regional Arts and Culture Council, and neighborhood residents Peg Bulter and Buster Simpson. It provides enough room for ten bicycles to park while filtering the roof's stormwater runoff and acting as an eye-catching piece of public art. [35, 36]



Image 37: Dekum Bike Corral in Portland, OR

Recommendations for Green Infrastructure



Retrofit the public right-of-way to include stormwater planters

Though the Green Loop will run through some streets that already have stormwater planters, where possible, streets along the alignment should be retrofitted and upgraded with additional stormwater infrastructure. This will allow stormwater runoff from surrounding properties and the public right of way to be filtered before entering the sewer systems, as well as create additional green space along the Green Loop. Furthermore, stormwater planters can serve as a barrier between vehicular, bike, and pedestrian traffic.



Incentivize developers along the Green Loop to include green walls

To enhance greenspace, improve building insulation, decrease energy use, decrease the heat island effect, and decrease air pollutants, the City should consider incentivizing developers to include green walls in new construction along the Green Loop.



Engage City agencies, community members, and local artists to design green infrastructure that is functional, visually attractive, and representative of the neighborhood

To create public buy-in, generate project support and educate the public about green infrastructure, local stakeholders should be consulted and allowed to participate in the design of various facilities, such as bike parking, transit stops, and covered seating areas along the Green Loop.



Use native plant species

Using native species supports local ecological systems and reduces facility maintenance.

SW 12th Avenue Green Street Project

Portland, Oregon

SW 12th Avenue between SW Montgomery and SW Mill Streets was retrofitted in 2005 to include a series of stormwater planters that allow water to be filtered and infiltrate the ground. In the event of a large storm, water flows out of the planters and travels downhill, going through a series of stormwater planters that slow it down to decrease the likelihood of erosion and urban flooding and filter it before it flows into the sewer system. The stormwater planters capture runoff from approximately 7,500 square feet of paved surfaces, cost approximately \$39,000, and are maintained by the City. [37]



Image 38: SW 12th Avenue green street in Portland, OR

General Recommendations

This section includes a number of recommendations that are not tied to a particular segment of the Green Loop. Additionally, given the condensed timeframe for exploring the Green Loop concept, there are also a number of recommendations regarding the process moving forward.

General Facility Recommendations



Implement a bike share program

While safe and separated facilities may help convince the interested but concerned group to ride a bicycle, a bicycle is vital to that equation. Purchasing a bike can be a big investment for a person who is not sure whether they will feel comfortable cycling in Downtown. Portland is under contract for bike share and the Green Loop would be a good opportunity to make that happen.



Consider a phased extension of the Green Loop from PSU along BPS' originally proposed alignment C

This proposed alignment has a number of benefits and met a great number of needs. However, it took potential users too far out of the way to be considered the best option.



Host creative bike rack design competitions

Unique to the Green Loop is its ability to celebrate the districts it runs through. Hosting competitions to design creative bike racks that would be featured in each district would help gain interest in the project. After installation, the bike racks would not only serve a functional purpose but would also double as public art. Additional engagement can be achieved by commissioning local artisans to manufacture these bike racks.



Create a scavenger hunt program

Similar to the Quest from Connect Historic Boston or McMenamin's Passport program, this could be used as a means of getting people to explore the loop. There could be trivia questions that are answered by visiting places and reading educational wayfinding along the Green Loop.



Have criteria in place to determine how to manage private events

The Eastbank Esplanade and Tom McCall Waterfront Park are popular places to hold fundraiser walks. There is a possibility that the Green Loop may also attract these types of events. Criteria should be in place to handle this influx.



Provide complementary bicycle facilities elsewhere in the vicinity

The Green Loop will not be the answer to all of Portland's biking needs; therefore, the Green Loop should be designed with the understanding that other streets in the area will also have a variety of bike lanes.

General Process Recommendations



Conduct focus groups with the interested but concerned population on the alignment

These could be similar to the bike tour during the Oregon Active Transportation Summit, except they should not be done with people that are experienced cyclists. Additionally, walking tours could be beneficial.



Humanize the Green Loop user's story

In trying to sell this facility to potential funders, painting a picture of who will benefit can help strengthen the case. This can be done through interviews and photos of community members included in a document or through a social media campaign.



Communicate and plan in tandem with other agencies

At this point, it seems as though many agencies are still grappling with why the Green Loop is a necessary facility. An integrated team comprised of people from all bureaus could help strengthen the case and work toward de-siloing city agencies for the purpose of efficient implementation of a world-class facility.



Do demonstration projects (such as Better Block) along the Green Loop

The concept of the Green Loop can be hard to comprehend, as many immediately assume it's simply a new bike lane. A demonstration project such as those managed by Better Block could help highlight what the Green Loop could be. If planning begins relatively soon, it may be possible for the Better Block team to carry out the event during the opening of the Tilikum Crossing in September 2015.



Let the community make decisions about public spaces

The community should be involved in selecting what features or amenities are included in plazas and parks along the facility. This could mean letting them test out a variety of seating options and voting for the ones they like best and could be facilitated during a Better Block test.



Engage with the homeless population

This population has a significant presence in the study area, but was not engaged in this planning process due to the student team's lack of expertise. Outreach should be done to understand this group's needs and desires as they relate to the Green Loop.

Maintenance & Stewardship

Summary of Recommendations

- Create an organization whose main objective is to oversee the continued success of the Green Loop
- Create a dedicated maintenance fund or revenue stream
- Capitalize on community interest
- Have installations along the Green Loop curated by nearby major institutions
- Maintain the Green Loop at a high level to ensure long term success and interest, which can directly translate to greater membership dollars

A major concern that arose during the public engagement process of our work was stewardship. People recognized that building a world-class facility is only as good as the plans and funding in place to maintain it well into the future. There is concern that the City does not have funds available in its budget to maintain another park-like facility. This fear was given some legitimacy in February, when the idea of not running water to the fountains in Downtown Portland was presented because of a lack in funding to maintain all recreation spaces across the city.

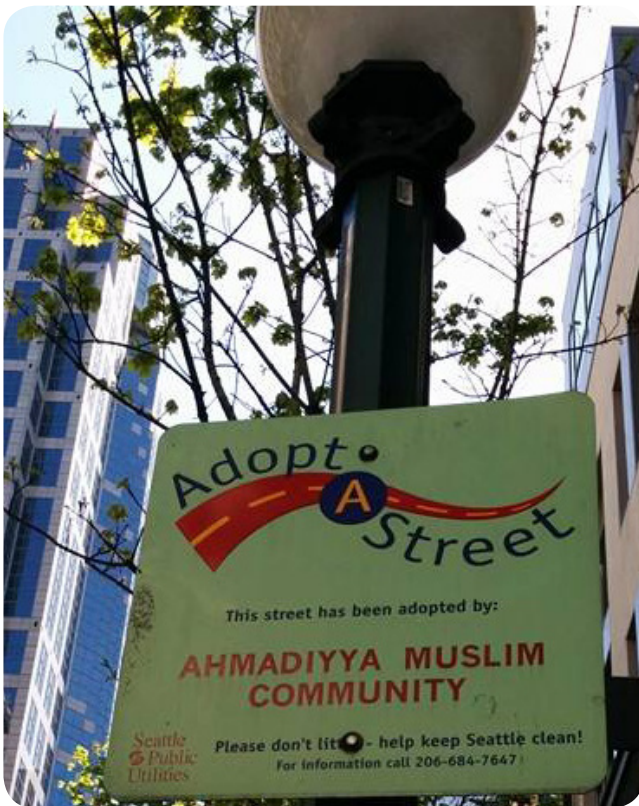


Image 39: Adopt-a-Street signage in Seattle, WA

Adopt-A-Block Program

Indianapolis, Indiana

Keep Indianapolis Beautiful, Inc. (KIBI) is a non-profit agency working within Indianapolis “to engage diverse communities to create vibrant public places, helping people and nature thrive.” They run a successful Adopt-A-Block program in Indianapolis. Residents sign up to be block leaders, who then organize block clean-ups and revitalization initiatives. Residents are provided with training and clean up kit that includes a broom, shovel, bags, gloves, dust pan, bucket, and a litter grabber. To spur greater further engagement, KIBI has hosted a competition between the blocks. The organization rates all of the blocks on a scale of one to four and each spring those blocks that average at least a two receive flowers to plant on their block. Lastly, KIBI has rolled out a Little BIG (Block Improvement Grants) Program. This allows block captains to apply for small micro-grants to host events or further beautify their block. At the heart of this program is leveraging the community’s interest to further engage the community and build pride within their neighborhood. [38]

Recommendations for Maintenance & Stewardship



Create an organization whose main objective is to oversee the continued success of the Green Loop

These organizations most frequently come to fruition in the form of a “friends of” group. This can be seen in the Indianapolis Cultural Trail in Indianapolis, the Underline in Miami, the High Line in New York, and the Intertwine in Portland. These organizations are responsible for maintaining and programming their facility. Because their main responsibility is this facility, their attention will not be divided across a number of different places in the city. This can also help to depoliticize decisions to be made about the facility as one agency will be advocating solely on behalf of it.



Create a dedicated maintenance fund or revenue stream

In an ideal situation, a dedicated endowment fund would be in place from the outset of the project. The Indianapolis Cultural Trail, for example, was able to establish this. In a setting, however, where philanthropy may not be that strong, a membership program should be established so that those of all incomes can help with the funding. This is best exemplified by the Friends of the High Line and their membership program.



Capitalize on community interest

There are organizations within the community that are extremely excited about the potential for this type of facility. While they may not have the capacity to help financially, their interest should be incorporated. They could participate as tour guides or as volunteer maintenance teams, as seen on the Indianapolis Cultural Trail. An Adopt-A-Block program should be established through which Local community groups could sign up to be responsible for maintaining a segment of the Green Loop. This would not negate the necessity of a paid maintenance team, but could cut down on the time and money needed to allocate to that.



Have installations along the Green Loop curated by nearby major institutions

One of the benefits to the Green Loop is its ability to connect a number of major Portland institutions and attractions. The Green Loop, however, should not just connect these places but should celebrate them. The organization charged with maintaining the Green Loop should partner with these institutions to curate pieces along the facility. The key to this is that the installations would change, thus keeping people coming back to see the facility throughout the year.

Friends of the High Line

New York City, New York

Maintaining the High Line is no small feat. The popularity of the High Line can be attributed to the wide array of programs put on by the Friends of the High Line. In addition to the programming, the High Line has featured over 120 artists from around the globe. All of this and the maintenance of the space is made possible through the Friends of the High Line's fundraising efforts.

The Friends of the High Line is responsible for fundraising 98% of the High Line's operating budget. This is done through a membership program, an "adopt a plant" program, and a number of benefit events. Annual memberships range from \$40–\$3000 and monthly memberships range from \$10–\$250 per month. Memberships are not only tax deductible, but come with a rewards system. Incentives range from a subscription to the High Line's bi-annual magazine and discounts at local businesses to access to member-only events and limited edition designer handbags.

The "Adopt a Plant" program allows members to sponsor specific plant species along the High Line. These plants range from \$25 to \$150 and in return the sponsor receives an adoption certificate and a professional photo of their plant species. Another form of funding comes from corporate sponsorship. The High Line works with corporations to collaborate and explore ways that their brands can align with work along the High Line in return for recognition and advertising space. [39]



Image 40: Friends of the High Line in New York, NY

SoMa Parklet

Portland, Oregon

Recently the SoMa EcoDistrict in Portland employed crowdfunding as a strategy for getting funding to build a parklet. Prior to the crowdfunding campaign, Portland State University students designed the potential parklet and the student project morphed into something that would become a reality and true amenity for the community. The students and SoMa were able to get services and some products donated for the parklet and found someone who was willing to supply insurance coverage for the parklet and covers the cost of loss parking revenue to the city for two years. \$15,000 was needed to purchase the remaining supplies to build the structure. Through an online crowd-funding campaign, the EcoDistrict was able to raise a little over \$15,000 dollars spread among approximately 141 people. The parklet opened June 2015. [40]



Image 41: The SoMa parklet near PSU campus in Portland, OR

Evaluation

Performance measures are an important way to measure the success of the Green Loop. A variety of tools are available; however, this report refers to the 2015 Evaluating Complete Street Projects guideline published by Smart Growth America. The guideline identifies four main steps in a project evaluation:

Agree to the goals and objectives of the project

The Green Loop has several key objectives:

- Improve health
- Expand open space
- Increase connectivity
- Support businesses
- Encourage riding
- Grow and build green

Determine the best ways to measure goals

Once the goals and objectives have been set, the City should gain some insights from community members in order to understand their expectations of the Green Loop. Collecting this input is the primary focus of this step in order to understand what matters to the community and how they will judge the Green Loop's success. During this step, the City should also set up data collection practices concerning what will be measured, who will measure it, how often it will be measured, and which thresholds determine success or failure.

Implement measures

These measurement practices should then be carried out. According to the Complete Streets guideline, the best time to measure conditions in order to create an adequate comparison of data is one year before project completion and three years after completion. One could rely on photos as a low-cost way of demonstrating a project's success, but both qualitative and quantitative data should support findings.

Share results

Packaging the results to share with the public after project evaluation is a final and necessary step in evaluating success of the Green Loop. The schedule for sharing should be determined during Step 2 in order to have resources in place to meet deadlines, whether it be one final report or annual reports. The results should be shared in formats that are as accessible as possible to a variety of community members.

Complete Streets Metrics

Access

One of the the Green Loop's objectives is to provide more access to destinations and public space.

Economy

Facilities like the Green Loop have had significant economic impacts.

Environment

The Green Loop is expected to add green infrastructure, parks and trees.

Place

The Green Loop has the capacity to improve the quality and quantity of public places in the Central City.

Safety

A fundamental transportation goal of facilities like the Green Loop is ensuring people are able to safely travel to their destinations.

Equity

Facilitating a greater variety of transportation options improves equity by making more of the city accessible.

Public Health

The Green Loop has great potential to improve public health by fostering active lifestyles and reducing the impacts of pollutants produced by vehicles.