

A healthy community, vibrant neighborhoods... *and bicycles everywhere!*



PORTLAND BICYCLE PLAN FOR 2030

FINAL DRAFT - JANUARY 2010

Exhibit A as amended

A WORLD-CLASS BICYCLING CITY



A healthy community, vibrant neighborhoods... *and bicycles everywhere!*

CITY OF PORTLAND
BUREAU OF TRANSPORTATION

1120 S.W. 5th Avenue, Suite 800
Portland, Oregon 97204



PORTLAND BICYCLE PLAN FOR 2030

FINAL DRAFT - JANUARY 2010





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Commissioner Amanda Fritz
Commissioner Randy Leonard
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This list includes all who served on the Steering Committee for any length of time over the three years of the plan development process.

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Patrick Sweeney, Bureau of Transportation

IN MEMORIAM

Doug McCollum
March 28, 1953 - October 30, 2008
Your contributions to to Portland's bikeway network will long be remembered.



The working groups for the *Portland Bicycle Plan for 2030* were formed in January of 2009 to address specific questions or elements related to completing the plan. They operated on a consensus basis to advise the Steering Committee. The composition of working groups was drawn from members of the project team, the Steering Committee, the Technical Advisory Committee and other interested persons.

VISION AND SCOPE / IMPLEMENTATION AND FUNDING STRATEGY STEERING WORKING GROUP

Articulated the vision for the Portland Bicycle Plan for 2030 and ensured that the scope of the plan reflected the vision. Developed implementation priorities and strategies.

Mia Birk, lead	Rob Bennett	Scott Bricker	Rob Burchfield	Rex Burkholder	Catherine Ciarlo
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Jonathan Nicholas	Rick Potestio	Shayna Rehberg	Susan Remmers	Ellen Vanderslice	

POLICY WORKING GROUP

Found places throughout the City's goals and policies where changes could elevate bicycling, and recommended policy language revisions. Drafted classification descriptions for new bicycle classifications.

Courtney Duke, lead	Lesley Barewin	Roger Geller	Jeanne Harrison	Denver Igarta	Keith Liden
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NETWORK WORKING GROUP

Helped select the locations for a new functional class of bicycle mobility corridors.

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Denver Igarta	John Mermin	Alice Meyers	Kevin Moore	Michelle Poyourow	Veronica Rinard
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ENFORCEMENT WORKING GROUP

Worked with Portland Police Bureau staff to articulate the City's approach to enforcement related to bicycling.

Greg Raisman, lead	Brendan Finn	Bob Glascock	Lt. Bryan Parman	Officer Robert Pickett
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HEALTH, EQUITY AND BICYCLING WORKING GROUP

Determined the scope of the health and equity elements of the plan, and recommended actions to be included.

Wendy Rankin, lead	Amy Gilroy	Alison Hill Graves	Katie Larsell	Michelle Kunec	Jane Moore
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DESIGN WORKING GROUP

Developed and reviewed best practices for bikeway design.

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Greg Raisman	Chris Smith	Eric Wiley			

BICYCLE PARKING WORKING GROUP

Developed a strategy for anticipating and responding to a growing demand for bicycle parking.

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OFF-ROAD BICYCLING WORKING GROUP

Determined the scope of the 'bicycling on natural surface trails' element of the plan, and recommended actions to be included.

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Erik Tonkin	Jill VanWinkle				

BIKE SHARING WORKING GROUP

Identified the most effective ways to integrate bike sharing into the plan.

Steve Hoyt-McBeth, lead	Veronica Rinard	Todd Roll	Chris Smith
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OPERATIONS AND MAINTENANCE WORKING GROUP

Articulated the City's approach to traffic operations and maintenance activities related to bicycling, and identified future activities.

Jamie Waltz, lead Kirstin Byer Dave Hutson Mark Lear Ellen Vanderslice Peter Wojcicki

WORKING GROUP ON INTEGRATING BICYCLING WITH TRANSIT AND OTHER MODES

Developed strategies for coordinating with the region's transit and transportation providers to integrate bicycling with transit and other modes.

Chris Smith, lead Sarah Figliozzi Katie Larsell John McDonald Colin Maher Jessica Roberts
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CONSULTANTS

Alta Planning + Design managed the 2007 public process and helped the Bureau of Transportation develop the Bikeway Quality Index and Cycle Zone Analysis.

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... AND TO PORTLAND RESIDENTS:

Thank you for your continued efforts to make Portland a world-class bicycling city !





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Foreword

Dear Friends,

Portland's first *Bicycle Master Plan* was adopted in 1996 and it has served us well. We are proud of what Portland has done to become the best bicycling city in North America.

But there is still work to be done. To build on our bicycling legacy, the *Portland Bicycle Plan for 2030* aims to make bicycling a critical component of our city's overall transportation system and a significant element of our sustainable green economy. More than an update of the 1996 plan, it proposes fundamental changes to city policy, to bikeway design, to the density of our bikeway network and to an array of supporting efforts and programs. The *Portland Bicycle Plan for 2030* also identifies the many benefits that will accrue to Portland as a result of its implementation.

That Portland functions well for bikes is not a matter of chance. The *Portland Bicycle Plan for 2030* follows in the tradition of Portlanders working to make our city better, and using sound planning to do so.

Our efforts are organized around a vision – that a Portland with the bicycle as a pillar of its transportation is truly a beautiful city. Bicycling has already done much to enhance the beauty of Portland, its people and its economy. It has offered a tremendous return on the modest investments we have made in building cycling infrastructure and promoting bicycle use. To the extent that we are able to realize the potential of bicycle transportation in Portland, so too will we realize the scope of its benefits.

Portland will be cleaner and healthier. It will attract more tourists and businesses, and will keep more of our money circulating through our local economy. We will have freedom of movement and freedom from traffic congestion. People will be able to meet their daily transportation needs more efficiently. Portland will remain a national model of how to make modern North American cities work.

We have done much already toward that end. We have gained valuable experience in building our 300-mile bikeway network and creating successful education and encouragement programs. We know what we need to do to make Portland a world-class bicycling city.

Now it is time to be bold in our vision – and successful in our implementation.

Sincerely,

A handwritten signature in black ink, appearing to read 'S.A. Adams', written in a cursive style.

Mayor Sam Adams



"Our intentions are to be as sustainable a city as possible. That means socially, that means environmentally and that means economically. The bike is great on all three of those factors. You just can't get a better transportation return on your investment than you get with promoting bicycling."

– Mayor Sam Adams



JONATHAN MAUS / BIKEPORTLAND.ORG





A vision for Portland in the year 2030

The **STEERING COMMITTEE** for the *Portland Bicycle Plan for 2030* included:

Mia Birk, Jay Graves (co-chairs),
Joe Adamski, Matt Arnold, Meeky
Blizzard, Scott Bricker,
Rex Burkholder, John Carroll,
Jim Chasse, Catherine Ciarlo,
Ayleen Crotty, M. Susan Dean,
Jennifer Dill, Chris DiStefano,
Sharon Fekety, Richard German,
Mark Ginsberg, Peter Koonce,
Katie Larsell, Mark Lear,
Keith Liden, Evan Manvel,
Jonathan Maus, Randy Miller,
Tom Miller, Jane Moore,
Kevin Moore, Jonathan Nicholas,
Jerry Norquist, Wendy Rankin,
Shayna Rehberg, Susan Remmers,
Veronica Rinard, Todd Roll,
Mark Seiber, Kathryn Sofich,
Chris Smith, Steve White and
Eric Wiley

A HEALTHY COMMUNITY

All Portlanders have equal access to the benefits of bicycling. Because they ride bicycles, Portlanders tend to be fit and healthy. All Portland children learn safe, effective bicycling skills in school.

VIBRANT NEIGHBORHOODS

Portland's streets are livable places that accommodate many activities. Neighborhood business districts are thriving as Portlanders shop locally. A civic commitment to share the road is reflected in mutual courtesy.

BICYCLES EVERYWHERE!

Portland is the hub of a connected regional bicycle network that includes bike lanes and bicycle boulevards, paths, trails and greenways, as well as protected bikeways separated from traffic on busy streets.

In 2030, **BICYCLING IS A FUNDAMENTAL PILLAR** of Portland's fully integrated transportation system.



Portland in the Year 2030

It is the year 2030, and Portland looks much different than it did a generation ago. By sharply reducing reliance on personal auto use, Portland significantly lowered its carbon footprint, eased traffic congestion, improved air quality and enhanced public health. One of the community's most valuable assets - the public right-of-way - was reclaimed for all Portland residents. By repurposing much of this space for pedestrians, bicyclists, mass transit, freight use and green infrastructure, Portland streets more efficiently move people and goods, filter and clean stormwater, absorb emissions and improve Portland's health, safety and livability.

Bicycling is now a fundamental pillar of the Portland's fully integrated transportation system, with more than a quarter of all daily trips taken by bicycle on the city's world-renowned bikeway network. Residents and visitors know they can readily find a low-stress, efficient and comfortable facility - be it a bicycle boulevard, bike lane, cycle track, paved trail, natural surface trail or other well-designed, maintained and marketed bikeway - to get from where they are to where they want to go. As a whole, Portland's cohesive tapestry of bikeways forms the hub of a vibrant regional active transportation network.

With a foundation in bicycling as a normal means of transportation, the youth of Portland's early 21st century Safe Routes to School program have matured, resulting in a Portland that is healthier, cleaner and more sustainable than it was at the end of the last century. Bicycle safety education and encouragement is integral with the youth experience in all Portland schools, and bicycle-related tours, events, races, rides and activities reinforce the childhood experiences of nearly all Portland residents.

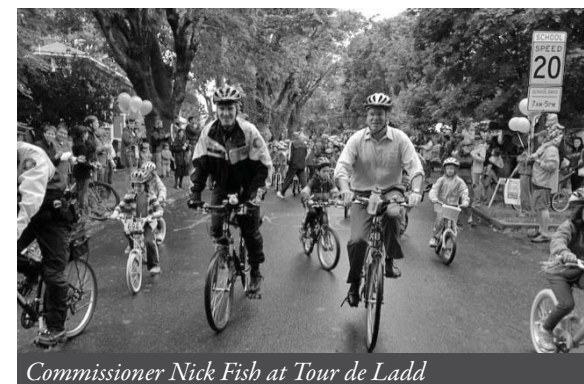
Children, women, immigrants, seniors and other populations that have historically not bicycled in large numbers now bicycle in higher proportions than ever before. This resulted from a land-use shift to a dynamic mosaic of mixed-use neighborhoods - allowing residents to work and learn, buy and sell, play and pray, all within an easy bicycle ride of their home. Portland has also experienced a shift in the health care industry towards a genuine commitment to fitness and nutrition as the foundation of personal wellness across the spectrum of age, wealth and ethnicity.

Portland's thriving economy derives from its fit and healthy employee base. Every business encourages employees and visitors to bicycle and offers high quality, plentiful bicycle parking. With more money in their pockets and circulating in the local economy due to



Young bicyclists in the park

TRANSPORTATION OPTIONS



Commissioner Nick Fish at Tour de Ladd

JONATHAN MAUS / BIKEPORTLAND.ORG



Morning bicycle commuters at the Broadway Bridge

JONATHAN MAUS / BIKEPORTLAND.ORG





A vision for Portland in the year 2030

reduced transportation costs, the business community has come to embrace bicycling as a hallmark of the Portland region. Thousands of green, sustainable, local jobs in manufacturing and distribution, retail sales and services, tourism, and professional services derive from Portland's successful bicycle-related industry.

By 2030, bicycling will be fully intertwined with Portland's regional transit system. Streetcar, light and commuter rail, water taxis and bus transit are all planned and operated with the needs of bicyclists in mind and as high-priority customers who will reach transit stations by bike and partner to reduce reliance on the automobile.

Visitors to Portland find bicycle transportation to be a signature feature of their experience. Bicycles, maps and route guidance are readily available throughout the region's town and neighborhood centers via shared bike kiosks, rental companies, hotels and corporate and academic campuses.

The cultural shift to bicycling that began in earnest at the turn of the century is no longer an oddity. Bicycling is not seen merely as a sport or the exclusive purview of young progressives. Portland residents do not identify themselves as 'bicyclists', but as users of a preferred means of transportation for regular daily activities.

The rise in bicycle use has been accompanied by a sharp increase in safety for all residents due to the use of international best practices in bikeway design, bicyclist and motorist safety campaigns, enforcement of high-risk traffic behaviors and evolution of laws and attitudes. Improved safety is tied to the increasing numbers of bicyclists, many of whom have reduced their driving trips and come to appreciate the lower stress experience of pedaling for daily transportation. Related to the decline in driving-related stress has been a burgeoning civic commitment to mutual courtesy.

Portland has become the nation's center of research, teaching and learning in green and sustainable urban planning, design, architecture and engineering. Through innovative partnerships and our commitment to Portland as a living laboratory of progressive change, residents have helped spread the revolution far and wide, evolved academic curricula and models, deepened their understanding of the rich benefits of sustainable transportation and reformed their previous automobile-centric approach to community design and operation. Researchers from across the world come to Portland, eager to see what it has done and then apply the lessons to their own communities.

This vision did not just happen as a result of geography, climate or historical happenstance.

It was carefully planned and fully funded by citizens determined to set a threshold for sustainable urban living in the 21st century. The vision came about because Portland's leaders recognized that bicycling could be a significant and incredibly positive means of transportation for tens of thousands of residents and an economic powerhouse for businesses who realize the benefits bicycling brings to health, safety and livability, as well as to the economy and the environment. By investing in bicycling as a hallmark of its transportation system, Portland was made more human and healthy, safe and splendid.

- Portland Bicycle Plan Steering Committee



Portland's first *Bicycle Master Plan* was adopted by City Council in 1996 and updated in 1998. The plan created a cost-effective blueprint for developing an interconnected bicycle network supported by innovative policies and programs to encourage bicycling. In the period between its publication and the completion of this new plan, Portland expanded its bikeway network to more than 300 miles, developed many effective programs to promote bicycling, added thousands of bicycle parking spaces and experienced an exponential rise in the number of people bicycling. In 2008, these efforts were recognized by the League of American Bicyclists when Portland was granted platinum-level status as a *Bicycle Friendly Community*.

Having more Portland residents choose to bicycle for transportation will address numerous public objectives. The *Portland Bicycle Plan for 2030* positions Portland for the tremendous growth in bicycling that the City expects over the next 20 years. A major theme of the new plan is that the City must plan and design for people who are not yet riding, and must create conditions that make bicycling more attractive than driving for short trips.

The *Portland Bicycle Plan for 2030* includes a list of capital projects and recommended actions. It recommends strengthening City policies in support of bicycling, providing more and better bicycle parking, expanding

educational and encouragement programs and developing ongoing measures of success.

The plan recommends expanding the network of planned bikeways from 630 to 962 miles, based on three key strategies:

1. Introduce safe, comfortable and attractive bikeways that can carry more bicyclists and serve all types and all ages of users, building on the best design practices of great bicycling cities around the world.
2. Construct a dense network of bikeways so that all Portland residents can easily find and access a route.
3. Create a cohesive network with direct routes that take people where they want to go.

A 20-year horizon will likely include many new trends and funding sources beyond what exist in 2009. New trends and funding sources will arise. This plan prepares Portland to be flexible and agile in responding to new opportunities to invest in the bicycle transportation system.

STRATEGIC IMPLEMENTATION RECOMMENDATIONS:

Amend the *Transportation System Plan (TSP)* to **adopt recommended policies and classifications** for bicycle transportation.

Identify and pursue **multiple strategies to increase funding** for green transportation.

Develop a **street design guide** that includes **bicycle design guidelines**.

Expand **encouragement programs** that provide services and equipment, support behavior changes, raise awareness and provide incentives that increase bicycling.

Build **as much** of the bicycle transportation system as possible, **as quickly** as possible.

Develop **strategies to ensure successful delivery** of bicycle projects.

Fund and construct projects in **areas underserved by the bikeway network** that score high in indicators of disadvantage.





Recommendations of the *Portland Bicycle Plan for 2030*:

2.1 *A broad policy context*

- 2.1 A. Put green transportation first.
- 2.1 B. Fully integrate bicycling into the *Portland Plan* project.

- 2.1 C. Further integrate support for bicycling into existing City policies.

2.2 *Bicycle policy recommendations*

- 2.2 A. Adopt a bicycle transportation policy to create conditions that make bicycling more attractive than driving for trips three miles or less and integrate support for bicycling into other *Transportation System Plan* policies.
- 2.2 B. Revise existing parking policies to include bicycle parking.

2.3 *Street classifications for bicycle travel*

- 2.3 A. Expand to a functional hierarchy of bicycle classifications.

- 2.3 B. Classify a fine-grained bicycle network.

- 2.3 C. Develop refinement plans for key areas and facilities.

3.1 *Expanding the bicycle network*

- 3.1 A. Provide a fine-grained bikeway network that serves key destinations.

3.2 *Bicycle facility design and engineering*

- 3.2 A. Develop design guidelines for new bicycle facilities that will attract riders of all ages and abilities.

3.3 *Bicycle parking*

- 3.3 A. Seek changes to regulations to ensure all land uses provide ample bicycle parking and end-of-trip facilities.
- 3.3 B. Anticipate and provide adequate bicycle parking, especially at high-demand locations.
- 3.3 C. Ensure a high quality of function and design of bicycle parking.

- 3.3 D. Encourage owners of existing buildings to upgrade bicycle parking.

- 3.3 E. Establish a funding stream to fulfill future bicycle parking demand, improvements and maintenance.

3.4 *Integrating bicycling with other travel modes*

- 3.4 A. Engage with partners to improve and simplify connections and transfers between bicycling and other travel modes.
- 3.4 B. Explore bike sharing systems.

3.5 *A green network*

- 3.5 A. Collaborate with Metro and other partners to realize a coordinated regional network of greenways.
- 3.5 B. Work with advocates for bicycling on natural surface trails and natural resources advocates developing strategies that increase opportunities for bicycling on natural surface trails, while protecting the natural environment and enhancing pedestrian safety.



3.5 C. Ensure that green street features and bicycle transportation improvements are mutually supportive.

3.6 *Operations and maintenance of the bicycle network*

3.6 A. Improve and preserve existing bikeways.

3.6 B. Develop maintenance practices that minimize physical hazards for bicyclists.

3.6 C. Accommodate bicyclists through construction zones.

3.7 *Bicycling in Portland's Central City*

3.7 A. Make Portland's Central City superlatively bicycle-friendly.

4.1 *Encouraging bicycling*

4.1 A. Expand the City of Portland's offering of maps, information and trip planning to encourage new bicyclists and increase convenience for those who are already riding.

4.1 B. Support programs to increase access to bicycles.

4.1 C. Expand programs that promote long-term changes in the transportation habits of Portland residents by encouraging bicycling.

4.1 D. Continue to raise the awareness of bicycling and reinforce safe bicycling behaviors.

4.1 E. Investigate strategies for providing incentives to bicycle.

4.2 *Safety education and enforcement*

4.2 A. Expand the Safe Routes to School program.

4.2 B. Increase safety education and outreach to encourage safe travel behavior for all travel modes.

4.2 C. Regularly assess road safety data to inform design and engineering improvements.

4.2 D. Implement enforcement practices that contribute to the safety and attractiveness of bicycling.



A popular business draws bike customers

JONATHAN MAUS / BIKEPORTLAND.ORG



Bicycle and pedestrian facility on the Hawthorne Bridge

GREG RAISMAN



Traffic enforcement at Sunday Parkways

JONATHAN MAUS / BIKEPORTLAND.ORG





Executive summary

4.3 *Wayfinding for bicyclists*

- 4.3 A. Improve wayfinding for users of Portland's network of bikeways.

5.1 *Overall approach to implementation*

- 5.1 A. Amend the *Transportation System Plan (TSP)* to adopt recommended policies and classifications for bicycle transportation.

- 5.1 B. Identify and pursue multiple strategies to increase funding for green transportation.

- 5.1 C. Develop a complete street design guide that includes bicycle design guidelines.

- 5.1 D. Expand encouragement programs that provide services and equipment, support behavior changes, raise awareness and provide incentives that increase bicycling.

- 5.1 E. Build as much of the bicycle transportation system as possible, as quickly as possible.

- 5.1 F. Develop strategies to ensure successful delivery of bicycle projects.

- 5.1 G. Fund and construct projects in areas underserved by the bikeway network that score high in indicators of disadvantage.

5.5 *Evaluation and measurement*

- 5.5 A. Continue to expand the means of evaluating how well the public is being served by Portland's bikeways network and the programs that support bicycling.



"If you can make a city move by bicycling, it will be a more human and egalitarian city."

- Enrique Peñalosa, former mayor of Bogata, Colombia



JONATHAN MAUS / BIKEPORTLAND.ORG

Part **ONE**





TOM SLOAN

Neighborhood:
MULTNOMAH VILLAGE

Reason for bicycling:
Commutes to work and
INSPIRES OTHERS that it's possible.

Favorite Portland bicycling event:
SUNDAY PARKWAYS

"We have a long way to go before we can really call ourselves a biking city. It's just not possible yet to feel completely safe and be protected from the danger, noise and smell of cars. We need better off-road facilities if we're going to achieve critical mass and therefore support for better bike policies. One day I hope that the entire city (including Southwest) can enjoy a system that really gets you where you need to go, plus takes advantage of this beautiful landscape we call Portland."

Bicyclist **PROFILE** Mary Anne



YAHOO MAPS



1.1 MAKING THE CASE FOR INVESTING IN BICYCLING

1.1.1 Introduction

The *Portland Bicycle Plan for 2030* advocates for bicycling as a legitimate and necessary transportation mode. It promotes bicycling as an increasingly important element in developing a community that is healthier, safer, more sustainable and defined by close-knit communities. It advances the notion of bicycling as a reasonable means of transportation for many common trips and elevates bicycling to the status of a main pillar in Portland's new urban transformation.

1.1.2 Bicycling creates safer streets

Portland's safety record shows that its roads are becoming safer as they become more bicycle-friendly. Nationwide, traffic fatalities are on the decline, but over the decade from 1999 to 2009 traffic fatalities in Portland have decreased three times faster than for the state as a whole and six times faster than for the country.¹ The per-trip crash rate for bicycling in Portland has decreased by approximately 70 percent in that time.²

Bicyclists in Portland are enjoying the phenomenon of safety in numbers.³ As

¹ Portland Bureau of Transportation

² Portland Bureau of Transportation

³ P. L. Jacobsen "Safety in numbers: more walkers and bicyclists, safer walking and bicycling" *Inj. Prev.*, Sep. 01, 2003 9: 205-209

more people ride, predictable things happen: bicyclists gain experience, drivers become more aware and expect to see bicyclists and community support for safety improvements grows.

1.1.3 Bicycling reduces the causes of global climate change and promotes a healthy environment

Accounting for 40 percent of carbon dioxide emissions in the Portland area, the transportation sector significantly contributes to greenhouse gas emissions and is the fastest growing source of these gases. In 2007, Portland City Council and the Multnomah County Board of Commissioners adopted resolutions directing staff to design a strategy to reduce local carbon emissions by 80 percent by 2050. To reach this reduction goal, the draft plan released in 2009 seeks a reduction of transportation sector emissions to ten percent below 2006 levels by 2010.⁴

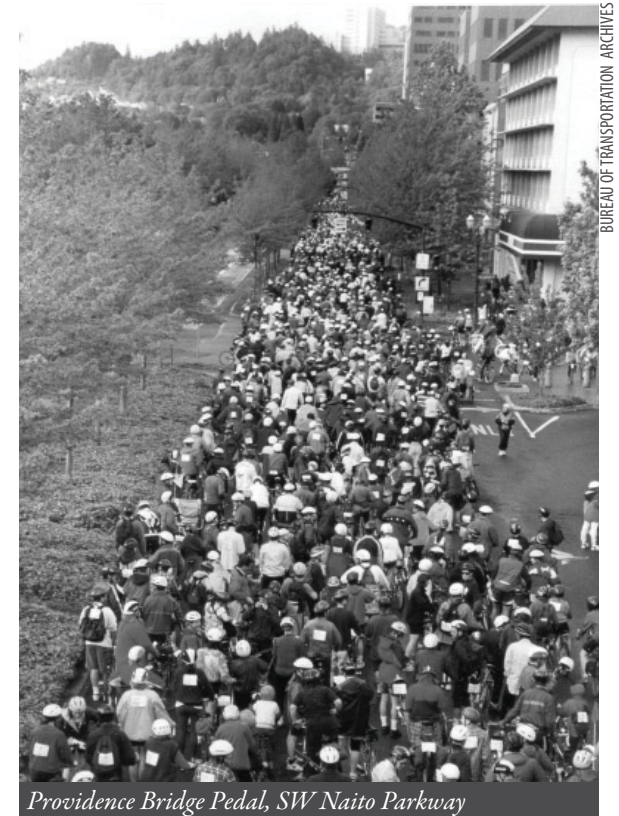
Bicycle transportation will play a pivotal role in achieving these reductions. Half of all trips in Portland are three miles or less. This is a trip length that is well-suited to bicycling. One of the most cost-effective changes Portland can make to reach its emissions reduction goal is to encourage bicycling for short trips.

⁴ Climate Action Plan 2009; draft available online at <http://www.portlandonline.com/bps/index.cfm?c=41896>



Bicyclists at the Providence Bridge Pedal

JONATHAN MAUS / BIKEPORTLAND.ORG



Providence Bridge Pedal, SW Naito Parkway

BUREAU OF TRANSPORTATION ARCHIVES





*“We must recognize that we are on the cusp of a **new wave of transportation policy**. The infrastructure challenge of President Eisenhower’s 1950’s was to build out our nation and to connect within. For Senator Moynihan and his colleagues in the 1980’s and 1990’s it was to modernize the program and **better connect roads, transit, rail, air and other modes**. Today, the challenge is to take transportation out of its box in order to ensure **health, vitality and sustainability** for our metropolitan areas.”*

– Robert Puentes, Brookings Institution, *A Bridge to Somewhere: Rethinking American Transportation for the 21st Century*

Achieving a greater bicycle mode-split in Portland will also help reduce pollution from particulates and other air toxins produced by motor vehicles. Numerous health studies link particulate pollution to reductions in lung function, increased hospital emergency room admissions and premature deaths. Epidemiological studies show that people living in more polluted cities have an increased risk of

premature death compared to those in cleaner cities.⁵

When cars and trucks deposit oil, antifreeze, grease and metals onto Portland streets and driveways the pollution finds its way into local waterways. Particulates from engine exhaust, such as nitrogen and other contaminants, eventually settle in water. Reducing car use helps reduce this level of pollution and the associated costs of cleanup.

1.1.4 Bicycling limits the causes and health care costs related to obesity

In 2001, the federal Centers for Disease Control and Prevention (CDC) labeled obesity a national health epidemic and linked obesity to insufficient physical activity. Obesity not only affects the health of some Americans, but also has a role in the rising cost of health care for all Americans.

In 2008, nearly a quarter of all Oregonians were obese.⁶ Bicycling has the potential to help address obesity’s increasing effects on Portland residents. According to the CDC, “automobile trips that can be safely replaced by walking or biking offer the first target for increased physical activity in communities.” Safe and attractive bikeways can help Portlanders achieve

5 <http://dsp-psd.communication.gc.ca/Pilot/LoPBdP/modules/prb98-4-smog/effctsofozone-e.htm>
6 National Center for Chronic Disease Prevention & Health Promotion Behavioral Risk Factor Surveillance System

the 30 minutes of daily physical activity the CDC recommends for fighting obesity.

The Safe Routes to School program is changing the health habits of an entire generation of school children. Portland’s program brings local transportation agencies together in partnership with schools, neighborhoods and community organizations to encourage students and families to help build strong bodies and clear minds. Since it began in 2005 Portland schools participating in the program have seen the number of students walking or bicycling to school increase to an average of 38 percent of all students.⁷

1.1.5 Bicycling provides equity and access to affordable transportation options

Equity in access to transportation is an important step in creating a sustainable city. With the annual average cost of owning and operating a car now estimated at more than \$7,000,⁸ bicycling offers a more affordable transportation option that still provides ‘door-to-door’ service. An improved network of bikeways will provide Portland residents and their families with an alternative means to access workplaces, schools, medical facilities, shopping areas, parks and transit facilities.

7 Source: Portland Bureau of Transportation
8 Source: AAA



As inner-city neighborhoods experience continued gentrification, minorities and low-income residents are increasingly pushed to the fringes of Portland, where transportation options are often more limited. The relative affordability of bicycle infrastructure and programs can help provide transportation equity to neighborhoods that may not yet have sufficient access to transit service or where walking is impractical.

1.1.6 Bicycling provides a viable transportation option

Seen by some as a tool of leisure since the rise of the automobile, the bicycle is re-emerging as a legitimate and viable transportation alternative. The bicycle is uniquely suited for Portland's urban setting in terms of space requirements and travel times and its ability to offer freedom of movement.

Bicycle transportation competes well against the automobile in urban settings where trip distances tend to be short. Overall trip times door-to-door are comparable and can be even faster by bicycle when the time to park is factored in. As more residents turn to bicycle transportation it continues to become an increasingly viable transportation option.

Creating a community where bicycling is viewed as a pillar of the transportation system is not without precedent. Numerous European cities

in Denmark, the Netherlands and Germany provide examples where government policies and practices have created safe and comfortable bicycle routes, resulting in bicycle mode shares approaching 40 percent of all trips.⁹ In many Asian cities the bicycle has been the preferred mode of urban transportation for decades.

1.1.7 Bicycling creates fun, vibrant and livable neighborhoods

Bicycling promotes interaction between neighbors, strengthens a person's awareness and connection to the Portland community and provides 'eyes-on-the-street' security. It is an important component in creating the types of dynamic neighborhood streets where people often prefer to live and the vibrant public spaces that support local retail activity.

Bicycling is fun and brings people together for many varieties of gatherings. The many bike rides in Portland¹⁰ and events such as Sunday Parkways, where miles of city streets are closed for a day, provide an opportunity for residents to experience bicycling on Portland roads in safer-than-usual conditions, while affording them an opportunity to interact with other residents and experience Portland's parks, neighborhoods and retail districts.

⁹ John Pucher, "Making Cycling Irresistible: Lessons from the Netherlands, Denmark, and Germany," *Transport Reviews*, Vol. 28, No. 4, July 2008, pp.495-528 (with Ralph Buehler); available online at <http://policy.rutgers.edu/faculty/pucher/>
¹⁰ In 2008 Portland hosted more than 4,000 rides and other organized bicycle events.



Bicycling in Southwest Portland

DAT NGUYEN



Portland bicycle commuters

BUREAU OF TRANSPORTATION ARCHIVES



Sunday Parkways, Southeast Portland

TODD BORKOWITZ





Part One: A world-class bicycling city

“Portland’s commitment to building a bike-friendly city has been great for tourism - investment in cycling infrastructure enhances our reputation as a sustainable destination.”

- Veronica Rinard, Travel Portland

Bicycling provides excellent recreational opportunities for active residents. Local bicycle events featuring road, track, mountain bike and cyclocross racing are growing. These events promote bicycling and physical activity in a supportive community environment and encourage young or novice riders to adopt healthy habits and a deeper understanding and appreciation for bicycling.

1.1.8 Bicycling supports Portland’s local economy

As most companies associated with the automobile and oil industries are headquartered and have production facilities outside the region, Portland experiences limited economic benefit from supporting the automotive economy. A recent study by Portland economist and Brookings Institute Fellow Joe Cortright estimated that residents in the Portland metropolitan area drive on average four miles less each day than the national average. Accordingly, the region’s residents

annually spend \$1.2 billion less on driving that they would if they drove at the national average. Of this amount, Cortright estimates that more than \$800 million circulates through the local economy each year.¹¹

Portland’s reputation for bicycling and green building is helping create a new bicycle economy. According to a 2008 study by Alta Planning + Design, Portland’s growing bicycle industry contributed about \$90 million to the local economy in 2007 and employed 1150 people.¹²

This industry includes businesses that specialize in custom bicycle frames, bicycle components, bike racks and bicycling apparel and numerous retail bicycle shops. Several local design firms specialize in bicycle facility planning and design. Portland’s for-profit bicycle events attract riders and racers from around the world. A successful bicycle tourism industry draws on Portland’s reputation as a premier bicycling city, helping attract conventions and drawing tourist dollars both locally and from abroad.¹³

11 Joe Cortright, “Portland’s Green Dividend,” A White Paper from CEOs for Cities, July 2007; available online at <http://www.ceosforcities.org>

12 “Bicycle-Related Industry Growth in Portland,” Alta Planning and Design, 2008

13 In 2009 Travel Portland recognized the City of Portland with its top tourism promotion award for its efforts to make Portland a platinum-level bicycle friendly community.

Portland’s progressive planning policies have given it a unique reputation for creativity and innovation. This reputation not only attracts green industry practitioners and entrepreneurs, but also highly-educated newcomers in other industries and professions who choose to live in Portland *because* of its commitment to building a safe and comfortable community with strong neighborhoods and a vibrant economy.

By encouraging more bicycling, Portland will further develop this industry, attract new entrepreneurs and create more local jobs.

1.1.9 Bicycling is a sound investment

Traffic congestion is a primary issue for urban areas in the twenty-first century. One of the most cost-effective means to address mobility challenges is to shift investment focus from the automobile to more efficient modes. With limited resources Portland has achieved the highest bicycle mode share of any major U.S. city. At the same time, Portland’s proportion of automobile commute trips decreased.

While multiple strategies are needed to address congestion, developing a comprehensive bicycle network supported by innovative programs offers the best return on investment of transportation funding and can dramatically increase the efficiency of the entire transportation system. The total estimated value of the Portland’s existing 300-



mile network of bikeways is approximately \$60 million, roughly equivalent to the cost of constructing just one mile of modern urban freeway.¹⁴ With a rise of bicycle mode share from near two percent in 1996 to approximately eight percent in 2008, Portland has demonstrated that bicycle infrastructure provides a solid return its investment.

1.2 UPDATING THE BICYCLE PLAN

1.2.1 Introduction

Portland's first *Bicycle Master Plan* was adopted by City Council in 1996 and updated in 1998. The plan created a cost-effective blueprint for developing an interconnected bicycle network supported by innovative policies and programs to encourage bicycling. In the period between its publication and the drafting of this new plan, Portland expanded its bikeway network to more than 300 miles, developed many effective programs to promote bicycling and experienced an exponential rise in the number of people bicycling. In 2008, these efforts were recognized by the League of American Bicyclists when Portland was granted platinum-level status as a *Bicycle Friendly Community*.

The Bureau of Transportation's efforts to implement the 1996 *Bicycle Master Plan* have produced a foundation of knowledge and greater understanding of what is needed to successfully build a world-class bicycle transportation infrastructure and encourage its use. The *Portland Bicycle Plan for 2030* is the document that will guide this implementation.

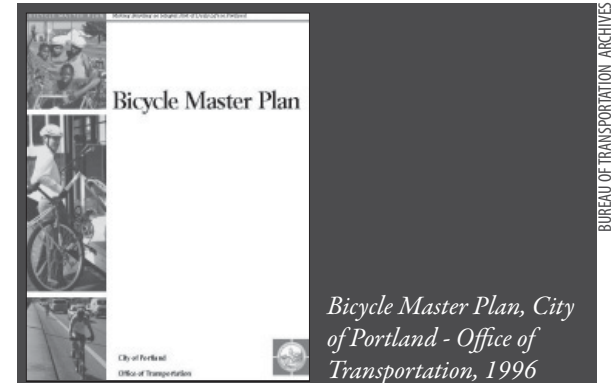
1.2.2 Public process

On June 17, 2006, 400 Portland bicycle and community activists and bicycle-industry business members gathered with representatives from Portland City Council, Metro Council



Local bike builders help support Portland's economy

JONATHAN MAUS / BIKEPORTLAND.ORG



Bicycle Master Plan, City of Portland - Office of Transportation, 1996

BUREAU OF TRANSPORTATION ARCHIVES



Portland Bicycle Plan open house, Franklin High School

JONATHAN MAUS / BIKEPORTLAND.ORG

¹⁴ Source: Portland Bureau of Transportation; values measured in 2007 dollars





Part One: A world-class bicycling city

and members of Congress for the first Portland Bike Summit. Together they looked back at Portland's success since 1991 in implementing a bikeway network, and the resulting growth in bicycling, and looked ahead at creative strategies for continuing the legacy of strong citywide support for cycling and increasing the number and diversity of Portland residents and visitors riding bicycles. The recommendations from the summit participants included significant expansion of bicycle-friendly infrastructure and a comprehensive update of Portland's 1996 *Bicycle Master Plan*. The *Portland Bicycle Plan for 2030* is the result of this process.

The development of the *Portland Bicycle Plan for 2030* was conducted in two phases. During Phase One, which began in 2007, the project team formed a Steering Committee and Technical Advisory Committee, collected and assessed information on existing conditions, led regular bicycle rides, gathered opinions from the community and agreed upon an approach to developing the plan. The team also held open houses, conducted extensive fieldwork and analysis and researched best practices in policy, network and design. An extensive *Existing Conditions Report*¹ was prepared and an initial updated bicycle network was proposed.

In Phase Two, the project team identified the desired elements of the updated plan and collaborated with the Steering Committee and Technical Advisory Committee to form eleven working groups to address the identified elements. Each working group submitted recommendations that were incorporated into the draft *Portland Bicycle Plan for 2030*. In May 2009, six public open houses were held throughout Portland to provide residents an opportunity to review proposed elements of the draft plan.

In the summer of 2009, suggestions and comments received at the open houses were processed and the proposed network was updated to reflect requested changes. A plan document was drafted. Following internal review, a public comment draft was issued on October 5, 2009. Public comments were accepted through November 8, 2009. The Portland Planning Commission held a public hearing on the evening of October 27, 2009. On November 10, the Planning Commission voted unanimously to “enthusiastically and warmly support the *Portland Bicycle Plan for 2030*.”

A detailed report of the public process for the development of the *Portland Bicycle Plan for 2030* can be found in Appendix H.

1.2.3 Approach

The approach to developing this plan is based on two main assumptions. The first is that it is desirable to attract Portland residents to bicycle who were not bicycling in 2009, especially those who are choosing to drive for most short trips. Many supporting arguments for this assumption are described in Chapter 1.1.

The second assumption is that one important way to attract future riders is to develop low-stress bikeways² that provide them with a sense of safety and comfort. This assumption is based on the lessons learned from the experiences of the most successful bicycling cities around the world as well as on work performed by the Bureau of Transportation to better understand the market for bicycling.

Lessons from the best bicycling cities

There are many cities in modern, industrialized nations around the world that have a relatively high bicycle mode split. Cities such as Amsterdam and Groningen in the Netherlands, Copenhagen in Denmark, and Freiburg im Breisgau in Germany, have created transportation systems where bicycling is often the simplest, most logical and enjoyable choice for many trips for many travelers. For residents

² Throughout this document, the term 'low-stress bikeway' is used to refer to bicycle facilities where bicyclists can expect to feel safer and more comfortable because the stress of negotiating with motorists for space in the roadway has been reduced or eliminated by design. See Appendix G, Glossary.

¹ Available for download online at this web page: <http://www.portlandonline.com/transportation/index.cfm?c=50736>



of these cities, concern about personal safety while bicycling is rarely a consideration, because successful bicycling cities have substantially reduced the element of fear associated with bicycling in an urban environment. Providing attractive, direct bicycle routes that feel safe and comfortable to bicyclists is one way these cities have attracted more riders. Chapter 3.2 further describes several of these low-stress facility types.

Understanding the market for bicycling

In 2005, Bureau of Transportation staff began developing an organizing framework for better understanding how Portland residents view bicycling for transportation. The work grew from the observation that, despite the advances Portland has made in facilitating bicycling, many residents still had concerns about the safety of bicycle transportation. Through analysis and interpretation, a typology was developed that categorizes residents into four types based on their approach to bicycling for transportation. This typology was vetted with transportation professionals with experience in bicycle planning, policy, and operations. A brief description of the four types can be found in Figure 1-2.³

Of course there are limitations to any model that puts individuals into categories. The

3 The Four Types, a more comprehensive discussion of the typology development, can be downloaded from this web page: <http://www.portlandonline.com/transportation/index.cfm?c=50736>

four types are not intended to be rigid characterizations but rather insight into potential market segments. A major premise of this plan is that the residents who are described as ‘interested but concerned’ will not be attracted to bicycle for transportation by the provision of more bike lanes, but may become tempted by a dense network of low-stress bikeways.

Solutions tailored to place

The physical, land use and geographic attributes that affect bicycling vary across Portland. To better understand the differences in conditions, City staff in 2007 developed an innovative method for tailoring the City’s bicycle strategy to districts with similar conditions and potential for bicycling. Dubbed the ‘Cycle Zone Analysis,’ the effort mapped areas as ‘cycle zones’ and evaluated each area’s connectivity, network density, land use and slope to generate a measure of bicycling potential. The quality of existing bikeways was also assessed. The Cycle Zone Analysis helped identify those areas where improved bikeways can most cost-effectively increase overall ridership in the network. It also helped staff propose new facilities and programs tailored to the preferences expressed by local residents. The Cycle Zone Analysis is described in more detail in Appendix C. Chapter 3.1 describes the rationale for expanding the bikeway network and defining projects for this plan.



Portland Bicycle Plan Steering Committee meeting

JONATHAN MAUS / BIKEPORTLAND.ORG



European bicycle planners in Portland, 2009

JONATHAN MAUS / BIKEPORTLAND.ORG



In the world’s best bicycling cities, like Amsterdam, people of all ages ride for all reasons

MARION BLEEKER



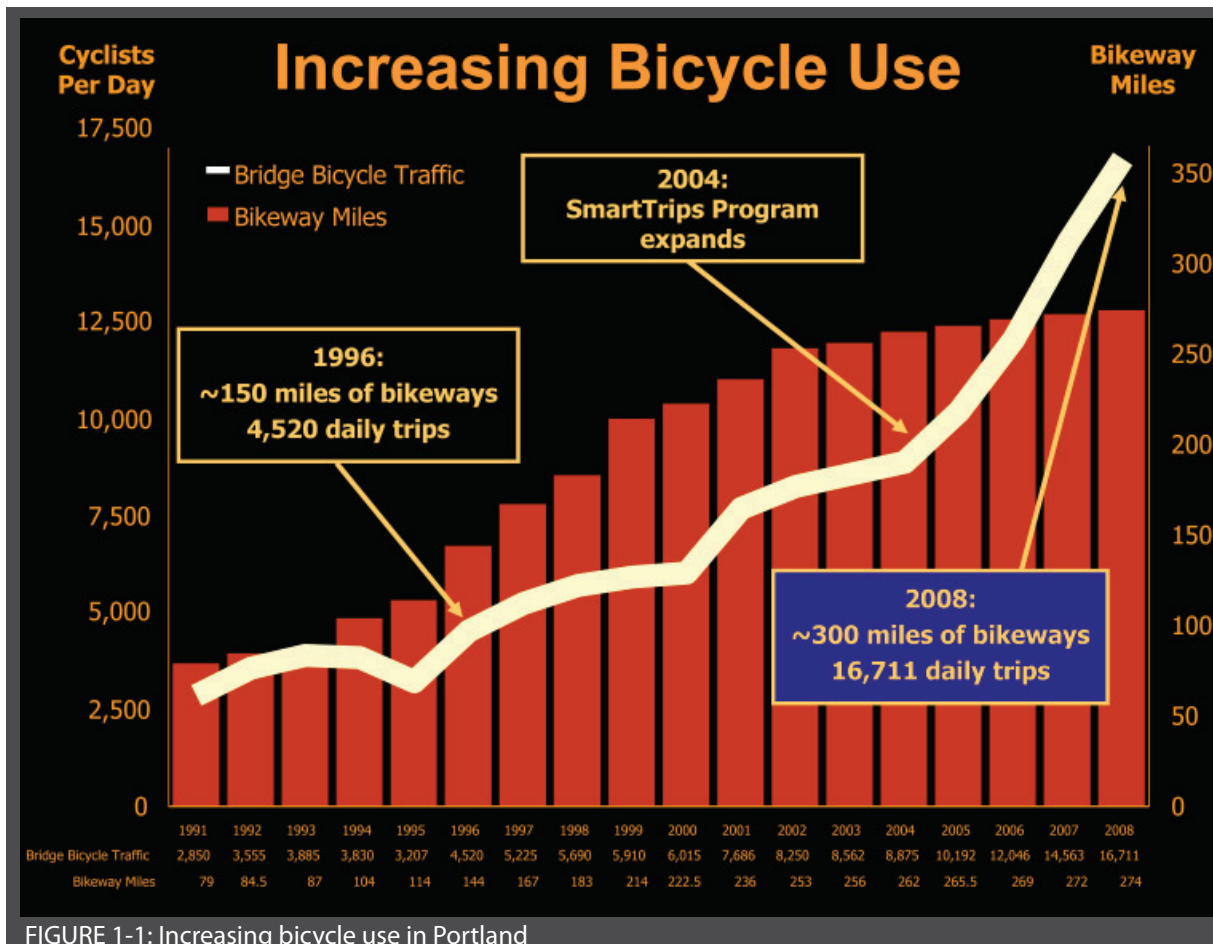


FIGURE 1-1: Increasing bicycle use in Portland

Expanding options for bicycle parking

One lesson Portland gleaned from the best bicycling cities is that the demand for good bicycle parking can easily outpace the supply if this important element of the bicycle transportation system is not addressed. This plan recommends new policies related to

bicycle parking, described in Chapter 2.2. The overall approach to providing bicycle parking is detailed in Chapter 3.3.

Making bicycling part of everyday life

This plan recognizes that programs to encourage bicycling are an important means of

promoting a sense of comfort and confidence, both for new and experienced riders. Research and experience demonstrate that simply providing the information residents want can help them make a change in travel behavior.⁴ Chapter 4.1 lays out the plan for expanding the City's programs to encourage bicycling.

1.2.4 How this plan will be used

The *Portland Bicycle Plan for 2030* will serve as the basis for an update of Portland's *Transportation System Plan*, a part of the *Comprehensive Plan*. The update will include policies, bicycle classifications and projects, and will address the need for policy guidance in managing and meeting competing demands in the public right-of-way.

The *Portland Bicycle Plan for 2030* also makes many recommendations for action. Beginning in Part Two, most chapters include recommendations accompanied by specific action items. These recommended actions will guide the activities of the City of Portland in implementing the plan. The recommendations are summarized in the Executive Summary and the entire list of recommended actions is included in Appendix A.

⁴ Werner Brög, Erhard Erl, and Nicola Mense, "Individualised Marketing: Changing Travel Behaviour for a better Environment"; paper presented at the Organisation for Economic Co-operation and Development Workshop on Environmentally Sustainable Transport, Berlin, 2002; available online at http://www.socialdata.de/info/publ_d.php



The *Portland Bicycle Plan for 2030* categorizes Portlanders into one of the following types based on their relationship to bicycle transportation:

'Not interested in bicycling' includes approximately a third of Portland residents who are not going to ride a bicycle for transportation, either because they are uninterested or unable to do so.

'Strong and fearless' bicyclists (about 1 or 2 percent) will ride anywhere, regardless of the bicycle facility or lack thereof. They are comfortable on busy roads without bike lanes and may - in many circumstances - prefer to have no bicycle facilities at all.

'Enthusied and confident' bicyclists (about 10 percent) are comfortable on busy streets with bike lanes. They are the group that has responded to Portland's many miles of bike lanes by riding. It is they who have made Portland America's most bicycle-friendly city.

'Interested but concerned' bicyclists (about half) include the vast majority of Portland residents. They may occasionally ride on trails or bicycle boulevards, while on vacation or on an organized group ride. 'Interested but concerned' residents would like to ride more, but are afraid because they do not feel safe near fast-moving traffic on busy streets, even when bike lanes exist. They would ride if they felt more comfortable on the roadways due to fewer and slower-moving cars or if more car-free alternatives were available.

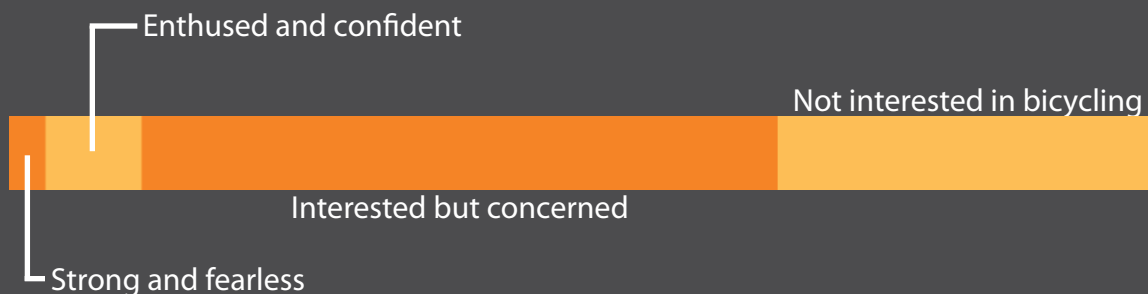


FIGURE 1-2: Four types of Portlanders



JONATHAN MAUS / BIKEPORTLAND.ORG



JONATHAN MAUS / BIKEPORTLAND.ORG



JONATHAN MAUS / BIKEPORTLAND.ORG





Part One: A world-class bicycling city

“We want to transform our transportation system into a truly multimodal system with strong alternatives to driving in order to maximize highway capacity, combat traffic congestion, reduce our reliance on oil and decrease greenhouse gas emissions.”

- Ray LaHood, United States Secretary of Transportation

This plan includes recommendations for future bicycle facilities on many miles of Portland streets. While potential alignments for proposed projects are conceptual until detailed project development work is conducted, the selected routes were developed through an iterative process that reflects the judgment of staff and citizens as to how a comprehensive bikeway network will function best. Any proposed bicycle facilities recommended for roadways over which the Portland Bureau of Transportation is not the road authority, or on lands not directly controlled by the Portland Bureau of Transportation, must first meet approval of the appropriate managing authority. Innovative bicycle facilities suggested in this plan will be successfully demonstrated before they are widely implemented.

Under the provisions of the State of Oregon’s Transportation Planning Rule, bicycle facilities proposed for regionally significant roadways may be subject to a refinement planning process prior to project development to determine whether the identified roadway corridor can accommodate bicycle facilities that are consistent with regional mobility standards. Such a refinement plan could shape the design of the bikeway or the selection of an alternate route.

In adopting the *Portland Bicycle Plan for 2030*, Portland City Council directs the Bureau of Transportation to update the *Transportation System Plan* to classify additional streets and to develop design guidelines and street sections for specific bikeway facility types within varying street classifications. Until the street classifications are adopted, and until guidelines have been developed and accepted by the City Engineer, private development on streets classified as Local Service Bikeways at the time of development generally will not be required to implement the bicycle infrastructure improvements in this plan. Private development on streets with existing higher classifications generally will be subject to required improvements.

1.2.5 Opportunities

As federal, state and local governments recognize the results of transformational

investment in urban transportation systems, bicycle networks will play an increasingly important role. Converging conditions are creating novel opportunities for increased investment in bicycle transportation. These include:

- Robust political and agency leadership at the local, regional, state and federal levels that is increasingly focused on bicycle transportation
- A growing understanding by residents of the role that bicycling can play in addressing some of the most critical challenges facing our communities
- A growing understanding by residents that bicycling is an inexpensive means to address these critical issues, and that bicycling offers a strong return on our transportation investments
- A strong and growing interest for bicycling in Portland as evidenced by people ‘voting with their wheels’ and by intensive media coverage of bicycling
- Significant lobbying efforts at the national level to reform transportation funding for ‘complete streets’ that advocate for designing streets for ALL users, including bicyclists
- Increased public demand and political support for safe neighborhood routes to



access schools and parks

- Increased agency utilization of bicycle modeling as a legitimate and needed planning tool

When new competitive funding becomes available from federal and state agencies, the *Portland Bicycle Plan for 2030* will allow Portland to be at the forefront of communities well prepared to promptly and effectively implement comprehensive and enduring bicycle infrastructure and programs.

1.2.6 Preparing for a twenty-year horizon

A 20-year horizon will likely include many opportunities beyond what exist in 2010. New trends and funding sources will arise that will demand responsive public agencies that can develop creative partnerships with other agencies as well as with the private sector. A goal of the *Portland Bicycle Plan for 2030* is to prepare Portland to be flexible and agile in responding to the complexities of future funding opportunities and thus be effective in increasing investment in its bicycle transportation system.

1.3 THE NATURE OF BICYCLING

1.3.1 Bicycles as vehicles

Bicyclists share commonalities with both automobile drivers and pedestrians. A bicycle in the public right-of-way is classed as a vehicle by the Oregon Revised Statutes. Bicyclists must adhere to many of the same rules as a driver. They must obey traffic signals and posted speed limits, yield to pedestrians and have appropriate lighting for dark conditions. Bicyclists also share many of the benefits provided to drivers. They may ride in a traffic lane and may occupy as much space as necessary to avoid hazards. While on a sidewalk or in a crosswalk, bicyclists are required by law to behave in a manner that maintains safe conditions for pedestrians.¹

Like pedestrians, bicyclists are slower, smaller and less visible than motor vehicles, and are more exposed and vulnerable than motorists.

Bicyclists also have unique characteristics that distinguish them from drivers or pedestrians when riding. They must maintain balance while avoiding hazards. They require only moderate distance to stop, but lack the ability to maneuver easily either laterally or backwards as pedestrians can. Bicyclists can keep their balance only by moving, so coming to a complete stop means a partial dismount for

¹ Bicyclists are prohibited by Portland City Code (16.70.320) from riding on sidewalks in the downtown area bounded by and including SW Jefferson, Front Avenue, NW Hoyt and 13th Avenue.



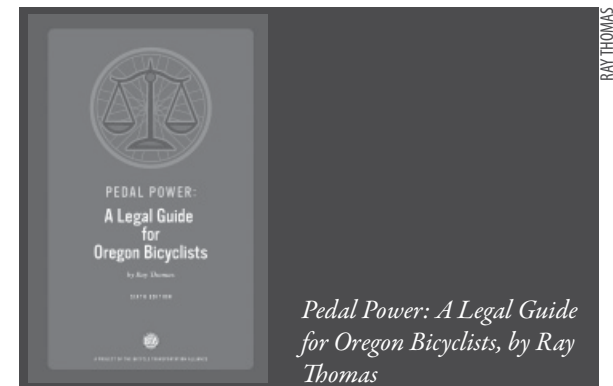
Rally for bicycle funding at Portland City Hall, 2009

JONATHAN MAUS / BIKEPORTLAND.ORG



Congressman Earl Blumenauer

JONATHAN MAUS / BIKEPORTLAND.ORG



Pedal Power: A Legal Guide for Oregon Bicyclists, by Ray Thomas

RAY THOMAS





*“For those of us who know what it feels like to be able to move **mile after mile at the speed of a bicycle**, it is sad to realize that many people will never ride a bicycle again after they get their first driver’s license.”*
- Ray Thomas, *Pedal Power: A Legal Guide for Oregon Bicyclists*

most riders. Bicyclists continually face dangers like opening car doors, turning trucks, drivers who fail to yield or distracted pedestrians.

Throughout this plan the term ‘bicyclist’ is used to refer generally to a rider of any type of human-powered pedaled vehicle. However, tricycles and other variations such as heavy-duty cargo bicycles have their own operational characteristics and need to be considered in providing bikeway facilities.

Spatial needs of bicyclists

To promote bicycle transportation as a more desired means of transportation, the *Portland Bicycle Plan for 2030* aims to accommodate the unique spatial needs of bicyclists to a level currently provided only to Portland drivers. The design of roads for motor vehicle operation takes into account the specifics of the site and its effect on operation. For example, where sufficient right-of-way permits,

increased lane and shoulder width are provided to accommodate safe maneuverability of motor vehicles traveling on steep, winding roads. Portland’s bicycle facilities should have similar flexibility to function in a site-specific manner. Standard-width bike lanes² may be sufficient in areas on straight roads with minimal topographical change but not in areas requiring greater bicycle maneuverability. In many instances, additional separation from automobiles may be necessary to maintain bicyclists’ sense of safety and comfort.

The nature of automobiles and transit vehicles allows for social interaction with fellow passengers while traveling in the roadway, a benefit not equally offered to bicyclists. Providing ample space for bicyclists to ride side-by-side recognizes the social nature of bicycling. It allows parents to supervise their children while bicycling and elevates bicycle transportation to a level similar to other transportation modes.

Preparing for advances in bicycle technology

Two of the main challenges to bicycle transportation using standard bicycle technology are uphill travel and limits on load capacity. Technological adaptations, such as electric assist bicycles and heavy-duty cargo bicycles and tricycles, help address these challenges.

² Referenced to typical standards in 2009

Electric assist bicycles have the potential to increase the length of bicycle trips and make direct but steep routes more attractive. Cargo bicycles and tricycles can handle much greater loads than standard bicycles and may be combined with electric assist technology to increase load capacity even further. Cargo bicycles and tricycles are often wider than standard bicycles and require wider bicycle facilities for safe operation.

In the future these adaptations may become more affordable and more widely used, and new technologies may become available. Within the twenty-year horizon of this plan such advances could play a role in reducing barriers to bicycling.

1.3.2 Bicycling and safety

There are good reasons for bicyclists to be concerned for their safety. Traffic injuries are the ninth leading cause of death worldwide, according to the World Health Organization.³ Public health experts believe that without intervention, traffic injuries will rise to fifth within 20 years, surpassing AIDS and tuberculosis.⁴ Pedestrians, bicyclists and motorcycle riders make up almost half of all traffic deaths.⁵

³ “W.H.O. Examines Traffic as Health Hazard,” <http://www.nytimes.com/2009/06/16/world/16traffic.html>
⁴ *ibid*
⁵ *ibid*



In addition to providing facilities designed for comfort and safety, establishing policies, education, enforcement and programs specifically oriented to bicycling will also increase bicyclist safety and promote increased bicycle use.

Adherence to legal, safe and courteous behavior while bicycling will increase bicycle safety and further legitimize bicycling as a viable transportation option. It can help reduce bicyclist-driver conflicts and promote a willingness to make the roadway safe for all users, particularly when bicycle facilities reach capacity and bicycle traffic overflows into motor vehicle lanes or sidewalks. Because community support for bicycle funding is tied to perceptions of bicyclist behavior and a sense of shared outcomes, bicyclists' adherence to 'a shared roadway for all users' is imperative.

1.3.3 Bicycling and children

As some of the most vulnerable users of public spaces, children are at significant risk when bicycling Portland streets, especially at crossings. The creation of safe bicycling facilities offers opportunities for children to learn proper bicycling skills that will serve them when they encounter motor vehicle traffic.

A 2005 survey found that while 71 percent of American adults walked to school as a child, only 17 percent of their own children did at

the time.⁶ In the 1990s and early 2000s, active transportation such as walking and bicycling became less common for children while childhood obesity rates rose. Children who are not exposed to bicycling may establish less healthy lifestyle habits and be less likely to ride a bicycle or understand the needs of bicyclists as adults. The *Portland Bicycle Plan for 2030* recognizes the significant value of learning to bicycle at an early age and promotes innovative programs like Safe Routes to School to help children establish healthy lifestyle habits while gaining confidence and independence through bicycling.

1.3.4 Bicycling and seniors

As the U.S. baby boom generation reaches retirement age, the unique needs of seniors demand greater attention. Many of the world's top bicycling cities currently have high rates of bicycling among seniors. In the Netherlands, for example, seniors make 24 percent of all their trips by bike.⁷ Bicycling provides seniors with an important opportunity for social interaction and exercise –activities that contribute to a healthier lifestyle.

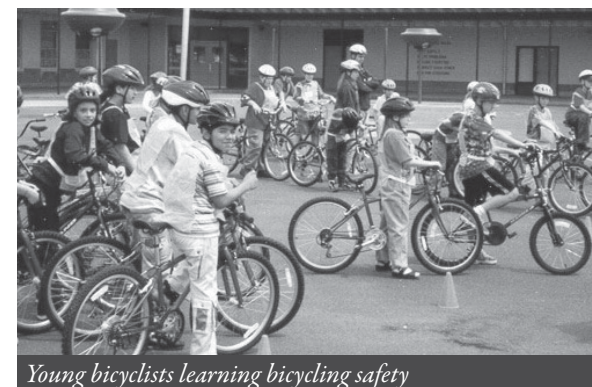
One study reported that 54 percent of older adults in the U.S. who live in areas inhospitable to walking, bicycling or transit said they would

⁶ "W.H.O. Examines Traffic as Health Hazard," <http://www.nytimes.com/2009/06/16/world/16traffic.html>
⁷ "Making Cycling Irresistible." John Pucher/Ralph Buehler. Rutgers University. July 2007



Bicyclist and pedestrian separation markings

BUREAU OF TRANSPORTATION ARCHIVES



Young bicyclists learning bicycling safety

BICYCLE TRANSPORTATION ALLIANCE



Portland's Older Adult Three-Wheeled Bicycle Program

ROM RICHINGS / MOMENTUM MAGAZINE





Part One: A world-class bicycling city

walk, bicycle or take transit more if their streets were improved.⁸ Seniors may move more slowly and require greater spatial needs than younger bicyclists. They can benefit from improved lighting, signage and pavement markings.

When the automobile is the only reasonable transportation option, some seniors may choose to drive even when their physical, sensory and cognitive capabilities have diminished, making them dangerous drivers and risking the safety of all right-of-way users. Roadways designed to meet the needs of senior bicyclists create safer streets while providing transportation choices for all ages.

1.3.5 Bicycling and pedestrians

While bicyclists and pedestrians share much in common, their different speeds, operations and spatial requirements demand careful design when their facilities overlap or are located near one another. The Bureau of Transportation's preference is to maintain separate and protected facilities for each mode where possible.

In locations where bicyclists and pedestrians share common facilities, Oregon law requires that bicyclists yield to pedestrians and give an audible signal when passing. The *Portland Bicycle Plan for 2030* promotes improved markings and signage, as well as educational

programs to remind bicyclists and pedestrians of their responsibilities in the public right-of-way.

Portland risks a rise in future bicycle-pedestrian incidents as bicycle mode share increases and bicycle facilities near maximum capacity unless bicycle facilities are appropriately designed when expanded.

In some parts of the city, such as Southwest Portland and East Portland, many roadways lack facilities for either bicycling or walking. In these areas, the provision of bicycle facilities should not reduce the safety and comfort of walking. For example, providing an uphill bike lane on a roadway that previously had a narrow shoulder could potentially reduce access for walking. This concern suggests the need for legislative clarification, as well as care in developing interim facilities. Ideally, facilities for both walking and bicycling would be developed concurrently.

1.3.6 Bicyclist to bicyclist

Since the skills, geographical knowledge and purposes of bicyclists vary greatly, bicycle facilities and programs should not be designed with a 'one size fits all' approach. Confident, fast-moving bicyclists can be as intimidating as motor vehicles to bicyclists with lesser skills, affecting their perception of safety and potentially deterring their use of bicycle

transportation. The *Portland Bicycle Plan for 2030* identifies the importance of providing facilities that meet the needs of a variety of bicyclists. It also recognizes that improvements and enforcement alone will not resolve this issue. Education programs are needed to ensure successful integration of different types of bicyclists and encourage safe, legal and courteous bicycling behavior among them.

⁸ "W.H.O. Examines Traffic as Health Hazard," <http://www.nytimes.com/2009/06/16/world/16traffic.html>



"The bicycle is the most civilized conveyance known to man."

- Iris Murdoch



PATRICK BARBER





E. GONZALES

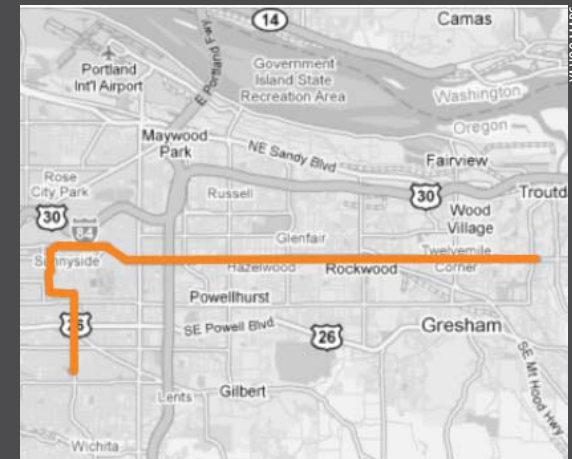
Neighborhood:
WOODSTOCK

Reason for bicycling:
Commutes to school and it **KEEPS MY SPIRITS UP** throughout the day.

Favorite Portland bicycling event:
THE NIGHT RIDE

"I'm inspired to bike by the feeling of freedom and being able to experience all that is around me. I find it's very convenient to not search for parking or stressing out in traffic. It has allowed me to meet new people on my routes and transition to the bus or MAX. I believe the urban lifestyle is more than just getting from point A to point B."

Bicyclist **PROFILE** Kenny



YAHOO MAPS



2.1 A BROAD POLICY CONTEXT

2.1.1 Introduction

Portland's acclaim as one of America's most livable and sustainable cities is a result of innovative planning efforts inspired by the vision of involved residents rethinking how they wanted to live. Over the past decades Portland has enjoyed a vibrant transportation system that promotes bicycling, walking and transit. The *Portland Bicycle Plan for 2030* builds upon the city's past planning success and aims to complement other planning efforts to support the creation of a world-class bicycling city.

Portland's evolution

In the early twentieth century, Portland, like most American cities, began to redevelop its urban transportation network to accommodate increasing use of the automobile. This redevelopment had significant impacts on the function and form of downtown and inner city neighborhoods. Streets were widened, buildings were torn down, streetcar lines were eliminated and entire neighborhoods became disenfranchised – all to meet the spatial demands and operational needs of the automobile.

During this time Portland began experiencing increased urban growth in once rural areas, resulting in landscapes designed specifically for the automobile and without basic amenities

such as bike lanes, sidewalks or access to public transportation. As a result, residents had few reasonable transportation options beyond the car. Commercial districts developed as multi-lane automobile-oriented corridors fronted with acres of parking lots, which made bicycle and pedestrian access uninviting, indirect and dangerous.

In the final third of the twentieth century, concerned Portland residents and business leaders who were committed to revitalizing downtown, improving air quality and introducing more transportation choices worked with strong, responsive government leadership to shift Portland's direction. Supported by the introduction of innovative statewide land use planning, Portland reclaimed its downtown, rejected planned freeways and built the nation's first light rail system. The success of these efforts yielded such Portland landmarks as Pioneer Courthouse Square and Tom McCall Waterfront Park, and set the course for decades of public and private investments in livability and innovations in transportation.

Portland's late twentieth century transformation happened not by chance but as a direct result of local, regional, state and federal decision-making. The *Portland Bicycle Plan for 2030* represents the synthesis of efforts that have developed over many decades. This plan



#1 | PORTLAND, OR





Part Two: A framework for bicycling policy

Opportunities for implementation of the *Portland Bicycle Plan for 2030*:

- **Active Transportation** - Metro
- **Airport Futures** – City of Portland and Port of Portland
- **Bicycles and Transit Plan** – TriMet
- **Climate Action Plan 2009** – City of Portland and Multnomah County
- **Freight System Master Plan** - City of Portland
- **Green Connectors** – City of Portland
- **Grey to Green** – City of Portland
- **Integrated Mobility Strategy** – Metro
- **Portland Plan project and Central City Plan** – City of Portland
- **Regional High Capacity Transit Plan** – Metro and TriMet
- **Regional bicycle parking code** – Metro
- **Regional Trails Strategy** – City of Portland
- **Regional Transportation Plan update** – Metro
- **Safe Routes to School program** – City of Portland
- **Portland Streetcar System Concept Plan** – City of Portland
- **Transit Investment Plan update** – TriMet
- **Transportation System Plan update** – City of Portland

FIGURE 2-1: Opportunities for implementation

addresses important 21st century problems and recommends policies and programs to guide future public investment reflecting the values held by Portland residents.

In 2009 the population of the Portland region has grown to more than two million residents and it is projected to reach three million by 2030.¹ If this plan is successful in attracting residents to bicycle, Portland's future holds many, many more bicyclists. This chapter discusses some of the strategies for preparing for this transformation with attention to planning efforts at every level.

¹ 2005 – 2060 Regional Population and Employment Forecast for the seven-county Portland-Beaverton-Vancouver OR-WA PMSA, Public Review Draft May 19, 2008

2.1.2 Relationship of this plan to other plans and planning efforts

The *Portland Bicycle Plan for 2030* is developed as a set of recommendations to inform the City's activities, to guide an update to the City's *Transportation System Plan* and to complement other planning efforts by providing detailed, publicly vetted guidance on issues related to bicycle transportation in Portland.

The *Transportation System Plan (TSP)* is the City's 20-year plan for transportation improvements. The Transportation Element (TE) serves as the policy basis for the *TSP*. The goals, policies and objectives contained in the TE are a subset of Portland's *Comprehensive Plan*, which guides Portland's long-term growth

and development.

The City's planning efforts are conducted within a regulatory framework set by a number of state and regional goals, policies and regulations. This regulatory framework is summarized in Chapter 1 of the *Transportation System Plan* and discussed in detail in Chapter 7 of that plan.²

The *Portland Bicycle Plan for 2030* is intended to complement planning efforts by Metro, TriMet, Multnomah County, the Port of Portland, the Portland Development Commission and other bureaus within the City of Portland, as well as efforts by adjacent jurisdictions, to foster a well-connected regional bicycle network.

The relationship of this plan to some specific plans and planning efforts are addressed below.

2.1.3 Climate action

The *Portland Bicycle Plan for 2030* will help implement the City of Portland's and Multnomah County's *Climate Action Plan 2009 (CAP)*.³ The *CAP* vision explicitly states, "Most people rely on walking, bicycle and transit rather than driving." The *Portland Bicycle Plan for 2030* provides the specific guidance needed to achieve the *CAP*'s goals for bicycling.

² *Transportation System Plan, City of Portland, updated 2007; available online at <http://www.portlandonline.com/transportation/index.cfm?c=38838>*

³ *Climate Action Plan 2009; available online at <http://www.portlandonline.com/bps/index.cfm?c=41896>*



2.1.4 Putting green transportation first

For decades Portland has embraced transportation choices and smart, compact growth, yet in 2009 driving alone was still the prevailing travel mode. Despite significant increases in bicycle transportation, it remains inaccessible as a realistic, primary means of personal mobility for most residents. More investment is needed to prioritize green transportation modes, such as bicycling, to attain a more balanced and sustainable transportation system. Systemic change at every level, from planning and zoning to the reallocation of the right-of-way, will be required.

Building a sustainable, efficient city that is vibrant, healthy and prosperous will require further elevating green transportation – those transportation modes that have the least environmental impact and greatest contribution to livability. Dubbed the ‘Green Transportation Hierarchy,’ this notion of prioritizing investment in walking, bicycling and transit travel is exemplified by cities such as Vancouver, British Columbia; Ottawa, Ontario and Calgary, Alberta. These cities have incorporated the Green Transportation Hierarchy into their city policies and codes to direct resources to transportation modes according to their measured degree of sustainability.

Specific strategies that will manifest Portland’s

Green Transportation Hierarchy include designating car-free or car-limited zones, reforming system performance standards to favor the movement of people over the movement of vehicles and further developing the ‘20-minute neighborhood’ concept. These strategies are discussed below.

Car-limited zones

Car-limited zones can take a variety of forms, including area-wide traffic calming or ‘home zones,’ pedestrian zones, EcoDistricts and temporary car-free events like Sunday Parkways.

Much of Portland has a dense network of streets. Overall, streets account for roughly a quarter of Portland’s total land area and more than half of its publicly owned land. About 70 percent of this public asset consists of neighborhood streets that function with low volumes of auto traffic. They are quiet streets that offer comfortable spaces for walking and bicycling. One way to protect such areas is to establish neighborhood ‘home zones’ to limit through travel for motor vehicles.

European cities have had success with pedestrian zones in their medieval city centers, where streets are narrow and a high concentration of retail and commercial destinations, pedestrian activity and travel alternatives already exist. Where such car-free districts in the U.S. have been tried, results have



The Springwater Corridor Trail, Southeast Portland

JONATHAN MAUS / BIKEPORTLAND.ORG



Green Transportation Hierarchy

BUREAU OF TRANSPORTATION ARCHIVES



Car-free street - Dusseldorf, Germany

DENVER IGARTA





Part Two: A framework for bicycling policy

been mixed. However, such districts could be a useful tool in the future.⁴

Events such as Portland’s Sunday Parkways⁵ give residents an opportunity to experience the unique benefits of walking, rolling or bicycling through neighborhoods where miles of streets are temporarily car-free and carefree.

Counting people, not cars

The *Regional Transportation Plan (RTP)* and the *TSP* require local jurisdictions to establish minimum motor vehicle ‘levels-of-service’, such as acceptable congestion levels, in their comprehensive plans to evaluate and determine system-wide transportation demand. The jurisdictions are permitted to adopt alternative standards, given they do not shift congestion to neighboring jurisdictions, result in *TSP* improvements inconsistent with the superseding *RTP*, increase single-occupant vehicle (SOV) travel or otherwise hinder the ability to reach mode targets.

The tools available to measure compliance with these standards does not take into account the potential of bicycle transportation to reduce motor vehicle use, a phenomenon that has been demonstrated in the best bicycling cities throughout the world.

4 The home zone treatment could be one element of an EcoDistrict developed under the Portland Metro EcoDistrict Initiative. See <http://www.pdxinstitute.org/index.php/ecodistricts>.
5 Sunday Parkways is described in more detail in section 4.1.5 of this plan.

Portland has pioneered strategies for urban growth management and sustainable transportation, and can continue this trend by developing alternative transportation system performance measures to serve all roadway users and achieve broader planning objectives. The *Portland Bicycle Plan for 2030* promotes the creation of new and innovative ways to measure multi-modal traffic flows, impacts to neighborhood livability and consistency with compact urban form policies. Metro’s update to the 2035 *RTP* calls for outcomes-based planning and broadens measures of success, creating a framework for addressing system needs in a more integrated and comprehensive manner.

2.1.5 20-minute neighborhoods: mobility on a human scale, at a human pace

As a mode of transportation, bicycling is an important tool for achieving the desired urban form envisioned in Portland’s *Comprehensive Plan* and Metro’s *2040 Growth Concept*.

The *Portland Plan* project has introduced the concept of the ‘20-minute neighborhood,’ a development where residents live within a short walk or bicycle ride to daily destinations such as grocery stores, schools, libraries, transit stations and parks. It is based on the experiences of comparably sized European cities that enacted supporting land use policies

aimed at forming neighborhoods that reduce the demand for longer distance travel. In a ‘20-minute neighborhood,’ bicycling provides an efficient, carbon-free travel alternative to walking for destinations that are not convenient or accessible within a short walk. In many parts of Portland the common destinations of daily life are already within a 20-minute bicycle ride, but some areas lack the bicycle transportation infrastructure to support such trips.

When supported by a defined and well-designed bicycle network and programs, the bicycle offers residents a transportation alternative that allows them to access basic services safely and efficiently without reliance on an automobile. This is especially true in areas like East Portland, where the concept of a ‘20-minute neighborhood’ that incorporates a bicycle network and ridership encouragement programs can support multiple goals.

In supporting the *Portland Bicycle Plan for 2030*, the Planning Commission recommended that the *Portland Plan* “designate a set of current and future 20-minute neighborhood centers and designate a set of corridors interconnecting these neighborhood centers, Region 2040 Town and Regional Centers and the Central City. Corridors connecting these centers should be priorities for separated in-roadway bikeways and, to the extent possible, should be coordinated with the *Portland*



Streetcar System Concept Plan to create continuous multi-modal mobility corridors between centers.”

2.1.6 The Portland Streetcar System Concept Plan

The *Portland Streetcar System Concept Plan* was accepted by Resolution no. 36732 on September 9, 2009. The plan designates a network of corridors determined to be the most viable to introduce streetcar service as the system expands in a manner to serve neighborhoods outside of the Central City.

Development of the *Portland Streetcar System Concept Plan* during the same period as development of the *Portland Bicycle Plan for 2030* allowed for coordination of planned routes. Carefully designed streetcar and bikeway networks will complement and reinforce each other as modes of transportation.

2.1.7 The Freight System Master Plan

The *Freight System Master Plan* was adopted by Ordinance no. 180132 on May 10, 2006. The plan provides a road map for managing freight movement and commercial delivery of goods and services in Portland. The Portland Freight Committee is charged with advising the Mayor, City Council and all City departments on matters relating to the multi-modal freight network. The Portland Freight Committee reviewed the draft *Portland Bicycle Plan for*

2030 and expressed support of overall goals that incrementally mitigate the need for system capacity expansion, but also expressed concern that implementation of the plan differentiate between freight movement and other motorized transportation.

2.1.8 West Burnside/Couch alternatives

Based on the *Burnside Transportation and Urban Design Plan*, adopted by Resolution No. 36114 in 2002, and the *West Burnside/Couch Alternatives Report*, adopted by Resolution No. 36499 in 2007, the *Portland Bicycle Plan for 2030* recommends moving the bicycle boulevard and classification of City Bikeway from NW Couch Street to an alternate east-west street to be selected as part of the *Pearl District Access and Circulation Plan*.

2.1.9 Policy context recommendations

2.1 A. Put green transportation first.

Specifically:

- Work to achieve the bicycle mode split and funding goals in the City of Portland and Multnomah County’s *Climate Action Plan 2009*
- Collaborate with other City bureaus and Metro to work toward adopting a ‘Green Transportation Hierarchy’ that prioritizes planning and investing in green transportation modes to elevate the relative



Bicycling into Downtown Portland

JONATHAN MAUS / BIKEPORTLAND.ORG



Car-free street - Copenhagen, Denmark

ELEEN VANDERSLICE



Planning for the Portland Streetcar

PORTLAND STREETCAR, INC.





Part Two: A framework for bicycling policy

importance of non-motorized modes

- As part of future modifications to the *TSP*, consider identifying ‘home zones’ or similar area-wide car-limited zones integrated with the overall bicycle network
- Collaborate with regional, state and federal partners to reform system performance measures and mobility standards to reflect the movement of persons rather than vehicles and favor green transportation modes
- Collaborate with regional, state and federal partners to develop transportation models and forecasting tools to accurately predict bicycle travel demand generated by capital and programmatic improvements and to model system performance that includes bicycling

2.1 B. Fully integrate bicycling into the *Portland Plan* project.

Specifically:

- Designate a set of current and future ‘20-minute neighborhood’ centers and designate a set of continuous multi-modal mobility corridors interconnecting these neighborhood centers, Region 2040 Town and Regional Centers and the Central City as priorities for separated in-roadway bikeways, coordinated, to the extent

possible, with the *Portland Streetcar System Concept Plan*

- Consider whether all Region 2040 Town Centers should be classified as bicycle districts
- Analyze space devoted to motor vehicles and bicycle parking in the public right-of-way, in commercial parking facilities and in accessory parking to all types of land uses, and recommend policies to ensure that space is allocated appropriately between vehicle types to accommodate parking needs while to the extent possible reducing the total square footage required for parking
- Conduct research to evaluate the impact of bicycling infrastructure and mode share on property values and make recommendations on the viability of value-capture funding methods such as Local Improvement Districts and Tax-Increment Financing for bicycle improvements
- Identify opportunities for zoning changes that will support retail centers to be located along appropriate identified bikeways
- Establish ‘eco-districts’ as neighborhood developments that emphasize sustainability by combining high performance buildings and infrastructure that reduce greenhouse gas emissions, promote efficient energy

and water use and offer residents access to essential services without need for an automobile

- Ensure all neighborhoods have adequate low-stress bicycle facilities connecting to neighborhood commercial corridors and centers so that local residents can safely and comfortably access them by bicycle or on foot
- Capitalize on implementation of streetcar and light rail lines to foster development that supports bicycling and walking
- Provide opportunities for high-density, mixed-use development along identified bikeways with adequate end-of-trip bicycle facilities and consider the creation of district-specific development standards such as improved bicycle parking requirements and amenity bonuses to promote bicycling and walking
- Introduce new residents to their ‘20-minute neighborhood’ with maps, coupons and other incentives to promote nearby services and amenities

2.1 C. Further integrate support for bicycling into existing *City* policies.

- Identify opportunities for revisions to existing *City* policies to ensure greater support for bicycling in *Portland*



2.2 BICYCLE POLICY RECOMMENDATIONS

2.2.1 Introduction

The intent of policy is to capture and preserve citizen aspirations for Portland’s future, to communicate those aspirations clearly to Portland agencies responsible for converting the goals and policies into action, and to provide the basis for regulating activities within the city. Statements in Portland’s *Comprehensive Plan*, which includes the *Transportation System Plan*, are ordered from the general to the specific: goals, policies and objectives.

The *Portland Bicycle Plan for 2030* recommends updating several policies and objectives related to bicycling in *Portland’s Transportation System Plan (TSP)*. These recommended changes support Goal 6 Transportation:

Develop a balanced, equitable and efficient transportation system that provides a range of transportation choices; reinforces the livability of neighborhoods; supports a strong and diverse economy; reduces air, noise and water pollution; and lessens reliance on the automobile while maintaining accessibility.

~ Goal 6 Transportation –
Portland *Comprehensive Plan*

This chapter outlines recommendations for changes to policies and objectives. Chapter 2.3 describes recommendations for changes to bicycle classifications, which are also part of the *TSP*. Appendix B lists the proposed policy language changes in detail. These recommendations for policy changes are intended to guide the next update to the *TSP*.

2.2.2 A new bicycle transportation policy

The policy for bicycle transportation adopted in 1996 (Policy 6.23 of the *TSP*) directs the City to “make bicycling a part of daily life in Portland.” This policy served Portland well for over a decade and bicycling since has become a part of daily life in much of the city. To further elevate bicycling and support the vision of this plan, the following new bicycle transportation policy language is recommended:

Proposed new policy 6.23 Bicycle Transportation

Create conditions that make bicycling more attractive than driving for trips of three miles or less.

This stronger policy language recognizes that the main competition to bicycle transportation is the automobile. A stronger policy statement is consistent with the recommendation to pursue a Green Transportation Hierarchy.



JONATHAN MAUS / BIKEPORTLAND.ORG

Bicyclists on SW Park Street, Downtown Portland



DENVER IGARTA

Bicycle boulevard along a mixed-use development in Vancouver, B.C., Canada





Part Two: A framework for bicycling policy

This stronger policy affirms the City’s intention to build facilities and offer programs that actively encourage bicycling for short trips. Including the ‘three mile’ distance in policy language acknowledges several things: that half of all trips within Portland are three miles or less; that three miles is a distance readily and efficiently traveled by bicycle; that bicycle-friendly cities around the world have determined that three miles is the distance beyond which bicycle trips begin to drop off as the primary mode choice; and that no matter how attractive it becomes, bicycling will not soon replace all automobile trips.

Three miles is a distance most riders can cover in less than 20 minutes at an easy-pace. This policy change will complement the ‘20-minute neighborhood’ concept of the *Portland Plan* project.

The proposed policy lends itself well to measurement - when more trips of three miles or less are made by bicycle than are made by automobile, Portland will know that it has achieved this policy aspiration.

2.2.3 Revised policies and new objectives for bicycle parking

The *Portland Bicycle Plan for 2030* recommends incorporating bicycle parking objectives within the parking policies of Portland’s *TSP* instead of within the bicycle transportation policy.

Portland’s 2005 *TSP* includes three separate policies related to automobile parking.¹ By contrast, bicycle parking is contained in a single objective under the City’s Bicycle Transportation policy.² Since bicycle parking provides comparable land use and transportation benefits to automobile parking, it is appropriate to consolidate all policies regarding both bicycle and automobile parking together. This plan proposes that new objectives for bicycle parking be incorporated into the existing parking policies.

2.2.4 New objectives for bicycling

The *Portland Bicycle Plan for 2030* recommends several new or revised objectives to support the vision of this plan. The recommended objectives fall under an assortment of policies in the *TSP*, covering transportation education, traffic calming, bicycle transportation, parking, street design, right-of-way improvements and maintenance. These new objectives are intended to provide the policy basis for the actions recommended in this plan. All proposed policy amendments are outlined in Appendix B.

¹ Policies 6.25, 6.26 and 6.27
² Objective 6.23E

2.2.5 Bicycle policy recommendations

2.2 A. Adopt a bicycle transportation policy to create conditions that make bicycling more attractive than driving for trips three miles or less and integrate support for bicycling into other *Transportation System Plan (TSP)* policies.

- Incorporate proposed policy and classification language into the next draft of the *TSP* update as outlined in Appendix B

2.2 B. Revise existing parking policies to include bicycle parking.

- Incorporate new proposed language and objectives to *TSP* Policies 6.26 On-Street Parking Management and 6.27 Off-Street Parking as outlined in Appendix B



2.3 STREET CLASSIFICATIONS FOR BICYCLE TRAVEL

2.3.1 Introduction

Street classifications designated in Portland's *Transportation System Plan* guide how each Portland street should function to determine the types of improvements they receive.

Portland's 1996 *Bicycle Master Plan* established three bicycle classifications and descriptions: City Bikeways, Off-Street Paths and Local Service Bikeways. City Bikeways serve the Central City, regional and town centers, station communities and other employment, commercial, institutional and recreational destinations. Off-Street Paths serve as transportation corridors and recreational routes for bicycling, walking and other non-motorized modes. Local Service Bikeways serve local circulation needs for bicyclists and provide access to adjacent properties.

These bicycle classifications established a binary system for on-street bikeways. Streets designated as City Bikeways are prioritized for investments in bicycle infrastructure over Local Service Bikeways. This classification system did not distinguish how different streets classified as City Bikeways might be expected to function within a network.

The *Portland Bicycle Plan for 2030* recommends modifying bikeway classifications in the *Transportation System Plan* to introduce a functional hierarchy of bikeway routes. A functional hierarchy directs the City to identify, anticipate and build for high demand on routes intended to carry those high volumes most efficiently. As Portland's bicycling ridership has increased, so has its need to improve the bikeways that carry – or are expected to carry – the highest volumes of bicyclists. Some routes should be optimized for these higher volumes based on their location, the areas from which they attract trips or the access they provide to destinations. This plan recommends a new classification of Major City Bikeways that will be applied to routes expected to carry the heaviest traffic and function most efficiently.

The functional classifications recommended for inclusion in the *Transportation System Plan* do not specify the facility on a given bikeway. Each roadway or path is assigned a suggested facility type on the City of Portland Recommended Bikeway Network Map that is a supplemental attachment to this plan document.

The Off-Street Paths classification in the 2005 *TSP* is primarily a description of a facility type, and this plan recommends eliminating Off-Street Paths as a separate classification and instead classifying these non-motorized routes with one of the new functional classifications.



Bicycle parking corral in Downtown Portland

JONATHAN MAUS / BIKEPORTLAND.ORG



Bike box in the Rose Quarter

JONATHAN MAUS / BIKEPORTLAND.ORG



Bicyclists on the Vera Katz Eastbank Esplanade

JONATHAN MAUS / BIKEPORTLAND.ORG





Part Two: A framework for bicycling policy

This plan recommends creating a further new classification: Bicycle Districts. The purpose of this classification is to recognize that, within certain dense, mixed-use areas of Portland with multiple destinations along most streets, all streets need to function well for people bicycling to or through the district.

The following section describes in detail the bikeway network classifications recommended by the *Portland Bicycle Plan for 2030*. Recommended policy language for these classifications can be found in Appendix B: Recommended Policy Amendments.

2.3.2 Major City Bikeways

Major City Bikeways are intended to form the ‘mobility backbone’ of Portland’s bicycle transportation system and provide primary connections to major attractors throughout the city, such as downtown or regional centers. The classification of Major City Bikeways is intended to set a new threshold for bikeway function. To achieve the width required to provide safe, comfortable facilities on streets developed as separated in-roadway bikeways it may be necessary to make trade-offs such as removal of travel lanes or on-street parking. The purpose of the Major City Bikeways classification is to create a policy basis for emphasizing bicycle transportation on such streets, provided that the essential movement of

other modes is addressed.¹

This recommended classification is intended to give greater weight to the requirements of bikeway design on Major City Bikeways than on other bikeways. On Major City Bikeways the entire corridor should function seamlessly and bikeway design should anticipate large numbers of bicyclists. Certain Major City Bikeways may be designated as ‘Regional Bicycle Parkways’ in a future *Regional Active Transportation Plan*.²

On Major City Bikeways developed as bicycle boulevards, advisory bicycle lanes, or other similar shared roadway facilities on Local Service Traffic streets, bicycle transportation will have priority over motorized travel.

Unless developed with separated facilities for bicycling, trails (formerly Off-Street Paths) classified as Major City Bikeways will continue to operate with equal priority for people

¹ The phrase ‘emphasize the movement of bicycles’ in the descriptions of Major City Bikeways and City Bikeways improvements is intended to support a connected bikeway network and bicycle mobility and access on these streets in a manner that is appropriate for the adjacent land use setting and is consistent with other adopted modal street classifications and street design guidelines.

² Regional Bicycle Parkways are described in the 2035 RTP as the backbone of the regional bicycle system, designed to serve as a green ribbon providing for direct and efficient travel for large volumes of cyclists with minimal delays in different urban environments and to destinations outside the region. The specific design of a bike parkway will vary depending on the land use context within which it passes through, e.g. an off-street facility along a stream or rail corridor, a cycle track along a main street or town center, or a bicycle boulevard through a residential neighborhood.

bicycling, walking or using other means of non-motorized transportation.

There are numerous areas in Portland’s transportation system where multiple bikeways converge, including nearly all bikeway bridges that cross barriers like freeways, railroads and rivers. Major City Bikeways are classified where the density of bicyclists is expected to be particularly high and requires focused facility design and operations planning that are oriented to large volumes of bicyclists (and their interaction with pedestrians). The following criteria were considered in developing Portland’s network of Major City Bikeways:

- Continuity
- Existing or anticipated high-level use
- Function as collectors
- Function as strategic areas and/or areas of high demand
- Function as funnels where bicyclists must necessarily gravitate as they traverse barriers
- Equity in spacing

Implementing Major City Bikeways will require a high level of investment that sets a new threshold for function, create benchmarks and measurable operating criteria and require repeated investments in these facilities over time to ensure they achieve their intended function.



2.3.3 City Bikeways

City Bikeways are principal bikeways not designated as Major City Bikeways. They establish direct and convenient bicycle access to all significant destinations within Portland, and function to allow residents access to Portland's bikeway network, ideally within three city blocks from any given point. They provide a mobility function and help establish the fine-grained network of a world-class bicycling city.

The primary distinction in design considerations between City Bikeways and Major City Bikeways is in weighing *the essential movement of other modes* against the need for safety and comfort in design of bikeways on streets carrying a traffic classification of Neighborhood Collector and above.

Unless developed with separated facilities for bicycling, trails classified as City Bikeways would continue to operate with equal priority for people bicycling, walking or using other means of non-motorized transportation.

2.3.4 Local Service Bikeways

Local Service Bikeways are intended to serve as local circulation routes for bicyclists and provide access throughout a neighborhood. All streets that are not classified as Major City Bikeways, City Bikeways or Bicycle Districts (except for controlled access roadways) should be classified as Local Service Bikeways.

2.3.5 Bicycle Districts

Bicycle Districts are areas with a dense concentration of commercial, cultural, institutional and/or recreational destinations where the City intends to make bicycle travel more attractive than driving. This new classification provides policy support to create bicycle-friendly commercial districts in areas that tend to attract a high volume of trips for multiple purposes. As focal points for economic, recreational and employment activities, such areas need to be exceptionally welcoming to people arriving by and traveling through by bicycle.

Bicycle Districts include areas where high levels of bicycle activity exist or are planned. They can include high-density neighborhoods with a mix of land uses such as the Central City, Gateway Regional Center, town centers and station communities. Within a Bicycle District, some roadways will be classified as either Major City Bikeways or City Bikeways. These streets are intended to serve a mobility function through and provide primary access to the district. However, because Bicycle Districts include multiple destinations on most streets, classification as a Bicycle District signals a policy intent that such areas provide excellent conditions for bicycle access on all roadways within the district.

Classifying Bicycle Districts in areas that



Major City Bikeway, Vera Katz Eastbank Esplanade

JONATHAN MAUS / BIKEPORTLAND.ORG



City Bikeway, SE Division Street

JONATHAN MAUS / BIKEPORTLAND.ORG



Local Service Bikeway

JONATHAN MAUS / BIKEPORTLAND.ORG





Part Two: A framework for bicycling policy

are also Pedestrian Districts is not meant to suggest that bicycle trips will replace walking as the primary travel mode. Rather, it is to ensure that streets within Portland’s most significant commercial districts accommodate both bicycling and walking. In creating this designation, the *Portland Bicycle Plan for 2030* recognizes districts as major attractors for all modes due to their land use mix and density.

Areas recommended in this plan as Bicycle Districts include Downtown Portland, the River District, the Lloyd District and the Gateway District.

According to the findings of the Cycle Zone Analysis (described in 1.2.3), the Lloyd District and Downtown Portland were determined to be the areas with the greatest potential for increased bicycling, based specifically on street connectivity, road network density, land use mix and topography. Poor bikeway quality and barriers to bicycle access present the most significant obstacles to realizing the promise of world-class bicycling conditions in these districts. Designating these areas as Bicycle Districts enables the City to tailor district-wide investments in bicycle infrastructure to take advantage of the unique opportunities they offer.

The River District is a burgeoning urban neighborhood situated directly between the

highest scoring ‘cycle zones’ and it has the potential to offer truly superb conditions for bicycling.

The Gateway District is envisioned as the second most important center within the City of Portland, just after the Central City. As the district develops there will be significant opportunities to create a unique and attractive bicycling environment.

During the public comment period on this plan, the Oregon Health Sciences University made a case for classifying the South Waterfront District as a Bicycle District. This possibility will be examined as part of the *Transportation System Plan* update in order to provide appropriate opportunities for involvement of all stakeholders and the public.

2.3.6 Recommendations for bicycle street classifications

2.3 A. Expand to a functional hierarchy of bicycle classifications

Specifically:

- Incorporate new bicycle classifications and classification descriptions into the next update of the *Transportation System Plan (TSP)*
- Examine the merits of classifying the South Waterfront District as a Bicycle District as

part of the update of the *TSP*

2.3 B. Classify a fine-grained bicycle network.

Specifically:

- Modify the bicycle classifications of streets shown on the maps that follow by incorporating these recommended changes into the next update of the *TSP*

2.3 C. Develop refinement plans for key areas and facilities.

Specifically:

- Identify targeted corridors where uncertainty or disagreement exists as to appropriate design treatment or alignment
- Work with agency partners, neighborhood and business associations to refine alignments and recommended design treatments for identified corridors



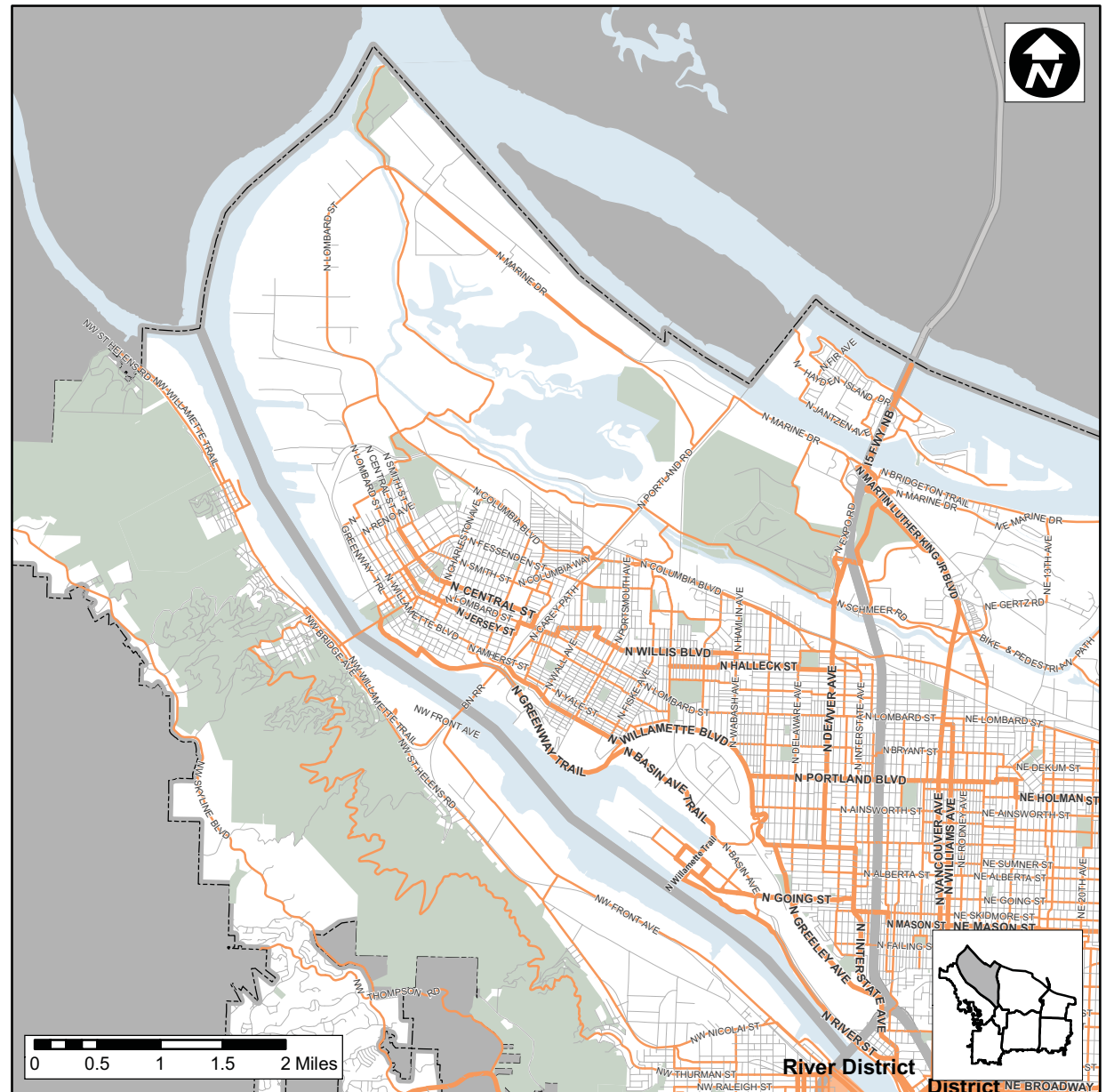
Proposed bicycle classifications North District

- Major City Bikeway
- City Bikeway
- Local Service Bikeway
- Proposed Bicycle District
- Transportation District Boundary
- Parks and Open Spaces
- Waterways
- City of Portland Area

This map shows 'existing' streets and trails that are already classified in the Transportation System Plan (TSP) and 'proposed' ones that are recommended to be classified when the TSP is updated. Some streets and paths are classified in the existing TSP and are proposed to be changed to a new classification.









Several undeveloped rights-of-way shown as Local Service Bikeways within the boundaries of Forest Park are classified as 'local service' for all modes in the 2007 Transportation System Plan (TSP) but may not be open to bicycle (or other) travel. Such classification discrepancies will be addressed when the TSP is updated.

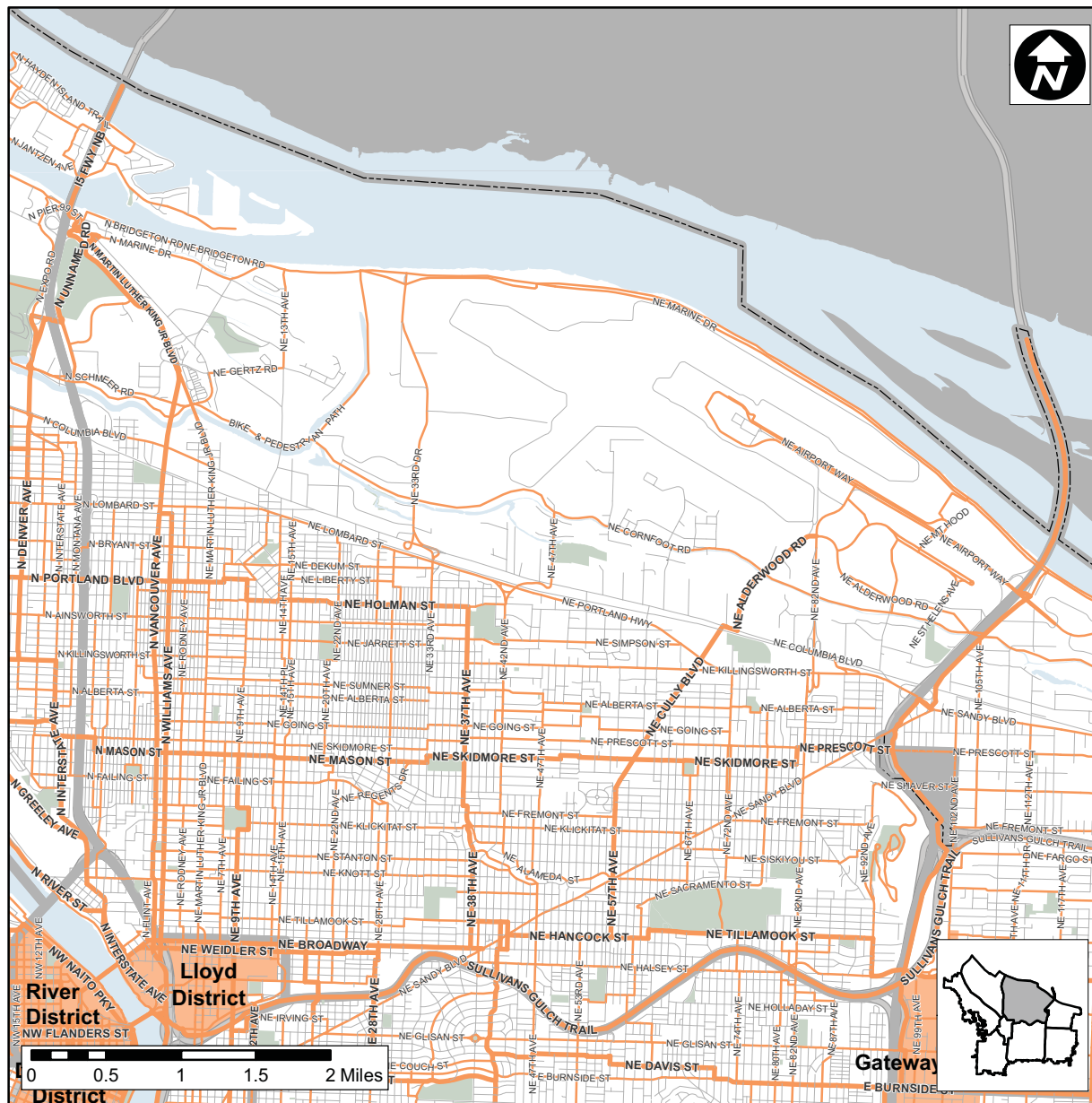
District boundaries match delineation in the TSP.



Part Two: A framework for bicycling policy

Proposed bicycle classifications Northeast District

-  Major City Bikeway
-  City Bikeway
-  Local Service Bikeway
-  Proposed Bicycle District
-  Transportation District Boundary
-  Parks and Open Spaces
-  Waterways
-  City of Portland Area



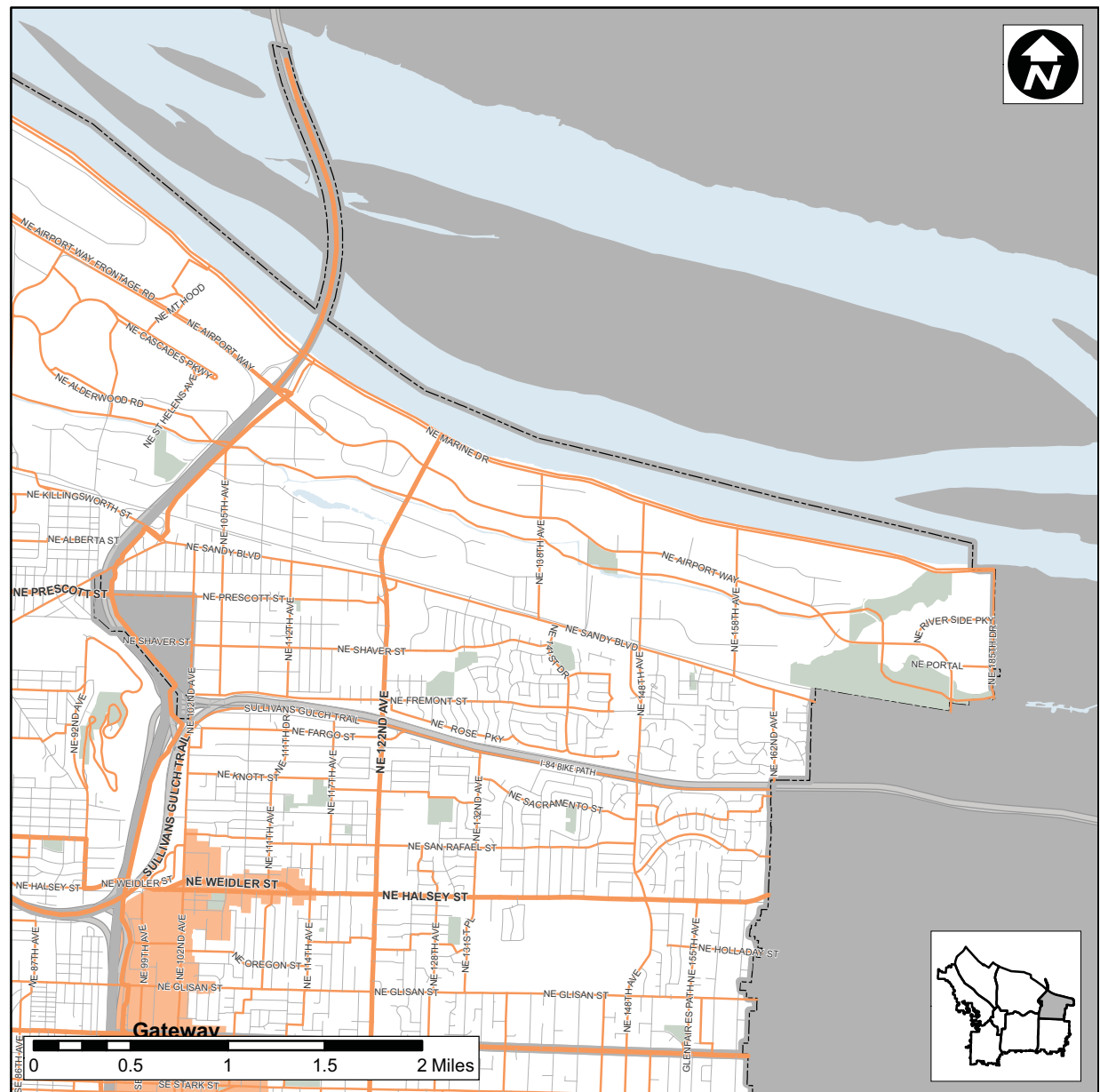
This map shows 'existing' streets and trails that are already classified in the Transportation System Plan (TSP) and 'proposed' ones that are recommended to be classified when the TSP is updated. Some streets and paths are classified in the existing TSP and are proposed to be changed to a new classification.

District boundaries match delineation in the TSP.



Proposed bicycle classifications Far Northeast District

- Major City Bikeway
- City Bikeway
- Local Service Bikeway
- Proposed Bicycle District
- Transportation District Boundary
- Parks and Open Spaces
- Waterways
- City of Portland Area











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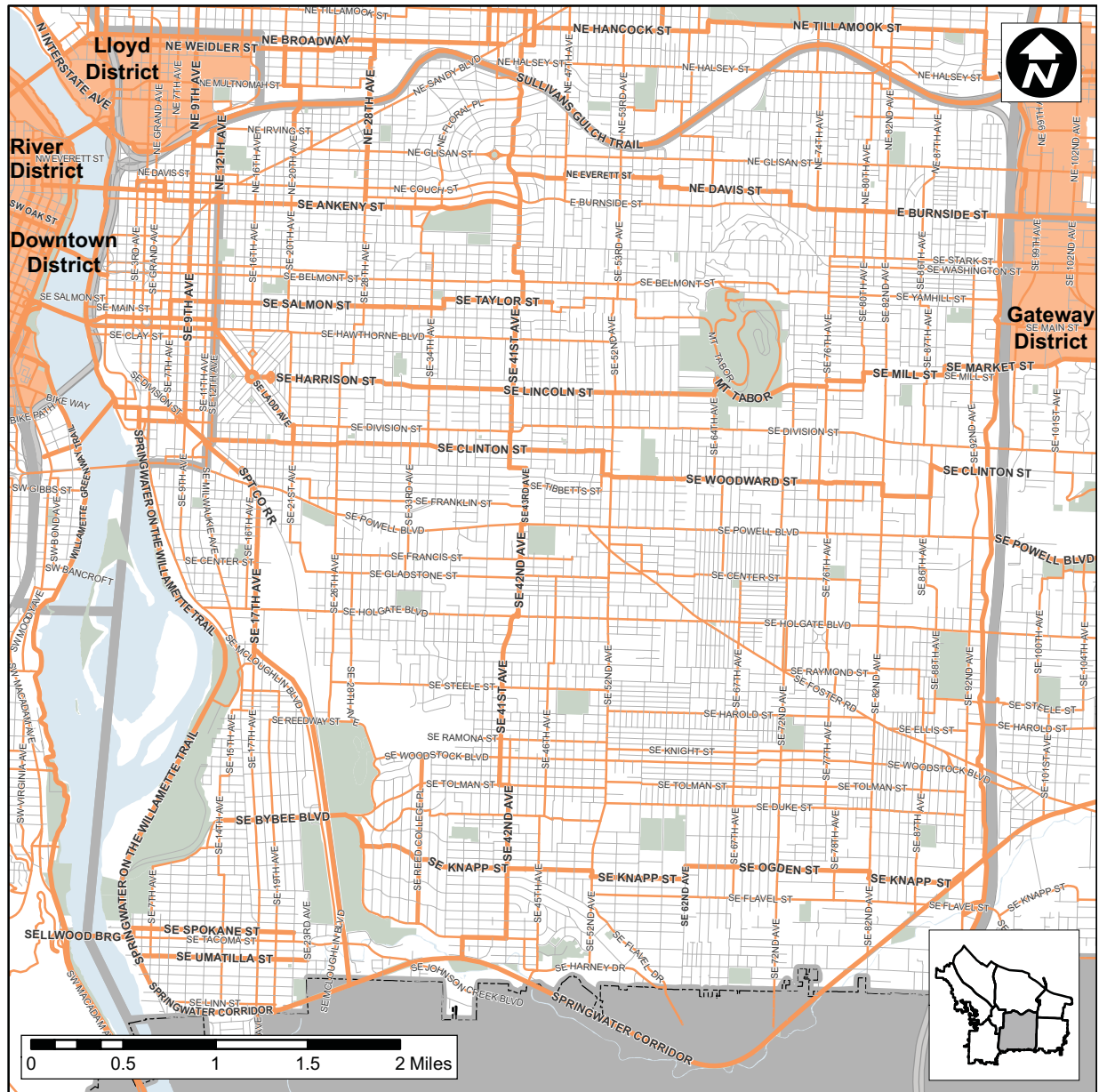
District boundaries match delineation in the TSP.



Part Two: A framework for bicycling policy

Proposed bicycle classifications Southeast District

-  Major City Bikeway
-  City Bikeway
-  Local Service Bikeway
-  Proposed Bicycle District
-  Transportation District Boundary
-  Parks and Open Spaces
-  Waterways
-  City of Portland Area



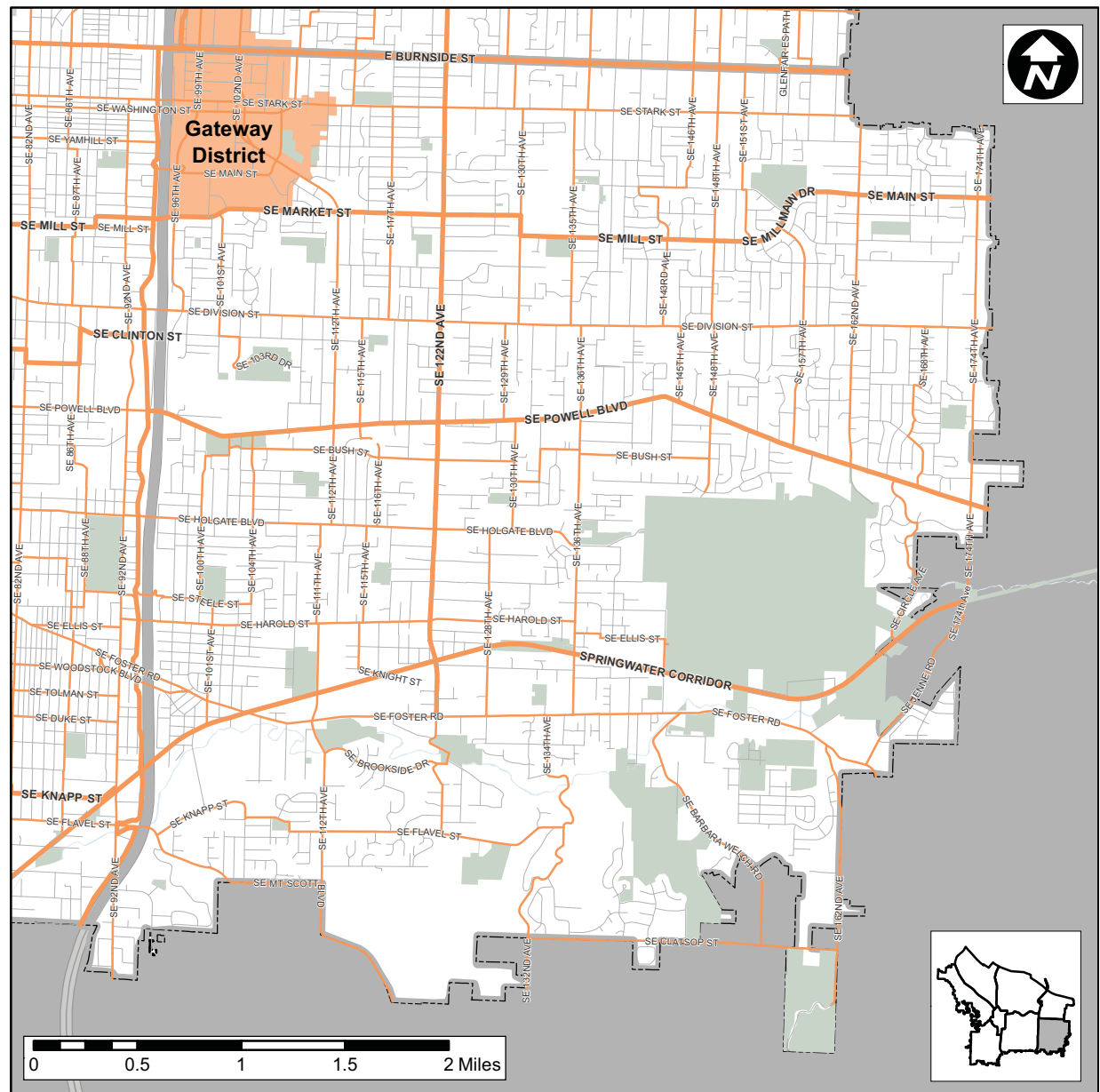
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District boundaries match delineation in the TSP.



Proposed bicycle classifications Far Southeast District

- Major City Bikeway
- City Bikeway
- Local Service Bikeway
- Proposed Bicycle District
- Transportation District Boundary
- Parks and Open Spaces
- Waterways
- City of Portland Area



This map shows 'existing' streets and trails that are already classified in the Transportation System Plan (TSP) and 'proposed' ones that are recommended to be classified when the TSP is updated. Some streets and paths are classified in the existing TSP and are proposed to be changed to a new classification.

District boundaries match delineation in the TSP.



Part Two: A framework for bicycling policy

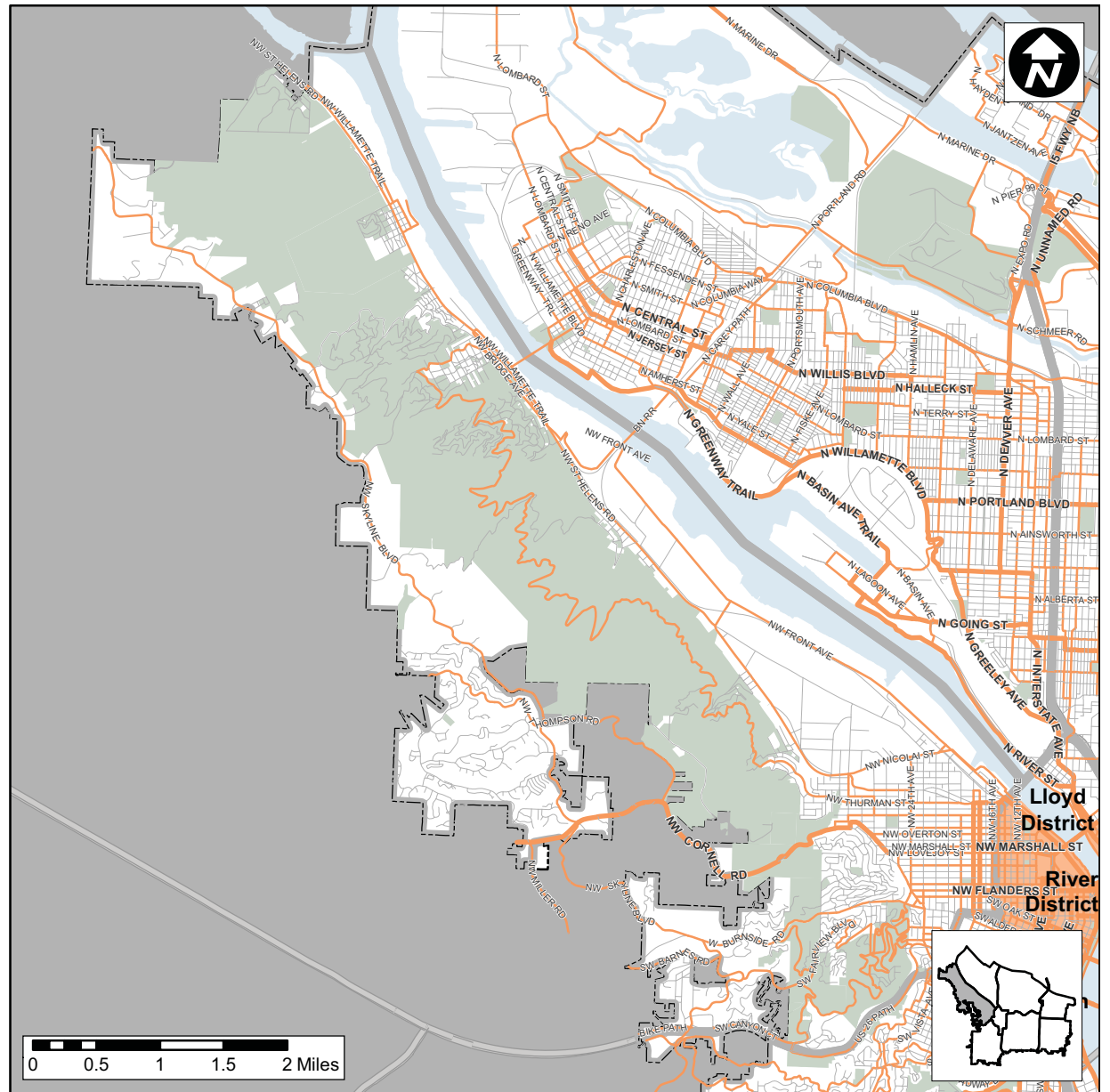
Proposed bicycle classifications Northwest District

- Major City Bikeway
- City Bikeway
- Local Service Bikeway
- Proposed Bicycle District
- Transportation District Boundary
- Parks and Open Spaces
- Waterways
- City of Portland Area

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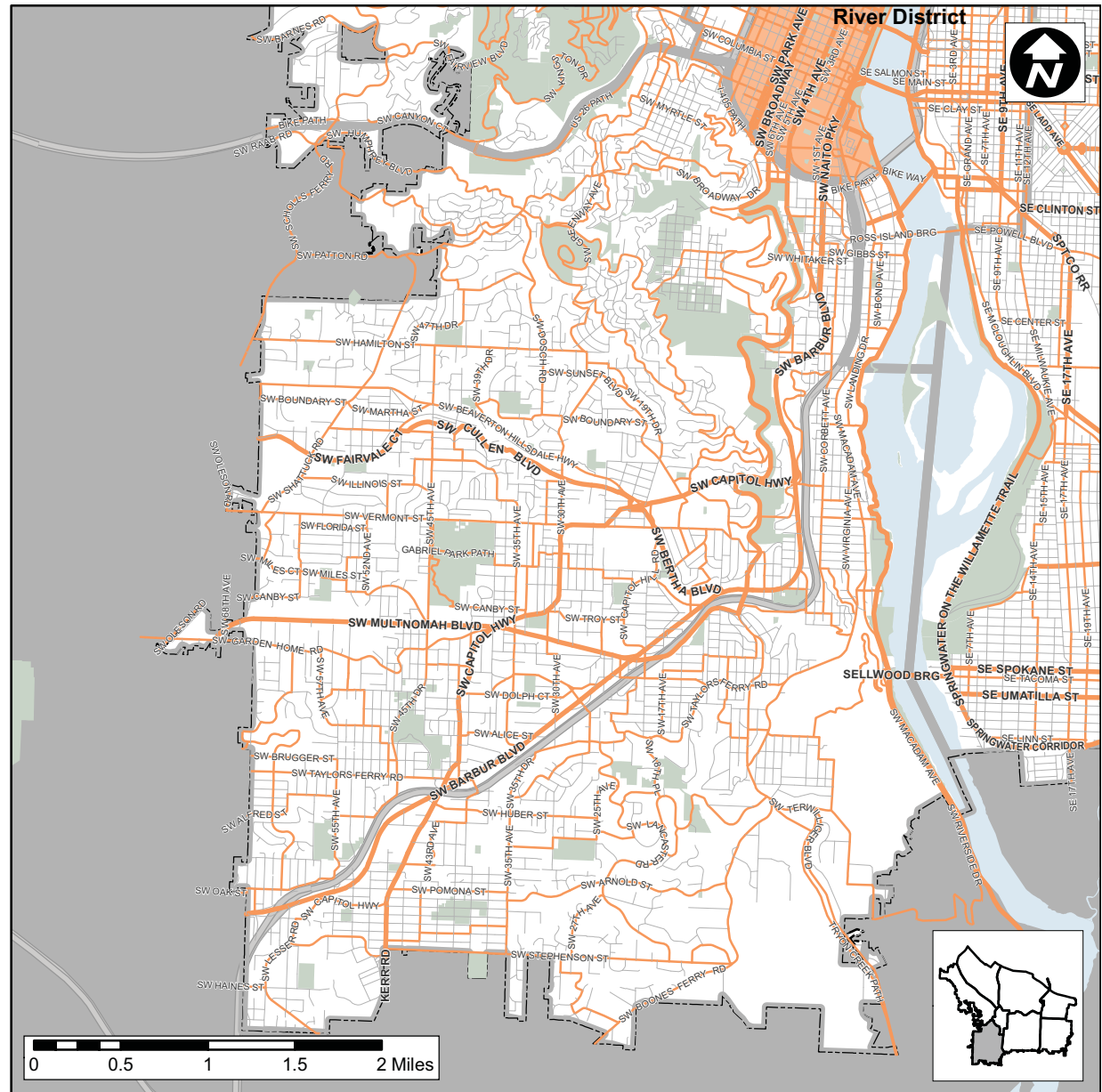
District boundaries match delineation in the TSP.





Proposed bicycle classifications Southwest District

- Major City Bikeway
- City Bikeway
- Local Service Bikeway
- Proposed Bicycle District
- Transportation District Boundary
- Parks and Open Spaces
- Waterways
- City of Portland Area











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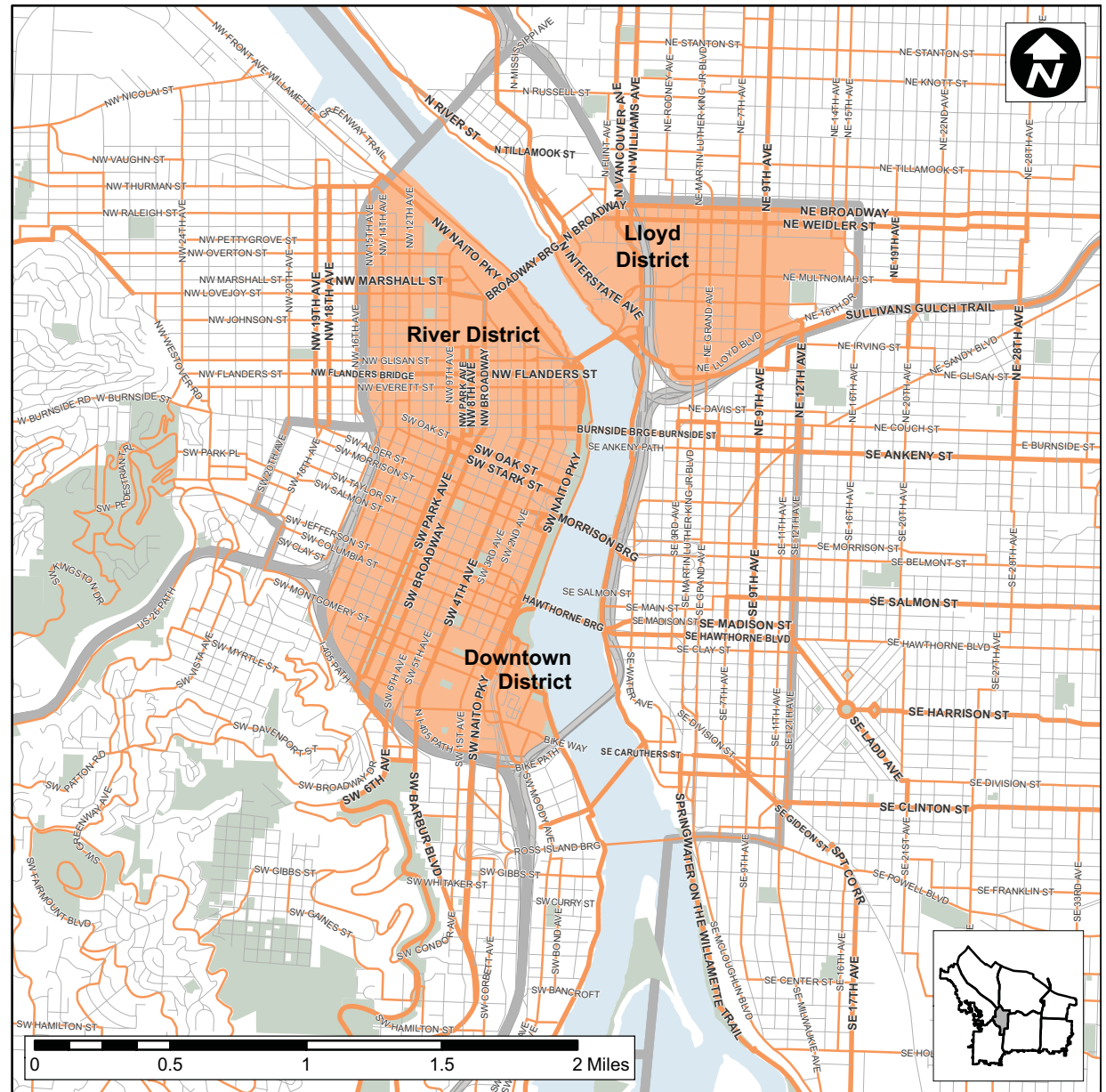
District boundaries match delineation in the TSP.



Part Two: A framework for bicycling policy

Proposed bicycle classifications Central City District

-  Major City Bikeway
-  City Bikeway
-  Local Service Bikeway
-  Proposed Bicycle District
-  Transportation District Boundary
-  Parks and Open Spaces
-  Waterways
-  City of Portland Area



This map shows 'existing' streets and trails that are already classified in the Transportation System Plan (TSP) and 'proposed' ones that are recommended to be classified when the TSP is updated. Some streets and paths are classified in the existing TSP and are proposed to be changed to a new classification.

District boundaries match delineation in the TSP.



*"Cycle tracks will abound
in Utopia."*

- H.G. Wells



JONATHAN MAUS / BIKEPORTLAND.ORG

Part **THREE**





Part Three: The bicycle transportation system



Neighborhood:
RICHMOND

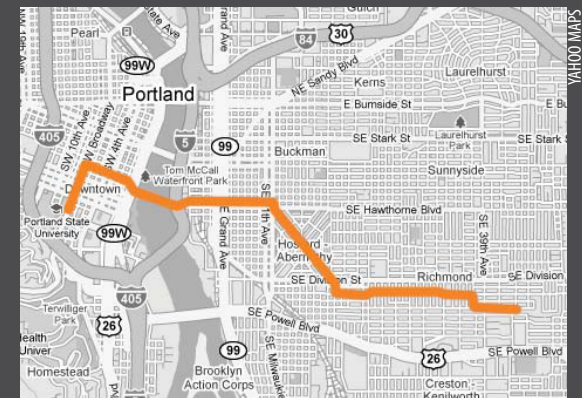
Reason for bicycling:
Commutes to school because it's **LESS HASSLE** than driving a car - and it saves money too.

Favorite Portland bicycling event:
PROVIDENCE BRIDGE PEDAL

"Block for block, Portland has the best biking infrastructure of any U.S. city. The lanes, the signs, the biking directions, the green boxes all make biking feasible for anyone in this city. I sold my car three years ago and haven't regretted it a day since."

Bicyclist PROFILE

Alana





3.1 EXPANDING THE BICYCLE NETWORK

3.1.1 Introduction

There is a direct correlation between the expansion of Portland's bicycle network and the growth in bicycle ridership that the city experienced between the early 1990's and 2009. Focused investments to build the city's bikeway network eliminated barriers to bicycling for many and gave proof to a 'build it and they will come' approach.

To attract more Portland residents to bicycle for transportation, the *Portland Bicycle Plan for 2030* proposes a three-pronged strategy for creating a more complete network:

1. Form a finer-grained bikeway network
2. Emphasize low-stress bicycle routes
3. Ensure access to common destinations

This strategy is consistent with guidance offered in the Dutch *CROW Manual*,¹ the world's most authoritative manual on bikeway design, which emphasizes cohesion, directness, safety, attractiveness and comfort as the primary factors in a successful bikeway network.

¹ CROW is the acronym of the Information and Technology Platform for Transport, Infrastructure and Public space, a Dutch non-profit collaboration between government and businesses that produces the CROW-publication 261 'Handboek verkeersveiligheid' ('Road safety manual').

3.1.2 Form a fine-grained bikeway network

A study of best practices from the world's most successful bicycling cities reveals that a dense bikeway network has the advantages of limiting out-of-direction travel and providing a variety of route options to each destination. Having more route options allows bicyclists of different skill and comfort levels to identify routes best suited to their transportation needs. Streets optimized for bicycle travel translate to savings in time and energy that help to make bicycling more attractive than driving.

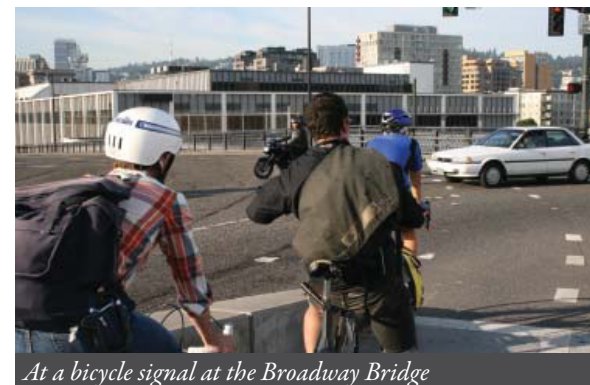
The density of Portland's recommended bikeway network varies from district to district. Spacing guidelines identified in the survey of best practices suggest that a bikeway be provided every 800 feet in urban areas (about three Portland blocks). While this standard can be met in many areas in Portland, it can't be achieved in all Portland neighborhoods due to disconnected roadway networks, physical barriers or terrain constraints. In such cases, the bikeway corridors have been spaced as closely as possible while minimizing out-of-direction travel and steep slopes.

Portland's 1996 *Bicycle Master Plan* proposed a network of planned bikeways. The *Portland Bicycle Plan for 2030* significantly expands that planned network. A network summary by facility type is provided in Figure 3.2.



Low-stress bicycle boulevard, SE Ladd Avenue

JONATHAN MAUS / BIKEPORTLAND.ORG



At a bicycle signal at the Broadway Bridge

TODD BORKOWITZ



Wide bike lane, N Vancouver Avenue

TODD BORKOWITZ





Part Three: The bicycle transportation system

Bicycle network **EXPANSION** by facility type:

Bicycle facility type	Existing developed miles	Miles added by this plan	Total miles at plan completion	Facility proportion of total system
Trails	75 miles	64 miles	139 miles	14%
Separated in-roadways (bike lanes, buffered bike lanes, cycle tracks)	176 miles	314 miles	490 miles	51%
Bicycle boulevards / advisory bike lanes	30 miles	256 miles	286 miles	30%
Enhanced shared roadways	-	47 miles	47 miles	5%
Signed connections	28 miles	0 miles	0 miles*	0%
TOTAL	309 miles	681 miles	962 miles	100%

* Routes previously identified as signed connections will be developed as another bicycle facility type in the *Portland Bicycle Plan for 2030*.

FIGURE 3-1: Bicycle network expansion by facility type

3.1.3 Develop a cohesive network of low-stress bikeways

As Portland’s bikeway network has expanded and ridership has grown, it has become clear that many residents who do not bicycle regularly would ride more often if they could minimize their exposure to automobile traffic. This realization forms the basis for this plan’s strategy to emphasize low-stress bicycle routes.

Low-stress bicycle facilities, including trails, low-traffic shared roadways (such as bicycle boulevards) and cycle tracks, are bikeways that are separated either physically or spatially from higher-volume roadways. Emphasizing development of this low-stress network of streets and trails provides an effective strategy for advancing the critical principles of cohesion, comfort, directness, safety and attractiveness commonly identified as international best practices for bikeway design.

Bicycle boulevards, in particular, have proven to attract high numbers of riders due to the level of comfort they provide, the mobility function they serve and their proximity to where people live and travel. Indeed, bicycle boulevards have become among the city’s most popular bikeways. Although bicycle boulevards represent only one percent of Portland’s overall roadway network, a recent study by Portland State University Professor Jennifer Dill found that they attracted ten percent of all the bicycle

“The draft Portland Bicycle Plan for 2030 takes Portland’s current bicycle planning effort to the next level by providing a more holistic range of bicycle planning policy, objectives and action items in order to improve facility design, safety, rider education, encouragement and enforcement.”
 - Portland Bicycle Advisory Committee letter to Portland Planning Commission, 2009

“We agree with the recommendation of the Plan to focus initial investments in bicycle boulevards to rapidly bring a comfortable cycling experience to as wide a portion of Portland as possible.”
 - Portland Planning Commission, October 2009



trips.² This 10:1 ratio is higher than the ratio either for streets with bicycle lanes or for trails.

A Bikeway Network Gap Analysis performed by the Bureau of Transportation in 2008 showed that fewer than 30 percent of Portland residents live within a quarter mile of developed low-stress bikeways.³ Even if the low-stress bicycle network designated within Portland's 1996 *Bicycle Master Plan* were completed, it would still serve only half of city's population.

The *Portland Bicycle Plan for 2030* calls for updating Portland's bicycle network to include more low-stress bicycle boulevards and trails, and to update its design guidelines to include treatments like buffered bike lanes and cycle tracks to make higher-volume roadways operate in a more low-stress manner for bicycling. The plan recommends a dense network of bikeways that will more than triple the size of the existing bicycle transportation network and increase the low-stress bicycle network more than ten-fold.

3.1.4 Provide direct access to common destinations

A 2008 assessment of Portland's existing bikeway network found that it fails to provide direct access to most commercial areas in Portland. Only 33 percent of designated main

²Bike-GPS: *Understanding and Measuring Bicycling Behavior, a focus on travel time and route choice.* Jennifer Dill, Ph.D., Portland State University. December 2008.

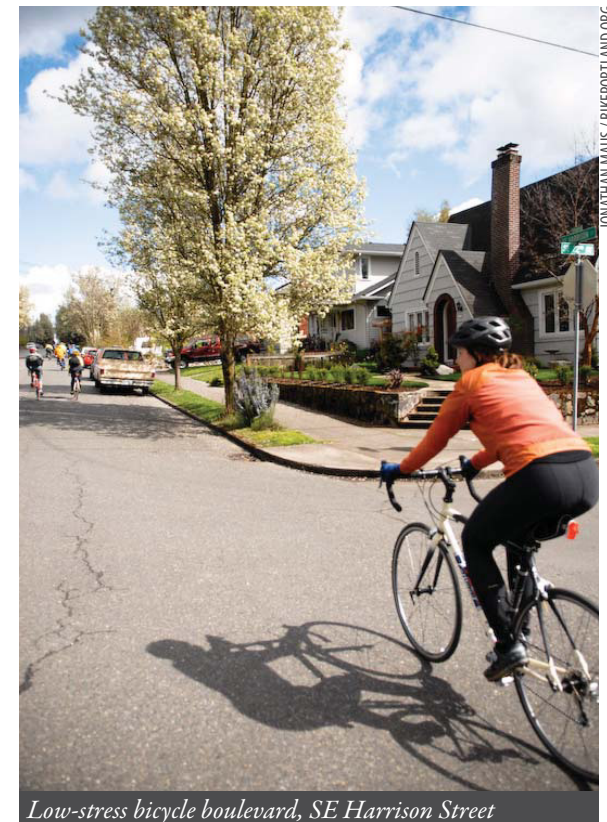
³ Such low-stress routes include the city's 32 miles of bicycle boulevards and 75 miles of off-street paths.

streets in Portland's *Transportation System Plan (TSP)* and only 20 percent of the streets in Metro's *2040 Growth Concept* centers (Central City, regional centers and town centers) had a developed bicycle facility at that time. The deficiency is due to the wide range of other demands on main streets for motor vehicle capacity, on-street parking and pedestrian facilities. Portland's 1996 *Bicycle Master Plan* called for bike lanes on many main streets where they have not yet been implemented due to such constraints.

The *Portland Bicycle Plan for 2030* promotes bicycle facilities on all main streets and recommends that they be designed to provide as much separation as feasible from the high volumes of traffic. Facilities such as wide bike lanes, buffered bike lanes and cycle tracks⁴ are appropriate to provide separation between bicyclists and motor vehicle traffic. As with any project, facilities must be tailored to the site context and constraints, and the essential needs of other modes and uses of the right-of-way, including walking, parking, street trees, freight and surface stormwater management, must be considered in their design.

As described in Part Five: Strategic Implementation, the initial strategy for building the new network will be to emphasize

⁴ Facility types are described in detail Chapter 3.2 and in Appendix G, Glossary



Low-stress bicycle boulevard, SE Harrison Street

JONATHAN MAULS / BIKEPORTLAND.ORG



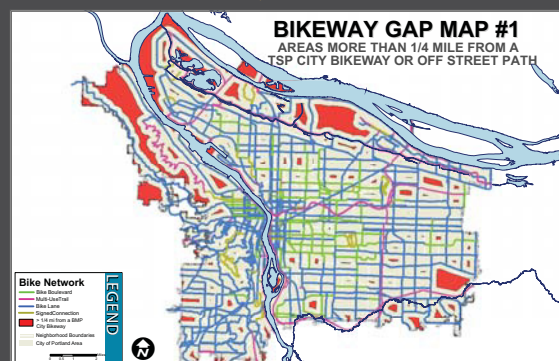
Low-stress bikeway connection through a Portland park

JONATHAN MAULS / BIKEPORTLAND.ORG



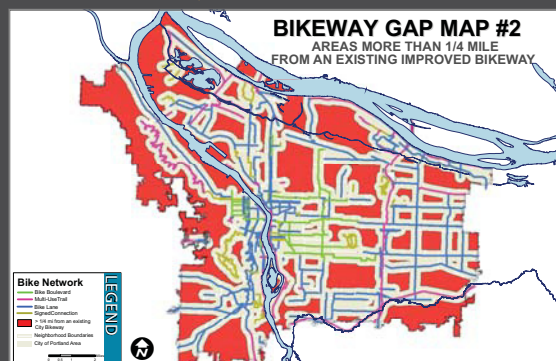
Part Three: The bicycle transportation system

Planned bikeways:



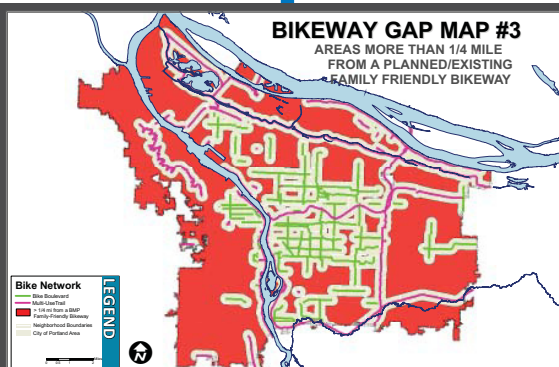
The red areas are more than one-quarter mile from any bikeway planned in the 1996 *Bicycle Master Plan*, including those not yet built.

Built bikeways:

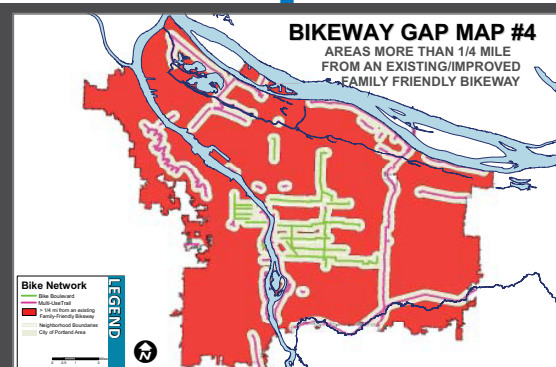


The red areas are more than one-quarter mile from any bikeway that is already built.

All bikeways



The red areas are more than one-quarter mile from a low-stress bikeway planned in the 1996 *Bicycle Master Plan*, including those not yet built.



The red areas are more than one-quarter mile from a low-stress bikeway that is already built.

Low-stress bikeways only

The **Bikeway Network Gap Analysis** showed that less than 30 percent of Portland residents live **within a quarter mile of a low-stress bikeway** that is already built, and only 50 percent would be served by a **complete buildout of the low-stress bikeways** included in the 1996 *Bicycle Master Plan*.

FIGURE 3-2: Bikeway Network Gap Analysis

the development of the low-stress network, especially bicycle boulevards and other shared roadway facilities. While a network emphasizing bicycle boulevards on residential streets can be implemented relatively readily, it may not provide direct access to the major commercial streets where many destinations are located. Copenhagen recognizes this limitation in its primary bicycle policy document, which states, "...cyclists prefer to ride on shopping streets where the pulse of the city can be felt and where they can shop on their way home from work. So-called 'back street' solutions have therefore been dropped as a planning principle in Copenhagen."⁵

Portland is not yet like Copenhagen. Bicycle boulevards provide desired separation from high volumes of traffic. Developing bicycle boulevards is a strategy that emphasizes comfort and safety over immediate access to commercial destinations. However, new routes for bicycle boulevards were selected to be near or to intersect commercial main streets and other commercial nodes.

3.1.5 Developing capital projects

The *Portland Bicycle Plan for 2030* includes capital projects to implement the proposed bikeway network. They are illustrated in the maps that follow in section 3.1.6, broken out by district. Projects have been sorted into two

5 Cycle Policy 2002-2012



strategies, the ‘80 percent’ implementation strategy and the ‘world-class’ implementation strategy. These strategies are described in more detail in Chapter 5.3.

The project lists in Appendix A include projects in the 80 percent implementation strategy. Projects in the world-class implementation strategy are shown on the maps, but have not been detailed in the project lists. However, projects in either strategy may be implemented at any time in the event a funding or partnership opportunity arises. Detailed estimates of costs have not yet been completed for most projects. Rough, low-confidence cost estimates expressed in 2008 dollars are included in the 80 percent project lists in Appendix A. The facility types noted in the project key and in the descriptions in Appendix A are explained in greater detail in Chapter 3.2.

Project identification process

The first step in developing a project list based on the strategy of expanding the network was to identify individual routes. This was accomplished through both field work and in-house analysis conducted by city staff and citizen volunteers.

Given the emphasis on creating a low-stress network, City staff sought to identify existing low-volume roadways that would lend themselves to development as shared roadway

bikeways. Where possible, these roadways were identified in a manner that would create a network with bikeways approximately every six blocks.

Roadways were assessed based on the following initial considerations:

Connectivity: Routes were chosen that provide connections to commercial areas, schools, parks, other bikeways and other significant destinations.

Classification conflicts: Routes were chosen to avoid roadways carrying higher level classifications for other modes that might conflict with development as a shared roadway bikeway.

Existing traffic conditions: Routes were preferred where the 85th percentile speed on the street was below 25 miles per hour and the average daily traffic on the street was 2000 vehicles or less.

Existing traffic infrastructure: Routes were preferred where crossing treatments or traffic calming facilities are already in place that a project can leverage.

Directness: Routes were preferred where the overall route was direct rather than including jogs from street to street.



Bikeway expansion to create better connections, such as a proposed connection from Lair Hill to South Waterfront

CHEM HILL



Springwater Corridor Trail bridge, completed in 2006

JONATHAN MAUS / BIKEPORTLAND.ORG

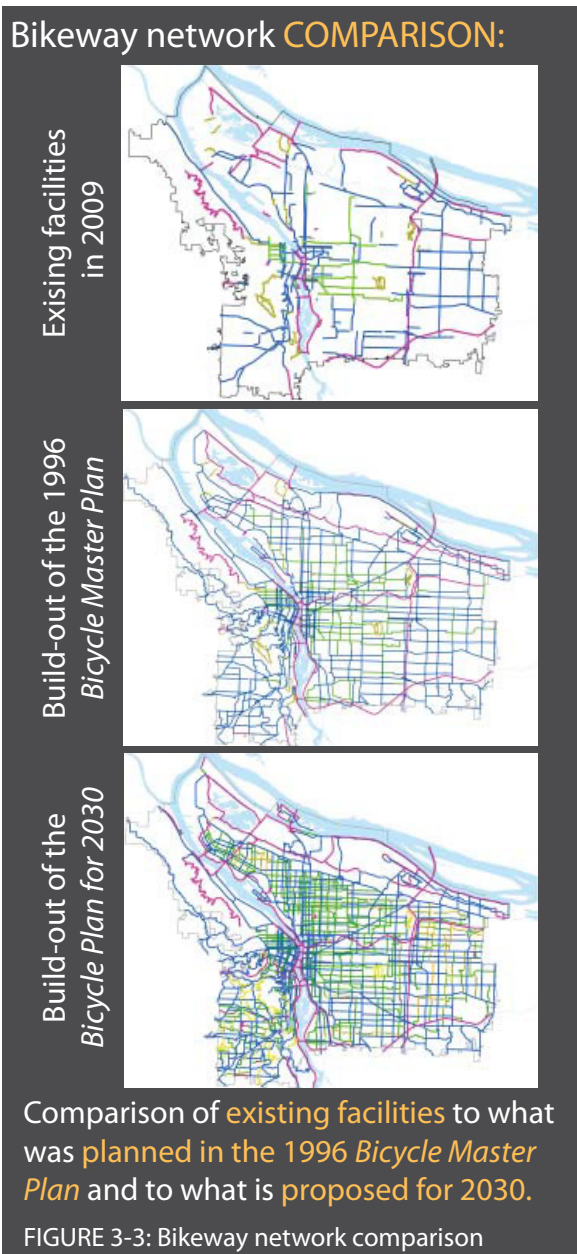


SE Spokane Street's bicycle boulevard, completed in 2009

JONATHAN MAUS / BIKEPORTLAND.ORG



Bikeway network COMPARISON:



Mobility: Routes were preferred in corridors of sufficient length to provide for the mobility needs of a person using a bicycle.

The network proposed in this plan resulted from the selection of routes based on the considerations above, then refinement of the choices based on staff and public feedback.

Local differences

It is inevitable that the density and design of bikeways will vary across Portland. The selection of projects and identification of bikeways must respond to the differing topographies and density of roadways found around the city. In East Portland, where the street grid is not well connected but slopes are mild, the plan includes bikeways parallel to the main high volume collector roadways that typify East Portland's transportation network. Busier roadways such as 122nd Avenue, Division Street, Powell Boulevard and others present conditions that make them uncomfortable for many people to bicycle. The new bikeways recommended in East Portland are intended to create a parallel system of shared roadway bikeways that will be more family-friendly than what exists there today.

In parts of Southwest Portland and the West Hills, the topography limits which roadways can be fully developed as direct, connected and low-stress bikeways. Ideally, routes with

more moderate grades and fewer curves were preferred. In areas with significant topography, however, any routes that are direct, continuous and parallel to the major roadways were selected to become bikeways.

Roadways with higher traffic volumes that have been added to the project list are intended to serve at least one of two functions: provide primary mobility for bicyclists in those parts of the city where these higher volume roadways offer the best direct connections, or provide immediate access to commercial districts.

3.1.6 Recommendations for bikeway network expansion

3.1 A. Provide a fine-grained bikeway network that serves key destinations.

Specifically:

- Prioritize bikeway improvements that serve regional and town centers, main streets, employment centers, commercial districts, transit centers and stations, institutions, schools, parks and recreational destinations
- Maintain an up-to-date list of existing system gaps, with conceptual design treatments and cost estimates needed to complete them
- Annually assess the list of existing bicycle network gaps and set priorities for their



completion

- Work closely with the Oregon Department of Transportation, Portland Parks & Recreation and adjacent jurisdictions to complete and maintain identified bicycle network improvements and provide bicycle access in areas where the opportunity to provide on-street bikeways is constrained
- Create a system of low-stress bicycle routes throughout all Portland neighborhoods
- Refine the bicycle transportation projects shown on the following maps and listed in Appendix A and work to amend the *Transportation System Plan* to include them

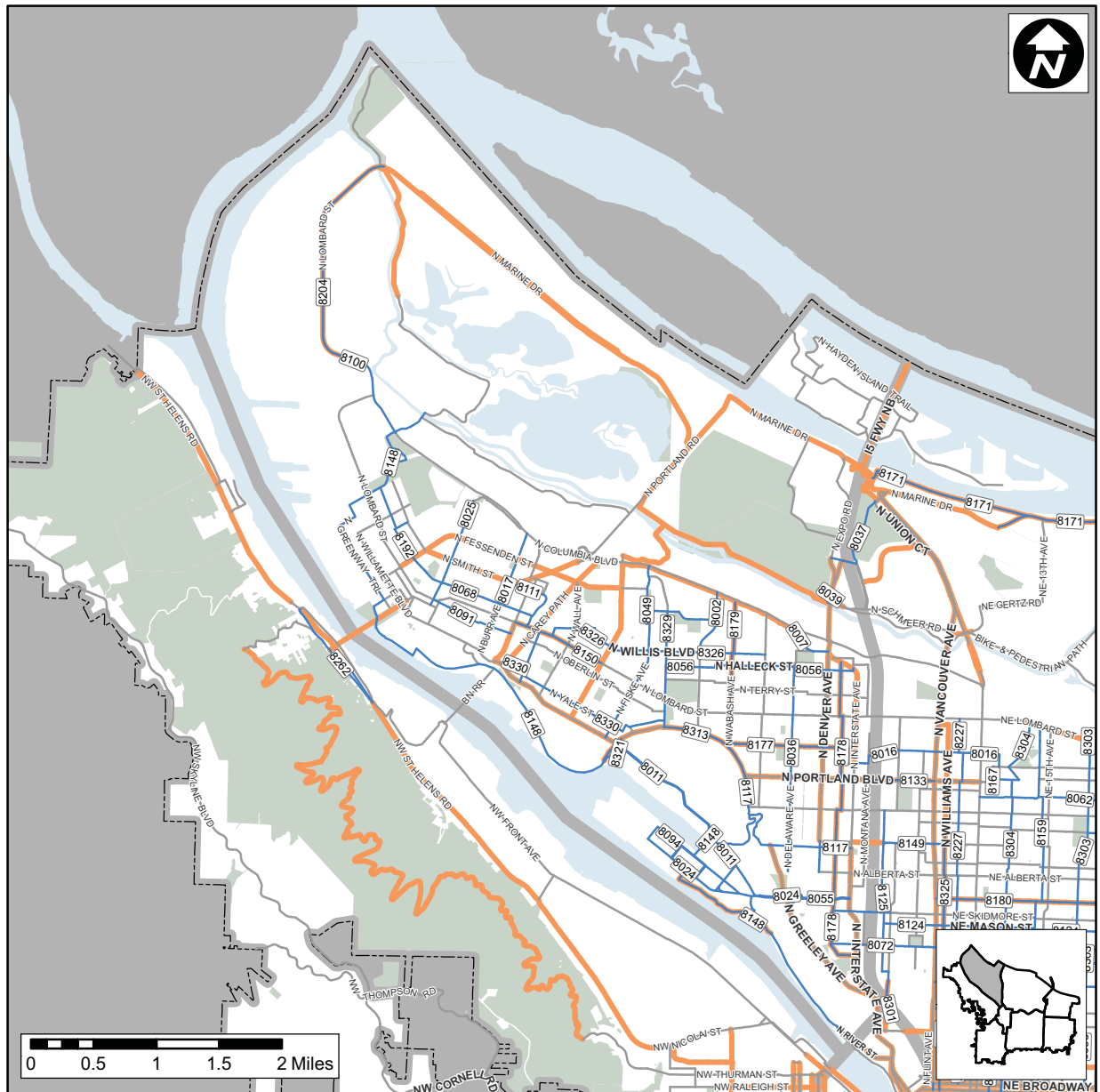




Part Three: The bicycle transportation system

Recommended bicycle network projects - North District

- Immediate and 80 Percent Strategies
- World-Class Strategy
- Existing or Funded Bikeway
- Transportation District Boundary
- Parks and Open Spaces
- Waterways
- City of Portland Area



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District boundaries match delineation in the TSP.



Project key - North District - FUNDED

Key no.	Corridor name	Suggested facility description
8133	MIDDLE N ROSA PARKS	Multiple facility types
8150	N LOMBARD (PORTSMOUTH - IDA)	Separated in-roadway
8177	NORTH BRYANT	Bicycle boulevard
8178	NORTH CONCORD	Multiple facility types
8179	NORTH WABASH	Bicycle boulevard
8204	OUTER N LOMBARD	Separated in-roadway
8321	WAUD BLUFF	Trail

Project key - North District - UNFUNDED

Key no.	Corridor name	Suggested facility description
8002	ALASKA-CHAUTAUQUA	Multiple facility types
8005	ANCHOR	Separated in-roadway
8007	ARGYLE	Multiple facility types
8008	BALLAST	Bicycle boulevard
8011	BASIN	Separated in-roadway
8016	BRYANT	Bicycle boulevard
8017	BURR	Bicycle boulevard
8024	CHANNEL	Separated in-roadway
8025	CHARLESTON	Bicycle boulevard
8033	COMMERCE	Bicycle boulevard
8036	DELAWARE	Bicycle boulevard
8037	DELTA PARK	Separated in-roadway
8038	DENVER	Bicycle boulevard
8039	DENVER-SCHMEER	Trail
8049	FISKE	Bicycle boulevard
8055	GOING TO THE RIVER PATH	Trail
8056	HALLECK	Bicycle boulevard
8068	INNER CENTRAL	Bicycle boulevard
8072	INNER FAILING	Multiple facility types
8085	INNER SKIDMORE	Separated in-roadway
8091	JERSEY	Bicycle boulevard
8094	LAGOON	Separated in-roadway
8100	LOMBARD GAP	Separated in-roadway
8111	LOWER SMITH	Bicycle boulevard
8117	LOWER WILLAMETTE BLVD	Bicycle boulevard
8119	MACRUM	Bicycle boulevard
8148	N GREENWAY TRAIL	Multiple facility types
8192	OUTER CENTRAL	Multiple facility types

Project key - North District - UNFUNDED (continued)

Key no.	Corridor name	Suggested facility description
8301	UPPER MISSISSIPPI	Separated in-roadway
8313	UPPER WILLAMETTE BLVD	Separated in-roadway
8326	WILLIS	Multiple facility types
8329	WOOLSEY	Multiple facility types
8330	YALE	Bicycle boulevard

See Appendix A for a comprehensive list of recommended projects with descriptions and estimated costs.



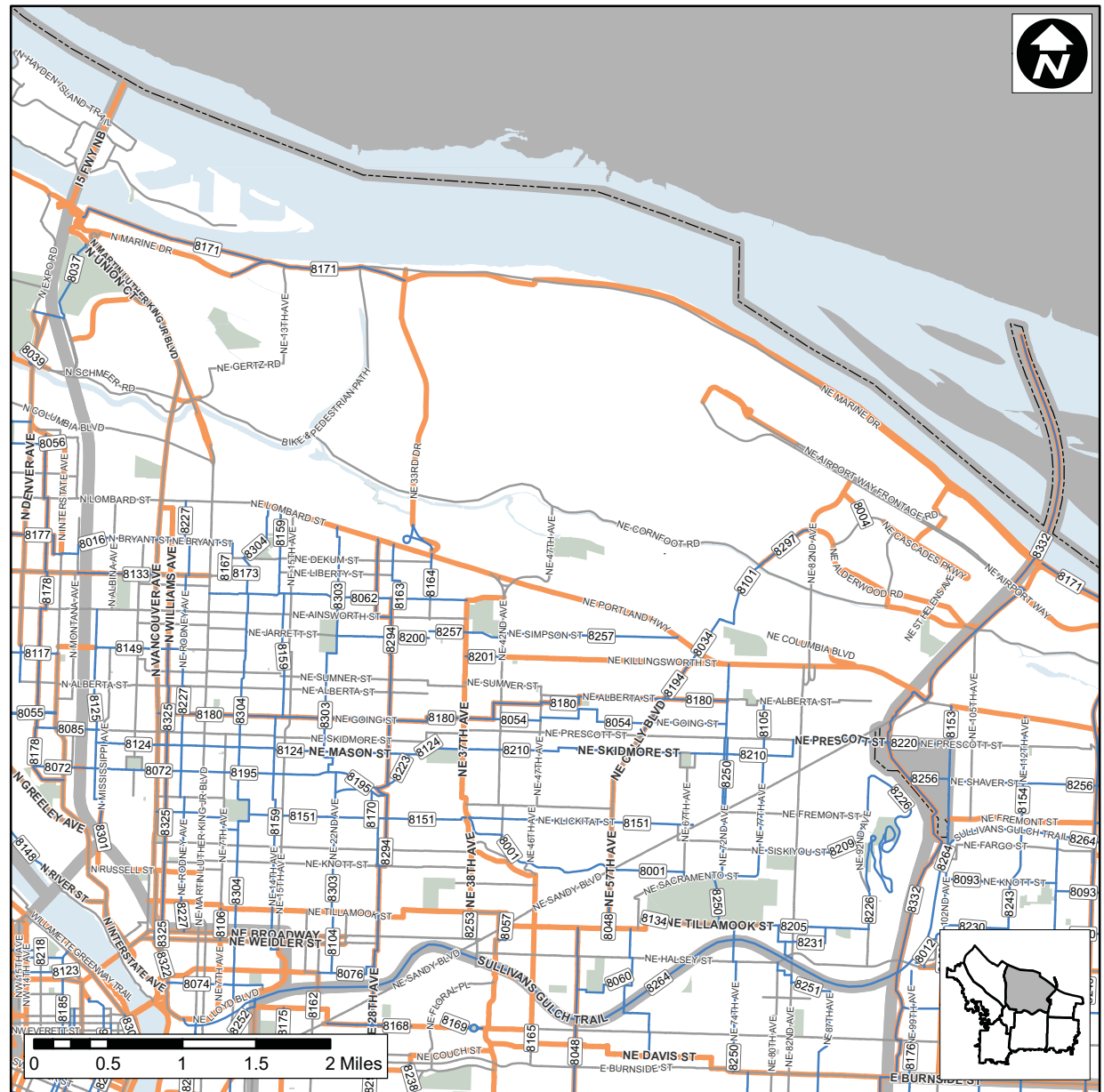
Part Three: The bicycle transportation system

Recommended bicycle network projects - Northeast District

- Immediate and 80 Percent Strategies
- World-Class Strategy
- Existing or Funded Bikeway
- Transportation District Boundary
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District boundaries match delineation in the TSP.





Project key - Northeast District - FUNDED

Key no.	Corridor name	Suggested facility description
8048	FIFTIES BIKEWAY	Multiple facility types
8133	MIDDLE N ROSA PARKS	Multiple facility types
8171	NE MARINE DR BIKEWAY	Multiple facility types
8180	NORTH-NORTHEAST GOING	Bicycle boulevard
8194	OUTER CULLY	Separated in-roadway
8205	OUTER NE TILLAMOOK	Multiple facility types
8294	TWENTIES BIKEWAY	Multiple facility types
8297	UPPER ALDERWOOD	Separated in-roadway

Project key - Northeast District - UNFUNDED

Key no.	Corridor name	Suggested facility description
8001	ALAMEDA	Multiple facility types
8004	AMBASSADOR	Bicycle boulevard or enhanced shared roadway
8016	BRYANT	Bicycle boulevard
8034	CULLY GAP	Separated in-roadway
8037	DELTA PARK	Enhanced shared roadway
8054	GOING	Bicycle boulevard
8057	HANCOCK	Multiple facility types
8060	HASSALO-63rd	Multiple facility types
8062	HOLMAN	Bicycle boulevard
8072	INNER FAILING	Multiple facility types
8076	INNER NE MULTNOMAH	Multiple facility types
8085	INNER SKIDMORE	Separated in-roadway
8101	LOWER ALDERWOOD	Separated in-roadway
8104	LOWER NE 22nd	Bicycle boulevard
8105	LOWER NE 77th	Bicycle boulevard
8106	LOWER NE 7th	Separated in-roadway
8124	MASON	Multiple facility types
8125	MICHIGAN	Multiple facility types
8134	MIDDLE NE TILLAMOOK	Separated in-roadway
8149	N KILLINGSWORTH	Separated in-roadway
8151	N/NE KLICKITAT	Multiple facility types
8159	NE 14th	Multiple facility types
8163	NE 29th	Bicycle boulevard
8164	NE 33rd INTERCHANGE	Separated in-roadway
8167	NE 6TH	Enhanced shared roadway
8170	NE KNOTT	Bicycle boulevard
8173	NE ROSA PARKS	Bicycle boulevard
8195	OUTER FAILING	Bicycle boulevard
8200	OUTER JARRETT	Bicycle boulevard

Project key - Northeast District - UNFUNDED (continued)

Key no.	Corridor name	Suggested facility description
8201	OUTER KILLINGSWORTH GAP	Separated in-roadway
8209	OUTER SISKIYOU	Multiple facility types
8210	OUTER SKIDMORE	Multiple facility types
8220	PRESCOTT GAP	Separated in-roadway
8223	REGENTS	Bicycle boulevard
8226	ROCKY BUTTE	Multiple facility types
8227	RODNEY	Bicycle boulevard
8231	SCHUYLER	Bicycle boulevard
8250	SE/NE 70s	Bicycle boulevard
8253	NE 38th	Bicycle boulevard
8257	SIMPSON	Multiple facility types
8264	SULLIVANS GULCH	Trail
8301	UPPER MISSISSIPPI	Separated in-roadway
8303	UPPER NE 22nd	Multiple facility types
8304	UPPER NE 9th	Multiple facility types
8325	WILLIAMS	Separated in-roadway
8332	I-205 PATH	Trail

See Appendix A for a comprehensive list of recommended projects with descriptions and estimated costs.



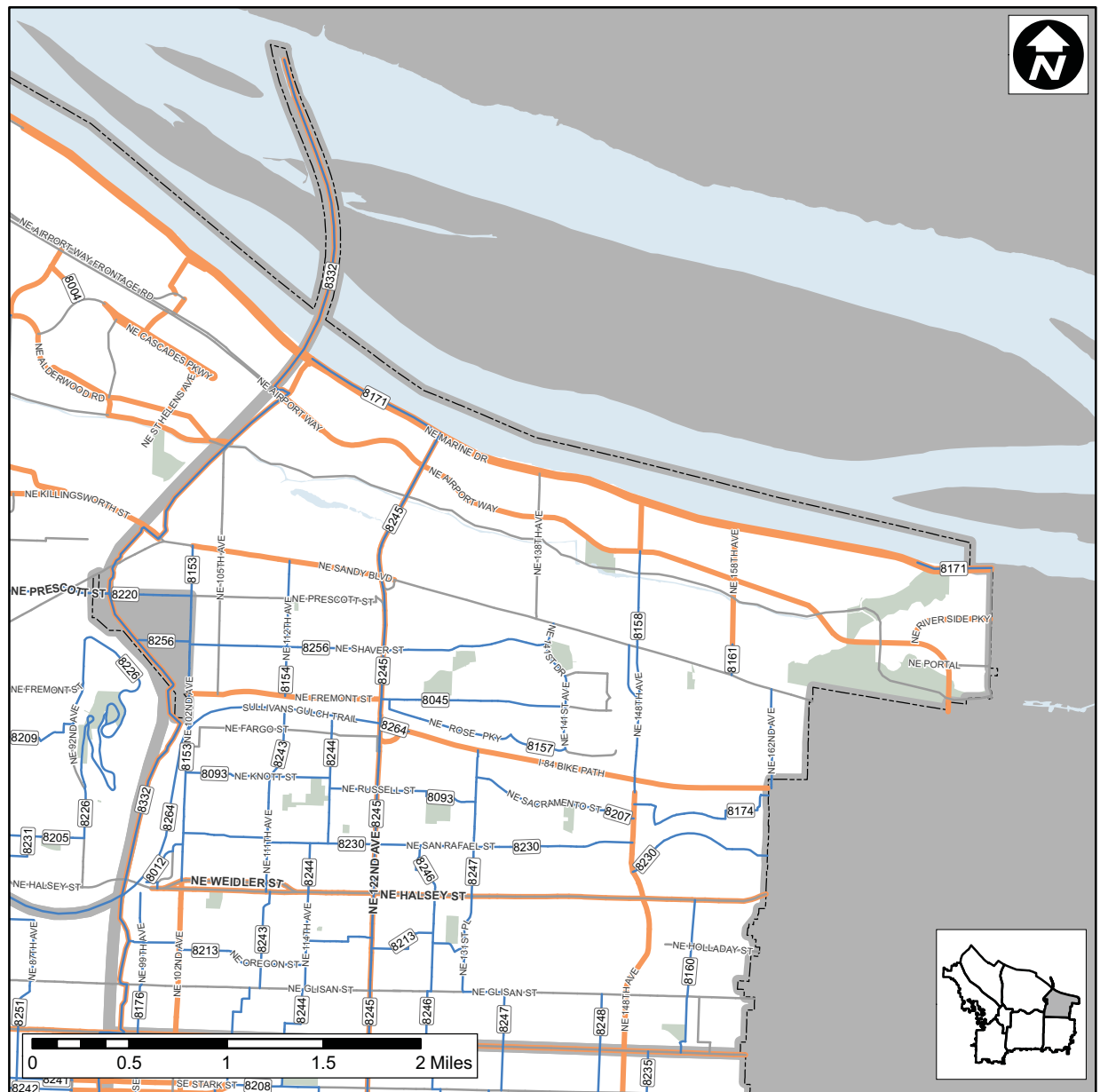
Part Three: The bicycle transportation system

Recommended bicycle network projects - Far Northeast District

- Immediate and 80 Percent Strategies
- World-Class Strategy
- Existing or Funded Bikeway
- Transportation District Boundary
- Parks and Open Spaces
- Waterways
- City of Portland Area

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District boundaries match delineation in the TSP.





Project key - Far Northeast District - FUNDED

Key no.	Corridor name	Suggested facility description
8171	NE MARINE DR BIKEWAY	Trail

Project key - Far Northeast District - UNFUNDED








Key no.	Corridor name	Suggested facility description
8012	BELL	Multiple facility types
8045	EAST FREMONT	Separated in-roadway
8093	KNOTT	Multiple facility types
8153	NE 102nd	Separated in-roadway
8154	NE 112th	Bicycle boulevard or advisory bike lane
8157	NE 141st	Multiple facility types
8158	NE 148th GAP	Separated in-roadway
8160	NE 155th	Multiple facility types
8161	NE 158th GAP	Separated in-roadway
8174	NE THOMPSON	Bicycle boulevard
8176	NE/SE 99th	Separated in-roadway
8207	OUTER SACRAMENTO	Bicycle boulevard or advisory bike lane
8213	PACIFIC/HOLLADAY	Multiple facility types
8220	PRESCOTT GAP	Separated in-roadway
8230	SAN RAFAEL	Multiple facility types
8243	SE/NE 111th	Multiple facility types
8244	SE/NE 117th	Bicycle boulevard or advisory bike lane
8245	SE/NE 122nd	Separated in-roadway
8246	SE/NE 130th	Multiple facility types
8247	SE/NE 135th	Multiple facility types
8248	SE/NE 146th	Bicycle boulevard or advisory bike lane
8256	SHAVER	Bicycle boulevard or advisory bike lane
8264	SULLIVANS GULCH	Trail

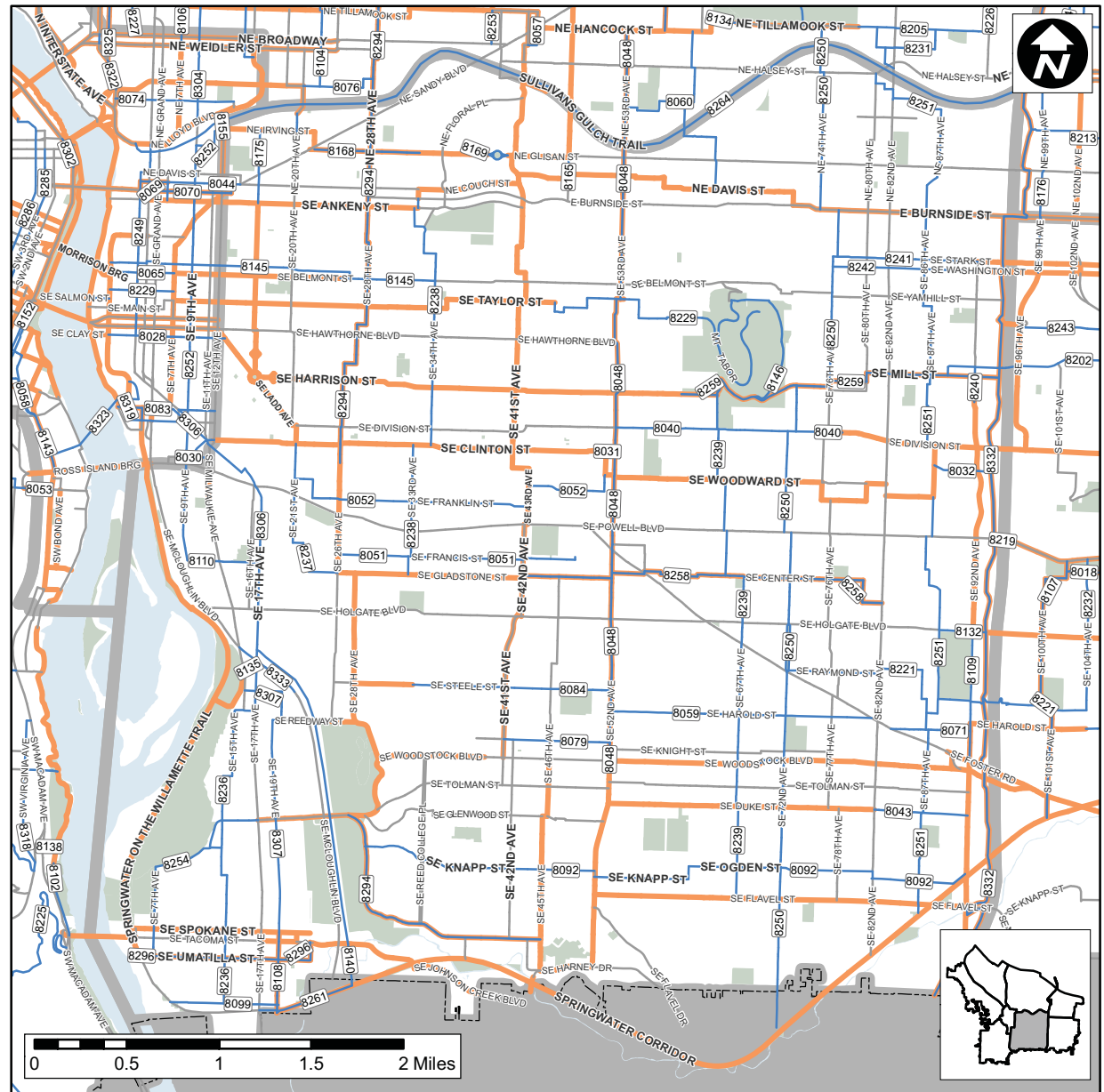
See Appendix A for a comprehensive list of recommended projects with descriptions and estimated costs.



Part Three: The bicycle transportation system

Recommended bicycle network projects - Southeast District

-  Immediate and 80 Percent Strategies
-  World-Class Strategy
-  Existing or Funded Bikeway
-  Transportation District Boundary
-  Parks and Open Spaces
-  Waterways
-  City of Portland Area



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District boundaries match delineation in the TSP.



Project key - Southeast District - FUNDED

Key no.	Corridor name	Suggested facility description
8048	FIFTIES BIKEWAY	Multiple facility types
8070	INNER E BURNSIDE	Separated in-roadway
8108	LOWER SE 19th	Bicycle boulevard
8109	LOWER SE 92nd	Separated in-roadway
8156	NE 13th	Trail
8236	SE 15th	Bicycle boulevard
8258	SE CENTER	Bicycle boulevard
8259	SE MILL	Multiple facility types
8294	TWENTIES BIKEWAY	Multiple facility types
8296	UMATILLA	Bicycle boulevard

Project key - Southeast District - UNFUNDED

Key no.	Corridor name	Suggested facility description
8028	CLAY	Separated in-roadway or enhanced shared roadway
8031	CLINTON GAP	Bicycle boulevard
8032	CLINTON PATH	Trail
8040	DIVISION GAP	Separated in-roadway
8043	DUKE	Bicycle boulevard
8044	E BURNSIDE-COUCH	Separated in-roadway or enhanced shared roadway
8051	FRANCIS	Bicycle boulevard or advisory bike lane
8052	FRANKLIN	Bicycle boulevard
8059	HAROLD	Separated in-roadway
8060	HASSALO-63rd	Multiple facility types
8071	INNER ELLIS	Separated in-roadway
8079	INNER RAMONA	Bicycle boulevard
8084	INNER SE STEELE	Separated in-roadway
8092	KNAPP	Multiple facility types
8099	LINN	Bicycle boulevard
8110	LOWER SE 9th	Bicycle boulevard
8132	MIDDLE HOLGATE	Separated in-roadway
8135	MIDDLE SE 17th	Multiple facility types
8140	MILWAUKIE LRT	Trail
8145	MORRISON-BELMONT	Separated in-roadway
8146	MT TABOR	Enhanced shared roadway
8162	NE 20th GAP	Separated in-roadway
8165	NE 47th	Separated in-roadway
8168	NE GLISAN	Separated in-roadway
8169	NE GLISAN CIRCLE	Separated in-roadway
8175	NE/SE 16th	Bicycle boulevard
8202	OUTER MARKET	Multiple facility types
8219	POWELL GAP	Separated in-roadway
8221	RAYMOND	Multiple facility types
8229	SALMON	Bicycle boulevard

Project key - Southeast District - UNFUNDED (continued)

Key no.	Corridor name	Suggested facility description
8237	SE 21st	Multiple facility types
8238	SE 34th	Bicycle boulevard
8239	SE 67th	Multiple facility types
8240	SE 92nd GAP	Separated in-roadway
8241	SE STARK GAP	Separated in-roadway
8242	SE WASHINGTON GAP	Separated in-roadway
8250	SE/NE 70s	Multiple facility types
8251	SE/NE 87th	Multiple facility types
8254	SELLWOOD	Multiple facility types
8261	SPRINGWATER	Trail
8306	UPPER SE 17th	Multiple facility types
8307	UPPER SE 19th	Bicycle boulevard
8328	WOODSTOCK GAP	Separated in-roadway
8332	I-205 PATH	Trail

See Appendix A for a comprehensive list of recommended projects with descriptions and estimated costs.

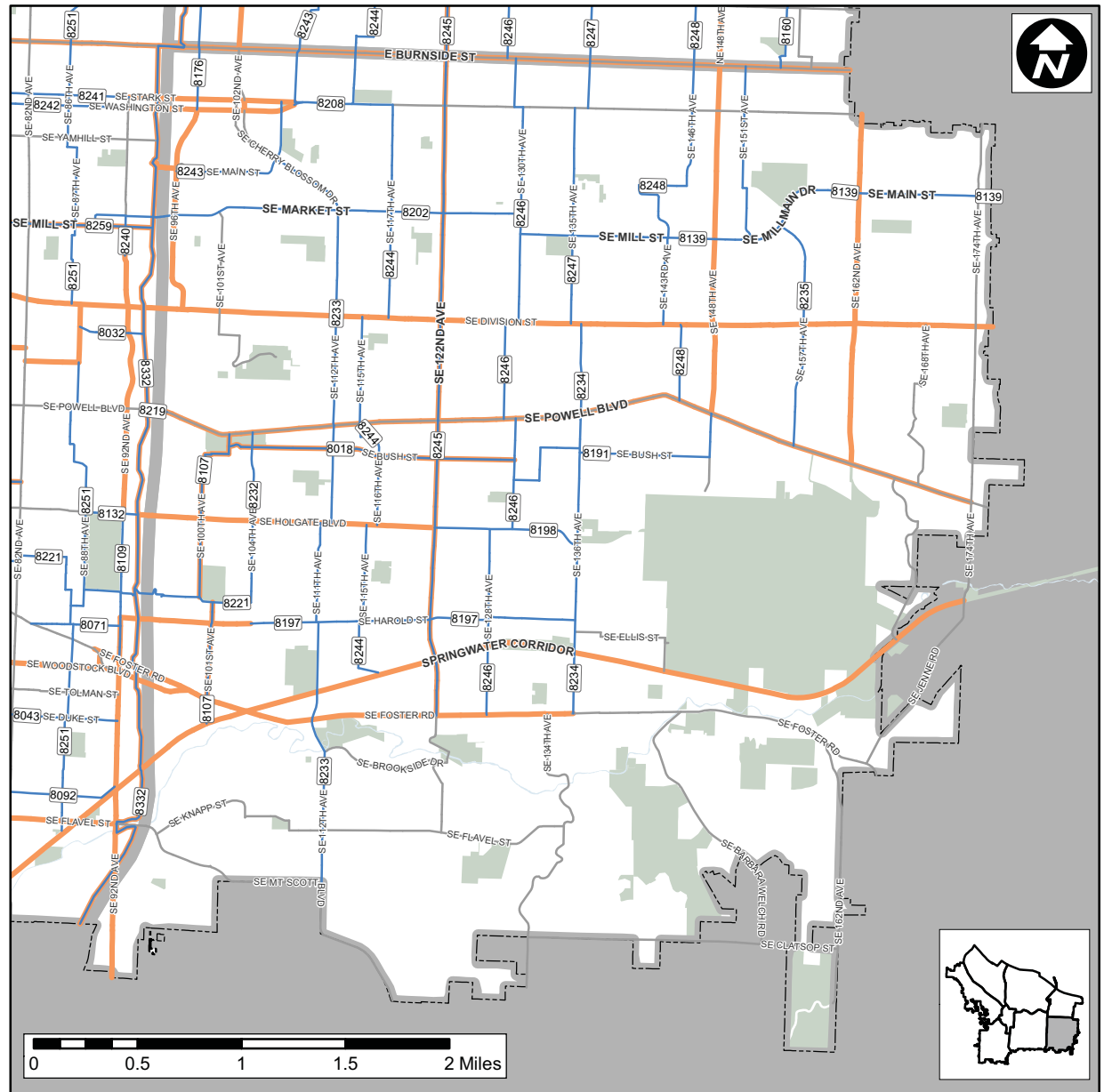




Part Three: The bicycle transportation system

Recommended bicycle network projects - Far Southeast District

- Immediate and 80 Percent Strategies
- World-Class Strategy
- Existing or Funded Bikeway
- Transportation District Boundary
- Parks and Open Spaces
- Waterways
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Project key - Far Southeast District - FUNDED

Key no.	Corridor name	Suggested facility description
8018	BUSH	Multiple facility types
8107	LOWER SE 101st	Multiple facility types

Project key - Far Southeast District - UNFUNDED

Key no.	Corridor name	Suggested facility description
8139	MILL	Bicycle boulevard
8176	NE/SE 99th	Separated in-roadway
8191	OUTER BUSH	Bicycle boulevard
8197	OUTER HAROLD	Separated in-roadway
8198	OUTER HOLGATE	Separated in-roadway
8202	OUTER MARKET	Separated in-roadway
8208	OUTER SE STARK GAP	Separated in-roadway
8219	POWELL GAP	Separated in-roadway
8221	RAYMOND	Multiple facility types
8232	SE 104th	Advisory bike lane
8233	SE 112th	Separated in-roadway
8234	SE 136th	Complete streets project
8235	SE 157th	Bicycle boulevard or advisory bike lane
8243	SE/NE 111th	Multiple facility types
8244	SE/NE 117th	Multiple facility types
8245	SE/NE 122nd	Separated in-roadway
8246	SE/NE 130th	Multiple facility types
8247	SE/NE 135th	Multiple facility types
8248	SE/NE 146th	Multiple facility types
8332	I-205 PATH	Trail

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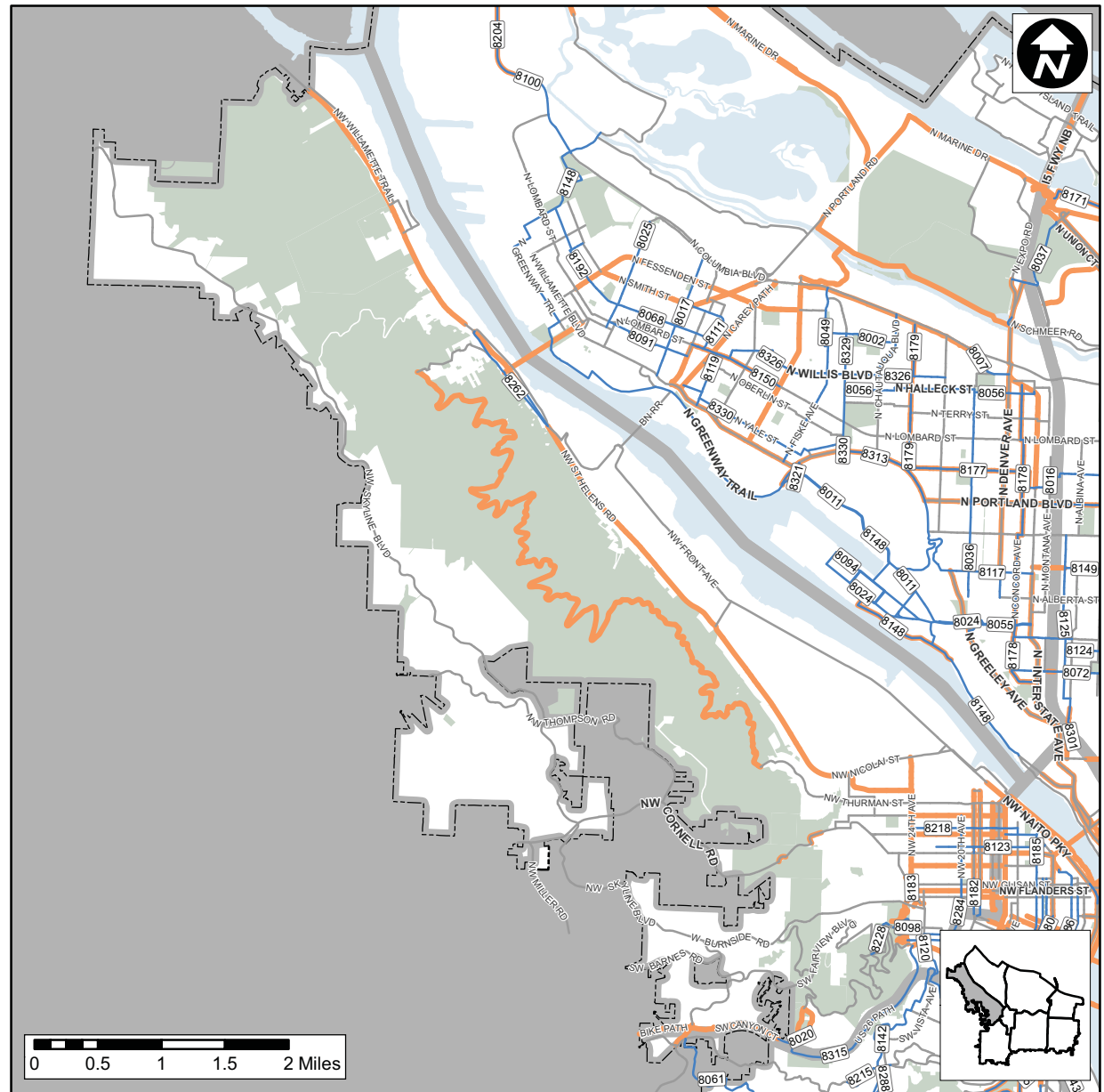




Part Three: The bicycle transportation system

Recommended bicycle network projects - Northwest District

- Immediate and 80 Percent Strategies
- World-Class Strategy
- Existing or Funded Bikeway
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Project key - Northwest District - UNFUNDED

Key no.	Corridor name	Suggested facility description
8020	CANYON-ZOO	Separated in-roadway
8098	LEWIS & CLARK CIRCLE	Enhanced shared roadway
8120	MADISON-MAIN	Multiple facility types
8123	MARSHALL	Bicycle boulevard
8142	MONTGOMERY-DOWNTOWN	Multiple facility types
8181	NW 18th	Separated in-roadway
8182	NW 19th	Separated in-roadway
8183	NW 24th	Separated in-roadway
8218	PETTYGROVE	Bicycle boulevard
8228	ROSE GARDEN WAY	Enhanced shared roadway
8262	ST HELENS GAP	Separated in-roadway
8284	SW/NW 20th	Multiple facility types
8331	INTERIM	Interim improvements

See Appendix A for a comprehensive list of recommended projects with descriptions and estimated costs.

Project key - Southwest District - FUNDED

Key no.	Corridor name	Suggested facility description
8053	GIBBS OVERPASS	Trail
8080	INNER RED ELECTRIC	Multiple facility types
8283	SW TERWILLIGER-WESTWOOD	Multiple facility types

Project key - Southwest District - UNFUNDED

Key no.	Corridor name	Suggested facility description
8006	APRIL HILL PARK	Trail
8009	BANCROFT	Bicycle boulevard or enhanced shared roadway
8010	BARBUR GAPS	Separated in-roadway
8013	BRIER	Multiple facility types
8014	BROADLEAF	Enhanced shared roadway
8015	BRUGGER	Bicycle boulevard
8019	CANBY	Bicycle boulevard or enhanced shared roadway
8021	CAPITOL HILL RD	Multiple facility types
8022	CARSON	Bicycle boulevard
8026	CHELTENHAM	Enhanced shared roadway
8027	CHESTNUT	Bicycle boulevard
8046	FAIRMOUNT	Enhanced shared roadway or advisory bike lane
8047	FAIRVALE	Bicycle boulevard
8050	FLORIDA	Bicycle boulevard
8061	HEWETT	Multiple facility types
8063	ILLINOIS	Bicycle boulevard
8064	INNER ALFRED	Bicycle boulevard
8066	INNER CANBY	Multiple facility types
8067	INNER CAPITOL	Separated in-roadway
8073	INNER HAMILTON	Enhanced shared roadway
8075	INNER MILES	Multiple facility types
8081	INNER RED ELECTRIC TRAILS	Trail
8086	INNER STEPHENSON	Separated in-roadway
8088	INNER TROY	Bicycle boulevard
8089	INNER VERMONT	Separated in-roadway
8095	LANCASTER	Separated in-roadway
8097	LAVIEW	Enhanced shared roadway
8102	LOWER BANCROFT-SELLWOOD GRNWAY	Trail
8103	LOWER I-405 PATH	Multiple facility types
8112	LOWER SW 18th	Multiple facility types
8113	LOWER SW 1st	Multiple facility types
8114	LOWER SW 35th	Separated in-roadway
8115	LOWER SW 5th	Separated in-roadway

(Continued on page 61)





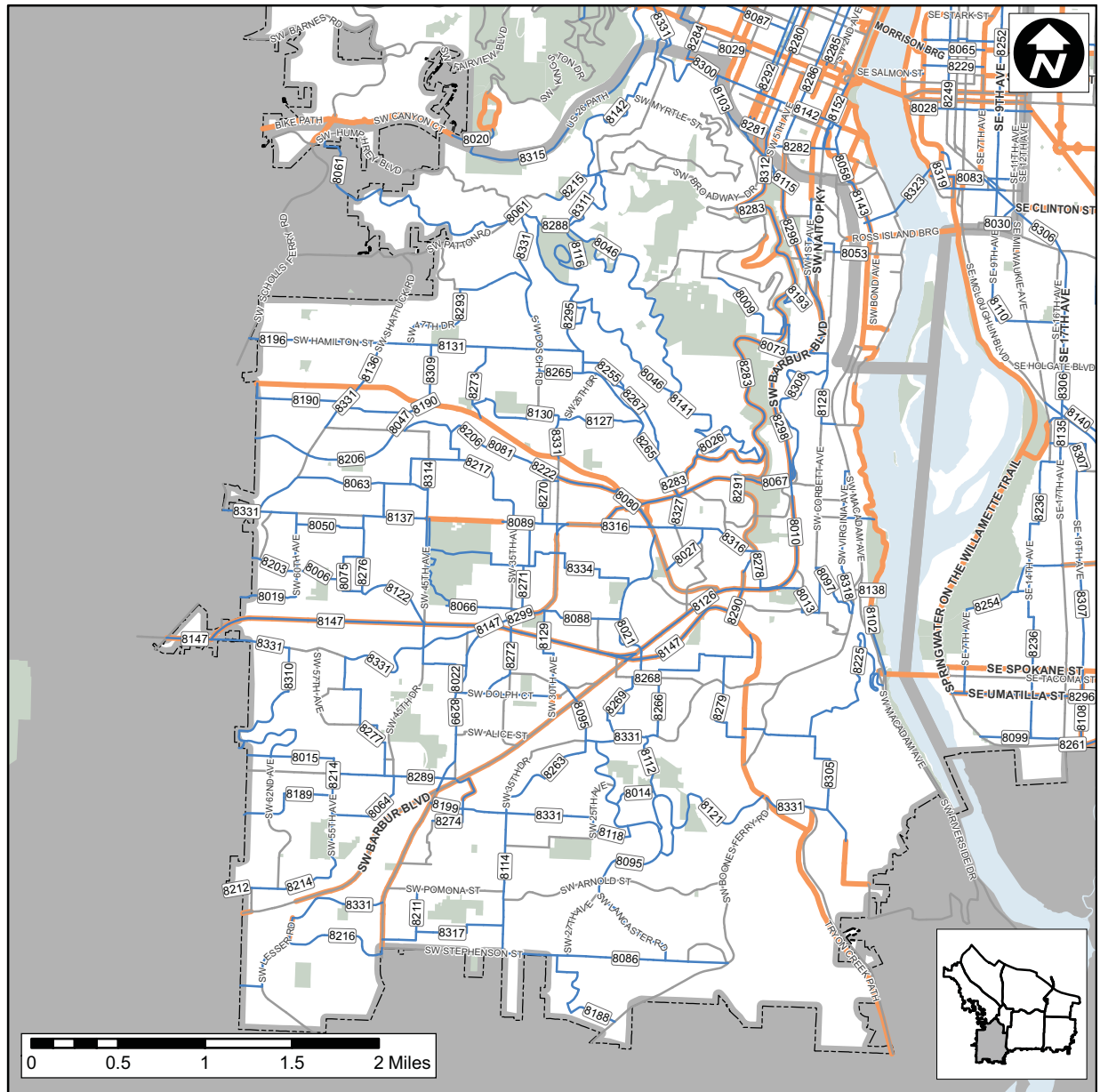
Part Three: The bicycle transportation system

Recommended bicycle network projects - Southwest District

- Immediate and 80 Percent Strategies
- World-Class Strategy
- Existing or Funded Bikeway
- Transportation District Boundary
- Parks and Open Spaces
- Waterways
- City of Portland Area

Potential alignments for proposed projects are conceptual until detailed project development work is conducted. Any proposed bicycle facilities recommended for roadways over which the Portland Bureau of Transportation is not the road authority, or on lands not directly controlled by the Portland Bureau of Transportation, must first meet approval of the appropriate managing authority. Suggested facility types that are innovations must be successfully demonstrated before they are widely implemented.

District boundaries match delineation in the TSP.





Project key - Southwest District - UNFUNDED (continued from page 59)

Key no.	Corridor name	Suggested facility description
8116	LOWER SW GREENWAY	Multiple facility types
8118	LURADEL	Bicycle boulevard
8121	MAPLECREST	Enhanced shared roadway
8122	MAPLEWOOD	Bicycle boulevard
8126	MIDDLE BARBUR	Separated in-roadway
8127	MIDDLE BOUNDARY	Bicycle boulevard
8128	MIDDLE CORBETT	Multiple facility types
8129	MIDDLE DOLPH	Multiple facility types
8130	MIDDLE DOSCH	Separated in-roadway
8131	MIDDLE HAMILTON	Multiple facility types
8136	MIDDLE SHATTUCK	Separated in-roadway
8137	MIDDLE VERMONT	Separated in-roadway
8138	MILES-GREENWAY	Enhanced shared roadway
8141	MITCHELL	Enhanced shared roadway
8142	MONTGOMERY-DOWNTOWN	Multiple facility types
8147	MULTNOMAH	Separated in-roadway
8188	ORCHARD HILL	Enhanced shared roadway
8189	OUTER ALFRED	Bicycle boulevard or enhanced shared roadway
8190	OUTER BOUNDARY	Bicycle boulevard
8193	OUTER CONDOR	Enhanced shared roadway
8196	OUTER HAMILTON	Separated in-roadway or advisory bike lane
8199	OUTER HUBER	Separated in-roadway
8203	OUTER MILES	Bicycle boulevard
8206	OUTER RED ELECTRIC	Multiple facility types
8211	OUTER SW 45th	Enhanced shared roadway
8212	OUTER SW OAK	Bicycle boulevard
8214	PASADENA	Multiple facility types
8215	PATTON GAP	Separated in-roadway
8216	PCC RD	Multiple facility types
8217	PENDLETON	Multiple facility types
8222	RED ELECTRIC BLVDS	Bicycle boulevard
8225	RIVERSIDE CEMETERY	Enhanced shared roadway
8255	SEYMOUR	Enhanced shared roadway
8263	STANLEY	Multiple facility types
8265	SUNSET	Multiple facility types
8266	SW 17th	Multiple facility types
8267	SW 18th	Bicycle boulevard or enhanced shared roadway
8268	SW 19th	Separated in-roadway
8269	SW 21st	Enhanced shared roadway
8270	SW 32nd	Enhanced shared roadway
8271	SW 34th	Bicycle boulevard

Project key - Southwest District - UNFUNDED (continued)








Key no.	Corridor name	Suggested facility description
8272	SW 35th-SPRING GARDEN	Bicycle boulevard or enhanced shared roadway
8273	SW 39th	Enhanced shared roadway
8274	SW 40th	Multiple facility types
8275	SW 50th	Bicycle boulevard or enhanced shared roadway
8276	SW 52nd	Multiple facility types
8277	SW 54th	Bicycle boulevard
8278	SW 5th	Enhanced shared roadway
8279	SW 9th	Bicycle boulevard
8284	SW/NW 20th	Multiple facility types
8288	TALBOT	Enhanced shared roadway
8289	TAYLORS FERRY GAP	Separated in-roadway
8290	TERWILLIGER BRIDGE	Separated in-roadway
8291	TERWILLIGER GAPS	Separated in-roadway
8292	SW PARK	Bicycle boulevard
8293	TUNNELWOOD	Multiple facility types
8295	TWOMBLY	Enhanced shared roadway
8298	UPPER BARBUR	Separated in-roadway
8299	UPPER CAPITOL	Separated in-roadway
8300	UPPER I-405 PATH	Trail
8305	UPPER PALATINE	Multiple facility types
8308	UPPER SLAVIN	Multiple facility types
8309	UPPER SW 45th	Bicycle boulevard or enhanced shared roadway
8310	UPPER SW 62nd	Enhanced shared roadway
8311	UPPER SW GREENWAY	Enhanced shared roadway
8312	UPPER TERWILLIGER	Separated in-roadway
8314	UPPER-MIDDLE SW 45th	Separated in-roadway
8315	US 26 PATH	Trail
8316	VERMONT-CHESTNUT	Bicycle boulevard
8317	VESTA	Bicycle boulevard or enhanced shared roadway
8318	VIRGINIA	Multiple facility types
8327	WILSON	Trail
8331	INTERIM	Interim improvements

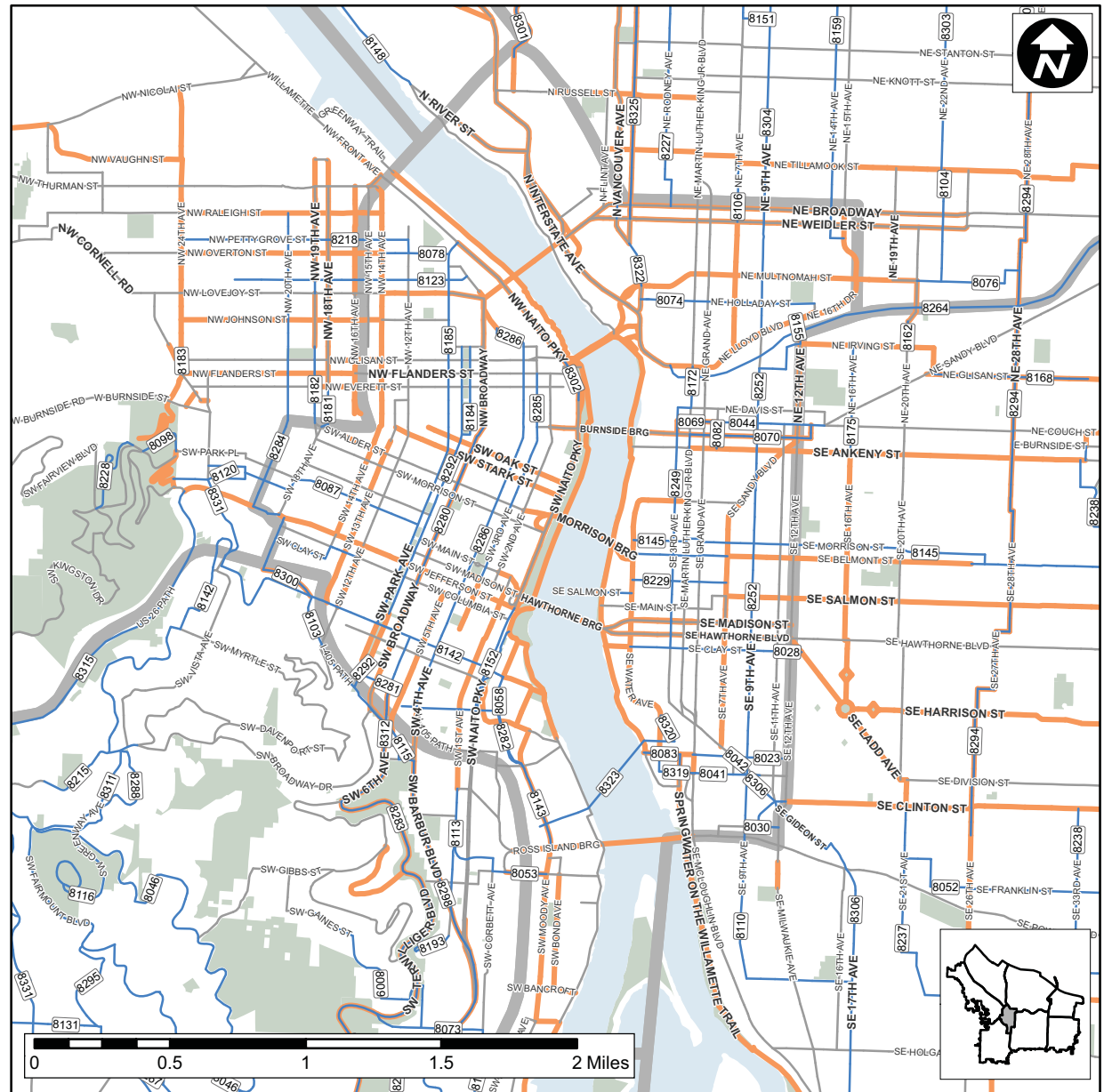
See Appendix A for a comprehensive list of recommended projects with descriptions and estimated costs.



Part Three: The bicycle transportation system

Recommended bicycle network projects - Central City District

-  Immediate and 80 Percent Strategies
-  World-Class Strategy
-  Existing or Funded Bikeway
-  Transportation District Boundary
-  Parks and Open Spaces
-  Waterways
-  City of Portland Area



Potential alignments for proposed projects are conceptual until detailed project development work is conducted. Any proposed bicycle facilities recommended for roadways over which the Portland Bureau of Transportation is not the road authority, or on lands not directly controlled by the Portland Bureau of Transportation, must first meet approval of the appropriate managing authority. Suggested facility types that are innovations must be successfully demonstrated before they are widely implemented.

District boundaries match delineation in the TSP.



Project key - Central City District - FUNDED

Key no.	Corridor name	Suggested facility description
8053	GIBBS OVERPASS	Trail
8069	INNER NE COUCH	Multiple facility types
8070	INNER E BURNSIDE	Separated in-roadway
8302	UPPER NAITO	Separated in-roadway

Project key - Central City District - UNFUNDED

Key no.	Corridor name	Suggested facility description
8023	CARUTHERS	Bicycle boulevard
8028	CLAY	Separated in-roadway or enhanced shared roadway
8029	CLAY-COLUMBIA	Multiple facility types
8030	CLINTON	Bicycle boulevard
8041	DIVISION PL	Separated in-roadway or advisory bike lane
8042	DIVISION ST/PL	Bicycle boulevard
8044	E BURNSIDE-COUCH	Separated in-roadway or enhanced shared roadway
8058	HARBOR DR PATH	Multiple facility types
8065	INNER BELMONT	Separated in-roadway
8074	INNER HOLLADAY	Bicycle boulevard
8078	INNER NW OVERTON	Bicycle boulevard
8082	INNER SE ANKENY	Multiple facility types
8083	INNER SE CARUTHERS	Multiple facility types
8087	INNER SW SALMON	Separated in-roadway
8090	INNER WOODWARD	Bicycle boulevard
8106	LOWER NE 7th	Separated in-roadway
8110	LOWER SE 9th	Bicycle boulevard
8120	MADISON-MAIN	Multiple facility types
8123	MARSHALL	Bicycle boulevard
8142	MONTGOMERY-DOWNTOWN	Multiple facility types
8143	MOODY	Separated in-roadway
8145	MORRISON-BELMONT	Separated in-roadway
8152	NAITO GAP	Multiple facility types
8155	NE 12th	Trail
8159	NE 14th	Bicycle boulevard
8172	NE MLK GAP	Separated in-roadway
8181	NW 18th	Separated in-roadway
8184	NW 8th	Bicycle boulevard
8185	NW 9th	Separated in-roadway
8187	NW PARK	Bicycle boulevard
8218	PETTYGROVE	Bicycle boulevard
8229	SALMON	Bicycle boulevard
8249	SE/NE 3rd	Enhanced shared roadway
8252	SE/NE 9th	Bicycle boulevard
8264	SULLIVANS GULCH	Trail

Project key - Central City District - UNFUNDED (continued)

Key no.	Corridor name	Suggested facility description
8280	SW BROADWAY	Separated in-roadway
8281	SW JACKSON	Separated in-roadway
8282	SW LINCOLN	Multiple facility types
8284	SW/NW 20th	Multiple facility types
8285	SW/NW 3rd	Separated in-roadway
8286	SW/NW 4th	Multiple facility types
8292	SW PARK	Bicycle boulevard
8301	UPPER MISSISSIPPI	Separated in-roadway
8304	UPPER NE 9th	Separated in-roadway
8306	UPPER SE 17th	Multiple facility types
8312	UPPER TERWILLIGER	Separated in-roadway
8319	WATER	Bicycle boulevard
8320	WATER LRT	Separated in-roadway
8322	WHEELER	Separated in-roadway
8323	WILLAMETTE LRT	Multiple facility types
8325	WILLIAMS	Separated in-roadway

See Appendix A for a comprehensive list of recommended projects with descriptions and estimated costs.





3.2 BICYCLE FACILITY DESIGN AND ENGINEERING

3.2.1 Introduction

The Bureau of Transportation aspires to develop innovative treatments and designs for its bikeways to meet the varied needs of Portland bicyclists and create safe, comfortable and attractive bicycling conditions. To attract new riders, Portland must expand the quantity and improve the quality of its low-stress bicycle facilities. The City will continue to study international best practices in bikeway design and work to adapt them to an American context. Appendix D, Bikeway Facility Design: Survey of Best Practices, documents an extensive review of practices from world-class bicycling cities where innovative bicycle facilities have been tried and tested. While several international bicycle facility types may be appropriate for Portland, each will require testing and evaluation in successful demonstration projects before it can be widely implemented.

Portland's *Bikeway Design and Engineering Guidelines*, included as part of the 1996 *Bicycle Master Plan*, have served as a guide for the design, construction and maintenance of Portland's bikeway network. Updating these guidelines is identified as a necessary and key action item in this plan. In addition to guiding design, the updated bicycle facility design

guidelines will address the difference between design standards and design guidelines as well as distinguishing between their application to private development and to public works projects.

3.2.2 Principles for bikeway design

The *Portland Bicycle Plan for 2030* promotes the following design principles, recognized by world-class bicycling cities around the world, to guide the development of new bikeway design guidelines:

Safety: Bikeways should be designed and built to be free of hazards and minimize bicyclist conflicts with other road users.

Comfort: Bikeways should be easy to use; the complexity of interaction between bicycle and motor vehicle should be minimal.

Attractiveness: Good design and a 'sense of place' should enhance the look and feel of the bicycling environment.

Direct routes: Bikeways should provide immediate proximity to the places residents want to go.

Cohesive system: A network of bikeways should provide seamless and connected access to a broad variety of destinations.

Selecting the appropriate facility type for each bikeway is critical to the success of the bikeway network. On streets where bicyclists interact with motor vehicles, the bikeway facility type and roadway design play an important role. To achieve the objectives listed above, the *Portland Bicycle Plan for 2030* supports a high degree of separation between bicyclists and automobiles where space is available.

3.2.3 Innovation in bikeway design

Portland has a reputation for successfully implementing innovative bicycle facility designs. Innovations in signal treatments, roadway markings and civil designs have been installed to address bicycle facility problems that standard design treatments do not sufficiently resolve. Portland worked with local and national research organizations to evaluate designs and has also worked through the Federal Highway Administration's (FHWA) process for experimenting with non-standard treatments. Such evaluations have been conducted for colored bike lanes, pedestrian hybrid beacons (HAWK signals) and bike boxes at intersections, among others.

Testing international designs that show promise for fulfilling the aims of this plan is consistent with the recommendations of the International Technology Scanning Program's *International Scan Summary Report on Pedestrian and*



*Bicyclist Safety and Mobility.*¹ Scan tour participants included high-level representatives from the FHWA, the American Association of State Highway Transportation Officials (AASHTO), the National Cooperative Highway Research Program (NCHRP), the Association of Pedestrian and Bicycle Professionals (APBP) and several state Departments of Transportation, including Oregon's.

Participants recognized that the high levels of bicycling seen in the countries they visited reflect supportive policies, design and culture. Their report also recognized that the U.S. needs to begin to introduce and adapt these international designs to an American context. The report authors noted their observations about "several approaches and designs that could be used to improve bicyclist safety in the U.S.," including bike boxes and separated facilities such as cycle tracks and colored bike lanes at conflict points. The Scan team noted that implementation and testing of these designs "has already begun" by local jurisdictions that are best positioned to take the lead in this implementation. Their report noted that ultimately "the Scan team will rely on 'champions' from numerous agencies,

¹ This document reports on an 'international scan' of ten cities in five countries sponsored by Federal Highway Administration (FHWA), American Association of State Highway Transportation Officials (AASHTO) and the National Cooperative Highway Research Program (NCHRP).

organizations and groups in the U.S. to put into practice these policies and approaches that will ultimately help to increase safety and mobility for...bicycling."

It is in this spirit that Portland will continue to introduce innovations in bikeway design. Much of the development of these designs and their implementation will be considered as part of the development of Portland's updated *Bikeway Design Guidelines*. Transforming national policies, standards and practices is an important step toward developing sustainable transportation systems that demonstrate successful urban bikeway networks. Portland is well-positioned to lead the U.S. in this transformation.

3.2.4 Overview of bikeway facility types

In Portland's 1996 *Bicycle Master Plan*, facility types were assigned to roadways based on the average number of motor vehicles using that street each day. Bike lanes were recommended for streets where average daily traffic was more than 3,000 motor vehicles per day. Local streets with lower traffic volumes were designated as bicycle boulevards.

The *Portland Bicycle Plan for 2030* expands the array of facility types and design treatments for bicycle infrastructure to appeal to a broader range of potential bicyclists. The sections that follow describe in detail the major facility types



Tight bicycle riding conditions in Downtown Portland

JONATHAN MAUS / BIKEPORTLAND.ORG



Concept of a bicycle boulevard crossing at an offset intersection with a two-way cycle track on the arterial street

MITCHELL FREY





Part Three: The bicycle transportation system

MILES by classification type:

Facility type	Total plan miles	Percent
Major City Bikeways	205	21%
Trails	54	5.5%
Separated in-roadways	96	10%
Bicycle boulevards	49	5%
Advisory bike lanes	5	0.5%
Enhanced shared roadways	1	0%
City Bikeways	757	79%
Trails	85	9%
Separated in-roadways	394	41%
Bicycle boulevards	199	21%
Advisory bike lanes	33	3%
Enhanced shared roadways	46	5%
TOTAL	962	100%
	miles	

FIGURE 3-4: Total plan miles by classification type

in this plan and under what conditions they may be implemented. The City of Portland's Recommended Bikeway Network Map included with this plan shows the suggested assignment of facility types to bikeways. Note that on many roadways several facility types are considered as potential design treatments. This

reflects the need for more thorough analysis and consideration of each roadway's unique conditions, which is typically ascertained during a more advanced project phase. Even where only one facility is suggested, additional project development may result in changes.

3.2.5 Separated in-roadway bikeways

Separated in-roadway bikeways are used where motor vehicle traffic volumes or speeds are high. They include:

Bike lanes: The portion of a roadway designated by an eight-inch stripe and bicycle symbol that is protected by Oregon law for exclusive bicycle travel.

Wide bike lanes, buffered bike lanes, passing bike lanes and colored bike lanes: New bike lane types that achieve greater capacity and a more comfortable experience for bicyclists.

Cycle tracks: An exclusive bicycle facility adjacent to the roadway but separated from motor vehicle traffic by a physical barrier or other buffer.

Implementing separated in-roadway bikeways:

Separated in-roadway facilities may be constructed through stand-alone bikeway projects, roadway reconstruction, new roadway

construction or routine roadway resurfacing.

On existing roadways, separated in-roadway facilities may be implemented by one of four strategies – narrowing existing travel lanes, removing travel lanes, removing on-street parking or widening the roadway shoulder. Such strategies can be implemented only after consideration of impacts to all modes, including observation and forecasting of motor vehicle and bicycle volumes and parking utilization. Where there are competing demands for roadway space, policy and classification inform how these demands are managed and met.

3.2.6 Shared roadway bikeways

Shared roadway bikeways are intended to be implemented on lower volume roadways than separated in-roadway facilities. Except for enhanced shared roadways this facility type is intended to prioritize the movement of bicycles.

Bicycle boulevards: Streets with low motorized traffic volumes and speeds where bicycle travel is given priority and where signs, markings, traffic calming and other improvements are used to discourage through trips by motor vehicles and create safe, convenient bicycle crossings of busy arterial streets.

Advisory bike lanes: Non-compulsory dashed bike lane striping. Typically, a street



would have an advisory bike lane on each side and a central motor vehicle travel lane wide enough for a single motor vehicle. Bicycles have priority, but motor vehicles may enter the bike lanes to pass oncoming traffic. This facility type has not been tested in Portland at the time of the publication of this plan.

Enhanced shared roadways: Roadways where bicycles are not given priority but bikeway signage and markings are used to increase driver awareness of bicycles on the roadway and traffic calming devices and/or intersection crossing treatments enhance bicycle travel.

Implementing shared roadway facility projects:

The principal considerations for implementing shared roadway bikeways are:

- Minimize the impact of motor vehicle volumes and speeds on the bicycling environment
- Create safe and comfortable crossings of high-volume roadways
- Create minimal disruption to the continuous flow of bicycle traffic

Each type of shared roadway bikeways also has its own unique considerations, as identified below.

Bicycle boulevards are best developed in areas with especially high potential for bicycle use so that the presence of bicyclists themselves on the street becomes a significant design element. Bicycle boulevards are also best developed in areas where through motor vehicle traffic can reasonably be directed to other streets.

Advisory bike lanes reflect a different method for providing priority in a shared roadway environment. This is a facility type that may best be used on low-volume streets that may have higher traffic volumes and speeds than would be desirable for a bicycle boulevard, although this remains to be tested. They may also be useful in areas where there are few opportunities to direct motorists to other streets due to a lack of nearby parallel routes. They may be appropriate where a high density of cycling activity is not immediately expected.

The enhanced shared roadways facility type is used on relatively low-volume roadways where the horizontal or vertical alignment of the roadway exceeds the recommended parameters for bicycle boulevards or advisory bike lanes.

3.2.7 Trails

Trails are bikeways that are outside of the roadway and fully separated from motorized vehicular traffic. They provide bicycle connections along corridors poorly served by streets and link bicycle trip origins to



TRANSPORTATION OPTIONS

Comfortable bicycling conditions attract bicycle commuters



JONATHAN MAUS / BIKEPORTLAND.ORG

Cycle track, SW Broadway near P.S.U.





“Bicycle boulevards are becoming so popular that some appear to carry more bikes than cars along certain stretches and have become a central part of neighborhoods’ ambience.”

– Jeff Mapes, The Oregonian

destinations along continuous greenbelts near rivers or other natural areas, where appropriate, or in abandoned or active railroad right-of-ways. Most trails in Portland are shared facilities, accommodating bicyclists, pedestrians, skaters and other non-motorized users. The Bureau of Transportation’s preferred policy is to maintain separate and protected facilities for each mode whenever possible.

Additional description of trail types can be found in Chapter 3.5.

Implementing Trails:

Trails may be shared by bicyclists, pedestrians and other non-motorized users, but should provide physical separation of each activity when practical. They should be protected or grade-separated at intersections with major roadways and be identified through signage.

In May, 2009, Portland Parks & Recreation released its *Trail Design Guidelines for Portland’s*

*Park System.*² These provide comprehensive guidance on siting, design and construction of trails.

3.2.8 Interim bicycle facility improvements

When a corridor is being developed, it may not be feasible to construct the ultimate preferred bikeway facility, for a variety of reasons. Sufficient funding may not be immediately available, or a desired improvement may be constrained by external factors. In such instances, an interim bicycle facility is preferred to no facility, provided it meets minimum standards. However, once the barriers to full implementation are overcome, the roadway should be developed with the intended facility.

3.2.9 Design and engineering recommendations

3.2 A. Develop design guidelines for new bicycle facilities that will attract riders of all ages and abilities.

Specifically:

- Experiment with and evaluate new facility types identified in the Bikeway Facility Design: Survey of Best Practices (Appendix D) that are applicable to Portland to improve operating conditions and safety for bicyclists

² Available online at <http://www.portlandonline.com/parks/index.cfm?a=250105&c=38306>

- Explore opportunities to collaborate with other cities to share experiences and best practices with innovative bicycle facilities
- Identify funding and potential partners for the development of bicycle design guidelines
- Collaborate with Portland Streetcar and TriMet to develop design guidelines for areas where streetcar or light rail facilities intersect, or are in close proximity to bicycle facilities
- Develop bicycle facility design guidelines for freight districts that consider the operational needs of both bicycles and trucks
- Work with ODOT, FHWA and other applicable agencies to streamline and accelerate design, testing and authorization of innovative bicycle facility designs
- Develop a system for evaluating bicycle facility designs and improvements that compares vehicular mobility with bicycle access
- Use all available traffic management tools and methods to create and maintain sufficiently low automotive volumes and speeds on bicycle boulevards to promote a comfortable bicycling environment
- Develop specific interim improvement



designs that can be implemented where the preferred improvement is not immediately feasible

- Design improvements to meet multiple objectives, such as accommodating storm drainage, bicyclists and pedestrians
- Develop new designs for safe, comfortable and attractive bikeways that can carry more bicyclists
- Work with local, national and international transportation research entities to thoroughly and scientifically evaluate new designs
- Work with emergency service providers to develop traffic calming techniques on emergency access routes that allow appropriate emergency response times

3.3 BICYCLE PARKING

3.3.1 Introduction

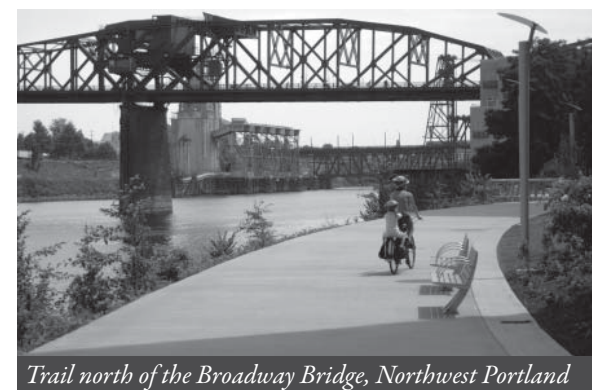
Bicycle parking is a key component of creating an attractive and functional bicycling network. Parking should be ubiquitous, convenient and secure, and complement the surrounding streetscape. The City of Portland has an opportunity to proactively respond to the parking needs of residents today as well as anticipate parking desires in the future.

Bicycle parking is implemented in Portland in one of three ways: as an initiative of the Portland Bureau of Transportation, through zoning code requirements and by way of non-required private initiative.

Portland's code¹ requires that new developments provide both short and long term bicycle parking.² The code also requires that buildings out of compliance with current code come into compliance with short-term requirements when they initiate a moderate improvement to the property.³

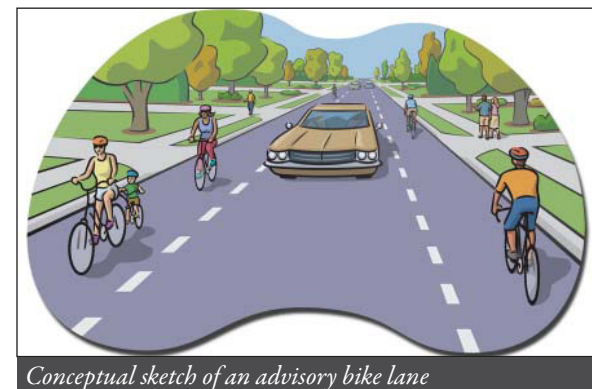
The Bureau of Transportation provides short-term bicycle parking in the public right of way

¹ Title 33.266.200
² Short-term bicycle parking refers to parking provided for visitors, customers, messengers and others expected to depart within two hours. Long-term bicycle parking is meant to accommodate employees, students, residents, commuters, and others expected to park more than two hours. This parking is to be provided in a secure, weather protected manner and location.
³ Title 33.258.070.D.1.d & 33.258.070.D.2.b.3



Trail north of the Broadway Bridge, Northwest Portland

JONATHAN MAUS / BIKEPORTLAND.ORG



Conceptual sketch of an advisory bike lane

MITCH FREY



Cycle track, SW Broadway near P.S.U.

JONATHAN MAUS / BIKEPORTLAND.ORG





Part Three: The bicycle transportation system

on an as-requested basis. Anyone can request bicycle parking in this manner. The Bureau of Transportation also manages the Bicycle Parking Fund, a code-established fund into which Portland property owners pay when they cannot satisfy their code requirements for short-term parking on-site.

Since the adoption of the 1996 *Bicycle Master Plan*, the City of Portland has developed a number of techniques to meet the increasing demand for bicycle parking and has installed thousands of short-term parking facilities throughout the city. Despite significant efforts and creative approaches to meet demand, Portland needs only to look to the world's best bicycling cities to see that bicycle parking demands must be anticipated and planned for comprehensively. As such, there remain significant opportunities to improve bicycle parking policies, programs and facilities, all which can help ensure that Portland's bicycle parking meets demand and increases the attractiveness of bicycling for both Portland residents and visitors.

3.3.2 Opportunities for building code improvements

One example of a potential improvement to the building code is found in the requirement for bicycle parking in multi-family dwelling units. Portland's 1996 *Bicycle Master Plan* proposed a minimum requirement of one long-

term bicycle parking space per multi-family dwelling unit. This recommendation was based on the fact that at that time 50 percent of all Portland residents owned a bicycle and more than half of those residents owned more than one bicycle. However, the code as ultimately adopted required only one space per four units and allowed long-term parking at multifamily complexes or dormitories to be inside a unit without supporting bicycle parking infrastructure or dedicated space.⁴

Most of the levels of bicycle parking recommended in the 1996 *Bicycle Master Plan* were reduced by the time they were adopted into code. As a result, the 1996 benchmarks of installing 10,000 commercial, residential and school-based long-term bicycle parking spaces within ten years and 20,000 spaces within twenty years will likely not be met.

In 2009, resident needs for bicycle parking are much greater than in 1996, with 70 percent of Portland residents owning one or more bicycles and sharp increases in the rates of bicycle commuting. Revising Portland's zoning code to increase the requirements for both short and long-term bicycle parking requirements will help meet the increasing demand for bicycle parking in new developments.

⁴ Title 33.266.220.B.2.d(7)

3.3.3 Bicycle parking needs in the public right-of-way

Much of the demand for bicycle parking is met through short-term parking. Short-term bicycle parking provides shoppers, clients, delivery persons, messengers and other visitors who generally park for two hours or less a convenient and readily accessible place to park bicycles.

Installations occur as a result of a community requests through the City's free Bicycle Rack Request Program. In response to such requests, the Bureau of Transportation will install staple racks within the right-of-way, usually on the sidewalk. Grouped parking facilities (bicycle parking corrals) are also installed on street surfaces in auto parking lanes to provide needed spaces in high demand locations.

TriMet has also developed guidelines to improve capacity and quality of bicycle parking at light rail stations and transit centers throughout the Portland region, although this parking is not necessarily provided within the public right-of-way.

Despite the City of Portland's efforts, there remains a significant deficit of public bicycle parking to serve the demand created by adjacent neighborhood, commercial or recreational land uses.



3.3.4 Bicycle parking qualities and innovation

City-provided bicycle parking within the right-of-way focuses primarily on function, rather than comfort or aesthetics. While the City does allow and grant permits for private installation of artistically designed ‘art racks’ they represent only a small fraction of all available parking.

In the future, Portland can create bicycle parking facilities that provide bicyclists with amenities such as improved signage, shelter, lighting or air pumps. Collaboration with local artists and designers can provide exciting opportunities to make public spaces and the bicycle parking more visible and attractive.

To ensure that bicycle parking within the right-of-way complies with City guidelines, the City of Portland must develop new protocols and instructional materials for the permitting and inspection of bicycle parking.

3.3.5 Bicycle parking in existing buildings

Only under limited circumstances does Portland’s building code allow the City of Portland to require that bicycle parking be provided at existing buildings, and then only for short-term parking. The requirement is triggered when a proposed remodeling project has an initial value greater than \$131,150 (as of 2009). As a result, many existing residential and

commercial buildings do not provide sufficient short or long-term bicycle parking.

One available incentive to provide bicycle parking is the Oregon Department of Energy’s Business Energy Tax Credit program. It encourages investment in energy efficient facilities such as bicycle parking. This program allows qualifying projects to take up to a 35 percent tax credit on the cost of the facilities.

Many Portland public schools also suffer from insufficient quantities of bicycle parking. Bicycle parking at schools is an important element in encouraging students to bicycle to school. However, as of 2009, programs like Safe Routes to School have no funding available to purchase and install bicycle racks.

3.3.6 Bicycle parking fund

In 2004, the City of Portland established the Bicycle Parking Fund to ensure that short-term, accessible bicycle parking would be provided within the right-of-way when insufficient room existed on private property. If a property owner can demonstrate that there is insufficient on-site space to provide the required short-term bicycle parking, the owner may opt to pay into the fund instead. In addition to funding bicycle parking in the right-of-way to serve contributing developments, the Bicycle Parking Fund may also be used to support bicycle parking improvements throughout the city.



Temporary event bicycle parking

CRISTAL MILLER



On-street bicycle parking corrals, Downtown Portland

BUREAU OF TRANSPORTATION ARCHIVES



Group bicycle parking improves visibility of facilities

JONATHAN MAUS / BIKEPORTLAND.ORG





Part Three: The bicycle transportation system

3.3.7 Bicycle parking recommendations

3.3 A. Seek changes to regulations to ensure all land uses provide ample bike parking and end-of-trip facilities.

Specifically:

- Amend Portland’s zoning code to increase short and long-term bicycle parking requirements, including prohibiting space within dwelling units, balconies or required open spaces not specifically designed for bicycle parking from counting towards long-term bicycle parking requirements
- Amend Portland’s zoning code to increase minimum short and long-term bicycle parking requirements at light rails stations and transit centers to reflect levels articulated in TriMet’s *Bicycle Parking Design Guidelines*⁵
- Amend Portland’s zoning code to require higher levels of short and long-term bicycle parking and shower/change facilities in high-demand areas, such as Bicycle Districts

⁵ TriMet, with input from regional stakeholders, has developed Bicycle Parking Guidelines. The guidelines consider station context and regional travel patterns, and are focused on three major factors for parking: location, amount and design. The guidelines will help TriMet and local jurisdictions determine the appropriate location, size and design of large scale bike-parking facilities, including RTP designated Bike-Transit Facilities.

3.3 B. Anticipate and provide adequate bicycle parking, especially at high-demand locations.

Specifically:

- Work with local business associations and other stakeholders to develop short and long term plans to address immediate and future bicycle parking needs
- Finalize policy and facility requirements for the approval and funding of on-street grouped bicycle parking facilities in metered and non-metered areas
- Develop programs and funding mechanisms to increase bicycle parking at public institutions (schools, campuses, civic centers and parks)
- Provide additional short term and covered bicycle parking at rail platforms and high demand bus stops in City of Portland rights-of-way and work with partner agencies to ensure adequate bicycle parking provision in non right-of-way locations
- Amend Title 17 (17.28.065.A) of the City code to allow the City Engineer to require that public improvement and streetscape plans provide grouped bicycle parking facilities in the right-of-way when demand merits
- Develop incentives and assistance to encourage private building owners to

purchase, obtain permit and install bicycle racks within the public right-of-way

- Develop strategies to increase the amount of covered and secure bicycle parking in City of Portland owned and privately owned parking garages in employment districts
- Revise special events permitting requirements to ensure that large events held in public spaces provide adequate short-term bicycle parking
- Establish City of Portland operated (or private/public collaboration) high capacity, automated bicycle parking facilities in high demand centralized locations

3.3 C. Ensure a high quality of function and design of bicycle parking.

Specifically:

- Review and revise existing design guidelines for the placement and design of bicycle parking on private property and within City of Portland rights-of-ways, including on-street grouped bicycle parking
- Ensure that guidelines for bicycle parking in the right-of-way address the preservation or enhancement of circulation space in the through pedestrian zone
- Review existing City approved rack types and develop guidelines for acceptable rack



designs

- Coordinate and communicate bicycle parking permitting requirements with City of Portland bureaus, other agencies and the business community
- Promote innovation in the design of bicycle parking facilities through partnerships with local artists, institutions and City of Portland bureaus
- Assess current levels of bicycle parking signage within Portland right-of-way and rail platforms, and develop a retrofit program for existing facilities
- Develop effective strategies to prevent bicycle theft

3.3 D. Encourage owners of existing buildings to upgrade bicycle parking.

Specifically:

- Develop materials and perform outreach to building owners and property managers, with information on potential funding sources, commercial benefits, tax credit opportunities and technical expertise on installation and preferred locations
- Develop a program to work with retail and business interests to increase short-term on-site bicycle parking in areas of Portland where on-street bike parking would be more

than 50 feet from the entrances to major retail venues

- Identify funding opportunities and develop programs to provide financial incentives that promote private party retrofitting of bicycle parking facilities at existing residential and commercial buildings

3.3 E. Establish a funding stream to fulfill future bicycle parking demand, improvements and maintenance.

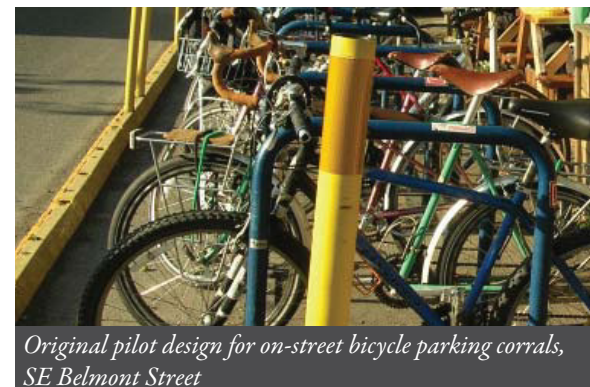
Specifically:

- Explore new funding mechanisms to finance increasing bicycle parking capacity throughout the city
- Develop a policy and funding mechanism to manage abandoned bicycles within the right-of-way
- Develop strategies to ensure that an inventory of City of Portland bicycle parking assets is current and accurate



Covered bicycle parking oasis, Hollywood Neighborhood

BUREAU OF TRANSPORTATION ARCHIVES



Original pilot design for on-street bicycle parking corrals, SE Belmont Street

BUREAU OF TRANSPORTATION ARCHIVES



On-street bicycle parking corral, N Mississippi Avenue

BUREAU OF TRANSPORTATION ARCHIVES





3.4 INTEGRATING BICYCLING WITH OTHER TRAVEL MODES

3.4.1 Introduction

A seamless integration of bicycling with other travel modes increases the potential for bicycling to serve all trip purposes and all trip lengths. Future improvements must integrate bicycling with public transit, intercity travel, taxis, car sharing and walking. Bike sharing also integrates the bicycle with other travel modes by allowing for multi-mode trips that begin or end with another travel mode.

Many issues arise when combining bicycles with other travel modes and actions are needed to strategically integrate bicycling with each mode.

3.4.2 Bicycling and public transit

By using transit for a portion of their trips, bicyclists have the option to avoid roadway segments with steep hills, difficult connections or other barriers to bicycling. For long trips, combining bicycling with transit can actually save more time than relying solely on either mode.

Since the first 1996 *Bicycle Master Plan* was adopted, significant progress has been made toward integrating bicycling with transit. Since then, more than 40 miles of new light rail and streetcar lines have been constructed and more than 125 miles of new bikeways have improved

connections to transit. Based on its policy objectives, the City of Portland adopted code requirements for bike racks and lockers at new light rail stations and transit centers. Long-term bicycle parking spaces at stations within the City of Portland increased almost ten-fold, from 24 in 1996 to 213 in fall 2009. All buses in TriMet's fleet are equipped with front bike racks. All MAX light rail vehicles are accessible to bicycles and 80 percent are equipped with bike hooks.

Taking a bicycle on transit was simplified when TriMet ended time-of-day restrictions and eliminated a permit requirement. However, as the number of Portland bicyclists has grown, so too has the demand for bicycle accommodation on buses and trains. Transit vehicles are increasingly unable to consistently accommodate bicycles, particularly during peak travel times.¹ Passenger frustration increases and using a bicycle for multi-mode commutes becomes less desirable.

Adding secure bicycle parking at transit stations is one strategy for reducing demand for taking bicycles on transit. In March 2009, TriMet committed \$1 million in federal stimulus funds to increase secure bicycle parking at transit stations by 65 percent. The 2035 *Regional Transportation Plan* designates regional bike-

¹ A survey performed by TriMet in 2007-2008 found that commuters traveling when trains are crowded accounted for 64% of bike-on-MAX trips.

transit facilities on both the bicycle and transit system maps. These are envisioned to be large scale bicycle parking facilities – ‘bike-and-rides’ – strategically located at transit stations across the region. TriMet, with input from regional stakeholders, has developed bicycle parking guidelines that consider station context and regional travel patterns. The guidelines will help TriMet and local jurisdictions determine the appropriate location, size and design of regional bike-transit facilities.²

Portland Streetcar

Bicycles are permitted on board the Portland Streetcar but there are no special accommodations for them. Bicyclists who take streetcar must hold onto their bicycles while onboard and may be asked to leave streetcars that become overcrowded.

Portland Aerial Tram

The Portland Aerial Tram is a unique component of Portland's public transportation system. The tram is owned by the City of Portland, which provides regulatory oversight and is responsible for maintaining the upper and lower stations, while Oregon Health & Science University oversees day-to-day operation of the tram. Bicycles are permitted on the Portland Aerial Tram, but there are no

² Regional bike-transit facilities proposed within the City of Portland include Goose Hollow MAX, PGE Park MAX, Lloyd Center MAX, Tacoma Street MAX, Gateway Transit Center, 122nd Avenue MAX, Rosa Parks Way MAX, Expo Center MAX, and Lents MAX.



bike racks or designated bike areas.

3.4.3 Integrating bicycling with intercity travel and other modes

Improvements are needed to better integrate bicycling with intercity travel, taxi travel, car sharing and walking.

Intercity travel by air, rail or bus often requires that bicycles be partially disassembled and boxed before shipping. Amtrak offers some trains with bike racks where bicycles can be transported without disassembly or boxing, but capacity is limited relative to the minimal size and capacity of the trains. For trips where transporting the bicycle is not necessary, providing secure long-term parking at Portland International Airport, Union Station and the Greyhound Bus terminal would make bicycling to intercity travel more desirable.

Most Portland taxis and car share vehicles are not equipped with bike racks. Increasing the number of vehicles with bike racks would provide greater options when travelling by bicycle.

In some areas, particularly Pedestrian Districts and Main Streets, secure bicycle parking allows bicyclists to easily access destinations in the district.

3.4.4 Bicycle integration strategies

The recommendations for integration address considerations in three general areas:

Bicycles on board transit

These recommendations address how the City of Portland can work with TriMet and other transportation providers to improve the convenience of bringing bicycles on board transit.

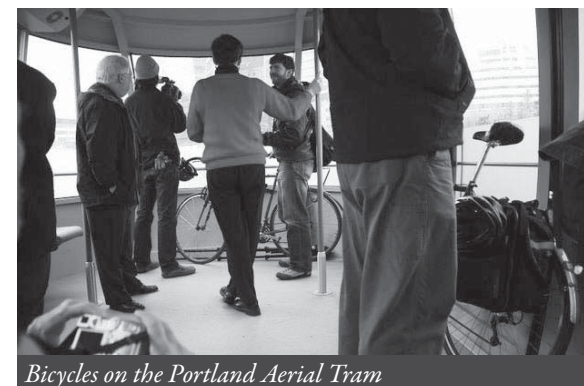
Parking bicycles to integrate with other modes

Many stations and transit centers either lack bicycle parking or experience demands that exceed supplies. Figure 3-5 illustrates TriMet MAX stations where 2009 bike boarding and bike parking are highest. Availability of bicycle parking does not match bike-transit travel patterns. For example, Goose Hollow and Pioneer Square North and South have a high number of bicycle boardings, but have no bicycle parking options available, whereas most stations on the Interstate Yellow Line and East Portland have available bike lockers and racks that have relatively low usage.

Bicycle parking improvements are needed to connect more residents with transit service. Convenient, secure and available bicycle parking allows passengers to bicycle to or from transit at the time of their choosing, without fear of vandalism or theft, and can provide



JONATHAN MAUS / BIKEPORTLAND.ORG



Bicycles on the Portland Aerial Tram

JONATHAN MAUS / BIKEPORTLAND.ORG



Bicycles parked at a Portland Streetcar stop

DENVER IGARTA





Part Three: The bicycle transportation system

Highest bike PARKING by station: (percent of capacity used)

- Hollywood TC / NE 42nd (100%)
- Rose Quarter TC (100%)
- Washington Park (100%)
- NE 60th (75%)
- Parkrose / Sumner TC (75%)
- Expo Center (50%)
- Kenton / N Denver (50%)

Highest bike BOARDINGS by station: (number bicycle ons & offs combined at peak hour)

- Goose Hollow (59)*
- Pioneer Square North / South (30)*
- PGE Park (19)*
- Galleria / SW 10th (Library) (17)*
- Old Town / Chinatown (13)*
- Rose Quarter TC / Interstate Rose Quarter (13)
- Washington Park (13)

*No long-term bike parking available

FIGURE 3-5: Highest bike parking by station

reliable and cost-effective access to transit for regular commute trips.

Secure bicycle parking will also make it possible

to bicycle at the start or end of intercity trips and to use car sharing conveniently.

Bicycle access to transit and other modes

Most transit centers and stations are served by multiple bikeways. However, access to some facilities from surrounding neighborhoods remains limited because of incomplete connections in the designated bikeway network. Where bikeways have been constructed near transit stations, access to these destinations will be enhanced by creating more direct bicycle routes or making safety improvements on existing routes. In 2009, there was direct access to only three transit centers via low-stress bicycle boulevards or trails (Hollywood TC, Gateway TC and Parkrose TC). Perceived safety also influences bike-on-transit trips - in TriMet's survey, 55 percent of bike passengers on MAX indicated that they brought their bicycle onboard to avoid busy or unsafe street segments.

3.4.5 Bike sharing

Bike sharing systems are automated, self-service bike rental systems that provide short-term access to a fleet of bicycles placed throughout a designated area. Bike sharing allows travelers who are not in possession of a bicycle to easily incorporate bicycling into a segment of a trip.

There are more than 100 bike sharing systems in Europe, but as of 2009, only two were

operational in North America. Systems vary widely in their levels of sophistication, intended users, cost and success. Although nonprofit organizations and universities run programs, local governments and transit authorities most commonly operate or sponsor bike sharing programs. Figure 3-6 shows the type of trips replaced by bike sharing trips in four major European cities.

Portland offers many advantages to a potential bike sharing system. For a North American city, Portland possesses an extensive network of bicycle facilities, while the Bureau of Transportation has a tradition of innovative bicycle programs. Portland's concentration of downtown jobs is surrounded by high-density neighborhood districts and provides an excellent market of potential users and bicycle trips.

Portland's high bicycle ridership will result in a successful bike sharing program. While bike sharing has had significant impact on bicycle mode share in large European cities like Paris and Barcelona, these cities began with significantly lower bicycle ownership rates and mode share rates than Portland. As of 2009, no city with a mode share equal or larger than Portland's has experienced a significant increase in mode share resulting from bike sharing. Given the high cost of bike sharing systems, it is prudent for the Bureau of Transportation to



analyze the cost-effectiveness of bike sharing compared to other strategies to meet the *Portland Bicycle Plan for 2030's* objectives.

3.4.6 Recommendations for integration of bicycling with other travel modes

3.4 A. Engage with partners to improve and simplify connections and transfers between bicycling and other travel modes.

Specifically:

- Engage TriMet and other transit providers to improve the reliability of 'bikes-on-board' options for routes that serve longer distance trips, including trips in future Streetcar and MAX corridors
- Encourage TriMet and other transit providers to retain capacity for 'bikes-on-board,' including during peak hours
- Collaborate with transit providers to develop additional options, including encouragement programs directed at use of expanded secure parking capacity for longer term expansion of mixed bike/transit trips
- Analyze how bike sharing programs might serve transit trips
- Encourage Amtrak and other inter-city carriers to add capacity and increase convenience for bringing bicycles on board

- Work with Portland International Airport, Union Station and the Greyhound Bus terminal to create bicycle assembly/packing areas
- Encourage taxi and car share companies to provide bike racks on vehicles
- Provide sufficient quantities of secure bicycle parking at High Capacity Transit stations
- Leverage streetcar signalization investments to assist perpendicular bikeway crossings of the streetcar corridor
- Fund and perform a study of bicycle-transit links at outlying transit centers and light rail stations to extend the efficient use of bicycles to all areas of the city
- Work with Portland International Airport, Union Station and the Greyhound Bus terminal to create more long-term parking such as lockers or other secure facilities that serve these terminals
- Evaluate the opportunity for a bicycle rental business at Portland International Airport
- Develop low-stress bicycle connections to targeted light rail stations and transit centers and create stronger bicycle-transit links at outlying transit centers and light rail stations to extend the bicycle access to all Portland neighborhoods



Bike sharing demonstrations, Laurelhurst Park

TODD BORKOWITZ



Bike rack on a TriMet bus

JONATHAN MALUS / BIKEPORTLAND.ORG





Part Three: The bicycle transportation system

Trip type replaced by BIKE SHARING:

	Paris	Barcelona	Lyon	London
Transit	65%	51%	50%	34%
Walk	20%	26%	37%	21%
Car / motor-cycle	8%	10%	7%	6%
Bicycle	NA	NA	4%	6%
Taxi	5%	NA	NA	NA
No travel	NA	NA	2%	23%

FIGURE 3-6: Trip type replaced by bike sharing

- Ensure that the bikeway network serves High Capacity Transit stations
- Ensure that the design of High Capacity Transit stations and transit centers facilitates easy transfer between different modes, including way-finding, signage, pavement striping and curb cuts

3.4 B. Explore bike sharing systems.

Specifically:

- Analyze the cost effectiveness of bike sharing systems
- Collaborate with TriMet and Portland State University to explore a bike sharing system with multiple partners

3.5 A GREEN NETWORK

3.5.1 Introduction

In the Vision for the *Portland Bicycle Plan for 2030*, “Portland’s cohesive tapestry of bikeways forms the hub of a vibrant regional active transportation network.” This chapter explores the importance of an interconnected green network as a foundation to this low-stress system.

The green network as described here consists of both off-street and on-street elements. The heart of the network is the regional connected trail system. Feeding the trail system are streets with park-like features. Together, these green corridors connect neighborhoods, parks, commercial districts, schools, natural areas and transit. They provide vegetated connections that help improve air and water quality and contribute to a healthy environment. A recent study linked access to opportunities to be active in such green settings to multiple health benefits.¹ Portland’s green network builds on a legacy that was created more than a century ago by John C. Olmsted, who identified a system of parkways, boulevards and parks to better connect Portland residents to nature.²

¹ “The mental and physical outcomes of green exercise,” J. Pretty et al., *International Journal of Environmental Health Research*, October 2005; 15(5): 319 – 337; accessed at http://www.greenexercise.org/Views_of_Nature.html

² Identified in the “Report to the Portland Park Board,” The Olmsted Brothers, 1903





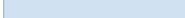
The iconic nature of major trail corridors can transform the transportation environment for bicycling and walking. On a smaller scale, opportunities to enhance the green network can be created using dedicated bicycle connections that link on-street facilities through key Portland parks. Trails, including both paved and natural surface facilities, can also provide good bicycle connections. Finally, bicycle facilities can be successfully integrated with green streets (as discussed in 3.5.6), developing roadways that foster urban ecology to help create a cleaner environment while adding to the bikeway network. Within each of these elements of the green network there are opportunities to expand and enhance Portland’s bicycle facilities network.

3.5.2 The regional trail network

Trails are a key factor in creating a network of low-stress bikeways to attract residents to bicycling. They offer an opportunity to ride a bicycle without the stress of interacting with motorized traffic. Many trail corridors have minimal street crossings, offering an opportunity for efficient bicycle travel to and from areas that may be otherwise difficult to serve solely by the on-street network. During the public comment period of the *Portland Bicycle Plan for 2030*, there was tremendous support for advancing the major trail corridor projects identified in the plan.



Portland regional trail network

-  Existing
-  Proposed
-  Highway/Arterial Street
-  Parks and Open Spaces
-  Waterways



This map shows the network of regional trails open to bicycles, and includes off-street and some on-street trail segments. This map is adapted from the Portland Parks & Recreation's Multi-use Regional Trail System map.





Part Three: The bicycle transportation system

"A connected system of parks and parkways is manifestly far more complete and useful than a series of isolated parks."

- The Olmsted Brothers, *Report to the Portland Park Board*, 1903

The Portland Parks & Recreation's 2020 *Vision*³ identifies trails as Portland Parks & Recreation's most heavily used resources, which "create an interconnected regional and local system of paths and walks...." Trails can serve as transportation and recreation, affording residents of all ages and abilities to exercise, relax, socialize and view wildlife, while travelling to desired destinations.

Portland Parks & Recreation identifies three trail types: regional trails, community connectors and local access trails. Most of the trails in the bikeway network in this plan are classed as regional trails in the Portland Parks & Recreation system. The extent of the Portland Parks & Recreation Regional Trail Network is shown on the map in this chapter entitled 'Portland Regional Trail Network.' The map shows only those trails where bicycles are permitted. Regional trails, which include both off street (paved and natural surface)

³ Available online at <http://www.portlandonline.com/parks/index.cfm?c=40182>

and on-street trails, connect to adjacent communities and significant natural features. Portland Parks & Recreation envisions regional trails "connecting people to each other and to the natural beauty of our city." Community connectors link important areas, typically using street rights of way, with local access trails that frequently run through parks, community centers and school sites.

Portland Parks & Recreation's *Recreational Trails Strategy*⁴ identifies the key benefits of trails and provides guidance to complete the vision of an interconnected parks system. It acknowledges that trail projects are complex undertakings requiring many partners, land acquisitions or agreements and significant funding. The Portland Parks & Recreation's trail funding strategy matches that of the *Portland Bicycle Plan for 2030* by identifying the need for Portland to be creative and opportunistic for when unique funding sources become available.

Regional opportunities for trails

In 2008, Metro convened a committee of civic, business and elected leaders to 'think big' about trails in the metropolitan region. The Blue Ribbon Committee for Trails released its recommendations in November of 2008

⁴ Available online at <http://www.portlandonline.com/PARKS/index.cfm?c=42627&a=120478>

in a report⁵ that includes a section called *The Special Case for Greenways*. According to the report, "Greenways are the premier travel corridors for walking and riding because they are safe and fast, and because they offer a natural experience that is removed from the noise and frenzy of the urban environment." Based on the recommendations of the Blue Ribbon Committee, Metro began developing an active transportation strategy to increase the region's effectiveness in securing funding to complete a region-wide network of on-street and off-street bikeways and walkways integrated with transit and supported by educational programs. Such a system would allow bicycling to become a practical and preferred option for average residents. It would provide new options for walking, including trails connected to neighborhoods and safe pedestrian crossings. The system would allow people to bicycle and walk to transit, schools, employment centers, parks, natural areas and shopping.

In 2009, Metro and other partners formed the Intertwine Alliance, a partnership of public and private organizations and businesses working collaboratively to connect and promote the region's green spaces. The Intertwine is the connected network of parks, trails and natural areas in the Portland, Oregon and Vancouver,

⁵ "The case for an integrated mobility strategy: Walking and biking offer immediate opportunity to tackle key challenges," Blue Ribbon Committee for trails final report, November 2008



Washington region. It provides opportunities to preserve natural areas, open spaces, water and wildlife habitat and to encourage recreation, connection to nature and active transportation like walking, running and bicycling.

It appears that new sources of funding for active transportation may be available in the future. Metro and other regional partners will remain important allies in aligning resources for development of the regional trails network with Portland's boundaries.

3.5.3 Bicycle facilities in Portland parks

Portland's extensive park system provides opportunities to expand Portland's bicycle network while supporting the goals of Portland Parks & Recreation's *2020 Vision* and Metro's Intertwine Alliance. Parks are often destinations for bicyclists and can provide connectivity to on-street bicycle facilities. They can also provide a safe and comfortable off-street environment for residents seeking to experience the fun of bicycling.

Dedicated bicycle connections through key Portland parks

Many parks have paved paths that are used by bicyclists as well as all other park users, including people walking, parents pushing prams and small children. Many of these routes were designed as park-scale paths, intended for multiple uses and low-speed travel. Such paths,

while available to bicyclists, are often not suited to high volumes of bicyclists or bicycling at typical roadway speeds.

In some cases, dedicated bicycle connections through parks have the potential to provide key connections for bicycle routes. Providing dedicated bicycle connections through parks requires addressing considerations of siting and design that are specific to their intended use and the expected volumes and speeds of users.

Collaboration between Portland Parks & Recreation and the Bureau of Transportation, in the development of this plan, has provided identification of key opportunities for extending the bicycle network through existing parks. This plan recommends classifying as City Bikeways more than a dozen new routes that pass through existing parks, adding new linkages to Portland's bicycle network.⁶

3.5.4 Off-road bicycling on natural surface trails

This plan recognizes the potential of off-road bicycling⁷ on natural surface trails to contribute to transportation as well as recreation, by attracting residents and introducing them to the pleasures of bicycling on natural surface trails.

⁶ In one location, Irving Park in Northeast Portland, the Bureau of Transportation has agreed with Parks & Recreation to recommend removing the City Bikeways classification through Irving Park and classifying a new bicycle route at the park's perimeter.
⁷ The term 'off-road bicycling' was chosen by the working group that addressed this subject area for the Portland Bicycle Plan for 2030 to refer to the sport or activity sometimes called 'mountain biking.'



JONATHAN MAUS / BIKEPORTLAND.ORG



TRANSPORTATION OPTIONS

Bicycling on the Leif Erikson Trail, Forest Park



ANNA LAXAGUE





Part Three: The bicycle transportation system

Natural surface trails provide bicyclists safe places to exercise and enjoy the natural environment. Particular benefits include:

Making connections: The ability to link natural surface trails with other bicycle-friendly facilities, such as multi-use trails or on-street bicycle facilities, will get more bicyclists riding more often.

Fun: Natural surface trails provide a unique respite from the uniform order of engineered riding surfaces and allow users to enjoy experiences that come from being on a variety of trails - from wide to narrow, smooth to rough, to high on a hillside overlooking a river.

Connection to nature & escape: Natural surface trails are enjoyable precisely because they are found in natural areas, parks and undeveloped open spaces. Trail riding gives bicyclists the opportunity to escape for the moment from society and enjoy the simple realness of being active in the outdoors.

3.5.5 Trail considerations

Trails, by their nature, typically separate bicyclists from motorized vehicles, but often allow shared use between bicyclists and pedestrians. As these latter users have different travel speeds and behaviors, adequate consideration should be given to the expected

volume of bicycle and pedestrian traffic to better ensure the safety of each. Appropriate design and engineering should create adequate trail width and provide separated facilities, where appropriate. Special care should be taken specifically where bicycle and pedestrian facilities intersect or overlap. Portland's trails should meet Portland Parks & Recreation's *Trail Design Guidelines for Portland's Park System*⁸ to ensure proper siting, design and construction of these facilities.

Natural surface trails

Unlike paved trails, the accepted guidelines for natural surface trails sometimes allow them to be placed in the landscape where topographic constraints prohibit an improved-surface facility. Valuable transportation connections can therefore be made that would otherwise not be possible. Not only are the placement criteria of natural surface trails more flexible than for paved trails, but the implementation costs are typically ten percent of an engineered, improved facility. Lower costs increase the value of natural surface trails, as they can meet the transportation and recreation needs of users at a small fraction of the budget for other types of dedicated non-motorized routes.

Operation and maintenance of natural surface trails, even if professionally designed to avoid

⁸ Available online at <http://www.portlandonline.com/parks/index.cfm?a=250105&c=38306>

and minimize soil erosion, stormwater runoff and other environmental impacts, will be different from operation and maintenance of paved trails. While paved trails may cost more to install and have a bigger initial footprint, some natural surface trails will have use impacts associated with mechanical erosion and compaction from hikers, bikers or equestrian users that will need to be managed over time to a greater degree than a paved surface. While operation and maintenance costs may be less for natural surface trails, they may be more than paved trails if heavily used or located in environmentally sensitive areas.

Natural surface trails can be the preferred option when environmental constraints preclude a wide, impervious surface trail, provided they are sited, constructed and signed to avoid and minimize impacts. Properly designed, narrow natural surface trails do not focus stormwater runoff, can be easily routed around large trees, and can minimize the removal of vegetation.

Singletrack trails

Singletrack natural surface trails offer additional recreational opportunities to attract residents to bicycling. These trails require users to travel in single file, allowing users a closer and more aesthetic connection to nature – an experience that cannot be replicated on wider trails.



3.5.6 Green streets

Green streets are significant components of Portland's green network and can provide on-street connections to nature in areas where site constraints limit the ability to create wide parkways or boulevards.

As defined in Portland's *TSP*, a green street is a street that:

- Manages stormwater on site through use of vegetated facilities
- Creates attractive streetscapes that enhance neighborhood livability by helping to calm traffic by introducing park-like elements into neighborhoods
- Serves as an urban greenway segment that connects neighborhoods, parks, recreation facilities, schools and main streets⁹

The *TSP* contains a policy objective under Policy 6.3, 'Transportation Education', to "Educate citizens and businesses about green streets and how they can serve as urban greenways to enhance, improve and connect neighborhoods to encourage their support, demand and funding for these projects."¹⁰

A comprehensive green street approach is an important development strategy to reduce

⁹ Portland Transportation System Plan, p. 2-179
¹⁰ Objective G, *ibid*, p. 2-4

On-street GREEN STREET Connector Concept:

"This map shows how Portland's primary open space assets could be connected together into a comprehensive network. ... there might be strategic advantages in linking together ... the river, public parks and recreation with natural trails. Such an interconnected 'nature-to-city and city-to-nature' system could then become a part of a seamless user experience. ... Thinking about networks in this manner also helps us imagine new roles and ways in which streets can function."

- Arun Jain

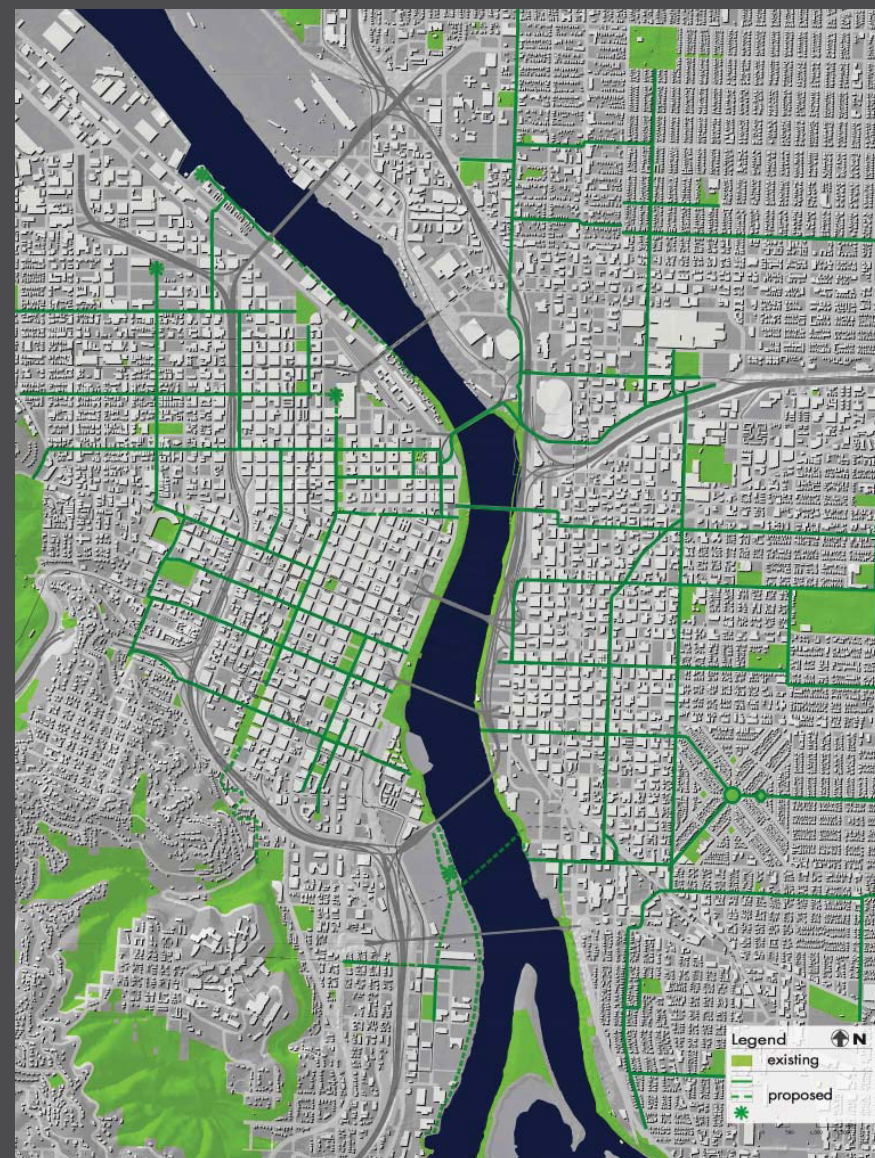


FIGURE 3-6: On-street Green Street Connector Concept





Part Three: The bicycle transportation system

polluted stormwater entering Portland’s rivers, divert stormwater from the storm sewer system and increase urban green space. In 2007, Portland City Council approved a green street resolution, report and policy to promote and incorporate the use of green street facilities in public and private development.

The green streets effort has resulted in various grant funding that is available to pay for green infrastructure facilities that manage stormwater, preserve or mimic the natural hydrologic cycle, control flow, improve water quality, enhance livability and provide other environmental benefits. These grants have funded many bicycle and pedestrian improvements that serve surface stormwater purposes.

The Portland Bureau of Environmental Services (BES) is considered a national leader in green streets design and has developed a robust green streets program that results in the creation of numerous green street facilities throughout Portland. Coordination between BES and the Bureau of Transportation (and other bureaus) is occurring regularly on a project-by-project basis and the City’s bureaus take an interdisciplinary approach to collaborating on Portland’s shared public infrastructure investments.

Green street opportunities

Green street projects are highly compatible with bicycle boulevards and other shared roadways

where traffic calming devices are desirable, and BES and the Bureau of Transportation have worked together to develop innovative improvements. Green street features can be designed to achieve multiple objectives, serving the needs of stormwater management, traffic calming, bicycle and pedestrian transportation, recreation and urban forestry. Opportunity exists for still greater collaboration between BES, Portland Parks & Recreation and the Bureau of Transportation in these areas in order to best leverage public spending and accomplish these varied objectives.

The vision of connected urban greenways on streets has informed a number of efforts in Portland, including initial development of the urban design framework for the *Portland Plan* project (Figure 3-6) and the early-stages green connectors work of the Bureau of Environmental Services. One model of an integrated urban greenway system can be found in Vancouver, B.C., which adopted the *Vancouver Greenway Plan* in 1995.¹¹ Vancouver defines a greenway as a “linear public corridor that connects parks, nature reserves, cultural features, historic sites, neighborhood, and retail areas, often along either natural corridors like river or ocean fronts or along rail rights-of-way or streets shared for transportation use.” Further development of urban greenways on public streets in Portland could be addressed in

¹¹ <http://vancouver.ca/greenways/>

the *Portland Plan* process.¹²

Green street challenges

Surface stormwater features installed in curb extensions have many benefits. As with any curb extension, careful consideration must be given to future development and transportation demand, including planned bike lanes or cycle track improvements.

Portland’s *Stormwater Management Manual*¹³ is a part of BES’s *Administrative Rules* that has established the requirements for stormwater management. The manual sets a threshold: projects of 500 square feet or more of impervious area are required to address stormwater management. This threshold can present challenges for some relatively small transportation improvements designed to improve bicycle or pedestrian safety.

3.5.6 Green network recommendations

3.5 A. Collaborate with Metro and other partners to realize a coordinated regional network of greenways.

Specifically:

- Prioritize the project development of Portland’s regional trails network

¹² Such a plan would take into account that the Bureau of Environmental Services is developing green streets one watershed basin at a time.

¹³ Available online at <http://www.portlandonline.com/BES/index.cfm?c=47952>



- Fund project development of major trail corridors in concert with Metro's The Intertwine effort so that these projects will be ready for implementation when construction funding becomes achievable in the future
- Further the development and enhancement of existing and proposed regional multi-use trails
- Advocate for regional networks to include Major City Bikeways, including bicycle boulevards
- Ensure that trails on Major City Bikeways are designed with appropriate separation between bicyclists and pedestrians
- Coordinate with the Oregon Department of Transportation and others to provide bicycle access in areas where on-street bicycle facilities are not available or the opportunities for providing them are constrained

3.5 B. Work with advocates for bicycling on natural surface trails and natural resources advocates developing strategies that increase opportunities for bicycling on natural surface trails, while protecting the natural environment and enhancing pedestrian safety.

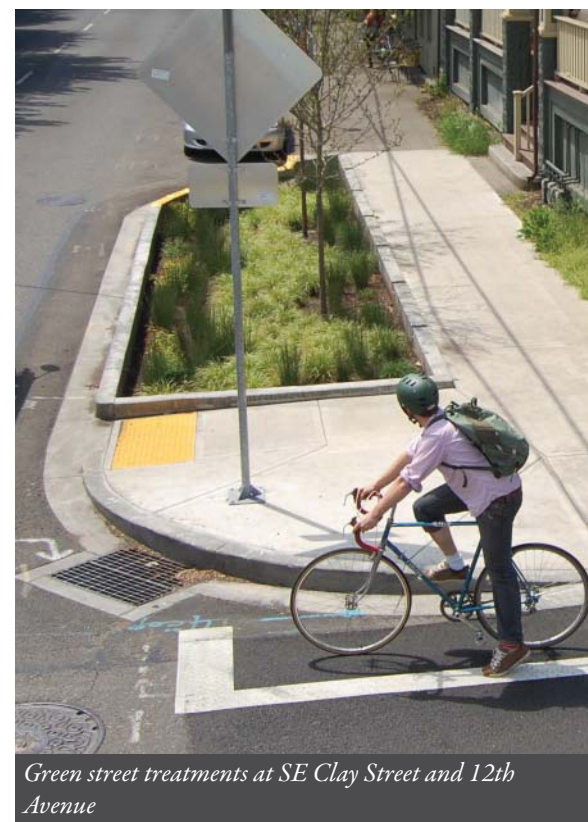
Specifically:

- Develop a map showing potential opportunities and alignments for bicycling on natural surface trails in Portland and the metropolitan region, integrated with existing and proposed recreation and non-motorized transportation facilities, with a particular focus on providing opportunities for neighborhoods that are underserved by other bicycle facilities
- Evaluate the potential for parallel natural surface trail alignments on existing or proposed non-motorized transportation facilities
- Further the development and enhancement of existing and proposed natural surface trail facilities, such as the proposed Gateway Green project
- Formalize relationships with advocacy groups for bicycling on natural surface trails and engage them in the planning, development, construction and on-going maintenance of natural surface trails and facilities

3.5 C. Ensure that green street features and bicycle transportation improvements are mutually supportive.



Potential SE Clay Street green street treatments



Green street treatments at SE Clay Street and 12th Avenue





Specifically:

- Refine how bicycle and pedestrian improvements are considered in applying the *Stormwater Management Manual*
- Develop cost-effective green (stormwater) treatments for bicycle boulevards, such as semi-diverters and curb extensions with bicycle pass-throughs
- Ensure that street improvements meet both stormwater and transportation objectives
- Seek innovative ways to integrate traffic calming, pedestrian, bicycle and stormwater designs
- Coordinate planned green street improvements with planned bicycle and pedestrian improvements at the pre-planning stage

3.6 OPERATIONS AND MAINTENANCE OF THE BICYCLE NETWORK

3.6.1 Introduction

Operation and maintenance of the bicycle network is as important as the initial construction to ensuring the comfort and safety of bicyclists. It is also critical to gauge the maintenance needs of new bicycle facilities, particularly innovative designs, to ensure that the appropriate resources are available to sufficiently maintain these new investments. Circumstances have made this difficult for the City of Portland over the last decade.

Between 2001 and 2009, transportation revenue declined and the Bureau of Transportation cumulatively cut \$68 million and 70 full time positions from its General Transportation Revenue (GTR) budget. These cuts have reduced the level of service of maintenance and contributed to an increase in unmet need, defined as the amount of additional funding and resources needed to bring a given asset class to acceptable condition and maintain it at that level.

On January 28, 2009, City Council passed Resolution No. 36672, which set new policy direction for the Bureau of Transportation to reduce services on local streets. This policy direction was implemented so that the Bureau

could focus its resources on maintenance of the busier streets that carry the most traffic, transit and commercial vehicles.

As new revenues become available, maintenance and preservation of existing transportation assets will be a priority.

3.6.2 Improving and preserving bicycle facilities

The *Portland Bicycle Plan for 2030* proposes many miles of new bikeways and will require the Bureau of Transportation to collaborate with other bureaus and agencies to leverage funds for system expansion of the bikeway network. Routine street maintenance and capital projects that renovate Portland streets provide unique opportunities to complete Portland's bicycle facilities in an efficient and cost-effective way. Collaborating on efforts to restripe, repave or enhance traffic controls on roadways will significantly reduce the time associated with developing the bikeway network.

Shared roadways, such as bicycle boulevards, employ a range of street treatments to calm motor vehicle traffic, treat stormwater and create attractive, aesthetic amenities. While prefabricated street features may help the City of Portland meet its bicycle network goals more efficiently, the impact of these prefabricated street features on maintenance is unclear.



The Bureau of Transportation’s Maintenance Operations group is consulted when introducing new bikeway designs and technology, and when identifying construction and maintenance costs. The *Portland Bicycle Plan for 2030* promotes a strategy for introducing new bicycle facility designs and concurrently evaluating long-term maintenance requirements.

3.6.3 Routine maintenance of bicycle facilities

Maintaining the spaces where bicyclists operate is essential to ensuring bicyclist safety and riding comfort. Hazards along the roadside, such as debris, improperly designed drainage grates, potholes, overgrown vegetation and loose gravel can endanger bicyclists. Poor maintenance can increase the likelihood of conflicts between bicyclists and motorists. For example, when accumulated debris is allowed to remain in bike lanes and paved roadway shoulders – as it is often prone to – it forces bicyclists to use a travel lane.

Gravel used during snow and ice events can present serious hazards in bike lanes. The presence of gravel on a roadway has a disproportionate impact on bicyclists, and the Bureau of Transportation’s Maintenance Operations group prioritizes streets with bike lanes when performing gravel recovery after a snow or ice event.

Preventive maintenance on paving or pavement overlays can create seams within a bike lane that present a hazard to bicyclists. If the entire roadway is not repaved, then aligning the pavement seam with the bike lane striping is the approach that has the least impact on bicycle operations.

3.6.4 Temporary bicycle facilities during construction

When construction activities in the roadway affect bikeways, safe and convenient detour routes through or around the construction zone should be established. Appropriate detour signage for both bicyclists and motorists should be placed where bikeways merge with travel lanes. Construction and detour signs should be located outside of the operating area of bicycle lanes consistent with procedures outlined in the *Manual of Uniform Traffic Control Devices*.

Specific guidance on proper design to preserve bicycle access during construction is also provided in Portland’s *Bikeway Design and Engineering Guidelines* and the *Oregon Temporary Traffic Control Handbook*.



Maintenance crews get creative with bike rider symbol

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Snow creates challenging bicycling conditions

JONATHAN MAUS / BIKEPORTLAND.ORG



Faded bike lane markings

BUREAU OF TRANSPORTATION ARCHIVES





“The more we shift auto trips to bicycling and walking, the less wear and tear we will see on our roadways. Along with the added benefits of lowering vehicle emissions and keeping local dollars in the local economy, it’s a bargain by any measure.”

- Mayor Sam Adams

3.6.5 Operations and maintenance recommendations

3.6 A. Improve and preserve existing bikeways.

Specifically:

- Explore opportunities for adding or enhancing bicycle facilities in street rehabilitation and signal maintenance projects
- Develop a strategy for funding a program to maintain special bicycle features and bicycle boulevards on local service traffic streets
- Conduct periodic assessment of signal operation in key bicycle, transit and freight corridors
- Maintain street lighting on bicycle facilities and in pedestrian zones to ensure safety
- Maintain roadway shoulders in areas

currently lacking other bicycle and pedestrian facilities

- Explore prefabricated street features, including doweled pedestrian islands and medians, assess installation and maintenance costs
- Standardize signage and pavement markings for bikeways and develop a strategy and funding for maintaining them
- Formalize a system for ensuring that on-street bicycle parking facilities (such as bicycle parking corrals) are maintained and that maintenance agreements with adjacent businesses are kept current
- Investigate costs and resources needed to ensure that off-street public and privately owned bicycle parking facilities are maintained
- Seek funds to perform tree trimming that will enhance the performance of streetlights on bicycle routes

3.6 B. Develop maintenance practices that minimize physical hazards for bicyclists.

Specifically:

- When maintaining streets with bike lanes, install needed pavement overlays to cover the entire roadway surface or locate paving seams to align with bike lane striping

- Ensure that drainage inlet grates are bicycle safe through installation and maintenance standards
- Maintain roadside vegetation and drainage facilities such as ditches and swales to forestall hazards for bicyclists and pedestrians
- Create educational materials to inform property owners of their responsibilities to maintain vegetation and gravel driveways on their property
- Give priority to streets with bicycle facilities when recovering gravel following snow and ice events
- Develop a strategy to fund ongoing maintenance of existing and future bikeways through public parks

3.6 C. Accommodate bicyclists through construction zones.

Specifically:

- Ensure accommodation of safe and direct bicycle traffic as part of construction traffic control plans
- Ensure appropriate signing in advance of and through construction zones, including as a condition of street use permits
- Provide training on proper bicycle accommodation for right-of-way and construction inspectors



3.7 BIKEWAYS IN PORTLAND'S CENTRAL CITY

3.7.1 Introduction

Portland's Central City is the economic and transportation hub of the metropolitan area and is expected to accommodate much of the region's future population growth. Its density results in multiple roadway demands and creates significant challenges to building a safe and comfortable bicycling environment. The success of the *Portland Bicycle Plan for 2030* depends on seamlessly integrating the bicycle into this mix.

Bicycling in the Central City is escalating as more residents, workers, shoppers and other visitors discover bicycling as an efficient means of transportation. Given its short block lengths, off-street paths and slow-moving traffic, the Central City should be an ideal place to bicycle.

Portland has the highest bicycling 'commute-to-work' rate of any major U.S. city, and bicycle traffic on the four bicycle-friendly bridges into downtown Portland¹ more than doubled between 2000 and 2008. As the Central City increasingly becomes a place where people live, work and play, there will be more bicycle trips within it – increasing the demand for safer and more comfortable bicycle facilities.

¹ Include the Broadway Bridge, Burnside Bridge, Hawthorne Bridge and Steel Bridge.

3.7.2 World-class bicycling conditions in Portland's Central City

The primary impediment to increasing bicycle use in Portland's Central City is the difficulty of finding enough roadway area to create comfortable on-street conditions bicycling due to the extensive amount of roadway dedicated to automobile movement and parking.

About half of all bikeways proposed for Portland's Central City in the 1996 *Bicycle Master Plan* have been implemented. The projects that have been deferred are primarily bike lanes that would have required removing either travel lanes or on-street parking.

Of the 146 miles of streets downtown, 24 miles have bike lanes and another 11 miles are designated bicycle boulevards or have parallel off-street paths. Travel to most destinations downtown requires bicyclists to share the roadway with motor vehicles.

Significant actions are needed to improve bicyclist safety in the Central City. Best practices from other world-class bicycling cities illustrate the importance of creating separation, whenever practical, between bicyclists and motorists.

Bicycling potential in the commercial core

A key finding from the Cycle Zone Analysis (see Appendix C) was that, citywide, the areas



Accumulated gravel creates hazardous bicycling conditions

BUREAU OF TRANSPORTATION ARCHIVES



Marked bicycle detour around construction

JONATHAN MAUS / BIKEPORTLAND.ORG



Bicyclists in traffic on NE Broadway

JONATHAN MAUS / BIKEPORTLAND.ORG





Part Three: The bicycle transportation system

with the greatest potential for achieving a high bicycle mode share were downtown Portland and the Lloyd District. These two areas, in addition to the River District between them, form Portland’s commercial core.

As the primary business district in the region, downtown Portland should accommodate bicyclists of all skills and abilities. Bicycle travel in downtown Portland occurs on shared roadways where bicyclists must mix with automobiles, transit and pedestrians. Many experienced bicyclists find downtown Portland streets to be adequate without separate bicycle facilities due to the generally slow traffic speeds (12 to 16 miles per hour). However, traffic conditions on downtown streets are often intimidating to the ‘interested but concerned’ bicyclist that the *Portland Bicycle Plan for 2030* aims to attract. A greater level of separation will be required to attract these people to bicycling.

The Central Eastside Industrial District

The character of the Central Eastside Industrial District is distinct from other districts within the Central City. It is classified in the *Transportation System Plan* as a Freight District. It is an area of predominantly light industrial uses with a mix of office, wholesale and retail establishments. There are destinations within the district that attract trips, and many trips pass through the district as well. Automobile parking demand tends to exceed supply within

the district. Some district stakeholders report observing people parking free in the district to walk or bicycle to downtown.

Bicycle transportation for workers within the district has the potential to reduce the demand for automobile parking. Bicycle facilities within the Central Eastside Industrial District should be designed with particular sensitivity to the movement of trucks.² Stakeholders within the district agree that on-street bicycle parking is a good solution where it is installed by request and with the approval of adjacent business and property owners.³

Some bicycle transportation improvements at the south end of this district are being planned in conjunction with construction of the Portland-Milwaukie Light Rail project.

3.7.3 Central City recommendations

3.7 A Make Portland’s Central City superlatively bicycle-friendly.

Specifically:

- Create Bicycle Districts in Downtown, the River District and the Lloyd District

- Use existing and innovative engineering tools to create conditions welcoming to bicyclists throughout the Central City

2 SE 3rd Avenue is intended to accommodate both truck loading activities and bicycle travel, and any project development will respect the needs of both.

3 Central Eastside Bicycle Plan Workshop,” summary notes from a workshop held in the Central Eastside Industrial District on September 4, 2009; available online at <http://www.portlandonline.com/transportation/index.cfm?c=50736&>



"When I got a bike I must have been the happiest boy in Liverpool, maybe the world. I lived for that bike."

- John Lennon



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Part FOUR





Part Four: Programs to support bicycling



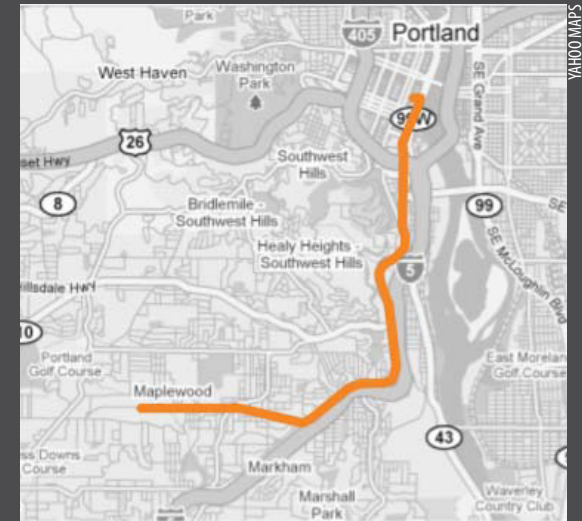
Neighborhood:
ASHCREEK

Reason for bicycling:
Commutes to work because it's the **RIGHT THING TO DO** - and it's a good year-round challenge.

Favorite Portland bicycling event:
THE WORST DAY OF THE YEAR RIDE

"Portland is such a great cycling city because most drivers here are aware of cyclists and recognize cycling as a valid and important transportation option. I love it that so many more people are commuting now and riding on nights and weekends than was the case when I started cycling again in 1996."

**Bicyclist
PROFILE**
Dean





4.1 ENCOURAGING BICYCLING

4.1.1 Introduction

Encouragement strategies are vital components of bicycling infrastructure projects. Portland has proven successful in developing innovative encouragement strategies resulting in a variety of projects and programs that reach a broad spectrum of Portland residents and visitors. Because of its comprehensive promotional, educational and encouragement strategies, Portland has seen dramatic increases in bicycle trips in conjunction with the expansion of its bikeway network.

The primary purposes of encouragement strategies are to:

- Reach out to Portland’s ‘interested but concerned’ residents to help make bicycling their first choice for transportation
- Attend to the service and information needs of current bicycle riders to help them ride safely and comfortably while making bicycling even more convenient

Equity in encouraging bicycling

Despite the cost savings and health benefits of bicycling, many people who could bicycle choose not to, particularly among communities of color and those who are economically or otherwise disadvantaged. In 2009, the Community Cycling Center in Portland

undertook a project called ‘Understanding Barriers to Bicycling’.¹ They began partnering with organizations serving communities of color in North and Northeast Portland in order to understand the cultural and economic barriers to bicycling and to design a pilot project to overcome those barriers. The Bureau of Transportation will benefit by incorporating the lessons learned from this effort into its encouragement projects and programs.

4.1.2 Promotion and encouragement overview

Encouragement programs are designed to motivate ‘interested but concerned’ residents to ride a bicycle confidently and securely. These programs help residents view bicycling as a reasonable transportation option and give them the opportunity to try bicycling in a low stress and safe setting. By participating in these programs residents gain more bicycling experience. With experience comes confidence, and with confidence bicyclists will ride in more varied settings. Ultimately, they become regular bicyclists and will maximize the number of trips they make by bicycle rather than driving.

Basic encouragement strategies incorporate:

- Service
- Behavior change

¹ More information about the project is available online at <http://www.communitycyclingcenter.org/index.php/understanding-barriers-to-bicycling/>



TRANSPORTATION OPTIONS

Transportation Options offers free bicycling and walking maps, and valuable travel information



JONATHAN MAUS / BIKEPORTLAND.ORG

Young bicyclists learning proper helmet use





Part Four: Programs to support bicycling

- Awareness
- Incentives

Each strategy addresses the primary subjective reasons why Portland residents choose not to ride a bicycle for transportation and aims to raise the comfort and safety for those who already choose to ride.

4.1.3 Services

Services mainly focus on increasing safety and convenience for current riders. Services enable current riders to increase the number and quality of trips they take by bicycle. Bicycling services are provided by numerous public agencies, non-profit organizations, volunteer groups and businesses.

Maps, information and trip planning

Bicycle maps that indicate bicycling routes and treatment types are a basic service for bicyclists. The City of Portland regularly updates, prints and distributes free bicycle maps for different areas of Portland. In 2008-2009, the Bureau of Transportation distributed approximately 90,000 bicycle and walking maps, all of which are also available free online. The City of Portland also publishes a guidebook on bicycling in Portland and develops bicycle safety curricula for children.

Other agencies, organizations and businesses publish the following material that the City of

Portland distributes:

- A guide to Oregon laws pertaining to bicycling
- A brochure on proper bicycle helmet fitting
- Instructions for children on safe riding skills and techniques
- A calendar of bicycling events and rides

Trip planning and information:

Trip planning tools offer assistance for new and experienced bicyclists planning a bicycle trip. An online tool called 'bicycle.org' is available for area bicyclists. It uses the Google Maps interface and Metro's region-wide Bike There map to provide route information for users. As inputs are limited, more advanced input choices, such as topography, traffic speeds and type of bicycle facility, would allow bicyclists to better assess ideal routes. Interface improvements would allow route information to be accessed by a broader audience of Portland bicyclists.

The City of Portland manages a maintenance request and information phone line that allows residents to leave a message and get questions or requests answered. The City of Portland also offers bicycle trip planning through its SmartTrips program, where residents can obtain a personalized bicycle trip plan, either by phone or by email.

Bicycle trip planning and bicycle facility maintenance request forms should be offered in more formats, similar to what transit agencies provide to their customers. The *Portland Bicycle Plan for 2030* promotes a 24-hour, 7-day-a-week phone or automated trip planning service with emergency roadside assistance for flat repair and other bike maintenance issues.

Containing the City of Portland's enhanced customer service and information options in one interactive website would serve as a main internet portal for Portland bicyclists. While the interface meets current needs for offering Portland's online maps, an overhaul is necessary to make it a more useful tool to promote Portland bicycling.

Transportation Management Associations:

Transportation Management Associations (TMAs) play a key role encouraging transportation options in large employment areas. TMAs provide customized, employer-based programs and information to increase cycling and other transportation alternatives. The Lloyd District TMA offers high-level customer service by providing a storefront for commuter information and offering individual consultations to its employers and employees. It also provides businesses information on attracting more customers to their stores by bicycle. Similarly, the Swan Island TMA publishes information specific to the Swan



Island employment center on optimal bicycle and transit routes.

Consistent funding is often a challenge for TMAs and staffing is a significant cost. The *Portland Bicycle Plan for 2030* promotes a program to help more TMAs succeed in Portland.

Equipping bicyclists

The City of Portland does not offer programs that provide bicycles or equipment for bicyclists, but other organizations have programs that could benefit from City of Portland support. These programs include free bicycles for low-income adults and children, bicycle education on urban cycling and free lights and locks for low-income residents.

Fleet bicycles

Encouraging businesses to promote the use of bicycles for work trips can positively impact costs to employees and employers while increasing mobility and fleet efficiency, particularly in a dense urban environment such as downtown Portland. Several Portland businesses and agencies have piloted or implemented bicycle fleets, and the City of Portland should partner with these organizations to learn more about the benefits of fleet bicycles. Tax breaks, policies and other incentives for encouraging fleet bicycles would help promote future investment.

4.1.4 Behavior change

The City of Portland tests, adopts and expands programs to promote long-term changes in the transportation habits of Portland residents, workers and students. These programs focus on offering information and providing hands-on experience to encourage bicycling and other transportation options as alternatives to driving.

City of Portland programs aimed at creating lasting changes in behavior include:

SmartTrips Residential Program

Reaching 20,000 to 30,000 Portland households per year, SmartTrips invites Portland residents to order bicycling and other transportation options information and participate in neighborhood bicycle rides and workshops. The program has successfully reduced single-occupant driving trips by almost nine percent annually since it began in 2003.

Offering the SmartTrips program in each district within Portland every five years would more effectively provide Portlanders with transportation information such as updates to Portland's bicycle network and bicycle shop locations, and changes to bicycle-relevant traffic laws. Expanding SmartTrips to include personal consultations with a City transportation options 'ambassador' would further address household-specific needs, questions or concerns regarding transportation options.



Learning bicycle handling skills at Sunday Parkways

TRANSPORTATION OPTIONS



JONATHAN MAUS / BIKEPORTLAND.ORG



Approaching a bicycle cut-through

BUREAU OF TRANSPORTATION ARCHIVES





Part Four: Programs to support bicycling

SmartTrips Business Program

Portland employers who join the SmartTrips Business Program are provided transportation options information and free consultations to encourage commute alternatives to driving. The Bureau of Transportation contacts businesses directly about the program. The *Portland Bicycle Plan for 2030* promotes that all employers subject to Oregon's Employee Commute Options rule execute a SmartTrips program at least every five years and provide transportation options information to new employees.

All major employers should also incorporate a transportation options kit into their new employee orientation to increase commuter options awareness and internalize the program into the orientation process. Employers offering transportation options materials should provide new employee SmartTrips kits.

SmartTrips to School

In 2009, 70 of 73 Portland public elementary and K-8 schools offered the parents of 2nd and 5th grade students an opportunity to order free transportation options materials and incentives through the SmartTrips to School program.

Initiating a SmartTrips College program would reach a broad, mobile portion of Portland's population that is often willing to bicycle. The Bureau of Transportation piloted a SmartTrips

program in partnership with Portland State University in 2007 and 2008 to evaluate student transportation needs. This partnership revealed that marketing and program implementation must be successfully targeted to entice college students to participate. Colleges and universities often have distribution and communication networks in place that SmartTrips can utilize, so that a SmartTrips College program that provided appropriate training would enable the institutions to administer the program internally.

New Resident SmartTrips

A SmartTrips program for new residents offers an opportunity to provide information on transportation options to residents who are new to Portland. This program should include opportunities for new residents to meet with a transportation options 'ambassador' to address household needs, questions or concerns regarding transportation options.

Bicycle Commute Challenge and other large-scale encouragement events

The Bicycle Transportation Alliance (BTA) annually orchestrates a free Bicycle Commute Challenge for area employers to compete with other employers for the highest level of employee bicycle commuting over a one-month period. As part of this event, the BTA offers bicycle commute workshops and invites participants to track their progress on a web-

based trip diary. In 2008, over 1,000 Portland area employers and over 10,000 commuters participated. Participants logged 1.2 million miles biked in September 2008!

The BTA and other bicycle-friendly organizations conduct numerous other large-scale encouragement events.

Personalized bicycle training

Potential bicyclists often benefit from relationships with co-workers, friends and relatives who already bicycle. This personal contact allows new bicyclists to learn and to experiment while having strong support and encouragement. Several organized and impromptu efforts exist in Portland to create mentor relationships or 'buddy programs' between new and experienced bicyclists who do not already know one another.

The City of Portland has developed and administered several small-scale bicycle training efforts for adults that are conducted primarily in group settings. These efforts include:

Women on Bikes: A free, annual training and encouragement program specifically for women.

Portland By Cycle: A free, annual educational and encouragement program for novice bicyclists.



Bike Champions: A pilot project that offers incentives for downtown commuters who encouraged their co-workers to ride a bicycle for transportation.

Biking is Back: A program aimed at allowing seniors to try comfortable and stable three-wheeled bicycles and encourages empowerment in transportation and health decisions.

The City of Portland does not offer bike safety clubs or bike camps for children. However, organizations like the Community Cycling Center offer these programs to teach safe riding skills and give low-income students the opportunity to earn a free bike, helmet and lock by meeting specific learning and safe-bicycling objectives. Offering similar clubs to more area schools and similar camps in more Portland neighborhoods would attract youth to bicycling programs. Increased funding for bicycle give-aways and scholarships for bicycling camps would allow more low-income youth to take advantage of the programs.

Culturally specific classes and rides can aid novice bicyclists from diverse backgrounds in becoming familiar with cycling in Portland. The City of Portland offers bicycle rides, clinics and Safe Routes to School volunteer trainings in Spanish to reach the growing community of Spanish-speaking Portland residents. Increased

classes and trainings in additional languages should make bicycling more accessible to Portland residents that speak English as a second language.

4.1.5 Awareness

Bicycling awareness programs alone do not typically create regular bicyclists, but they inform residents about how to bicycle in a safer, more convenient and comfortable manner. It is critical that bicycling infrastructure, services and behavior encouragement programs are promoted through awareness activities.

Outreach events

The Bureau of Transportation is invited to conduct outreach and promote bicycling and transportation choices at approximately 70 annual Portland area fairs and events each year. Public demand for staff time and materials exceeds current staff capacity. In 2008, Transportation Options staff was unable to fulfill approximately 40 requests for staff presence. The *Portland Bicycle Plan for 2030* recommends increasing outreach staff to allow the Bureau of Transportation to expand its participation in community awareness events for bicycling.

The Bureau of Transportation's most visible outreach event, Sunday Parkways, began in 2008. For this event the City of Portland hosts a variety of healthy physical activities in area



Raising bicycling awareness at the Providence Bridge Pedal

TRANSPORTATION OPTIONS



Group bicycle training

TRANSPORTATION OPTIONS



Public outreach

BUREAU OF TRANSPORTATION ARCHIVES





Part Four: Programs to support bicycling

parks, then links the parks with streets closed to automobiles. Sunday Parkways provides Portland residents an opportunity to safely recreate in their own neighborhood by walking, biking, running or rolling along the route to activities in the parks and to nearby shops and businesses. In 2008, the first Sunday Parkways event in North Portland took place on six miles of Portland streets which connected four parks. In 2009, Sunday Parkways were held in three Portland areas - North, Northeast and Southeast. For 2010, five events are planned. Delivering more Sunday Parkways events throughout warm weather months would raise awareness about bicycling and healthy activities, and provide Portland residents an opportunity to bicycle in an automobile-free environment.

Many other Portland organizations also help raise bicycling awareness. Shift, a non-profit organization self-described as a “loose-knit and informal bunch of bike-loving folks,”² hosts many popular bicycling events in Portland. Its monthly Breakfast on the Bridges event began as a way to thank bicycle commuters by offering them free coffee and donuts on the Steel and Hawthorne bridges. This event, entirely organized by volunteers and funded primarily via donations, has significant impact on bicycling awareness and has gained national notoriety from numerous articles, blog posts

² <http://www.shift2bikes.org/whoWeAre.php>

and films. Local groups like Shift organize more than 3,000 bicycle rides and events annually, which significantly raise bicycling awareness. While the City of Portland often partners with organizations for specific events, the *Portland Bicycle Plan for 2030* promotes the creation of formal policies to provide ongoing support to valuable community efforts.

Visibility campaigns

Visibility campaigns can take many forms. Public service announcement campaigns that include billboards, bus and transit advertisements, and television and radio spots can be effective at raising specific issue awareness. Portland has received positive public response from past road safety campaigns such as See and Be Seen and Eye to Eye’

Media coverage is also important in raising awareness about bicycling. A Portland State University student research study found a statistically significant correlation between increased media exposure and the number of bicyclists crossing Portland’s Willamette River bridges. While bicycling can also garner negative media, the study revealed that the number positive articles about bicycling far surpassed the number of negative articles.

Increased internet presence, through websites sponsored by either the City of Portland or community organizations, is key to

increasing bicycling visibility. Local blogs like BikePortland.org, for example, can convey current local bicycling issues to Portland residents while increasing international visibility of these issues. A stronger internet presence will also allow the City of Portland to offer its free bicycling maps online to increase their visibility. The *Portland Bicycle Plan for 2030* promotes an expansion of the City of Portland’s web portal, PortlandOnline,³ to have a more unique and interactive internet presence to increase the visibility of Portland bicycling.

Research, conferences and presentations

Portland has been both host and initiator of several prominent bicycling conferences. The Portland Bike Summit in 2006 convened Portland residents, bicycling advocates and government agencies to discuss and plan for bicycling in Portland. The World Carfree Cities International Conference, the Safe Routes to School National Conference and the Pro Walk/Pro Bike Annual Conference are other bicycling-related conferences that Portland has hosted. Bicycling organizations select host cities like Portland because of its internationally recognized reputation for cycling and walking. Portland bicycling reaps the benefits from this exposure locally, nationally and abroad.

Portland bicycling also benefits from research

³ <http://www.portlandonline.com/>



and academic endeavors in Portland, such as Portland State University’s Initiative for Bicycle & Pedestrian Innovation and the Oregon Transportation and Research Educational Consortium. Portland is often used by classes as a living laboratory to study bicycling issues and inspire new research that promotes bicycling.

Academic interest in bicycling issues in Portland ultimately has led to an increase in guest speakers coming to Portland to discuss bicycling. Bicycling presentations, whether general commentary or technical research, add to Portland’s collective knowledge on bicycling and further illustrates Portland’s reputation as a world-class bicycling city.

Advocacy and awards

There are several major bicycling advocacy groups with a core of dedicated activists committed to working with government agencies and the business community to advocate for better bicycling infrastructure and programs in Portland and throughout Oregon. The Bicycle Transportation Alliance (BTA) is the largest with 5,000 members statewide and 4,000 members in the Portland metropolitan area. The Portland Bicycle Advisory Committee (PBAC) advises and makes recommendations on bicycling policy, planning and projects for the City of Portland. The Northwest Trail Alliance (formerly Portland United Mountain Pedalers) advocates for trails

and infrastructure for mountain bike riders.

The Bureau of Planning and Sustainability recognizes businesses with significant and unique achievements in sustainability at its annual Businesses for an Environmentally Sustainable Tomorrow (BEST) Awards. The goal of the awards is to inspire the business community by showcasing innovation and commitment to sustainability. The *Portland Bicycle Plan for 2030* promotes the recognition of businesses for innovative sustainable practices, particularly if they result in an increase in bicycling.

4.1.6 Incentives

Incentives for bicycling are often focused on commuting and energy efficiency. For example, the City of Portland offers employees the opportunity to earn an additional \$38 (2009) each month for bicycling to work for 80 percent of all scheduled workdays, which matches the City’s transit subsidy. The *Portland Bicycle Plan for 2030* promotes utilization of similar bicycling subsidies at other workplaces.

Portland businesses can also take advantage of commute incentives by offering bicycle commuters up to \$20 each month in tax-free incentives for qualifying expenses. Also, the State of Oregon’s Business Energy Tax Credit (BETC) program allows employers to take a 35 percent tax credit when they invest in energy



Bicycling visibility campaigns

TRANSPORTATION OPTIONS



TriMet 'Bikes and Transit' presentation, 2008

JONATHAN MAUS / BIKEPORTLAND.ORG



Steering Committee Co-chair Jay Graves, Congressman Peter DeFazio, BTA's then-Executive Director Scott Bricker and Cycle Oregon's Jerry Norquist at a BTA awards event

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Part Four: Programs to support bicycling

efficiency strategies such as installing bicycle parking. Encouraging businesses, particularly in congested employment centers, to take advantage of state and federal incentives for bicycling commuters will help increase the number of bicyclists. While Oregon's BETC program has had some success at encouraging private sector programs that benefit bicycling, a City of Portland tax credit program could be tailored to the specific needs of Portland businesses and bicyclists to effectively increase private investment in bicycle improvements.

4.1.7 Recommendations for encouraging bicycling

4.1 A. Expand the City of Portland's offering of maps, information and trip planning to encourage new bicyclists and increase convenience for those who are already riding.

Specifically:

- Offer free transportation options information, such as New Resident SmartTrips, to new Portland residents
- Continue and expand developing bicycle maps in multiple languages
- Expand distribution of bicycling and walking maps to airports, transit stations, libraries, grocery stores and hotels
- Continue offering free bicycling and

walking map updates to residents, businesses and community organizations

- Offer more online interactive mapping features
- Provide regular updates on detours and traffic along popular bicycling routes
- Collaborate with regional agencies, including TriMet and Metro, to develop an online, interactive bicycle route planning tool
- Create a single website for accessing bicycle trip planning and customer service and as a repository for information like the City of Portland's bicycling maps
- Develop an interactive online map of bicycle parking
- Continue partnerships with current Transportation Management Associations (TMAs) and work with the business community and other organizations to help initiate new TMAs

4.1 B. Support programs to increase access to bicycles.

Specifically:

- Increase City of Portland support, including technical and funding support, to expand programs that help low-income Portland residents gain access to equipment

necessary to bicycle safely and comfortably

- Develop and market information and materials to encourage employers to initiate or expand fleet bicycle programs
 - Seek creative methods to engage communities in underserved areas by coupling encouragement and education with facility development
- ### 4.1 C. Expand programs that promote long-term changes in the transportation habits of Portland residents by encouraging bicycling.

Specifically:

- Offer the SmartTrips program in all Portland districts every five years
- Expand the SmartTrips Business program to promote bicycling and transportation options to Portland businesses more effectively, and partner with local agencies such as Metro, TriMet and the Department of Environmental Quality (DEQ) on outreach to Portland employers
- Collaborate with Portland schools to offer SmartTrips material to all parents of 2nd and 5th grade students
- Offer SmartTrips programs to 8th and 11th grade students, promoting age-appropriate transportation options and bicycling information



- Develop a SmartTrips program for new Portland residents
- Support participation in events that encourage bicycling for transportation, or support other goals and policies in the *Portland Bicycle Plan for 2030*
- Develop a pilot program to provide personalized bicycle training opportunities for novice riders
- Assess the best methods for developing a Portland citywide personalized training program
- Explore specific culturally-specific classes and rides to help novice bicyclists with varied cultural backgrounds get familiar with bicycling in Portland
- Develop partnerships with community organizations to provide bicycle training and education to residents with whom the City of Portland does not sufficiently engage

4.1 D. Continue to raise the awareness of bicycling and reinforce safe bicycling behaviors.

Specifically:

- Increase outreach staff to meet demand for bicycle and transportation options encouragement and education

- Offer additional Sunday Parkways and create a model for sustainable program funding
- Continue and expand partnerships with organizations promoting bicycling
- Ensure bicycling remains visible to the public through public campaigns, media coverage and a strong internet presence
- Increase support for conferences and research by partnering with organizations and sponsoring bicycling-related academic work
- Increase partnerships with local advocacy groups and support award programs that promote bicycling in Portland

4.1 E. Investigate strategies for providing incentives to bicycle.

Specifically:

- Encourage more employers to offer financial or other incentives to employees who bicycle to work
- Develop marketing materials to educate employers on federal and state credits for energy efficiency efforts which include promoting bicycling
- Explore the development of a City of Portland business tax credit program for bicycle-related investments



City of Portland's bicycling and walking maps



Sunday Parkways maps



Breakfast on the Bridges event





Part Four: Programs to support bicycling

4.2 SAFETY EDUCATION AND ENFORCEMENT

4.2.1 Introduction

During the process of developing the *Portland Bicycle Plan for 2030*, one theme often heard was the need to address unsafe bicyclist behavior. As more Portland residents begin bicycling, appropriately targeted safety education and enforcement will become critical elements and primary measures in developing a world-class bicycling city.

Since adoption of the 1996 *Bicycle Master Plan*, bicycling in Portland has become safer. The bicycle crash rate decreased significantly as bicycle ridership increased. An increase in safety is also reflected in crash data for Portland’s entire transportation system – as bicycling has become safer, so too has walking and driving. The conditions that improve bicycling transportation also improve overall safety. While nationwide and statewide traffic fatalities were decreasing in 2009, Portland’s fatality rate was declining six times faster than the national average and three times faster than the Oregon average. Regardless, concern for safety remains a significant barrier to increasing bicycling in Portland.

Safety education related to bicycling is divided into the following categories:

- General driver education, including the dangers of speed and driving under the influence, as well as compliance with traffic control devices
- Driver education specific to interactions with bicycles, including general awareness of sharing the road, how to safely pass, when to yield and how to safely overtake cyclists on the road
- Education specific to bicycling, including safely sharing the road, traffic laws and proper roadway positioning, such as navigating intersections

Traffic enforcement coupled with engineering, education and encouragement efforts is integral to bicycle traffic safety. Bicycle traffic enforcement efforts should encourage safe and lawful travel by strategically targeting high-risk behavior and locations, maximizing education benefits and focusing on community partnerships and communication. Balancing traffic enforcement with bicycle safety education and encouragement efforts will improve road safety for bicyclists, motorists and pedestrians while helping the City of Portland reach its goals for mode share, climate action and energy-reduction associated with bicycling.

4.2.2 New objectives for safety education and enforcement

The *Portland Bicycle Plan for 2030* develops

new objectives and related action items to improve road safety, promote bureau and agency collaboration and create traffic enforcement strategies pertaining to bicycling.

Bicycle crash data

Bicycle crash data is a key component of identifying potentially unsafe conditions for bicyclists. For example, the Portland Bureau of Transportation’s safety specialists analyze available crash data and discover that crashes are clustered in specific corridors and are particularly frequent at some intersections. Using this data, the Portland Bureau of Transportation is able to prioritize funds to redesign problematic intersections and increase education efforts for road users about the safety issues at intersections. For example, the Bureau of Transportation’s ability to experiment with bike boxes, new roadway treatments that allow bicyclists to move to the front of traffic queues at signalized intersections, is in part due to the analysis of crash data that identified problematic intersections for bicyclists.

There are four main repositories for bicycle crash data used by transportation safety specialists to evaluate crashes.¹ Increased reporting detail, particularly for less severe crashes, will provide the Portland Bureau of

¹ See 2007 Existing Conditions Report, Chapter 6 Safety; available online at <http://www.portlandonline.com/transportation/index.cfm?c=50736>



Transportation a better understanding of bicycle problem spots and will aid in creating more responsive policies and facilities that lead to safer bicycling conditions.

In addition, reports from roadway users and local stakeholders can also serve as valuable information when crash data does not reveal any immediate safety concerns. For example, bicyclists reported concerns about potential right-hook crashes at the N Interstate Avenue and N Greeley Avenue intersection before crash data showed any potential problems. In 2007, three crashes (with one fatality) occurred there within a six-month period. Crash data alone was not sufficient for identifying the intersection before crashes occurred, but bicyclists' reports were beneficial in redesigning the intersection and launching an education campaign about right-hook crashes.

Investigation of bicycle crashes

Full investigations of crashes that result in ambulatory injuries or worse to bicyclists and pedestrians will allow the Bureau of Transportation to develop more effective strategies to help prevent these crashes. Lack of data about bicycle crashes, particularly ones that do not involve an automobile, presents a gap in the Bureau of Transportation's understanding of the causes and proper actions needed to lower or eliminate bicycle crashes.

Efforts should be made to increase information gathering and distribution about bicycle crashes that do not involve contact with an automobile. These bicycle crashes include single crashes with a stationary object (like with a railroad track, with other bicycles, with a pedestrian or 'run-off-the-road' crashes).

4.2.3 Road safety

A key component of road safety is traffic speed. Higher automobile traffic speeds result in greater severity of crashes, particularly for bicyclists and pedestrians. As automobile speeds increase from 25 to 35 miles per hour, for example, pedestrian fatalities increase from 5 percent to 65 percent.² Bicyclists are equally vulnerable (see Figure 4-1).

By law, the Oregon Department of Transportation (ODOT) is responsible for establishing speed zones on all Oregon highways. Oregon cities and counties are not allowed to set or change speed limits but may appeal speed-related zoning recommendations to the State of Oregon's Speed Zone Review Panel. This system significantly limits Portland's ability to control speed limits to make streets safer and more attractive for bicycling.

The City of Portland's *Transportation System Plan* calls for reducing local traffic speeds

² Source: Portland Bureau of Transportation



Portland Police at an I Share the Road event



Traffic law enforcement





Part Four: Programs to support bicycling

Motor vehicle impact speed, stopping distance and **LIKELIHOOD OF FATAL OR SERIOUS INJURY** to a vulnerable roadway user:

<i>Impact speed (Miles per hour)</i>	<i>Stopping distance</i>	<i>Likelihood of injury</i>	
		<i>Percent fatal</i>	<i>Percent serious injury</i>
20	110 feet	0%	0%
25	150 feet	5%	65%
30	200 feet	45%	50%
35	250 feet	65%	33%

FIGURE 4-1: Likelihood of fatal or serious injury to a vulnerable roadway user

through enforcement and design in designated high-density Main Streets, Regional Centers and Town Centers³ to levels that are safe and comfortable for bicyclists and pedestrians. With more control over speed limits, the City of Portland will better achieve regional and local objectives while creating improved conditions for bicycling.

4.2.4 Safe Routes to School

Safe Routes to School is a partnership between the City of Portland, schools, neighborhoods, community organizations and agencies. These partners advocate for and implement programs to make walking and biking around our schools fun, easy, safe and healthy for all students and families in Portland. For the 2009-10 school year the Bureau of Transportation will offer Safe Routes to School programming to 70 elementary and K-8 schools throughout

³ As identified in Metro's 2040 Growth Concept

Portland. The number of participating schools and the type of programming they will receive for the 2009-10 school year include:

- 25 Portland schools will receive the comprehensive Safe Routes to School programming, including:
 - o Family friendly map of the safe bicycling and walking routes in the school's neighborhood
 - o Traffic enforcement support from the Portland Bureau of Transportation and the Portland Police Bureau
 - o Encouragement support from the Portland Bureau of Transportation's staff, which includes the SmartTrips to School individualized marketing program for parents, volunteer trainings for community members interested in promoting walking and biking at

their school, and assistance with special events such as International Bike and Walk to School Day

- o Educational programming such as child passenger safety seat education for grades K-1, pedestrian safety education for second graders and bike safety education for 5th graders
- o Engineering strategy report prepared by the Portland Bureau of Transportation's staff and targeted safety improvements, such as crosswalks, speed bumps and bicycle parking installation
- 15 Portland schools receive everything but the engineering strategy report and targeted safety improvements
- 30 Portland schools receive the Safe Routes to School map, enforcement support and encouragement support

4.2.5 Other safety education efforts

The City of Portland has several programs to address bicycle safety education:

Classes, campaigns and public service announcements

The City of Portland, other agencies and local organizations conduct a variety of efforts designed to educate and raise awareness about traffic and bicycle safety issues.

The Share the Road Safety Class was developed



for drivers, pedestrians and bicyclists who have received a citation for a traffic violation. The class is a collaborative effort with Multnomah County Courts, the Portland Bureau of Transportation, the Portland Police Bureau, and the Legacy Emanuel Trauma Nurses Talk Tough program. The class focuses on traffic laws and safety issues as they relate to bicyclists, pedestrians and motorists traveling in the public right-of-way. Individuals who have been cited and who successfully complete the class may be eligible to receive a dismissal of their conviction or a sentence of discharge (conviction entered but no fine) for their citation.

The Share the Path campaign is the City of Portland's educational effort aimed at increasing safety and comfort of the city's multiple-use trails. In addition to creating a well-distributed brochure, the campaign has staged several outreach events to educate trail users on bicycle and pedestrian safety. Share the Path followed the City of Portland's I Share the Road campaign to raise awareness about traffic safety and the numerous travel modes sharing the right-of-way.

The City of Portland also conducts Public Service Announcements (PSAs) that are often aimed at raising awareness. These are disseminated through various media outlets, the City of Portland's website, billboards, bus shelters, benches and posters.

Specific motorist and bicyclist education

Several opportunities exist to increase bicyclist and motorist education on traffic safety. Many public and private employers require or offer driver training for their employees. Exploring partnerships to shape the curriculum to include bicycle-specific information for motorists presents a unique educational opportunity to a group of road users that the City of Portland does not have direct access to. This also could help reach drivers who live outside of Portland but drive or ride a bicycle in Portland.

Another opportunity to educate road users about traffic safety occurs when new infrastructure projects are built. Road users may already be receptive to new messages because the built environment has changed. For example, the Portland Bureau of Transportation and the Portland Police Bureau conducted an educational campaign about intersection safety in conjunction with the construction of bike boxes at several high-crash intersections.

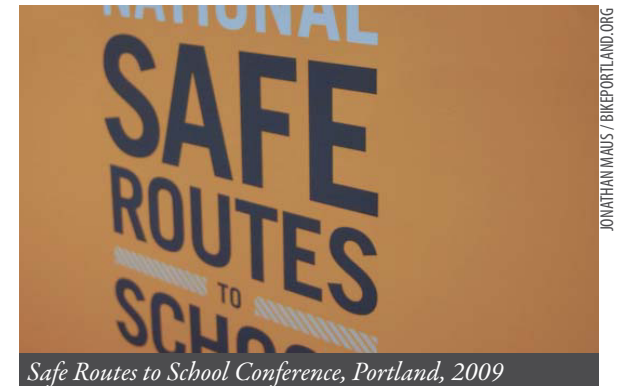
Bicycle helmet safety

Oregon law requires bicyclists 16 years of age or younger to wear a bicycle helmet. The Portland Bureau of Transportation collaborates with several community partners and Portland Public Schools to conduct the Safe Routes to School program and highlight the importance of helmet use for children. While adults are not required by law to wear a helmet, the City



Steering Committee Co-chair Mia Birk on Bike and Walk to School Day

BUREAU OF TRANSPORTATION ARCHIVES



Safe Routes to School Conference, Portland, 2009

JONATHAN MAUS / BIKEPORTLAND.ORG



'I Share the Road' event

ELEEN VANDERSICE





Part Four: Programs to support bicycling

of Portland encourages helmet use as research consistently shows a reduction in traumatic and fatal injuries when a bicyclist in a crash is wearing a helmet. The Portland Bureau of Transportation distributes an ODOT brochure that demonstrates proper helmet fitting. In addition, several Portland Bureau of Transportation maps and bicycling brochures have information regarding helmet use and encourage all bicyclists to wear one.

The Portland Bureau of Transportation has tracked helmet use in Portland since 1992 and recorded an increase from 44 percent to 76 percent in 2007. Helmet use is dramatically increasing while the bicycle crash rate is decreasing. All of these factors contribute to making Portland a safer place for bicyclists and other road users.

4.2.6 Portland Police Bureau enforcement

Enforcement strategies and actions are a key component of bicycle and traffic safety education. The *Portland Bicycle Plan for 2030* identifies actions below that will help establish the Portland Police Bureau as a national leader in bicycle safety traffic enforcement.

Community policing agreement

On October 15, 2009, the Portland City Council adopted Ordinance 183247, the Bicycle Transportation Alliance and

Willamette Pedestrian Coalition Community Policing Agreement. The agreement calls for an increased level of communication and cooperation among the community and key stakeholders with transportation responsibilities, a collaborative approach to traffic safety strategies, a list of the locations with the greatest need for improved safety and improved data collection processes to accurately inform the community of safety trends.

Multi-bureau enforcement strategies

The Portland Police Bureau and the Portland Bureau of Transportation collaborate to determine the causes of injury and death on Portland roadways and to respond to community concerns and service requests. To increase bicycle and traffic safety, the bureaus should develop traffic safety enforcement strategies based on crash history and/or service requests, then identify and apply specific best practices for enforcement that address bicycling safety challenges.

4.2.7 Recommendations for safety education and enforcement

4.2 A Expand the Safe Routes to School program.

Specifically:

- Offer a comprehensive Safe Routes to School program to all Portland schools

- Expand educational offerings to include programming for middle and high-school aged youth
- Support innovative programming for older youth, such as bicycle building workshops, bicycle racing or recreational athletic teams and leadership training to work with younger Safe Routes to School students
- Recruit and support parent and school staff volunteers to create more school-specific and culturally-specific encouragement programming

4.2 B Increase safety education and outreach to encourage safe travel behavior for all travel modes.

Specifically:

- Develop culturally specific outreach and education programs
- Continue offering the Share the Road safety class and make it available to the general public as a traffic safety educational opportunity
- Expand the Share the Path campaign and focus efforts on high bicycle and pedestrian traffic areas
- Explore a partnership with other agencies, such as ODOT and Metro, to develop a region-wide traffic safety program that includes classes and other opportunities for



road user education

- Develop more Public Service Announcements to raise awareness about traffic and bicycle safety
- Utilize educational tools, such as warnings, diversion-type classes and media coverage, and create an outreach model for education efforts to achieve maximum improvements in bicycle and traffic safety with minimal economic impact to drivers and bicyclists
- Work with ODOT and the Oregon State Legislature to achieve local control in setting speed limits
- Explore partnership possibilities with ODOT and driver education groups to shape the curriculum
- Continue educating Portland residents of all ages about proper helmet use and the safety benefits of wearing a helmet
- Educate Portland residents about conspicuity and bicycle light requirements and support programs that work to equip bicycles with appropriate lights

4.2 C Regularly assess road safety data to inform design and engineering improvements.

Specifically:

- Work with local and statewide organizations and agencies to ensure bicycle crash data is recorded, accurately catalogued and analyzed to result in safer bicycling and road conditions in Portland
- Fully investigate all bicycle, pedestrian and automobile crashes resulting in ambulatory injuries or worse, and investigate all lower severity crashes, whenever possible
- Develop and annually update a high-risk location list and a high-risk behavior list in collaboration and communication with the Bureau of Transportation and community groups
- Investigate reports from roadway users and local stakeholders about potential safety issues for bicyclists
- Clarify the City of Portland's multi-bureau strategies for addressing locations and behaviors with a high risk of injury or death, and for low-crash locations with high levels of concern for livability, community and equity
- Consider setting standards for street lighting specific to bicycle boulevards and other key bicycle facilities



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Enforcement of new bicycle facilities





Part Four: Programs to support bicycling

4.2 D Implement enforcement practices that contribute to the safety and attractiveness of bicycling.

Specifically:

- Incorporate multi-modal traffic safety and the enforcement strategy for helping to make bicycling safe and attractive into the daily work of all divisions of the Portland Police Bureau
- Create an outreach model for education missions
- Develop an enforcement hierarchy for bicycle safety and enforcement strategies to communicate priorities clearly. In particular, the Portland Police Bureau should:
 - Prioritize enforcement toward motorists, bicyclists and pedestrians based on available data that documents the correlation of specific travel behaviors to potential injury and livability concerns
 - Increase level of enforcement for drivers and bicycle riders who operate while under the influence of intoxicants
 - Clarify operating procedures for enforcement actions at ‘high crash’ and ‘low crash’ locations
- Create a calendar of bicycle safety-related enforcement activities and update it at regular intervals to communicate with the public about ongoing actions and strategies
- Produce an annual report summarizing the Portland Police Bureau’s and Portland Bureau of Transportation’s bicycle-related activities and results over the past year, set goals for the upcoming year and publish as part of the Portland Police Bureau’s existing annual enforcement summary
- Develop a strategy between Transportation, the Portland City Attorney, the Portland Police Bureau, other City of Portland bureaus and community groups to interpret unclear state and city laws pertaining to safe bicycling and develop possible legislative changes to clarify or improve existing laws, including the following considerations:
 - Safe passing distance
 - When a bicyclist may leave a bike lane
 - When a motorist may enter a bike lane
 - Stop sign requirements
 - Yield requirements
 - Bicycle lighting equipment
 - Culpability for non-reckless drivers
 - Rules and responsibilities on multi-use paths
 - Pedestrian use of bike lanes

4.3 WAYFINDING FOR BICYCLISTS

4.3.1 Introduction

Portland’s bicycle wayfinding system is intended to complement the City of Portland’s bikeway network. A consistent, logical and comprehensive wayfinding system makes bicyclists feel safe and comfortable on Portland’s streets and trails by guiding bicyclists to and along the best routes for riding in a particular direction or to a desired destination.

The primary elements of Portland’s wayfinding system are bicycle boulevard markings, bikeway destination signs and bike route signs. These facilities reinforce existing bikeways by making them comfortable, attractive and visible to bicyclists. They direct bicyclists to destinations of cultural, regional and local significance. They also alert motorists to anticipate the presence of bicyclists on the roadway. In 2009, approximately 800 bicycle boulevard markings, 700 bikeway destination signs and 500 bike route signs have been installed within Portland.

Additional treatments, such as sharrows, bike boxes, bike lanes, bike symbols and bike detection symbols, may be considered ‘secondary wayfinding’. These treatments are neither route-oriented nor destination-oriented, but indicate to both bicyclists and motorists where bicyclists are likely to position



themselves in the roadway. As with the primary wayfinding elements, secondary treatments improve conditions for bicyclists by making bikeways intuitive and communicating to both drivers and bicyclists the common expectations for roadway use.

4.3.2 Primary wayfinding

Portland's bikeway destination signs assist bicyclists who are already familiar with Portland's geography but may not necessarily know the most comfortable, safe and attractive routes on which to travel by bicycle. Boulevard markings reinforce bikeway destination signs by providing visual reminders to bicyclists that they are on a preferred bicycle route and direct them along the route at difficult intersections, offset intersections and route jogs.

Because new bicyclists and 'interested but concerned' Portland residents are likely to be familiar with Portland but not its bikeway network, destination signs and boulevard markings are a powerful tool for enhancing the bicycling experience.

Kiosks with maps that highlight existing bikeways and bikeable destinations within a neighborhood, commercial district or geographic area will provide bicyclists with information to safely, comfortably and conveniently access destinations that serve their everyday needs, such as grocery stores, schools,

parks, libraries and transit facilities.

If implemented, kiosks should be placed at neighborhood and commercial centers, as well as at major destination hubs. Examples of these locations include:

- Public spaces like Pioneer Courthouse Square
- Access and egress points of heavily-trafficked trails such as the Springwater Corridor Trail and the Vera Katz Eastbank Esplanade
- Transit centers such as Hollywood TC, Rose Quarter TC, and Gateway TC
- Major academic institutions like Portland State University, Portland Community College campuses, Reed College, Lewis and Clark College, Oregon Health & Science University and the University of Portland
- Neighborhood and commercial centers such as the Hawthorne District, the Hillsdale Town Center, Lents Town Center, the St. Johns Town Center, the Alberta Arts District, the Pearl District and Downtown Portland
- Regional attractions, including Washington Park, the Portland Art Museum and the Oregon Museum of Science and Industry (OMSI)



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Bicycle destination signage

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Part Four: Programs to support bicycling

4.3.3 Route-based wayfinding

A system of main routes identified with names or numbers and clearly marked has the potential to increase the comfort of bicyclists and improve their experience of the overall bikeway network. Facilities completed on Major City Bikeways would be logical candidates for inclusion in a route-based wayfinding system.

4.3.4 Coordination of wayfinding with other jurisdictions

The Oregon Department of Transportation (ODOT) will complete a standard bikeway destination sign template for use on ODOT rights-of-ways. Efforts should be made to coordinate with ODOT after design finalization to ensure that Portland's bikeways network is comprehensively served by destination signs and markings regardless of roadway jurisdiction.

City and state boundaries present unique challenges for bicycle wayfinding, as bikeways often end at municipal boundaries and bordering cities often lack wayfinding systems or have ones that significantly differ from Portland's. The City of Portland should actively engage with neighboring city and state governments to ensure that wayfinding guides bicyclists to destinations and bikeways within Portland, as well as to those in adjacent cities and states. The City should take a proactive approach to coordinating wayfinding systems

with neighboring municipalities, particularly those that are actively working to develop and implement their own bicycle wayfinding systems.

4.3.5 Wayfinding recommendations

4.3 A. Improve wayfinding for users of Portland's network of bikeways.

Specifically:

- Sign and mark all new bikeways
- Identify locations where bicycle signage and markings are needed to define the route or direct bicyclists to a destination or other bikeway
- Install bicycle kiosks with maps at strategic locations to direct bicyclists to destinations or along bikeways in a defined geographic area in order to improve the safety, comfort and attractiveness of bicycling routes
- Investigate the feasibility of developing a route-based wayfinding system to complement Portland's existing destination-based wayfinding system by conducting a study of best practices in route-based wayfinding and working with stakeholders, including the Bureau of Transportation's Maintenance Operations group, to identify feasible systems
- Investigate opportunities for implementing innovative wayfinding designs, such as

wayfinding to transit, multi-modal hubs and bicycle parking

- Coordinate bicycle destination sign networks with neighboring municipalities and standardize signs for bikeways
- Install bikeway destination signs, boulevard markings and other pavement markings that clearly communicate to bicyclists and motorists expectations for roadway use



“Driving a mile to the store for a quart of milk seems to me as much overkill as using a high-powered nail gun to hang a picture.”

- Jeff Mapes, author of *Pedaling Revolution: How Cyclists Are Changing American Cities*





TOM SLOAN

Neighborhood:
HOLLYWOOD / GRANT PARK

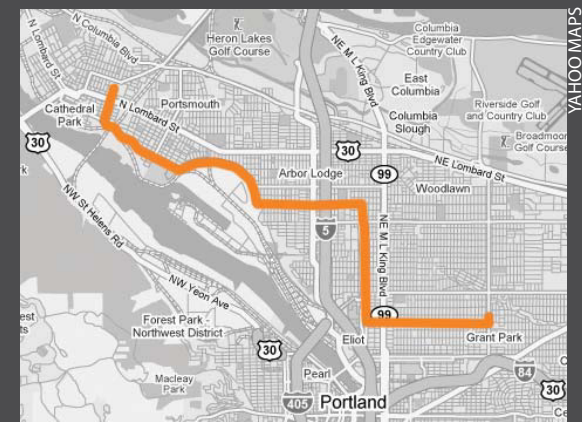
Reason for bicycling:
Commute, exercise and because we are
a **ONE CAR FAMILY**.

Favorite Portland bicycling event:
SUNDAY PARKWAYS

“When I bought my new bike, I sold my old one to my good friend Sarah. I was sad to see it go. Now she rides all around the neighborhood and she got her husband to buy a bike too. And I’m riding farther than I ever did before - on my new bike. That one purchase changed both our lives.”

Bicyclist **PROFILE**

Kim



YAHOO MAPS



5.1 OVERALL APPROACH TO IMPLEMENTATION

5.1.1 Introduction

The *Portland Bicycle Plan for 2030* is both an action plan and a capital projects plan. The plan lays out a vision for bicycling as a pillar of Portland's transportation system, with a greatly expanded bikeway network, ubiquitous bicycle parking and robust programs to serve all Portland residents. To achieve this vision, it is necessary to develop a strategy for implementation that considers both the near-term funding climate and the possibility of future funding that may result from successfully acting on the recommendations of this plan.

The approach to developing this plan, articulated in Chapter 1.2, is based on the twin assumptions that it is desirable to attract residents to bicycle for transportation who weren't bicycling in 2009, and that the best way to attract future riders is to develop bikeways that provide them with a sense of safety and comfort. As a consequence of this approach, the *Portland Bicycle Plan for 2030* recommends a network with many new miles of low-stress bikeways. This chapter sketches an approach for building this bikeway network over time.

Of course, building the network is only one part of implementing this plan. In order to build the network it will be necessary to update the City's

bicycle policies and develop design guidance for new street designs, as recommended in this plan. It will also be necessary to expand the offering of encouragement and education programs and link them to the construction of new projects. It will be necessary to effectively enforce traffic laws to encourage safer conditions for all road users. Ultimately, the implementation of this plan depends on the City's ability to identify and secure funding that will support the projects and programs recommended here.

5.1.2 Implementation approach

In the short term, the approach to implementing an expanded bikeway network must consider what is achievable and realistic given foreseeable funding. With multiple indications that the context for funding implementation may shift, this plan needs the flexibility to respond to changing external conditions.

Portland's current and proposed bikeway network comprises three main facility types: trails, low-stress shared roadways and separated in-roadway bikeways on major collectors. At a gross level, each of these three categories of bikeways lends itself to a focused approach to implementation. Such focused strategies offer certain costs and benefits.

For example, one approach might focus on



Bicycling on a bicycle boulevard, SE Lincoln Street

DENVERIGARITA



The City Traffic Engineer overseeing public reaction to a cycle track on SW Broadway, near P.S.U.

JONATHAN MAUS / BIKEPORTLAND.ORG



Springwater Corridor Trail, Southeast Portland

JONATHAN MAUS / BIKEPORTLAND.ORG





Part Five: Strategic **implementation** plan

completing the trail system. Trails give the greatest separation from motor vehicle traffic and have been demonstrated to attract riders. They are popular and generate much public support. Trails would serve as the foundation of the fine-grained network. Trail projects also tend to be complex undertakings requiring many partners, and tend to be expensive in comparison to other bikeway facility types.

A second approach would be to focus on building cycle tracks and other high-quality separated in-roadway bikeways on Portland's main commercial streets and major collectors. Similar to Portland's 1996 *Bicycle Master Plan*, that approach would emphasize bikeways on collector streets that remake the streets to serve the mobility and access needs of both drivers *and* bicyclists. Cycle tracks and other protected bikeways on these main streets would be highly visible markers of Portland's bikeway network expansion. In most instances, cycle tracks would replace roadway space dedicated to motor vehicle travel or parking – a revision that will require strong community support. As cycle tracks are not common facilities in North America, success of this facility type as a low-stress bikeway remains unproven.

A third approach would be to focus on implementing bicycle boulevards and other low-stress shared roadways. Because these facility types are less expensive to implement

than trails or cycle tracks, this approach has the advantage of allowing the most miles of network to be implemented for any given level of funding. Because these facilities are not on collector streets they are neither as visible as separated in-roadway bikeways, nor do they provide the same level of access to commercial destinations as separated in-roadway bikeways.

Portland's approach to implementing its expanded bikeway network, while occasionally focusing on specific bikeways or bikeway types, will necessarily make advances in all three areas. Ultimately, the overall approach to implementation must find the right balance between creating signature projects that demonstrate Portland's ultimate build-out as a world-class bicycling city while providing attractive and comfortable conditions for bicycle transportation to as many residents as quickly as possible.

Chapter 5.3 describes in more detail the three principal implementation strategies into which the projects in this plan have been sorted. The first of these – the immediate implementation strategy – focuses on what the City can afford in the immediate future. The '80 percent' implementation strategy will implement a comprehensive network that will place a low-stress bikeway within close proximity to at least 80 percent of Portlanders. The 'world-class' implementation strategy thoroughly introduces

world-class bikeways to many of Portland's commercial main streets and major collectors. These latter two strategies are not mutually exclusive. As Chapter 5.3 describes, they can be implemented in parallel, as conditions allow.

This parallel approach to implementing the network would inform several activities as follows:

Developing new bikeways

The focus for new bikeways is on achieving maximum separation from high volumes and high speeds of motor vehicle traffic. The five-year immediate implementation strategy calls for building many more miles of bicycle boulevards and other low-stress shared roadways. Bikeways on streets with high motor vehicle volumes will be designed to maximize separation from cars using cycle tracks, buffered bike lanes or wide bike lanes.

Improving existing bikeways

This will be undertaken through 'area improvement plans'. Unlike the development of new bikeways, which will mostly follow identified City Bikeways or Major City Bikeways corridors, area improvement plans will target parts of the city where existing bikeways do not meet best practices. Portland has collected a wealth of information about deficiencies and needed improvements in our existing system. Area improvement plans will



look at the package of treatments needed to improve cycling conditions in particular areas of Portland.

Raising the visibility of bicycling

Highly visible bicycle demonstration projects that showcase innovative facility types will also help build public support for bicycling. These projects allow the Bureau of Transportation to advance new facility types to adapt to the unique needs of residents in different Portland neighborhoods.

Being flexible

Chapter 5.3 identifies potential future funding scenarios. In the past, the Bureau of Transportation has benefited from being flexible and seizing opportunities that arise to develop projects. Flexibility to respond to shifting conditions for implementation is critical for the complete implementation of this the *Portland Bicycle Plan for 2030*.

Implementing interim facilities

Where it is not possible to implement the ultimate preferred facility immediately, the Bureau of Transportation will look for ways to implement an interim facility or a parallel facility, or make other changes that improve conditions for bicycling.

Undertaking large-scale demonstration projects

The Bureau of Transportation will capitalize on opportunities to undertake large-scale demonstration projects. Examples may include Metro’s Active Transportation Demonstration Projects program (begun in 2009), as well as similar efforts under a reauthorized federal highway bill that will extend from the Non-motorized Transportation Pilot Program that was adopted with the previous federal transportation reauthorization. Potential projects for demonstration projects include:

- Inner N/NE Demonstration Project, (a full build-out of the bikeway system north of the Lloyd District)
- Lents Area Demonstration Project, (a full build-out of the bikeway network in a three-mile radius from the Lents Town Center)
- McLoughlin Corridor Path
- Sullivan’s Gulch Trail
- North Willamette Greenway
- Southwest Active Transportation Corridor Project

5.1.3 Implementation challenges

As shown in figure 5-2, a low-confidence estimate of the total cost for construction of the capital projects in the *Portland Bicycle Plan for 2030* is more than \$600 million (in 2008 dollars).



Cycle track in Copenhagen, Denmark

ALTA PLANNING + DESIGN



Preparing to install pavement markings in a bike lane

BUREAU OF TRANSPORTATION ARCHIVES



Installation of bike racks for a new on-street bicycle corral

BUREAU OF TRANSPORTATION ARCHIVES





Part Five: Strategic implementation plan

Future funding to support bicycling may be either extremely limited or readily available, depending on political conditions and economic forces. The available funding will significantly affect the quality and physical extent of Portland's future bicycle network. Appendix F discusses possible sources for new funding.

Furthermore, to deliver a set of bicycle projects of this order of magnitude, should the funding become available, the Bureau of Transportation must develop a strategy for efficient project delivery.

5.1.4 Implementation recommendations:

5.1 A. Amend the Transportation System Plan (TSP) to adopt recommended policies and classifications for bicycle transportation.

Specifically:

- Identify funding, timeline and staffing for an overall update of the *TSP*
- In the event that an overall update cannot be completed in a timely fashion, consider undertaking a technical update of the *TSP* to adopt the recommendations of this plan
- Use the update of the *TSP* to develop policy guidance for resolving conflicts between classification

5.1 B. Identify and pursue multiple strategies to increase funding for green transportation.

Specifically:

- Form a task force to recommend new funding sources for bicycle facilities and other green transportation modes
- Work with elected leaders to position the City of Portland to receive funding under the federal reauthorization

5.1 C. Develop a complete street design guide that includes bicycle design guidelines.

Specifically:

- Identify funding, timeline and staffing to produce a new complete street design guide

5.1 D. Expand encouragement programs that provide services and equipment, support behavior changes, raise awareness and provide incentives that increase bicycling.

Specifically:

- Identify new models, partners and funding for program expansion
- Integrate the delivery of programs with projects

5.1 E. Build as much of the bicycle transportation system as possible, as quickly as possible.

Specifically:

- Prioritize projects that are easily implemented that also improve connectivity, expand coverage and maximize separation from motor vehicle traffic
- Be opportunistic and partner with others
- Make incremental improvements by installing interim facilities (such as climbing bike lanes or wide shoulders) or bikeways on parallel routes where projects are not easily implemented in their ultimate configuration; evaluate opportunities for interim facilities in Southwest Portland based on right-of-way needs, stormwater requirements, pedestrian needs and other issues to fill gaps between projects in the 80 percent implementation strategy
- Continue to build new bicycle boulevards
- Continue to refine the planned network and facilities to accommodate local preference, especially by:
 - o Funding and developing an *East Portland Bicycle Infrastructure Implementation Action Plan* that ensures that 80 percent of households will be within a half-mile of a low-stress



facility and includes the development of education and activities that will encourage high levels of use by a diverse group of East Portland residents

- o Funding and performing a study of the bicycle corridor that uses the NE 28th Avenue bridge over I-84
- o Funding and developing a *Southwest Portland Bicycle Infrastructure Implementation Action Plan*
- Develop and implement a list of high priority pilot corridors for separated in-roadway bikeways that can be initially created with ‘software’ (paint, signal timing changes, plastic pylons) rather than ‘hardware’ (concrete, asphalt, new signals) and, based on the results of these pilots, consider prioritizing permanent build-out of these corridors and construction of additional separated facilities
- Continue to install new on-street grouped bicycle parking
- Improve existing bikeways through area improvement plans
- Develop an inter-bureau improvement and maintenance project review and evaluation process to make planned bicycle system improvements in conjunction with other public facility improvements
- Address pedestrian travel needs when implementing bike lanes or other bicycle

facilities on roadways with no sidewalks

5.1 F. Develop strategies to ensure successful delivery of bicycle projects.

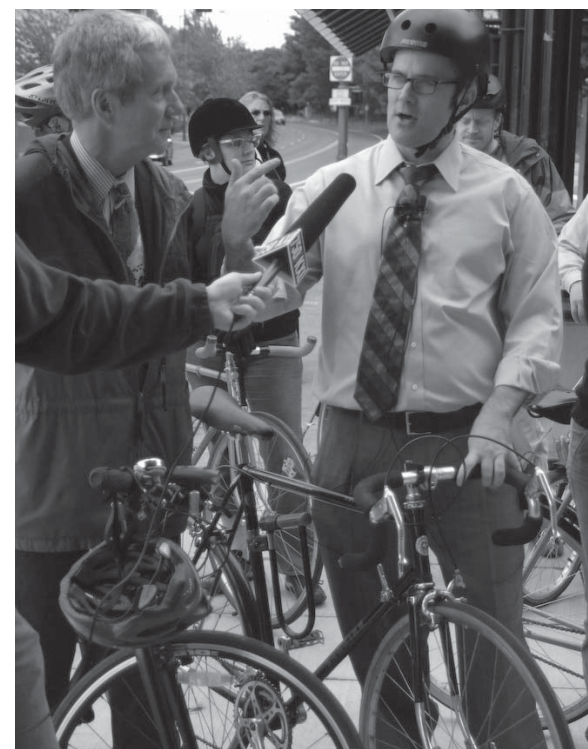
Specifically:

- Begin project development on multiple bicycle transportation projects
- Work with the Bureau of Transportation’s Engineering & Technical Services group and the Development & Capital Program to develop strategies for project delivery

5.1 G Fund and construct projects in areas underserved by the bikeway network that score high in indicators of disadvantage.

Specifically:

- Assure that implementation criteria include comprehensive measures of equity, including poverty, minority status and age
- Establish benchmarks for completed projects in targeted areas
- Regularly update the Equity Gap Analysis to account for changes in the low-stress bikeway network so that the results continue to inform project selection
- Develop a tool for addressing the health and equity effects of planned projects



TriMet General Manager Fred Hansen and Mayor Sam Adams

JONATHAN MAUS / BIKEPORTLAND.ORG



DAT NGUYEN





5.2 BIKEWAY IMPLEMENTATION CRITERIA

5.2.1 Introduction

The *Portland Bicycle Plan for 2030* lays out an ambitious range of strategies for implementing the bikeway network. Specific projects have been tentatively identified for the 5-year immediate implementation strategy. Additional work remains to set project priorities beyond the immediate period.

The following bikeway implementation criteria are proposed to help guide project selection in future years:

Equity

- How well does the project serve areas that are both deficient in low-stress bicycle facilities and high in the indicators of disadvantage, as informed by the Equity Gap Analysis?
- Is there geographic equity in the overall selection of projects for any given time period?

Community support

- Is the project supported as a priority for the neighborhood, neighborhood coalition, business association or other stakeholders?

Connectivity, access and barrier reduction

- Does the project address a significant barrier?

- Will the treatment make the facility usable by the ‘interested but concerned’?
- Does the project close a significant gap in the connectivity of the bikeway network?
- Does the project facilitate access to key destinations?
- Does the treatment mesh with deficiencies the Portland Bureau of Transportation identified in its Cycle Zone Analysis?

Visibility of bicycling

- Does the project add to the overall visibility of bicycling as a primary means of transportation?

Innovation

- Is the proposed treatment type innovative?
- Will it highlight a new type of design and in doing so provide needed information about the performance of the design?
- Will the project advance public acceptance of new design types?

Leverage

- Will the project leverage other investments?
- Does the project enhance existing investments made in the bikeway network?

Return on investment

- Is the project affordable with available funding?
- Will implementation of the project

preclude implementation of other projects?

- What is the expected return in terms of increased ridership, based on the potential for bicycling as identified in the Cycle Zone Analysis?

How the criteria are weighted will affect overall implementation. Emphasizing *equity* is a recommendation of this plan, but a focus on equity alone might produce projects that are not highly visible and do not provide the best return on investment. Focusing only on *connectivity, access and barrier reduction* could encourage high cost investments. An emphasis on *visibility* might lead to investments mostly on collector and main street commercial roads in Portland’s Central City. Considering only at *innovation* could lead to opportunities to test new facilities and treatments but neglect network cohesion and directness. An emphasis on *leverage* would lead more toward enhancing existing facilities. Finally, an emphasis on *return on investment* could lead to projects that would have the greatest impact on the most bicyclists for the least cost, and might ignore necessary high-cost investments.

This plan recommends being nimble in implementation, which requires sufficient flexibility to respond to changing conditions (such as public support or unexpected sources of revenue, for example). The *Portland Bicycle Plan for 2030*, and the structure of the



implementation strategies and guiding criteria, provides this flexibility.

5.2.2 Analyzing equity

In the summer of 2009, the Bureau of Transportation contracted with Portland State University to conduct an analysis of equity as it relates to the provision of new bicycle facilities in the *Portland Bicycle Plan for 2030*.¹ To make bicycling more attractive to historically disadvantaged populations, this analysis identifies areas of Portland where disadvantaged populations live, work, learn, play and access needed services. The study also addresses bicycle access to transit.

The analysis makes it clear that several clusters of census blocks are underserved. It is also evident that differences in age are more prevalent in outlying areas, whereas differences in poverty and race are more common in inner neighborhoods. Figure 5-1 displays the geometric mean of all indicators of disadvantage studied, including poverty, non-white population, youth and older adults, and compares it to areas that are poorly served by the existing low-stress bikeway network. Darker areas represent higher percentages of disadvantaged population, while the outlined boxes call out those census blocks with high percentages of disadvantaged that also rank in

¹ *Equity Gap Analysis, Final draft report by Jennifer Dill; available online at <http://www.portlandonline.com/transportation/index.cfm?c=50736&>*

the lowest quartile for access to the existing low-stress bicycle network.

The results of this study highlight many areas of Portland where improvements to the bikeway network would serve significant populations that rank high on the indicators of disadvantage. As new segments of the low-stress network are completed, the gap analysis can be easily repeated for the revised network, yielding a new quartile of areas with the least access to low-stress bikeways. The analysis will also be updated with data from the 2010 Census, when it is available.



Bicycling on a wide street in East Portland

DENVER IGARTA



Innovative treatments on SE Hawthorne Boulevard

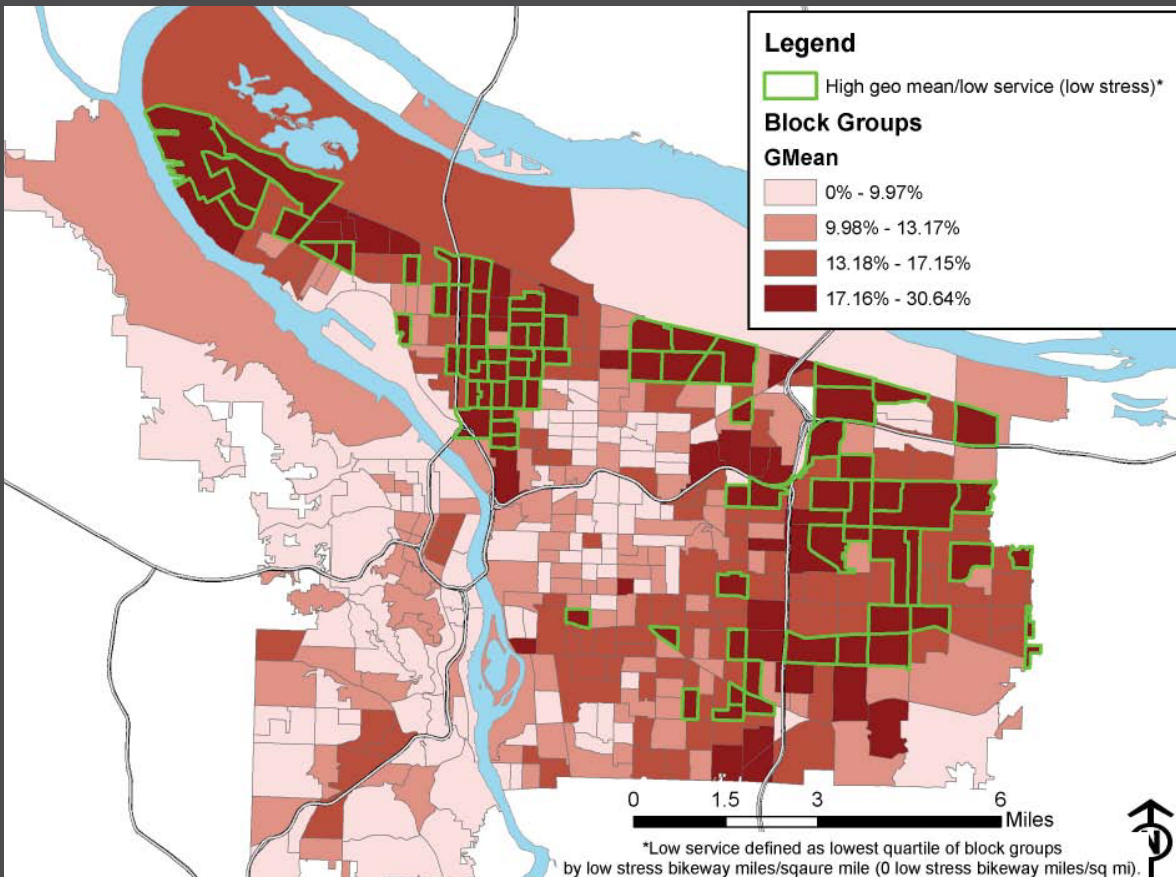
JONATHAN MAUS / BIKEPORTLAND.ORG



DAT NGUYEN



Equity GAP ANALYSIS:



Service gaps compared to indicators of disadvantage for existing bikeway network. (Darker areas are higher disadvantaged population; outlined boxes are **low service areas** with high disadvantaged population).

FIGURE 5-1: Equity Gap Analysis

5.3 NETWORK IMPLEMENTATION STRATEGIES

5.3.1 Introduction

This chapter elaborates on the approach to network implementation strategies introduced in Chapter 5.1. The *Portland Bicycle Plan for 2030* recommends three implementation strategies: the immediate implementation strategy, the ‘80 percent’ implementation strategy, and the ‘world-class’ implementation strategy. Each is associated with funding scenarios that provide a starting point for projects that the City of Portland can expect to build in the future.

The immediate implementation strategy presents those projects the City will tackle in the five years following completion of this plan, while the other two strategies are not specifically related to a timeline. The City does not need to complete the 80 percent strategy before beginning to implement the world-class strategy. Either strategy can be implemented – or elements from both can be implemented – within the same period. What distinguishes one strategy from the other is the availability of funding and community support for the strategy.

As further described below, the two main strategies differ significantly in the types of projects they undertake and the costs and challenges associated with their implementation.



Figure 5-2 compares the facilities, miles of bikeway and costs of all three strategies.

5.3.2 The immediate implementation strategy

The immediate implementation strategy focuses on developing shared roadway bikeways – mainly bicycle boulevards – in the initial five years after this plan’s adoption. While bicycle boulevards are the focus, the approach also seeks to advance both trail projects and pilot projects for cycle tracks, as well as other innovative bikeways on main commercial streets and other roadways with high motorized traffic volumes. This approach allows for efficiently spending the limited but tangible funding available for bicycle transportation in the near term, and will quickly make a cohesive bikeway network available to a majority of Portland residents. Such an approach, by building bicycle ridership, should garner increased support for the growth in bicycling investment that will be necessary to implement the complete *Portland Bicycle Plan for 2030*.

The immediate implementation strategy includes projects from the 80 percent implementation strategy for which funding is likely within five years following completion of this plan. In addition, projects that are already fully funded in either the near-term or mid-term will also be implemented; these are shown in the list of funded projects in Appendix A.

Funded projects will upgrade Portland’s 30 miles of existing bicycle boulevards and develop an additional 15 miles of bicycle boulevards to nearly complete status. This includes completion of the bicycle boulevard on NE Going Street, addressing the crossings at NE Martin Luther King, Jr. Boulevard and at NE 33rd Avenue.

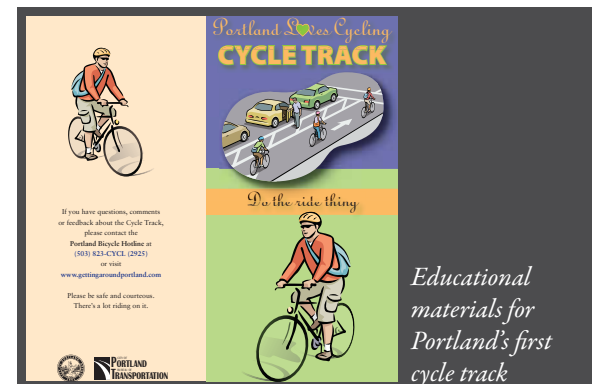
Beginning in 2011, Portland is likely to have available at least \$1.5 million annually for discretionary spending for bicycle infrastructure¹ Including other likely sources, approximately \$10-14 million is expected to be available for discretionary bicycle projects over the next five-year period. This is considered the ‘base funding scenario’ that will fuel the immediate implementation strategy. The Bureau of Transportation proposes to spend much of this funding on relatively economical bikeway projects that address equity issues, expand access, enhance connectivity and overcome existing barriers to bicycling. It will also reserve funding for projects that offer high visibility for bicycling and demonstrate innovative facilities.

¹ This includes \$50,000 annually from Transportation’s Capital Improvement Program, \$500,000 annually from the Affordable Transportation Fund, and, beginning in 2011, \$1 million annually from increased general transportation revenues from the Oregon Jobs and Transportation Act passed in the 2009 legislative session. This amount is in addition to the allocations to projects funded through the region’s six-year Metropolitan Transportation Improvement Program (MTIP).



GREG RAISMAN

SE Spokane Street's bicycle boulevard, completed in 2009



MICHEL FREY

Educational materials for Portland's first cycle track



DENVER IGARTA

Analyzing potential future bicycle facilities





Part Five: Strategic implementation plan

COSTS of citywide bicycle facilities:

FACILITY	FUNDED*		IMMEDIATE / 80 PERCENT		WORLD-CLASS		TOTALS	
	Miles	Cost	Miles	Cost	Miles	Cost	Miles	Cost
Trails	2.9	\$9,871,000	40.7	\$77,311,000	35.0	\$35,379,000	78.6	\$122,561,000
Separated in-roadway bikeways (bike lanes, buffered bike lanes, cycle tracks)	14.6	\$4,921,000	92.7	\$105,269,000	278.4	\$279,051,000	385.7	\$389,241,000
Bicycle boulevards and advisory bike lanes	26.0	\$7,975,000	155.3	\$38,820,000	74.9	\$18,733,000	256.2	\$65,528,000
Enhanced shared roadways	0.7	\$123,000	38.8	\$3,536,000	7.1	\$782,000	46.6	\$4,441,000
Total	44.2	\$22,890,000	327.5	\$224,936,000	395.5	\$333,945,000	767.1	\$581,771,000

*'Funded' project costs are for bicycle elements of projects only (see *List of Funded Projects* on page A-14 for full project costs). Calculations for miles and costs in 'immediate / 80 percent' and 'world-class' do not include miles and costs shown as part of funded projects.

FIGURE 5-2: Costs of citywide bicycle facilities

Opportunities will be sought during the five-year immediate implementation strategy to build on the demonstrations of innovative treatments piloted in 2009. These included buffered bike lanes on SW Stark Street and SW Oak Street, and a cycle track on SW Broadway near Portland State University. Project development will proceed for initial improvements to the south portal of Downtown Portland and the next round of shared roadway improvements, which includes an advisory bike lane in East Portland (running north/south roughly along 128th, 129th and

130th avenues). Other projects that will follow include enhancements for the N Vancouver Avenue / N Williams Avenue corridor, more bicycle boulevards and other shared roadways around Portland, and more high-visibility projects.

5.3.3 The '80 percent' implementation strategy

The '80 percent' implementation strategy is so named because its completion will result in at least 80 percent of Portland residents

being within one-quarter mile of a developed low-stress bikeway. Implementation of this strategy is also likely to get the City most of the way toward meeting its vision of more than a quarter of all trips made by bicycling.

The 80 percent implementation strategy focuses on spreading available funding widely, so that most Portland residents are close to low-stress bikeways. Most of the bikeway projects assigned to the 80 percent implementation strategy will construct shared roadway bikeways, and most of those will be bicycle



boulevards. The strategy also includes a number of other high-priority facilities that can be developed as conditions allow. In particular, this strategy recognizes the importance of the trail system as the foundation of the low-stress network. Accordingly, this strategy includes the city’s premier signature trail projects (the Sullivan’s Gulch Trail, the North Willamette Greenway and the Red Electric Trail).

Portland needs to be aggressive in seeking funds, including from sources not yet identified, to build the types and breadth of facilities recommended in this strategy. A detailed discussion of potential funding sources can be found in Appendix F.

5.3.4 ‘World-class’ implementation: completing the network

The ‘world-class’ implementation strategy is so named because its completion will create a truly world-class system of bikeways in Portland. It will establish bicycle infrastructure as an essential element of the urban streetscape. This strategy emphasizes the build-out of high-quality separated in-roadway bikeways, such as cycle tracks and buffered bike lanes, on main commercial streets and other higher volume collector roadways. The projects included in this strategy represent the largest part of the network’s development.

While the construction costs for this strategy

Program scenarios COSTS:			
Scenario Cost	Moderate \$1.56 million	High \$3.9million	World-class \$5.9 million
PROGRAM LEVELS			
Maps and trip planning	150,000 maps distributed \$150,000	200,000 maps \$200,000	200,000 maps \$200,000
Customer service	Continue at current service levels. \$20,000	Increased support for visitors and residents \$40,000	Increased support for visitors and residents with new website \$80,000
SmartTrips residential and business	Every eight years \$800,000	Every five years \$1.4 million	Every five years with new resident and expanded programs \$1.7 million
Outreach & events	70 events per year \$50,000	100 events per year \$80,000	150 events per year \$120,000
Organized rides	30 per year \$15,000	50 per year \$50,000	50 per year \$50,000
Visibility campaigns	One per year with limited media exposure \$20,000	Two per year with expanded media exposure \$60,000	Four per year with expanded media exposure \$160,000
Summits & conferences	None N/A	One per year \$75,000	One per year \$75,000

FIGURE 5-3: Program scenarios costs (CONTINUED on next page)





Program Scenarios COSTS:

Scenario Cost	Moderate \$1.56 million	High \$3.9million	World-class \$5.9 million
PROGRAM LEVELS (continued)			
Brown bags & classes	15 per year \$5,000	30 per year \$10,000	30 per year \$10,000
Incentives	Continuation of existing state tax credit for bicycle related projects N/A	Development of City of Portland business tax credit program for bicycle related investments \$500,000	Development of City of Portland business tax credit program for bicycle related investments \$500,000
Safe Routes to School program	25 schools per year with ten hours of in-classroom bicycle training \$500,000	100 schools per year in-classroom bicycle training and bicycle outreach to all elementary schools \$1.5 million	All schools participate in Safe Routes with ten hours of in-classroom bicycle training and bicycle outreach to all schools \$3 million

FIGURE 5-3: Program scenarios costs (CONTINUED from previous page)

have not been estimated in detail, they will likely be significant. This strategy will therefore be dependent on a dramatic shift in local, regional, state and federal transportation funding priorities.

5.3.5 Flexibility in implementation

While these three implementation strategies

are proposed, they should be considered as only suggestions. As noted in the previous section, this plan values the flexibility to respond to changing conditions and new opportunities. To the extent that conditions change, any bikeway classified in this plan can rise to the top of the list.

5.4 PROGRAM IMPLEMENTATION SCENARIOS

5.4.1 Funding for programs

Bicycle encouragement and promotional activities are traditionally funded through a combination of sources that include grants, energy credits and sponsorships. Funding for encouragement and education related to specific capital project implementation may be included in the capital funding.

Program funding scenarios

Figure 5-3 illustrates funding requirements for encouragement programs under three funding scenarios. The moderate funding scenario continues funding for programs at a similar rate to the 2009/2010 fiscal year. The world-class scenario shows what funding would be needed to achieve the preferred level of program delivery recommended in this plan.

5.4.2 Integrating program delivery with projects

As projects are completed, programs in encouragement, education and enforcement that are directly related to these projects should be provided.

In implementing the *Portland Bicycle Plan for 2030*, the City of Portland will construct miles of new bikeway facility types. Residents may not immediately understand how to behave



in the presence of these new bikeway types. This unfamiliarity should be addressed in each project through an integrated approach in the delivery of both projects and programs.

Portland's experimental bike box project in 2008 is a successful example of this integration. The installation of the bike boxes at targeted intersections was well-coordinated with other education and enforcement efforts. Prior to their installation, advertisements of the new bicycle facilities were located on billboards and bus sides, while new instructional signs were placed at the targeted intersections. This action helped generate significant media attention on the bike boxes.

When the new bike boxes were installed, regular users of the intersections were often aware of them, knew of their intent and were better prepared to react to them. Once the intersections were colored, Portland police officers immediately enforced violations at them. The initial enforcement began as an extension of the education effort, as officers provided instructional pamphlets to violators. After two weeks at each location, police officers began writing tickets to violators.

This approach was extremely successful and set precedence for the creation of new bicycling facilities. Furthering this success means incorporating education, enforcement,

encouragement and evaluation when constructing all of Portland's new bicycle facilities. Incorporating these elements into future projects should be performed during the initial development phase of these projects, as decisions about appropriate enforcement and evaluation may influence both design and project schedule.

A model for integrating project and program delivery

A typical project might proceed as follows.

1. Identify locations where new bikeways are to be developed (ideally, more than one bikeway would be developed simultaneously in a targeted area so that the education and encouragement efforts can benefit from economies of scale)
2. For innovative facilities, collaborate early with the Portland Police Bureau to identify issues related to enforcement (this was a successful model for Portland's bike boxes, as well as for the demonstration cycle track on SW Broadway, where early discussions with the Portland Police Bureau strongly influenced elements of the design)
3. Develop standard educational materials describing the design and intent of the new bikeway treatments



Portland bike box

JONATHAN MAUS / BIKEPORTLAND.ORG



Designs for billboards and marketing campaigns/ outreach

MITCHEL FREY



Discussing potential new bicycle boulevards with residents

JONATHAN MAUS / BIKEPORTLAND.ORG





4. Several weeks in advance of construction, inform residents within the influence area of the project to the changes they can expect (billboards, bus sides and newspaper advertisements for improvements targeted over large areas, while door hangers, neighborhood newsletters articles and local newspapers for smaller scale projects)
5. Several weeks in advance of implementation, collaborate again with the Portland Police Bureau to identify the implementation date and potential enforcement issues, and schedule enforcement activities (provide officers with necessary educational materials so that initial enforcement can focus more on education than punishment)
6. For projects that encompass a large area, coordinate encouragement efforts to get residents riding on the new facilities
7. Evaluate the success of the project by conducting before and after bicycle counts in the area or evaluating area wide changes in travel behavior in response to new bikeways (for an innovative facility type, evaluation can illuminate how residents use the facility and whether or not the Bureau of Transportation needs to modify its design)

5.5 EVALUATION AND MEASUREMENT

5.5.1 Introduction

Plans, projects and programs are evaluated to gain information that can guide future decisions. Evaluation can help to measure achievement of objectives, provide accountability to the public (and those who fund projects or programs) and increase community support for expanded efforts.

5.5.2 Measuring performance

This plan recommends the further development of performance measures and benchmarks for bicycling that fall under seven general themes: Bicycle mode share, Bikeway network, Children bicycling, Bicycle safety, Economic vitality, Healthy & livable city and Environment. Each of these themes is discussed in more detail below. Figure 5-4 lists a preliminary set of performance measures sorted into these themes.

The City of Portland has already set two benchmarks for bicycling. In May 2009, Mayor Sam Adams attended the Velo-City 2009 conference in Brussels and signed the Charter of Brussels, committing the City to numerous activities to support bicycling and achieve these two benchmarks:

- At least fifteen percent of all trips by bicycle by the year 2020

- Risk of a fatal bicycle crash reduced by 50 percent by the year 2020

Measuring bicycle mode share

The *Portland Bicycle Plan for 2030* lays out a vision of bicycling as a pillar of Portland's transportation system, with a bicycle mode share of 25 percent of all trips by 2030. Data on bicycling mode share for all trips in Portland has not been collected since Metro performed a Household Activity Survey in 1994-1995. Metro is poised to perform a new Household Activity Survey in 2010. The new data will set the baseline for total bicycle mode share.

Annual data is available from multiple sources to gauge bicycling's share of work trips. The two principle sources are the American Community Survey (ACS) from the U.S. Census Bureau and the Portland Auditor's Survey of Portland Residents. The Auditor's survey asks about both primary and secondary means of travel to work. For 2008, the ACS showed that 6.4 percent of work trips in Portland were made by bicycling. The Auditor's survey for 2009 reported that seven percent of Portland residents use a bicycle as their primary means of travel to work, and another ten percent as their secondary means. The Auditor's data is also available by city district.

Data about trips switched from drive-alone to bicycling and other modes is collected as part



of the evaluation component of SmartTrips programs.

Bikeway network evaluation

The bikeway network is the foundation of Portland's bicycle transportation system. There are many ways of measuring the City's performance on delivering the expanded network recommended in this plan. Many characteristics of the network can be evaluated based on data that is readily available, such as percent of the planned network that has been completed. Others, such as network connectivity, are more difficult to evaluate with existing tools. Although data on user satisfaction with the bicycle network would be valuable, no assessment tool to collect this information exists at the time of the publication of this plan.

Children bicycling

This theme is focused on children bicycling to school. The number of children walking or bicycling to school, the number of children trained in safe bicycling skills and the availability of school bike parking all will be measured as part of the Safe Routes to School program.

Bicycle safety

The bicycle crash rate is one important measure of bicycle safety. As discussed in Chapter 4.2, changes in crash reporting practices can

PERFORMANCE measures:

Themes	Performance category	Performance measure
Bicycle mode share	Bicycle share of all trips	Percent bicycle mode share for all trips (citywide / by district)
	Bicycle share of commute trips	Bicycle share of all commute trips / mode share targets by district
Bikeway network	Network completion	Percent of residents within a quarter mile of an existing improved bikeway / percent of bikeway miles completed
	Network connectivity	Bikeway network density: miles of bikeway per square mile / percent of missing links (total miles of gaps) in in the active bikeway network improved
	Attractiveness of bicycling for short trips	Bicycle share of all trips less than three miles
	Access to transit stations and centers	Percent of transit centers / stations with direct links to bikeway network from all directions
	Access to low-stress bikeway network	Percent of households within a quarter mile of a low-stress bikeway
	Quality of bicycle facilities (comfort / maintenance)	Percent of residents who feel safe and comfortable on bikeways / percent of residents satisfied with bikeway conditions

FIGURE 5-4: Performance measures (CONTINUED on next page)





Part Five: Strategic **implementation** plan

PERFORMANCE measures:

Themes	Performance category	Performance measure
Bikeway network	End of trip facilities (citywide)	Percent of residents satisfied with availability of public bicycle parking
	End of trip facilities at transit	Percent of transit stations that meet TriMet design standards
	Capital spending on bicycle infrastructure	Increase in funding for bicycle facilities
	Geographic equity of the network	Percent of low-stress bikeways improved that serve areas in the lowest quartile of existing service (low-stress bikeway miles per square mile) and the highest quartile of disadvantaged population groups (percent disadvantaged population per block group)
Children bicycling	Children walking or bicycling to school	Percentage increase in students walking or bicycling to school (percent of schools with 50 percent of children within a mile of walking or bicycling to school)
	Children trained in safe bicycling skills	Percent increase in children trained in bicycling safety
	School bike parking	Percent of Portland schools with adequate bicycle parking

FIGURE 5-4: Performance measures (CONTINUED from previous page AND on next page)

improve the quality of bicycle crash data by including crashes that do not involve a motor vehicle. Data on user perceptions of safety could be very valuable.

Economic vitality

The contribution of bicycling to Portland's economic vitality can be measured in multiple ways. These ways include assessing the strength of bicycle-related industries and employment, the impact of bicycling on tourism, and the availability of bicycle access and bicycle parking to commercial centers.

A healthy and livable city

Three key measures are suggested to better create a healthy and livable city: healthy residents, neighborhood livability and demographic equity. As a measure of healthy residents, the Centers for Disease Control and Prevention publishes statistics for Metropolitan Service Areas on the percentage of adults who meet the recommended levels of physical activity through lifestyle activities (including leisure, household and transportation). Neighborhood livability is a subjective measure for which proxies can be found in the Auditor's survey. Additional work remains to identify sources for data on the extent to which women, minorities and disadvantaged populations travel by bicycle.



The environment

The primary measure for the environment will be level of greenhouse gas emissions.

5.5.3 Developing new assessment and reporting tools

Several performance measures address user satisfaction with various aspects of the bicycle transportation system. One method of assessing satisfaction and reporting on both subjective and objective performance measures could be modeled on Copenhagen’s Bicycle Account. Published every two years, the Bicycle Account is an assessment of bicycling intended for both the citizens of Copenhagen and the City government. U.S. cities with similar programs include San Francisco, California and Seattle, Washington. The Bureau of Transportation has also considered undertaking resident surveys to assess subjective criteria (such as how comfortable a facility feels to bicyclists). To develop this assessment and reporting on a regular basis, the Bureau will need to identify the needed funding to support it.

5.5.4 Annual summer bicycle counts

The Portland Bureau of Transportation’s annual summer bicycle counts have been the City’s principle means of establishing baseline bicycle ridership throughout the city and tracking ridership trends on the bikeway network. Each summer, approximately 100 volunteers assist the City in counting bicyclists at various locations

PERFORMANCE measures:

Themes	Performance category	Performance measure
Bicycle safety	Rate of severe and fatal crashes	Percent reduction in per-trip rate of serious and fatal injury crashes (all trips / riders under age 18)
	Perceived safety	Percent of residents who do not walk or bicycle due to traffic safety concerns / percent of residents with a favorable sense of safety
Economic vitality	Bicycle-related employment	Percent increase in bicycling-related jobs and businesses / number of bicycle shops per capita
	Employer bicycle parking facilities	Percent of residents satisfied with their ability to store their bicycle at their workplace
	Bicycle tourism	Percent increase of Portland visitors engaged in bicycling / percent increase in dollars into Portland’s economy by tourists engaged in bicycling
	Access to commercial destinations	Percent of households with neighborhood commercial areas within one mile of their home / percent of bikeways on classified main streets that are developed

FIGURE 5-4: Performance measures (CONTINUED from previous page AND on next page)





PERFORMANCE measures:

Themes	Performance category	Performance measure
Economic vitality	Commercial area bicycle parking	Percent of commercial corridors (designated main streets) that have a bicycle parking plan completed by the City of Portland and the respective business association
	Healthy residents	Percent of residents meeting the recommended level of physical activity through transportation (such as walking or bicycling)
	Neighborhood livability	Percent of local streets with low traffic volumes (such as less than 3,000 cars per day)
Healthy & livable city	Demographic equity	Percent of bicycling population: low income, female, non-white, under age 18, over age 65, etc...
	Reduced vehicle emissions	Percent vehicle miles travelled (VMT) reduction in Portland / percent transportation-related greenhouse gas (GHG) reduction

FIGURE 5-4: Performance measures (CONTINUED from previous page)

around Portland during peak commute times (7:00 to 9:00 a.m. and 4:00 to 6:00 p.m.) to record information such as helmet use, gender and turn movements. Additionally, 24-hour automated counts are conducted using pressure-sensitive pneumatic hoses on Portland's bike-

friendly bridges and at selected trail locations. The bicycle counts data is used in a variety of analyses, including:

- Ridership growth on Portland's four main Willamette River bicycle bridges

- Bicycle mode share on Portland's four main Willamette River bicycle bridges
- Comparison of ridership trends and bikeway development over time
- Comparison of ridership trends and indexed crash rates
- Total ridership, helmet use and gender split trends over time, throughout Portland and within distinct neighborhoods

The longitudinal data collected through Portland's annual counts has many applications, such as:

- Identifying opportunities for improving the bikeway network
- Informing the development of the City's bicycle wayfinding system
- Forecasting bicycle demand for new, retrofitted or improved infrastructure
- Validating travel demand models
- Validating other sources of information on ridership and mode split trends, such as the City Auditor's Annual Service, Efforts, and Accomplishments Survey, the U.S. Census and others

An added benefit of Portland's bicycle counts program is that it involves the community and generates excitement about biking in Portland at the community level. Additionally, the



quantity of Portland’s bicycle ridership data and the quality of its counts program have made it a model of data collection and community involvement best practices for other cities. The Bureau of Transportation regularly responds to inquiries from public agencies, businesses, private firms, citizens and academic institutions regarding its counts program and ways in which similar practices can be implemented in other places.

5.5.5 Program evaluation

Encouragement activities related to increasing bicycle use are a cost-effective means for shifting the economies away from oil dependence and will be integral components to climate change solutions. It is becoming increasingly important to measure and verify the effectiveness of such programs, as competition for limited funds will likely intensify.

5.5.6 Evaluation and equity

As the bikeway network is constructed, it will be important to continue to analyze equity as it relates to the provision of new bicycle facilities. Measures related to aspects of equity are included in several of the performance themes and proposed measures.

5.5.7 Evaluation and measurement recommendations

5.5 A. Continue to expand the means of evaluating how well the public is being served by Portland’s bikeways network and the programs that support bicycling.

- Refine the performance measures for the bicycle transportation system and set baseline levels and periodic benchmarks to gauge progress toward the objectives of the *Portland Bicycle Plan for 2030*
- Continue and expand annual bicycle counts
- Improve the transparency and availability of annual bicycle counts data, especially by making it available to the public online and integrating it into Transportation’s Traffic Data (TDAT) software
- Expand collection of before and after data associated with encouragement programs and new infrastructure
- Continue to explore how analysis of geographic information can inform project priorities and improve the equitable delivery of public services
- Expand surveys and evaluation to assess the attributes of the ‘interested but concerned’ population
- Collaborate with Portland State



Volunteer counting bicycles at the Hawthorne Bridge

ELLY BLUE / BIKEPORTLAND.ORG



DAT NGUYEN





University's Center for Transportation Studies and Initiative for Bicycle and Pedestrian Innovation to develop new means of evaluation

- Collaborate with other universities and other cities throughout the United States and elsewhere to establish best practices for measuring and sharing information
- Continue annual SmartTrips evaluations
- Collaborate with Metro to improve their transportation demand models and forecasting to better reflect bicycle trips
- Collaborate with Metro to structure the upcoming regional household activity survey so that it provides useful baseline data for identified areas of targeted bikeway investments



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TRANSPORTATION OPTIONS

Appendix A





Appendix A: Action plan and project list

Recommendations and associated actions

Priority

Responsibility

Recommendations and associated actions	Priority	Responsibility
2.1 A BROAD POLICY CONTEXT		
2.1 A. Put green transportation first.		
<ul style="list-style-type: none"> Work to achieve the bicycle mode split and funding goals in the City of Portland and Multnomah County's <i>Climate Action Plan 2009</i> 	Immediate	Transportation; Planning & Sustainability; Multnomah County
<ul style="list-style-type: none"> Collaborate with other City bureaus and Metro to work toward adopting a 'Green Transportation Hierarchy' that prioritizes planning and investing in green transportation modes to elevate the relative importance of non-motorized modes 	Immediate	Transportation; Planning & Sustainability; Metro
<ul style="list-style-type: none"> As part of future modifications to the <i>TSP</i>, consider identifying 'home zones' or similar area-wide car-light zones integrated with the overall bicycle network 	Immediate	Transportation; Planning & Sustainability
<ul style="list-style-type: none"> Collaborate with regional, state and federal partners to reform system performance measures and mobility standards to reflect the movement of persons rather than vehicles and favor green transportation modes 	Medium-term	City of Portland; Metro; ODOT
<ul style="list-style-type: none"> Collaborate with regional, state and federal partners to develop transportation models and forecasting tools to accurately predict bicycle travel demand generated by capital and programmatic improvements and to model system performance that includes bicycling 	Medium-term	City of Portland; Metro; ODOT
2.1 B. Fully integrate bicycling into the <i>Portland Plan</i> project.		
<ul style="list-style-type: none"> Designate a set of current and future 20-minute neighborhood centers and designate a set of continuous multi-modal mobility corridors interconnecting these neighborhood centers, Region 2040 Town and Regional Centers and the Central City as priorities for separated in-roadway bikeways, coordinated, to the extent possible, with the <i>Portland Streetcar System Concept Plan</i> 	Medium-term	Planning & Sustainability; Transportation
<ul style="list-style-type: none"> Consider whether all Region 2040 Town Centers should be classified as bicycle districts 	Medium-term	Planning & Sustainability; Transportation
<ul style="list-style-type: none"> Analyze space devoted to motor vehicles and bicycle parking in the public right-of-way, in commercial parking facilities and in accessory parking to all types of land uses, and recommend policies to ensure that space is allocated appropriately between vehicle types to accommodate parking needs while to the extent possible reducing the total square footage required for parking 	Long-term	Planning & Sustainability; Transportation
<ul style="list-style-type: none"> Conduct research to evaluate the impact of bicycling infrastructure and mode share on property values and make recommendations on the viability of value-capture funding methods such as Local Improvement Districts and Tax-Increment Financing for bicycle improvements 	Long-term	Planning & Sustainability; Transportation
<ul style="list-style-type: none"> Identify opportunities for zoning changes that will support retail centers to be located along appropriate identified bikeways 	Medium-term	Transportation; Planning & Sustainability
<ul style="list-style-type: none"> Establish 'eco-districts' as neighborhood developments that emphasize sustainability by combining high performance buildings and infrastructure that reduce greenhouse gas emissions, promote efficient energy and water use and offer residents access to essential services without need for an automobile 	Medium-term	Transportation; Planning & Sustainability
<ul style="list-style-type: none"> Ensure all neighborhoods have adequate low-stress bicycle facilities connecting to neighborhood commercial corridors and centers so that local residents can safely and comfortably access them by bicycle or on foot 	Immediate	Transportation; Bureau of Planning & Sustainability;
<ul style="list-style-type: none"> Capitalize on implementation of streetcar and light rail lines to foster development that supports bicycling and walking 	Ongoing	Transportation; Bureau of Planning & Sustainability;
<ul style="list-style-type: none"> Provide opportunities for high-density, mixed-use development along identified bikeways with adequate end-of-trip bicycle facilities and consider the creation of district-specific development standards such as improved bicycle parking requirements and amenity bonuses to promote bicycling and walking 	Medium-term	Transportation; Bureau of Planning & Sustainability;
<ul style="list-style-type: none"> Introduce new residents to their '20-minute neighborhood' with maps, coupons and other incentives to promote nearby services and amenities 	Medium-term	Transportation; Planning & Sustainability
2.1 C. Further integrate support for bicycling into existing City policies.		
<ul style="list-style-type: none"> Identify opportunities for revisions to existing City policies to ensure greater support for bicycling in Portland 	Immediate	Transportation; City Council



Recommendations and associated actions (continued)

	Priority	Responsibility
2.2 BICYCLE POLICY RECOMMENDATIONS		
2.2 A. Adopt a bicycle transportation policy to create conditions that make bicycling more attractive than driving for trips three miles or less and integrate support for bicycling into other <i>Transportation System Plan (TSP)</i> policies.		
<ul style="list-style-type: none"> Incorporate proposed policy and classification language into the next draft of the <i>TSP</i> update as outlined in Appendix B 	Immediate	Transportation; City Council
2.2 B. Revise existing parking policies to include bicycle parking.		
<ul style="list-style-type: none"> Incorporate new proposed language and objectives to <i>TSP</i> Policies 6.26 On-Street Parking Management and 6.27 Off-Street Parking as outlined in Appendix B 	Immediate	Transportation; City Council
2.3 STREET CLASSIFICATIONS FOR BICYCLE TRAVEL		
2.3 A. Expand to a functional hierarchy of bicycle classifications.		
<ul style="list-style-type: none"> Incorporate new bicycle classifications and classification descriptions into the next update of the <i>Transportation System Plan (TSP)</i> Examine the merits of classifying the South Waterfront District as a Bicycle District as part of the update of the <i>TSP</i> 	Immediate Medium-term	Transportation; City Council Transportation; Planning and Sustainability
2.3 B. Classify a fine-grained bicycle network.		
<ul style="list-style-type: none"> Modify the bicycle classifications of streets shown on the maps that follow by incorporating these recommended changes into the next update of the <i>TSP</i> 	Immediate	Transportation; City Council
2.3 C. Develop refinement plans for key areas and facilities.		
<ul style="list-style-type: none"> Identify targeted corridors where uncertainty or disagreement exists as to appropriate design treatment or alignment Work with agency partners, neighborhood and business associations to refine alignments and recommended design treatments for identified corridors 	Immediate Ongoing	Transportation; City Council Transportation
3.1 EXPANDING THE BICYCLE NETWORK		
3.1 A. Provide a fine-grained bikeway network that serves key destinations.		
<ul style="list-style-type: none"> Prioritize bikeway improvements that serve regional and town centers, main streets, employment centers, commercial districts, transit centers and stations, institutions, schools, parks and recreational destinations Maintain an up-to-date list of existing system gaps, with conceptual design treatments and cost estimates needed to complete them Annually assess the list of existing bicycle network gaps and set priorities for their completion Work closely with the Oregon Department of Transportation, Portland Parks & Recreation and adjacent jurisdictions to complete and maintain identified bicycle network improvements and provide bicycle access in areas where the opportunity to provide on-street bikeways is constrained Create a system of low-stress bicycle routes throughout all Portland neighborhoods Refine the bicycle transportation projects shown on the project maps and listed in Appendix A and work to amend the <i>Transportation System Plan</i> to include them 	Immediate Ongoing Ongoing Ongoing Immediate start, long-term finish Immediate	Transportation Transportation Transportation Transportation; ODOT; Portland Parks & Recreation Transportation Transportation





Appendix A: Action plan and project list

Recommendations and associated actions (continued)

	Priority	Responsibility
3.2 BICYCLE FACILITY DESIGN AND ENGINEERING		
3.2 A. Develop design guidelines for new bicycle facilities that will attract riders of all ages and abilities.		
<ul style="list-style-type: none"> Experiment with and evaluate new facility types identified in the Bikeway Facility Design: Survey of Best Practices (Appendix D) that are applicable to Portland to improve operating conditions and safety for bicyclists 	Immediate	Transportation
<ul style="list-style-type: none"> Explore opportunities to collaborate with other cities to share experiences and best practices with innovative bicycle facilities 	Immediate	Transportation
<ul style="list-style-type: none"> Identify funding and potential partners for the development of bicycle design guidelines 	Immediate	Transportation
<ul style="list-style-type: none"> Collaborate with Portland Streetcar and TriMet to develop design guidelines for areas where streetcar or light rail facilities intersect, or are in close proximity to bicycle facilities 	Immediate	Transportation; Portland Streetcar; TriMet
<ul style="list-style-type: none"> Develop bicycle facility design guidelines for freight districts that consider the operational needs of both bicycles and trucks 	Immediate	Transportation
<ul style="list-style-type: none"> Work with ODOT, FHWA and other applicable agencies to streamline and accelerate design, testing and authorization of innovative bicycle facility designs 	Medium-term	Transportation
<ul style="list-style-type: none"> Develop a system for evaluating bicycle facility designs and improvements that compares vehicular mobility with bicycle access 	Medium-term	Transportation
<ul style="list-style-type: none"> Use all available traffic management tools and methods to create and maintain sufficiently low automotive volumes and speeds on bicycle boulevards to promote a comfortable bicycling environment 	Immediate	Transportation
<ul style="list-style-type: none"> Develop specific interim improvement designs that can be implemented where the preferred improvement is not immediately feasible 	Immediate	Transportation
<ul style="list-style-type: none"> Design improvements to meet multiple objectives, such as accommodating storm drainage, bicyclists and pedestrians 	Immediate	Transportation
<ul style="list-style-type: none"> Develop new designs for safe, comfortable and attractive bikeways that can carry more bicyclists 	Immediate	Transportation
<ul style="list-style-type: none"> Work with local, national and international transportation research entities to thoroughly and scientifically evaluate new designs 	Immediate	Transportation
<ul style="list-style-type: none"> Work with emergency service providers to develop traffic calming techniques on emergency access routes that allow appropriate emergency response times 	Long-term	Transportation; Fire & Rescue Bureau
3.3 BICYCLE PARKING		
3.3 A. Seek changes to regulations to ensure all land uses provide ample bike parking and end-of-trip facilities.		
<ul style="list-style-type: none"> Amend Portland's zoning code to increase short and long-term bicycle parking requirements, including prohibiting space within dwelling units, balconies or required open spaces not specifically designed for bicycle parking from counting towards long-term bicycle parking requirements 	Immediate	Transportation; Planning & Sustainability; Development Services; City Council
<ul style="list-style-type: none"> Amend Portland's zoning code to increase minimum short and long-term bicycle parking requirements at light rails stations and transit centers to reflect levels articulated in TriMet's <i>Bicycle Parking Design Guidelines</i> 	Immediate	Transportation; Planning & Sustainability; Development Services; TriMet; Metro; City Council
<ul style="list-style-type: none"> Amend Portland's zoning code to require higher levels of short and long-term bicycle parking and shower/change facilities in high-demand areas, such as Bicycle Districts 	Immediate	Transportation; Planning & Sustainability; Development Services; City Council
3.3 B. Anticipate and provide adequate bicycle parking, especially at high-demand locations.		
<ul style="list-style-type: none"> Work with local business associations and other stakeholders to develop short and long term plans to address immediate and future bicycle parking needs 	Immediate	Transportation
<ul style="list-style-type: none"> Finalize policy and facility requirements for the approval and funding of on-street grouped bicycle parking facilities in metered and non-metered areas 	Immediate	Transportation



Recommendations and associated actions (continued)

Priority Responsibility

	Priority	Responsibility
3.3 B., continued		
<ul style="list-style-type: none"> Develop programs and funding mechanisms to increase bicycle parking at public institutions (schools, campuses, civic centers and parks) 	Immediate	Transportation; Portland Parks & Recreation; Portland Public Schools; Multnomah County
<ul style="list-style-type: none"> Provide additional short term and covered bicycle parking at rail platforms and high demand bus stops in City of Portland right-of-ways and work with partner agencies to ensure adequate bicycle parking provision in non right-of-way locations 	Immediate	Transportation; TriMet
<ul style="list-style-type: none"> Amend Title 17 (17.28.065.A) of the city code to allow the City Engineer to require that public improvement and streetscape plans provide grouped bicycle parking facilities in the right-of-way when demand merits 	Immediate	Transportation; Planning & Sustainability; Development Services; City Council
<ul style="list-style-type: none"> Develop incentives to encourage private building owners to purchase, obtain permit and install bicycle racks in the public right-of-way 	Immediate	Transportation; Development Services
<ul style="list-style-type: none"> Develop strategies to increase the amount of covered and secure bicycle parking in City of Portland owned and privately owned parking garages in employment districts 	Immediate	Transportation
<ul style="list-style-type: none"> Revise special events permitting requirements to allow that large events held in public spaces provide adequate short-term bicycle parking 	Immediate	Transportation; Planning & Sustainability; Bureau of Development Services
<ul style="list-style-type: none"> Establish City of Portland operated (or private/public collaboration) high capacity, automated bicycle parking facilities in high demand centralized locations 	Long-term	Transportation; Planning & Sustainability; Development Services
3.3 C. Ensure a high quality of function and design of bicycle parking.		
<ul style="list-style-type: none"> Review and revise existing design guidelines for the placement and design of bicycle parking on private property and within City of Portland rights-of-ways, including on-street grouped bicycle parking 	Immediate	Transportation; Development Services
<ul style="list-style-type: none"> Ensure that guidelines for bicycle parking in the right-of-way address the preservation or enhancement of circulation space in the through pedestrian zone 	Ongoing	Transportation
<ul style="list-style-type: none"> Review existing City approved rack types and develop guidelines for acceptable rack designs 	Immediate	Transportation
<ul style="list-style-type: none"> Coordinate and communicate bicycle parking permitting requirements with City of Portland bureaus, other agencies and the business community 	Immediate	Transportation
<ul style="list-style-type: none"> Promote innovation in the design of bicycle parking facilities through partnerships with local artists, institutions and City of Portland bureaus 	Immediate	Transportation; Regional Arts & Culture Council; Environmental Services
<ul style="list-style-type: none"> Assess current levels of bicycle parking signage in Portland right-of-way and rail platforms, and develop a retrofit program for existing facilities 	Immediate	Transportation; TriMet
<ul style="list-style-type: none"> Develop effective strategies to prevent bicycle theft 	Immediate	Transportation; Police
3.3 D. Encourage owners of existing buildings to upgrade bicycle parking.		
<ul style="list-style-type: none"> Develop materials and perform outreach to building owners and property managers, with information on potential funding sources, commercial benefits, tax credit opportunities and technical expertise on installation and preferred locations 	Immediate	Transportation; Development Services
<ul style="list-style-type: none"> Develop a program to work with retail and business interests to increase short-term on-site bike parking in areas of Portland where on-street bike parking would be more than 50 feet from the entrances to major retail venues 	Immediate	Transportation; Development Services
<ul style="list-style-type: none"> Identify funding opportunities and develop programs to provide financial incentives that promote private party retrofitting of bicycle parking facilities at existing residential and commercial buildings 	Medium-term	Transportation
3.3 E. Establish a funding stream to fulfill future bicycle parking demand, improvements and maintenance.		
<ul style="list-style-type: none"> Explore new funding mechanisms to finance increasing bicycle parking capacity throughout the city 	Immediate	Transportation; City Council
<ul style="list-style-type: none"> Develop a policy and funding mechanism to manage abandoned bicycles in the right-of-way 	Medium-term	Transportation
<ul style="list-style-type: none"> Develop strategies to ensure that an inventory of City of Portland bicycle parking assets is current and accurate 	Immediate	Transportation





Appendix A: Action plan and project list

Recommendations and associated actions (continued)

Priority Responsibility

Recommendations and associated actions (continued)	Priority	Responsibility
3.4 INTEGRATING BICYCLING WITH OTHER TRAVEL MODES		
3.4 A. Engage with partners to improve and simplify connections and transfers between bicycling and other travel modes.		
• Engage TriMet and other transit providers to improve the reliability of 'bikes-on-board' options for routes that serve longer distance trips, including trips in future Streetcar and MAX corridors	Medium-term	Transportation; TriMet
• Encourage TriMet and other transit providers to retain capacity for 'bikes-on-board,' including during peak hours	Ongoing	Transportation; TriMet
• Collaborate with transit providers to develop additional options, including encouragement programs directed at use of expanded secure parking capacity for longer term expansion of mixed bike/transit trips	Immediate	Transportation; TriMet
• Analyze how bike sharing programs might serve transit trips	Medium-term	Transportation; TriMet
• Encourage Amtrak and other inter-city carriers to add capacity and increase convenience for bringing bicycles on board	Medium-term	Transportation; Amtrak
• Work with Portland International Airport, Union Station and the Greyhound Bus terminal to create bicycle assembly/packing areas	Medium-term	Transportation; Port of Portland; PDC
• Encourage taxi and car share companies to provide bike racks on vehicles	Medium-term	Transportation; various taxi providers
• Provide sufficient quantities of secure bicycle parking at High Capacity Transit stations	Medium-term	Transportation; TriMet
• Leverage streetcar signalization investments to assist perpendicular bikeway crossings of the streetcar corridor	Immediate	Transportation; TriMet
• Fund and perform a study of bicycle-transit links at outlying transit centers and light rail stations to extend the efficient use of bicycles to all areas of the city	Long-term	Transportation; PSU; TriMet
• Work with Portland International Airport, Union Station and the Greyhound Bus terminal to create more long-term bicycle parking such as lockers or other secure facilities that serve these terminals	Immediate	Transportation; Port of Portland; Portland Development Commission
• Evaluate the opportunity for a bicycle rental business at Portland International Airport	Medium-term	Transportation; Port of Portland
• Develop low-stress bicycle connections to targeted light rail stations and transit centers and create stronger bicycle-transit links at outlying transit centers and light rail stations to extend the bicycle access to all Portland neighborhoods	Immediate	Transportation
• Ensure that the bikeway network serves High Capacity Transit stations	Ongoing	Transportation; Metro; TriMet
• Ensure that the design of High Capacity Transit stations and transit centers facilitates easy transfer between different modes, including way-finding, signage, pavement striping and curb cuts	Ongoing	Transportation; Metro; TriMet
3.4 B. Explore bike sharing systems.		
• Analyze the cost effectiveness of bike sharing systems	Medium-term	Transportation
• Collaborate with TriMet and Portland State University to explore a bike sharing system with multiple partners	Medium-term	Transportation; PSU; TriMet
3.5 A GREEN NETWORK		
3.5 A. Collaborate with Metro and other partners to realize a coordinated regional network of greenways.		
• Prioritize the project development of Portland's regional trails network	Immediate	Transportation; Parks & Recreation; Metro
• Fund project development of major trail corridors in concert with Metro's The Intertwine effort so that these projects will be ready for implementation when construction funding becomes achievable in the future	Immediate	Transportation; Metro; Portland Parks & Recreation
• Further the development and enhancement of existing and proposed regional multi-use trails	Immediate	Parks & Recreation; Transportation; Metro
• Advocate for regional networks to include Major City Bikeways, including bicycle boulevards	Ongoing	Transportation; Metro
• Ensure that trails and paths on Major City Bikeways are designed with appropriate separation between bicyclists and pedestrians	Ongoing	Transportation; Metro; Parks & Recreation
• Coordinate with the Oregon Department of Transportation and others to provide bicycle access in areas where on-street bicycle facilities are not available or the opportunities for providing them are constrained	Ongoing	Transportation; Portland Parks & Recreation; ODOT



Recommendations and associated actions (continued)

Priority Responsibility

	Priority	Responsibility
3.5 B. Work with advocates for bicycling on natural surface trails and natural resources advocates developing strategies that increase opportunities for bicycling on natural surface trails, while protecting the natural environment and enhancing pedestrian safety.		
• Develop a map showing potential opportunities and alignments for bicycling on natural surface trails in Portland and the metropolitan region, integrated with existing and proposed recreation and non-motorized transportation facilities, with a particular focus on providing opportunities for neighborhoods that are underserved by other bicycle facilities	Immediate	Transportation; Portland Parks & Recreation
• Evaluate the potential for parallel natural surface trail alignments on existing or proposed non-motorized transportation facilities	Long-term	Transportation
• Further the development and enhancement of existing and proposed natural surface trail facilities, such as the proposed Gateway Green project	Immediate	Transportation; Portland Parks & Recreation; Metro; Environmental Services
• Formalize relationships with advocacy groups for natural surface trails and engage them in the planning, development, construction and on-going maintenance of natural surface trails and facilities	Medium-term	Transportation
3.5 C. Ensure that green street features and bicycle transportation improvements are mutually supportive.		
• Refine how bicycle and pedestrian improvements are considered in applying the <i>Stormwater Management Manual</i>	Medium-term	Transportation; Bureau of Environmental Services
• Develop cost-effective green (stormwater) treatments for bicycle boulevards, such as semi-diverters and curb extensions with bicycle pass-throughs	Medium-term	Transportation; Bureau of Environmental Services
• Ensure that street improvements meet both stormwater and transportation objectives	Immediate	Transportation; Bureau of Environmental Services
• Seek innovative ways to integrate traffic calming, pedestrian, bicycle and stormwater designs	Immediate	Transportation; Bureau of Environmental Services
• Coordinate planned green street improvements with planned bicycle and pedestrian improvements at the pre-planning stage	Immediate	Transportation; Bureau of Environmental Services
3.6 OPERATIONS AND MAINTENANCE OF THE BICYCLE NETWORK		
3.6 A. Improve and preserve existing bikeways.		
• Explore opportunities for adding or enhancing bicycle facilities in street rehabilitation and signal maintenance projects	Ongoing	Transportation
• Develop a strategy for funding a program to maintain special bicycle features and bicycle boulevards on local service traffic streets	Medium-term	Transportation
• Conduct periodic assessment of signal operation in key bicycle, transit and freight corridors	Immediate	Transportation
• Maintain street lighting on bicycle facilities and in pedestrian zones to ensure safety	Medium-term	Transportation
• Maintain roadway shoulders in areas currently lacking other bicycle and pedestrian facilities	Medium-term	Transportation
• Explore prefabricated street features, including doweled pedestrian islands and medians, assess installation and maintenance costs	Immediate	Transportation
• Standardize signage and pavement markings for bikeways and develop a strategy and funding for maintaining them	Medium-term	Transportation
• Formalize a system for ensuring that on-street bicycle parking facilities (such as bicycle parking corrals) are maintained and that maintenance agreements with adjacent businesses are kept current	Medium-term	Transportation
• Investigate costs and resources needed to ensure that off-street public and privately owned bicycle parking facilities are maintained	Medium-term	Transportation
• Seek funds to perform tree trimming that will enhance the performance of streetlights on bicycle routes	Medium-term	Transportation





Appendix A: Action plan and project list

Recommendations and associated actions (continued)

	Priority	Responsibility
3.6 B. Develop maintenance practices that minimize physical hazards for bicyclists.		
• When maintaining streets with bike lanes, install needed pavement overlays to cover the entire roadway surface or locate paving seams to align with bike lane striping	Ongoing	Transportation
• Ensure that drainage grates are bicycle safe through installation and maintenance standards	Ongoing	Transportation
• Maintain roadside vegetation and drainage facilities such as ditches and swales to forestall hazards for bicyclists and pedestrians	Ongoing	Transportation
• Create educational materials to inform property owners of their responsibilities to maintain vegetation and gravel driveways on their property	Medium-term	Transportation
• Give priority to streets with bike facilities when recovering gravel following snow and ice events	Ongoing	Transportation
• Develop a strategy to fund ongoing maintenance of existing and future bikeways through public parks	Medium-term	Transportation; Portland Parks & Recreation
3.6 C. Accommodate bicyclists through construction zones.		
• Ensure accommodation of safe and direct bicycle traffic as part of construction traffic control plans	Immediate	
• Ensure appropriate signing in advance of and through construction zones, including as a condition of street use permits	Immediate	Transportation; Bureau of Development Services
• Provide training on proper bicycle accommodation for right-of-way and construction inspectors	Immediate	Transportation; Bureau of Development Services
3.7 BIKEWAYS IN PORTLAND'S CENTRAL CITY		
3.7 A. Make Portland's Central City superlatively bicycle-friendly.		
• Create Bicycle Districts in downtown, the River District and the Lloyd District	Immediate	Transportation; Planning & Sustainability; City Council
• Use existing and innovative engineering tools to create conditions welcoming to bicyclists throughout the Central City	Ongoing	Transportation
4.1 ENCOURAGING BICYCLING		
4.1 A. Expand the City of Portland's offering of maps, information and trip planning to encourage new bicyclists and increase convenience for those who are already riding.		
• Offer free transportation options information, such as New Resident SmartTrips, to new Portland residents	Immediate	Transportation
• Continue and expand developing bicycle maps in multiple languages	Ongoing	Transportation
• Expand distribution of bicycling and walking maps to airports, transit stations, libraries, grocery stores and hotels	Medium-term	Transportation
• Continue offering free bicycling and walking map updates to residents, businesses and community organizations	Ongoing	Transportation
• Offer more online interactive mapping features	Medium-term	Transportation
• Provide regular updates on detours and traffic along popular bicycling routes	Immediate; ongoing	Transportation; other partners as appropriate
• Collaborate with regional agencies, including TriMet and Metro, to develop an online, interactive bicycle route planning tool	Immediate	Transportation; TriMet; Metro
• Create a single website for accessing bicycle trip planning and customer service and as a repository for information like the City of Portland's bicycle maps	Ongoing	Transportation
• Develop an interactive online map of bicycle parking	Long-term	Transportation
• Continue partnerships with current Transportation Management Associations (TMAs) and work with the business community and other organizations to help initiate new TMAs	Long-term	Transportation; local TMAs



Recommendations and associated actions (continued)

Priority Responsibility

	Priority	Responsibility
4.1 B. Support programs to increase access to bicycles.		
• Increase City of Portland support, including technical and funding support, to expand programs that help low-income Portland residents gain access to equipment necessary to bicycle safely and comfortably	Medium-term	Transportation
• Develop and market information and materials to encourage employers to initiate or expand fleet bike programs	Immediate	Transportation
• Seek creative methods to engage communities in underserved areas by coupling encouragement and education with facility development	Ongoing	Transportation
4.1 C. Expand programs that promote long-term changes in the transportation habits of Portland residents by encouraging bicycling.		
• Offer the SmartTrips program to Portland residents every five years	Medium-term	Transportation
• Expand SmartTrips employer program to promote bicycling and transportation options to Portland businesses more effectively, and partner with local agencies, such as Metro, TriMet and the Department of Environmental Quality (DEQ) on outreach to Portland employers	Immediate	Transportation; Metro; TriMet; DEQ
• Collaborate with Portland schools to offer SmartTrips programs to all parents of 2nd and 5th grade students	Immediate	Transportation; Portland Public Schools
• Offer SmartTrips programs to 8th and 11th grade students, promoting age-appropriate transportation options and bicycling information	Medium-term	Transportation; Portland Public Schools
• Develop a SmartTrips program for new Portland residents	Immediate	Transportation
• Support participation in events that encourage bicycling for transportation, or support other goals and policies in the <i>Portland Bicycle Plan for 2030</i>	Ongoing	Transportation
• Develop a pilot program to provide personalized bicycle training opportunities for novice riders	Long-term	Transportation
• Assess the best methods for developing a Portland citywide personalized training program	Long-term	Transportation
• Explore culturally-specific classes and rides to help novice bicyclists with varied cultural backgrounds get familiar with bicycling in Portland	Immediate	Transportation
• Develop partnerships with community organizations to provide bicycle training and education to residents with whom the City of Portland does not sufficiently engage	Medium-term	Transportation
4.1 D. Continue to raise the awareness of bicycling and reinforce safe bicycling behaviors.		
• Increase outreach staff to meet demand for bicycle and transportation options encouragement and education	Immediate	Transportation
• Offer additional Sunday Parkways and create a model for sustainable program funding	Immediate	Transportation
• Continue and expand partnerships with organizations promoting bicycling	Ongoing	Transportation
• Ensure bicycling remains visible to the public through public campaigns, media coverage and a strong Internet presence	Medium-term	Transportation
• Increase support for conferences and research by partnering with organizations and sponsoring bicycling-related academic work	Ongoing	Transportation
• Increase partnering with local advocacy groups and support award programs that promote bicycling in Portland	Ongoing	Transportation
4.1 E. Investigate strategies for providing incentives to bicycle.		
• Encourage more employers to offer financial or other incentives to employees who bicycle to work	Immediate	Transportation
• Develop marketing materials to educate employers on federal and state credits for energy efficiency efforts, including promoting bicycling	Ongoing	Transportation
• Explore the development of a City of Portland business tax credit program for bicycle-related investments	Long-term	Transportation
4.2 SAFETY EDUCATION AND ENFORCEMENT		
4.2 A. Expand the Safe Routes to School program.		
• Offer a comprehensive Safe Routes to School program to all Portland schools	Medium-term	Transportation
• Expand educational offerings to include programming for middle and high-school aged youth	Medium-term	Transportation
• Support innovative programming for older youth, such as bicycle building workshops, bicycle racing or recreational athletic teams and leadership training to work with younger Safe Routes to School students	Medium-term	Transportation
• Recruit and support parent and school staff volunteers to create more school-specific and culturally-specific encouragement programming	Immediate	Transportation





Appendix A: Action plan and project list

Recommendations and associated actions (continued)

	Priority	Responsibility
4.2 B. Increase safety education and outreach to encourage safe travel behavior for all travel modes.		
• Develop culturally specific outreach and education programs	Immediate	Transportation
• Continue offering the Share the Road safety class and make it available to the general public as a traffic safety educational opportunity	Immediate	Transportation
• Expand the Share the Path campaign and focus efforts on high bicycle and pedestrian traffic areas	Immediate	Parks & Recreation; Transportation
• Explore a partnership with other agencies, such as ODOT and Metro, to develop a region-wide traffic safety program that includes classes and other opportunities for road user education	Long-term	Transportation; ODOT; Metro
• Develop more Public Service Announcements to raise awareness about traffic and bicycle safety	Medium-term	Transportation
• Utilize educational tools, such as warnings, diversion-type classes and media coverage, and create an outreach model for education efforts to achieve maximum improvements in bicycle and traffic safety with minimal economic impact to drivers and bicyclists	Immediate	Transportation
• Work with ODOT and the Oregon State Legislature to achieve local control in setting speed limits	Immediate	Transportation; ODOT
• Explore partnership possibilities with ODOT and driver's education groups to shape the curriculum	Long-term	Transportation; ODOT
• Continue educating Portland residents of all ages about proper helmet use and the safety benefits of wearing a helmet	Ongoing	Transportation
• Educate Portland residents about conspicuity and bicycle light requirements and support programs that work to equip bicycles with appropriate lights	Ongoing	Transportation
4.2 C. Regularly assess road safety data to inform design and engineering improvements.		
• Work with local and statewide organizations and agencies to ensure bicycle crash data is recorded, accurately catalogued and analyzed to result in safer bicycling and road conditions in Portland	Medium-term	Transportation; Police; ODOT
• Fully investigate all bicycle, pedestrian and automobile crashes resulting in ambulatory injuries or worse, and investigate all lower severity crashes, whenever possible	Ongoing	Transportation; Police; ODOT
• Develop and annually update a high-risk location list and a high-risk behavior list in collaboration and communication with the Bureau of Transportation and community groups	Ongoing	Transportation
• Investigate reports from roadway users and local stakeholders about potential safety issues for bicyclists	Ongoing	Transportation
• Clarify the City of Portland's multi-bureau strategies for addressing locations and behaviors with a high risk of injury or death, and for low-crash locations with high levels of concern for livability, community and equity	Medium-term	Transportation
• Consider setting standards for street lighting specific to bicycle boulevards and other key bicycle facilities	Medium-term	Transportation
4.2 D. Implement enforcement practices that contribute to the safety and attractiveness of bicycling.		
• Incorporate multi-modal traffic safety and the enforcement strategy for helping to make bicycling safe and attractive into the daily work of all divisions of the Portland Police Bureau	Immediate	Police; Transportation
• Create an outreach model for education missions	Medium-term	Transportation; Police
• Develop an enforcement hierarchy for bicycle safety and enforcement strategies to communicate priorities clearly. In particular, the Portland Police Bureau should:	Immediate	Transportation; Police
• Prioritize enforcement toward motorists, bicyclists and pedestrians based on available data that documents the correlation of specific travel behaviors to potential injury and livability concerns	Immediate	Transportation; Police
• Increase level of enforcement for drivers and bicycle riders who operate while under the influence of intoxicants	Immediate	Transportation; Police
• Clarify operating procedures for enforcement actions at 'high crash' and 'low crash' locations	Medium-term	Transportation; Police
• Create a calendar of bicycle safety-related enforcement activities and update it at regular intervals to communicate with the public about ongoing actions and strategies	Ongoing	Transportation; Police



Recommendations and associated actions (continued)

Priority Responsibility

Recommendations and associated actions (continued)	Priority	Responsibility
4.2 D, continued		
<ul style="list-style-type: none"> Produce an annual report summarizing the Portland Police Bureau's and Portland Bureau of Transportation's bicycle-related activities and results over the past year, set goals for the upcoming year and publish as part of the Portland Police Bureau's existing annual enforcement summary 	Ongoing	Transportation; Police
<ul style="list-style-type: none"> Develop a strategy between the Bureau of Transportation, the Portland City Attorney, the Portland Police Bureau, other City of Portland bureaus and community groups to interpret unclear state and city laws pertaining to safe bicycling and develop possible legislative changes to clarify or improve existing laws, including the following considerations: <ul style="list-style-type: none"> Safe passing distance When a bicyclist may leave a bike lane When a motorist may enter a bike lane Stop sign requirements Yield requirements Bicycle lighting equipment Culpability for non-reckless drivers Rules and responsibilities on multi-use paths Pedestrian use of bike lanes 	Medium-term	Transportation; Police; City Attorney; other relevant Bureaus
4.3 WAYFINDING FOR BICYCLISTS		
4.3 A. Improve wayfinding for users of Portland's network of bikeways.		
<ul style="list-style-type: none"> Sign and mark all new bikeways 	Ongoing	Transportation
<ul style="list-style-type: none"> Identify locations where bicycle signage and markings are needed to define the route or direct bicyclists to a destination or other bikeway 	Immediate	Transportation
<ul style="list-style-type: none"> Install bicycle kiosks with maps at strategic locations to direct bicyclists to destinations or along bikeways in a defined geographic area in order to improve the safety, comfort and attractiveness of bicycling routes 	Long-term	Transportation
<ul style="list-style-type: none"> Investigate the feasibility of developing a route-based wayfinding system to complement Portland's existing destination-based wayfinding system, by conducting a study of best practices in route-based wayfinding and working with stakeholders, including the Bureau of Transportation's Maintenance Operations group, to identify feasible systems 	Long-term	Transportation
<ul style="list-style-type: none"> Investigate opportunities for implementing innovative wayfinding designs, such as wayfinding to transit, multi-modal hubs and bicycle parking 	Medium-term	Transportation
<ul style="list-style-type: none"> Coordinate bicycle destination sign networks with neighboring municipalities and standardize signs for bikeways 	Medium-term	Transportation
<ul style="list-style-type: none"> Install bikeway destination signs, boulevard markings and other pavement markings that clearly communicate to bicyclists and motorists expectations for roadway use 	Immediate	Transportation
5.1 OVERALL APPROACH TO IMPLEMENTATION		
5.1 A. Amend the <i>Transportation System Plan (TSP)</i> to adopt recommended policies and classifications for bicycle transportation.		
<ul style="list-style-type: none"> Identify funding, timeline and staffing for an overall update of the <i>TSP</i> 	Immediate	Transportation Planning
<ul style="list-style-type: none"> In the event that an overall update cannot be completed in a timely fashion, consider undertaking a technical update of the <i>TSP</i> to adopt the recommendations of this plan 	Contingent	Transportation Planning
<ul style="list-style-type: none"> Use the update of the <i>TSP</i> to develop policy guidance for resolving conflicts between classification 	Immediate	Transportation
5.1 B. Identify and pursue multiple strategies to increase funding for green transportation.		
<ul style="list-style-type: none"> Form a task force to recommend new funding sources for bicycle facilities and other green transportation modes 	Immediate	Office of the Mayor; Transportation
<ul style="list-style-type: none"> Work with elected leaders to position the City of Portland to receive funding under the federal reauthorization 	Immediate	Office of the Mayor; Transportation





Appendix A: Action plan and project list

Recommendations and associated actions (continued)

	Priority	Responsibility
5.1 C. Develop a complete street design guide that includes bicycle design guidelines.		
• Identify funding, timeline and staffing to produce a new complete street design guide	Immediate	Transportation
5.1 D. Expand encouragement programs that provide services and equipment, support behavior changes, raise awareness and provide incentives that increase bicycling.		
• Identify new models, partners and funding for program expansion	Immediate	Transportation
• Integrate the delivery of programs with projects	Immediate	Transportation
5.1 E. Build as much of the bicycle transportation system as possible, as quickly as possible.		
• Prioritize projects that are easily implemented that also improve connectivity, expand coverage and maximize separation from motor vehicle traffic	Immediate	Transportation
• Be opportunistic and partner with others	Immediate	Transportation
• Make incremental improvements by installing interim facilities (such as climbing bike lanes or wide shoulders) or bikeways on parallel routes where projects are not easily implemented in their ultimate configuration; evaluate opportunities for interim facilities in Southwest Portland based on right-of-way needs, stormwater requirements, pedestrian needs and other issues to fill gaps between projects in the 80 percent implementation strategy	Immediate	Transportation
• Continue to build new bicycle boulevards	Immediate	Transportation
• Continue to refine the planned network and facilities to accommodate local preference, especially by:	Immediate	Transportation
• Funding and developing an <i>East Portland Bicycle Infrastructure Implementation Action Plan</i> that ensures that 80 percent of households will be within a half-mile of a low-stress facility and includes the development of education and activities that will encourage high levels of use by a diverse group of East Portland residents	Immediate	Transportation
• Funding and performing a study of the bicycle corridor that uses the NE 28th Avenue bridge over I-84	Medium-term	Transportation
• Funding and developing a <i>Southwest Portland Bicycle Infrastructure Implementation Action Plan</i>	Medium-term	Transportation
• Develop and implement a list of high priority pilot corridors for separated in-roadway bikeways that can be initially created with 'software' (paint, signal timing changes, plastic pylons) rather than 'hardware' (concrete, asphalt, new signals) and, based on the results of these pilots, consider prioritizing permanent build-out of these corridors and construction of additional separated facilities	Immediate	Transportation
• Continue to install new on-street grouped bicycle parking	Immediate	Transportation
• Improve existing bikeways through area improvement plans	Medium-term	Transportation
• Develop an inter-bureau improvement and maintenance project review and evaluation process to make planned bicycle system improvements in conjunction with other public facility improvements	Medium-term	Transportation
• Address pedestrian travel needs when implementing bike lanes or other bicycle facilities on roadways with no sidewalks	On-going	Transportation
5.1 F. Develop strategies to ensure successful delivery of bicycle projects.		
• Begin project development on multiple bicycle transportation projects	Immediate	Transportation
• Work with the Bureau of Transportation's Engineering & Technical Services group and the Development & Capital Program to develop strategies for project delivery	Immediate	Transportation
5.1 G. Fund and construct projects in areas underserved by the bikeway network that score high in indicators of disadvantage.		
• Assure that implementation criteria include comprehensive measures of equity, including poverty, minority status and age	Immediate	Transportation
• Establish benchmarks for completing projects in targeted areas	Immediate	Transportation



Recommendations and associated actions (continued)

Priority Responsibility

• Regularly update the Equity Gap Analysis to account for changes in the low-stress bikeway network so that the results continue to inform project selection	Ongoing	Transportation
• Develop a tool for addressing the health and equity effects of planned projects	Medium-term	Transportation
5.5 EVALUATION AND MEASUREMENT		
5.5 A. Continue to expand the means of evaluating how well the public is being served by Portland's bikeways network and the programs that support bicycling.		
• Refine the performance measures for the bicycle transportation system and set baseline levels and periodic benchmarks to gauge progress toward the objectives of the <i>Portland Bicycle Plan for 2030</i>	Immediate	Transportation
• Continue and expand annual bicycle counts	Ongoing	Transportation
• Improve the transparency and availability of annual bicycle counts data, especially by making it available to the public online and integrating it into Transportation's Traffic Data (TDAT) software	Medium-term	Transportation
• Expand collection of before and after data associated with encouragement programs and new infrastructure	Ongoing	Transportation
• Continue to explore how analysis of geographic information can inform project priorities and improve the equitable delivery of public services	Immediate	Transportation
• Expand surveys and evaluation to assess the attributes of the 'interested but concerned' population	Medium-term	Transportation
• Collaborate with Portland State University's Center for Transportation Studies and Initiative for Bicycle and Pedestrian Innovation to develop new means of evaluation	Ongoing	Transportation; PSU
• Collaborate with other universities and other cities throughout the United States and elsewhere to establish best practices for measuring and sharing information	Ongoing	Transportation
• Continue annual SmartTrips evaluations	Ongoing	Transportation
• Collaborate with Metro to improve their transportation demand models and forecasting to better reflect bicycle trips	Immediate	Transportation; Metro
• Collaborate with Metro to structure the upcoming regional household activity survey so that it provides useful baseline data for identified areas of targeted bikeway investments	Immediate	Transportation; Metro





Appendix A: Action plan and project list

List of funded projects

	CENTRAL CITY	Facility Type	Full Project Cost	Bicycle Element Cost
8053	GIBBS OVERPASS	Trail	\$12,259,000	\$6,129,500
8069/8070	E BURNSIDE/COUCH COUPLET	Multiple facility types	\$17,852,000	\$5,000
8302	UPPER NAITO	Separated in-roadway	\$172,000	\$171,075
8325	WILLIAMS	Separated in-roadway	\$20,000	\$20,000
FAR NORTHEAST				
8171	NE MARINE DR BIKEWAY	Trail	\$634,000	\$317,000
FAR SOUTHEAST				
8018	BUSH	Multiple facility types	\$220,000	\$220,000
8107	LOWER SE 101st	Multiple facility types	\$85,000	\$85,000
NORTH				
8133	MIDDLE N ROSA PARKS	Multiple facility types	\$55,000	\$54,480
8150	N LOMBARD (PORTSMOUTH - IDA)	Separated in-roadway	\$765,000	\$764,196
8177	NORTH BRYANT	Bike boulevard	\$100,000	\$100,000
8178	NORTH CONCORD	Multiple facility types	\$100,000	\$100,000
8179	NORTH WABASH	Bike boulevard	\$100,000	\$100,000
8204	OUTER N LOMBARD	Separated in-roadway	\$1,813,000	\$1,812,396
8321	WAUD BLUFF	Trail	\$1,704,000	\$852,000
NORTHEAST				
8048	FIFTIES BIKEWAY	Multiple facility types	\$255,208	\$255,208
8133	MIDDLE N ROSA PARKS	Multiple facility types	\$476,000	\$475,002
8171	NE MARINE DR BIKEWAY	Multiple facility types	\$1,497,344	\$1,497,344
8180	NORTH-NORTHEAST GOING	Bike boulevard	\$100,000	\$100,000
8194	OUTER CULLY	Separated in-roadway	\$5,255,633	\$1,320,000
8294	TWENTIES BIKEWAY	Multiple facility types	\$918,787	\$918,787
8297	UPPER ALDERWOOD	Separated in-roadway	\$441,000	\$440,670
8325	N WILLIAMS	Separated in-roadway	\$180,000	\$180,000
SOUTHEAST				
8048	FIFTIES BIKEWAY	Multiple facility types	\$1,339,841	\$1,339,841
8069/8070	E BURNSIDE/COUCH COUPLET	Separated in-roadway	(see Central City projects)	
8108	LOWER SE 19th	Bike boulevard	\$98,415	\$98,415
8109	LOWER SE 92nd	Separated in-roadway	\$207,294	\$207,294
8258	SE CENTER	Bike boulevard	\$100,000	\$100,000
8259	SE MILL	Multiple facility types	\$100,000	\$100,000
8294	TWENTIES BIKEWAY	Multiple facility types	\$918,787	\$918,787
8296	UMATILLA	Bike boulevard	\$3,032,411	\$3,032,411
SOUTHWEST				
8053	GIBBS OVERPASS	Trail	(see Central City projects)	
8080	INNER RED ELECTRIC	Multiple facility types	\$2,150,000	\$1,075,000
8283	SW TERWILLIGER-WESTWOOD	Multiple facility types	\$100,000	\$100,000
STUDIES				
	North Portland Willamette Greenway Study (N Burlington Ave. to Steel Bridge)	Study mostly off-street path near the river for both bicycles and pedestrians	\$200,000	\$100,000
	Sullivan's Gulch Trail Master Plan (Eastbank Esplanade to I-205 path)	Study off-street path next to I-84	\$250,000	\$125,000

Notes on project cost assumptions

Except where project costs were established by others, the costs for projects in the Portland Bicycle Plan for 2030 were estimated roughly based on unit costs per mile in 2008 dollars. The cost assumptions for each facility type are shown in the adjacent table. These assumed costs, though planning level estimates, compare well to full project costs for bikeways under development and budgeted by PBOT in 2009 and 2010. These comparison costs generally do include factors for design, engineering, right-of-way acquisition, and contingency. Where projects contain multiple facility types, the total cost is estimated by summing the products of unit cost for each facility type multiplied by the length of the project that is assigned to that facility type. Where a decision on facility type is still pending, the cost of the more expensive facility type has been used. These estimates are considered to have a level of confidence appropriate to a comprehensive citywide plan.

Table of construction cost assumptions

Bikeway Facility Type	Construction Cost/Mile Assumption
Trail	\$1,000,000
Bike boulevard	\$250,000
Advisory bike lane	\$250,000
Separated in-roadway	\$1,000,000
Advisory bike lane or bike boulevard	\$250,000
Enhanced shared roadway	\$15,000
Enhanced shared roadway or bike boulevard	\$250,000
Separated in-roadway or advisory bike lane	\$1,000,000
Enhanced shared roadway or advisory bike lane	\$250,000
Separated in-roadway or advisory bike lane or enhanced shared roadway	\$1,000,000
Separated in-roadway or enhanced shared roadway	\$1,000,000



List of recommended projects with costs

Key no.	Corridor description	Suggested facility description	Length (miles)	Estimated Cost*
8001	ALAMEDA from NE Klickitat & 38th to NE 72nd Dr	Multiple facility types: bicycle boulevard (Klickitat & 38th - 42nd; Beaumont & 42nd - 67th; 67th - 72nd); separated in-roadway (42nd: Alameda - Beaumont)	1.9	\$532,000
8002	ALASKA-CHAUTAUQUA from N Woolsey Ave/N Willis Blvd to N Chautauqua Blvd/N Columbia Blvd	Multiple facility types: separated in-roadway (Woolsey - Trenton); bicycle boulevard or advisory bike lane (all other segments)	1.1	\$402,000
8004	AMBASSADOR from NE International Pky to Bike and Pedestrian Path connecting to NE 82nd Ave	Bicycle boulevard or enhanced shared roadway	0.1	\$19,000
8005	ANCHOR from N Channel Ave to N Basin Ave	Separated in-roadway	0.3	\$316,000
8006	APRIL HILL PARK from SW 57th Ave to SW 56th Ave	Trail	0.1	\$93,000
8007	ARGYLE from N Columbia Blvd to N Denver Ave	Multiple facility types: trail (Columbia - Delaware); separated in-roadway (Delaware - Denver)	0.4	\$397,000
8008	BALLAST from N Channel Ave to N Lagoon Ave	Bicycle boulevard	0.1	\$31,000
8009	BANCROFT from SW 9th Ave to SW Terwilliger Blvd	Bicycle boulevard or enhanced shared roadway	0.7	\$173,000
8010	BARBUR GAPS	Separated in-roadway. Major infrastructure improvements on bridges and overpasses to eliminate gaps in the Barbur Blvd bikeway	0.3	\$10,000,000 [†]
8011	BASIN from N Going St to N Greenway Trail	Separated in-roadway	1.7	\$1,654,000
8012	BELL from NE 100th Ave to NE 102nd Ave	Bicycle boulevard. Includes connection to NE 100th on NE Weidler	0.4	\$91,000
8013	BRIER from SW Barbur Blvd to SW Laview Dr	Multiple facility types: bicycle boulevard (Barbur - Brier; Brier - Laview); bicycle boulevard or enhanced shared roadway (Miles - Custer)	0.6	\$161,000
8014	BROADLEAF from SW Lancaster Rd to SW 18th Pl	Enhanced shared roadway	0.3	\$4,000
8015	BRUGGER from City Limits to SW Taylors Ferry Rd	Bicycle boulevard. Includes connection to Taylors Ferry on SW 55th	0.6	\$147,000

*Except as noted, project costs are a low confidence estimate of construction costs based on the assumptions described on p. A-14

[†]Project costs supplied by others

[‡]Funded project; project costs supplied by others





Appendix A: Action plan and project list

List of recommended projects with costs (continued)

Key no.	Corridor description	Suggested facility description	Length (miles)	Estimated Cost*
8016	BRYANT from N Greenwich Ave to NE Dekum St & NE 7th Ave	Bicycle boulevard. Includes connection on NE 7th Ave at eastern terminus	1.4	\$347,000
8017	BURR from N Willamette Blvd to N Columbia Blvd	Bicycle boulevard	1.0	\$255,000
8018	BUSH from SE 102nd Ave to SE 130th Ave	Multiple facility types: trail (102nd - 103rd); bicycle boulevard (103rd - 104th); bicycle boulevard or advisory bike lane (104th - 130th)	1.4	\$220,000 [‡]
8019	CANBY from City Limits to SW Vermont St	Bicycle boulevard or enhanced shared roadway	0.8	\$202,000
8020	CANYON-ZOO from SW Highland Rd to SW Zoo Rd	Separated in-roadway	0.3	\$289,000
8021	CAPITOL HILL RD from SW Barbur Blvd to SW Bertha Blvd	Multiple facility types: bicycle boulevard or enhanced shared roadway (Barbur - Troy; 21st - Custer); bicycle boulevard or advisory bike lane (Troy - 21st); enhanced shared roadway (Custer - Bertha)	0.9	\$164,000
8022	CARSON from SW 45th Ave to SW Capitol Hwy	Bicycle boulevard. Includes connection to Dolph and Capitol Hwy on SW 41st Ave	0.4	\$105,000
8023	CARUTHERS from SE Division St to SE 12th Ave	Bicycle boulevard	0.2	\$49,000
8024	CHANNEL from N Dolphin St to N Interstate Ave	Separated in-roadway. Includes connection to Interstate on Going.	2.0	\$2,004,000
8025	CHARLESTON from N Ivanhoe St to N Richards St	Bicycle boulevard	0.9	\$225,000
8026	CHELTENHAM from SW Capitol Hwy to SW Menefee Dr	Enhanced shared roadway. Does not include Dewitt - Westwood (Project 8283)	0.4	\$6,000
8027	CHESTNUT from SW Bertha Blvd to SW Vermont St	Bicycle boulevard	0.3	\$82,000
8028	CLAY from SE Water Ave to SE Ladd Ave	Separated in-roadway or enhanced shared roadway	0.6	\$632,000
8029	CLAY-COLUMBIA from SW 18th Ave to SW 12th Ave	Multiple facility types: bicycle boulevard (Clay: 18th - 12th; 12th: Clay - Columbia); separated in-roadway (Columbia: 14th - 12th)	0.4	\$171,000
8030	CLINTON from SE 9th Ave to SE 12th Ave	Bicycle boulevard	0.2	\$52,000

*Except as noted, project costs are a low confidence estimate of construction costs based on the assumptions described on p. A-14

†Project costs supplied by others

‡Funded project; project costs supplied by others



List of recommended projects with costs (continued)

Key no.	Corridor description	Suggested facility description	Length (miles)	Estimated Cost*
8031	CLINTON GAP from SE 51st Ave to SE 52nd Ave	Bicycle boulevard	0.0	\$12,000
8032	CLINTON PATH from SE 87th Ave to I-205 Bike Path	Trail	0.3	\$314,000
8033	COMMERCE from N Channel Ave to N Lagoon Ave	Bicycle boulevard	0.1	\$31,000
8034	CULLY GAP from NE Killingsworth St to NE Columbia Blvd	Separated in-roadway	0.4	\$353,000
8036	DELAWARE from N Alberta St to N Halleck St	Bicycle boulevard	1.6	\$408,000
8037	DELTA PARK from N Expo Rd to N Union Ct	Multiple facility types: separated in-roadway (Expo - Whitaker); enhanced shared roadway (Victory - Union Ct)	0.8	\$215,000
8038	DENVER from N Alberta St to N Killingsworth St	Bicycle boulevard	0.2	\$62,000
8039	DENVER-SCHMEER from N Denver Ave to Slough Trail	Trail	0.1	\$84,000
8040	DIVISION GAP from SE 52nd Ave to SE 77th Ave	Separated in-roadway	1.2	\$1,183,000
8041	DIVISION PL from SE 4th Ave to SE 9th Ave	Separated in-roadway or advisory bike lane	0.2	\$249,000
8042	DIVISION ST/PL from SE 8th Ave to SE 10th Ave	Bicycle boulevard. SE Division St (8th - 9th); SE Division Pl (9th - 10th)	0.1	\$28,000
8043	DUKE from SE 82nd Ave to SE 92nd Ave	Bicycle boulevard	0.5	\$127,000
8044	E BURNSIDE-COUCH from NE 6th Ave to NE 14th Ave	Separated in-roadway or enhanced shared roadway	0.4	\$394,000
8045	EAST FREMONT from NE 122nd Ave to NE 141st Ave	Separated in-roadway	1.0	\$951,000
8046	FAIRMOUNT Loop from SW Talbot Rd to SW Talbot Rd	Enhanced shared roadway or advisory bike lane	3.4	\$845,000
8047	FAIRVALE from SW Cameron Rd to SW Martha St	Bicycle boulevard	0.2	\$39,000

*Except as noted, project costs are a low confidence estimate of construction costs based on the assumptions described on p. A-14

†Project costs supplied by others

‡Funded project; project costs supplied by others





Appendix A: Action plan and project list

List of recommended projects with costs (continued)

Key no.	Corridor description	Suggested facility description	Length (miles)	Estimated Cost*
8048	FIFTIES BIKEWAY from SE Woodstock Blvd to NE Hancock St	Multiple facility types: separated in-roadway (Woodstock - Gladstone; Center - Lincoln; Taylor - Belmont); bicycle boulevard (Gladstone - Center; Lincoln - Taylor; Belmont - Hancock)	4.1	\$1,595,049‡
8049	FISKE from N Willamette Blvd to N Columbia Blvd	Bicycle boulevard	1.5	\$371,000
8050	FLORIDA from SW 60th Ave to SW 52nd Ave	Bicycle boulevard	0.4	\$97,000
8051	FRANCIS from SE 26th Ave to SE 48th Ave	Bicycle boulevard or advisory bike lane	1.3	\$322,000
8052	FRANKLIN from SE 21st Ave to SE Woodward St/51st Ave	Bicycle boulevard. Includes jogs on SE 23rd Ave and connection to Woodward on SE 51st Ave	1.9	\$469,000
8053	GIBBS OVERPASS from SW Kelly Ave to SW Moody Ave	Trail	0.2	\$12,259,000‡
8054	GOING from NE 41st Ave to NE 72nd Ave	Bicycle boulevard. Includes jogs on NE 47th Ave, NE 52nd Ave, NE Wygant St, and NE 55th Ave	1.7	\$429,000
8055	GOING TO THE RIVER PATH from N Basin Ave to N Interstate Ave	Trail	0.8	\$768,000
8056	HALLECK from N Woolsey Ave to N Interstate Ave	Bicycle boulevard	1.5	\$383,000
8057	HANCOCK from NE 42nd Ave to NE Hancock St	Multiple facility types: separated in-roadway (42nd - 43rd); enhanced shared roadway (Broadway - Hancock)	0.1	\$50,000
8058	HARBOR DR PATH from north of SW Sheridan St to SW Montgomery St	Multiple facility types: trail (north of SW Sheridan St - Harbor Dr); enhanced shared roadway (Harbor Dr - Montgomery St)	0.4	\$293,000
8059	HAROLD from SE 52nd Ave to SE Foster Rd	Separated in-roadway	1.4	\$1,414,000
8060	HASSALO-63rd from NE 53rd Ave to NE Davis St	Multiple facility types: bicycle boulevard (53rd - 60th; Oregon - Davis); separated in-roadway (Hassalo - Oregon). Includes connection to Hancock on 60th	1.5	\$525,000
8061	HEWETT from SW Humphrey Blvd to SW Talbot Rd	Multiple facility types: separated in-roadway (Hewett - Talbot); enhanced shared roadway (all other segments). Includes connection to Humphrey on 58th. Includes connection to Talbot on Patton	1.8	\$134,000

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†Project costs supplied by others

‡Funded project; project costs supplied by others



List of recommended projects with costs (continued)

Key no.	Corridor description	Suggested facility description	Length (miles)	Estimated Cost*
8062	HOLMAN from NE MLK JR Blvd to NE 37th Ave	Bicycle boulevard	1.7	\$437,000
8063	ILLINOIS from SW Shattuck Rd to SW 45th Ave	Bicycle boulevard	0.8	\$190,000
8064	INNER ALFRED from SW 55th Ave to SW Taylors Ferry Rd	Bicycle boulevard	0.5	\$128,000
8065	INNER BELMONT from SE Water Ave to SE 7th Ave	Separated in-roadway. Includes jog on Grand Ave	0.4	\$352,000
8066	INNER CANBY from SW 45th Ave to SW 35th Ave	Multiple facility types: trail (Gabriel Park Path); bicycle boulevard (Canby: Gabriel Park Path - 35th). Does not include connection to SW 34th (Project 8271)	0.8	\$516,000
8067	INNER CAPITOL from SW Vermont St to SW Barbur Blvd	Separated in-roadway	1.3	\$1,287,000
8068	INNER CENTRAL from N St Louis Ave to N Gilbert Ave	Bicycle boulevard	1.1	\$268,000
8069	INNER NE COUCH from NE 3rd Ave to NE 6th Ave	Multiple facility types: enhanced shared roadway (NE 3rd: Burnside - Couch); separated in-roadway (NE Couch: 3rd - 6th)	0.2	\$4,463,000 [‡]
8070	INNER E BURNSIDE from NE MLK Jr Blvd to NE 13th Ave	Separated in-roadway	0.4	\$8,926,000 [‡]
8071	INNER ELLIS from SE Foster Rd to SE 92nd Ave	Separated in-roadway	0.4	\$429,000
8072	INNER FAILING from N Concord Ave to N Williams Ave	Multiple facility types: trail (Failing Street Bridge); bicycle boulevard (all other segments)	0.9	\$263,000
8073	INNER HAMILTON from SW Terwilliger Blvd to SW Corbett Ave	Enhanced shared roadway. Includes connection to Terwilliger on SW Hamilton Terrace	0.6	\$9,000
8074	INNER HOLLADAY from NE Wheeler Ave to NE 13th Ave	Bicycle boulevard	0.6	\$160,000
8075	INNER MILES from SW 60th Ave to SW 52nd Ave	Multiple facility types: bicycle boulevard (Miles: 60th-April Hill Park; Logan: April Hill Park-54th; 54th: Logan-Custer; Custer: 54th-52nd); enhanced shared roadway (54th: Logan-Nevada; Nevada: 54th-52nd). Does not include April Hill Park (Project 8006)	0.6	\$96,000

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Appendix A: Action plan and project list

List of recommended projects with costs (continued)

Key no.	Corridor description	Suggested facility description	Length (miles)	Estimated Cost*
8076	INNER NE MULTNOMAH from NE 21st Ave to NE 28th Ave	Multiple facility types: separated in-roadway (27th - 28th); bicycle boulevard (all other segments)	0.4	\$182,000
8078	INNER NW OVERTON from NW 14th Ave to NW 9th Ave	Bicycle boulevard	0.2	\$62,000
8079	INNER RAMONA from SE 41st Ave to SE 52nd Ave	Bicycle boulevard	0.6	\$144,000
8080	INNER RED ELECTRIC from SW 30th Ave to SW Vermont St	Multiple facility types: bicycle boulevard (30th - BH Hwy; Capitol Hwy - Capitol Hill Rd); trail (BH Hwy - Capitol Hwy; Nebraska - Vermont)	0.7	\$2,150,000 [‡]
8081	INNER RED ELECTRIC TRAILS from SW Tower St to SW 33rd Pl	Trail	0.2	\$211,000
8082	INNER SE ANKENY from SE Ankeny St to SE Couch St	Multiple facility types: separated in-roadway (MLK: Ankeny - Burnside); bicycle boulevard (6th: Ankeny - Couch)	0.1	\$75,000
8083	INNER SE CARUTHERS from LRT Willamette River Crossing to SE 7th Ave	Multiple facility types: separated in-roadway (LRT Willamette River Crossing - Division Pl); bicycle boulevard (Grand - 7th). Includes connection to Division Pl on 4th. Does not include Caruthers (4th - Grand)	0.3	\$231,000
8084	INNER SE STEELE from SE 33rd Ave to SE 52nd Ave	Separated in-roadway	1.1	\$1,077,000
8085	INNER SKIDMORE from N Concord Ave to N Mississippi Ave	Separated in-roadway	0.5	\$461,000
8086	INNER STEPHENSON from SW 35th Ave to SW Boones Ferry Rd	Separated in-roadway	1.3	\$1,300,000
8087	INNER SW SALMON from SW 18th Ave to SW 9th Ave	Separated in-roadway	0.5	\$485,000
8088	INNER TROY from SW Capitol Hwy to SW Capitol Hill Rd	Bicycle boulevard	0.5	\$114,000
8089	INNER VERMONT from SW 36th Ave to SW Capitol Hwy Ramp	Separated in-roadway. Includes Vermont/30th intersection	0.5	\$532,000
8090	INNER WOODWARD from SE 10th Ave to SE Milwaukie Ave	Bicycle boulevard	0.1	\$19,000
8091	JERSEY from N Charleston Ave to N Ida Ave	Bicycle boulevard	0.7	\$168,000

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List of recommended projects with costs (continued)

Key no.	Corridor description	Suggested facility description	Length (miles)	Estimated Cost*
8092	KNAPP from SE 27th Ave to SE 92nd Ave	Multiple facility types: separated in-roadway (82nd: Ogden - Knapp); bicycle boulevard or advisory bike lane (all other segments)	3.4	\$882,000
8093	KNOTT from NE 102nd Ave to NE 132nd Ave	Multiple facility types: bicycle boulevard or advisory bike lane (102nd - 117th); bicycle boulevard (117th - 132nd)	1.5	\$384,000
8094	LAGOON from N Channel Ave (via Dolphin) to N Going St	Separated in-roadway	1.0	\$961,000
8095	LANCASTER from SW Stephenson St to SW 30th Ave	Separated in-roadway	2.6	\$2,640,000
8097	LAVIEW from SW Corbett Ave to SW Taylors Ferry Rd	Enhanced shared roadway	0.4	\$6,000
8098	LEWIS & CLARK CIRCLE from SW Sacajawea Blvd to SW Park Pl	Enhanced shared roadway	0.2	\$3,000
8099	LINN from Springwater Corridor to SE 19th Ave	Bicycle boulevard	0.6	\$147,000
8100	LOMBARD GAP from N Portland Greenway to N Rivergate Blvd	Separated in-roadway	0.8	\$843,000
8101	LOWER ALDERWOOD from NE Cully Blvd to NE Cornfoot Rd	Separated in-roadway	0.6	\$571,000
8102	LOWER BANCROFT-SELLWOOD GRNWX from Sellwood Bridge to SW Logan St	Trail	0.4	\$404,000
8103	LOWER I-405 PATH from SW 6th Ave to SW Montgomery St	Multiple facility types: separated in-roadway (6th - Broadway); trail (Broadway - Montgomery)	0.6	\$572,000
8104	LOWER NE 22nd from NE Multnomah St to NE Tillamook St	Bicycle boulevard	0.4	\$103,000
8105	LOWER NE 77th from NE 72nd Dr to NE Alberta St	Bicycle boulevard	1.6	\$393,000
8106	LOWER NE 7th from NE Weidler St to NE Tillamook St	Separated in-roadway	0.2	\$216,000
8107	LOWER SE 101st from Springwater Corridor to SE Powell Blvd	Multiple facility types: bicycle boulevard (Springwater - Bush & 101st; Bush - Powell); trail (101st - 102nd)	1.5	\$85,000 [†]
8108	LOWER SE 19th from Springwater Corridor to SE Spokane St	Bicycle boulevard	0.4	\$98,000 [‡]

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Appendix A: Action plan and project list

List of recommended projects with costs (continued)

Key no.	Corridor description	Suggested facility description	Length (miles)	Estimated Cost*
8109	LOWER SE 92nd from SE Foster Rd to SE Holgate Blvd	Separated in-roadway	0.7	\$705,000 [‡]
8110	LOWER SE 9th from SE 17th Ave to SE Woodward St	Bicycle boulevard	1.0	\$238,000
8111	LOWER SMITH from N Columbia Way to N Lombard St	Bicycle boulevard	0.6	\$141,000
8112	LOWER SW 18th from SW Maplecrest Dr to SW Taylors Ferry Rd & SW 17th Ave	Multiple facility types: enhanced shared roadway (Maplecrest - Taylors Ferry); separated in-roadway (18th - 17th)	0.5	\$73,000
8113	LOWER SW 1st from SW Barbur Blvd to SW Arthur St	Multiple facility types: separated in-roadway (Corbett: Gibbs - Grover); bicycle boulevard (all other segments). Includes connection to SW Kelly Ave on SW Grover St and SW Corbett Ave	0.7	\$219,000
8114	LOWER SW 35th from SW Stephenson St to SW Ridge Rd	Separated in-roadway	0.9	\$903,000
8115	LOWER SW 5th from SW 6th Ave to SW Barbur Blvd	Separated in-roadway	0.2	\$210,000
8116	LOWER SW GREENWAY from Council Crest to SW Talbot Rd	Multiple facility types: enhanced shared roadway (Council Crest Dr; Greenway Ave: Council Crest Dr - Talbot); bicycle boulevard or enhanced shared roadway (Council Crest - Council Crest Dr)	0.8	\$47,000
8117	LOWER WILLAMETTE BLVD from N Rosa Parks Way to N Interstate Ave	Bicycle boulevard	1.4	\$356,000
8118	LURADEL from SW Huber St to SW Lancaster Rd	Bicycle boulevard	0.4	\$91,000
8119	MACRUM from N Willamette Blvd to N Lombard St	Bicycle boulevard	0.4	\$108,000
8120	MADISON-MAIN from SW Murray Ln to SW Salmon St	Multiple facility types: bicycle boulevard (Murray - 18th); separated in-roadway (18th: Main - Salmon)	0.7	\$207,000
8121	MAPLECREST from SW Lancaster Rd to SW Terwilliger Blvd	Enhanced shared roadway	1.5	\$23,000
8122	MAPLEWOOD from SW 52nd Ave to SW 45th Ave	Bicycle boulevard	0.5	\$123,000

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List of recommended projects with costs (continued)

Key no.	Corridor description	Suggested facility description	Length (miles)	Estimated Cost*
8123	MARSHALL from NW 22nd Ave to NW Station Way	Bicycle boulevard	0.9	\$215,000
8124	MASON from N Michigan Ave to NE Skidmore St	Multiple facility types: separated in-roadway (33rd: Mason - Skidmore); bicycle boulevard (all other segments). Includes jogs on 33rd connecting to NE Skidmore and Michigan connecting to Skidmore	2.4	\$623,000
8125	MICHIGAN from N Fremont St to N Ainsworth St	Bicycle boulevard. Includes connection to Mississippi on Fremont.	1.3	\$393,000
8126	MIDDLE BARBUR from SW 23rd Ave to SW Capitol Hwy-Barbur Blvd Ramp	Separated in-roadway. Does not include viaduct gaps (Project 8010)	1.6	\$1,650,000
8127	MIDDLE BOUNDARY from SW 38th Pl to SW Sunset Blvd	Bicycle boulevard (38th - Dosch; 30th - Sunset). Does not include segments on Dosch (Projects 8130 & 8331)	0.9	\$223,000
8128	MIDDLE CORBETT from SW Macadam Ave to SW Slavin Rd	Multiple facility types: bicycle boulevard (Macadam - Corbett); separated in-roadway (Boundary - Slavin)	0.4	\$330,000
8129	MIDDLE DOLPH from SW Capitol Hwy to SW Troy St	Multiple facility types: bicycle boulevard (Capitol - 30th); separated in-roadway or advisory bike lane (Dolph - Hume); bicycle boulevard or enhanced shared roadway (30th - Troy)	1.1	\$462,000
8130	MIDDLE DOSCH from SW Boundary St to SW 33rd Dr	Separated in-roadway	0.1	\$138,000
8131	MIDDLE HAMILTON from SW Shattuck Rd to SW Twombly Ave	Multiple facility types: separated in-roadway (Shattuck - 47th); separated in-roadway or advisory bike lane (47th - Dosch); bicycle boulevard (Dosch - Twombly)	1.1	\$967,000
8132	MIDDLE HOLGATE from SE 88th Ave to I-205 Path	Separated in-roadway	0.3	\$254,000
8133	MIDDLE N ROSA PARKS from N Montana Ave to N Vancouver Ave	Multiple facility types: separated in-roadway (Montana - I-5 Overpass; Missouri - Vancouver); trail (I-5 Overpass)	0.5	\$529,000 [†]
8134	MIDDLE NE TILLAMOOK from NE 62nd Ave to NE 65th Ave	Separated in-roadway	0.1	\$135,000
8135	MIDDLE SE 17th from SE Ellis St to SE Schiller St	Multiple facility types: bicycle boulevard (Mitchell Trail - 17th); separated in-roadway (Ellis - Schiller)	0.4	\$350,000

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Appendix A: Action plan and project list

List of recommended projects with costs (continued)

Key no.	Corridor description	Suggested facility description	Length (miles)	Estimated Cost*
8136	MIDDLE SHATTUCK from SW Beaverton Hillsdale Hwy to SW Hamilton St	Separated in-roadway	0.3	\$288,000
8137	MIDDLE VERMONT from SW 52nd Ave to SW 45th Ave	Separated in-roadway	0.4	\$365,000
8138	MILES-GREENWAY from SW Macadam Ave to Willamette Greenway	Enhanced shared roadway	0.1	\$2,000
8139	MILL from SE 130th Ave to City Limits	Bicycle boulevard	2.4	\$598,000
8140	MILWAUKIE LRT from City Limits to SE 17th Ave	Trail	2.0	\$1,959,000
8141	MITCHELL from SW Westwood Dr to SW Fairmount Blvd	Enhanced shared roadway	1.1	\$16,000
8142	MONTGOMERY-DOWNTOWN from SW Patton Rd to SW Harbor Way	Multiple facility types: trail (12th - 10th; Park - Broadway; 4th - Harbor); bicycle boulevard (Patton - Vista; Vista - 12th; 10th - Park; Harbor - Harbor); separated in-roadway (Vista: Montgomery - Montgomery; Broadway - 4th); enhanced shared roadway (Montgomery: Vista - Vista)	2.6	\$1,082,000
8143	MOODY from Ross Island Bridge to north of SW Sheridan St	Separated in-roadway	0.3	\$331,000
8145	MORRISON-BELMONT from SE Water Ave to SE 34th Ave	Separated in-roadway	1.9	\$1,870,000
8146	MT TABOR Loop from Park Boundaries to Park Boundaries	Enhanced shared roadway	2.1	\$32,000
8147	MULTNOMAH from SW Oleson Rd to SW Terwilliger Blvd	Separated in-roadway	3.5	\$3,466,000
8148	N GREENWAY TRAIL from N River St to Columbia Slough	Multiple facility types: bicycle boulevard (Baltimore: Bradford - Decatur); enhanced shared roadway (Landfill Rd: Columbia Blvd - Columbia Slough); trail (all other segments)	9.8	\$35,571,000 [†]
8149	N KILLINGSWORTH from N Michigan Ave to NE Rodney Ave	Separated in-roadway	0.6	\$593,000
8150	N LOMBARD (PORTSMOUTH - IDA) from N Ida Ave to N Portsmouth Ave	Separated in-roadway	0.8	\$764,000 [‡]

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List of recommended projects with costs (continued)

Key no.	Corridor description	Suggested facility description	Length (miles)	Estimated Cost*
8151	N/NE KCLICKITAT from N Vancouver Ave to NE Sandy Blvd	Multiple facility types: bicycle boulevard (Vancouver - 7th; Siskiyou: 7th - 10th; 10th - Sandy); separated in-roadway (MLK: Cook - Fargo). Includes bicycle boulevard sections on Cook and Fargo	3.6	\$932,000
8152	NAITO GAP from SW Lincoln St to SW Jefferson St	Multiple facility types: separated in-roadway (Lincoln - Jefferson); trail (Lincoln - Waterfront Park)	0.7	\$734,000
8153	NE 102nd from NE Weidler St to NE Sandy Blvd	Separated in-roadway	1.7	\$1,726,000
8154	NE 112th from NE Fremont St to NE Sandy Blvd	Bicycle boulevard or advisory bike lane	0.7	\$174,000
8155	NE 12th from NE Irving St to NE Lloyd Blvd	Trail	0.1	\$98,000
8156	NE 13th from E Burnside St to NE Couch St	Trail	0.0	\$4,463,000 [‡]
8157	NE 141st from NE Fremont St to NE Sandy Blvd	Multiple facility types: bicycle boulevard (Rose Pky: Fremont - 141st; 141st: Rose Pky - Fremont); separated in-roadway or advisory bike lane (Fremont - Sandy)	1.7	\$423,000
8158	NE 148th GAP from NE 146th Dr to NE Airport Way	Separated in-roadway. Includes connection on 147th Ave	1.6	\$1,564,000
8159	NE 14th from NE 15th Ave & NE Halsey St to NE Lombard St	Multiple facility types: bicycle boulevard (15th - Failing; Holman - Lombard); bicycle boulevard or advisory bike lane (Failing - Holman); separated in-roadway (Killingsworth: 14th Ave - 14th Pl). Includes jog on Fremont.	3.0	\$774,000
8160	NE 155th from E Burnside St to NE Halsey St	Multiple facility types: bicycle boulevard (154th: Burnside - Couch); Trail (Glenfair ES Path: Couch - Glisan); bicycle boulevard or advisory bike lane (155th: Glisan - Halsey)	0.8	\$400,000
8161	NE 158th GAP from NE Sandy Blvd to NE Mason St	Separated in-roadway	0.2	\$158,000
8162	NE 20th GAP from NE Irving St to NE Pacific St	Separated in-roadway	0.1	\$95,000
8163	NE 29th from NE Holman St to NE Lombard St	Bicycle boulevard	0.4	\$104,000

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Appendix A: Action plan and project list

List of recommended projects with costs (continued)

Key no.	Corridor description	Suggested facility description	Length (miles)	Estimated Cost*
8164	NE 33rd INTERCHANGE from NE Holman St to Columbia Slough	Separated in-roadway	0.8	\$845,000
8165	NE 47th from NE Davis St to NE Glisan St	Separated in-roadway	0.1	\$120,000
8167	NE 6TH from NE Rosa Parks Way to NE Dekum St	Enhanced shared roadway	0.1	\$2,000
8168	NE GLISAN from NE 22nd Ave to NE 32nd Ave	Separated in-roadway	0.6	\$570,000
8169	NE GLISAN CIRCLE	Separated in-roadway	0.3	\$306,000
8170	NE KNOTT from NE Knott St to NE Ridgewood Dr	Bicycle boulevard	0.5	\$125,000
8171	NE MARINE DR BIKEWAY from I-5 to City Limits	Multiple facility types: Close gaps in Marine Dr separated in-roadway (NE 6th - 28th) and trails (Bridgeton Levee and one connector, 28th - 33rd, 112th - 122nd, and gaps near 185th)	3.7	\$2,130,835 [‡]
8172	NE MLK GAP from NE Davis St to NE Lloyd Blvd	Separated in-roadway	0.2	\$151,000
8173	NE ROSA PARKS from NE 6th Ave to NE 9th Ave	Bicycle boulevard	0.2	\$39,000
8174	NE THOMPSON from NE 148th Ave & NE Sacramento St to NE 162nd Ave & NE Sandy Blvd	Bicycle boulevard. Includes jogs on NE 150th Ave, NE 158th Ave, NE 161st Ave, and NE Russell St	1.4	\$357,000
8175	NE/SE 16th from SE Ankeny St to NE Irving St	Bicycle boulevard	0.4	\$99,000
8176	NE/SE 99th from SE Washington to NE I84 Fwy-99th Ave Ramp	Separated in-roadway	1.0	\$1,029,000
8177	NORTH BRYANT from N Willamette Blvd to N Dekum St & N Greenwich Ave	Bicycle boulevard. Includes connection to Dekum on Greenwich	1.1	\$100,000 [‡]
8178	NORTH CONCORD from N Interstate Ave & N Overlook Blvd to N Interstate Ave & N Concord St	Multiple facility types: bicycle boulevard (Overlook & Interstate - Ainsworth; Ainsworth - Rosa Parks; Rosa Parks - Lombard; Lombard - Interstate); separated in-roadway (all other segments)	2.6	\$100,000

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List of recommended projects with costs (continued)

Key no.	Corridor description	Suggested facility description	Length (miles)	Estimated Cost*
8179	NORTH WABASH from N Willamette Blvd to N Columbia Blvd	Multiple facility types: bicycle boulevard or advisory bike lane (Willamette - Willis); bicycle boulevard (Willis - Columbia)	1.2	\$100,000 [‡]
8180	NORTH-NORTHEAST GOING from N Vancouver Ave to NE 72nd Ave	Bicycle boulevard. Includes jogs on 33rd, 41st, 47th, and 52nd	4.0	\$100,000 [‡]
8181	NW 18th from SW Alder St to NW Everett St	Separated in-roadway	0.2	\$164,000
8182	NW 19th from W Burnside St to NW Hoyt St	Separated in-roadway. Includes gap on 19th (Lovejoy - Marshall)	0.3	\$331,000
8183	NW 24th from NW Flanders St to NW Glisan St	Separated in-roadway	0.1	\$52,000
8184	NW 8th from SW Park Ave to NW Hoyt St	Bicycle boulevard. Includes connection to Park on Ankeny	0.4	\$88,000
8185	NW 9th from W Burnside St to NW Naito Pkwy	Separated in-roadway	0.7	\$691,000
8187	NW PARK from SW Ankeny St to NW Hoyt St	Bicycle boulevard	0.3	\$81,000
8188	ORCHARD HILL from SW Boones Ferry Rd to SW Stephenson St	Enhanced shared roadway. Includes jogs on 27th Pl, Sylvania Terrace, and 29th Ave.	0.8	\$12,000
8189	OUTER ALFRED from City Limits to SW 55th Ave	Bicycle boulevard or enhanced shared roadway	0.6	\$154,000
8190	OUTER BOUNDARY from SW Beaverton Hillsdale Hwy to SW 45th Ave	Bicycle boulevard. Includes connection to BH Hwy on SW 65th Ave	1.1	\$274,000
8191	OUTER BUSH from SE 130th Ave to SE Powell Blvd	Bicycle boulevard. Includes connection to 130th on Center and 132nd. Includes connection to Powell on 148th	1.3	\$327,000
8192	OUTER CENTRAL from N St Louis Ave to N Bruce Ave	Multiple facility types: bicycle boulevard (St Louis - Bruce); enhanced shared roadway (Central - Smith). Includes connection to Smith on St Johns	0.6	\$159,000
8193	OUTER CONDOR from SW Terwilliger Blvd to SW Lane St	Enhanced shared roadway	0.2	\$3,000
8194	OUTER CULLY from NE Prescott St to NE Killingsworth St	Separated in-roadway	0.6	\$5,255,633 [‡]

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Appendix A: Action plan and project list

List of recommended projects with costs (continued)

Key no.	Corridor description	Suggested facility description	Length (miles)	Estimated Cost*
8195	OUTER FAILING from N Williams Ave to NE Edgehill Pl	Bicycle boulevard	1.5	\$383,000
8196	OUTER HAMILTON from SW Scholls Ferry Rd to SW Shattuck Rd	Separated in-roadway or advisory bike lane	0.8	\$765,000
8197	OUTER HAROLD from SE 104th Ave to SE 136th Ave	Separated in-roadway	1.6	\$1,566,000
8198	OUTER HOLGATE from SE 122nd Ave to SE 136th Ave	Separated in-roadway	0.7	\$713,000
8199	OUTER HUBER from SW Capitol Hwy to SW 35th Ave	Separated in-roadway	0.4	\$443,000
8200	OUTER JARRETT from NE 22nd Ave to NE 33rd Ave	Bicycle boulevard	0.6	\$156,000
8201	OUTER KILLINGSWORTH GAP from NE 37th Ave to NE 42nd Ave	Separated in-roadway	0.2	\$247,000
8202	OUTER MARKET from SE 89th & Mill to SE 130th Ave	Multiple facility types: bicycle boulevard (SE 89th & Mill - SE 92nd & Market); separated in-roadway (92nd - 130th)	2.1	\$1,959,000
8203	OUTER MILES from City Limits to SW 60th Ave	Bicycle boulevard	0.3	\$72,000
8204	OUTER N LOMBARD from N Rivergate Blvd to N Marine Dr	Separated in-roadway	1.8	\$1,812,000 [‡]
8205	OUTER NE TILLAMOOK from NE 78th Ave to NE 92nd Ave	Multiple facility types: separated in-roadway (78th - 82nd); bicycle boulevard (82nd - 92nd)	0.7	\$328,000
8206	OUTER RED ELECTRIC from City Limits to SW 37th Ave	Multiple facility types: trail (City Limits - Shattuck; 55th - Kanan); bicycle boulevard (55th - Kanan); enhanced shared roadway (Pendleton - Cullen)	1.8	\$830,000
8207	OUTER SACRAMENTO from NE 132nd Ave to NE 148th Ave	Bicycle boulevard or advisory bike lane	0.9	\$216,000
8208	OUTER SE STARK GAP from SE 108th Ave to SE 117th Ave	Separated in-roadway	0.5	\$515,000
8209	OUTER SISKIYOU from NE 77th Ave to NE 91st Ave & NE Fremont St	Multiple facility types: separated in-roadway (jog on Fremont Dr; Hillway - Fremont); bicycle boulevard (all other segments)	1.0	\$422,000

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†Project costs supplied by others

‡Funded project; project costs supplied by others



List of recommended projects with costs (continued)

Key no.	Corridor description	Suggested facility description	Length (miles)	Estimated Cost*
8210	OUTER SKIDMORE from NE 33rd Ave to NE 82nd Ave	Multiple facility types: bicycle boulevard (33rd - 52nd; 68th - Prescott); advisory bike lane (52nd - 66th). Includes jogs on NE 49th, 52nd, and 81st	2.5	\$637,000
8211	OUTER SW 45th from SW Vacuna St to SW Pomona St	Enhanced shared roadway	0.2	\$4,000
8212	OUTER SW OAK from City Limits to SW Pomona St	Bicycle boulevard	0.1	\$19,000
8213	PACIFIC/HOLLADAY from I-205 Bike Path to NE 131st Pl	Multiple facility types: separated in-roadway (I-205 Bike Path - 102nd); bicycle boulevard (102nd - 131st)	1.9	\$666,000
8214	PASADENA from City Limits to SW Taylors Ferry Rd	Multiple facility types: bicycle boulevard (City Limits - 64th); separated in-roadway (64th - 61st); enhanced shared roadway (61st - Taylors Ferry)	1.1	\$176,000
8215	PATTON GAP from SW English Ln to SW Ravensview Dr	Separated in-roadway	0.4	\$420,000
8216	PCC RD from SW Lesser Rd to SW Stephenson St	Multiple facility types: bicycle boulevard or enhanced shared roadway (Lesser - PCC Rd Trail); trail (PCC Rd Trail); separated in-roadway (PCC Rd Trail - SW Stephenson St)	0.7	\$246,000
8217	PENDLETON from SW Illinois St to SW Vermont St	Multiple facility types: bicycle boulevard (Illinois - 41st); enhanced shared roadway (41st - Vermont). Includes jogs on 47th, 37th, Dakota and 35th	1.0	\$114,000
8218	PETTYGROVE from NW 24th Ave to NW 12th Ave	Bicycle boulevard. Includes connection to Overton on 12th	0.9	\$221,000
8219	POWELL GAP from I-205 Bike Path to I-205 Freeway Ramps	Separated in-roadway	0.1	\$86,000
8220	PRESCOTT GAP from NE 81st Ave to NE 102nd Ave	Separated in-roadway	1.1	\$1,069,000
8221	RAYMOND from SE 72nd Ave to SE 104th Ave	Multiple facility types: bicycle boulevard (72nd - I-205; I-205 - 104th); trail (I-205 crossing)	2.0	\$690,000
8222	RED ELECTRIC BLVDS from SW 33rd Pl to SW 30th Ave	Bicycle boulevard	0.2	\$45,000
8223	REGENTS from NE 22nd Ave to NE Mason St	Bicycle boulevard	0.6	\$139,000

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Appendix A: Action plan and project list

List of recommended projects with costs (continued)

Key no.	Corridor description	Suggested facility description	Length (miles)	Estimated Cost*
8225	RIVERSIDE CEMETERY from SW Palatine Hill Rd to SW Macadam Ave	Enhanced shared roadway	1.5	\$22,000
8226	ROCKY BUTTE from NE 92nd Ave & Russell St to NE 92nd Ave & NE Tillamook St	Multiple facility types: separated in-roadway (92nd: Tillamook - Russell); enhanced shared roadway (Rocky Butte Rd: Russell - Fremont)	2.9	\$297,000
8227	RODNEY from NE Lombard St to NE Broadway	Bicycle boulevard. Includes connection to NE Broadway on Hancock and 2nd	3.0	\$742,000
8228	ROSE GARDEN WAY from SW Kenneth Terrace to SW Pedestrian Trail (north of Lewish and Clark & Sherwood)	Enhanced shared roadway	0.4	\$7,000
8229	SALMON from Eastbank Esplanade to SE 63rd Ave	Bicycle boulevard. Includes jogs on 45th, 46th, 49th and 55th	1.4	\$358,000
8230	SAN RAFAEL from NE 102nd Ave to City Limits	Multiple facility types: bicycle boulevard or advisory bike lane (102nd - 122nd; 148th - City limits); separated in-roadway or advisory bike lane (122nd - 148th)	3.1	\$1,777,000
8231	SCHUYLER from NE 80th Ave to NE 86th Ave	Bicycle boulevard. Includes connections to Tillamook on 80th and 86th, and connection to 82nd on 81st/Halsey	0.7	\$168,000
8232	SE 104th from SE Steele St to SE Powell Blvd	Advisory bike lane	0.8	\$205,000
8233	SE 112th from City Limits to SE 106th Ave	Separated in-roadway	3.7	\$3,654,000
8234	SE 136th from SE Foster Rd to SE Division St	Construct bicycle facilities, sidewalks, and crossing improvements to facilitate bicycle and pedestrian travel and access to transit	1.9	\$9,400,000 [†]
8235	SE 157th from SE Powell Blvd to E Burnside St	Bicycle boulevard or advisory bike lane	2.0	\$495,000
8236	SE 15th from SE Linn St to SE 17th Ave	Bicycle boulevard. Includes jogs on Malden, Tolman, and Ellis	1.8	\$445,000
8237	SE 21st from SE 26th Ave to SE Clinton St	Multiple facility types: bicycle boulevard or enhanced shared roadway (26th - Powell); separated in-roadway (Powell - Clinton)	0.9	\$437,000
8238	SE 34th from SE Gladstone St to E Burnside St	Bicycle boulevard. Includes jogs on Washington and Pine	2.2	\$540,000

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[†]Project costs supplied by others

[‡]Funded project; project costs supplied by others



List of recommended projects with costs (continued)

Key no.	Corridor description	Suggested facility description	Length (miles)	Estimated Cost*
8239	SE 67th from SE Flavel St to SE Lincoln St	Multiple facility types: trail (Division - Sherman); bicycle boulevard (all other segments)	2.7	\$748,000
8240	SE 92nd GAP from SE Lincoln St to SE Market St	Separated in-roadway	0.2	\$191,000
8241	SE STARK GAP from SE 76th Ave to SE 92nd Ave	Separated in-roadway	0.8	\$784,000
8242	SE WASHINGTON GAP from SE 76th Ave to SE 92nd Ave	Separated in-roadway	0.8	\$783,000
8243	SE/NE 111th from SE 96th Ave to Sullivan's Gulch Trail	Multiple facility types: bicycle boulevard (96th - Burnside); bicycle boulevard or advisory bike lane (Burnside - Flanders; Glisan - Sullivan's Gulch Trail); trail (Flanders - Glisan)	2.8	\$750,000
8244	SE/NE 117th from Springwater Corridor to Sullivan's Gulch Trail	Multiple facility types: trail (Springwater - 115th); bicycle boulevard (Knight - Holgate); advisory bike lane (Division - Stark); bicycle boulevard or advisory bike lane (Holgate - Division; Stark - Sullivan's Gulch Trail)	4.9	\$1,289,000
8245	SE/NE 122nd from SE Foster Rd to NE Marine Dr	Separated in-roadway	6.4	\$6,374,000
8246	SE/NE 130th from SE Foster Rd to NE San Rafael St	Multiple facility types: separated in-roadway (Stark: 129th - 130th; Glisan: 128th - 128th); bicycle boulevard or advisory bike lane (all other segments)	4.3	\$1,130,000
8247	SE/NE 135th from SE Division St to I-84 Bike Path	Multiple facility types: bicycle boulevard or advisory bike lane (Division - Stark); bicycle boulevard (Stark - Glisan); advisory bike lane (Glisan - I-84 Bike Path)	3.0	\$914,000
8248	SE/NE 146th from SE Powell Blvd to NE Glisan St	Bicycle boulevard (Division - Main & 145th); bicycle boulevard or advisory bike lane (Powell - Division; Main & 145th - Glisan)	2.2	\$562,000
8249	SE/NE 3rd from SE Clay St to SE MLK (via Davis)	Enhanced shared roadway. Includes connection to MLK on NE Davis.	0.9	\$13,000
8250	SE/NE 70s from Springwater Corridor to NE Killingsworth St	Multiple facility types: separated in-roadway (Springwater - Foster; Halsey: 74th - 74th); bicycle boulevard (Foster - Killingsworth)	8.1	\$3,481,000

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†Project costs supplied by others

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Appendix A: Action plan and project list

List of recommended projects with costs (continued)

Key no.	Corridor description	Suggested facility description	Length (miles)	Estimated Cost*
8251	SE/NE 87th from Springwater Corridor to NE Halsey St	Multiple facility types: trail (Boise - Bush); bicycle boulevard (Springwater - Boise; Bush - Powell; 87th - Halsey); separated in-roadway (82nd); advisory bike lane or Bicycle boulevard (Powell - Hassalo)	4.8	\$1,440,000
8252	SE/NE 9th from SE Woodward St to SE 12th Ave	Bicycle boulevard	1.9	\$480,000
8253	NE 38th from NE Broadway St to NE Tillamook St	Bicycle boulevard	0.2	\$45,000
8254	SELLWOOD from SE Umatilla St to SE 17th Ave	Bicycle boulevard	1.2	\$439,000
8255	SEYMOUR from SW Twombly Ave to SW 19th Dr	Enhanced shared roadway. Includes connection to SW Sunset Bicycle boulevard on 27th.	0.5	\$7,000
8256	SHAVER from I-205 Bike Path to NE 141st Dr	Advisory bike lane or Bicycle boulevard	2.1	\$529,000
8257	SIMPSON from NE 33rd Ave to NE Portland Hwy	Multiple facility types: trail (Fernhill Park Path); separated in-roadway (jog on 42nd); bicycle boulevard (all other segments)	1.7	\$560,000
8258	SE CENTER from SE 42nd Ave to SE 82nd Ave	Bicycle boulevard. Includes jogs on 52nd, 56th, 58th, 62nd, and 80th	2.1	\$100,000‡
8259	SE MILL from SE 60th Ave to I-205 Bike Path	Multiple facility types: bicycle boulevard (60th - 64th; 72nd - I-205); enhanced shared roadway (64th - 72nd)	1.9	\$100,000‡
8261	SPRINGWATER from SE 17th Ave to Milwaukie LRT Path	Trail. Includes connection to Linn on SE 19th	0.6	\$575,000
8262	ST HELENS GAP from St. Helens Rd to St. Helens Rd	Separated in-roadway	1.3	\$1,348,000
8263	STANLEY from SW 35th Ave to SW 23rd Dr	Multiple facility types: bicycle boulevard or enhanced shared roadway (35th - 26th); separated in-roadway (26th - 23rd)	0.9	\$402,000
8264	SULLIVANS GULCH from NE Lloyd Blvd to I-84 Bike Path	Trail	7.6	\$28,740,000†
8265	SUNSET from SW Hamilton St to SW Dewitt St	Multiple facility types: separated in-roadway (Hamilton - Sunset); separated in-roadway or advisory bike lane (Dosch Rd - Dewitt)	1.3	\$1,260,000

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List of recommended projects with costs (continued)

Key no.	Corridor description	Suggested facility description	Length (miles)	Estimated Cost*
8266	SW 17th from SW Taylors Ferry Rd to SW Terwilliger Blvd	Multiple facility types: bicycle boulevard or enhanced shared roadway (Taylors Ferry - Spring Garden); bicycle boulevard (Spring Garden - Terwilliger)	1.1	\$286,000
8267	SW 18th from SW Sunset Blvd to SW 25th Ave	Bicycle boulevard or enhanced shared roadway	0.6	\$153,000
8268	SW 19th from SW 17th Ave to SW Barbur Blvd	Separated in-roadway. Includes connection to 20th on Spring Garden	0.3	\$316,000
8269	SW 21st from SW Taylors Ferry Rd to SW Spring Garden St	Enhanced shared roadway	0.5	\$7,000
8270	SW 32nd from SW Vermont St to SW 30th Ave	Enhanced shared roadway	0.3	\$5,000
8271	SW 34th from SW Capitol Hwy to SW Vermont St	Bicycle boulevard. Includes connection to SW 35th on SW Canby St	0.6	\$156,000
8272	SW 35th-SPRING GARDEN from SW Dolph Ct to SW Capitol Hwy	Bicycle boulevard or enhanced shared roadway	0.5	\$124,000
8273	SW 39th from SW Beaverton Hillsdale Hwy to SW Hamilton St	Enhanced shared roadway. Includes connection to SW Mitchell St on SW 38th Ave	0.5	\$8,000
8274	SW 40th from SW 43rd Ave to SW Barbur Blvd	Multiple facility types: enhanced shared roadway (43rd - I-5 Overpass); trail (I-5 Overpass -Transit Center)	0.5	\$242,000
8275	SW 50th from SW Vermont St to SW Illinois St	Bicycle boulevard or enhanced shared roadway	0.2	\$48,000
8276	SW 52nd from SW Custer St to SW Vermont St	Multiple facility types: bicycle boulevard (Custer - Nevada); enhanced shared roadway (Nevada - Vermont)	0.4	\$53,000
8277	SW 54th from SW Taylors Ferry Rd to SW Garden Home Rd	Bicycle boulevard	0.9	\$231,000
8278	SW 5th from SW Terwilliger Blvd to SW Barbur Blvd	Enhanced shared roadway. Includes connections on SW Chestnut St and SW Barbur Blvd Frontage Rd	0.3	\$5,000
8279	SW 9th from SW Terwilliger Blvd to SW Hume St	Bicycle boulevard	0.6	\$160,000
8280	SW BROADWAY from SW Clay St to W Burnside Rd	Separated in-roadway	0.7	\$672,000

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Appendix A: Action plan and project list

List of recommended projects with costs (continued)

Key no.	Corridor description	Suggested facility description	Length (miles)	Estimated Cost*
8281	SW JACKSON from SW Park Ave to SW 6th Ave	Separated in-roadway	0.1	\$104,000
8282	SW LINCOLN from SW Grant St to SW Moody Ave	Multiple facility types: separated in-roadway (Grant - Naito); trail (Naito - Moody)	0.6	\$577,000
8283	SW TERWILLIGER-WESTWOOD from SW Capitol Hwy to SW Sheridan St	Multiple facility types: bicycle boulevard (Sunset - Cheltenham; Westwood - Terwilliger); separated in-roadway (Capitol - Dewitt; Westwood - Sheridan); enhanced shared roadway (Dewitt - Westwood)	3.2	\$100,000 [†]
8284	SW/NW 20th from SW Mill St to NW Raleigh St	Multiple facility types: trail (Metro Learning Center); bicycle boulevard (Jefferson - Morrison; Hoyt - Raleigh); separated in-roadway (Mill - Jefferson & 20th); bicycle boulevard or enhanced shared roadway (Morrison - Glisan)	1.4	\$623,000
8285	SW/NW 3rd from SW Madison St to NW Flanders St	Separated in-roadway	0.8	\$798,000
8286	SW/NW 4th from SW Lincoln St to NW Station Way	Multiple facility types: separated in-roadway (Lincoln - Glisan); bicycle boulevard (Glisan - Station Way)	1.6	\$1,406,000
8288	TALBOT from SW Patton Rd & Humphrey Blvd to SW Patton Rd & Greenway Ave	Enhanced shared roadway. Includes Talbot Terrace (Fairmount - Greenway)	1.0	\$15,000
8289	TAYLORS FERRY GAP from SW 55th Ave to SW 41st Ave	Separated in-roadway	0.7	\$703,000
8290	TERWILLIGER BRIDGE from SW 4th Ave to SW Barbur Blvd	Separated in-roadway	0.1	\$145,000
8291	TERWILLIGER GAPS	Separated in-roadway. Eliminate key gaps in the Terwilliger Blvd bikeway	0.3	\$296,000
8292	SW PARK from I-405 Path to W Burnside Rd	Bicycle boulevard	1.7	\$416,000
8293	TUNNELWOOD from SW Hamilton St to SW Dosch Rd	Multiple facility types: bicycle boulevard or enhanced shared roadway (Hamilton - Bancroft); enhanced shared roadway (Bancroft - Dosch)	1.0	\$106,000
8294	TWENTIES BIKEWAY from SE 45th Ave & SE Crystal Springs Blvd to NE Lombard St	Multiple facility types: bicycle boulevard (42nd - Bybee; Clinton - Stark; Broadway - Lombard); separated in-roadway (Woodward - Clinton; Stark - Broadway; Knot: 28th - 29th)	7.0	\$1,837,574 [‡]

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[†]Project costs supplied by others

[‡]Funded project; project costs supplied by others



List of recommended projects with costs (continued)

Key no.	Corridor description	Suggested facility description	Length (miles)	Estimated Cost*
8295	TWOMBLY from SW Dosch Rd to SW Fairmount Blvd	Enhanced shared roadway	0.5	\$7,000
8296	UMATILLA from Springwater Corridor to SE Tacoma St	Bicycle boulevard. Includes jog on SE 23rd Ave	1.0	\$3,032,411†
8297	UPPER ALDERWOOD from NE Cornfoot Rd to NE 82nd Ave	Separated in-roadway	0.4	\$441,000‡
8298	UPPER BARBUR from SW Capitol Hwy to SW Sherman St	Separated in-roadway	1.8	\$1,821,000
8299	UPPER CAPITOL from SW Barbur Blvd to SW 31st Ave	Separated in-roadway	1.4	\$1,368,000
8300	UPPER I-405 PATH from SW Montgomery St to SW 18th Ave	Trail	0.2	\$207,000
8301	UPPER MISSISSIPPI from N Graham St to N Cook St	Separated in-roadway	0.3	\$324,000
8302	UPPER NAITO from NW Davis St to Steel Bridge	Separated in-roadway	0.2	\$171,000‡
8303	UPPER NE 22nd from NE Tillamook St to NE Lombard St	Multiple facility types: bicycle boulevard or advisory bike lane (Tillamook - Knott); bicycle boulevard (all other segments). Includes jogs on NE Alameda St, NE Alameda Dr, NE Killingsworth St, and NE Morgan St	2.7	\$685,000
8304	UPPER NE 9th from NE Lloyd Blvd to NE Lombard St	Multiple facility types: separated in-roadway (Lloyd - Broadway); bicycle boulevard (Broadway - Fargo; Fremont - Lombard); trail (Irving Park)	3.7	\$1,482,000
8305	UPPER PALATINE from SW Terwilliger Blvd to SW Palatine Hill Rd/Riverside St	Multiple facility types: bicycle boulevard (Terwilliger - Boones Ferry); separated in-roadway (Boones Ferry - Riverside St)	1.2	\$1,061,000
8306	UPPER SE 17th from Milwaukie LRT to SE Division Pl	Multiple facility types: separated in-roadway (Milwaukie LRT Trail - Powell; 11th: Gideon - Clinton); trail (Powell - Brooklyn; 11th - 9th/Division Pl); bicycle boulevard (Brooklyn: trail - Gideon; Gideon: Brooklyn - 11th)	1.5	\$1,344,000
8307	UPPER SE 19th from SE Spokane St to SE Milwaukie Ave	Bicycle boulevard	1.6	\$389,000

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Appendix A: Action plan and project list

List of recommended projects with costs (continued)

Key no.	Corridor description	Suggested facility description	Length (miles)	Estimated Cost*
8308	UPPER SLAVIN from SW Slavin Rd Path to SW Hamilton St	Multiple facility types: bicycle boulevard or enhanced shared roadway (Slavin Rd Path - Corbett); separated in-roadway (Slavin Rd - Hamilton)	0.8	\$281,000
8309	UPPER SW 45th from SW Beaverton Hillsdale Hwy to SW Hamilton St	Bicycle boulevard or enhanced shared roadway	0.3	\$85,000
8310	UPPER SW 62nd from SW Brugger St to SW Garden Home Rd	Enhanced shared roadway	1.4	\$21,000
8311	UPPER SW GREENWAY from SW Talbot Rd to SW Patton Rd	Enhanced shared roadway	0.3	\$5,000
8312	UPPER TERWILLIGER from SW Sam Jackson Park Rd to SW Montgomery St	Separated in-roadway. Does not include gaps in the existing network	0.4	\$435,000
8313	UPPER WILLAMETTE BLVD from N Woolsey Ave to N Portland Blvd	Separated in-roadway	0.8	\$815,000
8314	UPPER-MIDDLE SW 45th from SW Vermont St to SW Pendleton St	Separated in-roadway	0.3	\$342,000
8315	US 26 PATH from SW Canyon Ct to SW Canyon Rd/Murray St	Trail	1.6	\$1,596,000
8316	VERMONT-CHESTNUT from SW Capitol Hwy to SW Terwilliger Blvd	Bicycle boulevard	1.0	\$238,000
8317	VESTA from SW 49th Ave to SW 35th Ave	Bicycle boulevard or enhanced shared roadway. Includes jog on SW 45th (Vesta - Vacuna) and SW 39th (Vacuna - Coronado)	0.8	\$198,000
8318	VIRGINIA from SW Laview Dr to SW Macadam Ave	Multiple facility types: separated in-roadway (Laview - Virginia); bicycle boulevard (Taylors Ferry - Macadam); enhanced shared roadway or advisory bike lane (Virginia - Greenway); trail (Greenway connector). Includes connection to Greenway on Nebraska	1.0	\$317,000
8319	WATER from SE Caruthers to SE 4th Ave	Bicycle boulevard	0.1	\$35,000
8320	WATER LRT from SE Sherman St to SE Water Ave	Separated in-roadway	0.1	\$120,000
8321	WAUD BLUFF from N Greenway Trail to N Willamette Blvd	Trail	0.2	\$1,704,000 [‡]

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List of recommended projects with costs (continued)

8322	WHEELER from NE Multnomah St to N Broadway	Separated in-roadway	0.2	\$218,000
8323	WILLAMETTE LRT from SW Moody Ave to SE 4th Ave	Multiple facility types: trail (Moody - Eastbank Esplanade); separated in-roadway (Eastbank Esplanade - 4th)	0.6	\$626,000
8325	WILLIAMS from NE Weidler St to N Jessup St	Separated in-roadway	2.0	\$200,000
8326	WILLIS from N Westanna Ave & N Lombard St to N Peninsular Ave	Multiple facility types: bicycle boulevard (Westanna: Lombard - Houghton; Houghton: Westanna - Berkeley; Berkeley: Houghton - Willis; Willis: Berkeley - Portsmouth); advisory bike lane (Willis: Portsmouth - Peninsular)	1.9	\$469,000
8327	WILSON from SW Vermont St to SW Capitol Hwy	Trail	0.2	\$221,000
8328	WOODSTOCK GAP from SE 69th Ave to SE 72nd Ave	Separated in-roadway	0.1	\$132,000
8329	WOOLSEY from N Amherst St to N Trenton St	Multiple facility types: bicycle boulevard or advisory bike lane (Amherst - Lombard); bicycle boulevard (Lombard - Trenton)	0.9	\$218,000
8330	YALE from Peninsula Crossing Trail to N Woolsey Ave	Bicycle boulevard. Includes connection to Willamette on Woolsey. Includes connection to Peninsula Crossing Trail on Amherst	1.5	\$373,000
8331	INTERIM Improvements in Southwest Portland	Interim improvements such as uphill bike lanes or paved shoulders that make key connections	5.7	\$1,614,000
8332	I-205 PATH from Southern City Limits to Northern City Limits	Enhance the I-205 multi-use path by addressing key barriers to comfort and safety, reducing out-of-direction travel and improving visual appeal	10.7	TBD
8333	HWY 99E CROSSING between SE Milwaukie and SE 19th	Develop a safe, comfortable bicycle and pedestrian crossing of 99E somewhere between SE Milwaukie and SE 19th Avenue to connect the Brooklyn and SMILE neighborhoods	0.0	TBD
8334	NEVADA from SW 45th to Capitol Hill Road	Trail (45th to 37th), bicycle boulevard (east of 37th)	1.5	\$653,000

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Appendix A: Action plan and project list

District cost summaries

North District Bicycle Facilities						
Facility	80 Percent		World Class		Total	
	Miles	Cost	Miles	Cost	Miles	Cost
Trails	10.29	\$ 36,404,871.91	7.04	\$ 7,036,454.27	17.33	\$ 43,441,326.18
Separated in-roadway bikeways (bike lanes, buffered bike lanes, cycle tracks)	7.55	\$ 7,548,574.80	27.63	\$ 27,625,570.35	35.17	\$ 35,174,145.15
Bicycle boulevards and advisory bike lanes	17.74	\$ 4,434,510.14	12.21	\$ 3,054,065.61	29.95	\$ 7,488,575.76
Enhanced shared roadways	0.40	\$ 5,933.64	2.04	\$ 497,486.47	2.44	\$ 503,420.11
Total	35.97	\$ 48,393,890.49	48.92	\$ 38,213,576.71	84.89	\$ 86,607,467.20

Far Southeast District Bicycle Facilities						
Facility	80 Percent		World Class		Total	
	Miles	Cost	Miles	Cost	Miles	Cost
Trails	7.68	\$ 325,418.25	0.09	\$ 94,405.68	7.77	\$ 419,823.93
Separated in-roadway bikeways (bike lanes, buffered bike lanes, cycle tracks)	13.62	\$ 21,142,683.72	24.66	\$ 24,662,344.53	38.49	\$ 46,005,028.25
Bicycle boulevards and advisory bike lanes	17.42	\$ 4,354,858.49	5.21	\$ 1,303,402.17	22.63	\$ 5,658,260.66
Enhanced shared roadways	0.00	\$ -	0.00	\$ -	0.00	\$ -
Total	38.72	\$ 25,822,960.46	29.97	\$ 26,060,152.38	68.89	\$ 52,083,112.85

Northeast District Bicycle Facilities						
Facility	80 Percent		World Class		Total	
	Miles	Cost	Miles	Cost	Miles	Cost
Trails	7.62	\$ 20,896,989.17	8.71	\$ 8,713,374.23	16.33	\$ 29,610,363.40
Separated in-roadway bikeways (bike lanes, buffered bike lanes, cycle tracks)	5.29	\$ 5,286,607.65	61.17	\$ 61,165,293.13	66.45	\$ 66,451,900.78
Bicycle boulevards and advisory bike lanes	41.02	\$ 10,254,647.91	19.15	\$ 4,787,690.53	60.17	\$ 15,042,338.44
Enhanced shared roadways	3.53	\$ 71,205.56	1.16	\$ 17,453.21	4.70	\$ 88,658.77
Total	57.46	\$ 36,509,450.29	90.19	\$ 74,683,811.10	147.65	\$ 111,193,261.39

Northwest District Bicycle Facilities						
Facility	80 Percent		World Class		Total	
	Miles	Cost	Miles	Cost	Miles	Cost
Trails	0.05	\$ 49,266.28	5.50	\$ 5,503,363.37	5.55	\$ 5,552,629.66
Separated in-roadway bikeways (bike lanes, buffered bike lanes, cycle tracks)	2.47	\$ 2,472,054.69	39.06	\$ 39,064,542.97	41.54	\$ 41,536,597.66
Bicycle boulevards and advisory bike lanes	2.30	\$ 575,707.97	1.90	\$ 476,132.40	4.21	\$ 1,051,840.37
Enhanced shared roadways	1.00	\$ 67,246.82	0.32	\$ 4,780.17	1.32	\$ 72,026.99
Total	5.82	\$ 3,164,275.76	46.79	\$ 45,048,818.92	52.62	\$ 48,213,094.68

Far Northeast District Bicycle Facilities						
Facility	80 Percent		World Class		Total	
	Miles	Cost	Miles	Cost	Miles	Cost
Trails	2.46	\$ 2,460,015.85	4.63	\$ 4,626,639.98	7.09	\$ 7,086,655.83
Separated in-roadway bikeways (bike lanes, buffered bike lanes, cycle tracks)	10.62	\$ 10,623,649.93	14.06	\$ 14,057,860.24	24.68	\$ 24,681,510.17
Bicycle boulevards and advisory bike lanes	19.06	\$ 4,765,195.24	3.08	\$ 769,574.78	22.14	\$ 5,534,770.02
Enhanced shared roadways	0.03	\$ 466.42	0.00	\$ -	0.03	\$ 466.42
Total	32.18	\$ 17,849,327.43	21.76	\$ 19,454,075.00	53.94	\$ 37,303,402.43

Southwest District Bicycle Facilities						
Facility	80 Percent		World Class		Total	
	Miles	Cost	Miles	Cost	Miles	Cost
Trails	4.56	\$ 4,562,843.58	5.05	\$ 5,049,701.88	9.61	\$ 9,612,545.46
Separated in-roadway bikeways (bike lanes, buffered bike lanes, cycle tracks)	29.90	\$ 35,567,759.11	43.06	\$ 43,061,582.54	72.97	\$ 78,629,341.65
Bicycle boulevards and advisory bike lanes	18.31	\$ 4,577,556.20	9.03	\$ 2,259,086.03	27.34	\$ 6,836,642.23
Enhanced shared roadways	30.14	\$ 3,181,289.81	3.51	\$ 260,702.45	33.65	\$ 3,441,992.26
Total	82.92	\$ 47,889,448.69	60.66	\$ 50,631,072.90	143.57	\$ 98,520,521.59

Southeast District Bicycle Facilities						
Facility	80 Percent		World Class		Total	
	Miles	Cost	Miles	Cost	Miles	Cost
Trails	4.35	\$ 3,315,646.88	0.87	\$ 869,045.18	5.22	\$ 4,184,692.06
Separated in-roadway bikeways (bike lanes, buffered bike lanes, cycle tracks)	12.77	\$ 12,770,000.00	43.58	\$ 43,577,962.11	56.15	\$ 56,147,962.11
Bicycle boulevards and advisory bike lanes	30.10	\$ 7,524,076.52	20.94	\$ 5,234,646.49	51.03	\$ 12,758,723.01
Enhanced shared roadways	2.74	\$ 189,293.62	0.00	\$ -	2.74	\$ 189,293.62
Total	49.96	\$ 23,799,017.03	65.39	\$ 49,681,653.78	115.14	\$ 73,280,670.81

Central City District Bicycle Facilities						
Facility	80 Percent		World Class		Total	
	Miles	Cost	Miles	Cost	Miles	Cost
Trails	2.76	\$ 8,358,185.03	3.82	\$ 3,816,182.96	6.57	\$ 12,174,367.99
Separated in-roadway bikeways (bike lanes, buffered bike lanes, cycle tracks)	9.60	\$ 9,602,395.75	26.09	\$ 26,090,872.59	35.69	\$ 35,693,268.34
Bicycle boulevards and advisory bike lanes	8.25	\$ 2,062,123.35	4.48	\$ 1,119,573.94	12.73	\$ 3,181,697.29
Enhanced shared roadways	0.97	\$ 20,488.63	0.10	\$ 1,497.59	1.07	\$ 21,986.22
Total	21.58	\$ 20,043,192.76	34.49	\$ 31,028,127.07	56.07	\$ 51,071,319.84



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- B-8 Proposed *Comprehensive Plan* revisions





Introduction

Proposed policy recommendations were developed by the plan's Policy Working Group and the *Portland Bicycle Plan for 2030* Project Team. This is a draft proposal. Additional review by the public, by Planning Commission, and by City Council, will be required before final language is crafted for policy changes. Opportunities for additional public review and discussion will occur as part of any amendment process for the *Transportation System Plan* and the *Comprehensive Plan*.

Note on format:

Underlined text is proposed new language.

~~Strike out~~ text is existing policy language that is proposed for deletion.

For context, some existing policy language is included even though no change is proposed.

GOAL 6 TRANSPORTATION

Develop a balanced, equitable, and efficient transportation system that provides a range of transportation choices; reinforces the livability of neighborhoods; supports a strong and diverse economy; reduces air, noise, and water pollution; and lessens reliance on the automobile while maintaining accessibility.

Policy 6.3 (Transportation Education): Implement educational programs that support a range of transportation choices and emphasize safety for all modes of travel.

Policy 6.3 (Transportation Education) NEW OBJECTIVES:

6.3 Objective H

Increase bicycle safety education, enforcement and outreach to encourage safe travel behavior of all modes and to increase bicycling in Portland.

6.3 Objective I

Promote bicycling as safe and convenient transportation to and from school.

6.3 Objective J

Continue and expand encouragement programs that provide services and equipment, support behavior changes, raise awareness, and provide incentives that increase bicycling in Portland.



Policy 6.7 Bicycle Classification Descriptions

Maintain a system of bikeways to serve all bicycle users and all types of bicycle trips in a manner that makes bicycling more attractive than driving for short trips.

Explanation: Bicycle Classifications include a functional hierarchy that helps define the bicycle network operation.

Objectives:

A. Bicycle Districts

Bicycle Districts are areas with a dense concentration of commercial, cultural, institutional and/or recreational destinations where the City intends to make bicycle travel more attractive than driving.

Land Use. High density and mixed-use neighborhoods should be targeted as bicycle districts. Auto-oriented development should be discouraged in Bicycle Districts.

Characteristics. The size and configuration of a Bicycle District should be consistent with the scale of bicycling trips. A Bicycle District includes the streets along its boundaries, except where the abutting street is classified as a Regional Trafficway.

Improvements. All streets within a Bicycle District are important in serving bicycle trips. Appropriate bicycle facilities should be determined for each street based on the desired bicycling conditions and operations. Use the Bikeway Design and Engineering Guidelines to design streets within Bicycle Districts.

B. Major City Bikeways

Major City Bikeways form the backbone of the city's bikeway network and are intended to serve high volumes of bicycle traffic and provide direct, seamless, efficient travel across and between transportation districts.

Land Use. Major City Bikeways should support 2040 land use types.

Improvements. Major City Bikeways should be designed to accommodate large volumes of bicyclists, to maximize their comfort and to minimize delays by emphasizing* the movement of bicycles. Motor vehicle lanes and on-street parking may be removed on Major City Bikeways to provide needed width for separated-in-roadway facilities where compatible with adjacent land uses and only after taking

*The phrase 'emphasizing the movement of bicycles' in the description of Major City Bikeways is intended to support a connected bikeway network and bicycle mobility and access on these streets in a manner that is appropriate for the adjacent land use setting and is consistent with other adopted modal street classifications.





Appendix B: Recommended **policy** amendments

into consideration the essential movement of all modes. Off-street paths designated as Major City Bikeways should have separate tracks for bicycles and pedestrians where practical.

C. City Bikeways (existing language replaced with the following)

City Bikeways are intended to establish direct and convenient bicycle access to significant destinations, to provide convenient access to Major City Bikeways and to provide coverage within three city blocks of any given point.

Land Use. City Bikeways should support 2040 land use types and residential neighborhoods. Improvements: City Bikeways emphasize* the movement of bicycles. Motor vehicle lanes and on-street parking may be removed on City Bikeways to provide needed width for separated-in-roadway facilities where compatible with adjacent land uses and only after taking into consideration the essential movement of all modes.

D. Local Service Bikeways

Local Service Bikeways are intended to serve local circulation needs for bicyclists and provide access to adjacent properties.

Classification. All streets not classified as Major City Bikeways or City Bikeways, with the exception of Regional Trafficways not also classified as Major City Traffic Streets, are classified as Local Service Bikeways.

Improvements. Consider the following design treatments for Local Service Bikeways: shared roadways, traffic calming, bicycle lanes, and extra-wide curb lanes. Crossings of Local Service Bikeways with other rights-of-way should minimize conflicts.

On-Street Parking. On-street parking on Local Service Bikeways should not be removed to provide bicycle lanes.

Operation. Treatment of Local Service Bikeways should not have a side effect of creating, accommodating, or encouraging automobile through-traffic.

Policy 6.13 Traffic Calming

6.13 G (Traffic Calming) [NEW]

Use traffic calming tools and other available tools and methods to create and maintain sufficiently low

*The phrase 'emphasize the movement of bicycles' in the description of City Bikeways is intended to support a connected bikeway network and bicycle mobility and access on these streets in a manner that is appropriate for the adjacent land use setting and is consistent with other adopted modal street classifications.



automotive volumes and speeds on bicycle boulevards to ensure a comfortable cycling environment on the street.

Policy 6.23 Bicycle Transportation

~~Make the bicycle an integral part of daily life in Portland, particularly for trips of less than five miles, by implementing a bikeway network, providing end-of-trip facilities, improving bicycle/transit integration, encouraging bicycle use, and making bicycling safer.~~

Create conditions that make bicycling more attractive than driving for trips of three miles or less.

6.23 Objective A

~~Complete a network of bikeways that serves bicyclists' needs, especially for travel to employment centers, commercial districts, transit stations, institutions, and recreational destinations.~~

Form a citywide network of connected bikeways on streets including streets with low traffic speeds and low traffic volumes. Provide the highest degree of separation on busier streets to preserve access to common destinations. Accommodate cyclists of all ages and abilities.

6.23 Objective B

~~Provide continuous bicycle facilities and eliminate gaps in the bike lane system~~ bikeway network.

6.23 Objective C

Install bicycle signage along bikeways where needed to define the route and/or direct bicyclists to a destination or other bikeway.

6.23 Objective D

~~Increase bicyclist safety and convenience by making improvements, removing physical hazards such as dangerous storm gates and supporting changes to adopted statutes and codes that would enhance the safety of bicyclists.~~

Design bicycle facilities with safety and comfort as basic requirements to attract riders of all ages and skill levels.

6.23 Objective E (Existing objective on bicycle parking moved to 6.26)

6.23 Objective E [NEW]

Ensure that the health, social, economic, and environmental benefits of bicycling are accessible to all Portlanders regardless of race, ethnicity, age, economic status, geographical location or language spoken.





6.23 Objective F

Encourage the provision of showers and changing facilities for commuting cyclists, including the development of such facilities in commercial buildings and at 'Bike Central' central locations.

6.23 Objective G

Increase the number of bicycle-transit trips.

Increase the number of multi-modal trips that include bicycling for at least one trip segment by improving and simplifying connections and transfers to transit.

6.23 Objective H

Promote bicycling as safe and convenient transportation to and from school.

6.23 Objective I [NEW]

Provide bikeway system improvements that will serve key destinations, such as Metro 2040 centers and main streets, employment centers, commercial districts, transit stations, institutions, schools, and recreational destinations.

6.23 Objective J [NEW]

Support bike-sharing programs aimed at visitors, tourists, employees, and residents to increase access to bicycles.

6.23 Objective K [NEW]

Maintain Portland's position as a national leader in the evaluation of bicycle improvements and ridership through on-going data collection and monitoring of changes to bicycling infrastructure and in riding behavior.

6.23 Objective L [NEW]

Support changes to remove institutional barriers in statutes, policies, and codes that discourage safe and efficient bicycle use.

Policy 6.26 On-Street Parking Management

Manage the supply, operations, and demand for parking and loading in the public right-of way to encourage economic vitality, safety for all modes, and livability of residential neighborhoods.

6.26 Objective A

Support land uses in existing and emerging regional centers, town centers, and main streets with an



adequate supply of on-street parking spaces while emphasizing grouped bicycle parking in the street.

6.26 Objective E [NEW]

Provide and maintain public bicycle parking at high-demand locations in the Central City, neighborhood business nodes, cultural and recreational destinations, transit nodes and employment centers.

6.26 Objective F [NEW]

Ensure a highly functional and high quality design of bicycle parking installed in the public right of way.

Policy 6.27 Off-Street Parking

Regulate off-street parking to promote good urban form and the vitality of commercial and employment areas.

6.27 Objective D [NEW]

Support changes to regulations to ensure that all land uses provide an ample quantity of short- and long-term bicycle parking and end-of-trip facilities consistent with an increasing bicycle mode share.

6.27 Objective E [NEW]

Encourage owners of existing residential or commercial buildings to supplement and upgrade off-street long-term and short-term bicycle parking.

Goal 11B Public Rights-of-Way

Improve the quality of Portland's transportation system by carrying out projects to implement the 2040 Growth Concept, preserving public rights-of-way, implementing street plans, continuing high-quality maintenance and improvement programs, and allocating limited resources to identified needs of neighborhoods, commerce, and industry.

Policy 11.10 Street Design and Right-of-Way Improvements

Design improvements to existing and new transportation facilities to implement transportation and land use goals and objectives.

11.10 Objective F (Street Design and Right-of-Way Improvements)

Provide planned bicycle facilities on designated alignments and in conjunction with street improvements, or develop equally safe and convenient alternative access for bicycles on parallel streets





~~when the appropriate bikeway facility cannot be provided on the designated street. because of severe environmental or topographical constraints, unacceptable levels of traffic congestion, or the need to retain on-street parking.~~

11.10 Objective R [NEW]

Require adequate right-of-way or easements where adequate space for planned bikeway and pedestrian facilities is not available.

11.10 Objective S [NEW]

Continue to test, evaluate, and implement appropriate innovative design treatments that improve operating conditions and safety for cyclists.

11.10 Objective T

Utilize interim bicycle facility improvements where the preferred design treatment is not currently feasible.

Policy 11.12 Maintenance

Support activities and programs that preserve, maintain, and prevent deterioration of the existing transportation system.

11.12 Objective F [NEW]

Make improvements to the bicycle network, including removing physical hazards, and maintain the bicycle infrastructure in a timely and efficient manner.

Proposed *Comprehensive Plan* revisions

These proposed revisions must reviewed in context as part of the Portland Plan and subsequent Comprehensive Plan updates in 2010 and 2011.

Goal 15: Economic Development

Objective X.1

Market Portland as a destination for bicyclists and encourage the provision of bike rentals by the private sector.

Objective X.2

Encourage the retention and expansion of the bicycle industry in Portland to increase economic opportunities and enhance our international reputation as a bicycling center.



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Appendix C





Appendix C: Cycle Zone Analysis

Introduction

The urban fabric that forms Portland is more a mosaic of distinct neighborhoods than a homogenous mass of streets, homes and businesses. As a result, Portlanders commonly possess a great deal of pride and affinity for their own neighborhood. It is essential for any city planning effort to consider the mix of qualities and characteristics that make each neighborhood unique.

To better understand how conditions for bicycling vary across Portland, an innovative Geographic Information System (GIS) based tool was developed in 2007 for tailoring the City's bicycle strategy to districts with similar conditions and potential for bicycling. Called the Cycle Zone Analysis (CZA), the method allows a better understanding of how existing conditions for bicycling vary across Portland. The Cycle Zone Analysis tool also allows a more tailored approach to improving conditions for bicycling by directly addressing the deficiencies unique to each cycle zone.

Goals of the analysis:

- Better comprehend the different existing conditions for bicycling in Portland
- Project which areas have the greatest potential for bicycling
- Combine the metric for bikeway quality

with the cycle zone analysis to understand the relationship between bicycling potential and bikeway quality

- Use this information to target investments that will achieve the maximum returns on financial investment through increases in bicycle mode share

'Cycle zones' were defined as distinct areas within the City that possesses similar characteristics for bicycling. Thirty-two cycle zones were identified as units of analysis, based on similarity in quality and density of the developed bikeways, geographic and infrastructure barriers, and trip distance to common destinations. The validity of the proposed cycle zone boundaries was tested with members of the City's Bicycle Advisory Committee as well as with bicycling advocates and city residents.

Bikeway Quality Index (BQI)

Two hundred and twenty miles of existing, bike lanes and boulevards were evaluated across a list of factors to establish the Bikeway Quality Index (BQI). The score for each segment was calculated as the percentage of the ideal condition for a given segment. Each of these factors was assigned a weight based on its importance relative to the other factors analyzed. Slightly separate factors were considered in assigning bikeway quality to

bicycle lanes and bicycle boulevards.

Factors of bikeway quality:

- Motor vehicle speeds and volumes
- Number of travel lanes
- Width of bicycle lanes
- Dropped bicycle lanes and difficult transitions
- Jogs in route
- Quality of pavement
- Quality of intersection crossings
- Number of stops

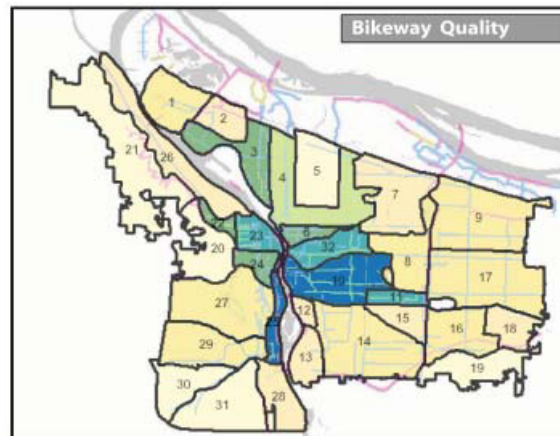
The ratings by zone for conditions for bicycling are shown in Maps 1 through 6, illustrating the individual metrics of bikeway quality, physical barriers, density of roadway network, street connectivity, land topography (slope), and land use. The Existing Conditions Map (Map 7) combines the individual measurements for each zone into an overall cycle zone rating. This map reflects overall conditions for bicycling in each area of Portland. Map 8 shows the relative potential of each zone for increased bicycling. This rating is generated by removing from the overall rating equation those two elements that will be addressed by the *Portland Bicycle Plan for 2030*: bikeway quality and barriers. The potential score for each cycle zone is based on its street connectivity, roadway network density, land use, and topography, as these are the factors that are not likely to change as a result of this plan.



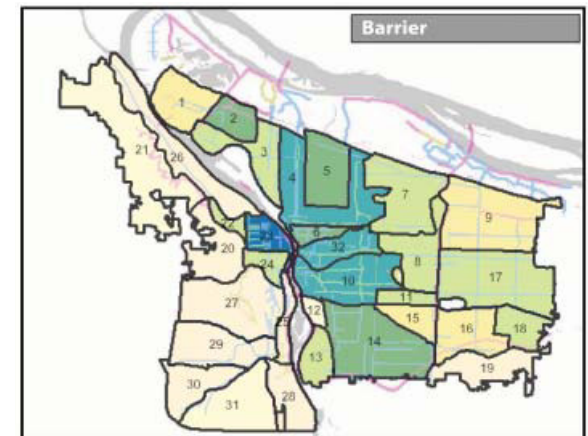
The Cycle Zone Analysis has proved a useful means of organizing information about what the City has accomplished, why some areas of the city are better for bicycling than others, and which areas have the best potential and why. It is an organizing principle that in some cases highlights the needs for very specific improvements. This analysis is also useful in further demonstrating the effectiveness of Portland strategy of promoting those urban elements that support bicycling, not the least of which is development of a comprehensive bikeway network. Comparing past and present bicycling conditions and use by zone demonstrates that as the quality of individual cycle zones improves, ridership increases.

Additional details of the Cycle Zone Analysis can be found in Chapter 7 of the *Existing Conditions Report*.¹

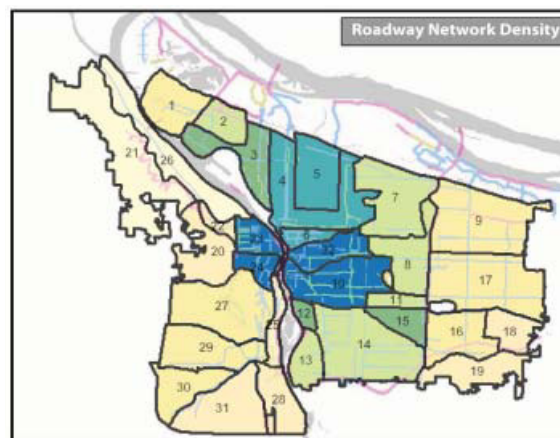
Map 1



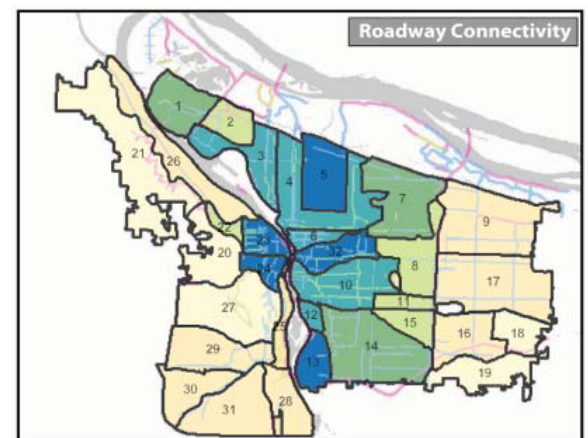
Map 2



Map 3



Map 4



Darker areas on each map represent zones with higher Bikeway Quality Index (BQI) scores. Lighter areas on each map represent zones with lower Bikeway Quality Index (BQI) scores.

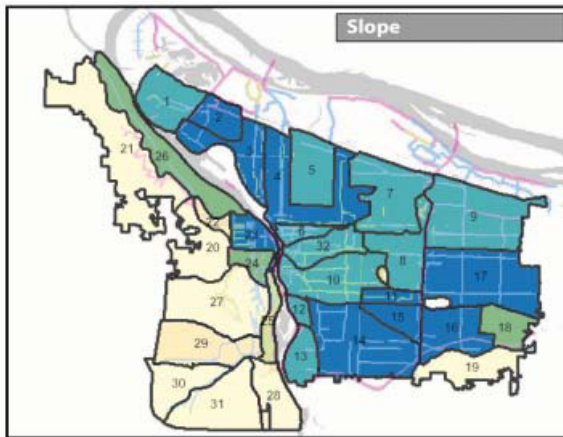
¹ Available online at <http://www.portlandonline.com/transportation/index.cfm?c=50736&>



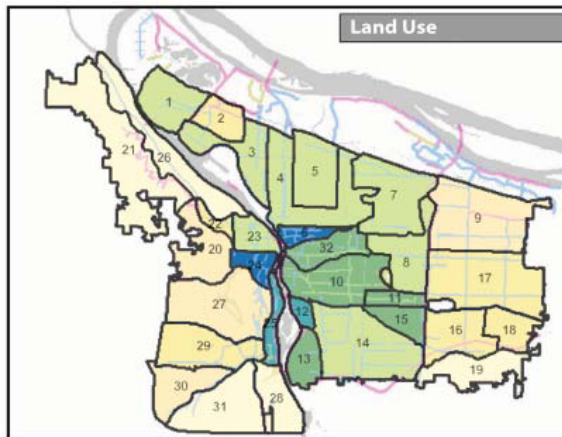


Appendix C: Cycle Zone Analysis

Map 5

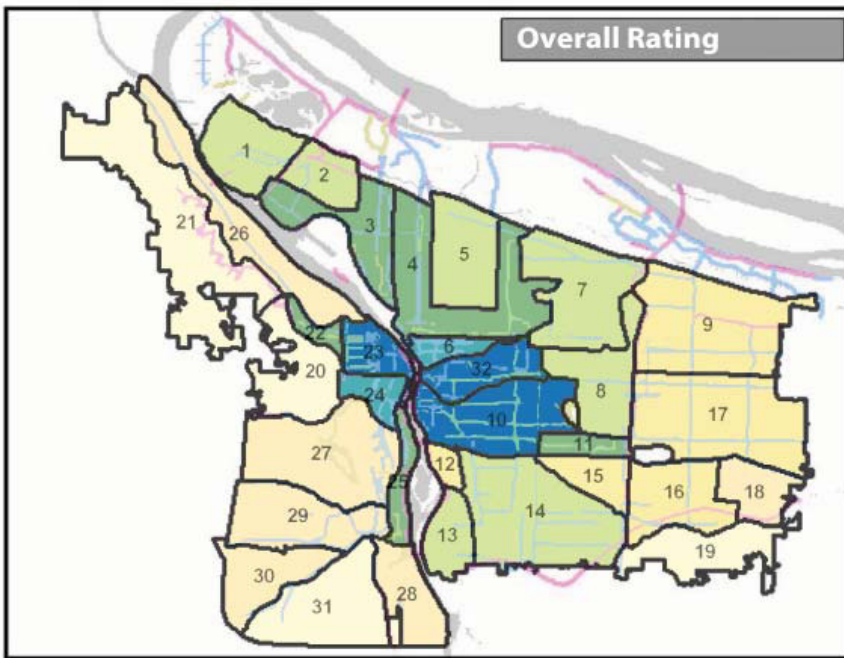


Map 6



Darker areas on each map represent zones with higher Bikeway Quality Index (BQI) scores. Lighter areas on each map represent zones with lower Bikeway Quality Index (BQI) scores.

Map 7



Map 8

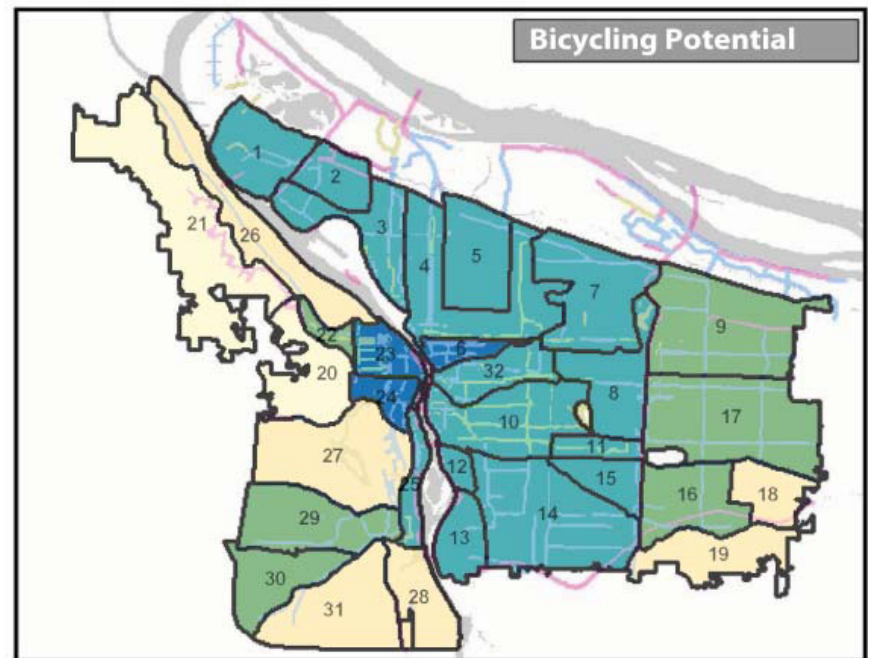




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Appendix D: Bikeway facility design: survey of best practices

Introduction

The unprecedented numbers of people bicycling in Portland has necessitated expansion of the bikeway design tools available to the city's traffic engineers. Portland is looking to world leaders in bicycle transportation to meet this growing demand. Many cities from across the globe have long recognized the merits of bicycling as an important means of transportation and have led the way in facilitating bicycle traffic through innovation and adaptation of bicycle-friendly infrastructure.

This report documents an extensive review of best practices from world-class bicycling cities where the most innovative technology advances in designing for bicycle traffic have been proven effective. The purpose of the report is to create a guide for traffic engineers, designers and planners detailing tried-and-tested bicycle facility designs along with essential considerations for their implementation.

Portland aims to help lead a national effort to develop standards and guidelines for designing bikeways that meet the wide ranging needs of the cycling public for safe, comfortable and attractive conditions. Currently, the City's *Bikeway Design and Engineering Guidelines* established as Appendix A of the 1996 *Bicycle Master Plan* serve as the local manual for the design, construction and maintenance

of the city's bikeway network. Formation of the *Portland Bicycle Plan for 2030* presented the opportunity to revisit these guidelines, make enhancements to approved designs and integrate new designs into a revised manual that will meet the bicycling demands projected in coming decades.

Current State of the Practice

In 1996 when the city's original bikeway design guidelines were adopted the bicycle mode share in Portland was roughly two percent for commute trips. Today, eight percent of Portlanders reported bicycling as their primary commute mode and 10 percent of those who sometimes used a different mode reported bicycling as their secondary commute mode. Nationally, only 0.5 percent of trips to work are made by bicycle according to the 2007 *American Community Survey*.

Standard guidance on bikeway design outlined in national manuals, namely the American Association of State and Highway Transportation Officials (AASHTO) *Guide for the Development of Bicycle Facilities* and the *Manual on Uniform Traffic Control Devices (MUTCD)*, has proven insufficient to address the levels of bicycling experienced in Portland. The intense influx of bicyclists using the city's transportation system has begun to exceed the capacity of developed facilities. If Portland is successful in realizing more than one quarter

of all trips made by bicycle as envisioned in this *Portland Bicycle Plan for 2030*, current practices will not suffice. Thus, new design guidelines and standards need to be adopted to ensure safe traffic conditions in the future for all travel modes.

Bikeways for Portland's Future

Portland has a reputation for implementing innovative designs that are not found in any domestic traffic design manual. Demonstration projects implemented by the Portland Bureau of Transportation, such as bicycle boxes at several high-risk intersections, have been lauded by the cycling public. Still, the city's existing bikeway network has primarily appealed to those residents who are already confident in their cycling abilities and enthusiastic riding on major streets alongside motor vehicles.

Moving forward, Portland is committed to developing better designs for bikeways that will have greater appeal to the average citizen who is interested in bicycling but concerned about their safety. A key recommendation of the *Portland Bicycle Plan for 2030* is to expand the palette of bikeway designs to facilitate creating conditions that make bicycling more attractive than driving for short trips. Separation from high volumes of high-speed traffic is an essential element of the plan's approach, as it is in the world's most bicycle-friendly cities.



Next Steps

Most of the facilities contained within this report are considered nonstandard or experimental in the United States. Some treatments will require enabling legislation to permit their usage. In addition, transfer of any appropriate engineering technologies from other countries will require context-sensitive translation to fit local conditions.

The bikeway designs collected and published as part of this report will be further evaluated and considered for potential inclusion in revisions to the City's *Bikeway Design and Engineering Guidelines* that will direct future bikeway improvements within the City of Portland.

Survey of best practices

Hard copy included as a separate document and available on-line at: www.portlandonline.com/transportation/BicycleMasterPlan





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Appendix E: Existing conditions summary

Chapter 1: introduction

The City of Portland adopted its first *Bicycle Master Plan* in 1996 and updated it in 1998. In 2006, the Portland Bureau of Transportation undertook a major effort to update the *Bicycle Master Plan*. As part of that process, a report documenting past developments and the status of bicycling in the city was written to serve as a starting point for the new master plan. Most of the *Existing Conditions Report* was completed in 2007 with some chapters revised or updated in 2009. This Executive Summary is excerpted from the completed report.

Chapter 2: Bicycle use

By all metrics, bicycling in Portland is growing dramatically. Based on Transportation's annual counts and surveys, the annual Service, Efforts, and Accomplishments (SEA) survey administered by the City of Portland Auditor's office, the American Community Survey (ACS), and the US Census, many more Portlanders are bicycling for more trips since the adoption of the City's first *Bicycle Master Plan* in 1996. For example:

- Bicycle traffic across the four bicycle friendly Willamette River bridges has increased 321 percent since 1990
- In 2006, 14.5 percent of Portlanders reported that bicycling served as their primary or secondary commuting mode

- Between 1990 and 2005, the US Census reported a 190 percent increase in bicycle commuting in Portland

According to the SEA survey, the highest areas of bicycle commuting occur in inner Northeast and Southeast, while North Portland has experienced the greatest increase in the city (430 percent).

While bicycle commuting trends are showing significant growth, commute trips make up only about 25 percent of all trips a person makes each day. Surveys show that Portland residents are also cycling for non-commute trips such as shopping, leisure and fitness trips. For example, a 2007 survey of Portland residents revealed that only 29 percent of active cyclists commute to work by bicycle; however, 46 percent use a bicycle to run errands. Although specific data on mode share for errands and neighborhood trips does not exist, the high number of active cyclists reporting bicycle usage for errands suggests that cycling plays a large role in Portland's transportation system.

Through years of surveys and public outreach campaigns, the Bureau of Transportation knows much more about Portland residents' bicycle usage today than in 1996.

- 70 percent of Portland residents own or have regular access to a bicycle

- Between 60 and 70 percent of bicyclists on the road today are male (no other mode of transportation has such a high level of gender imbalance)
- Residents over 65 years old are under-represented in bicycle use and over-represented in terms of being negatively predisposed to cycling

In 2006, the City of Portland conducted surveys and focus groups with Portlanders to better understand the characteristics of bicyclists and non-bicyclists. The results of that endeavor aided staff in developing four classifications to represent Portlanders and their attitudes towards cycling.

- The vast majority (60 percent) of city residents is categorized as 'Interested but Concerned' – they are not quite ready to hit the streets on a bicycle, but they would like to under the right circumstances
- Around seven percent of city residents are categorized as 'Enthusied and Confident' – they will bicycle readily if some kind of bicycle facility, such as bike lanes, exists
- Around 1 to 2 percent of city residents are categorized as 'Strong and Fearless' – they will bicycle regardless of conditions
- Around 33 percent are categorized as unable, unwilling, or uninterested in cycling



- The Strong and Fearless’ and ‘Enthusied and Confident’ cyclists helped shape the 1996 *Bicycle Master Plan*. That plan’s focus on bike lanes on arterial streets reflects the interests and dominant thinking of the time. However, in order to encourage the 60 percent of city residents considered ‘Interested but Concerned,’ the new master plan must address their concerns about bicycling: primarily traffic speed, traffic volume, and distances.

Chapter 3: Evaluation of 1996 *Bicycle Master Plan* benchmarks

The following eight components were used to evaluate the City’s progress on meeting the goals and benchmarks in the original *Bicycle Master Plan*:

1. Increase bicycle mode share
2. Reduce bicycle crashes
3. Complete the bicycle network
4. Reduce maintenance requests by bicyclists
5. Install signal detection and pavement markings
6. Provide end-of-trip facilities for bicyclists
7. Encourage integration of bicycles and transit
8. Provide bicycle education and encouragement to city residents

Mode share

Goal: Inner Portland - 10 percent bicycle mode share for all trips by 2006; Citywide - 6 percent mode share for all trips.

Results: Data on mode share for all trips is incomplete. The 2000 Census reported 3.14 percent bicycle commute mode share for inner Portland and 2.13 percent citywide. Other measures, such as specific neighborhood surveys, show commute mode splits as high as 10 percent in some inner eastside neighborhoods and below 1 percent in outer eastside neighborhoods.

Crashes

Goal: 10 percent reduction in bicycle-motor vehicle crashes by 2006.

Results: Reported bicycle-motor vehicle crashes have remained static from 1996 to 2005. However, based on a significantly decreasing bicycle crash rate, conditions for bicycling are safer today than in 1996.

Bicycle network

Goal: 378 miles of developed bicycle multi-use trails, boulevards, signed connections, and bike lanes by 2006; 60 percent of the 20-year goal of 630 bicycle network miles; 204 identified bicycle projects.

Results: 290 miles of the bicycle network

completed; 48 percent of the 20 year network goal; 68 constructed bicycle projects.

Maintenance of bikeway network

Goal: 50 percent reduction in bikeway network maintenance requests.

Results: The number of maintenance requests has not been accurately tracked over the last 10 years. Since 1996, the Bureau of Transportation has developed new reporting mechanisms for residents to make maintenance requests. In 1996, requests were made in writing and mailed to Maintenance Operations. Today, residents can simply dial a number and leave a voicemail maintenance request. Thus, it is expected that maintenance requests have most likely increased.

Pavement markings & signs

Goal: 50 percent of all signals with detection should be tuned and retrofitted with pavement markings by 2006.

Results: 65 percent of all loop detectors are set to function for bicycles. In 1996, the City contained 25 loop detectors markings; by 2006, the City had 161 loop detector markings.

End-of-trip facilities

Goal: Provide 3,440 short-term bicycle parking spaces; 7,527 long-term spaces; shower and changing facilities available to all bicyclists.





Appendix E: Existing conditions summary

Results: The City manages 4,705 short-term parking spaces and can account for 569 long-term spaces. While long-term parking may seem well short of the goal, most long-term spaces are administered by private developers and are difficult to count. Shower and changing facilities are also difficult to count because they are also most often found in private developments. The City has made building code changes to promote shower and changing facilities in new construction and has developed a Bike Central program to provide facilities for bike commuters.

Bicycle & transit

Goal: No specific benchmark; statement of intent to incorporate bicycles and transit.

Results: In 2006, all TriMet buses and light rail trains carry bicycle racks or designated bicycle areas. TriMet provides short- and long-term bicycle parking, including 340 bicycle lockers.

Education & encouragement

Goals: Stage five citywide promotional events. Provide bicycle safety education in schools. Promote children bicycling to school. Conduct other promotional events.

Results: Portland hosts 2,100 cycling-related events each year, including those sponsored by the City and other community organizations. Regarding education, 81 percent of school age

children have received bicycle safety education, while 11 percent of Portland students receive bicycle safety education annually. Portland’s Safe Routes to School program showed a 10 – 20 percent increase in walking and biking to school among participating schools in 2006. The Bureau of Transportation also encourages bicycling and other transportation options through its award-winning individualized marketing program, Portland SmartTrips. The program annually shows 9 – 12 percent reductions in drive-alone trips and offers hundreds of bicycle rides, clinics and outreach events.

Chapter 4: Bicycle-related goals, policies & objectives

The City of Portland’s goals and policies related to transportation emphasize, above all else, balance between modes competing for limited right-of-way. In 2002, Portland adopted its *Transportation System Plan (TSP)* as part of the City’s Comprehensive Plan. The *TSP* is Portland’s guiding policy and planning document for transportation.

The *TSP’s* Transportation Goal does not specifically mention bicycles but contains many elements that favor bicycle transportation. Several policies and objectives supporting the Transportation Goal relate directly to bicycling. Policy 6.23 states: “Make the bicycle an integral part of daily life in Portland, particularly for

trips of less than five miles, by implementing a bikeway network, providing end-of-trip facilities, improving bicycle/transit integration, encouraging bicycle use, and making bicycling safer.” There are a series of objectives set out to support this policy.

The *TSP* also spells out the City’s bikeway network classifications:

- **City Bikeways** – Serve the Central City, regional and town centers, station communities, and other employment, commercial, institutional, and recreational destinations.
- **Off-street Paths** – Serve as transportation corridors and recreational routes for bicycling, walking, and other non-motorized modes.
- **Local Service Bikeways** – Serve local circulation needs for bicyclists and provide access to adjacent properties

Each of these classifications includes supporting objectives to assist implementation. The 1996 *Bicycle Master Plan* describes one of three developments for each City Bikeway: 1) bike lanes, 2) bicycle boulevard, or 3) signed connection.

The *TSP* also includes a number of policies and ordinances that may affect future street and bicycle facilities designs. For example,



street classifications define the types of movements that should be emphasized on each street such as motor vehicles, freight, transit, emergency vehicles, pedestrians, and bicycles. The classifications are used to help determine street improvements. Since an individual street can possess numerous classifications and serve diverse functions, it can be difficult to balance the multiple demands. Providing more definition on the conditions where specific bikeway facilities and designs should be prioritized may help to reduce the level of ambiguity when conflicts occur.

In addition to street classifications, traffic congestion/level of service, mode split, transportation demand management, and transportation system management policies also affect bicycle facilities planning and design.

On-street automobile parking policies also plays a role in planning for and developing bicycle facilities. City policies support the need for both on-street parking and bikeway facilities on certain designated streets. Although conditions must always be evaluated on a case-by-case basis, it may be beneficial to adopt more clearly defined guidelines for prioritization on certain roadways.

Street connectivity, traffic calming and diversion have played major roles in developing Portland's bicycle network. Street connectivity allows

bicyclists to find alternative routes to major arterials, but can also lead to more auto traffic on quieter residential streets where bicycle boulevards and other low-traffic bicycle routes are located. Traffic calming and diversions work by maintaining the benefits of street connectivity without sacrificing the lower traffic volumes and speed that make for a comfortable bicycling environment.

Chapter 5: Encouragement

Portland has pursued several strategies to encourage residents to bicycle. The City's signature effort is the award-winning SmartTrips Program. SmartTrips builds on the principle that individuals engaged in a dialogue about alternative transportation are more likely to change their behavior than if simply presented with more advertising and promotional activities. SmartTrips offers city residents the opportunity to order information and resources on transportation options and participate in hands-on programs that assist them in making the choice to walk, bike, ride transit, and carpool.

Portland's SmartTrips program has consistently resulted in decreased drive alone trips and increased bicycling and walking. Surveys show between a 9 to 12 percent relative decrease in drive alone trips. SmartTrips focuses on neighborhood trips, such as shopping and leisure activities, as a way to encourage

Portlanders to use alternative modes. This approach, coupled with City employees staging and participating in hundreds of community events each year, serves as the key factors in encouraging residents to take advantage of transportation choices.

There are four basic encouragement strategies: providing service, changing behavior, raising awareness, and providing incentives to ride. While SmartTrips touches on all of these areas, the City employs other strategies and develops partnerships with non-governmental, community, and business groups to encourage bicycling.

Chapter 6: Bicycle safety – education & encouragement

Bicycling in Portland has become safer since the adoption of the *Bicycle Master Plan* in 1996. When comparing bicycle ridership numbers and bicycle crashes, the crash rate has decreased significantly. Nevertheless, safety continues to be a barrier to bicycling both for those who bicycle and those who don't.

The first step in evaluating the safety of bicycling in the City requires analyzing crash and safety information. That, however, can be a daunting task as information for bicycle crashes lacks the detail and uniformity associated with motor vehicle crashes. Bicycle crash data for Portland comes from four main sources:





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- Oregon Department of Transportation Statewide Crash Data System
- Police Crash Investigation Reports
- Pedestrian Bicycle Crash Analysis Tool (PBCAT)
- Oregon Trauma Registry

Even with these varied reporting tools, only 10 – 20 percent of all bicycle crashes are reported. The more severe the crash, the more likely it is to be reported. Additionally, crashes resulting in a trauma tend to receive more thorough police investigations that reveal more details about the crash.

National data from the Federal Highway Administration indicates that 70 percent of bicycle injuries resulting in an emergency room visit do not involve a motor vehicle and that nearly 31 percent of crashes occurred on non-roadway locations (off-street paths). In Portland, a gap exists in effectively collecting non-motor vehicle related crashes, thus skewing data on bicycle crashes in the city.

Statewide crash data have significant limitations, as it does not provide a complete picture of the events that resulted in a crash. For example, a motor vehicle driver might be assigned a failure to yield error, when they were actually making a right turn across a bike lane and hit the bicyclist. For policy implications, it

is important to have a more detailed description of crashes to see what patterns, if any, exist with the broad error categories set out in the Statewide Crash Data System.

In addition to the error categories in the Statewide Crash Data System, injuries, fatalities, and errors leading to fatalities are also tracked. However, as the bicycling advocacy group Right of Way reported, New York City Police inaccurately assigned error to bicyclists in fatal crashes in 40 – 60 percent of the cases.

Key statistics on bicycle accidents:

- 90 percent of all crashes (including bicycle and motor vehicle), regardless of fault, are caused by human error
- 68 percent of bicycle crashes in Portland occur at intersections
- 81 percent of all bicyclist injury crashes and 77 percent of bicyclist fatalities in Portland take place on streets with higher classifications, such as Neighborhood Collector and Major Traffic Street
- 22 of 25 bicyclist fatalities in Portland between 1995 and 2007 took place where no bike lane existed
- Alcohol played a role in 35 percent of all bicycle fatalities between 1993 and 2005
- Helmet use has increased by nearly 25 percent between 1992 and 2006

Chapter 7: Bikeway network

Between adoption of the 1996 *Bicycle Master Plan* and 2006, Portland added 122 miles of developed bikeways to its network and saw bike traffic over the four bicycle-friendly Willamette River bridges (Hawthorne, Burnside, Broadway, and Steel) nearly triple. The development of Portland’s bikeway network has been the primary ingredient in the success at increasing bicycle use over the past 10 years.

The 1996 *Bicycle Master Plan* selected bikeways based on several criteria, including:

- Connection to land uses
- Ease of implementation
- Needs for safety improvements
- Lack of parallel facilities
- Need of continuity
- Providing a bikeway every half-mile both north-south and east-west

In addition, Transportation used previously existing plans for bikeways to identify potential corridors.

The 1996 *Bicycle Master Plan* recognizes four types of facilities :

- Bike lanes – Striped lanes for the exclusive use of bicycles on roadways where the average daily traffic is 3,000 cars per day or



greater

- Bicycle boulevards – Rather than exclusive lanes, boulevards are shared roadway environments with other treatments, such as traffic calming, to improve the bicyclist’s experience
- Signed connections – Generally connector routes with signs leading to points of interests or other bikeways
- Off-street paths

In 2006, Portland’s bikeway network was approximately 45 percent complete; however, there are notable differences between different areas of the city. In Southwest, for example, only 28 percent of the network is complete, whereas the Central City’s network is 58 percent complete.

One of the Bureau’s most successful programs at adding miles to the bikeway network is Missing Links. The program, funded at a modest \$50,000 per year, has been opportunistic and efficient in developing city bikeways in conjunction with other projects, particularly working with regularly scheduled pavement overlays. Without the Missing Links program and funding, 41 miles of city bikeways – typically developed as bike lanes – would not have been striped or would have cost much more if undertaken as a separate project.

Building the bikeway network has produced more bicyclists. There is a strong correlation between the growth of Portland bikeway network and growth in ridership. By examining the four bicycle-friendly Willamette River bridges, the correlation between the bikeway network and ridership is most evident. As the networks serving the Hawthorne, Broadway, and Steel bridges have developed over time, the ridership on those bridges has grown. Similarly, as the facilities serving the Burnside Bridge have not grown, neither have the number of bicycle trips across that bridge.

Recent additions to the bikeway network have added significantly to ease of operation and connectivity, but have not added many miles. Nevertheless, these additions represent sizeable investments in terms of funds expended, planning resources tapped, and engineering resources devoted, including:

- The scramble signal in the Rose Quarter
- The HAWK signal at 41st and E Burnside
- The Three Bridges project on the Springwater Corridor
- The Eastbank Esplanade and Riverwalk on the Steel Bridge
- The Bikeway Network Signing Project
- The Port of Portland’s multi-use path to the airport

In addition, the Bureau of Transportation is building numerous curb extensions and median refuges that facilitate bicyclists’ crossings of busy arterial streets.

Chapter 8: Bicycles in the central city

Portland’s Central City includes downtown, the Lloyd District, Central Eastside, and several other neighborhoods that make up the region’s largest hub for employment and commercial activity. Bicycling in the Central City has seen dramatic increases and its accessibility by bicycle helped bicycling grow in Portland’s inner eastside neighborhoods. Furthermore, according to the 2000 Census, 280,000 Portland residents live within three miles of the Central City – an easy bicycle ride. Such a large population base in such close proximity to the region’s major employment, shopping, and entertainment area make the Central City a prime location to encourage an explosion of cycling.

A number of factors will contribute to an increase in bicycle use in the Central City, including:

- Development of new facilities and educating residents about bicycle accessibility
- Increasing gas prices
- Increasing congestion





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- Increasing density
- Increasing awareness of the relationship between health and activity
- Continued mixed use land development

In addition, the Central City is increasingly becoming a place where people not only work, but also live and play. There will be more non-work trips to and within the Central City over time that will create more demand for better bicycling conditions.

Designing a bikeway network for Portland's Central City has been challenging. For example, based on traffic volumes and street classification, bike lanes are currently the recommended bikeway treatment for downtown City Bikeways. However, in many areas of downtown where traffic and street conditions are complex, the Portland Bicycle Advisory Committee has historically been unable to reach consensus about striping bike lanes. Currently, downtown has limited bike lanes and no bike boulevards. New bikeway designs and classifications, reevaluating the current standards, and increased education and enforcement may be required to increase the amount of bicycling downtown and, concurrently, in the Central City.

Access between the Central City and North and East Portland is facilitated by high-

quality bicycling amenities on the Hawthorne, Broadway, and Steel bridges as well as well-engineered roadway connections to those bridges. While the Burnside Bridge includes bike lanes, access to and from the bridge on both the east and west ends is interrupted and substandard and bicycle trips across the bridge have remained relatively flat (compared to the other bridges) since 1996. The Morrison Bridge's current facilities are substandard and dangerous for cyclists, but the bridge is slated to receive a multi-use path in 2009. The Ross Island Bridge also has substandard facilities for cyclists with no direct developed surface bikeway connections and a narrow shared use sidewalk on the bridge itself.

Bikeway facilities between the Central City and other parts of town, including Northwest, Southwest, and the River District can vary greatly. The bikeway network often includes dropped bike lanes, lack of treatments, or missing links in key areas. Other areas, including South Waterfront and Lloyd District, are generally well served with some access issues in certain key points.

Chapter 9: Bikeway design, construction, and maintenance practices

The bicyclist's experience riding Portland's bikeway network is largely defined by the physical conditions on the road. What types of facilities are built and how they are built are

essential to the creation of an attractive and comfortable environment for bicycling. Once a bikeway feature is established, maintaining its level of quality and performance becomes equally important.

The Bureau of Transportation is the primary architect of the city's bikeway network. Design is based on the Bikeway Design and Engineering Guidelines in Appendix A of the *Bicycle Master Plan*. Ninety percent of the city's bikeway designs are found in Appendix A. That section was based on two main source documents: the American Association of State and Highway Transportation Officials (AASHTO) manual *Guide for the Development of Bicycle Facilities 1999*, and the 1996 Oregon Department of Transportation (ODOT) *Oregon Bicycle and Pedestrian Plan*. A third document also informs bikeway design: the *Manual on Uniform Traffic Control Devices* (MUTCD) sets standards for traffic signs and signals and pavement marking.

The Portland Bureau of Transportation has incorporated much of the guidance outlined within the Design and Engineering Guidelines (Appendix A of the 1996 *Bicycle Master Plan*) as standard construction practices. Several issues, particularly storm water catch basins and gutters within bike lanes and construction on streets with bike lines, still exist and merit more detailed consideration.



Maintenance practices are also a key component in a functioning bikeway. As with the City's construction practices, many guidelines contained in the *Bicycle Master Plan* have been incorporated into standard maintenance practices within the City. The key maintenance issues affecting bicyclists are:

- New pavement overlay practices that could affect provision of bike lanes on repaving projects
- Street sweeping
- Gravel cleanup following storm events
- Pavement overlays and substandard drainage grates
- Transitioning from painted lanes and pavement markings to thermoplastic striping
- Roadside maintenance, such as vegetation

While the majority of the designs for bikeways can be found in Appendix A of the *Bicycle Master Plan*, new or relevant designs that merit discussion include :

- Bicycle Activated Signals
- HAWK Signals
- Pedestrian Half Signals
- Scramble Signals
- Bicycle Boxes

- Crossing Treatments
- Traffic Diversion
- Bike Lanes
- Blue Bike Lanes
- Shared Lane Pavement Markings
- Hawthorne Bridge Pathway Markings
- Bikeway Signing and Markings

Chapter 10: Bicycle parking

Bicycle parking is a key component of a functional bicycle network. A person is much less likely to bicycle if there is no place to park the bike safely. In order to function well, bike parking must be:

- Ubiquitous – available everywhere cyclists ride
- Conspicuous – in plain view to assure the public that places exist to leave their bikes
- Secure – provide some level of assurance that the bike will not be stolen
- Accessible – easily serve the needs of the bicyclist at destinations

There is little doubt that the demand from citizens and the business community for high quality bike parking exists and is growing. Several different surveys administered in 2008 show a high level of interest in more extensive parking facilities. For example,

several surveys of downtown commuters and residents have revealed between 27 - 37 percent of respondents said they would bicycle more if more parking existed. Additionally, 52 percent of Central Eastside residents responding to a Transportation survey reported that more bike parking would help them drive less.

Much of the demand for bicycle parking is met through short-term parking. Transportation primarily installs staple racks in the right-of-way (usually on the sidewalk). In addition, City of Portland code requires new private developments to install short-term parking on the property near main entrances. Short-term parking locations are identified in one of four ways:

- Requests by citizens or businesses
- As required by Portland code (33.266.200 Bicycle Parking) at new developments
- Privately installed parking permitted by Transportation for location in the right-of-way
- As a component of public works projects

The Bureau has also developed several new and innovative methods to meet parking and end-of-trip facilities demand:

- Bike corral: located on the street, they provide parking for 16 to 24 bicycles in two





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motor vehicle parking spaces

- Bike oasis: covered bicycle parking facilities with parking for approximately 10 bicycles; built on the sidewalk
- Bike Parking Fund: Allows property owners to meet their short-term bicycle parking requirement by paying into a Bureau-administered fund used to provide short-term bicycle parking throughout the city
- Floor Area Ratio (FAR)bonus: Allows developers to build 40 additional square feet—beyond what code would otherwise allow—for every square foot they dedicate to bicycle commuter shower and locker room facilities

Long-term bicycle parking is meant to accommodate employees, students, residents, commuters, and others expected to park more than two hours. Long-term parking should be located in a secure, weather-protected environment and can include lockers, locked room facilities with standard racks and limited access, or standard racks in a monitored location. In order to assist developers and property owners, Transportation created a guide for building long-term bicycle parking that both meets City code and bicyclists’ needs.

In order to meet long-term parking demand, the Bureau of Transportation developed the ‘Bike Central’ concept in 1996 as a network of

facilities that provide bicycle commuters with permanent clothes storage, showers and secure bicycle parking. Users pay a fee to access the facilities. In 2007, two Bike Central locations still operate: one in downtown and one in the Lloyd District. While Bike Central is an innovative public-partnership designed to meet long-term end-of-trip facilities needs, it only meets a small amount of the demand for long-term parking spaces and only serves bicyclists with destinations near the facilities.

Portland has added thousands of bicycle parking spaces since the adoption of the *Bicycle Master Plan* in 1996. City staff has developed new tools and worked with stakeholders, community members, and businesses to ensure bicycle parking standards that works for Portlanders. Nevertheless, the City faces several issues in building the next wave of bicycle parking:

- Lack of system or policy to anticipate or calculate bicycle parking demand
- Inadequate policy to meet demand for on-street bike parking facilities
- Lack of data on existing long-term parking and facilities and bicyclists’ needs
- A building code that allows an apartment or dormitory to serve as long-term parking
- Effectively addressing bicycle security and

theft

- Growing demand for bicycles on transit and for parking at transit stations
- Lack of policy or rules providing guidance for parking at special events

Chapter 11: Bicycle and transit integration

Part of the City’s goal to make the bicycle an integral part of daily life involves improving bicycle/transit integration. Linking together policies encouraging both bicycle and transit use can effectively reduce Portlanders’ dependence on their automobiles.

TriMet is the Portland metro region’s main transit provider and the agency’s general policy on bicycles is to “permit the transport and operation of a bicycle upon the District Transit System.” TriMet’s Administrative Rules establish the specific standards for bringing bicycles on buses and rail vehicles and for using TriMet lockers and racks.

TriMet’s *Transit Investment Plan (TIP)*, a five-year plan outlining the agencies strategies and programs to meet regional goals, contains the follow statement:

“TriMet will continue to promote bike access to transit by expanding the distribution of bike racks and lockers as new investments in high capacity transit are made. TriMet will



work with local jurisdictions to improve bike access and awareness of bicycle facilities in the metropolitan area. High capacity transit corridors will preserve, enhance, or establish bike routes.”

Since 1995, every bus operated by TriMet has been equipped with a bicycle rack. In the past, bicyclists were required to obtain a special permit to use the racks; however, in 2002, TriMet eliminated that requirement. In addition to TriMet, C-Tran, which serves Clark County, Washington, and several other transit providers in the Willamette Valley include bicycle racks on their buses.

Since 1991, bicycles have been permitted aboard TriMet’s light rail system, MAX. In 1996, TriMet eliminated time of day restrictions; however, bicycles may still be excluded today if there is lack of room in designated bike areas. Most of TriMet’s light rail vehicles are equipped with four hooks for hanging bicycles per railcar. Some of TriMet’s older vehicles require bicyclists to stand at the end of the car and no hooks are provided. Similar to light rail, bicycles are allowed on Portland Streetcar and the Portland Aerial Tram but without specific infrastructure.

The rising popularity of bringing bicycles aboard transit vehicles has increased TriMet’s interest in enhancing bicycle parking at transit

stations to encourage bicyclists to park-and-ride to their destination. Many MAX stations and all transit centers within Portland offer a combination of long-term bike lockers/lids and short-term bike racks. TriMet’s website lists the locations of long-term rental lockers and their availability. In 2008, TriMet convened a working group to reevaluate and potentially redesign bicycle parking at transit stations.

The creation of complementary bikeway and transit networks contribute to the development of an interconnected multi-modal transportation system. Both TriMet and the City of Portland *Comprehensive Plan* emphasize integrating the bicycle and transit trip. The City’s existing bikeway network was developed with consideration towards providing access to transit stations. Still, with less than half of the network complete, notable gaps remain in the bicycle routes feeding transit. Safe, direct bicycle routes to transit can efficiently expand the convenience, capacity, and feasibility of both modes.

Chapter 12: Bicycle-related industry

The City’s investment and commitment to bicycling and bicycling infrastructure has helped attract a growing, vibrant bicycle-related industry. In 2006, Alta Planning + Design completed a report documenting the impact of bicycling on Portland’s economy.

Alta found that total annual bicycle-related economic activity is close to \$63 million. The study divided economic activity related to bicycling into four general categories: retail and repair; distribution and manufacturing; tours, rides, races and events; and, professional services. Bicycle-related businesses account for an estimated 600 to 800 jobs, with seasonal variation. Portland’s bicycle-friendly reputation attracts planners and designers worldwide to tour Portland’s infrastructure. More than 80 percent of businesses surveyed emphatically state that Portland’s reputation for being a bicycle friendly city is good for their business.

Following Alta’s report, the Portland City Council passed a resolution to designate and support Bicycle-Related industry as an official “target industry.” The resolution states that it is “in the City’s best interest to foster the development of this fast-growing market niche, as it is a strategic economic investment that would contribute to both the City’s economy and its transportation goals.”

The Portland Development Commission in concert with the Bureau of Transportation has since initiated a collaborative effort with the business community to make Portland the most desirable place in the country for bicycle businesses. The initial set of priorities included:

- Organizing a large-scale bicycle race





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- Providing assistance (technical/financial) to local bicycle-related companies
- Forming a statewide business association



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DENVER GARTIA





Appendix F: Past, present and future funding

Introduction

The City of Portland, Metro and the State of Oregon are national leaders in planning for and funding bicycle infrastructure and encouraging residents and tourists to use it. From the 1971 Bicycle Bill, which dedicates one percent of state highway funds to bicycle and pedestrian improvements, to Portland's bike parking fund, which allows developers to pay to offset part of their short-term parking requirements, the Portland region has consistently identified and developed innovative funding mechanisms to fund bicycling.

Despite this, allocating funds and resources to develop the bicycle network, facilities and programs needed to meet the goals of Portland's 1996 *Bicycle Master Plan* benchmarks has proven challenging. Given the tremendous returns in bicycling infrastructure and programs from the modest investment that has been made, the City of Portland may have underinvested in bicycling infrastructure and programs. To meet the many aims of the *Portland Bicycle Plan for 2030*, the Portland region must continue to identify and allocate new revenues to develop and maintain the bicycle system and further promote its use to make Portland a world-class bicycling city.

Since 1996, the Portland Bureau of Transportation has developed its bicycle network by partnering with other agencies

and leveraging funds into greater development and investment. Portland's Missing Links program, for example, spent a mere \$50,000 per year from 2001 to 2006 to develop over 41 miles of bikeways just by collaborating with the Bureau of Transportation's Operations and Maintenance group to stripe bike lanes and make other basic improvements while routine pavement maintenance was being performed.

The Portland Bureau of Transportation also collaborates with other Portland agencies, TriMet, Metro and the Oregon Department of Transportation (ODOT) to fund bicycle projects. For example, it teamed with the Portland Bureau of Environmental Services (BES) on new bicycle infrastructure on several City of Portland funded Green Street projects. The Portland Bureau of Transportation also assisted TriMet in providing improved bicycle access through the Rose Quarter Transit Center, eliminating a major bicycling barrier at minimal cost to the City of Portland. By coordinating overlapping project needs with other agencies and bureaus, the Portland Bureau of Transportation is able to make efficient use of public resources to ensure the provision of appropriate bicycle facilities.

Existing sources of bicycle funding

The Portland Bureau of Transportation has utilized the following sources to fund Portland's bicycle network and programs since adoption

of the 1996 *Bicycle Master Plan*.

City of Portland General Transportation Revenue

General Transportation Revenue (GTR) is funded primarily through the Oregon and Multnomah County gas taxes and vehicle registration fees (allocated to Portland), and partially from Portland parking meter revenues. Most GTR is used to fund the ongoing operation and maintenance of the entire transportation system. Out of the GTR that is allocated to capital projects, some provides a match for federal and state grants, while other amounts fund modest improvements such as the Missing Links program. Many capital improvement projects include bicycle and pedestrian accommodations, even if they are not specifically bicycle or pedestrian projects.

Only a portion of the City of Portland's capital expenditures for transportation are funded with GTR, which (except for parking revenue) cannot legally be used to finance major off-street bicycle facilities, such as paths and trails.

In the past, the Portland Bureau of Transportation submitted numerous projects for GTR funding. Portland's 1996 *Bicycle Master Plan* set a priority list for funding projects, provided a proposed schedule and described how projects would result in a complete bicycle network that met



established benchmarks. However, as incoming transportation revenues declined, projects were instead funded based on opportunity, not according to the hierarchy adopted in the Portland 1996 *Bicycle Master Plan*.

City of Portland General Fund

The City of Portland's largest source of funding is the General Fund, which generates revenues primarily from taxing property owners and businesses. While the Bureau of Transportation does not typically receive General Fund support, in years where General Fund revenue exceeds projections, the excess (one-time General Fund) is allocated by Portland City Council to fund specific one-time projects.

The planning process for the *Portland Bicycle Plan for 2030* was partially funded with one-time General Fund money. These funds have also been used to finance small capital projects aimed at increasing safety of bicyclists and pedestrians, and to finance off-street bicycle facilities, such as paths and trails, that cannot legally be funded with gas tax revenue.

Metropolitan Transportation Improvement Program / Regional Flexible Funds

Metropolitan Transportation Improvement Program (MTIP) is a document prepared every two years that identifies how all federal transportation money is scheduled to be spent in the Portland metropolitan region during a

four year cycle. The MTIP comprises projects and programs administered by Metro, ODOT, TriMet, and SMART through such federal sources as Transportation Enhancements, Congressional earmarks, Bridge funds and Transit New Starts/Small Starts. The two programs of funds within the MTIP that are administered by Metro are known as 'Regional Flexible Funds.'

Regional flexible funds (RFF) come from two different federal grant programs: the Surface Transportation Program and the Congestion Mitigation/Air Quality Improvement Program. Metro manages the RFF program whereby the Metro Council and the Joint Policy Advisory Committee on Transportation (JPACT) select which transportation programs and projects to fund. Regional Flexible funds, though they comprise only about four percent of the transportation investment in our region, attract considerable interest because they may be spent on a greater variety of transportation projects than can most federal transportation funds.

The allocation process identifies which projects in the *RTP* will receive funding. Regional flexible funds are allocated every two years through a competitive process. Portland typically submits project and program applications to Metro. Several bicycle projects and programs in Portland have been approved to receive Regional Flexible funds, such as The

50s Bikeway, an on-street bicycle improvement corridor in Northeast and Southeast Portland, as well as the 20s Bikeway, the Morrison Bridge multi-use trail and the TravelSmart program.

Transportation Enhancement (TE) Program grants

Administered by the Oregon Department of Transportation (ODOT), Transportation Enhancement (TE) grants are significant sources of funding that occur through regular cycles. They come from federal revenues and distributed through a competitive process. New bike lanes, sidewalks, and green street features on 92nd Avenue in East Portland were funded through a TE grant.

Other federal funding

The City of Portland has benefited from other federal funding opportunities such as the Environmental Protection Agency's Mobile Source Emissions grants. For example, the Portland Bureau of Transportation used an EPA grant to help fund a substantial portion of its inaugural Sunday Parkways events. Similarly, several miles of bikeways that connect people to jobs were funded with Federal Jobs Access and Reverse Commute funds.

Oregon Pedestrian and Bicycle Grant Program

Administered by the Oregon Department of Transportation (ODOT), the Pedestrian





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and Bicycle Grant Program is a competitive grant program that provides approximately \$5 million dollars every two years to Oregon cities, counties and ODOT's regional and district offices for design and construction of pedestrian and bicycle facilities. Proposed facilities must be within public rights-of-way. Grants are awarded by the Oregon Bicycle and Pedestrian Advisory Committee. The Portland Bureau of Transportation applied and received a Bike and Walk Grant to construct a HAWK (High-intensity Activated crossWalk) signal on the SE 42nd Avenue bikeway at E Burnside.

One-time grants

One-time grants are significant sources of funding that occur at only special times. As part of the I-5 Delta Park to Lombard lane expansion project, ODOT provided \$1 million in grants for community enhancement projects in the project influence area. The Portland Bureau of Transportation applied for and received funding to stripe bike lanes on N Rosa Parks Way. It also received a clean air grant from the federal Environmental Protection Agency to conduct its Sunday Parkways events (also funded by Metro), allowing thousands of Portlanders to experience biking and walking on car-free streets.

Transportation System Development Charges

Transportation System Development Charges (TSDC's) are one-time fees assessed by the City

of Portland on new or modified development. TSDC's cover part of the cost of transportation facilities needed to serve new development and the residents who occupy or use the new development. With extensive public input, then Portland Bureau of Transportation identifies a list of growth-oriented, multi-modal transportation improvement projects that will guide the spending of TSDC revenues over a 10-year period.

TSDC's helped fund the bicycle and pedestrian path on the Steel Bridge, connecting the Vera Katz Eastbank Esplanade to Tom McCall Waterfront Park. From 1997 to 2007, the City of Portland was able to fund about 70 percent of the projects on its list. The 2008 to 2018 list includes several bicycle infrastructure projects, as well as multi-modal projects that contain bicycle improvements.

Tax Increment Financing funds

Administered by the Portland Development Commission (PDC), urban renewal funds are used to finance new public investments in Urban Renewal Areas (URAs), including transportation projects for bicycling, in identified areas of urban blight. Public investments in these URAs are funded using 'tax increment financing' (TIF), allowing the PDC to borrow money against future property taxes on new growth in the URA. The funds typically must be used within the same URA

boundary where they are generated.

Within the Interstate Corridor URA, PDC and the Portland Bureau of Transportation is developing bicycle and pedestrian improvements on N Denver Avenue.

Local Improvement District funds

A Local Improvement District (LID) is created when district property owners share in the cost of transportation infrastructure, or other public improvements like water or sewer lines. LID funds can be used for transportation projects only when a majority of property owners agree.

With project funding from an LID, the Portland Bureau of Transportation assisted Lloyd District property owners redevelop the NE Broadway/Weidler streetscape, which included widening sidewalks and adding new bike lanes.

Business Energy Tax Credit

Oregon's Business Energy Tax Credit (BETC) program, or 'Betsy', allows individuals, businesses, and other entities to take an Oregon tax credit for energy efficiency investments, like transportation. The BETC program, as it applies to bicycling, allows only bicycle equipment purchases (like racks for bicycle parking) to receive tax credit.

The Portland Bureau of Transportation has



used the BETC for establishing its SmartTrips marketing program, which promotes utilization of alternative transportation in targeted Portland neighborhoods, as well as Safe Routes to Schools.

The Portland Bureau of Transportation's Neighborhood Traffic Calming Program

From the late 1980s to 1999, the Portland Bureau of Transportation's Neighborhood Traffic Calming Program constructed traffic calming devices on Portland's streets to improve neighborhood livability. Traffic calming involved devices that slow automobile speeds and, in some cases, diversion of through traffic. Traffic calming and diversion helped reduce daily automobile trips on SE Lincoln Street from approximately 5,000 to about 2,000, resulting in the street becoming one of Portland's most successful bicycle boulevards.

The Neighborhood Traffic Calming Program inspired other bicycle-related collaborations. For example, the Bureau of Transportation partners with the Bureau of Environmental Service's Green Street program to create new roadway infrastructure to help manage stormwater and calm traffic, while providing pedestrian and bicycle improvements.

Private sector

Much of the private sector's contribution to public bicycle improvements results from

incentives in the Portland Zoning Code, or from other funding mechanisms like LIDs. For example, Portland requires that easily accessible short-term bicycle parking be provided with new development. Developers who cannot meet this standard because of site constraints have the option to pay into a city-operated bicycle parking fund. This revenue is used to fund short-term parking within the right-of-way, allowing the Portland Bureau of Transportation to ensure provision of adequate parking facilities.

Also, an innovative incentive created through the implementation of Portland's 1996 *Bicycle Master Plan* encourages private developers to fund end-of-trip bicycle facilities. The incentives allow developers who built these facilities to claim a 40:1 floor area ratio (FAR) bonus and build 40 additional square feet (beyond what code otherwise allows) for each square foot they dedicate to bicycle commuter facilities like bike parking, showers and locker rooms. The ODS Tower at 601 SW 2nd Avenue in Downtown Portland was one of the first projects to take advantage of this incentive.

Direct funding is often willingly provided from private sources, and includes partnerships and sponsorships for various Portland bicycling programs. For example, the SmartTrips program partners with private sector companies to leverage resources to promote bicycling.

The future of bicycle funding

The Portland Bureau of Transportation's future bicycle transportation funding needs will best be met by a combination of new funding mechanisms and innovative, cost-effective partnerships. Portland is increasingly well positioned to receive future bicycle-oriented funding from competitive processes because numerous Portland bicycle projects are planned and awaiting funding, and investments in bicycle infrastructure have proven successful at increasing bicycle mode share in Portland.

Government opportunities can act as a catalyst for the kind of partnerships that may be the key to Portland's future bicycle funding. The sections below discuss possible government opportunities at the federal, state, regional and local levels.

Federal opportunities

Federal elected officials continually express an interest in funding walking, bicycling and transit. Several federal opportunities have arisen or are in the works that have the potential to fund significant bicycle projects, including:

- American Reinvestment and Recovery Act
- Energy Efficiency and Conservation Block Grant program
- Surface transportation authorization bill
- Federal cap-and-trade program for reduced carbon dioxide emissions





Appendix F: Past, present and future funding

American Recovery and Reinvestment Act

In 2009, the Bureau of Transportation is using \$2.8 million in funds from the American Recovery and Reinvestment Act to install 15 miles of bicycle boulevards and resurface the Springwater Corridor trail.

Energy Efficiency and Conservation Block Program

The Energy Efficiency and Conservation Block Grant program, created in 2007, is funded in 2009 by the American Recovery and Reinvestment Act. Nationally, a total of \$3.2 billion has been funded, including more than \$2.7 million in formula grants and nearly \$455 million in competitive grants. Under the formula grants, the City of Portland is eligible for up to \$5,626,100 that can be used for “development and implementation of transportation programs to conserve energy.”¹

Surface transportation authorization bill

When the Federal government undertakes the reauthorization of the surface transportation bill, it will likely present several opportunities for future funding:

- The City of Portland is seeking \$25 million in federal funds for a citywide bicycle boulevard program
- The City of Portland has been working with

¹ <http://www.eecbg.energy.gov>

the Rails to Trails Conservancy (RTC) to position Portland as one of 40 U.S. cities to receive \$50 million under RTC’s request for \$2 billion for Active Transportation for America

- Metro is seeking \$75 million in reauthorization money to fund active transportation demonstration projects that, if funded, would likely include projects the City of Portland has identified

In July 2009, Representative James Oberstar, chairman of the Committee on Transportation and Infrastructure, testified at a hearing on surface transportation financing before the Committee on Ways and Means Subcommittee on Select Revenue Measures that his committee has “developed a surface transportation authorization bill that will transform Federal surface transportation from an amalgamation of prescriptive programs to a performance-based framework for intermodal transportation investment.”² Oberstar noted that significant funding must be identified for the new bill.

Federal cap-and-trade legislation

In June 2009, the House of Representatives passed H.R. 2454, American Clean Energy And Security Act of 2009. It is not yet clear whether constructing bicycle infrastructure would be an eligible activity under the bill as written, and

² <http://transportation.house.gov>

the bill is sure to change further as it moves through the Senate. The Portland Bureau of Transportation will continue to monitor this as a potential future funding source.

The Portland Bureau of Transportation will continue to identify those unique opportunities where investments in the bicycle network also provide benefits to air quality, the economy or other factors.

State of Oregon opportunities

There are several opportunities at the state level.

Oregon Jobs and Transportation Act of 2009

Oregon’s Jobs and Transportation Act of 2009 contained several changes for developing and funding transportation projects. The bill included several important goals that significantly impact the funding climate for bicycle projects and programs in Oregon. The bill:

- Requires Metro to develop land use and transportation scenarios that significantly reduce greenhouse gas emissions
- Directs the Oregon Department of Transportation to develop a least cost planning model for decision making
- Creates an Urban Trail Fund, to be appropriated to develop and maintain



multi-use trails within urban areas

- Creates a fund of \$24 million for multi-modal projects
- Sets aside \$3 million (one percent) for bicycle and pedestrian projects

In addition, the passage of this bill will mean an increase in General Transportation Revenues apportioned to the City of Portland, beginning in 2011.

Future update of the State of Oregon's Bicycle and Pedestrian Plan

The State of Oregon in 2006 completed an update of the 25-year transportation plan, called the *Oregon Transportation Plan (OTP)*. The State's bicycle and pedestrian plan was adopted in 1995 and could be updated in the foreseeable future to reflect the changing nature of bicycling in Oregon. A key policy change to aid bicycle funding would tie funding for bicycle projects and programs to mode share goals. For example, if Oregon's policy goals included reaching a 10 percent bicycle mode share in Oregon's six metropolitan areas by 2015, State funding for bicycle infrastructure would then be appropriately adjusted to meet that goal.

Possible future change to the Oregon Bicycle Bill

The call in the Jobs and Transportation Act

of 2009 to create dedicated funding for non-highway projects could potentially lead to an increase in a future legislative session to the minimum-funding threshold associated with the Oregon Bicycle Bill, from one percent to 1.5 percent or higher. In addition to requiring that bikeways and walkways be provided as part of all road projects, the Oregon Bicycle Bill requires the Oregon Department of Transportation, cities and counties to spend reasonable amounts of their share of the state highway fund on facilities for pedestrians and bicyclists, with a minimum expenditure of one percent.

Western Climate Initiative carbon credits

The State of Oregon participates in the Western Climate Initiative (WCI), which is a cooperative agreement between eight western states and British Columbia that aims to cap carbon emissions and issue carbon credits, which could provide funds for bicycle projects. The cap will take effect in 2015, if the federal government does not create a nationwide cap-and-trade that would supersede the WCI system.

While additional detail is needed on how the WCI's cap-and-trade program will function for bicycling, Portland could benefit from this funding once a carbon measurement for bicycling is identified. Portland can prepare for this potential funding by building carbon-

reducing bicycle infrastructure that will eventually allow for trading the credits for funding. Rigorous accounting that evaluates the impacts of specific projects will be likely be needed, but the Portland Bureau of Transportation already has extensive experience collecting data and evaluating project and program impacts, so Portland may be well poised to utilize potential WCI funding.

City of Portland and Metro opportunities

While state and federal funding mechanisms offer many upcoming opportunities, local and regional funding options could provide the greatest flexibility and the best chance for sustained support.

Affordable Transportation Fund

One new funding source for bicycle projects is certain: In the 2009-2010 budget, Portland Mayor Sam Adams created the Affordable Transportation Fund, which will make \$500,000 available annually to support investments in innovative bicycling improvements and make key connections in the bikeway network.

Future funding directions

The potential funding suggestions that follow were advanced in initial brainstorming sessions with key strategists about funding for bicycle infrastructure. They are offered here as concepts only. Each would require refinement and





Appendix F: Past, present and future funding

discussion with affected stakeholders to be developed into funding proposals.

The concepts include:

- Creating an account funded through the General Fund to finance bicycle and pedestrian trails
- Asking voters to pass a green transportation general obligation bond initiative, either citywide or at the regional level
- Implementing street maintenance fees, or stormwater treatment fees
- Levying a citywide sales tax on the purchase of new bicycles, or other bike-specific tax
- Licensing bicyclists or registering bicycles
- Creating a non-profit organization, similar to the Portland Parks Foundation
- Changing policy to allow advertising in the right-of-way that could generate funds for bicycle infrastructure
- Identifying funding to implement the *Climate Action Plan*

General Fund trail funding

Since trails outside of the right-of-way are not eligible for General Transportation Revenue spending, and since the City of Portland has a general interest in completing Portland's trail system, the Portland Bureau of Transportation

should examine whether there is community support for dedicating some small part of the General Fund annually to the construction of bicycle and pedestrian trails.

Green transportation bond measure

Portland residents have repeatedly shown strong support for funding sustainable or green spaces initiatives. For example in 2006, Metro's \$227 million Parks and Natural Area bond passed in Clackamas County with 52 percent of the vote, Washington County with 55 percent of the vote, and Multnomah County with 65 percent of the vote. The margin was even higher in the City of Portland, with two out of every three voters backing the measure.

Portland resident's strong support of the Metro bond suggests that voters are receptive to local funding measures that enhance regional sustainability. With eight percent of Portland residents reporting bicycling as their primary commute mode and another ten percent reporting bicycling as their secondary commute mode there could be strong local support for expanding sustainable transportation choices with a citywide or regional general obligation bond measure.

Street maintenance fee or stormwater fee

Increased funding could come from a new fee, such as the proposed street maintenance fee that served as the linchpin of the Safe, Sound,

and Green Streets initiative discussed in 2008 and 2009. A stormwater management fee for pollution from automobiles on Portland residents' sewer bills is another possibility. In either case, Portland could offer residents the opportunity to voluntarily increase the fee, with excess dollars allocated to bicycling or other sustainable transportation programs. Such voluntary programs have been successful for Portland General Electric's Green Source renewable energy option, and for the check-box donations on the Oregon state tax form. A bill with street maintenance or other fee could include a similar check-box option for sustainable transportation.

Taxing bicycle sales

This is one of several suggestions that have at their heart the notion that bicyclists should pay for some part of the bicycling system. Although Oregon has no statewide sales tax, municipalities may levy sales taxes. A direct tax on bicycle-specific products could generate revenue and create a clear connection to the tax's beneficiaries to demonstrate that bicyclists help pay for transportation infrastructure. An argument against such a tax, or any other charge on bicyclists, is that it may discourage bicycling by making it too expensive. A tax on bicycles or bicycling products could also adversely affect Portland's bicycle industry.

A bicycle tax has precedents, both in Portland



and elsewhere. In 1899, Multnomah County passed legislation that included a bicycle tax to fund bicycle paths. More recently, Colorado Springs, Colorado funded their bicycle master plan with over \$100,000 collected from a \$4 citywide tax on all purchases of new bicycles.

Licensing bicyclists or registering bicycles

Licensing bicyclists or registering bicycles is a way to involve bicyclists directly in paying for the bicycling system. Licensing bicyclists could also serve as a means to ensure bicyclists are aware of traffic laws and their responsibilities. Similar to bicycle registration, licensing of bicyclists is likely to be costly to administer in comparison to the revenue generated, and both mechanisms have the potential to discourage bicycling. In the 2009 Oregon legislative session, HB 3008 would have levied a biennial \$54 registration fee on adult bicycles, a proposal that was received unfavorably by Oregon's bicycling community and never made it out of committee.

Non-profit model

The non-profit organization model offers a potential source of sustained revenue for bicycling. The Portland Parks Foundation, established to create a parks expansion fund and provide financial aid to low-income youth, supplements Portland Parks & Recreation by raising private funds and performing tasks that a Portland bureau is not designed to perform. A

similar foundation could perform such work for bicycling, and run high-profile events, such as Sunday Parkways, as a way to increase exposure and funding.

Advertising in the right-of-way

The City of Portland typically does not allow advertising in the right-of-way, although TriMet has long been permitted to advertise on benches and shelters in the right-of-way, as well as on trains and buses that occupy it. Strategically expanding the cases where advertising is allowed in the right-of-way has the potential to generate revenue for bicycle infrastructure. For example, bicycle sharing systems in Paris and Washington, DC, are operated by private advertising companies that actually pay to place the system (and advertise on it).

Some local interests have proposed bike station vending machines where a bicyclist with a flat tire could buy a new inner tube, replace it and use a compressed air pump to inflate the new tube. In the future there may be enough demand for such installations that the Portland Bureau of Transportation would consider permitting them in the right-of-way, for a fee. It is likely that such installations could include advertising.

Climate action

The City of Portland/Multnomah County *Climate Action Plan* could be a powerful

catalyst for new sources of funding for carbon-free transportation options like bicycling.







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G-2 Glossary terms



TODD BORKOWITZ





Appendix G: Glossary

Advisory bike lane

See *Bicycle facilities*.

Arterial street

Any street that is not a Local Service Traffic Street according to the traffic classification maps in the Transportation Element of the *Comprehensive Plan*. Arterials include Regional Trafficways, Major City Traffic Streets, District Collectors, Neighborhood Collectors and Traffic Access Streets.

Attractor

A use that, by its nature, draws large numbers of people to it for special events or regular activities. Regional attractors include places such as sports arenas and convention centers.

Benchmark

A specific target or goal to be achieved in a specific timeframe. Benchmarks are used to determine the attainment of performance indicators and performance measures (defined below).

Bicycle boulevard

See *Bicycle facilities*.

Bicycle District

A proposed classification to be added to the *Transportation System Plan*. Refer to Proposed Policy 6.7 (Appendix B).

Bicycle facilities

The following bicycle facility types are discussed in this plan:

Advisory bike lanes: Non-compulsory dashed bike lane striping on both sides of the street that leave a central motor vehicle travel lane wide enough for a single motor vehicle - giving bicycles priority while allowing motor vehicles to enter the bike lane to pass each other.

Bicycle boulevards: Streets with low traffic volumes where the through movement of bicycles is given priority over motor vehicle travel (Source: Portland's 1996 *Bicycle Master Plan*).

Bike lanes: That portion of the roadway designated by an eight-inch stripe and bicycle symbol that is protected by Oregon law for exclusive bicycle travel.

Buffered bike lanes: Bike lanes that have a marked buffer between the bicycle travel area and any adjacent travel lanes or parking lanes for motorized vehicles.

Cycle tracks: Exclusive bicycle facilities adjacent to the roadway but separated from motor vehicle traffic by a physical barrier or other buffer; typically also separated from walkways.

Enhanced shared roadways: Streets shared with motorized traffic where bicycles are not given priority but bikeway signage and markings are used to increase driver awareness of bicycles on the roadway and traffic calming devices and/or intersection crossing treatments enhance bicycle travel.

Separated in-roadway bikeways: A facility design which separates the bicycle travel lane from motor vehicle travel lanes with striping or a physical barrier. They are most appropriate on streets with higher motor vehicle traffic speed or volume. Bike lanes and cycle tracks are examples of separated in-roadway bicycle facilities.

Shared roadway bikeway: A facility design for streets with low traffic volume and speed where bicycles and motor vehicles share travel lanes. Bicycle boulevards, advisory bike lanes and enhanced shared roadways are examples of shared roadway bikeways.

Trails: Bikeways that are off-street and fully separated from motorized vehicular traffic; often shared with other non-motorized users. Includes shared facilities on bridges.

Bicycle Transportation Alliance (BTA)

A non-profit organization that promotes bicycling and advocates for improved bicycling facilities.



Bike lane

See *Bicycle facilities*.

Bike station

A public or private facility that provides a variety of bicycle services, such as bicycle parking, showers and changing rooms, bicycle repair, and sales of bicycles and equipment.

Bikeway

Used generally to describe a bicycle route, but also can refer to a *Transportation System Plan* classification (such as *City Bikeway* and *Major City Bikeway*).

Bikeway design treatments

See *Appendix D* for detailed descriptions of ‘bike box’, ‘bike corral’, ‘bike sharing’, ‘bike oasis’ and ‘signed connection’.

Car-limited zone

An area where use of private automobiles is limited through some kind of agreement or traffic calming treatment.

Central City

The area consisting of Downtown, the River District, the Lloyd District, the Central Eastside Industrial District and the South Waterfront District. It has the highest density development in the Metro region, with the most diverse mix of land uses and the greatest concentration of commerce, offices and cultural amenities.

City Bikeway

An existing classification in the *Transportation System Plan* for which a new definition is proposed. Refer to Proposed Policy 6.7 (Appendix B).

Climate Action Plan (CAP)

Forty-year plan, developed by the City of Portland and Multnomah County, that identifies individual and institutional actions intended to reduce the impact of Portland businesses and residents on global climate.

Complete street

A planning concept where streets are designed for the comfort and safety of all users, including bicyclists, pedestrians and motorists.

Cycle track

See *Bicycle facilities*.

East Portland

The geographic area of Portland generally east of NE/SE 92nd Avenue that comprises the *Far Northeast* and *Far Southeast* transportation districts shown on the classification and project maps.

EcoDistrict

An integrated and resilient district or neighborhood that is resource efficient; captures, manages, and reuses a majority of energy, water, and waste on-site; is home to

a range of transportation options; provides a rich diversity of habitat and open space; and enhances community engagement and wellbeing. (Source: *Portland Oregon Sustainability Institute*)

Fine-grained network

A dense and connected system that provides many route options.

Green street

A street that:

- Handles stormwater on site through use of vegetated facilities
- Creates attractive streetscapes that enhance neighborhood livability by helping to calm traffic by introducing park-like elements into neighborhoods
- Serves as an urban greenway segment that connects neighborhoods, parks, recreation facilities, schools and main streets

Home Zone

A Home Zone is a clearly marked residential area where the road or roads are used for a wide range of activities besides simply driving. All road users share the space and respect its many uses and the streets are places for people, not just traffic. Vehicles travel slowly, people safely use the whole of the street to gather and play in and travel through. As well as traffic calming measures, the street may also have seating,





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planting schemes and play equipment. (Source: *Campaign for Better Transport, U.K.*)

'Interested but concerned'

Portland residents who might be interested in riding a bicycle but are concerned that the bicycle transportation network does not provide enough comfort and safety.

Local Improvement District (LID)

A finance method for public improvements that allows a group of property owners to share costs and benefits.

Local Service Bikeway

An existing classification in the *Transportation System Plan*. Refer to Proposed Policy 6.7 (Appendix B).

Low-stress bikeways

Routes where bicyclists can expect to feel safer and more comfortable because the stress of negotiating with motorists for space in the roadway has been reduced or eliminated by design. (*Adapted from a concept by Peter Furth.*)

Main Street

A *2040 Growth Concept* design type that usually features mixed-use retail storefront development. Main streets feature street designs that emphasize pedestrian, public transportation, and bicycle travel (Source: *RTP*).

Major City Bikeway

A proposed classification to be added to the *Transportation System Plan*. Refer to Proposed Policy 6.7 (Appendix B) for definition.

Metro

The regional government and designated metropolitan planning organization (MPO) for the Portland region. It is governed by a seven-member elected Metro Council and is responsible for regional transportation planning activities, such as the preparation of the *Regional Transportation Plan* and the planning of regional transportation projects.

Mixed-use areas

Compact areas of development that include a variety of uses, such as commercial and residential uses.

Mobility

The ability to move people and goods to and from places. Mobility improves when the transportation network is refined or expanded to improve capacity of one or more modes, allowing people and goods to move more efficiently toward a destination.

Mode split

The proportion of all trips that are made by each of the possible modes of travel (walking, bicycling, transit, or driving).

Motor vehicle level-of-service (LOS)

A qualitative measure that describes operational conditions within a traffic stream. A level-of-service definition generally describes these conditions in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort, convenience and safety.

Multi-mode trip

A trip in which the traveler uses more than one travel mode, such as riding a bicycle to a light rail station, then taking the train.

Multimodal

Having a variety of modes available for any given trip, such as being able to choose between walking, riding a bicycle, taking transit or driving to a certain destination. In a transportation system, it means providing for many modes within a single transportation corridor.

Off-road bicycling on natural surface trails

Refers to the activity or sport often called 'mountain biking.'

Oregon Department of Transportation (ODOT)

State agency that, under the guidance of the Oregon Transportation Commission, oversees and maintains Oregon's highway system.



Peak-hour

Either of the two weekday rush-hour time periods: typically 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m.

Pedestrian hybrid beacons

A special type of hybrid beacon used to warn and control traffic at an unsignalized location to assist pedestrians (or bicyclists) in crossing a street or highway at a marked crosswalk, included in the 2009 Manual on Uniform Traffic Control Devices adopted by the Federal Highway Administration on December 16, 2009. The beacons facing traffic are dark until activated by a pedestrian or bicyclist.

Performance indicator

A specific quantity of a performance measure that, when met, indicates attainment of desired performance of a plan, project or program.

Performance measure

Quantity or percentage statement used to determine the effectiveness, efficiency, quality or timeliness of a plan, project or program.

Port of Portland

Public agency that owns and maintains the five marine terminals, four airports and seven business parks in the three-county area. It is governed by a nine-member commission appointed by the Oregon Governor.

Regional Center

Design type designated in *Metro's 2040 Growth Concept*. After the Central City, regional centers have the region's highest development densities, the most diverse mix of land uses, and the greatest concentration of commerce, offices and cultural amenities. They are very accessible by all modes, and have streets that are oriented to pedestrians. Gateway is the only regional center in Portland (Source: *RTP*).

Regional Transportation Plan (RTP)

The 20-year transportation plan developed by Metro to guide transportation in the region. It is the region's transportation system plan that is required by the State of Oregon's Transportation Planning Rule.

Right-of-way (ROW)

A public or private area that allows for the passage of people or goods. It includes passageways such as freeways, streets, off-street paths and alleys. A public right-of-way is one that is dedicated or deeded to the public for public use and is under the control of a public agency.

Safe Routes to School

A partnership between the City of Portland, schools, neighborhoods, community organizations and agencies that advocates for and implements programs to make walking

and biking around our schools fun, easy, safe and healthy for all students and families in Portland. Also, a planning concept that suggests that transportation infrastructure should allow children to safely walk and bicycle to school, and a program administered by the Federal Highway Administration (FHWA) that funds infrastructure projects and programs that support the concept.

Separated in-roadway bikeway

See *Bicycle facilities*.

Shared roadway bikeway

See *Bicycle facilities*.

Station Community

A *2040 Growth Concept* design type located along light rail corridors and featuring a high-quality pedestrian and bicycle environment. They are designed around the transportation system to best benefit from the public infrastructure. Station Communities include local services and employment, but are primarily residential developments oriented toward the Central City, regional centers and other areas that can be accessed by rail for most services and employment (Source: *RTP*).

Town Center

A *2040 Growth Concept* design type that functions as a local activity area and provides





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close access to a full range of local retail and services within a few miles of most residents. They do not compete with regional centers in scale or economic diversity, but they will offer some specialty attractions of regional interest. Town Centers have excellent multimodal access and connections to regional centers and other major destinations (Source: *RTP*).

Traffic calming

Roadway design strategies to reduce vehicle speeds and volumes, aimed at improving traffic safety and neighborhood livability. Measures include, but are not limited to, traffic-slowing devices. Examples of other traffic calming measures are traffic diverters, curb extensions and medians.

Traffic-slowing devices

Devices that slow emergency response vehicles as well as general traffic. Speed bumps and traffic circles are the only traffic-slowing devices currently utilized in Portland.

Trails

See *Bicycle facilities*.

Transit Center

A location where a number of bus and/or high-capacity transit vehicles stop. They often contain waiting areas, transit information and timed transfer opportunities.

Transit-oriented development

A mix of residential, retail, office and other uses and a supporting network of streets, bikeways and pedestrian paths oriented to a light rail station or transit service. They include high-density residential development near transit stations to support the neighborhood commercial uses and have a lower demand for parking than auto-oriented developments.

Transportation District

For *TSP* purposes, one of the eight Portland Transportation Districts identified: Central City, North, Northeast, Far Northeast, Southeast, Far Southeast, Northwest and Southwest.

Transportation System Plan (TSP)

A plan for one or more transportation facilities that are planned, developed, operated and maintained in a coordinated manner to supply continuity of movement between modes and within and between geographical and jurisdictional areas.

Tri-County Metropolitan Transportation District (TriMet)

The transit agency serving the Tri-County Metropolitan Transportation District, including much of Clackamas, Multnomah, and Washington Counties.

2040 Growth Concept

A concept for the long-term growth management of our region, developed by Metro. It describes the preferred form of regional growth, including where growth should be clustered, what the appropriate densities are for various land use design types and which areas should be protected as open space. The *2040 Growth Concept* was adopted as part of the Regional Urban Growth Goals and Objectives in 1995 (Source: *RTP*).

20-Minute Neighborhood

An urban planning concept where residents live within a short casual walk or bicycle ride to all the essential destinations of daily life, such as grocery stores, schools, libraries, transit and parks.

Vehicle miles traveled (VMT) per capita

The total number of miles driven by all vehicles within a given time period and geographic area, divided by the number of residents of the area.



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BUREAU OF TRANSPORTATION ARCHIVES

Appendix H





Appendix H: Summary of public involvement

Introduction

The development of the *Portland Bicycle Plan for 2030* was conducted in two phases. The public involvement efforts for each phase are described in this appendix.

Phase I public involvement

In Phase I, the planning effort was called the *Platinum Bicycle Master Plan Update*. The objectives for public involvement in Phase I were as follows:

- To engage as many people as possible in a ‘community conversation’ about what was working and not working, about how to attract more people to bicycling and about how far the City of Portland can go toward making bicycling a truly integral part of daily life
- To reach beyond the usual suspects to the less bike-oriented areas of town, honor their differences and craft strategies tuned to their unique needs and opportunities
- To embrace, explain, and gather input on the bicycle boulevard concept and its potential application throughout the City

Key public involvement findings for Phase I:

Through surveys, discussion and facilitated presentations, bicyclists were asked about their travel habits and preferences. Some key findings were as follows:

- Of those surveyed at the public meetings, 88 percent describe themselves as either ‘bold and fearless’ or ‘enthused and confident,’ and only ten percent as ‘interested but concerned’
- Bicyclists do not like fast cars on the roads and consider fast motor vehicles to be a ‘big deterrent’ to riding
- Few cars and the presence of bicycle boulevards are important factors in making bicycling good for the respondents
- 79 percent of those surveyed at the public meetings reported bicycling to work
- Of those who do not bicycle to work, 12 percent use a car, citing safety as the number one reason they don’t ride, with weather as a close second
- A concern for safety was listed as the primary barrier to bicycling

Platinum Steering Committee, 2007

The Platinum Steering Committee was convened in March 2007 to guide the development of the *Platinum Bicycle Master Plan Update*. The committee consisted of stakeholders and representatives of entities with interest in bicycling in Portland. Committee members included representatives from the health community, representatives from two neighborhood coalitions, staff members from bicycle advocacy groups, staff members from

local and state government, business leaders, members from Portland’s Bicycle Advisory Committee and others.

The committee members were asked to help set goals and policies for the City, review public process and outreach, help reach beyond the usual bike-friendly constituency, be forward thinking and gauge the success of public involvement efforts.

The Platinum Steering Committee met three times in 2007: on March 7th, April 11th and May 9th. Meeting notes from these meetings are available in the *Background Materials* section of the *Portland Bicycle Plan* website: <http://portlandonline.com/transportation/BicycleMasterPlan>

Monthly rides

The Portland Bureau of Transportation led monthly *Bicycle Master Plan Rides* on the first Tuesday of every month from February through October 2007. The rides focused on existing bikeways in different parts of town.

There were multiple goals for these rides: to educate Portland residents about bicycle facility design; to create the feeling of a world-class bicycling city through numbers of bicyclists riding and to create a regular forum for discussing what works and doesn’t work for bicycling.



More than 100 riders turned out for the May 2007 ride after then Mayor Potter had proposed in late April to cut the funding for the Platinum *Bicycle Master Plan* Update project in the budget for 2007-2008.

Outreach for Phase I public meetings

Mailers, flyers and internet invitations were used to reach as many citizens in Portland as possible. More than 9,700 individuals and lists were e-mailed notices and reminders about the three public meetings.

A team of interns distributed more than 600 flyers to bike shops, bars, coffee shops and grocery stores. Flyers were also distributed at events such as the Mt. Tabor race series and Breakfast on the Bridges. 10,000 mailers were sent to SmartTrips participants. 13 print news organizations received a news release.

Results from Phase I public meetings

Three public meetings were held in June 2007 to seek public input on the existing conditions portion of the Platinum *Bicycle Master Plan* Update. Meetings were held in outer Southeast Portland on June 5th, downtown on June 12th and at Jefferson High School in North Portland on June 14th.

These public meetings were used to collect valuable data about how Portland bicyclists use the roadway system and what would make

it work better for them. Participants were asked to weigh factors that make bicycling good or bad, identify themselves by rider type, and provide information about their trips to work, retail, and other destinations. They were also asked to provide lists of specific bikeway facilities they liked and disliked. Maps were provided to allow people to draw where they ride. An exercise encouraging people to rate their favorite and least favorite places to ride was also available. Staff members accepted comments on all subjects related to bicycling in Portland.

The results are summarized below. A more complete PDF report on the results can be downloaded from the *Background Materials* section of the Portland Bicycle Plan website, <http://portlandonline.com/transportation/BicycleMasterPlan>.

Profile of those who attended

Of the 176 people who attended the three Phase I public meetings, most were bicyclists. In response to a question about what type of rider they considered themselves, 88 percent of respondents identified themselves either as 'enthused and confident' riders (59 percent) or 'bold and fearless' (29 percent). (By comparison, staff estimated at the time that these two groups made up about seven percent of the general population). Of the remaining respondents, ten percent were 'interested but

concerned,' and two percent did not answer this question. No respondents identified themselves overtly as 'no way/no how.'

The age groups most heavily represented were the 25-34 years and 35-44 years groups. 64 percent of attendees were male and 36 percent female.

What makes bicycling good or bad?

Bicycle boulevards and streets with low volumes of motor vehicle traffic were the most important factors that made bicycling good for the respondents, with off-street paths and bike lanes coming in just behind. Surprisingly, trip distance was not rated a big deterrent to bicycling, nor were narrow bike lanes or big hills. Few respondents reported stop signs as a deterrent.

The most frequently cited factor that makes bicycling unpleasant for respondents was the presence of fast cars. Other factors that scored highly as deterrents were difficult crossings, the presence of high volumes of motorized traffic, and having too much to carry. (Interestingly, an approximately equal number of people reported that having too much to carry was not a deterrent).

Destination map exercise

More than 170 people took part in the destination mapping exercise. The average





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distance traveled per any type of trip was 2.7 miles. The commute trip was the longest trip on average at 4.6 miles, yet that trip had the highest bicycle mode split at 79 percent.

Southeast Portland was well represented in the meetings, with 38 percent of all attendees being from that area. Northeast was also well represented at 24 percent, and North Portland had 16 percent of attendees. East Portland only saw a four percent participation rate. Southwest had 11 percent. Central City had one percent. Northwest seven percent.

Of all reported trips in the destination mapping exercise, 38 percent of trips were less than one mile in length, and another 25 percent of trips were between one and two miles. Of those trips that were less than one mile, 45 percent of the participants used their bicycle, 44 percent walked, ten percent drove, and one percent used transit. As trip distances increase, use of automobiles goes up. Trips between one and three miles have the highest use of bicycles, and trips greater than four miles have the highest use of automobiles.

Travel to work/school

Although 39 percent of the participants work more than four miles from their homes, and another 21 percent work three to four miles from their homes, 79 percent of all respondents commute to work by bike. Only 12 percent

of those surveyed use an automobile to get to work.

Travel to grocery stores

Respondents in the East and Southwest travel the furthest to purchase food, between two and three miles. People living in the Southeast and Northeast travel the shortest distances, between one and two miles. However, 43 percent of those surveyed reported using their bikes to carry groceries, while 39 percent use a car and 16 percent walk to the grocery store. Respondents in North and Northeast have the highest number of people biking to grocery stores, with Southeast a close second.

For people who don't ride to the grocery store, having too much to carry was a bigger barrier to bicycling than safety concerns.

Travel to coffee shops, bars, and bakeries

Citywide, more than half of all respondents live within a mile of a coffee shop, bar or bakery. People living East Portland have farther to go for these kinds of services, with an average of two to three miles.

Northeast has the highest number of bicyclists for this type of trip, and East Portland has the fewest bicycling trips of this nature. However, for people who did not bike, safety and a preference for walking were cited as barriers to bicycling to coffee shops.

Travel to retail shops

Fifty-five percent of those surveyed reported riding bikes to retail shops, while 24 percent reported driving to these establishments. Only 35 percent of respondents reported these destinations are less than one mile from the respondent's home or work. Most districts have between two and three miles to travel for retail.

Travel to parks and leisure

Only 31 percent of attendees reported parks and leisure destinations being less than one mile from their work or home. The average distance to these places was between three and four miles for all areas. However, 61 percent bicycle to parks and only 20 percent drive.

Travel to visit family and friends; running errands

Residents in the Southwest and outer East travel the furthest to visit family and friends, while respondents in Northwest travel between two and three miles. 33 percent of those surveyed drive to visit family and friends and 50 percent ride their bikes.

For errands, 54 percent run errands by bike, while there was a near equal split between walking and driving. People living on the east side of the Willamette reported traveling between three and four miles to run errands, while Southeast, Northwest, and Southwest residents travel between one and two miles.



Outer East residents tend to drive to their errands more than bike, while Northeast has the highest numbers of bicyclists.

In the news and on the internet in 2007

In 2007 the bicycle plan update was covered in the news by Willamette Week, the Portland Tribune, The Oregonian, KGW, the Portland Mercury and Bikeportland.org. Some articles highlighted the goals of the plan. Many articles focused on the funding cut of the Platinum *Bicycle Master Plan* proposed by then Mayor Tom Potter in April 2007 and the bicycling community's strong reaction to the proposal. (After the Mayor's office received more than 350 e-mails and phone calls from outraged bicycling advocates, and with support from then Commissioner of Transportation Sam Adams and other city commissioners, the funding was restored).

Internet forums proved to be a significant source of information and comments. Although at times the comments could veer off topic or become personal, the internet forums – especially Bikeportland.org – generally provide valuable feedback about bicycling in Portland. Discussion topics included unimproved roadways, preferences for low volume, low traffic streets, helmet usage and recreational vs. transportation riding.

Presentations and other outreach in Phase I

Roger Geller gave a presentation about the Platinum *Bicycle Master Plan* update to the Portland Business Alliance Transportation Committee and also gave a brown bag presentation on the Platinum effort.

A workshop was held with members of the Portland Bicycle Advisory Committee (PBAC) and the Portland United Mountain Pedalers (PUMP) to educate PBAC members about mountain bike issues in urban areas. In addition, Mia Birk, Roger Geller, Gregg Everhart (Portland Parks & Recreation) and Tom Miller participated in a PUMP ride and discussion, and Mia met with International Mountain Bicycling Association staff.

Phase II public involvement

Between the Phase I public involvement period and Phase II, significant technical work was completed on the elements of a new plan, particularly the field work and mapping of an expanded network. In April 2008, Portland was awarded Platinum status by the League of American Bicyclists. In Phase II the effort to update the 1996 *Bicycle Master Plan* was called the *Bicycle Master Plan* update project.

The objectives for public involvement in Phase II were to:

- Reach out to the 'interested but concerned' population
- Validate the choices of routes for network expansion and collect information from local experts about possible alternative routes
- Inform the public about the broad range of planned actions that the draft plan encompasses and seek comments on their relative importance
- Collect suggestions for locations for future on-street grouped bicycle parking
- Assess the level of public support for funding bicycle improvements
- Identify people interested in testifying in favor of the plan at public hearings

Bicycle Master Plan Steering Committee, Phase II

During Phase II the Steering Committee for the plan was expanded to include representatives from additional stakeholder groups, including Portland's development and business communities. Representatives were recruited from more neighborhood coalitions. In addition, there was turnover in representation for some stakeholder groups. The complete member list for the Steering Committee appears in the acknowledgment section of the draft *Portland Bicycle Plan for 2030*. The Steering Committee met nine times between November





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2008 and December 2009. Meeting notes from these meetings are available in the *Background Materials* section of the Portland Bicycle Plan website, <http://portlandonline.com/transportation/BicycleMasterPlan>.

Internet review of the network maps

Beginning in March 2009, PDF maps of the proposed network were posted online at the *Bicycle Master Plan* website for review by interested parties. An online comment form was created to solicit comments on specific routes. In July 2009, the maps were updated to include changes made as a result of the comments received from the public open houses and the new maps were made available online.

Phase II public open houses

Six public open houses were held in May 2009. The purpose of the open houses was to inform residents about all the elements of the plan, validate the plan's general direction, and collect specific feedback on the proposed network and improvements.

The open houses were jointly planned to showcase both the *Bicycle Master Plan* update project and the *Portland Streetcar System Plan* project, which had a similar schedule for completion. For the *Bicycle Master Plan* update project, this had the advantage of possibly broadening attendance and attracting

attendees who may not have come to an open house focused solely on the bicycle plan. It also allowed an up-front focus on the integration of bicycling and streetcar transportation, from the big picture down to the question of how to design safe bicycle facilities in the vicinity of streetcar tracks.

Schedule of public open houses in 2009:

- Southeast Portland, Franklin High School Cafeteria, Tuesday, May 5, 2009
- East Portland, David Douglas High School North Cafeteria, Wednesday, May 6, 2009
- North Portland, Roosevelt High School Cafeteria, Monday, May 11, 2009
- Central City and Northwest, Portland Building Room C, Wednesday, May 13, 2009
- Northeast Portland, Grant High School Cafeteria, Thursday, May 14, 2009
- Southwest Portland, Wilson High School Cafeteria, Monday, May 18, 2009

Outreach for public open houses in 2009

A flyer was created advertising the open houses. It was translated into Spanish, Vietnamese and Russian. More than 500 paper flyers were distributed; with packets of 50 flyers delivered to each of the Neighborhood Coalition offices. Flyers were also distributed to some bicycle shops, including the Community Cycling Center. The open houses were posted on the Transportation website and Office of

Neighborhood Involvement calendar. A news release was sent to the Portland Bureau of Transportation media list of nearly 400 news outlets. E-mail notice of the event was sent to distribution lists totaling more than 15,000 recipients, including all the neighborhood land use and transportation committee chairs, SmartTrips and Safe Routes to Schools lists, the Safe, Sound and Green public interest list, and others. Steering Committee members were asked to reach out to their constituents.

Easing barriers to participation

All the open houses were scheduled between 4:00 p.m. and 7:00 p.m. to be accessible both to those who find it easier to participate during regular business hours and to those for whom a time outside regular business hours was preferred. Light refreshments were provided (with a focus on healthy, organic snacks). Certified childcare was available at every open house, with at least one bilingual childcare provider who was fluent in Spanish. Extra bicycle parking was provided at each open house except the one at Franklin High School, which had adequate existing bicycle parking.

For those who were unable to attend an open house or simply wanted more time to study the information presented, a 'virtual open house' was maintained online for three months following the initial open house dates. Attendees of the virtual open house were able



to fill out the survey administered at the open houses or comment on specific routes.

Results from the public open houses in 2009

Attendance at the open houses was relatively strong, with 382 people who signed in. A total of 231 respondents completed a survey at one of the six open houses, or online. Of those who identified their gender, there were 107 male and 87 female respondents. Respondents ranged in age from 16 to 80, with a median age of 43. A plurality (47 percent) self-identified as 'enthused and confident' bicyclists.

Survey questions and responses are shown in the accompanying graphs, broken out by type of rider. There was strong agreement across all types of cyclists on every question. On questions 1, 4, 5 and 7, more than 209 respondents marked 'strongly agree' or 'agree,' meaning that nearly half the participants were supportive of these questions.

Question 2 was the least-supported question. While 139 respondents marked agree or strongly agree, 51 marked disagree or strongly disagree. Respondents were also most likely to mark 'neutral' on this question. Question 3 was the second-lowest, with 175 agree or strongly agree responses, 19 disagree or strongly disagree and 34 neutral.

The six survey respondents who self-identified

as 'not interested' in cycling were the most likely to disagree with the questions. On questions 3, 5 and 6, four out of six of these respondents strongly disagreed, and on question 7, five out of six strongly disagreed.

In addition to taking the overall survey, attendees had the opportunity to fill out comment cards to make specific comments on the bicycle network and also to suggest locations for on-street grouped bicycle parking. More than 800 suggestions were processed.

In the news and on the internet in 2009

The May 2009 open houses were covered extensively in several neighborhood newspapers, including the Southwest Portland Post and the Southwest Neighborhood News. BikePortland.org also posted several stories.

Presentations and other public outreach in Phase II

In addition to meetings of the Steering Committee and Technical Advisory Committee and the public open houses, the following presentations or other outreach activities were logged during Phase II:

2/25/09 - Presentation to the North East Coalition of Neighborhoods (NECN)

2/26/09 - Presentation to the SW Trails group

3/10/09 - Presentation to the Portland Bicycle Advisory Committee

3/24/09 - Tabling at Lents Neighborhood Association

4/2/09 - Presentation to the Portland Freight Advisory Committee

4/6/09 - Presentation to the Central Northeast Neighbors Land Use and Transportation committee (CNN LUTOP)

4/14/09 - Presentation to the Portland Bicycle Advisory Committee

4/20/09 - Presentation to the Southeast Uplift (SEUL)

5/18/09 - Presentation to the Community and School Traffic Safety Partnership Pedestrian and Bicycle Safety Technical Advisory Committee

5/21/09 - Presentation at the Portland Bicycle Brown Bag Series

6/2/09 - Presentation to the Central Eastside Industrial Council (CEIC) Land Use Committee

6/5/09 - Presentation to the Ross Island Early Risers Kiwanis

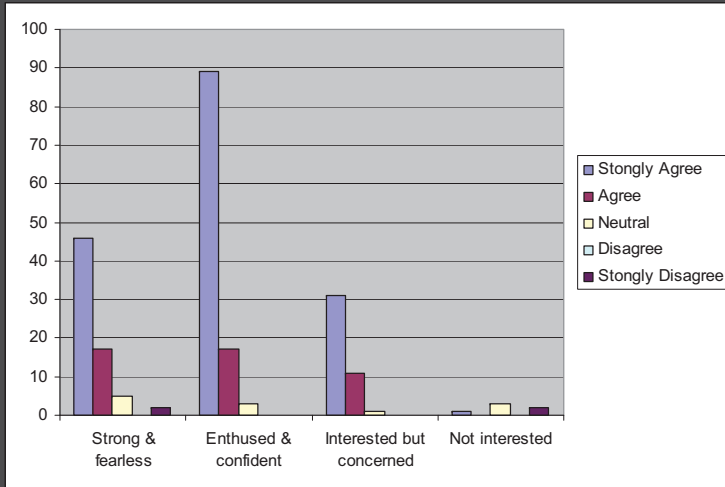
6/14/09 - Lents Neighborhood Bike Ride



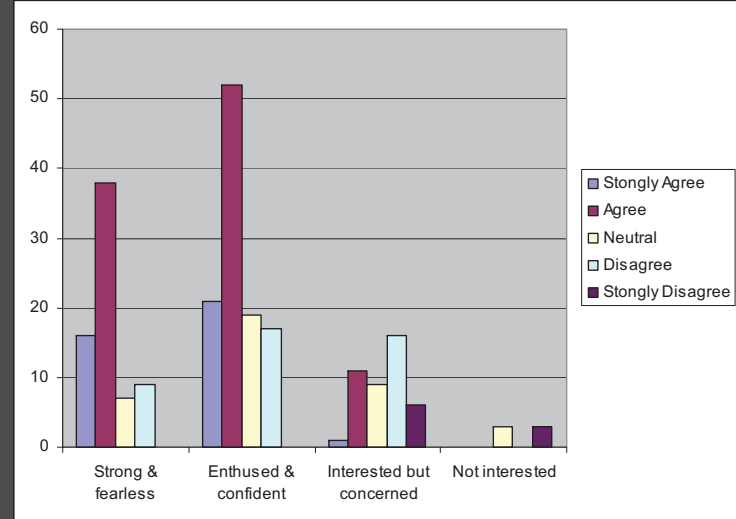


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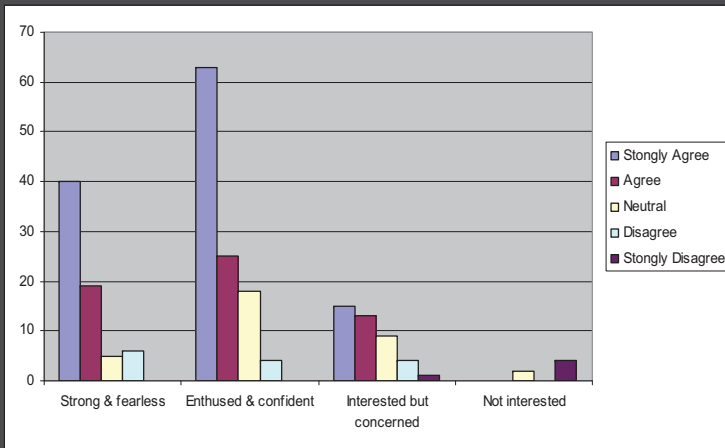
Question 1: *An approach that focuses on providing a low stress, family friendly bikeway network is a good way to attract more people to use bicycles for transportation.*



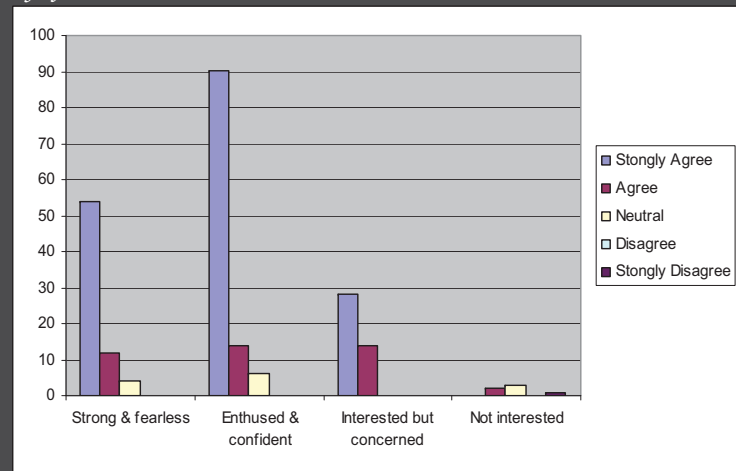
Question 2: *I am comfortable riding my bicycle on the busier streets in Portland that have bike lanes provided, and feel the bike lane design provides sufficient space and comfort.*



Question 3: *It is a priority for me to have bicycle access the entire length of Portland's main streets and through business districts.*

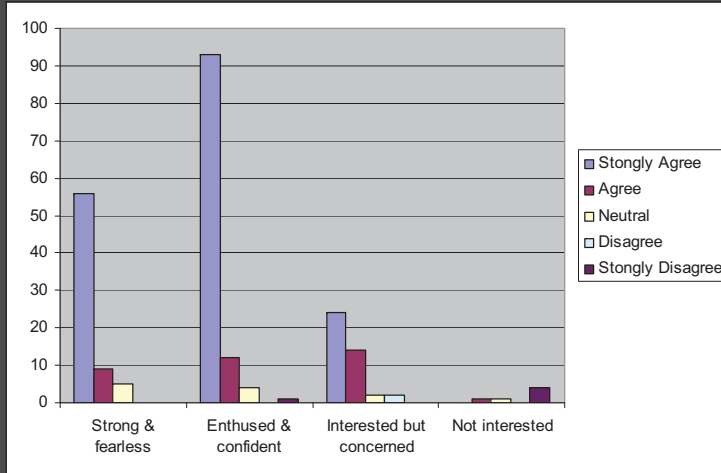


Question 4: *It is appropriate and important for the City to run programs like Safe Routes to School that teach kids bicycle and pedestrian safety in our schools.*

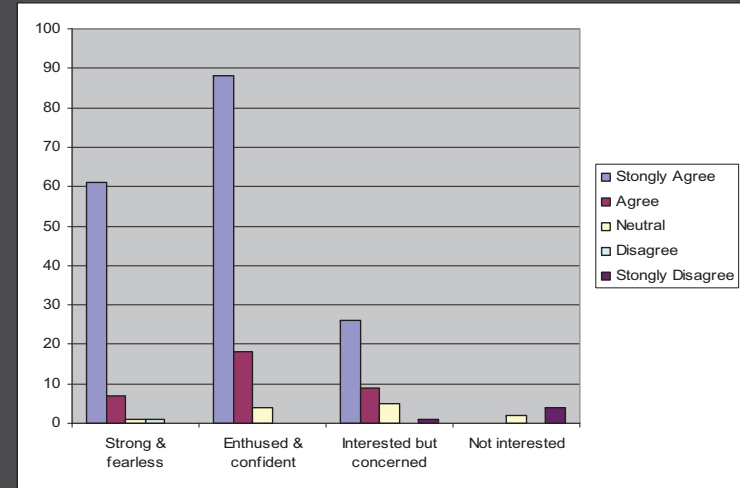




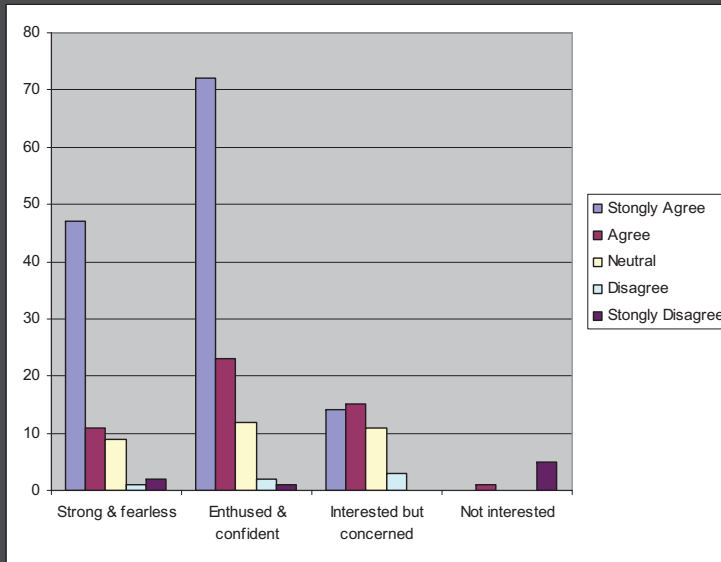
Question 5: *I am willing to be mildly inconvenienced as a motorist to improve conditions for bicycling in Portland.*



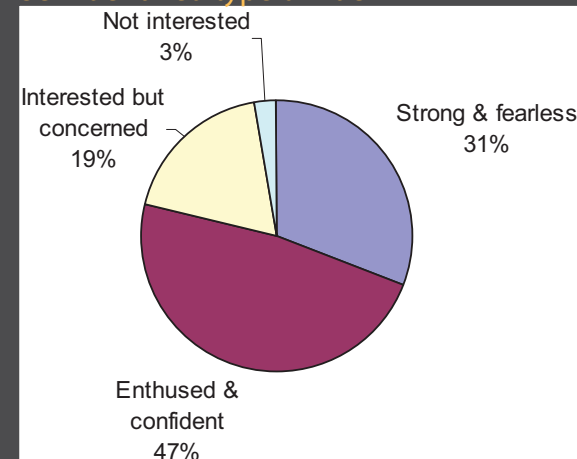
Question 6: *Raising \$10 million per year for the next 15 years to pay for the highest priority bicycle improvements outlined in the Bicycle Master Plan will cost every Portland resident \$1.50 per month: This is a reasonable amount for me to pay for the services provided.*



Question 7: *Sunday Parkways and similar programs that provide a temporary car-free environment for bicyclists and others are important to me.*



Self-identified type of rider





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7/21/09 - Presentation to the Portland Pedestrian Advisory Committee

7/24/09 and 7/25/09 - Tabling at the East Portland Exposition

8/11/09 - Briefing to the Portland Planning Commission

9/4/09 - Central Eastside *Bicycle Plan* Workshop

10/8/09 - East Portland Neighborhood Organization

10/13/09 - Northwest Industrial Assoc. Board of Directors

10/14/09 - Cornell Road Sustainability Coalition

10/15/09 - SWTrails

11/5/09 - Portland Freight Committee

11/18/09 - Brooklyn Neighborhood Association

Public comment period and Planning Commission hearing

A public comment draft of the *Portland Bicycle Plan for 2030* was released on October 5, 2009, with comments due by November 8. There were 202 communications with comments

tallied during the comment period, including 17 paper letters, 23 online forms, and 162 e-mails. Of the 202 people who wrote, 17 were simply opposed to any improvements for bicycling, 59 were supportive of the plan without detailed comments, 25 wrote specifically regarding support for trail projects, and about 75 wrote in support with detailed suggestions for changes. Altogether, there were 216 separate suggestions for changes to maps or projects.

On October 27, 2009, a hearing was held before the Planning Commission. Thirty-three people testified, and an additional seven submitted only written comments. Public testimony was closed and the hearing was continued to November 10, 2009.

There were broad themes to the public testimony and public comments. There was very strong support for elevating the importance of trail projects, which had been slotted into ‘Tier 2’ – particularly the Sullivan’s Gulch Trail and North Willamette Greenway projects. Of the importance of trails to a low-stress network, one commenter said the plan was “all capillaries and no arteries.”

There was criticism that the plan was not bold enough on several fronts. The Bicycle Transportation Alliance wrote, “As it stands, the plan does not live up to Portland’s potential

nor does it provide the investments needed to address our region’s need to make the most of our existing transportation system. And because of a lack of adequate resources, the plan fails to live up to Portland’s efforts to address global warming.”

There was concern that the plan gave only lip service to equity, and did not address the real needs in East Portland. There was concern in Southwest Portland that the proposed first tier projects would not provide enough connectivity.

On November 10, the Planning Commission voted 5-0 to “enthusiastically and warmly support the Portland Bicycle Plan for 2030.” The Commission’s motion included several suggestions for improving the plan and endorsed staff recommendations for addressing the comments and testimony.

A complete report on the public comments and a memorandum summarizing the changes made to the plan as a result are available online at <http://portlandonline.com/transportation/BicycleMasterPlan>, by navigating to the Background Materials page.



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