A large, stylized orange outline of a bicycle is positioned in the upper half of the page, set against a teal background. The bicycle is shown from a side profile, facing right. The text "seattle bicycle master plan" is located in the upper left quadrant, with three yellow dots to its right.

seattle bicycle master plan ●●●

State of the Seattle Bicycling Environment Report October 2012



Pike Place Market

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What is the purpose of this report?

Since its adoption in 2007, the Seattle Bicycle Master Plan (BMP) has served as the blueprint for making improvements to Seattle's bicycle network. When the 2007 BMP was developed, it focused largely on expanding on-street bicycle facilities and completing the urban bicycle trail system. The BMP has been effective at guiding improvements to the City's bicycle system and significant progress has been made since 2007.

The 2007 Bicycle Master Plan included plans for a 5-year update, which presents the opportunity to include fast-evolving best practices and new thinking in bicycle facilities, safety, and design. The 2012 BMP update will also focus on developing a bicycle network and strategies that make bicycling comfortable and accessible for a wider variety of users and trip types. Ultimately, the BMP update will develop a more connected bicycle network for all Seattle residents.

The State of the Seattle Bicycling Environment Report presents current data and information based on what has been implemented since the BMP was adopted in 2007 and the work occurring now. This report provides a snapshot of Seattle's existing bicycling environment and will help set the stage for developing recommendations in the Bicycle Master Plan Update.

The assessment of the current state of cycling in Seattle will inform efforts to:

- Update the current bicycle network map and incorporate facility types that are not in the existing plan, such as neighborhood greenways and cycle tracks, to help encourage people of all ages and abilities to ride a bike
- Develop a more robust process to identify areas of greatest need and priority for bicycle facilities
- Incorporate updates to bicycle design standards that have been developed since 2007
- Identify education, encouragement, enforcement, and evaluation needs to support investments in bicycle infrastructure and network improvements

The baseline information in this report summarizes progress on the 2007 plan and provides context for new opportunities to take bicycle riding to the next level in Seattle.



Framework for

POLICY & PLANNING



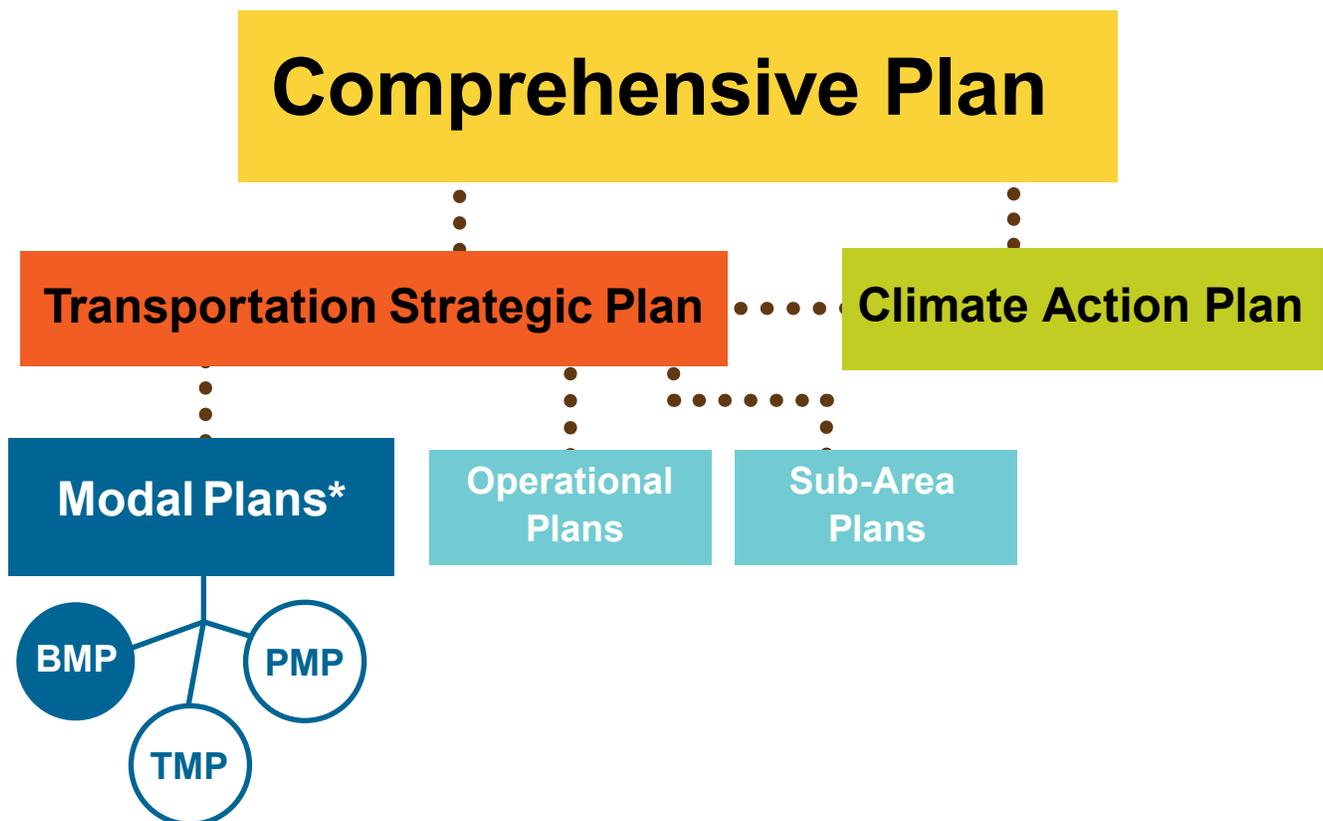
Spokane Street Swing Bridge

The following section outlines the current structure of policies and plans that relate to bicycle projects and programs, including funding sources. The hierarchy of relevant planning documents in Seattle is shown at the bottom of the page.

The City of Seattle's 2005 Comprehensive Plan, *Toward a Sustainable Seattle*, guides high-level land use and transportation policy issues. The Comprehensive Plan is organized around a set of four core values:

- Community
- Environmental Stewardship
- Economic Opportunity and Security
- Social Equity

As required by the Growth Management Act, Seattle's Comprehensive Plan contains a Transportation Element. The Transportation Element is consistent with, and helps implement, the land use vision for the City (articulated in the plan's Land Use Element). Much of the policy direction in the Transportation Element is designed to promote multi-modal transportation options within and between urban centers and villages, which are areas designated for future employment and housing growth.



* Bicycle Master Plan (BMP), Transit Master Plan (TMP), Pedestrian Master Plan (PMP)



Within the Seattle Department of Transportation (SDOT), the overall policy direction in the Transportation Element of the Comprehensive Plan helps frame the more specific goals, policies, and strategies in other documents, including the Transportation Strategic Plan and modal plans such as the Bicycle Master Plan, Pedestrian Master Plan, and Transit Master Plan.

The Bicycle Master Plan, like all of the SDOT modal plans, flows from the guidance of the Transportation Strategic Plan (TSP).

Policy Framework

Comprehensive Plan

There are broad goals and policies in the Transportation Element of the Comprehensive Plan that are specific to bicycling. The main goals are:

- TG15 Increase walking and bicycling to help achieve City transportation, environmental, community and public health goals.
- TG16 Create and enhance safe, accessible, attractive and convenient street and trail networks that are desirable for walking and bicycling.
- T17 Provide, support, and promote programs and strategies aimed at reducing the number of car trips and miles driven (for work and non-work purposes) to increase the efficiency of the transportation system, and reduce greenhouse gas emissions.
- T34 Provide and maintain a direct and comprehensive bicycle network connecting urban centers, urban villages and other key locations. Provide continuous bicycle facilities and work to eliminate system gaps.



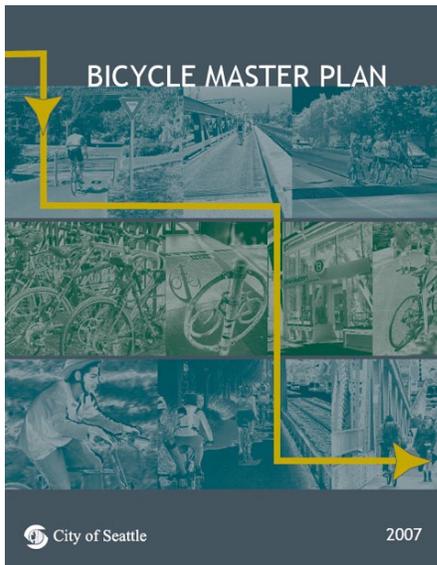
Complete Streets

In addition to the goal and policy framework established in various planning documents, the City Council adopted a Complete Streets policy in 2007. The Complete Streets policy encompasses all modes, including bicycles, and helps frame the City's overall commitment to a variety of travel modes. The Complete Streets policy states in part that:

- SDOT will plan for, design and construct all new City transportation improvement projects to provide appropriate accommodation for pedestrians, bicyclists, transit riders, and persons of all abilities, while promoting the safe operation for all users; and
- SDOT will incorporate Complete Streets principles into the Department's Transportation Strategic Plan; Seattle Transit Plan; Pedestrian and Bicycle Master Plans; Intelligent Transportation System Strategic Plan; and other SDOT plans, manual, rules, regulations and programs as appropriate.



2007 Bicycle Master Plan



The 2007 Bicycle Master Plan (BMP) is framed around two broad goals:

Goal 1: Increase use of bicycling in Seattle for all trip purposes. Triple the amount of bicycling in Seattle between 2007 and 2017.

Goal 2: Improve the safety of bicycling throughout Seattle. Reduce the rate of bicycle crashes by one third between 2007 and 2017.

The 2007 BMP includes four objectives that build on the two goals:

Objective 1: Develop and maintain a safe, connected, and attractive network of bicycle facilities throughout the city.

Objective 2: Provide supporting facilities to make bicycle transportation more convenient.

Objective 3: Identify partners to provide bicycle education, enforcement, and encouragement programs.

Objective 4: Secure funding and implement bicycle improvements.

BMP Policy Update Considerations

The updated BMP policy framework will continue to emphasize increasing bicycle ridership and improving safety as important policy goals, along with strategies to continue to build successful partnerships, programs, and funding sources for bicycle improvements. The updated plan will also include several new policy themes and revised goal statements in order to improve consistency throughout the modal plans and address the needs of all types of cyclists in the city, including the following topics:

Equity:

Social equity is one of the four main themes of the City's Comprehensive Plan and an important theme throughout all city planning efforts. Inclusion in planning processes and equity in service delivery are key principles of the BMP update.

Connecting to and within urban villages, neighborhoods, and major destinations:

Both the City Comprehensive Plan and The Puget Sound Regional Council's *Vision 2040* plan emphasize accommodating new growth through compact development in urban villages and urban centers. The BMP should have more explicit policy direction to prioritize bicycle connections within and between urban villages and neighborhoods, and to connect to key destinations.

New facility types:

One important priority for the BMP update is to incorporate new types of facilities that feel safe and appeal to a broad range of people. These facilities include neighborhood greenways, which are improvements made to residential streets to optimize biking and walking, and on-street bicycle facilities with a greater degree of separation from motorized traffic, such as buffered bike lanes and cycle tracks. The plan will include goals and policies that reflect community interest and support of these facility types and continued innovation.

Livability:

The BMP update will include a new goal emphasizing the role bicycling as an important component of a livable city, which provides healthy, affordable, and non-polluting transportation options.

Mission/Vision statement:

The current Bicycle Master Plan goals are focused on what could be achieved within the 10-year timeframe of the plan. The plan does not include a broader, longer term vision for what should be accomplished to improve bicycling in the city. A long term vision is important for creating support for the transformational network that is needed to make Seattle a world-class city for biking and will be included in the updated plan.

Bicycle Program and Project Funding

While policy and planning documents guide the strategic implementation of the Bicycle Master Plan, funding is a critical component that determines how much SDOT is able to accomplish each year.

The following chart summarizes annual funding levels for bicycle projects and improvements between the adoption of the BMP in 2007 and the end of 2011. The totals include capital projects and annual programs specific to BMP

implementation, as well as trail projects and combined pedestrian/bicycle projects like the Thomas Street overpass and Linden Avenue. The totals do not include larger capital projects that have bicycle elements, but were not part of implementing the 2007 BMP.

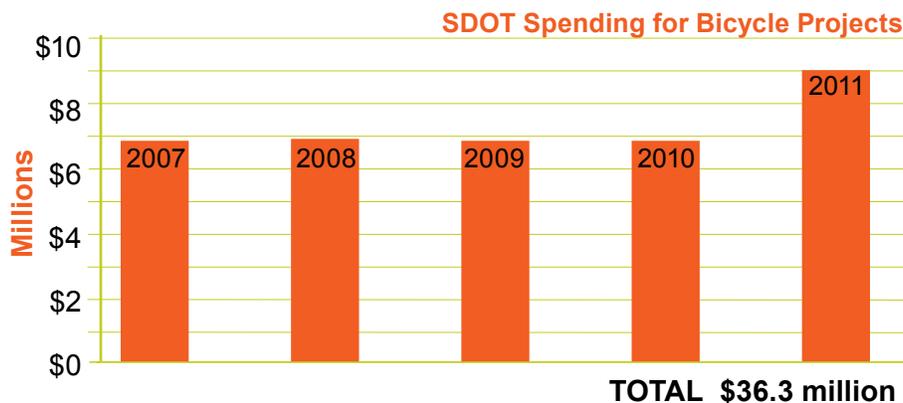
Between 2007 and 2011, SDOT invested \$36 million in bicycle improvements guided by the 2007 Bicycle Master Plan. These improvements were funded by a combination of local funds and state and federal grants.

Local Funds

In 2006, Seattle voters passed a nine-year, \$365 million levy for transportation maintenance and improvements known as Bridging the Gap (BTG). The levy is complemented by a commercial parking tax.

The nine-year goals of Bridging the Gap are to:

- Reduce the infrastructure maintenance backlog
- Pave and repair Seattle streets
- Make seismic upgrades to the city's most vulnerable bridges
- Improve pedestrian and bicycle safety and create safe routes to schools
- Increase transit speed and reliability



The levy funds many programs and projects to achieve these goals. Funding from Bridging the Gap also supports projects that help implement the Bicycle and Pedestrian Master Plans, creates a Safe Routes to School Program, improves transit connections and helps neighborhoods get larger projects built through the Neighborhood Street Fund large project program.

The BTG levy approved by voters stipulates that certain percentages of the levy revenue be spent on different categories of projects, including the stipulation that no less than 18 percent be spent on pedestrian, bicycle and safety projects. The levy expires in 2015.

State and Federal Grants

SDOT has been successful in obtaining grant funding for bicycle projects, including multi-use trails, a pedestrian and bicycle bridge, and Safe Routes to School infrastructure and education projects. SDOT has been more strategic in recent years about ensuring that grants are submitted for the most competitive projects. It is difficult to determine the exact amount of bicycle-specific grant funding that SDOT has received, as bicycle improvements have historically been included as portions of larger Capital Improvement Projects. Still, since 2008 SDOT received a total of \$11 million in grant funding for projects that included bicycle elements. SDOT has the potential to receive an additional \$22 million in 2012.



the Seattle Bicycle Facilities Network

RECENT ACCOMPLISHMENTS



The 2007 BMP was created to achieve two goals:

- 1) **Increase bicycling** in Seattle for all trip purposes
- 2) **Improve safety** of bicyclists throughout Seattle

What has changed for bicycling in 5 years?

This section of the report documents the work that has been done since adoption of the 2007 Bicycle Master Plan (BMP), including how much of the 2007 plan has been implemented and how the Seattle Department of Transportation's progress compares to the performance targets identified in the BMP. This section also describes several pilot projects and innovations that SDOT has developed since the BMP was adopted in 2007.

As mentioned in the previous section, the 2007 plan included four principal objectives. These objectives were supported by specific strategic performance measures that enable the city to monitor progress and evaluate performance over time. The performance measures offer a tool to quantify whether SDOT has achieved the goals and objectives in the plan.

SDOT also has been able to implement several new projects and programs beyond what was originally recommended in the 2007 plan in response to more recent best practices for bicycle facilities and opportunities to leverage other resources. For example, Seattle has now installed several buffered bicycle lanes, green bicycle lanes, and green bicycle boxes. These types of improvements are designed to make bicyclist behavior more predictable and increase safety and comfort for people riding bicycles.



7th and Dearborn



RECENT ACCOMPLISHMENTS

Existing Bicycle Network Implementation Progress:

As of the end of 2011, the City of Seattle has completed 53% of the total network recommended in the 2007 BMP for the 10-year timeframe of the plan. This percentage increases to 68% when bicycle facilities that were installed prior to the 2007 are included in the total amount.

Table 1 summarizes how this progress by facility type. In total, the current network is 307.7 miles, including 72.8 miles of bicycle lanes and climbing lanes, 81.8 miles of shared pavement markings (sharrows), 5.5 miles of neighborhood greenways, 47.2 miles of multi-use trails, 98 miles of signed routes, and 2.4 miles of other on- and off-street bicycle facilities.

The maps on the following pages show the evolution of Seattle's bicycle network over time. Figure 1 shows the bicycle network before the 2007 Bicycle Master Plan. Figure 2 shows the bicycle facilities network completed between 2007 and 2012. Figure 3 shows the existing bicycle facilities network as of 2012.

Table 1: Summary of 2007 BMP Network Completion

FACILITY TYPE	TOTAL MILES RECOMMENDED IN 2007 BMP	EXISTING MILES (Before 2007)	BUILT BETWEEN 2007-2011	PERCENT 2007 NETWORK COMPLETE
Bicycle lanes/Climbing Lanes	143.3	25.5	47.3	51%
Shared Lane Pavement Markings	110.5	0.3	81.5	74%
Neighborhood Greenways (Previously Bicycle Boulevards)*	18.1	0	5.5	30%
Multi-Use Trails	58.2	39.4	7.8	81%
Signed Routes**	75.9	0	98	129%
Other On-Street Bicycle Facilities***	46.1	2.2	0	5%
Other Off-Street Bicycle Facilities****	2.6	0.2	0	8%
TOTAL NETWORK	454.7	67.6	240.1	68%

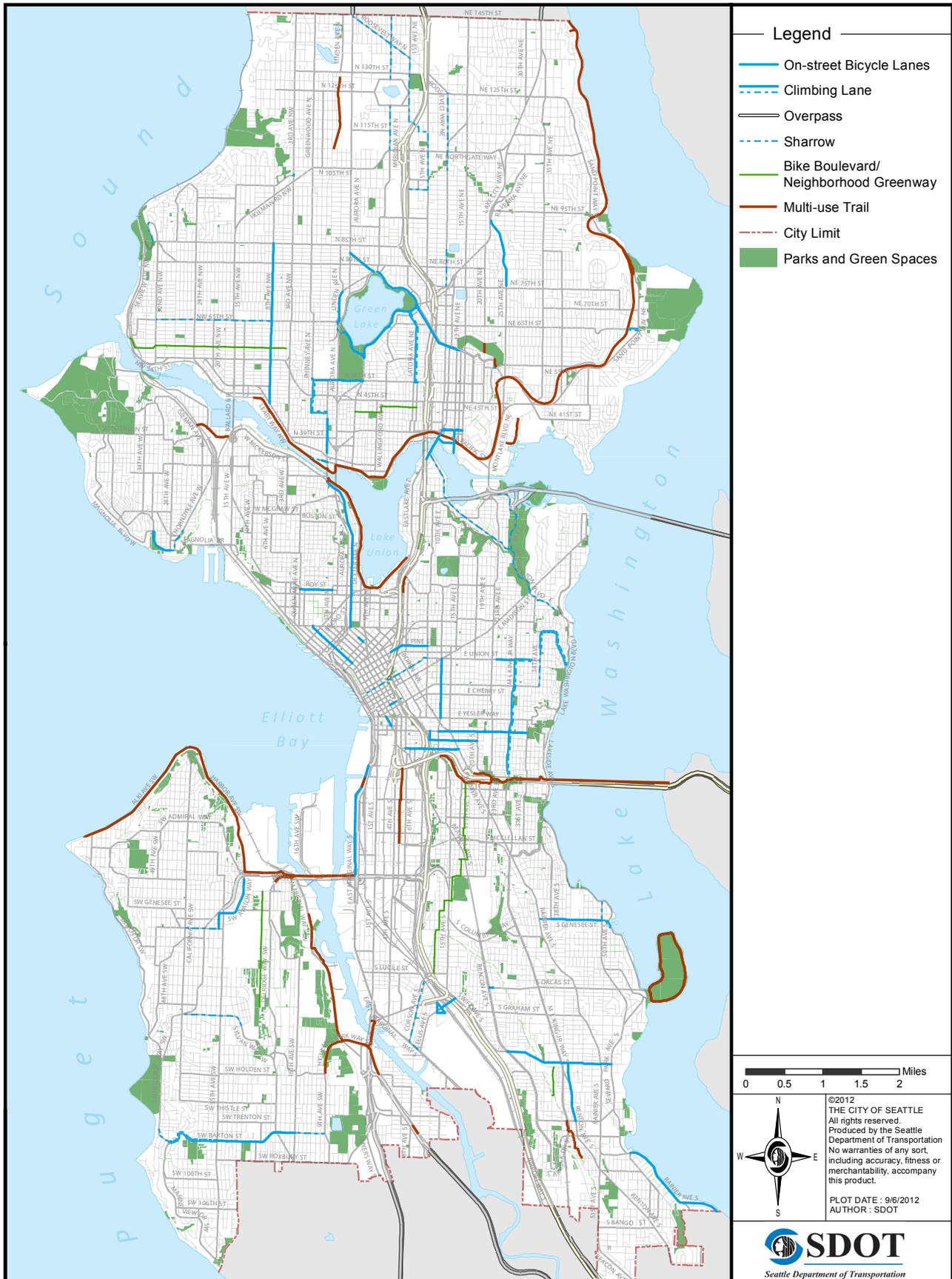
*= Bicycle boulevards were a designated facility in the 2007 BMP. The terminology has changed in 2011 in response to a grassroots community effort to encourage more cycling and walking on residential streets, which was largely modeled off of Portland's evolution from bicycle boulevards to neighborhood greenways. The 18.1 miles of bicycle boulevards in the 2007 BMP recommendations will now be known as neighborhood greenways, with a more robust network of neighborhood greenways to be included in the BMP update process.

** = The 2007 BMP included a 230-mile system of signed bicycle routes, but only 75.9 miles were recommended for the 10-year plan timeframe, 2007-2016.

***= Includes wide outside lanes, edgelines, paved shoulders, and peak hour bus/bicycle only lanes. Also included in this category are those streets identified for "future study"

****= Include sidepaths, one-way bicycle-on-sidewalk pairs, and pedestrian/bike only bridges

Figure 1: Bicycle Facilities Completed Prior to 2007



RECENT ACCOMPLISHMENTS

Figure 2: Bicycle Facilities Completed between 2007-2012

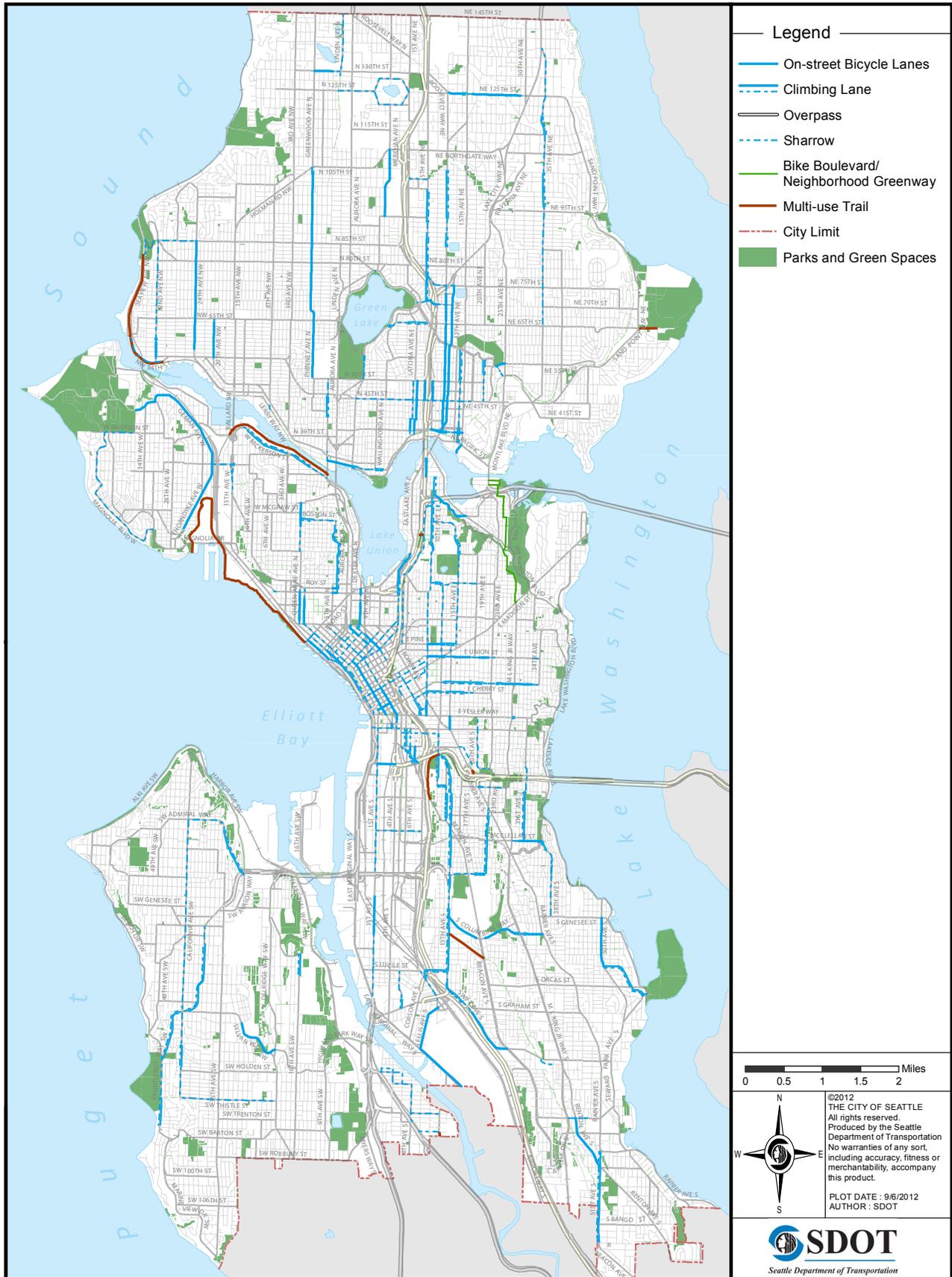
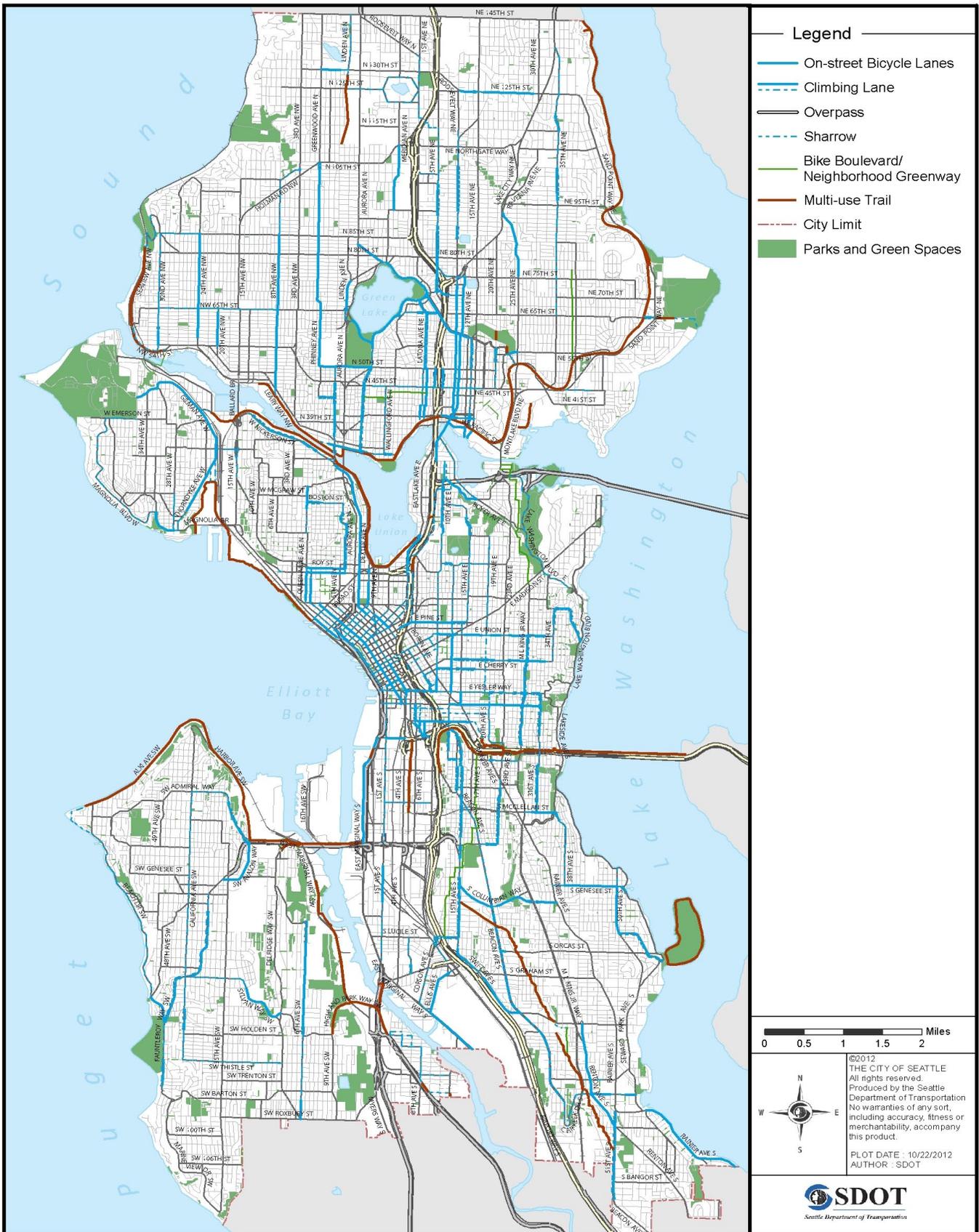


Figure 3: Current Bicycle Facility Network (2012)



RECENT ACCOMPLISHMENTS

Evaluation of 2007 Bicycle Master Plan Performance Measures

Eight performance measures were recommended to gauge the City's progress on meeting goals and objectives in the original Bicycle Master Plan. A full explanation of each performance measure is on the following page, and Table 2 identifies whether SDOT is on track to achieve the 2007 BMP goals and objectives.

Table 2: Bicycle Master Plan Performance Measures (2007 BMP)*

	PERFORMANCE MEASURE	BASELINE MEASUREMENT	PERFORMANCE TARGET	2011 EVALUATION	ON TRACK
GOAL 1	Number of bicyclists observed at counting locations throughout Seattle	2007 counts	Triple number of bicyclists between 2007 & 2017	2007 downtown counts = 2,273 2011 downtown counts = 3,330**	No
GOAL 2	Number of reported bicycle crashes per total number of bicyclists counted and annual traffic volumes	2007 collision rate	Reduce the bicycle crash rate by one third between 2007 & 2017	2007 collision rate = 0.158*** 2011 collision rate = 0.105	Yes
OBJECTIVE 1	Percentage of Bicycle Facility Network Completed	67.6 miles of existing facilities (in 2007)	Implement 450 miles of recommended facilities by 2017 (includes existing)	67.75 with 67.6 miles of existing facilities prior to the adoption of the 2007 BMP (52.8% not including the facilities that were existing prior to 2007)	Yes
OBJECTIVE 2	Number of bicycle racks installed through the SDOT Bicycle Parking Program		Provide 6,000 racks by 2017 (includes existing)	806 bicycle racks installed between 2007 & 2011 + 3,000 existing bicycle racks = 3,806	Yes
OBJECTIVE 3	Number of Seattle Bicycling Guide Maps distributed	23,338 maps distributed in 2005	150,000 bicycle maps to be distributed between 2007 & 2017	Approximately 292,780 maps distributed between 2007 & 2011	Yes
OBJECTIVE 4	Percentage of targeted SDOT staff who participate in training on bicycle issues	Counted in 2007	100% of targeted staff participating in training every year	SDOT has not tracked this metric	Unknown
	Number of bicycle project grant applications applied for and obtained for bicycle programs	Tracked in 2007	At least one grant application for every available funding opportunity	2008 applied for 3 grants & received 2 - 2009 applied for 4 grants & received 3 - 2010 applied for 4 grants & received 4 - 2011 applied for none - 2012 - applied for 7, all pending	Yes, except for 2011
	Number of Bicycle Spot Improvements Completed	Counted in 2007	Depends on needs & priorities set for each year	33 on-street spot improvements	Dependent upon each year's needs

* This table does not include the performance measures recommended for consideration by non-city agencies or organizations.

**SDOT did not count at all 29 locations surrounding Downtown in 2011, only locations that were expected to have 50 or more bicycles were counted due to lack of volunteers. For the 15 of 29 locations not counted in 2011, volumes for 2011 were derived by applying the average growth rate at locations with counts.

*** This number is the number of reported bicycle collisions per cyclist counted in the downtown counts.

Explanation of Performance Measures

Goal 1: Triple the number of bicyclists between 2007 and 2017

Methodology: The number of bicyclists observed at counting locations throughout Seattle is difficult to compare from 2007 to 2011 because the counts in 2011 were only done in 14 of the 29 locations used in 2007, due to lack of volunteers.

Therefore, in order to compare the 2007 downtown baseline counts to 2011, SDOT calculated the percent increase in cyclists from the locations with valid counts in both 2010 and 2011. This same increase - 2.4% - was then applied to the 15 locations with 2010 counts only to derive an estimated 2011 count volume.

In 2011, SDOT began to count cyclists more frequently (quarterly on a weekday between 10 AM – noon and between 5 - 7 PM, as well as Saturdays from noon to 2 PM), so the data collected is better and more detailed, including the ability to count cyclists outside of commute hours. This new method will allow SDOT to gain a better understanding of ridership trends, although unlike the old methodology, it does not capture the gender of riders or helmet usage.

ACTION: Using the methodology described above, SDOT calculated a net increase from 2,273 riders in 2007 to 3,330 during the annual downtown counts. According to these count numbers, SDOT is not on track to meet the goal of tripling the number of cyclists by 2017.

Goal 2: Reduce the collision rate by one third between 2007 and 2017

ACTION: SDOT calculated the change in the collision rate using the number of reported bicycle crashes each year per cyclist counted in the downtown counts. Using the 2011 count estimate of 3,330 total cyclists (explained above), the collision rate was reduced from 0.158 per cyclist in 2007 to 0.105 per cyclist in 2011.

Objective 1: Percentage of bicycle facility network completed

ACTION: SDOT is on-track to complete the full network build out of 454.7 miles of bicycle facilities, as 68% of the network has been completed as of end-of-year 2011. However, many of the facilities installed have been the projects that are easier to implement, such as shared lane markings (sharrows). Public outreach for the BMP update also suggest that some projects implemented since 2007 are not appropriate for riders of all ages and abilities.



RECENT ACCOMPLISHMENTS

Objective 2: Number of Bicycle Racks Installed

ACTION: SDOT installed 798 bicycle racks and eight on-street bicycle corrals between 2007 and 2011. Many of these installations are in response to requests from property owners. Generally, the City is on-track to implement the bicycle rack performance target.

Objective 3: Number of Seattle Bicycle Guide Maps Distributed

ACTION: SDOT has printed the annual city-wide bicycle maps to help encourage people on bikes to find their way to destinations. SDOT nearly doubled the amount of bicycle maps that were printed and distributed between 2007 and 2011. In 2012, a web-based city-wide bicycle map was created as a supplement to the paper maps.

Objective 4: Percentage of Targeted SDOT Staff who Participate in Training on Bicycle Issues

ACTION: SDOT encourages staff to attend available webinars to learn about bicycling projects and innovations from other cities and professionals. However, participation has only been tracked for some staff, therefore the increase in the percentage of staff participating in training since 2007 is unknown.

Objective 4: Number of Bicycle Project Grant Applications Applied For and Awarded.

ACTION: SDOT has been successful in applying for and receiving funding to install bicycle facilities. The only year that SDOT did not apply for any bicycle improvement grants was in 2011.

Objective 4: Number of Bicycle Spot Improvements

ACTION: Since 2007, SDOT has completed 33 on-street spot improvement projects. As the performance target specifies, the right number of spot improvements depends on needs and priorities set each year.

**TRIPLE THE
NUMBER OF
BICYCLISTS**



**FEWER
COLLISIONS**



**NETWORK
COMPLETION**



**MORE BIKE
RACKS**



**INCREASE STAFF
TRAINING**



**INCREASE
GRANT FUNDING**



**MORE SPOT
IMPROVEMENTS**



Additional Bicycle Facility Accomplishments

Other bicycle improvements that SDOT has made to the bicycling environment between 2007 and 2011 include the following accomplishments, though not all were recommendations in the original BMP:

- Built five new signals specifically for bicycles
- Improved trail crossings at six locations
- Improved pavement at 40 locations along the Burke-Gilman Trail, 16 locations along the Duwamish Trail, and 8 locations along the Ship Canal Trail
- Completed innovative pilot projects including: buffered bike lanes, green bike boxes and lanes, contraflow bike lanes and staircase runnels.

Innovation and Pilot Projects

In the course of implementing the 2007 BMP, SDOT planners and engineers have moved beyond the 2007 recommendations and found ways to create safer bicycle facilities and design projects according to updated standards. By applying the latest best practices and finding opportunities to leverage other SDOT roadway projects, conditions have improved for all users.

The following pages describe examples of innovative bicycle treatments and pilot projects that were not part of the 2007 BMP recommendations, yet have helped Seattle become a more bicycle-friendly city. None of the operational and design standards for the below facility types have been formally adopted by the City of Seattle, although the update of the Bicycle Master Plan provides an opportunity to incorporate these types of facilities into the updated network map and plan document. Full descriptions of each facility type can be found on pages 46-50.



RECENT ACCOMPLISHMENTS



Contraflow Bicycle Lanes:

Contraflow bicycle lanes, such as the one shown above on N 34th Street, provide access for cyclists headed in the opposite direction of motor vehicles on a one-way street where there is no parking. The contraflow bicycle lane is usually separated by delineators and marked with signage.

Contra-flow bicycle lanes have also been installed on 6th Avenue S between S Dearborn Street and Seattle Boulevard S and on NE 40th underneath the University Bridge.



Buffered Bicycle Lanes:

Buffered bicycle lanes provide a painted buffer between people on bicycles and other vehicles. As part of the Dexter Ave N repaving project in 2011, SDOT implemented a Complete Streets approach, which improves conditions for all users of the street – including pedestrians, bicyclists, transit, and those who live on the street. Six-foot bicycle lanes were installed in each direction between the travel lane and parking lane, with a two- to three- foot painted buffer zone (striped cross-hatched area) between the bicycle lane and travel lane. The project also reduced conflicts between buses and bicycles by installing the bicycle lane between the curb and transit islands at 10 out of 12 bus stops in the project area.

Buffered bicycle lanes have also been installed on N 130th Street, E Marginal Way S, Admiral Way SW, and 7th Ave. SDOT has received positive feedback about the comfort and quality of the facilities.





Green Bicycle Lanes and Bicycle Boxes:

Green bicycle lanes highlight areas where bicycles and motorized vehicles cross paths. Green bicycle boxes are an intersection safety design to reduce bicycle and motorist collisions. The box creates space between motor vehicles and the crosswalk, allowing bicyclists to position themselves in front of motor vehicle traffic at a signalized intersections. The main goal of colored pavement applications is to improve safety by increasing awareness and visibility of cyclists and to encourage people riding bikes to make more predictable approaches to and through the intersection.

SDOT has installed green bicycle lanes at 35 locations and green bicycle boxes at six locations. The photo above was taken at N 34th St and Fremont Ave N.



Staircase Runnels:

Because of extreme grade changes and hilly terrain, Seattle has numerous staircases that provide pedestrian access to destinations. SDOT has begun to study the use of staircase runnels to help people on bikes traverse the topography. Runnels are a narrow ledge along the side of a staircase which allow a bicyclist to push their bicycle up or down the stairs. These small staircase design additions have a great impact on making bicycling in the city even more convenient and accessible.

In 2011, SDOT installed a pilot wooden runnel on a stairway connecting the Alki Trail and the West Seattle Bridge Trail. Due to the positive feedback that SDOT received on the wooden runnel, SDOT included a permanent runnel as part of the staircase replacement at SW Spokane St between SW 60th and SW 61st streets.



RECENT ACCOMPLISHMENTS



Cycle Tracks:

The Linden Avenue North Complete Street Project created an opportunity for SDOT to improve roadway conditions and safety for all users of the street. A two-way, one side of the street cycle track will be built to separate bicycle traffic from motorists and pedestrians, using a raised curb or striping and parallel parking as a buffer. This project completes the missing link in the Interurban Trail.

A cycle track will also be implemented along Broadway in conjunction with the First Hill Streetcar project and along portions of Fifth Avenue North and Mercer as part of the Mercer West project.

BMP Evaluation Update Considerations

The update of the Bicycle Master Plan provides an opportunity to emphasize design standards and implementation of facilities that meet the needs of bikers of all ages and abilities. The projects listed in the previous section provide a sense of the progressive direction that SDOT has been moving towards incorporation of new designs and best practices for bicycle projects. It will be important for the update of the BMP to closely

align the policy framework with performance measures to ensure that Seattle continues to become a world-class bicycling city for people of all ages and abilities. The BMP update should consider the following issues in order to continue moving forward with implementation of the Bicycle Master Plan:

Evaluate Old and New Performance Measures for Effectiveness

SDOT should reevaluate the performance measures used in the 2007 plan and determine if they will be useful moving forward with the next phase of implementation of the bike plan and consider whether existing and new measures will best allow the city to track its progress towards reaching the plan's vision. Performance measures should relate to the updated policy framework in the plan.

Expand Innovative Facilities

Pilot projects have been successful in meeting the needs of bicyclists in conflict areas. SDOT should formalize use of new types of facilities and continue to explore innovative treatments that improve comfort and safety for all users of the roadway.

Evaluate Existing Facilities

While SDOT is meeting the commitments of facility implementation based on the 2007 performance metrics, the BMP update should evaluate whether new information about facilities should require updates to existing facilities. In addition, the desire to implement facilities that serve all ages and abilities will likely entail defining what an all ages and abilities network actually means and who the riders are, adding new links to the bicycle network and changing some of the facility type recommendations from the 2007 BMP.



the Seattle Bicycle Facilities Network

BICYCLE SYSTEM GAPS



Gaps in the bicycle network exist in various forms, ranging from short “missing links” on a street or trail, to large geographic areas with very few or no bicycle facilities.

This section of the report provides a summary of a gap analysis that SDOT conducted to assess progress made in implementing the 2007 BMP. The purpose of the gap analysis is to identify existing network gaps – defined as a project that was recommended in the 2007 BMP, but has not yet been implemented. Additional opportunities for system evolution were identified according to GIS analysis, an equity analysis, and a set of streets defined in the 2007 BMP as “streets commonly used by bicyclists”. Both gaps and opportunities identified through this analysis will help to inform the development of an update to the recommended bicycle network.

Gap Analysis Methodology

By the end of 2011, 68% of the network recommendations from the 2007 plan had been completed. Of the unimplemented projects 23% were bike lanes, 9% were sharrows, 4% were multi-use trails, 4% were greenways (formerly referred to as bicycle boulevards), 46% were signed routes, 14% were other on-street facilities, and 1% were other off-street facilities (see note on page 10 for definitions). Gaps in the bicycle network exist in various forms, ranging from a short “missing link” on a specific street or trail, to large geographic areas with very few or no bicycle facilities. These gaps are classified into three categories: crossing gaps, network gaps and corridor gaps. Each of these types are described more thoroughly below.

- **Crossing gaps** are bicycle-related intersection improvements recommended in the 2007 BMP, but have not been implemented.
- **Network gaps** are “missing links” in the network recommended in the 2007 BMP that are less than ¼ mile in length and were recommended as either bike lanes, climbing lanes, sharrows, bicycle boulevards or multi-use trails, but have not yet been implemented.
- **Corridor gaps** are larger voids in the network (greater than ¼ mile in length). These gaps are most often corridors needed to connect neighborhoods to destinations, giving bicycle riders a variety of travel route options.

The gap analysis also identified opportunities to expand the bicycle network beyond what was recommended in the 2007 plan. These ‘opportunities for system evolution’ highlight areas to expand, improve, or upgrade the network recommended in the 2007 BMP. The gap analysis includes these network-based opportunities, but also notes opportunities based on the desire to create a more equitable and inclusive network for bicycling in Seattle.



SYSTEM GAPS

Existing System Gaps

Figure 4 shows recommended projects from the 2007 BMP that have not been implemented. These gaps are classified into three categories: crossing gaps, network gaps and corridor gaps.

Crossing gaps:

Of the 113 intersection improvements proposed in the 2007 BMP, 13 crossing improvements have been constructed (7 signal upgrades, 4 median islands and 2 curb extensions). The remaining 100 recommendations that have not been funded require varied facilities, including further study in some cases.

Additionally, 42 intersections have been improved with treatments (i.e., bike boxes or green bike lanes) that were not recommendations from the 2007 plan.

Network gaps:

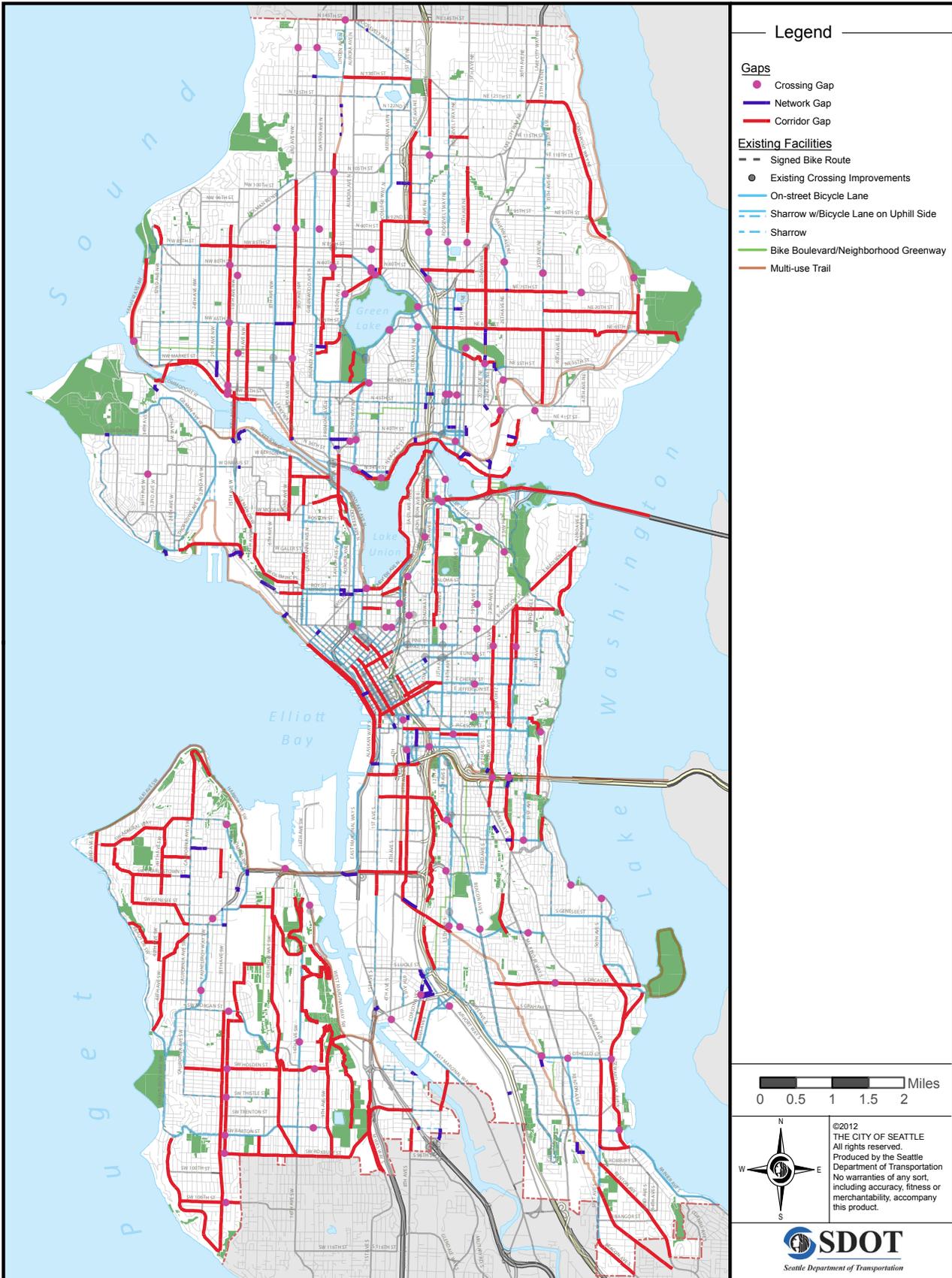
Of the 9 miles of network gaps in the existing system, 2 miles were proposed bicycle lanes or climbing lanes, 3 miles were proposed sharrows, 2.5 miles were proposed multi-use trails and 1 mile was a proposed bicycle boulevard. The average size of a network gap was one tenth of a mile. Network gaps often connect two existing bicycle facilities (i.e., Dexter Ave N to 9th Ave N on Roy St).

Corridor gaps:

Of the 116 miles of corridor gaps, 55 miles were recommended bicycle lanes or climbing lanes, with an average length of more than 1 mile. Over 33 miles of these corridor gaps were recommended as sharrows, with an average length of .75 miles. Approximately 27 miles of the corridor gaps were recommended multi-use trails, with an average length of 1 mile. Bicycle boulevards made up approximately 1 mile. Corridor gaps are often connections that are difficult locations due to any variety of natural or man-made barriers (i.e., Queen Anne hill).



Figure 4: Bicycle System Gaps



SYSTEM GAPS

Opportunities for System Evolution

In addition to projects recommended in the 2007 plan, this analysis takes into consideration those locations that were identified in the BMP as streets that were “commonly used by bicyclists,” such as shared roadways, paved shoulders and wide outside lanes. These streets are included in the analysis since they are potential locations for enhancements to serve riders of all ages and abilities.

Also included in this analysis are those streets and areas that were not included in the 2007 BMP, but would provide system connectivity to parts of the city that have little or no connection currently. Improving connectivity throughout the bicycle system is a priority in the BMP update. The gap analysis classified these locations into four categories, described below.

Crossing opportunities are specific intersections within the existing bicycle system that lack dedicated bicycle crossing markings (cross-bike) or other treatments to accommodate safe, predictable and comfortable bicycle travel. They are primarily intersections where vehicle/bicycle interaction poses a challenge for riders. Examples include bike lanes on a major street

“dropping” to make way for right-turn lanes at the intersection, or a lack of intersection crossing treatments for a route or trail as it approaches a major street.

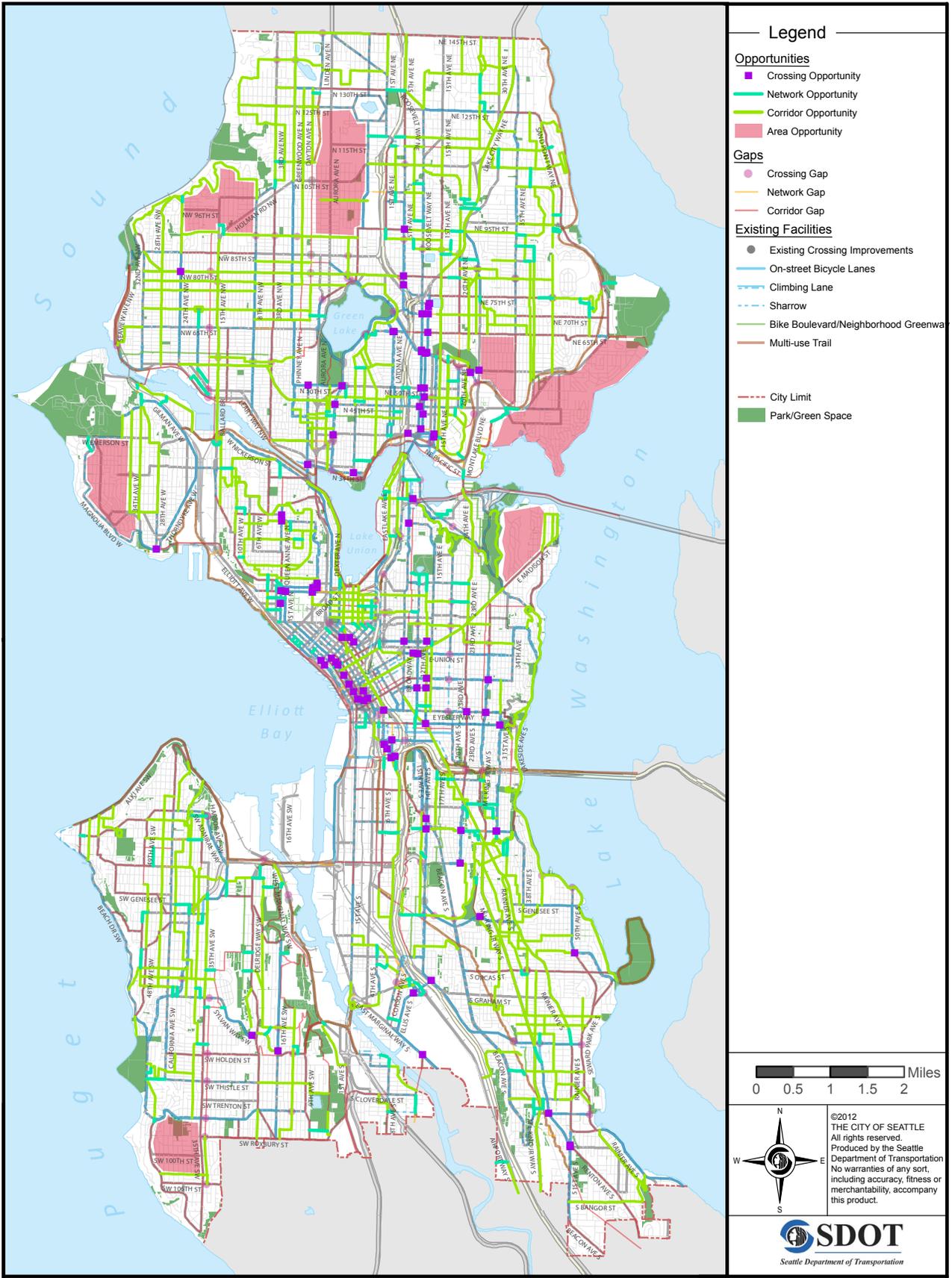
Network opportunities are small (no greater than ¼ mile) segments of the roadway that are not part of the existing or recommended bicycle system, but that could provide new and important connections. They provide the connectivity needed to link corridors, neighborhoods and destinations together.

Corridor opportunities are larger (greater than ¼ mile) portions of the roadway where there are either no existing or planned bicycle facilities. Corridor opportunities include important connections to major destinations, residential streets identified in the 2007 BMP as “streets commonly used by bicycles,” as well as locations that were not part of the original network map. The streets identified in this group represent locations that can be challenging to implement due to their characteristics (i.e., narrow pavement width, steep slope, etc.).

Area opportunities are larger geographic areas where few or no bicycle facilities exist or are planned according to the 2007 BMP. These locations include areas that are not within a quarter mile of an existing or planned facility.



Figure 5: Bicycle System Opportunities



SYSTEM GAPS

Equity Analysis

In addition to identifying areas for improvement in the existing bicycle system, an equity analysis was performed to examine the existing distribution of bicycle facilities compared to the distribution of historically underserved populations. For this analysis indicators include:

- Percentage of non-white population
- Percentage of households within the census tract that are below poverty level (as defined by the U.S. Census Bureau)
- Population distribution of people under 18 years of age
- Population distribution of people 65 years of age and older,
- Percentage of households within the census tract with zero automobile available for daily use

The demographic analysis used the 2010 decennial census and the American Community Survey's 5-year estimates (2006-2010). The analysis used a threshold for each socio-economic variable, so that those tracts that had a value greater than the mean value for any given variable was given a score of one (1). For example, a tract that had an above average minority population percentage and an above average percentage of households below poverty was given a score of two (2). The maximum score possible was five (5) and the minimum possible score of zero (0). Figure 6 shows the results of the composite equity scores.

The distribution of bicycle facilities or 'level of bicycle service' was calculated by dividing the total mileage of bicycle facilities (bike lanes, shared lane markings, multi-use trails) in a census tract by the number of square miles in the census tract (bicycle facility miles/square mile).

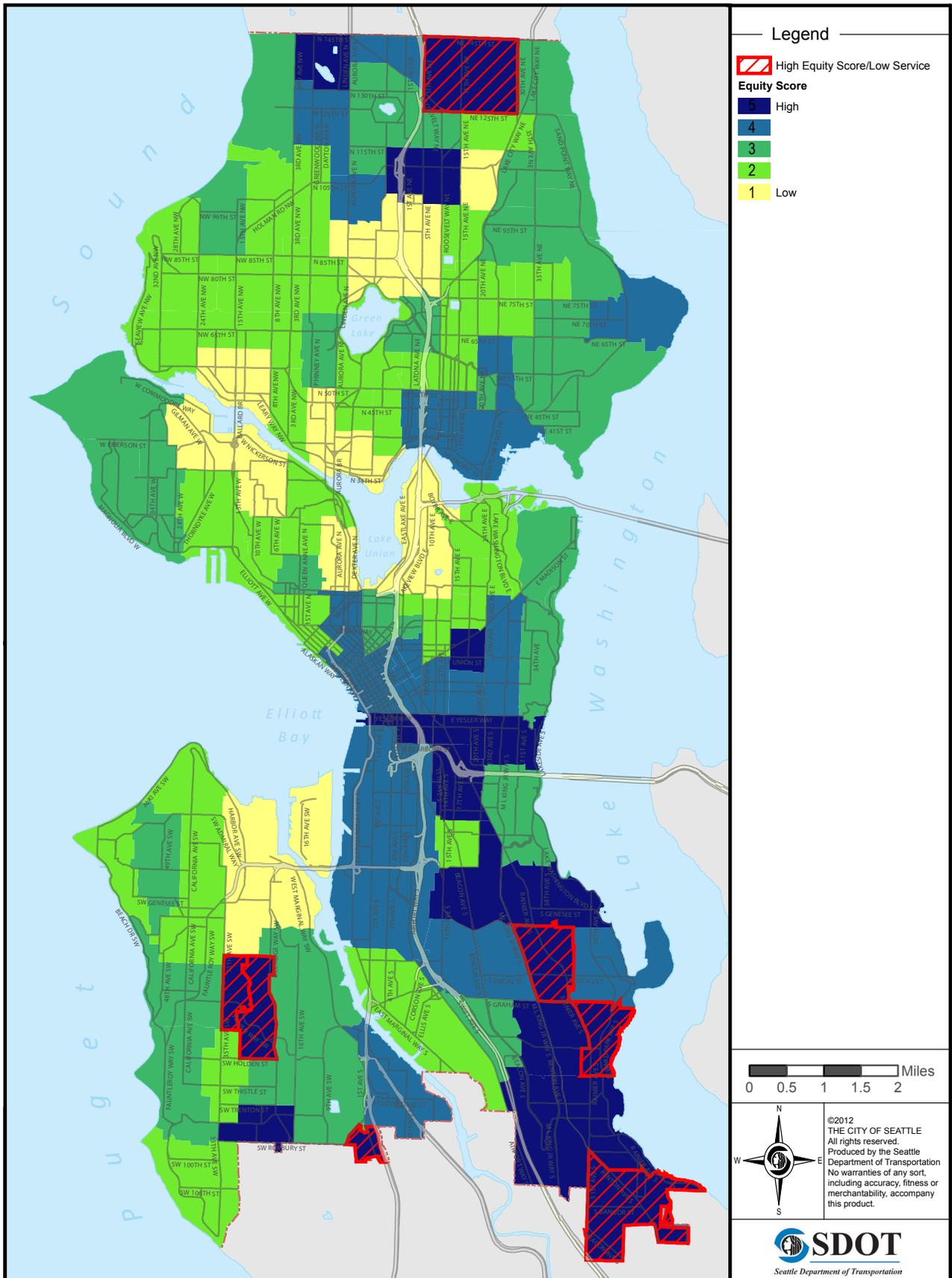
For the purposes of this analysis, those census tracts that were in the lowest quartile (lowest 25%) were considered to be 'low service areas'.

In some areas, a high equity score corresponds with a low level of bicycle service provision. Figure 6 illustrates the location of this overlap. The outlined boxes (in red hatch) call out those census blocks with a high equity score (composite of underserved populations) and low service, in terms of bicycle facilities.

The results of the demographic analysis combined with the assessment of existing facilities highlights several areas of Seattle where improvements to the bicycle system would benefit underserved populations. As new segments of the system are completed, the gap analysis can be easily repeated for the updated system, providing the opportunity to understand potential areas of the City that merit additional focus and investment.



Figure 6: Equity Analysis - Population Distribution and Service Provision



SYSTEM GAPS

System-wide Opportunities

The gaps and opportunities identified in this chapter provide valuable information which, in addition to other information such as roadway characteristics and continued public input, will inform the development of an updated recommended bicycle facility network.

High-quality bicycle facilities, such as cycle tracks, are needed as Seattle expands its bicycle system and attracts new people to make trips by bicycle. To become a world-class bicycling city, the updated bicycle system map must include bicycle facilities and treatments that increase rider predictability and comfort.



Cycle Tracks

A cycle track is physically separated from motor traffic and distinct from the sidewalk. Cycle tracks have different forms but all share common elements—they provide space that is intended to be exclusively used for bicycles and are separated from motor vehicle travel lanes, parking lanes, and sidewalks.



Neighborhood Greenways

Neighborhood greenways are a collection of lower volume, lower speed streets designed to give priority of travel to people riding bicycles and pedestrians. Neighborhood greenways are designed to promote a safer and more comfortable travel option for users of all ages and abilities. Seattle neighborhood greenways groups are active in numerous Seattle neighborhoods and have been working to identify streets appropriate for greenways.



WHO'S RIDING WHERE & WHEN?



The availability of data from multiple count efforts provides a rich source of information from which to develop a snapshot of cycling activity in Seattle today.

As noted previously, ridership is a key performance measure identified in the 2007 BMP. Bicycle counts provide the best information available regarding the number of bicyclists throughout the city. While counts provide a key metric to evaluate progress on the plan, they are also an important component of other analyses that support implementation decisions over time.

Accurate and consistent information on the current use of bicycle facilities serves to help SDOT in the following ways:

- Secure grant funding
- Measure the return on investment of new facilities
- Determine where and when to build new facilities
- Inform agency budgeting decisions
- Better understand bicyclist behavior

This section of the report provides a general overview of bicycle activity patterns and trends in Seattle based on a review of bicycle count data conducted by SDOT and other agencies.

Summary of Existing Counts

Bicycle activity in Seattle has been documented in a variety of forms and by multiple organizations. SDOT has been counting bicycles at access points to downtown since 1992. In 2008, SDOT began conducting counts at other locations around the city. These two count programs are being replaced by a single quarterly count program of 50 locations throughout the city using methodology recommended by the National Bicycle and Pedestrian Documentation Project (NBPDP). The quarterly count program began in 2011. Details on the current SDOT count methodology are shown in the box below.

Additional count data has been collected in coordination with the annual Washington State Bicycle and Pedestrian Documentation Project, which includes 25 Seattle locations that have been counted since 2009. These counts are coordinated by the Puget Sound Regional Council (PSRC) and the Cascade Bicycle Club. Periodic counts of bicycles on transit have been conducted by Sound Transit and include bicycles observed on Sound Transit trains and buses, as well as bicycles observed on non-Sound Transit (King County Metro and Community Transit) buses. King County Metro also conducted surveys of bikes on buses in 2002 and 2007.

SDOT Current Bicycle Count Methods:

Quarterly Bicycle Counts

Count Locations: 50 count locations (13 locations came from previous count locations)

Time: weekday (10:00 AM – 12:00 PM and 5:00 - 7:00 PM) and weekend (Saturday: 12:00 PM – 2:00 PM)

Season: quarterly counts (January, May, July, September)

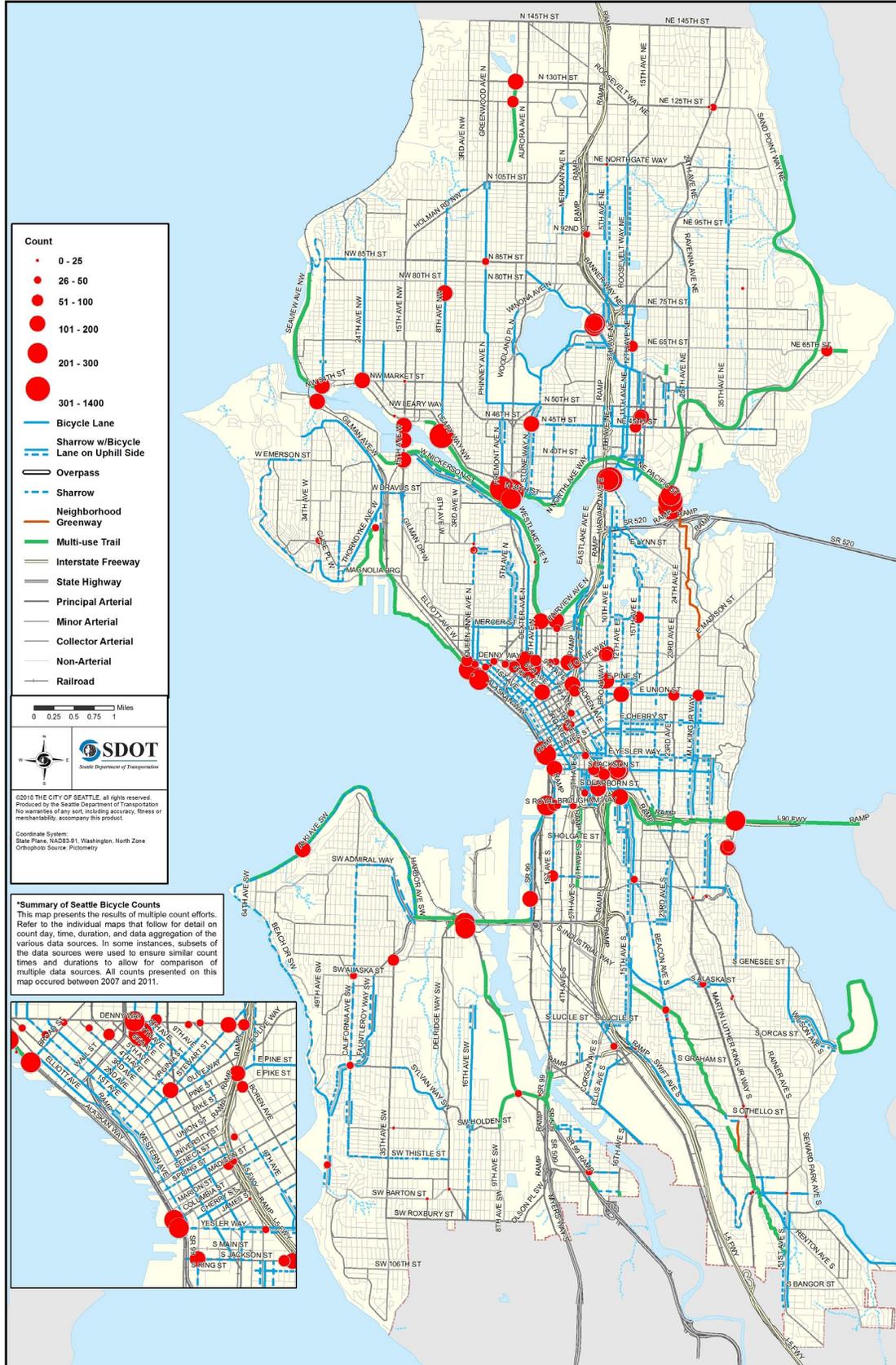
History: quarterly count program follows the National Bicycle and Pedestrian Documentation Project methodology. One year complete (2011); 2012 in progress

Automated Counter

Installed in October 2012 on Fremont Bridge



Figure 7: Summary of Seattle Bicycle Counts



WHO'S RIDING

Figure 7 provides an overview of the various count efforts active in Seattle. Summary totals were generated through the use of hourly and seasonal adjustment factors and averaged over multiple years of data when historic counts are available. As indicated on the map, bicycle counts tend to be highest in the north end of Seattle (north of the Ship Canal), in the downtown core, and at 'pinch points' in the transportation network, such as bridges.

Key Findings

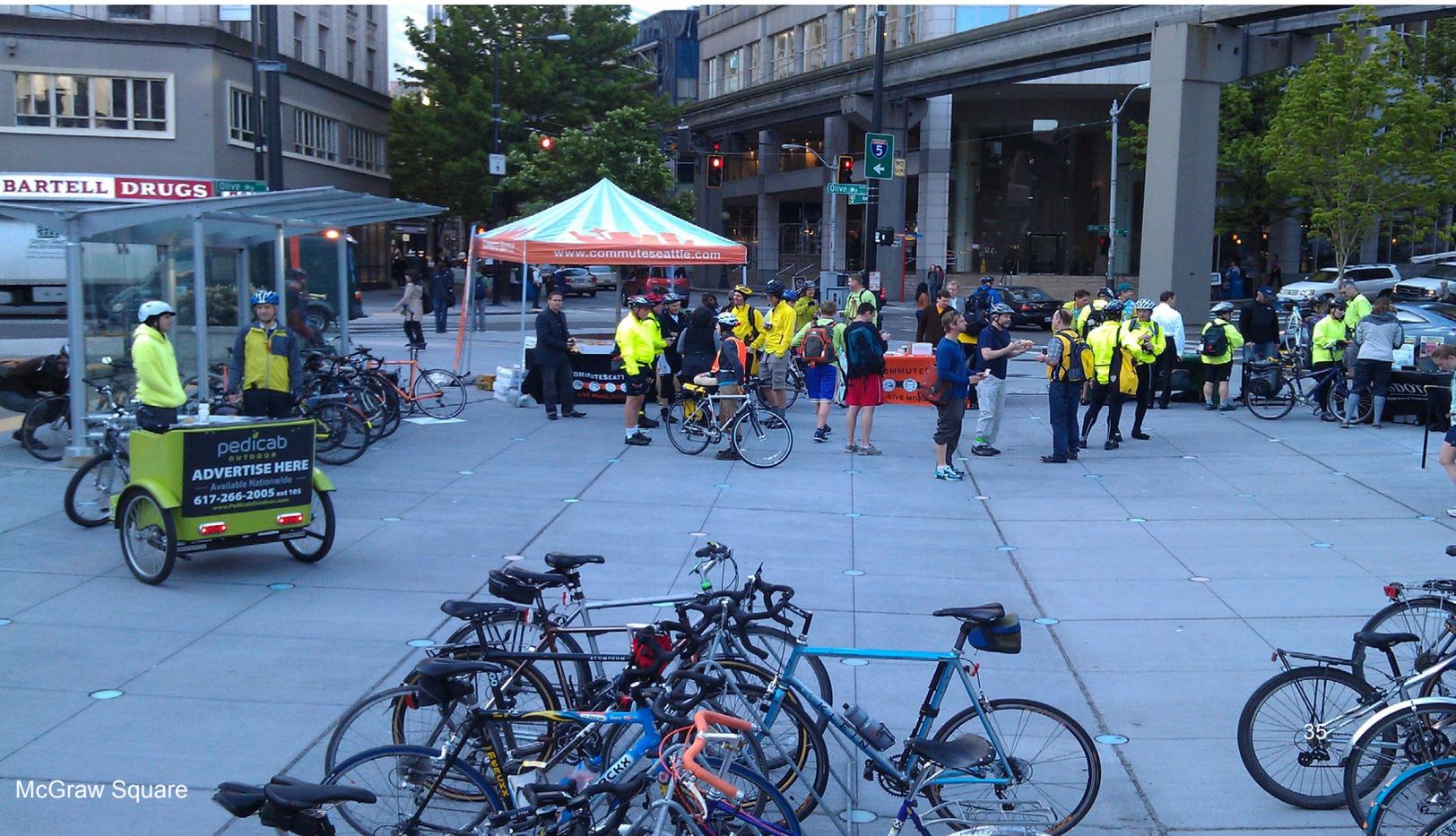
Cycling Activity Varies Throughout the City

Data indicate that the north end of Seattle (north of the Ship Canal) and the downtown core are areas with highest recorded count volumes, while counts are lower south of I-90, on Beacon Hill, and along Martin Luther King Way. Cycling volumes tend to be highest at 'pinch points' such as bridges, where few alternate routes exist.

Riding a bike appears to be dramatically higher in North Seattle than South Seattle. There are also several neighborhoods with low documented bicycling activity, including Magnolia, Queen Anne, and all of Southwest and East Seattle.

Fewer bicycles were counted south of I-90, on Beacon Hill, and along Martin Luther King Way, though counts were generally higher in West Seattle. Lower counts in these areas may be the result of more challenging topography and a less robust network. Specific high count locations are described on the following pages.

Figure 8 (next page) shows the bicycle count volumes recorded in summer and fall of 2011 as part of the SDOT quarterly bicycle count program, which uses the methodology recommended by the National Bicycle and Pedestrian Documentation Project. Figure 9 (next page) shows count data from SDOT's older Downtown count program, in 2009 and 2010.



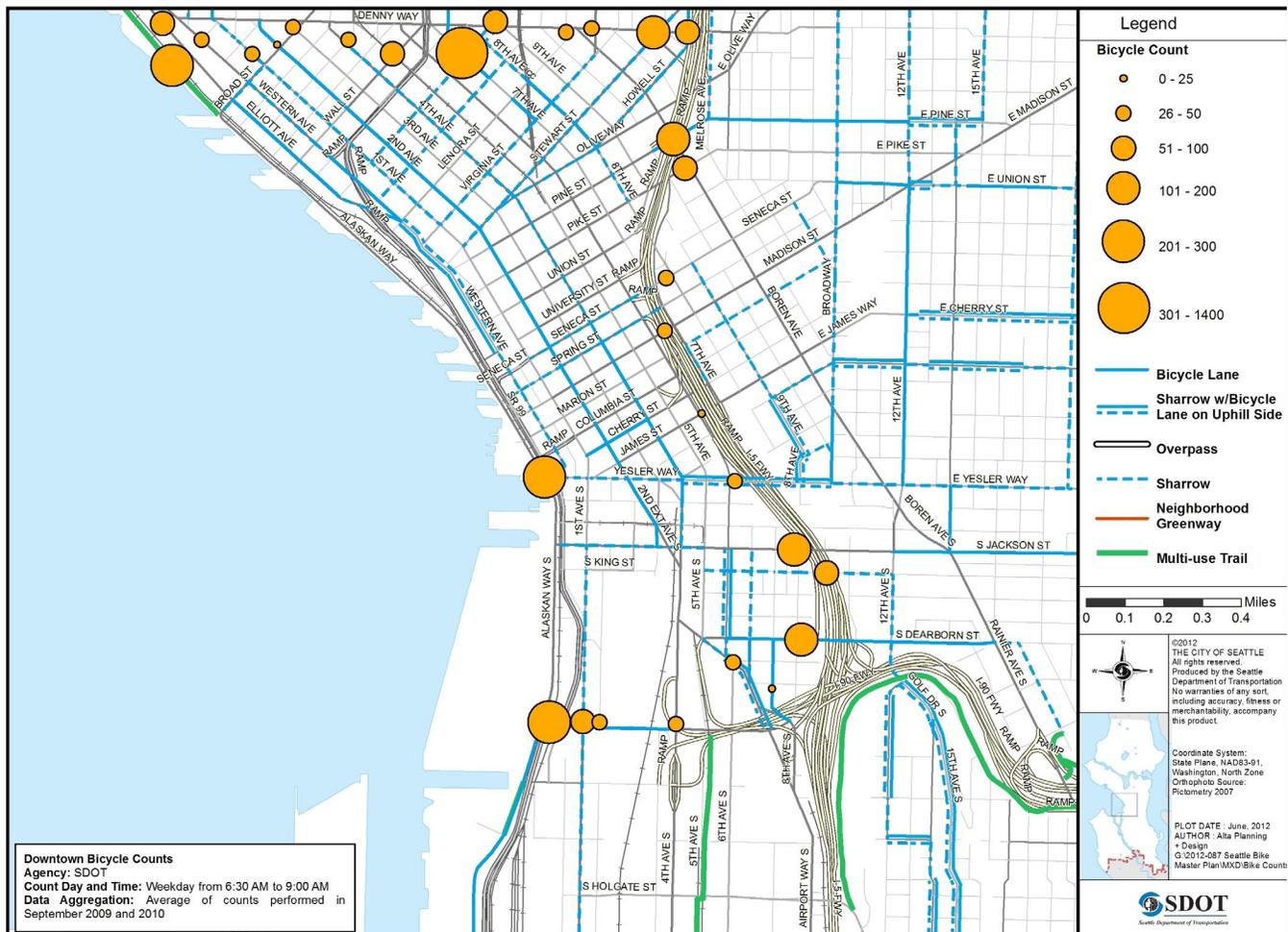
Some of the highest count locations in the transportation network include:

- Fremont Bridge, which is connected to the Burke-Gilman Trail
- University Bridge, which is connected to the Burke-Gilman Trail
- Burke-Gilman Trail between the Fremont Bridge and Aurora Bridge
- Burke-Gilman Trail and 8th Avenue NW
- Montlake Bridge
- Dexter Avenue N and Bell Street

Additional high volume count locations in Seattle include:

- NE Ravenna Boulevard, E Greenlake and Way, N/NE 71st Street
- E Marginal Way S and S Hanford Street
- Westlake Avenue N and Valley Street
- Duwamish Trail and Lower West Seattle Bridge
- I-90 Trail and West Bridge

Figure 9: Downtown Weekday Bicycle Counts (Average of 2009 and 2010)



Bicycle volumes have increased steadily.

In 2011, bicycle volumes in Downtown Seattle were nearly 200% higher than in 1992.

Helmet Use

Helmet use has risen steadily over time, from 71% of cyclists in 1992 to over 90% in 2009.

Female Bicyclists

The share of female riders has increased slightly, from 20% of all cyclists in 1992 to 22% in 2011. This data is based on the counts in Downtown Seattle only. It may be that female cyclists are gravitating towards routes with bicycle facilities, such as multi-use trails, which provide increased separation from motor vehicles.

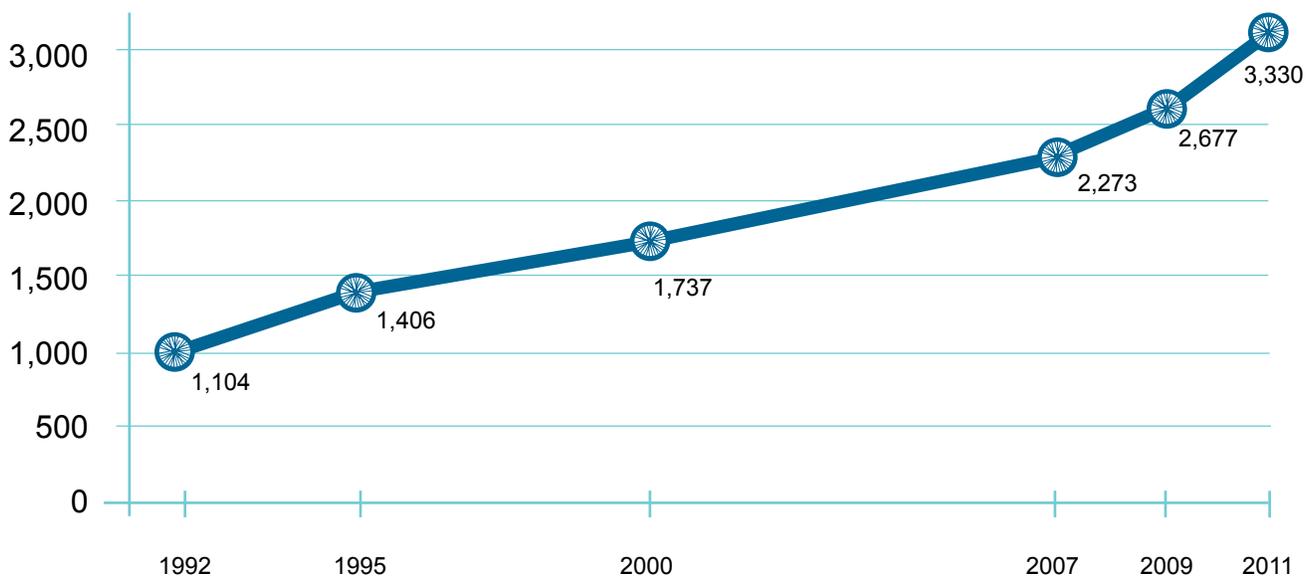
Weekday vs. Weekend

The weekday peak afternoon period generally experiences greater bicycling activity compared with the peak weekend period, indicating a potentially higher proportion of utilitarian (i.e., commute) riding compared with recreational use.

Seasonal trends

Cycling is highest in mid and late summer (July through September) and much lower in winter.

Figure 10: Total Cyclists Change Over Time, Downtown Seattle



Source: 1992-2011 Downtown Seattle Bicycle Counts



Overall Rise in Cycling and Decline in Collision Rate

The downtown count data is the most consistent data available and can be used as a general indicator of an increased trend in bicycling in the City. When reviewed with collision data as shown in Figure 11, while there is a trend towards an increase in bicycling, the overall collision rate is declining.

BMP Update Count Considerations

Discontinuing the Downtown Count program after 2013 will effectively eliminate the ability to compare newer counts to past performance on the 2007 Bicycle Master Plan goal of tripling the number of bicyclists observed at counting locations throughout Seattle by 2017, as the new Quarterly Bicycle Count program began in 2011 while the Downtown Count program dates back to 1992.

As SDOT updates the performance measures in the BMP, updating the methodology for collecting ridership data will be important to be able to assess progress on increasing ridership as the plan is implemented.

The phasing out of the Downtown and Citywide Bicycle Count programs also eliminates the ability to track gender and helmet use. SDOT should consider how to continue documenting these rider characteristics using the new count methodology or whether to resume the Downtown Count Program in the future. There is a great need in tracking a rider's gender as women riders are commonly known a proxy of perceived safety.

SDOT should also review previous count locations with the highest counts and consider adding them to the new Quarterly Bicycle Count program or installing automatic counters to continue to monitor these locations.

Finally, as one of the goals of the BMP update is to increase bicycling for all trip purposes and new facilities on non-arterial streets, such as greenways are built, SDOT will need to consider whether current count methodology adequately captures non-commute trips and trips on residential streets.



BICYCLE PROGRAMS



Education, enforcement, and encouragement programs are essential to improving bicycle safety and to encouraging more bicycling throughout the city.



As the bicycle network is built out, programs are important in order to educate bicyclists and motorists about how to safely share the road. Programs are also helpful for promoting cycling as a fun, healthy, flexible, affordable, and viable form of transportation.

This chapter documents and assesses the various education, encouragement, and enforcement programs that have been undertaken by SDOT and other partners since adoption of the 2007 Bicycle Master Plan. These programs are summarized in tables included in the appendix. The needs identified in this task will help inform the development of programmatic recommendations in the BMP update. The assessment also identifies types of programs or coverage needs for future consideration.



BICYCLE PROGRAMS

Key Programming Resources and Partner Organizations

Within SDOT, the Policy & Planning and Traffic Management divisions devote staff time to education and encouragement programs and to working with the Seattle Police Department (SPD) on enforcement. SDOT has formed partnerships with several local non-profit organizations to develop, operate, and maintain a variety of bicycle programs that will help encourage and increase the amount of bicycle riders.

Example Partner Organizations

- **Cascade Bicycle Club**
With over 14,000 members, Cascade Bicycle Club is the largest bicycle club in the United States. Cascade has an affiliated 501(c) (3) charitable organization, the Cascade Bicycle Club Education Foundation (CBCEF). CBCEF's mission is "Creating a better community through bicycling." Their education, advocacy and outreach efforts encourage people to ride bikes for transportation, fitness and fun; promote a more bicycle-friendly environment; improve bicyclists' safety; and create more livable communities.
- **The Bicycle Alliance of Washington (BAW)**
The Bicycle Alliance of Washington is a registered 501(c)3 organization. The BAW

supports bicyclists and a bike-friendly Washington by advocating for adequate funding for a complete non-motorized transportation infrastructure, working to increase the percentage of all types of bicycle ridership in Washington by ensuring that bicycles are recognized as a reasonable and mainstream transportation option, and educating communities to become bicycle-friendly and embrace a share the road philosophy.

- **Bike Works**

Bike Works is a non-profit community bike shop/organization centered on bicycles that combines youth development, community engagement, bicycle recycling, and a social enterprise bike shop to help build a sustainable and healthy community. Bike Works sells affordable recycled bicycles to the greater Seattle community while generating revenue to run youth programs, and helps to get more people riding bikes.

- **Commute Seattle**

Commute Seattle is a not-for-profit transportation service organization working to provide alternatives to drive-alone commuter trips in an effort to improve access to and mobility through downtown Seattle. Commute Seattle's ambitious goal is to shift to 35,000 daily drive-alone commute trips to transit, cycling, walking and ridesharing by 2015.





BMP Update Programmatic Needs

There are three clear needs for bicycle program direction in the BMP update, although others may be identified throughout the project timeline. These needs are:

- Program evaluation
- Programs to reach new or hesitant cyclists, especially among groups that are underrepresented among current cyclists
- Programs and campaigns to reduce conflicts and improve safety between road users

Evaluation

The 2007 BMP did not focus on program evaluation. Therefore, it is difficult to determine what programs have most helped increase the number of people riding bicycles or bicycle safety. The BMP update should consider how to better incorporate evaluation and monitoring into programming efforts to ensure that effective programs are continued and programs that are not effective are either improved or discontinued.

Targeted Audience

Bicycle programs should be targeted to reach specific audiences. As elsewhere in the 2012 update, SDOT is particularly interested in meeting the needs of new cyclists and programmatic efforts that will encourage cycling for those people that may be interested in riding a bike, but are not yet comfortable enough to consider biking as a convenient and viable form of transportation. These people may include the following:

- Women
- Low-income
- Families
- Seniors
- Youth



OPERATIONS



SDOT has begun to move beyond the 2007 BMP recommendations to employ a wider range of bicycle facility types to improve safety and create better conditions for riders of all ages and abilities.

This chapter identifies standard facilities and describes SDOT's current operations and design standards for on-street bicycle facilities (bicycle lanes and sharrows), off-street bicycle facilities (multi-use trails), and end-of-trip facilities (location and design requirements for bicycle racks). These are the facilities that were recommended and have been implemented from the 2007 BMP. This chapter also identifies design standards that have been incorporated in recent years, such as buffered bicycle lanes, green bicycle lanes and bicycle boxes, and cycle tracks, which have been, or are currently being, implemented even though they were not included in the 2007 BMP.

As bicycle project implementation has progressed and research and best practices for bicycle facility design has evolved, SDOT has modified and updated some design standards to further improve safety. However, the design and operational standards of these innovative bicycle treatments have not been officially adopted into any plan. SDOT has utilized best practices and new bicycle facility designs to ensure the operations and design of these facilities are installed correctly. The Bicycle Master Plan Update provides an opportunity to include these standards in the plan, and the plan update will include a new facility/improvements toolkit with operational and design guidance.

Standard Facilities

The following treatments are standard industry tools and facilities that are described and detailed in the 2007 BMP. Seattle will continue to implement these facilities based on existing design guidance.



OPERATIONS



Bike/Bus Lanes



Bicycle Route Signs



Bicycle Racks



Bicycle Accomodation on Transit



Shared Lane Markings (Sharrows)



Innovative Facilities

The following bicycle facilities either are current pilot projects in Seattle or under consideration for use. Design guidance needs to be updated to include clear standards for implementation.



Dexter Ave N



Walingford Neighborhood Greenway



6th Ave

Crossbikes

In 2011, SDOT started installing intersection crossing markings called crossbikes at spot intersections to improve visibility of bicyclists. SDOT included crossbikes as part of the first neighborhood greenway projects, beginning in 2012. As part of the update to the BMP, SDOT will evaluate the use of crossbikes in the City.

Neighborhood Greenways

Neighborhood Greenway elements include crossing improvements at arterial crossings, sharrows and signing along the greenway route. SDOT will further develop consistent design standards for treatments used on greenways during the BMP update process.

Contraflow Bicycle Lanes

Prior to the 2007 BMP, there was one existing contraflow bike lane in the city. In 2010, SDOT installed a second contraflow bike lane. SDOT will continue to refine internal design guidance and use contraflow lanes on future projects where one-way street corridors could provide an important connection for bicyclists.





7th Ave



Eastlake Ave E and E Fuhrman St



E Pine St and 12th Ave E

Buffered Bicycle Lanes

In 2010, SDOT installed its first buffered bicycle lanes. Three projects were completed that year: N 130th Street, 7th Avenue and Roosevelt Way NE.

SDOT will continue to look for opportunities to install buffered bike lanes and identify clear design guidance and implementation criteria and metrics in the BMP update.

Green Bicycle Lanes

A colored bike lane is a portion of the bicycle lane used to indicate that motorists should expect to see bicyclists when they cross the bike lane to make a left or right turn. Likewise, bicyclists should expect to see motorists crossing the colored bike lane.

To date, SDOT has installed 36 colored bike lane locations. SDOT is continuing to experiment with different materials for the best product for both durability and cost. SDOT will continue to install green bike lanes where needed and continue to look for new tools and treatments to use at known conflict points.

Green Bicycle Boxes

In 2010, SDOT installed several green bike boxes. Four locations were completed that year by following Portland's examples and designs. Educational signage was created and installed at each location. New design guidance on bicycle boxes was included in the 2010 Urban Bikeway Design Guide from the National Association of City Transportation Officials (NACTO). SDOT will continue to use NACTO as a tool and will look to incorporate recommendations from recent and forthcoming research about bike boxes.





Cycle Tracks

SDOT currently has three cycle track projects planned and designed. Construction should begin in 2012 for the Linden Complete Streets Project and the First Hill Streetcar Project. Both projects include a two-way cycle track as part of larger streetscape redesign. In addition, a cycle track has been included in the Mercer West Project. Construction should begin in 2014.

Seattle looked to other cities that have used this treatment for guidance in their design, such as Portland, Vancouver, BC, and Montreal. The NACTO Urban Bikeway Design Guide also has a section on cycle track design that has been referenced to support Seattle's pilot projects. New guidance in the BMP update should be provided on designs for intersections and driveways, using information from recent research and best practices from other cities in the US and Canada that have installed cycle tracks.

Bicycle Signals

SDOT has a installed bicycle signal in one location (N 34th St and Fermont Ave N for the contraflow bike lane). The BMP update should include recommendations for the use of other signal related facility improvements should be defined and explored in the BMP update, including: bicycle signals (bike-specific signal heads), bicycle access at half signals and other pedestrian crossing signals, and signal timing for bicyclists.

Staircase Runnels

SDOT has improved its stairway design standard to include a bicycle runnel. Starting in 2011 and continuing in 2012, major stairway rehabilitation projects have considered installing a runnel.

As the runnel program matures, it is SDOT's desire to also construct projects that add runnels to existing stairways. The update to the BMP should identify the need to use staircase runnels where possible to provide connectivity.



On-Street Bicycle Corrals

SDOT has been developing on-street bicycle corrals throughout the City. Current practice includes the installation of on-street corrals (primarily using the Dero-brand 'cycle-stall' prefab module) on a request basis and where perceived demand was high enough to warrant a corral instead of traditional racks.

The BMP update should consider how to prioritize on-street bicycle corrals depending on land use or other factors and taking advantage of spacing where spaces where vehicle parking is not allowed.

BMP Update Operations Needs

SDOT has utilized best practices and new bicycle facility designs to ensure the operations and design of bicycle facilities are installed correctly. In general, standard facilities will continue to be installed based on current design practices.

However, the BMP update also provides the opportunity to review new implementation techniques for some standard facilities. SDOT will continue to be innovative in its approach to improve safety, predictability, and comfort of the bicycle network cyclists of all ages and abilities.

The BMP update will also include new facility types and the respective operational and design guidance for consistency in application, including increased use of the NACTO Urban Bikeway Design Guide.





MOVING FORWARD

The Bicycle Master Plan Update will build upon the significant progress achieved to date and continue the momentum established by the 2007 Master Plan.



The State of the Seattle Bicycling Environment Report provides a snapshot of Seattle’s existing bicycling environment, particularly project and program accomplishments, current policy and implementation guidance, and historic and current bicycling usage trends among Seattle residents. The technical information summarized in this report, in addition to a wealth of stakeholder and public input, establishes the baseline from which the Bicycle Master Plan Update’s recommendations will be made.

A more detailed analysis phase of the BMP update effort will set the stage for identifying a bicycle facilities network and program solutions. This includes taking a close look at the existing network and programs to identify where additions or adjustments may be needed and looking to peer communities that are successfully putting best practices into action. SDOT is also examining other important elements, such as equity and demand, to help create a bicycling environment that is appealing and useful for residents of all ages, abilities and backgrounds. Key next steps include updating the bicycle network map, project and program development and prioritization, identification of funding opportunities, creating a clearly defined phasing and implementation plan, and identifying opportunities to enhance SDOT’s implementation efforts.

The Bicycle Master Plan Update will include a comprehensive suite of policy, project and programmatic recommendations to take Seattle to the next bicycling level. In charting a course to transform Seattle into a world-class bicycling city, SDOT and other project partners should consider the issues discussed in the following paragraphs, identified from the existing conditions analysis. These and many other considerations will be expanded upon in the forthcoming Bicycle Master Plan Update.



MOVING FORWARD

Bicycle Facilities Network

- Develop an objective and data-driven method for identifying appropriate bicycle facility types (e.g., bike lane, neighborhood greenway) on the network based on a variety of factors including street characteristics and land use context.
- Develop seamless bicycle connections with other transportation modes, particularly transit.
- Revisit existing bicycle facilities design practices to determine whether they contribute to a comfortable and safe riding environment for riders of all ages and abilities. Updated design guidelines and standards will be based on national and international best practices.
- Expand the use of emerging and innovative infrastructure treatments (e.g., cycle tracks, green bike lanes) to enhance the riding environment for persons of all ages and abilities.



Education, Encouragement, Enforcement, Evaluation and Outreach

- Conduct a scan of national and international best practices in bicycle education and outreach to identify improvement opportunities for Seattle.
- Work with partner agencies and organizations to streamline existing bicycle education and outreach efforts. For instance, some overlap exists between SDOT's activities and those of partner agencies/organizations.
- Develop methods to improve SDOT's outreach to areas of the community with lower levels of bicycling activity.
- Continue to expand the reach of SDOT's education and outreach activities (e.g., Road Safety Summit, K-12 curriculum, driver education).



Funding

- Challenge of funding new or more expensive types of bicycle facilities
- Streamline the internal process for tracking grant and other funding opportunities.

Implementation

- Be opportunistic with project implementation, such as identifying “quick-win” spot improvements and implementing projects in tandem with other transportation system improvements.
- Determine which performance measures have proven most useful for tracking implementation progress over time and identify new measures as needed. For example, opportunities may exist to streamline current bicycle count procedures to gain a better understanding of usage trends (e.g., better tracking of usage by gender and expanding counts to collect data beyond commuting trends).
- Enhance the process for identifying bicycle network maintenance needs. Examples of elements affecting the user experience include surface quality and condition of pavement markings and signage. SDOT should consider whether current facility condition monitoring practices are sufficient, and identify opportunities for improvement if needed.
- Develop a process for monitoring the effectiveness of programmatic efforts, and put this process into action on a recurring basis.

Conclusion

The Bicycle Master Plan Update will build upon the significant progress achieved to date and continue the momentum established by the 2007 Master Plan. This planning effort provides opportunities to take advantage of emerging and state-of-the-art best practices for bicycle facility design and program implementation, and will set the stage for transforming Seattle into a community where bicycling is a safe, comfortable and viable travel mode for people of all ages and abilities.



Programs Implemented by SDOT, 2007-2012

PROGRAM NAME	PROGRAM TYPE	IMPLEMENTING ORGANIZATIONS	TARGET AUDIENCE	FUNDING SOURCE	STATUS
Way to Go: One Less Car	Encouragement	SDOT	Car owners	General Fund	Current - began 2000
Safe Routes to School	Education & encouragement	SDOT, Bicycle Alliance of Washington, Feet First	Elementary Schools	Bridging the Gap & grant funding	Current - began 2007
Traffic control devices/signage	Education	SDOT	All users of roadways	General Fund & Bridging the Gap	Always in use
Traffic laws	Enforcement	SPD	All users of roadways	General Fund	Daily with occasional increased enforcement
Annual bicycle map	Education & encouragement	SDOT	Cyclists	General Fund & Bridging the Gap	Updated & printed every year
Support efforts to obtain funding	Education & encouragement	SDOT & partners	Cyclists	Grant funded	Pursued when appropriate for project implementation
Bike Smart	Education & encouragement	Cascade Bicycle Club	Cyclists	Bridging the Gap	Program no longer exists
Walk, Bike Ride Challenge	Education & encouragement	SDOT	All residents	General Fund	Current - began 2010
Online Seattle Bicycle Map	Education & encouragement	SDOT	Cyclists	General Fund	Current - began 2012
Bicycle Racks	Encouragement	SDOT	Cyclists	General Fund & Bridging the Gap	Current - began 1981
Videos	Education	SDOT & Art Institute of Seattle	All users of the roadway	Staff coordination time	Partnership exists & produced first video 2012
Website with bicycle information*	Education & encouragement	SDOT	All residents	Staff time	Ongoing
Programs that have not been implemented, but were recommended in the 2007 plan:					
Online bicycle route wayfinding system	Encouragement	N/A	N/A	N/A	Has not been pursued
Display bicycle route system maps Downtown & in Urban Villages	Education & encouragement	N/A	N/A	N/A	Has not been pursued

*See:
<http://www.seattle.gov/waytogo/>
<http://www.seattle.gov/transportation/bikeprogram.htm>
<http://www.seattle.gov/transportation/saferoutes.htm>

Programs Funded and Managed by Other Organizations

PROGRAM NAME	PROGRAM TYPE	IMPLEMENTING ORGANIZATIONS	TARGET AUDIENCE	FUNDING SOURCE	STATUS
Commute Trip Reduction	Encouragement	WA State Law - Large Employers	Employees	Privately funded	Current
Ride SMART safety program/Bike to Work Month*	Education & encouragement	Cascade Bicycle Club & CBCEF	Cyclists	Unkown	Current
Bicycle maintenance classes	Education	REI & Cascade Bicycle Club	Cyclists	Unkown	Current
Cycle tracks - trip mapping	Encouragement	Puget Sound Regional Council (PSRC)	Cyclists	Unkown	Current - began 2012
Bicycle Sundays	Encouragement	Seattle parks & Recreation & Cascade Bicycle Club	Cyclists	Unkown	Program exists on Sundays throughout the summer
Bike Buddy & Go By Bike	Encouragement	Bicycle Alliance of Washington	New bicycle commuters	Unkown	Current (Bike Buddy - currently being reorganized & updated)
Youth Programs**	Encouragement	CBCEF	youth	Unkown	Current
Earn-A-Bike & other programs	Education & encouragement	Bike Works	Cyclists & youth	Unkown	Current
Give 3 Feet campaign	Education	Cascade Bicycle Club & Group Health	All users of the roadway	Unkown	Current
Cascade Bi-annual Bikes & Business meeting	Education	Cascade Bicycle Club	Major employers	Unkown	Current
Bicycle Amenity Inventory Map	Encouragement	Commute Seattle	Cyclists	Unkown	Current
Bicycling Business Events/Forums	Education & encouragement	Commute Seattle	Downtown businesses & employees	Unkown	Current
in Motion	Education & encouragement	KC Metro	All residents	Varies	Current
Bikes in buses	Encouragement	KC Metro	All cyclists	Unkown	Different neighborhoods as funding is found
Bikes on buses, link light Rail & Sounder trains	Encouragement	Sound Transit	All cyclists	Unkown	Current
Food & Fitness	Education	KC Public Health	All residents	Unkown	Current
Kidical Mass Rides	Education & encouragement	Totcycle	Families	Volunteers	Current
Spokespeople Rides	Education & encouragement	Spokespeople (Seattle Neighborhood Greenways Organizers)	All residents	Volunteers	Current
Bike Trains & Bike to School Days	Education & encouragement	Walk.Bike.Schools!	Students & families	Volunteers	Current

* Includes riding, maintenance, and commuter classes, as well as seniors classroom and riding classes

**Includes summer camps for kids, Trips for Kids Seattle, Basics of Bicycling (3-week on-bike course at elementary schools within four school districts), Urban riders (four-hour on-bike safety class for teenagers), and the Major Taylor Project (an after-school youth development program aimed at underserved youth)

website: <http://www.seattle.gov/transportation/bikemaster.htm>
email: bmpupdate@seattle.gov

