

## **Infrastructure Equity Policy Expert Group Map Packet for October 3, 2012**

### **Purpose of Exercise**

The eight maps of this packet provide a context for three discussion questions (below). City bureaus will introduce the maps, followed by small group discussions and reporting back to the full PEG. The PEG received a demographics presentation on September 5.

PEG members are encouraged to learn from one another, and build a rapport across different perspectives. This team-building approach will help the PEG to discuss draft Comprehensive Plan policies, in coming months.

### **Infrastructure Levels of Service—Examples**

- Map 1: Combined Water Service and Main Breaks
- Map 2: Sewer Condition and Capacity
- Map 3: Condition of Arterial and Collector Streets
- Map 4: Sidewalks on Arterial Streets
- Map 5: Public Parks and Natural Areas Half-Mile Service Areas

### Discussion Questions:

1. Do service gaps exist for this bureau? Why?
2. Are communities of color, people with disabilities, or low-income populations overly affected by service gaps?
3. What would more equitable service look like?

### **Portland Demographics (on the wall)**

- Map 6: Poverty
- Map 7: Communities of Color
- Map 8: Renters
- Map 9: Housing Density

# Infrastructure Levels of Service

## Portland is a full service community

The City of Portland provides many services to its residents; among them are water, sewer, transportation and parks. City bureaus that provide these services have developed Level of Service (LOS) standards in order to provide services equitably across the city, and to guide investments in building, operating, and maintaining the facilities that deliver the services.

## Why do streets and parks look different in some areas?

Portland of today is a patchwork of subdivisions built over time, and under different standards to dedicate and construct streets, parks and other public structures. Many parts of today's City were built under Multnomah County rules, then annexed into the City. Multnomah County allowed fewer street improvements than does the City. As a result, pockets of Northeast and outer East have streets without curbs or sidewalks, and fewer parks.

## How does the City keep track of its public structures?

The City of Portland owns public structures (pipes, streets, buildings, etc.) valued at \$23 billion. Managing those assets requires informed decisions--to repair, replace or rehabilitate existing assets; respond to regulatory mandates; or serve new growth. City bureaus use "asset management" to protect these community investments and ensure long-term, reliable service delivery.

In 2003, asset managers from the City's infrastructure bureaus formed the City Asset Manager's Group, to collaborate on data issues, explore ways to improve (within and across bureaus), and prepare an annual report to City Council. Members represent infrastructure, finance and planning bureaus. Recent improvement areas include service levels and managing risk.

Key measures in the reports are the number of assets, replacement value, condition, and unmet funding needs. Recent reports are found at:

<http://www.portlandoregon.gov/bps/49854>.

## What is a "level of service"?

Service levels set measurable standards against which actual achievement can be compared. Service levels set expectations for what service to provide, in what quantities, and how often. Service levels are most useful in a long term perspective. There are internal and external service level targets. Service levels may address reliability, quality, quantity and safety.

Bureaus can evaluate service levels and cost of service with customers and regulators, to set the optimum service level they are prepared to support.

## What are some examples of service standards?

Five examples of bureau LOS standards follow. These are just samples: for example, the Water Bureau tracks and reports each year on 27 key service levels. Other bureaus have more LOS standards, too. For more information on these and other service standards, contact the City bureau in charge of that service.

The next few pages show:

- Combined Water Service and Main Breaks
- Sewer Condition and Capacity
- Condition of Arterial and Collector Streets
- Sidewalks on Arterial Streets
- Public Parks and Natural Areas Half-Mile Service Areas

These sample LOS maps provide a glimpse of bureau services, but are not intended to represent the full range of bureau services. Bureaus also apply other best practices to manage their assets.

## Discussion questions

The Infrastructure Equity PEG will discuss:

1. Do service gaps exist for this bureau? Why?
2. Are communities of color, people with disabilities, or low-income populations overly affected by service gaps?
3. What would more equitable service look like?

## Water Bureau Sample Level of Service: Combined Water Service and Water Main Breaks

### Key Water Service Level Goals

The Water Bureau Strategic Plan (2008 - 2011) established a list of key service levels. These service levels represent the bureau's performance goals. The Water Bureau is committed to tracking progress and reporting the results.

Those water service levels fit into three categories:

- Essential to customers
- Important to the community
- Key to water system operation

Many are tied to the water system's physical infrastructure. By their nature, these service levels are applied system-wide, and not specific to neighborhood.

Among the key service levels related to infrastructure:

- Deliver water to customers with limited outages. We have two service levels: No more than 5% of customers out of water for more than 8 hours a year; and No customer out of water more than 3 times per year. In the last fiscal year, less than 1% of customers were out of water for more than 8 hours a year; and one customer was out of water more than 3 times.
- Deliver water to customers at adequate pressure. We have a service level to maintain minimum service pressures of 20 pounds per square inch during normal demands 99% of the time. Our focus is on expanding our monitoring and evaluation to better understand our performance relative to this service level.
- Deliver water to customers of the highest quality. We have a service level to maintain compliance with all state and federal water quality regulations. In 2009, the Bureau had its first Maximum Contaminant Limit violation for total coliforms, but has remained in 100% compliance since that time.
- Have water to fight fires available when needed. We have a service level that there is at least one working hydrant within 500 feet of a service connection. There was only one instance in the last year when a hydrant went out of service so that no working hydrant was available within 500 feet, and this hydrant was repaired within 3 business days.

- Make sure our isolation valves work when needed, so if a pipe breaks, we can limit the damage. We have a service level that 90% of valves will operate when needed. This is verified by our inspection program showing 97% of valves were found to operate when tested.

### Water Main Breaks

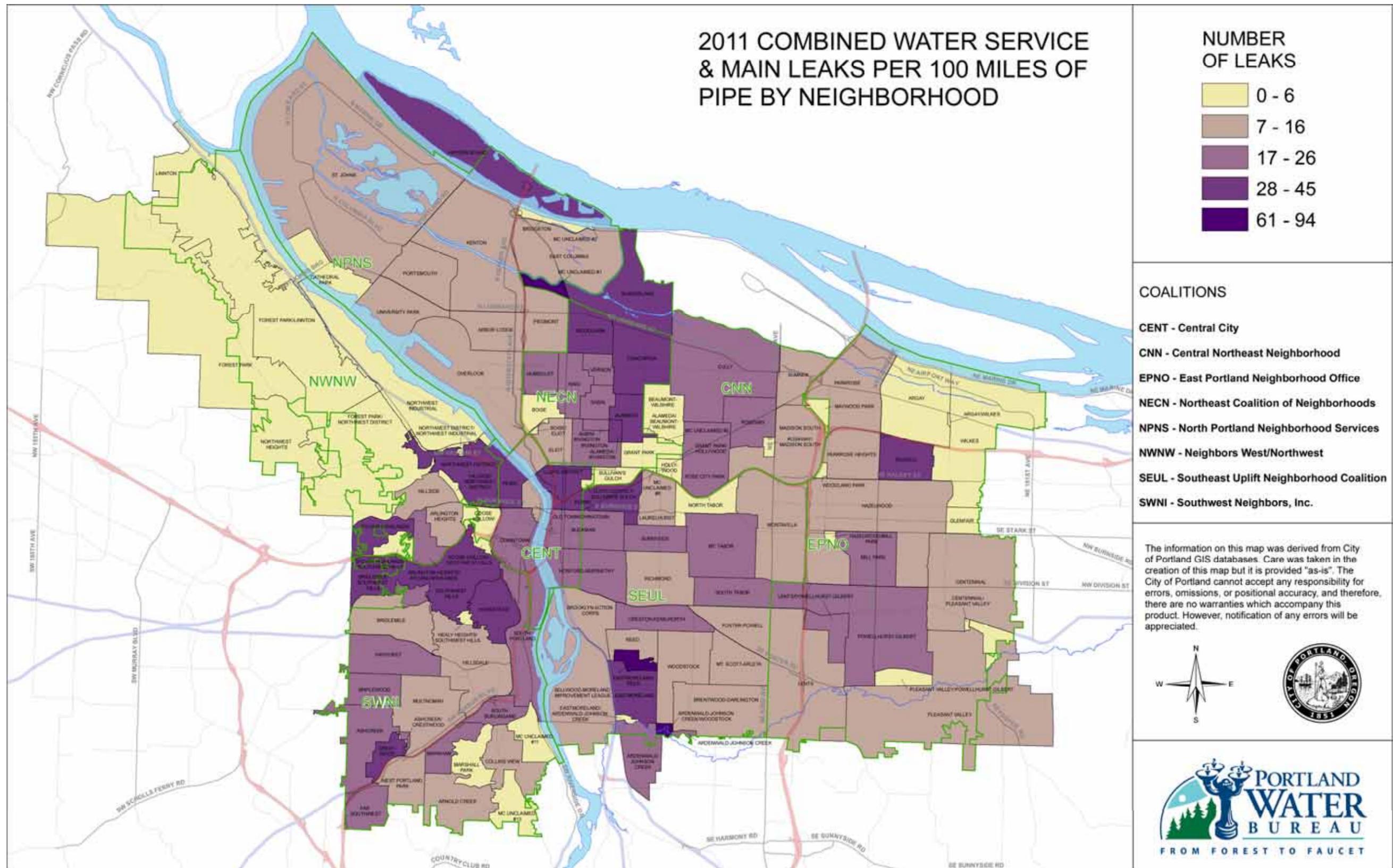
The Water Bureau has estimated that most of its 2200 miles of distribution system pipe are in good condition, and most of its 175,000 service lines (from the pipe in the street to the meter, about another 1000 miles in length) are in good or fair condition. A pipe in "good condition" is expected to have more than half of its useful life remaining, and a service line in "fair condition" is expected to have more than a quarter of its useful life remaining – on average. The majority of pipes in the water distribution system are made of cast iron and ductile iron, and have average useful lives of at least 150 years. The majority of water service lines are made of copper and are expected to last at least another 30 years.

Pipes and service lines do leak and break. Leaks and breaks often require the Water Bureau to interrupt service, affecting supply of water to customers. This is reflected in the key service levels to limit outages (see above). While maintaining its system, the Water Bureau has been recording information about when leaks and breaks occur, for the last 40 years.

The American Water Works Association (AWWA) of water supply utilities has defined a reasonable measure of the condition of the water distribution system to be "the total annual number of leaks and breaks per 100 miles of distribution piping." This indicator is called the "Water Distribution System Integrity" measure. Leaks and breaks can occur on the pipes, the service lines, valves and hydrants.

In **Map 1** below, the number of leaks or breaks from July 2009 to June 2010 (one year) are given by Neighborhood Coalition. According to the AWWA study, the average leak-break rate for water utilities is 37. Most neighborhood results fall below the national utility average. 75% of the water utilities have leak-break rates of 16 or greater. The overall Water Bureau results are close to this level, at 15 leaks-breaks/100 miles of distribution pipes per year.

Map 1



## Bureau of Environmental Services Sample Level of Service: Sewer Condition and Capacity

The Portland Bureau of Environmental Services (BES) operates and manages three systems: a combined sewer system, a separated sanitary system, and a separated stormwater system. It serves 575,000 people, numerous commercial and industrial facilities, and six wholesale customers. The existing system consists of 1,441 miles of separated storm and sanitary sewers, 891 miles of combined sewer that carry both stormwater and sanitary waste, 911 green street facilities, 96 pump stations, and two wastewater treatment plants.

The City's combined sewer system covers 30% of City area and the majority of its population. Combined sewers carry both sanitary and stormwater runoff in the same pipes. Separate sanitary and storm sewer systems serve the remaining 70% of City area, mostly in the western and outer eastern areas. BES contracts with PBOT to maintain the City's sewers.

### Asset Management

BES has used asset management for nearly 20 years. In 2009, BES participated in an international asset management benchmarking project.

BES recently updated system plans for the combined and sanitary collection systems. A stormwater system plan is in progress. Using these system plans and a risk register, BES identifies projects based on life-cycle cost and financial, social, and environmental benefits. Business risk was used to evaluate proposed capital projects for BES' capital improvement program for Fiscal Year 2012 - 2016.

The goal is cost-effective expenditures that result in optimal asset value and customer service.

The current estimated replacement value of BES assets is \$6.26 billion. In general, most sanitary and combined sewer systems are in good or very good condition. About

40% of the stormwater system and 63% of the wastewater treatment system are in good or very good condition.

For 2010, BES reports an annual funding gap of \$28 million a year. The most significant issues are:

- \$123 million to rehabilitate sewer pipe that has exceeded its useful life.
- In the combined system, many properties have risk of basement sewer backups more frequent than the 25-year storm. Capacity improvements are required to meet the bureau's levels of service.
- \$60 million for capacity-related projects at the Columbia Boulevard Wastewater Treatment Plant.

A long-term commitment for Combined Sewer Overflow (CSO) requires that BES redirect stormwater out of the combined sewer system.

### Sewer Capacity and Backup

Conveying sewage requires pipes that are adequately sized and in good structural condition. Undersized pipes pose risk of flooding to basements and to the surface. BES's design standard for combined sewer pipes (pipes that carry both sanitary and storm flows) requires that pipes convey sewage for all storm events up to a 25-year frequency. Sanitary pipes are required to convey flows for all storm events up to a 5-year frequency.

Pipes that are in poor condition pose risk of structural failure, which might cause basement and surface flooding, a sinkhole to the surface, and require emergency repair.

Asset management helps BES focus its capital resources on the parts of the system with the highest risk of failing to meet Levels of Service. [Map 2](#) illustrates the total system risk in terms of costs of failures. Not surprisingly, the highest risk is in the oldest parts of the sewer system.



## **Bureau of Transportation Sample Level of Service: Streets of Citywide Significance**

The Portland Bureau of Transportation (PBOT) manages transportation assets with a replacement value of \$8 billion. Improved streets, the sidewalk system, bridges, traffic signals (signal hardware), and streetlights make up 93% of the dollar value. The pavement system, alone, is valued at over \$5 billion. Portland also owns streetcars, an aerial tram, support facilities, traffic calming devices, signs, parking meters, parking structures, pavement markings, bikeways, guardrails, retaining walls, the Harbor Wall, stairways, and traffic signal computer controllers.

### **Asset Management**

PBOT uses asset management to effectively and efficiently allocate resources, measure performance, and track infrastructure needs. Recent achievements include implementing a new pavement management system, expanding condition monitoring to more assets, and assessing risk of asset failure.

Transportation maintenance liability continues to increase as assets age, and revenues do not match.

### **Streets of Citywide Significance**

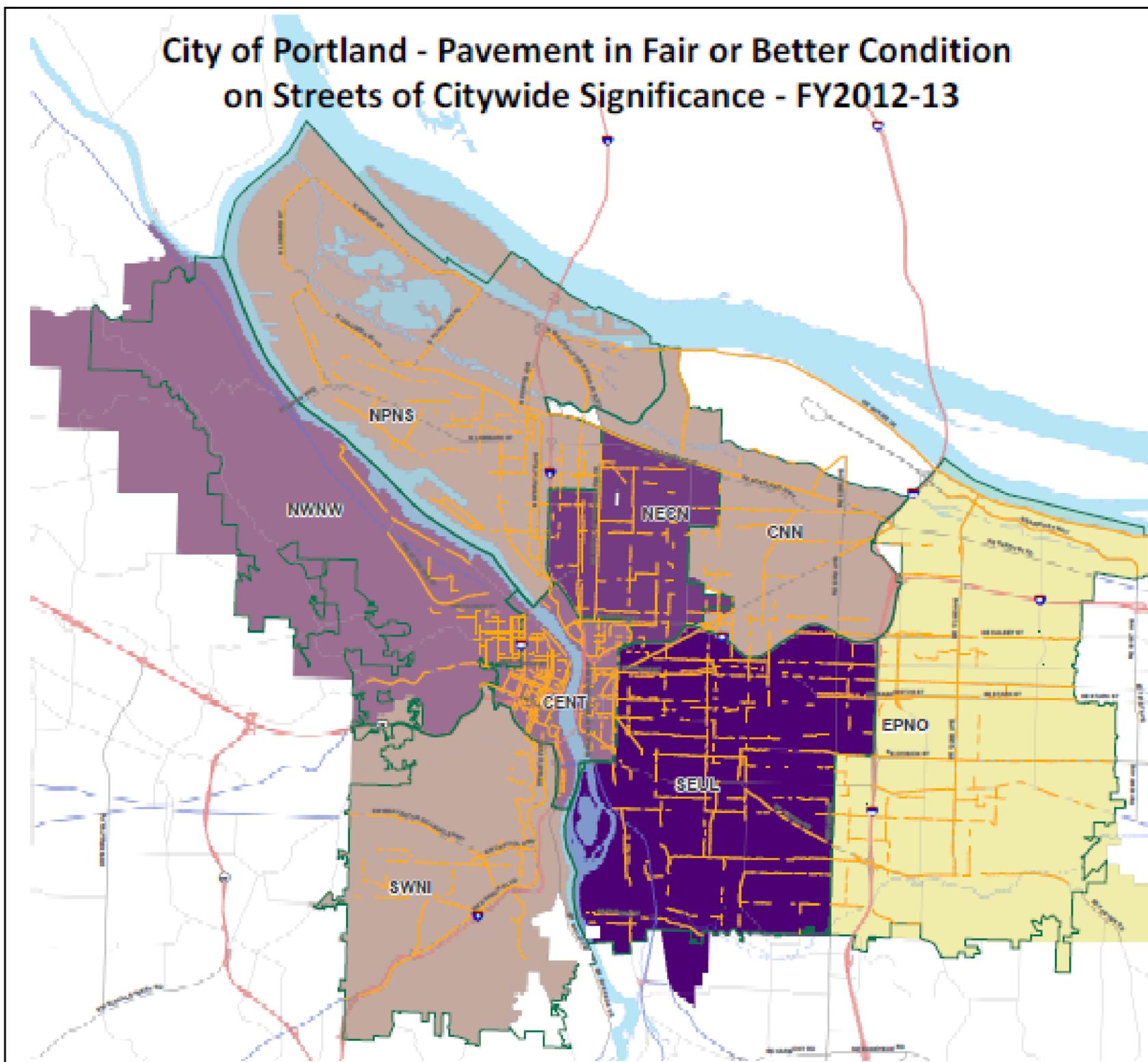
**Map 3** shows Portland's "streets of citywide significance" (SCS). They are 900 miles of major streets (classified as collectors and arterial streets) that carry the heaviest amounts of freight and transit, and the 400 miles of neighborhood greenways on local streets. Streets of citywide significance are travel corridors that PBOT prioritizes to invest due to high traffic volume across all travel modes (freight, transit, motor vehicles, pedestrians and bicycles). Safety is a key element that factors into the SCS designation. PBOT uses this prioritization because City resources do not fully match transportation maintenance needs. PBOT uses SCS streets to prioritize its maintenance operations.

### **How to Read Map 3**

This map highlights the pavement condition of street segments in fair or better condition. This map does not display the condition of local streets or state highways, such as NE/SE 82<sup>nd</sup> Avenue, SE Powell Boulevard, and SW Barbur Boulevard. The percent of SCS streets in each district is calculated from the total amount of SCS streets in each district.

This map groups the data into ONI Coalition Districts. A lower percentage means fewer SCS streets are in fair or better condition. A high percentage means more streets are in fair or better condition. East Portland (EPNO) has the greatest percent of SCS streets in fair or better condition, while Southeast (SEUL) has the lowest percentage.

## City of Portland - Pavement in Fair or Better Condition on Streets of Citywide Significance - FY2012-13



### Bureau Notes

Streets of Citywide Significance (SCS)  
Percentage of SCS Streets in Fair or Better Condition

	SCS Streets	Fair or Better	% Fair or Better
CENT	173	118	68%
CNN	121	91	75%
EPNO	261	215	82%
NECN	118	74	64%
NPNS	230	178	77%
NWNW	81	54	66%
SEUL	288	187	65%
SWNI	113	87	77%
<b>Total</b>	<b>1381</b>	<b>982</b>	<b>71%</b>

(lane miles)

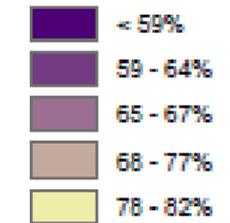
There are approximately 4,900 lane miles of streets within the City. (A lane mile is defined as being one lane wide and one mile long) Approximately 1,900 lane miles are on collectors and arterials which are the "major" streets in Portland (Sandy Blvd., Division, Capitol Hwy, 122nd, Grand, etc.) There are also about 3,000 lane miles of local streets on which most residents live.

Based upon Transportation's current budget, not all streets in the City can be maintained. In 2008, City Council passed an ordinance directing PBOT to discontinue maintenance work (excluding pothole repair) on local streets within the City.

The "Streets of Citywide Significance" (SCS) are made up of almost 900 miles of collector/arterials that carry the heaviest amounts of freight and transit and also the 400 miles of "Neighborhood Greenways" on local streets.

"Streets of Citywide Significance" (SCS) are travel corridors PBOT prioritizes for expenditures due to their high traffic volume across all modes (freight, transit, motor vehicles, pedestrians and bicycles). Safety is a key element that factors into the SCS designation. The prioritization is necessary because the scope of resources needed to maintain transportation infrastructure greatly exceeds resources available. These established priorities guide how Maintenance Operations crews do the work to maintain the infrastructure.

### Percentage of SCS Streets in Fair or Better Condition



### Coalitions

- CENT - Central City
- CNN - Central Northwest Neighborhood
- EPNO - East Portland Neighborhood Office
- NECN - Northwest Coalition of Neighborhoods
- NPNS - North Portland Neighborhood Services
- NWNW - Neighbors West/Northwest
- SEUL - Southwest Uplift Neighborhood Coalition
- SWNI - Southwest Neighbors, Inc.

### SCS Streets - Fair or Better

SCS Streets - Fair or Better Condition

Note:  
The width of the symbol for SCS streets has been exaggerated for visual clarity. It does not represent the actual width of SCS streets.

The information on this map was derived from City of Portland databases. Care was taken in the creation of this map but it is provided "as is". The City of Portland cannot accept any responsibility for use, omission, or positional accuracy and therefore, there are no warranties, which accompany this product. Necessary notification of any errors will be appreciated.



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## Bureau of Transportation Sample Level of Service: Sidewalks on Arterial Streets

**Map 4** shows arterial streets across the City with and without sidewalks, as well as the location of current sidewalk projects.

Portland's sidewalk system is made up of sidewalks, corners, and curbs. The system provides pedestrians with a safe way to access transit, neighborhood shopping facilities, parks and schools. Curbs not only provide the edge for the pedestrian network, but they also channel water to the drainage system, which helps preserve street pavement.

The American with Disabilities Act (ADA) mandates that Transportation upgrade the sidewalk system with accessible corners. Portland Bureau of Transportation schedules construction of these ramps by citizen request, as well as annual programmatic reconstruction of corners. Corners in poor condition or pedestrian access, needing enhancement, receive priority. Sidewalk inspectors identify hazardous corners that need maintenance.

### How big is the sidewalk system?

Sidewalks	Estimated 2,504 miles
Corners	37,782 corners 42% of corners have ramps 8% of corners built since 2005 when detectable warning strips were added
Curbs	Estimated 3,258 miles
Replacement value	Estimated \$1.8 billion

With proper maintenance and renewal, sidewalks and corners last about 40 years and curbs about 60 years. Due to budget reductions, inspections of sidewalks will focus primarily on arterial and connector streets.

The City's ADA Transition Plan aims to build 700 to 1,000 ADA compliant corners each year. ADA compliancy changes over time as new standards are adopted. When these standards change, Transportation changes the building standards to be in compliance. Currently, 8% of corners meet the most current standards, which include detectable warning strips. Forty-two percent of the sidewalk system does have corner ramps, which met the ADA requirements of the day.

At the current funding level, it will take more than 64 years to bring all the corners into compliance. Corners are inspected with sidewalks. It is estimated that 24% of improved corners are in good condition. Improved corners are made of concrete and have a curb.

### Unmet Need

An additional \$235 million is needed to bring the curbs and corners into fair or better condition. Although sidewalks are typically in the public right-of-way and owned by the City, adjacent property owners are financially responsible for constructing and repairing sidewalks. Developers are responsible for building or repairing sidewalks at the time of construction. The unmet need does not include the cost of building sidewalks where none exist.

### Accomplishments

In Fiscal Year 2010-11:

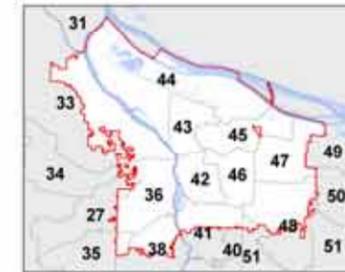
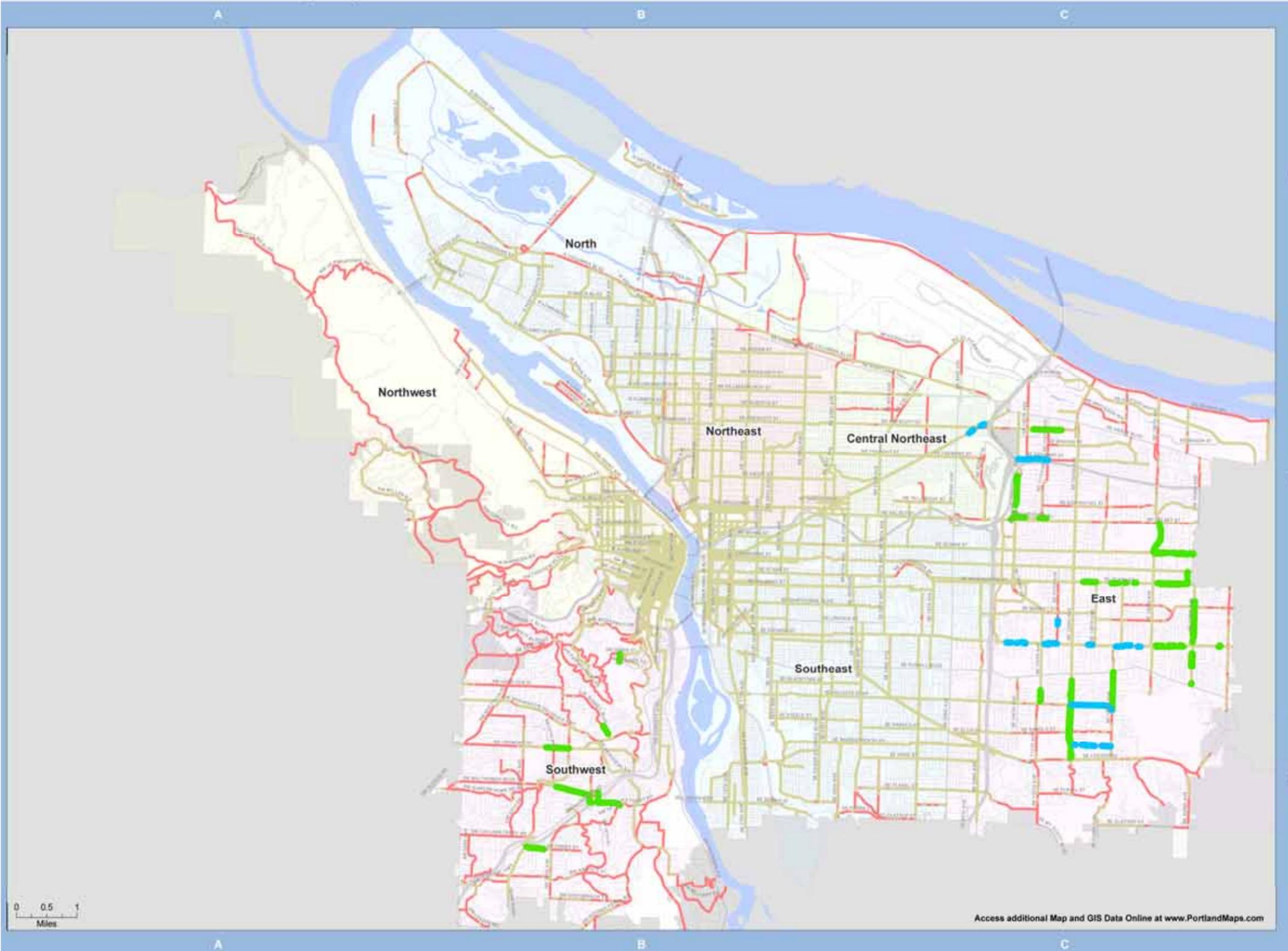
- Transportation's Maintenance Operations crews built 722 ADA compliant corners
- Transportation's Capital Improvement Program built or rebuilt 2.49 miles of sidewalks
- As a result of sidewalk inspection, 593 properties were identified as needing repair (posted), approximately 8.42 miles of sidewalk

### How to Read Map 4

This map shows arterials with sidewalks (gold) and arterials without sidewalks (red). This map does not show information on local streets or most state highways, such as NE/SE 82<sup>nd</sup> Avenue, SE Powell Boulevard, and SW Barbur Boulevard. This map also shows in green and blue the location of current and future funded sidewalk projects.

# Map 4

## Sidewalk Projects on Arterials in Southwest and East Portland & Remaining City-Maintained Arterial Streets with Sidewalks and without Sidewalks



Oregon House Districts

**\$16 Million for Sidewalk Projects  
in Southwest and East Portland  
to be Built in 2012-2013**



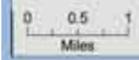
**Sidewalk Projects  
with Other Funding**



**Arterials with Sidewalks**



**Arterials with No Sidewalks**



Access additional Map and GIS Data Online at [www.PortlandMaps.com](http://www.PortlandMaps.com)



March 13, 2012

## **Parks & Recreation Sample Level of Service: Public Parks and Natural Areas Half-Mile Service Areas**

Portland Parks & Recreation (PP&R) manages over 7,500 acres of natural areas and over 3,400 acres of developed parks – about 12 percent of Portland's land base. In addition to developed parks and natural areas, there are five golf courses, nine botanical gardens, an arboretum and a raceway. PP&R also manages over a million square feet of buildings, including 13 swimming pools, 12 community centers, numerous picnic shelters, restrooms and stadiums and one historic mansion. Recreation facilities include 151 miles of trails, 121 playgrounds, 351 sports fields, 35 community gardens and 117 tennis courts. PP&R oversees the City's urban forestry program.

Infrastructure assets in Portland's park system are currently valued at almost \$900 million, and include built and natural assets. This multitude of parklands, recreation facilities, support facilities, trees, and natural areas contribute to access to nature, recreational opportunity, environmental quality, and livability within the city.

A variety of other agencies and organizations provide park and recreation services to Portland residents, either independently or in partnership with PP&R. These include Metro and neighboring jurisdictions, the state of Oregon, public and private schools, non-profit agencies, homeowners' associations, churches, and private social, athletic and fitness clubs.

### **Asset Management**

PP&R collects and compares data on asset condition and customer demand for park use. The data is used to identify capital needs and budgets, develop consistent maintenance and operations regimes, fulfill City and federal reporting requirements, inform system planning, and support financial forecasting. In short, asset management helps prioritize capital projects and allocate scarce resources.

### **Park Experience**

PP&R's 2020 Vision includes a goal to "Provide a wide variety of high quality recreation services and opportunities for all residents." An objective of this goal, and a measure of our level of service, is the ability to "provide a basic, developed Neighborhood Park

facility within a half mile (approximately 10 to 15 minute walk) of every Portland resident". The basic park experience includes developed parks (parks with, at a minimum, grass, trees, circulation, open play areas and seating), and accessible natural areas over 1/6 of an acre in size.

**Map 5** shows the percentage of households that are within 1/2 mile walk of a park or natural area. The 1/2 mile distance is calculated using the walkable street and trail system, so parks in areas with poor transportation circulation systems have smaller service areas and serve fewer people. Along with Portland Parks (developed and undeveloped parks), Map 5 also shows service areas of other public park providers and school service areas.

Typically, the districts with lower levels of service are the more recently annexed parts of the city, where former county parks with fewer amenities were added to the system. PP&R is actively working to improve that level of service. In 2009, the percentage of households within a 1/2 mile walk of a developed park or natural area was 76%; in 2010, it was 77%.

As PP&R works to meet the ½ mile goal, it faces the following challenges:

- Properties with the capacity and characteristics to provide a reasonable park experience are not always available in the areas of greatest need.
- Funds to acquire new park land, which come primarily from Parks SDC's, PDC and bond resources, can only be used to address needs created by population growth, not to remedy deficiencies in levels of service, thereby slowing progress in meeting the goal.

While PP&R is actively working to provide services in areas currently not meeting this level of service goal, we also must maintain and operate the existing parks and open spaces and facilities that currently meet this level of service. Developed parks need to have the grass mowed, trash picked up, and picnic tables maintained. Keeping existing services operational is as important as expanding the system. The expense map reflects all PP&R expenses.

Map 5

