

PORTLAND PLAN

Human Health and Safety



PORTLAND PLAN BACKGROUND REPORT FALL 2009

**Planning and Sustainability Commission
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EXECUTIVE SUMMARY

This report characterizes a wide range of health issues as part of the City of Portland's comprehensive planning efforts. The report summarizes what is currently known about Portland's health and safety, describes conclusions from national studies about the relationship between health and community design and presents potential policy options the City could explore to support health.

Planners are rediscovering the intersection between health and good community design and the impact that planners and decision makers can have on public health. Where we put our homes, businesses, places of play, transportation systems and natural areas directly affects how much physical activity we get, how much healthy food we eat, whether we get sick from poor air and water quality and whether we feel safe and connected to our communities. If the built environment influences health, then the decisions planners make for the future of a community also have health impacts on that community.

The Portland Plan presents an opportunity to be more clearly outline the positive impacts municipal planning can have on individual and community health and how we may consider further health impacts as we plan for the next several decades. This report is intended to contribute to public conversation around health as a planning issue and to allow fuller consideration of policy choices and investment priorities.

KEY FINDINGS AND RECOMMENDATIONS

1. Portlanders face rising rates of obesity, diabetes, chronic disease, cancer and asthma and exceed nationwide targets for these conditions. These health outcomes can affect the city's communities disproportionately.

Portland's rising rates of obesity, diabetes, chronic disease, cancer and asthma represent some of our greatest health challenges. Although rates in the city are generally on par or better than rates in surrounding counties and the nation as a whole, they are well above national targets – and they are continuing to rise.

Studies have confirmed that individuals and communities with lower incomes, educational attainment and status tend to have poorer health and shorter life spans than those with higher incomes and wealth. Portland has areas of concentrated poverty and lower educational attainment, which indicates the potential for geographic concentrations of communities that have higher risks for poor health outcomes. In fact, evidence indicates that some health outcomes (e.g., asthma) and behaviors (e.g., amount of physical activity) do vary in different areas and communities throughout the city.¹

Adequately addressing these health challenges will require the continuation and strengthening of a broad array of policies related to transportation, land use, physical activity, food access, health care and environmental quality. Additional policies related to economic development, housing standards and education policy also can work to reduce health disparities.

¹ Podobnik, Bruce, "Portland Neighborhood Survey: Report on Asthma Rates in Northeast, Southwest, and West Portland." Lewis and Clark College, May 23, 2002. Accessed on January 2, 2009 at <http://www.lclark.edu/~podobnik/asthma02.pdf>.
(Add additional citations)

2. A number of the City's goals and policies work to promote and protect the health of Portlanders. However, the City of Portland should make health an explicit planning goal.

The City of Portland's current Comprehensive Plan includes a broad range of policies that work to promote health. The City's coordinated land use and transportation, housing, economic development, environmental and public safety policies create a strong foundation for protecting and promoting health in the community. In the pursuit of these goals, many steps Portland has taken have also supported community health. For example, the city's extensive network of bike lanes and pedestrian paths, commitment to walkable, mixed-use neighborhoods and strong transit system all are in line with the recommendations coming out of recent research on community health promotion. However, Portland has a long way to go to ensure that the benefits of a healthy community extend to all of its residents, and to ensure that negative health burdens are minimized for our most vulnerable populations.

The City of Portland can influence community health by considering it during the planning process and by supporting policies, programs and investment priorities that will help improve health determinants and encourage healthy behavior choices. Specifically, the Bureau of Planning and Sustainability can focus efforts on directing urban development in a manner that supports community health and economic, educational and social equity. A planning goal describing the City's commitment to health would further integrate health in the City's comprehensive planning framework.

The City also should infuse health and people into the language of existing comprehensive planning goals and policies. The City of Portland's current Comprehensive Plan includes a broad range of policies that work to promote health. However, the language of many of these policies does not refer to people or human health. Refocusing the language of these policies to highlight their intended impacts on health would reestablish their foundational purpose: to protect and improve the lives and health of all Portlanders.

To better integrate consideration of public health into planning decisions, the City should establish partnerships and policies that support collaboration between local health officials, the community and planners in creating planning policy and priorities. Partnerships should extend to improve the tracking of health information, the development and modeling of best practices and the incorporation of health impact assessments into planning processes.

Without health as a planning lens, future decisions made through the Portland Plan could cause unintended consequences that would undermine our community's physical and mental health. In addition, careful planning could ameliorate some local health disparities. The City of Portland should explicitly consider health when making planning and investment decisions so that the resulting physical environment makes healthy choices easy.

3. To effectively combat rising rates of obesity, diabetes and chronic disease, Portlanders must have convenient and safe access to healthy foods, walking and bicycling networks and recreational opportunities.

Full-service grocery stores, pedestrian and bicycle networks, parks, recreation facilities and natural areas are not evenly distributed in Portland.

Access to Healthy Foods

People with easy access to healthful foods, and limited access to unhealthful foods, tend to eat more fruits and vegetables and have improved nutrition and overall health. In general, Portland is rich in food outlets, with strong networks of grocery stores, farmers' markets and community-supported agriculture (CSAs) providing multiple places to procure healthful, local and organic food. However, some areas of Portland are underserved by full-service grocery stores and farmers markets; many of these areas have relatively high concentrations of poverty and demand for food assistance services continues to rise. The City of Portland should encourage expanded access to healthy foods by planning for new food outlets, creating supportive regulatory environments for healthful food and agriculture and incorporating food access and urban agriculture into community design.

Access to Walking and Biking Networks

Many Portland residents do not get adequate daily exercise. In fact, less than half of people at a healthy weight exercise the recommended amount. To ensure opportunities for active living and physical activity, the City must continue to (1) pursue coordinated land use and transportation systems that put people within walking and biking distance of the destinations and services they need, (2) continue to improve pedestrian and bicycle networks and (3) address safety issues. While Portland's bike network has improved extensively over the past 20 years, there are still areas of the city where bike infrastructure is poor and cycling rates are low. The pedestrian environment has notable strengths, especially in inner neighborhoods and downtown, but it is limited in East and Southwest Portland by a disconnected sidewalk network.

Access to Parks, Recreation and Natural Areas

Recreational opportunities in Portland are numerous and diverse. However, some parts of the city have fewer options for active recreation than others, and gaps exist throughout the city for different recreational opportunities. Only half of all City residents live within a half mile of a developed park. Significant areas of the city have limited walkable access to natural areas, and some areas lack play areas, aquatic facilities and other recreation facilities. The City of Portland and its partners must ensure equitable distribution of and access to recreational opportunities such as parks, natural areas, recreation centers and programs, trails and gardens.

4. To address high rates of cancer and asthma, the City must continue to work to improve the quality of its air and water.

Pollutants commonly found in the Portland's air and surface waters have been linked to increased risk of cancer, respiratory disease and asthma.

Outdoor Air Quality

In general, Portland's air quality has improved over the past five years. However, Portland still faces problems with toxic air pollutants, particularly in areas close to freeways. The city's benzene levels are rising and are eight times higher than national ambient air quality standards. These high levels of benzene and other pollutants associated with motor vehicles translate into high relative cancer risks, particularly in North and Northeast Portland, downtown and areas along highways. Negative

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health impacts could be further concentrated by the city's land use policies that cluster high-density development near transportation corridors. The areas that have the poorest air quality also have a high proportion of low-income and ethnic/racial minorities, a fact that raises potential equity issues. The City of Portland should continue to work to improve outdoor air quality through coordinated land use and transportation systems, development of alternative transportation networks, and separation of industrial uses.

Indoor Air Quality

On average, people spend about 90 percent of their time indoors, putting them at risk of exposure to pollutants found in indoor air. Examples include radon, environmental tobacco smoke, biological contaminants, combustion-related pollutants and pesticides. These pollutants have known health impacts such as higher risks for respiratory irritation, asthma and cancer. The City of Portland can work to address certain indoor pollutants through building codes and standards that regulate building materials and construction; through programs that encourage testing and remediation for pollutants such as radon, lead and asbestos; and through awareness and education programs about the importance of personal choices.

Surface Water Quality

Water quality in the Willamette River and the Columbia Slough has shown significant improvements (from "poor" to "fair") in the past five years, in part because of reductions in combined sewer overflows (CSOs). However, people who swim, boat or fish in some local waters face real health risks from water quality problems associated with the remaining combined sewer overflows, non-point source pollution, historical pollution and the impacts of upstream activities. Continued improvements to address combined sewer overflows and clean up the Portland Harbor Superfund Site will significantly improve the health of our major rivers. To further improve the quality of the City's rivers and streams, additional efforts will be needed to reduce, control and treat non-point source pollution and emerging pollutants.

Drinking Water

Portland's drinking water currently meets or exceeds the existing stringent water quality standards set by the federal Safe Drinking Water Act – mainly because Portland has a protected drinking water source. However, at least two issues related to drinking water remain. First, the City may be required to make substantial capital improvements to its water system in order to comply with new federal rules intended to reduce the risks of illness from *Cryptosporidium*. Second, fluoride is not naturally found in Portland's drinking water. The Portland Water Bureau does not add fluoride to the city's water, although this practice is recommended by the U.S. Public Health Service to prevent tooth decay.

5. To protect the health of Portlanders, the City should preserve and improve residents' access to medical care and continue efforts to prepare for emergencies.

Not all Portlanders have sufficient access to preventive or emergency care. This may limit their ability to receive adequate health care when needed. Portland has seen an increase in the number of emergency medical incidents over the past ten years. Response times for fire and medical emergencies exceed targets in many parts of the city.

Access to Health Care

Not all Portlanders have equitable access to health care. However, because the City of Portland does not directly provide health care to its citizens, the City's ability to affect health care access is limited. Additionally, many of the factors affecting access to health care are beyond the scope of this assessment and are tied to a number of other socioeconomic, equity and cultural issues. Regardless, the issue of equitable access to health care deeply affects residents' quality of life and cannot be ignored. The City can work to address larger socioeconomic issues that affect health care access and collaborate with private and public providers—particularly Multnomah County—to ensure that health care facilities are appropriately and equitably sited and served by transportation infrastructure. Further conversations with health care providers and stakeholders should shape the City's work in this area.

Fire and Medical Response

During fiscal year 2007-2008, Portland Fire and Rescue responded to a record number of incidents—more than 65,700. Two-thirds of these were medical emergencies, and 3 percent were fire incidents. This represents the lowest number of fire incidents in 50 years. Over the last 10 years, the number of fire incidents has declined 22 percent, while the number of medical incidents has increased 40 percent.

The City of Portland continues to face challenges in meeting its fire and emergency response time goals. In 2007, the most recent year available, the response time for both fire and medical emergency calls was more than a minute longer than the Bureau's target time.

Crime

In general, residents' safety and their perception of safety have improved over the past decade.² Since 1998, Portland's crime rate has declined 51 percent for person crimes and 28 percent for property crimes. In 2008, most residents felt safe walking alone in their neighborhoods during the day, and more than half of residents felt safe walking alone in their neighborhoods at night. Residents in East Portland neighborhoods tend to have higher crime rates and perceptions of fear than other areas of the city.

Emergency Preparedness

Natural hazards such as severe weather, landslides, flooding, wildfires and earthquakes pose a real threat to the safety of Portland residents. Safeguarding people and the environment from natural disasters requires a coordinated and collaborative community partnership. Identifying, planning for and mitigating natural hazards to permanently reduce or alleviate losses of life and property will require a range of strategies including planning, policy changes, projects and improving public awareness. These activities are the responsibility of individuals, private businesses and industries, as well as local, state and federal governments.

² City of Portland Auditor's Office, "Service Efforts and Accomplishments, 2008-2009."

RESOURCES

COMMONLY USED TERMS

Behavioral Risk Factor Surveillance System (BRFSS) – The Behavioral Risk Factor Surveillance System (BRFSS) is a telephone questionnaire initially developed by the CDC in the early 1980s to collect state-level data to monitor state-level prevalence of the major behavioral risks among adults associated with premature morbidity and mortality such as cigarette smoking and inactivity.

Chronic disease – Chronic disease describes a health condition that occurs over a long period of time, e.g., several weeks, months or years.

Health determinant – A physical, social or environmental condition that impacts an individual's health either directly or indirectly by affecting behavior.

Health disparity – A health disparity indicates the difference in the incidence, prevalence, mortality and burden of diseases and other adverse health conditions that exist among specific population groups.

Health equity – All persons have fair opportunities to attain their full health potential, to the extent possible.

Health inequities – Health disparities that result from a variety of social factors such as income inequality, economic forces, educational quality, environmental conditions and access to health care.

Health outcome – Changes in health status (mortality and morbidity) which result from the provision of health (or other) services, exposure to health determinants or other causes.

Healthy People 2010 (HP 2010) – A program of the Department of Health and Human Services, *HP 2010* is a nationwide health promotion and disease prevention agenda. Its primary goals are to increase the quality and years of life and to minimize health disparities among Americans. This set of 467 10-year objectives in 28 health target areas was published in 2000 with input from hundreds of organizations and agencies around the country.

Socio-economic status (SES) – A description of a person's societal status using factors or measurements such as income levels, relationship to the national poverty line, educational achievement, neighborhood of residence or home ownership. This combination of social and economic factors is often used as an indicator of household income and/or opportunity.

visionPDX – A two-year community visioning process carried out by the City of Portland adopted in 2007. Over 17,000 Portlanders were involved in the process; the rich data collected from the public provides important community perspectives on a wide range of topics.

ACRONYMS

CAA – Clean Air Act

CWA – Clean Water Act

EPA – Environmental Protection Agency

DEQ, ODEQ – Oregon Department of Environmental Quality

CDC – Centers for Disease Control and Prevention

NAAQS – National Ambient Air Quality Standards

NATA – National Air Toxics Assessment

PATA – Portland Air Toxics Assessment

City of Portland Bureaus:

BES – Bureau of Environmental Services

BPS – Bureau of Planning and Sustainability

PBOT – Portland Bureau of Transportation

PF&R – Portland Fire and Rescue

PP&R – Portland Parks and Recreation

PWB – Portland Water Bureau

KEY REFERENCES

Local

Community Health Assessment Quarterly (<http://www.co.multnomah.or.us/health/hra/haq.shtml>)

This short newsletter, published three times yearly, focuses on one public health topic using Multnomah County-specific data. Several are relevant for planning concerns.

The Environmental Health of Multnomah County, 2003 (<http://www.mchealth.org/enviroreport>)

Though somewhat dated, this thorough report pulls together much data relevant for land use planning, including air and water quality, solid and hazardous waste, food safety, vector-borne disease and more.

Everyone Matters: A Practical Guide to Building Community for All Ages: Report of the Multnomah County Task Force on Vital Aging (2008) (<http://www.portlandonline.com/fish/index.cfm?a=238786&c=47690>)

Providing statistics, trends and recommendations, this report focuses on strategies for successfully employing and engaging older adults.

The Health of Multnomah County (http://www.co.multnomah.or.us/health/hra/health_mc.shtml)

This report provides summary data on the health of Multnomah County residents, including obesity, physical activity, substance abuse, communicable diseases, causes of death and more. No section of the report is older than 2004 and many are more recent.

A Healthy, Active Oregon: Statewide Physical Activity and Nutrition Plan, 2007-2012
(http://www.oregon.gov/DHS/ph/pan/docs/PAN_rpt_07.pdf)

Prepared by the Nutrition Council of Oregon and the Oregon Coalition for Promoting Physical Activity, this statewide plan lays out Oregon's current status around everything from breastfeeding to physical activity and offers a set of goals, objectives and strategies for the state to implement. Includes various planning-related recommendations.

Oregon Asthma Surveillance Report June 2007 (<http://www.oregon.gov/DHS/ph/asthma/docs/report.pdf>)

Report summarizing incidence of asthma in Oregon, with county-level data.

Promoting Physical Activity and Healthy Eating Among Oregon's Children: A Report to the Oregon Health Policy Commission, January 2007. (http://www.oregon.gov/DHS/ph/pan/docs/Child_obesity_Rpt.pdf)

See in particular recommendations on land use planning and transportation, as well as parks and recreation.

Racial and Ethnic Health Disparities in Multnomah County: 1990-2004
http://www.co.multnomah.or.us/health/hra/reports/health_disparities_2006.pdf

Report card on Racial and Ethnic Health Disparities March 2008
(<http://www.co.multnomah.or.us/health/hra/reports/reportcard.pdf>)

Reporting on health disparities in 17 indicators across race/ethnicity: 10 mortality indicators, four pregnancy and birth indicators and three infectious disease indicators. In the 2006 report, health disparities were found for 11 of the indicators, with African Americans faring worse when compared to non-Hispanic whites than any other group. The good news: things seem to be improving over time for most groups.

Regional Equity Atlas: Metropolitan Portland's Geography of Opportunity (<http://www.equityatlas.org>)

The Coalition for a Livable Future's report and interactive website has detailed maps and analysis on many equity and access indicators. Some specific Portland information is available from CLF directly; report focuses largely on region as a whole.

The World Health Organization's Age-Friendly Cities Project in Portland, Oregon: Summary of Findings (http://www.pdx.edu/media/i/o/foa_who_summaryoffindings.pdf)

Report on age-friendly elements of Portland, as well as barriers to age-friendliness, gathered from a series of focus groups with older adults, caregivers and service providers. Full report is also available.

National

HDMT: Healthy Development Measurement Tool (<http://www.thehdmt.org>)

This tool is a comprehensive measurement tool for development projects which includes a set of 122 baseline community indicators for San Francisco in 28 objectives, corresponding targets for developments and a well-referenced set of health impacts for each area of consideration. Existing policies in SF and policy/design strategies are also linked to each topic.)

How to Create and Implement Healthy General Plans: A toolkit for building healthy, vibrant communities through land use policy change (2008) (http://www.healthypartners.org/toolkit_healthygp.html)

This toolkit covers everything from how to assess existing health conditions to writing a healthy general plan to implementing the plan with appropriate zoning and local plans. This extensive report includes many relevant additional resources and examples and model health language for a health element in a general plan.

Integrating Planning and Public Health: Tools and Strategies to Create Healthy Places (2006)
(Marya Morris, General Editor. PAS Report Number 539/540)

The Planning Advisory Service Report was released by the American Planning Association. The report makes the case for planning and health practitioners to work together, outlines health impacts on multiple planning topics and explores tools for planning and public health collaboration.

Life and Death from Unnatural Causes: Health and Social Inequity in Alameda County
(http://www.acphd.org/AXBYCZ/Admin/DataReports/00_2008_full_report.pdf)

This 166-page report examines the health of Alameda County from an equity perspective, reporting on detailed health information and its relationship to various socioeconomic factors. The document provides an excellent model for exploring health inequities and policy solutions.

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Why Place Matters: Building a Movement for Health Communities (PolicyLink)
(http://www.policylink.org/documents/WhyPlaceMattersreport_web.pdf)

Looking from an equity perspective, this report details economic, physical, social and service factors impacting individual and community health, and provides a series of case studies and examples demonstrating positive responses to these challenges.

USEFUL LINKS

Local

Multnomah County Health Department (<http://www.mchealth.org>)

The Multnomah County Health Department is the public health agency for the City of Portland. In partnership with the communities it serves, the Multnomah County Health Department assures, promotes and protects the health of the people of Multnomah County.

Oregon Department of Environmental Quality (<http://www.deq.state.or.us>)

The Oregon Department of Environmental Quality (DEQ) is a regulatory agency whose job is to protect the quality of Oregon's environment.

National³

Centers for Disease Control (CDC) (<http://www.cdc.gov>)

The CDC is a national public health agency is been dedicated to protecting health and promoting quality of life through the prevention and control of disease, injury, and disability. The mission of the CDC is to collaborate to create the expertise, information, and tools that people and communities need to protect their health – through health promotion, prevention of disease, injury and disability and preparedness for new health threats.

Active Living by Design (www.activelivingbydesign.org)

Active Living by Design is a national program sponsored by the Robert Wood Johnson Foundation and the University of North Carolina at Chapel Hill School of Public Health. The website contains useful statistics and case studies on efforts to promote physical activity via environmental changes.

Active Living Research (www.activelivingresearch.org)

Active Living Research is national program sponsored by the Robert Wood Johnson Foundation that supports research to examine how environments and policies influence active living for children and their families. The website includes an online research database and policy-related case studies.

Design for Health (www.designforhealth.net)

³ Many of the following links and descriptions come from Public Health Law & Policy's "How to Create and Implement Healthy General Plans: A toolkit for building healthy, vibrant communities through land use policy change." (2008)

Design for Health is a collaboration between the University of Minnesota and Blue Cross and Blue Shield of Minnesota aiming to connect local governments with new research into the health influences of built environments. The website includes a technical assistance library, fact sheets and case studies.

National Association of City and County Health Officials (NACCHO)
www.naccho.org/topics/hpdp/Land_Use_Planning.cfm

The National Association of City and County Health Officials (NACCHO) has a “Community Design and Land Use Program” web portal, which includes fact sheets, profiles, a flowchart for collaboration between planners and health departments, a planning/health jargon glossary and other resources.

PolicyLink (www.policylink.org)

PolicyLink is a national research and action institute advancing economic and social equity. PolicyLink has published numerous reports on the topic of Health in Communities.

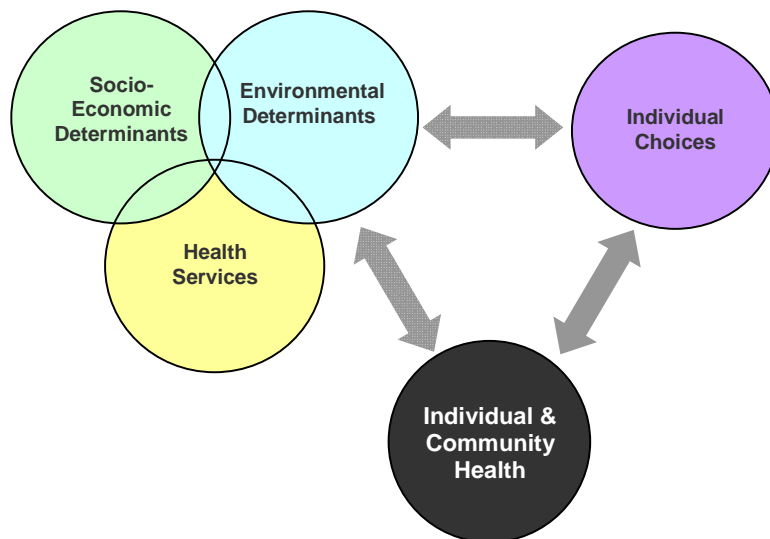
CHAPTER 1: INTRODUCTION

A healthy city is a place where residents can socialize with friends and neighbors; safely walk and bike; purchase healthy food; breathe clean air; and help make decisions that improve their community. Many of Portland’s current land use and transportation plans already help make Portland as a healthy place to live in many ways. Current efforts to amend the City’s comprehensive plan represent an opportunity to be more direct about the positive impact that these plans have on individual and community health and allow us to consider further health impacts as we plan for the next several decades.

HEALTH DETERMINANTS

Though much of the national debate on health focuses on affordable, accessible health care, lack of access to medical care is in fact a relatively small cause (10-15%) of early disease and death in the United States.⁴ Instead, health is increasingly seen as a complex interaction between genetics, behaviors, physical and environmental conditions and social conditions like education level and income.

Figure 1.1: Interconnections among health determinants, behaviors and outcomes



These physical, environmental, and social conditions, called “health determinants,” shape an individual’s behaviors and choices as well as the health outcomes of that individual. Collectively, health determinants can influence the health of entire communities. Figure 1.1 illustrates these connections.

Health determinants can impact health outcomes directly or indirectly by causing changes in behavior. For example, the health of a person living in a community with high crime (the health determinant) can be directly impacted through greater risk of injury (health outcome) if the person herself becomes a victim of a crime. That

same social determinant, high crime levels, can also cause the individual to avoid walking outside (a change in individual behavior), reducing the amount of exercise she gets, which can also impact her health (indirect impact).

Many Portlanders recognize that for residents to be healthy, they need to live in communities that provide opportunity to be active, breathe clean air and access healthy goods and services such as healthy food, transit and social services. In visionPDX, an extensive public engagement effort that involved over 17,000 Portlanders, residents clearly expressed the link between community health

⁴ Bay Area Regional Health Inequities Initiative, “Health Inequities in the Bay Area,” 2008.

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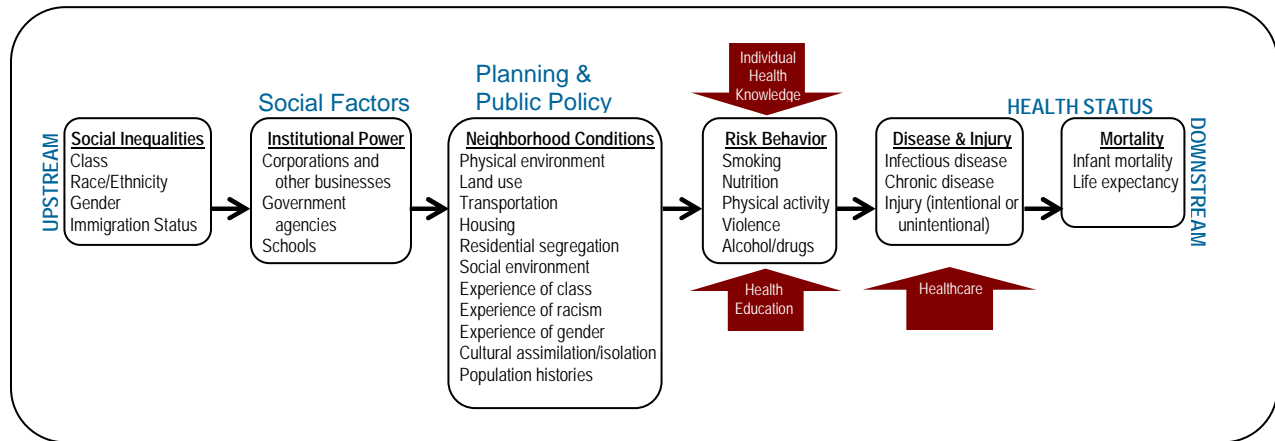
and the smart growth policies Portland has pioneered. They believe people living in communities with access to healthful foods and quality healthcare, destinations that are easy to walk or bike to, parks and trails in good repair and good access to transit find it easier to eat better and exercise more. Likewise, they expressed the idea that people who live in communities without these elements or with unsafe conditions that discourage interaction have fewer healthy options.

Where a person lives and works determines his exposure to poor air or water quality, unsafe transportation options and crime, which can directly and indirectly affect health outcomes. Some visionPDX respondents noted that they experience the impacts of pollution on a daily basis because they live near sources of pollution and suffer from asthma or other health complications as a result of pollution. They are concerned that many Portlanders lack access to “healthy infrastructure” that characterizes the inner neighborhoods, including access to bike and pedestrian paths; high-quality, organic produce and opportunities for exercise and physical activity.⁵ Some situations may lead to particularly acute impacts: for example, communities of concentrated poverty are often affected to a greater degree due to limited social or community supports and higher rates of exposure to negative impacts like crime and pollution.

Much of the health dialogue in the United States centers on individual behaviors, health education and disease prevention (“downstream” approaches). However, lately there has been more attention on the systemic causes and impacts of the upstream factors that play into health, such as the built environments that are created by land use, transportation, natural resources, and public facilities planning and policy making. Figure 1.2, below, explores the connections among both downstream and upstream characteristics or experiences that impact health. Planning and public policy decisions – particularly those related to land use, transportation, housing, and the environment – primarily impact upstream physical and environmental health determinants. We should create a physical environment that is conducive to health – an environment that makes the healthy choice the easy choice.

⁵ visionPDX, “Voices from the Community: the visionPDX Input Report,” now available at <http://www.visionpdx.com/reading/inputsummary/index2.html>. The summary provided here comes from the health chapter unless otherwise indicated.

Figure 1.2: Upstream and Downstream Health Determinants



THE LINK BETWEEN PLANNING AND HEALTH

The built environment created and managed by local land use and transportation plans impacts human health in a number of ways. There is sufficient evidence today that links built environment characteristics such as land use mix, transportation systems, housing patterns and natural areas to health behaviors such as physical activity and healthy eating, health impacts from poor air and water quality, and health determinants such as safety, social cohesion and mental health for people of all ages, incomes and abilities.

Planners generally do not consider their impacts on individual or community health as a matter of course. However, the planning profession got its start in addressing public health concerns at the end of the 19th Century. When city planners and health officials worked together to create land use and zoning patterns to protect residents from industrial pollution and unsanitary conditions. New laws required access to fresh air and sunshine, even in dense urban neighborhoods, while making sure buildings and sewage systems met certain standards for livability. Separating land uses resulted in dramatic improvements in infectious disease rates and in safer and more sanitary home and work environments.

Over the 20th Century, land use and transportation policies implemented to protect the public's health created disconnected communities, contributed to sprawl and presented many barriers to maintaining a healthy lifestyle. People's place of residence became divorced from where they worked and played. The mid-century rise of the automobile as the dominant mode of transportation facilitated the relocation of people away from the urban center to further and further suburbs. These trends have collectively resulted in greater automobile dependence, increasingly sedentary lifestyles, increased emissions, loss of natural habitat and increasing air and water pollution, as well as countless other effects that contribute greatly to our current health burdens.

Today, people are rediscovering the intersection between health and good community design and the impact that planners and decision-makers can have on public health. Where we put our homes, businesses and places of play, our transportation systems and natural areas directly impacts how much physical activity we get or how much healthy food we eat, whether we get sick from poor air and water quality, or whether we feel safe and connected to our communities. If the built

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environment impacts health, then the decisions planners make for the future of a community will also have health impacts on that community.

Portland has not previously considered health explicitly in its comprehensive plan. However, in the pursuit of other goals, many steps Portland has taken have also supported community health. Our extensive network of bike lanes and pedestrian paths our commitment to walkable, mixed-use neighborhoods and our strong transit system are all in line with the recommendations coming out of newer research on community health promotion. However, we have a long way to go to ensure that the benefits of a healthy community extend to all Portland residents, and to ensure that negative health burdens are minimized for our most vulnerable populations.

ACHIEVING A HEALTHY PORTLAND PLAN

Over the next three years, the Bureau of Planning and Sustainability is combining and updating the City's 1980 Comprehensive Plan and the 1988 Central City Plan in the Portland Plan. The Portland Plan is an inclusive, citywide effort to guide the physical, economic, social, cultural and environmental development of Portland over the next 30 years. The plan builds on the work the community did through visionPDX, which captured and fleshed out our shared values of sustainability, equity and accessibility, community connectedness and distinctiveness.

The City of Portland can promote community health and remove barriers to better health through the consideration of health during the planning process and through support of policies, programs and investment priorities conducive to improving health determinants and encouraging healthy behavior choices. Specifically, the Bureau of Planning and Sustainability can focus efforts for the Portland Plan to directly address urban development in a manner supportive of community health and by planning our city to promote economic, educational and social equity.

Without using health as a planning lens, future decisions made through the Portland Plan may cause unintended consequences that work counter to our community's physical and mental health. For example, efforts to increase residential density along major arterials, while encouraging easy access to services and transit, could expose more residents to air pollution from automobile exhaust resulting in increased health risks for asthma and cancer. The health lens can also bring to light disparities in health outcomes for communities that differ in geography, ethnicity and income throughout Portland so that planners can better address these disparities.

Many of the issues under consideration in the Portland Plan – housing, economic development, urban form, infrastructure, the environment – have significant overlaps with health and safety. For example, research shows that income and education affect people's health. Therefore, policies that support jobs, financial stability and quality education impact their health as well. As this document illustrates, the quality of our homes, our air and water, our economy, our roads and our neighborhoods can have profound effects on our health.

The values brought forward from visionPDX – sustainability, equity and accessibility, and community connectedness – likewise impact how we might choose to address or improve our communities. Through visionPDX, Portlanders expressed support for a variety of government actions that would further community health including:

- Protecting the natural environment;

- Reducing the presence of toxins in public places;
- Providing access to parks, walking trails, biking trails and other places where community members can exercise for free;
- Regulating the food supply to keep harmful substances out of people’s diets; and
- Supporting alternate modes of transportation, thereby reducing dependence on automobiles.

These ideas, and the others described in this report, are only a start. This document begins to describe the multitude of policy choices we are making or could make to improve the health of Portlanders. The public conversations to follow the background research phase will be particularly focused to consider these issues, and potential policies to address them, together.

ABOUT THIS DOCUMENT

This is an existing conditions report on community health and safety designed to inform the Portland Plan process. It includes a summary of what is currently known about Portland’s health and safety, conclusions from national studies about the impact and intersections between health and community design and some ideas for potential policy options the City could explore to support health.

Most sections are presented as follows:

Table 1.1: Section Organization

Section Header	Information Covered	Example topic: Physical Activity
The Issue?	What do we know about a particular issue and its relationship to health outcomes?	What do we know about how physical activity impacts health? What have studies shown in terms of how the built environment impacts how much exercise people get?
Local Conditions	What data has been collected in Portland or Multnomah County on the topic?	How much exercise do local residents get? What does our sidewalk network look like? How safe and connected are our streets?
Conclusions	Given the above two topics, what can we say about this issue in Portland? Where are there gaps in information? What key findings and opportunities exist?	Examples (not an actual conclusion): “We don’t have enough data to understand the local conditions.” OR “While we understand that physical activity and sidewalk networks are related, the sidewalk network in an area is fairly complete, and so additional interventions to better the sidewalk network are not needed.”
Policy Choices	Examples of how other municipalities have addressed this topic, or example policies that have been proposed elsewhere.	“Shasta County, CA has developed a walkability checklist which they have used to...” “Pedestrian Master Plans have been adopted in such many municipalities, including Alameda County, CA and San Diego...”

The data used is pre-existing; no new data has been collected to create this report. As part of the research, however, the authors identify gaps in current data collected and avoid drawing conclusions when data is not conclusive. Sources include multiple City of Portland bureaus, the Multnomah County Health Department, and the Centers for Disease Control’s Behavioral Risk Factor Surveillance System (BRFSS), among many others. We cannot guarantee the quality of the

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data, and cannot provide an in-depth analysis of data limitations, though we will attempt to point out gaps in data that might be needed to make stronger policy decisions.

Where possible, the report compares Portland or Multnomah County data with that of surrounding counties, the state as a whole or national averages. It compares current performance with past data to provide a longitudinal perspective. A more relevant comparison, however, might link current trends with where we want to be. For this perspective, we turn to the Healthy People 2010 objectives. This set of 467 10-year objectives in 28 health target areas was published by the U.S. Department of Health and Human Services with input from hundreds of organizations and agencies around the country, and compare data with Healthy People 2010 indicators where possible.

CHAPTER 2: HEALTH OUTCOMES

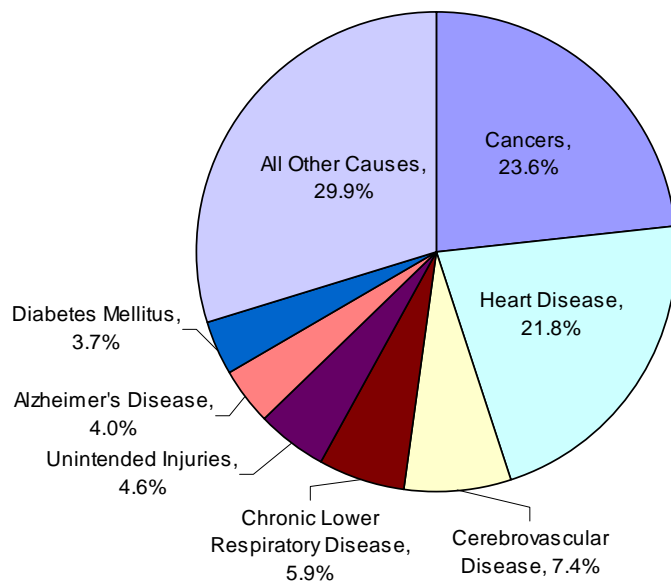
INTRODUCTION

Before determining which policy choices are appropriate for the City of Portland, it is important to document our community’s current health. The conditions and diseases explored in this section are leading causes of death in Oregon themselves, or are ones that contribute to diseases that are, known to be linked to environmental causes. A condition’s inclusion in the chapter does not necessarily mean that it is a major concern locally; rather, the exercise of researching the data and comparing to established goals or other data will determine which are of most concern for Multnomah County or the City of Portland.

LEADING CAUSES OF DEATH IN OREGON

The leading causes of death in Oregon for 2005 (the latest year for which complete information has been released) are displayed in Figure 2.1. The top causes of death are cancer and heart disease, with cerebrovascular disease (includes stroke, lack of oxygen to the brain because of damage to blood vessels), chronic lower respiratory disease and unintended injuries next on the list.

Figure 2.1 Leading Causes of Death in Oregon, All Ages, 2005^{6,7}



However, when the same information is broken into age groups, the statistics can appear quite different (see Table 2.1). Because of higher numbers of older adult deaths, the causes of death in the upper age groups tend to be those that show up as the top causes of death in the state.

For children and younger adults, death by unintentional injuries are ranked much higher, as are drug-induced deaths.

⁶ Oregon Public Health Division, Vital Statistics - Death Records, 2005

⁷ Existing data may under-count minority populations, in particular members of the Native American community.

Table 2.1: Top 5 Leading Causes of Death in Oregon by Age Group, 2005⁸

Rank	Ages 0-14	Ages 15-34	Ages 35-64	Ages 65+
1	Perinatal Conditions	Unintentional Injuries*	Cancer	Heart Disease
2	Congenital Malformations	Suicide	Heart Disease	Cancer
3	Unintentional Injuries*	Drug-Induced	Unintentional Injuries*	Cerebrovascular Disease
4	Sudden Infant Death Syndrome	Cancer	Alcohol-induced	Chronic Lower Respiratory Disease
5	Injuries of Undetermined Intent	Homicide	Drug-Induced	Alzheimer's Disease

*Unintentional Injuries includes motor vehicle and other transport accidents, falls, firearms, drowning, poisoning and exposure to smoke and fire.

OBESITY AND OVERWEIGHT

The Issue

The potential health impacts of overweight and obesity have become increasingly clear in recent years. Multnomah County's Community Health Assessment Quarterly summarized potential impacts in its recent examination of overweight and obesity:

Individuals who are overweight or obese are at increased risk for a number of chronic diseases including Type 2 diabetes, hypertension, high cholesterol, coronary heart disease, stroke and certain types of cancer (e.g. breast and colon cancer). These health problems will have an adverse impact on quality of life and increase the risk of premature mortality.⁹

How do we measure obesity?

Obesity and overweight are measured by the Body Mass Index calculation (BMI), which is calculated using height and weight figures. People of healthy weight have a BMI of under 25; overweight people have a BMI of between 25 and 29.9, and obese individuals' have a BMI of 30 or above.

Connection to the Built Environment

Evidence indicates that the urban environment influences both food consumption choices and level of physical activity. For example, "low-density, auto-dependent development and sprawl can negatively impact physical activity by making residents car-dependent. Sidewalks in poor condition or non-existent; a lack of walkable destinations such as school, work, or the supermarket; disconnected street networks; and a lack of transit options" also discourage physical activity.¹⁰ On the nutrition side, studies have indicated that lack of access to full service supermarkets is correlated to decreased fruit and vegetable consumption and decreased likelihood of meeting recommended limits for fat consumption. Studies have shown that residents in areas with little healthful food access experience higher obesity rates and higher rates of residents dying prematurely from diabetes, cancer and heart disease.¹¹ Fuller examination of these issues is continued in Chapter 6, Food Access and Chapter 8, Active Living.

⁸ Oregon Vital Statistics Annual Report 2005, <http://www.dhs.state.or.us/dhs/ph/chs/data/arpt/05v2/chp6toc.shtml>

⁹ Multnomah County Health Department Community Health Promotion, Partnerships and Planning Office of Health Assessment and Evaluation, "Overweight and Obesity," *Community Health Assessment Quarterly*, Fall 2008.

¹⁰ Morris, Marya, editor, "Integrating Planning and Public Health: Tools and Strategies to Create Healthy Places," Chicago, IL, American Planning Association, October 2006.

¹¹ Gallager, M. "Examining the Impact of Food Deserts on Public Health in Chicago," 2006.

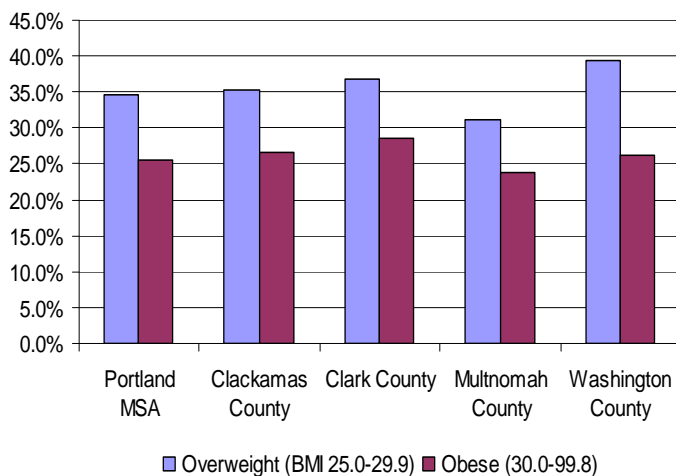
Local Conditions

BRFSS data shows Multnomah County has lower overweight and obesity rates than other surrounding counties or the Metropolitan Statistical Area as a whole (see Figure 2.2). Despite the fact that the percentage of overweight adults has remained largely the same since the early 1990s, Multnomah County obesity rates in the same time period have more than doubled from 11 percent to 24 percent. This is similar to the national and Oregon rates, as shown in Figure 2.3; while the overweight percentage has not greatly changed, the obesity rates both nationally and in Oregon have increased dramatically since 1995.

While Multnomah County is doing better than the region as a whole on these issues, the county falls short of Healthy People 2010 goals, which call for 60 percent of the population to be at a healthy weight with only 15 percent qualifying as obese. The region has a long way to go to reach these targets, though many overweight people are trying to change the statistics: "In 2005, 56 percent of overweight adults and 78 percent of obese adults reported trying to lose weight."¹²

Overweight or obese adults in Multnomah County age 45 or older are more likely to have high blood pressure or high cholesterol than their counterparts at healthy weights. About one quarter of overweight or obese adults 45 or older were also diagnosed with diabetes.¹³

Figure 2.2 Overweight and Obesity of Adults in the Portland Metropolitan Area, 2007¹⁴

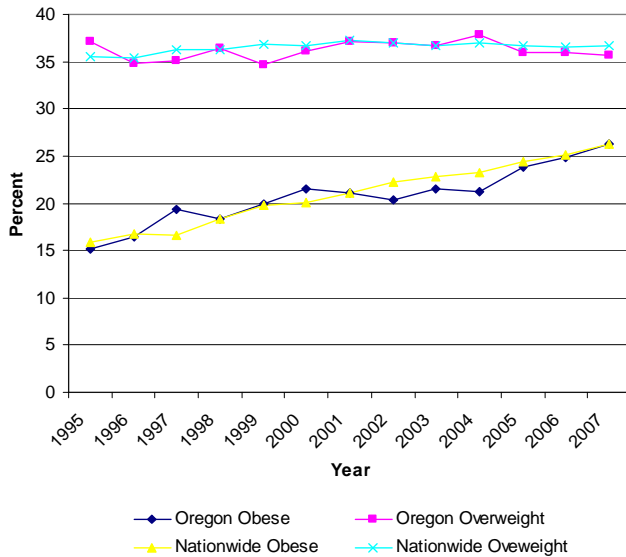


¹² Department of Human Services, Physical Activity and Nutrition Program, "Oregon Overweight, Obesity, Physical Activity, and Nutrition Facts," January 2007.

¹³ *Ibid.*

¹⁴ Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2007.

Figure 2.3: Obesity and Overweight, Oregon and US, 1995-2007¹⁰



Consumption of Fruits and Vegetables

Nutrition and physical activity are the two major predictors for maintaining a healthy weight. The amount of fruits and vegetables consumed daily is often used as a proxy for adequate nutrition. According to the Centers for Disease Control, over 70 percent of Multnomah County residents fail to eat the recommended five or more fruits or vegetables a day.¹⁵ The 2005 Dietary Guidelines for Americans increased the recommended daily servings of fruits and vegetables to 9 (1/2-cup) servings¹⁶; most of Portland’s residents are not meeting this target.

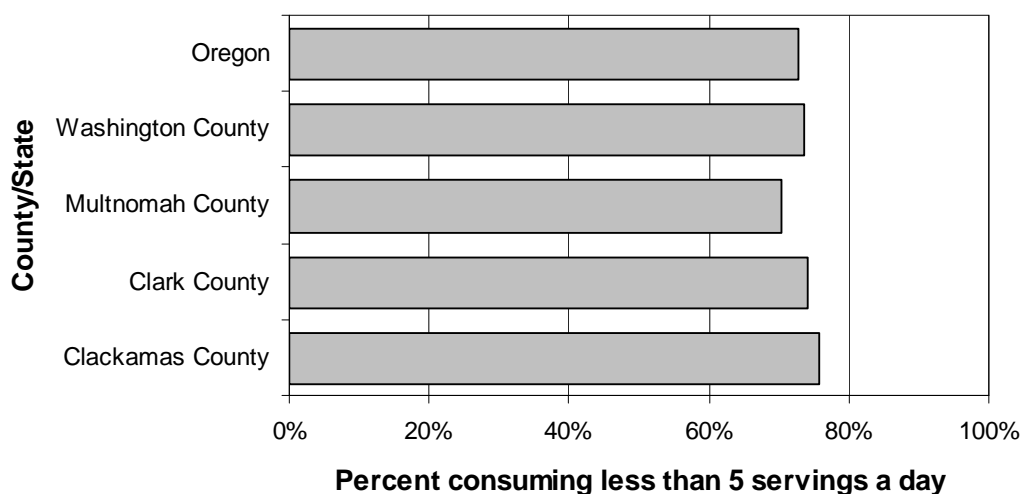
These consumption choices can result in noticeable health impacts: increased consumption of fruits and vegetables has been linked to reduced risk for many chronic diseases including stroke, Type 2 diabetes, and certain cancers as well as coronary heart disease.¹⁷ While Multnomah County’s rate is actually better than the surrounding counties and Oregon as a whole, the County is falling short of Healthy People 2010’s target that at least 70 percent of all people over the age of two consuming at least two servings of fruit and 50 percent consuming at least three servings of vegetables, see Figure 2.4.¹⁸

¹⁵ *Ibid.*

¹⁶ Dietary Guidelines for Americans, 2005. Accessed at <http://www.health.gov/dietaryguidelines/dga2005/document/default.htm> on December 8, 2008.

¹⁷ *Ibid.*

¹⁸ U.S. Department of Health and Human Services. “Healthy People 2010, Volume 2, Objectives for Improving Health Part B: Focus Areas 15-28.” Objective 19: Nutrition accessed on January 19, 2009 at: http://www.healthypeople.gov/Document/HTML/Volume2/19Nutrition.htm#_Toc490383124 .

Figure 2.4: Percent of population consuming less than five servings of fruits and vegetables per day¹⁹

Physical Activity

Healthy People 2010 goals include 30% of all adults exercising five times a week for 30 minutes or longer and 30% exercising vigorously for at least 20 minutes three times a week.²⁰ Overall, Multnomah County and Oregon meet these goals, though some subgroups do not.

Overweight and obese individuals in Multnomah County tend to exercise less than people at healthy weights. In 2005, 48% of those in the healthy weight range met the recommendations for moderate or vigorous physical activity while only 32% of overweight individuals and 17% of obese individuals met the recommendations.²¹

In addition, Oregonians who earn less money or are less educated tend to exercise less than people with more education or higher income levels. Latinos exercise statistically less than the average in the state; African Americans and Native Americans exercise more than the average (and more than white non-Latinos).

This report reviews this topic in greater detail in Chapter 8, Active Living.

¹⁹ CDC Behavioral Risk Factor Surveillance System

²⁰ U.S. Department of Health and Human Services. "Healthy People 2010, Volume 2, Objectives for Improving Health Part B: Focus Areas 15-28." Objective 22: Physical Activity and Fitness accessed on January 19, 2009 at: <http://www.healthypeople.gov/Document/HTML/Volume2/22Physical.htm> .

²¹ Multnomah County Health Department Community Health Promotion, Partnerships and Planning Office of Health Assessment and Evaluation, "Overweight and Obesity," *Community Health Assessment Quarterly*, Fall 2008.

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Economic Impacts of Overweight and Obesity

A study in Oregon between 1998 and 2000 estimated the direct and indirect medical costs of obesity to be \$781 million. This figure included preventive, diagnostic and treatment services related to obesity as well as lost income from decreased productivity, reduced activity, absenteeism and premature death.²² A second study examining increases in health care expenses in the U.S. due to obesity found that 27 percent of the increases in per capita health care spending between 1987 and 2001 was due to obesity – due to both the greater number of obese people and greater health care expenditures for obese people. Costs incurred by the obese were 37 percent higher than costs incurred by those with normal weight in 2001.²³ Almost a quarter of those costs were attributable to three conditions: diabetes, heart disease and high cholesterol.

Obesity and Food Insecurity

People are considered to be food insecure if they do not have physical or economic access to sufficient, safe, nutritious food to maintain a healthy and active life. Obesity is often present in food-insecure households. This apparent paradox has its root in the reactions to hunger. First, food-insecure households will often try to maximize calories per dollar. Calorie-dense foods can stave off hunger but also can be high in fat and provide limited nutritional content, leading to weight gain.¹ Second, low-income neighborhoods often have less access to healthful foods, leading to less nutritionally appropriate choices available. This issue of food access in Portland is explored further in the Food System Background Report. Third, people who go through periods of not having enough food to eat may tend to overeat when food is available. This can happen monthly, as food stamps run out early, or can be part of a longer cycle of food insecurity. This cycle can result in weight gain. Finally, the body itself may adapt in times of low food availability, becoming more efficient and conserving energy by storing more calories as fat.² In America, obesity is often strongly linked to hunger and food insecurity.

¹Food Research & Action Center, “The Paradox of Hunger and Obesity in America,” 2005. Accessed at <http://www.frac.org/pdf/hungerandobesity.pdf> on Dec. 16, 2008.

² Ibid.

Disparities among ethnicities and low-income populations

Ethnic or racial groups in Multnomah County have different levels of obesity and overweight. Asian Americans had the lowest rates of overweight or obesity in Multnomah County, but their rates were higher than the national average. African Americans had lower rates locally than nationally (28 percent countywide vs. 34 percent nationally). Native Americans/Alaska Natives and Hispanics had the highest rates, and the rate for Hispanics was significantly higher than the national average for Hispanics (30 percent countywide vs. 24 percent nationally).²⁴

Interestingly, immigrants generally come to the United States with lower rates of obesity overall. However, after they have lived here for a period of time, they are likely to have higher BMI. In one study, immigrants on arrival had an obesity rate of 8 percent versus the U.S. average of 22 percent; for those immigrants who had been in the U.S. 15 years or more, the obesity rate approached the

²² Ibid.

²³ Thorpe, Kenneth E., Florence, C.S., Howard, D.H. and Joski, P., “The Impact of Obesity on Rising Medical Spending.” *Health Affairs: The Policy Journal of the Health Sphere*, 20 October 2004.

²⁴ Multnomah County Health Department Community Health Promotion, Partnerships and Planning Office of Health Assessment and Evaluation, “Overweight and Obesity,” *Community Health Assessment Quarterly*, Fall 2008.

U.S. average.²⁵ Research suggests that characteristics such as the built environment and social networks in United States communities are determinants of the declining health status among immigrants.

The Coalition for a Livable Future's Regional Equity Atlas found that, poorer communities and communities of color generally had less access to nature and, to a lesser degree, parks; they also often tended to be located in areas with fewer sidewalks.²⁶ Both of these findings indicate potential built environment influences on elevated overweight and obesity in these communities.

ASTHMA

The Issue

Asthma is a chronic condition in which a person's airways are inflamed and sensitive to allergens or irritants. When the airways come in contact with these irritants, they contract, which makes breathing difficult. Asthma affects both children and adults; its causes include genetic predisposition as well as environmental exposure to triggers like allergens in the home (mold, dust mites and cockroaches), indoor and outdoor air pollution, and airborne particulate matter.

Asthma is distributed unevenly throughout the population, and socio-economic characteristics have been shown to impact likelihood of asthma. "Nonwhite children residing in urban areas and children living in poverty have a significantly higher risk of asthma and higher disease morbidity than do white children; for example, asthma prevalence, hospitalization, and mortality rates are higher for black children than for white children."²⁷ In one study, African American children had twice the asthma rate as Caucasian children in families with incomes less than half the federal poverty rate. Hispanic children's asthma rates were no higher than those for Caucasian children, and the racial disparities disappeared in middle- and upper-income households.²⁸ Other studies have found links between asthma occurrence and experience of violence, stress and crime.²⁹

Connection to the Built Environment

Proximity to high-traffic transportation corridors and industrial sites are associated with asthma and respiratory conditions. The volume of vehicle traffic and per capita vehicle miles traveled are also associated with poor air quality and related chronic respiratory conditions. One study examined impacts on asthma of reducing automobile congestion in Atlanta, GA, during the 1996 Olympic Games. Traffic counts were reduced by 22 percent, leading to a 28 percent decline in daily ozone concentrations and a 41 percent decrease in acute-care asthma events.³⁰

²⁵ Goel MS, McCarthy EP, Phillips RS, and Wee CC, "Obesity among US immigrant subgroups by duration of residence." *JAMA*. 2004 Dec 15;292(23):2860-7.

²⁶ Coalition for a Livable Future, "The Regional Equity Atlas: Metropolitan Portland's Geography of Opportunity," 2007.

²⁷ Williams DR, Sternthal M, Wright, RJ, "Social Determinants: Taking the Social Context of Asthma Seriously," *Pediatrics* Vol. 123 Supplement March 2009, pp. S174-S184.

²⁸ Smith LA, Hatcher-Ross JL, Wertheimer R, Kahn RS, "Rethinking race/ethnicity, income, and childhood asthma: racial/ethnic disparities concentrated among the very poor." *Public Health Rep*. 2005 Mar-Apr;120(2):109-16.

²⁹ Williams DR, Sternthal M, Wright, RJ, "Social Determinants: Taking the Social Context of Asthma Seriously," *Pediatrics* Vol. 123 Supplement March 2009, pp. S174-S184.

³⁰ Cummins, S.K. and R.J. Jackson, "The Built Environment and Children's Health," *Pediatric Clinics of North America*, V48(5), pp. 1241-1252, 2001. Accessed on January 2, 2009 at <http://www.cdc.gov/healthyplaces/articles/The%20Built%20Environment%20and%20Children%20Health.pdf>.

Local Conditions

The rates of adults who have been diagnosed with asthma in Multnomah County are similar to the nation as a whole, while other area counties' rates are higher than both Multnomah County and the national average (Table 2.2). A comparison with 2002 data indicates that rates have increased for most of the metropolitan area, with the exception of Clark County where, 2002 rates were higher than the national average, but 2007 rates are closer to average. Healthy People 2010 does not set targets for overall prevalence of asthma and instead focuses on reducing hospitalizations, deaths and activity limitations and increasing the number of asthmatics who receive appropriate care and patient information. The data presented here does not correlate to these targets.

Table 2.2: Adult Asthma Rates, 2002 and 2007³¹

County	Have ever been told they have asthma		Have been told they currently have asthma	
	2002	2007	2002	2007
Clackamas County, OR	10.8%	16.3%	6.4%	9.4%
Clark County, WA	18.4%	15.1%	12.5%	9.3%
Multnomah County, OR	12%	13.1%	7.1%	8.4%
Washington County, OR	13.1%	15.4%	8.4%	9.2%
Nationwide	11.8%	13.1%	7.6%	8.3%

Geographic and SES Disparities

A Lewis and Clark College study of asthma rates in various areas in and near Portland in 2002 demonstrates some revealing differences within the Portland metropolitan region. While the data collection process was different from BRFSS (the college's survey of 1181 people was in person and included children, while BRFSS data does not), the results suggest equity issues to consider in policy development.

The households surveyed were located in one of three areas:

- North Portland, along the I-5 corridor between the Rose Quarter and Columbia Blvd;
- Orenco Station in Hillsboro (a new development, at the time, in Washington County);and
- Southwest Portland, along the I-5 corridor between Taylor's Ferry and the Ross Island Bridge

Beyond the geographic differences, the three communities reflected different ethnic and racial compositions and different income levels, with North Portland being the most diverse and having the lowest income levels.

The asthma rates were the highest in North Portland, with 14.7 percent of respondents saying they currently had asthma. This rate is much higher than the 8.4 percent rate of the county as a whole reported in 2002 by BRFSS (though, again, the data included children), and is higher than the other areas surveyed by the college. The percentage of those reporting current asthma in Southwest Portland was 7.8 percent, and Orenco Station was lower than the other two areas with only 5.1 percent reporting current asthma.

³¹ BRFSS

Among those with asthma in the study, there were also differences in both rates of health insurance coverage and ability to pay for medications to treat the asthma. Again, North Portland fared the worst of the three: 14 percent of those with asthma had no health insurance coverage, and 41 percent said they had occasional or constant difficulties in paying for their medication. All respondents with asthma in Southwest Portland and Orenco Station had health coverage, and only 3 percent in Southwest Portland reported difficulty in paying for their medication.³²

While Multnomah County as a whole is currently in line with the national average, this study indicates that geographic differences exist. These differences could indicate differences in environmental factors, such as proximity of housing to highways or other pollution sources, quality of housing, access to health care and others. Other factors, such as income level and racial or ethnic makeup, can also play a role in rates.

Further details about asthma and causes of asthma is available in Chapter 4: Clean Environments under Air Toxics.

DIABETES

The Issue

Diabetes is a condition in which the body either does not produce the hormone insulin (Type 1 diabetes) or either does not produce enough or cannot metabolize the insulin produced (Type 2), leading to high blood sugar levels, increased urination, weight gain and more serious complications.

The American Diabetes Association reports that 65 percent of all people with diabetes die from heart disease or stroke; adults with diabetes are two to four times more likely to experience stroke or death by heart disease as adults without diabetes.³³ Diabetes is linked closely with other diseases, many of which are life-threatening: obesity, heart disease, stroke, hypertension, high cholesterol, kidney disease and others.

While the causes of Type 1 diabetes include genetics and exposure to some viruses, Type 2 diabetes is more closely linked to obesity, lack of physical activity and poor eating habits, as well as age, ethnic background and family history.³⁴ Type 2 diabetes is by far the more common of the two types, and rates have been rapidly increasing greatly over the past several decades, even among youth.

Connection to the Built Environment

As mentioned above, Type 2 diabetes is tied to factors like physical activity and nutrition. The built environment influences people's access to sidewalk and bike networks, determines whether there

³² Podobnik, Bruce, "Portland Neighborhood Survey: Report on Asthma Rates in Northeast, Southwest, and West Portland." Lewis and Clark College, May 23, 2002. Accessed on January 2, 2009 at <http://www.lclark.edu/~podobnik/asthma02.pdf>.

³³ American Diabetes Association, "Complications of Diabetes in the United States." Accessed on January 2, 2009 at <http://www.diabetes.org/diabetes-statistics/complications.jsp>.

³⁴ Centers for Disease Control and Prevention. National diabetes fact sheet: general information and national estimates on diabetes in the United States, 2007. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2008.

The Portland Plan

are destinations to walk or bike to and can shape access to healthful (and not-so-healthful) foods. See the section on Connection to the Built Environment under Obesity above for more information.

Local conditions

Prevalence

The region seems to be doing slightly better than the nation as a whole in diabetes prevalence, and Multnomah County has the lowest rates in the region. In the state as a whole, diabetes mellitus was the sixth leading cause of death for both males and females in 2005 (the most recent year for which data has been released). In Oregon, cases of diabetes have increased 35 percent, from 4.6 percent to 6.3 percent over the past ten years; the diabetes rate has also increased in Multnomah County during that time.

The rate of diabetes cases in Multnomah County, 62 per 1,000 population, is over three times higher than the Healthy People 2010 target of 20 per 1,000 population (Healthy People 2010 Target 5.3) as shown in Table 2.3. Multnomah County's rate of diabetes-related death per 100,000 was 96 in 2005³⁵, which is substantially higher than the Healthy People 2010 target of 45 diabetes-related deaths per 100,000 (Healthy People 2010 Target 5.5).³⁶

Table 2.3: Have you ever been told by a doctor that you have diabetes?³⁷

County	Yes*	Pre- or Borderline Diabetes
Clackamas County, OR	8.2%	1.5%
Clark County, WA	7.6%	1.1%
Multnomah County, OR	6.2%	1.2%
Washington County, OR	7.2%	0.9%
Nationwide	8.1%	1.1%

* Does not include pregnancy-related diabetes

Disparities among people of color

Diabetes more often affects lower income Oregonians and people of color, (Figures 2.5 and 2.6). Death rates for African American and Hispanic Oregonians due to diabetes are significantly higher than for non-Hispanic whites, with African American and Hispanic women faring the worst.³⁸

³⁵ Multnomah County Health Department, "Diabetes Mortality and Morbidity," Community Health Assessment Quarterly, vol. 4, Issue 1, Winter 2009.

³⁶ U.S. Department of Health and Human Services. *Healthy People 2010*. 2nd ed. With Understanding and Improving Health and Objectives for Improving Health. 2 vols. Washington, DC: U.S. Government Printing Office, November 2000.

³⁷ BRFSS, 2007

³⁸ Multnomah County Health Department, "Overweight and Obesity," Community Health Assessment Quarterly, vol. 3, Issue 3, Fall 2008.

Figure 2.5 Diabetes-related Mortality Rate by Race or Ethnicity, Multnomah County³⁹

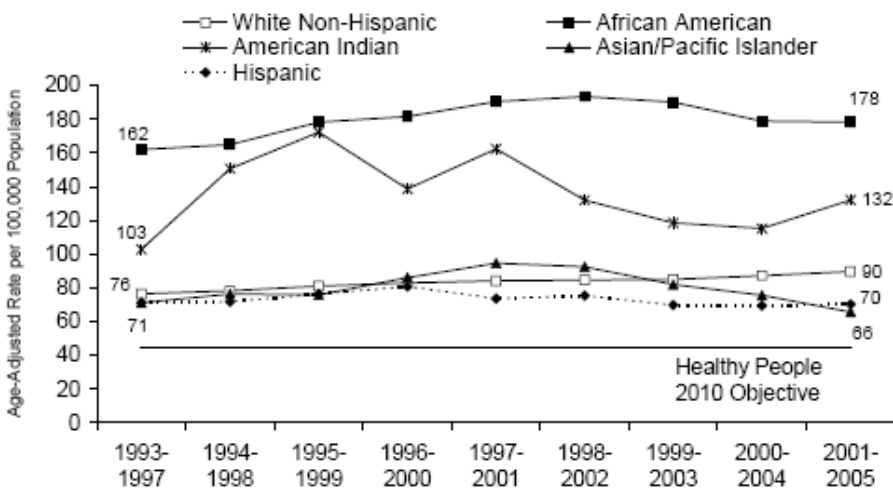
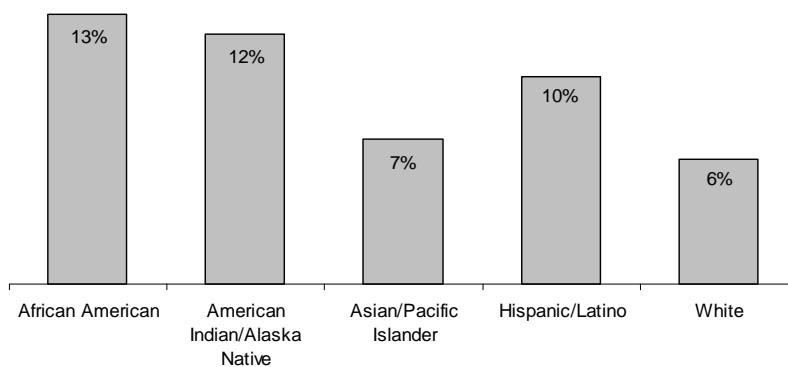


Figure 2.6 Diabetes Prevalence by Race/Ethnicity, Oregon, 2004-2005^{40,41}



Premature mortality measures the number of years of life lost due to diabetes, calculated from 75 years. By this measure, people of color are at significantly greater risk of dying younger from diabetes than non-Hispanic whites, (Table 2.4).⁴² “In Multnomah County in 2001-05, African Americans had a statistically higher diabetes mortality rate compared with other groups. Native Americans had the second highest diabetes mortality rate.”⁴³

³⁹ Multnomah County Health Department, “Overweight and Obesity,” Community Health Assessment Quarterly, vol. 3, Issue 3, Fall 2008.

⁴⁰ Note: Rates are age-adjusted to the U.S. 2000 Standard Population. Data for the categories African American, American Indian/Alaska Native, Asian/Pacific Islander, and White do not include respondents of Hispanic ethnicity.

⁴¹ Oregon Public Health Division, BRFSS Race Oversample 2004-2005

⁴² Oregon Department of Health and Human Services, Public Health Division, “The Burden of Diabetes in Oregon: Surveillance Report,” September 2008.

⁴³ Multnomah County Health Department, “Report Card on Racial and Ethnic Health Disparities,” March, 2008.

Table 2.4 Mean number of lost years to premature death from diabetes⁴⁴

Overall	12.36
Men	13.35
Women	11.13
African Americans	14.82
American Indians/Alaska Natives	16.24
Asian/Pacific Islanders	11.68
Whites	6.97
Hispanics	24.87

Economic Costs of Diabetes

While the full economic costs of diabetes are not known, a 2007 estimate put national direct and indirect costs at \$174 billion. On average, medical expenditures for diabetics are 2.3 times higher than for non-diabetics.⁴⁵ Analysis of some Oregon hospitals in 2006 put the cost of diabetes-related hospitalizations at \$1.1 billion.⁴⁶ In Multnomah County in the same year, the cost of hospitalizations with a primary diagnosis of diabetes was almost \$16 million, with an average of \$16,020 per hospitalization.⁴⁷

CORONARY HEART DISEASE

The Issue

Coronary heart disease (CHD) is caused when blood flow and, therefore, oxygen, is slowed to the heart by plaque and fatty buildup in the arteries. CHD is largely preventable; risk factors include high blood pressure, high cholesterol, smoking, lack of exercise, obesity and diabetes. Yet CHD is one of the leading causes of death in the nation.

Connection to the Built Environment

CHD is related to lack of exercise, obesity and diabetes. Thus, the same factors in the built environment – access to recreation, infrastructure for physical activity, access to healthful foods, perceptions of safety and more – that impact diabetes and obesity also relate to CHD.

Local Conditions

CHD is the second leading cause of death in both Oregon and Multnomah County.⁴⁸ Rates in Multnomah County have dropped 34% over the past 10 years, reflecting national trends. Mortality rates have decreased for both men and women and all racial and ethnic groups. The CHD rate for African Americans in Multnomah County is higher than for other population groups, but that gap is

⁴⁴ Oregon Public Health Division, Vital Statistics - Death Records, 2005, via Oregon Department of Health and Human Services, Public Health Division, "The Burden of Diabetes in Oregon: Surveillance Report," September 2008.

⁴⁵ National Diabetes Information Clearinghouse, "National Diabetes Statistics, 2007," accessed January 2, 2009 at <http://diabetes.niddk.nih.gov/dm/pubs/statistics/#complications>.

⁴⁶ Ibid.

⁴⁷ Multnomah County Health Department, Health Assessment and Evaluation, "Diabetes in Multnomah County." Community Health Assessment Quarterly, vol. 4 issue 1, Winter 2009.

⁴⁸ Multnomah County Health Department; Office of Health Assessment and Evaluation, "Coronary Heart Disease," Community Health Assessment Quarterly, vol. 2, issue 3, Fall 2007.

not statistically significant (see Table 2.5) and is narrowing.⁴⁹ Multnomah County meets the Healthy People 2010 target of less than 166 deaths per 100,000, for all racial and ethnic groups and females.⁵⁰

Table 2.5 Heart Disease Mortality in Multnomah County by Race/Ethnicity⁵¹

Race/Ethnicity	2001-05 Mortality Rate/100,000 people	Disparity Ratio	Health Disparity Grade
African American	216.5	1.1	No disparity
Asian	92.4	0.5	No disparity
Native American	192.5	1.0	No disparity
Hispanic	93.1	0.5	No disparity
White, non-Hispanic	194.6	Comparison Group	

"No Disparity" = No significant disparity between the group of color and White non-Hispanics.

Despite these improvements, medical costs for CHD remain high. Hospitalizations in Multnomah County with a primary diagnosis of CHD in 2005 cost over \$71 million in 2005,⁵² with an average cost of over \$32,000 each.

CANCER

The Issue

Cancer is a generic term for a large group of diseases that can affect any part of the body. Other terms used are malignant tumors and neoplasms. One defining feature of cancer is the rapid creation of abnormal cells that grow beyond their usual boundaries, and which can then invade adjoining parts of the body and spread to other organs. This process is referred to as metastasis. Metastases are the major cause of death from cancer.

Cancer is a leading cause of death worldwide: it accounted for 7.4 million deaths (around 13 percent of all deaths) in 2004. Lung, stomach, colorectal, liver and breast cancer cause the most cancer deaths each year. In high-income countries, tobacco and alcohol use, and being overweight or obese are major risk factors for cancer. Low-income countries also count low consumption of fruits and vegetables as a major risk factor for cancer. Carcinogens from environmental exposure to radiation, toxins like asbestos or arsenic (in drinking water, for example), viruses or bacteria are all major causes of cancer.⁵³

Connection to the Built Environment

Cancer has many associations with air or water toxins. Cancer is also related to obesity and overweight, bringing in the physical activity and nutritional issues that are also relevant for obesity.

⁴⁹ Ibid.

⁵⁰ Ibid.

⁵¹ Multnomah County Health Department Report Card on Racial and Ethnic Health Disparities, March, 2008.

⁵² Ibid.

⁵³ World Health Organization Media Centre Fact Sheets: "Cancer." Accessed on 5/11/2009 at <http://www.who.int/mediacentre/factsheets/fs297/en/index.html>.

Local Conditions

In 2005, cancers were collectively the number one cause of death for both males and females in Oregon. Oregon has one of the highest incident rates of skin cancer, though death rates from melanoma are close to the national average.⁵⁴

Between 1996 and 2005, Multnomah County had significantly higher cancer incidence and deaths from cancer than the state average. In 2005, the age-adjusted rates of death per 100,000 people in Multnomah County was 209.5, above the 198.3 per 100,000 of Oregon as a whole, and well above the Healthy People 2010 target of 159.9 deaths per 100,000.⁵⁵

In the state as a whole, deaths by cancer decreased during this time period, despite its continued place as the leading cause of death. Of the cancers, lung cancer is the leading cause of cancer death for both men and women in Oregon; this is likely because early detection tools are not effective, which leads to worse outcomes when the cancer is discovered.⁵⁶ Smoking is the number one risk factor for lung cancer. Breast cancer is the most reported form of cancer overall and for women; for men, prostate cancer has the highest prevalence. Colorectal cancer is the second deadliest form of cancer in the US at nearly 50,000 deaths. Major risk factors for all cancers include poor diet and obesity.

As is found nationally, Oregon African Americans and American Indians/Alaskan Natives have higher rates of cancer and mortality from cancer than do non-Hispanic whites; Hispanics have lower cancer incidence and mortality than non-Hispanics both in Oregon and nationally.⁵⁷ In Multnomah County in 2001-05, no group of color had statistically higher rates of overall cancer mortality than White non-Hispanics. In fact, Asian and Hispanics had statistically lower rates of relative mortality (see Table 2.6 and Figure 2.7).

Table 2.6 Rate of Mortality from Cancer by Race/Ethnicity, Multnomah County⁵⁸

Race/Ethnicity	2001-05 Mortality Rate/100,000 people	Disparity Ratio	Health Disparity Grade	Met Healthy People 2010 Target**?
African American	232.6	1.1	No disparity	No
Asian	148.3	0.7	No disparity	Yes
Native American	160.1	0.8	No disparity	No
Hispanic	117.0	0.6	No disparity	Yes
White, non-Hispanic	207.8	Comparison Group		No

** Healthy People 2010 target is no more than 159.9 deaths/100,000.

“No Disparity” = No significant disparity between the group of color and White non-Hispanics.

⁵⁴ Multnomah County Health Department, “Skin cancer,” Community Health Assessment Quarterly, vol. 3 Issue 2, Summer 2008.

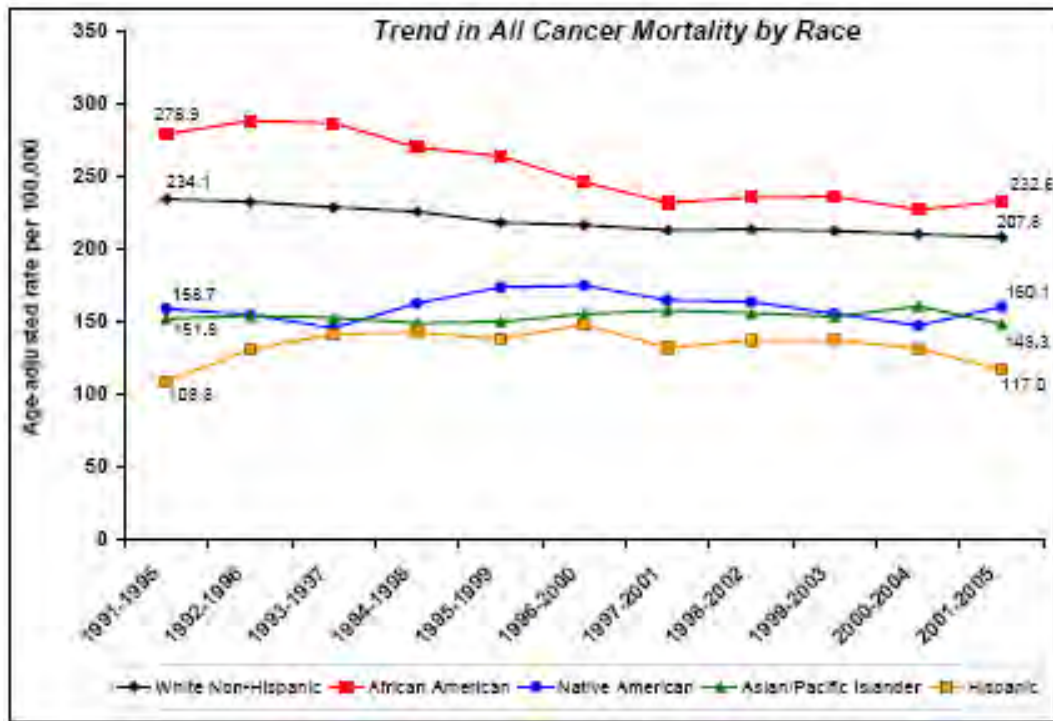
⁵⁵ Oregon Cancer Registry, “Cancer in Oregon, 2005: Annual report on cancer incidence and mortality among Oregonians,” August 2007.

⁵⁶ *Ibid.*

⁵⁷ *Ibid.*

⁵⁸ Multnomah County Health Department Report Card on Racial and Ethnic Health Disparities, March, 2008.

Figure 2.7 Trend in All Cancer Mortality by Race, 1981-2005⁵⁹



HYPERTENSION

The Issue

Hypertension, or high blood pressure, can lead to stroke, cardiovascular disease, heart attack, and kidney and eye problems. Hypertension has several risk factors including obesity, lack of physical activity, too much sodium, high stress levels, and smoking or excessive drinking. The likelihood of hypertension increases with age. African Americans are more likely than whites and other racial/ethnic groups to have hypertension; rate of successful control of hypertension is also different between whites and African Americans.⁶⁰

Connection to the Built Environment

Hypertension has been linked to levels of physical activity, obesity and nutrition (especially salt intake). Access to recreation, infrastructure for physical activity, access to healthful foods, perceptions of safety and more – factors that would impact obesity – are also related to hypertension.

⁵⁹ Multnomah County Health Department Report Card on Racial and Ethnic Health Disparities, March, 2008.

⁶⁰ Satcher, David, "Examining Racial and Ethnic Disparities in Health and Hypertension Control," *Annals of Family Medicine* 2008 November; 6(6): 483–485.

Local Conditions

Multnomah County has a lower rate of people reporting high blood pressure (20.7%) than most surrounding counties and the nation as a whole (27.5%) as shown in Table 2.7. The target of adults with current high blood pressure set by Healthy People 2010 is 16 percent.⁶¹ The Multnomah County rate from the BRFSS study cannot be compared to the Healthy People 2010 target because the BRFSS data includes anyone who has been told they have high blood pressure, not just people with current cases.

As shown in Figure 2.8 below, residents of Multnomah County who are overweight or obese have a much greater likelihood of having high blood pressure (and high cholesterol) than those at a healthy weight. High blood pressure itself is a risk factor for other conditions such as stroke, heart disease, diabetes and kidney failure.

Figure 2.8 Prevalence of High Blood Pressure & High Cholesterol by Weight in Adults 45 years and Older. Multnomah County, 2002-05⁶²

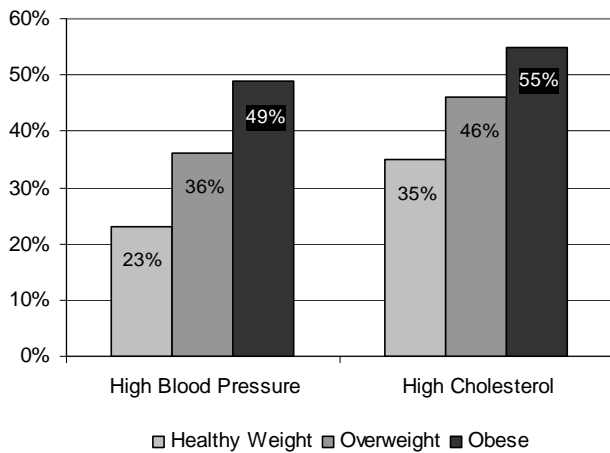


Table 2-7: Adults who have been told they have high blood pressure⁶³

County	% Yes	% No
Clackamas County, OR	25	75
Clark County, WA	24.7	75.3
Multnomah County, OR	20.7	79.3
Washington County, OR	20	80
Nationwide	27.5	72.5

⁶¹ http://www.healthypeople.gov/Document/HTML/Volume1/12Heart.htm#_Toc490544222

⁶² Multnomah County Health Department's *Community Health Assessment Quarterly*, Fall 2008.

⁶³ BRFSS, 2007

UNINTENDED INJURIES

The Issue

Unintended injuries as defined here include motor vehicle and other transport accidents, falls, firearms, drowning, poisoning and exposure to smoke and fire. This category includes a variety of causes of death, of which motor vehicle accidents is one of the largest, making up about a third of all deaths in this category in 2005 in Oregon.

Connection to the Built Environment

Not all of the factors that make up “unintended injuries” will be related to the built environment; for example, poisonings and death by firearms have little to do with city services. However, safe infrastructure, particularly transportation infrastructure, can impact traffic safety, pedestrian safety, cyclist safety and more. More information about traffic safety and accidents is offered in Chapter 5, Safe Environments, Transportation Safety section.

Local Conditions

While some categories of unintentional injuries seem to impact all age groups, others were focused in certain age groups. For example, falls made up over 25 percent of deaths by unintentional injury in 2005 in Oregon, but 80 percent of those falls impacted people 75 years and older. Accidental poisonings affected more people in the 25-54-year-old categories than the other groups.⁶⁴

Unintended injuries accounted for about 39.3 deaths per 100,000 people in 2005 in Oregon. This is well above the Healthy People 2010 target of 17.5 deaths per 100,000.⁶⁵ In Multnomah County between 2001 and 2005, there were no disparities in motor vehicle crash rates between groups of color and white non-Hispanics (see Table 2.8).

Table 2.8 Motor Vehicle Crash Mortality by Race/Ethnicity, Multnomah County⁶⁶

Race/Ethnicity	2001-05 Mortality Rate/100,000 people	Disparity Ratio	Health Disparity Grade	Met Healthy People 2010 Target**?
African American	6.9	0.8	No disparity	Yes
Asian	9.2	1.1	No disparity	Yes
Native American	no rate			
Hispanic	9.6	1.1	No disparity	No
White, non-Hispanic	8.8	Comparison Group		Yes

** Healthy People 2010 target for mortality by motor vehicle crash is no more than 9.2 deaths/100,000.

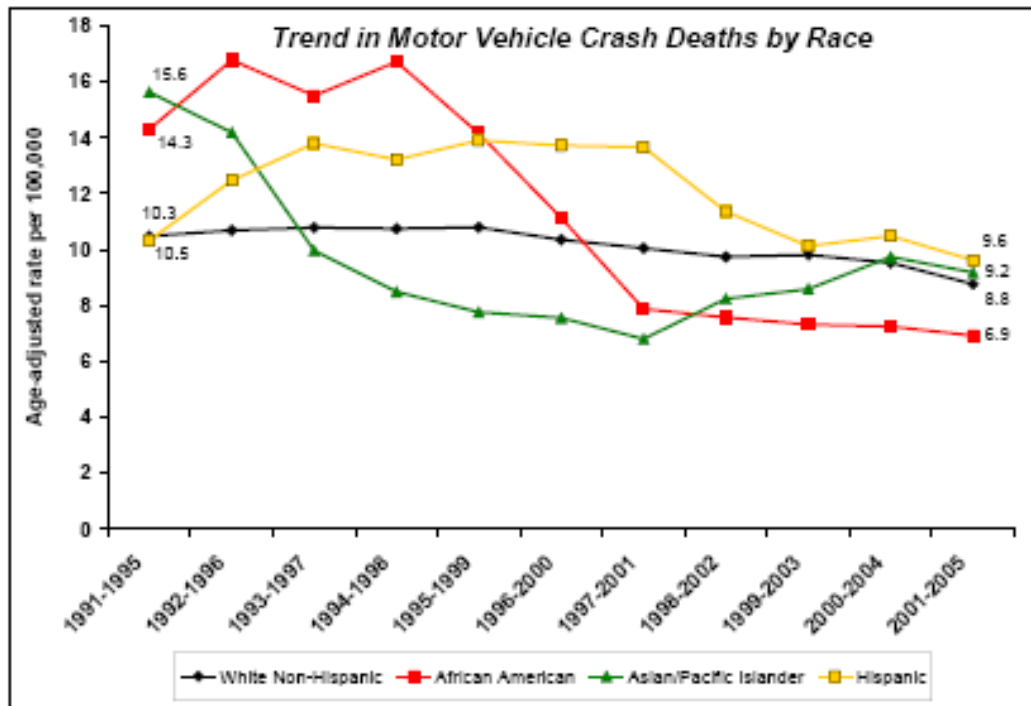
“No Disparity” = No significant disparity between the group of color and White non-Hispanics.

⁶⁴ Oregon Vital Statistics Annual Report 2005, <http://www.dhs.state.or.us/dhs/ph/chs/data/arpt/05v2/chp6toc.shtml>, Table 6-6.

⁶⁵ http://www.healthypeople.gov/Document/HTML/Volume2/15Injury.htm#_Toc490549391

⁶⁶ Multnomah County Health Department Report Card on Racial and Ethnic Health Disparities, March, 2008.

Figure 2.9: Trend in Motor Vehicle Crash Deaths by Race/Ethnicity in Multnomah County⁶⁷



CONCLUSIONS

Multnomah County generally does not fare worse, and often fares a bit better, than both surrounding counties and the nation as a whole in the conditions we’ve reviewed. One exception is cancer, where Multnomah County’s rate of incidence and rate of death have been worse than the state numbers for the past ten years.

However, where Healthy People 2010 targets are available for comparison to the trends, it is clear that Multnomah County is not headed in the right direction in many of these rates, especially percent of population overweight or obese; prevalence of diabetes; and rates of death for cancer and unintended injuries (though motor vehicle crash deaths are decreasing for all racial/ethnic groups in recent years).

Where data is available, disparities among different ethnic and racial groups are evident.

- Latinos tend to exercise less, have higher levels of obesity, higher premature mortality from diabetes than non-Latino whites, but have lower heart disease mortality, lower rates of diabetes mortality and lower rates of cancer incidence and mortality.
- African Americans have higher rates of obesity than the county average but rate lower than African Americans nationally; much higher rates of diabetes mortality than any other group and somewhat higher rates of heart disease mortality and cancer incidence and mortality. African Americans are also more likely to have hypertension, though local data is not

⁶⁷ Multnomah County Health Department Report Card on Racial and Ethnic Health Disparities, March, 2008.

available. They do exercise more than the state average and more than non-Latino whites and were somewhat less likely to die in motor vehicle crashes.

- Asians/Pacific Islanders had the lowest rates of obesity and overweight in the county; however, those rates were higher than Asians/Pacific Islanders nationally. Rates of diabetes-related mortality were the lowest for any group in the most recent time period, though premature mortality from diabetes was almost double that of whites. Heart disease mortality was about half that of non-Latino whites and the lowest of any group; cancer mortality was also one of the lowest (second only to Latinos).
- Native Americans had higher rates of obesity than most other groups, despite having a higher proportion of the population meeting exercise goals. Native Americans are second only to African Americans in diabetes prevalence in Oregon; their diabetes mortality rate falls in the middle while mean number of years lost to premature death from diabetes was second to Latinos. They also fall in the middle in terms of heart disease and cancer mortality.

Most of the chronic conditions described above have risk factors that can be linked to elements of the physical environment. Other areas not explored, such as childhood and adult injuries and pedestrian injuries, have similar relationships to the built environment. Much of the current interest in the intersection between public health and planning explores ways for planners to “make the healthy choice the easy choice,” or help people make healthy decisions by ensuring good access to healthful foods (or limited access to poor food choices), making activity easy by providing safe, convenient walking and biking routes or ensuring good access to parks and recreational activities; and reducing toxic exposure by cleaning the air and water.

CHAPTER 3: HEALTH EQUITY

INTRODUCTION

Many negative health conditions disproportionately affect those with the lowest incomes and educational levels as well as people of color. There is a social gradient in health that has been well-documented: individuals who have lower incomes, educational attainment and status tend to have poorer health and shorter life spans than those with higher incomes and wealth. This can be experienced in many different ways:

“Disadvantage has many forms and may be absolute or relative. It can include having few family assets, having a poorer education during adolescence, having insecure employment, becoming stuck in a hazardous or dead-end job, living in poor housing, trying to bring up a family in difficult circumstances and living on an inadequate retirement pension.

“These disadvantages tend to concentrate among the same people, and their effects on health accumulate. The longer people live in stressful economic and social circumstances, the greater the physiological wear and tear they suffer, and the less likely they are to enjoy a healthy old age.”⁶⁸

This chapter focuses on the health impacts of both personal and neighborhood socioeconomic status, race/ethnicity and community connectedness.

SOCIOECONOMIC STATUS

What is Socioeconomic Status?

Socioeconomic status (SES) is a description of a person’s societal status using factors or measurements such as income levels, relationship to the national poverty line, educational achievement, neighborhood of residence, or

visionPDX on Equity and Health

As demonstrated through visionPDX, Portlanders are deeply concerned about the disparities they see in our community, including those around health and safety. The definition of equity included several related statements:

- We value communities that are safe, crime-free and work in partnership with public safety efforts.
- We value a caring community that seeks to support those in need of help or assistance.
- We prepare for emergencies and support development and maintenance of infrastructure – sidewalks, roads, bike paths, sewer and water lines, power lines, urban tree canopy, etc. – that will support safe and healthy communities.

Respondents made the connection between the extent to which people have access to recreation, safe streets or well-maintained infrastructure and their health. How well we’re providing people the tools to choose healthy lifestyles, as well as removing from their environments pollutants and stressors, will impact both individuals’ health and the health of the community.

Health Equity Definitions

Health intersects with equity when health disparities and inequities arise. **Health disparities** are differences between population groups in the presence of disease, health outcomes, or access to care. Disparities include both acceptable and unacceptable differences. **Health inequities** are health disparities that result from a variety of social factors such as income inequality, economic forces, educational quality, environmental conditions, and access to health care. Such social factors that affect health outcomes are called **social determinants of health**.

⁶⁸ Wilkinson, R. and M. Marmot, eds., “Social Determinants of Health: The Solid Facts, second edition.” International Centre for Health and Society, World Health Organization, 2003.

home ownership.⁶⁹ This combination of social and economic factors is often used as an indicator of household income and/or opportunity.

What is the Impact of SES on Health?

There are three ways (SES) influences a person's health through its association with access to healthcare; exposure to poor environmental quality and behavior and lifestyle. Together, these three factors are estimated to account for up to 80 percent of premature mortality.⁷⁰

On an individual basis, level of education, income, occupational position and other factors can have far-reaching impacts on health status. On a broader scale, social conditions – social norms in a community and social connection among neighbors – can impact individual health choices, such as smoking or level of physical activity. The connections between SES and health also go beyond individual choice to include “access to and quality of health care, more material deprivation and a stressful psychosocial environment,”⁷¹ as well as numerous specific health outcomes.

EDUCATION, INCOME AND JOB STATUS

The Issue

Factors like educational attainment, income level and job classification have been linked to higher mortality rates, increased risk factors and health outcomes.

Job-related health and safety issues

There is evidence that “people in the lowest occupational positions are more likely to suffer from depression, diabetes, heart disease, arthritis, chronic pain, and tension headaches than people with the highest occupational positions.”⁷² This can be linked to the fact that jobs that pay less tend to be riskier, more stressful and/or less stable.

Status issues

There is some evidence that lower-status jobs can impact health regardless of the conditions of the position. Some studies indicate that “a person's perception of his or her position in society...makes a difference in health outcomes. People who feel they are on the ‘bottom rung’ of the societal ladder are likely to be sicker, independent of income.”⁷³ The relevance of the perception of holding a low-status job can be offset by holding other positions of respect in the community, such as at church or in organizations; that is, the job status is not the only variable in ones perception of status.

⁶⁹ Centers for Disease Control and Prevention, “Appendix D: Glossary of HIV Prevention Terms.” Accessed on 5/7/2009 at <http://www.cdc.gov/hiv/topics/cba/resources/guidelines/hiv-cp/appendixD.htm>.

⁷⁰ Shavers, VL, “Measurement of Socioeconomic Status in Health Disparities Research,” *Journal of the National Medical Association*, vol. 99, no. 9, September 2007.

⁷¹ Volkers, Anita C., GP Westert and FG Schellevis, “Health disparities by occupation, modified by education: a cross-sectional population study,” *BMC Public Health* 2007, 7:196.

⁷² PolicyLink for The California Endowment, “Why Place Matters: Building a Movement for Healthy Communities,” 2007.

⁷³ *Ibid.*

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Access to insurance and health services

High housing costs relative to income can lead to lower expenditures on healthful foods or health services while higher incomes can result in increased ability to pay for health insurance. The cultural competence of health care providers also influences the quality of care.

Income Stratification

Neighborhoods with lower average incomes will have poorer self-reported health than neighborhoods with higher average incomes; but uneven distribution of income can also impact health outcomes. In areas with extreme differences in income levels – for instance, neighborhoods with very rich and very poor people living side-by-side – all groups will have poorer health outcomes than areas where the disparities are not as great.⁷⁴

Neighborhood SES

Community-level socioeconomic conditions can impact both behavior and health. Several studies have found that a neighborhood's overall SES can influence the likelihood of smoking and exercising because of social norms. It can also impact levels of depression, hostility and mortality risk.⁷⁵ "Neighborhood SES has also been associated with self-reported poor health, mortality, smoking-related diseases, diabetic eye disorders, loss of function in older adults, coronary heart disease, and low birth weight."⁷⁶ Some of the reasons behind these poor health outcomes reveal both lack of social/community supports and resources, as well as exposure to pollution, crime or other negative influences.

Local Conditions

Educational Attainment

Portland has a very educated population compared with other major U.S. cities. According to the most recent estimates nearly 90 percent of the population that is 25 year or older are high school graduates or higher and 38 percent had a bachelor's degree or higher.⁷⁷ While Portland has much higher levels of college or graduate degree attainment than some other large cities such as Chicago (29 percent), Denver (36 percent) and Los Angeles (29 percent) rates are lower other west coast cities like Seattle (53 percent) and San Francisco (50 percent) and San Diego (40 percent) that lead the nation in educational attainment. Figure 3.1 illustrates the educational attainment of the Portland population.

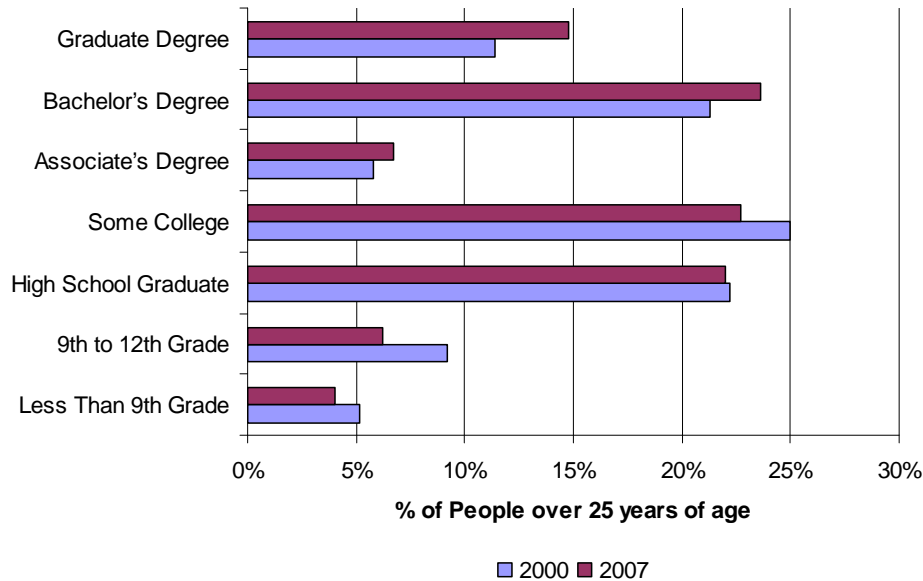
⁷⁴ *Ibid.*

⁷⁵ PolicyLink for The California Endowment, "The Influence of Community Factors on Health: An Annotated Bibliography," 2004.

⁷⁶ *Ibid.*

⁷⁷ American Community Survey, 2007.

Figure 3.1 Educational Attainment of People in Portland, 2000 and 2007⁷⁸



Education seems to have a strong geographical dimension in Portland. Map 3-1 indicates the concentration of people over age 25 with college degrees as of the 2000 Census. The map clearly shows high percentages of people with college degrees in West Portland and Inner East Portland; most areas have between 45% and 77% of adults with college degrees. Areas of Outer East and North Portland, in stark contrast, have much lower percentages of people with college degrees, ranging primarily between 3% and 30% with college degrees.⁷⁹

Income and Poverty

Portland has benefited from the economic expansion of the 1990's, and this is reflected in the growth in Per Capita Income and Median Family Income (MFI) of the population since the 1990s. According to the most recent ACS estimates, Portland's MFI (\$59,748) is just a percent below that of the nation (\$60,374). However, the city's MFI is well below that of West Coast cities such as Seattle (\$81,355), San Francisco (\$81,136) and San Jose (\$85,816) while it is higher than many large cities like Los Angeles, Chicago and Phoenix.

However, even as income has grown, both the absolute number and the proportion of people living below poverty have also grown. In 2007, 15 percent of population was living below the poverty line. Further, 20 percent of related children under 18 were below poverty line compared with 14 percent of people 65 years and old and over. Facing the most hardship are female householder families with 29 percent of such families living below poverty. In comparison, nationally about 13 percent of the population lives below poverty with a much higher proportion (18 percent) of children under 18 years living below poverty limits. Poverty figures for cities like Seattle, San Francisco and San Jose are comparatively lower at 13 percent, 12 percent and 10 percent respectively.

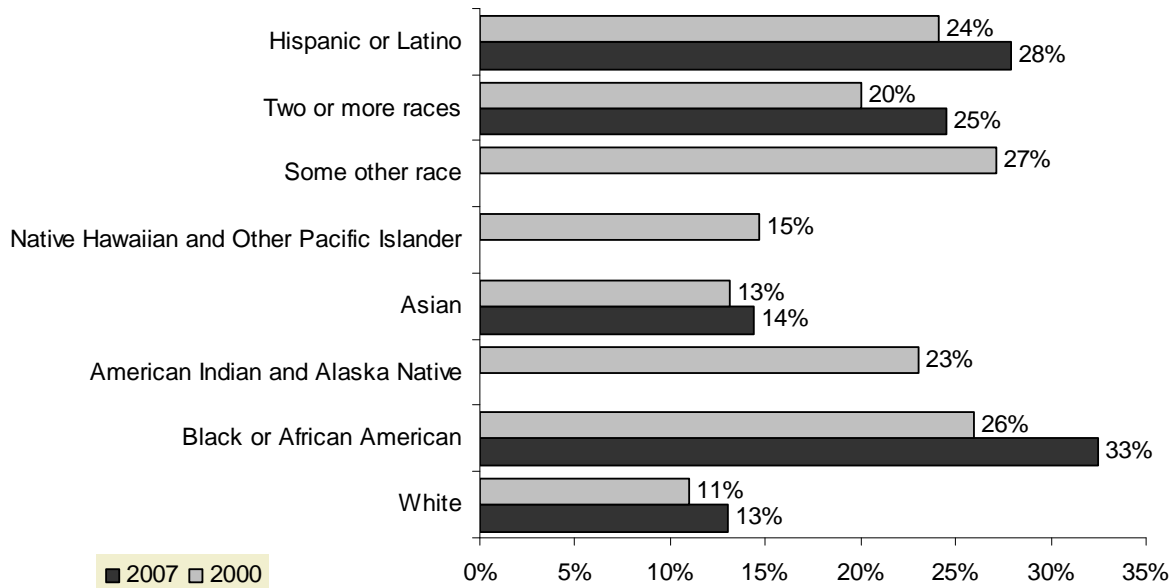
⁷⁸ 2000 Decennial US Census and American Community Survey 2007.

⁷⁹ American FactFinder, "Census 2000 Demographic Profile Highlights: Portland, OR."

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Poverty rates also vary by race and ethnicity, see Figure 3.2, with African American and Latinos facing the highest rates of poverty, and some of the greatest increases since 2000.

Figure 3.2 Portland Population in Poverty, 2007⁸⁰



Map 3-2 demonstrates geographical patterns with regards to concentration of poverty. As of the 2000 Census, poverty in Portland was concentrated in downtown, along MLK Jr. Blvd in Northeast Portland, parts of North Portland and areas further out in East Portland. Western neighborhoods in Portland and parts of inner east Portland have much lower concentrations of poverty.

Some of the areas highlighted in these maps, such as Outer East Portland, have issues with infrastructure: lack of sidewalks and paved roads, lower-quality bikeways, less access to commercial areas to meet local needs, and other confounding challenges that can impact health and are being examined through the Portland Plan process. Others, like Downtown and Inner NE, have better access to transit, connected streets and walkable destinations but still might be missing some important assets.

RACE AND ETHNICITY

The Issue

Racial and ethnic determinants of health also have social dimensions. A review of the literature led PolicyLink to make the following statement: “African Americans, Hispanics, Native Americans, and some groups of Asian Americans suffer poorer health outcomes than Whites, regardless of socioeconomic position, because of the stress associated with being a person of color.”⁸¹

Impacts can range from chronic pain and heart problems to anger issues and increased use of drugs and alcohol. Internalized racism can lead to depression, violence, suicide and conditions like

⁸⁰ American Community Survey 2007.

⁸¹ PolicyLink for The California Endowment, “Why Place Matters: Building a Movement for Healthy Communities,” 2007.

obesity and diabetes. Though different from what are normally thought of as socioeconomic conditions, social aspects of race and ethnicity (as well as gender) also impact the health outcomes of populations.

Research by former Surgeon General David Satcher and colleagues calculated that during 1991-2000, nearly 177,000 deaths were averted because of advances in medical technology. However, if the disparity between African Americans and Whites were eliminated, over 886,000 deaths would have been avoided.⁸²

Local Conditions

Historically, Portland has not been a racially diverse city. As recent as 1990, nearly 85 percent of the city was racially white. The unprecedented population growth in the 1990's brought a change in the racial make up of the city, and the proportion of Whites has declined since then with most recent estimates putting it at about 81 percent. Nationally, the population that identifies itself as white is about 76 percent, making Portland relatively less racially diverse. Using the same measure, Portland is less diverse than West Coast cities like Seattle (74% White), San Francisco (56% White) and San Jose (51% White) and much less diverse than many other large cities across the nation including Atlanta (39% White), Denver (61% White) and Los Angeles (47% White).

The change in the ethnic composition of Portland is more striking than the shifts in racial composition. In the 1990s, only 3.2 percent of the population was Hispanic. By the year 2000, the Hispanic population made up nearly 7 percent of the population and the number of Hispanics/Latino in the City continues to grow. The current share (2007 estimate) is about 8.5 percent, (see Figure 3.3).⁸³

In 2010, The Coalition for Communities of Color, in conjunction with Portland State University, published a report that documents the experiences of people of color in Multnomah County. The report, entitled Communities of Color in Multnomah County: An Unsettling Profile, identifies significant and unsettling disparities between communities of color and whites across a variety of areas, including income and poverty levels, employment, education, access to health care, and child welfare – all of which are determinants of health.

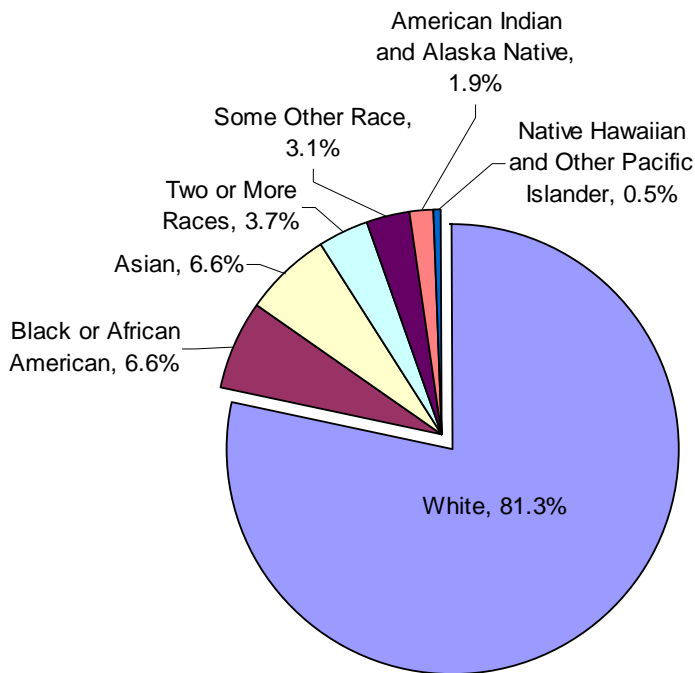
The full report is available online at:

<http://coalitioncommunitiescolor.org/docs/AN%20UNSETTLING%20PROFILE.pdf>

⁸² Bay Area Regional Health Inequities Initiative, "Health Inequities in the Bay Area," 2008.

⁸³ There is general agreement that the U.S. Census likely undercounts certain population groups, including the poor and communities of color. This can happen because of mistakes in reporting the data, fear of consequences if the information is shared and who the Census is carried out (by mail, which might miss homeless people or people who have informal living arrangements).

Figure 3.3 Racial Distribution of Portland's Population, 2007⁸⁴



The Hispanic population of the nation is about 15 percent, a rate nearly double that of Portland. Seattle's rate of about 6 percent is less than Portland's share while California cities like San Francisco (14%) and San Jose (31%) have a much larger Hispanic population. Based on available population projections, it is expected that the Hispanic population in Portland is expected to grow in the coming decades.

The geographic distribution of some of these racial and ethnic communities became increasingly dispersed between 1990 and 2000. While African Americans remain concentrated in North and Northeast Portland, more African Americans were living along I-5, in the St. Johns area and in the East north of I-84 and along the blue MAX line. Growth in the Latino population in Portland was concentrated in North and Northeast Portland. Native Americans also experienced a population growth in the region between 1990 and 2000, generally concentrated in outer Portland neighborhoods.⁸⁵

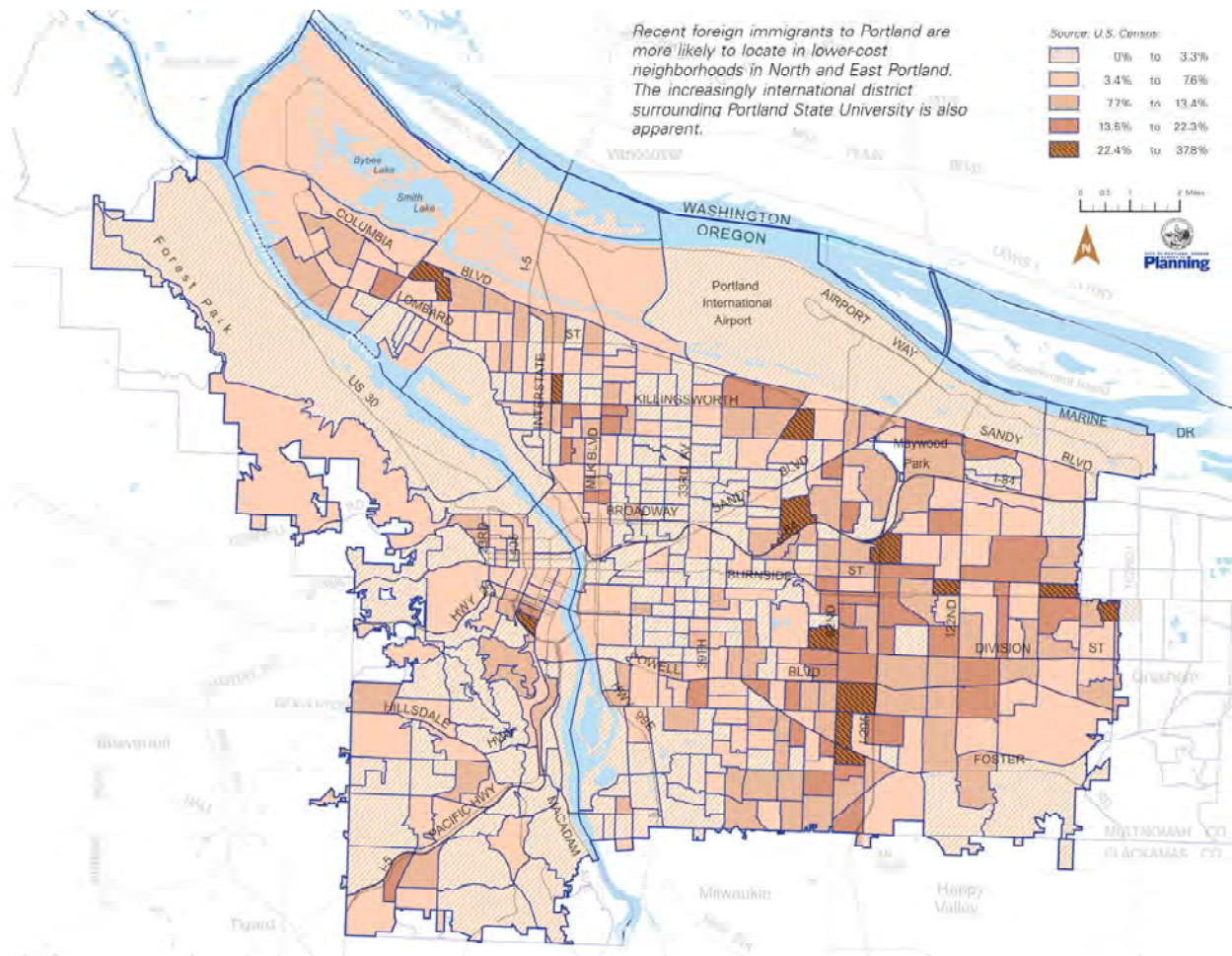
Some parts of the city are also becoming increasingly international, with influxes of immigrants and refugees. Areas that saw the largest influxes of foreign immigrants between 1990 and 2000 were concentrated in some of the Outer East neighborhoods and parts of North Portland as shown below in Figure 3.4.⁸⁶

⁸⁴ 2007 American Community Survey

⁸⁵ Coalition for a Livable Future, "The Regional Equity Atlas: Metropolitan Portland's Geography of Opportunity," 2007.

⁸⁶ Portland Present, January 2004, City of Portland Bureau of Planning.

Figure 3.4 Percent Change in Foreign Immigrants by Block Group, Portland, 1989-1999⁸⁷



COMMUNITY CONNECTEDNESS AND SOCIAL COHESION

Some researchers link many of the health impacts related to socioeconomic status with the level of social cohesion that neighborhoods have.⁸⁸ Higher levels of mutual support can seemingly protect health; conversely, lower levels of support or the breakdown of social relations can reduce trust and increase levels of violence.⁸⁹

One study examined the association between social capital and self-rated health and found that factors like low income, low education or smoking were strongly associated with people rating their health as poor. However, even after adjusting for these variables, low social capital still influenced

⁸⁷ City of Portland Bureau of Planning, *Portland Present*

⁸⁸ Social cohesion has been defined as “the quality of social relationships and the existence of trust, mutual obligations and respect in communities or in the wider society.” The term is used here along with “social capital,” which largely refers to the same set of issues (definition from Wilkinson, R. and M. Marmot, eds., “Social Determinants of Health: The Solid Facts, second edition.” International Centre for Health and Society, World Health Organization, 2003).

⁸⁹ Wilkinson, R. and M. Marmot, eds., “Social Determinants of Health: The Solid Facts, second edition.” International Centre for Health and Society, World Health Organization, 2003.

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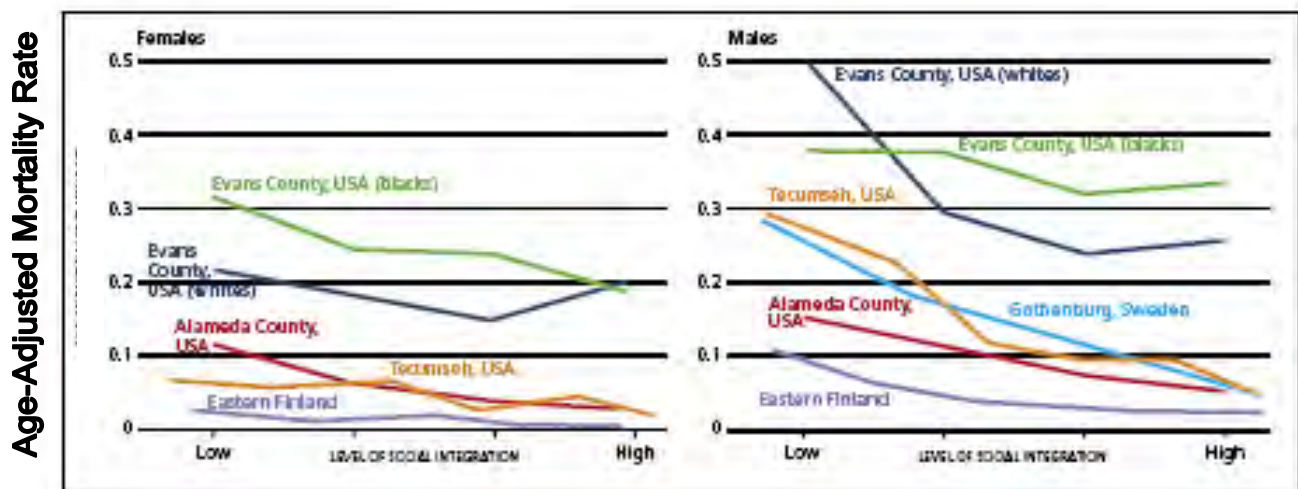
how often people rated their health as poor. The lowest-income people in the study were most affected by social capital.”⁹⁰

The authors of that study suggested that strong social capital can improve health outcomes in neighborhoods by:

- promoting faster dissemination of health information;
- establishing social norms encouraging healthy behaviors;
- exerting social control over deviant health-related behavior (for example, drug use), or collectively preventing crime; and
- increasing access to local services through political and social processes.⁹¹

In five different studies, mortality rates were lower in areas with higher levels of social cohesion, and vice versa, supporting the concept that lack of social cohesion can lead to premature death.

Figure 3.5 Level of Social Integration and Mortality in Five Prospective Studies



At the extreme, people can experience social exclusion, a phenomenon where people are excluded from the social life of the community due to poverty, discrimination, racism, hostility, unemployment and stigmatization. People can be excluded from access to decent housing, education, transport, services or civic activities. The longer that people live in disadvantaged circumstances and experience social exclusion, the more likely they are to suffer from a range of health problems, particularly cardiovascular disease.⁹²

Gentrification

Gentrification occurs when an influx of higher income residents into a neighborhood causes displacement of communities, often low-income or people of color, to dispersed settings often

⁹⁰ PolicyLink for The California Endowment, “The Influence of Community Factors on Health: An Annotated Bibliography,” 2004.

⁹¹ Kawachi I, Kennedy BP, et al. Social capital and self-rated health: a contextual analysis. *American Journal of Public Health*. 1999;89:1187-1193.

⁹² Wilkinson, R. and M. Marmot, eds., “Social Determinants of Health: The Solid Facts, second edition.” International Centre for Health and Society, World Health Organization, 2003.

outside the closer-in urban neighborhoods. The changes in neighborhood networks and conditions that result from gentrification have deep impacts on levels of social cohesion, resulting in negative health impacts to community members.

One study of breast cancer found higher incidence of late-stage diagnosis in areas with low SES profiles when compared to areas with higher levels of affluence, less concentrated disadvantage and lower levels of immigration. However, areas experiencing gentrification had higher incidence of late-stage breast cancer diagnosis than even in neighborhoods that were low-SES but not changing. “The UIC researchers suggest that women living in upward-changing neighborhoods may experience disruption of social networks, interruption in access to health care services, and stress relating to social isolation and financial problems as housing costs rise.”⁹³

Similarly there is evidence that the same disruption can occur in the areas people move to when displaced from gentrifying neighborhoods:

Hundreds of studies indicate that neighborhood characteristics have an important impact on health. It is reasonable to believe that variations in the geography of opportunity are causing many of the neighborhood differences in health outcomes we observe. However, the geography of opportunity continues to change. According to a 2006 report by Berube and Kneebone, suburban poor now outnumber urban poor. As gentrification of the inner cities proceeds, poor people are pushed out to the first ring of suburbs. This process continues to promote marginalization – both institutional and interpersonal – based on income, race, ethnicity, and nativity, and there is no question that it is an extraordinary generator of health disparities. In short, many of the differences in health that we now focus on as racial or ethnic disparities reflect processes of spatial marginalization that exclude the poor and “minorities” from living in places that allow access to health protective goods and services and protection from risks to their health.⁹⁴

CONCLUSION

The creation of health goes well beyond good choices, access to medicine or even quality of the built environment. Seemingly unrelated factors like education, income, self-perceived status, racism and social cohesion have been demonstrated to have long-lasting impacts on both individual and community health.

The Portland Plan can affect health by addressing many issues; the built environment, job creation, affordable housing and quality education policies can all work to improve individual and community health. Additional policies that would also impact the health of low-income communities could focus on economic development, reducing racial and poverty segregation, reducing inequalities in wealth, facilitating political participation and building community capacity.⁹⁵ Exploration of these policies are outside the scope of this document, but background reports on housing, economic development

⁹³ Iconocast, “Breast cancer diagnosis comes late for women in gentrifying neighborhoods,” <http://www.iconocast.com/Korean/A9EG0/News1.htm>.

⁹⁴ Kaplan, George, “Health Status Disparities in the United States,” Woodrow Wilson International Center for Scholars, edited transcript, April 04, 2007.

⁹⁵ PolicyLink for The California Endowment, “The Influence of Community Factors on Health: An Annotated Bibliography,” 2004.

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and others prepared for the Portland Plan will likely include many ideas on how Portland can do this work of building equity more effectively in the future.

While the level of local information provided in this chapter does not offer the detail for a fine-grained approach to addressing issues in specific parts of Portland, this discussion of potential health impacts is intended to begin a conversation in communities and in government about the health dimensions of issues of poverty and socioeconomic status. This lens can be carried forward in policy discussions that will follow in the Portland Plan process.

CHAPTER 4: CLEAN ENVIRONMENTS

OUTDOOR AIR QUALITY

What's the Issue?

Air pollutants include a wide variety of substances including particulate matter, ozone, carbon monoxide and other contaminants. In general, air pollutant levels are determined by the type of pollutant, its source, and local wind patterns. Air pollution can cause or exacerbate a wide range of illnesses, and chronic high exposure can result in cardiovascular and respiratory illness and cancer. People most susceptible to severe health problems from air pollution include individuals with existing heart or lung problems, pregnant women, children under 14 and outdoor workers.

Federal, state and local laws, including the federal Clean Air Act, which establishes acceptable emission levels for point sources and requires reductions for non-point sources, such as automobile exhaust regulate air quality levels in Portland. The Clean Air Act also includes the Integrated Urban Air Toxics Strategy, which “outlines state program elements to advance the Clean Air Act goals of 75 percent reduction in cancer incidence associated with air toxics, and a substantial reduction in public health risks for effects other than cancer”.⁹⁶

Health Impacts⁹⁷

Hospitalizations and Mortality

Air pollutants have been shown to cause hospitalizations and deaths, especially for diseases of the respiratory and circulatory systems. Of particular concern are air pollutants — such as particulate matter and benzene — which are associated with lung cancer. (More information on the air pollutants found in this section can be found in Table 4.1. However available data show no indication that air pollution in the County is increasing hospitalizations or death rates for lung cancer. There were more than 330 non-smoking lung cancer deaths in Multnomah County between 1990 and 2000, and the rate declined 16 percent from 1990 to 2000 (Figure 4.1). There was no

visionPDX on Clean Environments

There is considerable disagreement over pollution levels in Portland. Many respondents believe the streets, parks, highways, air and drinking water is clean, while others believe more needs to be done to alleviate pollution in our city and region. These respondents are concerned for their health and well-being and feel that their quality of life is compromised due to pollutants.

While some Portlanders appreciate the existing air quality, especially compared to other cities, many believe there is much room for improvement. Some people speak specifically about wanting to reverse the negative health implications, such as asthma, that they believe are related to transit emissions. Those who live near freeways and are disproportionately affected by polluted air expressed this feeling particularly strongly.

Many people like that Portland sets an example for low-impact stormwater management and numerous people appreciate the taste of Portland's tap water. However, many expressed concerns over the cleanliness of water from our rivers, streams and occasionally tap water in residents' homes. People think that clean, quality water should be available to all, and that the City government should ensure that drinkable water is affordable.

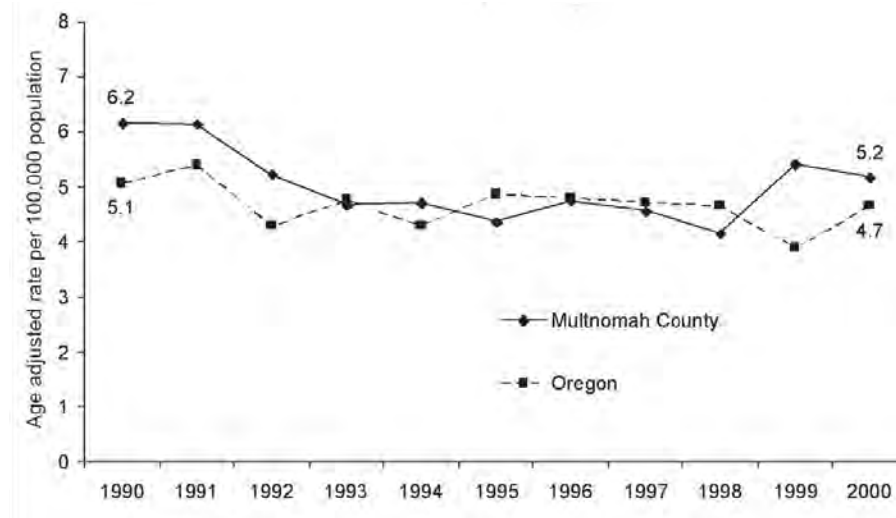
⁹⁶ Oregon Department of Environmental Quality, “Portland Air Toxics Assessment”. 2006. Online: <http://www.deq.state.or.us/aq/toxics/pata.htm>

⁹⁷ Multnomah County Health Department, “The Environmental Health of Multnomah County” 2003.

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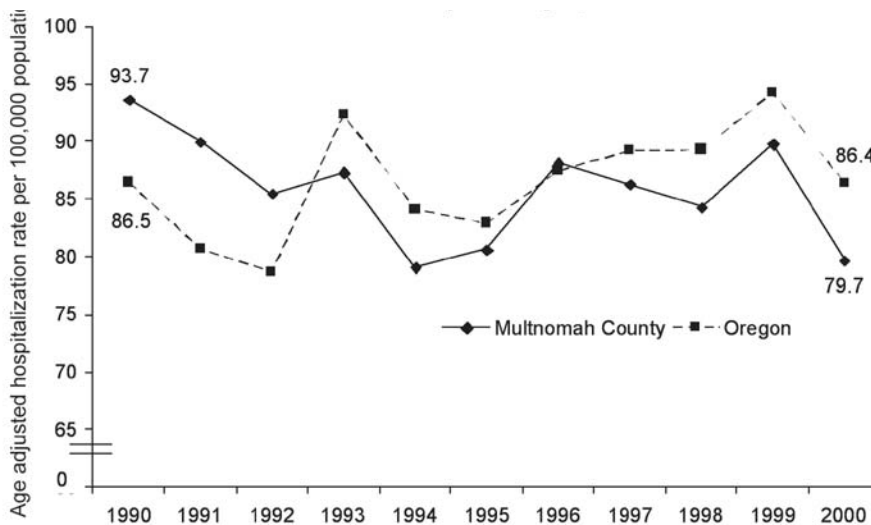
indication in the data of health disparities by ethnicity and race. Nonetheless, the risk for cancer from air toxics is highest in the most diverse areas of the County.

Figure 4.1. Non-Smoking Lung Cancer Death Rates – Multnomah County & Oregon, 1990-2000⁹⁸



The rate of hospitalization for respiratory diseases in the County remained unchanged between 1990 and 2000 (Figure 4.2), while hospitalization rates for circulatory diseases declined 21 percent in the same period. Hospitalization data are not available by ethnicity and race, so health disparities are not explored.

Figure 4.2. Hospitalization Rate for all Respiratory Diseases – Multnomah County & Oregon, 1990-2000⁹⁹



⁹⁸ Multnomah County Health Department

⁹⁹ Multnomah County Health Department

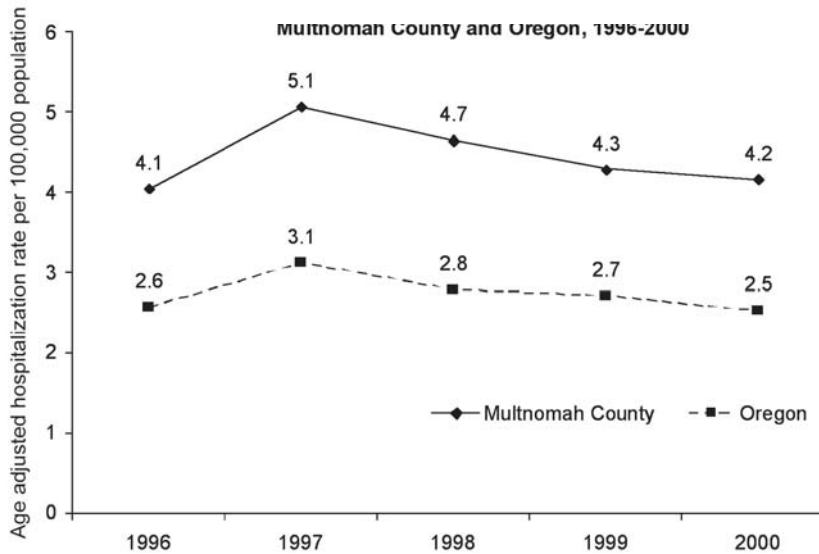
Asthma

Researchers have found evidence linking air pollution to asthma attacks, and some research indicates that air pollution can cause the development of asthma. In 2006, asthma affected more than 9 percent of U.S. children, making it the most common serious and chronic disease among children. Asthma affects racial and ethnic minorities more than whites; it is estimated that asthma is 26 percent more prevalent in African American children than in White children.¹⁰⁰ In Multnomah County, an estimated 7 percent of children, and 9 percent of adults had asthma in 2000.

There is some evidence to indicate that asthma rates are higher in areas of Multnomah County with poorer air quality. The Portland Neighborhood Survey - a recent survey of residents near the North I-5 corridor in Portland (where NATA data shows that air toxics are emitted in higher concentrations) - has found that asthma rates are twice that of Multnomah County, Oregon (7.7%), and the Nation. Although these data should be viewed with caution due to small sample size, the survey found that 14.4% of residents had asthma. Nearly 50% of those reporting asthma in the survey were African American, possibly indicating that asthma rates for African Americans are higher in this area.¹⁵

According to data obtained from the Oregon Association of Hospitals, asthma hospitalization rates for asthma in Multnomah County are twice that for Oregon, (Figure 4.3). Between 1996 and 2000, there were more than 1300 hospitalizations due to asthma.

Figure 4.3 Hospitalization Rate for Asthma – Multnomah County and Oregon, 1996 to 2000¹⁰¹



¹⁰⁰ National Health Interview Survey, National Center for Health Statistics, Centers for Disease Control and Prevention, 2006.

¹⁰¹ Multnomah County Health Department

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CRITERIA POLLUTANTS

The Clean Air Act requires EPA to set National Ambient Air Quality Standards for six common air pollutants, or “criteria pollutants”: particulate matter, ground-level ozone, carbon monoxide, sulfur oxides, nitrogen oxides and lead. These pollutants are known to be unhealthy at high levels or with prolonged exposure. The standards set maximum permissible levels based on health and environmental criteria.

Motor vehicle emissions and the combustion of gas, oil and wood are the primary man-made sources of these pollutants. Industry contributes to approximately 15 percent of criteria pollutant levels. These levels have been reduced significantly since the 1990 Clean Air Act, which mandated pollution prevention measures for many industrial pollution sources.

According to the Oregon DEQ, ground-level ozone (smog) fine particulate matter (PM_{2.5}) from sources like wood smoke and cars, air toxics, and greenhouse gases are the air pollutants of greatest concern.¹⁰²

Exposure to criteria pollutants can have major impacts on health:

- Particulate matter has been linked to heart and lung diseases, including respiratory infections, bronchitis, asthma, and emphysema. Components are also known or suspected carcinogens.
- Ozone can cause irritation of the nose, throat and lungs; increased airway resistance; decreased efficiency of the respiratory system; chest pains; and headaches. Long-term exposure can cause significant breathing problems, such as loss of lung capacity and increased severity of both childhood and adult asthma.
- High concentrations of carbon monoxide strongly impair the functions of oxygen-dependent tissues, including brain, heart and muscle. Prolonged exposure to low levels of CO aggravates existing heart disease or circulatory disorders. Even in otherwise healthy adults, carbon monoxide has been linked to increased heart disease, decreased performance, and diminished mental capacity. High CO levels have been associated with low birth weights and increased infant mortality.¹⁰³
- Exposure to sulfur dioxide can cause breathing difficulty for people with asthma and with chronic exposure, can result in respiratory illness, lung and eye irritation, and aggravation of existing heart disease. Sulfur dioxide can also react with other chemicals in the air to form sulfate particles. When these are breathed, they gather in the lungs and are associated with increased respiratory symptoms and disease, difficulty in breathing, and premature death.¹⁰⁴
- Nitrogen dioxide is a lung irritant. It may be related to chronic pulmonary fibrosis and is toxic in high concentrations.

More detail on the health impacts of these pollutants can be found in Table 4-1 on page 58.

¹⁰² Oregon Department of Environmental Quality, Air Quality Division. “2007 Oregon Air Quality Data Summaries”, Online: <http://www.oregon.gov/DEQ>

¹⁰³ Oregon Department of Environmental Quality, Air Quality Division. “2007 Oregon Air Quality Data Summaries”, Online: <http://www.oregon.gov/DEQ>

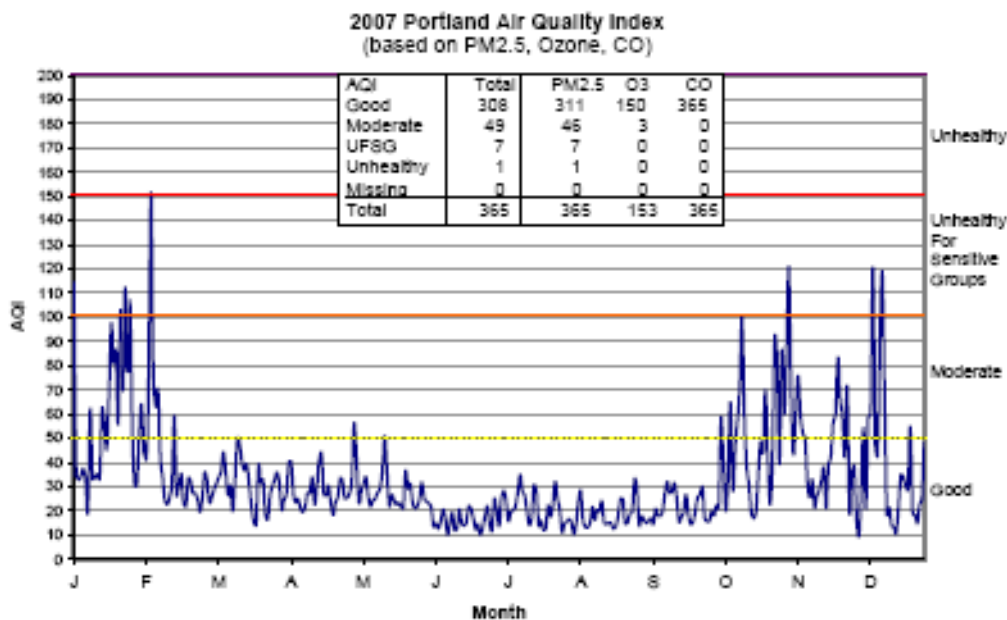
¹⁰⁴ Environmental Protection Agency, “Health and Environmental Impacts of SO₂” Online: <http://www.epa.gov/air/urbanair/so2/hlth1.html>, March 2009.

Local Conditions

The Air Quality Index (AQI) is a measure of ambient air quality based on particulate matter (PM2.5), ozone and carbon monoxide, three criteria pollutants. The AQI is reported on a scale of 0-300, where higher values indicate increasingly poor air quality conditions. At levels of 101 or higher, the air is considered to be unhealthy for people with heart disease, respiratory disease, older adults, and children. At levels of 201 and higher, the air is considered very unhealthy, and prolonged outdoor activity is discouraged for all residents.

In general, Portland’s air quality in 2007 was good during the summer months (an AQI of less than 50), with winter levels generally in the moderate category (AQI from 51 to 100), as see in Figure 4.4. However, in 2007, the air quality degraded to a condition considered unhealthy for sensitive individuals (AQI between 101 and 150) on seven days and reached a level unhealthy for all individuals (AQI greater than 150) on a single day in February. Air pollution is influenced by the weather, particularly when wind levels are low. Particulate matter levels tend to be higher in winter months, while ozone levels tend to be higher in summer months.

Figure 4.4 2007 Portland Air Quality Summary¹⁰⁵



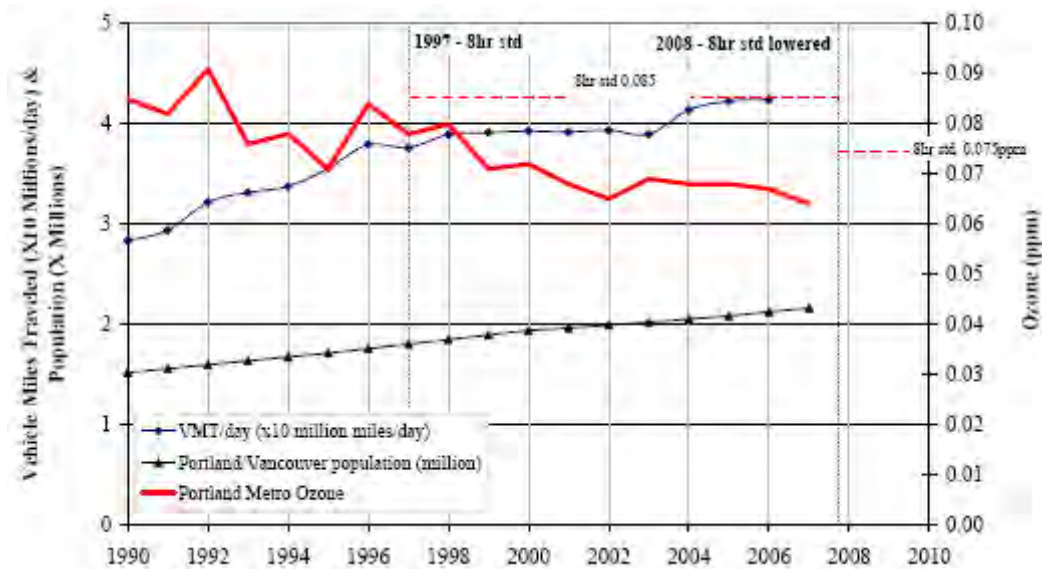
Portland has not exceeded Oregon’s National Ambient Air Quality Standards for PM2.5, PM10 or carbon monoxide in the past 10 years. Air quality in the city exceeded NAAQS standards for ozone once in 2006 and 2002, and three times in 1998.¹⁰⁶ Figure 4.5 shows that despite population growth in the Portland metropolitan area, ozone levels have, in general, been declining since 1990. Current annual averages are below the National Ambient Air Quality Standards.

¹⁰⁵ Oregon Department of Environmental Quality, Air Quality Division. “2007 Oregon Air Quality Data Summaries”, Online: <http://www.oregon.gov/DEQ>

¹⁰⁶ Ibid.

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Figure 4.5 Average Annual Ozone Levels and Vehicle Miles Traveled, 1990-2007¹⁰⁷



AIR TOXICS

Air toxics are generally defined as air pollutants known or suspected to cause serious health problems like birth defects and cancer. Title III of the 1990 Clean Air Act Amendments designated 188 Hazardous Air Pollutants which are regulated to protect human health. The EPA further identified 33 of these pollutants as Urban Air Toxics and studied their levels nationwide in 1996. According to EPA's National Air Toxics Assessment, there are 16 toxic air pollutants in Oregon's air modeled at levels more than 10 times the federally determined safe level.¹⁰⁸

In 2006, the Oregon Department of Environmental Quality (DEQ) completed an air quality modeling study called the Portland Air Toxics Assessment (PATA). The assessment was designed to estimate levels of 12 air toxics in the Portland area, based on local geography, meteorology and emissions and to characterize the distribution and risk of exposure.¹⁰⁹ The 12 air pollutants modeled included metals (nickel, arsenic and chromium), volatile organic compounds (benzene, 1,3-butadiene and perchloroethylene), carbonyls (primary acetaldehyde and primary formaldehyde), diesel particulate matter, perchloroethylene, acrolein, chloroform and polycyclic organic matter. Other air toxics were believed to be below levels of concern.

Air toxics can be released into the air from both natural sources (rocks, forest fires) and man-made sources (motor vehicle emissions, manufacturing and industry, burning of wood and other materials). Air toxics can harm both the natural environment and residents' health. All of these substances, except Acrolein, are known or suspected to cause cancer. Table 4.1 on page 58

¹⁰⁷ Ibid. Note: Portland/Vancouver ozone trend using the three year average of fourth highest eight hour ozone value with Vehicle Miles Traveled and Population trends. In 2008 the eight hour standard was lowered to 0.075 ppm. Population figures are from Portland State University Population Research Center. Vehicle miles traveled are taken from Metro for the Portland/Vancouver area.

¹⁰⁸ Oregon Department of Environmental Quality, "Portland Air Toxics Assessment". 2006. Online: <http://www.deq.state.or.us/aq/toxics/pata.htm>

¹⁰⁹ Ibid.

displays the primary sources, health impacts and geographic areas of concern for human health related impacts of these twelve air toxics.

Local conditions

The Portland area has seen significant declines in carbon monoxide and large particulate matter (PM10) levels over the past twenty years, Figure 4.7 on page 62. However, levels of these criteria pollutants have been flat to increasing in the past five years while ozone has seen more gradual decline over the same periods. Levels of small particulate matter (PM2.5) have remained relatively flat, though with variable peaks. Levels for all of these criteria pollutants were below Oregon DEQ Benchmarks for 2007, though small particulate matter (PM2.5) levels exceeded the benchmark in 2006.

Levels of aldehydes in the region's air have been relatively flat, though variable, over the eight-year period from 2000 through 2007; (Figure 4.8). During this period, levels exceeded benchmarks for five quarters. Levels of arsenic and nickel have exceeded benchmarks at times since 2000, most recently in 2007, (Figure 4.9). Benzene levels have been flat to increasing since 2005 and are currently 8-10 times greater than Oregon DEQ benchmarks, (Figure 4.10).

Areas of Concern

According to the Portland Air Toxics Assessment, modeled levels of diesel particulate matter, chromium, polycyclic organic matter, and acrolein reached levels of concern citywide, with the highest exposure levels associated with major highways. High levels of benzene, 1,3 butadiene, acetaldehyde, formaldehyde, and arsenic were also associated with major highways, though levels were lower in other areas of the city. Levels of chloroform and perchloroethylene were above levels of concern only in very small geographies (near the paper and pulp operation in Camas for chloroform and near large dry-cleaning sites for perchloroethylene). Levels of nickel were considered below levels of concern citywide.

The Portland Air Toxics Assessment also examined the cancer risk from air toxics. An analysis of emissions data, released in 2006, shows that the mean cancer risk for Portland area residents is 66 in a million.¹¹⁰ All areas examined exceed the health-protective guideline for air toxics established under the Clean Air Act of a one in a million cancer risk.

Furthermore, the cancer risk to city residents varies based on where they live. North, Northeast, Downtown and areas near freeways are particularly at-risk. Figure 4.5 "illustrates an overall estimated health impact from air pollutants. While roadways seem to be the primary indicator for compromised air quality, the patterns vary considerably around the region. With a higher density of highways occurring in downtown Portland, it may not be surprising that downtown has some of the highest concentrations of air pollutants; however these trends are not confined only to downtown... Suburban areas such as... near the interchange of Interstates 84 and 205 are also affected by high concentrations of air pollutants."¹¹¹ Not all air pollution and related health impacts can be linked to

¹¹⁰ Oregon Department of Environmental Quality, "Portland Air Toxics Assessment". 2006. Online: <http://www.deq.state.or.us/aq/toxics/pata.htm>. Based on Chapter 8. Risk Characterization (Table 8.4), mean cumulative cancer risk estimate at the 50th percentile.

¹¹¹ Shandas, V. and George, L. "Spatial Patterns of Air Toxins in the Region." *Metroscape*, Winter 2009.

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transportation corridors as seen in Industrial areas of Northwest Portland that have high relative health impact scores, but low traffic volumes.

Figure 4.6 Combined Health Impacts of Air Pollutants¹¹²

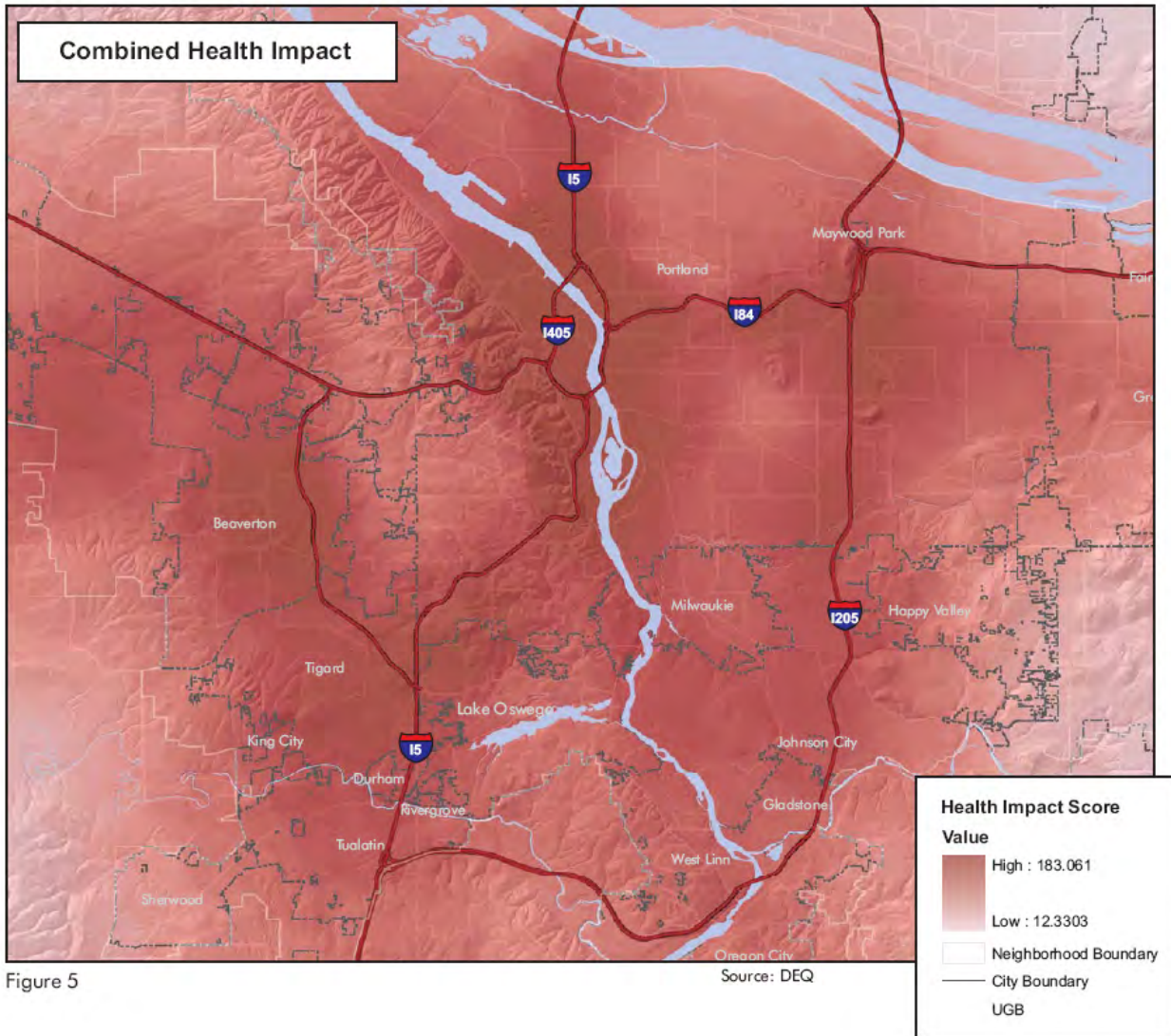


Figure 5

CONCLUSIONS

In general, air quality in Portland, particularly levels of criteria pollutants, has been improving over the past five years. However, benzene levels currently exceed Department of Environmental Quality benchmarks over ten-fold, leading to significant potential health impacts. Due to air pollutants, cancer risk citywide exceeds the health-protective guideline for air toxics established under the Clean Air Act. The City as a whole has higher than desired relative cancer risk, though areas of North and Northeast Portland, Downtown and areas along highway corridors fare particularly

¹¹² Ibid.

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poorly. This distribution of air pollutants and related health risks could pose an equity issue as these areas also have a high proportion of low-income and ethnic/racial minorities.

Improving air quality will require major efforts to reduce non-point source pollutants, particularly auto emissions. Though there may be limited improvements in the levels and types of pollutants emitted by cars and trucks in the future, policies to encourage reductions in vehicle miles traveled will likely have greater short, and long-term impacts on pollutant levels.

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Table 4.1. Primary Sources and Areas of Concern for Key Air Toxics in the Portland Area

Substance	Primary Man-made Sources	Known Health Impacts¹¹³	Geographic Areas of Concern¹¹⁴
Fine Particulate (PM10 and PM2.5) (particles less than 10 microns and 2.5 microns in diameter, respectively)	motor vehicles, utility and industrial boilers and dryers, wood stoves, open burning, slash burning, and field burning	Particulate matter can cause health problems through inherent toxicity, damage to the respiratory system, or through adsorbed toxic substances. Relationships have been shown between exposure to high concentrations of particulate matter and increased hospital admissions for respiratory infections, heart disease, bronchitis, asthma, emphysema, and similar diseases. In addition, there may be several potential carcinogens present on particulate matter.	
Total Suspended Particulate (TSP) (particles less than 100 micro-meters in diameter)	motor vehicles, utility and industrial boilers and dryers, wood stoves, open burning, slash burning, and field burning	See fine particulate matter.	
Sulfur dioxide (SO2)	In Oregon: combustion of diesel, heating oil, and low sulfur coal	SO2 is a lung and eye irritant, can cause bronchial constriction and exacerbation of existing respiratory diseases. Chronic exposure to SO2 can lead to coughing, shortness of breath, fatigue, and bronchitis.	
Carbon monoxide (CO)	Motor vehicle emissions, wood stoves	High concentrations of CO strongly impair the functions of oxygen-dependent tissues, including brain, heart, and muscle. Prolonged exposure to low levels of CO aggravates existing conditions in people with heart disease or circulatory disorders. Even in otherwise healthy adults, carbon monoxide has been linked to increased heart disease, decreased athletic performance, and diminished mental capacity. High CO levels have been associated with low birth weights and increased infant mortality.	
Ozone	Ozone is not emitted directly into the air but is formed through a series of reactions between other pollutants and oxygen (O2) during hot weather. Most important are Nitrogen oxides and volatile organic compounds.	Ozone can cause irritation of the nose, throat, and lungs; increased airway resistance; decreased efficiency of the respiratory system; chest pains; and headaches. Long-term exposure can cause significant breathing problems, such as loss of lung capacity and increased severity of both childhood and adult asthma.	
Nitrogen Dioxide (NO2)	Motor vehicle emissions, utility and industrial boilers	Nitrogen dioxide is toxic in high concentrations. It is a lung irritant and may be related to chronic pulmonary fibrosis. It is also important in the photochemical reactions leading to the formation of ozone.	

¹¹³ Oregon Department of Environmental Quality, Air Quality Division. "2007 Oregon Air Quality Data Summaries", Online: <http://www.oregon.gov/DEQ>

¹¹⁴ Oregon Department of Environmental Quality, "Portland Air Toxics Assessment". 2006. Online: <http://www.deq.state.or.us/eq/toxics/pata.htm>

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Substance	Primary Man-made Sources	Known Health Impacts ¹¹³	Geographic Areas of Concern ¹¹⁴
Arsenic	combustion of distillate oil and natural gas used for heating homes and businesses (widespread), metal smelting, pesticide treatment of crops	Inorganic arsenic is a human poison. High levels in food or water can be fatal. Arsenic damages many tissues including nerves, stomach and intestines, and skin. Lower levels of exposure to inorganic arsenic may cause nausea, vomiting, and diarrhea, decreased production of red and white blood cells, abnormal heart rhythm, blood vessel and nerve damage. Breathing inorganic arsenic increases the risk of lung cancer. EPA has classified inorganic arsenic as a known human carcinogen.	Elevated cancer risks from arsenic align with major highway corridors within the Portland area; lower levels in other areas of city
Chromium	Surface coating of plastic parts; steel manufacturing, burning fossil fuels	Long-term exposure to chromium VI may cause respiratory tract damage, increase the risk of lung cancer, and result in complications during pregnancy and childbirth. EPA has classified chromium VI as a known human carcinogen. The most common form of chromium, chromium III, is not known to cause cancer and is less toxic.	May pose a cancer risk at all estimated exposures in the Portland area; High concentrations predominantly along the west bank of the Willamette River, extending northwest from the Portland urban core, along major highway corridors, and in the Beaverton area
Nickel	Industrial boilers and processes, electroplating, incineration of municipal garbage (contained in many consumer products)	Respiratory effects, including chronic bronchitis and reduced lung function, have been observed in workers who breathe large amounts of nickel. Nickel may also cause reactions in sensitive skin upon contact. Some people react if they consume nickel in food or water, or react if they breathe it. EPA has classified several forms of nickel as known or probable human carcinogens.	High concentrations predominantly along the west bank of the Willamette River, extending northwest from the Portland urban core. Nickel is unlikely to pose either a non-cancer or cancer health risk in the Portland area.
Benzene*	Motor vehicle emissions, residential wood combustion, manufacturing of plastics and synthetic fibers, tobacco smoke	Long-term inhalation of benzene causes many disorders including anemia, excessive bleeding, damage to the immune system and genetic damage. EPA has classified benzene as a known human carcinogen.	Elevated cancer risks align with major highway corridors; lower risk across a broader geographic extent
1,3 Butadiene	Motor vehicle emissions; lawn and garden equipment, marine and recreational vehicles, manufacturing of plastics	Long-term inhalation of 1,3-butadiene can result in an increased incidence of cardiovascular diseases, including rheumatic and atherosclerotic heart diseases (hardening of the arteries) and can cause blood disorders. EPA has classified 1,3-butadiene as a probable human carcinogen.	Highest cancer risk aligns with Interstate 5 through SW Portland; high risks along the other major roadways; lower risk across a broader geographic extent
Perchloroethylene (Tetrachloroethylene)	Dry cleaning, textile processing, chemical manufacturing, degreasing, solvent	Exposure to high levels can cause acute health effects including: central nervous system damage, kidney dysfunction, and severe respiratory irritation. Long term, low level exposures can cause neurological impairment, and severe liver and kidney damage. Perchloroethylene is classified as a possible human carcinogen.	Poses a cancer risk only when exposures are significantly elevated; levels are consistent across city, increases with proximity to dry cleaning sites

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Substance	Primary Man-made Sources	Known Health Impacts ¹¹³	Geographic Areas of Concern ¹¹⁴
Acetaldehyde	Motor vehicle emissions, construction equipment, residential wood burning	Health effects from breathing small amounts of acetaldehyde over long periods are uncertain. EPA has classified acetaldehyde as a probable human carcinogen.	Elevated cancer risks align with major highway corridors
Formaldehyde*	Motor vehicle emissions, construction equipment, diesel fuel combustion, wood burning, power plants, incinerators, manufacturing facilities, tobacco smoke	Chronic exposure to inhaled formaldehyde is associated with respiratory symptoms and eye, nose, and throat irritation and increased incidence of lung and nasal cancer. EPA considers formaldehyde to be a probable human carcinogen.	Highest cancer risk aligns with major highway corridors; lower risk across a broader geographic extent
Chloroform	Wastewater treatment facilities,	Chloroform exposure is associated with effects on the liver, including hepatitis and jaundice, and central nervous system effects, such as depression and irritability. ¹¹⁵	Poses cancer risk where levels are significantly elevated; risks align with the pulp paper operation at Camas (source eliminated since data collected)
Diesel Particulate Matter*	On and off-road diesel engines	Combustion-related particulate matter is associated with severe impacts such as heart attacks, stroke, cardiovascular death and lung cancer in adults. Carbon soot particles from diesel engines absorb other metals and toxics produced by diesel engines such as cancer-causing aldehydes and PAH (polycyclic aromatic hydrocarbons.) Studies link cancers, particularly lung cancer, and increased rates of respiratory and cardiovascular disease and risk of premature death to diesel exhaust exposures. ¹¹⁶	Risk is significant across the city; higher concentrations likely exist in the downtown area where there is a concentration of emissions from vehicles, construction, marine and rail sources.
Acrolein	Wood burning, structural fires, and construction	Can cause eye, nose, throat, and skin irritation and respiratory congestion. It has not been classified as a probable carcinogen. ¹¹⁷	Main source of non-cancer adverse health effects in the area; risk is ubiquitous across the area; higher exposure and risk levels are confined to northeast and southeast and an area north of Lake Oswego, possibly along the 217 highway corridor
Polycyclic organic matter	Motor vehicle emissions, wood combustion, asphaltting roads	Limited information on short and long-term health impacts. Long-term exposure to one form of POM, benzo(a)pyrene, has resulted in dermatitis, eye irritation, and reduced fertility. EPA has classified POM compounds as probable human carcinogens.	May pose a cancer risk at all estimated exposures in the Portland area; highest cancer risk aligns with major highway corridors

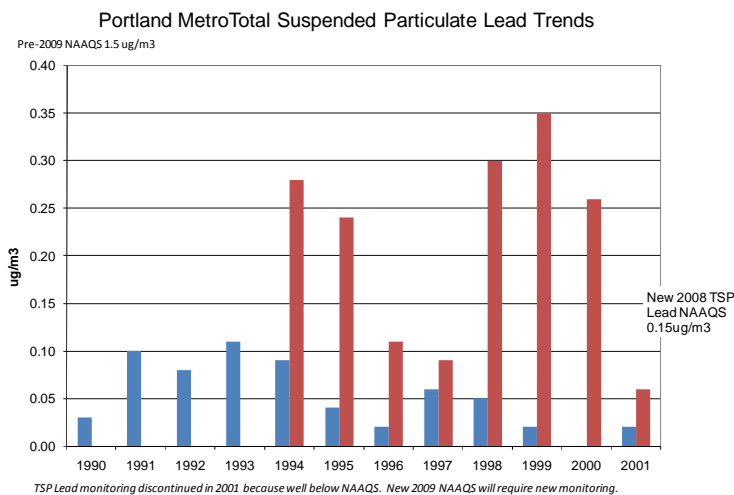
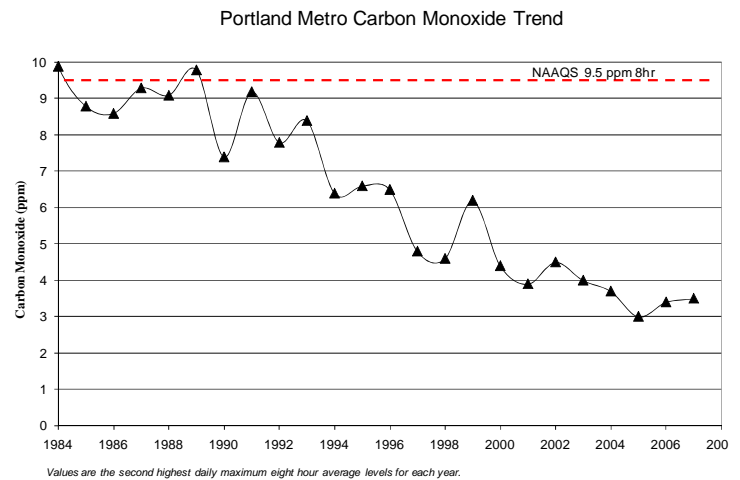
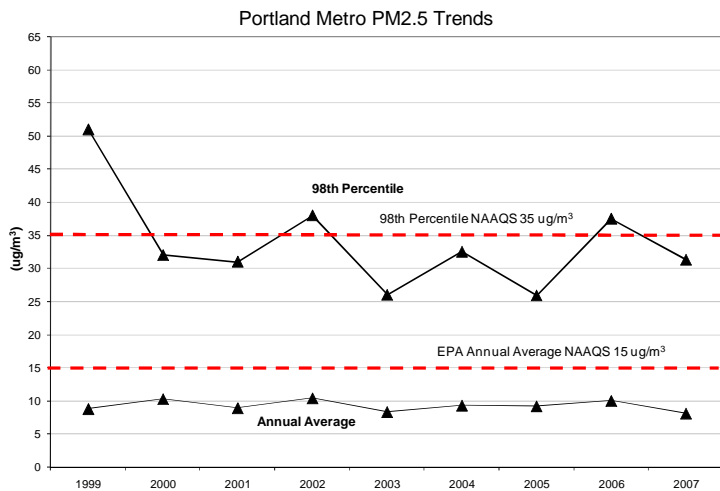
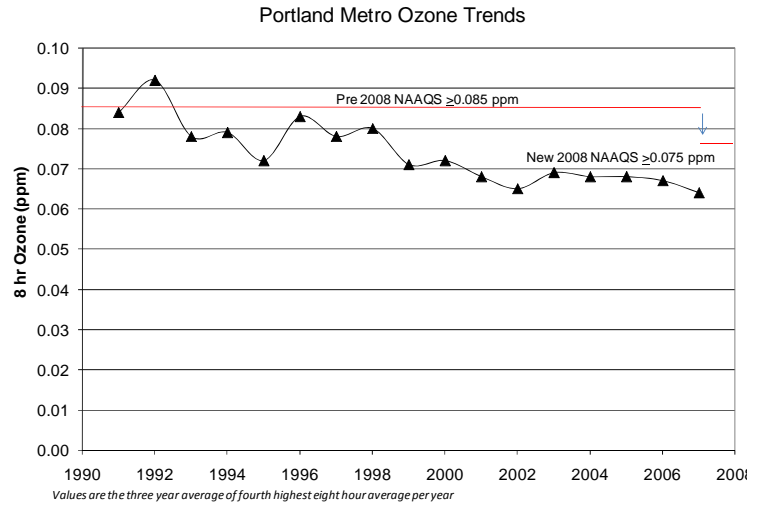
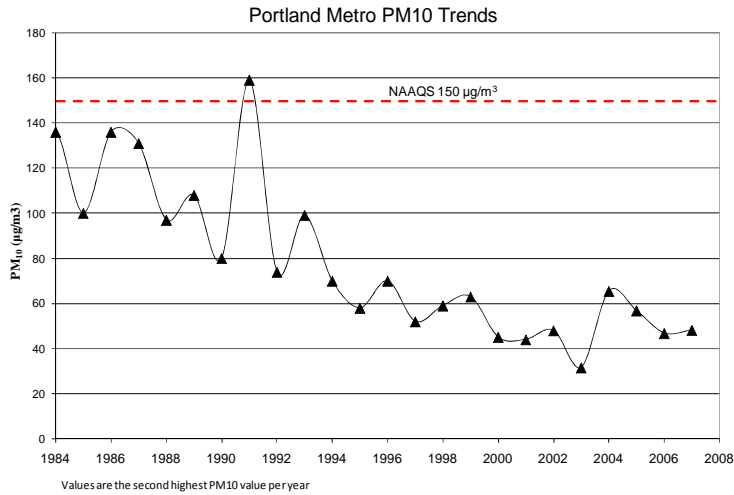
* Top three sources of adverse health effects and cancer risk within the Portland area.

¹¹⁵ Environmental Protection Agency, "Air Toxics Website: Chloroform". Online: <http://www.epa.gov/ttn/atw/hlthef/chlorofo.html>

¹¹⁶ Clean Air Task Force.

¹¹⁷ Environmental Protection Agency, "Air Toxics Website: Acrolein". Online: <http://www.epa.gov/ttn/atw/hlthef/acrolein.html>

Figure 4.7. Portland Trends for Criteria Pollutants



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Figure 4.8 Portland Air Toxics Trends - Aldehydes

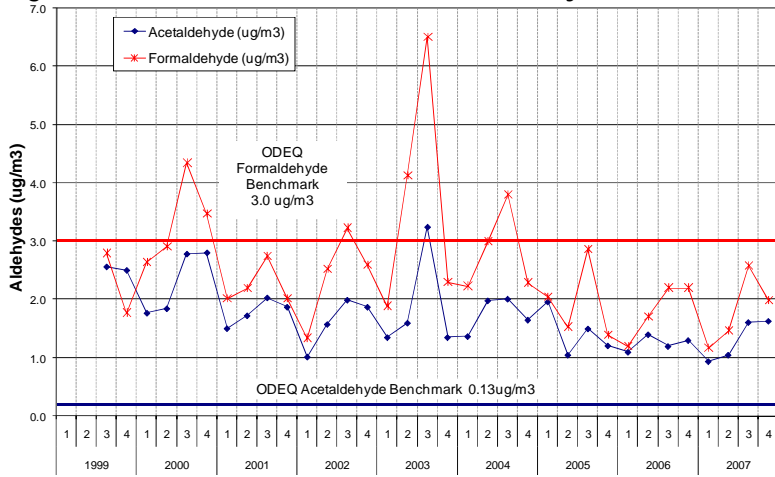


Figure 4.9 Portland Air Toxics Trends – Arsenic, Lead, Nickel

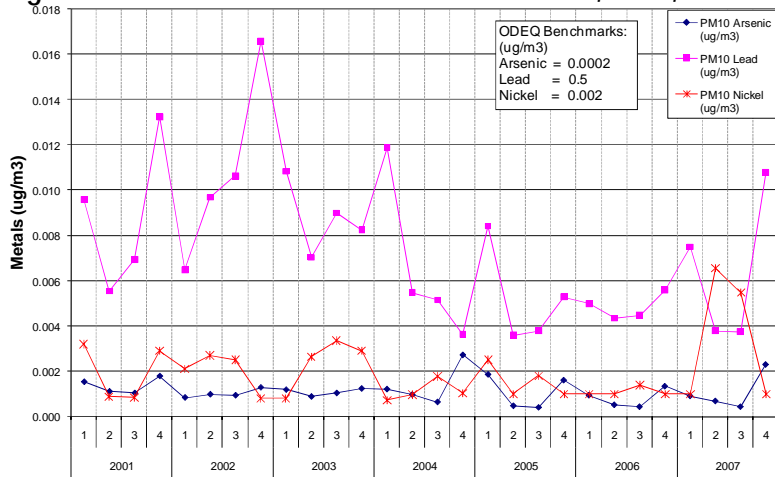
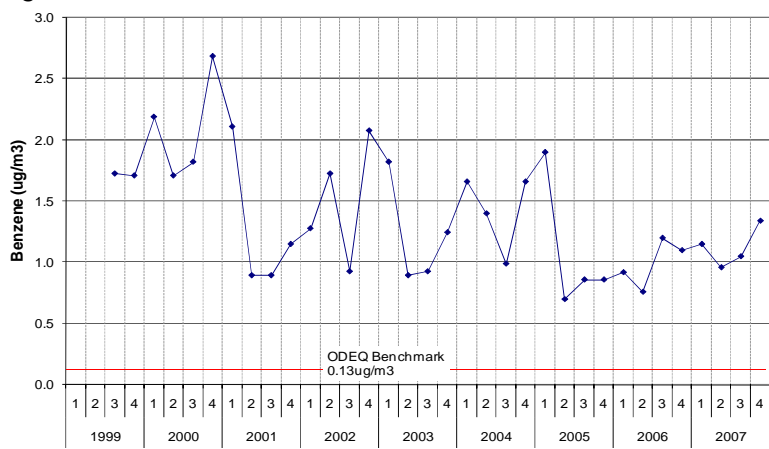


Figure 4.10 Portland Air Toxics Trends - Benzene



HOUSEHOLD TOXICS AND INDOOR AIR QUALITY

What's the Issue?

Portlander's face potential health risks from exposure to household toxics and indoor air pollutants. Indoor air pollutants of concern include radon, organic gases, tobacco smoke, biologicals like pollen and mold, asbestos, carbon monoxide, nitrogen dioxide, formaldehyde, and respirable particles. The primary sources of indoor air pollution are indoor combustion, including smoking and wood or gas burning stoves, fireplaces, heaters, and furnaces; household cleaning and other products; building materials and furnishings; and heating and air systems. Indoor air quality problems can be exacerbated by poor ventilation, high temperatures and high humidity levels.

Toxic chemicals from consumer products, food, and industrial pollution, including perfluorinated chemicals (PFCs), phthalates, mercury, organophosphate pesticide metabolites, bisphenol A, and polychlorinated biphenyls (PCBs) can also contaminate our bodies. While some of these toxic chemicals come from contaminated soil, air, and water, many of the pollutants also come from food, everyday household dust, and from direct contact with such everyday products as personal care items, plastic products, consumer electronics, and stain-resistant furniture.¹¹⁸

Many people spend up to 90 percent of their time indoors, in homes, workplaces, schools, restaurants, and shops.¹¹⁹ With so much time indoors, exposure to poor indoor air quality and toxics in homes and places of employment can have major impacts on residents' health. In addition, those who are likely to spend the most time indoors - children, elderly, and the chronically ill - are also more likely to be susceptible to these negative health impacts.¹²⁰

Health impacts of indoor air pollutants and household toxics can vary depending on the pollutant, type of exposure, and person exposed (age, pre-existing medical condition, sensitivity). Effects can be felt immediately or can occur months or years later, acute or chronic and can come from single or repeated exposure. For some people, sensitivity can increase with long-term or repeated exposure. These toxics and pollutants, or their breakdown products, can also accumulate in the body, if they remain in the body for periods of time before being excreted. The length of time a pollutant or toxic chemical remains in the body will depend on its properties. However, this bioaccumulation can lead to increased health impacts as the 'body burden' of a single toxic or combination of toxics increases.

Immediate effects from indoor air pollutants can include eye, nose and throat irritation, exacerbation of existing respiratory diseases like asthma, fatigue, dizziness and headaches. Reducing exposure can often reduce or eliminate these symptoms. Steps can also be taken to improve indoor air quality, including improving ventilation, choosing lower or non-polluting products and furnishings, and ensuring heating and air systems are functioning properly. Impacts from chronic exposure can be more severe, and include respiratory disease, heart disease, and cancer. The health impacts associated with a variety of indoor air pollutants can be found in Table 4.4.

¹¹⁸ Oregon Environmental Council, *Pollution in People: A Study of Toxic Chemicals in Oregonians*. November 2007. Online: <http://www.oeconline.org/resources/publications/reportsandstudies/pollutioninpeople.pdf>. Accessed September 2010.

¹¹⁹ Environmental Protection Agency, "The Inside Story: A Guide to Indoor Air Quality," Online: <http://www.epa.gov/iaq/pubs/insidest.html>. Retrieved: January 26, 2009.

¹²⁰ Ibid.

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However, according to the EPA,

While pollutants commonly found in indoor air are responsible for many harmful effects, there is considerable uncertainty about what concentrations or periods of exposure are necessary to produce specific health problems. People also react very differently to exposure to indoor air pollutants. Further research is needed to better understand which health effects occur after exposure to the average pollutant concentrations found in homes and which occur from the higher concentrations that occur for short periods of time.¹²¹

Health risks of household toxics can include disruption of endocrine and reproductive systems (phthalates), learning deficits (PCs), impaired neurological development (mercury), increased cancer risk (PFCs) and hormone disruption (bisphenol A).¹²²

Local Conditions

Environmental Tobacco Smoke

Environmental tobacco smoke is defined as smoke given off by cigarettes, pipes, or cigars to which nonsmokers can be exposed. Environmental tobacco smoke causes approximately 3,000 deaths nationwide each year among adult nonsmokers, serious lower respiratory tract infections and asthma among children, and has been linked to sudden infant death syndrome (SIDS) among infants.¹²³

According to the Center's for Disease Control, approximately 13 percent of Oregonians smoke on a daily basis and another 4 percent smoke occasionally.¹²⁴ The State of Oregon currently prohibits smoking in almost all public places and places of employment, including enclosed private and public workplaces, bars, restaurants and most hotel rooms. Smoking is also prohibited within ten feet of any entrance, window or air intake vent of a building. Smoking in homes and other private buildings continues to contribute to indoor air pollution.

Lead

Lead paint is found primarily in homes built before 1950, although it is also sometimes found in homes built as late as 1978 when a manufacturing ban on lead based paint was enacted. According to the 2000 U.S. Census, 40 percent of Multnomah County's housing units were built before 1950 and 79.6% were built in 1979 or earlier. Map 4.1 shows the percent of housing built in 1950 or earlier by census tract; in inner Northeast and Southeast neighborhoods have a higher percentage of housing built in 1950 or earlier.¹²⁵

¹²¹ Ibid.

¹²² Oregon Environmental Council, *Pollution in People: A Study of Toxic Chemicals in Oregonians*. November 2007. Online: <http://www.oeconline.org/resources/publications/reportsandstudies/pollutioninpeople.pdf>. Accessed September 2010.

¹²³ Multnomah County Health Department, "The Environmental Health of Multnomah County" 2003. Accessed 12/2009 Online. <http://www.co.multnomah.or.us/health/>

¹²⁴ National Center for Chronic Disease Prevention & Health Promotion, "Behavioral Risk Factor Surveillance System, Four-Level Smoking Status for Oregon, 2007", Online: <http://apps.nccd.cdc.gov/brfss/display.asp?cat=TU&yr=2007&qkey=4394&state=OR>. Retrieved February 3, 2009.

¹²⁵ Multnomah County Health Department, "The Environmental Health of Multnomah County" 2003. Accessed 12/2009 Online. <http://www.co.multnomah.or.us/health/>

A February 2001 Multnomah County Health Department (MCHD) study looked at the prevalence of household lead dust hazards in North, Northeast and Southeast Portland housing built before 1930. It was found that 71 percent of homes in the study had lead dust levels that exceeded federal standards. It is important to note also that, at the time the study was conducted, the federal standards were 50 percent less stringent than they are today.¹²⁶

Plumbing can also be a source of lead exposure for Portland residents. All known lead service connections were removed from the City’s water system prior to 1998. However, exposure can still occur if a building’s plumbing contains lead.

Testing of children through the Multnomah County Health Department indicates 1 percent of those children who are actually tested have confirmed elevated blood lead levels (above 15 ug/dL). Blood lead levels of 10 micrograms per deciliter (10 ug/dL) or more can adversely affect a child’s intelligence, behavior and development. The Oregon Department of Human Services, Lead-Based Paint Program tracks the number of children county-wide who have tested positive for elevated blood lead levels, (Table 4.2). Although testing for childhood blood lead has increased in the County, the average blood lead levels have shown a decline. However, there are still many at-risk children living in the County who are never tested for lead. Therefore, the actual prevalence of childhood lead poisoning in the County is unknown.¹²⁷

Table 4.2 Confirmed Childhood Lead Poisoning Cases*, Multnomah County¹²⁸

Level	1993	1994	1995	1996	1997	1998	1999	2000	2001
≥10 ug/dL	94	90	63	49	39	58	56	64	44
≥15 ug/dL	32	31	20	18	13	21	20	19	17

* 70% of the cases were determined to be caused by leaded house paint.

Asbestos

Asbestos was used from 1930-1950 as insulation and until 1977 in other building materials. Map 4.1 shows that homes built in these decades are distributed throughout the City, though higher numbers exist in central Northeast, outer East, and Southwest Portland. However, existence of and exposure to asbestos varies based on a home’s location, building materials, construction method, and whether improvements or renovations have been made.

Radon

The EPA has designated Multnomah County of “Moderate Potential” for radon exposure. This means that the average radon measurements for homes in the region should be in the range of two to four picocuries per liter (pCi/L).¹²⁹ Data available from Oregon Department of Human Services, Oregon State Radiation Protection Services show radon levels are within such a range. Of 998 homes tested in Multnomah County, the average level of radon was 3.1 pCi/liter which is higher

¹²⁶ Ibid.

¹²⁷ Ibid.

¹²⁸ Oregon Department of Human Service, Lead-Based Paint Program

¹²⁹ *Indoor Air Radon - EPA Map of Radon Zones*. U.S. Environmental Protection Agency. Accessed: 4/2/2009. <http://www.epa.gov/iaq/radon/zonemap/oregon.htm>

than the national average indoor radon level of 1.3 (pCi/L). There were 253 homes (25 percent) in Multnomah County which tested higher than 4 pCi/liter.¹³⁰

However, homes in North and Northeast Portland (zip codes: 97211, 97212, 97213, 97217, 97218) and in select areas of inner Southeast (zip code: 97206) are more likely to test positive for high levels of radon than other areas of the City, as Map 4.2 shows.¹³¹ Areas along Alameda Ridge and the Columbia River have high levels of granite rock deposited during the Missoula floods approximately 15,000 years ago which can emit radon gas.

Biologicals

Biological air pollutants, including pollen, mold and fungi are prevalent in the air due to Portland's climate and vegetation. Mold can also be a problem in homes located over wetlands or in the floodplain, where ambient moisture levels are high.

Combustion Related Pollutants

Combustion-related pollutants include carbon monoxide, nitrogen dioxide, respirable particles and formaldehyde. The levels of combustion-related pollutants in a structure vary based on the use of indoor combustion heating sources (wood stoves, fireplaces, etc) and the structure's ventilation. Information is not readily available on the use of indoor combustion heating sources in the Portland area.

Pesticides, Formaldehyde, and Organic Gases

These pollutants are common in many household products and furnishings, and are used for outdoor maintenance. Levels in Portland will vary based on household and commercial use of these products.

Estimated Costs of Environmental Exposure

In 2008, the Oregon Environmental Council completed a study to estimate the total economic impact of six types of childhood and adult diseases and disabilities linked to exposure to environmental pollution. The total estimated cost was \$1.57 billion per year, with a range of \$1.25 to \$2.00 billion, or approximately 1.18% of the Oregon Gross State Product (U.S. Bureau of Economic Analysis, 2006). The estimates are summarized in Table 4.3. Based on conservative assumptions, these estimates demonstrate that the health and related costs of environmentally attributable diseases and disabilities are imposing a significant cost to Oregonians.¹³²

¹³⁰ Radiation Protection Services: Radon Levels in Oregon Homes. Oregon Public Health Services, Oregon Department of Human Services. Accessed: 4/2/2009. <http://www.dhs.state.or.us/publichealth/rps/radon/county.cfm>

¹³¹ Scott Burns, Portland State University

¹³² Adapted from: Oregon Environmental Council, The Price of Pollution: Cost Estimates of Environmentally-Related Disease in Oregon. February, 2008. Online: <http://www.oeconline.org/resources/publications/reportsandstudies/pop>. Accessed September 2010.

Table 4.3 Annual Environmentally Attributable Cost of Adult and Childhood Diseases, Oregon 2007¹³³

Condition	EAFR	Annual Cost (Range)
Asthma	10-35%	\$30 million (range: \$10-\$35 million)
Birth Defects	2-10%	\$2.8 million (range: \$1.3 - \$7.7 million)
Cancer	2-10%	\$131 million (range: \$52 - \$262 million)
Cardiovascular Disease	4-9%	\$343 million (range: \$211 - \$474 million)
Childhood Lead Exposure	100%	\$878 million in lost lifetime earnings
Neurobehavioral Disorders	5-20%	\$187 million (range: \$94 - \$374 million)

Notes:

EAFR: Environmentally Attributable Factor Range

Asthma: Acute exacerbations related to outdoor, non-biologic pollutants from sources such as vehicle exhaust and emissions from stationary sources; does not include exacerbations due to household allergens, molds, second-hand smoke, infections or climatic conditions.

Birth Defects: Does not include all defects linked to environmental contaminants.

Cancer: conservative estimate, as there is a great deal of uncertainty regarding the environmental risk factors for cancer; does not account for childhood environmental exposures that lead to cancer development later in life.

Cardiovascular Disease: Only considers air-pollution associated mortality.

Childhood Lead Exposure: Method is based on lost income and does not take account of direct health care costs for screening and treatment, or indirect costs such as special education.

Neurobehavioral Disorders: Includes medical treatment and special education costs for mental retardation, autism, and cerebral palsy.

CONCLUSIONS

Portlander’s daily lives put them at risk of exposure to pollutants found in indoor air, food, and household materials and products. These pollutants have known health impacts including higher risks for respiratory irritation, neurological impacts, asthma and cancer, among others. The City can work to address certain pollutants through building codes and standards that regulate building materials and construction; programs to encourage testing and remediation for pollutants like radon, lead and asbestos; pesticide reduction programs; expansion of regulations that limit the use and sale of highly toxic products; and through awareness and education programs about the importance of personal choices regarding exposure to pollutants.

¹³³ Ibid.

Table 4.4 Indoor Air Pollutants

Source	Health Effects	Levels in Homes	Steps to Reduce Exposure
Radon			
Earth and rock beneath home; well water; building materials.	No immediate symptoms. Estimated to contribute to between 7,000 and 30,000 lung cancer deaths each year. Smokers are at higher risk of developing radon-induced lung cancer.	Based on a national residential radon survey completed in 1991, the average indoor radon level is 1.3 picocuries per liter (pCi/L).	
Environmental Tobacco Smoke			
Cigarette, pipe, and cigar smoking.	Eye, nose, and throat irritation; headaches; lung cancer; may contribute to heart disease. Specifically for children, increased risk of lower respiratory tract infections, such as bronchitis and pneumonia, and ear infections; increased severity and frequency of asthma; decreased lung function.	Particle levels in homes without smokers or other strong particle sources are the same as, or lower than, those outdoors. Homes with one or more smokers may have particle levels several times higher than outdoor levels.	Do not smoke in your home or permit others to do so; If smoking indoors cannot be avoided, increase ventilation in the area where smoking takes place. Open windows or use exhaust fans.
Biologicals			
Wet walls, ceilings, carpets, and furniture; poorly maintained humidifiers, dehumidifiers, and air conditioners; bedding; household pets.	Eye, nose, and throat irritation; shortness of breath; dizziness; lethargy; fever; digestive problems. Can cause asthma; humidifier fever; influenza and other infectious diseases.	Indoor levels of pollen and fungi are lower than outdoor levels (except where indoor sources of fungi are present). Indoor levels of dust mites are higher than outdoor levels.	Ensure proper ventilation, particularly in basements, kitchens, bathrooms, and laundry areas; Clean and dry water-damaged carpets; clean and change water in humidifiers, air conditioners, and refrigerators frequently.
Carbon Monoxide (CO)			
Unvented kerosene/gas heaters; leaking chimneys and furnaces; back-drafting from furnaces, gas water heaters, woodstoves, stoves and fireplaces. Vehicle exhaust from attached garages. Tobacco Smoke.	At low concentrations, fatigue in healthy people and chest pain in people with heart disease. At higher concentrations, impaired vision and coordination; headaches; dizziness; confusion; nausea. Can cause flu-like symptoms that clear up after leaving home. Fatal at very high concentrations.	Average levels in homes without gas stoves vary from 0.5 to 5 parts per million (ppm). Levels near properly adjusted gas stoves are often 5 to 15 ppm and those near poorly adjusted stoves may be 30 ppm or higher.	Ensure indoor heaters and stoves are in proper working order and are ventilated; do not idle cars inside garages
Nitrogen Dioxide (NO₂)			
Kerosene heaters, unvented gas stoves and heaters. Environmental tobacco smoke.	Eye, nose, and throat irritation. May cause impaired lung function and increased respiratory infections in young children.	Average level in homes without combustion appliances is about half that of outdoors. In homes with gas stoves, kerosene heaters, or unvented gas space heaters, indoor levels often exceed outdoor levels.	See steps under carbon monoxide.

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Source	Health Effects	Levels in Homes	Steps to Reduce Exposure
Organic Gases			
Paints, paint strippers, and other solvents; wood preservatives; aerosol sprays; cleansers and disinfectants; moth repellents and air fresheners; stored fuels and automotive products; hobby supplies; dry-cleaned clothing.	Eye, nose, and throat irritation; headaches, loss of coordination, nausea; damage to liver, kidney, and central nervous system. Some organics can cause cancer in animals; some are suspected or known to cause cancer in humans.	Studies have found that levels of several organics average 2 to 5 times higher indoors than outdoors. During and for several hours immediately after certain activities, such as paint stripping, levels may be 1,000 times outdoor levels.	Use household products according to manufacturer's directions and in well-ventilated areas.
Respirable Particles			
Fireplaces, woodstoves, and kerosene heaters. Environmental tobacco smoke.	Eye, nose, and throat irritation; respiratory infections and bronchitis; lung cancer. (Effects attributable to environmental tobacco smoke are listed elsewhere.)	Particle levels in homes without smoking or other strong particle sources are the same as, or lower than, outdoor levels.	Ensure indoor heaters, furnaces, and stoves are in proper working order and are ventilated
Formaldehyde			
Pressed wood products. Urea-formaldehyde foam insulation (UFFI). Combustion sources and environmental tobacco smoke. Durable press drapes, other textiles, and glues.	Eye, nose, and throat irritation; wheezing and coughing; fatigue; skin rash; severe allergic reactions. May cause cancer. May also cause other effects listed under "organic gases."	Average concentrations in older homes without UFFI are generally well below 0.1 (ppm). In homes with significant amounts of new pressed wood products, levels can be greater than 0.3 ppm.	Use "exterior-grade" pressed wood products (lower-emitting because they contain phenol resins, not urea resins); maintain proper air temperature, humidity, and ventilation.
Pesticides			
Products used to kill household pests. Also, products used on lawns and gardens that drift or are tracked inside the house.	Irritation to eye, nose, and throat; damage to central nervous system and kidney; increased risk of cancer.	Preliminary research shows widespread presence of pesticide residues in homes.	Use according to manufacturer's directions. Ensure proper ventilation during use; use non-chemical methods of pest control where possible.
Asbestos			
Deteriorating, damaged, or disturbed insulation, fireproofing, acoustical materials, and floor tiles.	No immediate symptoms, but long-term risk of chest and abdominal cancers and lung diseases. Smokers are at higher risk of developing asbestos-induced lung cancer.	Elevated levels can occur in homes where asbestos-containing materials are damaged or disturbed.	Leave undamaged asbestos material alone if it is not likely to be disturbed; Use trained and qualified contractors for control or cleanup measures.
Lead (Pb)			
Lead-based paint, contaminated soil, dust, and drinking water.	Lead at high levels (lead levels at or above 80 micrograms per deciliter (80 ug/dl) of blood) can cause convulsions, coma, and even death. Lower levels of lead can cause adverse health effects on the central nervous system, kidney, and blood cells. Blood lead levels as low as 10 ug/dl can impair mental and physical development.		Keep areas where children play as dust-free and clean as possible; Leave lead-based paint undisturbed if it is in good condition; do not sand or burn off paint that may contain lead; Do not remove lead paint yourself.

Adapted from: EPA, "The Inside Story: A Guide to Indoor Air Quality", Online: <http://www.epa.gov/iaq/pubs/insidest.html>, February 2009.

NOISE POLLUTION

Noise pollution can include noise from sources such as road, rail and air traffic, construction and industry as well as neighborhood noises such as power equipment, animals, garbage trucks and street sweepers and sound equipment. In 1999, the World Health Organization developed guidelines for average community sound levels of 50-55 dBA (daytime) and over 45 dbA (nighttime). Noise above these thresholds is often considered moderately to seriously annoying and can result in health impacts such as stress and sleep disturbance.

Noise Control Program¹³⁴

The Bureau of Development Services' Noise Control Office is responsible for enforcing the provisions in the City of Portland's noise code (Title 18), helping to resolve citizens noise concerns and assisting with noise variance applications. Portland City Code Title 18 gives the Bureau of Development Services authority to enforce regulations covering most aspects of noise pollution. Title 18 sets general permissible noise levels for daytime (7 am -10 pm) of 55 dBA in residential areas, and 50 dBA for nighttime, as well as specific permissible noise levels for certain noise generating activities.¹³⁵

The Bureau of Development Services has also developed a Draft North Portland Noise Study in response to noise concerns in North Portland. More information and a copy of the draft report can be found online at: <http://www.portlandonline.com/bds/index.cfm?c=47564&>.

SURFACE WATER QUALITY

What's the Issue?

Portland's geography is shaped by two major rivers, the Columbia and the Willamette, as well as their countless tributary creeks and streams. The rivers, streams and lakes provide habitat for fish and wildlife as well as recreational activities such as swimming, fishing and boating. However, rain falling on streets, parking lots and other hard surfaces carries pollutants into these waterbodies, reducing their benefits

The federal Clean Water Act regulates discharges of pollutants into waterbodies, including Portland's streams and rivers, to protect both human and wildlife health. The Oregon Department of Environmental Quality (DEQ) is responsible for adopting water quality standards to protect beneficial uses of the State's waters. These standards are developed to indicate the condition of a waterbody, serve as a planning tool, and act as a benchmark to protect human and aquatic health.

Local Conditions

Water Pollution Sources

Pollution into water bodies is generally grouped into two categories: non-point and point sources. Point sources can be tracked back to one point – usually a pipe or ditch – where wastewater is discharged to a river or stream. As authorized by the Clean Water Act, the

¹³⁴ City of Portland Bureau of Development Services. Noise Control Program. Online: <http://www.portlandonline.com/bds/index.cfm?c=42438>. Accessed September 2010.

¹³⁵ City of Portland Code: Title 18 Noise Control. Online: <http://www.portlandonline.com/auditor/index.cfm?c=28182>. Accessed September 2010.
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National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters. Nonpoint sources come from many places. As rain falls, it picks up and carries a variety of pollutants to nearby streams and rivers. These pollutants can be animal wastes, sediment, oil and grease, excess fertilizer, etc. Since nonpoint sources cannot be traced back to one starting point and do carry a range of pollutants, they are difficult to quantify. However, they are the leading cause of water quality problems. It has been estimated that non-point sources account for a significant portion of recreational water pollution.

Water Quality

The Oregon Water Quality Index (OWQI) analyzes a defined set of water quality variables and produces a score describing general water quality. The water quality variables included in the OWQI are temperature, dissolved oxygen (percent saturation and concentration), biochemical oxygen demand, pH, total solids, ammonia and nitrate nitrogens, total phosphorus and bacteria. OWQI scores range from 10 (worst case) to 100 (ideal water quality). The Department of Environmental Quality Laboratory maintains a network of ambient water quality monitoring sites to collect the data used in calculating the OWQI. Table 4.5 lists the minimum mean seasonal Oregon Water Quality Index score for a number of monitoring sites in the Portland area. It also includes significant trends in water quality at these points over the past decade.

Table 4.5 Oregon Water Quality Index Scores and Trends for Select Monitoring Sites, 2006

Site	River Mile	Min Mean Seasonal OWQI	Category	Trend (WY 1997-2006)	
COLUMBIA					
Columbia River at Portland Marker 47 (upstream Willamette)	102.5	86	Good	None	
WILLAMETTE – LOWER (selected)					
Beaverton Creek at Cornelius Pass Rd (Orencia)	0.3	54	Very Poor	None	
Clackamas River at High Rocks	1.2	92	Excellent	None	
Columbia Slough at Landfill Road	2.6	44	Very Poor	Increasing	+17.3
Fanno Creek at Bonita Road (Tigard)	2.3	62	Poor	Decreasing	-6.7
Johnson Creek at SE 17th Avenue (Portland)	0.2	30	Very Poor	None	
Swan Island Channel midpoint (Willamette River)	0.5	81	Fair	None	
Tualatin River at Boones Ferry Road	8.6	57	Very Poor	Decreasing	-18.0
Tualatin River at Elsner Road	16.2	63	Poor	Decreasing	-19.5
Willamette River at Hawthorne Bridge	13.2	85	Good	None	
Willamette River at SP&S RR Bridge (Portland)	7.0	82	Fair	Decreasing	-2.9
SANDY					
Sandy River at Troutdale Bridge	3.1	90	Excellent	None	

According to this index, water quality was scored as poor or very poor in at least portions of Johnson Creek, the Columbia Slough, Fanno Creek, Beaverton Creek and the Tualatin River in 2006. Water quality was scored as excellent at the monitoring sites in the Sandy and Clackamas Rivers. Water quality in the Columbia River, upstream of the mouth of the Willamette, was scored as good.

Water quality in the Willamette River was rated as good at the Hawthorne Bridge but declines to fair further downstream at the monitoring location located under the BNSF (SP&S) Railroad Bridge. Trending data has shown that water quality in the Willamette River, as measured by the OWQI, has improved from fair to good at monitoring sites located just upstream of the City boundaries and downstream where the river leaves the City boundaries at the St. John's site.^{136, 137} Trending data also show improvements in water quality conditions the Columbia Slough.

Combined Sewer Overflows

Water quality improvements recorded in the Willamette River and the Columbia Slough are due in part to the Combined Sewer Overflow project underway by the Bureau of Environmental Services over the past decade. This project has reduced the amount of stormwater and sewer overflow that flows into the Columbia Slough during rain events by 99 percent and into the Willamette by 66 percent. With the completion of the project in 2011, combined sewer overflows into the Willamette will be reduced by 96 percent, further improving the health of the Willamette River.

Portland Harbor

¹³⁶ The Willamette's Water Quality Index increased from 83 (fair) to 87 (good) at the Waverly monitoring site, upstream of where it enters the City of Portland (river mile 17.6) and from 81 (fair) to 88 (good) at the St. John's monitoring site downstream of where it leaves the city (river mile 6.8).

¹³⁷ City of Portland Service Efforts and Accomplishments, 2007-2008

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Water quality in the Portland Harbor, the stretch of the Willamette River between Sauvie Island and the Broadway Bridge, has also been impacted by pollution from a century of shipping, industrial and commercial activity. Prior to the passing of the Clean Water Act, industrial pollution was largely unregulated, and industrial waste disposal, urban stormwater runoff, and agricultural runoff, contributed to the contamination of sediment on the floor of the river. Because of this contamination, the US Environmental Protection Agency has designated the Portland Harbor on the National Priorities List – commonly known as Superfund – which mandates the cleanup of remaining pollutants.¹³⁸ The City is currently working with Harbor businesses and other public agencies in the first phase of the clean-up process.

Emerging Chemical Contaminants

A growing number of substances that are used every day, including pharmaceuticals, cosmetics and personal care products, are turning up in waterbodies across the U.S. These “emerging chemical contaminants” often occur at very low levels. With improved detection technologies, their widespread distribution in the environment is becoming observed, and concerns are increasing about their potential impacts on fish and shellfish, wildlife and human health. Hormones, antibiotics and other drugs, which are commonly found in animal and human waste sources, are examples of emerging contaminants. Current-use pesticides and perfluorinated compounds – chemicals used in consumer products to make them stain- and stick-resistant – are other emerging contaminants.¹³⁹

Although several of these emerging contaminants have been detected in water and sediment in the Lower Columbia River, information from locations elsewhere in the Basin is extremely limited. In response to these newly recognized contaminants, the U.S. Geological Survey (USGS) is sponsoring a four-year study in the Lower Columbia River addressing the movement of emerging contaminants from water to sediment, and through the food web to fish-eating birds, to evaluate the threat to the environment and human health.¹⁴⁰

In March 2009, Oregon DEQ released a draft list of 175 “Priority Persistent Pollutants” that affect Oregon’s waterbodies in response to a request by the state legislature. By June 2010, Oregon DEQ must report on the various sources of these pollutants along with methods to reduce and control their discharge into rivers and streams.¹⁴¹

Health Impacts

Waterborne Disease Outbreaks

Waterborne disease outbreaks in recreational water, caused by bacterial contamination of water bodies usually result in gastrointestinal illnesses in humans and are an acute health threat to those exposed. According to data from the Oregon Department of Human Services, only a single recreational water-based outbreak occurred in the Portland area between 2003

¹³⁸ City of Portland, “The City’s Role in the Portland Harbor Cleanup”. Online: <http://www.portlandonline.com/bes/index.cfm?c=32138>

¹³⁹ US Environmental Protection Agency, Columbia River Basin: State of the River Report for Toxics, January 2009, chapter 3, page 9. Online: <http://yosemite.epa.gov/r10/ecocomm.nsf/Columbia/SoRR>

¹⁴⁰ US Environmental Protection Agency, Columbia River Basin: State of the River Report for Toxics, January 2009, chapter 3, page 9. Online: <http://yosemite.epa.gov/r10/ecocomm.nsf/Columbia/SoRR>

¹⁴¹ Oregon Department of Environmental Quality, “Senate Bill 737”, Online: <http://www.deq.state.or.us/wq/SB737/index.htm>

through 2006. The outbreak of norovirus occurred in Blue Lake and resulted in 29 reported cases of illness.

Fish Advisories

The State Office of Environmental Health and the Oregon Department of Environmental Quality have issued fish advisories for Portland-area waterways based on elevated levels of persistent toxics, primarily PCBs (polychlorinated biphenyls) and mercury. These persistent toxics do not break down in the environment and can accumulate in fish and other plants and animals. If these fish are then consumed by humans, these toxics may be harmful if they reach certain concentrations in specific organs. Because of this, people who eat fish from polluted waterways, particularly large predatory fish, can consume high levels of contaminants. Current fish advisories for the Portland area include:

- PCBs: large fish caught in Portland Harbor (Fremont Bridge to Sauvie Island), established in 2004; and all fish caught in the Lower Columbia Slough, established in 1993; and
- Mercury: all Willamette River fish, established in 2001

Children and women of childbearing age who may become pregnant are at special risk of negative impacts due to consumption of contaminated fish. Because of this, the Oregon Department of Human Services recommends that these groups limit their consumption of fish caught in areas with high pollution levels.

The fish advisories for Columbia Slough recommend that the fatty parts of fish should be avoided by all people eating fish from the slough. In addition, ODHS recommends that the skin, all fat, eggs and internal organs should be removed before consumption to reduce exposure. Fish caught in the vicinity of Portland Harbor should only be consumed in quantities of an 8-ounce meal per month. Any crayfish taken within 1000 feet of the property lines of the former McCormick and Baxter site located south of the Burlington Northern Railroad Bridge in Portland Harbor should not be eaten.¹⁴²

Combined Sewer Overflow Advisories

The Bureau of Environmental Services issues a CSO advisory for the Willamette River each time the combined sewers overflow between May 15 and October 15. The Bureau also issues a blanket advisory during the rainy season, from late fall through the winter and early spring. When an overflow warning is in effect, people should avoid activities in the river during which water could be swallowed. Those who fish should wash their hands following contact with the water and cook fish thoroughly to kill bacteria.

Unintentional Drowning & Water-related injury

From 2001 through 2005, 46 people died from unintentional drowning in Multnomah County and another 31 were hospitalized for water-related injuries. Half of the people who died from unintentional drowning in this period were between the ages of 15 and 34. However, not all of these injuries and deaths occurred in natural waters (lakes, rivers, and streams).¹⁴³ The

¹⁴² Oregon Department of Human Services, <http://www.oregon.gov/DHS/ph/envtox/fishconsumption.shtml>

¹⁴³ Oregon Department of Human Services, Injury and Violence Prevention Program, "Injury Deaths by County and Year." Accessed 4/2/2009. Online: <http://www.oregon.gov/DHS/ph/ipe/index.shtml>

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drowning rate for Oregon and Multnomah County is higher than the national rate and do not meet the Healthy People 2010 target rate of 0.9 drowning deaths per 100,000 people.

Conclusions

Water quality in the Willamette River and the Columbia Slough has shown significant improvements (from “poor” to “fair”) in the past five years, particularly because of reductions in combined sewer overflows (CSOs). However, water quality problems arising from remaining combined sewer overflows, non-point source and historic pollution, and upstream impacts have real health risks to those swimming, boating, and fishing in some local waters.

Surface water quality is a multi-jurisdictional responsibility. The health of our rivers and streams depends not only on the actions of the City of Portland but also numerous people, businesses, and agencies who work and live within their watershed. While the City of Portland does not have complete control over the health of the river, many City actions, policies and program can impact water quality. Continued improvements to address combined sewer overflows and cleanup of the Portland Harbor Superfund site will have significant positive impacts on the health of our major rivers. To further improve the quality of the City’s rivers and streams, additional efforts will be needed to reduce, control, and treat non-point source pollution and emerging pollutants.

Additionally, unintentional drowning in Multnomah County remains high and does not meet Healthy People 2010 targets.

POLICY CHOICES

Environmental quality can be improved through a variety of policies and programs, many of which the City already supports. People’s exposure to poor outdoor air quality can be limited by either reducing air pollutants, through incentives or regulations to reduce vehicle miles traveled and emissions from point-source pollutants, or by siting and designing sensitive uses such as schools and housing to limit and mitigate exposure. Outdoor air quality can be further improved through greening initiatives and more generally through shifts to cleaner forms of energy production. Healthy indoor air can be promoted through building codes and standards, education and outreach and testing programs.

The City can protect and enhance the water quality of our streams and rivers by reducing surface water run-off in urban areas through watershed-based green infrastructure and restoration programs and by ensuring proper handling and treatment of wastewater. Protecting, restoring and enhancing natural resources, including creeks, shoreline, hillsides, natural habitat, tree canopy and open space, can also have significant positive impacts on water quality, as well as air quality, ambient air temperature and wildlife habitat.

Additionally, to protect both air and water quality, the City should continue to ensure that contaminated sites are adequately remediated before allowing new development. Response plans should be in place to respond to existing contaminated sites and to potential releases of pollutants in the future.

DRINKING WATER QUALITY

What’s the Issue?

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Contamination in drinking water, including chemicals, bacteria and viruses, can cause disease and illness. Because of this, federal and state standards have been established for a range of potential contaminants to ensure acceptable levels are maintained. The Portland Water Bureau provides drinking water from the federally protected Bull Run Watershed and a back-up groundwater system to the residents of Portland and other nearby communities. This drinking water meets or exceeds all drinking water standards.

Drinking Water Regulations

Drinking water is regulated through the federal Safe Drinking Water Act and the Oregon Drinking Water Quality Act. The purpose of these acts is to assure safe drinking water free of contaminants to Oregonians using public water supplies. Primary (i.e., legally enforceable) standards for drinking water call for regulation and treatment of water supplies to eliminate pathogens, chemicals, and disinfectants (and their by products) in drinking water. To accomplish this objective these acts require that drinking water be tested regularly for 94 contaminants. Seven of these contaminants are pathogens such as *Cryptosporidium*, *Giardia lamblia* and *E. coli*, all of which can cause gastrointestinal illness if ingested. Regulations require the disinfection of water to remove or inactivate such organisms so that they do not pose a health threat. Organic and inorganic chemicals are also regulated, especially those that have been linked to chronic illnesses like liver and kidney disease, nervous system problems and cancer. Nitrate, a chemical mostly linked to fertilizer runoff, is especially dangerous to infants, and can interfere with breathing.¹⁴⁴

Local Conditions

Drinking Water Sources

The Portland Water Bureau is the primary public water supplier to residents of the City of Portland. The Bull Run Watershed, near Mount Hood, is the largest source of surface water. It has been Portland's primary water source for more than 100 years, and is of such high quality that it is one of the few surface water sources not required by the Environmental Protection Agency to be filtered.¹⁴⁵ The Bureau also maintains a backup groundwater source from the Columbia South Well Field. A small number of residents supply their own drinking water through approximately 225 active drinking water wells. These private wells are not regulated under federal and state drinking water acts.

Contaminants

Drinking water contaminants can include metals that dissolve into the water from natural deposits in the watershed, naturally occurring microorganisms and viruses, and byproducts of disinfection. If untreated, many of these contaminants can cause negative health impacts – ranging from minor illnesses to organ damage and chronic diseases - in those exposed. Table 4.6 includes contaminants monitored in the City's water supply, as well as their primary sources.

To ensure drinking water quality, the Portland Water Bureau collects approximately 9,000 water samples each year and conducts approximately 49,000 water analyses on those

¹⁴⁴ Multnomah County Health Department, "The Environmental Health of Multnomah County" 2003. Accessed 12/2009 Online. <http://www.co.multnomah.or.us/health/>

¹⁴⁵ Ibid.

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samples. The Portland Water Bureau's Water Quality Laboratory is accredited by both the National and Oregon Environmental Laboratory Accreditation Programs. According to this rigorous testing, the City's drinking water meets or exceeds water quality standards. Table 4.6 shows the performance of the City's drinking water in key indicators. Table 4.7 documents the City's performance in a wider variety of water quality indicators.

Table 4.6 Water Quality Standards and Performance ¹⁴⁶

Indicator	'07-'08	Standard
Maximum Turbidity	1.29	≤ 5.00
Minimum pH	7.0	≥ 7.0
Maximum chlorine residual	1.9 mg/L	< 4.0 mg/L
Positive samples of coliform bacteria	0.12%	≤ 5.00%

Three contaminant areas are of particular concern to the Portland Water Bureau: cryptosporidium, a microorganism that is now subject to more stringent regulation by the EPA, lead, and emerging contaminants. The descriptions below are taken from the Portland Water Bureau's annual Drinking Water Quality Report for 2008.

Cryptosporidium

Cryptosporidium is a microorganism (protozoan) naturally present in bodies of surface water throughout the world. Symptoms of Cryptosporidium infection include nausea, diarrhea, and abdominal cramps. Most healthy individuals are able to overcome the disease within a few weeks. However, immuno-compromised people have more difficulty and are at greater risk of developing severe, life-threatening illness. Cryptosporidium must be ingested for it to cause disease, and may be spread through means other than drinking water.

Surface water supplies are particularly vulnerable if they receive runoff or are exposed to human or animal wastes. Since wildlife inhabits the Bull Run watershed, the Portland Water Bureau regularly monitors for Cryptosporidium and has done so for more than ten years. Occasionally, the Portland Water Bureau finds Cryptosporidium at low levels. No Cryptosporidium cysts have been detected in water samples since 2002.

In January 2006, the federal EPA issued a drinking water rule¹⁴⁷ establishing new national standards to further reduce the risks of illness from Cryptosporidium. These standards, as written, require additional treatment processes by 2012 for unfiltered water systems such as Portland's. Because of the protected status of Portland's Bull Run source, and the very low incidence of Cryptosporidium in Bull Run source water, the city filed a legal challenge to the new federal rule. The legal challenge seeks to establish alternative and less expensive methods of compliance. On November 6, 2007 a three-judge panel of the Washington, DC District Court of Appeals issued a unanimous decision, rejecting the City of Portland's challenge to the rule.

In response to the court ruling, the city is pursuing parallel compliance strategies. Commissioner Randy Leonard has directed the Portland Water Bureau to begin planning and budgeting to achieve compliance with the new rule as written. This includes the evaluation, selection and development of one of the treatment approaches prescribed in the rule. In

¹⁴⁶ City of Portland, Service Efforts and Accomplishments, 2007-2008.

¹⁴⁷ Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR or LT2 rule)

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addition, Commissioner Leonard has directed the bureau to attempt to obtain a variance to the rule from the EPA. A variance could conceivably enable the bureau to avoid the expenses associated with building a new treatment facility if the city can demonstrate to the EPA that, due to the nature of the Bull Run source, such action is unnecessary.¹⁴⁸

Lead

According to the Portland Water Bureau's 2008 Drinking Water Quality Report, lead was not detected in Portland's water sources and the City has removed all known lead service connections from its distribution system. However, residents may still be exposed to lead in their drinking water if their building's plumbing contains lead.¹⁴⁹ "Depending on the level of exposure, lead can adversely affect the nervous system, kidney function, immune system, reproductive and developmental systems and the cardiovascular system. Lead exposure also affects the oxygen carrying capacity of the blood. The lead effects most commonly encountered in current populations are neurological effects in children and cardiovascular effects (e.g., high blood pressure and heart disease) in adults. Infants and young children are especially sensitive to even low levels of lead, which may contribute to behavioral problems, learning deficits and lowered IQ."¹⁵⁰

Emerging Contaminants

In the water industry, chemicals that are not currently regulated and whose health effects from drinking water exposure are being studied are considered emerging contaminants. Contaminants include a wide range of chemicals and products used throughout the environment. Currently pharmaceuticals and personal care products (PPCPs) are considered emerging contaminants. Today, new technology exists to detect more substances at lower levels than ever before. Many of the emerging contaminants are being found at extremely low levels, typically in parts per trillion. Drinking water standards are typically set in the parts per billion range, which is 1,000 times higher than parts per trillion.

Portland proactively tests for contaminants beyond those required. Typically none are detected. In 2006, drinking water from the Bull Run was tested for 33 PPCPs, with a single detect for caffeine. In 2007, drinking water from three groundwater aquifers was tested for 33 PPCPs, with detections for acetaminophen and ibuprofen (over-the-counter pain killers), sulfamethoxazole (an antibiotic) and caffeine (a natural stimulant).¹⁵¹

Filtration

The City of Portland is one of a handful of municipalities in the nation that are exempt from filtration requirements, due to the high quality of the city's Bull Run drinking water source. The Bull Run source meets the filtration avoidance criteria of the 1989 Surface Water Treatment Rule and has had a waiver from the requirement to filter since 1991. The Surface Water Treatment Rule, adopted by the Environmental Protection Agency in 1989, is a federal regulation that requires all drinking water systems in the nation drawing from surface water sources to meet specific, measurable water treatment standards.¹⁵² Amendments to the

¹⁴⁸ Portland Water Bureau, "Drinking Water Quality Report 2008", Online: <http://www.portlandonline.com/shared/cfm/image.cfm?id=198764>

¹⁴⁹ Ibid.

¹⁵⁰ U.S. Environmental Protection Agency. "Lead in Air". [Online] <http://www.epa.gov/air/lead/health.html>

¹⁵¹ Ibid.

¹⁵² Portland Water Bureau, "Surface Water". Online: <http://www.portlandonline.com/water/index.cfm?c=29764>
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Surface Water Treatment Rule were passed in 2005 that set forth additional regulations for surface water sources and surface water storage (see *Cryptosporidium*, above).

Fluoridation

The Centers for Disease Control and the U.S. Public Health Service recommend that drinking water contain fluoride at levels between 0.7 and 1.2 milligrams per liter to help prevent tooth decay.¹⁵³ According to the U.S. Surgeon General, “community water fluoridation continues to be the most cost effective, practical and safe means for reducing and controlling the occurrence of tooth decay in a community.”¹⁵⁴

Water from Portland’s primary drinking water source, the Bull Run watershed, does not naturally contain fluoride and the City does not add fluoride to its drinking water. Portland is one of few communities in the U.S. that does not fluoridate its water. Because of the lack of fluoride in Portland’s drinking water, the City does not meet the Healthy People 2010 objective calling for at least 75% of community residents to receive optimal levels of fluoride in their drinking water.

Local water providers, such as the Portland Water Bureau, have authority over water fluoridation. In 1980, voters in the City of Portland approved a ballot measure that eliminated the City’s requirement for fluoridation of municipal drinking water.¹⁵⁵ In 2007, it was estimated that adding fluoride to Portland’s drinking water would result in approximately \$1 million in upfront costs and \$500,000 in annual operating costs.¹⁵⁶ City residents are encouraged to consult with their dentists regarding fluoride treatments to help prevent tooth decay.

Conclusions

Portland’s drinking water currently meets or exceeds existing stringent water quality standards set by the federal Safe Drinking Water Act, due in large part to its protected water source. Residents are provided with high-quality drinking water with few contaminants. However, a few issues related to drinking water remain. First, the City may be required to make substantial capital improvements to its water system in order to comply with new federal rules intended to reduce the risks of illness from *Cryptosporidium*. Second, fluoride is not found in Portland’s drinking water, though it is recommended by the U.S. Public Health Service to prevent tooth decay. Finally, there may be potential future health impacts from emerging contaminants – chemicals that are not currently regulated and whose health effects from drinking water exposure are being studied. The Portland Water Bureau proactively monitors levels of these contaminants and typically finds no level of contamination.

¹⁵³ National Academy of Science. “Fluoride in Drinking Water: A Scientific Review of EPA’s Standards”. March 2006. Online: http://dels.nas.edu/dels/rpt_briefs/fluoride_brief_final.pdf

¹⁵⁴ *Community Water Fluoridation: Surgeon General’s Statement, 2001*. Centers for Disease Control and Prevention. Accessed 3/26/2003. <http://www.cdc.gov/OralHealth/factsheets/fl-surgeon2001.htm> cited in Multnomah County Health Department. “The Environmental Health of Multnomah County”, 2003.

¹⁵⁵ Portland City Auditor, <http://www.portlandonline.com/auditor/index.cfm?a=4993&&c=27246>

¹⁵⁶ City of Portland 2007 Legislative Package

Table 4.7 Drinking Water Quality¹⁵⁷

Contaminant	Minimum Detected	Maximum Detected	Maximum Contaminant Level or Treatment	Maximum Contaminant Level Goal	Sources of Contaminant	Notes
Regulated Contaminants						
Source Water from Bull Run Watershed						
Turbidity	0.25 NTU	1.79 NTU	5 NTU	Not Applicable	Erosion of natural deposits	The typical cause of turbidity is particles of sediment in the water that can interfere with disinfection and provide a medium for microbial growth. Large storm events can result in increased turbidity, causing the PWB to shut down the Bull Run system and serve water from the Columbia South Shore Well Field.
Giardia	Not Detected	One sample of 50 liters had 3 cysts	Disinfection to inactivate 99.9% of cysts	Not Applicable	Animal wastes	Wildlife in the watershed may be hosts to Giardia lamblia, the organism that causes giardiasis. Chlorine is effective in inactivating Giardia.
Total Coliform Bacteria	Not Detected	1 sample had 370 colonies (96% had < 100 colonies/ 100 ml)	> 90% of samples measured in last 6 mo. ≤ 100 colonies/ 100 ml of water.	Not Applicable	Found throughout the environment	Coliform bacteria are naturally present in the environment and are an indicator that other potentially harmful bacteria may be present. The PWB uses chlorine to control these bacteria. Total coliform samples are collected from both the source water and the distribution system.
Fecal Coliform Bacteria	Not Detected	1 sample had 6 colonies (100% < 20 colonies/ 100 ml)	> 90% of samples measured in last 6 mo. ≤ 20 colonies/ 100 ml of water.	Not Applicable	Animal wastes	The presence of fecal coliform bacteria in source water indicates that water may be contaminated with animal wastes. The Portland Water Bureau uses chlorine to control these bacteria.
Entry Points to Distribution System — from Bull Run and the Groundwater Well Field						
Nitrate Nitrogen	< 0.01 ppm	0.22 ppm	10 ppm	10 ppm	Natural deposits, animal wastes	Nitrate, measured as nitrogen, can support microbial growth. Excessive nitrate levels can contribute to health problems.
Antimony	< 2 ppb	3 ppb	6 ppb	6 ppb	Natural deposits; industrial manufacturing	Chronic consumption at levels well over those detected can increase cholesterol and decrease blood sugar. The PWB is unaware of any natural or manmade sources of antimony in the wellfield, but further investigations are being performed.
Arsenic	< 1 ppb	3 ppb	10 ppb	0 ppb	Found in natural aquifer deposits	Arsenic and fluoride are natural elements that can dissolve into water that is in contact with soil or in groundwater aquifers. At detected levels, arsenic and fluoride are unlikely to significantly contribute to adverse health effects.
Fluoride	<0.05 ppm	0.13 ppm	4 ppm	4 ppm	Found in natural aquifer deposits	
Hexachlorocyclopentadiene	< 0.05 ppb	0.06 ppb	50 ppb	50 ppb	Probable byproduct of drinking water disinfection	HEX is not often found in drinking water, but it may be formed during the chlorination of water as part of the disinfection process. Chronic, high level HEX may cause liver, kidney and heart damage. It is unlikely to pose a health risk at the levels found in Portland's drinking water.

¹⁵⁷ Portland Water Bureau, "Drinking Water Quality Report 2008", Online: <http://www.portlandonline.com/shared/cfm/image.cfm?id=198764>

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Contaminant	Minimum Detected	Maximum Detected	Maximum Contaminant Level or Treatment	Maximum Contaminant Level Goal	Sources of Contaminant	Notes
Distribution System of Reservoirs, Tanks and Mains						
Total Coliform Bacteria	Not Detected	2 samples of 338 in October (0.59%) had detectable bacteria	Must not detect coliform bacteria in more than 5.0% of samples in any month	0% of samples with detectable coliform bacteria	Found throughout the environment	Coliform bacteria are naturally present in the environment. Their presence is an indicator that other potentially harmful bacteria may be present. The PWB uses chlorine to control these bacteria. Total coliform samples are collected from both the source water and the distribution system.
Total Trihalomethanes (Running average)	13 ppb	16 ppb	80 ppb	Not Applicable	Byproduct of drinking water disinfection	During disinfection, certain byproducts form as a result of chemical reactions between chlorine and naturally occurring organic matter in the water. These byproducts can have negative health effects. The disinfection process is carefully controlled to remain effective, while keeping byproduct levels low. Monitoring in Portland's system detected trihalomethanes and haloacetic acids, regulated disinfection byproducts.
(Single result)	11 ppb	32 ppb	Not Applicable			
Haloacetic acids: (Running average)	17 ppb	23 ppb	60 ppb	Not Applicable	Byproduct of drinking water disinfection	
(Single result)	9 ppb	47 ppb	Not Applicable			
Total Chlorine	Residual Not Detected	1.9 ppm	4 ppm	Maximum Residual Disinfectant Level (MRDL) = 4 ppm	Chlorine and ammonia are used to disinfect water.	Chlorine residual is necessary to maintain disinfection throughout the distribution system. Adding ammonia to chlorine results in a more stable disinfectant and helps to minimize the formation of disinfection byproducts. Total chlorine residual is a measure of free chlorine and combined chlorine and ammonia in our distribution system.
Unregulated Contaminants						
Entry Points to Distribution System — from Bull Run and the Groundwater Well Field						
Radon	293 picocuries per liter	293 picocuries per liter	293 picocuries per liter	n/a	Found in natural aquifer deposits	Radon is a naturally occurring radioactive gas that you cannot see, taste, or smell. Radon has never been detected in the Bull Run supply. It is detected at varying levels in the city's groundwater wells.
Sodium	2.7 ppm	6.8 ppm	16 ppm	n/a	Added to water during treatment, found in natural aquifer deposits	There is currently no drinking water standard for sodium. At the level found in drinking water, it is unlikely to contribute to adverse health effects.
Acetaminophen	18 ppt	18 ppt	18 ppt	n/a	Source unknown, possible percolation into groundwater aquifer	Acetaminophen (e.g., Tylenol), caffeine (natural stimulant), ibuprofen (e.g., Advil) and sulfamethoxazole (antibiotic) are part of an emerging group of contaminants referred to as Pharmaceutical and Personal Care Products (PPCPs). These contaminants are not currently regulated and the health effects from long-term, low-level exposure from drinking water are unknown. More rigorous testing for PPCPs is taking place in 2008.
Caffeine	9.2 ppt	17.1 ppt	25 ppb	n/a		
Ibuprofen	2.4 ppt	2.4 ppt	2.4 ppt	n/a		
Sulfamethoxazole	1.8 ppt	1.8 ppt	1.8 ppt	n/a		
ppm = parts per million ppb = parts per billion ppt = parts per trillion						

CHAPTER 5: SAFE ENVIRONMENTS

Protecting the public from manmade and natural hazards is a basic function of the City of Portland and a variety of public and private partners throughout the city, state and nation. Public safety is protected, in part, through the preparedness and response of police, fire and emergency responders, as well as through code enforcement, inspectors, animal control and other government services.

Public safety can be threatened by crime, fire and medical emergencies, natural hazards, traffic accidents, terrorism and disease outbreak, all of which are discussed further in this section.

CRIME

What's the Issue?

Crime, particularly violent crime, can have direct impacts on individual's health and safety by leading to direct physical or psychological injury, or through related fear.

Violent crime can result in temporary or permanent injury or even death. Primary causes of violent injury include gun-related crime, domestic violence, alcohol-related violence, drunk driving, and drug-related crime. Victims of violent crime often also experience psychological distress and may suffer from Post Traumatic Stress Disorder (PTSD). Mental health problems can include depression, disturbed sleep, memory impairment, and hyperarousal.¹⁵⁸ Experiencing violent crime can also lead to other behaviors that can impact health, such as alcohol and substance abuse.

Property crimes, such as burglary or theft, can cause psychological distress and can impact living standards, particularly in lower-income areas.

A person does not have to be a direct victim or witness of crime to suffer physical and psychological consequences. The fear caused by crime can cause a variety of health problems including depression, stress, and sleeping problems. If residents fear crime in their neighborhoods or cities, they may be less likely to leave their homes or use certain public spaces. This reduced mobility can cause related social isolation and exacerbate health consequences.¹⁵⁹

In summary, it is clear that "...criminal activity not only has immediate effects in terms of physical injury and psychological distress but is associated with chronic ill health. Those who witness crime

visionPDX on Safe Environments

When considering public safety in Portland, two different pictures emerge. One is of a safe, clean city, with people who generally respect each other and wish to live in peace. The other is of a city that is rapidly becoming less safe as drugs and gangs increase their influence and urban renewal projects shift attention away from basic concerns such as public safety. Currently, whether a person experiences the of these feelings or the second depends in large part on where he or she lives.

Portlanders want all parts of the city to feel safe and secure, from Chinatown to East Portland to the city's many MAX trains and bus stops. Many believe safety, especially in ones own neighborhood, is a key ingredient to livability. Portlanders want city government to re-prioritize public safety; they want safer biking and pedestrian paths and safer streets.

Many believe Portland's government needs to reorient to ensuring that basic services are met, including maintaining infrastructure and ensuring excellent police and emergency services.

¹⁵⁸ Fred Robinson & Jane Keithley, "The Impacts Of Crime On Health And Health Services: A Literature Review," Health, Risk & Society, Vol. 2, No. 3, 2000.

¹⁵⁹ Ibid.

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can suffer psychological and psychosomatic problems, and the fear of crime can lead people to limit their lifestyles in ways which are not conducive to good health. It follows that crime is an important issue for health and the health services, both at the level of care of individual victims and from a public health perspective.¹⁶⁰

Local Conditions

Citywide, the crime rate has been declining in the past decade, and is down 51 percent for person and 28 percent for property since 1998, see Table 5.1.¹⁶¹

Table 5.1 Citywide Crime Rate (Crimes per 1,000 population)¹⁶²

Type	2003	2004	2005	2006	2007	5-year Trend	10-Year Trend
Property	77.7	76.0	68.3	57.6	56.2	-28%	-28%
Person	8.1	7.3	6.9	6.9	6.5	-20%	-51%

The number of reported crimes varies across the various regions of the city, due in part to differences in residential and employment populations. Crime rates are lowest in Southwest and highest in the Downtown area, see Table 5.2.

Table 5.2 Reported Offenses by Region¹⁶³

	North	Inner NE	Central NE	Outer NE	Inner SE	Outer SE	SW	NW	Downtown	Total
Murder	5	6	2	6	0	1	1	1	4	26
Rape	23	27	10	65	270	29	14	9	16	463
Robbery	189	187	99	315	139	93	20	70	186	1,298
Aggr. Assault	285	243	143	329	242	159	62	57	208	1,728
Burglary	503	707	431	1,325	777	188	255	246	153	4,585
Larceny	2,254	2,809	1,311	5,546	3,157	1,664	1,016	1,766	2,136	21,659
Vehicle Theft	529	515	303	1,574	773	498	131	252	176	4,751
Arson	32	48	19	80	63	29	25	13	18	327
Total Part I	3,280	4,542	2,318	9,540	5,178	2,961	1,524	2,414	2,897	34,654
Total Part II	4,511	4,740	2,804	9,522	4,968	3,305	1,477	1,944	5,904	39,175
Total Part III	11,475	11,699	7,586	24,659	12,489	8,266	3,976	4,877	14,306	99,333
Grand Total	19,806	20,981	12,708	43,721	22,735	14,532	6,977	9,265	23,107	173,832
Rate/1,000*	349	362	287	359	235	301	117	349	1,794	

* Based on 2000 Census figures.

Crime can also impact residents' mental health through fear. In Portland, the majority of residents (91 percent) feel safe walking alone in their neighborhoods during the day, but only 59 percent feel

¹⁶⁰ Ibid.

¹⁶¹ SEA 2007

¹⁶² City of Portland, Office of the City Auditor. *Service Efforts and Accomplishments: 2007-2008*; December 2008.

¹⁶³ City of Portland, Office of the City Auditor. *Service Efforts and Accomplishments: 2007-2008*; December 2008.

safe walking in their neighborhoods alone at night. In general 30-55 percent of people in Northwest, Southwest, Downtown, and inner southeast feel safe walking in their neighborhoods at night. Fewer than 20 percent of people feel safe walking alone at night in their neighborhoods in many areas of outer East and North Portland. Citywide, fewer people feel safe walking alone Downtown during the day (81 percent) and at night (31 percent).¹⁶⁴

Conclusions

In general, resident safety and perception of safety have generally improved over the past decade.¹⁶⁵ Since 1998, Portland's crime rate has declined 51% for person crimes and 28% for property crimes. In 2008, most residents continue to feel safe walking alone in their neighborhoods during the day, and more than half of residents feel safe walking alone in their neighborhoods at night. However, eastern neighborhoods tend to have higher crime rates and perceptions of fear than other areas of the city.

FIRE AND MEDICAL EMERGENCIES

What's the Issue?

A variety fire and medical emergencies can also threaten the health and safety of Portland's residents and visitors. Portland Fire & Rescue (PF&R) is the primary first responder for fires and medical emergencies in the City of Portland. PF&R also gives and receives support from neighboring jurisdictions to improve service in some areas.

From July of 2007 to July of 2008, four people were killed in fires in Portland and 179 experienced fire-related injuries.¹⁶⁶ Loss of life due to fires in Portland is less than one per 100,000 residents per year. Efficient and effective fire safety and response services are instrumental to limiting the number and degree of fire-related injuries and deaths.

Portland Fire and Rescue responded to over 43,000 calls for emergency medical assistance in fiscal year 2006-07, over half of which required transport to a hospital or other medical facility.

Local Conditions - Fire

Portland Fire & Rescue (PF&R) provides fire, emergency medical services, and special response, as well as prevention, education, and inspection services to the City of Portland and Maywood Park. The bureau serves a residential population of approximately 580,000 as well as commercial, industrial, and institutional areas. In fiscal year 2006-2007, PF&R responded to an average of 6.8 fires per day. Of these, approximately 30% were structural fires, 28% were brush or wildland fires, 16% were vehicle fires, and 25% were trash or other types of fires, see Table 5.3. The top ten reasons for fire response by PF&R are displayed in Figure 5.1. Fires represented about one of every 25 calls received by the fire bureau over the past year.

Table 5.3 National Fire Protection Association Call Type¹⁶⁷

¹⁶⁴ Ibid.

¹⁶⁵ City of Portland Auditor's Office, "Service Efforts and Accomplishments, 2008-2009"

¹⁶⁶ Conversation with PF&R, February 9, 2009.

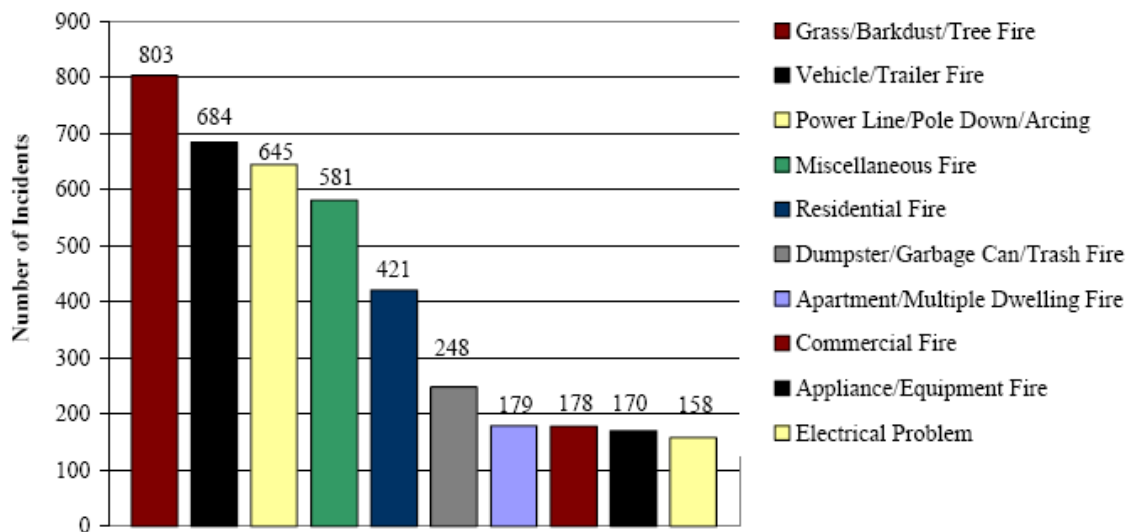
¹⁶⁷ Portland Fire and Rescue, "Standard of Emergency Response and Coverage." May 2008.

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Type	FY 04-05	FY 05-06	FY 06-07
Fire			
Structure	725	746	757
Vehicle	446	390	405
Brush	425	601	706
Trash	320	377	347
Misc.	286	237	266
Total	2,202	2,351	2,481
Average Per Day	6	6.4	6.8
Emergency Medical Services			
Code 3 (priority)	--	--	40,297
Code 1 (non-priority)	--	--	2,220
Total	--	--	42,517
Average Per Day	--	--	116
Service*	--	--	6,032
Other	--	--	11,797
Total	--	--	62,827

* Service calls include non-emergency fire or medical-related responses. Note: In FY 2006-07, a significant number of calls for service at the Portland International Airport were excluded from the Incident database. Because little information remains related to those calls they are not reflected above.

Figure 5.1 Top Ten Reasons for Fire Response by Initial Dispatch Code, FY 2006-2007¹⁶⁸



From July 2005 to July 2007, 64 percent of structural fires occurred within the Southeast and Northeast quadrants of the city, split almost equally; Northwest Portland experiences the fewest structural fires at 6.8 percent.

Fire Trends

¹⁶⁸ Portland Fire & Rescue, "FY 2006-2007 Annual Report". Online: <http://www.portlandonline.com/fire/index.cfm?c=48228&a=179154>

The number of fires per 1,000 residents fell 30 percent in the 10 years between 1998 and 2008 and 18 percent in FY 2007-08 alone. The total number of fire incidents in FY 2007-08 was 2,074, the lowest on record for at least 50 years. The number of structural fires per 1,000 residents fell 25 percent in ten years, and remains lower than the average rate of six comparison cities. Four civilians lost their lives in fires in Portland in the past year, a rate of 0.7 per 100,000 residents – the lowest rate in nine years. No firefighters have lost their lives in the line of duty in 30 years.¹⁶⁹

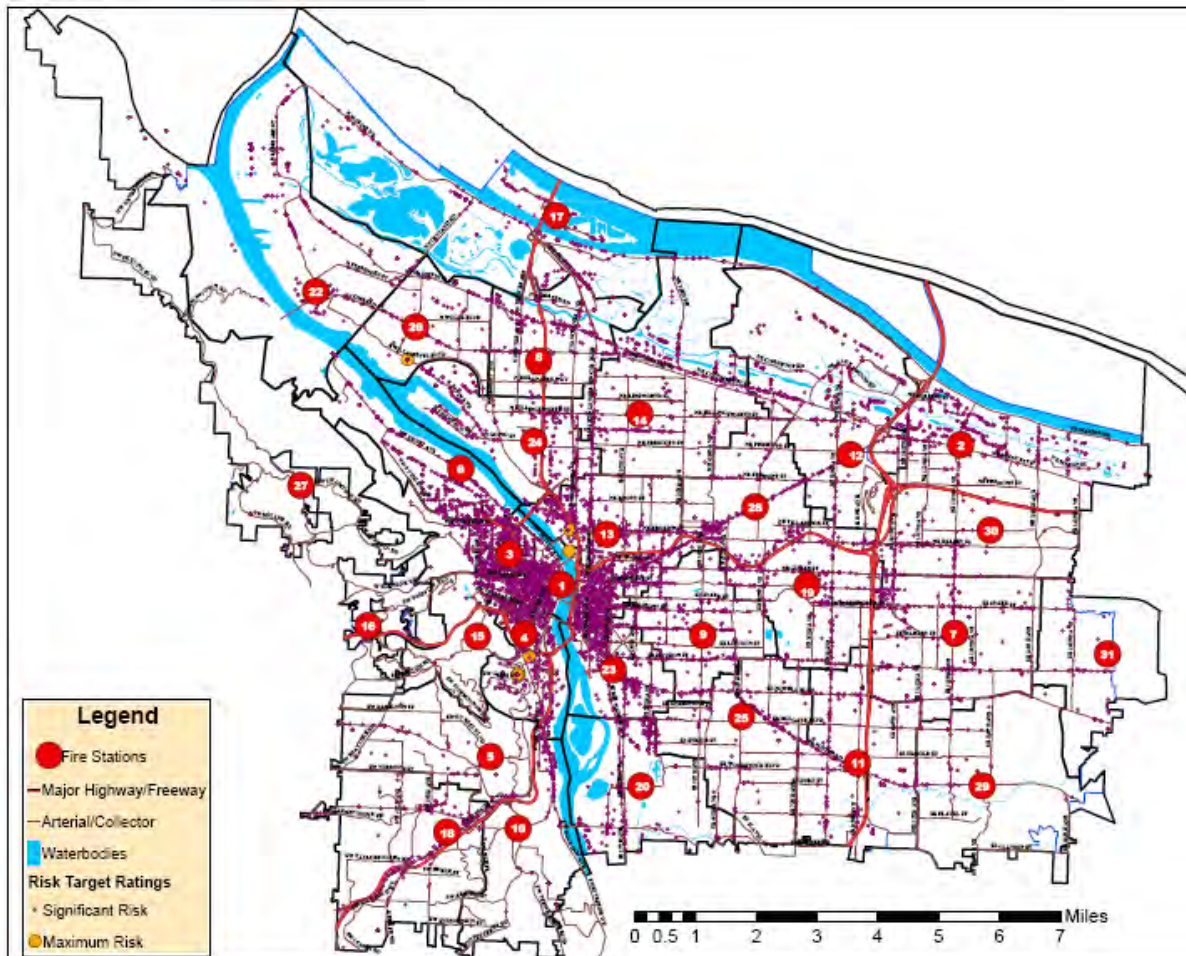
Water Supply

Adequate water supply for fire suppression is key to effective fire response. Portland Fire and Rescue receives water from the Portland Water Bureau and uses hydrants throughout the city for fighting fires. A study conducted for Portland Fire & Rescue in 2005 determined that “...approximately 34 percent of Portland’s occupancies require fire flows for suppression that are greater than what PF&R can provide (Figure 5.2). Unfortunately, only 10 percent of these occupancies feature sprinklers. However, the majority of the high-risk occupancies...are located in areas of the City where additional PF&R resources are easily accessible, such as the downtown core.”¹⁷⁰ Fire hydrant densities are adequate in most areas of the City, except in some open space and forested areas, where water must be delivered through a “water tender apparatus” such as a tanker truck.

¹⁶⁹ City of Portland, “Service Efforts and Accomplishments: 2007-2008”, December 2008.

¹⁷⁰ City of Portland, Portland Fire & Rescue, “Standard of Emergency Response Coverage” [Online] <http://www.portlandonline.com/fire/index.cfm?c=40789>, June 2008.

Figure 5.2 High-Risk Occupancies



Response Time

PF&R’s goal is to be able to respond to incidents within 5 minutes and 20 seconds, including both turnaround and travel time. In fiscal year 2006-2007, the average citywide response time was 6 minutes and 49 seconds. Figure 5.3 shows average response time by fire management area. Response tends to be fastest for locations close to fire stations. Many of these areas, shown in green, have response times that meet the bureaus goals. However, many other areas of the city do not meet response targets. Response tends to take the greatest amount of time for outer areas of southwest, northwest, and north of the Columbia Slough.

Average fire response time has been relatively consistent over the past three years, (Figure 5.4).

Figure 5.3 Fire Response Times at 90th Percentile by Fire Block, FY 2006-2007¹⁷¹

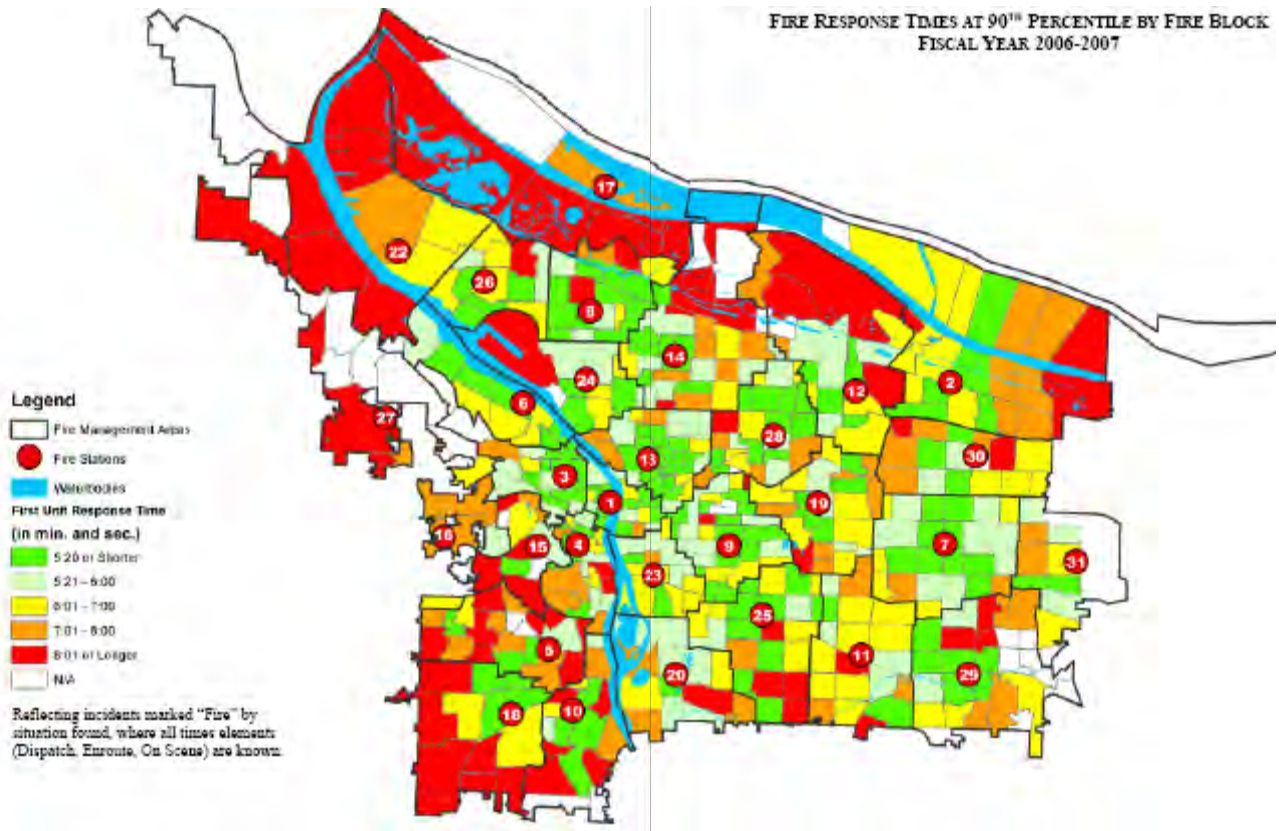
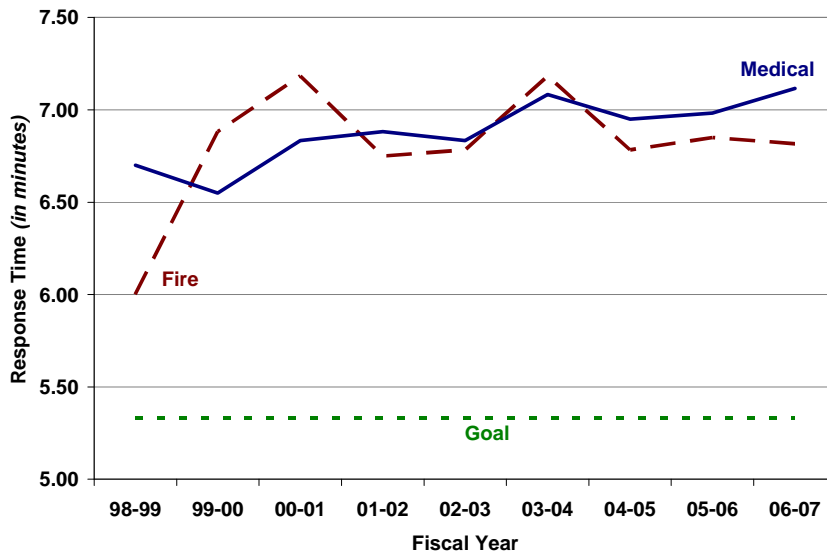


Figure 5.4 Medical and Fire Response Time, FY 1998-99 to 2006-07¹⁷²



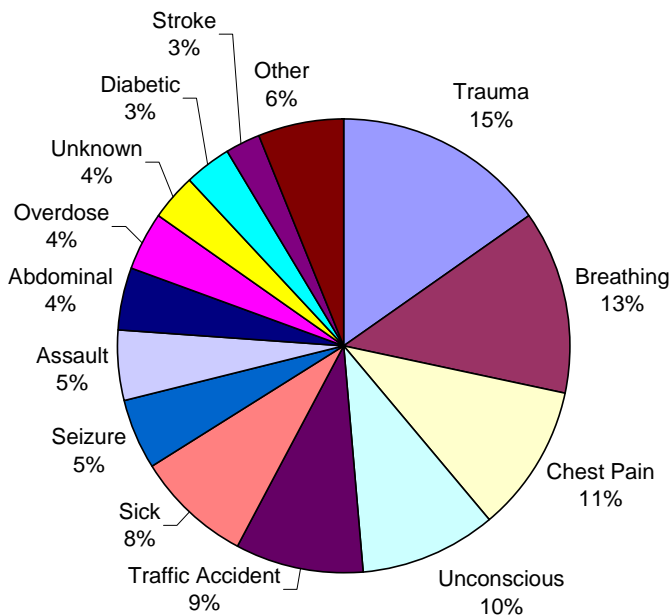
¹⁷¹ Ibid.

¹⁷² Portland Fire & Rescue, "FY 2006-2007 Annual Report". Online: <http://www.portlandonline.com/fire/index.cfm?c=48228&a=179154>

Local Conditions – Medical Emergencies

Portland Fire and Rescue received over 43,000 calls in 2006-2007 for emergency medical services, representing approximately 70% of total calls. Approximately half of these calls result in patients requiring transport to medical facilities, often for cardiac, trauma, and respiratory problems. Figure 5.5 shows the range of types of emergency medical situations PF&R responded to in 2006-2007.

Figure 5.5 Frequency of EMS calls, FY 2006-07¹⁷³



Call Volume

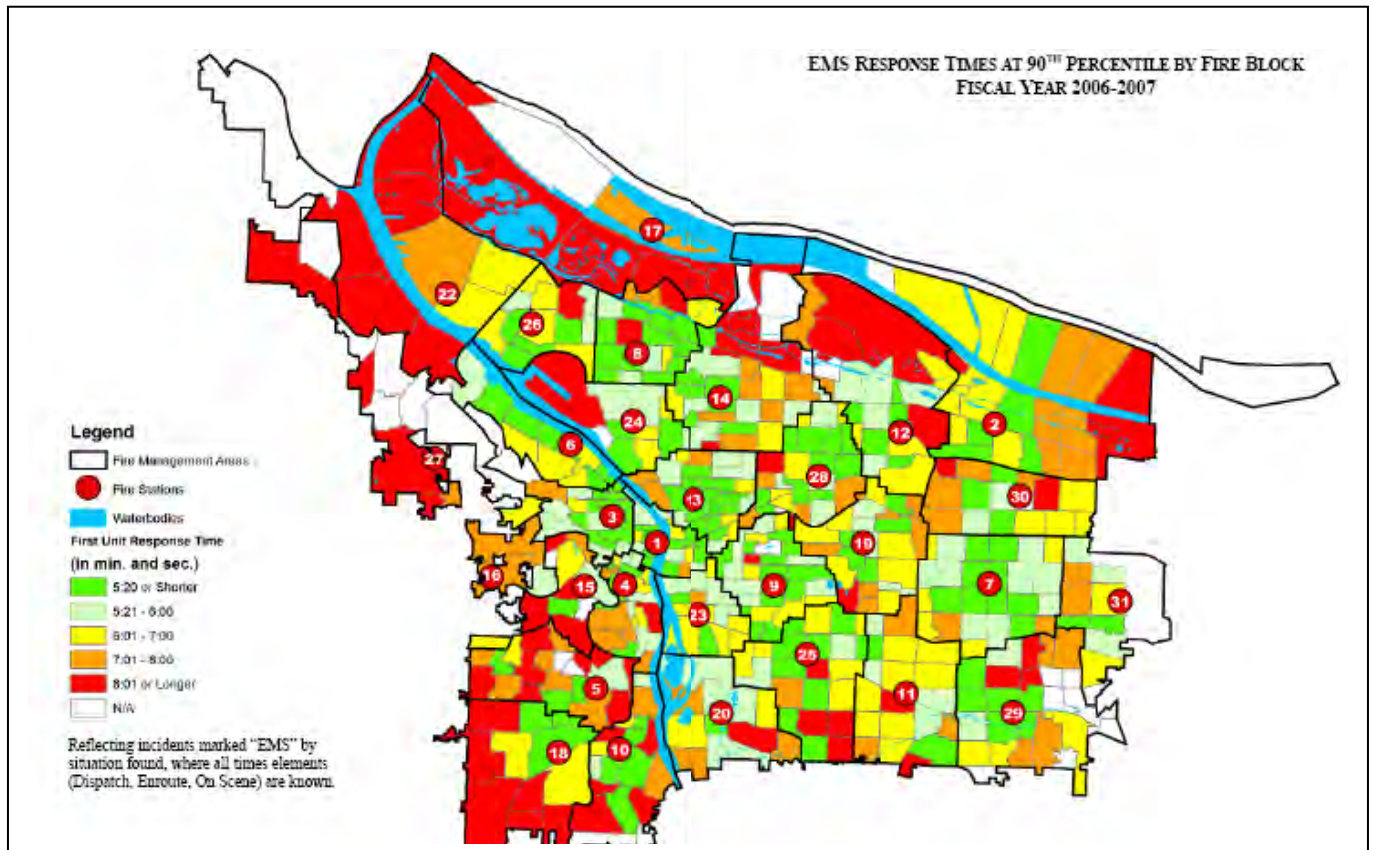
Medical call volume for fiscal years 2005 to 2007 was highest in Downtown (Station #1), Mill Park (Station #7) and Lents (Station #11). Each of these stations received over 7,500 calls in this period. Lowest call volume areas, where stations received fewer than 1,000 calls, include NW Industrial (Station #6), Burlingame (Station #10), Southwest Hills (Station #15), Sylvan (Station #16), and Forest Park (Station #27).

Response Time

Portland Fire and Rescue’s goal is to respond to emergency medical service calls within 5 minutes and 20 seconds from dispatch. In fiscal year 2006-2007, the average citywide response time was 7 minutes and 7 seconds. Figure 5.6 shows 90th percentile response time by fire management area. Response tends to be fastest for locations close to fire stations. Many of these areas, shown in green, have response times that meet the bureaus goals. However, many other areas of the city do not meet response targets. Response tends to take the greatest amount of time for outer areas of southwest, northwest, and north of the Columbia Slough. Medical response time has been on an increasing trend for the past ten years, (Figure 5.4).

¹⁷³ Ibid.

Figure 5.6 EMS Response Times at 90th Percentile by Fire Block, FY 2006-2007



Conclusions¹⁷⁴

Portland Fire and Rescue responded to a record number of total incidents in fiscal year 2007-2008, over 65,700. Two-thirds of these were medical emergencies while only 3 percent were fire incidents, which decreased to the lowest number in 50 years. The number of fire incidents has been declining (22 percent over past 10 years); while there has been a 40 percent increase in medical incidents.

The City continues to face challenges in meeting its fire and emergency response time goals. The response time for both fire and medical emergency calls was well over one minute longer than the Bureau's target time. 9-1-1 priority call response times exceed goals (90 percent answered within 20 seconds, dispatched within 120 seconds) and dispatch times do not meet goals for other types of calls.

¹⁷⁴ City of Portland Auditor's Office, "Service Efforts and Accomplishments, 2008-2009"

TRANSPORTATION SAFETY

The Issue

Traffic accidents are a major cause of injury and death nationwide and are a top cause of death for people under 24 years of age. Overall, traffic accidents, injuries, and fatalities in Portland have been declining since the mid-1980s, despite increasing population and traffic density. At approximately this same time, Portland began to make ongoing improvements to the city's alternative transportation infrastructure and heightened focus on traffic safety monitoring and improvements. Injury and fatality rates reached the lowest recorded levels since tracking began in 1925. However, there are still a number of high accident locations throughout the city and traffic accidents have resulted in thirty to forty deaths in the City of Portland each year for the past ten years.¹⁷⁵

In addition to causing injury or fatality, traffic accidents and poor overall traffic safety can result in a poorer overall environment for walking and biking. This may discourage use of these transportation modes and further undermining health (see Chapter 8, Active Living).

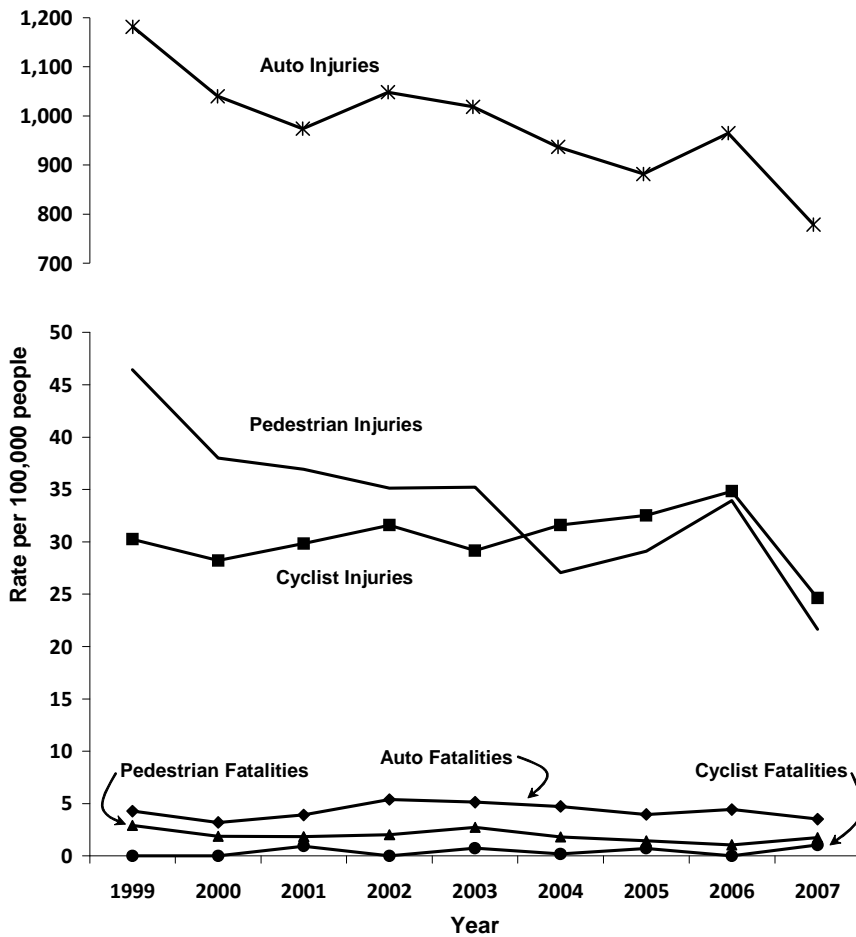
Local Conditions

Automobile Safety

The number of people injured in traffic collisions in Portland declined 21% from 5,905 to 4,691 between 2003 and 2007, see Figure 5.7. This represents a significant decline in per capita automobile crash related injuries. The number of traffic fatalities also shows a declining trend, though approximately 3 to 5 people per 100,000 still die each year in automobile collisions.

¹⁷⁵ City of Portland, Bureau of Transportation, "2008 Traffic Fatality Summary" [Online] <http://www.portlandonline.com/shared/cfm/image.cfm?id=238406>.

Figure 5.7 Traffic Related Injury and Fatality Rate, 1999 to 2007



High crash locations, or intersections with high numbers and high severity crashes, persist along a number of major arterials in the City - most notably 82nd Ave, 122nd Ave, Glisan St, Stark St, Foster Rd, and the Broadway/Weidler/Vancouver/Williams area (see Map 5.1 and Table 5.4).¹⁷⁶

Table 5.4 High Auto Crash Intersections

SE 39 th at Powell	SE Duke St at 82 nd Ave	NE Glisan St at 102 nd Ave
NE Sandy at 82 nd Ave	SE Stark St at 102 nd Ave	NE Marine Dr at 33 rd Ave
SE Powell at 122 nd Ave	N Weidler St at Vancouver Ave	N Broadway at Williams Ave
SE Powell at 92 nd Ave	NE Fremont St at MLK Blvd	E Burnside at 82 nd Ave
NE Halsey at 122 nd Ave	SE Foster Rd at 96 th Ave (I-205)	SE Foster Rd at 122 nd Ave
SE Stark St at 122 nd Ave	SE Division St at 162 nd Ave	W Burnside St at 23 rd Ave
NE Columbia Blvd at MLK Blvd	SE Stark St at 148 th Ave	NE Glisan St at 82 nd Ave
NE Glisan St at 122 nd Ave	SE Washington St at 96 th Ave	SE Washington St at 102 nd Ave
SE Holgate Blvd at 82 nd Ave	N Broadway at Vancouver Ave	NE Sandy Blvd at 39 th Ave
SW Washington St at 2 nd Ave	SW Jefferson Rd at Canyon Rd	
SE Foster Rd at 82 nd Ave	SE Foster Rd at 92 nd Ave	

¹⁷⁶ City of Portland Bureau of Transportation, *Safe Sound and Green Streets*:

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Bicyclist Safety

The City has focused on improving cycling conditions by providing cycling facilities such as bike lanes and bike boulevards; cycling safety improvements, like signage and signals; and through educational campaigns. Due to this investment, the City's bike system has grown from 83 miles of bikeways in 1992 to 271 miles in 2008. Portland has seen a continuous increase in the number of cyclists over the past decade, from just over 2,500 daily trips over the Willamette River bridges, to over 16,700 daily trips in 2008. The number of crashes involving cyclists has remained relatively constant each year since 1991, with the exception of a large drop in 2008. However, since the total number of people cycling has increased dramatically over the same period, the City has seen a significant decline in the crash rate among cyclists, (Figure 5.8).

Figure 5.8 Bicyclist Crash Rates¹⁷⁷

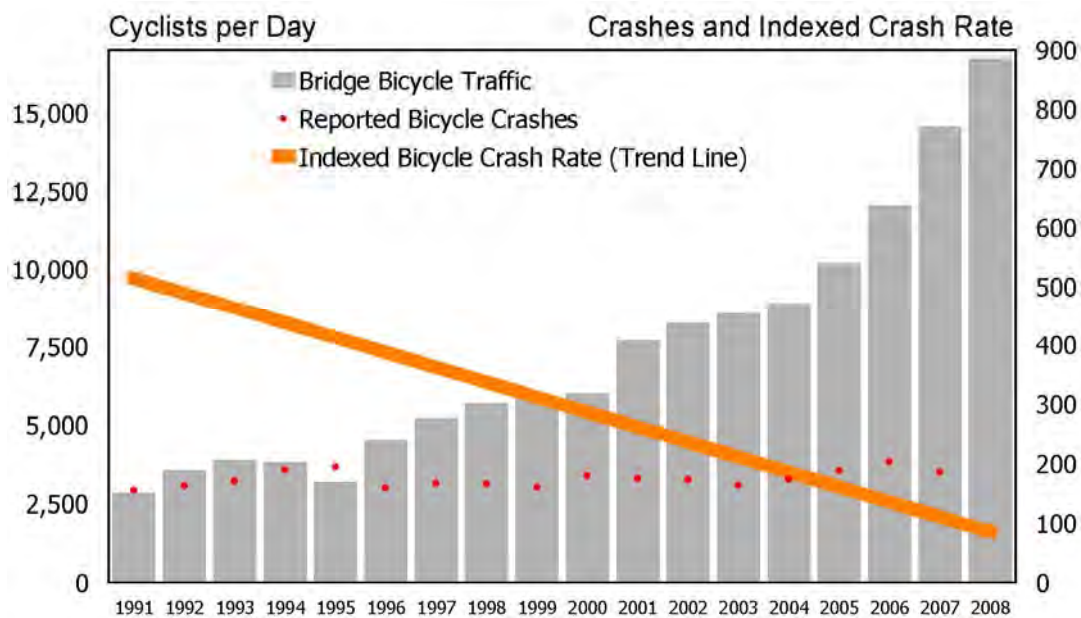


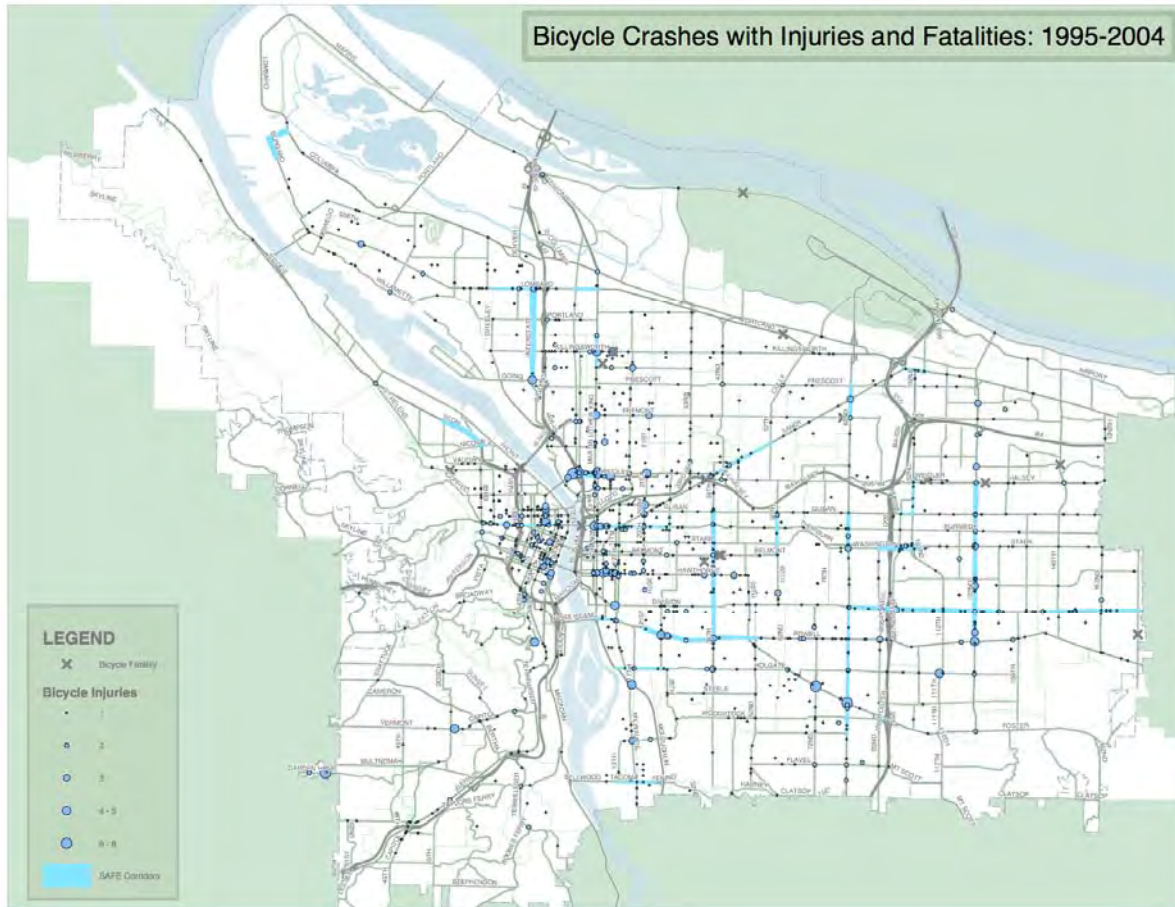
Figure 5.9 shows the location of reported bicycle crashes occurring between 1994 and 2004. There is a concentration of crashes in inner northeast, southeast, and downtown Portland, where there are also higher numbers of riders. High numbers of crashes also occurred along outer east and southwest Portland arterials and in more geographically dispersed areas of the rest of the city. The most frequent bicycle crashes involve a vehicle making a right or left hand turn (15.5 percent) or the bicyclist or motorist running a stop sign or signal (25 percent).^{178, 179}

¹⁷⁷ Portland Cycle Zone Analysis Presentation

¹⁷⁸ Data for 2002-2006.

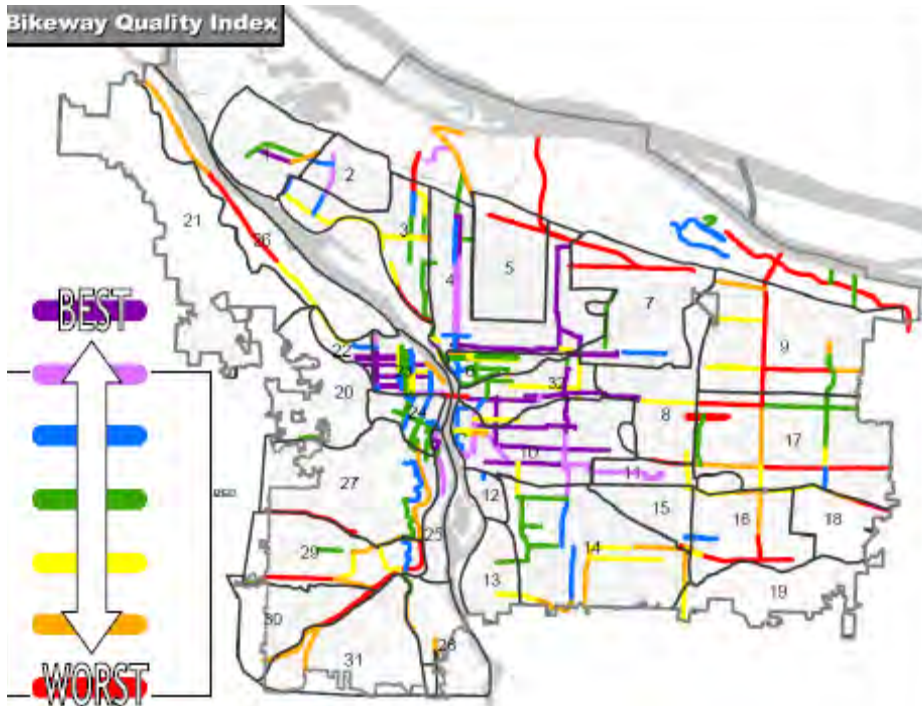
¹⁷⁹ City of Portland Bureau of Transportation. "Improving Bicycle Safety in Portland". Online: <http://www.portlandonline.com/transportation/index.cfm?&c=46717&a=185776>. October, 2007.

Figure 5.9 Bicycle Crashes with Injuries and Fatalities: 1995 to 2004



Poor bikeway quality can expose riders to additional accident risk, particularly if high automobile volumes or speeds are present, there are difficult transitions along the route, or the roadway condition is hazardous. The Bureau of Transportation completed an assessment of all existing City bikeways in the summer of 2008 and rated each bikeway's quality based on automobile speeds, automobile volumes, dropped bicycle lanes, difficult transitions, number of travel lanes, width of bicycle lanes, jogs in route, quality of pavement, quality of intersection crossings, and number of stops. Figure 5.10 illustrates the results of this assessment. In general, bikeway quality was higher in inner Northeast, inner Southeast, and Downtown Portland. Outer East, North, Northwest, and Southwest Portland tended to have bikeways of lower quality. However, bikeways of very high and very low quality can be found in virtually all areas of the City.

Figure 5.10 Bikeway Quality Index



Citywide, 44 percent of residents rated their neighborhood streets as good or very good for bicyclist safety. However, significantly fewer residents rated cyclist safety as good in many outer east and southwest neighborhoods.¹⁸⁰

Pedestrian Safety

Apart from increases in 2006 and 2007, pedestrian injuries have been declining since 1999. Intersections with high numbers of crashes involving pedestrian injuries can also be found in all areas of the city. Concentrations of high pedestrian crash intersections can be found on SE 82nd Ave, SE Division, SW Barbur, SW Beaverton-Hillsdale Highway, NW Highway 30, NE Sandy, NE Halsey, NE 102nd Ave, and N Willamette Blvd. A full list of high pedestrian crash intersections can be found in Table 5.5 and displayed on Map 5.2. Many of these roads are considered major arterials or state routes, with higher traffic volumes and speeds.

Citywide, just over half of residents rated their neighborhood streets as good or very good for pedestrian safety in 2007. However, significantly fewer residents rated pedestrian safety as good in many outer east and southwest neighborhoods.

¹⁸⁰ City of Portland 2007 Resident Survey

Table 5.5 High Pedestrian Crash Intersections

Northeast	Northwest	Southwest
NE Broadway at 26 th Ave	NW Burnside at Uptown Ter	SW Barbur at Troy St
NE Broadway at 35 th Ave	NW Burnside at Maywood Dr	SW Barbur at Luradel St
NE Killingsworth at 57 th Ave	NW Hwy 30 at Harbor Blvd	SW Barbur at SW 30 th Ave
NE Sandy at 59 th Ave	NW Hwy 30 at 56 th Ave	SW Barbur at 11240
NE Sandy at 85 th Ave	NW Hwy 30 at 112 th Ave	SW Beav.-Hills Hwy at 35 th Ave
NE Sandy at 64 th Ave	Southeast	SW Beav.-Hills Hwy at 42 nd Ave
NE Halsey Ave at 114 th Ave	SE 82 nd Ave at Ash St	SW Beav.-Hills Hwy at 50 th Ave
NE Halsey at 126 th Ave	SE 82 nd Ave at Cooper St	North
NE Halsey at 140 th Ave	SE 82 nd Ave at Main St	N Lombard at Chase Ave
NE 82 nd at Thompson	SE 82 nd Ave at Lambert St	N Lombard at Russet St
NE 102 nd Ave at Davis St	SE 82 nd Ave at Pacific St	N Rosa Parks at Newcastle
NE 102 nd Ave at Oregon St	SE 82 nd at Francis St	N Willamette at Harvard
NE 102 nd Ave at Hancock St	SE Foster Rd at 107 th Ave	N Willamette at Woolsey
NE 102 nd Ave at Shaver St	SE Foster at 116 th Ave	N Willamette at Washburne
NE 122 nd at Stanton	SE Division at 45 th Ave	
NE 122 nd Ave at Holladay St	SE Division at 66 th Ave	
	SE Division at 87 th Ave	
	SE Division at 105 th Ave	

According to the City’s Resident Survey, perception of walking safety varies by neighborhood. In general, residents in inner neighborhoods rate their local streets as safer for pedestrians than do those in Southwest, outer Southeast, and central Northeast. Pedestrian safety ratings are particularly low in the Markham, Arnold Creek-Marshall Park, and Maplewood neighborhoods of Southwest Portland.

Conclusions

The number of individuals injured in traffic collisions, including autos, bikes and pedestrians fell 21 percent from 2003 to 2007, from 5,905 injured to 4,691. In 2007, the numbers of bicyclists and pedestrians injured in traffic was the lowest in nine years. However, although 29 percent fewer bicyclists were injured in traffic collisions in 2007 than 2006, six bicyclists died in traffic collisions. Only 44 percent of residents rated their neighborhood streets as good or very good for the safety of bicyclists.

High crash locations persist along a number of major arterials in the City - most notably 82nd Ave, 122nd Ave, NE Glisan St, Stark St, SE Division Street, SE Foster Road, Barbur Boulevard, and the Broadway/Weidler/Vancouver/Williams area. The City of Portland has been pursuing a programs and investments to address high crash intersections, through engineering solutions (safety improvements), creating more desirable routes on lower traffic streets, education, and enforcement of traffic laws.

HAZARDOUS WASTE

The Issue

Hazardous wastes - including acids, solvents, resins, sludge, and heavy metals - are toxic chemicals, primarily generated through commercial and industrial activity. According to the Environmental Protection Agency (EPA), over 40 million tons of hazardous waste is produced in the U.S. each year. Examples of hazardous waste producers include large industrial facilities such as chemical manufacturers, electroplating companies and steel mills, as well as more common businesses such as dry cleaners, auto repair shops, hospitals, exterminators and photo processing centers.¹⁸¹ Contamination of the environment can also occur from residential properties, mostly through leaking underground storage tanks.

According to a recent national survey, six in ten Americans feel that hazardous wastes pose a very serious health threat.¹⁸² Hazardous wastes that are mishandled or spilled can contaminate the environment and can harm human health. Long-term exposure to hazardous wastes such as benzene are known to cause cancer in humans, and heavy metals such as mercury and lead can damage the brain, kidneys, the nervous system and fetal development.¹⁸³

Local Conditions

Generators

Industries that generate hazardous waste are grouped into three separate categories depending upon the amount they generate. Large Quantity Generators produce more than 2,200 pounds per month, Small Quantity Generators produce less than 2,200 pounds, and Conditionally Exempt Generators (CEGs) produce less than 220 pounds of hazardous waste per month. CEGs are not required to submit information on their hazardous waste. The Oregon DEQ issues permits to industries that generate hazardous waste, in 2008, there were 70 Large Quantity Generators, 107 Small Quantity Generators, and 182 conditionally exempt generators. Most Large and Small Quantity Generators are located in the Northwest Industrial, North, and Northeast areas of Portland.¹⁸⁴

Over 405,000 tons of hazardous waste was produced by generators in the City in 2008.¹⁸⁵ The vast majority of this waste (99 percent) was produced in the form of exempt wastewater by a dozen large quantity generators. Exempt wastewaters exhibit the characteristics of hazardous waste but are exempt from the definition of hazardous waste since they are regulated under the Clean Water Act. Exempt wastewaters are treated by the City of Portland's wastewater treatment systems to meet water quality standards before being discharged. Some generators also pre-treat wastewater before it enters the City's wastewater treatment system.

¹⁸¹ Hazardous Waste. U.S. Environmental Protection Agency. Accessed 04/ 18/2003. <http://www.epa.gov/ebtpages/wasthazardouswaste.html>

¹⁸² Pew Charitable Trusts. Prepared by Princeton Survey Research Associates. National Survey of Public Perceptions of Environmental Health Risks: Report on the Findings. Washington, DC: Georgetown University. 2000.

¹⁸³ Canada vs. the OECD: An Environmental Comparison: Hazardous Waste 2001. Organization for Economic Cooperation and Development (OECD). Accessed 04/18/2003. <http://www.environmentalindicators.com>.

¹⁸⁴ Oregon Department of Environmental Quality, Hazardous Waste Division. 2009.

¹⁸⁵ Ibid.

Large generators also produced the majority (93 percent) of non-exempt hazardous waste, totaling 3,127 tons. Small generators produced 219 tons.¹⁸⁶

Table 5.6 Hazardous Waste Generation, 2008¹⁸⁷

Type of Generator	Total		Hazardous Waste*			Exempt Wastewater		
	#	Waste Produced (tons)	#	Waste Produced (tons)	% of total waste	#	Waste Produced (tons)	% of total waste
Small Quantity Generators	107	240	119	240	0.1%	0	0	0%
Large Quantity Generators	70	405,020	87	3,505	0.9%	12	401,515	99%
Conditionally Exempt	182	6	18	6	0.0%	0	0	0.0%
Total	359	405,266	224	3,751	0.9%	12	401,515	99%

* Totals include regular and one-time emissions.

Superfund Sites

The EPA has the authority to cleanup the most hazardous sites in the U.S., and it keeps track of sites through the National Priorities List (NPL). The Superfund program is the cleanup funding source for the NPL. The City of Portland currently has one NPL-listed sites, the Portland Harbor, which is currently in the cleanup process. More information on the Portland Harbor can be found in Chapter 4: Clean Environments, Surface Water Quality.

Leaking Underground Storage Tanks

As of 2008, the EPA had identified over 18,000 leaking underground storage tanks in the City of Portland. The vast majority of these tanks (14,700) are heating oil tanks located at residential properties, while about 3,300 tanks are located on commercial or industrial properties. These tanks often contain(ed) gasoline, biodiesel, used oil or heating oil. As of 2008, 65 percent of these tanks were either undergoing or had completed cleanup.¹⁸⁸

Brownfields

A brownfield is any “abandoned, idled, or under-used industrial and commercial facility where expansion or redevelopment is complicated by real or perceived environmental contamination.”¹⁸⁹ Most sites listed were or are presently commercial or industrial properties that improperly handled hazardous wastes.¹⁹⁰ Oregon DEQ tracks brownfield sites throughout Oregon with suspected, confirmed or past hazardous wastes. Although the actual number of brownfields in Multnomah County is unknown, we can approximate the number using DEQ’s Environmental Cleanup Site Information (ECSI) database, which tracks contaminated sites from 1989 to 2008. All sites listed, many of which are active businesses, have documented or suspected hazardous substance contamination (from solvents, metals, etc.) in soil, surface water, groundwater, or sediments. According to ECSI data, there are currently 383 sites in the City of Portland with confirmed

¹⁸⁶ Ibid.

¹⁸⁷ Ibid.

¹⁸⁸ City of Portland, Bureau of Planning, 2009.

¹⁸⁹ Potential Brownfield Sites in Oregon from the Oregon Department of Environmental Quality’s Environmental Cleanup Site Information (ECSI) and UST Cleanup Databases. Department of Environmental Quality: Portland, Oregon. 2003.

¹⁹⁰ Frequently Asked Questions About ECSI – DEQ’s Environmental Cleanup Site Information Database. Department of Environmental Quality: Portland, Oregon. 2003.

hazardous wastes that may harm human health or the environment. Of these, 175 require further investigation and cleanup of the site. In addition, the City of Portland is home to an additional 307 sites suspected to have hazardous wastes. According to ECSI data, 208 sites have been cleaned up, and require no further action. An examination of potential brownfields reveals that most sites are in the Northwest industrial, North and Northeast areas of Portland, as shown in Table 5.7.

Table 5.7 Contaminated Sites in Portland

Type of Site	SW	SE	NW	NE	N	Total
Contamination suspected but not confirmed	20	50	70	85	82	307
Contamination confirmed or Institutional Controls in place	26	20	45	35	49	175
No further action required.	19	41	22	85	41	208
Total	65	111	137	205	172	690

Source: Oregon Department of Environmental Quality, ECSI Database Query, May 26, 2008.

Landfills

A municipal solid waste landfill is located in St. Johns, near Smith and Bybee lakes and the Columbia Slough. This location was the primary landfill for Portland's waste for 50 years until it closed in 1991. While in operation, the landfill accepted residential and industrial waste. Industrial waste included approximately 5,000 drums of pesticide manufacturing waste, disposed of in the early 1960's. St. Johns landfill has confirmed leaks of hazardous substances, and some of these substances are making their way into nearby lakes (Smith and Bybee lakes), streams (e.g., the Columbia Slough) and groundwater. These hazardous substances are potentially harmful to human health.¹⁹¹

Conclusions

There are many hazardous waste sites throughout the County - especially in Northwest Industrial, North, and Northeast Portland - that have contaminated the environment and may be posing human health risks. In many cases, health threats from hazardous waste are being reduced through state and federal programs charged with cleanup of hazardous waste sites. However, many hazardous waste sites remain. The human health impacts to Multnomah County residents is unclear.

EMERGENCY PREPAREDNESS

The Issue

The potential exists for food-, air- and water-borne contaminants and disease outbreaks; natural hazards such as floods, wildfires, landslides and earthquakes; and terrorist acts to cause injury, illness or death among Portland residents. A number of local, state and federal agencies participate in planning for these events, work to mitigate their risk, and respond to emergencies as they occur.

Local Conditions - Disease Outbreak and Prevention

¹⁹¹ Multnomah County Health Department, "The Environmental Health of Multnomah County" 2003. Accessed 1/2009 Online. <http://www.co.multnomah.or.us/health/>

Pandemic Flu¹⁹²

Pandemic flu is a worldwide, human epidemic of a new influenza virus. A pandemic flu may create a massive health crisis, depending on the severity of the virus. On June 11, 2009, the World Health Organization (WHO) signaled that a global pandemic of H1N1 influenza was underway. H1N1 cases have been identified in Multnomah County and in much of Oregon. Since the pandemic declaration, the H1N1 virus has continued to spread. In Multnomah County and in Oregon, H1N1 illness has continued through the summer, in a pattern consistent with the rest of the United States.

The Multnomah County Health Department anticipates that there will be more cases, hospitalizations, and deaths associated with this pandemic in the future. The H1N1 virus, in conjunction with the regular seasonal influenza viruses, poses the potential to cause significant illness with associated hospitalizations and deaths during the U.S. influenza season.

Public health leaders are also concerned that the avian flu virus (H5N1) could become a human pandemic if it gains the ability to pass easily from person to person. The current H5N1 strain has killed millions of birds (chickens, ducks, geese, etc.) and hundreds people since 2003. Multnomah County is tracking international reports of infections, developing response plans that can be put in place quickly, and is working to establish relationships with communities that may be disproportionately affected by a local outbreak.

Public health officials in Multnomah County has developed emergency plans to respond to many kinds of public health emergencies, including an influenza pandemic. The Multnomah County Health Department has also been working to educate businesses, schools, organizations and many others about the importance of planning for and responding to the H1N1 flu pandemic, and about healthy habits that everyone should learn to prevent the spread of germs every day.

The Department is also talking to community partners about public health measures that may be necessary to slow the spread of disease in a severe influenza pandemic. These measures focus on reducing contact between people, and include:

- closing schools, day care centers, and community centers;
- staggering work shifts;
- isolating sick individuals and their contacts at home; and
- canceling non-essential public gatherings.

Individuals, families, schools, businesses, health care providers, social service and faith-based groups all play a key role in planning for and responding to a public health emergency.

¹⁹² Excerpted from the Multnomah County Health Department website, <http://www.mchealth.org>, accessed March 2009.

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*Foodborne Illness*¹⁹³

Although the food supply in the United States is one of the safest in the world, preventing foodborne illness and death continues to be a major public health challenge. The CDC estimates that 76 million people get sick, more than 300,000 are hospitalized and 5,000 Americans die each year from foodborne illness.¹⁹⁴

Multnomah County Health Department performs approximately 8,000 inspections of restaurants, special events, street vendors, hotels and motels, child care centers, schools and adult foster care settings each year. Health inspectors make sure that hot foods are hot, cold foods are cold, hand washing facilities are available and are used, and raw meats are not mixed with vegetables. These practices, if improperly performed, can lead to foodborne illness.

Although foodborne illnesses are reported to the local health department, surveillance of exposure and illness is complicated. Foodborne illnesses can be severe or even fatal, yet milder cases are often not detected because individuals do not seek medical care. Further, many diseases that are transmitted through food are also spread through water or from person to person. Thus, the cause of the disease may be difficult to trace.

*Foodborne Outbreaks*¹⁹⁵

Although most foodborne illness occurs in a private or home setting, occasionally foodborne disease outbreaks affect large groups of people. A foodborne disease outbreak is defined as the occurrence of two or more cases of the same clinical illness among people from different households resulting from the ingestion of the same food. A food borne outbreak is an indication that there was a breakdown in the food safety system. Laboratories and clinicians are required to report incidence of foodborne illness to the Multnomah County Health Department. The Health Department then investigates the foodborne illness incident and reports the case(s) to the State Acute and Communicable Disease Office. Public health epidemiologists investigate outbreaks to control them, and also to learn how similar outbreaks can be prevented in the future.

Outbreaks are identified through citizen complaints or surveillance data from individual counties of identifiable foodborne illnesses. Outbreak data are, however, difficult to quantify. Frequently an individual case of foodborne illness may be identified, and while the case may be part of an outbreak, the cases are not linked. While outbreaks do not represent nearly as many cases of foodborne illness as isolated cases, there is much to learn about foodborne illness from outbreaks.

*Campylobacteriosis*¹⁹⁶

Campylobacteriosis is one of the most frequently reported foodborne illnesses in the United States and causes fever and diarrhea. Campylobacter is the bacteria that causes Campylobacteriosis, and it lives in the intestines of healthy birds. Most raw poultry is contaminated with Campylobacter. Eating undercooked poultry, red meats or other food that has been contaminated with juices from

¹⁹³ Excerpt: Multnomah County Health Department, "The Environmental Health of Multnomah County" 2003.

¹⁹⁴ *Food Safety Office*. Centers for Disease Control and Prevention. Accessed: 6/ 28/2002. <http://www.cdc.gov/foodsafety/>

¹⁹⁵ Excerpt: Multnomah County Health Department, "The Environmental Health of Multnomah County" 2003.

¹⁹⁶ Excerpt: Multnomah County Health Department, "The Environmental Health of Multnomah County" 2003.

raw poultry or red meats is the most frequent source of this infection. Data from 1996-2000 show Oregon third behind California and Minnesota for the highest incidence of Campylobacteriosis.

Rates of Campylobacteriosis have declined in both Multnomah County and Oregon since 1991 when there was a spike in the rate of Campylobacteriosis in Multnomah County due to increased screening of children with diarrheal illnesses. This screening occurred in association with a Shigella (a bacteria spread by not washing hands) outbreak in children's day care centers.

Salmonella

Salmonella bacteria are widespread in the intestines of birds, reptiles and mammals, which can spread to humans through a variety of different foods made from animals. Salmonella can get into the blood stream and cause life-threatening infections in persons with poor health or weakened immune systems, especially the very young or elderly. Incidence of Salmonella has fluctuated throughout the 1990's and do not show a steady trend. The rate in the County in 2000 was 11.7 cases per 100,000.

E. coli

E. coli is a bacterial pathogen commonly found in cattle. Human illness typically follows consumption of food or water that has been contaminated with microscopic amounts of cow feces and can cause severe and bloody diarrhea and painful abdominal cramps, without fever. E. coli has the potential for causing kidney failure, especially in children. Rates of E. coli infection have steadily declined in Multnomah County since 1992.

Health Department inspections

In order to prevent foodborne illness outbreaks, local health departments inspect food service facilities to insure they comply with food safety regulations. In Multnomah County in 2001, six different food service facilities (0.24 percent) failed to comply with Oregon Food Sanitation Rules.

In 2001, there were 436 food borne related complaints to the health department, a rate of 0.654 complaints per 100,000 population. Food handlers' certification training is required for all food service workers but as of 2001, only 82 percent of food handlers in Multnomah County had a food handlers card.

Although rates of illness caused by unsafe food handling have declined in both Multnomah County and Oregon since the early 1990s, Multnomah County has not met national objectives in reducing rates of foodborne illness. To meet national objectives involves risk reduction activities by individuals, education of food processors, preparers and servers, and adherence to national food manufacturing regulations.

Vector-Borne Disease

A vector-borne disease is one transmitted by organisms, such as mosquitoes, rodents, ticks and fleas. Vectors can transmit a disease they are carrying to humans through bites, burrowing or contaminating living spaces.

Vector-borne diseases of primary concern in Multnomah County include St. Louis encephalitis, Western Equine encephalitis, and West Nile virus. These mosquito-borne viruses most often cause

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no symptoms or a mild illness in an individual who has been bitten by an infected mosquito. In very rare instances, a Western Equine encephalitis or West Nile virus infection can cause fatal illness or coma.

In general, incidence of vector-borne diseases contracted in Multnomah County is very limited, with only a few cases reported each year. The first and only case of human-contracted West Nile Virus in Multnomah County was reported in 2006, although others have contracted the disease in other Oregon counties.¹⁹⁷ West Nile virus has been reported in birds and mosquitoes. The majority of reported diseases, particularly malaria, are actually contracted outside of the County.

Local Conditions - Natural Hazards

This section is adapted from the City of Portland's *Natural Hazard Mitigation Plan* and provides an overview of Portland's 2001 risk assessment; the complete, hazard-specific results are detailed in Appendix C of the City of Portland's *Natural Hazard Mitigation Plan*.

Portland is vulnerable to several natural hazards including earthquake, severe weather, flood, landslide, erosion, wildland urban interface fire, invasive plant species, and volcanic activity.¹⁹⁸ All of these hazards impact life, property and the environment and subsequently public health and safety.

Managing the city's vulnerability to hazards includes the daily activities of fire and medical rescue, transportation system improvement, crime reduction, and hazardous waste management. Complimented by prevention and mitigation actions within watershed management, fire fuel load reduction strategies, asset management planning, building code enforcement and invasive plant species eradication non emergency response bureaus are aiding in lowering the risk to the hazards.

At the hub of this coordinated effort to assure the public's health and safety under the most extreme conditions is the community and their effort to be aware of what and where the hazards are in Portland, do their part to prevent and mitigate the hazards and know how to respond to the interruption caused by hazards.

History and Risk Assessment Summary

A risk assessment is the process for identifying and evaluating the impact of natural hazards on life, property and the environment. Risk assessments combined with provide information about the

Natural Hazard Mitigation Plan

The mission of the 2010 Natural Hazard Mitigation Plan is "To reduce risk, prevent loss of property and commerce and promote expedient recovery, while safeguarding people and the environment from natural disaster events through a coordinated and collaborative community partnership." To do so we agree to the vision that "By creating a legacy of mitigation activities, City and community leaders' proactive implementation of long-term, cost effective mitigation measures has protected its population, its properties, its natural and built environment and its investments. The forethought of Portland's leaders has preserved the City through decades of hazard events."

Oregon's Statewide Planning Goals and Guidelines Goal 7: Areas Subject to Natural Hazards; To protect people and property from natural hazards; states: A.1. "Local governments shall adopt comprehensive plans (inventories, policies and implementing measures) to reduce risk to people and property from natural hazards." The City of Portland is doing this through the adoption of the 2010 Natural Hazard Mitigation Plan and through the recognition of hazards as a part the city's sustainability in the public safety chapter of the Portland Plan.

¹⁹⁷ Oregon Department of Human Services, Acute and Communicable Disease Prevention. "West Nile Virus Summary Report" 2006-2008. Accessed 4/2/2009. Online: <http://www.oregon.gov/DHS/ph/acd/diseases/wnile/survey.shtml>

¹⁹⁸ Portland Office of Emergency Management. "2010 Natural Hazards Mitigation Plan".

areas where the hazards may occur and an analysis of the potential risk to life, property and the environment that may result from natural hazard events. Part of this analysis is the property value or their insurance coverage amount which informs benefit to cost comparisons for decision makers.

Earthquake

Portland is located inland of the Cascadia Subduction Zone and within a region expected to withstand severe damage from a magnitude (M) 9.0 earthquake. The widespread, regional nature of the earthquake hazard means that the entire Portland population is at risk. Risk to infrastructure varies by the type of construction and proximity to the fault line and liquefaction zones. Both the number of older buildings and presence of liquefiable soils along the rivers and streams are recognized as conditions that amplify the hazard. The Portland Hills Fault and the East Bank Fault are local, crustal earthquake faults that have less of a probability of occurring than the Cascadia fault but could damage Portland with a potential M6.5 earthquake.

Earthquakes listed as less than M5.0 do not have a record of damage for the Portland area. The 2010 Mitigation Planning Team determined that significant quakes in the area were over M5.0. Table 5.8 depicts a list of historical earthquakes from 1980 to present which exceeded M5.0 and were located within 100 miles of the city.

Table 5.8. Historical Earthquakes for the City of Portland

Year	Depth (Miles)	Magnitude	Miles from Portland
1980	2.5	5.0	53
1980	3.1	5.0	60
1981	4.5	5.5	38
1989	11.2	5.1	82
1993	12.4	5.6	33.5

North America's strongest recorded earthquake occurred in Prince William Sound off the coast of Alaska on March 27, 1964, measuring M9.2. Many Portland residents felt ground motion resulting from this historic event, however no local damage occurred.

The largest recorded earthquake epicenter within 100 miles of Portland occurred in Scotts Mills on March 25, 1993, which measured M5.6 and caused sporadic minor damage to buildings. The shaking was intense enough to require damage assessment team deployments to perform bridge and key infrastructure inspections. The average magnitude of all historic earthquakes is M3.19 with an average distance of 52.4 miles from the city.

The most vulnerable structures are unreinforced masonry buildings. Those along major emergency response routes are of particular concern due to the debris caused by falling bricks.

Severe Weather

Projected changes in temperature over the next 100 years will likely reduce the winter snowpack and cause more snow to fall as rain; more frequent periods of drought, drier summers, increased fire danger and higher levels of pollution in the Portland area.

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The city is also subject to severe weather pattern shifts. Several historic events have affected the city, such as severe thunderstorms, tornadoes and periods of below-freezing temperatures. Four lightning injuries have occurred in Multnomah County since 1995. Severe low temperature events occurred in 2004 and 2008 bursting water pipes and impairing travel.

Two of the most notable extreme weather events of the past decade include:

- **July 2009 Heat Wave:** In the last week of July 2009, a historic heat wave occurred in Portland and broke several heat records for this area. This heat wave included the top two hottest three-day periods in Portland. July 2009 was also the second hottest month on record for Portland, with July 29 reaching 106 °F, just one degree short of the record of 107 °F set in July 30, 1965 and on August 8 and 10, 1981.
- **December 2008 Winter Storm:** Between December 14 and 26, 2008, the city experienced three major snowstorms that produced historically significant snowfall amounts. This series of winter storms has been described as one of the worst snow and severe weather events to affect the region in over 60 years and was the snowiest December since 1940. The city received 18.9 inches of snow (measured at the Portland National Weather Service Office) by the end of December 2008.

Extreme precipitation is projected to increase in the winter months and decrease in the summer months. More frequent periods of drought due to climate change are of particular concern for the Pacific Northwest. Projected changes in temperature will likely reduce the winter snowpack and cause more snow to fall as rain, subsequently affecting April to September stream-flow. Though streams in the summer months will be prone to low-flow situations, many of these systems are vulnerable to an increased flooding risk in the winter months. Flooding risk is greatest in systems where more wintertime precipitation will fall as rain rather than snow.

Days with extreme heat and heat waves (at least three continuous days over 90 °F) are projected to occur more frequently in the 21st century. In particular, the elderly, urban-dwelling and those with chronic illness are most at risk to these extreme heat events. x

Floods

Flooding has greatly impacted Portland in the past and has the potential to do so in the future. One of the more severe flood years on record occurred in 1996, when many rivers and creeks throughout the Willamette River watershed rose to 100-year flood levels. On Friday, February 9, 1996, the Willamette River crested 10 feet 6 inches above flood stage; just inches away from testing the plywood wall built at Portland's downtown seawall. The Columbia River crested at 11 feet 2 inches above flood stage, testing the strength of the levees that protect Portland International Airport and areas north of Columbia Boulevard. Johnson Creek crested at 6 feet 5 inches above flood stage. Each year, there is about a one in 25% chance of a similar storm. A more serious storm could bring floodwaters over the downtown seawall and into the central business district.

Two types of flooding primarily affect Portland: urban flooding and riverine flooding. In addition, any low-lying area has the potential to flood. A majority of land within Portland is urbanized and has a high concentration of impervious surfaces that either collect water or concentrate flow in unnatural channels. During periods of urban flooding, streets can become swift moving rivers and basements

can fill with water. Storm drains and catch basins can also back up with vegetative debris and cause additional, localized flooding.

Numerous areas are currently subject to urban flooding and the number of at-risk areas could increase without proper infrastructure to guide water overflow. The continued increase of impervious surfaces related to development significantly contributes to Portland's future flood risk as increased runoff subsequently exceeds the capabilities of existing drainage infrastructure. Mitigation measures including green building codes, permeable pavement and bioswales will decrease water runoff and potential urban flooding.

Landslides

Landslides are common in Portland because the area has steep slopes, abundant precipitation and in some areas, weak soils. Dominant landslide-prone areas were identified based on terrain information (slope and stability factors), geologic characteristics and degrees of water saturation. There are 28,100 households at risk from the variety of landslides in the Portland area, primarily in southwest, northwest and outer southeast, see Map 5.3. These are debris flows in valley bottoms, steep bluffs along rivers and wet hills silt soils with most of the households in the west hills silt.

As many as 800 landslides accompanied the storms of the winter of 1996. Ninety landslides were reported in the winter storm of 2007-2008. Portland's two most famous landslides have occurred in the West Hills and were reactivated by construction activity. The Washington Park landslide was reactivated in 1895 when the city cut off the ancient landslide toe when it put in two new reservoirs. This landslide has since slowed to four centimeters per year. The Children's Museum, World Forestry Center and the Oregon Zoo also are built on a large landslide reactivated in 1957 by the widening of Highway 26 which also cut off the toe. This landslide is now stabilized.

Landslides can occur with other hazards, thereby exacerbating conditions as described below:

- Earthquake shaking can trigger events ranging from rockfalls and topples to massive slides.
- Intense or prolonged precipitation can saturate slopes and cause failures leading to landslides.
- Landslides into a reservoir can indirectly compromise dam safety and a landslide can even affect the dam itself.
- Wildfires can remove vegetation from hillsides significantly increasing runoff and landslide potential.
- Construction projects accomplished without regard to geography, landslide toe locations, or historic slide events can increase landslide potential.
- Development and other activities can also provoke landslides. Increased runoff, excavation in hillsides, shocks and vibrations from construction, non-engineered fill and changes in vegetation from fire, timber harvesting and land clearing can trigger landslide events. Broken underground water mains can also saturate soil and destabilize slopes initiating slides.

Wildfires

Portland's considerable urban forest land increases its susceptibility to wildfires within the city limit. Wildfire risk was assessed based on a number of factors, including slope, vegetation fuel types, and

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structure data of properties in the interface. As there is no historical data available, the frequency and severity of urban interface fire could not be reliably calculated; however, areas of concern were identified through the risk assessment. The population exposed to wildfire hazard in these areas is currently 64,400. Total residential and commercial structures at risk amount to nearly \$8 billion.

Wildfires can be caused by activities such as machinery operation, arson or campfires, or by natural events like lightning. Wildfires often occur in park land and open spaces or other areas of flammable vegetation. The 2009 Wildfire Readiness Assessment: Gap Analysis Report stated that “Wildfires are increasing across the western United States. This increase is attributed to a buildup of forest fuels as a result of past fire suppression policies. Climate change increases the susceptibility of vegetation to fire due to longer dry seasons. The risk of loss to homes and businesses built at the margins of city natural areas is significant and growing.”

The most recent sizable wildland fire was the Mock’s Crest (or Willamette Bluffs) fire that occurred in August of 2001. A two-mile section of grass and brush was ignited along the railroad tracks paralleling the base of Swan Island. The fire quickly traveled up the bluff to Willamette Drive threatening structures near the University of Portland. This fire mobilized all off-duty members of Portland Fire and Rescue along with mutual aid from five surrounding fire departments.

Portland covers 87,040 acres. Of these, 14,500 acres are categorized as natural areas and stream corridors and 4,000 acres are classified as developed parks and open spaces. The city’s park natural areas designated as wildfire hazard areas include Powell Butte, the Willamette Bluffs or Escarpment, (Oaks Bottom and Mock’s Crest) Marquam Nature Park, Terwilliger Wildlands, Kelly Butte, Rocky Butte and Mt. Tabor. The two largest areas are Forest Park and Powell Butte. These natural areas have been identified as high risk by Oregon Department of Forestry and Portland Fire and Rescue because high-density commercial and residential development are found surrounding the natural area parks and open spaces, see Map 5.3.

Invasive Plant Species

Invasive plants are those species that spread at such a rate that they cause harm to human health and the environment. In general, most invasive plants are non-native species; however, not all non-native plants are invasive. Bureau of Planning and Sustainability has developed lists of native, nuisance and prohibited plants.

When invasive plants like English ivy or clematis dominate the groundcover, there is very little root structure to bind the soils. Therefore, large areas dominated by invasive plants are more likely to erode during flood events or high precipitation than areas with a diverse understory of trees and shrubs, which provide more root structure diversity. Invasive plants provide less streamside cover and shade increasing stream temperatures. Monocultures of invasive plants create fuel for wildfires. English ivy or clematis vines climb trees and can become a conduit for fire to reach the tree canopy, where it is more difficult to control and more likely to threaten nearby structures. Invasive plants can reduce the amount of tree cover by preventing trees from becoming established, causing them to fall down prematurely, or reducing their growth rate.

Based on the pervasive nature of invasive plants the extent of their impact in the city is considered critical. Invasive plant species are a hazard that threatens life and infrastructure because of the impact they have on watersheds. Their growth causes unstable soil which becomes more

vulnerable to landslides, greater fuel for wildfire and impairs the tree canopy. There are also some plants that do cause injury and death to people and animals due to their toxicity and/or skin reaction. This hazard category is a current environmental condition which if not mitigated could exacerbate an event. Because of its pervasive coverage and impact it is included in the 2010 Natural Hazard Mitigation Strategy.

Erosion

The City has identified riverine erosion areas along its rivers, creeks and tributaries. Erosion of any type rarely causes death or injury; however, erosion can cause significant destruction to property and infrastructure. Generally, erosion occurs when the flow of a river changes and is directed towards the banks or mid-channel islands. These changes can be caused by surface wind stress and gravity waves that occur during storm events.

Erosion occurrences are typically secondary events that are directly linked to other hazard events such as flood, severe weather, landslide and wildland urban interface fire events.

The 2008 Erosion and Sediment Control Manual is a key reference for actions to be taken to mitigate erosion in development and maintenance situations. This plan extends the vulnerability to not only riverine areas, but any location where land is being moved and therefore impacts the natural areas.

Volcanic Activity

A volcano is a vent or opening in the earth's crust from which molten lava (magma), pyroclastic materials and volcanic gases are expelled onto the surface. Volcanoes can unleash destructive power greater than nuclear bombs and pose a serious hazard if located near populated areas. Ash fall and tephra, the expelled cloud of gas and granular volcanic rock, could adversely impact the city operations and air quality.

Mt. St. Helens has been the most active volcano in the Cascade range during the last 10,000 years. In Oregon, awareness of the potential for volcanic eruptions has greatly increased since the May 18, 1980 eruption which killed 57 people. The coverage area was 230 square miles and reached 17 miles northwest of the crater.

The extensive north-south chain of volcanoes in the Cascade Range was formed by earthquakes originating from the Cascadia Subduction Zone. Mountains within this chain are Mt. Adams (31 miles due east of Mt. St. Helens), Mt. Hood (47 miles east-southeast of Portland), Mt. St. Helens (50 miles northeast of Portland), and Mt. Jefferson (70 miles southeast).

Mt. St. Helens is believed to be the volcano with the greatest potential to have a near term impact on the region because of its ongoing activity since the cataclysmic event in May 1980. Mt. St. Helens ejected tephra to altitudes of 12 to 20 miles and deposited it over an area of 40,000 square miles or more. Wind direction and velocity, along with the vigor and duration of the eruption, will control the location, size and shape of the area affected by tephra fall.

Due to proximity the major hazard for the city would be the impacts of ash or tephra. Ash clouds could affect humans and aquatic life as the ash accumulation increases the natural turbidity of waterbodies, causing increased treatment requirements. Events can vary from minor to heavy with

minor events reducing visibility and respiratory and breathing difficulty. Driving can become potentially treacherous from reduced visibility and particulate ingested engine damage. Other problems common from air-entrained ash particles could include clogged and damage City sewage systems, mechanical equipment failure caused by the abrasive nature of volcanic ash and economic losses caused by business slowdowns and the cost of ash removal.

Response to volcanic ash events like all other hazard events is a coordinated effort by multiple public and private agencies and the population possibly impacted.

Multi-Hazard Areas

Multiple hazards are located in certain areas of Portland. Along the Willamette River the potential for flood, landslide, erosion, and liquefaction are coupled with significant development which exacerbates the impact of the hazards. The steep slopes and the dominance of invasive plants within the forested west hills magnify the potential risk of landslides, erosion and wildfire due to urbanization within and abutting the hazard areas. In the city core, the age of buildings and the significance of infrastructure services, dense population and businesses all factor in to the risk related to the hazards of earthquake and severe weather.

Critical Facilities and Infrastructure

Cascading effects of hazards impact the infrastructure of the city which creates greater risk to the population of Portland. Critical facilities and infrastructure are “Publicly and privately controlled systems and assets, including the built and natural environments and human resources, essential to sustained functioning of the Portland/Vancouver metropolitan area. Such systems and assets specifically include those necessary to ensure continuity of security, safety, health and sanitation services, support the area’s economy and/or maintain public confidence. Incapacitation or destruction of any of these systems or assets would have a debilitating impact on the area either directly, through interdependencies and/or through cascading effects.”¹⁹⁹ Critical infrastructure includes public services that have a direct impact on quality of life such as communication technology, vital services such as public water supplies and sewer treatment facilities and transportation facilities, such as airports, heliports, highways, bridges, tunnels, roadbeds, overpasses, railways, bridges, rail yard depots and waterways, harbors or dry docks.

Hazard mitigation and asset management consider the impact of hazards on the critical infrastructure. If any of these facilities and lifelines are impaired during a disaster, the ability to protect the public’s health, safety and quality of life is compromised and recovery will be lengthy.

In 2007 regional emergency management agencies (representing Clackamas, Columbia, Multnomah and Washington in Oregon counties and Clark County in Washington) sponsored a review of critical infrastructure in the region. One of the outcomes of this process was to develop an agreed upon regional definition of the infrastructure and the identification of interdependent infrastructure. The key infrastructure depended upon by most was energy, both electricity and fuel. The importance of strengthening and finding alternatives to these two systems is integral to public health and safety.

¹⁹⁹ Urban Area Security Initiative, Critical Infrastructure Protection Plan, 2007.

Conclusion

The importance of including hazard related risk into all planning efforts is because natural hazards pose a real threat to public health, safety and the quality of life for Portland residents. Safeguarding people and the environment from natural disaster events requires a coordinated and collaborative community partnership. Identifying, planning for and mitigating natural hazards to permanently reduce or alleviate losses of life and property will require a range of strategies, including planning, policy changes, projects and improving public awareness. The 2010 Natural Hazard Mitigation Plan identifies the natural hazards, the plans and the actions that will mitigate the hazards through programs involving many city bureaus and public and private engagement. Emergency Management is not just about response; it is also about sharing the responsibility for mitigating the hazards, preparing and protecting the assets of our community.

CHAPTER 6: FOOD ACCESS

THE ISSUE

Food access is a term that refers to the ability to obtain healthful, affordable food. Food access can be compromised because there are no grocery stores in particular areas; stores that are there might be difficult to get to using the existing transportation network; food might not be affordable; or grocery or convenience stores might have limited options of healthful foods.²⁰⁰ Other challenges, like limited knowledge of how to prepare, properly store and preserve healthful foods, or concentrations of restaurants and stores selling predominantly unhealthy convenience foods, are also important factors affecting food choices and access.

Note: Gardening, community gardens, urban agriculture and other topics focused on growing food in the City are included in the Urban Agriculture section in the Food Systems Background Research document. While gardening and growing food can certainly improve food security and increase access to fresh produce, this topic will not be included in this chapter.

Food access is related to hunger and food insecurity, which occurs when a person does not have physical or economic access to sufficient, safe, nutritious food to maintain a healthy and active life. While food access can be a challenge in urban and rural areas alike, this chapter will focus on urban areas whose issues will most likely be similar to Portland's.

Barriers to Access

The British Food Access Network has concluded that four factors play into what they term “food poverty” or lack of food access:

Accessibility – How do people reach food retailers, and are there any food retailers near to their home? For those who do not have access to adequate public or private transport, not being able to get to the shops is a defining factor in their ability to buy healthy affordable food.

visionPDX on food access:

Portlanders support the notion that people of all income levels should have access to multiple sources of fresh, local food. The focus of respondents was on creating more opportunities for growing ones own food locally within the city, as well as an appreciation of stores that sell local foods from area farmers, (New Seasons Market, for example) and farmers markets. Portlanders also support the preponderance of locally-owned restaurants that serve local food, our brew pubs and our vibrant farmers markets.

Many respondents would like to see even more farmers markets in Portland, especially in low-income neighborhoods that currently lack access to fresh, local food. About 63 percent of respondents in a visionPDX phone survey indicated that they would be very or somewhat willing to pay for the creation of a permanent public market (similar to Seattle's Pike Place Market) in downtown Portland.

A major theme that runs through the data is the desire to have equity in access to local food. Respondents consistently express the need to increase access to local food among low-income populations so that all Portlanders can benefit from the region's agricultural abundance. This could happen, respondents suggest, through subsidizing CSA shares, providing community gardens within walking distance of all Portlanders, and ensuring that farmers markets are more equitably distributed across the city.

²⁰⁰ SustainWeb, Food Access Network, “What is food poverty?” Accessed at <http://www.sustainweb.org/page.php?id=187> on December 17, 2008.

Availability – Even if somebody can get to a food retailer, they may not be able to buy the healthy food that they want. Local food retailers may not stock healthy options, such as fruit, vegetables and lean meats, due to a shorter shelf life, lower profit, a perceived lack of interest or a shortage of storage options. Some local shops may not accept WIC vouchers or SNAP/Food Stamps.²⁰¹

Affordability – Expenditure on food is the most flexible part of household budgets as the amount spent on food is often whatever is left over when all the essential bills have been paid. When sudden or unexpected costs happen, the amount available to spend on food is reduced. Nutrient-dense foods (especially fruits, vegetables and whole grains) tend to cost more and the cost of these foods has increased faster than the cost of calorie-dense foods such as chips and cookies.

Awareness – Many individuals lack the knowledge, skills or time needed to buy and cook foods from scratch. There is also a lot of misinformation about nutrition and healthy foods in the media meaning many people do not know where to start.²⁰²

To this list of four, a group of Masters of Urban and Regional Planning students at Portland State University are currently exploring the issue of food access in Portland; and have added a fifth factor:

Appropriateness – The ability of available goods to satisfy the preferences of specific groups of people with distinctive food preferences, primarily ethnic groups but also others such as local food advocates who prefer to buy locally-produced foods.²⁰³ People can be reluctant to purchase food with which they are unfamiliar, due cultural traditions or worries that “unusual” food will be rejected by the family and so get wasted.²⁰⁴

Discussion of food access can include elements of all five of these factors. Activists and, increasingly, governments, are attempting to ensure strong access to food for all through a variety of programs and policies that consider these issues. The following chapters will explore some of these further and will outline what others have done to address food access in their communities.

GROCERY STORES

The Issue

The barriers to food access discussed above apply specifically to grocery stores. The location of grocery stores can impact people’s eating habits, and there is a widespread belief that communities suffer without direct access to an affordable full-service grocery store. The selection of products offered, and their prices, are also at issue.

²⁰¹ As of Oct. 1, 2008, *Supplemental Nutrition Assistance Program* (SNAP) is the new name for the federal *Food Stamp Program*. In this document, we will refer to SNAP/food stamps as the program name to avoid confusion.

²⁰² SustainWeb, Food Access Network, “What is food poverty?” Accessed at <http://www.sustainweb.org/page.php?id=187> on December 17, 2008.

²⁰³ Community Food Concepts, “Foodability: Visioning for Healthful Food Access in Portland,” Portland State University Masters of Urban and Regional Planning Program, June 2009.

²⁰⁴ Community Food Concepts, Foodability MURP Workshop Project, “Barriers to Access.”

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Health Benefits

Health benefits of a nearby full-service²⁰⁵ grocery are becoming increasingly well-documented. There is ample evidence that access to a close supermarket increases fruit and vegetable consumption.²⁰⁶ This increased consumption, measured in studies within 1 kilometer (.62 mile) but documented as far away as two miles, has been shown to be particularly beneficial for low-income communities and communities of color. People living within 1 kilometer of a grocery store were also, in one study, half as likely to be overweight than those who live in neighborhoods without a food store.²⁰⁷

A study from Leeds, England, assessed the food-consumption patterns in a neighborhood before and after a new grocery store was developed as a health intervention. Researchers found “a significant upward shift in fruit and vegetable consumption in the post-intervention period... amongst those who had the poorest diets in the pre-intervention period.”²⁰⁸ Another study of pregnant women and food consumption found that pregnant women living more than four miles away from a supermarket have poorer diets than pregnant women living less than two miles from a supermarket.²⁰⁹ A recent study also linked a concentration of “healthy” food stores – full-service groceries and produce markets – with lower body mass index and lower prevalence of obesity.²¹⁰

Poor diets have been linked to several health conditions, especially obesity, Type 2 diabetes and high cholesterol; these conditions are also often found in low-income communities and communities of color.

Barriers to Access

As mentioned above, some of the main barriers to healthful foods can be transportation, what foods stores are actually stocking and affordability of those products. Access is also often tied to income, race or ethnicity disparities and the transportation system.

Income and Racial/Ethnic Disparities

Food access disparities among different income and ethnic groups is well-documented. Low-income and minority communities tend to have less access to supermarkets than wealthier and predominantly white communities, while having a greater number of corner stores, convenience stores, and liquor outlets.^{211 212213}

²⁰⁵ In this paper, “full-service” food markets or grocery stores are considered to be those that provide a full array of food options, including fresh produce, meats and dairy products as well as packaged foods.

²⁰⁶ Black, J.L. and J. Macinko. 2008. “Neighborhoods and obesity.” *Nutrition Reviews*. 66(1): 2-20.

²⁰⁷ Hatherly, Joanne, “Distance from grocery store determines weight: Study,” Vancouver Sun, April 6, 2009. Accessed on May 14, 2009 at

<http://www.vancouversun.com/business/fp/Want+lose+weight+Move+closer+grocery+store/1470781/story.html>.

²⁰⁸ Wrigley N., D. Warm, and B. Margetts. 2003. “Deprivation, diet, and food-retail access: findings from the Leeds ‘food deserts’ study” *Environment and Planning A*, 35(1): 151 – 188.

²⁰⁹ Laraia, B., A.M. Siega-Riz, J. Kaufman, and S. J.Jones. 2004. “Proximity of supermarkets is positively associated with diet quality index for pregnancy.” *Preventive Medicine*, 39: 869-875.

²¹⁰ Medical News Today, “Access To ‘Healthy’ Food Stores Associated With Lower Prevalence Of Obesity In New York City,” March 21, 2009. Accessed on 6/1/2009 at <http://www.medicalnewstoday.com/articles/143099.php>.

²¹¹ Black, J.L. and J. Macinko. 2008. “Neighborhoods and obesity.” *Nutrition Reviews*. 66(1): 2-20.

²¹² <http://www.policylink.org/pdfs/HealthyFoodHealthyCommunities.pdf> (Healthy Food, Healthy Communities: Improving Access and Opportunities Through Food Retailing)

In a study of census tracts in New York, Maryland, and North Carolina, low-income neighborhoods had half as many full-service grocery stores and four times as many convenience or limited-service stores as the wealthiest neighborhoods. Areas that were predominantly minority or racially mixed neighborhoods again had half as many supermarkets as predominantly white areas. And, “in general, poorer areas and non-White areas also tended to have fewer fruit and vegetable markets, bakeries, specialty stores, and natural food stores. Liquor stores were more common in poorer than in richer areas.”²¹⁴

A study of neighborhoods in Atlanta found that wealthy African American neighborhoods still had fewer supermarkets than wealthy white neighborhoods, indicating the impact of race on store locations independent of income.²¹⁵

This result can have consequences: an extensive study published in the *American Journal of Public Health* looked at reported food choices of over 10,500 people in four geographic regions in the U.S. This study found that African Americans’ consumption of fruits and vegetables increased by 32% for each additional grocery store in the census tract; for white Americans, consumption increased 11% for each additional grocery store. Even after controlling for education and income, more African Americans living in census tracts with at least one supermarket met dietary guidelines for fruits and vegetables.²¹⁶

Transportation Barriers

Up to one-quarter of low-income households are transit-dependent and do not own an automobile. In fact, low-income households are 6 to 7 times more likely to not own cars than other U.S. households. “Nevertheless, most low-income households attempt to use cars for food shopping, even though more than half cannot rely on a car that they own.”²¹⁷ This impacts the time spent getting to and from the store. One study of transportation to grocery stores in the San Francisco area found that on average, residents of low-income communities spent one hour getting to and from the store, while people in affluent areas on average could reach three stores within 10 minutes roundtrip.²¹⁸ Fewer transportation options may affect the likelihood of low-income people visiting convenience stores and both paying more for similar products or being limited by inadequate selection of healthful foods.

²¹³ http://www.marigallagher.com/site_media/dynamic/project_files/1_DetroitFoodDesertReport_Full.pdf (Examining the Impact of Food Deserts on Public Health in Detroit)

²¹⁴ Moore, Latetia V., and A. V. Diez Roux. 2006. “Associations of neighborhood characteristics with the location and type of food stores.” *American Journal of Public Health*, 96 (2): 325-331.

²¹⁵ A. Helling et al, “Race and Residential Accessibility to Shopping and Services,” *Housing Policy Debate*, no. 14 (2003): 69-101.

²¹⁶ Kimberly Morland, PhD, Steve Wing, PhD and Ana Diez Roux, MD, PhD, “The Contextual Effect of the Local Food Environment on Residents’ Diets: The Atherosclerosis Risk in Communities Study.” November 2002, Vol 92, No. 11 | *American Journal of Public Health* 1761-1768.

²¹⁷ http://departments.oxy.edu/uepi/cfj/publications/transportation_and_food.pdf

²¹⁸ Flournoy, Rebecca and Treuhaft, Sarah, “Healthy Food, Healthy Communities: Improving Access and Opportunities Through Food Retailing,” Policy Link and the California Endowment, Fall 2005.

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One study found that after a new grocery store opened, the “main travel mode used by those respondents [who had switched to shopping at the new store] shifted significantly towards walking.” Car and taxi usage fell.²¹⁹

Local Conditions

Portland has many grocery chains and independent stores serving residents’ retail food needs, and it appears that those stores are covering some of the most densely-populated areas of the city (see Map 6-1).

As discussed above in the Health Benefits section, different researchers have used various distances as their proxy for appropriate physical access to grocery stores, ranging from a five-minute walk to two miles and beyond. Most of the studies thus far in Portland have chosen one mile as the upper limit for grocery access, based on an appropriate walking distance. One mile generally corresponds to a twenty-minute walk.

There have been three recent examinations of the Portland metropolitan area’s access to full-service grocery stores. These all noted similar and/or overlapping areas of no grocery service throughout the city.

Regional Equity Atlas

The Coalition for a Livable Future used data collected in 2003 by the Portland Multnomah Food Policy Council to contribute to a food access section in their Regional Equity Atlas. In this analysis, some of the areas within the city of Portland that have poor access to grocery stores include:

- The Wilkes neighborhood in Outer Northeast Portland
- Along I-5 in North and Northeast Portland, including the Boise neighborhood
- South of Powell in Outer East Portland
- In the area south of downtown, including the Homestead and South Portland neighborhoods

The data source used in this study for Multnomah County was the Oregon Department of Agriculture’s list of licensed food retailers, vetted fairly significantly by on-the-ground and phone verification.^{220,221}

Metroscape

In 2007, an article in *Metroscape* magazine examined food access in the region. Looking only at grocery access within the city of Portland, some of the same areas as in the Regional Equity Atlas show up as being further than one mile from the nearest full-service grocery store:

- Along I-84 east of I-205
- Along I-5 just north of Downtown

²¹⁹ Wrigley N., D. Warm, and B. Margetts. 2003. "Deprivation, diet, and food-retail access: findings from the Leeds 'food deserts' study" *Environment and Planning A*, 35(1): 151 – 188.

²²⁰ Coalition for a Livable Future, "The Regional Equity Atlas: Metropolitan Portland's Geography of Opportunity," Portland State University and Coalition for a Livable Future, 2007.

²²¹ Email correspondence with Deb Lippoldt,

Further areas identified as being grocery store-deficient include:

- Large areas of St. Johns and the Portsmouth neighborhood
- Some block groups along I-205
- Along the southern border of Portland on the east side
- Several neighborhoods on the west edge of Portland

The article also examines concentrations of convenience stores, concentrations of poverty and concentrations of households without access to a car. While no conclusions are drawn within the text of the article, the maps indicate that:

- Areas identified as having poor food access overall (few or no full-service groceries and high concentrations of convenience stores) generally have low population densities, with few notable exceptions (I-5 north of Downtown being one)
- Areas identified as having poor food access are often areas with higher rates of poverty

Looking at areas of low car access and poor food access together, only the area north of downtown along I-5 had both these characteristics; most areas with poor food access did not have a concentration of households with no car.²²²

Sparks Study

The final study was a thesis completed by Andrea Sparks, a graduate student at the University of Oregon now working at the U.S. Dept. of Housing and Human Services on “food desert” issues.²²³ In this study, distance from both census tracts and block groups to the nearest stores were measured and analyzed, as well as variety (number of stores within walking distance – here defined as 1000 meters/3280 feet or an average 15-minute walk in an urban area) and competition (number of stores from different chains and parent companies within walking distance). Her study area was the Portland metro area contained within the urban growth boundary.

The results were interesting and not necessarily following in the trends described in national studies above:

- Significant, though weak relationships between higher-poverty areas and shorter average distances to the nearest supermarkets
- A significant, though weak, relationship between areas of higher rates of poverty and more supermarkets within walking distance.

Tracts were given ratings from Very Low Access to Very High Access.²²⁴ The three tracts with extreme poverty (the highest rates of poverty in the study area, over 40 percent below poverty level) were located in Northeast Portland, and each of them were found to have Very High or High levels of supermarket access. However, in the next level down, 14 of the 24 high poverty areas (20

²²² Margheim, Joy, “The Geography of Eating Well: Food Access in the Metrocape,” *Metrocape*, Winter 2007.

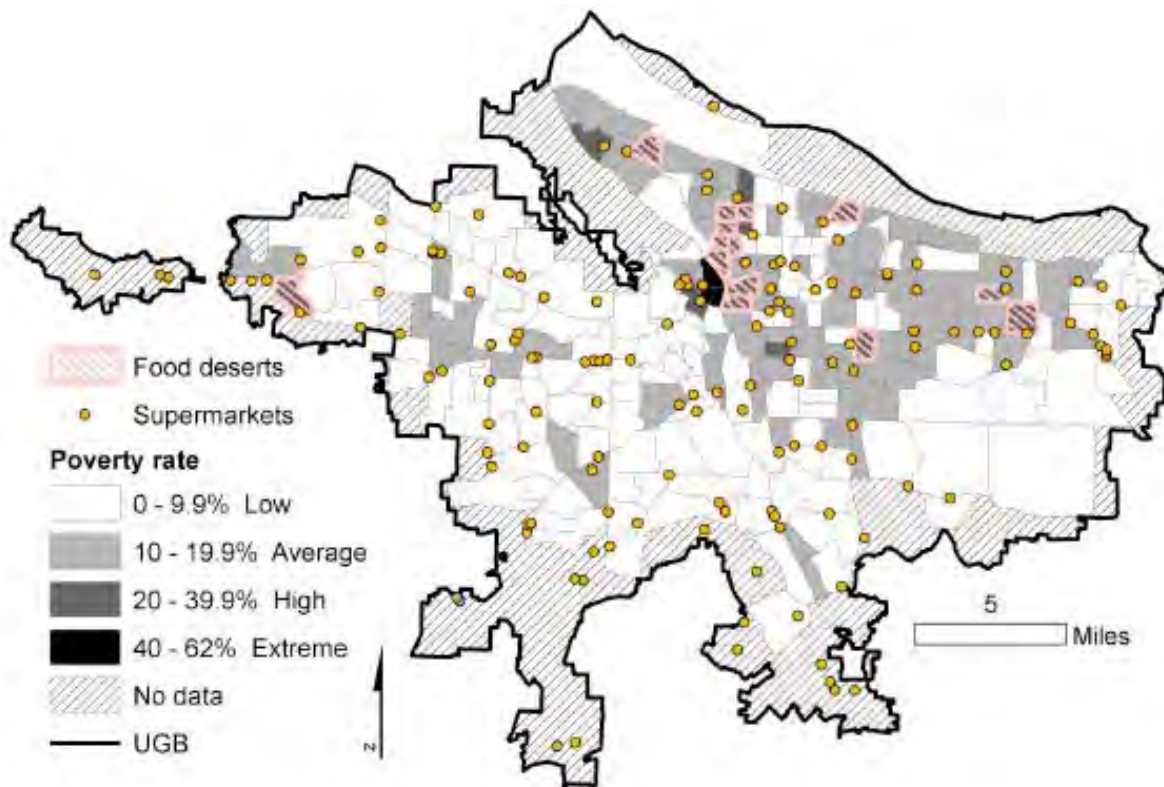
²²³ Sparks, Andrea Leigh, “Measuring Food Deserts: A Comparison of Models Measuring the Spatial Accessibility of Supermarkets in Portland, Oregon.” Thesis presented to the Department of Planning, Public Policy and Management and the Graduate School of the University of Oregon, June 2008.

²²⁴ The categories assigned to different block groups were based on different criteria in each of the three measures calculated: distance to nearest store; access to more than one store; and number of different chains within walking distance. For more information, see Sparks.

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percent to 39.9 percent below poverty level), most of which are in the city of Portland, had Low or Very Low levels of supermarket access. The author defines these tracts, where there is a combination of high poverty and low access, as food deserts. As can be seen in Figure 6.1, many of these tracts are located in Northeast Portland.

Figure 6.1 Poverty Rates and Food Deserts²²⁵



Physical Access

The Bureau of Planning and Sustainability has reviewed the data used in this last paper and has adopted it as the starting point for analysis of grocery store access in Portland. To the list of chain grocery stores we have added a number of additional, non-chain stores that provide a full-service grocery experience, including food cooperatives and independent larger stores like Sheridan Fruit Co. and Fubonn Supermarket. We have mapped these stores with boundaries that represent half-mile and mile distances to the stores via walking paths (Map 6-1).

Analysis of this map echoes past findings: large areas of east Portland, North Portland west of I-5, as well as areas of SW Portland have areas of no coverage by full-service grocery stores. Because of topography and roads, the stores that do serve SW Portland have smaller walking coverage areas than stores built in flatter areas of the city. Considering only half-mile walking distances, there are many areas of little to no coverage, while the one-mile distance shows fewer holes. Almost 53

²²⁵ Sparks, Andrea Leigh, "Measuring Food Deserts: A Comparison of Models Measuring the Spatial Accessibility of Supermarkets in Portland, Oregon." Thesis presented to the Department of Planning, Public Policy and Management and the Graduate School of the University of Oregon, June 2008.

percent of the city is within one mile of a full-service grocery store, while only about 18 percent is within a half-mile.²²⁶

While much of SW Portland is highly educated, largely white, with access to cars and low poverty rates, the same cannot be said of some of the other areas missing grocery coverage. For example, a large swath of North Portland east of St. Johns and west of I-5 has only one grocery store with healthful food access, that being the Big City Produce at New Columbia (which is relatively small compared to chain supermarkets).

This area has higher concentrations of poverty and higher population density (see Maps 6-1 and 6-2) than other parts of the city, but little access to fresh food. Other areas with limited coverage like the area just north of Downtown and the Cully neighborhood also have high poverty concentrations relative to the rest of the City, but few grocery options. Many of the areas described here are some of the most diverse parts of Portland, raising questions about whether the racial and ethnic disparities in food access that have been noted in other cities is also present here. More data focused on this issue is welcome.

This model only considers location of full-service grocery stores, not other fresh food access points; see the section on the Retail Food Environment Index in this chapter for a new model for measuring food access.

Affordability

For many older, more diverse cities, food access has often been discussed as an issue of disinvestment in low-income communities. In this model, suburban stores have opened where wealthier people lived, leaving people in poor communities to have fewer options and higher prices.²²⁷ This is especially true in neighborhoods with only small stores, which generally cannot offer food for the same lower prices as larger stores. In Portland, the issue seems a bit different, not the least because many of Portland's closest-in neighborhoods have become more affluent, and areas of poverty are shifting to areas that are further away from the central core.

Costs of food

But are food costs higher in higher-poverty parts of the city? Limited data is available, but some studies indicate that lower-income areas of Portland do not suffer from higher food prices in full-service grocery stores than higher-income or more suburban locations. A market basket survey conducted by PSU students as part of the Lents community food assessment in 2004 found that chain stores with locations in Lents and other parts of the City did not have significantly higher food prices in their Lents store; one chain was found to have slightly higher prices in Lents, while another had slightly lower prices.

There was larger variation among store chains. For example, it cost almost \$50 less to buy equivalent foods at Winco, the lowest-priced store, than at Albertsons, the highest, in this informal

²²⁶ Calculations made on areas – not population or households – and includes open space and industrial land.

²²⁷ Mark Vallianatos, Amanda Shaffer, Robert Gottlieb, "Transportation and Food: The Importance of Access. A Policy Brief of the Center for Food and Justice, Urban and Environmental Policy Institute," October 2002.

study. When the two “bag-your-own” stores (Winco and Food-4-Less) were removed from consideration, the differences in price were not as extreme.²²⁸

A 2008 University of Washington study in Seattle neighborhoods found that grocery stores in lower-income communities were actually a good deal cheaper than those in more affluent communities: a \$112 difference between the most expensive store and the cheapest, and a \$31 difference between two Safeway supermarkets. Grocery store representatives questioned the results.²²⁹ This result is opposite what has been documented in many other cities, including cities with large amounts of disinvestment in urban areas and high concentrations of poverty.

With this limited data, one might conclude that in Portland, the cost of food may have more to do with what chain grocery is frequented (and how large of a store it is), rather than which branch of that chain is used.

Shopping habits

Other Portland-area studies found that the choice of which chain to use shaped food access habits for low-income Portlanders. Two neighborhood-level community food assessments (CFA)²³⁰ conducted by local nonprofit organizations in the Lents neighborhood and in areas of North and Northeast Portland, focused on reaching lower-income residents and gaining information about their buying habits. What they found was that food access is more complicated than whether a full-service store is located nearby.

Survey results showed that often in areas that were served by a store, the lack of affordability of the store – whether it was a higher end store like New Seasons Market or Whole Foods, or even a more common chain store like Safeway – would impact a resident’s decisions about where to purchase food. Those low-income residents surveyed appear to tend to travel greater distances to stores they perceive as being more affordable, like Winco and Wal-Mart.

One family demonstrated this phenomenon in a 2008 *Oregonian* article on grocery access. The Calderon family shops once a month at the Clackamas Winco – 10 miles and an hour away by bus. This store is cheaper than those in their Northeast Portland neighborhood and on the same bus route, making transfers unnecessary. Despite the fact that several grocery stores, including a New Seasons Market only eight minutes away by bus in the other direction, are in their neighborhood, the Calderons believe they can’t afford to shop there on the food stamps they receive.²³¹

The survey data collected by the Interfaith Food and Farms Partnership in the North/Northeast Portland community food assessment backs up this anecdotal evidence. The survey targeted low-income respondents by collecting data at emergency food sites, discount grocers and at local churches. Almost half of the 202 respondents were dissatisfied with the number of full-service

²²⁸ PSU, “Lents Community Food Assessment Market Basket Survey Results.”

²²⁹ Langston, Jennifer, “Location plays role in how groceries are priced: Survey calculates cost of the same foods at various Seattle stores,” *Seattle Post-Intelligencer*, August 18, 2008.

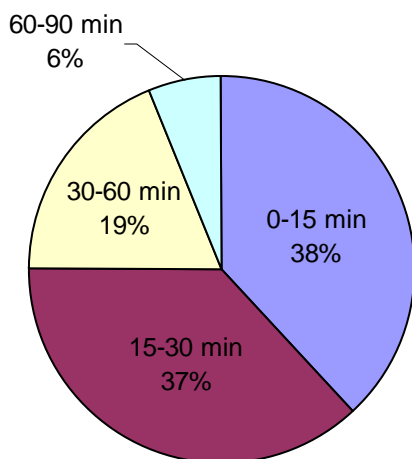
²³⁰ A community food assessment is a process that empowers a community to describe their own community food security needs, and mobilize to address them. Through community food assessments, “diverse stakeholders work together to research their local food system, publicize their findings, and implement changes based on their findings.” (Community Food Security Coalition, “Community Food Assessment Program.” Accessed on 3/11/2009 at http://www.foodsecurity.org/cfa_home.html)

²³¹ Parker, Paige, “Portland’s low-income neighborhoods are city’s ‘food deserts,’” *The Oregonian*, November 15, 2008.

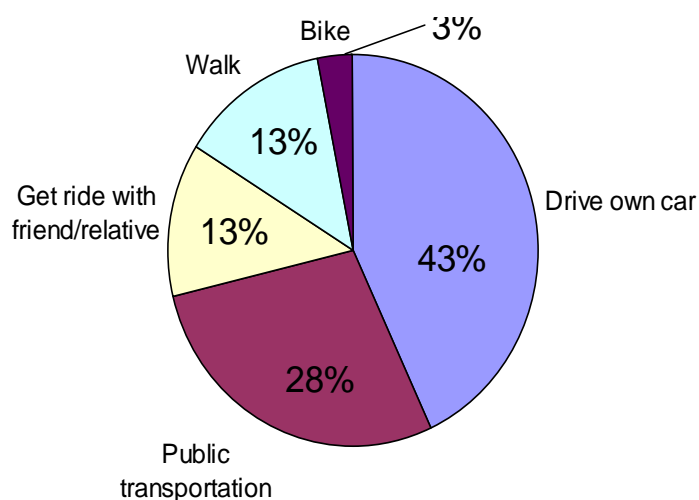
stores in their neighborhood, despite the fact that most of them lived within a half mile of one. One quarter of respondents spent 30 to 90 minutes one way to reach the store they most frequently used, and 43 percent of them did not have ready access to a car.²³²

Figure 6.2 Travel to Grocery Store, N/NE Portland Community Food Assessment Respondents²³³

How Long Respondents Travel to Get to the Grocery Store (one-way)



How do Respondents get to the Grocery Store?



For both food assessments, many respondents (30 percent in N/NE Portland and 39 percent in Lents) felt that they didn't eat enough fruits or vegetables, and four out of five respondents in Lents said they would like to eat a healthier diet. Most felt they would prepare more fresh foods if they had more time or grocery money.²³⁴

This data makes the picture of food access more complicated than the simple measure of whether a full-service store is nearby or not.

What does it take to build a new supermarket?

Whether the areas that have been identified as having little access to full-service grocery stores can support a new store can be affected by population density, land access, financing and other factors. Here are a few things to consider:

- Supermarkets typically need 40,000 – 50,000 people in their “trade area” to be viable. The number of people nearby is more important than their income.
- Stores aim to do \$350,000 in sales per week. Supermarkets plan on people who live nearby spending about one-fifth of their per capita weekly (PCW) food expenditures (which

²³² Interfaith Food and Farms Partnership, “Everyone Eats! A Community Food Assessment for Areas of North and Northeast Portland, Oregon,” Ecumenical Ministries of Oregon’s Interfaith Network for Earth Concerns, June 2008.

²³³ Interfaith Food and Farms Partnership, “Everyone Eats! A Community Food Assessment for Areas of North and Northeast Portland, Oregon,” Ecumenical Ministries of Oregon’s Interfaith Network for Earth Concerns, June 2008.

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averages \$35) at their store; people outside the trade area are expected to spend 5 percent of their PCW.

- A 50,000 square foot store needs about five acres of land on which to locate. Urban sites generally need four parking places for every thousand square feet of store.
- Construction costs and ability to finance will impact timelines and viability of the project. Supermarket construction costs about \$90 to \$150 per square foot.²³⁵

These kinds of market concerns would need to be considered by any company looking to locate, or being asked to locate, in an underserved community. Approaches other jurisdictions have utilized to overcome some of these limiting factors and encourage grocery stores in low-income communities are described in this chapter's policy examples.

Grocery Access Conclusions

Access to food is most commonly identified with access to full-service grocery stores. Based on a one-mile standard, there are clearly some parts of Portland that are not well-served by grocery stores. Some of these areas, like the southeast corner of the city, are sparsely populated and may not be able to support a large, full-service store. Other areas are likely better candidates for stores; however, simply locating a store in an underserved neighborhood does not ensure that all residents of that neighborhood will choose to use the new store (and, hopefully, benefit from the healthy offerings therein). Some will likely continue to travel long distances to achieve the lower prices that bargain stores are perceived to offer.

In Portland, data indicate that grocery access is more complicated than whether a store is within walking distance. Affordability is also an important factor in determining where people shop, as well as availability and accessibility. While many communities contain at least one full-service supermarket, there are concerns about whether this one store can serve all members of their communities. In many cases, low-income people are left traveling long distances to reach affordable, quality food. In addition to proximity, other factors like affordability, quality, selection and cultural appropriateness all also play into the food access issue.

Gaps exist in the data we have available to get a clearer sense of the many factors that play into food access. Data collected from grocery stores on the zip codes of their customers would help determine the extent to which people travel from their homes in search of food. More extensive data collection on residents' buying and consumption habits would be useful to draw a clearer image of how people access food. Further analysis of the role that convenience stores and other retail food outlets play in providing food would clarify the opportunities for impacting food access in Portland. More data is also needed on how transit routes and safe biking/walking facilities connect to grocery stores.

²³⁴ Lents Community Food Survey report, November 2004.

²³⁵ LISC Commercial Markets Advisory Service, "Is a grocery store in your neighborhood's future?" Commercial Advisor newsletter, Summer 2008.

CONVENIENCE STORES

The Issue

Convenience stores, despite their high numbers, are generally not considered to be strong contributors to healthful, affordable food access. In her study of food access in Portland, Joy Margheim states:

Convenience stores boast limited shelf space and different access to wholesalers, and thus tend to offer more highly processed, snack-type foods. Because they typically offer smaller package sizes, smaller stores such as convenience stores are relatively expensive (hence the assumption that a consumer is paying for convenience, not necessarily quality). While they play an important role in urban life and may stock widely different items depending on their ownership and clientele, convenience stores usually are not a reliable source for healthy, economical meals...The concern regarding convenience stores is relative concentration. An area with many convenience stores may offer few incentives to healthy eating, particularly if there are no grocery stores nearby.

A seminal 1997 USDA study found that prices at grocery stores are on average 10 percent lower than convenience stores and small, independent stores.²³⁶ As to selection and variety of products, most convenience stores carry only a few basic staples, with most shelf space taken up by soft drinks, tobacco products, beer, snacks, candy and lottery tickets.

One study of convenience stores and bodegas (small corner shops) in New York City compared availability of healthful foods for diabetics in East Harlem and the adjacent Upper East Side. East Harlem has the city's highest rates of diabetes and obesity and one of the lowest median incomes, while the Upper East Side has the lowest rates of diabetes and obesity in the city and one of the highest median incomes.

While only 9 percent of the bodegas in East Harlem carried the five recommended foods for diabetics (diet soda; 1 percent fat or fat-free milk; high-fiber and/or low-carbohydrate bread; fresh fruits; and fresh green vegetables or tomatoes), 48 percent of bodegas in the Upper East Side carried these items. This demonstrates that convenience stores and small markets or bodegas are not by definition devoid of healthful options, and location or demographics of shoppers can unfortunately impact what is sold.

Bodegas vs. Convenience Stores

"Although similar, bodegas and convenience stores are not exact substitutes. Bodegas [also called corner stores] rely on a business model unique to the inner city - combining characteristics of a convenience store, grocery, and deli - and offer substantial benefits to a community. They are often owned independently, by immigrants, offer flexible hours of operation, and are located in convenient locations."

Stringer, Scott M., Manhattan Borough President, "FoodStat: Measuring the Retail Food Environment in NYC Neighborhoods," May 2009.

²³⁶ Phillip Kaufman, James MacDonald, Steve Lutz and David Smallwood. "Do the Poor Pay More for Food?: Item selection and price differences affect low-income household food costs." USDA ERS. AER n. 759. 1997.

Challenges and Opportunities

Because of the omnipresence of such small neighborhood stores, many organizations looking at food access are now working to increase the supply of healthful food options at such stores. The Healthy Corner Stores Network (HCSN) provides a forum for sharing best practices and lessons learned, as well as related research on helping “convert” small corner and convenience stores into places with healthful food options.²³⁷

These conversions can be as simple as helping an existing store to sell pre-packaged cut fruit, as the Healthy Corner Store Initiative is doing in Philadelphia. The Initiative (funded by the Robert Wood Johnson Foundation) provides refrigerated barrels and marketing materials to market packages of fruit. The fruit is sold at an affordable rate – \$1 per pack – and also provides greater profits at 40 cents per pack than do other, less healthy snacks the store already sells.

Larger-scale conversions to a fuller selection of fresh produce offer some economies to existing stores. “Conversion to selling healthy food involves relatively little added cost — refrigerated fixtures, inventory of new items and the time required to purchase, handle and display the new, perishable items are the main items — and takes advantage of management that has some operating skills and experience and knows, and is well known by, the neighborhood from which its customers come.”²³⁸

A survey of corner stores in Washington, DC, also found that most independent owners were interested in providing more foods with high nutritional values like fresh produce, and that most of them accepted food stamps issued through the Supplemental Nutrition Assistance Program. Almost half of them did have some produce in the store. These factors make a good foundation on which to build healthier food access.



Healthy Corner Store Initiative refrigerated barrels to sell healthy snacks at corner stores.

²³⁷ Healthy Corner Stores Network, www.healthycornerstores.org.

²³⁸ Bolen, Ed and Kenneth Hecht, “Neighborhood Groceries: New Access to Healthy Food in Low-Income Communities,” California Food Policy Advocates, January 2003.

Joint Ventures Involving Neighborhood Corner Stores

The following text is from Ed Bolen and Kenneth Hecht, "Neighborhood Groceries: New Access to Healthy Food in Low-Income Communities," California Food Policy Advocates, January 2003.

A Collaboration Between Farmers/Growers and Corner Stores

Neighborhood corner stores or specialty markets could collaborate with growers who supply farmers' markets, thus benefiting both entities. Corner stores could cut costs by dealing directly with growers and getting access to the freshest produce. Growers could add a new market to supplement their weekly, and often limited-season, farmers' market sales. Growers would naturally need to work with a network of small stores in order to make the driving and drop-off time worthwhile. For the stores, a key issue would be finding an experienced person to set up the farmer-store arrangements and to provide on-going coordination.

A Collaboration Between Supermarkets and Corner Stores

Under this model, a large supermarket (either independent or part of a chain) or specialty store might act as a central "hub" for a network of small corner stores — satellite stores that might carry the supermarket's name or brand or logo — in the surrounding neighborhoods. The larger market would buy produce, perhaps directly from local farmers, and other goods, storing, handling, delivering and re-selling them to local corner stores. An important feature of this model is that the larger market would also act as an advisor or mentor to neighborhood storeowners. While the larger markets could gain customers and revenue, corner stores could increase their sales by drawing on the expertise, buying power and other economies enjoyed by the larger market.

A Network of Small Markets

While small market owners are notoriously independent, they could cut costs and increase sales by participating in a cooperative or franchise-type produce operation. A successful model can be found in the approach used by Ace Hardware stores. Such a cooperative system would be aimed at resolving some of the problems that are associated with distribution limitations faced by small storeowners. This model would enable a number of small stores to establish a "buying group" to purchase products at lower prices from a reduced number of distributors. The storeowners might also advertise under a common, recognizable "umbrella" brand. The model might even enable small storeowners to become competitive in price and product mix with the full service traditional supermarkets.

However, these stores face challenges as well. Profits from fresh produce are unpredictable: "Because many customers prefer to buy produce at supermarkets where fresh produce often is less expensive and more varied, corner stores typically keep very small quantities of fresh fruits and vegetables in stock—and they are not always able to sell the food before it spoils."²³⁹

Other challenges noted include the following:

- No marketing or displays of produce
- Average quality of produce
- Costs can vary greatly and are not always displayed

The Washington, DC, report lays out a series of recommendations for community organizations, local government and corner store owners themselves to address issues of building capacity and demand and solving sourcing issues. At this point, there are numerous resources and studies to help develop a healthy corner store program and address some of the very real challenges to helping small corner and convenience stores become the healthy food access points they could be.

²³⁹ District of Columbia Department of Health, "Creating Healthy Corner Stores in the District of Columbia: Healthy Corner Store Program – Phase One Research Results and Recommendations," October 2008. Accessed on June 4, 2009 at http://www.dchunger.org/pdf/cornerstores08_phaseone_report.pdf.

RESTAURANTS AND FAST FOOD

The Issue

The following section, Trends in Eating Out, is an excerpt from Multnomah County Health Department's Fast Food and Chain Restaurant Nutrition Labeling Policy Initiative prepared by The Chronic Disease Prevention Program July 15, 2008.

Trends in Eating Out

Dining Out More: National trends show that Americans are dining out more. In 1970, Americans spent just 26 percent of their food dollars on restaurant meals and other foods prepared outside their homes. By 2003, Americans were spending almost half (46 percent) of their food dollars on away-from-home foods and consuming a third of their daily calories while eating out.²⁴⁰

Increasing Portion Sizes: Portion sizes have grown over time. It is not uncommon for a single restaurant meal to provide half a day's calories or a whole day's recommended calories. Restaurant foods are often served in large portions well beyond the recommended standards of the Food and Drug Administration (FDA), and priced in a way that makes larger serving sizes more appealing.²⁴¹ For example, a Double Gulp from 7-Eleven contains six servings, meaning it provides six times as many calories as would a standard serving size of soft drink.

Increased Calorie Intake

Several studies have found a positive association between eating out and higher calorie intake and higher body weights. Increased calorie intake is a critical factor in rising obesity rates.²⁴² Children eat almost twice as many calories at a restaurant compared to at home.²⁴³ Studies suggest that foods consumed away from home are more calorie-dense and nutritionally poorer compared with foods prepared at home: foods that people eat from restaurants and other food service establishments are generally higher in nutrients for which over-consumption is a problem (like fat and saturated fat) and lower in nutrients that people need to eat more of (like calcium and fiber) as compared to home prepared food.²⁴⁴

Health Impacts of Fast Food Restaurant Concentration

Eating at fast food restaurants regularly has a negative impact on health. Fast food restaurants tend to cluster around schools²⁴⁵ and in low-income neighborhoods.²⁴⁶ For example, a study in England and Scotland showed there was a significant positive association between neighborhood poverty and the mean number of McDonald's outlets per 1000 people.²⁴⁷

Fast food restaurants are often used as a proxy for unhealthy food access.²⁴⁸ However, studies of fast food have shown mixed results in terms of whether a concentration of fast food restaurants equals increased consumption of unhealthy foods. In California, obesity and diabetes prevalence

²⁴⁰ National Restaurant Association, 2002. Also Center for Science in the Public Interest, *Anyone's Guess*, November 2003.

²⁴¹ Center for Science in the Public Interest. *Anyone's Guess*. November 2003.

²⁴² Binkley et al., 2000; Jeffery & French, 1998; Ma et al., 2003; McCrory et al., 2000; McCrory et al., 1999).

²⁴³ Zoumas-Morse C, Rock CL, Sobo EJ, Neuhouser ML. "Children's Patterns of Macronutrient Intake and Associations with Restaurant and Home Eating." *Journal of the American Dietetic Association* 2001. vol. 101, pp. 923-925.

²⁴⁴ Lin et al, 1999; Clemens et al., 1999; Jeffery & French, 1998; Ma et al., 2003.

were found to be highest in adults “who have the most fast-food restaurants and convenience stores near their homes relative to grocery stores and produce vendors.”²⁴⁹ Another study, though, found “proximity of ‘fast food’ restaurants to home or work was not associated with eating at ‘fast food’ restaurants or with BMI.”²⁵⁰ A recent study of 13,000 New Yorkers found that, while higher concentrations of full-service grocery stores were associated with lower BMI and lower prevalence of obesity, higher concentrations of convenience stores and fast food were not significantly associated with higher obesity or BMI.²⁵¹

These studies could have produced different results due to differences in methodologies or locations; however, conclusions are mixed on studies of concentrations of fast food restaurants’ impact on consumption and health outcomes. One possible explanation is the distance examined; a recent study of fast food restaurants near schools found an association with student obesity if the restaurant was within one-tenth of a mile of the school, but a restaurant being one-quarter or one-half mile didn’t have the same effects.²⁵² Researchers recognize the methodological challenges; research on health impacts of fast food restaurants will continue to be a field ripe for exploration.

Local Conditions

There are over 4,000 food and drink establishments in the Portland metro area.²⁵³ The city has a reputation for numerous high-quality restaurants, many of which buy from local farmers and feature local cuisine. These partnerships between restaurants and local agriculture have been strengthened by such efforts as the Chef Collaborative Portland Chapter, which arranges events where chefs and farmers can meet and connect; Ecotrust’s Food and Farms program which in 2009 is launching FoodHub where buyers and sellers of regional food can connect; and Slow Food Portland, which works to reconnect people with food and sends chefs, food producers and others to the international Slow Food conference. These efforts and more have made Portland a restaurant hotspot – an “across-the-board great eating town,” as *Sunset* magazine put it.²⁵⁴

Portland also has a plethora of chain restaurants and fast food places familiar to most U.S. cities. Multnomah County prepared a map of fast food and chain restaurants in the county²⁵⁵ represented

²⁴⁵ Austin, S. Bryn et al. "Clustering of Fast-Food Restaurants Around Schools: A Novel Application of Spatial Statistics to the Study of Food Environments." *American Journal of Public Health* 95, no. 9 (September 2005): 1575-1581.

²⁴⁶ <http://www.ajpm-online.net/article/PIIS0749379704001394/fulltext> (Fast food, race/ethnicity and income: A geographic analysis)

²⁴⁷ Cummins, SC., L. McKay, and S. MacIntyre. 2005. "McDonald's Restaurants and Neighborhood Deprivation in Scotland and England." *American Journal of Preventive Medicine*, 29 (4): 308-310.

²⁴⁸ C.M. Burns and A.D. Inglis, "Measuring food access in Melbourne: Access to healthy and fast foods by car, bus and foot in an urban municipality in Melbourne." *Health & Place*, Volume 13, Issue 4, December 2007, Pages 877-885.

²⁴⁹ <http://www.healthpolicy.ucla.edu/pubs/publication.asp?pubID=250#> (Designed for Disease: The Link Between Local Food Environments and Obesity and Diabetes)

²⁵⁰ <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1397859> (Are Fast Food Restaurants and Environmental Risk Factor for Obesity?)

²⁵¹ Medical News Today, "Access To 'Healthy' Food Stores Associated With Lower Prevalence Of Obesity In New York City," March 21, 2009. Accessed on 6/1/2009 at <http://www.medicalnewstoday.com/articles/143099.php>.

²⁵² Currie, Janet, Stefano DellaVigna, Enrico Moretti, and Vikram Pathania, "The Effect of Fast Food Restaurants on Obesity," National Bureau of Economic Research Working Paper No. 14721, February 2009.

²⁵³ 2002 Economic Census.

²⁵⁴ "Good eating in Portland," Accessed on June 6, 2009 at <http://www.sunset.com/food-wine/flavors-of-the-west/good-eating-portland-00400000024328/>.

²⁵⁵ The term "chain restaurants" used here includes restaurants with more than 15 outlets nationwide that serve similar or identical menus of food and operate under the same brand. This includes everything from Denny's to Outback

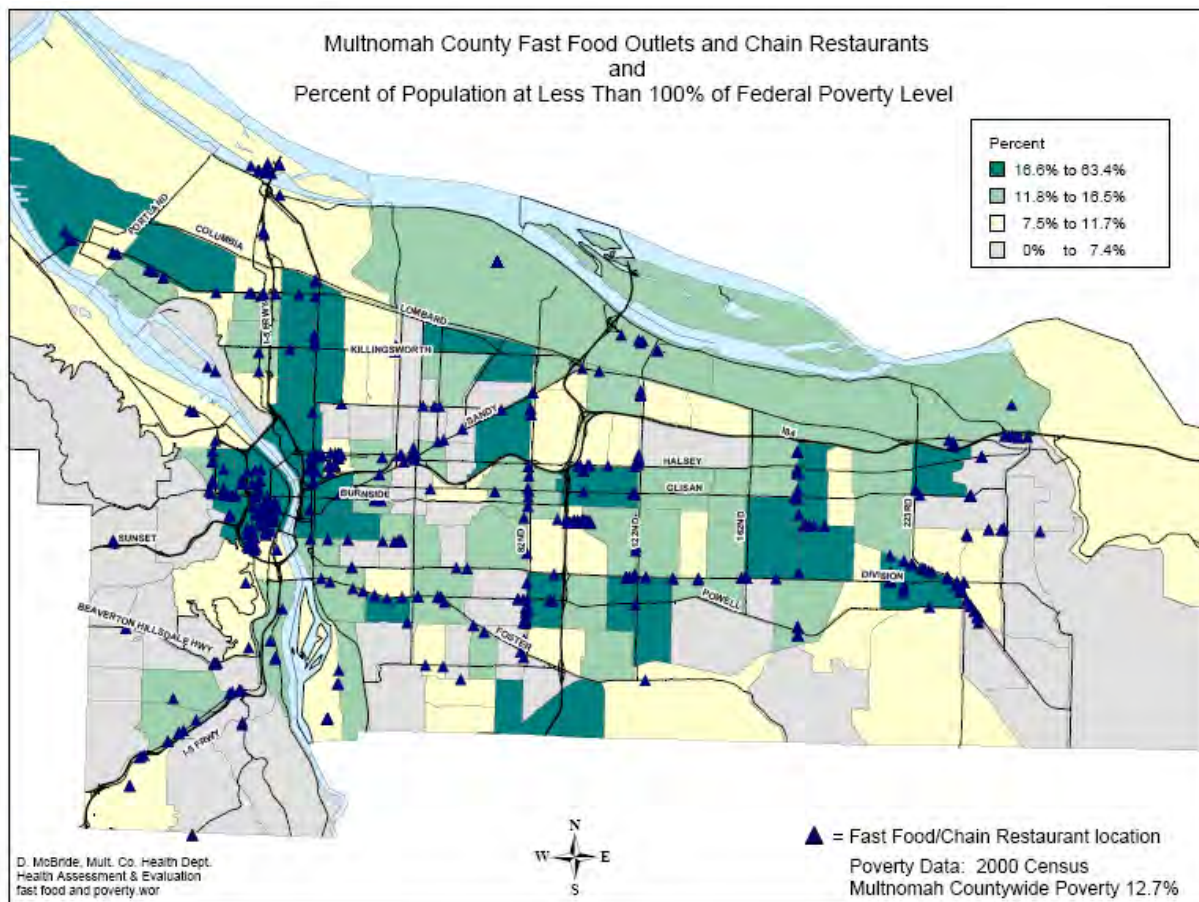
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here as (Map 6-3). The map shows some 375 fast food restaurants and an additional 50 or so chain restaurants across Portland.

Not surprisingly, these restaurants are generally clustered along larger arterials and in downtown, where traffic will contribute to greater sales. As seen on the map, most of the restaurants are within a half-mile of a school. Particular clusters are noted on MLK and Grand near Broadway/Weidler; in the Mall 205 area of Stark and Washington; and along 82nd especially south of Powell. These are generally very car-intensive parts of the city.

There does seem to be some relationship between clustering of fast food and chain restaurants and areas of higher poverty, as seen from Figure 6.3 below. The data used is from the 2000 Census, so some changes in these figures may have occurred since this time. However, it does appear that people in areas of higher poverty often have clusters of fast food restaurants nearby. One example is along MLK, Jr. Blvd in NE Portland, but many of the clusters along arterials also coincide with Census tracts of higher poverty, and vice versa.

Figure 6.3 Multnomah County Fast Food Outlets and Chain Restaurants and Percent of Population at Less than 100% of Federal Poverty Level



Steakhouse, Pizza Hut, etc. "Fast food restaurants" fall under this same definition but in general are assumed to mean a restaurant where food is pre-prepared or offered within several minutes of ordering; where food is paid for upon ordering and where a drive-through option may be available.

Little data has been collected to determine who within Portland eats at fast food restaurants, how often, or how they make their food choices. Nationally, the number of fast food restaurants has increased seven-fold from 30,000 in 1970 to 220,000 in 2001. Fast food is especially popular among adolescents, who on average visit a fast-food outlet twice per week.²⁵⁶ Within the Lents Community Food Survey, 33 percent of respondents reported that they eat at fast food restaurants once a week or more often, while 65 percent reported eating at fast food restaurants a few times a month or more often.²⁵⁷ Health data is not available at a level to be able to compare health outcomes of people who live near to fast food restaurant concentrations versus those who do not.

Local Policy

Recently, local governments have taken action on the issue of fast food restaurants and the risk of obesity. Multnomah County's Board of Commissioners, acting as the Board of Health, voted in 2008 to require chain restaurants and coffee shops with over 15 outlets nationwide to post caloric information on display boards, including drive-throughs, and additional information on written menus. The process to implement this direction is underway. Multnomah County follows New York City, King County, WA and San Francisco in adopting nutrition labeling for chain restaurants.

The City of Portland zoning code regulates placement and design of drive-through facilities, often associated with fast food restaurants. The code states: "Drive-through facilities are allowed in the zones which are intended for auto accommodating development. They are not consistent with or supportive of areas where the desired character is pedestrian-oriented development." To this end, they are prohibited in several of the more pedestrian-serving commercial zones and several subdistricts, though allowed in all industrial zones and several employment zones. The zoning code has undoubtedly contributed to the placement of fast food restaurants along major auto-serving arterials in Portland.

Restaurant Conclusions

More information would be required to determine the extent to which Portlanders in general, and subgroups in particular, rely on fast food restaurants to meet their nutritional requirements. However, there do appear to be linkages between concentrations of poverty and clusters of fast food restaurants, mirroring similar findings in other cities regarding marketing unhealthy foods to lower-income populations. A comparison of concentrations of fast food restaurants with specific health outcomes in smaller geographic areas would be useful in determining the extent to which the two are associated.

The new menu labeling program underway at Multnomah County can help ameliorate some of the impact by making consumers more aware of the caloric content of foods they plan on ordering, at the point of sale. Other steps governments can take include limiting additional fast food restaurants from locating near schools or locating in their jurisdictions altogether.

²⁵⁶ Paeratakul, S et. al., "Fast food consumption and dietary intake profiles - Fast Food," Nutrition Research Newsletter , Nov, 2003.

²⁵⁷ Lents Community Food Survey report, November 2004.

FOOD ASSISTANCE AND CHARITABLE FOOD

The Issue

Hunger continues to be an issue for many households in the United States – 11.1 percent in 2007. Within these households are over 12 million children.²⁵⁸ The food and nutrition assistance system in the United States is made up of federal and state government programs like SNAP/food stamps and supplemental nutrition support programs. These programs are the nation's safety net against food insecurity. In addition are charitable food networks of food banks, food pantries and soup kitchens. These charitable networks do receive food from U.S. Department of Agriculture commodities, but these amounts have declined significantly in recent years. USDA commodities accounted for only 10 percent of food distributed by Oregon Food Bank in fiscal year 2007-2008.²⁵⁹ Emergency food assistance programs also rely on food industry donations, food drives and purchased food to serve their clients.

Many people in the United States rely on food assistance and charitable food to meet this basic need; the number is rising in the wake of the economic downturn. The underlying causes of hunger are definitely crucial to address; while there still is hunger and food insecurity, though, the food assistance and charitable food systems should be made to be as robust as possible. Local conditions are considered here both to get a sense of the demand for the services and to document the way that so many community members access food.

²⁵⁸ Feeding America, "Issues – Hunger Fact Sheets," Accessed 3/11/2009 at <http://www.hungeractioncenter.org/fact-sheets.aspx>.

²⁵⁹ Oregon Food Bank, "The State of Hunger: 2007-08 Statistics for the Oregon Food Bank Network serving Oregon and Clark County, Washington."

Figure 6.4 Percentage of Households Reporting Indicators of Adult Food Insecurity, by Food Security Status, 2007



Source: United States Department of Agriculture Economic Research Service, "Food Security in the United States: Definitions of Hunger and Food Security."

Hunger in Oregon

Hunger Ratings

Hunger is now measured in the United States using the terms "low food security" and "very low food security." Defined by the US Department of Agriculture, low food security refers to reduced variety, quality or desirability of diet, with little or no indication of reduced quantity of food. Very low food security indicates disrupted eating patterns or reduced consumption²⁶⁰, exemplified by skipped meals, smaller portions, etc. Figure 6.4 examines indicators of food insecurity and how common they are among the different groups.

²⁶⁰ United States Department of Agriculture Economic Research Service, "Food Security in the United States: Definitions of Hunger and Food Security." Accessed May 30, 2009 at <http://www.ers.usda.gov/briefing/foodsecurity/labels.htm>.

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Oregon has consistently ranked as one of the more food-insecure states in the nation in recent years. After the unfortunate moniker of “hungriest state in the nation” was given to Oregon in 2000, advocates had made progress in addressing low food security: in 2005, Oregon had risen to number 17 in the national rankings after a push to expand enrollment in federal food stamps, among other actions.²⁶¹ However, with growing unemployment and increasing living expenses, these gains have largely evaporated. The most recent rankings from the USDA show that between 2005 and 2007 Oregon had more people with very low food security than all other states except for Maine.²⁶²

Causes of Hunger

Oregon Food Bank’s recently released biennial study of emergency food box recipients demonstrates the complexity of conditions that brings people into the emergency food network. Some of the most often-cited reasons for participation were that food stamps were insufficient to meet food needs; high food costs; high fuel and heating costs; and either recent or persistent job loss.²⁶³

Currently, the federally-gathered statistics on poverty and hunger are collected separately, so it is difficult to correlate them, but clearly there is a relationship between hunger and low- or no-income households. In the most recent Oregon Food Bank survey, 46 percent of households receiving emergency food had at least one member working, and 20 percent of households had members looking for work. Despite this, fully two-thirds of respondents live below 100 percent of the 2008 Federal Poverty Level.²⁶⁴

Other challenges cited by respondents included:

- Child care costs: 63 percent reported that child care is too costly.
- Housing costs: 29 percent of respondents had had to move within the past two years because of the cost of housing.
- Health care: 58 percent of households are putting off medical care; 68 percent are delaying dental care and 47 percent are putting off purchases of medicine. Forty percent of survey respondents reported having medical debt.

Other challenges, such as low educational attainment, pre-existing debt, lack of health coverage and being disabled, contributed to the challenges respondents face.

Health Impacts of Hunger

Research is emerging on the health consequences of childhood food insecurity. The Childhood Hunger Initiative of Oregon compiled research into the continuing medical education (CME) course,

²⁶¹ Oregon Hunger Relief Task Force, <http://oregonhunger.org/panel-2.html>. Accessed on Dec. 9, 2008.

²⁶² Nord, Mark; Andrews, Margaret and Steven Carlson, “Household Food Security in the United States, 2007,” USDA Economic Research Service, Economic Research Report Number 66, November 2008.

²⁶³ Oregon Food Bank, “Profiles of Hunger and Poverty in Oregon: 2008 Oregon Hunger Factors Assessment.” September 2008.

²⁶⁴ *Ibid.*

*“Childhood Food Insecurity: Health Impacts, Screening and Intervention.”*²⁶⁵ Some of the conclusions are listed below:

- Children living in food insecure households are at higher risk for upper respiratory infections, stomachaches, headaches and increased hospitalization.^{266,267}
- Food insecurity is also related to heightened levels of depression and anxiety among mothers and children.²⁶⁸
- Mothers may feel frustration, guilt and fear about the household food situation and other household economic constraints.²⁶⁹
- Children from food insecure households are more likely to exhibit behavioral problems such as aggression, inattention, aggression and anxiety.²⁷⁰
- Teenagers experiencing food insecurity are especially at-risk. They are five times more likely to have attempted suicide and more likely to be depressed.²⁷¹

Neighborhood and environmental conditions may affect household food insecurity by limiting access to affordable and healthful food choices. These conditions may account for why food-insecure adults and children may be at greater risk for obesity.

Local Conditions

Statewide Distribution of Emergency Food

The amount of emergency food being distributed in Oregon showed signs of increase in the past year. Oregon Food Bank (OFB) works with 16 regional agencies in the state, with a larger network of 915 local member agencies and programs (food pantries, soup kitchens, etc.). This entire network distributed 57.8 million pounds of food in the past year. Map 6-4 shows the location of OFB-affiliated food assistance sites in Portland, including congregant meal sites, emergency food box sites and several children’s feeding program sites. The sites are clustered in downtown and in inner NE and North Portland, with other sites scattered around the city.

After holding steady for three years, the number of emergency food boxes distributed statewide increased 5 percent from 752,000 in Fiscal Year 2007 to 792,000 in FY2008.²⁷² Almost half of these

²⁶⁵ Course found at: <http://ecampus.oregonstate.edu/hunger>

²⁶⁶ Alaimo K, Olson CM, Frongillo EA. “Food insufficiency and American school-aged children’s cognitive, academic and psychosocial development.” *Pediatrics*. 2001; 108(1): 44-53.

²⁶⁷ Cook JT, Frank DA, Berkowitz C, Black MM, Casey PH, Cutts DB. “Food insecurity is associated with adverse health outcomes among human infants and toddlers.” *J Nutr*. 2004;134:1432-1438.

²⁶⁸ Whitaker RC, Phillips SM, Orzol SM. “Food insecurity and the risks of depression and anxiety in mothers and behavioral problems of their preschool-aged children.” *Pediatrics*. 2006;118(3):e859-e868.

²⁶⁹ Hamelin A, Habicht J, Beaudry M, “Food insecurity: consequences for the household and broader social implications.” *J Nutr*. 1999; 129:525S-528S.

²⁷⁰ Kleinman RE, Murphy JM, Little M, Pagano M, Wehler CA, Regal K, Jellinek MS. “Hunger in children in the United States.” *Pediatrics*. 1998; 101(1):e3.

²⁷¹ Alaimo K, Olsen C. “Family food insufficiency, but not low family income, is positively associated w/ dysthymia and suicide symptoms in adolescents.” *J Nutr*. 2002; 132:719-725.

²⁷² Oregon Food Bank, “The State of Hunger: 2007-08 Statistics for the Oregon Food Bank Network serving Oregon and Clark County, Washington.”

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food boxes, or over 370,000, were distributed within Multnomah County.²⁷³ In addition to the food boxes, which provide enough food for three to five days of meals, about 4 million emergency meals were served and 87,000 people received food through other programs. Over 1.3 million of these emergency meals were served in Multnomah County alone.

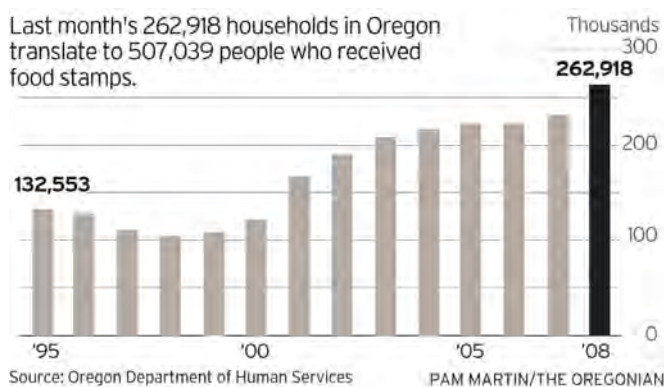
The numbers from the first two quarters of 2008-09 show a 15 percent increase statewide in food box distribution over the same period last year. Five out of 20 regional food banks reported increases greater than 25 percent.²⁷⁴ This is despite the fact that most agencies will only serve a household a limited number of times. The numbers are expected to rise as unemployment and the impacts of the economic recession deepen.

Supplemental Nutrition Assistance Program (SNAP)/Food Stamps

SNAP (formerly called the Food Stamp Program) is a program of the federal government to provide food assistance funds to low-income households. The federal government pays for the cost of the benefits (over \$40 million a month for Oregon in 2007²⁷⁵), and shares administration costs with the state. SNAP is the nation's largest food and nutrition assistance program for low-income Americans. In 2008, the Food Stamp Program served almost 25 million Americans each month, with an annual cost to USDA of \$37.5 billion.²⁷⁶

The number of people signed up for SNAP/food stamps continues to increase in Oregon, as shown in this *Oregonian* chart from December 2008 (below). Currently, over 500,000 Oregonians, or one in seven, receives support through SNAP. This is a record number of people receiving benefits at any one time in Oregon. This number includes over 170,000 people in the Portland metro area – a 13% increase from November 2007.²⁷⁷ Looking more specifically at Multnomah County, in July 2008 the count was just under 96,000 people receiving SNAP from 54,105 households.

Figure 6.5 Oregon Food Stamp Usage, 1995 through November 2008



²⁷³ Commission on Children, Families and Community (CCFC), "Profile of Hunger and Food Insecurity Issues in Multnomah County," September 15, 2008. Accessed on December 10, 2008 at <http://www2.co.multnomah.or.us/ChildrenFamily/pdf/Economic%20Security/Profile%20of%20Hunger.doc>.

²⁷⁴ Accessed at <http://www.oregonfoodbank.org/> on February 8, 2009.

²⁷⁵ Accessed at <http://www.oregon.gov/DHS/assistance/foodstamps/foodstamps.shtml> on February 8, 2009.

²⁷⁶ United States Department of Agriculture Economic Research Service, "Briefing Rooms: Supplemental Nutrition Assistance Program (SNAP)." Accessed on 3/11/2009 at <http://ers.usda.gov/Briefing/SNAP/>.

²⁷⁷ Cole, Michelle, "Food stamps aid hits state record," *The Oregonian*, December 17, 2008.

Maps 6-5 and 6-6 show how SNAP/food stamp participation has risen between January 2007 and February 2009 in different parts of Portland, by zip code. Looking at actual numbers on Map 6-5, the parts of Portland with the largest increases during this time period were East Portland and parts of North Portland. These two parts of Portland do not have a particularly high population density, though several Census tracts within these areas do show higher concentrations of poverty. Looking at the increases by percentage on Map 6-6, much of the city increased by 20 percent or more, with one section of SW Portland south of downtown showing an increase of over 80 percent.

Participation does not necessarily reflect the number of people eligible to take part in SNAP/food stamp benefits: “The Oregon Hunger Relief Task Force (OHRTF) estimates that 81% of eligible Multnomah County households participate in the program, which is slightly above the statewide average participation of 79 percent of eligible households. The participation rate for seniors is much lower. OHRTF estimates that only 42 percent of eligible seniors (age 60 & over) in Multnomah County participate in the program.”²⁷⁸

Special Supplemental Nutrition Program for Women, Infants & Children (WIC)

WIC serves families most in need of preventive health services; the program works to overcome health disparities through health care and vouchers to purchase nutritious foods. Statewide in 2007, Oregon WIC served 168,000 women, infants and children. Vouchers were cashed for healthful foods at grocery stores totaling \$75.5 million, and at farmers' markets and farm stands for \$417,000. Over three quarters of Oregon WIC's budget goes to the nutrition vouchers.²⁷⁹

In Multnomah County, just over 30,000 women, infants and children were served in 2007, from 12,253 households. Sixty-eight percent of these households had at least one working member – slightly less than the 72 percent average statewide. Just over 60 percent of the households were at or below the federal poverty level. Multnomah County's share of nutrition vouchers in 2007 included \$13.5 million to grocery stores and \$74,560 to farmers.

Free and Reduced Lunch Program

The Commission on Children, Families and Community has this summary of the Free and Reduced Lunch Program in Multnomah County:

The Free/Reduced Lunch (FRL) program is the second largest feeding program (after the Food Stamp Program) for low-income families. In 2007 school year, 47.6 percent of all public school children in Multnomah County participated in the FRL program. 43,676 children and youth ate a FRL meal during the 2007 school year. Oregon Department of Education's most recent reports (2006 school year) for the school snack and supper program indicate that 404,169 meals were served to students in Multnomah County schools.

Related, but separate to FRL is the Summer Food Service Program (SFSP) which provides meals to children and youth during summer months. It is coordinated by non-profit organizations, faith

²⁷⁸ Commission on Children, Families & Community (CCFC), “Profile of Hunger & Food Insecurity Issues in Multnomah County,” September 15, 2008. Accessed at <http://www2.co.multnomah.or.us/ChildrenFamily/pdf/Economic%20Security/Profile%20of%20Hunger.doc>.

²⁷⁹ Oregon Department of Human Services, “Oregon WIC: 2007 Annual Report,” accessed on February 8, 2009 at http://www.oregon.gov/DHS/ph/wic/docs/annual2007/wic_annual_report.pdf.

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groups and school districts. A three-year United Way grant recently allowed the program to be expanded in the tri-county area, and during the grant period, participation doubled. In the summer of 2007, 361,000 meals were served to children and youth; 2,280 meals were also served to low-income parents at SFSP sites.²⁸⁰ Many of the sites were in Portland Parks and Recreation facilities, highlighting how a City bureau is already engaged in this issue.

Support for Growing Food

Several organizations involved in charitable food distribution also have programs to help people on food assistance grow some of their own food:

- The Learning Gardens at the Oregon Food Bank serve as an educational location as well as growing food for volunteers and others.
- Growing Gardens focuses on building gardens in the backyards of low-income families and supporting them for three years to establish the gardening practice.
- Janus Youth Programs runs several gardening projects in low-income housing developments to foster leadership development and increase the consumption of fresh foods among residents.
- The Portland Fruit Tree Project works with volunteers to harvest existing fruit from backyard trees. The harvest is shared between volunteers, who themselves are often low-income, and food banks, where it is distributed to people accessing food assistance.

Increasing the capacity of all Portlanders to grow some of their own food can help develop food security and increase capacity and independence. More information on growing food in the city is in the Urban Agriculture section of the Food System Existing Conditions Report.

Food Assistance Conclusions

Multnomah County is not winning the battle against hunger. The need for food assistance and charitable food continues to grow, despite advocates' best efforts. The economy presents a severe challenge in the delivery of emergency food to Portlanders. As seen in the Oregon Food Bank numbers above, demand has already greatly increased in the last half of 2008, with more increases expected in the coming months.

The Commission on Children, Families and Community offered some perspectives on challenges to increased demand:

Oregon's economic slowdown may severely impact access to adequate nutrition and food in our community. Rising food, energy, and transportation costs constitute the potential of a "perfect storm" impacting food security for low-income households. Inflation will directly affect the capacity of low-income households to maintain a "food secure" status during the winter months. Health experts warn about the challenge that low-income parents face in choosing to "heat or eat," which puts children and youth at-risk for food insecurity during the winter months.

²⁸⁰ Commission on Children, Families & Community (CCFC), "Profile of Hunger & Food Insecurity Issues in Multnomah County," September 15, 2008. Accessed at <http://www2.co.multnomah.or.us/ChildrenFamily/pdf/Economic%20Security/Profile%20of%20Hunger.doc>.

Seniors, disabled adults and others who live on fixed-incomes are also at greater risk of food insecurity and hunger in periods of economic inflation. Recent survey data conducted with Loaves & Fishes' clients indicates that 16 percent of homebound seniors in their program rely on their one meal a day for their primary nutrition source. Fifteen percent (15 percent) of on-site diners rely on the meal served at a meal site for their primary nutrition of the day. Multnomah County's Aging & Disabilities Services Division reports indicate that local senior centers are experiencing a higher volume of calls requesting information on emergency food services and energy assistance.

Food budgets, as mentioned above, are often seen as the most flexible or expendable part of a household's budget. When the fixed costs are paid, whatever is left over can be spent on food. One key way to stabilize a household's food budget and reduce the need for emergency food is to raise its income so that more is left over. Efforts through the Portland Plan at economic development, increasing access to education and ensuring community affordability can all impact food access and issues of hunger.

DIRECT MARKETING

Direct marketing, or the practice of selling directly by farmer to consumer, is a rapidly growing field in American agriculture. Direct market farms can be smaller-scale, even start-up operations as well as more established farming businesses. Some common faces of direct marketing include farmers' markets, community-supported agriculture (CSA) operations, farm stands and U-pick operations and public markets. Some of these models are so new that little research has been done nationally or locally on their impacts. However, direct marketing still shows significant economic and social benefits to Portland, in addition to the health benefit of increasing access to healthful, local foods.

Farmers' Markets

The Issue

Farmers' markets offer direct connections between farmer and customer; they provide fresh, just-picked fruits and vegetables and other locally-made products; they reduce the distance food travels from farm to plate; and they provide opportunities for people to gather and interact.

Access to healthful foods

Access to fresh produce is one of the perceived benefits of farmers' markets. Programs have been established to help low-income populations access fresh produce at farmers' markets, through SNAP/food stamps and subsidies from the Women, Infants, and Children (WIC) Farmers' Market Nutrition Program (in Oregon, called the WIC Farm Direct Nutrition Program) and the Seniors Farmers' Market Nutrition Program (in Oregon, called the Seniors Farm Direct Nutrition Program). In Oregon in recent years, over \$1 million worth of mainly fresh fruits and vegetables have been sold yearly through farmers' markets and roadside stands through these two programs.^{281,282} In comparison, WIC vouchers for all food throughout the state totaled almost \$76 million. In 2008 in Oregon, 27,075 WIC participants and 32,210 seniors received Farm Direct Nutrition Program

²⁸¹ "Direct from the Oregon Farm", May 04, 2005, *The Oregonian*

²⁸² Oregon Farmers' Markets Association, "Women, Infants, Children (WIC) and Senior Farm Direct Nutrition Program," accessed 5/30/2009 at http://www.oregonfarmersmarkets.org/cust/wic_senior.html.

(FDNP) checks to purchase fresh produce directly from local farmers. Statewide, 549 farmers participated in the FDNP via 89 farmers' markets and 243 farm stands.²⁸³

Despite their success, both the WIC and senior programs are federal funds that go through the allocation process each year. Food stamps, on the other hand, are mandatory and currently make up half of the Farm Bill. If an individual or family applies for and qualifies for SNAP/food stamps, they receive them, whereas the other two programs are limited by the amount allocated. Therefore, the potential to increase farmers' sales is much greater through SNAP. Also, SNAP can be used on a much broader basis at markets, including being used to purchase vegetable plants.

One study, published in 2008, indicates that the WIC Farmers' Market Nutrition Program can be an effective way of increasing consumption of fresh fruits and vegetables. In California, WIC participants receiving subsidies to farmers' markets increased daily fruit and vegetable consumption by almost three servings, and sustained the increased consumption for six months after the subsidy was removed.²⁸⁴ Aside from this survey, little data has been published to prove or disprove that farmers' markets can increase consumption of fruits and vegetables overall. See below under *Local Conditions – Low-Income Shopping at Farmers' Markets* for a local pilot project at the Lents International Farmers' Market in 2008 to increase use of food stamps.

Local Conditions

Portland's network of farmers' markets are growing in number, customers and sales. Portland's neighborhoods now hosts 18 farmers' markets (see Map 6-7), with many more serving the metro region. Farmers' market vendors sold \$11.2 million worth of goods in 2007; this number continues to rise faster than population growth, indicating that farmers' markets are gaining market share.²⁸⁵ The total economic impact of Portland's network of farmers' markets is estimated to be over \$17 million; the markets produce more than 150 jobs with nearly \$3.2 million in employee compensation.²⁸⁶

Low-Income Shopping at Farmers' Markets

A survey of food stamp recipients in Portland in 2005 revealed several barriers to spending food stamps at farmers' markets, despite the fact that many farmers' markets accept SNAP/food stamps²⁸⁷. First, many respondents indicated that they did not eat many fruits or vegetables. Of the 108 food stamp clients surveyed, 81 percent consumed less than three fruits or vegetable servings in a day in any form, and most ate one or less fresh item.

²⁸³ Oregon Public Health Division, DHS, and the Conference of Local Health Officials, "Best Practices: 2008 Farm Direct Nutrition Program – A fruitful season." Oregon Public Health Connection, vol. 3 no. 11, November 26, 2008.

²⁸⁴ Dena R. Herman, PhD, MPH, RD, Gail G. Harrison, PhD, Abdelmonem A. Afifi, PhD, and Eloise Jenks, MEd, RD, "Effect of a targeted subsidy on intake of fruits and vegetables among low-income women in the Special Supplemental Nutrition Program for Women, Infants, and Children." American Journal of Public Health. 2008 Jan;98(1):98-105. Epub 2007 Nov 29.

²⁸⁵ Barney & Worth, Inc., "Growing Portland's Farmers' Markets: Portland Farmers' Markets/Direct-Market Economic Analysis," Prepared for the City of Portland, November 2008.

²⁸⁶ *Ibid.*

²⁸⁷ "Electronic Benefits Transfer" or EBT is the new method of transaction for the SNAP or Food Stamp Program. Over the past several years, the system has moved from paper coupons to electronic management. This has been challenging for farmers' markets to install the needed equipment to process EBT cards and for their shoppers, whose transactions are now more complicated.

Barriers for eating fruits and vegetables purchased raw included perceptions that raw foods were expensive (perhaps especially so when measured in terms of calorie-density rather than nutrient-density), inconvenient and complex. However, many respondents cited their children as strong motivators for eating more healthily (including more fresh produce), and others indicated that they would like to eat more produce but simply could not afford to buy more.²⁸⁸

Respondents viewed market selection as poor and higher priced than grocery stores. The limited market hours and locations also pose challenges. Vendors can market their products on a per-item basis, but also on a per-pound basis, so pricing comparisons can be confusing.

The survey found that Women, Infants and Children (WIC) Farm Direct Nutrition Program introduced several of the respondents to farmers' markets; 19 out of the 25 WIC households had shopped at farmers' markets. However, respondents did not continue to shop there after the WIC benefits ended.²⁸⁹

A recent effort to promote food stamp use at the Lents International Farmers' Market (LIFM) in 2008 was more promising. In partnership with New Seasons Market, LIFM provided customers at the market who used food stamps with a dollar to dollar match, up to five dollars, for each Sunday the market was open in July 2008. The incentive provided food stamp customers with a potential of \$20 in free produce for the entire month of July. Food stamp customers spent almost four times as much at the market during the campaign than prior to its launch. Food stamp spending at the market was sustained significantly after the promotion campaign ended.²⁹⁰ Results from this promotion campaign suggest that food stamp shoppers will spend money on fresh fruits and vegetables when they can stretch their dollars to do so.

Farmers markets are adding card services to capture these SNAP/food stamp dollars, but it is too early to determine the full impact on sales. More community outreach and education is required to inform SNAP participants that farmers markets are a food access point and for the farmers to make their booth SNAP- friendly through better signage.

What is the Potential for Developing Additional Successful Farmers' Markets in Portland?

The City of Portland report titled "Growing Portland's Farmers' Markets" indicates that there is strong market potential for growth of Portland area farm-direct markets due to growing interest in local, fresh and organic produce and other food items. Further, it is likely that there are small farmers who would be available to supply new farmers' markets in the years to come, especially as older farmers retire and smaller, specialty farms continue to grow in Oregon. One barrier for young farmers is land. Portland's government can play an advocating role in saving farm land outside the urban growth boundary and maximizing the tillable plots inside the city.

In choosing a market site, communities need to be mindful about the demographics of their community and the dynamics of neighboring farmers' markets. Key to the successful "movement"

²⁸⁸ New Territories Research for the Oregon Food Bank, "The Price of Eating Right: Oregon Trail at Farmers' Markets," October 2005.

²⁸⁹ *Ibid.*

²⁹⁰ Gilroy, Amy, "Farmers' Markets and Electronic Benefit Transfer (EBT): Reaching the underserved community at the Lents International Farmers' Market (LIFM)," Community Health Partnership, November 2008.

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of farmers' markets over the last fifteen years has been the collaboration and cooperation among markets. Thinking about a citywide network of farmers' market provides an opportunity to strategically place markets so each resident has access in their own community but can also support other markets on different days. For instance, the Montavilla Farmers' Market has been successful since opening in 2007 because they chose to be a Sunday market which compliments their neighboring Hollywood's Saturday farmers' market. As markets mature, Portland may be better able in the future to determine what an appropriate catchment area is for a farmers' market or other farm direct marketing venues, and how many is an appropriate number.

In the meantime, an Oregon State University study has found that up to 75 percent of customers to Portland's markets live within a two-mile radius of the market at which they shop.²⁹¹ Map 6-7 shows Portland's network of farmers' markets with a two-mile walking-distance radius around them. About 15 percent of the city's area is within one mile of a farmers' market, while only 3.5 percent of the city is within a half mile.²⁹²

Looking at these locations, there are several areas around the edges and in Southeast that appear to be underserved by the current markets. Three neighborhoods in particular that are identified as underserved parts of the city are St. Johns in North Portland, Cully/Concordia in Northeast, and Centennial/Hazelwood in Outer East.²⁹³ However, new markets have now opened in the St. John's and King neighborhoods, expanding services to these areas.

Farmers' Markets Conclusions

Portland's network of farmers' markets are growing in number and sales, providing a quality community experience while bringing fresh, local produce directly to consumers. While areas not well-served by farmers' markets are certainly evident, the local organizations that have sprung up to support new markets in recent years (those in Montavilla, Parkrose, Lents, Westmoreland and others) have created successful smaller markets in new parts of the city.

Not all neighborhoods will have the community capacity to support the week-to-week farmers' market. In fact, markets can drain the energy in the community and provide strains on relationships. Other farm direct models need to be explored. For instance, one model is Mobile Markets which are farm stands on wheels. Gorge Grown in Hood River has a pilot program that shows promising results.²⁹⁴

While there are benefits to residents of having a farmer's market in low-income communities, it's important to note that many challenges exist to opening and sustaining a low-income farmers market, such as recruiting vendors who can make more money at higher-income markets; securing permanent low cost sites, transportation access in communities with lower rates of car ownership, less transit service and incomplete walking/biking networks; and recruiting customers who may perceive economic and cultural barriers. Local and national studies are beginning to explore and identify strategies for successful low-income communities.

²⁹¹ Barney & Worth, Inc., "Growing Portland's Farmers Markets: Portland Farmers Markets/Direct-Market Economic Analysis," Prepared for the City of Portland, November 2008.

²⁹² Calculations made on areas – not population or households – and includes open space and industrial land.

²⁹³ Barney & Worth, Inc., "Growing Portland's Farmers Markets: Portland Farmers Markets/Direct-Market Economic Analysis," Prepared for the City of Portland, November 2008.

²⁹⁴ <http://www.gorgegrown.org/mobilemarket.cfm>

More data is needed on the impact of farmers' markets on produce consumption. If there is an area of Portland that is determined to have food access issues, how will forming a farmers' market there help address the issue?

It appears there is a next generation of farmers, but a serious strategy needs to be developed to assure land is available for future generation of farmers. The City of Portland can use its stewardship/partnership role with other jurisdictions to secure local foods for the next generation of Portlanders.

Community-Supported Agriculture (CSA)

The Issue

Community-supported agriculture (CSA) is a model for selling farm-fresh produce to subscribers or shareholders who purchase a "share" of the season's harvest upfront. This harvest is then delivered or offered for pick-up usually once a week for the growing season.

CSAs and Food Access

Do CSAs affect food access issues? The upfront cost of vegetables for the entire season could deter many people living paycheck-to-paycheck from taking part, if they even know the option exists. The structure of the weekly pickup could also be challenging to those with variable schedules. However, the mobile nature of these farms' drop-off or pick-up sites could provide access to fresh produce, cheese, meats and eggs to areas that are not currently served by grocery stores.

One farm in Washington offers a SNAP/food stamp-only CSA in addition to multiple other revenue streams – however, they only require weekly payments, rather than the upfront costs. The organization Just Food in New York City works with 50 regional CSAs. Thirty of them have flexible payment options, and some take SNAP/food stamps.²⁹⁵

Local Conditions

The Portland area has some 42 CSAs selling everything from vegetables to eggs and cheese to flowers, according to the Portland Area CSA Coalition.²⁹⁶ These CSAs range from large-scale farms growing food in rural parts of Oregon and bringing it in to town each week, to farmers who grow food primarily in urban backyards, bringing new meaning to the term "urban agriculture." These farms serve the entire Portland metro region. In addition, there are several CSAs working directly with church congregations through the Interfaith Food and Farms Partnership; in this arrangement, church congregations directly support a CSA and receive food, while the CSA also provides scholarships to lower-income shareholders.

A survey conducted by the Bureau of Planning and Sustainability²⁹⁷ collected data from 18 of these area CSAs selling food shares to Portland residents in 2008. The number of shares varied from

²⁹⁵ Lyons, Zachary D. "Food Stamp-CSA Opens Access to the Freshest Food," Rodale Institute, March 17, 2008.

²⁹⁶ Portland Area CSA Coalition, "Alphabetical List of CSAs Serving the Portland Area," <http://portlandcsa.org/oregon-csa-farms.php>.

²⁹⁷ For more information on the survey, contact Steve Cohen at 503-823-4225 or scohen@ci.portland.or.us.

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three to 400, with a total for the 18 farms of 1884 shares. Average number of shares was 99 and the median was 50 shares.

Most of these farms maintain waiting lists for future seasons ranging from three to 700 people, with five farms at or above 100 people. The total number of people on waiting lists for the farms was 1874, or almost 100 percent of the existing capacity within these farms. Ten of the farms plan on expanding their land base and/or number of shares offered in the near future to meet some of this demand; for those farms willing to be specific in their predictions of expansion, around 940 additional shares, or 50 percent of existing demand, are expected to be offered.

Price per full share varied a good deal, from \$324 to \$1,100, with the average price at \$573 and the median at \$500. Total sales in 2008 from these 18 farms is estimated to be around \$1,071,500.

CSA Conclusions

It is clear from the waiting lists that current demand for community-supported agriculture is greater than supply in Portland. More data would be helpful to determine the impact of CSAs on their subscribers and on food access in Portland. The challenges they face in using urban land would also be instructive to determine barriers to increasing supply.

Farm Stands and U-Pick Operations

Mobile farm stands are another way to bring produce to areas without it; other operations let consumers come to them to harvest their crops. The Tri-County Farm-Fresh Produce Guide (www.tricountyfarm.org/index.asp) is an online and paper guide to farms in the three counties of Multnomah, Washington and Clackamas who sell directly to consumers. Currently they have about 63 member farms in the three counties: 12 in Multnomah County, 19 in Clackamas County and 32 in Washington County. Of those in Multnomah County, two, Giusto Farms and Trapold Farms, are within the Portland city boundaries. Six more are on Sauvie Island.

Giusto Family Farm

The Giusto family has been farming in what is now the Parkrose neighborhood in Portland since 1917, when the Rossis and the Giustos formed a farming partnership that lasted 70 years and two generations. In 1989 the partnership was amicably dissolved, and Aldo Giusto still farms with his son Dominic. The Giustos still farm five plots, including four in Northeast Portland totaling around 29 acres, with an additional 35 acres in Mulino. An additional 16 acres were sold off to development in 1996, and the farmers report feeling “encroached upon” by the city expansion.

The Giustos bring in Walla Walla onions and fruit from Hood River, but all the vegetables they sell are grown on their own land. About 50 percent of their income, however, comes from wholesaling their vegetables. While they used to supply Fred Meyer and Safeway, consolidation in the industry caused the entry cost to rise and selling to them was no longer feasible. They now sell to Unified Western Grocers (a wholesale grocery cooperative), Sheridan Fruit Company and Pacific Coast Fruit Company.

For more information:

Riegel, Rich. “Giusto Farms: A story of Italian immigration to America.” The Mid-County Memo, August 2008.

Riegel, Rich. “Giusto Farms : A family tradition.” The Mid-County Memo, August 2008.

Crain, Liz. “Cooked right, Oregon Brussels sprout a new image.” January 6, 2006.

These farms provide either farm stands for fresh-picked produce and other products, u-pick opportunities for various fruits and vegetables, or both. Prices vary but can be well below a grocery store, especially for u-pick operations which require more time and effort from the customer. Trapold Farms is a farm stand located in outer Northeast Portland where they used to farm, but now food is brought in mainly from Sauvie Island. Giusto Farms is the only active farming operation left in NE Portland, and they supplement with additional land in Mulino²⁹⁸ (see sidebar).

A company called The Farm Stand operates four farm stands in Portland as a vehicle to help college students raise money for school. Pat Rice and Karen Rutledge started the berry-selling business as a fun side-project to their first career, nursing. However, they grew the business to support more students, and now each summer around 20 students operate four farm stands around Portland.²⁹⁹ The stands sell fresh berries, honey and processed berry products.

Farm Stand Locations:

- 4600 block of NE 138th (across from Costco)
- 12505 NE Halsey
- NE Sandy & 141st
- 5633 SE Division

Cleveland's West Side Market won a 2008 Great Public Place award from the American Planning Association for its role as a culinary and cultural landmark.

Public Markets

The Issue

Public markets are more permanent structures than farmers' markets, often open several days a week and selling everything from produce to fish and meats, cheeses, breads and more. The West Side Market in Cleveland, for example, was named a 2008 Great Public Place by the American Planning Association not only for its long tradition of serving Clevelanders delicious fresh and prepared foods, but for its role as a community anchor. West Coast markets like Pike Place in Seattle and Granville Island in Vancouver, BC are also well-known food places and destinations in their own right.

Health benefits

The health benefits of eating more fresh produce have been discussed above. It has also been shown in recent research that the nutritional value



²⁹⁸ Riegel, Rich. "Giusto Farms: A story of Italian immigration to http://www.midcountymemo.com/aug08_giusto2.html. Accessed 11/26/2008.
²⁹⁹ Boule, Margie, "Berries sweeten the chances of success for <http://www.thefarmstands.com/whatothers.html>. Accessed 11/26/2008.

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of many crops has declined as they have been increasingly produced through high-yield monoculture.³⁰⁰ This heightens the importance of sourcing a variety of foods from small local producers.

An August 2006 study by the Project for Public Spaces entitled “Public Markets and Community Health: An Examination”³⁰¹ found that there is a potential for a “double bottom-line of market profitability and community health achievement” when public markets work with health entities:

With a successful market, existing community services, especially health entities (broadly defined, private or public) see public markets as a critical neighborhood asset building vehicle, and therefore as a strategic partner in developing a healthier community. Similarly, existing public markets, including those who have embarked on “public health” programs within their markets, definitely see the health entities as their strategic partners in maturing the markets into more economically viable ones.

For the purpose of this study, the term “public market” referred to both permanent indoor public markets and farmers’ markets. But it’s clear that permanent indoor markets offer many options for health-related activities – lectures, classes, “health fairs,” etc. – potentially more than do seasonal farmers’ markets.

Food access benefits

Interestingly, although the common perception is that fresh, locally-grown foods are too expensive for low-income shoppers, a 2003 study of public markets and farmers’ markets found that “[i]n terms of affordability, the case study markets still seem to have a leg up on what little competition there is. In unsolicited responses to the question ‘What is the greatest benefit of the market to the community?’ 22 percent of customers mentioned price. Furthermore, over 70% of customers agreed that they shopped at the market because it has better prices than the stores in their neighborhood.”³⁰²

Local Conditions

The quest to re-establish Portland's own public market has been long – for the past 10 years, local food enthusiasts and others who could see the benefits of a year-round, indoor public market have been advocating for its establishment and searching for the proper location. They have been inspired not only by Portland’s current status as a food mecca, but also by our long history of public markets, starting with the New Market Theater in 1872 and including the Portland Public Market built in 1933 which covered the waterfront between the Hawthorne and Morrison bridges and was the largest public market in the nation at the time.

Interest on the part of the City in the re-establishment of a public market in Portland was demonstrated as early as 2001, when PDC and City Commissioner Charlie Hales’ office funded a two-site feasibility study that focused on the central fire station on Ankeny Square and the Federal

³⁰⁰ Davis, Donald R., “Declining Fruit and Vegetable Nutrient Composition: What Is the Evidence?” *HortScience* 44: 6-223 (2009).

³⁰¹ Moon, J. Robin, “Public Markets and Community Health: An Examination.” For the Project for Public Spaces. Accessed 3/10/2009 at http://www.pps.org/pdf/public_markets_community_health.pdf.

³⁰² Project for Public Spaces, Inc. “Public Markets & Community-Based Food Systems: Making Them Work in Lower-Income Neighborhoods.” Accessed on 3/10/2009 at http://www.pps.org/pdf/kellogg_report.pdf.

Building at 511 NW Broadway.³⁰³ PDC also helped to fund an extensive feasibility study of the Ankeny Square site in 2006.³⁰⁴ Both of these studies indicated that Portland has capacity and support for a public market located downtown. This was reinforced by a poll conducted by Davis, Hibbitts and Midghall, Inc. in the fall of 2007, which clearly showed that Portlanders have a strong interest (63 percent) in a public market, even though the poll did not specify a site.³⁰⁵

It is important to note that farmers' markets and public markets can co-exist and can also benefit one another by getting more consumers accustomed to buying local foods directly from the producers. The relationship between Portland's public market advocates and area farmers' markets is cordial, and discussions about incorporating seasonal outdoor vendors in plans for the public market are ongoing.

The proposed location for the James Beard Public Market is on the west end of the Morrison Bridge - a County-owned property that will be up for sale in 2009. The Historic Portland Public Market Foundation, the 501(c)(3) entity that emerged from the original committee of public market advocates, plans to respond to the request for information.

Integral to current plans for a public market in Portland, to be named the James Beard Public Market, is the assumption that it will be located on a MAX line near the downtown transit mall, so that Portlanders from all over the city will be able to get there easily. The James Beard Public Market will insist on having vendors representing a full cross section of ethnic and socio-economic strata in Portland; will create incentives for low-income, SNAP/food stamp, and WIC shoppers to purchase fresh, healthy foods; and will offer free classes in cooking and nutrition. These incentives will be funded by targeted sponsors, ideally health care foundations.³⁰⁶

Retail food environment index (RFEI)

Definition

The Retail Food Environment Index (RFEI) is a way of thinking about the relative abundance of different types of retail food outlets in a given area by creating a ratio of those outlets. The RFEI is constructed by dividing the total number of fast-food restaurants and convenience stores by the total number of supermarkets and produce vendors (produce stores and farmers markets) in the area. The result is the ratio of retail food outlets that offer little in the way of fruits

$$\text{RFEI} = \frac{(\# \text{ fast food restaurants} + \# \text{ convenience stores})}{(\# \text{ supermarkets} + \# \text{ produce stores} + \# \text{ farmers markets})}$$

³⁰³ Urbsworks, Inc., "Portland Public Market 2-Site Feasibility Study," 2002. Accessed 3/10/2009 at http://www.portlandpublicmarket.com/PDF/UW_2002_2SiteFeas.pdf.

³⁰⁴ Portland Development Commission, "Portland Public Market Study, Phase 1: Market and Financial Feasibility." Prepared by Bay Area Economics, GBD Architects, Project for Public Spaces and Shiels Obletz Johnsen, July 11, 2005. Accessed on 3/10/2009 at <http://www.portlandpublicmarket.com/PDF/FinalFeasibilityStudy7-11-5.pdf>.

³⁰⁵ Davis, Hibbitts & Midghall, Inc., "Telephone survey findings for visionPDX," September 27, 2007. Accessed on 3/10/2009 at <http://www.visionpdx.com/downloads/visionPDXsurveyresults.pdf>.

³⁰⁶ Email exchange with Amelia Hard, President of the Board of Directors for the Historic Portland Public Market Foundation, 3/18/2009.

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and vegetables and other healthy foods to those in which fruits and vegetables are readily available.³⁰⁷ The higher the number, the easier it is to find unhealthful food choices in a particular place.

The RFEI originated in California, where the California Center for Public Health Advocacy in 2005 calculated the RFEI for all California counties and cities with greater than 250,000 people.³⁰⁸ New York City has followed suit with its “FoodStat” calculation, which uses the same equation, and which has been tested in a pilot study of East Harlem and the Upper East Side.³⁰⁹

Limitations

The ratio does not reflect all elements of an area’s food environment, as several outlets are not included in the calculation:

- sit-down restaurants
- coffee shops
- ethnic food stores
- specialty stores like fish and meat markets or candy or chocolate stores
- emergency food outlets
- CSA dropoff sites
- food carts

When conducted in California, the ratio also did not include convenience stores associated with gas stations, which underestimates the ratio somewhat.

Further, data source can make a large difference. One study of data sources for retail food outlets in California found significant differences between the telephone business directory and the state-collected information for four cities under investigation: the state had over 30 additional sites to the telephone directory, while the directory listed 260 additional sites to the state-collected data.³¹⁰ Consistency is key, and on-the-ground data verification would be ideal (such as that carried out in the New York City pilot study).

Nor does the ratio necessarily take into account efforts that certain outlets (those on the top of the equation, or fast food restaurants and convenience stores) are making to provide healthier options, or the prevalence of unhealthful foods at supermarkets and other retail food outlets on the bottom of the equation. The ratio also assumes that all outlets are of equal importance; for example, one 1,000 square foot convenience store has the same weight as a full-service, 30,000 square foot supermarket. This assumption does not take into account how people use the different outlets.

³⁰⁷ Collective Roots, “Retail Food Environment Index (RFEI),” Accessed on June 5, 2009 at <http://www.collectiveroots.org/rootpedia/r/rfei>.

³⁰⁸ California Center for Public Health Advocacy, “Searching for Healthy Food: The Food Landscape in California Cities and Counties,” Accessed on June 5, 2009 at <http://www.publichealthadvocacy.org/searchingforhealthyfood.html>.

³⁰⁹ Stringer, Scott M., Manhattan Borough President, “FoodStat: Measuring the Retail Food Environment in NYC Neighborhoods,” May 2009. Accessed on June 5, 2009 at http://mbpo.org/uploads/Food_Stat_FINAL.pdf.

³¹⁰ Wang, My C. et. al., “The neighborhood food environment: sources of historical data on retail food stores,” *The International Journal of Behavioral Nutrition and Physical Activity*, vol. 3, no.15, 2006.

Benefits

Despite these limitations, the calculation can be extremely useful, especially in the face of growing evidence that food choices are determined to a certain extent by available options. The ratio provides a way to compare geographic areas using the same data. Given the rise in obesity and nutrition-related chronic disease, using a ratio such as this can begin to help us understand the impact of the food environment on local health outcomes. An interesting analysis, both of the RFEI tool itself and of the quality of food environments and their impact on health, could be done with localized RFEI scores coupled with localized health information to see if there were a correlation between the two.

Further, the RFEI starts to quantify an issue that has largely been discussed in qualitative terms until now.

Local Conditions

While it is beyond the scope of this document to conduct a detailed RFEI analysis of Portland, the data already gathered for this document does allow for some back-of-the envelope calculations of the retail food environment in Portland.

Data and Sources

Fast Food Restaurants: Data on fast food and chain restaurants was shared with us from Multnomah County Health Department. The data was stripped of all chain restaurants such as Red Robin, Denny's, Red Lobster and other sit-down, though chain, restaurants. This is consistent with the ratio not considering sit-down restaurants in the equation. Some of the most frequent chains included in the total were Subway, Taco Bell, McDonalds and Burger King. Other outlets that are included are Starbucks, as they sell pre-made sandwiches; Pizzicato and other pizza places; and specialty outlets like Jamba Juice and Baskin Robbins. The total number of outlets for the City of Portland was found to be 377.

Convenience Stores: The number of convenience stores was determined by examining a list of stores in Portland with the North American Industry Classification System (NAICS) code of 44512, convenience stores without gas stations. Source is the Oregon Employment Department, 2006. Primary outlets were 7-11 and Plaid Pantry outlets, as well as numerous local, independent stores. The total number was 165.

Full-Service Grocery Stores: Data was culled from the full service grocery store list (mapped in Map 6-1); the chain stores came from the database created by Andrea Sparks for her analysis of supermarkets in the metro area;³¹¹ added to this were several non-chain stores that were determined to provide a level of full service for its customers such that they should be included in the analysis for a total of 62 full-service grocery stores in Portland.

Farmers' Markets: Included in the total are the 17 currently-operating markets.

³¹¹ Sparks, Andrea Leigh, "Measuring Food Deserts: A Comparison of Models Measuring the Spatial Accessibility of Supermarkets in Portland, Oregon." Thesis presented to the Department of Planning, Public Policy and Management and the Graduate School of the University of Oregon, June 2008.

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$$\begin{array}{r}
 \text{RFEI} = \\
 \frac{(\# \text{ fast food restaurants} + \\
 \# \text{ convenience stores})}{(\# \text{ supermarkets} + \# \text{ produce stores} + \\
 \# \text{ farmers' markets})}
 \end{array}
 \qquad
 \begin{array}{r}
 \text{RFEI for Portland} = \\
 \frac{(377 + 165)}{(62 + 23 + 17)} \\
 = 5.31
 \end{array}$$

Produce Stores: The NAICS code 44523, Fruit and Vegetable Markets, lists 23 outlets for Portland. Source is InfoUSA, January 2008.

Plugging these numbers into the equation, we get an overall RFEI for Portland of 5.31.

This compares unfavorably to most California cities, as seen in Table 6.1 below. The number means that there are over five times as many places to find unhealthful foods as healthful foods in Portland. Portland ranks higher than most major California cities, as well as most California counties in the study.

Table 6.1 Retail Food Environment Index (RFEI) of selected cities

City	RFEI
Bakersfield, CA	6.63
Fresno, CA	6.23
Portland	5.31
San Diego, CA	4.58
Los Angeles, CA	4.24
San Francisco, CA	3.85
Oakland, CA	3.81

Looking at Portland's five quadrants (Table 6.2), there is a fair amount of disparity in the RFEI. Southwest Portland ranks the worst among the five areas with a score of seven, potentially because of a large number of fast food restaurants clustered in downtown.

North and Northeast Portland have similar scores both below Southwest with 5.45 and 5.50 respectively. North Portland has relatively small numbers across the categories; Northeast has clusters of fast food restaurants at Lloyd Center and the airport that may have contributed to their higher score. Both of these quadrants' scores were above the City average.

Northwest also has low numbers throughout, and ended up with the lowest RFEI of 4.22. Southeast Portland has almost as many fast food restaurants as does Northeast, and more than double the number of convenience stores; however, this quadrant also has more supermarkets, produce stores and farmers markets, which brings down the RFEI to 4.68, below the City's average.

Table 6.2 Retail Food Environment Index (RFEI) of selected areas of Portland

Quadrant	Fast Food Restaurants	Convenience Stores	Supermarkets	Produce Stores	Farmers' Markets	RFEI
North Portland	35	25	7	2	2	5.45
Northeast	121	33	17	7	4	5.50
Southeast	104	74	22	11	5	4.68
Southwest	90	22	10	1	5	7
Northwest	27	11	6	2	1	4.22

RFEI Conclusions

Because the RFEI is a new tool, there is no clear sense of what number is “acceptable” or positive in terms of providing successful healthful food access. And there are limited locations (currently, California cities and counties) that have used the RFEI to consider healthful food access, meaning there are few places to which to compare the RFEI. These back-of-the-envelope calculations can be seen as an additional input to a broader discussion of food access in Portland. As the tool is more frequently used and refined, this calculation will be worth revisiting.

FOOD ACCESS CONCLUSIONS

The Food Access chapter of this background report explored the various ways people access food, summarized what is known about their impact on food access, health, community and the economy and explored the Portland context for each access point.

It is clear that Portland is rich in food outlets, with strong networks of CSAs, farmers’ markets and grocery stores providing multiple places to procure healthful, local and organic food. Community commitment to these direct marketing channels is strong, as evidenced by significant waiting lists for CSAs and strong community support for existing and new neighborhood farmers’ markets, as well as a high number of restaurants serving locally-grown cuisine.

Concurrently, Portland also has many fast food restaurants and convenience stores which offer many unhealthy alternatives, and are potentially concentrated in areas with higher poverty – areas where the population may already have multiple health challenges. Further, parts of the city are not currently served by full-service groceries, farmers markets or farm stands. One measure of food access, the Retail Food Environment Index, shows that many parts of Portland have more than five times the number of outlets for unhealthy foods as for healthful foods.

Demand for food assistance services continues to rise, and Oregon continues to have high rates of food insecurity when compared to other states. Consumption of fruits and vegetables remains well below the U.S. Surgeon General’s recommendation of nine half-cup servings a day in Multnomah County, leading to significant threats to community and individual health. While Portland is rich in resources, much can still be done to increase access to healthful foods and thereby improve the health of Portland’s residents.

Additional Study

Community Food Concepts (CFC) is a group of six graduate students in the Masters of Urban and Regional Planning program of Portland State University which has completed the Foodability project. This group worked with the Bureau of Planning and Sustainability to develop a well-defined

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vision and accompanying goals for food access in Portland that can be used to ground and direct future assessments and actions by the City and other organizations.

This vision is supported by a set of maps displaying the contours of the City's current geographies of food accessibility as they relate to the vision for different income groups, evaluation criteria, and recommendations.

For more information on all these topics, please see the Food Systems Existing Conditions Report Food Access section.

POLICY EXAMPLES

Governments have been using a variety of tools to address food access issues.

Creating the environment to support food access

Zoning and Plans

Several cities are incorporating food issues into comprehensive and general plans, and adding zoning code language to address food access and urban agriculture issues.

- Fresno, CA incorporated a definition for farmers' markets in their zoning code and allows farmers' markets in more zones.³¹²
- San Francisco, CA changed the parks zoning code in 2007 to allow farmers' markets on Parks properties and changed the SF administrative code to require that farmers' markets accept forms of payment provided by participants in food assistance programs.
- San Francisco also has removed zoning barriers to opening a general grocery store when it replaces another grocery store.
- Chula Vista, CA's General Plan recognizes health and its relationship to food access through its policy to "promote access to healthy foods through opportunities such as farmer's markets."

Fast Food Regulations

Cities may require special permits or minimum distances from schools for fast food establishments. In addition to zoning regulations, some cities are prohibiting the use of trans fats in fast food establishments and requiring the display of nutrition information for all menu items. Some cities prohibit the development of any new formula food establishments; Los Angeles is the most recent and well-publicized example of a city using this tool.

- In Detroit, MI, certain carry-out, fast food, and drive-in restaurants must be at least 500 feet from the nearest point of an elementary, junior high, or senior high school site.
- Washington DC's new comprehensive plan limits location and proliferation of fast-food restaurants.

³¹² The City of Portland currently allows farmer's markets and public markets in commercial and some employment zones, with some restrictions.

- In San Francisco, the city banned formula business (or chain businesses) in some areas and residents must be notified whenever a formula retail business applies to open in their neighborhood.
- In Boston, MA, food service establishments, vending machines and mobile food vendors are prohibited from serving food containing trans fats.

Licensing & Covenants

In New York, Mayor Bloomberg prioritized licensing pushcart greengrocers to expand access to fresh produce. San Francisco and Chicago have made it easier to open a grocery store that is replacing another.

- New York City now has a special permit for greengrocer pushcarts, with an aim to have 1,500 operating throughout the city.
- Chicago passed legislation that restricts the use of land use covenants. These covenants are often used by grocery stores to limit the use of vacated property even once it has been sold.

Incentives for Improving Local Food Systems

Tax Incentives and Loan Programs

Cities are using property tax exemptions, credits, and rebates to encourage the development of new grocery stores and community gardens in underserved areas. Low interest loans, energy discounts, and planning and technical assistance combine with tax incentives to create a comprehensive incentive package.

- Washington, DC has approved a 10-year Supermarket Tax Exemption Act to provide property tax exemptions and other tax incentives for new grocery stores in targeted areas.
- Community gardens are recognized as amenities for the purposes of the low income housing tax credit system in New Jersey.
- Chicago has a Grocery-Anchored Retail Loan program that provides low interest loans for grocery stores opening in food deserts.

Grants and Loans

Cities can use Community Block Grant monies to support farmer's markets, community gardens, or corner store conversions. In addition, some states are finding ways to fund projects regionally and locally.

- Wisconsin is investing in projects that increase local food sales through the Buy Wisconsin, Buy Local program.
- Pennsylvania's statewide Fresh Food Financing Initiative is aimed to support supermarket development in underserved areas by using loans to fill in the gaps where store developers cannot count on traditional financial institutions.

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Technical Assistance or Support

Beyond financial incentives, many cities have programs that make it easier for businesses and individuals to support the local food system.

- Chicago has worked with consultants to provide developers with neighborhood assessments to encourage grocery store development.
- Baltimore is also helping grocery stores to assemble land for new development.
- In Baltimore and in New York, the city is working with corner stores to increase the supply of healthy food choices.
- Sioux City, IA, has an Organic Market Partnership that is designed to bring businesses to the area and help market local foods.
- Portland's BEST program works with businesses to reduce waste and to purchase food in a more sustainable manner.

Data Collection/Assessment

- Institutionalize collection of food access related data by municipal government and other partners.
- Support community food assessments (CFAs) by local stakeholders by providing City liaison to each CFA and maintaining database of CFAs that have been conducted.

Partnerships

- Form Food Access Advisory Committee to the Bureau of Planning and Sustainability to weigh in on current and long-range planning projects.

Policies for Specific Types of Access Points

Farmers and Public Markets:

- Assist markets to secure permanent sites with needed infrastructure.
- Incorporate farmers' markets and public markets into the zoning code (Fresno, CA).
- Ensure that all Portland-area farm-direct markets are equipped with wireless EBT card readers to allow SNAP/food stamp users to purchase food at those markets.
- Establish incentives to farmers for selling at markets serving low-income areas (which may not offer the same profit margin as markets in more affluent areas, or more established markets).
- Hire a staff person designated as a market liaison. This person could connect farmers with markets, offer technical assistance and coordinate other city efforts to support the markets.

Food Assistance and Charitable Food:

- Increase collaboration between local farmers and food assistance providers to increase fresh produce offerings.

- Work to establish community kitchens with space for cooking and canning classes/opportunities and to incubate food entrepreneurs.
- Publicize and distribute more WIC and Senior Farm Direct Nutrition Coupons.

Retail store access

- Examine transit routes and walking and biking networks with an eye for improving access to existing grocery stores.
- Assess areas of the city that are under-served by full-service grocery stores and determine what land use planning or transportation actions would help attract a grocery store to the area.
- Explore consumer food co-ops like the Self-Help and Resource Exchange (SHARE) project which uses community service to buy down the cost of groceries.
- Create incentive programs to retrofit groceries and corner stores with equipment to store and sell fresh fruits and vegetables as well as whole grain products.
- Streamline permitting for mobile vegetable/fruit trucks which can serve areas of the city with low food access.
- Develop a Healthy Corner Store voluntary initiative that encourages small food retailers and convenience store merchants to designate x% of shelf space to healthful food items.

CHAPTER 7: ACCESS TO NATURE

What's the Issue?

Access to nature is the opportunity to visually and physically experience natural environments and things – from trees and greenery, to streams and rivers, to large natural areas. Access to nature has been shown to improve environmental, physical, and mental health through the wide-ranging benefits discussed below. However, without carefully planning, opportunities to experience nature through parks and natural areas, urban trees, or riparian areas could become scarcer as the City grows and becomes denser.

Environmental Health Impacts

From an environmental standpoint, greenspaces and trees can improve air quality, moderate temperatures, help reduce waterway pollution, reduce ambient noise.

These environmental benefits can translate to healthier residents by improving the quality of the urban environment and reducing the potential for negative health impacts.

Improved Air Quality

Certain vegetation, including many plants and trees, can reduce air pollution levels by removing pollutants from the air. "This occurs because plants reduce winds, causing particulates to settle out of the atmosphere onto plants or the ground where precipitation washes the particulates into the soil below. Certain gases such as nitrogen oxides, carbon monoxide, chlorine and fluorine halogens, ammonia, and ozone are removed by absorption and stored in the leaves and needles of some woody vegetation."³¹³ Plants also improve air quality as they absorb and sequester carbon dioxide and release oxygen during photosynthesis. Portland's Friends of Trees estimates that a mature tree will sequester 223 pounds of CO₂ annually.³¹⁴ It is important to note, however, that not all plants can tolerate high pollution levels. Urban trees and shrubs in Portland remove 1,280 metric tons of pollutants annually, including 450 tons of PM₁₀, 200 tons of NO₂ and 132 tons of SO₂.³¹⁵

Temperature

Trees and vegetation can help mitigate temperature extremes – helping to insulate buildings and reduce wind speeds during colder months, and providing shade and reducing urban temperatures

visionPDX on Access to Nature

People express the need to preserve and restore natural areas, parks, forests wildlife areas and rivers, with particular attention paid to offering underserved neighborhoods the same outdoor benefits as others. Portlanders express a deep appreciation for parks and open spaces, believing that access to these places within the city contributes immeasurably to Portland's livability. They want trees, forests and greenery to remain central to Portland's landscape.

In terms of access, many Portlanders are impressed with how easily accessible parks and open spaces are. Others, however, would like to see accessibility improved, especially for people with disabilities, children and residents of low-income communities. Portlanders are concerned with equity in regards to parks and open spaces, calling for more parks and better-maintained parks in low-income neighborhoods.

³¹³ Coalition for a Livable Future. *Regional Equity Atlas*. 2007.

³¹⁴ cite: Friends of Trees in PP&R

³¹⁵ Nowak, D., Crane, D., Stevens, J. "Air Pollution Removal by Urban Trees and Shrubs in the United States". *Urban Forestry & Urban Greening*. 4(3):115-223, 2006.

during summer months. This ability may become even more important in the future – as scientists predict that the Portland area will experience greater temperature variation as a result of climate change. Moderating temperatures can reduce the incidence of heat and cold related injuries.

Water Quality

Urban trees, open spaces, and natural waterways can help improve water quality by infiltrating and filtering stormwater. This, in turn, reduces the amount of stormwater that runs directly into our local rivers, carrying pollutants and sediment from the urban landscape. Infiltration and filtration of runoff can also serve to clean water and replenish groundwater sources, making more water available for local ecosystems and further improving the water quality of our rivers.

Sound Control

“The leaves, twigs and branches on vegetation absorb sound energy, as do grasses and other low growing plants, especially sounds in the higher frequencies which are the most bothersome to people. Plants dissipate sound energy by refraction that occurs when sound passes through vegetative barriers and bends around plant structures. Barriers of trees and vegetation in conjunction with walls and landforms can reduce highway noise by 6 to 15 decibels. Vegetation also masks unwanted sound by providing sounds of nature — rustling leaves and singing birds — to cover unwanted noise. People can focus on those natural sounds that are more pleasing than the noise of the city.”³¹⁶

Individual Health Impacts

Not only can nature help improve health by bettering the urban environment we live in, it can also impact health directly. For the individual, access to nature, in many forms, can directly enhance psychological health and happiness.

Physical Health

Access to nature has been shown to directly affect health, by reducing blood pressure, easing pain, calming digestive systems and speeding recovery from injury. A number of studies have demonstrated this correlation. One study, conducted at a Pennsylvania hospital, examined ten-years of surgical patient records. It found that patients who had windows overlooking trees were more likely to have shorter hospital stays, require less medication, and have fewer negative comments in attendant’s notes, as compared to those who’s windows faced brick walls.³¹⁷

Another study, conducted in the Netherlands, compared health information for more than 10,000 residents, based on where they lived (in 625 square meter increments). The study found that residents who lived near green spaces were more likely to rate themselves as being in good health. The study also found that the type of ‘nature’ did not matter; residents were likely to see benefit from living near parks, forests, natural areas, or agricultural land. Finally, a “ten percent increase in

³¹⁶ Coalition for a Livable Future. *Regional Equity Atlas*

³¹⁷ R. S. Ulrich, “View through a Window May Influence Recovery from Surgery,” *Science* 224 (1984): 420-421, cited in Howard Frumkin, “Beyond Toxicity: Human Health and the Natural Environment, *American Journal of Preventive Medicine* 20, no. 3, (2001): p. 237.

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nearby greenspace was found to decrease a person's health complaints in an amount equivalent to a five year reduction in that person's age.³¹⁸

The benefits of green space on mortality have been shown to be inversely proportional to socioeconomic status. That is, while proximity to green space is beneficial for everyone, it is more beneficial for underserved populations.³¹⁹ Children also are major recipients of the benefits of green space; a study of children in Indianapolis showed that children in 'greener' neighborhoods are 13% less likely to become obese, primarily due to opportunities/incentives for outdoor physical activity and decreased stress. These findings are true even after controlling for socioeconomic and demographic factors.³²⁰

Mental Health

Access to nature has also been shown to improve mental health, through reducing stress and aggression, improving concentration, and improving child development.

"Research on recreational activities has shown that savanna-like settings are associated with self-reported feelings of 'peacefulness,' 'tranquility,' or 'relaxation,'" Howard Frumkin writes. "Viewing such settings leads to decreased fear and anger...[and] is associated with enhanced mental alertness, attention, and cognitive performance, as measured by tasks such as proofreading and by formal psychological testing."³²¹

Richard Louv's book [Last Child in the Woods: Saving our Children from Nature-Deficit Disorder], recounts numerous studies documenting how exposure to natural environments enhances children's cognitive development by improving their awareness, attention, reasoning and observational skills.³²²

Local Conditions

Parks & Natural Habitat

The Coalition for a Livable Future, an organization located in Portland, recently completed an analysis of access to parks and natural habitat in the Portland area. According to this analysis, access to natural areas in the City of Portland is limited, and unequally distributed. Approximately three quarters of Portland's population lives within a half mile distance of a park or natural area³²³, however only about half of residents can walk to a park or natural area within a half mile³²⁴, as many areas lack sidewalks or connected streets. This relatively poor access occurs despite a large park system of over 9,000 acres, the equivalent of nearly 25 acres per person.

³¹⁸ Sjerp de Vries, Robert A. Verheij, and Peter P. Groenewegen, "Nature and Health: The Relation between Health and Green Space in People's Living Environment" (paper presented at the conference "Cultural Events and Leisure Systems," Amsterdam, the Netherlands, April 2001). cited in Sherer, Paul, The Benefits of Parks: Why America Needs More City Parks and Open Space

³¹⁹ Mitchell, R. and Popham, F. "Effect of exposure to natural environment on health inequalities: an observational population study". *Lancet*. 372(9650):1655-1660. 2008.

³²⁰ Bell, J., Wilson, J., Liu, G. (2008) Neighborhood Greenness and 2-Year Changes in Body Mass Index of Children and Youth. *American Journal of Preventive Medicine*. 35(6):547-553.

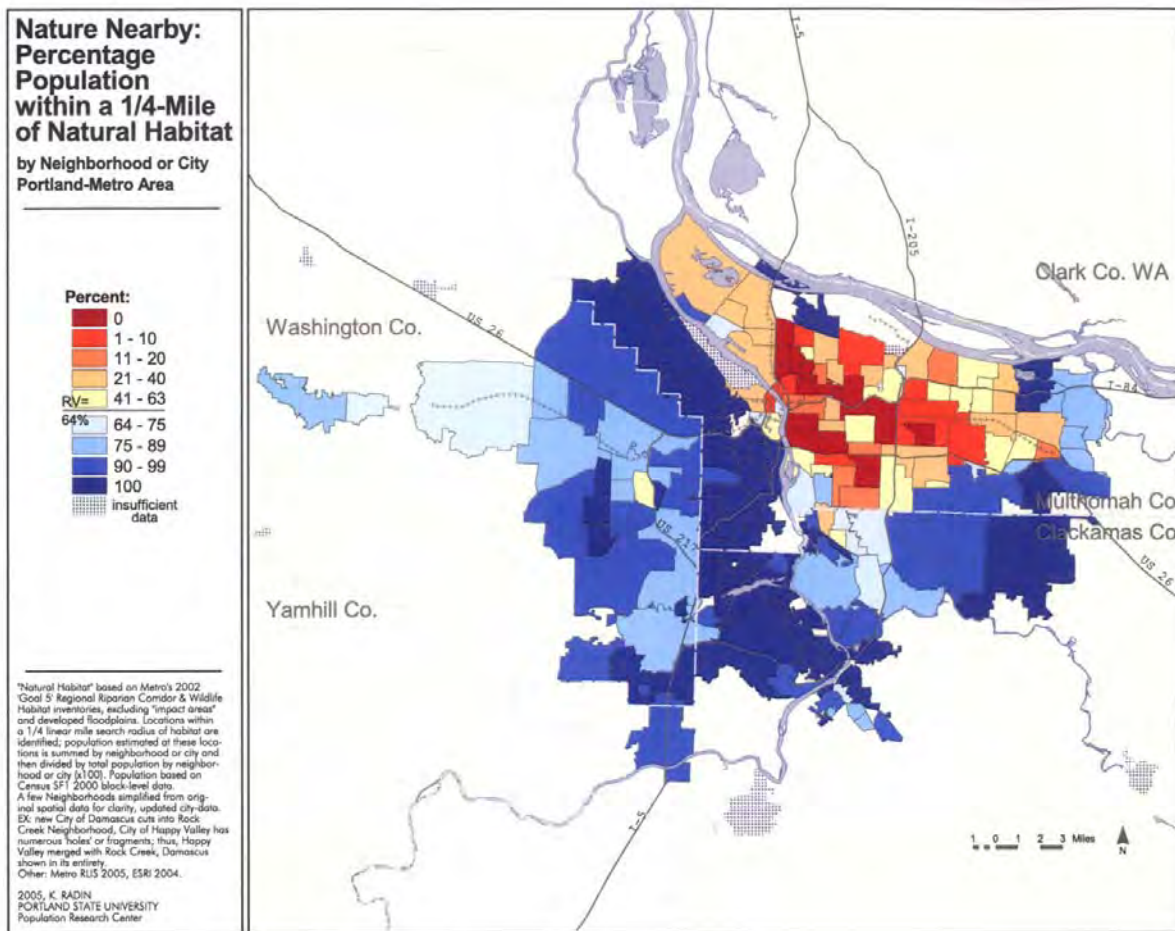
³²¹ Ulrich., p. 237.

³²² Coalition for a Livable Future, "Regional Equity Atlas"

³²³ Portland Parks & Recreation

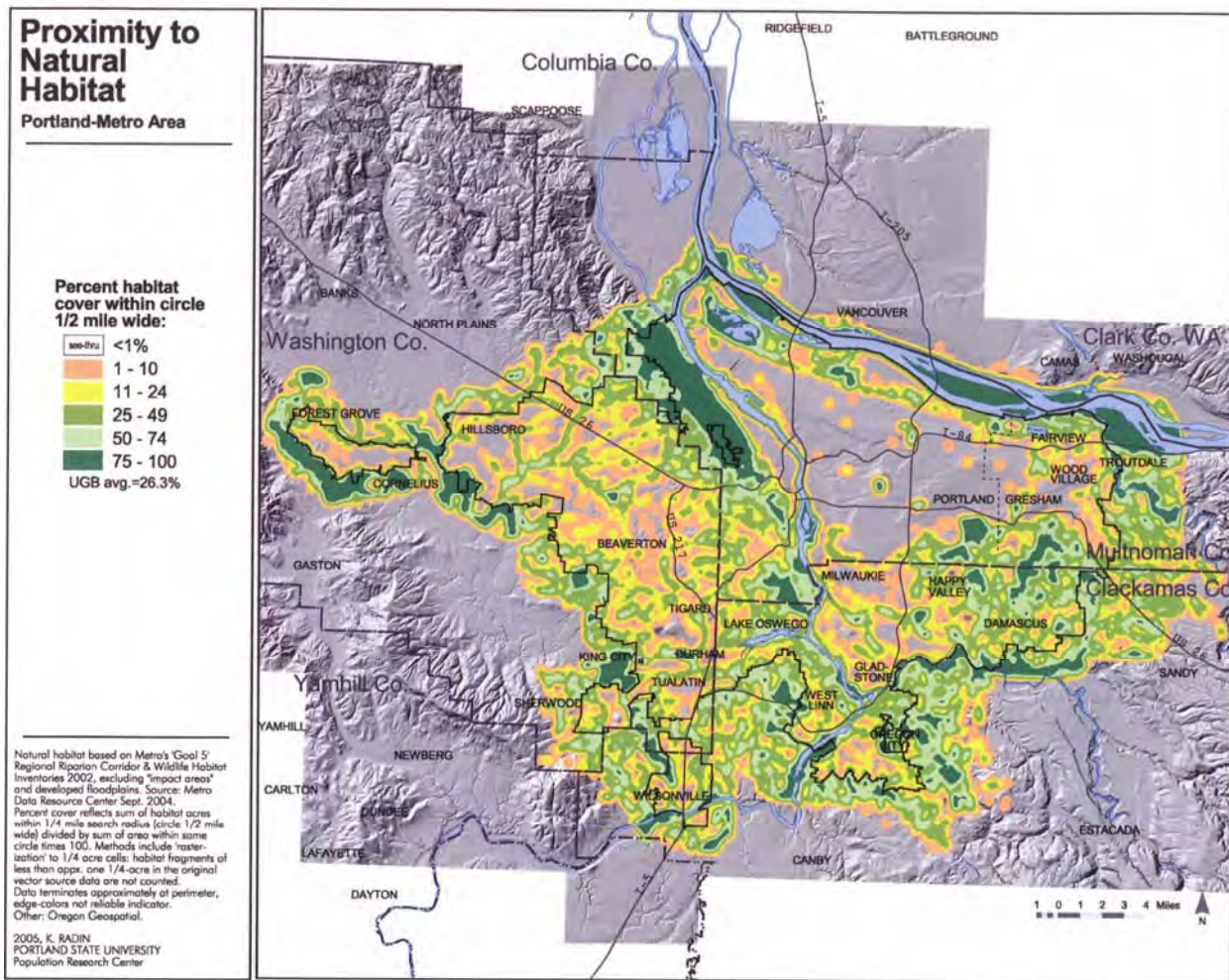
³²⁴ Coalition for a Livable Future, "Regional Equity Atlas"

Figure 7.1 Percentage Population within 1/4 mile of Natural Habitat³²⁵



³²⁵ Coalition for a Livable Future, Regional Equity Atlas

Figure 7.2 Proximity to Natural Habitat³²⁶



Neighborhoods with the worst public park and greenspace access include Parkrose Heights, Hayden Island, and King in North and Northeast Portland. The Parkrose Heights neighborhood is one of the largest and furthest areas from public park of any area in the metro region.

Some areas of the City, primarily in Northwest, Southwest and Outer Southeast Portland have above average access to natural areas, while the majority of North, Northeast, and Inner Southeast have very limited access, with less than 50 percent of people living within a quarter mile of a natural habitat area (Figure 7.1). In fact, many areas of Inner Northeast and Southeast Portland have no access to natural areas within a quarter mile of residents.

Equity of Access

“Based on the integrated parkland access score for the four-county region, worse-access neighborhoods are more likely to have above average poverty rates. For example, 45 percent of neighborhoods with below- average access have above -average poverty rates, while only 31

³²⁶ Ibid.

percent of neighborhoods with above average access have above-average poverty rates. A slight disparity also exists for communities of color: 29 percent of neighborhoods with below average access have above average shares of people of color, while slightly fewer – 25 percent – of neighborhoods with above-average access have above average shares of people of color. Neighborhoods with above-average poverty or people of color and poor parklands access include: King, Humbolt, Cully, Parkrose and Parkrose Heights in North and Northeast Portland.

Disparities in access to nature are much more extreme. For example, 71 percent of neighborhoods with below average access to natural habitat have above average poverty rates, while only 18 percent of neighborhoods with above average access have above average poverty rates. The same relationship holds true for both child poverty and communities of color. Neighborhoods with above average poverty or people of color and poor access to nature include: Portsmouth, King, Humbolt, and Cully in North and Northeast Portland; and Mill Park, Montavilla, Parkrose, Hazelwood, Centennial, and Powelhurst-Gilbert neighborhoods in East Portland.³²⁷

Urban Forest

The urban forest is a second primary source of nature exposure. Portland's public streets, parks and natural areas contain nearly 1.5 million trees of different varieties. Total forest canopy coverage for the City of Portland exceeds 24,000 acres or 26 percent of the city's land cover.

However, the urban forest is also unevenly distributed throughout the city. Southwest, Northwest, and Outer Southeast have the highest levels of tree canopy, while North, Northeast and inner Southeast tend to have lower levels (Map 7.1). Economically disadvantaged neighborhoods often have fewer trees than more wealthy areas. Tree canopy coverage can also change over time as trees mature (increasing canopy coverage) or are removed.

Distribution of urban trees can be improved through planting, which can have a major impact over time. Research at the Portland State Department of Geography documented significant increases (between 5 and 20 percent) in the forest canopy of many older, nature-poor inner North and Southeast Portland neighborhoods over the last 30 years. These increases often occurred in areas where tree planting efforts had focused in the past. The City of Portland estimates that there are sufficient tree spaces in the right-of-way to plant over 290,000 additional trees throughout the city.³²⁸

Conclusions³²⁹

Expanding the quantity and accessibility of public parks and natural areas will be increasingly important to reduce disparities, keep parks and nature accessible to everyone in our region, and thereby sustain the multiple benefits to the region's health, cultural identity and quality of life. More important to improving access over time will be setting goals for a minimum level of service for the entire region and developing funding mechanisms and other tools to achieve and maintain those goals as the region grows.

³²⁷ Ibid.

³²⁸ Portland Parks & Recreation, Portland's Urban Forest Canopy Assessment and Public Tree Evaluation, October 2007

³²⁹ Conclusions excerpted from: Coalition for a Livable Future, *Regional Equity Atlas*, 2007.

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The value of, and opportunity to, re-nature the existing urban areas cannot be understated. As older urban centers redevelop, new opportunities to restore and enhance access to nature will abound. This means more fully integrating the built and natural environment to manage flows of urban storm water and wildlife throughout our urban watersheds, even in our most urbanized areas. Protecting and restoring an interconnected system of natural areas and wildlife corridors, and more fully integrating the built and natural environments, can expand access to natural places within walkable distances, increase their social and aesthetic values, and thereby distribute nature's numerous human health and quality of life benefits more equitably across the region.

Disparities in access to nature in our region stem from both past policy decisions shaping where and how much to invest in public parks, and in patterns of development, urbanization and demographic change that have altered the ecological and the social landscape. Unfortunately, in the former case, the region is not currently making public investments in neighborhood and community parks like it did during the urban parks movement a century ago. Evidence suggests that most jurisdictions are not even maintaining current park service levels. The reasons for this relate directly to lack of adequately public financing for parks despite voter willingness to support parks at the polls. Current park system development charges (SDCs) are inadequate to pay for the full costs of new parks necessary to service new growth.²⁰ Over time, as the costs of growth are left unpaid, overall park service levels decline. Meanwhile, planning and development has only begun to address the need to provide adequate access to nature. Protection of natural areas has not kept pace with development. The Portland metropolitan region did add over 8,100 acres of natural areas to the regional system of protected public access greenspace in the last decade and will add more in the upcoming years thanks to the passage of a second regional greenspaces bond in 2006. However, in the booming 1990s, it lost an estimated 18,000 acres – an area larger than the city of Gresham – to development, a rate of loss that has likely continued up to the present.²¹

CHAPTER 8: ACTIVE LIVING

SUMMARY

This section reviews data on local physical activity levels and active living, which is incorporating physical activity into daily routines. This includes opportunities for walking and biking for transportation and accessing areas for recreation (parks, trails, other recreational opportunities).

THE ISSUE

Relationship to health

Physical activity is listed as a leading health indicator in Healthy People 2010. Regular physical activity is associated with many positive health outcomes, including lower rates of mortality for all ages and a reduced risk for many conditions: coronary heart disease, high blood pressure, colon cancer, Type 2 diabetes and obesity included. Physical activity also appears to enhance ones mood and reduce depression.³³⁰

There is evidence that socioeconomic factors such as race or ethnicity, income, gender and age can impact the extent to which people experience the negative health impacts of not exercising. For example, households that earn less than \$15,000 a year, people of color and women are all groups who are more likely to be sedentary and more likely to be at risk for health problems related to lack of exercise.³³¹

Physical Activity in Daily Routine

Incorporating physical activity into the daily routine is a proven way to get the recommended amount of physical activity. In one study of those who used public transit, almost 30 percent achieved 30 minutes of exercise a day simply by walking to and from transit.³³² Another study concluded that “[e]ach additional hour spent in a car per day was associated with a 6 percent increase in the likelihood of obesity. Each additional hour walked per day was associated with a 4.8 percent reduction in the likelihood of obesity.”³³³

Walking and biking are inversely correlated with car use: in lower auto-use countries like Sweden, trips by walking and biking make up as much as 40 percent of all trips made; in countries where auto use is higher, percentage of trips by walking and biking is lower, around 20 percent. In the

visionPDX on active transportation:

In general, people would like it to be easier and safer to walk, cycle and skate. They advocate for expanded walking trails and bridges, bicycle and pedestrian-only areas and creating measures to enhance safety for cyclists and pedestrians. The overriding opinion expressed in this section is that alternative modes are the way of the future and as such, should be supported and encouraged by the City.

³³⁰ U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, “Physical Activity and Health: A Report of the Surgeon General,” Washington, D.C., Government Printing Office, 1996. Accessed at <http://www.cdc.gov/nccdphp/sgr/sgr.htm> on January 15, 2009.

³³¹ Emerine, Dan and Eric Feldman, “Active Living and Social Equity: Creating Healthy Communities for All Residents,” International City/County Management Association, January 2005.

³³² Besser LM, Dannenberg AL. 2005. Walking to public transit: Steps to help meeting physical activity recommendations. *American Journal of Preventative Medicine* 29(4):273-280.

³³³ Frank L, Andresen MA, Schmid TL. 2004. Obesity relationships with community design, physical activity, and time spent in cars. *American Journal of Preventive Medicine* 27(2):87-96.

U.S., trips by walking or biking measured only 10 percent, with 84 percent of all trips made by car.³³⁴

Community design and the intersection of land use and the transportation system both greatly impact how easy it is to make exercise part of one's routine. In large-lot suburban areas, for example, fewer walking or biking destinations lead to higher trips by car. But even in denser urban settings barriers can arise. Street and sidewalk networks near transit stops can be difficult to navigate, unsafe or discontinuous. Transit stops near large parking lots, such as park-and-ride facilities, make it difficult to walk to destinations.

One study of transportation habits in Minneapolis and St. Paul, MN, found that proximity (within 400 meters) to on-street bike facilities like a marked bike path significantly increased the likelihood of biking. Similarly, living within 200 meters of commercial retail significantly increased likelihood of walking trips.³³⁵ While people might choose to locate close to these resources, there may be a relationship between number of destinations and infrastructure for biking and the levels of walking and biking, respectively. Other studies have noted positive associations between physical activity through travel and improved street connectivity, higher density and the presence of mixed land uses.^{336,337}

Physical Activity in Parks and Open Spaces

Increased access to parks is a significant predictor of the levels of physical activity people get. A CDC task force found in 2001 that enhancing access to spaces for physical activity resulted in 25 percent more people exercising at least three days a week.³³⁸

A review of a group of studies by the American Journal of Preventive Medicine found that good or enhanced access to places for physical activity plus outreach and education can produce a 48 percent increase in frequency of physical activity.³³⁹ "The same group of studies showed that access to a place to exercise results in a 5.1 percent median increase in aerobic capacity, along with a reduction in body fat, weight loss, improvements in flexibility, and an increase in perceived energy."³⁴⁰ In addition, children with access to park playgrounds within 1km of have been shown to be five times less likely to be overweight/obese than were children without close park playground

³³⁴ Frank LD, Engelke P. How land use and transportation systems impact public health: A literature review of the relationship between physical activity and the built form. ACES: Active Community Environments Initiative Working Paper #1. Available at <http://www.cdc.gov/nccdphp/dnpa/pdf/aces-workingpaper1.pdf>.

³³⁵ Krizek, Kevin J. and Pamela Jo Johnson, "Proximity to Trails and Retail: Effects on Urban Cycling and Walking," *Journal of the American Planning Association*, Vol. 71, No. 1. Winter 2006.

³³⁶ Rodriguez, Daniel A., Asad J. Khatak and Kelly R. Evenson, "Can New Urbanism Encourage Physical Activity? Comparing a New Urbanist Neighborhood with Conventional Suburbs." *Journal of the American Planning Association*, Vol. 71, No. 1. Winter 2006.

³³⁷ McCormack, Gavin, Billie Giles-Corti, Max Bulsara, "The relationship between destination proximity, destination mix and physical activity behaviors," *Preventive Medicine*, Volume 46, Issue 1, January 2008.

³³⁸ CDC. 2001. Increasing physical activity: A report on recommendations of the Task Force on Community Preventive Services. Available at <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5018a1.htm>.

³³⁹ Kahn EB. 2002. The effectiveness of interventions to increase physical activity. *American Journal of Preventative Medicine* 22:87-88.

³⁴⁰ Sherer, Paul, "The Benefits of Parks: Why America Needs More City Parks and Open Space," *The Trust for Public Land*, 2006.

access.³⁴¹ This finding is consistent with another study that found that the percentage of land that is park space around a home accounts for 10% of the variability of physical activity in young children, after controlling for socioeconomic and demographic factors.³⁴²

Studies looking at parks in particular have also shown increases in activity based on increased access: one study indicated that a 1 percent increase in park space can increase physical activity in youth by 1.4 percent.³⁴³ Another found that each additional park within a half mile increased physical activity by 2.8 percent.³⁴⁴

LOCAL CONDITIONS

Rates of physical activity

Compared to other cities in the western U.S., the Portland region does quite well in physical activity rates overall: we rank higher than every city except for San Francisco in getting the recommended level of physical activity, and our rates of people who are inactive or who engage in no leisure-time activity are low compared to other Western cities.³⁴⁵

A majority (55.4 percent) of Multnomah County residents meet the recommendations for exercise,³⁴⁶ almost 30 percent get vigorous exercise for at least 20 minutes three days a week.³⁴⁷ Data from Oregon as a whole reveals certain patterns of physical activity based on levels of income, education and racial/ethnic differences. As the chart below indicates, people who earn less money and have less education tend to exercise less in Oregon than people with more education or higher income levels.

Figure 8.1 Oregon Adults Meeting CDC Physical Activity Recommendation, by Education and Income, 2005³⁴⁸

³⁴¹ Potwarka, L., Kaczynski, A., Flack, A. (2008) Places to Play: Associations of Park Space and Facilities with Healthy Weight Status among Children. *Journal of Community Health*. 33:344-350.

³⁴² Roemmich, J., Epstein, L., Raja, S., Yin, L., Robinson, J., Winiewicz, D. (2006) Association of access to parks and recreational facilities with the physical activity of young children. *Preventive Medicine*. 43:437-441.

³⁴³ Roemmich JN, Epstein LH, Raja S, Robinson J, Winiewicz D. 2006. Association of access to parks and recreational facilities with the physical activity of young children. *Preventive Medicine* 43(6):437-441.

³⁴⁴ Cohen DA, et. al. 2006. Public parks and physical activity among adolescent girls. *Pediatrics* 118:1381- 1389.

³⁴⁵ Greenlight Greater Portland, <http://www.greenlightgreaterportland.com/library/files/2008/11/physical-activity.xls>.

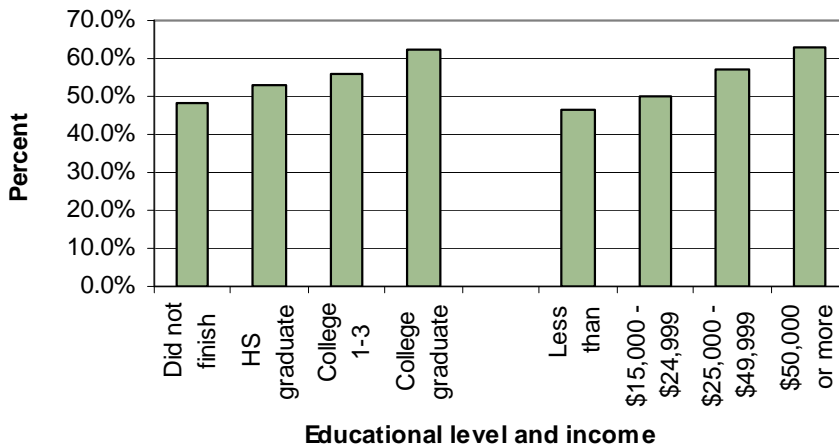
³⁴⁶ The CDC recommends that adults get 30+ minutes of moderate physical activity five or more days per week, or vigorous physical activity for 20+ minutes three or more days per week.

³⁴⁷ National Center for Chronic Disease Prevention and Health Promotion's Behavioral Risk Factor Surveillance System, [http://apps.nccd.cdc.gov/BRFSS-](http://apps.nccd.cdc.gov/BRFSS-SMART/ListMMSACountiesQuest.asp?MMSA=71&cty=110&yr2=2007&qkey=4418&cat=PA#PA)

[SMART/ListMMSACountiesQuest.asp?MMSA=71&cty=110&yr2=2007&qkey=4418&cat=PA#PA](http://apps.nccd.cdc.gov/BRFSS-SMART/ListMMSACountiesQuest.asp?MMSA=71&cty=110&yr2=2007&qkey=4418&cat=PA#PA).

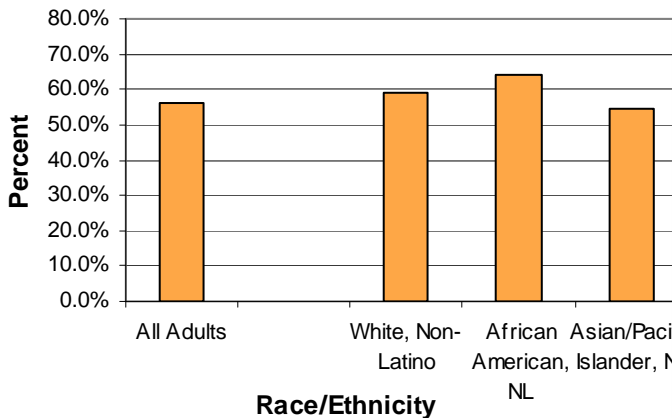
³⁴⁸ Oregon Behavioral Risk Factor Surveillance System, presented by Department of Human Services, Physical Activity and Nutrition Program, "Oregon Overweight, Obesity, Physical Activity, and Nutrition Facts," January 2007.

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Interestingly, a review of the same data organized by race and ethnicity shows a different picture: while non-Latino whites do have fairly high levels of people meeting the physical activity recommendations, non-Latino African Americans and Native Americans actually fare better in this category. Asians/Pacific Islanders and Latinos rank below the average rate; the Latino rate is statistically significant when compared to non-Latino whites.³⁴⁹

Figure 8.2 Oregon Adults Meeting CDC Physical Activity Recommendation, Age-Adjusted, 2005³⁵⁰



visionPDX on walking:

Portlanders highly value neighborhoods and districts with shopping areas, entertainment, services and amenities within walking distance. Being able to “do errands on foot” and “walk to everything I need” is seen as a central ingredient of livability that makes Portland “warm, neighborly, and convenient.” People want to see pedestrian paths, bridges and sidewalks increased and overwhelmingly advocate making some parts of the city limited to only pedestrians or, at a minimum, car-free. They imagine a future in which many more people choose to walk to school, work and social activities because walking is safe, convenient, healthy and adequately supported by public transportation.

The Centers for Disease Control and Prevention

³⁴⁹ Oregon Behavioral Risk Factor Surveillance System, presented by Department of Human Services, Physical Activity and Nutrition Program, “Oregon Overweight, Obesity, Physical Activity, and Nutrition Facts,” January 2007.

³⁵⁰ Oregon Behavioral Risk Factor Surveillance System, presented by Department of Human Services, Physical Activity and Nutrition Program, “Oregon Overweight, Obesity, Physical Activity, and Nutrition Facts,” January 2007.

(CDC) recommends at least 30 minutes of moderate physical activity at least five days each week for youth and children. One in five 8th graders in Oregon doesn't meet this standard, while one in four 11th graders does not.³⁵¹

PEDESTRIAN NETWORK

The Issue

Walking has been linked to multiple health benefits, including increasing bone density, strengthening muscles, weight loss, improving cardiovascular fitness, improving mental health and more.³⁵² While walking for exercise is one of the most common forms of exercise in the U.S., the built environment also impacts people's willingness and ability to use walking as a form of transportation. There is a connection between the likelihood to walk and the presence of destinations to walk to. Studies have also demonstrated links between walkable communities and levels of social capital³⁵³, for example, walkable communities and less weight gain.³⁵⁴

Local Conditions

While Portland's bike culture gets a lot more press, Portlanders have been equally passionate about pedestrian facilities in recent years. The City produced a Pedestrian Master Plan in 1998 that made links between walking and health, and established walking as a viable transportation option. Also in this document was a nascent expression of what we are now discussing as "20-minute communities:" walkable neighborhoods with commercial and civic destinations, and urban villages linked together by high-speed transit. Key to providing a walkable neighborhood is coordinating land use and transportation so that people have destinations within walking distance.

New mapping resources are available to the public to measure the walkability of a community. Walk Score is an application using Google Maps that measures the walkability of a place based solely on number and proximity to neighborhood amenities: restaurants, grocery stores, schools, parks, bars, coffee shops, libraries and more. The Walk Score map of Portland is below.

In rating addresses, Walk Score is not able to take into account street environment, cleanliness, safety, crime, topography, freeways or bodies of water, or many other factors that contribute to a walking environment. The distances are calculated based on "crow flies" distances rather than using the street network. However, it provides an interesting way to look at concentration of amenities, which relates to how much people will walk in their communities.

³⁵¹ Office of Disease Prevention and Epidemiology, Physical Activity and Nutrition Program, "Promoting Physical Activity and Healthy Eating Among Oregon's Children: A Report to the Oregon Health Policy Commission," January 2007.

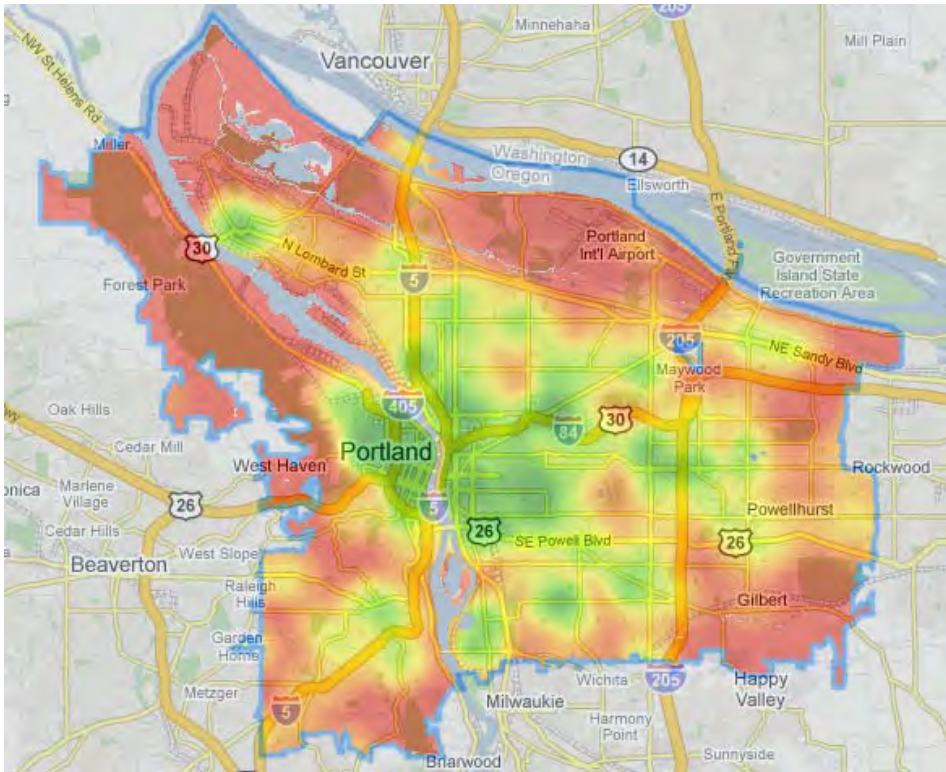
³⁵² Hart, Jane. "The Health Benefits of Walking." *Alternative and Complementary Therapies*, February 2009, 15(1): 7-10.

³⁵³ Leyden, Kevin, "Social Capital and the Built Environment: The Importance of Walkable Neighborhoods," *American Journal of Public Health*, vol. 93 no. 9, September 2003.

³⁵⁴ Nagourney, Eric, "Patterns: In Older Neighborhoods, Less Weight Gain," *The New York Times*, August 5, 2008.

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Figure 8.3 Walk Score Map of Portland³⁵⁵



One important factor in whether people will walk is the infrastructure available to do so. The City's Pedestrian Master Plan admitted that sections of Portland, especially some Southwest neighborhoods and the Multnomah County area (East Portland) annexed by Portland some 30 years ago, were largely lacking in pedestrian amenities. This is evident in the pedestrian network map (Map 8.1) reflecting today's infrastructure – large sections of Southwest and Outer East Portland have a discontinuous sidewalk system. While sidewalks are not the only good pedestrian environments, they are an important piece of the pedestrian environment, and the story this map tells is important in terms of where Portland is succeeding and where we have more work to do.

Despite these shortfalls, the City's existing sidewalk network represents an investment of \$1.6 billion or 20 percent of the value of the City's infrastructure, second only to paved streets. The City has 8,692,461 square yards of sidewalk, 37,567 improved street corners, and 3,239 lineal miles of curbs. The replacement value of sidewalks is estimated at \$860.5 million, curbs at \$649.8 million, and improved street corners \$113.5 million.³⁵⁶

Despite the fact that homeowners are required to maintain the sidewalks in front of their houses in Portland, the sidewalk system has one of the greatest unmet City maintenance needs at \$139 million. Of that \$139 million, \$73.6 million consists of improved corners needing curb ramps

³⁵⁵ www.walkscore.com

³⁵⁶ Bureau of Planning and Sustainability, "Citywide Systems Plan Existing Conditions Report," 2009.

installed to meet American with Disabilities Act requirements. The other \$64.9 million is the cost to replace curbs that are currently in poor condition.³⁵⁷

Beyond the sidewalk network itself, several other factors contribute to the quality of the walking environment. These include corner ramps, type and quality of crosswalks, pedestrian bridges, presence of trees and other greenery, “human scale” buildings that provide visual interest and other factors like street connectivity. Also, pedestrians walk on offstreet trails and other locations which may not be maintained by the Bureau of Transportation.

The connectivity of the street to the rest of the transportation network in itself can have a large impact on the quality of pedestrian access. If streets are discontinuous or cause a pedestrian to walk significantly out of her way, this can be a considerable barrier to walking.

According to the Service Efforts and Accomplishments (SEA) survey conducted by the Auditor’s Office, 4 percent of respondents walked to work as their primary commute mode in 2008. This number has not shifted significantly since 1999. As a secondary commute mode, walking was listed by 7 percent of respondents. Just over half (51 percent) of respondents felt that the safety of their neighborhood for pedestrians was good or very good, up from 42 percent in 2000, although these figures varied substantially by neighborhood.³⁵⁸

Also see the section on Traffic Safety in *Chapter 5: Safe Environments* in this document for information on pedestrian safety in Portland.

³⁵⁷ Bureau of Planning and Sustainability, “Citywide Systems Plan Existing Conditions Report,” 2009.

³⁵⁸ Office of the City Auditor, Portland, OR, “City of Portland Service Efforts and Accomplishments: 2007-08. Eighteenth Annual Report on City Government Performance,” December, 2008.

BICYCLE NETWORK

The Issue

Cycling has many of the health benefits associated with cardiovascular exercise overall: decreased risk of heart disease, obesity, Type 2 diabetes, etc. Further, additional benefits have been measured:

“Studies have shown that bicycle commuters work more efficiently, arriving to work eager and alert, and due to a cyclists’ improved health, they have fewer job-related injuries. The use of non-motorized transportation provides exercise, reduces fatal accidents, increases social contacts and reduces air and noise pollution...

Furthermore, traffic reduction on streets increases safety and opportunities for social interaction between residents and workers.”³⁵⁹

Extensive bicycle infrastructure has been demonstrated to impact the level of bicycling in a community³⁶⁰ and the quality of the infrastructure (bike lanes separated from traffic, for example) impacts ridership within specific population groups such as women.³⁶¹

Local Conditions

Portland has long been known as a city friendly to cyclists. Portland was the first major city, and second city overall, to be awarded the platinum-level Bicycle Friendly Community designation by the League of American Bicyclists. The award celebrates Portland’s 270 miles of bike lanes, bike boulevards³⁶² and paved trails; incentives to developers to provide showers and locker rooms; requirements for bike parking in new development and redevelopment projects; and an extensive wayfinding system designed for cyclists.³⁶³

These bike infrastructure improvements have led to strong growth in bicycle ridership; as seen in the chart below, almost 15,000 daily trips by bike cross the bridges of the Willamette. The City of Portland Office of the Auditor reports that 16 percent of Portlanders use the bicycle as their primary or secondary commute vehicle. The maps below show the differences in regions of the City: in Inner Northeast Portland, for example, the figure jumps to 28 percent, while in Outer East Portland

visionPDX on bicycling:

Portlanders are proud of this city’s “bike-friendly” attitude, people and policies. They imagine a future in which bicycling is a highly attractive transportation and commuting option. The primary concern around cycling involves safety; both cyclists and automobile drivers feel that the current road-sharing arrangement is stressful and unnecessarily dangerous. Supporters of cycling also believe it deters a large number of bicycle-friendly people from choosing cycling as their primary mode of transportation. Separating cars from cyclists is seen as a safety imperative, along with better driver’s education and stiffer penalties for cyclists who ignore traffic rules.

³⁵⁹ San Francisco Department of Public Health, Environmental Health Section, Program on Health Equity and Sustainability, “Bicycle Environmental Quality Index (BEQI).” Accessed on June 3, 2009 at http://www.sfpbes.org/HIA_Tools_BEQI.htm.

³⁶⁰ Cohen, Deborah, et. al. “Letter to the Editor: Impact of a new bicycle path on physical activity,” *Preventive Medicine*, Volume 46, Issue 1, January 2008, Pages 80-81.

³⁶¹ Garrard, Jan, Geoffrey Rose and Sing Kai Lo, “Promoting transportation cycling for women: The role of bicycle infrastructure,” *Preventive Medicine*, Volume 46, Issue 1, January 2008, Pages 55-59.

³⁶² From the City’s Bicycle Master Plan: “A bicycle boulevard is a street with low traffic volumes where through movement of bicycles is given priority over motor vehicle travel... Traffic control is designed to limit conflicts between automobiles and bicycles and give priority to through bicycle movement.”

³⁶³ http://www.bikeleague.org/programs/bicyclefriendlyamerica/communities/bfc_portland.php

it stands at 7 percent. A 2006 survey showed that 43 percent of Portland residents in inner Northeast and Southeast think bicycling is an important part of their lifestyle.³⁶⁴

Figure 8.4 Bicycle Trips over the Four Bicycle-Friendly Bridges, 1991-2007

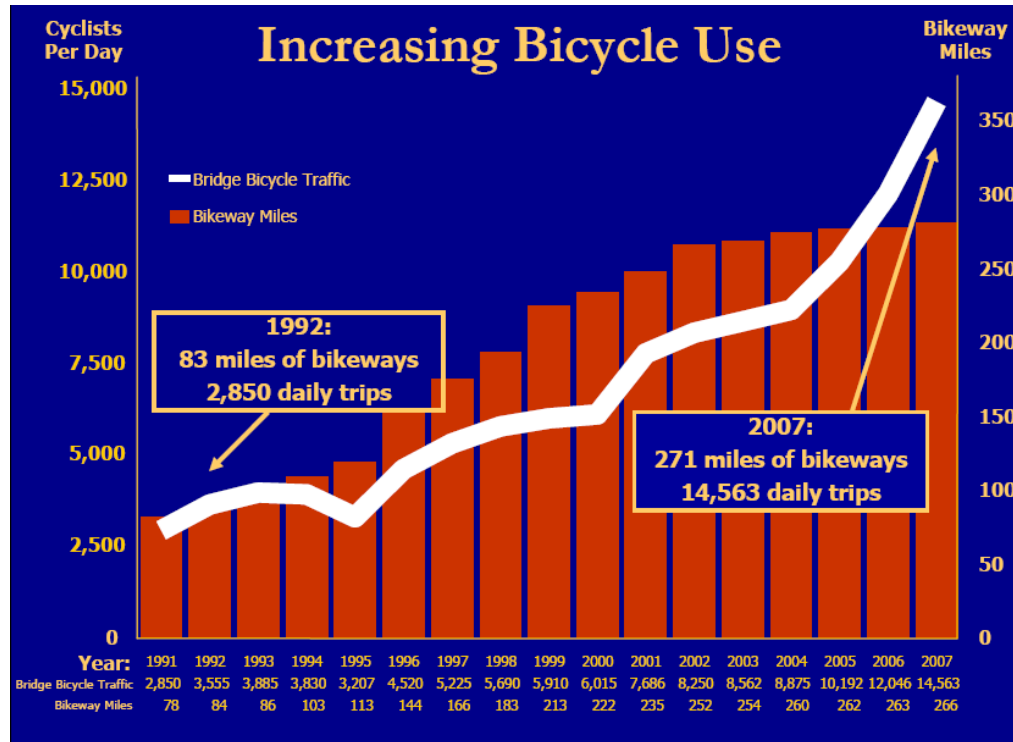
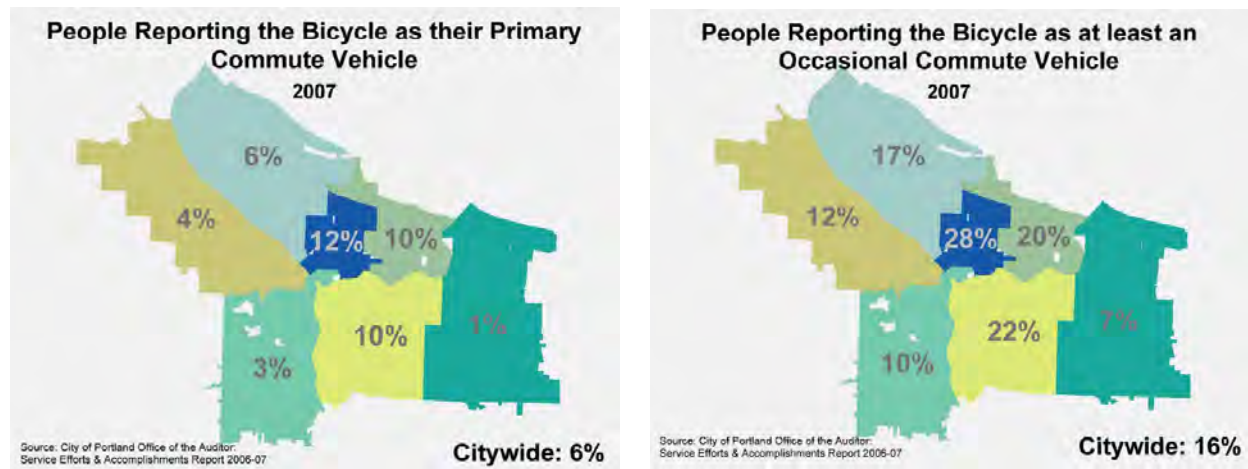


Figure 8.5 Bicycle Use as a Commute Vehicle, 2007



In order to explore some of these geographic differences in a more nuanced way, the City of Portland recently conducted a Cycle Zone Analysis to help inform bicycle planning in the city. The Bureau of Transportation worked with the public and stakeholders to divide the City into 32 cycle

³⁶⁴ Bureau of Transportation, "Platinum Bicycle Master Plan Phase I: Existing Conditions Report." Chapter 2: Bicycle Use.

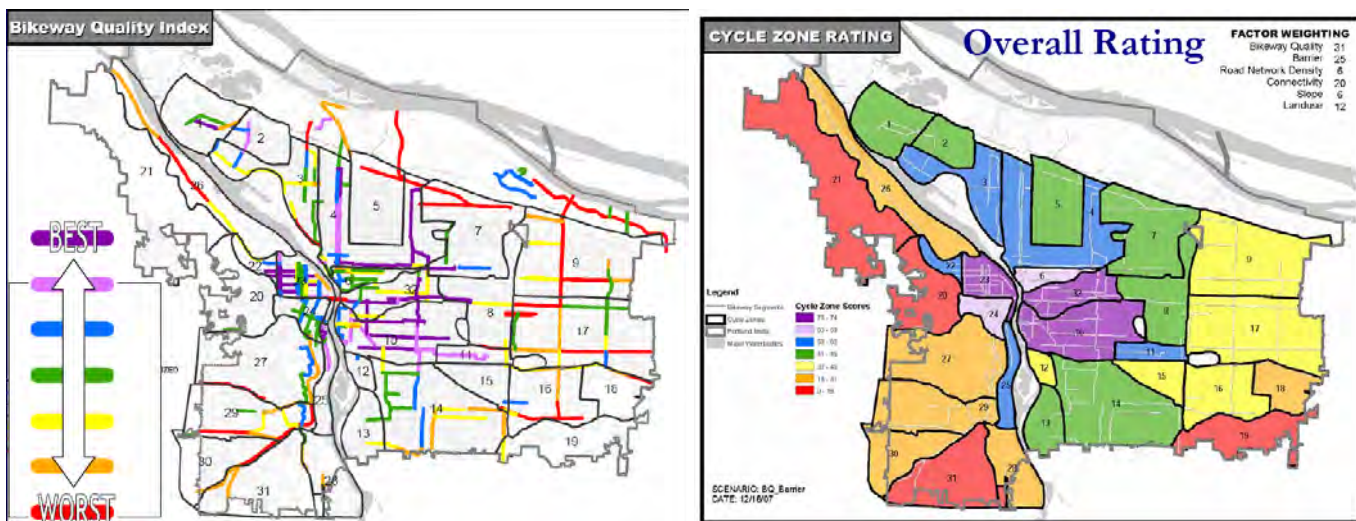
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zones, which are based on similarity in riding experience. They then used the zones to consider a number of characteristics including:

- Automobile speeds
- Automobile volumes
- Dropped bicycle lanes
- Difficult transitions
- Number of travel lanes
- Width of bicycle lanes
- Jogs in route
- Quality of pavement
- Quality of intersection crossings
- Number of stops

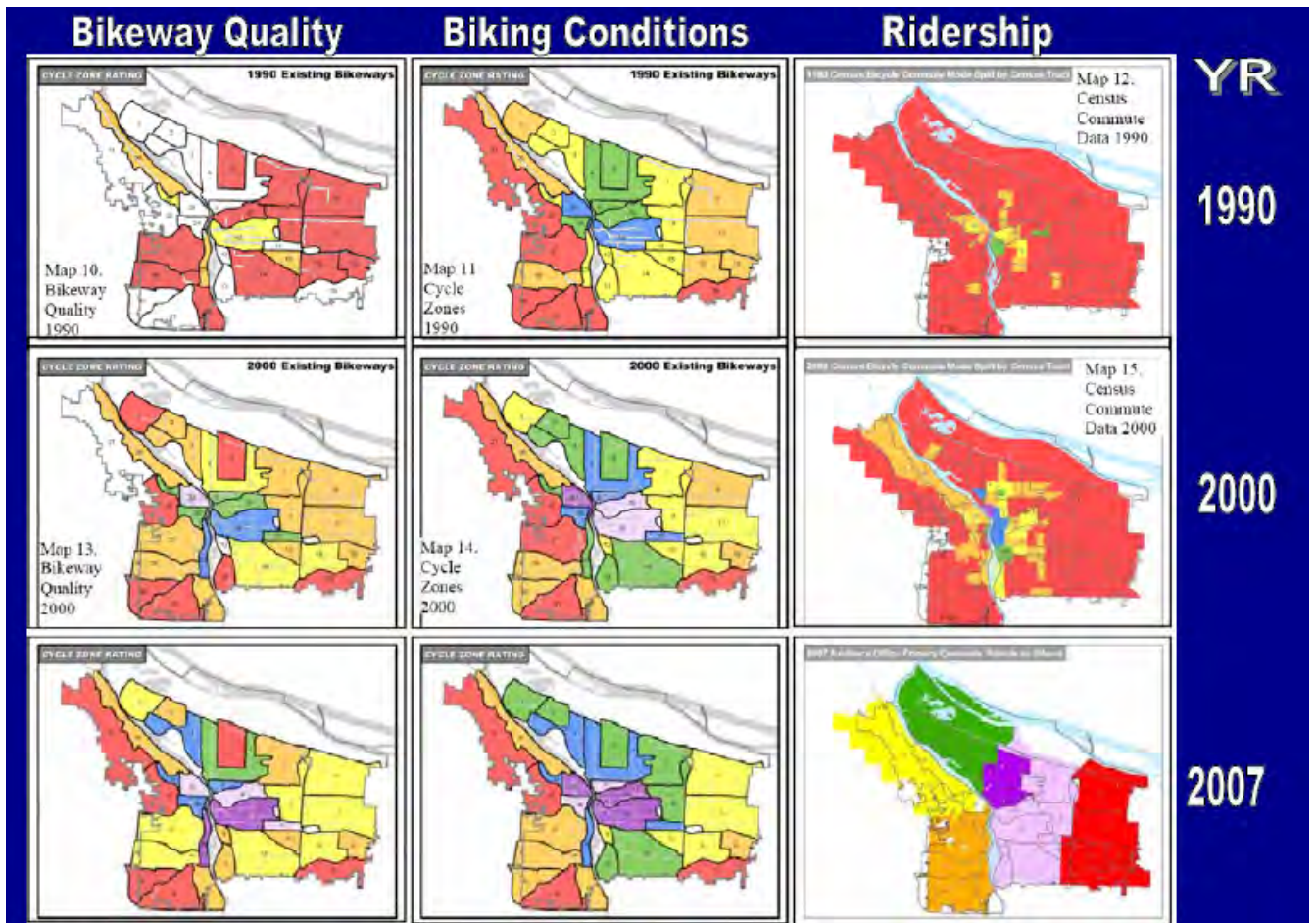
The resulting Bikeway Quality Index (BQI) is a means to assess relative quality of existing bikeways. As can be seen from the maps below, areas that tend to have higher ratings on the BQI are those that are denser, with a strong grid network of streets with high connectivity. Another finding of the BQI analysis was that most of the City's bike boulevards ranked higher on the BQI than most of the bike lanes, or separated lanes for bike traffic on higher-volume streets. This means that the biking experience on bike boulevards tends to be better than on even the best of the bicycle lanes. This has led the City to consider prioritizing bike boulevards in expansion of the bike network in Portland.

Figure 8.6 Bicycle Quality Index, 2008



The BQI gives us another way to look at Portland's evolving bike network and growth in ridership over the past 20 years, as shown in the chart below. With bikeway quality and conditions poor to moderate in 1990, the ridership was largely focused in the innermost parts of Portland. The transition to current conditions has been fairly dramatic since that time.

Figure 8.7 Cycle Zones and Ridership, 1990-2008



The BQI indicates that the immediate potential for maximizing biking exists in the Inner East Portland neighborhoods, with North Portland second. These are also areas of significant population density, meaning that even current infrastructure serves many of the city’s residents.

However, not all parts of the City have the same resources – the most recent Service Efforts and Accomplishments survey published by the City’s Auditor’s Office found that only 44 percent of residents rated their neighborhood streets as good or very good for the safety of bicyclists.” This rate was down from a high of 54 percent in 2006, only 2 years prior to this survey.³⁶⁵

West Portland has a fundamental challenge in its topography, which is very hilly and can be difficult for riders. Southwest Portland also does not score high on bikeway quality, barriers in some parts of the quadrant and connectivity in other parts, while Northwest Portland has consistently poor ratings throughout the categories. Outer East Portland also scores poorly, though the challenges there are more focused on roadway connectivity and road network density, as well as bikeway quality.

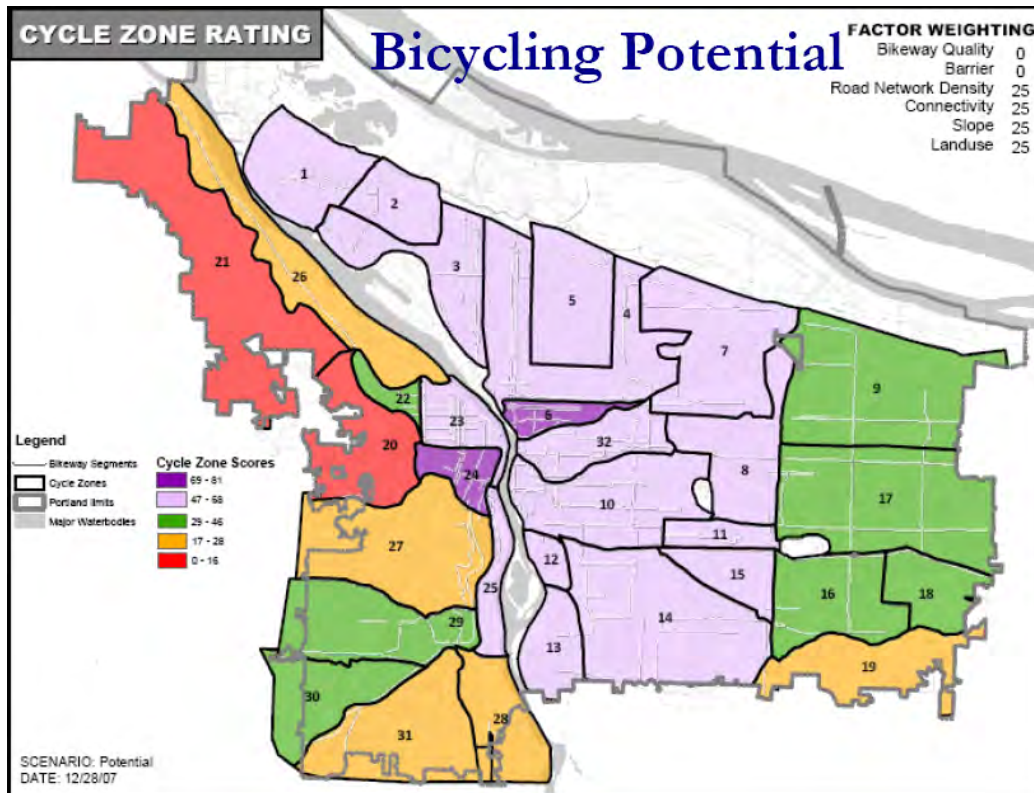
³⁶⁵ Office of the City Auditor, Portland, OR, “City of Portland Service Efforts and Accomplishments: 2007-08. Eighteenth Annual Report on City Government Performance,” December, 2008.

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In 2009-2010 Community Cycling Center is doing a community-based research listening and assessment project to identify barriers and opportunities for increasing cycling among low-income residents. This information may be useful in considering removal of barriers for diverse populations.

Based on the findings of the Cycle Zone analysis, the areas with the most potential are shown in Figure 8-8.

Figure 8.8 Bicycling Potential based on Cycle Zone Rating



The City of Portland Bureau of Transportation continues to research current conditions of the bicycle network in the process of updating the Bicycle Master Plan, currently underway. More data is available at <http://www.portlandonline.com/transportation/index.cfm?c=44674>, including the Cycle Zone Analysis presentation and an existing conditions report that tracks benchmarks, growth in ridership and a review of existing bicycle policies and objectives in the City's comprehensive plan.

Also see the section on Traffic Safety in *Chapter 5: Safe Environments* in this document for information on bicycle safety in Portland.

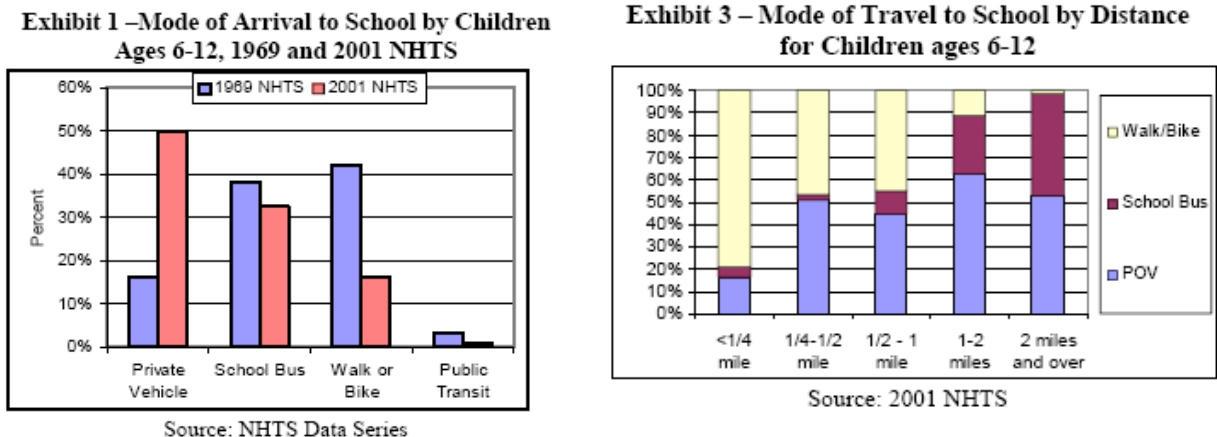
Safer Routes to Schools

The Issue

Related to but distinct from the conversation about pedestrian and biking facilities in Portland is the important issue of how children travel to school each day. School commuting is associated with everything from traffic congestion to health to establishing patterns of physical activity. Mode choice has changed greatly in the past 40 years. In 1969, nationally about 15 percent of school children ages 6-12 arrived at school in a private vehicle. In 2001, half of all school children were driven to school.

One factor underlying this change is the increased distance children travel to school. In 1969, just over half (54.8 percent) of students lived a mile or more from their schools. By 2001, three-quarters of children traveled a mile or more to school. Other potential factors include weather, sidewalk distribution and use of child care prior to or after school hours.³⁶⁶ Traffic safety is also a major concern for children and parents.

Figure 8.9 Children’s Mode of Travel to School



Active commuting (walking and biking) can have significant impacts on the levels of physical activity of children. The health impacts of children and youth getting less exercise are clear: Inactive children, when compared with active children, weigh more, have higher blood pressure and lower levels of heart-protective high-density lipoproteins (HDL cholesterol).³⁶⁷ Inactive children are likely to become inactive adults. The Centers for Disease Control and Prevention (CDC) recommends at least 30 minutes of moderate physical activity at least five days each week for youth and children. One in five 8th graders and one in four 11th graders in Oregon does not meet this standard.³⁶⁸

366 U.S. Department of Transportation Federal Highway Administration, “National Household Travel Survey Brief: Travel to School: The Distance Factor,” January 2008.

367 Alliance for a Healthier Generation, “Facts on Physical Activity.”

368 Office of Disease Prevention and Epidemiology, Physical Activity and Nutrition Program, “Promoting Physical Activity and Healthy Eating Among Oregon’s Children: A Report to the Oregon Health Policy Commission,” January 2007.

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By taking a comprehensive approach to make daily biking and walking a safer and more convenient transportation choice, children have greater opportunities to become more physically active. Once active at an earlier age, it has been shown that children are more likely to maintain an active lifestyle into adulthood.

Local Conditions

As seen in the chart below, about 26 percent of 8th graders and 23.4 percent of 11th graders are either overweight or at risk of becoming overweight in Multnomah County. Also, only 55 percent of 8th graders and 40.4 percent of 11th graders meet the recommendations for physical activity. Working on the issue of safe routes to schools can impact these figures and provide another outlet for physical activity for youth and children.

Table 8.1 Modifiable Risk Factors among 8th and 11th Graders in Multnomah County, 2005-2006³⁶⁹

	8th Grade	11th Grade
At risk of overweight	15.3%	13.2%
Overweight	10.7%	10.2%
Met current physical activity recommendations	55.1% ^{°°}	40.4% ^{°°}
Consumed 5 or more servings of fruits and vegetables per day	26.6% ^{**}	18.3%
Had breakfast every day	43.2% ^{°°}	34.5%
Drank 3 or more glasses of milk per day	21.9% ^{**}	13.6% ^{°°}
Drank 7 or more sodas per week	26.6%	23.5% ^{°°}
Bought soda at school 1 or more days per week	18%	37.1% ^{**}
Participated in PE daily	54.9%	5.4% ^{°°}
Watched TV more than 2 hours daily	34.1%	24.1%

^{°°} Statistically significantly lower than Oregon average

^{**} Statistically significantly higher than Oregon average

Oregon’s Statewide Physical Activity and Nutrition Plan 2007-2012 calls for the following steps to support physical activity incorporated into the school commute: “To expand and promote walking and bicycle riding to school, districts shall retain existing neighborhood schools, site new schools in a manner that fosters such physical activity, designate new routes and implement programs and promotional events.”³⁷⁰

Table 8-2 reports on the current mode split for school commuting in Oregon. Overall, almost one-third of students grades 1-8 walk or bike to school a majority of the time; another third takes the bus and 44 percent ride in a car or carpool.

³⁶⁹ Oregon Healthy Teens Survey via the Oregon Overweight, Obesity, Physical Activity, and Nutrition Facts report, January 2007.

³⁷⁰ Nutrition Council of Oregon and the Oregon Coalition for Promoting Physical Activity, “A Healthy, Active Oregon: Statewide Physical Activity and Nutrition Plan 2007-2012.”

Table 8.2 Modes of School Commute by Children in Oregon Who Live within 2 Mile of School, by Grade Group, 2002³⁷¹

On a regular basis,	Grades 1-3	Grades 4-5	Grades 6-8	Overall
Child walks to school at least 3 days per week	18.0%	27.6%	36.4%	26.2%
Child bikes to school at least 3 days per week	3.3%	4.0%	9.1%	5.2%
Child rides the school or public bus to school at least 3 days per week	40.0%	39.3%	33.8%	38.0%
Child rides in a car or carpool to school at least 3 days per week	48.2%	41.4%	40.4%	44.0%

* Parents were asked to estimate frequency with which child used various modes of commute. Categories were not presented as mutually exclusive and results do not necessarily total 100%.

The City of Portland’s Safer Routes to School (SR2S) is a coalition-led program that brings transportation together in partnership with schools, neighborhoods and community organizations to encourage students and families to get to and from school in ways that reduce traffic, increase safety, build strong bodies and clear minds and provide a cleaner environment.

The Portland Safer Routes to School program currently provides Education, Encouragement, Engineering, Enforcement, and Evaluation in an Equitable manner (6 ‘E’s) to support students in 25 schools (see Figure 8.10) to be safe, have fun, grow healthy and get there. SR2S is currently offering an additional 46 Portland Schools modified 3 ‘E’ (Equity, Encouragement, Enforcement) services. When funding opportunities arise, SR2S would like to expand this service provision to a more effective 6 ‘E’ level.

Parent surveys at 25 City of Portland ‘6 E’ Safer Routes schools showed:

- Mode share of active transportation choices is 22.0 percent larger in fall 2009 than it was in fall of 2006 in the Portland schools receiving Portland Safer Routes to School ‘6 E’ programming
- The longer a school receives Portland Safer Routes to School ‘6 E’ programming, the higher the positive response rate to questions of parents’ perceptions of the health and enjoyment of walking and bicycling³⁷²

Parents identify barriers to students walking, biking, and rolling to school in the following order:³⁷³

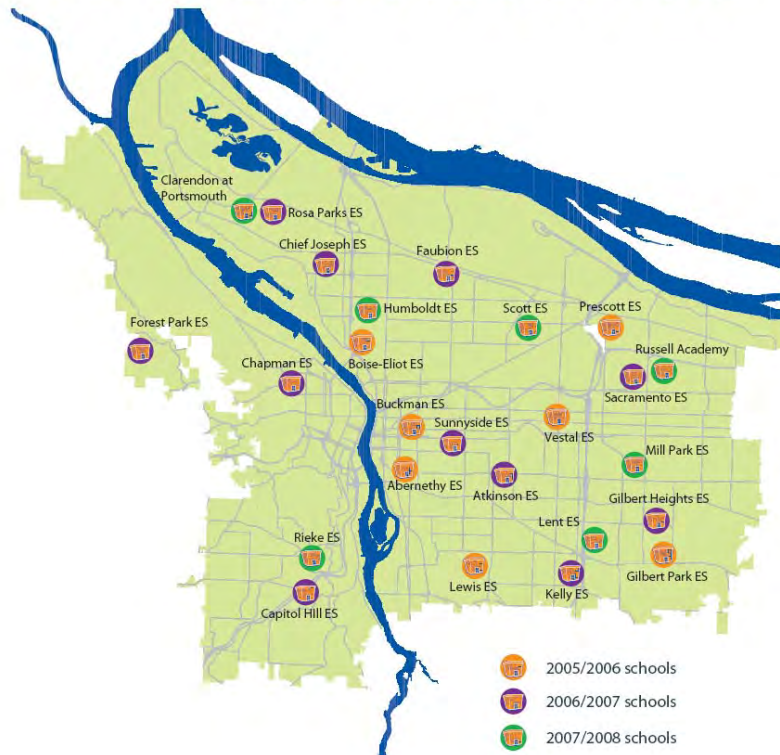
- | | | | |
|------------------|-----------------------|----------------------|-------------------------|
| 1. Distance | 4. Traffic Volume | 7. Violence or Crime | 9. Crossing Guards |
| 2. Intersection | 5. Weather or Climate | 8. Time | 10. Extracurricular |
| 3. Traffic Speed | 6. Sidewalks & Paths | 9. Adults to Walk | 11. Driving Convenience |

³⁷¹ Oregon Behavioral Risk Factor Surveillance System via the Oregon Overweight, Obesity, Physical Activity, and Nutrition Facts report, January 2007.

³⁷² Wintergreen, Lore, Portland Safer Routes to School Project Coordinator, personal communication, April 3, 2009.

³⁷³ Ibid.

Figure 8.10 2007-2008 Portland Safer Routes to Schools



RECREATIONAL OPPORTUNITIES³⁷⁴

Portland Parks and Recreation offers Portlanders numerous opportunities for both passive and active recreation. Below is a summary of what PP&R offers and how they rate themselves on their success at meeting their own goals and targets. Of course, PP&R is not the only provider of recreational opportunities in the community; however, focusing on these services that the City has in its purview is appropriate for this document.

Portland Parks & Recreation (PP&R) manages over 7,000 acres of natural areas and over 3,200 acres of developed parks – totaling about 10 percent of Portland’s land base.

visionPDX on recreation:

People appreciate the variety of recreational opportunities available at parks, including opportunities to play sports, take classes, hike on trails and experience wildlife within the city boundaries. Others, however, would like to see accessibility improved, especially for people with disabilities, children and residents of low-income communities. Portlanders are concerned with equity in regards to parks and open spaces, calling for more parks and better-maintained parks in low-income neighborhoods. Looking to the future, Portlanders want current open spaces preserved and more open spaces created as the city’s population grows and becomes denser.

³⁷⁴ Most of the information on PP&R facilities in this chapter comes from the Infrastructure Condition and Capacity Analysis prepared for the Portland Plan.

The City has 180 developed parks, 47 habitat parks, five golf courses, seven 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 shelters, restrooms and stadiums and one historic mansion. Recreation facilities include 177 miles of trails, 142 playgrounds, over 300 sports fields, 30 community gardens and more than 100 tennis courts.

Table 8.3 Summary of Parks & Recreation Inventory

Parks	3,200 acres	Golf Courses	5 courses
Natural Areas	7,000 acres	Skateparks	5 skateparks
Trails	177 miles	Community Gardens	30 gardens
Community Centers	12 facilities	Play Areas	142 areas
Aquatic Facilities	13 pools	Stadiums	3 facilities
Tennis Facilities	>100 courts	Botanical Gardens	7 gardens
Athletic Fields	>300 fields		

Service Goals

It is the goal of Portland Parks and Recreation to provide a recreational opportunity – such as a developed park, trail, or access to a natural area – within a half mile (approximately a ten minute walk) of all residents. This goal requires both physical proximity and physical access to recreational opportunities; however it may not be feasible to meet this goal in areas with severe geographical constraints. Portland Parks and Recreation may expand this goal to commercial and industrial areas in the future.

Approximately 76 percent of Portland’s population lives within a half mile of a developed park or a natural area; however, when the “walkability” of the street network is taken into account, only half of all residents live within a half mile walk of a developed park or natural area.³⁷⁵ Significant gaps in park distribution exist in areas throughout the city, (Map 8-2), and will require at least 150 acres of additional parkland to resolve. Additionally, a number of existing park properties in Outer East Portland are currently undeveloped and provide more limited recreational opportunities.

Despite these limitations, and despite recent population growth, developed park acres per capita remained steady at approximately 19 acres per 1,000 residents over the last 10 years. Resident ratings of parks are the highest in 10 years, with 86 percent of residents in 2008 rating the overall quality of parks as good or very good. In every measure of park quality, residents’ ratings improved over the last 10 years. In addition, 83 percent of respondents rated their neighborhood on closeness of parks as “good” or “very good.”³⁷⁶

Current Usage

Portlanders use their park system heavily. Only 10 percent said that they did not visit a park in the last year, and 44 percent reported visiting a park more than 10 times in the last year. However, the

³⁷⁵ Coalition for a Livable Future, *Regional Equity Atlas*

³⁷⁶ City of Portland Office of the Auditor, “City of Portland Service Efforts and Accomplishments: 2007-2008, Eighteenth Annual Report on City Government Performance,” December 2008.

The Portland Plan

rate of youth participation in recreation activities has fallen for the past five years based on residents' responses.³⁷⁷

Community Centers

Community Centers Goal

Parks 2020 Vision, adopted in 2001, has an objective of providing “a full-service community center – that is, a center with a pool, arts facilities, classrooms and active recreation facilities – within three miles of every resident.”³⁷⁸

Current Community Center Service

PP&R has three centers that meet the 2020 Vision definition of a full-service center: East Portland (pool opened in winter '09), Mt. Scott and Southwest. A pool may be added at University Park but this has not been determined at this time. A fifth center is planned for the Washington-Monroe site in Inner Southeast Portland. At around 75,000 sq. ft., it will be the largest center in the system. Construction is expected in 2012.

The remaining PP&R community centers provide some capacity, but the number and kind of activities that can be provided are limited by the size and age of the facility. (Map 8-3) for existing and proposed community centers and their service areas.

Conclusions

Currently, there is sufficient service in central Southwest, along a broad swath on either side of I-205 and parts of North and Northeast Portland. Construction of a new combined center at the Washington-Monroe site will provide sufficient service for inner Southeast and Downtown. The largest gaps in service occur in inner Southeast, outer Northeast (Cully) and distant Southeast (122nd and beyond).

Aquatic Facilities³⁷⁹

Aquatics Goal

As mentioned above, Parks 2020 Vision has an objective of providing a community center with a pool within three miles of every resident. A generally accepted standard of sufficient public swimming pool capacity is to be able to accommodate 1 percent the total population in a pool at any one time. Using this standard, the City of Portland needs to accommodate about 5,000 people at a time.

³⁷⁷ City of Portland Office of the Auditor, “City of Portland Service Efforts and Accomplishments: 2007-2008, Eighteenth Annual Report on City Government Performance,” December 2008.

³⁷⁸ Portland Parks & Recreation, “Parks 2020 Vision,” Accessed at <http://www.portlandonline.com/parks/index.cfm?c=40182>.

³⁷⁹ Portland Parks and Recreation, Draft Aquatic Facilities Technical Paper, June 2008

Current Aquatics Service

The City of Portland currently owns or manages five outdoor pools and five indoor pools. Outdoor pools are only open for the summer season, from mid-June through Labor Day, and generally see between 12,000 and 90,000 visitors for the 11-week season. Indoor pools are open year-round and range in attendance from just over 10,000 to over 200,000 visitors annually. While swimming pools accommodate most aquatic activities in Portland, additional access to water is provided by beaches, wading pools, spray pools and some fountains.

Currently, PP&R can accommodate about 3,300 people in the summer at any one time if all the pools are at capacity. Only about 60 percent of what is needed. Indoor pools can only accommodate about 1,000 people and seasonal outdoor pools can accommodate 2,300. Most PP&R aquatic facilities are operating at capacity and use is anticipated to increase, MLC is/ has been closed.

Conclusions

In general, Southwest, inner Northeast, North and parts of Southeast are fairly well served. No PP&R outdoor pools are located east of I-205. Areas in Outer East and Northeast have few indoor pool facilities. The East Portland pool just opened in early 2009. All pools except Buckman Pool are ADA accessible. Buckman Pool cannot be retrofitted to provide access.

Play Areas

Play Area Goal

Parks 2020 Vision outlined a goal of providing developed neighborhood parks within a safe 10-minute (approximately half-mile) walk of every resident. Play areas should be provided within parks based on the following levels of service as possible, depending on the conditions and opportunities:

- A small play area within walking distance (10 minutes or a half mile) of every resident with as much variety as can be accommodated.
- Larger play areas in larger parks that can accommodate more children with separate areas for bigger and smaller kids and provide more extensive creative play settings.
- Special destination play areas with adventure play, water play, and nature play themes.

All play areas must meet ADA requirements and include a variety of interesting, enjoyable and challenging equipment and play opportunities.

Current Play Area Service

Play areas are provided mainly in parks and elementary schools, but there are numerous gaps in service. Map 8-4 shows park locations with play areas and a half mile (ten-minute) walking distance around each one, as well as a half mile service area around public school play areas. The map clearly shows the gaps in service, and the location of park lands that could fill those needs. School play areas are taken into account in areas where there are none in parks. These service areas are modeled using the street network, so dead-ends do not model as access. Roads with four lanes or more are considered to be barriers to safe access for children.

Table 8.4 Schools currently filling play area gaps

Abernethy ES	Faubion ES	Markham ES	Prescott ES	Smith ES
Alameda ES	Irvington ES	Lynchwood ES	Richmond ES	Stephenson ES
Alder ES	Gilbert Heights ES	Margret Scott ES	Rigler ES	West Powellhurst ES
Arthur Academy	Glenfair ES	Menlo Park ES	Sacajawea Center	Wilcox ES
Cherry Park ES	Lynch Meadows ES	Mill Park ES	Shaver ES	Wilkes ES

Quality of play areas varies substantially, and many are inadequate. They may contain very little play equipment, equipment in very poor condition, or simply equipment that provides very little challenge. Some still contain hazardous wooden elements that decay over a relatively short amount of time and are not safety compliant. Drainage issues are a problem in some areas.

Conclusions

Many areas of the city are well-served in terms of close access to play areas but gaps can be seen throughout Portland, notably in Outer East Portland and Southwest Portland. Currently, over 30 percent of play areas do not meet ADA standards. There are insufficient settings for creative and nature-based play in neighborhood parks throughout the city.

Skateparks

Skateparks Goal

Parks 2020 Vision acknowledged the need to accommodate recreation such as skateparks, stating “Emerging recreational activities place new demands on an already strained park system. The city is unable to satisfy rapidly growing public demand for skateboarding.” Based on the information available, with an understanding that use and demand would grow over time, PP&R decided to initially plan for a system of 150-350,000 square feet with between nine and sixteen park locations as a way to meet the current demand.

Current Skatepark Service

There are five public skateparks in Portland: the Pier Park and Glenhaven skateparks in North and Northeast Portland, which are considered district parks, Ed Benedict Park in outer Southeast Portland and in Southwest, Gabriel Park skatepark and the smaller Holly Farm skatespot. These parks are uncovered and unlit and are open from dawn to dusk. Aside from these five public facilities, the Burnside skatepark is located under the east end of the Burnside Bridge, and is primarily managed by users.

Sport Courts³⁸⁰

Sport Court Goal

The Parks 2020 Vision document outlined a goal of providing developed neighborhood parks within a half-mile of every resident. Sports courts are an essential facility for public recreation, and a common component of a developed park. While not every developed park needs a sports court,

³⁸⁰ Portland Parks and Recreation, Draft Sport Courts Technical Paper, June 2008

everyone in the city should be able to walk safely to a sports court for recreation, exercise and social gathering.

Basketball Courts

Current Service

There are 340 basketball courts distributed throughout the city of Portland in parks, public and private schools, community centers and gymnasiums. Of this total, the majority (233) are provided by public schools. PP&R provides 70 basketball courts and private schools provide 37.

Future Demand

Based on a review of participation trends and discussions with PP&R staff, participation is expected to continue at least at current levels. Participation tends to be relatively constant because basketball is one of a handful of sports that have few barriers for new and experienced players. Furthermore, the wide distribution of courts and portable hoops make it available to almost everyone.

Tennis Courts

Current Service

Approximately 170 tennis courts in parks and at public schools are scattered throughout the city, though there is a general deficiency in number in the outer east area, east of I-205. Approximately 69 percent of all tennis courts in the City are provided by PP&R. The remaining courts are provided by several public school districts and a variety of private schools. Of the 171 courts in the City, 155 or 91 percent are outdoor courts. Of these, about half (47 percent) are lighted, with most found in PP&R parks. There are only 12 indoor facilities in the city – PP&R provides seven of them at its two indoor tennis centers.

Current Use

Surveys for PP&R between 1986 and 2004 show a low level of participation in Portland. Of 13 facilities and activities queried, tennis ranked last in demand, with 19.0 percent of population expressing a need for more courts. Half said there was an adequate number of courts. This low level of participation needs to be viewed with caution because it may be attributed to the small number of indoor courts, which limits year-round participation. Also, PP&R tennis staff note that in the spring, when outdoor tennis begins to increase, almost all city courts are being used by public schools. Year-round participation is limited by the small number of indoor courts.

Community Gardens³⁸¹

Current Community Garden Service

PP&R maintains 31 community gardens and about 1,000 plots (usually 400 square foot in size for the full-size plots) throughout the City, serving approximately 3,000 gardeners. Most of the gardens

³⁸¹ Portland Parks and Recreation, Draft Community Gardens Technical Paper, June 2008

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are located in inner Southeast, Northeast and North and Southwest Portland. Three gardens are located east of I-205.

The number of plots per garden varies, with the smallest gardens (Patton) having eight to ten plots and the largest garden (Fulton) comprising 102 plots. In 2006, the Community Gardens Program lost two sites and about 183 plots to development (Reed College, 156 plots and Blair, 27 plots). Improvements at the various garden sites include fencing, locked gates, water lines, signs, and raised accessible beds. In addition to regular plots, the system includes half plots and raised beds, which are used for education programs and for gardeners who are disabled. Some gardens have sheds for tool storage, paved paths, and other amenities.

Outside of PP&R, there are several other community gardens run by individuals and nonprofits (see Map 8-5). These gardens have not been surveyed as a group, and contact information is scattered.

Community Gardens Goal

PP&R has not determined an appropriate level of service for community gardens. Other communities have called for a certain number of gardens per population; in its comp plan, Seattle adopted a goal of one garden per 2,500 households. Were Portland to adopt a similar standard, Portland's goal would be 90 gardens, triple it's current number. Using Seattle and Denver (relatively comparable in terms of population number, density, and geographic location) as reference points, it is clear that the City of Portland is lagging in terms of garden plots per person.

Table 8.5 Comparison of Community Garden Service in Three Western Cities³⁸²

	Portland	Seattle	Denver
Population (2004)	533,492	571,480	556,835
# of Garden Sites	30	53	60
# of Garden Plots	1,000	1,900	1,250
Plots / Population	1:533	1:300	1:445
Sites / Population	1:17,780	1:10,780	1:9,280

However, a perhaps more accurate representation of need would be level of demand. Currently, PP&R maintains a waiting list of around 1,000 households with little marketing (see Map 8-6). Other surveys have found that interest in using a community garden plot is about 50 percent of respondents.³⁸³ Considering that the number of plots available in the entire system is 1,000 plots, the need is not nearly being met with current garden plots.

Other available lands have been identified through such efforts as the Diggable City Project (looking at available City-owned land) and County Digs (Multnomah County's tax-foreclosed lands being made available for urban agriculture projects); churches and schools also have access to urban property. However, no one organization has been able to access and use this land for more community gardens in an organized fashion, though one-off projects are common such as the independently-run community gardens mentioned above.

³⁸² Portland Multnomah Food Policy Council, "City of Portland Community Gardens Program Recommendations," February 2008.

³⁸³ Portland Multnomah Food Policy Council, "City of Portland Community Gardens Program Recommendations," February 2008.

For more information on community gardens, including information on the benefits community gardens provide, read the *Infrastructure Condition and Capacity Report* and the *Food Systems Existing Conditions Report*.

Trails³⁸⁴

Current Trails Service

The City of Portland maintains 23 regional trails, 80 miles of local access trails in developed parks and 60 miles of local access trail in natural areas. Portland Parks & Recreation trails complement other facilities used as trails, including sidewalks, bike lanes, bikeways and boulevards, rails-with-trails, hiking trails, shared use trails, and transit. In addition to the City of Portland – Portland Parks & Recreation (PP&R), the Portland Bureau of Transportation (PBOT), the Bureau of Environmental Services (BES), and the Water Bureau – many other agencies provide facilities used as trails. Substantial portions of trails, such as the Willamette Greenway and Columbia Slough trails, are located on private land and maintained by the landowners. In some cases, railroads allow trails to be built over or along their rail beds.

Metro Trails

The Metro Regional Government acquires, develops and maintains regional parks, natural areas, greenways and trails in the greater Portland region. The vision for a regional system of trails and greenways has expanded to nearly 30 cities and four counties within the Portland/Vancouver metropolitan region. Plans call for a 950-mile network of regional trails - including water trails and greenways - but only about 30 percent of them have been completed.

The Blue Ribbon Committee for Trails was formed in 2008 to evaluate the current trails system and propose funding strategies and changes to get the planned system built. The case statement developed by the committee and adopted by the Metro Regional Council in November 2008 makes a strong argument for the importance of trails in Portland's transportation network and lays out barriers and opportunities to developing more trails in the region.

Trails Goal

Within the City of Portland, PP&R has an adopted regional trail vision of 220 miles of regional trails connecting people to each other and to the natural beauty of our city.

Current Use

A survey commissioned by Portland Parks & Recreation in 2004 found that 77 percent of Portlanders used trails each year; over 50 percent at least monthly. 74 percent of the respondents were satisfied with the quality and quantity of trails – most likely due to the diverse types of trails.

³⁸⁴ Source for Portland-specific information: Recreational Trails Strategy: A 20-Year Vision for Portland's Regional Trail System, June 2006

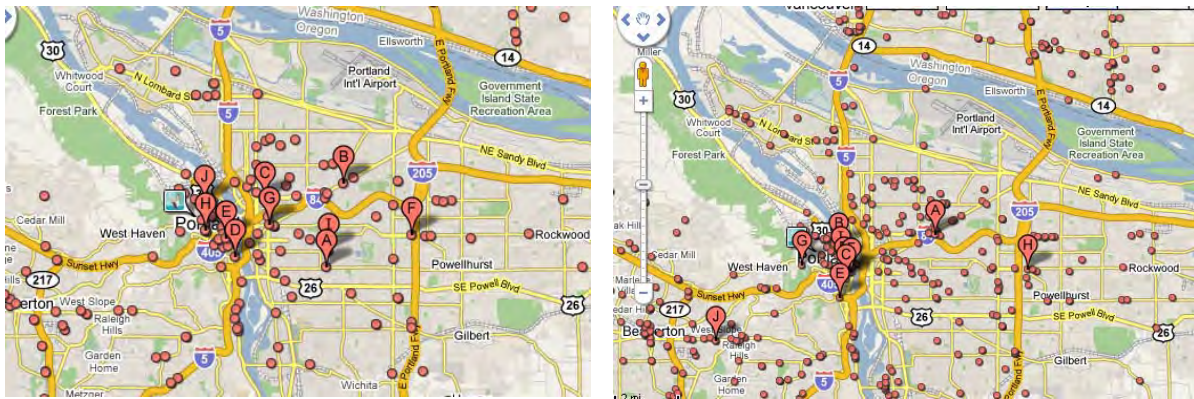
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Other recreational opportunities

Beyond Portland Parks and Recreation, there are many private service providers that contribute to recreational opportunities in Portland. These include YMCAs/YWCAs, Boys and Girls Club, private gyms and fitness centers and many more. Mapping these private resources is outside the scope of this report, but a quick search on Google came up with dozens of options throughout Portland. These options can be as affordable than PP&R offerings, depending on the service requested.

Figure 8.11 Portland Area Gyms and Fitness Centers

Google Maps: searching for “Portland gym” Google Maps: searching for “Portland fitness”



CONCLUSIONS

To ensure opportunities for active living and physical activity we need:

- Coordinated land use and transportation systems that put people within walking and biking distance to destinations and services they need
- Equitable distribution of recreation opportunities such as parks, recreation centers, trails and gardens

Compared to other cities, Portland’s bike network and bike infrastructure are strong; however, new mapping shows many areas and ways in which this network can improve to bring in new cyclists. The pedestrian environment has similar bright spots, especially in inner neighborhoods and downtown, but is limited in several parts of the city by a disconnected sidewalk network. More information on cyclist and pedestrian safety is available in *Chapter 5: Safe Environments* under Traffic Safety.

Recreational opportunities in Portland are numerous and diverse; however, some parts of the city, especially outer East Portland and the west side of Portland, have fewer options for active recreation than others, and small gaps exist throughout the city for different recreational opportunities. The number of community gardens managed by PP&R is not meeting community demand for this service.

POLICY CHOICES

Walkable/Bikeable Communities

- Create walkable, transit and bicycle-oriented neighborhoods, districts and corridors by requiring development patterns that have a high frequency of street connections, a mixed-use land use pattern and transit-supportive densities
- Ensure that residents will be able to walk and bike to meet their daily needs
- Assess neighborhood walkability and set a walkability standard (e.g. quarter to half-mile) for residents' access to daily retail and service needs and transit stops
- Work with school districts to encourage reuse of existing school sites; work to develop a proximity standard for student access to new and existing school facilities
- Support and expand Portland's Safer Routes to School program
- Encourage public and commercial buildings to have open stairs and pleasant stairwells

Recreational Facilities

- Build neighborhoods with safe and attractive places for recreational exercise
- Pursue joint-use agreements to share facilities with schools, especially in neighborhoods that suffer a disproportionate lack of recreational facilities
- Identify opportunities to increase acreage of total recreational areas
- Establish and fund a high level of service standard for parks and community gardens
- Prioritize local parks, playgrounds and recreation facilities in currently underserved areas
- Require new housing developments to incorporate recreation and open space for activity
- Connect parks, open spaces and recreation corridors with an interconnected systems of streets, trails and sidewalks

Transportation Facilities

- Create a balanced transportation system that provides for the safety and mobility of pedestrians, bicyclist, those with strollers, and those in wheelchairs at least equal to that of auto drivers
- Establish design guidelines and/or level of service standards for a range of users, including access for disabled and bicyclists
- Use traffic calming techniques to improve street safety and access
- Require a dedicated portion of the transportation budget to go to pedestrian and cyclist amenities
- Prioritize attention to transportation traffic around schools
- Establish development requirements that give priority to transit-oriented development

Policy options for developing community gardens are available in the *Food Systems Existing Conditions Report, Chapter 4: Urban Agriculture*.

CHAPTER 9: ACCESS AND QUALITY OF HEALTH CARE

THE ISSUE

Access to preventive care and treatment is important for early diagnosis and treatment of illness, as well as for behavioral advice that can promote wellness and head off later development of chronic illness which is more difficult and expensive to treat. The Healthy People 2010 initiative includes a goal to “improve access to comprehensive, high-quality healthcare services” in order to achieve the primary goals of increasing quality and length of life and eliminating health disparities. The visionPDX process indicated that Portlanders feel many City residents lack access to healthcare, with the major barriers being high costs and lack of insurance.

Barriers to access

Many factors contribute to lack of health care access. Factors not addressed here include income, education, home environment and personal beliefs about health and illness.

Insurance Coverage

Lack of insurance coverage causes people to go without preventive care, making them more likely to be hospitalized for chronic conditions and more likely to die in the hospital.³⁸⁵

Care Affordability

People who have access to employer-based or personal coverage may not be able to afford the premiums for one or all family members. Even when people do have insurance coverage, they may not be able to find a provider who can provide care, and the cost of care may still be prohibitive.³⁸⁶

Transportation

A 2002 report, “Roadblocks to Health,” from the Bay Area nonprofit Transportation and Land Use Coalition (TALC), defined “adequate transportation access to health care” as “the ability to reach a healthcare facility within a 30-minute travel time on public transit or a half-mile walk.” A study in

visionPDX on access to health care:

On the whole, Portlanders are thrilled that there are so many healthcare options available in Portland. They like the many choices for both western and alternative healthcare services and they like the size of our city, saying that it feels like healthcare opportunities are relatively close by.

However, many are deeply concerned about the rapidly rising cost of healthcare, which places medical attention out of reach of many people in our community. Portlanders call for a reduction in the cost of “basic” healthcare services so that everyone can afford to receive, and benefit from, medical and dental care. Portlanders are ardent proponents of preventative care, believing that costs across the system can be kept to a minimum if every person has access to annual check-ups and other routine preventative care measures.

Overwhelmingly, Portlanders want to see all people have access to healthcare, either by expanding insurance programs to cover everyone or by creating a local system of universal care.

³⁸⁵ Kaiser Commission on Medicaid and the Uninsured.2008. “The uninsured: a primer.” Retrieved 1/12/2008 from <http://www.kff.org/uninsured/7451.cfm>.

³⁸⁶ Devoe J, Baez A, Angier H, Krois L, Edlund C, Carney P. 2007. Insurance + access does not equal health care: typology of barriers to health care access for low-income families. *Annals of Family Medicine* 5(6):511-518.

Boston found that Latino parents identified transportation difficulties, lack of money, long waiting times, lack of health insurance and cultural insensitivity as the major barriers to bringing their children in for checkups or treatment. Transportation was the primary reason that parents deferred bringing in their children.³⁸⁷ Mexican-American Medicaid enrollees in a Texas study cited transportation as a factor preventing their use of preventive perinatal and infant health services.³⁸⁸

Transportation factors affecting health care access include:

- Frequency, routing and coordination of public transit
- Transportation provided by private facilities – shuttles, bus tickets, taxi vouchers
- Transportation provided by Medicaid programs. Federal regulations require state Medicaid programs to ensure “necessary transportation to and from providers” but leaves details up to the states

Appropriate Services

A number of studies indicate that people are unable to get preventive medical care because of a lack of appropriate care availability. Appropriateness of care factors affecting health care access include:

- Opening hours and reasonable waiting times
- Type of care offered (i.e. specialty care)
- Cultural and linguistic accessibility³⁸⁹

LOCAL CONDITIONS

Insurance coverage

The City of Portland has no direct responsibility to provide or ensure access to health care. However, the health of Portlanders directly affects the City in many ways, including its economic health. Access to social and health services is inadequate in Portland, as in the state and country overall. It is difficult to assess how many people are going without needed preventive care, but it is certain that the number is substantial.

Exactly 83.5 percent of adult Multnomah County residents reported that they had health insurance on the 2007 BRFSS surveys, leaving 16.5 percent without health insurance. This figure is slightly higher than that collected through the 2006 Oregon Population Survey, a phone survey of over 4,000 households statewide, which found that 15.6 percent of Oregonians lack coverage. The rate for children statewide lacking health insurance was 12.6 percent. Interestingly, this survey found

³⁸⁷ Flores G, Abreu M, Olivar M, Kastner B. 1998. Access barriers to health care for Latino children. *Archives of Pediatric and Adolescent Medicine* 152:1119-1125.

³⁸⁸ Moore P and JT Hepworth. 1994. Use of perinatal and infant health services by Mexican-American Medicaid enrollees. *Journal of the American Medical Association* 272(4):297-304.

³⁸⁹ Bell, J and V Rubin. 2007. *Why Place Matters: Building a Movement for Healthy Communities*. Retrieved 12/19/2008 from http://www.policylink.org/documents/WhyPlaceMattersreport_web.pdf

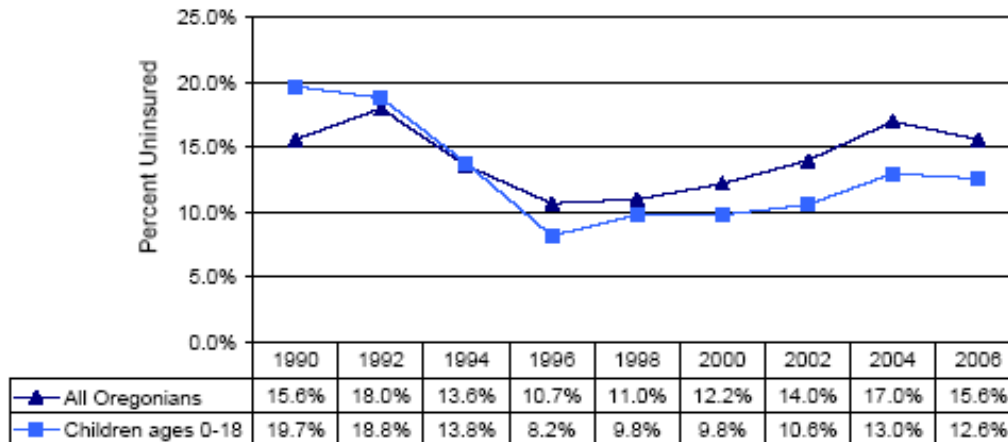
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that almost two-thirds of uninsured Oregonians have incomes above the federal poverty level, which in 2006 for a family of four was \$19,350.³⁹⁰

Table 9.1 Health Care Coverage: Do you have any kind of health care coverage?³⁹¹

County	% Yes	% No
Clackamas County, OR	90	10
Clark County, WA	89.4	10.6
Multnomah County, OR	83.5	16.5
Washington County, OR	86.8	13.2
Nationwide	85.6	14.4

Figure 9.1 Oregonians without Health Insurance³⁹²



Availability of care

In 2005, 58.8 percent of people in Oregon had employer-based health insurance, 27.1 percent had public health insurance and 15.6 percent were entirely uninsured.³⁹³ Access to insurance is just one hurdle in accessing healthcare; as described above, costs for services even under insurance plans can be prohibitive. In one study in Oregon, one in six women with private coverage and one-third of women with Medicaid stated that they postponed or went without needed health services in the past year because they could not afford the cost.³⁹⁴

Local Care Providers

Locally, care providers include a mix of private and public options. Multnomah County Health Department (MCHD), the major provider of care for low-income residents, has a mandate to “assure

³⁹⁰ Office for Oregon Health Policy and Research, “Progress Report: Health Insurance Coverage in Oregon Remains Flat,” Accessed on Feb. 8, 2009 at <http://www.oregon.gov/OHPPR/RSCH/docs/NR2006InsuranceNumbers.pdf>.

³⁹¹ BRFSS, 2007

³⁹² Office for Oregon Health Policy and Research

³⁹³ United States Census Bureau. Retrieved 1/08/2009 from http://pubdb3.census.gov/macro/032006/health/h05_000.htm

³⁹⁴ Cain, Joanna and Michelle Berlin, “Women’s Health in Oregon: Health Care Access & Consequences,” Oregon Health and Science University, http://www.ohsuwomenshealth.com/path/pdfs/OHFB_OHSU_CWH_HealthCareAccess&Consequences.pdf.

access to necessary and dignified health care.” MCHD provides services through health clinics, schools, jails, WIC, dental clinics, and other programs. In 2007, MCHD provided medical care to 63,264 people. 49 percent of these clients had no health insurance and 47 percent had Oregon Health Plan/Medicaid coverage. 30 percent of visits required language interpretation. This client population is not representative of the general population in Multnomah County, which had an estimated population in 2006 of 681,454.

The Coalition of Community Health Clinics (CCHC), a consortium of nonprofit clinics in Multnomah County, has a mission to improve access to quality health care for underserved populations. In 2008, CCHC provided care to 38,419 people in 225,904 visits. 42 percent of those visits were not covered by any insurance, and 31 percent were covered by government insurance.

Kaiser Permanente serves approximately 485,000 people in Northwest Oregon and Southwest Washington. Other large hospital systems, such as OHSU (166,201 patients seen in 2006) and Providence provide care to 262,000 people. The number of people who forego primary and acute care due to barriers to access is unknown.

Physical Access

At this time no analysis of overall health care facility accessibility in Portland exists. Public transit in inner Portland is extensive, and many facilities are well served by transit, as seen in Map 9.1, though that does not guarantee that Portlanders can get to the specific facility they need in a reasonable amount of time, particularly at night or on weekends. Multnomah County actively seeks to site its clinics for maximum transit access. OHSU provides a shuttle between the West campus and the Willow Creek MAX station, but we could not identify any other shuttles provided by county clinics or hospitals in the City.

Map 9.1 shows the locations of Portland’s hospitals, Multnomah County health clinics, CCHC clinics and clinics associated with the major Portland providers (Kaiser, Providence, Legacy and OHSU), as well as population density and streets with frequent-service transit lines. Additional private primary health clinics, alternative health centers, dental clinics and other specialties are not included on this map though hundreds of these sites are located throughout the City.

CONCLUSIONS

Public surveys like visionPDX indicate that Portlanders face similar challenges in accessing health care as do people throughout the U.S., with major factors being coverage, cost, transportation and appropriateness of care. More data on uninsured Portlanders or Multnomah County residents’ health coverage, status and access to the health system would be helpful in determining the scope of the issue.

Because the City of Portland does not directly provide healthcare to its citizens, the City’s ability to affect health care access is limited. Also, many of the factors affecting access to health care are beyond the scope of this assessment, and are entangled with a number of other socioeconomic, equity and cultural issues.

Even though the City does not directly provide health care, Portland cannot ignore this issue, which deeply affects the quality of life of Portlanders. The City can work to address larger socioeconomic issues affecting health care access, and it can work in collaboration with private and public

providers, particularly with Multnomah County, to ensure that facilities are appropriately and equitably sited and served by transportation infrastructure. Further conversations with health care providers and stakeholders should shape work of the City of Portland in this area.

POLICY EXAMPLES

In the absence of national action, cities across the country are taking action to improve access to health care. These actions primarily address the issue of insurance coverage and/or number of facilities:

San Francisco has recently begun a program called “Healthy San Francisco,” designed to make comprehensive health care available to all City residents.³⁹⁵

Sacramento’s General Plan goal of “improv[ing] the provision of human services and promot[ing] public health and safety” has relevant policy language:

“Facilities Location. The City shall work with the County on identifying adequate sites for health and human services facilities within the city to ensure that such facilities are easily accessible, distributed equitably throughout the city in a manner that makes the best use of existing facilities, and are compatible with adjoining uses.”

“Co-Location. The City shall encourage the integration of multi-use human service functions within existing and future facilities, where feasible.”]

Benicia, CA’s General Plan starts considering transportation in terms of health care access: “Provide and maintain affordable transportation services to and from health facilities (in and out of town), especially for the elderly and disabled.”

Some consideration has been given to the issue of physical access to care in the San Francisco Bay Area as well. There, the Transportation and Land Use Coalition published a report on access to a number of health-supporting resources, including health clinics and hospitals. This report included GIS analysis of access in 15 low-income communities. After the publication of the report, “Roadblocks to Health,” Bay Area groups formed collaborations across disciplines to address the issues identified.³⁹⁶ Actions taken included adding shelters and benches at bus stops, disseminating transit information in Spanish, increasing frequency of buses to community clinics and improving communication between health and transportation agencies. A proposed further initiative would add a step in the location process for all clinics (nonprofit and county health department) and to ensure that transportation access is a key factor.³⁹⁷

Access to health care has to do with financial stability. The City can impact how much people spend on transportation and housing, and where good jobs are located, which all impact access to care. Any action that the City takes to improve access to health care must be carefully coordinated with private and public providers, especially with Multnomah County.

³⁹⁵ Katz, M. 2008. Golden gate to health care for all? San Francisco’s new universal-access program. *New England Journal of Medicine* 358 (4):327-329

³⁹⁶ Hobson, J and Quiroz-Martinez. 2002. Roadblocks to Health: Transportation Barriers to Healthy Communities. Retrieved on 12/19/2008 from <http://transformca.org/resource/roadblocks-health>

³⁹⁷ Transportation and Land Use Coalition. 2006. Priorities for Access to Health. Retrieved 12/19/2008 from <http://transformca.org/resource/priorities-access-health>

CHAPTER 10: POLICY CONCLUSIONS

KEY FINDINGS

The City of Portland currently lacks a Comprehensive Plan goal regarding community health.

The City of Portland can influence community health by considering of health during the planning process and through support of policies, programs, and investment priorities conducive to improving health determinants and encouraging healthy behavior choices. Specifically, the Bureau of Planning and Sustainability can focus efforts for the Portland Plan to direct urban development in a manner supportive of community health and economic, educational and social equity. A planning goal describing our commitment to health would further support and engrain health in the City's comprehensive planning framework.

Without health as a planning lens, future decisions made through the Portland Plan may cause unintended consequences that counter to our community's physical and mental health. In addition, some local health disparities could be ameliorated with careful planning. The City should explicitly consider health when making planning and investment decisions to create a physical environment that makes the healthy choice the easy choice. To inform the consideration of health in planning decisions, the City should also establish working partnerships with local and regional health agencies and experts.

A number of the City's goals and policies work to promote and protect the health of Portlanders.

The City of Portland's current Comprehensive Plan includes a broad range of policies that work to promote health. The City's coordinated land use and transportation, housing, economic development, environmental and public safety policies set a strong foundation for protecting and promoting health in our community.

Current Comprehensive Plan goals and policies include limited connections to the health of Portlanders.

The language of many of the City's current Comprehensive Plan policies does not refer to people or human health. Refocusing the language of these policies to highlight their intended impacts on health would reestablish their foundational purpose – to protect and improve the lives and health of Portlanders. The most significant health related policy gaps in the City's current Comprehensive Plan center on access to healthy food and inclusion of health in planning processes.

The City's current Comprehensive Plan does not include policies related to healthy food access or to the inclusion of health partners and issues in planning processes.

Potential policy areas to promote greater access to health foods should center on improving walkability and access to healthy food outlets, removing zoning and land use barriers that restrict the siting of healthy food outlets, providing land for growing food in appropriate locations, and utilizing incentives, economic development tools, and education to support the expansion of local producers, processors, distributors and retailers.

To better integrate consideration of public health in planning decisions, the City should establish partnerships and policies that support collaboration between local health officials, the community

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and planners in setting planning policy and priorities. Partnerships should extend to improve the tracking of health information, the development and modeling of best practices and the incorporation of health impact assessments into planning processes.

Potential Policy Areas

This section provides key health-related policy areas and sample policies for a variety of traditional planning topics. The sample policies were gleaned from a scan of health-oriented municipal and county planning documents from around the country.³⁹⁸ The policies listed are not intended to represent a recommended list; in fact, the City's current Comprehensive Plan includes similar policies in many areas. Instead, it is intended to demonstrate how health can be integrated into a variety of traditional comprehensive planning topics and provide an overview of key policy areas.

Access to Healthcare

- **Distribution of Facilities:** Encourage the location of health clinics and services throughout the community and in underserved or high-need areas.
- **Transit Access:** Work with local transit agencies to develop transit routes that connect residents to health service facilities. Ensure service especially from neighborhoods with higher proportions of transit dependent populations such as low-income households, seniors and people with disabilities.

Economic Development

- **Access to Opportunity:** Ensure that all residents have access to economic opportunities that provide the material and social means for human development.
- **Workforce Development:** Ensure a strong workforce that can compete in the regional economy. Provide workforce development programs including education, training and recruitment. Attract quality businesses and industries to the city
- **Quality Jobs:** Attract and retain quality jobs in the City. Provide adequate employment opportunities for residents. Quality jobs are safe and provide wages that are sufficient for meeting basic human needs, time off for illness and leisure, autonomy and opportunities for skill development. Adopt a local first hire ordinance that provides incentives to new businesses that hire a minimum of 30 percent local residents.
- **Local Business:** Promote locally-owned and cooperative enterprises and businesses in the city. Maximize economic and community benefits. Create a small business development program for the city. Work with the chambers of commerce.

³⁹⁸ Policies are excerpted from the following sources:

City of Portland, Comprehensive Plan

City of Richmond, CA, "City of Richmond General Plan, Community Health and Wellness".

Cohen, D. et al. "How neighborhoods can reduce the risk of obesity", RAND Corporation, 2007.

Morris, M. "Planning and Designing the Physically Active Community", American Planning Association, 2006.

Morris, M. et al. "Integrating Planning and Public Health: Tools and Strategies to Create Healthy Places", American Planning Association, 2006.

Nutrition Council of Oregon and Oregon Coalition for Promoting Physical Activity, "A Healthy, Active Oregon: Statewide Physical Activity and Nutrition Plan, 2007-2012." Online:

http://www.oregon.gov/DHS/ph/pan/docs/PAN_rpt_07.pdf

Planning for Healthy Places and Raimi + Associates, "How to Create and Implement Healthy General Plans", 2008

- **Green Business:** Attract and retain green businesses in the City. Develop an incentives program to attract and retain green businesses, and for existing businesses to become clean and green. Coordinate with the workforce development, training and recruitment programs to ensure that green jobs benefit local residents.
- **Transit Access:** Support business districts in areas that are well served by public transit facilities.

Environment

Improve the quality of the built and natural environment in the City to support a thriving community and to reduce disparate health and environmental impacts, especially on low income and disadvantaged communities.

- **Outdoor Air Pollution:** Protect the population from impacts of stationary and non-stationary sources of pollution. Monitor and assess the impact of air pollution on health. Avoid locating new sensitive uses such as schools, childcare centers and housing in proximity to polluting mobile and stationary sources of pollution. Design buildings and public spaces to mitigate poor air quality.
- **Outdoor Air Pollution – Transportation:** Promote alternative transportation and reduce vehicle miles traveled.
- **Indoor Air Pollution:** Promote healthy indoor air quality.
- **Natural Resources:** Protect, restore and enhance natural resources. Natural sources include creeks, shoreline, hillsides, natural habitat, tree canopy and open space, especially in new development and redevelopment projects. Develop a conservation plan and funding mechanism to identify, protect and enhance natural resources in the city.
- **Brownfield Redevelopment:** Ensure that contaminated sites in the City are adequately remediated before allowing new development. Engage the community in overseeing remediation of toxic sites and the permitting and monitoring of potentially hazardous industrial uses. Develop a response plan to address existing contaminated sites in the city. Coordinate with regional, state and federal agencies. Include guidelines for convening an oversight committee with community representation to advise and oversee toxic site cleanup and remediation on specific sites in the city. Address uses such as residential units, urban agriculture and other sensitive uses.
- **Noise Buffers:** Ensure adequate buffers or noise mitigation measures between sensitive uses. Sensitive uses include residential units and major noise polluters such as roadways, railroads, port and heavy industry.
- **Energy:** Encourage the production of renewable energy and use of fuel-efficient or renewable technologies in the City.
- **Pest Management:** Protect sensitive areas in the city from harmful effects of pesticide use. Develop an Integrated Pest Management (IPM) Plan to restrict the use of harmful pesticides, especially in sensitive areas on city owned property. Sensitive areas include creeks, wetlands, other natural habitat, and urban agriculture. Develop an incentives program to encourage private land owners to restrict the use of pesticides, especially in sensitive areas.

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- Stormwater Management: Reduce surface water run-off in urban areas to protect water quality in the creeks, wetlands and rivers.
- Sustainable Development and Practices. Promote green and sustainable development in the city to support a healthy local economy, protect the environment and improve the health and quality of life of residents.
- Green Infrastructure: Promote “green” infrastructure in the city that relies on natural processes. Green infrastructure may include storm water drainage and flood control, thereby reducing environmental impacts and energy consumption.
- Greening: Prioritize “greening” efforts to keep air and water clean. Trees and other vegetation slow erosion and filter pollutants from water and air while reducing the heat island effect and ozone formation.

Food

- Grocery access: Identify grocery access as a priority for economic development and provide fast-track permitting for grocery stores in underserved areas. Establish a walkability standard (e.g., a quarter- to half-mile) for access to retailers/sources of fresh produce as part of the 20-minute neighborhood concept.
- Access to healthful foods: Encourage convenience stores, liquor stores and ethnic food markets, especially in areas with limited access to full-service grocery stores, to carry fresh produce through incentives programs or otherwise.
- Access to land: Provide land for growing food through using City or other public resources; require space for community gardens on multi-family housing developments; designate or prioritize vacant land, rights-of-way, easements and other lands for urban agriculture; encourage growing on rooftops.
- Direct marketing: Remove zoning and land use barriers to farm stands, farmers’ markets and CSA drop-off sites; support direct marketing by providing or helping to secure permanent market sites.
- Unhealthy food: Consider using zoning code provisions to avoid a concentration of unhealthy food providers or “formula” restaurants within neighborhoods and near schools. Make new chain retail stores conditional uses.
- Economic development: Assess and plan for local food processing/wholesaling/distribution facilities to connect local agriculture to markets such as retailers, restaurants, schools, hospitals and other institutions.
- Institutional purchasing: Support access to healthful foods through purchase; serve only food consistent with dietary guidelines in government-owned buildings and at events.
- Education and research: Disseminate information about healthful eating habits; offer residents classes in gardening, cooking or composting; encourage or support community food assessments as important tools to identify the needs of specific communities.

Health in Planning Process

- **Collaboration with Local Public Health Agencies:** Develop regular channels of communication and collaboration between local health officials and planners. Local public health officials should advise planners on their ability to impact the health of residents.
- **Track Health Information:** Establish procedures to track community health information systematically and in ways appropriate for use in built environment decisions.
- **Model Best Practices:** Model best practices related to promoting healthy communities at government offices and government-organized events.
- **Community Involvement:** Local government agencies, including planning and public health, should work collaboratively with the community to develop and achieve the general plan's vision for a healthy community.
- **Health Impact Assessments (HIAs):** Incorporate health impact assessments into planning processes.

Housing

- **Aging in Place:** Encourage housing construction that is accessible and visitable and that allows aging in place to increase access to housing by the elderly and disabled communities.
- **Affordability:** Ensure an adequate supply of quality affordable housing in the City to promote stable and integrated communities, and to provide healthy living conditions for all residents.
- **Access to Services:** Ensure that affordable housing units are located close to amenities. Community and retail amenities include park, full-service grocery store, transit stop and retail and public services.
- **Housing Quality:** Ensure that housing units protect public health and safety. Address lead and asbestos contamination, structural safety, and deferred maintenance in existing homes in the city, especially the affordable housing units.
- **Range of Housing:** Provide a range of housing types to meet diverse needs in the City.
- **Mixed Income:** Strive to eliminate residential segregation and concentrations of poverty by promoting affordable housing that is integrated into mixed-income neighborhoods.
- **Homelessness:** Ensure an integrated system of care for people experiencing homelessness. Develop a homeless plan to provide shelters and transition facilities, with wrap-around programs and services for people dealing with homelessness, substance abuse and mental health.
- **Green Building:** Promote green building practices that support "healthy homes".
- **Community Cohesion:** Support cohesive neighborhoods and lifecycle housing to promote health and safety.

Land Use and Development

- **Green Building:** Update the building code to support, provide incentives for, or require compliance with "green building" practices.

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- Site design and urban development: Encourage pedestrian-oriented urban design and streetscapes that encourage physical activity.
- Encourage mixed-use, pedestrian, bicycle and transit-oriented development, particularly along major corridors and surrounding transit nodes.
- Jobs and Housing Location: Balance commercial and residential development to reduce the number of people who must commute a long distance of work; prioritize commercial/economic development strategies that match jobs to existing residents' skills and employment needs.
- Locate sensitive uses, such as schools and multi-family housing, away from environmental hazards, such as highways and wetlands.
- Density Minimums: Establish density minimums for residential, commercial, and retail development to ensure development that supports transit and walkable environments
- 20-Minute (or Complete) Neighborhoods: Promote the concept of "20-minute communities," where people can walk to reach services, stores and civic amenities like parks and libraries, to encourage walking and biking and improve community cohesion.

Parks & Recreation

- Level of Service: Establish and fund high level of service standards for parks and recreation areas.
- Sufficient Networks: Ensure that Portland has an extensive system of parks, recreation facilities and natural areas to adequately serve current and future needs of residents.
- Public Access: Ensure that all Portland residents have access to adequate and quality park and recreation opportunities that support increased physical activity, improved mental health and greater social cohesion.
- Walkability: Set a walkability standard for residents' access to parks and recreational facilities.
- Public Spaces: Promote diverse public spaces that provide pleasant places for neighbors to meet and congregate.
- Transportation Access: Promote pedestrian, bicycle and public transit connections between residential neighborhoods and parks, recreation facilities and open space.
- Quality: Ensure that parks, recreation facilities and open spaces are well maintained and safe for families, children and seniors.
- Joint-Use: Encourage school districts, parks and recreation departments and local non-profits to collaborate on shared use of facilities, especially in neighborhoods that suffer a disproportionate lack of recreational facilities and in areas where schools have inadequate play areas.

Transportation

- Comprehensive Transportation Networks: Provide a comprehensive and continuous system of active transportation modes in the city. Improve mobility through pedestrian, bicycle and transit networks that connect residents and key destinations (including employment centers,

healthy food retail outlets, retail services, educational institutions, parks and recreation and community facilities), especially in underserved neighborhoods.

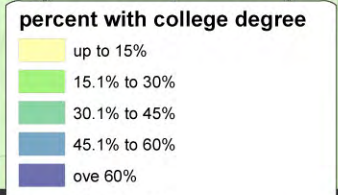
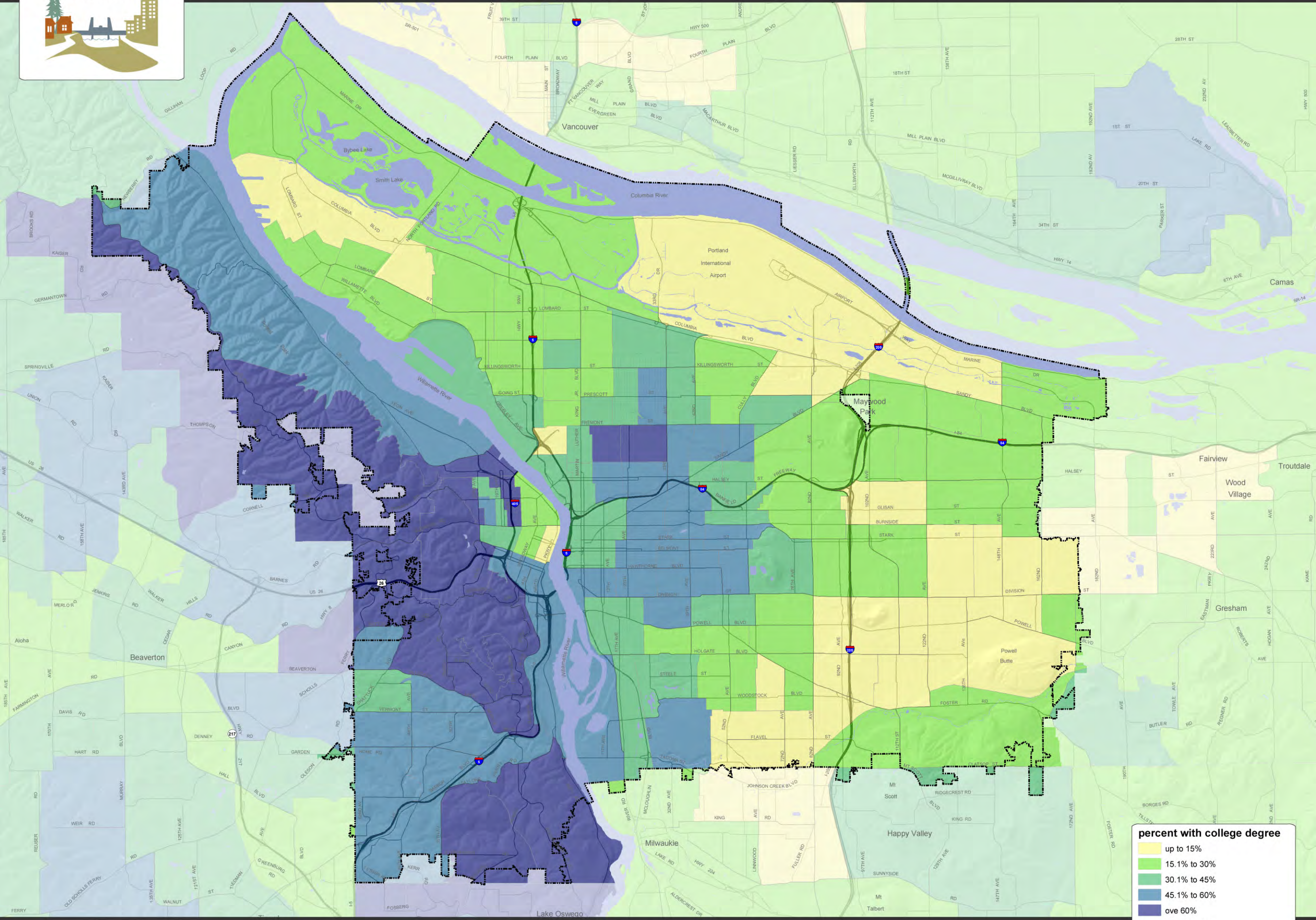
- **Access to Safe Active Transportation.** Ensure that all residents have access to adequate and safe public transit and active transportation options that reduce dependence on fossil fuels, improve safety, increase physical activity, reduce air and noise pollution and make streets safe for people of all ages.
- **Street Connectivity:** Adopt roadway design guidelines that enhance street connectivity
- **Level of Service Standards:** Establish level of service standards and/or design guidelines for a range of users, including access for bicyclists and people with disabilities. Require the transportation network to meet level of service standards for pedestrians and cyclists in addition to those established for cars.
- **New Development:** Require new development and redevelopment projects to provide pedestrian and bicycle amenities including bikeways, sidewalks, secured bicycle parking signage and other streetscape improvements, as appropriate.
- **Pedestrian Access:** Set a walkability standard (e.g., a quarter- to half-mile) for residents' access to daily retail needs and nearest transit stops. Support walkability audits to identify inconvenient or dangerous routes and prioritize infrastructure improvements in communities with the most need.
- **Dedicated Funding:** Require a dedicated portion of the transportation budget to go to pedestrian and cyclist amenities.
- **Traffic Safety:** Use traffic calming techniques (e.g., medians, refuges, street trees, on-street parking) to improve street safety and access.
- **Rail Safety:** Improve railroad crossings and minimize conflict with land use and transportation infrastructure in the city. Develop a railroad crossing plan that addresses safety and infrastructure improvements needed at all at-grade railroad crossings in the City.
- **Freight:** Plan truck routes that avoid neighborhoods and schools to minimize safety, noise and pollution conflicts.
- **Parking:** Reduce parking requirements for developments that locate near transit (e.g., within a quarter-mile of a transit stop) and that provide walking, biking and disability access facilities. Establish parking maximum (rather than minimum) requirements in pedestrian zones.



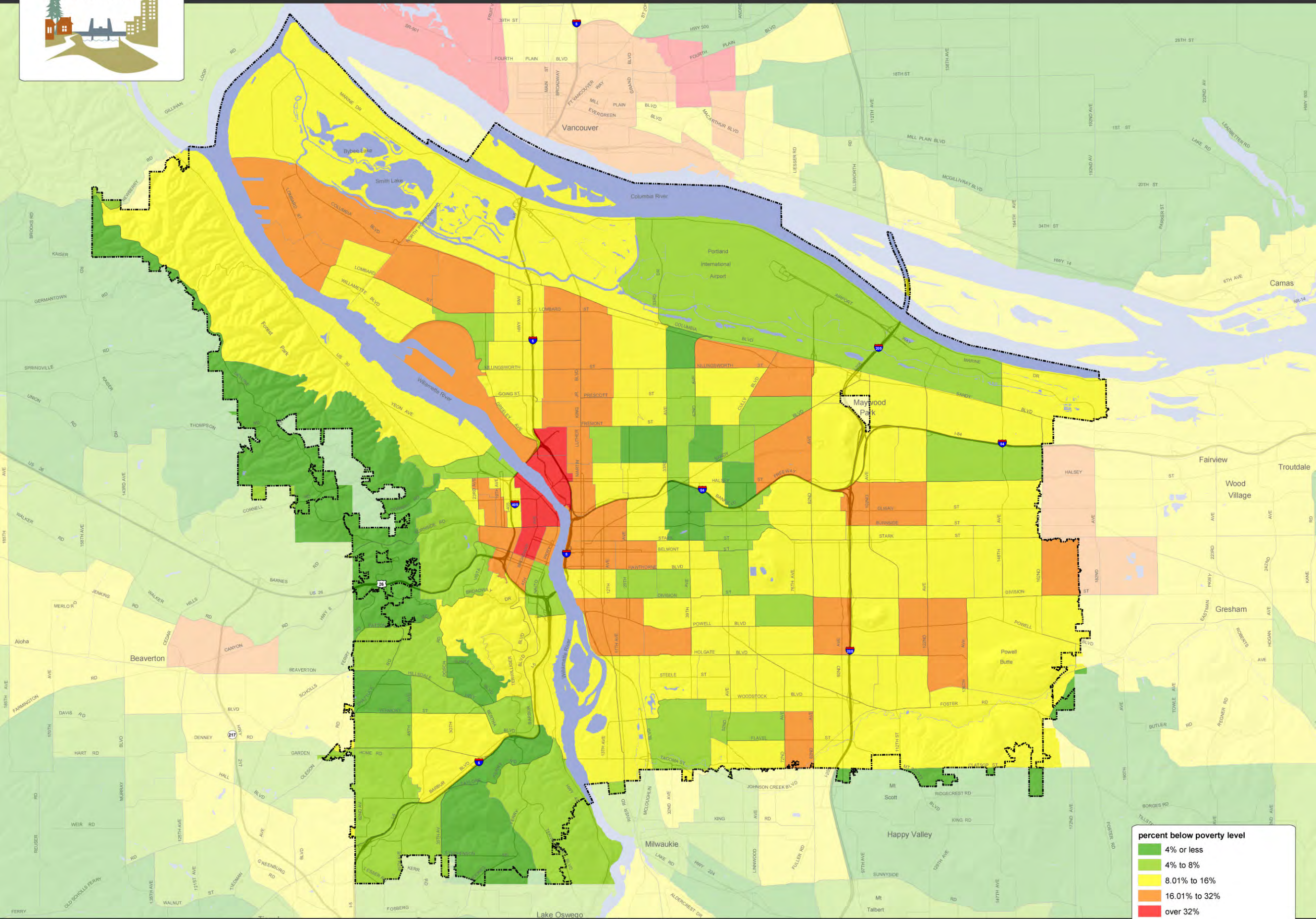
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MAPS

- Map 3.1 Educational Attainment of People in Portland
- Map 3.2 Portland Population in Poverty
- Map 4.1 Relative Risk of Lead and Asbestos in Housing
- Map 4.2 Radon Risk
- Map 5.1 High Crash Locations (Automobile)
- Map 5.2 High Crash Locations (Pedestrian)
- Map 5.3 Natural Hazard Zones
- Map 6.1 Full Service Grocery Stores, with Population Density
- Map 6.2 Full Service Grocery Stores, with Percent below Poverty Level
- Map 6.3 Fast Food and Chain Restaurants
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- Map 8.4 Play Area Inventory and Service Areas
- Map 8.5 Community Gardens
- Map 8.6 Community Garden Waiting List
- Map 9.1 Medical Facilities



census data:
2000 US Census data by census tract.



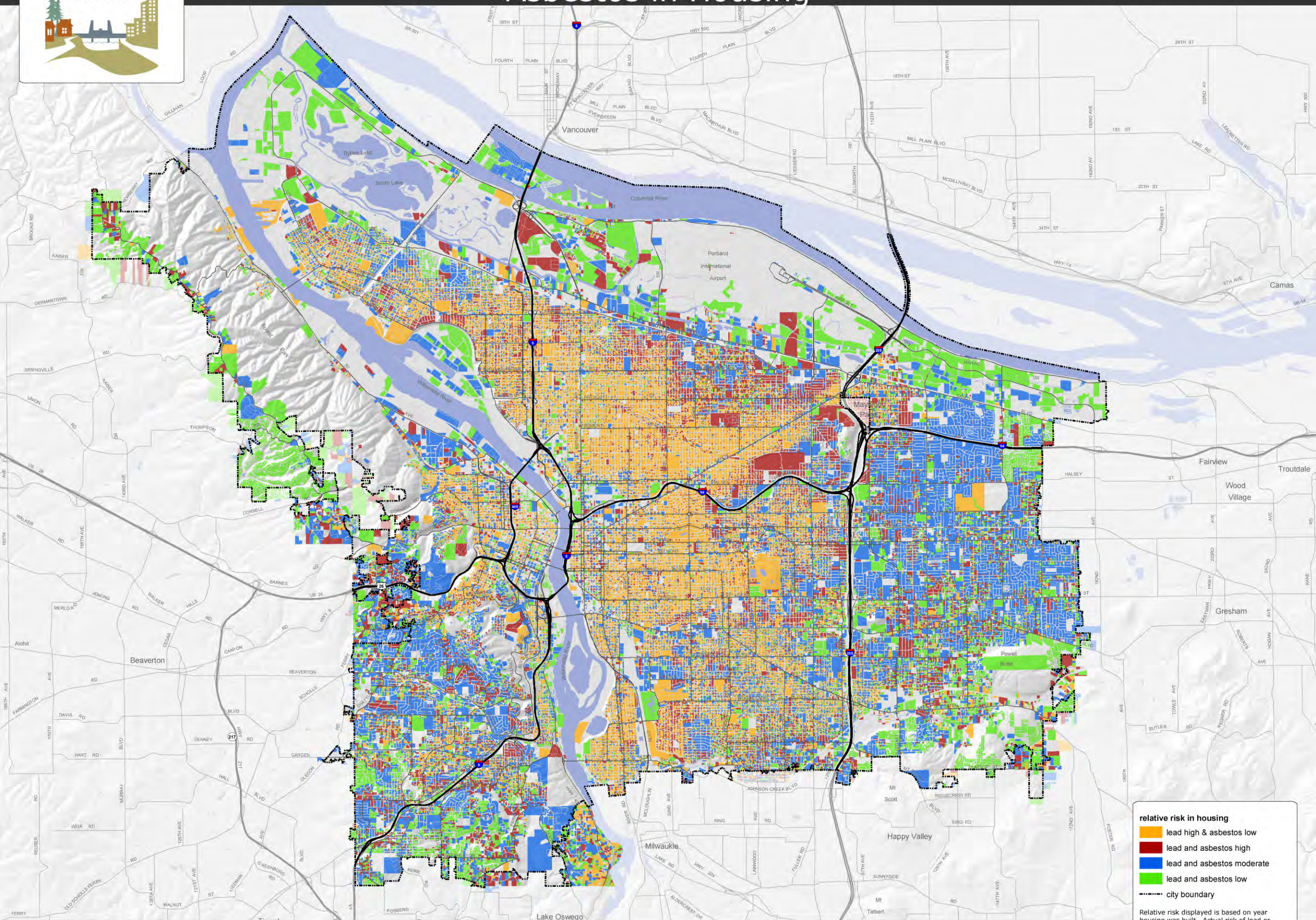
percent below poverty level

- 4% or less
- 4% to 8%
- 8.01% to 16%
- 16.01% to 32%
- over 32%

----- city boundary

census data:
2000 US Census data by census tract.

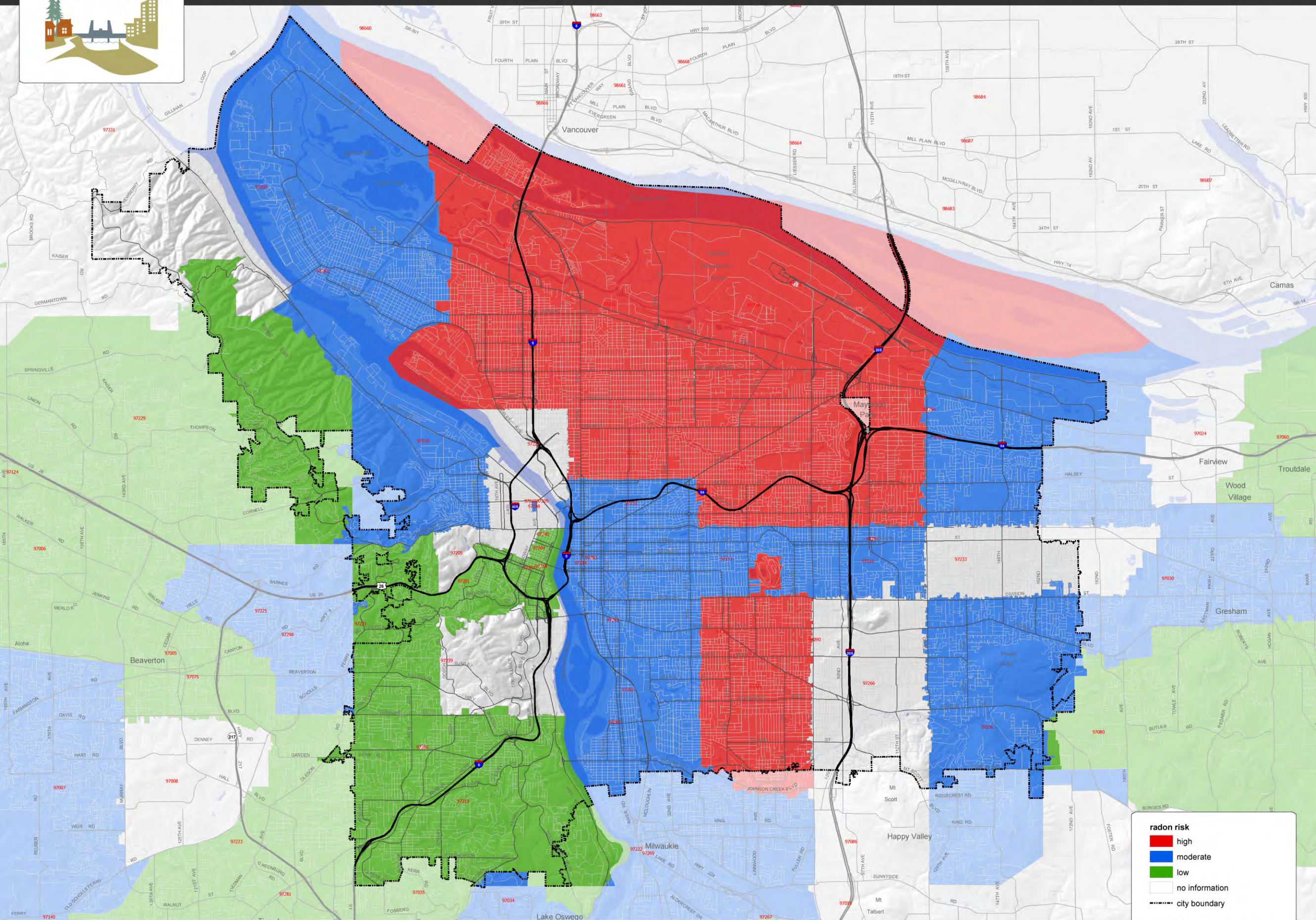




relative risk in housing

- lead high & asbestos low
- lead and asbestos high
- lead and asbestos moderate
- lead and asbestos low
- city boundary

Relative risk displayed is based on year housing was built. Actual risk of lead or asbestos exposure varies based on building materials and practices and whether remediation has occurred.

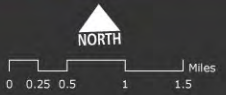


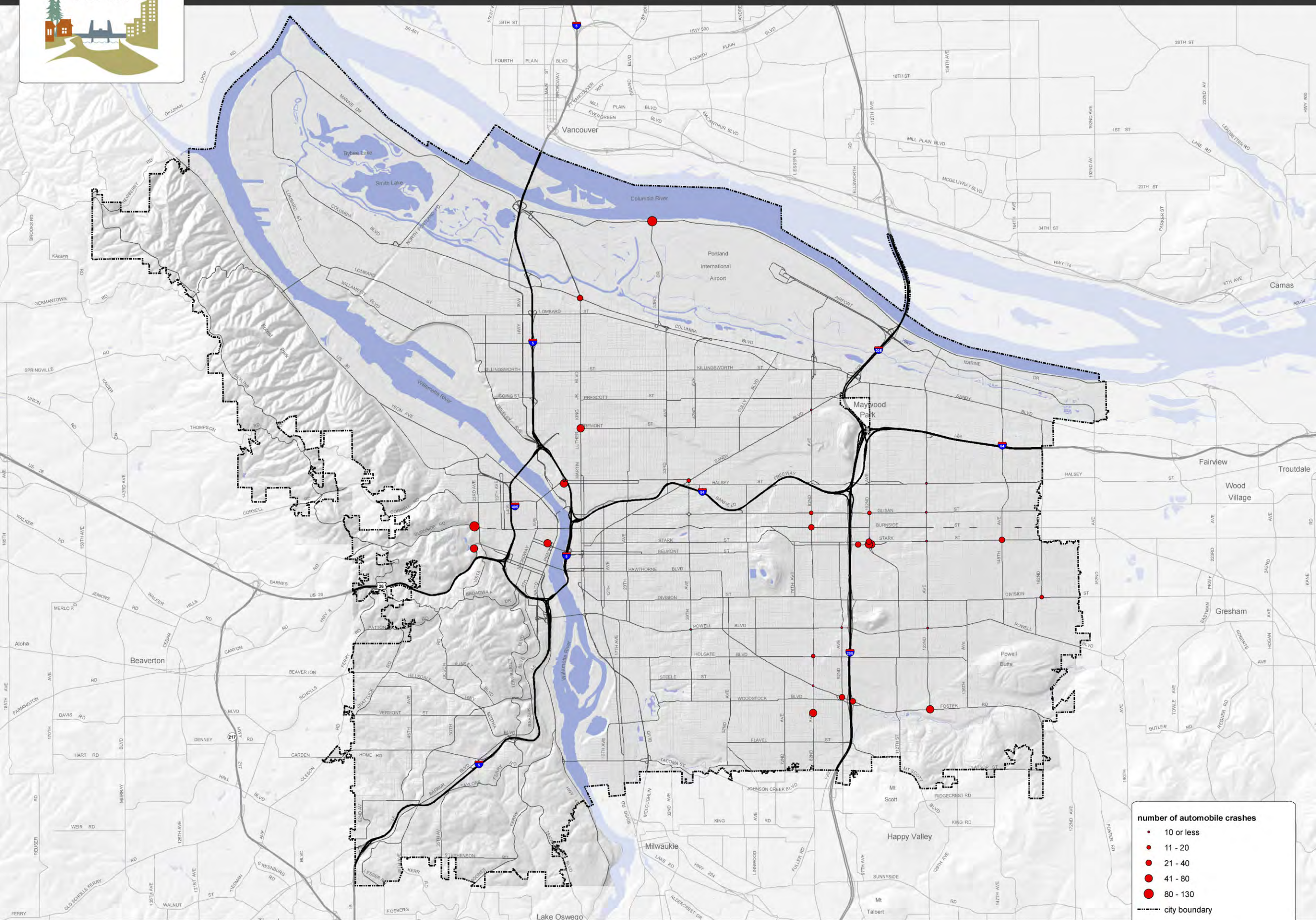
radon risk

- high
- moderate
- low
- no information
- city boundary

radon risk:
developed by Scott Burns, Dept. of
Geology, Portland State University,
Feb. 2003.

June 11, 2009 City of Portland | Bureau of Planning and Sustainability | Geographic Information System
The information on the map was derived from digital data-bases on the City of Portland, Bureau of Planning and Sustainability GIS. Care was taken in the creation of this map but it is provided "as is". The City of Portland cannot accept any responsibility for error, omissions, or positional accuracy, and therefore, it here are no warranties which accompany this product. However, notification of any errors will be appreciated.

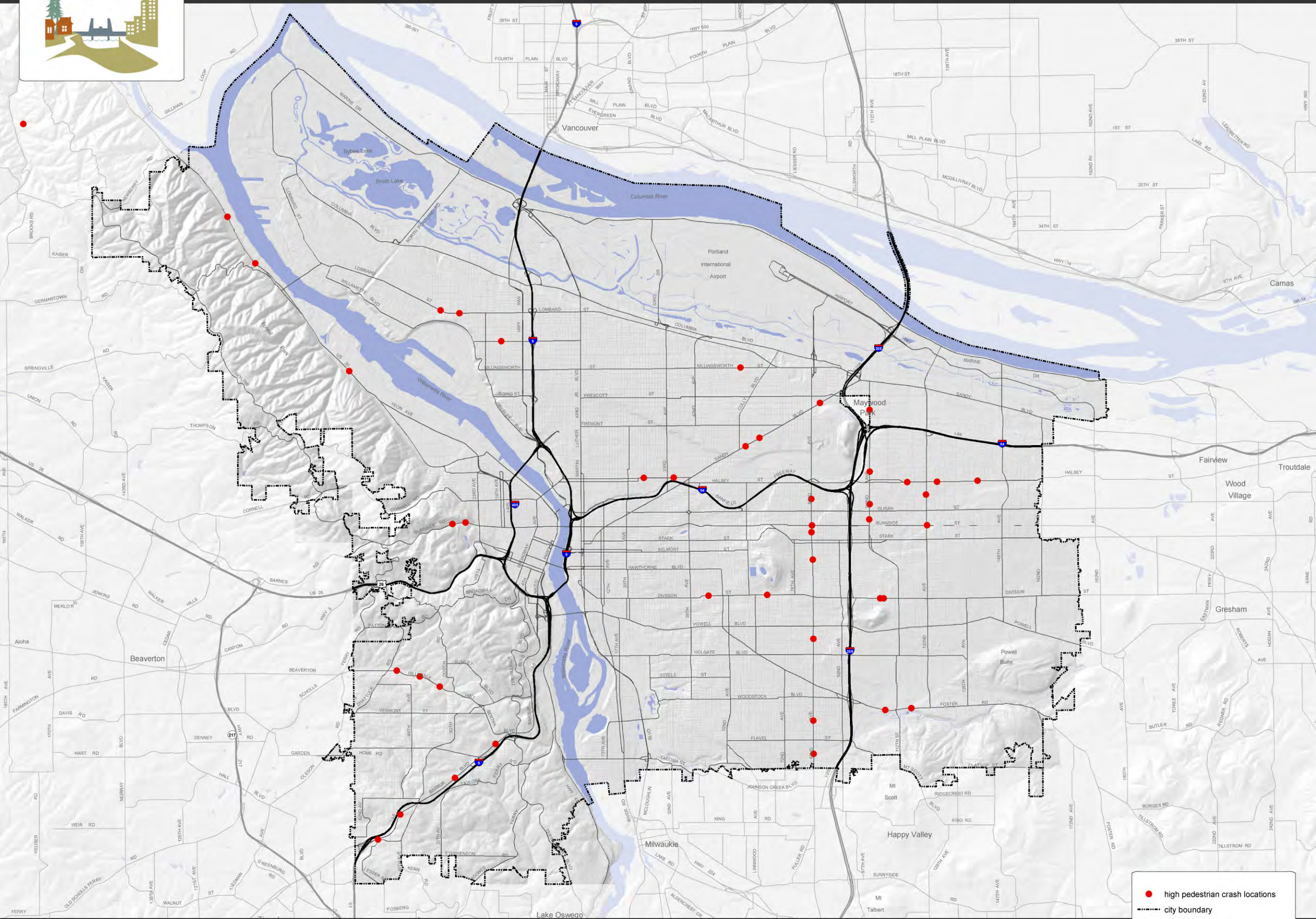




number of automobile crashes

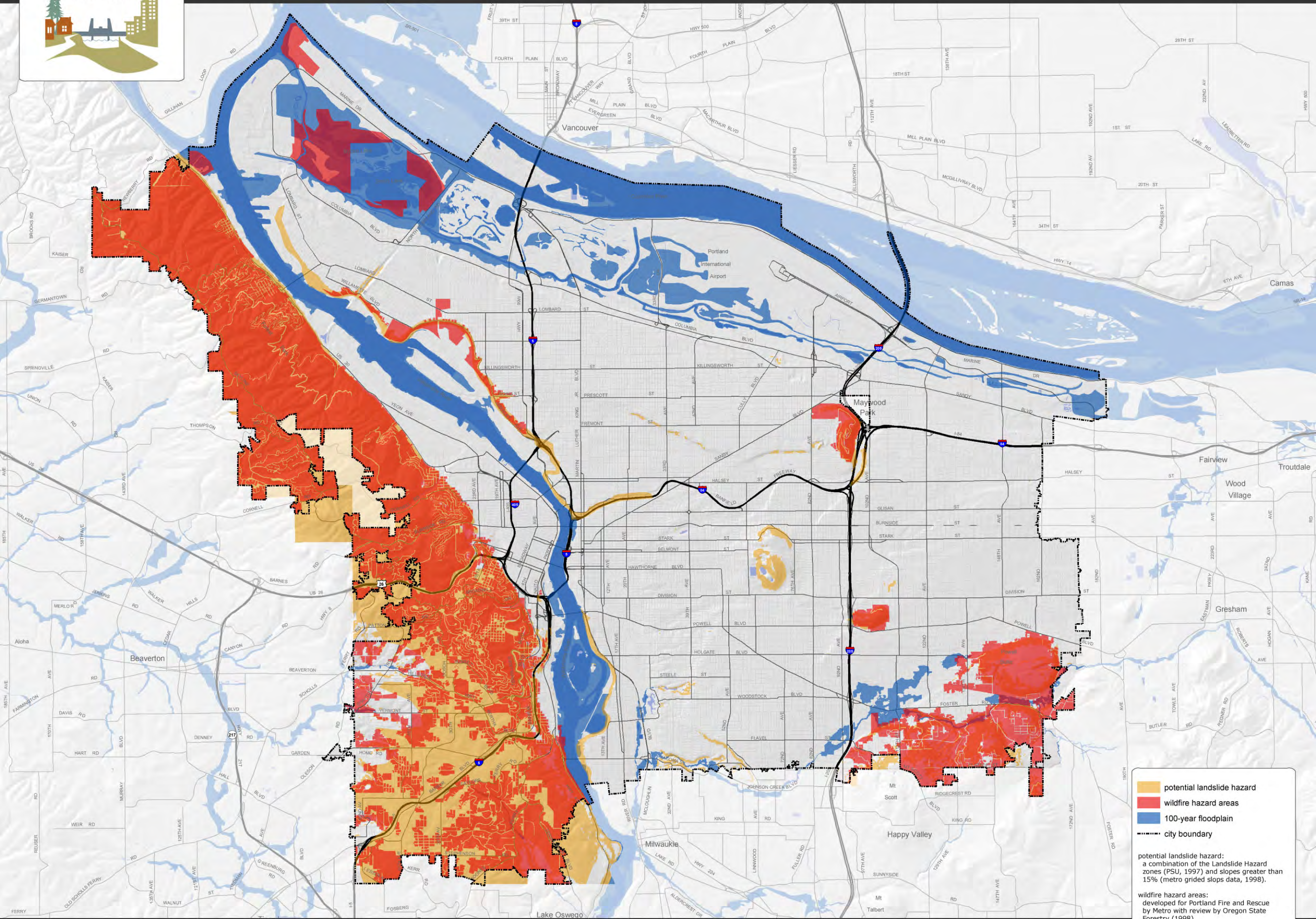
- 10 or less
- 11 - 20
- 21 - 40
- 41 - 80
- 80 - 130
- city boundary

automobile crashes:
developed by City of Portland, Bureau
of Transportation (Feb. 2008).



- high pedestrian crash locations
- city boundary

pedestrian crash intersections:
developed by City of Portland, Bureau
of Transportation (Feb. 2008).

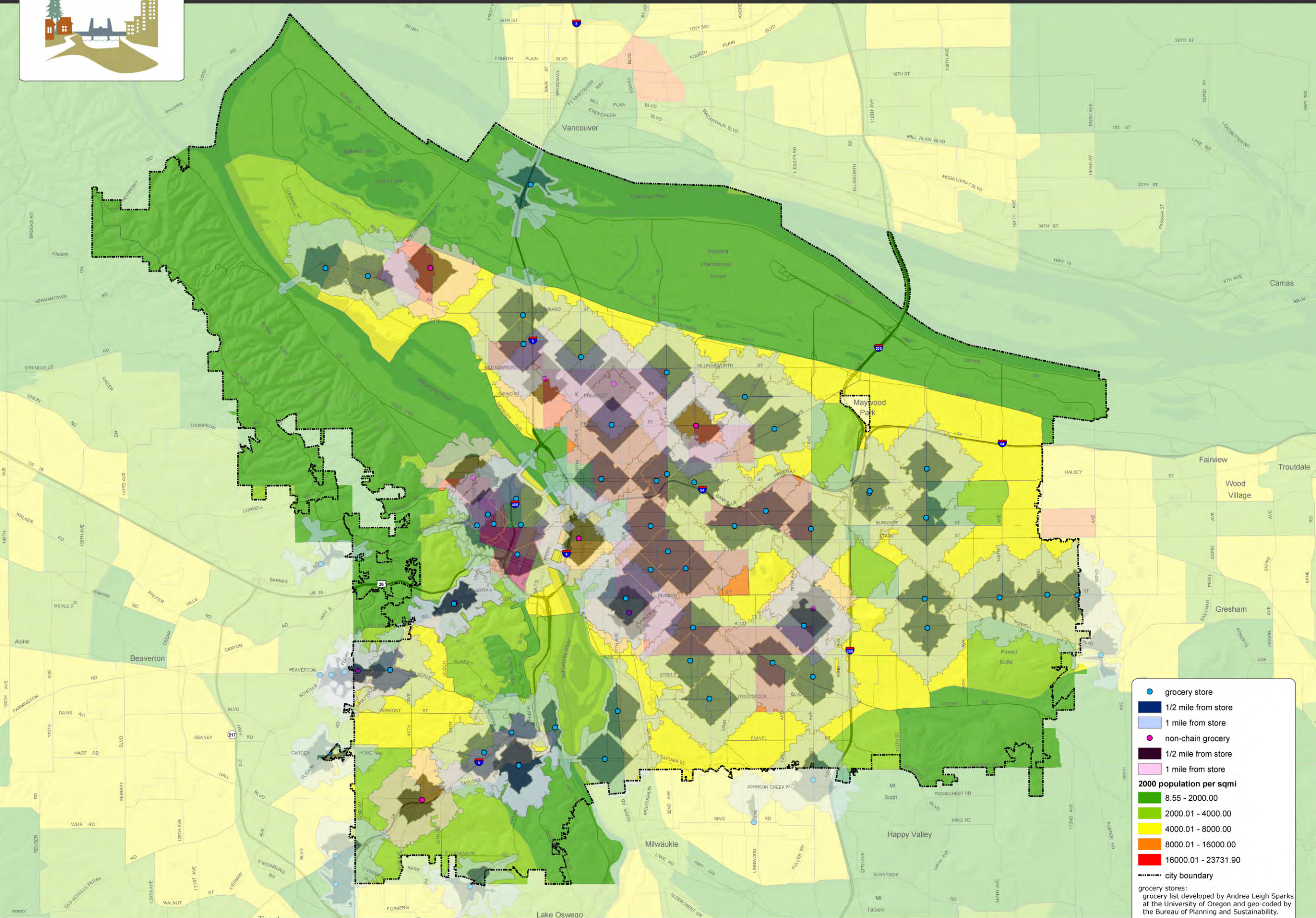


- potential landslide hazard
- wildfire hazard areas
- 100-year floodplain
- city boundary

potential landslide hazard:
a combination of the Landslide Hazard zones (PSU, 1997) and slopes greater than 15% (metro grided slopes data, 1998).

wildfire hazard areas:
developed for Portland Fire and Rescue by Metro with review by Oregon State Forestry (1998).

100-year floodplain:
FEMA 100-year floodplain updated Oct. 2004



- grocery store
- 1/2 mile from store
- 1 mile from store
- non-chain grocery
- 1/2 mile from store
- 1 mile from store

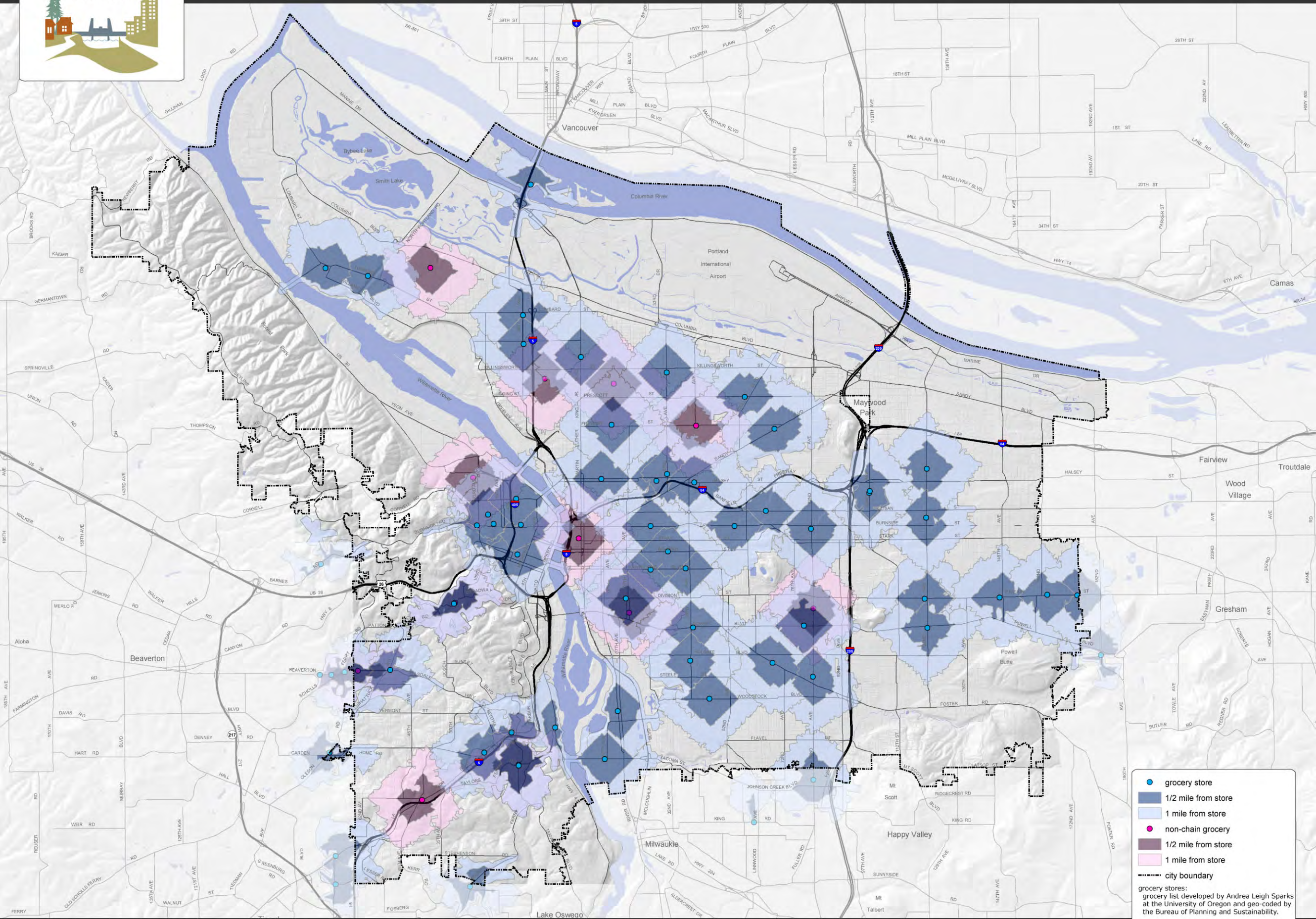
2000 population per sqmi

- 8.55 - 2000.00
- 2000.01 - 4000.00
- 4000.01 - 8000.00
- 8000.01 - 16000.00
- 16000.01 - 23731.90

----- city boundary

grocery stores:
grocery list developed by Andrea Leigh Sparks at the University of Oregon and geo-coded by the Bureau of Planning and Sustainability.

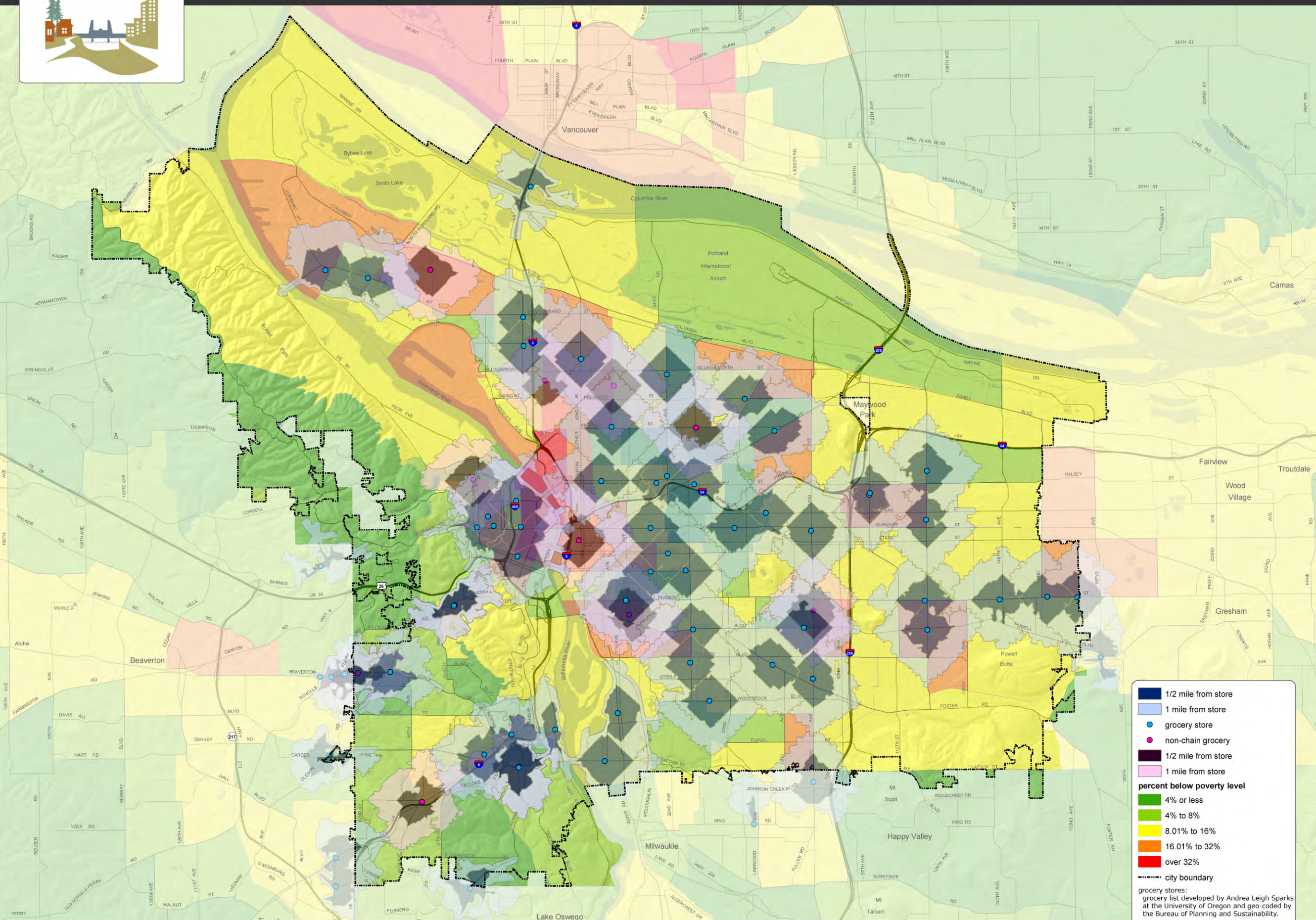
additional stores added by the Bureau of Planning and Sustainability, including food co-ops and a few other smaller or ethnic full-service stores.



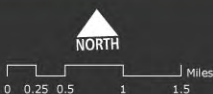
- grocery store
- 1/2 mile from store
- 1 mile from store
- non-chain grocery
- 1/2 mile from store
- 1 mile from store
- city boundary

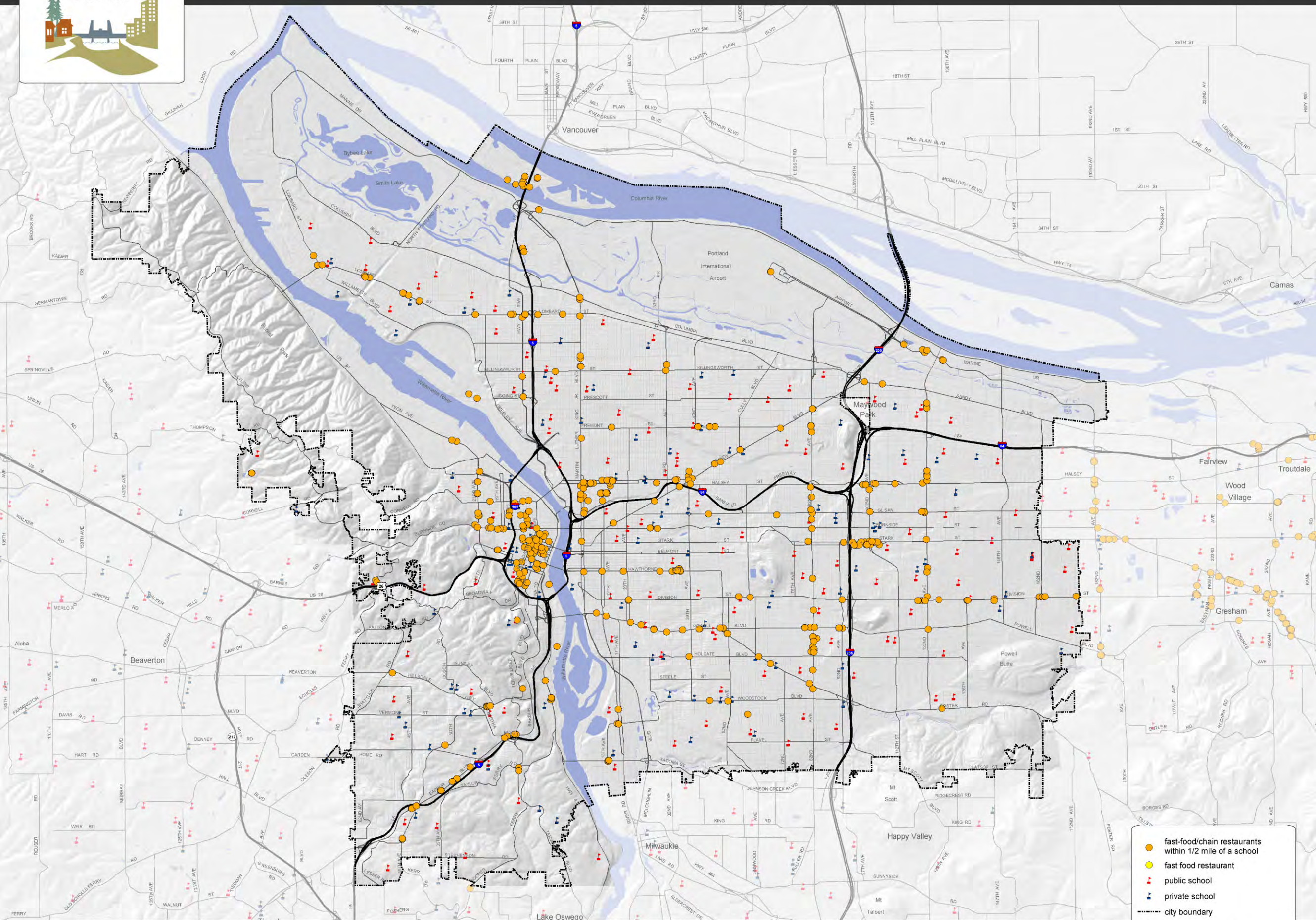
grocery stores:
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additional stores added by the Bureau of Planning and Sustainability, including food co-ops and a few other smaller or ethnic full-service stores.



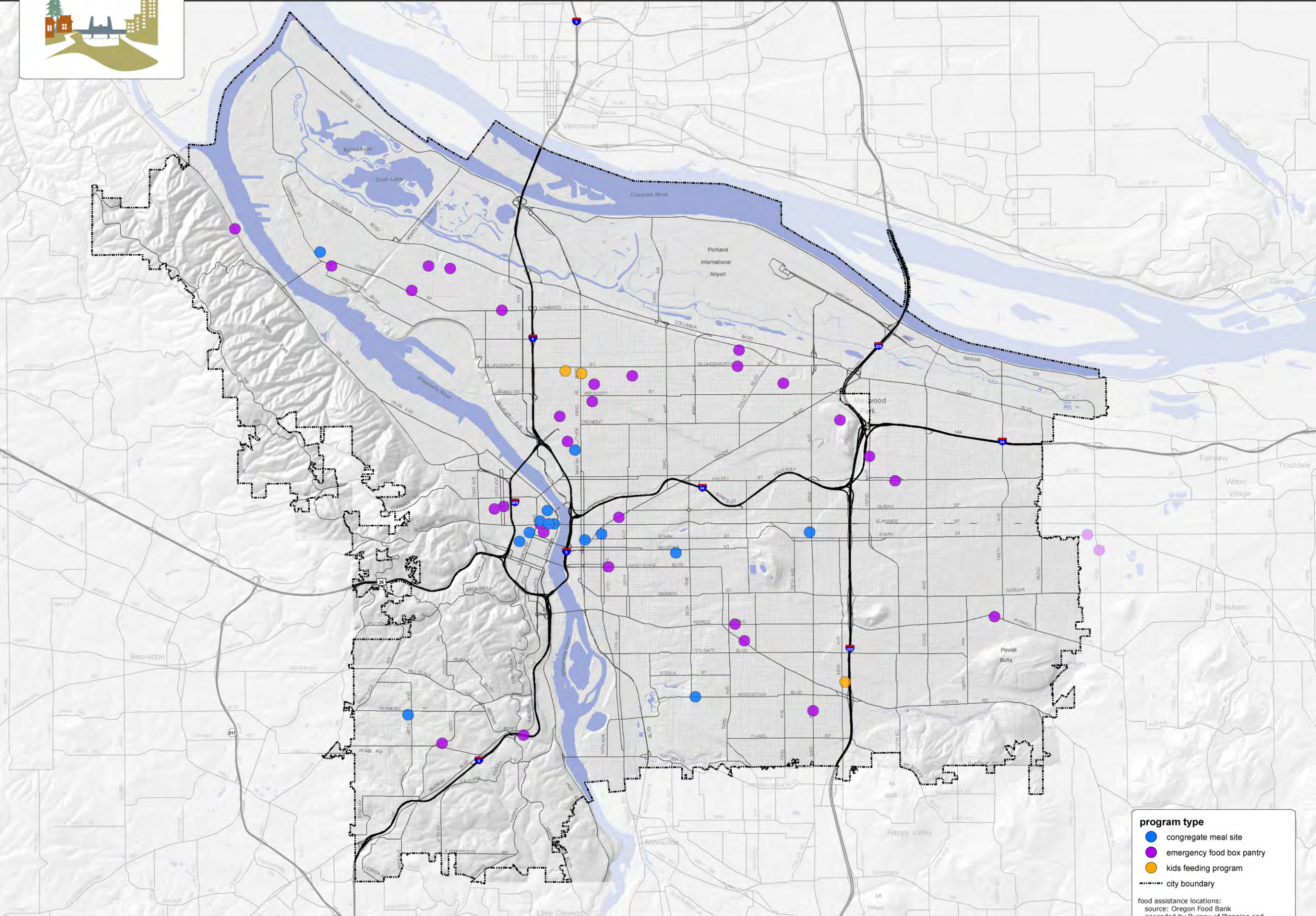
1/2 mile from store
 1 mile from store
 grocery store
 non-chain grocery
 1/2 mile from store
 1 mile from store
percent below poverty level
 4% or less
 4% to 8%
 8.01% to 16%
 16.01% to 32%
 over 32%
 city boundary
 grocery stores:
 grocery list developed by Andrea Leigh Sparks at the University of Oregon and geo-coded by the Bureau of Planning and Sustainability.
 additional stores added by the Bureau of Planning and Sustainability, including food co-ops and a few other smaller or ethnic full-service stores.





- fast-food/chain restaurants within 1/2 mile of a school
- fast food restaurant
- public school
- private school
- city boundary

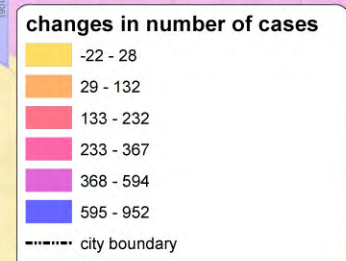
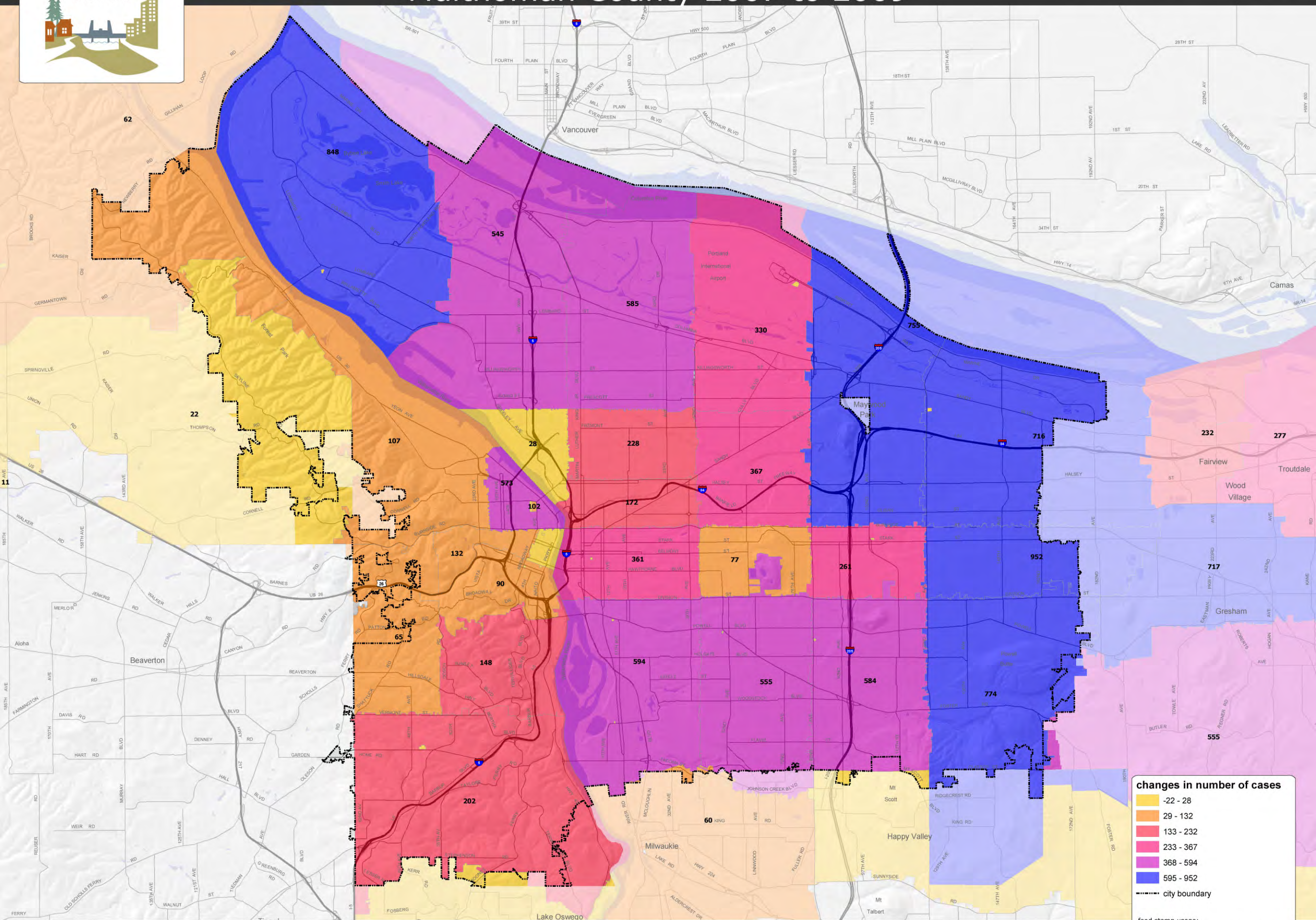
restaurants:
data provided by Multnomah County
Department of Health (Feb. 2008).
Location is approximate.



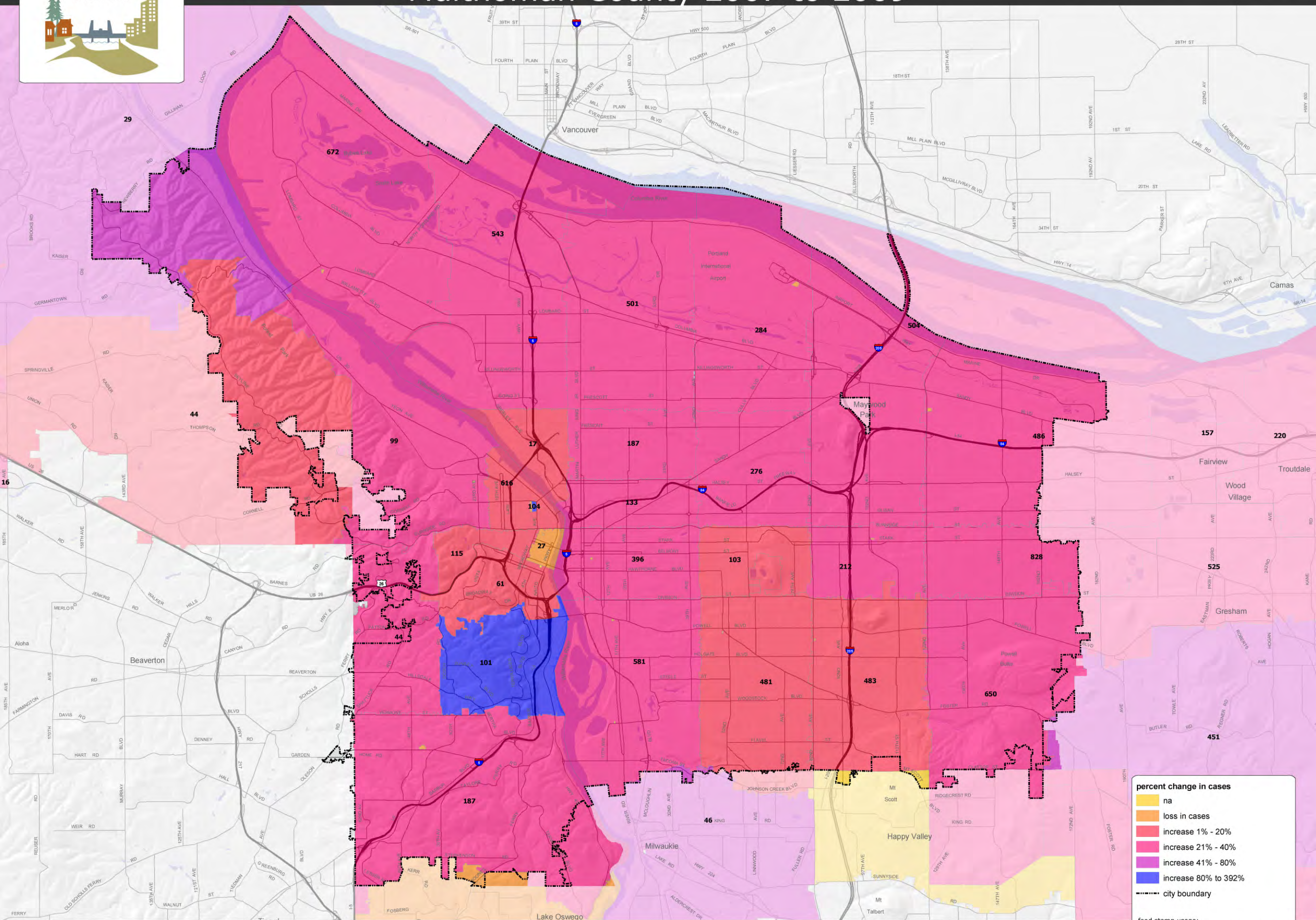
- program type**
- congregational meal site
 - emergency food box pantry
 - kids feeding program
 - city boundary

food assistance locations:
source: Oregon Food Bank
geocoded by Bureau of Planning and Sustainability (April 2009)

Note: Mobile Feeding Program (The Messenger Van) not mapped.



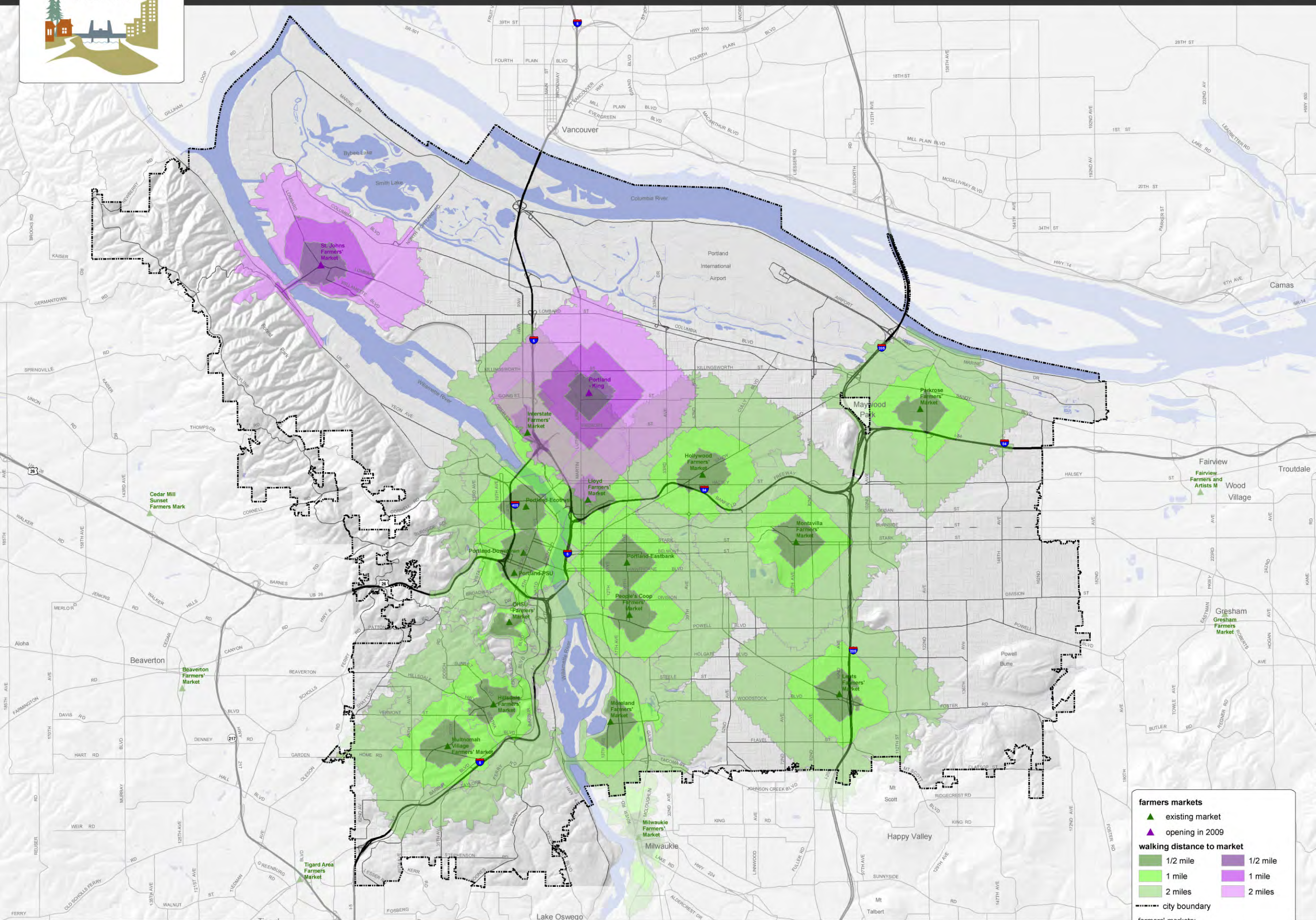
food stamp usage:
data provide by Multnomah County for
January 2007, February 2008 and
February 2009.



percent change in cases

- na
- loss in cases
- increase 1% - 20%
- increase 21% - 40%
- increase 41% - 80%
- increase 80% to 392%
- city boundary

food stamp usage:
data provide by Multnomah County for
January 2007, February 2008 and
February 2009.



farmers markets

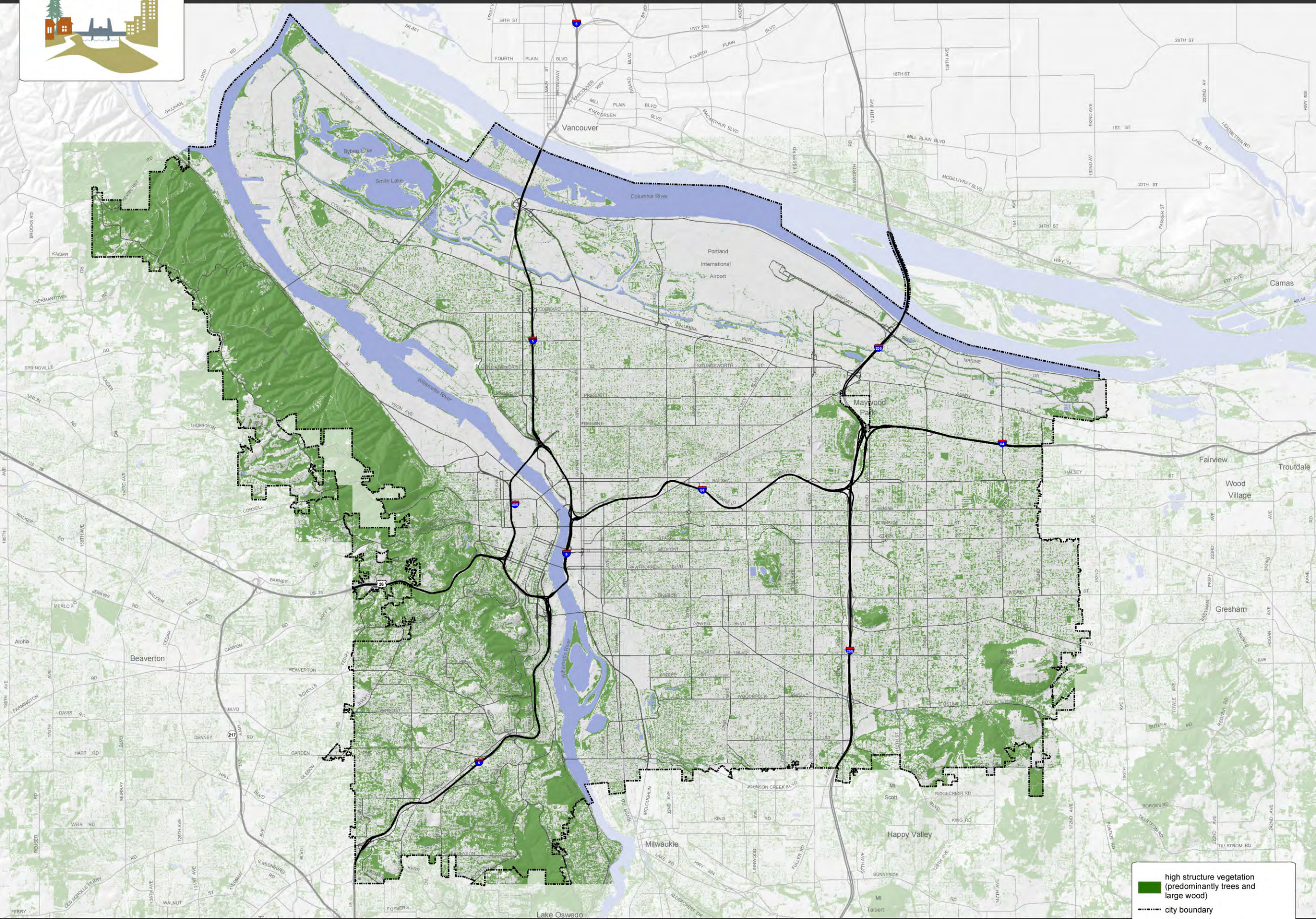
- ▲ existing market
- ▲ opening in 2009

walking distance to market

- 1/2 mile
- 1 mile
- 2 miles

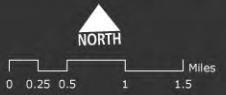
--- city boundary

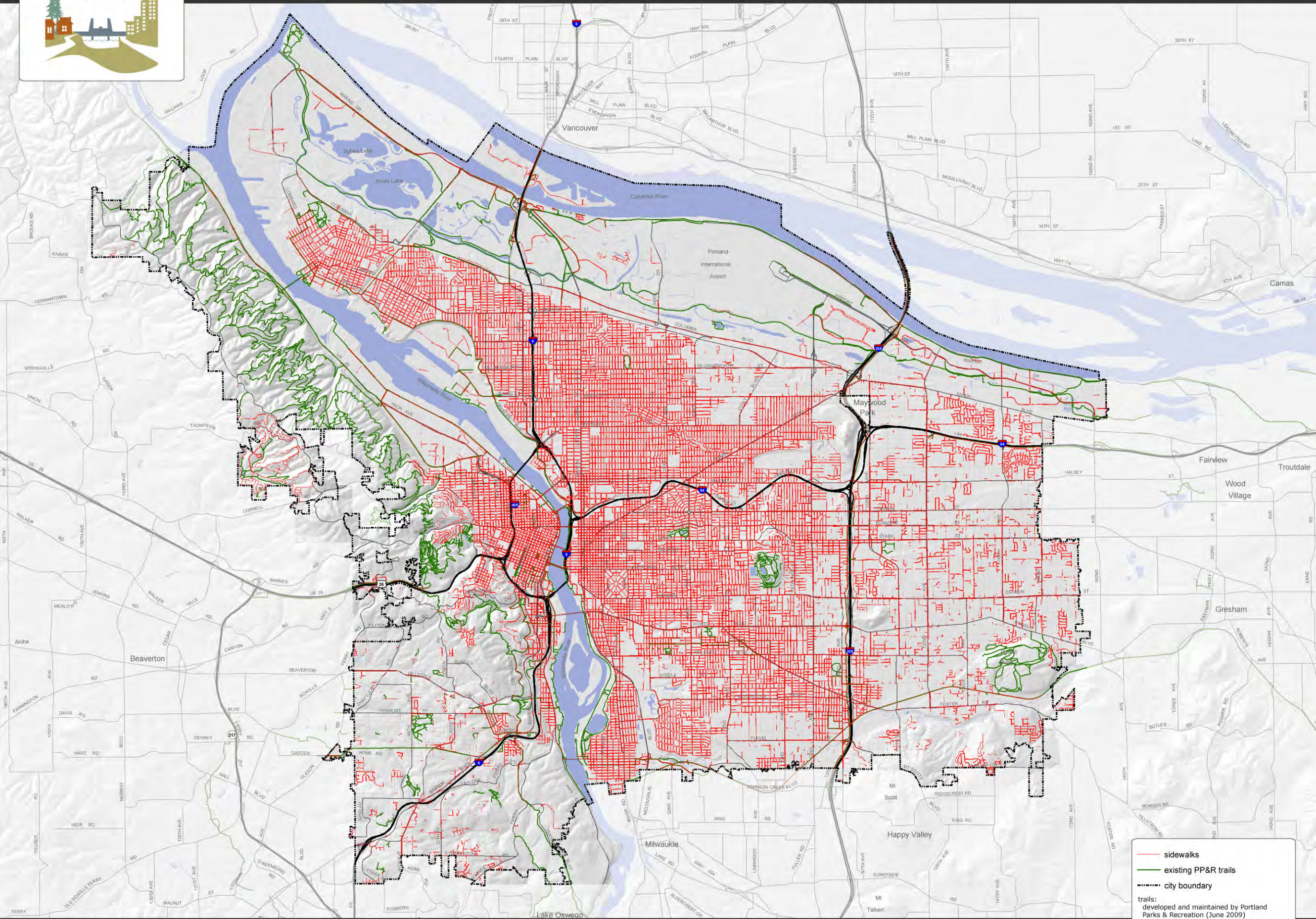
farmers' markets:
data compiled and mapped by Portland State University (2008). additional data mapped by Bureau of Planning from PACSAC.ORG website.



high structure vegetation (predominantly trees and large wood)
city boundary

high structure vegetation: developed by Metro using automated methods from 2007 color infrared photos.

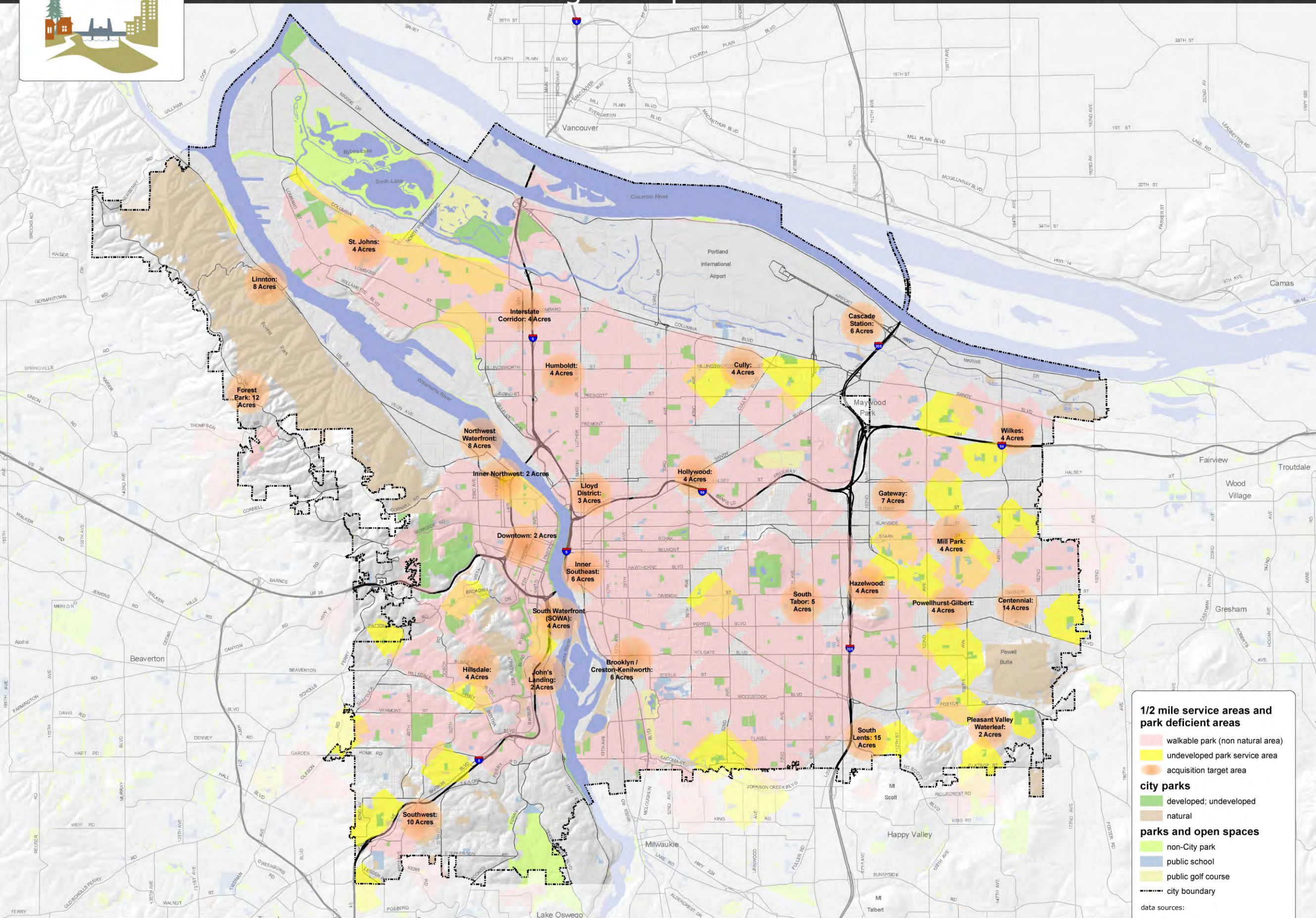




- sidewalks
- existing PP&R trails
- - - city boundary

trails:
developed and maintained by Portland Parks & Recreation (June 2009)

sidewalks:
developed by City of Portland, Bureau of Transportation (Feb. 2008).



1/2 mile service areas and park deficient areas

- walkable park (non natural area)
- undeveloped park service area
- acquisition target area

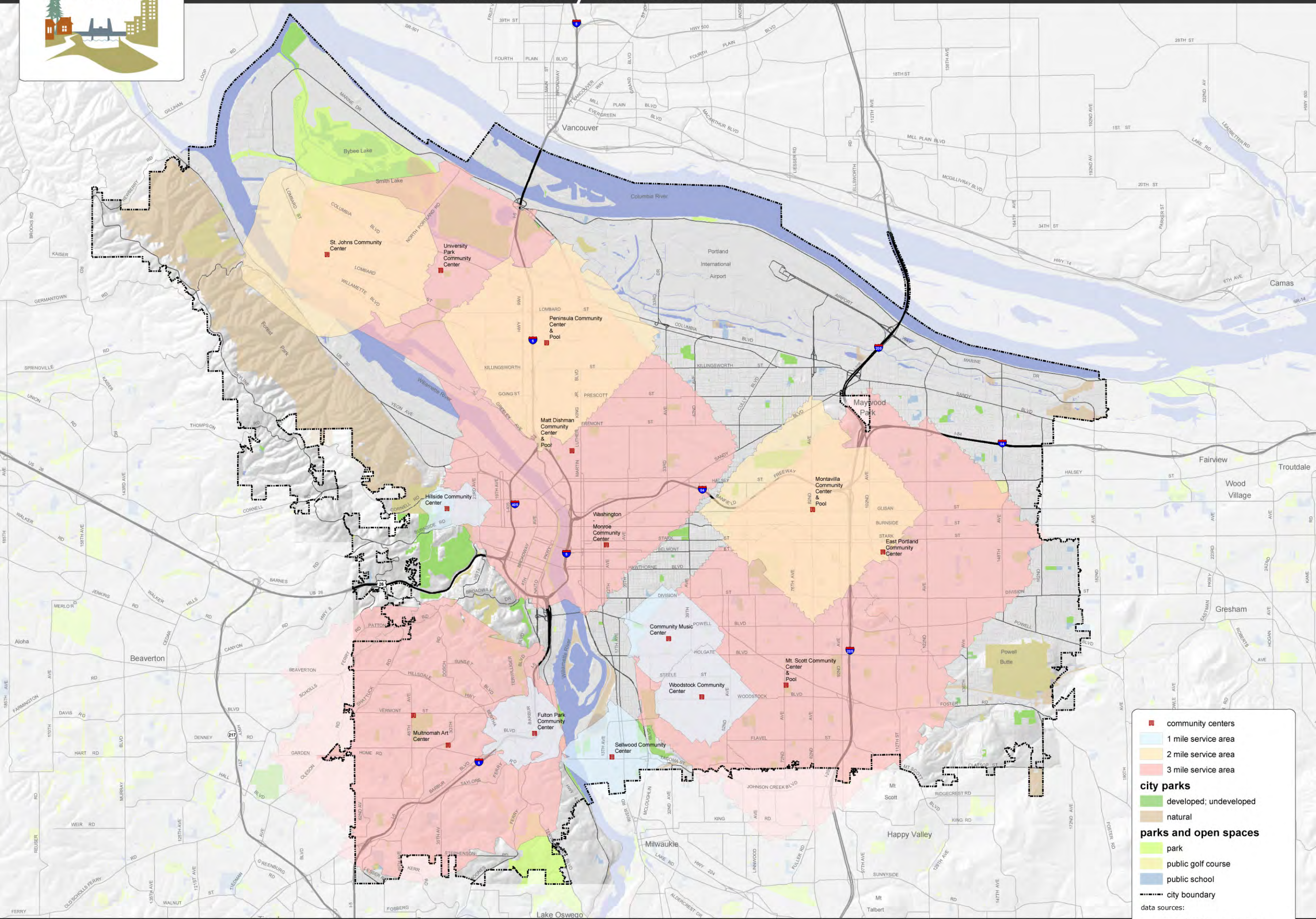
city parks

- developed; undeveloped
- natural

parks and open spaces

- non-City park
- public school
- public golf course
- city boundary

data sources:
 city parks and facilities maintained by Portland Parks & Rec (current June 2008).
 Other parks from Metro parks & open space (May 2008)



- community centers
- 1 mile service area
- 2 mile service area
- 3 mile service area

city parks

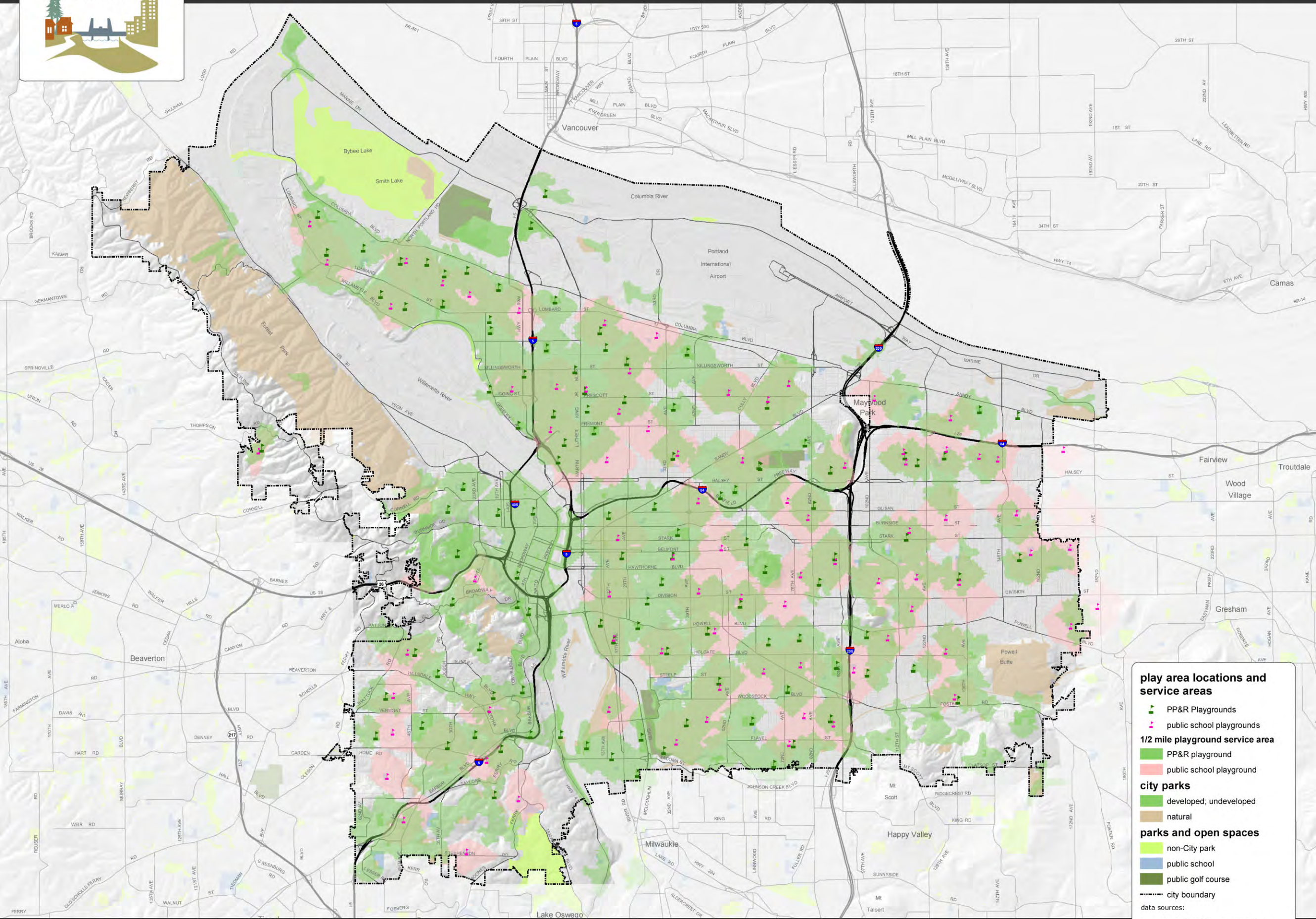
- developed; undeveloped
- natural

parks and open spaces

- park
- public golf course
- public school
- city boundary

data sources:

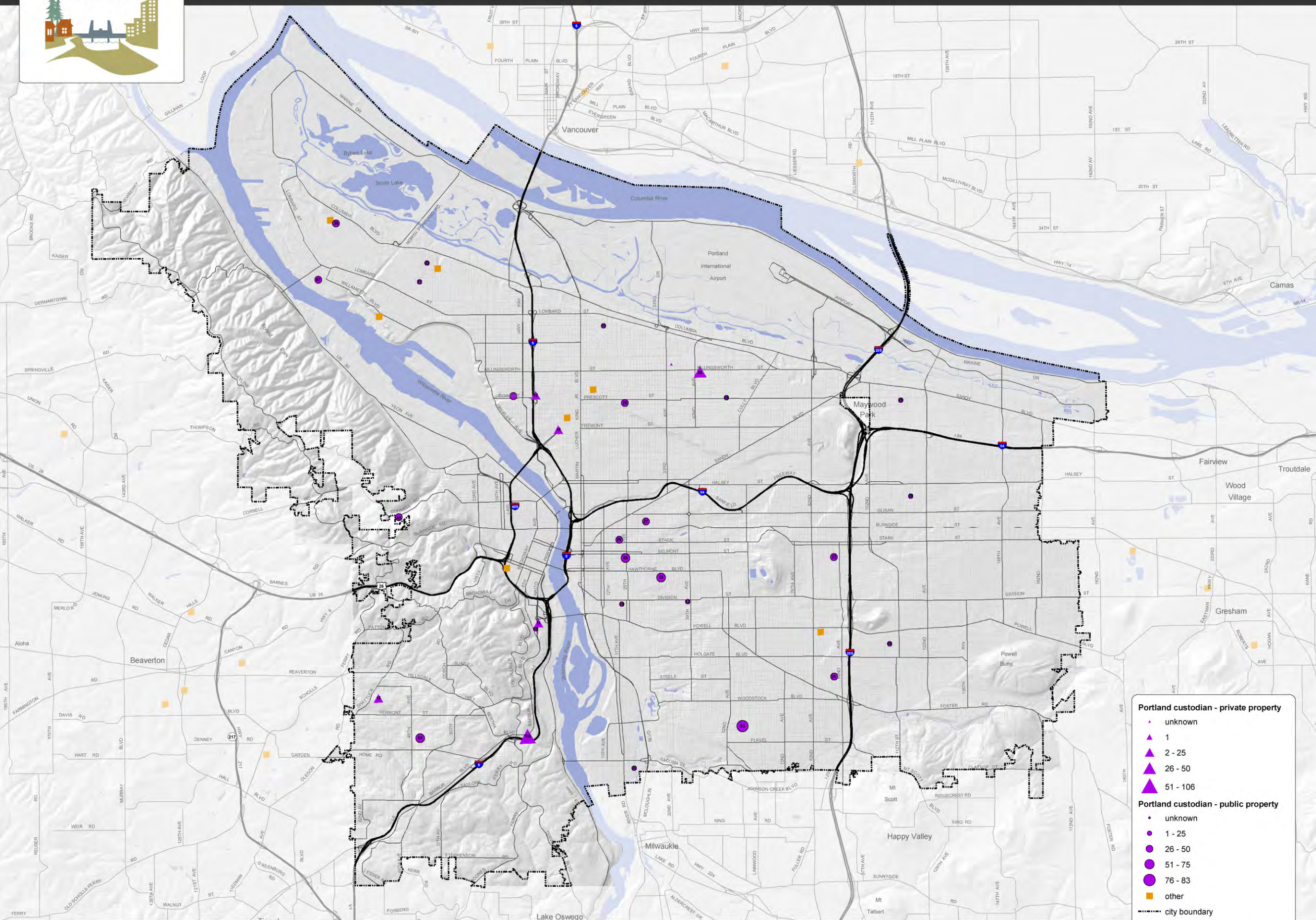
city parks and facilities maintained by Portland Parks & Rec (current June 2008). Other parks from Metro parks & open space (May 2008)



play area locations and service areas

- PP&R Playgrounds
- public school playgrounds
- 1/2 mile playground service area
- PP&R playground
- public school playground
- city parks**
- developed; undeveloped
- natural
- parks and open spaces**
- non-City park
- public school
- public golf course
- city boundary

data sources:
 city parks and facilities maintained by Portland Parks & Rec (current June 2008).
 Other parks from Metro parks & open space (May 2008)



Portland custodian - private property

- ◆ unknown
- ▲ 1
- ▲ 2 - 25
- ▲ 26 - 50
- ▲ 51 - 106

Portland custodian - public property

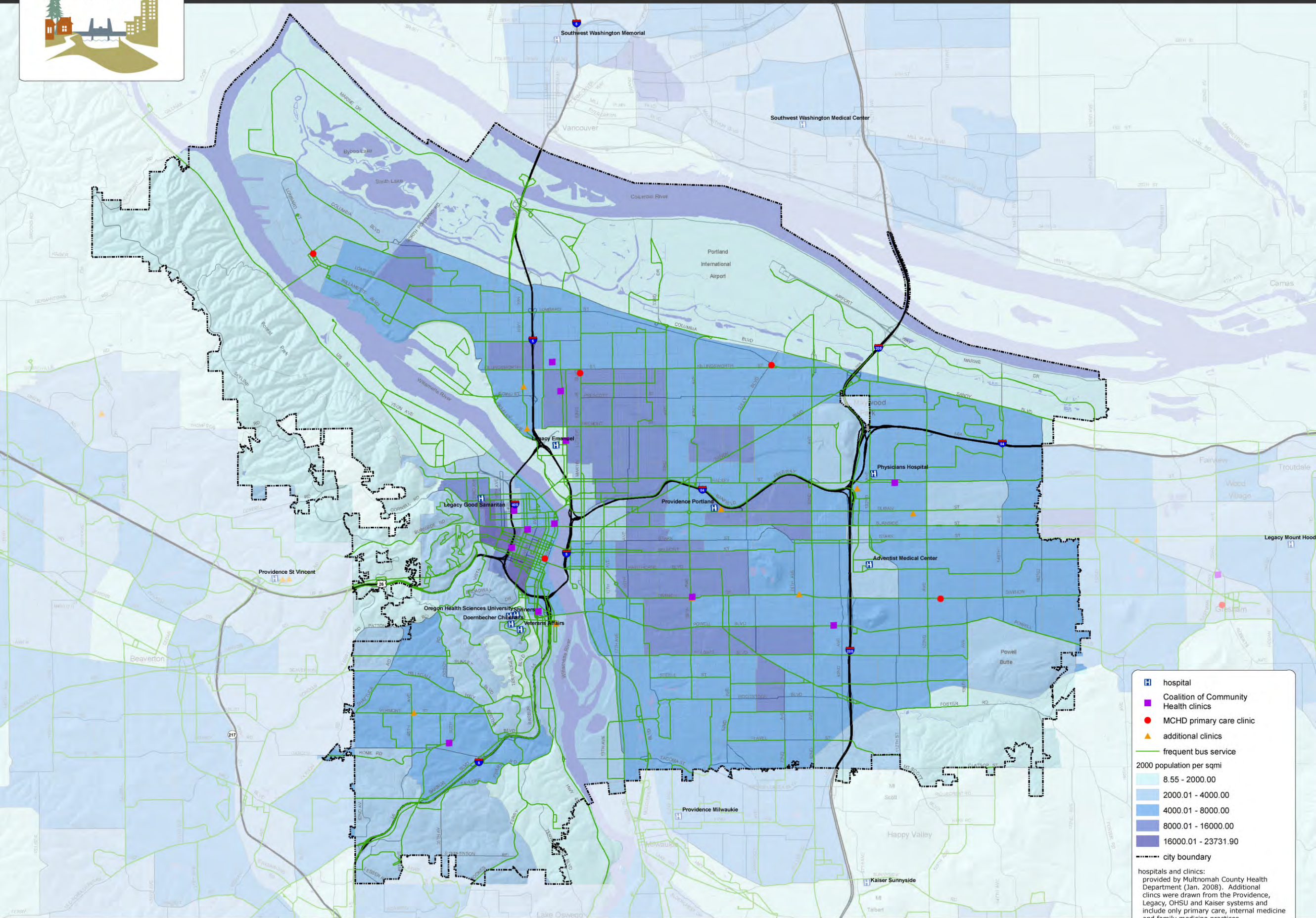
- unknown
- 1 - 25
- 26 - 50
- 51 - 75
- 76 - 83
- other






--- city boundary

June 11, 2009 City of Portland | Bureau of Planning and Sustainability | Geographic Information System
 The information on the map was derived from digital data-bases on the City of Portland, Bureau of Planning GIS. Care was taken in the creation of this map but it is provided "as is". The City of Portland cannot accept any responsibility for error, omissions, or positional accuracy, and therefore, there are no warranties which accompany this product. However, notification of any errors will be appreciated.

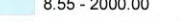
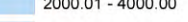
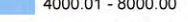
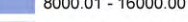
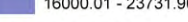


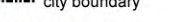
community gardens:
 data developed and mapped by PSU Institute for Portland Metropolitan Studies (2008)



-  hospital
-  Coalition of Community Health clinics
-  MCHD primary care clinic
-  additional clinics
-  frequent bus service

2000 population per sqmi

-  8.55 - 2000.00
-  2000.01 - 4000.00
-  4000.01 - 8000.00
-  8000.01 - 16000.00
-  16000.01 - 23731.90

-  city boundary

hospitals and clinics:
provided by Multnomah County Health Department (Jan. 2008). Additional clinics were drawn from the Providence, Legacy, OHSU and Kaiser systems and include only primary care, internal medicine and family medicine practices.

frequent bus service:
from Tri-Met (Sept. 2008).