



## **Regional Challenges**

### **Overview Paper: Human Health**

Regional Open Space Strategy (ROSS)

DRAFT

# Open Space and Human Health in the Central Puget Sound Region

## PROBLEM STATEMENT AND CONNECTION TO OPEN SPACE

The conditions in which people are born, grow, live, work, and age are recognized determinants of health (WHO, 2015). In addition to the social and physical environments where individuals live, interaction with open space and nature is likely an important influence on personal and community level health and well-being (Wolf et al., 2015a). This overview paper considers how strategic open space planning may provide opportunities and affordances for increased human health and well-being in the Central Puget Sound Region. It is intended to be a succinct reference for planners, public health officials, and open space decision-makers to understand the relationship between health and open spaces, and assist in open space preservation and strategic planning decisions. The contents are based on the extensive research evidence about the positive relationships of nature and open space experiences for human health (See *Appendix A* for more information).

### Defining Open Space

As used in the ROSS process, the term open space is broadly inclusive, referring to the diverse landscape elements within the landscape gradient – from wilderness to urban centers – that is the Central Puget Sound Region:

- Patches or relic expressions of native ecosystems (e.g. urban forests, greenbelts, conservation lands, riparian corridors etc.);
- Constructed nature for cultural activities and recreation (e.g. parks, community gardens, pocket parks, botanical gardens);
- Active transportation corridors (e.g. streetscapes, bike paths and lanes etc.);
- Engineered technologies that are integrated within built form to serve ecological functions (e.g. green roofs, living walls, green stormwater infrastructure such as bioswales etc.);
- Areas located within public, private, and working lands (e.g. farm and forest lands, backyards, golf courses etc.); and
- ‘Blue infrastructure’ (e.g. the waterways and shorelines available for fishing, boating, swimming, kayaking etc.).

### Human Health Definition

Many people regard health as the domain of doctors, treatments and hospitals. Yet *health* is defined by a complex web of lifestyles and conditions, professional diagnoses, cultural values, and community circumstances that are interwoven with and influenced by broader economic, social, environmental and political systems. The World Health Organization (WHO) defines health as “a state of complete physical, mental and social well-being, and not merely the

absence of disease” (WHO, 1946). Socio-economic conditions, including the physical environment, are referred to as social determinants by public health professionals. Conditions of one’s community and the broader landscape can determine health status and the distribution of opportunities for healthful living.

### **Contemporary Health Concerns**

A combination of physical, mental and social issues has created complex public health challenges in the region and nation. Non-communicable diseases (NCDs) such as cardiovascular disease, cancer, respiratory disease and diabetes have surpassed infectious diseases as the leading causes of illness and death. People of all ages are increasingly facing health risks that lead to chronic disease and early mortality. For example, the prevalence of overweight conditions and obesity among children and adults has increased significantly in the nation and region to previously unseen levels, particularly among vulnerable populations. By 2020 mental and substance use disorders are anticipated to surpass physical diseases as a major cause of disability worldwide (Hyde, 2011).

Public health officials widely acknowledge the importance of both disease prevention and health promotion to address contemporary health concerns. Research evidence suggests that encounters with nature and open spaces can aid in alleviating the burden of disease. Additionally, recent research is examining causal pathways to health conditions (i.e. connections between physical activity and diabetes, air quality and cancer, or stress and immune response) to help understand the types of open space elements that might improve specific health outcomes.

### ***What Is the Role of Open Space in Health Promotion and Well-Being?***

While the evidence linking open space with positive and specific health outcomes is still growing, key agencies such as the Centers for Disease Control and Prevention (CDC) and the National Parks Service (NPS) have recognized that parks and other open spaces are important resources for public health. As a result, these agencies are implementing programs and actions that address the growing challenges in public health. One such program is the Healthy Parks, Healthy People program, a movement to reframe the role of public open spaces as powerful health prevention strategies to inspire healthy lifestyle choices and opportunities through a relationship with nature and the outdoors. Listed below are four major themes surrounding human health and open spaces that are relevant to the Central Puget Sound Region:

1. **Healthy Communities:** social and cultural connections, partnerships, economic development and tourism;
2. **Healthy Parks:** managing the environment, sustainability, effective park management, and designing healthy parks for people;

3. **Healthy Participation:** participation that includes people of diverse backgrounds and demographics, integrating facilities and programs, recreation and tourism experiences, and education; and
4. **Healthy People:** mental and physical health, quality of life, and holistic well-being (WHO, 1946).

Open spaces provide unique resources for promoting healthy behaviors, lifestyles, and opportunities. They can also offer demonstrable and often distinct physical, mental, and social health benefits through their environments (e.g. green and blue spaces), facilities (e.g. multi-modal transportation infrastructure) and programs (e.g. educational and cultural programs).

### **Health Outcomes and Pathways**

Current evidence suggests that open space planning and management can contribute to health promotion and disease prevention through specific pathways (see articles in *Appendix A* for greater detail). Open space environments, and their associated facilities and programs, can promote behaviors leading to specific health improvements:

1. **Promoting physical activity** (e.g. increase walking, cycling) that reduces the risk of cardiovascular disease, cancer, depression and other noncommunicable, chronic conditions.
2. **Promoting mental health** (e.g. mental restoration, stress recovery, therapy) that reduces impacts from conditions ranging from ADHD and depression, to dementia in older adults.
3. **Building social capital** (e.g. promote social interactions, social capital) that maintains supportive social connections that contribute to health and improving community cohesion (associated with crime reduction).
4. **Improving air quality** (e.g. increase oxygen, reduce ozone and air particulates) that can improve resident's cardiovascular and respiratory health.
5. **Improving water supply and quality** (e.g. restore predevelopment hydrologic cycles, reduce flooding, provide clean water) that can reduce digestive diseases, neurotoxicity, cancer risks, and mold exposure.
6. **Reducing toxic chemical exposures** (e.g. clean soil through phytoremediation of plants, provide pesticide-free foods) that can reduce cancer risks, neurotoxicity, human development, and toxicity risks.
7. **Improving access to healthy food** (e.g. P-patches, backyard gardens, farms, etc.), that creates local food supply and household nutrition.
8. **Improving resilience to environmental disasters** (e.g. help reduce the likelihood or severity of flooding, sea level rise, high heat episodes) that enables citizen-based first response and adaptive response based on prior community level open space engagement and stewardship.

## ***Why is a Regional Approach to Open Space Necessary in Advancing Objectives for Human Health?***

A regional approach to open space in the Central Puget Sound Region can support health by enabling equitable distribution and experiences of high quality open spaces that support health promotion and disease prevention. Interconnected open spaces within a regional system can enhance and support co-benefits of human health and well-being in a variety of ways:

### **1. Recognizing and Connecting Varying Spatial Scales:**

Open spaces and their health benefits occur at different scales, from backyard gardens to the national parks. A regional approach recognizes the value of formulating interventions across multiple spatial scales. Tim Beatley, an urban planner, proposes the 'nature pyramid' (similar to a food pyramid) as a guideline for how much nature exposure humans require in their lives in order to maximize health benefits. The nature pyramid concept speaks to the need for access to small-scale everyday nature such as street trees, as well as access to larger regional parks to maximize health and well-being benefits (Beatley, 2012). Creative approaches are needed; for instance well-designed engineered technologies (i.e. green walls and roofs) can provide access to small-scale, nearby nature within dense urban areas. The ability of any single jurisdiction to address access and connectivity needs varies; only the largest jurisdictions in the Central Puget Sound Region may now have the necessary capacity. Achieving better access across this nature pyramid requires a regional approach to open space planning and policy.

### **2. Connecting Ecological and Infrastructure Systems:**

Ecological and cultural functions, and the situations that support causal for health outcomes, are optimized by open space connectivity. Comprehensive open space planning should interface projects having ecological goals and objectives (such as riparian habitat restoration) with human health potential (including trails and water access). Other examples include: linked wetlands to maximize stormwater cleansing, thus reducing toxic chemical exposures and cancer and neurotoxicity risks; extended trail systems having clear social or nature destinations provided across conservation lands thus providing higher quality long distance recreation, and contributing to reduced risk of cardiovascular disease, diabetes or depression. Open space systems could also align with and connect to other multi-jurisdictional infrastructures such as transportation, watershed, and stormwater systems. For example, bicycle lanes and paths that connect parks provide both recreation and active transit opportunities. An integrated systems outlook is necessary to optimize health benefits.

### 3. Uniting Communities and Resources:

Many local governments are working to improve community conditions, yet their programs and actions are focused within their jurisdictional boundaries. Local jurisdictions will often collaborate on broader policy or regulations in order to address needs or initiate improvements with neighboring communities. A regional approach to open space systems planning could provide shared policies and goals needed to stimulate dialogue and action across communities. Coordinated, strategic investment in open spaces by multiple communities may be especially critical to help less wealthy communities address health issues

#### Models and Precedents

National, regional, and local efforts related to health and open space systems are emerging, as interest in this integration of policy and programs is growing rapidly across the United States. Here is a sample of programs and precedents for region-wide approaches to open space uses that incorporate improved population health.

##### 1. National Efforts:

- **Parks Prescription** programs are supported by medical professionals in some communities in the U.S. Patients are prescribed frequency, duration, and extent of routine physical activity within local parks (Golden Gate NPC, 2010);
- A **Complete Streets** policy promotes active transportation systems of all modes of transport (including pedestrian mobility, bicycle usage, and connectivity to mass transit) and utilizes open space connections (Smart Growth America, 2015);
- **Safe Routes to School** programs encourage active transit for children from their homes to school and can utilize open space connections (Safe Routes, 2015);
- The **Health Impact Assessment** (HIA) approach introduces health considerations into community planning and new development or policies (The PEW Charitable Trusts, 2015);
- The Centers for Disease Control and Prevention (CDC) support a **Healthy Communities Program** (CDC, 2015) that offers guidance, best practices, and technical meetings for better health at the community level, including the physical environment. Local entities, including Public Health – Seattle and King County, Seattle Children’s Hospital, and the Healthy King County Coalition, have received healthy communities funding to work on regional population health policies and environment change;
- As part of its Healthy Places program the CDC provides resources and tools for **Parks, Trails, and Health**;
- The **Trust for Public Land** has published a series of case studies and policy documents concerning parks and health, including Fitness Zones to the Medical Mile: How Urban Park Systems Can Best Promote Health and Wellness <http://www.tpl.org/our-work/parks-people/fitness-zone-area> and ParkScore (The Trust for Public Land, 2015);

- **America's Great Outdoors** is a national initiative to promote conservation and recreation, and calls out public health as an important concern (White House, 2015); and
- The **City Parks Alliance** has issued a policy statement about why parks matter for public health (City Parks Alliance, 2015).

## 2. Pacific Northwest and Regional Efforts:

- The Washington **Growth Management Act** directs communities to identify lands and corridors within the urban growth area that could be useful as open spaces and provide health and recreational opportunities (RCW, Ch 36);
- The **Puget Sound Regional Council** is doing work around health equity and transportation (PSRC, 2015); and
- The Portland metro area **Intertwine Alliance** engages residents with nature and the outdoors and has launched a health program (The Intertwine, 2015).

## 3. Local Efforts:

- The **Seattle Shoreline Street Ends** program converts unused pocket parcels of public land to become parks and water access points across communities (Seattle.gov, 2015); and
- Precedents of **Shared Use Agreements** have allowed communities to use open space resources otherwise reserved to a single district or jurisdiction (PSRC, 2012).

## ***What Are the Challenges Facing Health and Open Space Initiatives in the Central Puget Sound?***

There are several key challenges to understanding and addressing health and well-being as it relates to open spaces in the Central Puget Sound Region:

### **Open Space Equity**

The Central Puget Sound Region is uniquely abundant in forests, freshwater, marine systems, and mountain landscapes. However, access to open spaces is not uniform across all communities and demographic groups. Additionally, open space programming, training, social support, maintenance, and resources are also not equitably distributed. There is also a growing awareness that certain significant health problems (e.g., obesity, asthma) are found in higher incidence in communities that also have little open space. One open space planning challenge is to find ways to interlace open spaces within the urbanized built environment to integrate nature where people live, particularly places with fewer nature amenities. Open space quantity, access, quality, and cultural applicability are recognized environmental justice concerns, including access by vulnerable and less mobile populations.

### **Open Space and Health Economics**

Justifying the costs of open spaces by examining the human health benefits and their

associated cost savings is a difficult task and not often examined. A benefits analysis entails specifying health outcomes, predicting outcomes at a population or geographic scale, and assigning a monetary value to these health benefits (Wolf et al., 2015b). A cost analysis, or the determination of what organizations, agencies, or individuals should pay for to create, sustain, and maintain open space, is another challenge. Costs include land base, programs, facilities and maintenance. Such in depth analysis to determine full cost accounting of open spaces, and especially in terms of net health benefits and cost savings is difficult, and requires collaboration of both health and natural resource economists.

Traditional health service providers and insurers have not yet included open spaces in their financial models. Entities that provide support for health prevention programs and cost reductions may not be the same that pay for related medical treatments and therapies. For example, insurance companies may benefit from preventive measures paid for by local government jurisdictions. Additionally, jurisdictions might provide programs or actions that are indirectly paid for by the public and provide societal benefits that are not easy to measure and communicate back to the public. Because of the complex and diverse institutions associated with health and open spaces, full cost/benefit accounting, and applying new financing models is a challenge for health and open space planning.

### **Cross-Departmental and Multi-Jurisdictional Collaboration**

Effective incorporation of open space environments, facilities, and programs for health and well-being in any single local government jurisdiction requires collaboration between governmental departments, including public health and safety, public utilities, parks and recreation, transportation, and planning. While research shows that experiences with nearby open spaces are highly effective in addressing health, communities are learning that open space connectivity across scales is also important (e.g. bicycle transit or recreational trails supporting active living). Such large scale systems often span political boundaries so collaboration must also be multi-jurisdictional. Obstacles can include funding, regulatory, and communication barriers between departments, disciplines, agencies and jurisdictions.

### **Accessing and Understanding the Evidence-Based Literature**

Literally thousands of studies have been done in recent decades on the role of open space and nature experience in human health and well-being promotion and disease prevention. The evidence about the relationship between open space and health spans many topics including the extent of nature (such as presence of parks or trees), access disparities for specific populations (e.g. children, elderly), economic benefits (e.g. reduced health care costs), and comprehensive or community planning (*see Appendix A: Supportive Research and Publications*). While much of the research can be found using health search engines such as PubMed, local decision-makers and practitioners may not be able to purchase articles, or know search keywords. Additionally, most research on health and open space experiences has limitations: limited sampling, nature settings that are not landscape scale (e.g. healing

gardens for hospital patients), and small outcome effects. Few studies have examined health outcomes based on large-scale open space conditions that can be translated to regional public health or planning programs.

## **SUMMARY**

While not specific to the Central Puget Sound region, a growing body of scientific evidence indicates strong linkages between open space experiences and human health and wellness. Protecting, stabilizing and expanding an open space facilities and systems network in the Central Puget Sound Region can help mitigate the serious health issues facing the region's communities while simultaneously supporting vibrant, beautiful and ecologically resilient communities. Equitable distribution of high quality open space environments, facilities, and programs for people will enable people to experience nearby nature, and can help address environmental and social justice concerns in our region. Regional multi-scale (from neighborhood to region) open space systems planning is needed to create opportunities for activities and programs that promote better health and wellness for individuals and communities, and address health disparities in the region. However, more analysis may be needed to better understand the current inventory of open space, the range and type of health benefits that such spaces can provide, and the open space conditions that are most supportive at the regional level. Innovative programs are emerging locally and nationally, and a review of examples can help jump start ideas about open space potential and health oriented activities.

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## **APPENDIX A: SUPPORTIVE RESOURCES and PUBLICATIONS**

### **Academic Literature on Open Spaces and Health Topics**

These peer-reviewed research articles highlight the state of the science concerning nearby nature experiences and outdoor activity. Abstracts, and some entire articles, can be accessed using scholarly search services such as PubMed or Google Scholar. A more complete presentation of nearly 40 years of research on these topics can be found at the Green Cities: Good Health web site, hosted by the University of Washington (University of Washington, 2015).

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## Technical Literature on Open Spaces and Health Topics

These publications have been published by regional and local organizations to highlight key research about the connection between open space and human health and wellbeing topics, and to support regional planning. They provide information and guidance to planners, public health officials, grant writers and open space decision makers that may not have easy access or training to use academic literature such as articles found through PubMed. Most of these can be easily accessed online using Google search.

#	Title	Sponsor/Publisher	Year	environmental risks (e.g. air, water, climate)	physical activity + obesity	stress + physiological conditions	mental health + function	focus on children	social + community cohesion/benefits	economic benefits and/or costs	environmental justice or inequalities	planning, mgmt + stewardship
1	Designing for Active Living Among Adults	Robert Wood Johnson Foundation	2008		x							
2	Do All Children Have Places to Be Active?	Active Living Research	2011		x			x				
3	Improving Health and Wellness Through Access to Nature	American Public Health Association	2014	x	x	x			x			x
4	Health Benefits to Children from Contact with the Outdoors and Nature	Children & Nature Network	2010		x	x	x	x				
5	An Unhealthy America: The Economic Burden of Chronic Disease	Milken Institute	2007			x				x		

#	Title	Sponsor/Publisher	Year	environmental risks (e.g. air, water, climate)	physical activity + obesity	stress + physiological conditions	mental health + function	focus on children	social + community cohesion/benefits	economic benefits and/or costs	environmental justice or inequalities	planning, mgmt + stewardship
6	The Economic Benefits of Open Space, Recreation Facilities and Walkable Community Design	Robert Wood Johnson Foundation	2010		x					x		
7	Benefits of Urban Parks: A Systematic Review	The International Federation of Parks and Recreation Administration	2013	x	x	x			x		x	
8	Mindfulness Practice in Woods and Forests: An Evidence Review	The Mersey Forest Forest Research	2013			x	x					
9	Natural Thinking	The Royal Society for the Protection of Birds	2007			x	x	x	x			
10	Parks and Other Green Environments: Essential Components of a Healthy Human Habitat	National Recreation and Park Association	2010		x	x	x		x			
11	Healthy Planning: An Evaluation of Comprehensive and Sustainability Plans Addressing Public Health	American Planning Association	2012									x

#	Title	Sponsor/Publisher	Year	environmental risks (e.g. air, water, climate)	physical activity + obesity	stress + physiological conditions	mental health + function	focus on children	social + community cohesion/benefits	economic benefits and/or costs	environmental justice or inequalities	planning, mgmt + stewardship
12	Research on the Beneficial Aspects of the Experience of Nature in Cities: A Literature Review	TKF Foundation	2012		x	x	x		x			
13	Reflect and Restore: Urban Green Space for Mental Wellness	Nature Sacred (TKF Foundation)	2014			x	x					
14	Feeling Stressed? Take a Time Out in Nature	Nature Sacred (TKF Foundation)	2013			x	x		x			
15	From Fitness Zones to the Medical Mile: How Urban Park Systems Can Best Promote Health and Wellness	Trust for Public Land	2011		x					x		x
16	Intersections: Health and the Built Environment	Urban Land Institute	2013		x					x		x
17	Urban River Parkways: An Essential Tool for Public Health	Center for Occupational and Environmental Health	2014	x	x							