









*Climate Resilience Summit  
2018 Session*

# Reimagining Our Rights to Our Rights-of-Way

January 6, 2018





# WELCOME!



**Hannah Kett**

Cities Program Manager  
The Nature Conservancy

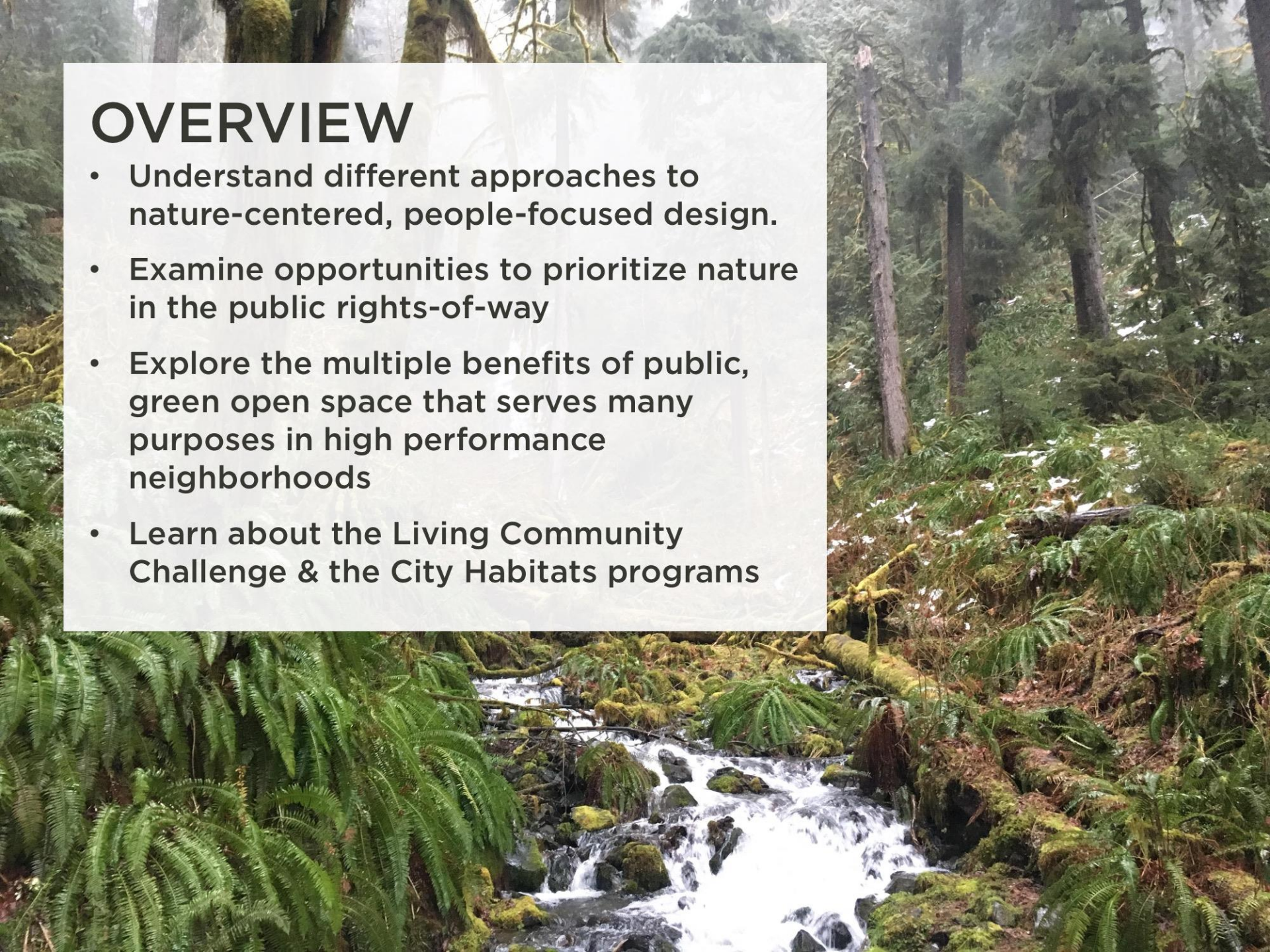
**Marisa Hagney**

Living Community Challenge Manager  
International Living Future Institute



# OVERVIEW

- Understand different approaches to nature-centered, people-focused design.
- Examine opportunities to prioritize nature in the public rights-of-way
- Explore the multiple benefits of public, green open space that serves many purposes in high performance neighborhoods
- Learn about the Living Community Challenge & the City Habitats programs



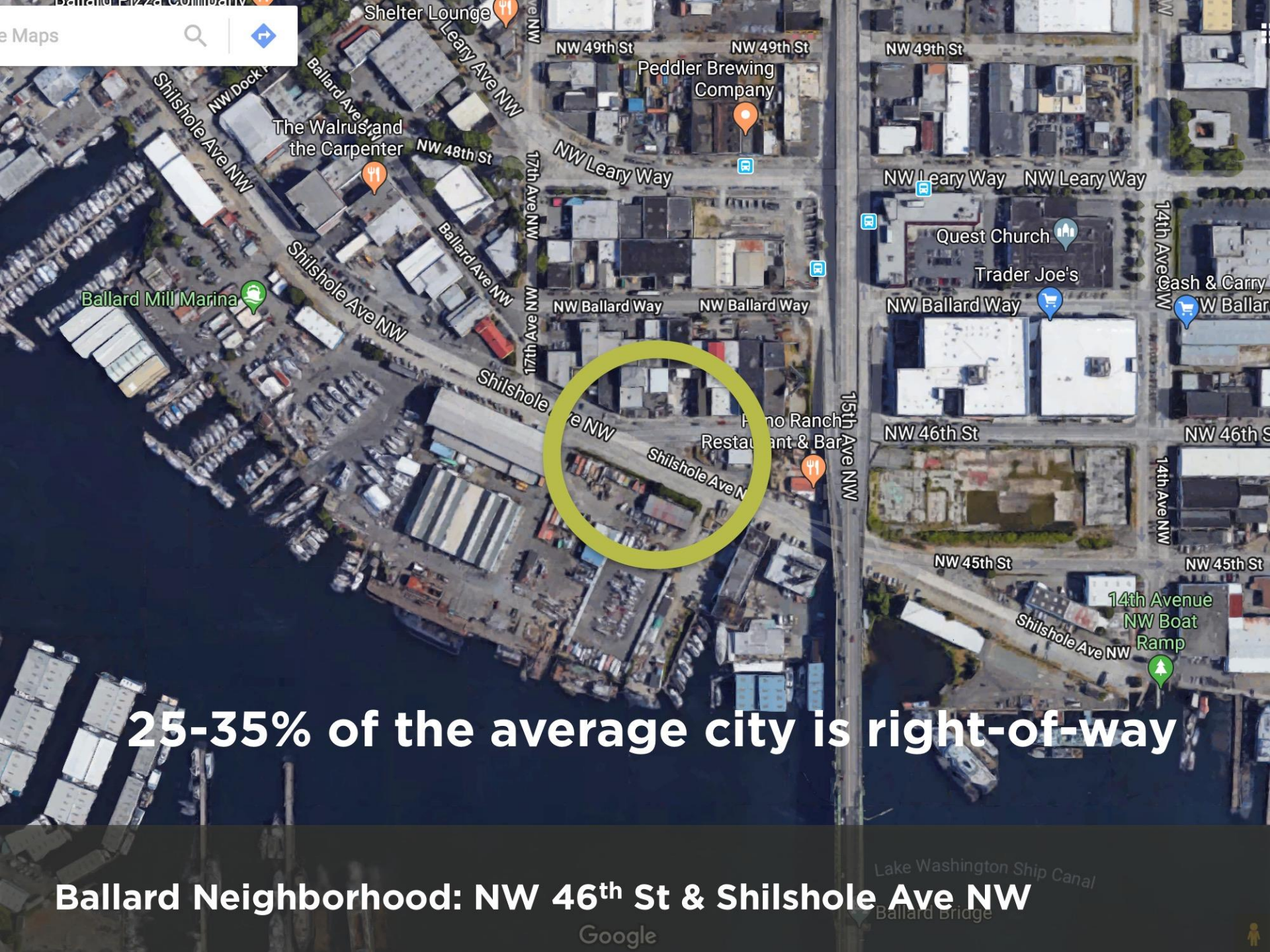


# REIMAGINING SEATTLE - WHAT IS THE PROBLEM?



**Stadium District: Airport Way S & S Charles St & Maynard Ave S**





**25-35% of the average city is right-of-way**

**Ballard Neighborhood: NW 46<sup>th</sup> St & Shilshole Ave NW**





# SINGLE-PURPOSE INFRASTRUCTURE

Roof



Street



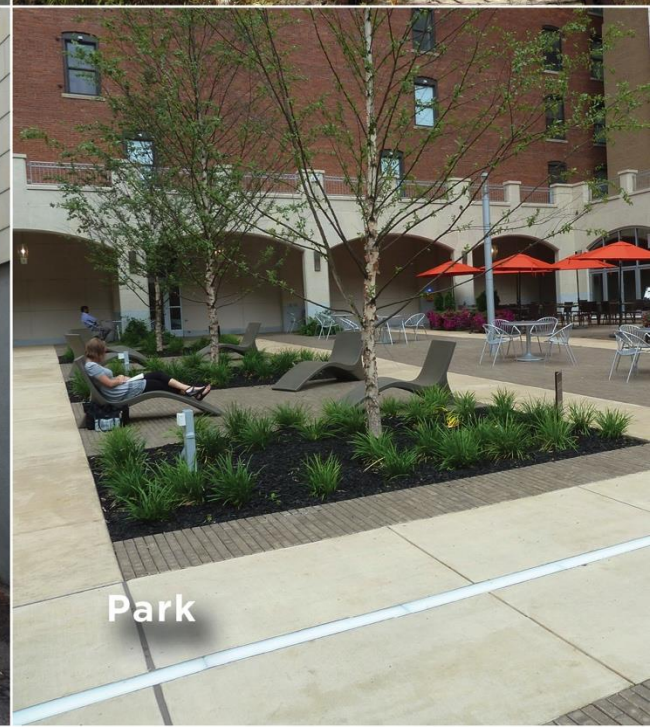
Viaduct



Wall



Alley



Park



# RIGHT-OF-WAY OPPORTUNITIES

Placemaking

Habitat

Food Access

Mobility

Resilience

Health

Stormwater

Energy

Biophilia

Beauty

Equitable Open Space

Safety



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INSTITUTE<sup>SM</sup>

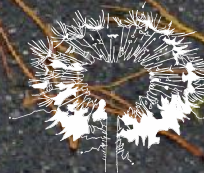


# REIMAGINING OUR RIGHTS

*to the*

# RIGHT-OF-WAY

#GreenTheGrey



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**LIVING FUTURE**  
INSTITUTE<sup>SM</sup>







# Challenges For Cities

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CLIMATE  
CHANGE



POLLUTION  
CONTROL



PHYSICAL &  
MENTAL HEALTH



CHILDHOOD  
HEALTH



CRIME  
PREVENTION



ENVIRONMENTAL &  
SOCIAL EQUITY



ECONOMIC  
SUCCESS

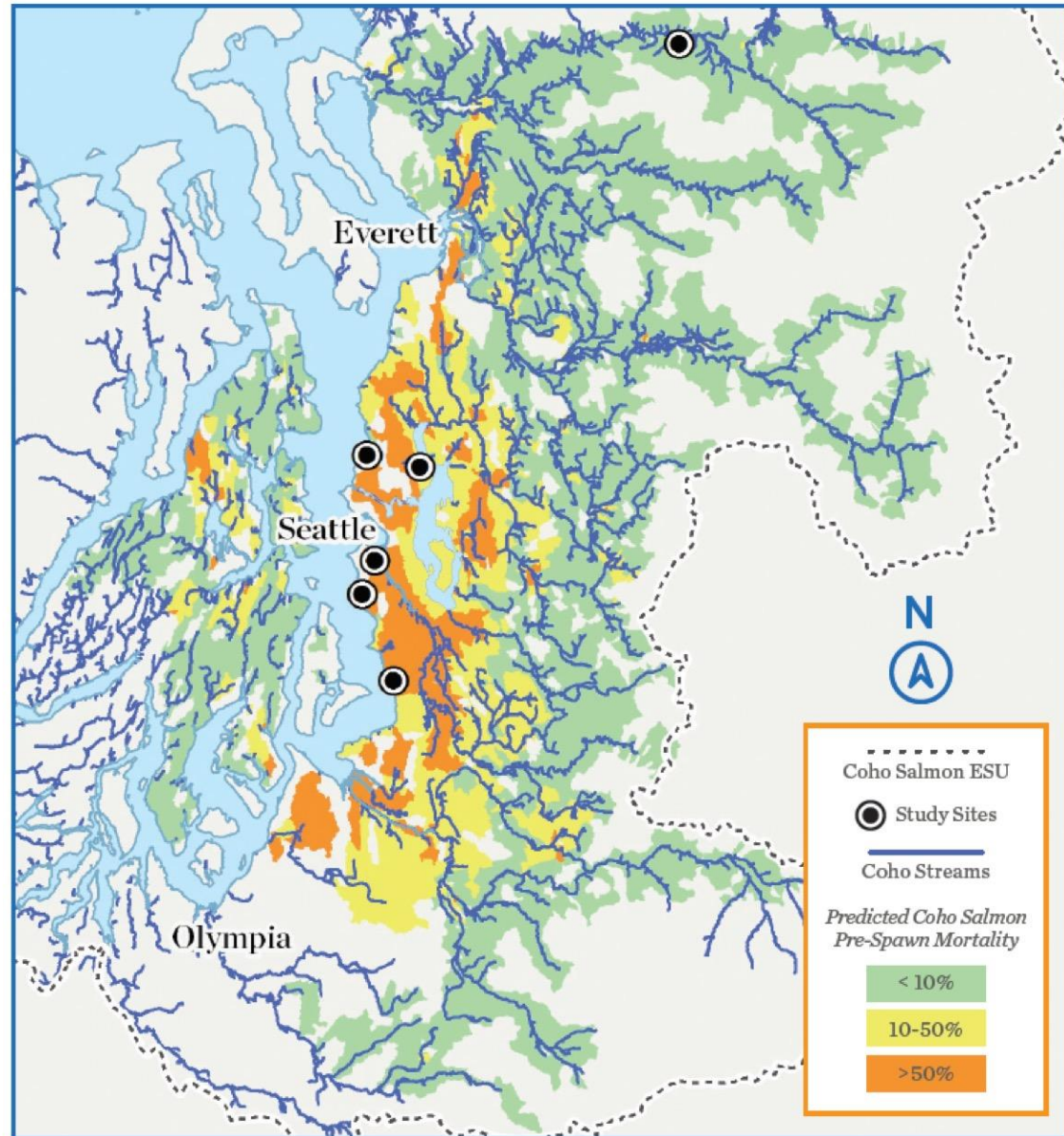


GROWING  
POPULATIONS



# Cities for People & Nature

Coho Salmon Pre-Spawn Mortality







## A Legacy of Environmental Racism



## TREE CANOPY COVER

Seattle Citywide goal of **30%** by 2037  
as of 2016:

**28%**

vs.

**20%**

CITY OVERALL  
AREAS

LOW INCOME  
AREAS





**NATURE PROVIDES  
SOLUTIONS**





**NEARBY NATURE**



# WOMEN'S MORTALITY RATE

Associations strongest for respiratory and cancer mortality

↑ greenery = ↓ 12% mortality rate







## Research Tells Us:

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**3X MORE ACTIVE**  
WHEN LIVING IN A GREEN  
COMMUNITY



**CAN ADD \$1000'S**  
TO A HOME'S VALUE



**WAY LESS**  
PROPERTY CRIME





**NATURE AS  
A FILTER**



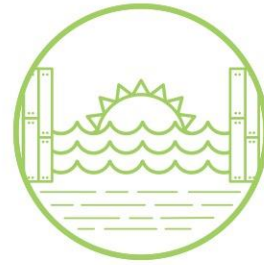


## Research Tells Us:

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**CLEANER  
AIR**  
IN OUR  
COMMUNITIES



**REDUCED  
FLOODING**  
FROM CLIMATE  
CHANGE



**IMPROVED  
WALKABILITY**  
TRAFFIC CALMING  
& SAFER





**NATURE TO  
CONNECT US**





## Research Tells Us:

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**BUILDS  
RELATIONSHIPS**  
IN OUR COMMUNITIES



**LOWERS  
STRESS  
AND DEPRESSION**



**PLACE & IDENTITY**  
ADD VALUE & MEANING  
TO OUR LIVES





## Research Tells Us:

---



### **VIBRANT RETAIL**

SHOPPER CHOICE & SPENDING



### **INCREASING EQUITY**

IN OUR  
COMMUNITIES



### **BETTER WORK & LEARNING**

INCREASED ATTENTION  
& FOCUS





## GREEN vs. GREY

The City of Philadelphia evaluated two infrastructure options designed to meet the same stormwater needs, with different overall benefits

### VALUE

**\$2.85** billion

GREEN/GREY

**\$0.122** billion

GREY





# HELPING CHILDREN





**TEST SCORES &  
ADHD BENEFITS**



**OBESITY**







## JUST A 20 MINUTE WALK

Children 7-12 years old  
diagnosed with ADHD  
concentrate better after  
a walk in an urban park



BIRTH  
WEIGHT



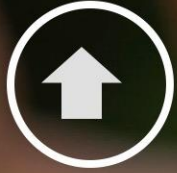
IMMUNE  
FUNCTION





# SUPPORTING AGING





**MENTAL & PHYSICAL  
HEALTH**

**SOCIAL  
CONNECTION**







# PROMOTING HEALING







**STRESS  
LEVELS**



**POSITIVE FEELINGS**







**HAPPINESS**



**ATTENTION  
CAPACITY**

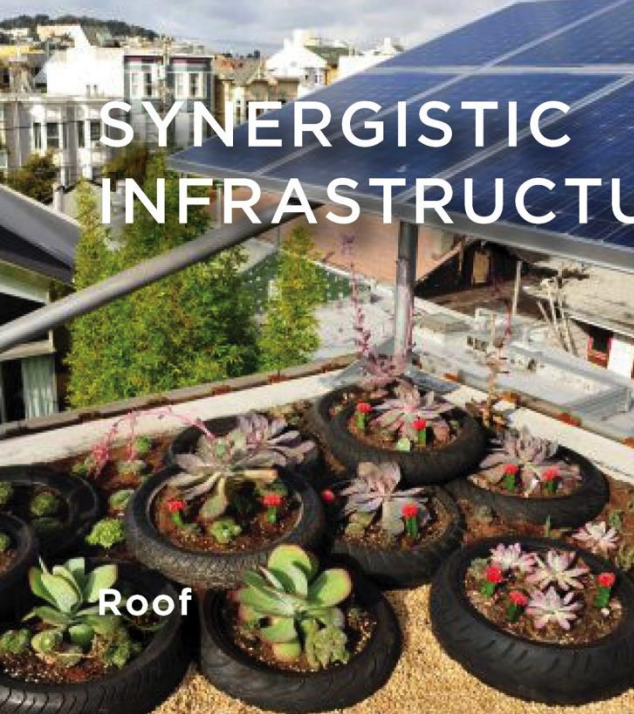








# SYNERGISTIC INFRASTRUCTURE



Roof



Street



Viaduct



Wall



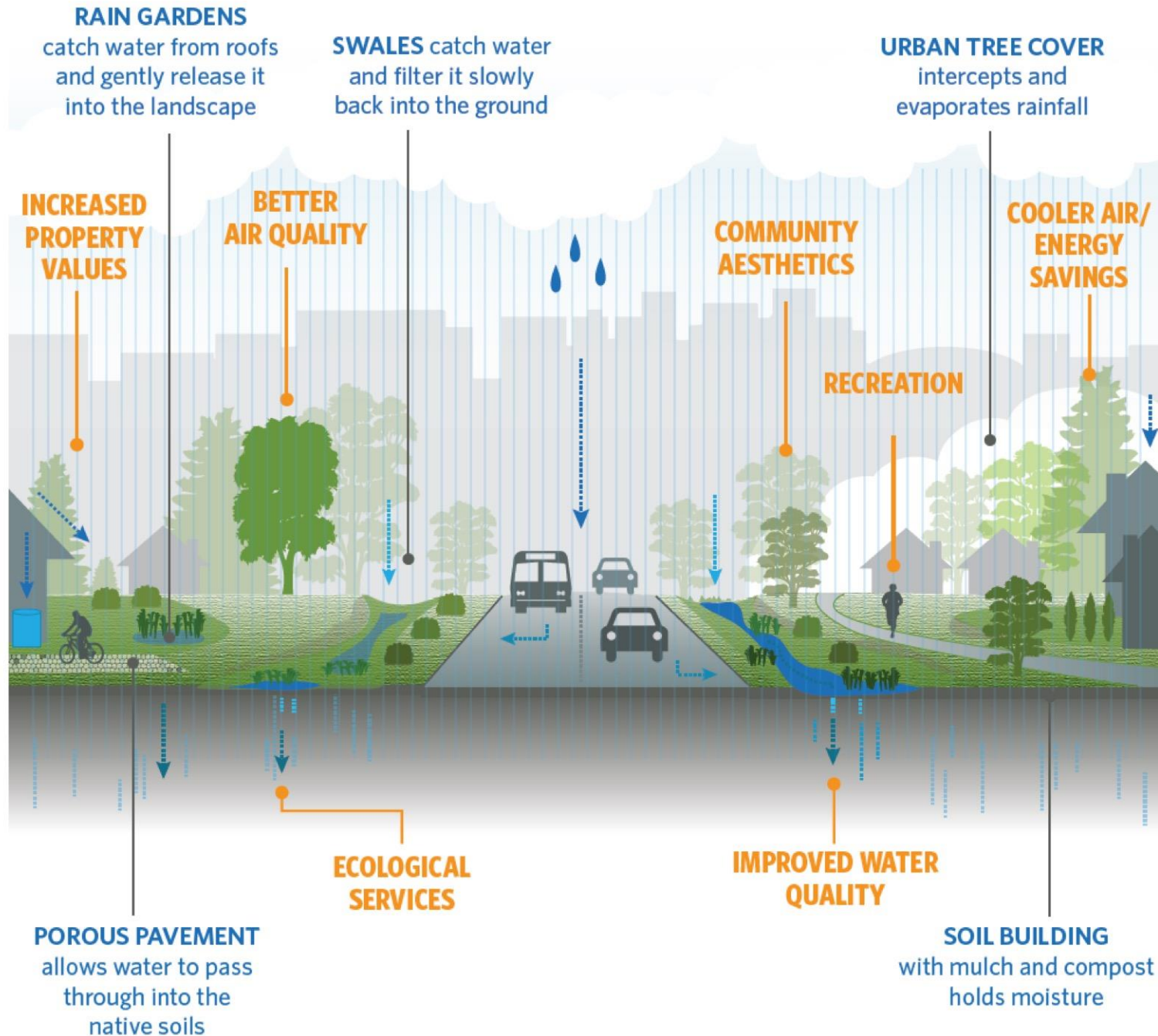
Alley



Park



# #GreenTheGrey







Innovating beyond  
what is required



PATTERN 01

# URBAN REWILDING

COMMUNITIES SHOULD INTEGRATE NATURE, INCLUDING WILD NATURE, INTO THEIR BUILT ENVIRONMENTS



THROUGH A NEW SYNTHESIS OF RESTORATION ECOLOGY, ARCHITECTURE, AND URBAN PLANNING AND DESIGN.









Opportunities for food production in the right-of-way

Wide and safe places to walk and play

Stormwater managed in natural features

Transit and personal vehicles accommodated in dedicated lanes

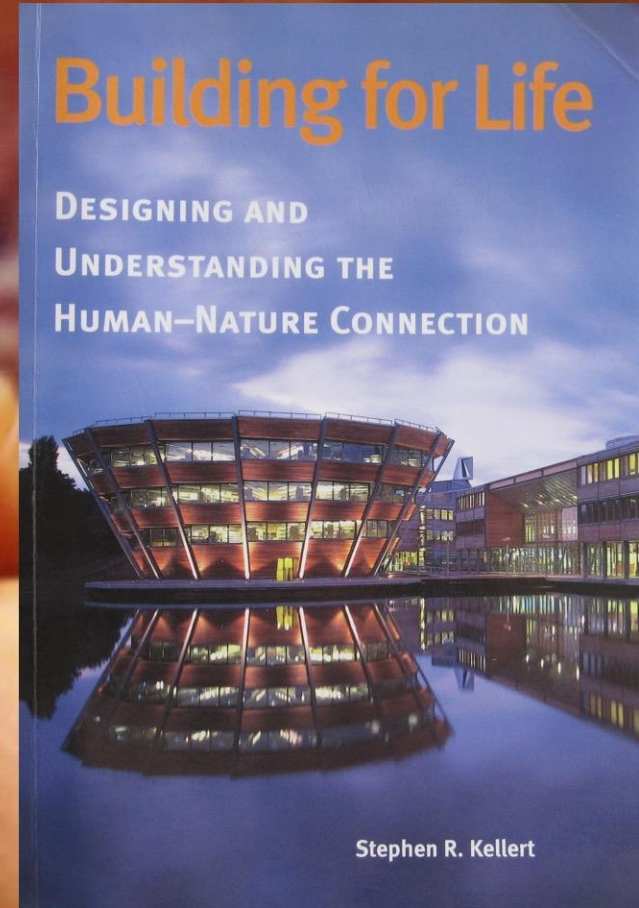
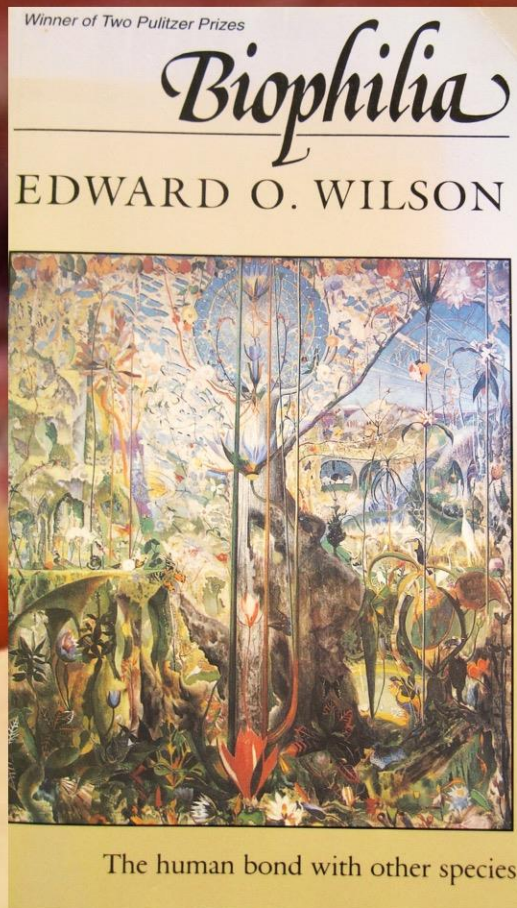
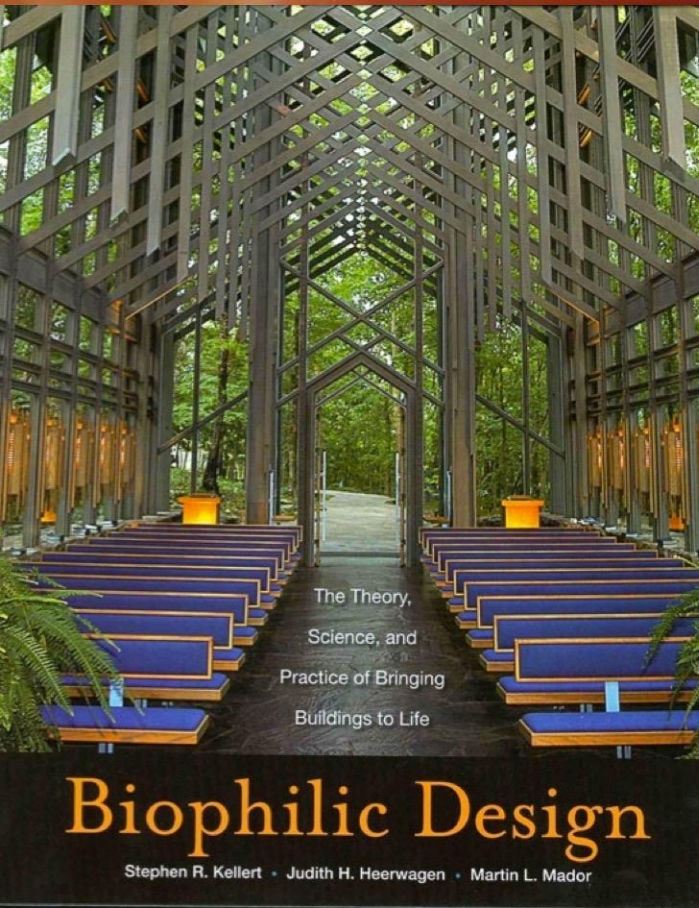


**Toward a Living Community:  
A Vision for Seattle's First Hill  
and Adjacent Neighborhood**

International Living Future Institute  
Toward a Living Community: A Vision for Seattle's First Hill and Adjacent Neighborhoods  
- 2015 ILFI Report | [living-future.org/lcc](http://living-future.org/lcc)

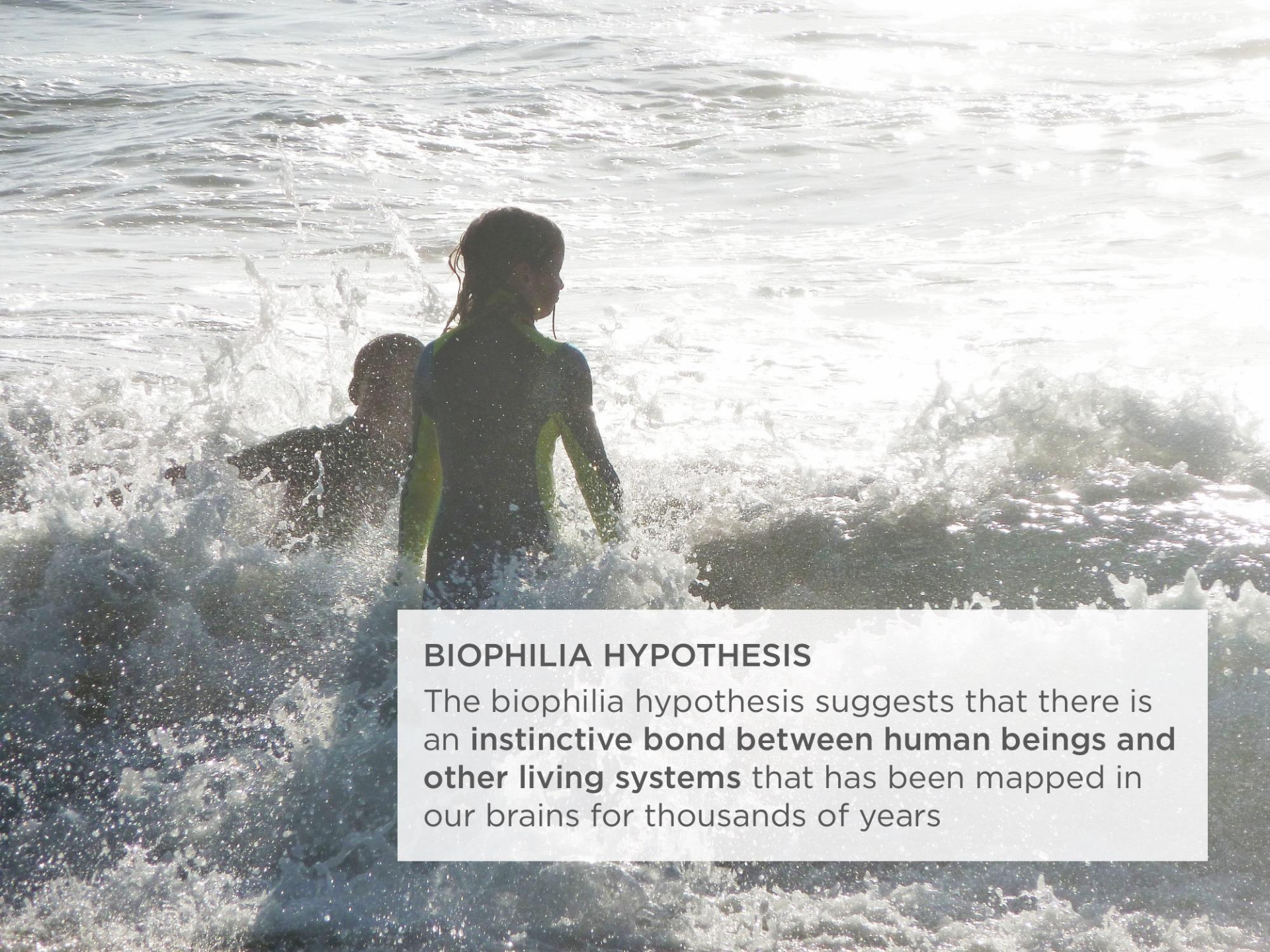






**BIOPHILIA**  
LOVE OF LIFE





## BIOPHILIA HYPOTHESIS

The biophilia hypothesis suggests that there is an **instinctive bond between human beings and other living systems** that has been mapped in our brains for thousands of years



# THE SIX BIOPHILIC DESIGN ELEMENTS

by Stephen R. Kellert



ENVIRONMENTAL  
FEATURES



NATURAL SHAPES  
AND FORMS



NATURAL PATTERNS  
& PROCESSES



LIGHT AND SPACE



PLACE-BASED  
RELATIONSHIPS



EVOLVED HUMAN-  
NATURE  
RELATIONSHIPS



# THE SIX BIOPHILIC DESIGN ELEMENTS + ATTRIBUTES

By Stephen R. Kellert

## ENVIRONMENTAL FEATURES

Color      Water  
Air        Sunlight  
Plants     Animals  
Natural materials  
Views and vistas  
Façade greening  
Geology and landscapes  
Habitats and ecosystems  
Fire

## NATURAL SHAPES & FORMS

Botanical motifs  
Tree and columnar supports  
Animal (mainly vertebrate) motifs  
Shells and spirals  
Egg, oval, and tubular forms  
Arches, vaults, domes  
Shapes resisting straight lines & right angles  
Simulation of natural forms  
Biomorphy  
Geomorphology  
Biomimicry

## NATURAL PATTERNS & PROCESSES

Sensory variability  
Information richness  
Age, change, and the patina of time  
Growth and efflorescence  
Central focal point  
Patterned wholes  
Bounded spaces  
Transitional spaces  
Linked series and chains  
Integration of parts to wholes  
Complimentary contrasts  
Dynamic balance and tension  
Fractals  
Hierarchically organized ratios & scales

## LIGHT AND SPACE

Natural light  
Filtered and diffused light  
Light and shadow  
Reflected light  
Light pools  
Warm light  
Light as shape and form  
Spaciousness  
Spatial variability  
Space as shape and form  
Spatial harmony  
Inside-outside spaces

## PLACE-BASED RELATIONSHIPS

Geographic connection to place  
Historic connection to place  
Ecological location to place  
Cultural connection to place  
Indigenous materials  
Landscape orientation  
Landscape features that define building form  
Landscape ecology  
Integration of culture and ecology  
Spirit of place  
Avoiding placelessness

## EVOLVED HUMAN-NATURE RELATIONSHIPS

Prospect and Refuge  
Order and Complexity  
Curiosity and Enticement  
Change and Metamorphosis  
Security and Protection  
Mastery and Control  
Affection and Attachment  
Attraction and Beauty  
Exploration and Discovery  
Information and Cognition  
Fear and Awe  
Reverence and Spirituality





**COLOR, ORDER & COMPLEXITY, AFFECTION & ATTACHMENT**  
**UNIVERSITY OF WASHINGTON**  
**Seattle, WA**

Image courtesy [www.depts.washington.edu](http://www.depts.washington.edu)



# PATTERN 04 BLUE-GREEN STREETS



SOME STREETS CAN BE REBUILT AS NEW, MULTI-FUNCTIONAL PLACES OF WATER COLLECTION AND STORAGE, BIOPHILIA, RECREATION, WASTEWATER TREATMENT, AND OTHER ECOSYSTEM SERVICES.







INTERNATIONAL  
**LIVING FUTURE**  
INSTITUTE<sup>SM</sup>

# LCC PILOT PROJECT—BLUE-GREEN STREET

Noe Valley, San Francisco, California, USA





# LIVING COMMUNITY CHALLENGE<sup>SM</sup> 1.2

A Visionary Path to a  
Regenerative Future



INTERNATIONAL  
**LIVING FUTURE**  
INSTITUTE<sup>SM</sup>



# THE METAPHOR OF THE FOREST

ROOTED IN PLACE AND YET:

Adapted to climate and site

Harvests all energy + water

Waste = resource

Symbiotic

Diverse

Beautiful



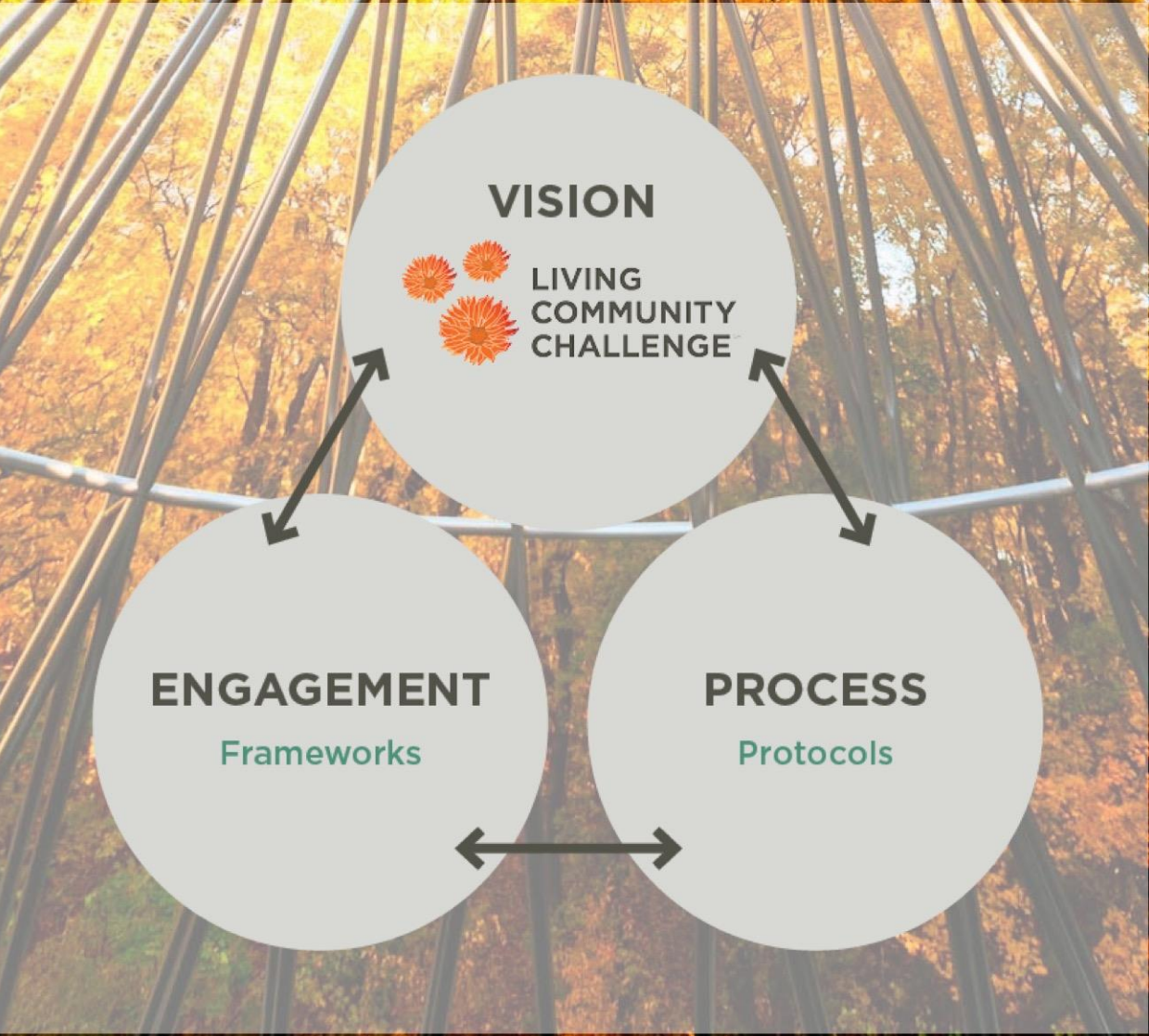
**LIVING  
COMMUNITY  
CHALLENGE** <sup>SM</sup>



A NEW MODEL OF COMMUNITY BUILDING  
A NEW MODEL OF URBAN DESIGN  
REINVENTING THE CITY & CAMPUS







**VISION**



**LIVING  
COMMUNITY  
CHALLENGE**

**ENGAGEMENT**

Frameworks

**PROCESS**

Protocols



LIVING  
COMMUNITY  
CHALLENGE™  
**PETALS**



**PLACE**



**WATER**



**ENERGY**



**HEALTH &  
HAPPINESS**



**MATERIALS**



**EQUITY**



**BEAUTY**





LIVING  
COMMUNITY  
CHALLENGE™

# IMPERATIVES



LIMITS TO GROWTH  
URBAN  
AGRICULTURE  
HABITAT  
EXCHANGE  
HUMAN POWERED  
LIVING



NET POSITIVE  
WATER



NET POSITIVE  
ENERGY



CIVILIZED  
ENVIRONMENT

HEALTHY  
NEIGHBORHOOD  
DESIGN

BIOPHILIC  
ENVIRONMENT

RESILIENT  
COMMUNITY  
CONNECTIONS



LIVING MATERIALS  
PLAN

EMBODIED  
CARBON  
FOOTPRINT

NET POSITIVE  
WASTE



HUMAN SCALE +  
HUMANE PLACES

UNIVERSAL ACCESS  
TO NATURE & PLACE

UNIVERSAL ACCESS  
TO COMMUNITY  
SERVICES

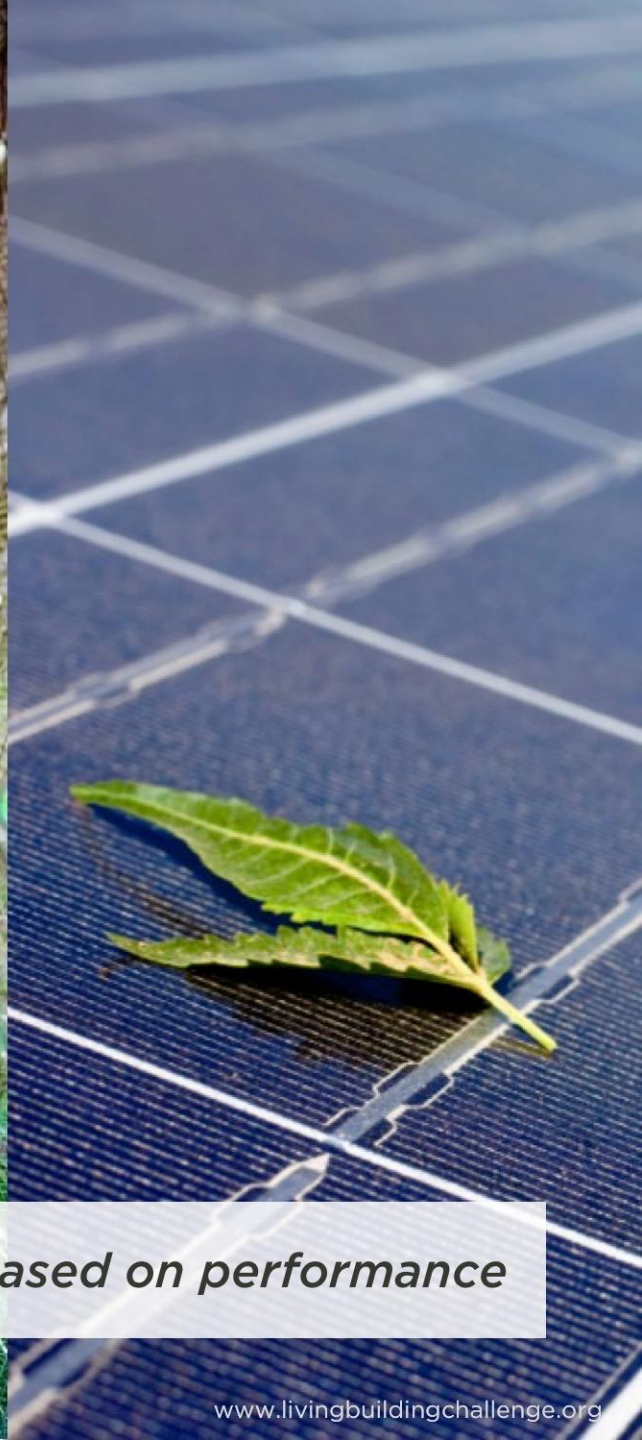
EQUITABLE  
INVESTMENT

JUST  
ORGANIZATIONS



BEAUTY + SPIRIT  
INSPIRATION +  
EDUCATION





**CERTIFICATION PATHS - *based on performance***





**LIVING  
COMMUNITY  
CHALLENGE™**

## LIVING CERTIFICATION

**All Imperatives  
are mandatory**

Certification is based  
on actual  
performance

*Living Certification for  
majority of capital  
projects developed or  
renovated by the  
community (50% by  
area or individual  
building count)*

## PETAL CERTIFICATION

**3 Petals** or more

One of which must be  
either **Water, Energy**  
or the **Materials** Petal  
and

**01:** Limits to Growth

**20:**

Inspiration+Education

*Petal Certification for  
majority of capital  
projects developed or  
renovated by the  
community (50% by  
area or individual  
building count)*



## ZERO ENERGY CERTIFICATION

**2 Imperatives**

**01:** Limits to Growth

**07:** Net Positive  
Energy (100% only,  
does not require  
storage)

*ZE Certification for  
majority of capital  
projects developed or  
renovated by the  
community (50% by  
area or individual  
building count)*





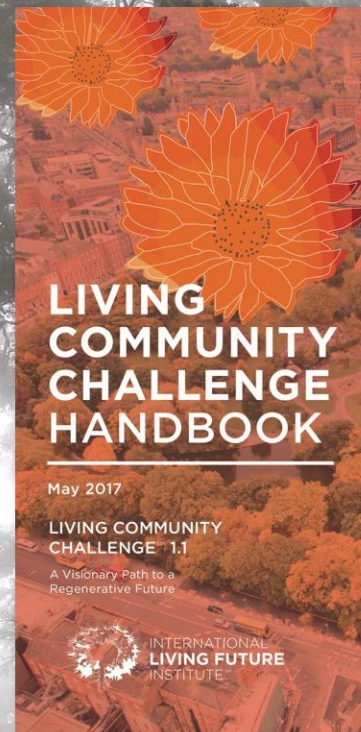
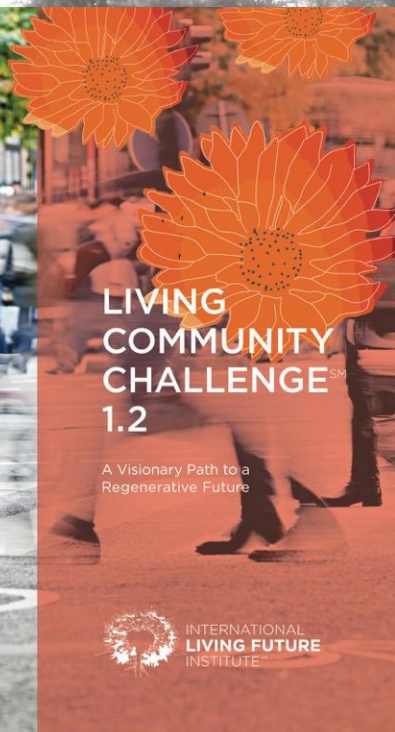
**LIVING  
COMMUNITY  
CHALLENGE™**

## **LCC CRITERIA:**

1. Diversity of uses
2. Multiple buildings
3. At least one multi-modal street
4. Shared infrastructure\*







# LCC PROGRAM MATERIALS

## STANDARD & HANDBOOK

PDF AVAILABLE FREE ONLINE

[LIVING-FUTURE.ORG/LCC](http://LIVING-FUTURE.ORG/LCC)



**1**

**REGISTRATION**

**2**

**PLANNING**

**3**

**IMPLEMENTATION**

**4**

**CERTIFICATION**

**BASIC PROCESS**



An aerial photograph of a city grid, likely San Francisco, with a semi-transparent masterplan overlay. The overlay shows a grid of streets and blocks. A large, light-colored arrow points upwards from the bottom center of the grid. A ruler is placed diagonally across the grid, and a pair of white markers is placed horizontally across the middle. The text 'NEW MASTERPLAN' is overlaid in white, bold, sans-serif font. The background shows the actual city buildings and streets, with some buildings highlighted in a light blue color.

**NEW  
MASTERPLAN**


An aerial photograph of a city grid, likely San Francisco, with a semi-transparent masterplan overlay. The overlay shows a grid of streets and blocks. A large, light-colored arrow points upwards from the bottom center of the grid. A ruler is placed diagonally across the grid, and a pair of white markers is placed horizontally across the middle. The text 'EXISTING NEIGHBORHOODS' is overlaid in white, bold, sans-serif font. The background shows the actual city buildings and streets, with some buildings highlighted in a light blue color.

**EXISTING  
NEIGHBORHOODS**

An aerial photograph of a city grid, likely San Francisco, with a semi-transparent masterplan overlay. The overlay shows a grid of streets and blocks. A large, light-colored arrow points upwards from the bottom center of the grid. A ruler is placed diagonally across the grid, and a pair of white markers is placed horizontally across the middle. The text 'TYPES OF COMMUNITIES' is overlaid in white, bold, sans-serif font. The background shows the actual city buildings and streets, with some buildings highlighted in a light blue color.

**TYPES OF COMMUNITIES**

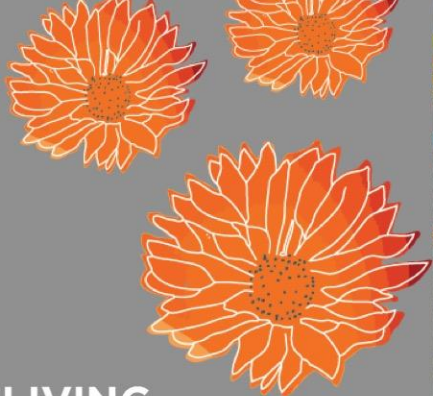




**MUNICIPAL COMPREHENSIVE PLANS**  
**NEIGHBORHOOD PLANNING EFFORT**  
**MAJOR GREYFIELD REDEVELOPMENT**  
**UNIVERSITY CAMPUS**  
**RURAL ECO VILLAGE**

**TYPES OF COMMUNITIES**





**LIVING  
COMMUNITY  
CHALLENGE**

**10 REGISTERED**  
(3 confidential)



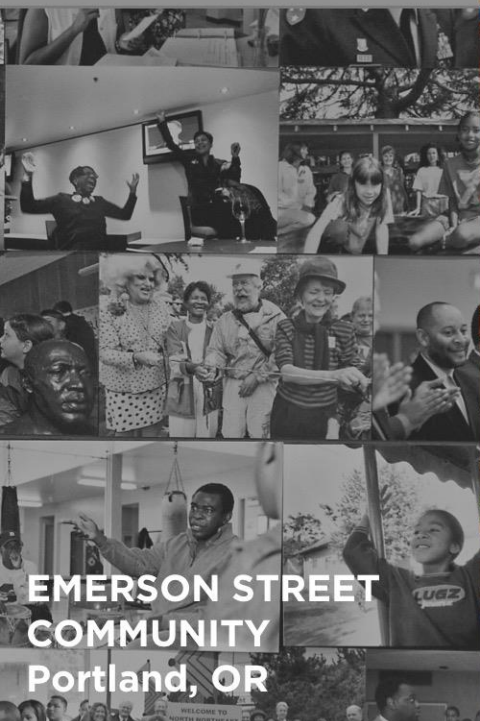
**WILLIAMS COLLEGE**  
Williamstown, MA



**CAL STATE  
UNIVERSITY**  
Monterey Bay, CA



**NORTH RAINIER  
MT BAKER HUB**  
Seattle, WA



**EMERSON STREET  
COMMUNITY**  
Portland, OR



**UPTOWN  
MASTERPLAN UPDATE**  
Normal, IL



**HOLY CROSS**  
New Orleans, LA



**RESERVA SANTA FE**  
Estado de Mexico, MX



## PATTERN 01 URBAN REWILDING

### Description:

**COMMUNITIES SHOULD INTEGRATE NATURE, INCLUDING WILD NATURE, INTO THEIR BUILT ENVIRONMENTS THROUGH A NEW SYNTHESIS OF RESTORATION ECOLOGY, ARCHITECTURE, AND URBAN PLANNING AND DESIGN.** People need frequent contact with nature for individual and community health and well-being. Historically, urban development designed nature out of the city for reasons of culture, convenience and cost. Fortunately, remedies abound, and they often cost less than the engineered solutions designed to replace the lost ecosystem services of natural systems. Long forgotten, underground streams can be daylighted and re-created. The ocean and bay shores can be restored to their original wild states, bringing with them native fish and aquatic habitat. Native plant species and



soils should be used in planting strips, medians, parks and plazas, so that the city's indigenous ecology is re-created, in turn promoting native biota and insects. Wild corridors should be re-created through the city, allowing wild reptiles, mammals, and birds to reclaim habitat and have a presence. Wilderness in the city also allows all people to experience nature, not just those who have the means to leave the city to travel to distant wild places.



## PATTERN 02 HUMAN-SCALE COMMUNITIES

### Description:

**THE HUMAN SCALE MUST BE THE PRIMARY CRITERIA FOR DESIGN DECISIONS AT ALL LEVELS OF THE CITY, INCLUDING BUILDINGS, BLOCKS, THE TRANSPORTATION NETWORK, AND OPEN SPACES.** Cities are human habitat. Most cities, however, are not designed to a human scale. Everywhere, streets are designed mainly for cars, rather than biking or walking, buildings designed as iconography rather than interaction, and public spaces designed for grandeur rather than intimacy and functionality. Cities that are not overtly designed for the human scale feel dangerous, gigantic, and disorienting, as if we are visitors in an alien land.

Streets, buildings, and open spaces should benefit people and recognize that walking and bicycling—human-scale transportation—is a very significant element of mobility within a city. Buildings must be designed to relate to the human scale along the exterior, with windows, doorways, balconies, etc. Parks should avoid vast expanses of blank open space in favor of benches, trees, fountains, food vendors, or wilderness. The city itself should also start to form itself based on human-scaled transportation by defining neighborhood boundaries with walkable areas from commercial centers that meet 100% of daily need.



## PATTERN 03 STREETS FOR PEOPLE

### Description:

**THE STREET NETWORK SHOULD BE DESIGNED PRIMARILY FOR SMALL-SCALE HUMAN MOBILITY AND OTHER HUMAN NEEDS, RATHER THAN FOR CARS.** Today in San Francisco, the primary purpose of streets is to move cars, goods, buses, and trains. A disproportionate percentage of street right-of-way is designated for single-occupancy and large vehicles, even though that is not how most trips within the city are made, or how the street right-of-way can be optimally used. All streets do not need to carry all vehicles—the street network should identify key routes for large vehicles, emergency access, and through traffic, but then the majority of street miles should be designated for human-scaled mobility and other Living Community functions, such as linear open space, rainwater and energy harvest and storage, wild places, pedestrian paths and food growing.



## PATTERN 04 BLUE-GREEN STREETS

### Description:



**SOME STREETS CAN BE REBUILT AS NEW, MULTI-FUNCTIONAL PLACES OF WATER COLLECTION AND STORAGE, BIOPHILIA, RECREATION, WASTEWATER TREATMENT, AND OTHER ECOSYSTEM SERVICES.** The Blue-Green Street integrates stormwater flows, natural streams, wetlands and later-stage greywater treatment by transforming the old street paradigm into a new place of biophilia, recreation, natural cooling, systems learning and wild habitat. The result is a linear park that could include bike paths, jogging trails, continuous wetlands for capturing, treating, or storing stormwater, or that connects a network of eco-machines treating later stages of wastewater. With the provision of water, a lush, wild landscape of large shrubs and tree groves is possible, providing a cooling microclimate on hot days. A Blue-Green Street can be integrated into many street types, from boulevards to neighborhood streets, and from alleyways to bike paths. The result is places that are much more people-centric and biophilic.



## PATTERN 05 STREET-TO-TABLE

### Description:

**FOOD GROWING SHOULD BE INTEGRATED INTO THE EVERYDAY LIFE OF THE STREET**—urban food pathways, wild edibles, and grab-and-go street grazing. Planting strips and medians should be used to plant edible plants and fruit-bearing trees, or perhaps even a row crop or two, linking a larger urban agriculture system of productive front yards, vacant lots and community gardens. **Our communities must become places to produce and to create food, rather than simply places to live, work, and consume.** Street-grown food is also an important element of city wildness and biophilia. Streets, rooftops, front yards and community gardens can be part of a network of food production and distribution, expressing the larger context of a more deeply local and inclusive food footprint for the city. As streets become less focused on cars and their accompanying toxicity, they become places with good solar and people access—an ideal place for growing food and creating an ever-present symbol of the restoration of our relationship to food.



## PATTERN 11 SHOW & TELL

### Description:

**AS PART OF PLANNING PROCESSES, SMALL, REAL PROJECTS MUST SPROUT UP AROUND THE COMMUNITY TO BUILD MOMENTUM AND PROGRESS, AND TO DEMONSTRATE THE VISION OF THE COMMUNITY.** Typical planning processes are often long, and their engagement process can favor certain personality types. Broadening the nature of the planning process to include action and tangible change can help sustain vision and be more inclusive of a broader cross-section of the community. Community gardens, parkettes, bike barns, new bike lanes, solar kiosks and community clean-ups are all examples of small actions that create anticipation and a sense of reality within the planning process. At a larger scale, an initial Living Building—perhaps a public building or a net-zero energy home retrofit demonstration—can reframe the sense of possible for the community.



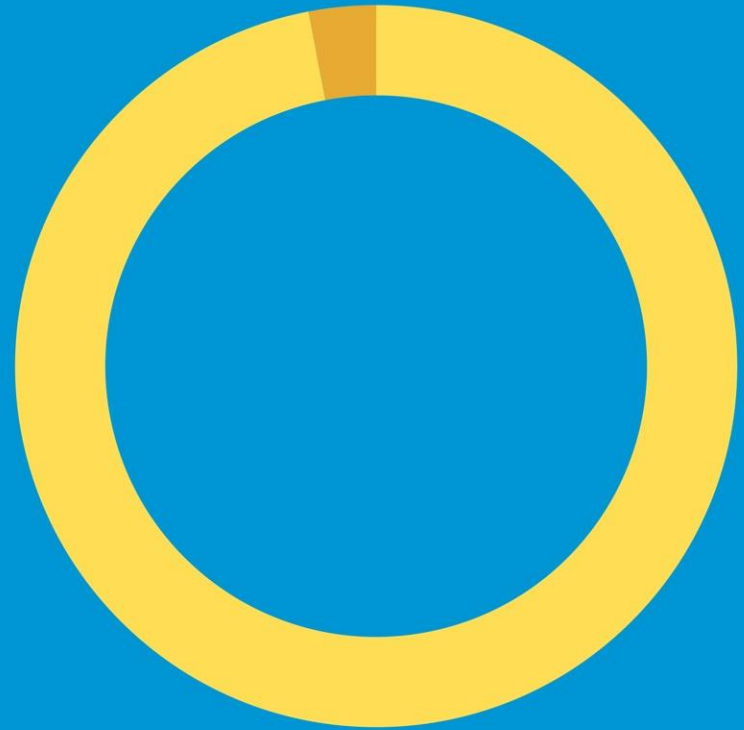




# CITIES



With one of the most aggressive stormwater programs in the USA, we are poised to solve less than 4% of the overall pollution problem







# Swale on Yale

Seattle / Vulcan



**HIGHWAY STORMWATER RUNOFF**

**RAIN WATER REUSE**



**Center of the Universe**

**Stephen C. Grey & Associates**

**RAIN GARDENS  
FILTER STORMWATER**

**CLEANED WATER  
TO LAKE UNION**



**WEBER THOMPSON**  
© 2017





# World Relief Seattle Kent Hillside Paradise Parking Plots



# ECOSS Co Lam Temple





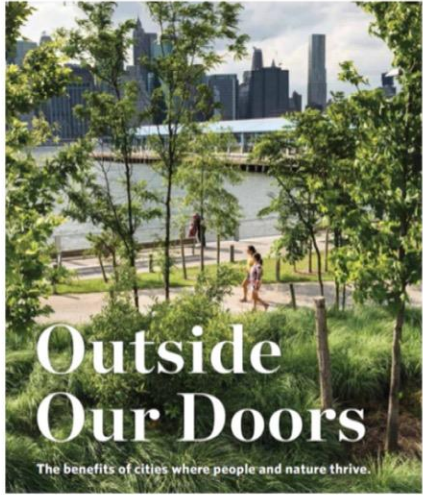




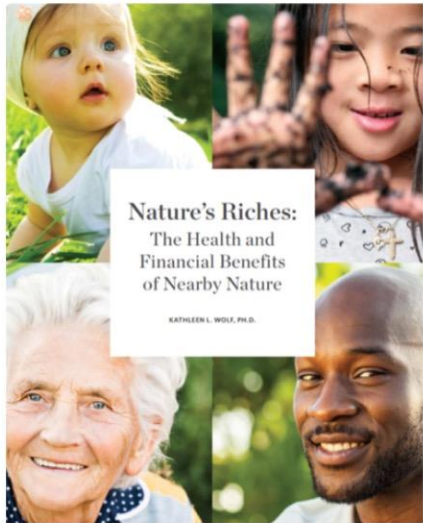


Thriving  
nature,  
Thriving  
people.





The Nature Conservancy



**MORE  
INFORMATION  
AVAILABLE**



UNIVERSITY of  
WASHINGTON



Pacific Northwest  
Research Station

The Nature Conservancy 



Hannah Kett  
Puget Sound Cities Program Manager  
The Nature Conservancy  
[hannah.kett@tnc.org](mailto:hannah.kett@tnc.org)



Marisa Hagney  
Living Community Challenge Manager  
International Living Future Institute  
[marisa.hagney@living-future.org](mailto:marisa.hagney@living-future.org)



**Questions?**



# REIMAGINING SEATTLE - GET YOUR POST-ITS READY



**Stadium District: Airport Way S & S Charles St & Maynard Ave S**





**Stadium District: Airport Way S & S Charles St & Maynard Ave S**





**Stadium District: Airport Way S & S Charles St & Maynard Ave S**





# Ballard Neighborhood: NW 46<sup>th</sup> St & Shilshole Ave NW



Ballard Marine Service

United E

Shilshole Ave NW

NW 46th St

NW 46th St

Ballard Auto Detail

Shilshole Ave NW

Pacific Coast  
Manag  
Shilsh

Ballard Neighborhood: NW 46th St & Shilshole Ave NW





**Ballard Neighborhood: NW 46<sup>th</sup> St & Shilshole Ave NW**



12,000 

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in Puget Sound

ADD A RAIN  
GARDEN



**RAIN GARDENS** : 3,848  
in Puget Sound



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## 3rd Annual Puget Sound Green Infrastructure Summit



city habitats

**Date:** February 9, 2018  
**Time:** 8:30 AM - 5:30 PM

**Location:** Cascadia College (U.W. Bothell)  
18345 Campus Way NE, Bothell, WA 98011

Diverse leaders from Puget Sound cities and towns convene to map the strategic role of urban green infrastructure in our shared clean water future.





This is where  
big ideas gain  
momentum.

May 1-4, 2018 | Portland, OR

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**Join the movement.**



**LIVING  
FUTURE<sup>®</sup> 18**  
AUTHENTICITY + ACTION



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**Questions?**