



CAPITOL HILL EcoDistrict

A proposal for district-scale
sustainability



Prepared by GGLO
Full Report
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Cover Image Credit: Dan Bertolet

What is an EcoDistrict?

An EcoDistrict is sustainability applied at the neighborhood scale. EcoDistricts provide a framework for realizing advanced sustainability — increasing efficiencies, reducing pollution, restoring ecosystems, and improving communities — through behavior change, building design and infrastructure investments. EcoDistricts are measured for improved performance over time.



Bank of America

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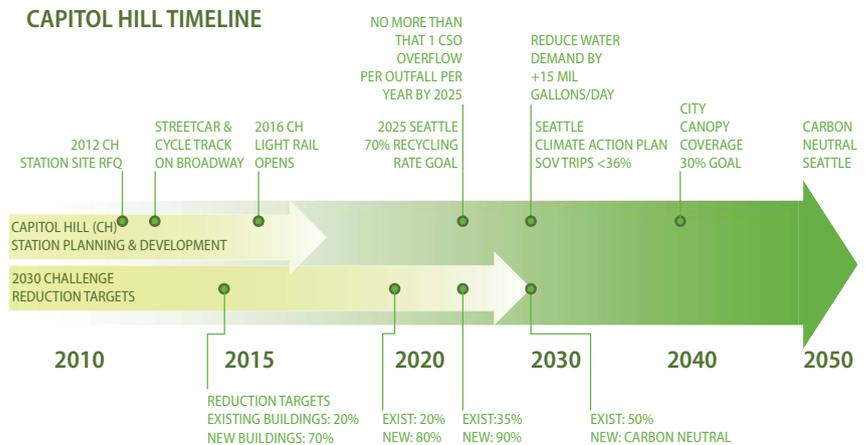
Person walking on the sidewalk.

Person pushing a cart on the sidewalk.

Group of people walking on the sidewalk.

EXECUTIVE SUMMARY

In March 2011 the Bullitt Foundation awarded Capitol Hill Housing a grant to spearhead the creation of a new “EcoDistrict” on Capitol Hill, allowing them to work with GGLO to conduct the research and outreach efforts detailed in this report. The intention of this report is to support the establishment of an EcoDistrict on Capitol Hill with an inventory of information and recommendations for action; it is a catalogue of goals, targets, metrics and strategies. As this EcoDistrict initiative grows, Capitol Hill Housing looks forward to continuing to work with the Capitol Hill community to improve the neighborhood’s environmental impacts, and thereby serve as a role model for other neighborhoods, encouraging city, state and national governments to match Capitol Hill’s commitment.



Capitol Hill Timeline in the context of major City and Architecture 2030 Challenge goals. (Image Credit: GGLO)

Why Here?

Increased social and environmental challenges, both global and regional, have highlighted the need for an evolving approach to sustainable community building. The EcoDistrict approach is a good model for meeting those demands, while supporting citywide efforts such as creating a carbon neutral Seattle by 2050, by leveraging community action and the efficiencies of district-scale systems.

Why Capitol Hill Housing?

Capitol Hill Housing has been working to make Capitol Hill a sustainable community for 35 years. As a Public Development Authority and Community Development Corporation, Capitol Hill Housing has been providing leadership in creating a vibrant and engaged community on Capitol Hill. Taking a leadership role on the creation of an EcoDistrict is the logical next step.

Why Now?

Several recent developments and neighborhood sustainability outreach efforts have motivated Capitol Hill Housing to initiate work on forming an EcoDistrict on Capitol Hill:

- Light rail station and streetcar infrastructure investments are planned for Capitol Hill
- Cooperative efforts have demonstrated the value of community building around sustainability
- The Federal Sustainable Communities program inspired Capitol Hill Housing to more explicitly connect affordable housing with transportation access and the environment
- Organizations such as The Bullitt Foundation have provided sustainable leadership in the neighborhood through the pursuit of the "Living Building Challenge"

[Opposite Page]

The streetcar, pedestrians, and mix of housing and commercial uses at the ASA Flats + Lofts by GGLO, sets the scene for a transit oriented community. (Image Credit: Gregg Galbraith)



*These wayfinding icons are found throughout the documents.
(Image Credit: GGLO)*

EXECUTIVE SUMMARY

Approach

The general approach to creating a functioning EcoDistrict can be organized around six primary phases, as illustrated below. This study includes tasks in four of six phases: Research, Outreach, Vision, and Strategies. The initial structure for this study is outlined in the "EcoDistrict Roadmap" (available in Appendix D).

Research

Collect and analyze information on the site context, EcoDistrict best practices nationwide and around the world, and relevant related projects and initiatives that can inform the development of local vision, goals and strategies. Research includes EcoDistrict best practices (see Appendix A & B) as well as an analysis of Capitol Hill (see *Study Area* chapter) which includes a wide range of assets (see *Performance Areas* chapter) that together make the case for the an EcoDistrict on Capitol Hill.

Outreach

Engage partners, resources, stakeholders, and the community to discuss priorities, brainstorm potential strategies, and solicit valuable feedback. A series of meetings were conducted in this phase (see Appendix C) to engage potential partners and stakeholders, identify resources, and discuss priorities. Continued outreach will be an essential component of the EcoDistrict's future development.

Vision

Define a vision for the EcoDistrict that establishes overarching guiding principles.

The starting point has been a vision of a high-performing, socially vibrant and equitable neighborhood that grows from the Station Area Sites to achieve advanced environmental performance goals in six areas. Visioning and goal setting "Postcards from the Future", written by community members at a Capitol Hill EcoDistrict outreach forum, are summarized throughout this report .

Strategies

Determine a set of EcoDistrict strategies, at both the building and infrastructure scales, to pursue. Establish metrics and targets, and current performance baselines to track improvements over time. EcoDistrict best practices and site asset research as well as outreach feedback informed suggested Goals, Targets, Metrics, and Strategies catalogued in this report. Future phases of the Capitol Hill EcoDistrict will continue to influence these items.

Implementation

Set priorities and implement the strategies.

Tasks will occur in future phases.

Measurement

Conduct ongoing assessment of EcoDistrict performance, provide feedback, and make improvements.

Tasks will occur in future phases.

EXECUTIVE SUMMARY

Creating a Catalogue for Capitol Hill

In this early phase of Capitol Hill's EcoDistrict, a site analysis of neighborhood resources and preliminary community outreach was conducted in order to inform initial recommendations for sustainability work on Capitol Hill. This report is the catalogue of that work to assist Capitol Hill to develop its EcoDistrict, with goals, metrics and strategies identified around specific environmental 'performance areas': **Community**, **Transportation**, **Energy**, **Water**, **Habitat** and **Materials**.

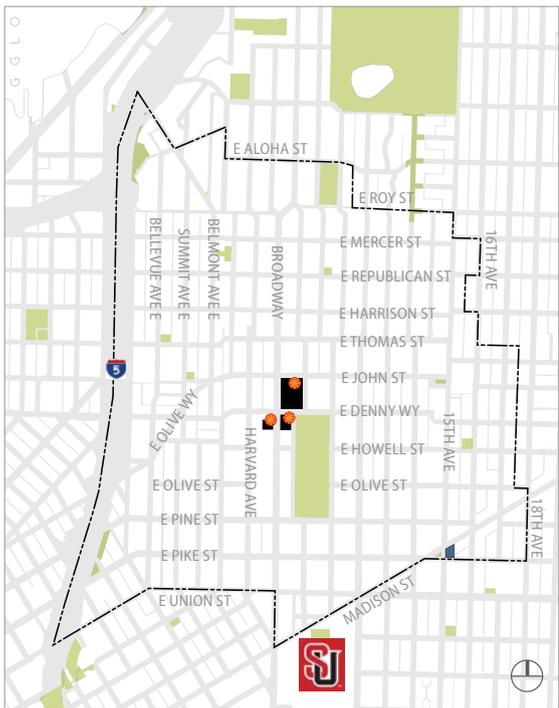
Study Area

The specific areas of focus for this Capitol Hill EcoDistrict Study include the:

- 1) Capitol Hill Urban Center Village and Pike/Pine Urban Center Village
- 2) The Sound Transit–owned properties on and around the planned LINK light rail station

The existing city boundary designations for Urban Center Villages provide a useful district-wide boundary for compiling and comparing data about neighborhood demographics, land use, and utilities, and for establishing baselines and evaluating future progress; however, the area is *not* intended to prescribe a specific EcoDistrict boundary. The EcoDistrict boundary will evolve as the EcoDistrict develops.

Ultimately, it is hoped that the Station Area development becomes a catalyst for the surrounding neighborhood, kick-starting its evolution into a mature, district-scale EcoDistrict and model for the region.



STATION ENTRY 

STATION AREA SITES 

ECODISTRICT STUDY AREA BOUNDARY
(Capitol Hill Urban Center Village + Pike/Pine Urban Center Village) 

BULLITT CENTER 

PARK 

WATER BODY 

PARCEL/ROW GRID 

POTENTIAL ECODISTRICT PARTNER: SEATTLE UNIVERSITY 

EcoDistrict Study Areas Map Diagram

This map shows where the Station Area Sites are along Broadway, as well as the EcoDistrict study area boundary defined by the Capitol Hill Urban Center Village and Pike/Pine Urban Center Village boundaries. The Urban Center Villages provide a useful district-wide boundary for compiling and comparing data about neighborhood demographics, land use, and utilities, and for establishing baselines and evaluating future progress; however, the area is not intended to prescribe a specific EcoDistrict boundary. (Image Credit: GGLO)

EXECUTIVE SUMMARY: GOALS & STRATEGIES

Recommended Goals & Strategies

Capitol Hill is a prime neighborhood for establishing an EcoDistrict. An extensive account of the neighborhood's many site assets and baseline performance for each of the six performance areas is detailed in the *Performance Areas* chapter. Further, this chapter catalogues initial recommendations for performance goals, targets, metrics, and strategies for each performance area. Criteria for developing recommended strategies in the Capitol Hill EcoDistrict included consideration of:

1. Best Practices from EcoDistrict Case Studies (see Appendix A & B)
2. Stakeholder Priorities (see Appendix C)
3. Existing Sustainability Projects, Opportunities and Local Resources
4. Site Assets and Quantitative Data Analysis of Baseline Performance (see *Performance Areas* chapter)
5. Potential Equity, Economic, and Environmental Impacts

Strategy 'Scatter Plot' Summaries

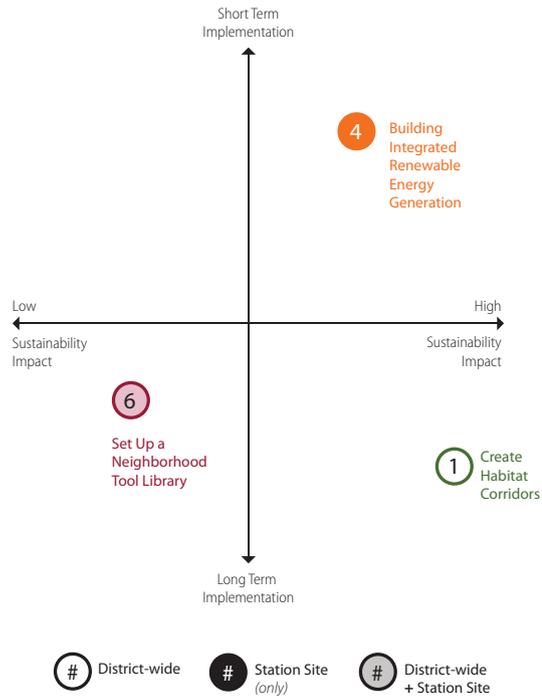
Recommended strategies are summarized on Scatter Plot diagrams in this Executive Summary and at the end of each performance area section in the *Performance Areas* chapter. In order to organize the strategies on the Scatter Plots, each is given an identification number and a "dot" that indicates whether the strategy should be implemented District-wide and/or on the Station Area Sites (see example graph at left). These numbered dots are then located on the Scatter Plots based on the perceived implementation time frame and sustainability impact of each strategy:

Implementation: Short Term – Long Term

Some strategies are relatively quick to implement, such as many associated with the Station Area Sites due to the imminent development, (shown at the top of the summary graph) while other strategies are more long term and will require more time to completely implement and yield full benefits (shown at the bottom of the summary graph).

Sustainability Impact

All recommended strategies can contribute to EcoDistrict success; however, some strategies have increased levels of impact (shown to the right of the summary graph) – more carbon reduction, greater impact on an equitable community, additional water efficiency, more carbon sequestered, greater waste reduction, or more potential for EcoDistrict awareness to excite the community to take action. It will be important to explore a variety of strategies—short & long term with an assortment of impact—at the beginning of the EcoDistrict work in order to achieve steady progress over time.

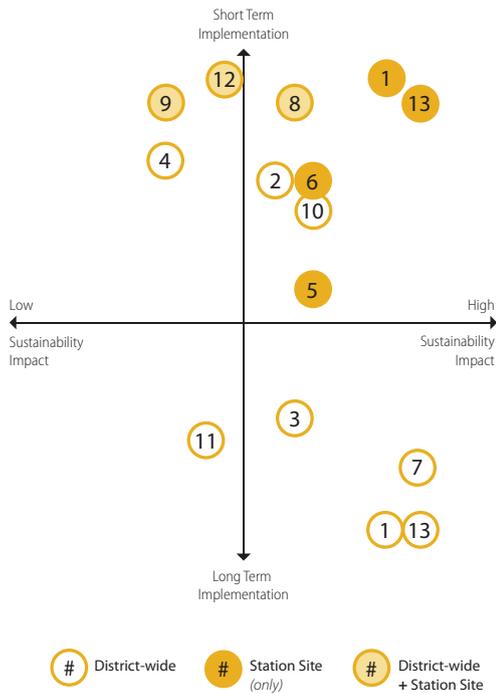


For Example...

- 6 Materials Strategy #6: Set Up a Neighborhood Tool Library
- 4 Energy Strategy #4: Building Integrated Renewable Energy Generation
- 1 Habitat Strategy #1: Create Habitat Corridors

Example Strategy Summary Scatter Plot
Dots are color coded by Performance Area — **Community, Transportation, Energy, Water, Habitat, and Materials**. Numbers are for identification purposes only and do not reflect a judgement about the importance or priority of any recommended strategy. See explanation at right for more about the organization of this Scatter Plot.
(Image Credit: GGLO)

EXECUTIVE SUMMARY: GOALS & STRATEGIES



Note: The number on each dot corresponds to the Strategies listed at right.

Community

Intent: Create an equitable, healthy and vibrant community that supports sustainable living

Goals:

- Benefit the Broadest Possible Spectrum of People
- Increase Human Health and Well-Being
- Maximize Sustainable Behaviors
- Enrich Social Networks and the Cultural Environment
- Increase Quality of the Public Realm
- Increase Density, Diversity of Uses, and Street Activity

Strategies:

Equity

1. Build New Affordable Housing
2. Develop a Community Fruit Tree Harvesting & Food Bank Donation Program

Health

3. Grow a Capitol Hill Community Orchard
4. Map all Urban Fruit Trees
5. Establish an Urban Farm Plot at the New TOD Development
6. Relocate the Broadway Farmers Market at the New TOD Development
7. Retrofit Wood-Stoves and Wood-Burning Fireplaces
8. Restrict Gas-Powered Yard Equipment
9. Monitor Air Quality Inside and Outside Buildings

Cultural Vibrancy

10. Develop Piazzette in Underutilized Spaces
11. Improve Hillclimbs Adjacent to I-5
12. Organize a Community Public Art Project Event
13. Increase Population and Employment Density Near High Capacity Transit

EXECUTIVE SUMMARY: GOALS & STRATEGIES

Transportation

Intent: Reduce the negative environmental impact of automobile use by maximizing the opportunities for walking, biking, and transit use

Goals:

- Prioritize Active Transportation
- Maximize Access to Clean, Low Carbon Transportation Options
- Reduce Vehicle Miles Travelled (VMTs)
- Enable Car-Free Households (*also a UDF goal*)
- Increase the Safety of Walking and Biking
- Improve Wayfinding around District and to Various Transportation Options

Strategies:

Transit

1. Provide Transit Passes to Tenants
2. Install Real-Time Arrival Info Monitors at Transit Stops

Vehicles

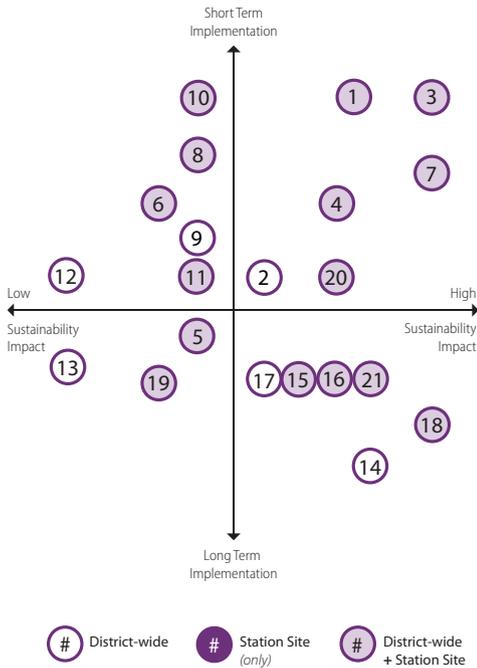
3. Minimize Installation of New Parking Stalls
4. Convert Parking Stalls/Street Parking to New Use
5. Create a Parking Management District
6. Increase Car-Sharing Stalls & Stops (for ZipCar, Avego, etc)
7. Separate Parking Stall Cost from Rent/Lease Costs
8. Plan a “Guerilla Parking Day”
9. Campaign to Remove Subsidies for Restricted Parking Zones

Walking/Pedestrians

10. Develop a Neighborhood Wayfinding Program/Install Wayfinding Signage
11. Create an EcoDistrict Pedestrian Zone
12. Create an Annual Pedestrian Count Program
13. Conduct a Neighborhood Walkability Audit
14. Improve Alleys
15. Repair/Replace Inaccessible Sidewalks
16. Install Woonerfs/Convert Low Traffic Streets or Alleys to Woonerfs
17. Advocate for Pedestrian Infrastructure and Funding

Biking

18. Install More Bike Boxes at Major Intersections
19. Install Creative Bike Racks
20. Implement a Bike-Sharing Program
21. Open a Bikestation on Capitol Hill



Note: The number on each dot corresponds to the Strategies listed at right.

EXECUTIVE SUMMARY: GOALS & STRATEGIES

Energy

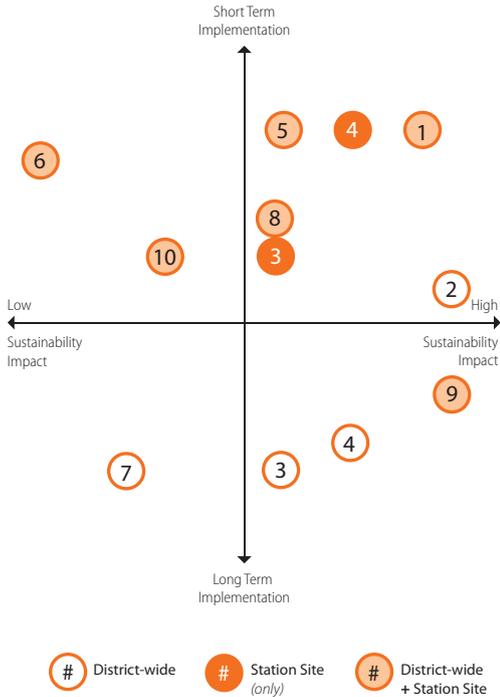
Intent: Reduce non-renewable energy use & associated greenhouse gas emissions

Goals:

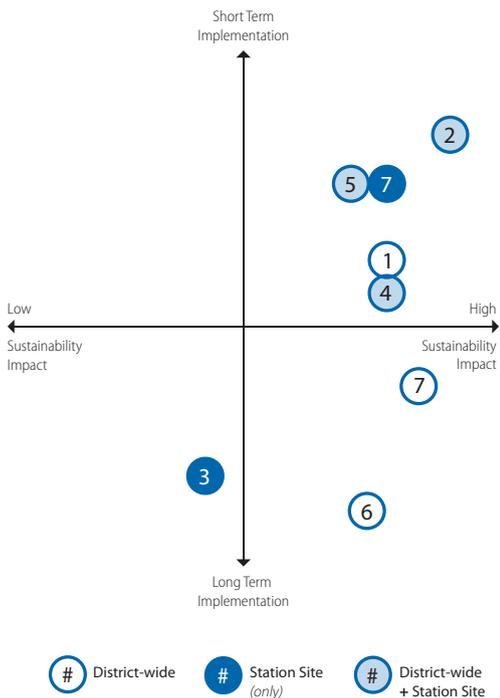
- Reduce Energy Use by Minimizing Demand and Maximizing Conservation
- Provide New and Expand Existing Options for Improving Energy Efficiency in Buildings and throughout the District
- Optimize Infrastructure Efficiencies at All Scales
- Use Renewable Energy
- Reduce Mix of Energy Generated from Fossil Fuels Consumed in the District | Increase the Mix of Renewable Energy

Strategies:

1. Energy-Efficient Building Design (Target Big Users)
2. Energy Retrofits on Existing Buildings (Target Big Users)
3. Integrate with External District Energy System
4. Building Integrated Renewable Energy Generation
5. Certify All New Development to LEED Gold Minimum
6. Renewable Energy Purchase Agreement
7. Small-Scale Hydropower
8. Participate in the Seattle 2030 District
9. Advanced Metering
10. Visualize Energy Use - Dashboards & Pavement



Note: The number on each dot corresponds to the Strategies listed at right.



Water

Intent: Conserve potable water; reduce blackwater production and stormwater runoff

Goals:

- Reduce Stormwater Runoff within and from the District
- Reduce Potable Water Consumption
- Use Potable Water for Highest and Best Use - Utilize Greywater for Appropriate Tasks
- Maintain Availability, Reliability and Affordability of Water

Strategies:

1. Convert Underused PGS's to Habitable or Permeable Uses
2. Water Visualization - Education: Residential
3. Water Reuse: New Multi-family and Non-Residential
4. Efficient Water Fixture Retrofits & Installations
5. Stormwater Management - Green Roofs/Walls (New)
6. Stormwater Management - Green Roofs/Walls (Retrofit)
7. Stormwater Management - Swales/Raingardens

EXECUTIVE SUMMARY: GOALS & STRATEGIES

Habitat

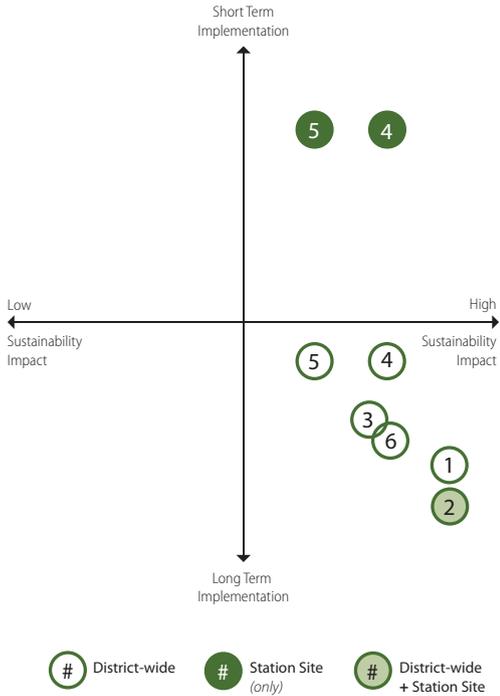
Intent: Enrich urban habitat in the district and in the surrounding neighborhoods to promote biodiversity and support the community, even as development increases the intensity of the built environment

Goals:

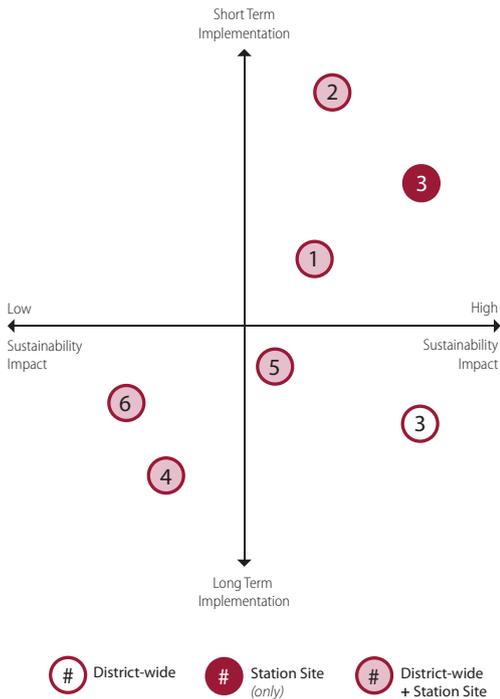
- Advance Current and Emerging Watershed Goals
- Protect, Regenerate, and Manage Habitat and Ecosystem Function at All Scales
- Prioritize Native and Structurally Diverse Vegetation
- Create Habitat Connectivity within and beyond the District
- Avoid Human-made Hazards to Wildlife and Promote Nature-friendly Urban Design
- Prioritize High-quality, Habitat-creating, Flexible Open Spaces (parks, plazas, community gardens, and recreation fields)

Strategies:

1. Create Habitat Corridors
2. Increase Tree Canopy
3. Create Habitat - Parks
4. Create Habitat - ROW
5. Create Habitat - Green Roofs & Walls
6. Create Habitat - Backyards



Note: The number on each dot corresponds to the Strategies listed at right.



Materials

Intent: Reduce the negative environmental impacts of materials through conservation and diversion

Goals:

- Zero Waste
- Reduce Material Use
- Reduce Solid Waste - Maximize Reuse, Salvage, Recycling, and Composting
- Minimize Use of Virgin Materials
- Maximize Use of Recycled and Salvaged Materials
- Make the Local/Regional Product Choice the Easy Choice

Strategies:

1. Develop Outreach to Reduce Residential Waste & Increase Diversion Rates
2. Provide Ample Space for Recycling, and Organic and Waste Disposal
3. Maximize Use of Recycled, Regional & Salvaged Materials in Buildings
4. Optimize Procurement Activities through Group Purchasing
5. Promote Yard/Garden Shares
6. Set Up a Neighborhood Tool Library

EXECUTIVE SUMMARY: GOALS & STRATEGIES

Next Steps

This report represents the initial phase of the Capitol Hill EcoDistrict. Subsequent phases will: expand public outreach; establish an EcoDistrict management structure within a clear boundary; refine goals, metrics, and strategies; develop an Action Plan; embark on detailed feasibility studies of individual policies and strategies under consideration; implement strategies, policies and projects in support of EcoDistrict goals; measure progress against baselines to assess performance and adjust the EcoDistrict's course as necessary.



Dancers' Series: Steps, 1982
Public Art by Jack Mackie, on Broadway, Capitol Hill
(Image Credit: Joel Davis-Aldridge)



While **EcoDistrict** and **District Energy** sound alike, they are not synonymous.

E-co-Dis-tract /ē-kō 'dis-trikt/

An **EcoDistrict** is sustainability applied at the neighborhood scale. EcoDistricts provide a framework for realizing advanced sustainability — increasing efficiencies, reducing pollution, restoring ecosystems, and improving communities — through behavior change, building design and infrastructure investments. EcoDistricts are measured for improved performance over time.

Dis-tract En-er-gy /'dis-trikt 'e-nā-jē/

District Energy is a systems-strategy for generating and distributing energy across multiple buildings. District energy strategies have been widely implemented in Europe, particularly Scandinavia — Seattle Steam is a local example of a district energy system. District energy systems are only one potential infrastructure component of a comprehensive EcoDistrict.

World Urbanization:
For the first time, the number of people living in urban areas surpasses the number of people living in rural areas and, by 2050, two-out-of-three people will live in cities.

(Source: UN DESA, 2010)

*[Opposite Page]
Raingardens at Burien Town Square by GGLO.
(Image Credit: Derek Reeves)*

WHAT IS AN ECODISTRICT?

What is an EcoDistrict?

An EcoDistrict is sustainability applied at the neighborhood scale. They promote a comprehensive approach to advanced sustainability that addresses improved performance over time. EcoDistricts provide a framework for increasing efficiencies, reducing pollution, restoring ecosystems, and improving communities—through behavior change, building design and infrastructure investments. Around the world, some of the most innovative sustainability work is currently taking place in EcoDistricts.

Why are EcoDistricts formed?

It is widely recognized that the prospects for sustainable development are greatly improved when design is approached from a systems perspective. In the case of the built environment, this means thinking beyond a single, isolated building, and tapping into synergies with the surrounding buildings, infrastructure, and community. An EcoDistrict is a conceptual framework designed to facilitate this scale jump. To that end, an EcoDistrict can entail a wide variety of sustainability strategies implemented at scales ranging from a few buildings to entire neighborhoods.

EcoDistricts are formed to help create sustainable communities in the fullest sense of the definition, covering the spectrum of social, economic, and ecological realms. Technical sustainability strategies are a means to an end, not an end in themselves. An EcoDistrict need not sacrifice affordability or equitable access for environmental performance—energy efficiency translates to reduced utility expenses, for example. Indeed, a successful EcoDistrict leverages untapped district-scale synergies to create a win-win for both people and the planet.

How long have EcoDistricts been around?

Neighborhood scale sustainability has been around for hundreds, if not thousands of years. Examples of communities living in balance with the environment include historical settlements such as Native American cliff dwellings, modern, intentional communities like EcoVillages, which were created during the latter part of the twentieth century to enhance social, economic and environmental sustainability, and University campuses, which have some of the most established examples of district-scale systems found in the U.S.

Over the last decade or so, growing environmental challenges, as well as population shifts towards cities, have led to renewed interest in sustainable design at the neighborhood scale and the important role that urban neighborhoods play in creating a sustainable future. The recently launched LEED for Neighborhood Development program and the Portland Sustainability Institute's EcoDistrict Initiative are two of the most prominent examples of this trend in thinking.

"EcoDistrict" as a self-referential term is rather new, but there are many examples of EcoDistrict-related projects nationally and internationally, both conceptual and constructed, that set specific sustainability goals around sustainable behavior and the built environment, apply design strategies at the building-scale and district-scale to meet them, and establish management structures to support initial and ongoing development. (See Appendix B for some example EcoDistrict case studies)



Measuring Performance

GGLO collaborated with Capitol Hill Housing in the design of Broadway Crossing (LEED Silver), and then continued with measuring building performance after building occupancy. Lessons learned allowed the team to fine tune building operations. (Image Credit: William P Wright)

WHAT IS AN ECODISTRICT?

How are EcoDistricts assessed?

EcoDistricts assess sustainability through the lens of "Performance Areas"—**Community, Transportation, Energy, Water, Habitat** and **Materials**—which provide a comprehensive view of sustainability across a broad spectrum of issues (such as energy efficiency, waste management, and community health). Through performance areas the EcoDistrict promise of advanced sustainability is realized; no one area dominates and all are considered together.

Each performance area has its own:

- declaration of *intent*, or statement that details the overall vision of the performance area,
- set of high-level *goals* that identify what the EcoDistrict should strive for in that performance area,
- set of *targets* that quantify the goals with specific measurable targets within a defined time period,
- list of *metrics* or ways of measuring performance and assessing when goals and targets are met, and
- set of *strategies* or projects for achieving performance goals and targets.

Performance areas provide a useful framework for measuring EcoDistrict success over time and for clarifying community goals. As EcoDistricts form and initial research and goal setting begins, baseline measurements of neighborhood "performance" in each performance area will set the base point from which improvements can be measured over time. Additionally, baseline measurements can reveal which areas may be in more need of work than others and thereby help inform which strategies should be implemented sooner rather than later.

PoSI

With the 2009 launch of their EcoDistrict Initiative, the Portland Sustainability Institute (PoSI) elevated the neighborhood sustainability discussion. They drafted an EcoDistrict Framework, which included work on performance areas and a selection of toolkits, initiated five pilot EcoDistricts in Portland, and created an annual EcoDistrict Summit. Throughout this report, PoSI's toolkits are referenced as resources to aid in the development of the Capitol Hill EcoDistrict.

BUILDINGS



The upcoming Bullitt Center on Capitol Hill is a great example of sustainability strategies implemented at the building scale. It is designed by Miller Hull to generate all its own energy, collect and reuse rainwater, and support the health of its occupants with non-toxic materials, natural ventilation, and daylighting. (Image Credit: Miller Hull Partnership Architecture; Seattle, Washington)

INFRASTRUCTURE



Bioswales and rain gardens are excellent strategies at the infrastructure scale to sustainably manage district stormwater. (Image Credit: GGLLO)

PEOPLE



Community gathering places like Cal Anderson park, events like Outdoor Movies, and neighborhood CSA food deliveries by bike are great strategies for supporting a sustainable and vibrant community. (Image Credit: Fork & Frame)

WHAT IS AN ECODISTRICT?

How are specific sustainability strategies chosen?

The choice of a specific set of appropriate strategies to pursue in any EcoDistrict depends on numerous site-specific factors – including community goals, site location, context, stakeholders, the regulatory environment, economics, demographics, politics, etc. While all strategies contribute to neighborhood performance, individual strategies address a variety of scales. For example:

- **Buildings:** Sustainable design strategies at the building-scale or site scale can individually contribute to neighborhood goals such as energy and water efficiency, waste management, and sustainable education through building design. *High performance buildings* are integral to EcoDistricts. While building scale strategies do not require site-wide management or shared ownership, these strategies should be established, regulated, and measured for progress across an entire EcoDistrict.

Increasing the number of building-scale projects in the neighborhood has many benefits such as: growing a local, experienced workforce; identifying and removing regulatory barriers; and supporting market shift and behavior change.

- **Infrastructure:** Green infrastructure strategies tackle sustainability at the district-scale, beyond the borders of individual sites. They can be essential for achieving higher levels of neighborhood-wide sustainability, while distributing costs that might be difficult for a single urban site. District-wide energy, stormwater and materials efficiencies, habitat creation and protection, and transportation infrastructure are examples of *green infrastructure* strategies that connect high performance buildings and individual sites to large district-wide systems. As a shared resource, district-scale infrastructure may require common ownership and/or management across an EcoDistrict.

While some infrastructure is most efficient at the regional scale, in many cases, sustainable infrastructure strategies are best implemented locally. District-scale infrastructure allows for more control to channel investments to neighborhood priorities and to fast-track implementation. These district-scale systems are often more resilient in the face of crisis than regional systems that rely on one central plant.

- **People:** Strategies that encourage *sustainable behavior*, or people-scale sustainability, are best suited to address equity, health, and cultural vibrancy through outreach and education. EcoDistrict strategies for people-scale sustainability involve people who live and work in the EcoDistrict, as well as members of the surrounding community. They provide an essential balance for EcoDistrict sustainability by directly addressing the social realm, while helping ensure that the strategies employed at the building-scale and district-scale (infrastructure) benefit the community in a holistic way and operate to their fullest potential.

People-scale strategies promote behavior change through access to new information, education and training, as well as through offering monetary and other incentives.

The research detailed in this report represents the first phase at assessing Capitol Hill's assets and current performance in each performance area in order to provide an initial set of recommended strategies, at each scale, for the community to consider as work continues towards developing a fully functioning EcoDistrict.

WHAT IS AN ECODISTRICT?

How are EcoDistricts created?

EcoDistrict creation can be separated into three phases:

- (1) organization and establishment,
- (2) pre-assessment and strategy development (which includes research of best practices, neighborhood site assets, and performance baselines), and
- (3) project planning, implementation and performance monitoring.

In the United States, most of the EcoDistrict work to date has only progressed through phases (1) or (2), which are less capital-intensive than phase (3). In some cases a single entity starts the organization of an EcoDistrict with pre-assessment research, while a formal management group is being established. In other cases, a formal management group initiates the pre-assessment and planning phase. Once an appropriate set of strategies have been determined, the next step is to implement them through projects overseen by an established EcoDistrict management entity.

In Europe and Canada, several EcoDistrict-type projects have progressed through phase (3), but the capital-intensive district-scale systems involved were primarily funded by the private sector and/or government. Notable examples include: BedZED, Dockside Green, Southeast False Creek, EVA Lanxmeer, and Malmo Western Harbour (see Appendix B for other case studies).



*Southeast False Creek, Vancouver, BC
(Image Credit: Don Vehige)*

Example Case Study: Southeast False Creek (Vancouver, BC)

SCALE: 80 acres, eventual build out of 6.3 million sf of residential development (~6,600 units)

GOALS: Create a leading model of sustainability in North America, incorporating forward-thinking infrastructure, strategic energy reduction, high-performance buildings and easy transit access.

METRICS: Energy use 40% Better than ASHRAE 90.1 2001, 50% Reduction in water use, 100% of site stormwater diverted

SUSTAINABILITY STRATEGIES: Passive building design, district energy (neighborhood energy utility, waste heat recovery), rainwater harvesting and reuse, green roofs, LEED-ND Platinum, 1/3 of housing affordable, sustainability indicators and targets adopted

MANAGEMENT: City of Vancouver

FINANCE: Millennium SEFC Properties (private), City of Vancouver (public)

IMPLEMENTATION STATUS: First phase complete (1,100 units and 68,000 sf commercial)
(see Appendix B for other case studies)



Capitol Hill Housing with the assistance of a grant from the Bullitt Foundation is spearheading the exploration of creating an EcoDistrict on Capitol Hill.

EcoDistricts Benefit

Neighbors:

"Provides a tangible way to get involved in improving and enhancing the neighborhood's economic vitality and sustainability, as well as a new form of organization."

Businesses:

"Provides a platform to deliver district-scale infrastructure and building products and services to market."

Developers and Property Owners:

"Creates a mechanism to reduce development and operating costs by linking individual building investments to neighborhood infrastructure."

Utilities:

"Creates a model for integrated infrastructure planning to guide the development of more cost-effective and resilient green infrastructure investments over time. EcoDistricts also provide a mechanism for scaling conservation and demand-side management goals by aggregating district-wide projects."

Municipalities:

"Supports a neighborhood sustainability assessment and investment strategy to help meet broader sustainability policy and economic development goals. EcoDistricts put demonstration projects on the ground, save local money and resources, and stimulate new business development."

(Source: The EcoDistricts Framework, v1.1, June 2011, Portland Sustainability Institute)

WHAT IS AN ECODISTRICT?

How are EcoDistricts implemented?

In order to *implement* projects to meet neighborhood goals, EcoDistricts need a clearly defined management structure, financing, and policy support:

- **Management:** Management entities, which vary in form from EcoDistrict Steering Committees to Business Improvement Districts, support initial and ongoing EcoDistrict development. Establishing a management structure is a critical early step in the process of creating an EcoDistrict. The entity may be a new organization, an existing organization expanded to take on the new role, or an alliance of existing organizations. The Portland Sustainability Institute's EcoDistricts Toolkit recommends an "Engagement to Governance" process, which emphasizes the importance of up front community engagement in determining the optimum management structure. Management entities must have the authority to act on behalf of the EcoDistrict, guide the development of an EcoDistrict's vision and strategies, manage funding and investments, and assess performance.
- **Finance:** Financing is needed to support initial and ongoing research, design, and development. The implementation of district-scale sustainability strategies typically requires substantial financial investment. There are several factors that create challenges for EcoDistrict financing, including multiple stakeholders and property owners, project complexity, risk associated with large up front costs and a long time frame for build out, and the difficulty of separating the public and private benefits provided. The Portland Sustainability Institute's EcoDistricts Toolkit identifies a wide range of potential sources of capital, including cost-sharing/partnerships, below-market-rate loans, debt/bonds, grants, impact/service fees, private equity, revolving loans, subsidies, tax assessments, tax increment financing, third party ownership, and voluntary contributions.
- **Policy Support:** The prospects for EcoDistrict success are strongly influenced by public policy, which includes regulations, incentives, and other government actions. In general, public policy should be crafted to create certainty, reduce financial risk, and incentivize sustainable behavior and investment. Almost as important, any existing policy that unintentionally creates barriers to EcoDistrict implementation must be addressed. The Portland Sustainability Institute's EcoDistricts Toolkit provides a list of public policy actions that have the potential to facilitate EcoDistrict development, such as regulations (zoning codes, building codes, and energy codes); public-private partnerships; financial incentives (tax credits, grants, subsidies, etc); technical assistance for assessments and projects; and third party certification requirements or incentives for compliance.





Seattle Residents use their bodies to spell out 350ppm on the Fisher Pavilion at Seattle Center as part of a Climate Action Now event. (Image Credit: Jay Dotson Photography)

CAPITOL HILL ECODISTRICT

Why Here?

Increased social and environmental challenges, both global and regional, have highlighted the need for an evolving approach to sustainable community building. Globally, climate change threatens the establishment and continuation of a high quality of life for ourselves and future generations, particularly the poor. Locally, increasing water and air pollution, the depletion of fisheries and timber stock, and loss of wildlife are negatively affecting human health and habitat. To reverse these trends, and restore the world's concentration of carbon dioxide in the atmosphere to sustainable levels—350ppm (see www.350.org/about/science)—cities and neighborhoods must lead the way to radically cutting carbon emissions between now and 2050. Further, they must reach a sustainable balance with all resources to create planet-healthy, habitat-healthy, and people-healthy communities. The EcoDistrict approach is a good model for meeting those demands by leveraging community action and the efficiencies of district-scale systems.

The Capitol Hill neighborhood is an ideal location for an EcoDistrict in Seattle, from its vibrant, walkable urban form to its progressive, engaged residents, the area is rich in assets that facilitate sustainable and equitable urban living (greater analysis of the neighborhood's many assets appears in the *Performance Areas* chapter). Additionally, the Capitol Hill neighborhood, like much of Seattle and the Pacific Northwest, has a long history of championing environmental sustainability. Creating an EcoDistrict would contribute to and grow that legacy, as well as support citywide efforts to create a carbon neutral Seattle by 2050.

Upcoming development on the Sound Transit-owned LINK light rail Station Area Sites offers an unprecedented near-term window of opportunity for implementing efficient district-scale systems from the ground up, for building green buildings, and promoting a culture of sustainability in a concentrated area of Capitol Hill. Much of the site analysis reported here has focused on the Station Area Sites, since its development can plant the seed for a new EcoDistrict on Capitol Hill; this seed of development can serve as a catalyst for the surrounding neighborhood, kick-starting its evolution into a mature, district-scale EcoDistrict. (See the *Study Area* chapter for more information about the EcoDistrict Study Area boundary.)

Why Capitol Hill Housing?

Capitol Hill Housing has been working to make Capitol Hill a sustainable community for 35 years. Founded by community activists in 1976, Capitol Hill Housing initially focused on combating neighborhood disinvestment. The organization provided financing and a tool lending library to help local residents fix up their homes. Capitol Hill Housing's early work exemplified social equity, smart growth and collaborative consumption.

Today Capitol Hill Housing owns and operates 1,132 apartments, all affordable for low and moderate income families. Their portfolio covers 8 neighborhoods across Seattle as well as White Center, while retaining a focus on Capitol Hill and the 12th Avenue Corridor of the Central Area. Capitol Hill Housing's commitment to sustainability has grown with time, as have visible connections between thriving urban neighborhoods, access for low-income people, and protection for the environment.

As a Public Development Authority and Community Development Corporation, Capitol Hill Housing has been providing leadership on Capitol Hill in creating a vibrant and engaged community. Taking a leadership role on the creation of an EcoDistrict is the logical next step.

[Opposite Page]
Visualizing the Station Area Sites as a "seed" of EcoDistrict Development that can grow across the neighborhood over time. (Image Credit: GGL0)

CAPITOL HILL ECODISTRICT

Why Now?

Several recent developments and neighborhood sustainability outreach efforts have motivated Capitol Hill Housing to initiate work on forming an EcoDistrict on Capitol Hill:

- Light rail and streetcar planning have sparked a neighborhood-wide reevaluation of the neighborhood's auto-infrastructure needs and use of space. Community organizing has focused on how to maximize the benefits of new development around the Sound Transit LINK light rail Station Area Sites on Broadway. It is hoped that EcoDistrict planning can capitalize on the planning momentum established for the area by the recently released *Capitol Hill Light Rail Station Sites Urban Design Framework* (UDF).
- Cooperative efforts like Sustainable Capitol Hill have demonstrated the value of community building around sustainability.
- The federal Sustainable Communities program (a collaboration between the U.S. Department of Housing and Urban Development, the U.S. Department of Transportation, and the U.S. Environmental Protection Agency) and the Puget Sound Regional Council's Growing Transit Communities that it funds inspired Capitol Hill Housing to more explicitly connect affordable housing work with transportation access and the environment.
- The Bullitt Foundation approached Capitol Hill Housing about creating a neighborhood-scale sustainability initiative after locating its new "Living Building Challenge"-designed headquarters on Capitol Hill.

As this EcoDistrict initiative grows, Capitol Hill Housing looks forward to continuing to work with the Capitol Hill community to improve the neighborhood's environmental impacts, and thereby serve as a role model for other neighborhoods, encouraging city, state and national governments to match Capitol Hill's commitment.



*The Capitol Hill Light Rail Station Under Construction
(Image Credit: Sound Transit)*



*What will replace the Red Wall?
(Image Credit: Carissa Franks)*

PoSI's Steps to Governance

Step 1: Engage Stakeholders

*Determine Representatives in your Community
Make an Inventory of Community Resources
Define the Message and Goals*

Step 2: Create an EcoDistrict Steering Committee

Step 3: Develop a Vision and Priorities and Document Commitments

Step 4: Determine Stakeholders' Roles and Responsibilities

Understand that the stakeholder created entity must have the following basic powers: Ability to design an organization, form a Board, and oversee operations; Enter into contracts and agreements with private parties and government agencies; Hold title to real estate; Accept grants and borrow funds; Purchase, construct, improve, operate and maintain sustainability projects within the EcoDistrict

Step 5: Formalize the EcoDistrict Governance Entity

(Source: EcoDistricts Organization, Engagement and Governance, 2011, v1.1)

Local Funding Resources

- Dept of Parks Opportunity Funds
- SPU Natural Drainage Systems Project
- SPU Environmental Grants
- Seattle Dept of Neighborhood's:
 - > Neighborhood Project Funds (SDOT and Parks projects)
 - > Neighborhood Matching Funds
- SDOT's Neighborhood Street Fund
- Sound Transit Bicycle Facilities Partnership within a half mile of its facilities (motion #M2009-36 Attachment A)
- Seattle Foundation Grants
- Local Improvement District

(Source: Capitol Hill-Broadway Transit Oriented Development, Development Guidelines and Urban Design Recommendations Report, February 2010, p.14)

CAPITOL HILL ECODISTRICT: IMPLEMENTATION

Successful implementation of EcoDistrict goals and strategies requires a management entity that has the authority to act on behalf of the EcoDistrict, financing to fund initial and ongoing research, design and development, and public policy support to facilitate implementation of projects. Capitol Hill's EcoDistrict can benefit from the Portland Sustainability Institute's work on governance, financing, and policy, as well as the local and regional resources listed below as it explores these issues in future phases.

Management

Example Management Structures

Because EcoDistricts are still a relatively new concept, there are limited relevant management examples. PoSI's "Steps to Governance" will be a useful framework for Capitol Hill's EcoDistrict development. Many of the EcoDistrict examples cited in Appendix B deviate from the community-driven EcoDistrict model either because they are privately owned, or because they are managed and funded by municipal governments. Appendix B summarizes several examples of EcoDistricts with management entities most relevant to the Capitol Hill EcoDistrict (note: management may evolve over time).

Local Management Resources

There are several existing neighborhood organizations in Capitol Hill that have the potential to take on the EcoDistrict management role individually, or in alliance, including: Capitol Hill Housing, the Capitol Hill Chamber of Commerce, the Capitol Hill Community Council, and the Capitol Hill Champion.

Finance

Example Financing Models

District-scale funding mechanisms identified in PoSI's EcoDistrict Toolkit include Business Improvement Districts; Local Improvement Districts; Property Assessed Clean Energy (PACE) Districts; Parking Benefit Districts; Voluntary Transportation Management Association Contributions; Urban Renewal Areas; and System Development Charges (impact fees). Potential future models include Climate Benefit Districts, Local Commercial REITs for Renters; Local Investing Opportunities Networks (LION), and Community IPOs.

Funding Resources

Similar to the Seattle 2030 District, there are a variety of funding sources available at the federal, regional and local level. A few sources particularly applicable to Transit Oriented Development projects on the Station Area Sites are listed at left.

Multiple City Programs Promote Sustainability

The City of Seattle has a range of sustainability-related programs in several departments that could potentially provide guidance or assistance for the proposed EcoDistrict:

Office of Sustainability and Environment: *District energy feasibility study that rates Capitol Hill as one of Seattle's most promising sites for district energy; Climate Action Plan, and ongoing programs to reduce Seattle's carbon footprint.*

Department of Planning and Development: *Energy Benchmarking and Disclosure; "Priority Green" permitting; Sustainable Communities; Sustainable Infrastructure; Green Factor*

Seattle Planning Commission: *Transit Communities Report issued in 2010; Housing Seattle affordable housing report issued winter 2011*

Office of Economic Development: *Community Development Loan Program; Community Development Block Grant Small Business Loan Fund; Seattle Climate Partnership*

Department of Transportation: *Broadway Streetcar design in progress; Transit Master Plan update in progress; Bridging the Gap; Pedestrian Master Plan and Bicycle Master Plan completed*

City Council: *The Regional Development and Sustainability Committee can be expected to support district-scale sustainability strategies such as district energy*

Office of Housing: *Supports affordable, transit oriented development, and infill housing.*

Mayor's Office: *Walk, Bike, Ride Initiative*

CAPITOL HILL ECODISTRICT: IMPLEMENTATION

Policy

Example Policy Frameworks

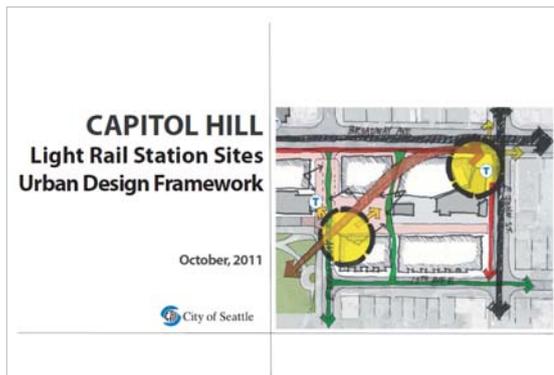
Because EcoDistricts are a relatively new concept, policy frameworks specifically designed to promote district-scale sustainability strategies do not yet exist in the U.S. But there may be potential opportunities to tap existing policy mechanisms.

Local Policy Resources

Currently there is little in the way of existing local policy that would help promote an EcoDistrict on Capitol Hill. Possible new or modified approaches include:

- Adaptation of the City's Priority Green permitting program to fast track permitting for projects that meet sustainability requirements established by the EcoDistrict
- Application of lessons learned from the Bertschi School's Science Wing and Bullitt Foundation's Cascadia Center, both projects pursuing living building certification, e.g. code that applies to water reuse
- Application of relevant policy developed for Yesler Terrace
- Pilot project for energy-use metering to demonstrate compliance with the City's reporting requirements

The City of Seattle has been proactive about planning for the Capitol Hill light rail station sites that comprise the catalyst site of the proposed EcoDistrict. In particular, the *Capitol Hill Light Rail Station Sites Urban Design Framework* (UDF) establishes a vision for the area with many potential synergies with EcoDistrict strategies, though a UDF does not mandate compliance. In June 2011 Sound Transit and the Seattle City Council initiated talks to negotiate a development agreement for the Capitol Hill light rail station sites. The intention of these negotiations is to craft a development agreement that ensures future development responds to the vision of the UDF. It is expected that this process will lead to amendments to the Seattle Land Use Code specific to the sites. This development agreement represents an ideal opportunity to formalize new policy that defines or establishes an EcoDistrict.



Cover of the Capitol Hill Light Rail Station Sites Urban Design Framework



Capitol Hill Housing's Goal

"Our goal on Capitol Hill is to take advantage of the development of the light rail station—that giant hole in the ground—to implement systems, from the ground up, that can grow over time to district-scale or connect to district energy as it approaches Capitol Hill. We are exploring strategies including high performance buildings, on-site energy generation, potable water conversion, zero waste, district energy and others. We have the density and we have the opportunity but the timing is urgent. We do not want yet another opportunity lost."

Chris Persons, Capitol Hill Housing Executive Director

VISION

The overall vision of Capitol Hill's EcoDistrict will evolve over time, but the starting point for this study has been a vision of a high-performing, socially vibrant and equitable neighborhood reflected in the Broadway light rail Station Area development and across the neighborhood, that meets environmental performance goals in six areas – **Community, Transportation, Energy, Water, Habitat,** and **Materials**. This working vision was derived from a synthesis of the research presented in the following chapters, and input from community stakeholders (see Appendix C: Outreach for a summary of all outreach efforts and contributors to date). Finer grain, specific visions and goals are detailed in the *Performance Areas* chapter.

A Vision for the Capitol Hill EcoDistrict

It is possible to envision a future when all members of the Capitol Hill community, including low-income individuals and families, can access quality goods, services, and jobs without the need for a car. Walking and biking has become a part of daily life, keeping people healthy. Utility bills are low because energy and water use is efficient. Sharing and renting reduce material expenses while minimizing waste. Revenue is generated from recycling and composting the waste that remains. Everyone has access to healthy, delicious, and sustainable food. More money is invested in people, rather than material goods; growing work skills and expanding experiences are prioritized. Residents have a strong voice in neighborhood decisions and can afford to stay in their homes as the neighborhood changes. A more sustainable way of life facilitates new social interactions that build relationships, community and political power.

A Day in the Life: Postcards from the Future

Here is one imagined "day in the life" description of an Autumn Saturday afternoon on Capitol Hill in 2050 based upon the common themes found in the "Postcards from the Future" that community members wrote at the December 2011 Forum on Capitol Hill's EcoDistrict convened by Capitol Hill Housing. It is written from the perspective of a grandmother thinking about her grandchildren's upcoming visit and reflecting on her day.

This morning I woke up full of excitement over your arrival...and a head full of to-do tasks. Your room in the community guest room is reserved, but I still have to get dinner fixings and run my weekly errands. Fortunately I can run them all on foot! I love how easy it is to walk everywhere in my neighborhood - the grocery store is only three blocks away! As I walked I marvelled at how much Capitol Hill has changed in the last forty years. Things that I thought could only be a dream are all around me now: there are lush, beautiful bioswales along the streets, more people walking and biking around than driving through, and a neighborhood energy dashboard at the transit station. And of course, the excellent network of buses, along with the streetcar, came in handy when the clouds broke and the rain began to fall just as I finished my errands. Once I was home and dry, and the sun came back out, I spent some time in the community garden, helping to tend the plants and picking out some fresh brussel sprouts for dinner. Soon after that it was time to catch the LINK light rail to the airport to pick you up!

[Opposite Page]
Overlook at Fremont Peak Park by GGLO.
(Image Credit: Derek Reeves)





STUDY AREA



EcoDistrict Study Areas Map Diagram

This map shows where the Station Area Sites are along Broadway, as well as the EcoDistrict study area boundary defined by the Capitol Hill Urban Center Village and Pike/Pine Urban Center Village boundaries. The Urban Center Villages provide a useful district-wide boundary for compiling and comparing data about neighborhood demographics, land use, and utilities, and for establishing baselines and evaluating future progress; however, the area is not intended to prescribe a specific EcoDistrict boundary. (Image Credit: GGLO)



The goal of establishing an EcoDistrict on Capitol Hill is to promote sustainability at the neighborhood scale. One near term goal is to leverage the potential of the Sound Transit-owned Station Area Sites to act as a realizable catalyst for EcoDistrict development. To analyze both the larger neighborhood site assets and the Station Area Sites site assets, the following two specific geographic areas are the focus of this study:

- 1) Capitol Hill Urban Center Village and Pike/Pine Urban Center Village (aka the "District-wide" area and "EcoDistrict Study Area")
- 2) The Sound Transit–owned properties on and around the planned LINK light rail station (aka the "Station Area Sites")

The Urban Center Villages provide a useful district-wide boundary for compiling and comparing available City of Seattle data about neighborhood demographics, land use, and utilities, and for establishing baselines and evaluating future progress; however, the area is not intended to prescribe a specific "EcoDistrict Boundary."

The Study Area boundary does not preclude strategies from being applied to areas outside the Study Area. Many district-wide strategies presented in the Performance Areas chapter are applicable to adjacent areas (such as Volunteer Park to the north, Miller Play Field & Community Center to the east, and Seattle University to the south). In fact, coordination with and inclusion of these areas will enhance the success of the Capitol Hill EcoDistrict. As the EcoDistrict develops, the Study Area boundary and a defined "EcoDistrict Boundary" will evolve.

[Opposite Page]

View from the Station Area Sites to the City Beyond
(Image Credit: Carissa Franks)



STUDY AREA: STATION AREA SITES



Diagram of the Capitol Hill light rail station development sites.
(Image Credit: Sound Transit)



Artist's rendering of one of three new station entries to the underground LINK light rail station platforms. (Image Credit: Hewitt Architects)



Rendering of the planned streetcar line and cycle track at the corner of Broadway and Denny Way (Image Credit: SDOT)

At the center of the Study Area, the Station Area Sites are comprised of four development properties adjacent to the future Capitol Hill light rail station that were acquired by Sound Transit as part of the construction process. Covering approximately 1.6 acres distributed across four sites (designated A, B, C, and D in the site diagram at left), the properties will be sold off for mixed-use development to coincide with the completion of the station. The station is slated to open in 2016, and Sound Transit plans to initiate a Request for Qualifications (RFQ) process for the development sites in 2012. The simultaneous development of these properties, combined with the construction of the light rail station, makes this area ripe for capitalizing on district-wide development synergies.

Small-Scale, Manageable, Integrated Design Opportunity

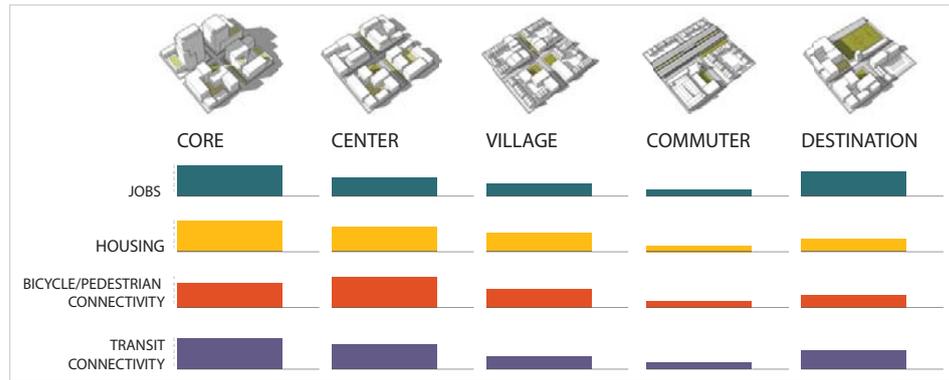
The Station Area Sites offer a unique opportunity to design an integrated group of buildings from the ground up. While the developable property comprises a land area that is relatively small compared to a full EcoDistrict, that limited scale is an asset because implementation of projects will be a more manageable undertaking. Implementing smaller projects in the near-term can provide on-the-ground examples of success that can act as a catalyst for work on the EcoDistrict scope and boundaries.

Consolidated Control Over the Site: Master Developer

The Station Area Site's single owner and upcoming sale are an asset for facilitating the start of an EcoDistrict. The property sale will be regulated by a development agreement, which offers a potential mechanism to require and regulate participation in the EcoDistrict, or at least to establish a unified vision for future developers. The importance of Sound Transit's potential role in providing a binding framework for establishing the EcoDistrict via a development agreement cannot be understated. Sound Transit has worked pro-actively with the Capitol Hill community on planning for the Station Area Sites, and can be expected to engage on the EcoDistrict. However, the level of engagement necessary to craft a development agreement that helps establish an EcoDistrict is beyond Sound Transit's normal purview. The sale of the Station Area Sites to a single Master Developer or Development Team would best provide for the ability of the development to meet community goals as outlined in both the Urban Design Framework (UDF) and this study.

STUDY AREA: STATION AREA SITES

This high-capacity transit station area typology was developed for the 2009 report *Transit-Oriented Communities: A Blueprint for Washington State*. Station areas are categorized by urban form and land use intensity, and ranked by a set of performance metrics, including jobs, housing, bicycle/pedestrian connectivity, and transit connectivity. As a general rule, the greater magnitude of these measures, the more community and regional benefits provided by the TOC. The Capitol Hill light rail station area falls in the high range of the "Center" station area type, and has great potential to become a high-performing transit-oriented community. (Image Credit: Futurewise, GGLO, and Transportation Choices Coalition)



Potential for a Transit-Oriented Community

With the coming of a light rail station and the Broadway streetcar, the Capitol Hill neighborhood is set to become one of Seattle's best opportunities for realizing an ideal transit-oriented community (TOC). TOCs are neighborhoods that give people greater access to housing, jobs, services, and recreation without relying on a personal vehicle—a land use pattern that leads to a lower cost of living and higher quality of life for people of all economic levels, and long-term sustainability for the planet. Well designed TOCs deliver substantial economic, social, and environmental benefits to local residents as well as to the greater region.

The area around the Station Area Sites supports key ingredients for a high-performing TOC, including density of housing and jobs, a diverse mix of uses, a walkable, bikable street network, and open space. Developing the Station Area Sites as an EcoDistrict "seed" at the core of the Capitol Hill neighborhood has the potential to fully leverage all the benefits of a TOC, and elevate the neighborhood to an even higher level of sustainability.

Planning Support for a TOC at the Station Area Sites:

"Zoning: Allows multi-use structures up to 40', 65', and 105' **Station Area Overlay:** Removes upper level lot coverage limitation, allows higher floor-area-ratios (in combination with commercial zoning designation), allows single purpose residential uses, and removes minimum parking requirements (in combination with commercial zoning designation)

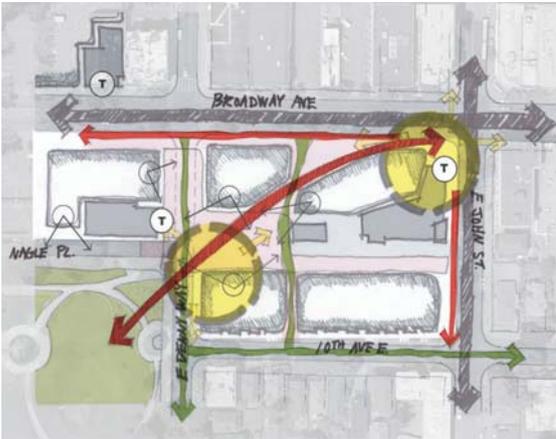
Urban Center Designation: Removes parking requirements (in combination with commercial zoning designation)"

(Source: *Capitol Hill-Broadway Transit Oriented Development, TOD Precedent Study, February 2009, p.36*)

UDF Recommendations

Pursuit of Environmentally Sustainable Design and Programming Solutions: Development Guidance

Work with efforts already underway to explore the viability of shared design solutions that result in more environmentally responsible form and function. Refer to the findings of the Capitol Hill Housing study on the potential for an EcoDistrict centered on the station sites (funded by a Bullitt Foundation grant).



Urban Design concept sketch for the Capitol Hill Light Rail Station Sites Urban Design Framework (Image Credit: City of Seattle)

STUDY AREA: STATION AREA SITES

Previous Intensive Planning

The Station Area Sites have benefited from many previous community- and City-guided neighborhood urban design and planning efforts, including:

- Sound Transit Capitol Hill Station Transit Oriented Development (TOD) Sites Baseline Report (2008)
- Capitol Hill - Broadway TOD Development Guidelines and Urban Design Recommendations Report (2010) by Schemata Workshop and Makers Architecture
- Nagle Place Extension Workshop (2010)
- Capitol Hill Light Rail Station Sites Urban Design Framework (2011) by City of Seattle

These previous planning efforts are an asset to EcoDistrict development as they inform EcoDistrict goals and strategies, as well as build support for EcoDistrict planning. Of all the completed studies, the UDF is the best resource for this study; it builds on the previous planning work and establishes guiding principles that are well-aligned with the EcoDistrict approach. For example, the UDF envisions the Station Area Sites as a "dynamic heart for the Capitol Hill Community", "a model for transit-oriented communities", a place with "affordable housing and community services that support the diversity of the neighborhood", and the site of "sustainable and collaborative design and development" that results in a "dynamic place" of a "civic quality." The UDF also calls out the following strategies that have potential synergy with an EcoDistrict:

- Seek opportunities for innovative and integrated sustainable building practices across the development sites.
- Work with efforts already underway to explore the viability of shared design solutions that result in more environmentally responsible form and function, such as district energy, water and stormwater resources, management of "waste", optimizing food production and composting, etc.
- Explore flow through ventilation, maximization of passive heating and cooling systems.
- Include consideration of green stormwater infrastructure.

The UDF also explicitly mentions the proposed EcoDistrict, which may assist the EcoDistrict plan to be included in some capacity in the Sound Transit development agreement. (See sidebar)





PERFORMANCE AREAS

In this chapter, Capitol Hill EcoDistrict research and suggested strategies are laid out for each of the six performance areas – **Community**, **Transportation**, **Energy**, **Water**, **Habitat**, and **Materials** – as follows:

- **Intent:** This statement details the overall intention or vision of the performance area and has been crafted in consideration of supporting the overall EcoDistrict Vision.
- **Site Assets:** These detail a wide range of neighborhood characteristics that together make the case for the neighborhood as an ideal location for a successful EcoDistrict.
- **Goals:** These identify what the EcoDistrict should strive for, or what it values, and frames the development of specific targets. They are informed by known City goals, the Urban Design Framework, the Architecture 2030 Challenge, and the Portland Sustainability Institute's work on EcoDistrict performance goals.
- **Suggested Targets:** These quantify the goals with specific, measurable targets within a defined time period.
- **Metrics:** These list possible ways of measuring performance and assessing when goals and targets are met; as new goals and targets get developed, additional metrics will be established.
- **Baselines:** Current measurements for each of the listed metrics set the base point from which improvements can be measured over time. Many baselines are presented graphically, and some appear as part of the Site Assets sections of this chapter. Other baselines require further study to provide necessary data.
- **Strategies:** The tangible ways to realize EcoDistrict goals. These are the suggested projects and practices that make everything real, from the building-scale to the neighborhood-scale; they respond to local neighborhood assets, goals and resources. The sustainability impact and recommended implementation area (on the Station Area Sites or District-wide) for each strategy are identified.

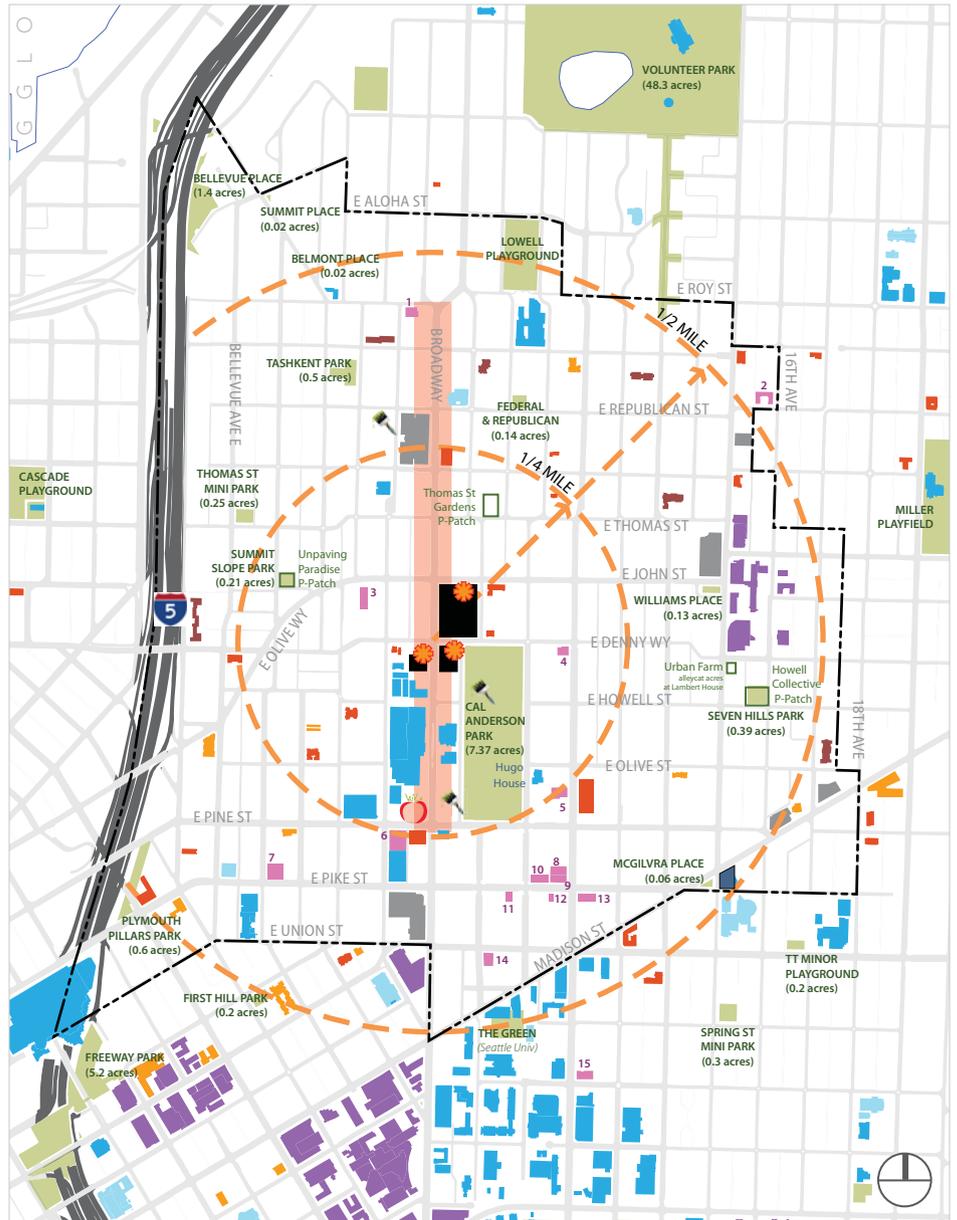
As future phases of the EcoDistrict proceed, building community support, initiating public policy work, developing an action plan, assessing project feasibility, and project development will continue to influence the development of goals and strategies. The current list is intended to frame that continued work and provide a catalogue of research and strategies for Capitol Hill.

*[Opposite Page]
Green Roof and Community Gardens at the ASA Flats + Lofts by GGLO
(Image Credit: Gregg Galbraith)*



COMMUNITY: SITE ASSETS

- STATION ENTRY 
- STATION AREA SITES 
- ECODISTRICT STUDY AREA BOUNDARY
(Capitol Hill Urban Center Village + Pike/Pine Urban Center Village) 
- BULLITT CENTER 
- PARK 
- WATER BODY 
- STREETS & ALLEY GRID 
- CAPITOL HILL HOUSING PROPERTY 
- SEATTLE HOUSING AUTHORITY PROPERTY 
- OTHER AFFORDABLE & SENIOR HOUSING 
- WALK RADIUS 
- BROADWAY BUSINESS IMPROVEMENT AREA 
- GROCERY STORE 
- URBAN AGRICULTURE: P-PATCHES & FARMS 
- FARMERS MARKET 
- HEALTH &/OR REHAB CENTER 
- LEARNING CENTER OR CIVIC INSTITUTION 
- RELIGIOUS INSTITUTION 
- PUBLIC ART
"Waterworks" by Douglas Hollis (Cal Anderson Park)
Jimmy Hendrix Statue (Broadway & Pine)
"Contour" by Iole Alessandrini (Capitol Hill Branch Library) 
- ARTS VENUE 
 1. Harvard Exit
 2. Launch Dance Theater
 3. Artattack Theater
 4. Artist Trust
 5. Velocity Dance Center
 6. The Egyptian
 7. Theater Schmeater
 8. NW Film Forum
 9. Repertory Actors Theare
 10. Annex Theatre
 11. Printer's Devil Theatre
 12. Balagan Theatre
 13. Vox Box
 14. Odd Duck Studio
 15. Photographic Center Northwest



EcoDistrict Community Site Context & Assets Map Diagram

This map shows how well served the EcoDistrict study area is from a density, connectivity, and diversity of services perspective. There are many community services like parks, grocery stores, arts and civic institutions within walking distance of the Station Area Sites. (Image Credit: GGLO)





Capitol Hill is the nucleus of Seattle's LGBT Community
(Image Credit: Flickr Curtis Cronn)



Activated street on 12th Ave. (Image Credit: Dan Bertolet)

A breakdown of uses by Zoning and Existing Use in the Capitol Hill Urban Center Village and Pike/Pine Urban Center Village show how the EcoDistrict Study Area has a high percentage of residential uses provided by a combination of mixed-use buildings, multi-family buildings, and single-family homes. While there are a low percentage of vacant sites available for development, underdeveloped sites (such as surface parking lots) and under used ROW areas present opportunities for achieving necessary growth in accordance with EcoDistrict goals and Seattle's Comprehensive Plan. *Note: The ROW percentages include a portion of I-5, which is included in the Urban Center Village boundaries; approximately 5% of the total ROW percentages are from I-5. (Image Credit: GGLO from 2000 Census)

COMMUNITY: SITE ASSETS

Intent: Create an equitable, healthy and vibrant community that supports sustainable living

An EcoDistrict needs to implement environmentally sustainable projects that also increase the overall equity, health and cultural vibrancy of the district. In many respects, Capitol Hill already is an equitable, sustainable and culturally vibrant place – affordable housing is a priority of the community and local property developers like Capitol Hill Housing, sustainability is supported by both the urban form and community groups, and there are many cultural events and activities held throughout the year, day and night. The list of community site assets that appears in this section summarizes these existing people and place assets that can be leveraged in the continued formation of an EcoDistrict on Capitol Hill.

Density: Sustainable Urban Form

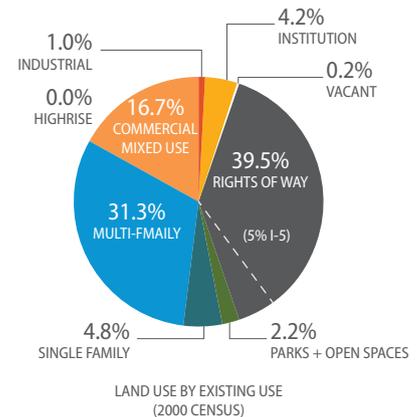
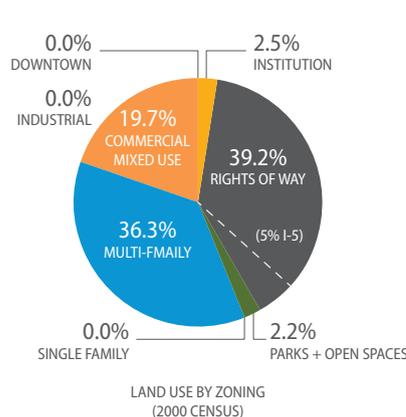
Capitol Hill's density supports a diverse array of neighborhood businesses, transit infrastructure, and community gatherings. As of 2009, Capitol Hill's population density (50 people per acre) was second only to the Belltown neighborhood (54 people per acre) in downtown Seattle. New EcoDistrict development on the Station Area Sites and throughout the greater neighborhood that maximizes density will only enhance this existing neighborhood asset.

Active Streets

Many of the streets on Capitol Hill are active and lively, especially the main thoroughfares and retail streets like Broadway, which are predominantly lined with low-rise commercial and mid-rise multifamily uses. The smaller grain and historic fabric of the Pike/Pine Corridor also contribute to the pedestrian friendly and active street character of the neighborhood. The UDF supports design strategies that activate the street at the Station Area Sites through mixed-use development.

Accessible Services & Affordable Housing

The neighborhood's strong mix of affordable housing options, as well as learning institutions (which include public and private elementary and secondary schools, a Community College, and a University), grocery stores, and parks within a short walk of the Station Area Sites are major site assets that support community equity and accessibility.





Capitol Hill has hosted a weekly farmers market since 2005. The current Broadway Sunday Farmers Market is held right in front of Seattle Central Community College on Capitol Hill, at Broadway and Pine. It is open every Sunday, May 8 through December 18, from 11am to 3pm. (Image Credit: Capitol Hill Seattle blog)



Cal Anderson Park, adjacent to the proposed EcoDistrict Station Area Sites. (Image Credit: Dan Bertolet)



Capitol Hill Ice Rink at Cal Anderson Park (Image Credit: Sound Transit)

COMMUNITY: SITE ASSETS

Healthy Living

Capitol Hill provides a diversity of options to support healthy living, such as a farmer's market and local grocery stores, walking and biking commute options, and multiple parks and recreation fields within the neighborhood.

Urban Agriculture Resources

There are multiple urban agriculture resources on Capitol Hill that promote public health, sustainable behavior and equitable access to food: there are three P-Patches within a 1/2 mile walk of the Station Area Sites, an upcoming urban farm from Alleycat Acres at the Lambert House, various urban tree harvesting efforts, multiple local CSAs (like Fork & Frame, which delivers all of their produce in the Capitol Hill area by bike) and a weekly Farmers Market. A new EcoDistrict could expand and enhance many of these existing assets.

Community Gathering Spaces and Events

Capitol Hill has many parks, squares and community gathering places, the largest of which is the 7.37 acre Cal Anderson Park adjacent to the Station Area Sites. Cal Anderson is home to both formal and informal community events year round, such as outdoor movies in the summer and ice skating in the winter. The public plaza next to Seattle Central Community College, on the corner of Broadway and E Pine, is another large open space that serves the community well – from May to December it is the site of the Broadway Sunday Farmers Market. These gathering places create a strong sense of place and promote community interaction. The Capitol Hill community is hoping to expand its public open spaces with the new development on the Station Area Sites; the UDF locates a new public plaza and pedestrian walkway in the middle of the Station Area Sites, connecting the transit station entries from north to south.

Strong Arts Community

Capitol Hill has a strong arts community, with many theater, dance, art, and music venues, and public artwork located throughout the neighborhood. There is great potential for an EcoDistrict community public art project that builds awareness about urban sustainability.

Existing Engagement Infrastructure

There are many existing community groups and initiatives that can support EcoDistrict engagement efforts. "12th Ave Meets Broadway," a joint initiative of Capitol Hill Housing and the Capitol Hill Chamber of Commerce (funded by OED and Impact Capital) is one such example of a group working on complementary EcoDistrict efforts (ensuring diversity, strengthening community, supporting small businesses, and improving the pedestrian realm).

The Bullitt Foundation



**Green Futures
Research & Design Lab**

Logos of Potential EcoDistrict Allies



"Site D" adjacent to SCCC is highlighted in blue on the aerial photo above; the other station area sites are highlighted in red. (Aerial Photo via Seattle Central Community College)

COMMUNITY: SITE ASSETS

Allied Non-Profits and Agencies

- **Bullitt Foundation:** Ongoing engagement in EcoDistrict work and related sustainability initiatives; their Living Building project, now under construction, has the potential to become an anchor in the southeastern extents of the EcoDistrict.
- **Preservation Green Lab:** The lab has been actively researching district energy and performance-based energy codes.
- **International Living Future Institute:** This recent consolidation of Cascadia, the Living Building Challenge, ECOtone, and the Natural Step Network was founded with the mission of "community-driven transformation."
- **Puget Sound Regional Council (PSRC):** Their recent Sustainable Communities Grant will fund planning for the LINK light "north corridor" which includes Capitol Hill station. PSRC also runs the Building Efficiency Testing and Integration (BETI) Center and Demonstration Network, which could provide resources for building energy efficiency strategies.
- **Seattle 2030 District:** This public-private collaborative is working to create a high-performance building district using the 2030 Challenge for Planning as a foundation. Members can access tools and resources such as Clinton Climate Initiative Preferred Purchasing network, streamlined permitting, Federal Block Grant low interest funding, and energy monitoring software.
- **Cascade Land Conservancy (recently renamed For Terra):** Their Cascade Agenda Cities Program has been actively engaged in the Capitol Hill station sites planning process.
- **Green Futures Lab (GFL):** Work within the University of Washington and local communities to provide education and collaboration around urban green infrastructure and a sustainable public realm.

Other organizations that have the potential to contribute to the EcoDistrict project include the Capitol Hill Chamber of Commerce, the Capitol Hill Community Council, the Capitol Hill Champion, and Sustainable Capitol Hill. (The Champion, a joint committee of the Chamber and the Council was a coauthor of the Urban Design Framework.) The Greater Seattle Business Association can be expected to play a role in shaping the EcoDistrict, and the Neighborhood Farmers Market Alliance (operators of the Broadway Farmers Market) will be an important collaborator for the open space planning.

Proactive Neighborhood Property Owners & Developers

Many Capitol Hill property owners and developers have been actively engaged in environmental and community issues for years. As noted in Appendix C, many have participated in outreach efforts during this initial phase of the EcoDistrict and can be expected to have important, constructive input on the EcoDistrict formation moving forward. Several significant local businesses could also potentially provide support for the project, including members of the Broadway Business Improvement Area.

Large property owners in the vicinity of the EcoDistrict include higher education institutions, such as Seattle University which has the potential to contribute significantly to the EcoDistrict in terms of visioning, educational program implementation as well as through direct staff and student participation. Seattle Central Community College (SCCC) owns 15 acres adjacent to the Station Area Sites; if the Sound Transit parcel on the west side of Broadway is developed by SCCC ("Site D"), SCCC will have the opportunity to play an important role in creating the EcoDistrict.





"Engaged, Safe, Lively, Pedestrian. I can afford to live here. Anyone can afford to live & create here."

"Postcard from the Future"

(Source: Postcard from the Future, Forum on Capitol Hill's EcoDistrict, December 2011)



Thomas Street Gardens P-Patch

Address: 1010 E Thomas Street

<http://www.thomasstreetgarden.blogspot.com/>

Size: 3,200 sq ft | Plots limited to 10 x 10

Number of Plots: **35**

Avg Length of Waitlist: **173**

Avg Wait: **4-5 years**

Ownership of Land: Seattle Dept. of Parks & Rec

Unpaving Paradise

Address: E John St & Summit Ave E

<http://unpavingparadise.blogspot.com/>

Howell Collective

Address: 16th Ave E & E Howell St

<http://howellcollective.wordpress.com/>

(Image Credit: Junghwa Suh)

COMMUNITY: GOALS | TARGETS | METRICS | BASELINES

Note: Community metrics and targets will be further explored in a future phase of the EcoDistrict study as community outreach increases. Growing public engagement is recognized as a critical action for determining community goals and projects, generating excitement, and building community investment in the EcoDistrict. As this EcoDistrict initiative matures, community organizing efforts will empower residents to shape their future while paying extra attention to impacts on the poor and disenfranchised. The existing engagement infrastructure highlighted in Community: Site Assets will be a valuable tool for growing outreach and developing synergies between community groups, such as "12th Ave Meets Broadway."

Goals:

- Benefit the Broadest Possible Spectrum of People
- Increase Human Health and Well-Being
- Maximize Sustainable Behaviors
- Enrich Social Networks and the Cultural Environment
- Increase Quality of the Public Realm
- Increase Density, Diversity of Uses, and Street Activity

Suggested Targets:

- Increase Affordable Housing Near Transit Nodes to Meet Housing Seattle Recommendations
- At least 50% of all Housing Units on the Station Area Sites are Affordable (income at or below 80% AMI) for at least 50 years from development completion, and 25% of that 50% should serve income levels at or below 50% AMI (*also a UDF goal*)
- Increase Air Quality in the Region (And Beacon Hill Monitoring Station) as Monitored by Puget Sound Clean Air Agency
- Increase Amount of Locally Grown Food Donated to Local Food Banks
- Lower Obesity Rates
- Lower Waitlist Length and Time for P-Patch Plots
- Increase # of P-Patch Plots and/or Urban Farms
- Improve Public Realm (Add more gathering spaces, maximize under-utilized spaces, re-purpose parking areas for community use, etc.)



Housing Seattle

Seattle lacks affordable family-sized housing with three or more bedrooms.

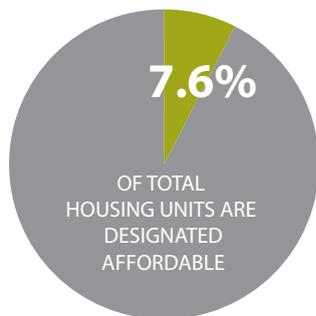
Inadequate supply:

16,000 very low-income housing units
50,000 very low-income renter households

Housing is more affordable near arterials with frequent transit service

(Source: Housing Seattle,

A Report by The Seattle Planning Commission, Winter 2011)



- Station Area Sites
- EcoDistrict Study Area (Cap Hill UCV + Pike/Pine UCV)
- Park
- Capitol Hill Housing
- Seattle Housing Authority
- Other Affordable and Senior Housing

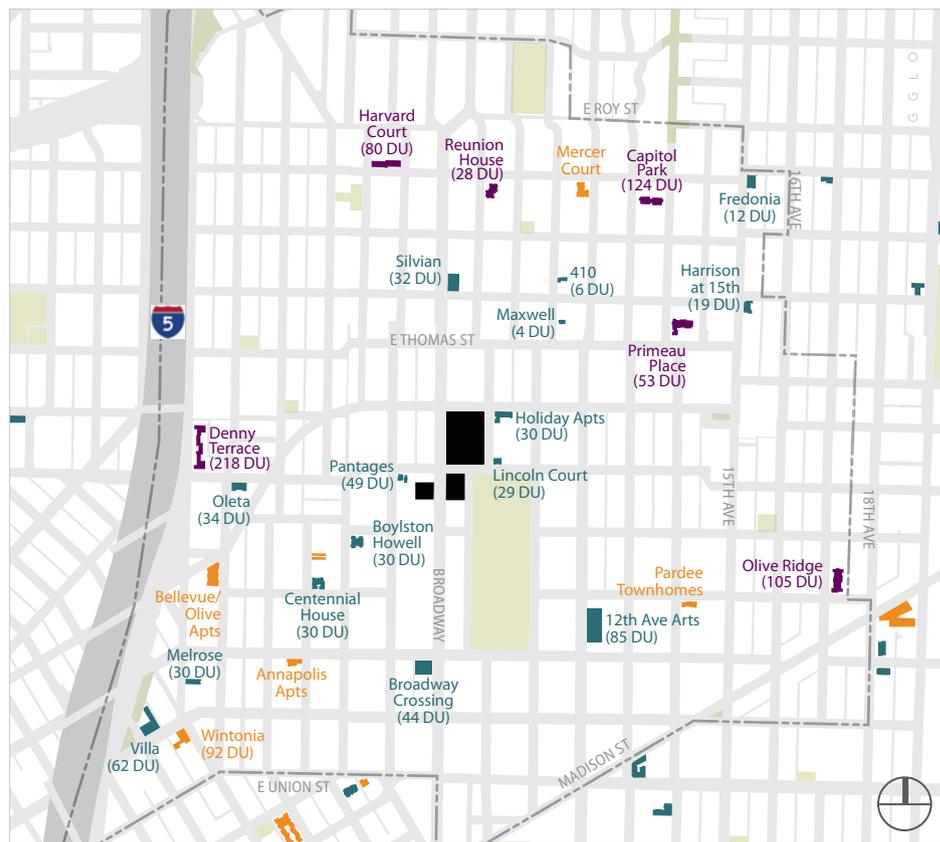
Existing Affordable and Senior Housing Map Diagram
Pie chart shows the percent of affordable housing from the inventory of affordable dwelling units shown on the map compared to the total number of housing units in study area as calculated in the 2000 Census.
(Image Credit: GGLO)

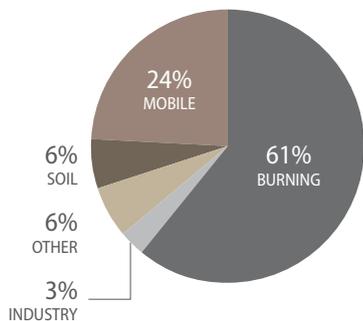
Metrics

The following metrics can be used to measure the EcoDistrict's performance now and over time in the area of community sustainability in relation to equity, health and cultural vibrancy.

Equity

- Total % Affordable Housing Units
- % Monthly Income Spent On Housing (baseline requires study)
- % Monthly Income Spent on Transportation per Household (15 - 19% of monthly income - Source: Center for Neighborhood Technology)
- # of Neighborhood Food Banks and Amount of Locally Grown Food Received for Distribution (baseline requires further study)





1996 Regional Emissions Sources of PM_{2.5} Particles
 'Measured daily concentrations of PM_{2.5} do not meet the local health goal at monitoring stations in three of the Agency's four counties. Kitsap County's two monitoring sites meet the goal... Gas-powered yard equipment is not only noisy but spews exhaust into the air – in the summertime contributing about 13 percent of our region's summertime ozone, which can result in smog.
 (Data Source: Puget Sound Clean Air Agency; Image Credit: GGLO)

Healthy Living: Air Quality

Air Quality is an essential component of healthy living. Fine particulate matter (PM_{2.5}) exposure is related to respiratory disease, decreased lung function, asthma attacks, and serious health effects. Diesel & gasoline emissions from 'mobile' sources, outdoor burning, fireplaces & woodstoves, industry, and other sources such as dust contribute to poor air quality. The Puget Sound Clean Air Agency is a regional agency working with the EPA and Washington Department of Ecology to monitor and regulate air pollution for Kitsap, King, Pierce, and Snohomish counties. Top priorities include: fine particles, air toxics, ozone, and environmental justice. Efforts to increase air quality through both **Community strategies and **Transportation** strategies will be especially important as population increases and behaviors, such as wood stove burning and vehicular emissions, that contribute the most to our poor air quality will potentially increase.**

Metrics

Health

- Fine Particulate Matter (PM_{2.5}) Emissions from Wood Burning
- # Of Gas-Powered Yard Equipment Used / Owned within the District (baseline requires further study)
- # of CSAs
- # of P-Patches and Urban Farms (see also: map in Site Assets: Community for baseline information)
- # of Public Fruit Trees and Lbs of Fruit Harvested Annually

See [Transportation: Metrics](#) for additional metrics related to public health.

Cultural Vibrancy

- Amount of Public Art found throughout neighborhood (see map in Site Assets: Community for baseline information)
- # of Community Events Held Annually (see Site Assets: Community for some baseline information; additional research required)
- Land Use by Existing Use
- Population and Employment Density Near Transit Nodes
- % Employees at Large Employment Centers (such as Hospitals and Universities) that Live within the District (baseline requires further study)

Baselines:

Baseline figures for most of the above metrics appear in the charts and figures in the left margins of this section, as well as on the Affordable Housing Baselines Map on the previous page. Other baselines appear in the Site Assets section as indicated above.



COMMUNITY: STRATEGIES

Strategies

Equity

Build New Affordable Housing

Implement on the Station Area Sites and District-wide

Challenges, Opportunities, & Local Resources: Capitol Hill Housing has a new affordable housing project in the works (12th Ave Arts) and is interested in participating in development on the Station Area Sites. The UDF also supports the action of building affordable housing on the Station Area Sites.

Develop a Community Fruit Tree Harvesting & Food Bank Donation Program

Form a community group that harvests fruit from neighborhood trees for local food banks; Mapping fruit trees is a related strategy.

Implement District-wide

Challenges, Opportunities, & Local Resources: Community Harvest of Southwest Seattle (www.gleanit.org), Solid Ground's Community Fruit Tree Harvest (<http://www.solid-ground.org/Programs/Nutrition/FruitTree/Pages/default.aspx>), and City Fruit (<http://cityfruit.org>) are all active local models. Potential Funding includes City Fruit's South Seattle fruit harvest sells a portion of its fruit through markets and restaurants located in south Seattle as part of a project to develop a model for covering costs.

Related Performance Area(s): Community (Health)

Health

Grow a Capitol Hill Community Orchard

Use a park, or other underdeveloped site, or street trees in right of way, or college campus open spaces to grow a community orchard, which can provide a free source of local fruit for neighbors and local food security programs while providing space for public agricultural education and community gathering -- support all equity, health, and cultural goals.

Implement District-wide

Challenges, Opportunities, & Local Resources: Community Orchard of West Seattle (<http://www.fruitinwestseattle.org/>) is a good local resource; their orchard broke ground in January 2011 at South Seattle Community College. The Beacon Hill Food Forest is also an emerging resource (<http://beaconfoodforest.weebly.com/index.html>). SDOT currently prohibits fruit trees in planting strip.

Related Performance Area(s): Habitat

Map all Urban Fruit Trees

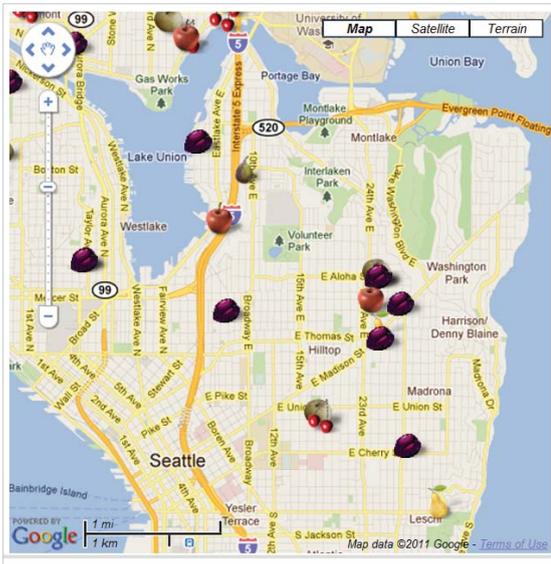
Implement District-wide

Challenges, Opportunities, & Local Resources: Use the City Fruit Online Tree Mapping Project

Related Performance Area(s): Habitat

Neighborhood Food Banks

There are **three food banks** in the study area -- Chicken Soup Brigade (1002 E Seneca St), Jewish Family Services (1601 16th Ave), Salvation Army Food Bank (1101 Pike St) -- **increasing their supply of locally grown food** would contribute to equity and health goals around access to sustainable food.



Screenshot of City Fruit's Online Tree Mapping Project

"The City Fruit mapping project has developed a simple way to map fruit trees from a computer terminal or a mobile device, like a cell phone. Individuals tree owners and other urban residents are urged to map fruit trees, and by doing so, create a grassroots inventory of a so far undocumented urban resource." There are currently only a smattering of fig, apple, pear and cherry trees mapped in the vicinity of Capitol Hill. More could be mapped and harvested through community engagement.



Urban Farming Resources

Solid Ground's Lettuce Link Program

Lettuce Link partners with the Department of Neighborhoods P-Patch program to encourage and support Seattle gardeners in growing extra produce for Seattle food banks, meals programs and shelters.

Alleycat Acres Urban Farming Collective

"Alleycat Acres is an urban farming collective that aims to reconnect people with food. To achieve this, we create community-run farms on under utilized urban spaces."

P-Patch Trust

Non-profit volunteer organization in Seattle that works to build, preserve and protect community gardens in Seattle's neighborhood by targeting efforts towards providing garden acquisition and development in addition to program support and advocacy.

City of Seattle Urban Agriculture Ordinance 123378

In 2010, the City of Seattle mayor approved an urban farm and community garden ordinance to improve access to locally grown food. This ordinance encourages urban agriculture by changing codes to allow for increased development.

Today's gas-powered lawn mower emits as much pollution in one hour as driving a newer car 140 miles. An older mower may belch four times as much pollution.

(Source: Puget Sound Clean Air Agency)



COMMUNITY: STRATEGIES

Health

Establish an Urban Farm Plot at the New Transit-Oriented Development

Implement on Station Area Sites

Challenges, Opportunities, & Local Resources: See resource list at left

Related Performance Area(s): Habitat

Relocate the Broadway Farmers Market at the New Transit-Oriented Development

Implement on Station Area Sites

Challenges, Opportunities, & Local Resources: This is also recommended in the UDF.

Related Performance Area(s): Community (Cultural Vibrancy)

Retrofit Wood-Stoves and Wood-Burning Fireplaces

Promote EPA-certified wood stoves and wood-burning fireplace insert retrofits

Implement District-wide

Challenges, Opportunities, & Local Resources: Puget Sound Clean Air Agency

Potential Funding: Puget Sound Clean Air Agency Wood stove "buy-back" program

Related Performance Area(s): Energy

Restrict Gas-Powered Yard Equipment

This strategy could be integrated with a Materials Strategy around neighborhood tool sharing and would improve neighborhood air quality.

Implement on the Station Area Sites and District-wide

Challenges, Opportunities, & Local Resources: Puget Sound Clean Air Agency education

Related Performance Area(s): Energy; Materials

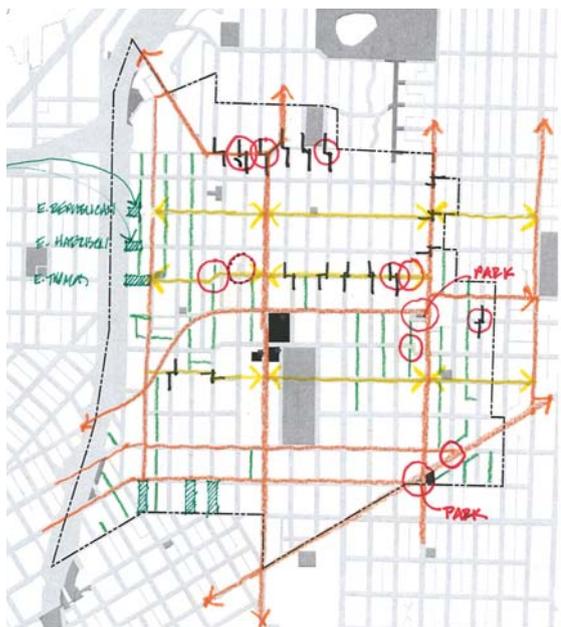
Monitor Air Quality Inside and Outside Buildings

Monitor and communicate air quality values to residents to increase awareness and support information gathering.

Implement on the Station Area Sites and District-wide

Challenges, Opportunities, & Local Resources: The US Embassy in Beijing monitors air quality and shares the results via Twitter and in an iPhone App.

COMMUNITY: STRATEGIES



-  PIAZZETTA OPPORTUNITY
-  SHIFT IN STREET GRID
(OPPORTUNITY FOR ADDITIONAL TRAFFIC CALMING / PEDESTRIANS)
-  HIGH STREET (TRAIL)
-  PER PRIVILEGE STREET (ACCESS TO HIGH STREET)
-  ALLEY
-  CONCRETE STREET OR STAIR CLIMBS
(TRAIL)

Piazzetta Opportunity Sites Sketch Map

There are a number of areas in the neighborhood where the street grid shifts creating larger street widths and the opportunity for developing small plazas, gardens, or wider sidewalks. These opportunity sites are identified on the above map diagram. (Image Credit: GGLO)

Cultural Vibrancy

Develop Mini Piazzette in Underutilized Spaces

Develop mini plazas or gardens in underutilized areas (see sketch plan map diagram at left) to increase vibrancy while improving stormwater management and habitat amenities in the right-of-way.

Implement District-wide

Challenges, Opportunities, & Local Resources: WRP Associates is developing a new apartment building adjacent to the piazzetta opportunity site at E Thomas St and Harvard Ave.

Related Performance Area(s): Transportation; Water; Habitat

Improve Hillclimbs Adjacent to I-5

Improve the use and safety of the stair climbs and hills adjacent to I-5 at E Republican St, E Harrison St, and E Thomas St. This would improve the public realm and neighborhood connectivity. Incorporating green infrastructure would help manage stormwater too.

Implement District-wide

Related Performance Area(s): Community (Equity and Health); Transportation (Walking/Pedestrians); Water

Organize a Community Public Art Project Event

Organize a community public art project event that asks people to answer "What does an EcoDistrict mean to you?" and create installations around the neighborhood.

Implement on the Station Area Sites and District-wide

Challenges, Opportunities, & Local Resources: It would be good to partner with local arts organizations, community organizations, and area schools. Integration on the Station Area Sites would be a good first step.

Related Performance Area(s): Could apply to all or none of the other performance areas; primarily about community building and raising awareness and excitement about the EcoDistrict.

Increase Population and Employment Density Near High Capacity Transit

Implement on the Station Area Sites and District-wide

Challenges, Opportunities, & Local Resources: Station Area Overlay District; Housing Seattle (<http://www.seattle.gov/planningcommission/docs/HousingSeattle.pdf>); Transit-Oriented Communities: A Blueprint for Washington State (<http://futurewise.org/priorities/TOCblueprint>); Capitol Hill Urban Design Framework; Seattle Transit Communities - Integrating Neighborhoods with Transit (<http://www.seattle.gov/planningcommission/projects/transit.htm>)

Related Performance Area(s): Transportation



COMMUNITY: STRATEGIES

Strategies Summary

The Scatter Plot at left summarizes the previously listed strategies and organizes them based on implementation time frame and sustainability impact. The dots signifying each strategy are coded by their implementation area: District-wide, Station Site (only), and District-wide + Station Site. The number of each dot corresponds to the list below:

Equity

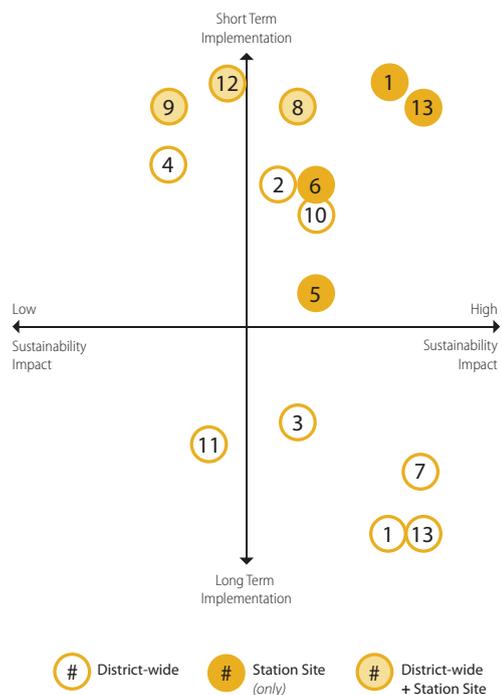
1. Build New Affordable Housing
2. Develop a Community Fruit Tree Harvesting & Food Bank Donation Program

Health

3. Grow a Capitol Hill Community Orchard
4. Map all Urban Fruit Trees
5. Establish an Urban Farm Plot at the New TOD Development
6. Relocate the Broadway Farmers Market at the New TOD Development
7. Retrofit Wood-Stoves and Wood-Burning Fireplaces
8. Restrict Gas-Powered Yard Equipment
9. Monitor Air Quality Inside and Outside Buildings

Cultural Vibrancy

10. Develop Piazzette in Underutilized Spaces
11. Improve Hillclimbs Adjacent to I-5
12. Organize a Community Public Art Project Event
13. Increase Population and Employment Density Near High Capacity Transit



Implementation Time Frame

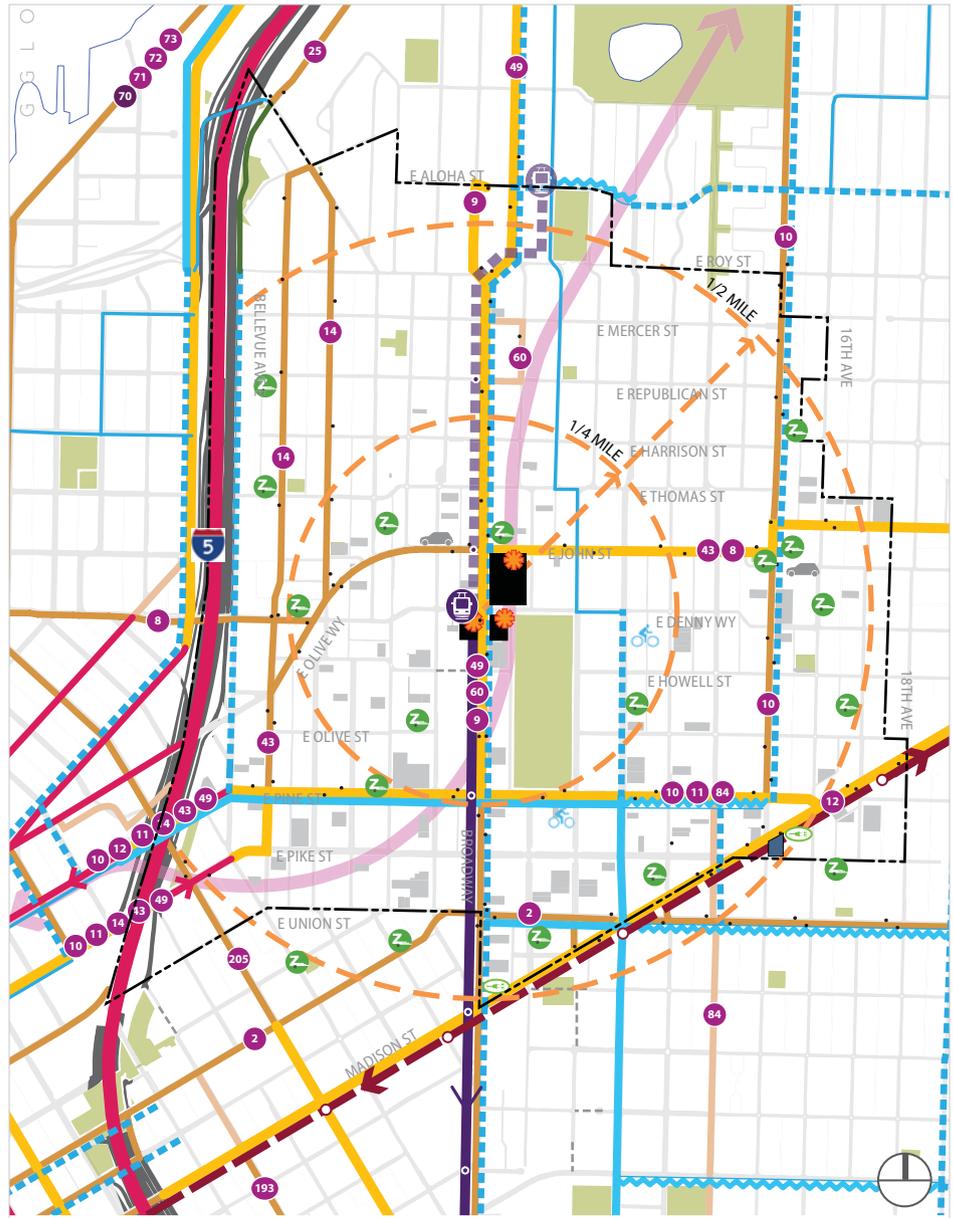
Some strategies are relatively quick to implement, such as many associated with the Station Area Sites due to the imminent development (shown at the top of the summary graph), while other strategies are more long term and will require more time to completely implement and yield full benefits (shown at the bottom of the summary graph).

Sustainability Impact

All recommended strategies can contribute to EcoDistrict success; however, some strategies have increased levels of sustainability impact (shown to the right of the summary graph).

TRANSPORTATION: *SITE ASSETS*

- STATION ENTRY 
- STATION AREA SITES 
- ECODISTRICT STUDY AREA BOUNDARY
(Capitol Hill Urban Center Village + Pike/Pine Urban Center Village) 
- BULLITT CENTER 
- PARK 
- WATER BODY 
- STREETS & ALLEY GRID 
- WALKWAY 
- WALK RADIUS 
- LINK LIGHT RAIL TUNNEL 
- FUTURE STREETCAR LINE 
- FUTURE STREETCAR EXPANSION 
- PROPOSED BUS RAPID TRANSIT
(Source: Seattle Transit Master Plan, Summary Report, 09/2011) 
- BUS ROUTE # 
- PRINCIPAL TRANSIT STREET W/ BUS ROUTE 
- MAJOR TRANSIT STREET W/ BUS ROUTE 
- MINOR TRANSIT STREET W/ BUS ROUTE 
- LOCAL TRANSIT STREET W/ BUS ROUTE 
- BUS STOP 
- (Sources: King County Metro System Map, 10/2011;
GIS; Seattle Transit Master Plan)
- BIKE LANE 
- BIKE SHARROW 
- BIKE SHARROW W/ BIKE LANE ON UPHILL 
- BIKE ROUTE (CONNECTOR STREET) 
- BIKE TRAIL 
- BIKE SHOP 
- (Source: Seattle Bicycling Guide Map 2011)
- SURFACE PARKING 
- AVEGO GO520 RIDE SHARE STOP 
- ELECTRIC CAR CHARGING LOCATION 
- ZIPCAR STOP 



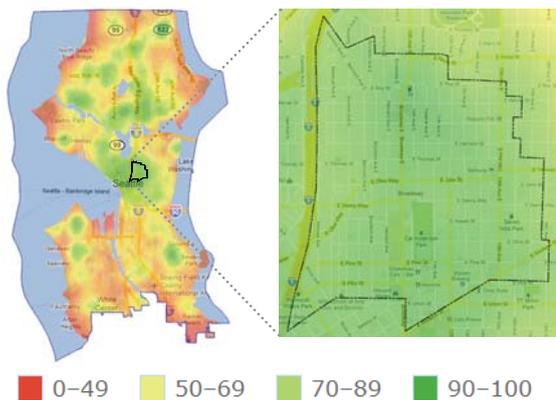
EcoDistrict Transportation Assets Map Diagram

This map shows how well served the EcoDistrict study area is by a diversity of transportation options. All major bus routes, bike lanes, and planned transit infrastructure improvements are shown. Existing locations for electric car charging stations and Avego car sharing pick up points are also mapped.

(Image Credit: GGLO)



TRANSPORTATION: *SITE ASSETS*



Walk Score Maps of Seattle and Capitol Hill reveal that the neighborhood is one of the most walkable in the city. (Source: www.walkscore.com/WA/Seattle/Capitol Hill)

Intent: Reduce the negative environmental impact of automobile use by maximizing the opportunities for walking, biking, and transit use.

The majority of Seattle's carbon emissions come from transportation, so to address the city's environmental impacts, the way people and goods are moved must change. Given this context, Capitol Hill has an opportunity to expand transportation choices and lead the charge away from auto-dependence. The neighborhood is already on track to do so: its lower than average single occupancy vehicle car trips, high walkability, proximity to downtown, bike infrastructure, and frequent bus service will soon be buttressed by a new light rail station, streetcar line and separated bike lane (cycle-track). These assets are a great foundation for Capitol Hill's EcoDistrict to build upon.

High Walkability

Capitol Hill is one of the most walkable neighborhoods in the city – Walk Score quantifies the neighborhood's walkability with a score of 91 out of 100; the neighborhood favors walking as a primary method of commuting at levels that support a carbon neutral Seattle. From the epicenter of the Station Area Sites, much of the neighborhood's destinations are within a 1/2 mile walk. An EcoDistrict could both capitalize on this high walkability and improve it with projects that improve sidewalks and wayfinding, slow traffic (see James Ct woonerf project for example), and increase local business and community space destinations. Improving pedestrian safety is also already a priority of the Capitol Hill Community Council, which currently has a taskforce called the "12th Avenue Transportation Safety Project" working on improving pedestrian safety along 12th Avenue.

Good Bus Service

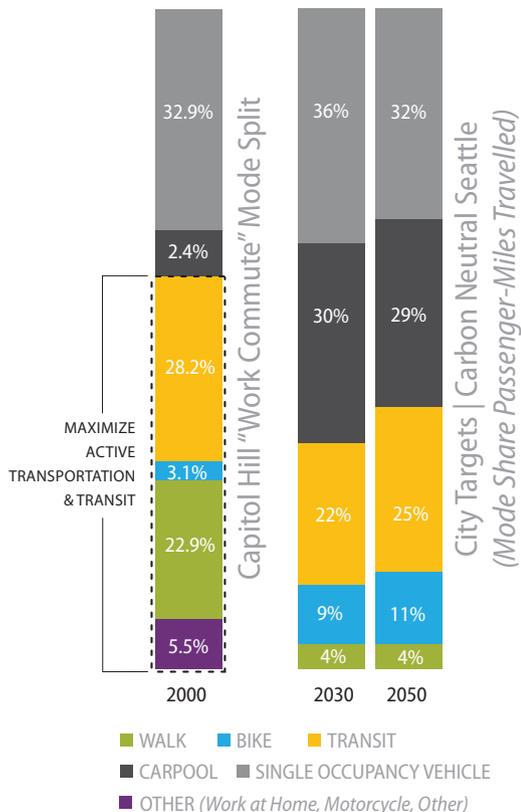
There are ten bus routes that directly serve Capitol Hill within the EcoDistrict study area. Along each route, there are bus stops approximately every two blocks. The strongest connections are to and from downtown. Capitol Hill already exceeds city targets for transit use (see bar graph at left).

Good & Improving Bike Infrastructure

The bike infrastructure on Capitol Hill is fairly good – there are sharrows on three of the main north/south streets, a designated bike lane on Pine St, two bike shops within 1/4 mile of the Station Area Sites, a growing number of bicycle parking racks, and a few of the City's first bike boxes (at 12th and Pine and 12th and Madison) – and there are existing plans for additional infrastructure improvements, such as the upcoming separated bike lane (cycle-track) on Broadway. Alta Bicycle Share is working with the City on a feasibility study to bring a bicycle sharing program to Seattle and Capitol Hill would be an ideal pilot location.

Excellent Future Transit Expansions

Capitol Hill is at the center of many new transportation projects: a new streetcar opening in 2014 will connect Capitol Hill to Yesler Terrace and King St Station; the new LINK Light Rail extension opening in 2016 will connect Capitol Hill to downtown and the airport to the south and to the University District to the north; and a new Bus Rapid Transit line identified in the City's Transportation Master Plan will run up and down Madison to improve the neighborhood's east/west connections.



Capitol Hill's Transportation Mode Split and City Carbon Neutral Targets (Sources: City targets for mode share from "Getting to Zero: A Pathway to a Carbon Neutral Seattle"; Work Commute Mode Split based on 2000 Census data for Capitol Hill Urban Center Village and Pike/Pine Urban Center Village) (Image Credit: GGLO)





In the Capitol Hill Urban Center Village, the average number of **vehicles per household is 0.8**; In the Pike/Pine Urban Center Village the average number of **vehicles per household is 0.6**; The average number of **vehicles per household citywide is roughly 1.**

(Source: City Councilman Tim Rasmussen, June 2005)



There are currently **260 bike racks** within the Capitol Hill Urban Center Village and Pike/Pine Urban Center Village.

(Source: SDOT)

Bicycle Collisions Reduction Goal

“The 2007 Bicycle Master Plan sets an ambitious goal of decreasing the rate of bicycle-involved collisions by a third over the 10-year life of the plan.” (2010 Seattle Traffic Report, Section Four - Traffic Collision Rates)

TRANSPORTATION: GOALS | TARGETS | METRICS | BASELINES

Alternative Vehicle Use Support

While driving cars is the least sustainable transportation mode choice, reducing the number of single-occupant trips through car sharing and carpooling, and using alternative fuel vehicles, helps reduce overall emissions. Two car sharing programs already serve Capitol Hill: Avego Car Sharing and ZipCar. Additionally, there are two electric car charging locations along E Madison Street.

Goals:

- Prioritize Active Transportation
- Maximize Access to Clean, Low Carbon Transportation Options
- Reduce Vehicle Miles Travelled (VMTs)
- Enable Car-Free Households (*also a UDF goal*)
- Increase the Safety of Walking and Biking
- Improve Wayfinding around District and to Various Transportation Options

Suggested Targets:

- Reduce Carbon Emissions and VOC Emissions from Transportation Mix
- Increase All Active Transportation Trips (i.e., biking and walking) over baseline by 2030
- Surpass Seattle's Carbon Neutral 2030 Mode Share Goals of 9% for Biking by 2020 (all other mode share targets have already been met or surpassed)
- Reduce Per Capita Daily VMT by 50% by 2030
- Reduce Total Car Parking Area over baseline by 2030
- Increase Total # of Car Sharing Stops over 2011 baseline by 2030
- Halve the # of Ped/Bike-to-Car Collisions by 2020 (*The 2007 Bicycle Master Plan sets a goal of reducing collisions by a third by 2020*)
- Increase # of People Walking Along Key Pedestrian Corridors (like Broadway and E Pine St) over baseline by 2030
- Increase Total Area of Bike Parking and/or Total # of Bike Racks over 2011 baseline by 2030
- Increase Membership in Bicycle Clubs/Coalitions (like Cascade Bicycle Club)
- Increase Freight Delivery by Bike and Low-emission Transportation

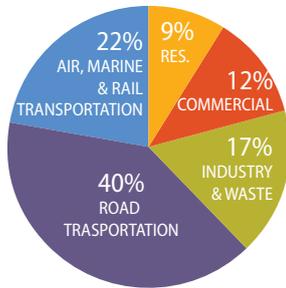


TRANSPORTATION: GOALS | TARGETS | METRICS | BASELINES

Metrics

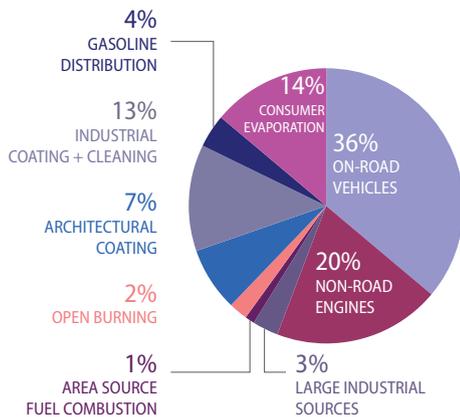
The following metrics can be used to measure the EcoDistrict's performance now and over time in the area of transportation.

- Total Annual Carbon Emissions and/or VOC Emissions from Transportation
- District Performance Relative to the Seattle Climate Action Plan goals
- Mode Split for the District of All Modes
(see Transportation: Site Assets for baseline information)
- Distance to/from Transit Options and Residences and Community Facilities
(see Community: Site Assets and Transportation: Site Assets for baseline information)
- Daily Vehicle Miles Traveled (VMT)
(baseline requires further study)
- Vehicle Flow (Average Annual Daily Traffic) on Key Arterials
- Total Area of Car Parking and/or Total # of Parking Stalls
- Total # of On-Street Parking Spots
(baseline requires further study)
- Average # of Cars Per Household
- % Monthly Income Spent on Transportation per Household
(15 - 19% of monthly income - Source: Center for Neighborhood Technology)
- # of Car Sharing Stops and Programs
(see map in Transportation: Site Assets for baseline information)
- # of Ped/Bike-to-Car Collisions Annually
- # of People Walking Along Key Pedestrian Corridors
(baseline requires further study)
- Walkscore
(see Transportation: Site Assets for baseline information)
- Total Area of Bike Parking and/or Total # of Bike Racks
- Total # or Total Miles of Bike Lanes and Sharrows
(see map in Transportation: Site Assets for baseline information)
- # of Bikes Available for Use through a Bike-Sharing Program
- # of Bike Shops and/or Bike Storage Facilities
(see map in Transportation: Site Assets for baseline information)



TOTAL = 11.3 tCO₂e

Seattle Citywide GHG Emissions by Sector
Road Transportation accounts for 40% of total annual carbon emissions.
(Source: 2008 Seattle Community Greenhouse Gas Inventory)



2005 Distribution of Summertime VOC Emissions
"Summertime" is defined as June, July and August
"Volatile organic compounds (VOCs) are our main ozone precursor. Of these, gasoline-powered vehicles make up the largest contributor."
(Source: Puget Sound Clean Air Agency, "2005 Air Emission Inventory")

Baselines

Baseline figures for most of the above metrics appear in the charts and figures in the left margins of this section, and on the Transportation Baselines Map in the Site Assets section. Other baselines appear in the Site Assets section as indicated above.





"There are fewer automobiles in 2030. There is more foot traffic. I have, in some respects, everything I could want within walking distance: film, theater, fashion, books, clean air, a teen space, happy neighbors."

"Postcard from the Future"

(Source: Postcard from the Future, Forum on Capitol Hill's EcoDistrict, December 2011)



Park(ing) Day 2009 Spots
(Image Credit: Flickr "carfreedays")

TRANSPORTATION: STRATEGIES

Strategies

Capitol Hill already performs strongly from a transportation point of view and its primary strategy for further improvement is to leverage the many upcoming public transit projects that will help the neighborhood meet many of its transportation goals.

Transit

Provide Transit Passes to Tenants

Implement on the Station Area Sites and District-wide

Related Performance Area(s): Community

Install Real-Time Arrival Info Monitors at Transit Stops

Implement on the Station Area Sites and District-wide

Related Performance Area(s): Community

Vehicles

Minimize Installation of New Parking Stalls

Convert Parking Stalls/ Street Parking to New Use (e.g. gardens, bike parking, or habitable area)

Create a Parking Management District

Implement on the Station Area Sites and District-wide

Challenges, Opportunities, & Local Resources: Seattle Zoning Code; UDF Parking Goals (< 1 stall per unit); There are a number of on-street parking areas that could be converted to green street infrastructure, bike parking, food stalls, or small plazas. Potential funding: Parking Benefits District

Related Performance Area(s): Community; Water; Habitat

Increase Car-Sharing Stalls & Stops (for ZipCar, Avego, etc)

Implement on the Station Area Sites and District-wide

Separate Parking Stall Cost from Rent / Lease Costs

Use parking policy to improve transportation behavior. Do not include parking in rent/ lease structure.

Implement on the Station Area Sites and District-wide

Plan a "Guerilla Parking Day"

Transform street parking into usable space.

Implement on the Station Area Sites and District-wide

Challenges, Opportunities, & Local Resources: feet first and PARK(ing) DAY - Seattle (<http://my.parkingday.org/group/parkingdayseattle>); Permitting guidelines can be found online; Projects are funded by participants

Related Performance Area(s): Community (Health and Vibrancy)

Campaign to Remove Subsidies for Restricted Parking Zones

Parking permits in the "Area 1" RPZ are currently subsidized by Group Health, which allows neighborhood residents to park up to four cars for free (see: http://www.seattle.gov/transportation/parking/rpz_z4.htm). Removing these subsidies would accelerate behavior change away from reliance on SOVs and support the conversion of existing parking spaces to more sustainable uses.

Implement District-wide

Related Performance Area(s): Community (Health and Vibrancy); Water



TRANSPORTATION: STRATEGIES

Walking / Pedestrians

Develop a Neighborhood Wayfinding Program / Install Wayfinding Signage

Facilitate increased walking and biking by developing a neighborhood wayfinding program.

Implement on the Station Area Sites and District-wide

Challenges, Opportunities, & Local Resources: The "Legible London" (<http://www.tfl.gov.uk/microsites/legible-london/>) and "Walk Raleigh" (<http://walk-raleigh.com>) projects are two good examples of city- and community-driven wayfinding strategies.

Related Performance Area(s): Community (Equity, Health, Vibrancy)

Create an EcoDistrict Pedestrian Zone

Create an EcoDistrict Pedestrian Zone to manage street/sidewalk improvements and the installation and maintenance of wayfinding signage.

Implement on the Station Area Sites and District-wide

Related Performance Area(s): Community (Equity, Health, Vibrancy)

Create an Annual Pedestrian Count Program

Use the National Bicycle and Pedestrian Documentation Project methodology to count pedestrians (<http://bikepeddocumentation.org/>) and establish a baseline count; continue this program over time to monitor improvements and compare performance to other neighborhoods around the city and country.

Implement District-wide

Challenges, Opportunities, & Local Resources: The City uses the recommended methodology for their pedestrian counts, but they do not cover Capitol Hill.

Related Performance Area(s): Community (Health and Cultural Vibrancy)

Conduct a Neighborhood Walkability Audit

Conduct a "Walkability Audit" to field verify current sidewalk conditions, assess where sidewalks are not accessible to disabled or aging populations, and engage the community around improving neighborhood walkability.

Implement District-wide

Challenges, Opportunities, & Local Resources: See <http://www.walkinginfo.org/problems/audits.cfm> for more information on how to conduct walkability audits; Capitol Hill Community Council's 12th Ave Pedestrian Safety Committee (<http://capitolhillcommunitycouncil.org/blog/>)

Related Performance Area(s): Community (Health and Cultural Vibrancy)

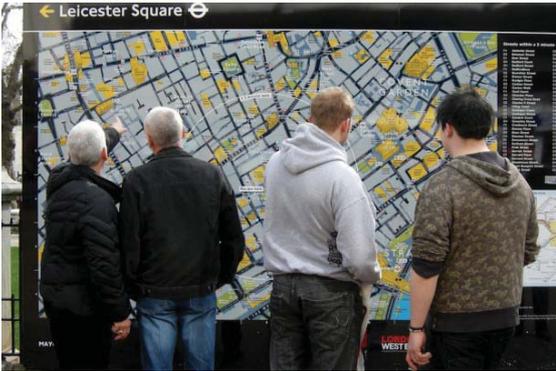
Improve Alleys

Improve alleys to create better walkability throughout neighborhood and strengthen connections to parks, piazzetta opportunity sites (see map in Community strategies), and pedestrian priority streets. Incorporate green infrastructure to assist with district water goals.

Implement District-wide

Challenges, Opportunities, & Local Resources: "Activating Alleys for a Lively Seattle: Seattle Integrated Alley Handbook"

Related Performance Area(s): Community (Equity, Health, Vibrancy); Water



Pedestrians in front of a "Legible London" wayfinding sign.
(Image Credit: Martin Deutsch)



Photo of a Student Conducting a Pedestrian Count in Seattle
(Image Credit: City of Seattle, "Public Spaces Public Life" 2009)

Capitol Hill Alley Conditions

50% of the alleys have 2 or more drains

66% of the alleys are paved with concrete while

33% have asphalt pavement.

There is no discoverable furniture in the alleyways.

Around **50%** of alleys are used for parking.

66% of the alleys have accessible business entries.

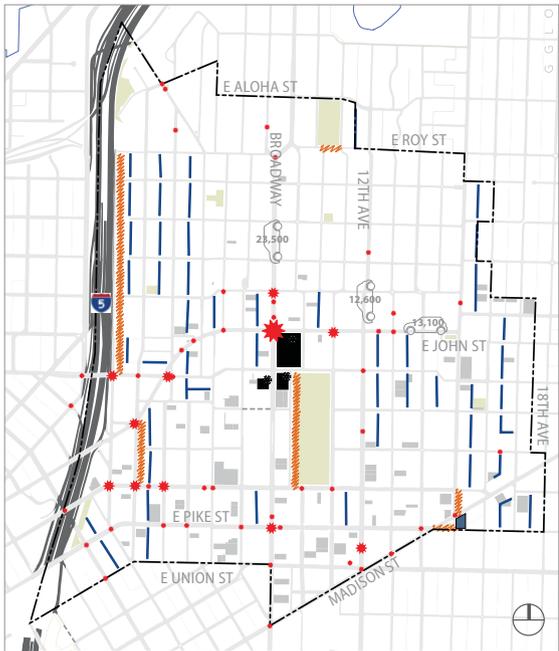
There are an average of **3.5** garage doors per alley.

(Source: Adapted from

"Activating Alleys for a Lively Seattle: Seattle Integrated Alley Handbook")



TRANSPORTATION: STRATEGIES



Transportation Baselines Map

Shows baseline information about the number and locations of pedestrian/bike collisions with cars in 2008 as reported in the "Capitol Hill Specific Neighborhood Data" PDF (http://www.seattle.gov/dpd/cms/groups/pan/@pan/@plan/@neighborplanning/documents/web_informational/dpds016985.pdf); sidewalks that need improvements as identified in the 2007 Sidewalk Inventory Map (<http://www.seattle.gov/transportation/docs/SidewalkInventory2007.pdf>) from the Seattle Pedestrian Master Plan; amount (16.6 acres) and location of parking as identified by parcel use and lot size in GIS, and average annual daily vehicle flow on key arterials per SDOT. (Image Credit: GGLO)

Repair/Replace Inaccessible Sidewalks

After conducting a neighborhood walkability audit, improve identified sidewalks as part of an EcoDistrict strategy for strengthening neighborhood walkability as well as equity and accessibility.

Implement District-wide

Related Performance Area(s): Community (Equity and Vibrancy)

Install Woonerfs / Convert Low Traffic Streets or Alleys to Woonerfs

Woonerfs (aka "streets for living") are an excellent strategy for slowing traffic, expanding shared public space, and improving neighborhood walkability, bikability and permeability.

Implement on the Station Area Sites and District-wide

Challenges, Opportunities, & Local Resources: 12th Ave Stewardship Committee and the Seattle Parks Department; James Court Woonerf (<http://www.seattle.gov/parks/ProParks/projects/12thAve.htm>).

"Festival Streets" are recommended as part of the Station Area Sites' development in the UDF.

Related Performance Area(s): Community (Health and Vibrancy), Water

Advocate for Pedestrian Infrastructure and Funding

Walking is a primary form of transportation, but funding for pedestrian infrastructure is not commensurate with its high use. Re-appropriating funds for car infrastructure and advocating for pedestrians are priorities for rebalancing investments and improving the public realm.

Implement District-wide

Related Performance Area(s): Community (Equity, Health, Vibrancy); Water (related to converting right-of-ways)

TRANSPORTATION: STRATEGIES

Biking

Install More Bike Boxes at Major Intersections

Implement on the Station Area Sites and District-wide

Challenges, Opportunities, & Local Resources: Bike boxes are expensive (about \$10,000 each for the special paint and labor), but they are a priority of the City's "Walk/Bike/Ride" program.

Install Creative Bike Racks

Host a design/build competition to install EcoDistrict-inspired bike racks to engage the community and increase overall bike parking space.

Implement on the Station Area Sites and District-wide

Challenges, Opportunities, & Local Resources: SDOT Rack Program helps provide bike racks throughout the city and has experience with bike rack design competitions.

Implement a Bike-Sharing Program

Implement on the Station Area Sites and District-wide

Challenges, Opportunities, & Local Resources: Potential partners include: Bike Works, The Bicycle Alliance of Washington, Cascade Bicycle Club, and Feet First.

Next Step: Engage with the City and Alta Bike Share about bringing their bike sharing program to Capitol Hill as a Seattle pilot project.

Related Performance Area(s): Community (Equity, Health, Vibrancy); Materials

Open a Bikestation on Capitol Hill

Open a "Bikestation" facility that provides support services to bicyclists, including secure, staffed bicycle parking and resources for repairs, maps, and other information.

Implement on the Station Area Sites or District-wide

Challenges, Opportunities, & Local Resources: Ongoing funding may be a challenge - Seattle's only Bike Port (formerly Bikestation Seattle) decided to close as of December 31, 2011 due to lack of funds.

Related Performance Area(s): Community (Equity, Health, Vibrancy); Materials



Rendering of James Ct Woonerf and new "12th Ave & E James Ct Pro Park."
(Image Credit: Hewitt Architects)



Bike Box on Capitol Hill (Image Credit: SvR Design Company)



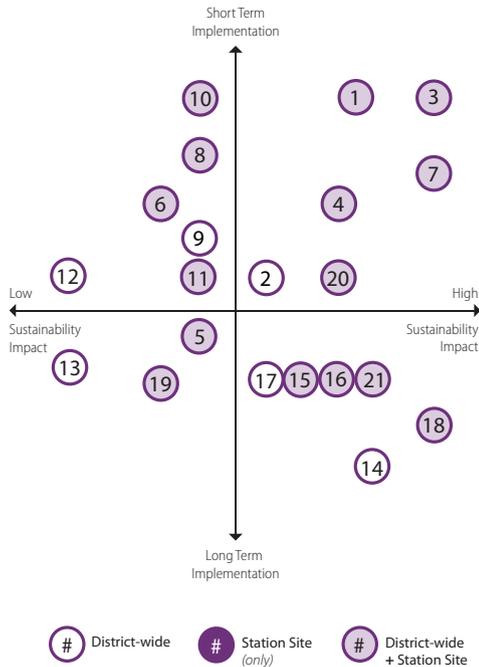
Photo of Bike Port in Pioneer Square
Bike Port (formerly Bikestation Seattle) provides secure bicycle parking, bicycle repair, and bike rentals. It closed December 2011.
(Image Credit: Robert Ashworth "theslowlane")



TRANSPORTATION: STRATEGIES

Strategies Summary

The Scatter Plot at left summarizes the previously listed strategies and organizes them based on implementation time frame and sustainability impact. The dots signifying each strategy are coded by their implementation area: District-wide, Station Site (only), and District-wide + Station Site. The number of each dot corresponds to the list below:



Implementation Time Frame

Some strategies are relatively quick to implement, such as many associated with the Station Area Sites due to the imminent development (shown at the top of the summary graph), while other strategies are more long term and will require more time to completely implement and yield full benefits (shown at the bottom of the summary graph).

Sustainability Impact

All recommended strategies can contribute to EcoDistrict success; however, some strategies have increased levels of sustainability impact (shown to the right of the summary graph).

Transit

1. Provide Transit Passes to Tenants
2. Install Real-Time Arrival Info Monitors at Transit Stops

Vehicles

3. Minimize Installation of New Parking Stalls
4. Convert Parking Stalls/ Street Parking to New Use
5. Create a Parking Management District
6. Increase Car-Sharing Stalls & Stops (for ZipCar, Avego, etc)
7. Separate Parking Stall Cost from Rent / Lease Costs
8. Plan a “Guerilla Parking Day”
9. Campaign to Remove Subsidies for Restricted Parking Zones

Walking / Pedestrians

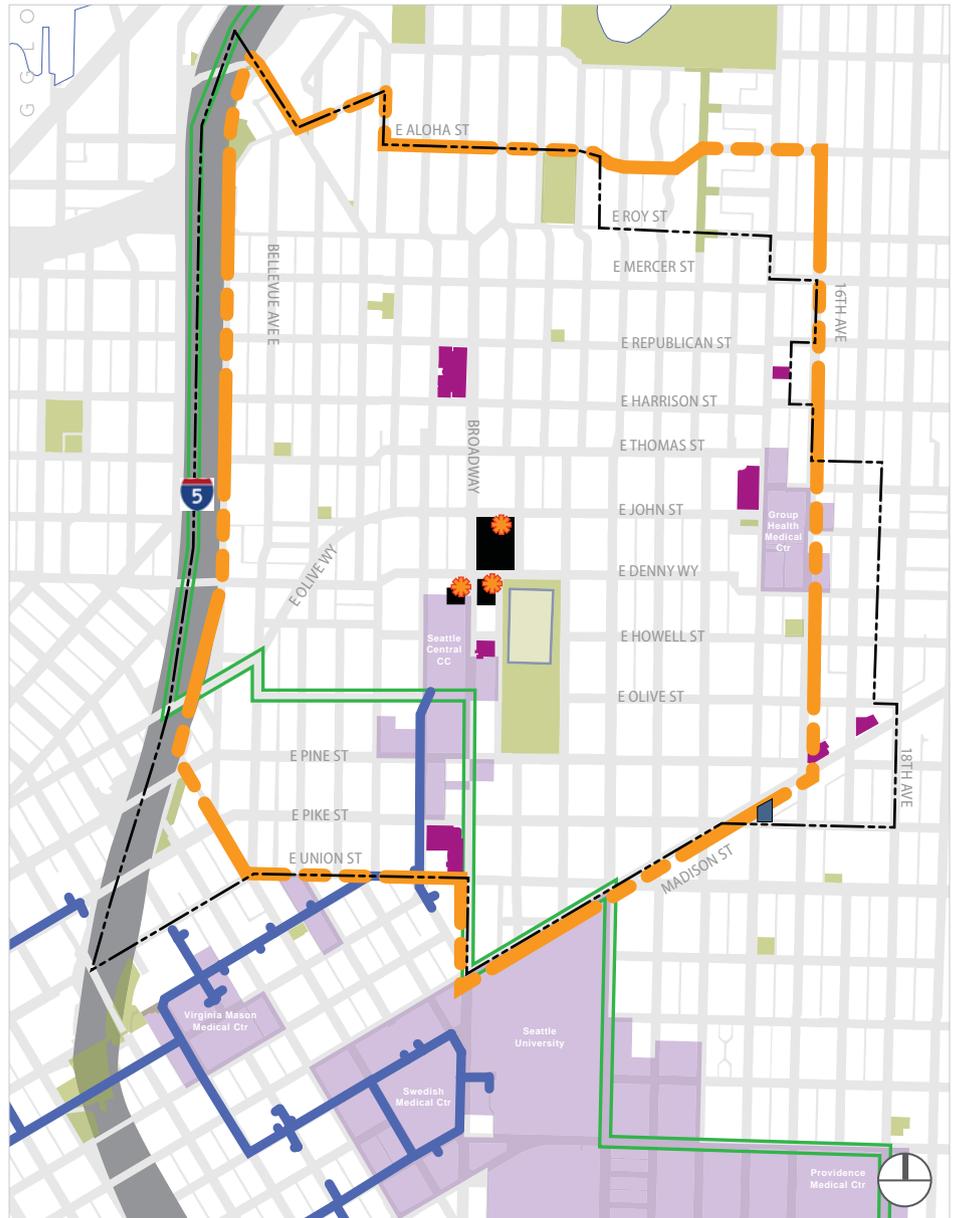
10. Develop a Neighborhood Wayfinding Program/Install Wayfinding Signage
11. Create an EcoDistrict Pedestrian Zone
12. Create an Annual Pedestrian Count Program
13. Conduct a Neighborhood Walkability Audit
14. Improve Alleys
15. Repair/Replace Inaccessible Sidewalks
16. Install Woonerfs / Convert Low Traffic Streets or Alleys to Woonerfs
17. Advocate for Pedestrian Infrastructure and Funding

Biking

18. Install More Bike Boxes at Major Intersections
19. Install Creative Bike Racks
20. Implement a Bike-Sharing Program
21. Open a Bikestation on Capitol Hill

ENERGY: SITE ASSETS

- STATION ENTRY 
- STATION AREA SITES 
- ECODISTRICT STUDY AREA BOUNDARY
(Capitol Hill Urban Center Village + Pike/Pine Urban Center Village) 
- BULLITT CENTER 
- PARK 
- WATER BODY 
- PARCEL/ROW GRID 
- PRESERVATION GREEN LAB DISTRICT ENERGY STUDY AREA 
- SEATTLE 2030 DISTRICT EAST BOUNDARY 
- SEATTLE STEAM LINE 
- LINCOLN RESERVOIR 
- MAJOR INSTITUTION 
- HEAT SOURCE: GROCERY STORES & CREMATORIUM 



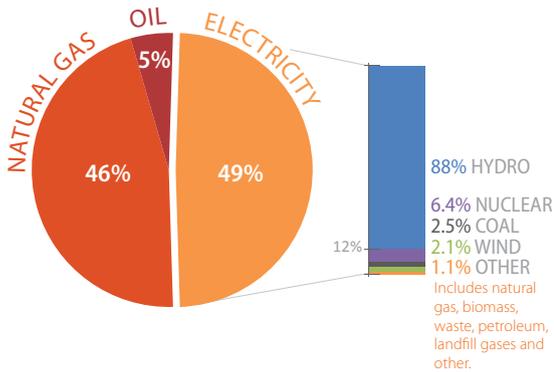
EcoDistrict Energy Assets Map Diagram

This map shows the many assets the neighborhood has for improving energy efficiency: potential district energy systems are under evaluation, energy audit and upgrade programs are available to homeowners and business owners, and nearby institutions and utilities could provide resources and support for starting up new programs. (Image Credit: GGLO)

ENERGY: SITE ASSETS

Intent: Reduce non-renewable energy use & associated greenhouse gas emissions.

Designing and operating energy efficient buildings and increasing the use of renewable sources of energy are recognized strategies for combating climate change, since buildings are responsible for nearly half of U.S. CO₂ emissions (46% in 2011 according to U.S. Energy Information Administration / Architecture 2030) through their energy use. Despite popular wisdom to the contrary, Seattle also contributes to this story, so reducing consumption and increasing efficiencies are important long-term issues for Capitol Hill. Furthermore, population growth and an increase in electric vehicles will likely grow electricity demand beyond the capacity of existing sources unless further conservation measures are taken. Luckily, Capitol Hill has many assets that can support energy conservation, energy efficient building design, and renewable energy generation strategies.



Seattle Building Energy Consumption by Fuel Type + Electricity Supply Fuel Mix
This chart shows the energy consumption mix for Seattle buildings in 2008, as well as the energy supply fuel mix for electricity supplied by Seattle City Light in 2010. (Sources: 2008 Seattle Community Greenhouse Gas Inventory; Seattle City Light) (Image Credit: GGLO)

Green Up!

"Green Up is Seattle City Light's voluntary green power program for residential and business customers. By enrolling in Green Up, customers purchase green power for a portion of their electricity use and demonstrate their support for wind power and other new renewable energy projects in the Northwest."
(Image Credit: Seattle City Light)

Capitol Hill Participation
164 Homes
0 Businesses

(Source: Community Power Works;
data for zip code 98122, as of 02/2012)



Progressive Utility Providers

Utility providers that serve Capitol Hill have several programs that may be tapped to further the goals of an EcoDistrict. Seattle City Light (electricity) and Puget Sound Energy (natural gas) both have a range of conservation programs. Seattle City Light also has the "Green Up" program, which allows customers to purchase Renewable Energy Credits and help the utility cover the slightly higher cost of producing and integrating renewable energy into the Northwest grid. Seattle City Light is also committed to increasing its supply of low carbon fuel sources. In 2008 hydroelectric and wind power constituted 90.1% of Seattle City Light's supply, which is a great benefit for meeting renewable energy supply targets and carbon neutrality goals, but electricity is not the whole energy consumption story. According to the 2008 Seattle Community Greenhouse Gas Inventory, buildings in Seattle use slightly more natural gas and oil (51%) than electricity (49%) to meet building energy needs. Setting goals and implementing targets that improve energy efficiency, as well as the renewable energy fuel mix, in the Capitol Hill neighborhood will be important for achieving overall neighborhood sustainability.

Seattle Building Energy Benchmarking & Reporting

Measure What Matters – Establishing actual energy performance through benchmarking is an essential first step toward energy efficiency. Capitol Hill will benefit from Seattle's mandated benchmarking program that requires commercial and multi-family buildings of 5 or more units to track and report energy performance on an annual basis. The legislation also obliges building owners to disclose the information upon request by a prospective tenant, buyer, or lender in a real estate transaction. Not only will this enable the City to monitor progress toward achieving citywide efficiency targets and provide building owners a baseline performance value to assist efficiency investment decisions, but create an informed market for the leasing and purchasing of real estate.

Community Power Works Program Service Area

"Community Power Works" (CPW) was founded with funding from the U.S. Department of Energy's BetterBuildings program and is administered by the City of Seattle. The program provides discounted energy audits to a range of building types (single-family homes, multi-family buildings, hospitals, large commercial associated with Seattle Steam, and food-service related businesses are all covered), with the intention of helping building owners make important energy upgrades and increase their





The Seattle Climate Action Plan is undergoing an update to lay out a roadmap for how Seattle can become carbon neutral by 2050. (Image Credit: Office of Sustainability & Environment)



Seattle 2030 District Map (Image Credit: Seattle 2030 District)



Seattle Steam Company in downtown Seattle (Image Credit: Michael Stearns Hybrid3 Design)

ENERGY: SITE ASSETS

energy efficiency by at least 15%. The program also facilitates low interest loans for energy upgrades and has a pre-approved contractor list. Since Capitol Hill is mostly built out and has many older buildings, this could be a great asset for the EcoDistrict to exploit and promote. As of January 2012, the program is available city-wide.

Carbon Neutral Seattle

Capitol Hill has the potential to be the testing ground for pilot project investments associated with Seattle's pursuit for carbon neutrality. In 2005, Seattle spearheaded the U.S. Mayors Climate Protection Agreement which committed over 1,000 cities to reduce their greenhouse gas emissions to the levels required in the Kyoto Protocol. In 2010, Seattle City Council adopted the ambitious goal for Seattle to become the nation's first carbon neutral city. The Seattle Climate Action Plan will be our roadmap for carbon neutrality by 2050.

High Performance District Neighbor: Seattle 2030 District

Capitol Hill's EcoDistrict is well located to learn from or partner with the Seattle 2030 District, which abuts Capitol Hill to the west. As their website says:

"The Seattle 2030 District is an interdisciplinary public-private collaborative working to create a ground-breaking high-performance building district in Downtown Seattle that aims to dramatically reduce the environmental impact of building construction and operations...with the Architecture 2030 Challenge for Planning providing our performance goals..."

As part of their work, the Seattle 2030 District is researching and developing financing models for energy upgrades; these would likely be applicable to Capitol Hill too.

Potential Expansion of Seattle Steam Service

Seattle's existing district energy utility, Seattle Steam, is a candidate for providing thermal district energy to Capitol Hill. Seattle Steam's lines currently come up to Capitol Hill via Harvard Ave and serve a Seattle Central Community College building located at the corner of Broadway and Pine, just a few blocks from the Station Area Sites. Seattle Steam could expand its service area, and the EcoDistrict, if it pursues district energy, has the potential to act as a catalyst for extending service north along Broadway.

ENERGY: SITE ASSETS

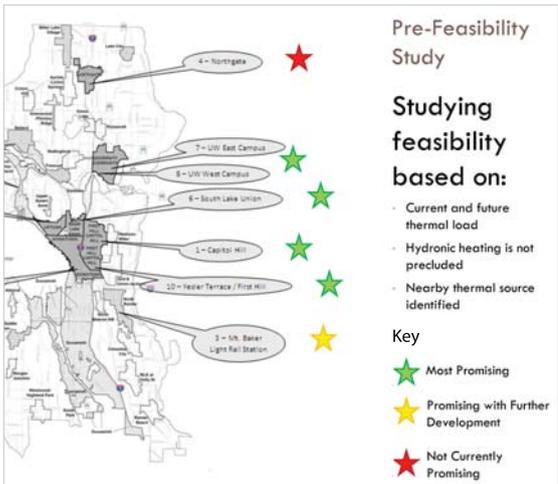
Thermal District Energy Studies in Pursuit

There is strong support for studying the feasibility of a thermal district energy system on Capitol Hill. The City is issuing a RFEOI (Request for Expressions of Interest) in early 2012 for an entity to spearhead the development of a proposal for building and operating a district energy utility in the city. As a precursor to this RFEOI the City completed a pre-feasibility study on district energy systems in Seattle and identified Capitol Hill as a good candidate for a system.

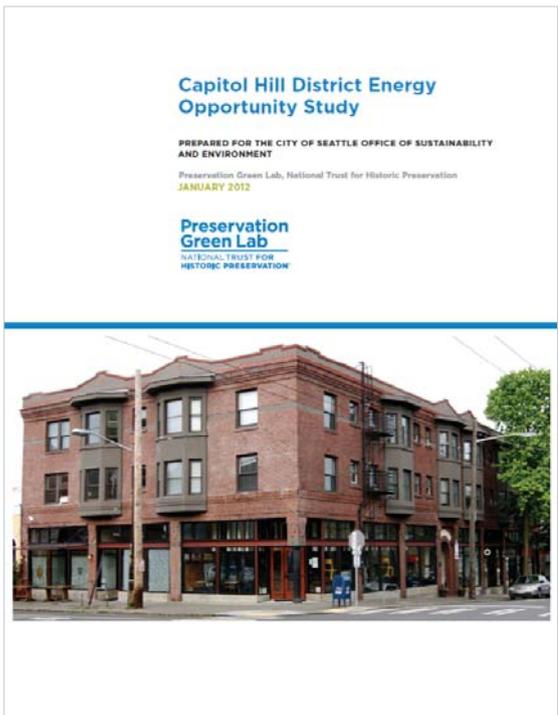
In support of that assessment, the City recently contracted with Preservation Green Lab (PGL) to conduct a deeper analysis of Capitol Hill's potential for a thermal district energy system. PGL's study area overlaps the EcoDistrict study area (see boundaries on Energy Assets Map); their analysis supplements this report. PGL's study will be issued in early 2012 and will outline potential district energy concept plans, as well as contain a deep-dive study of Capitol Hill's building stock, including type and age of buildings and HVAC systems.

Potential Heat Sources

From a high-level it is apparent that Capitol Hill has a number of potential sources of heat for a thermal district energy system: there are six grocery stores (which often have excess heat available from their refrigeration system), a crematorium next to the station area sites (and while a candidate for redevelopment, excess heat may also be a resource), one hospital (with two more nearby) and two college campuses (from which waste heat recovery may be possible), and there is the Lincoln Reservoir underneath Cal Anderson Park (which may have low grade heat potential in a district energy system).



Most Promising Neighborhoods for District Energy in Seattle
This chart is excerpted from the 2011 Seattle District Energy Pre-Feasibility Study and shows that Capitol Hill was designated as "most promising" for receipt of a district energy system. (Image Credit: City of Seattle, 2011)



Cover of "Capitol Hill District Energy Opportunity Study"
A deep-dive study of Capitol Hill's building stock, including type and age of buildings and HVAC systems, to be issued in early 2012. (Image Credit: Preservation Green Lab)

Energy Efficiency

"Increase energy efficiency in building design and operations, as well as in vehicle efficiency [to] result in over 30% energy savings by 2030 (per capita in residential, per square foot in commercial, and per-mile in vehicles) and over 50% by 2050, relative to 2008 levels."

(Getting to Zero: A Pathway to a Carbon Neutral Seattle, May 2011)



Neighborhood Energy Profile

Of the 1,500 buildings in the neighborhood, 80% (+1,200) are residential, occupy 70% of total floor area, and have an annual baseline energy budget which is 50% of the neighborhood's total (based on national average energy use intensity by building use).

Because non-residential energy use is disproportionately larger than its percentage of total buildings (and building area) in the neighborhood (20% and 30% respectively), targeting energy efficiency strategies for non-residential buildings should be a priority. Given the large numbers of residential buildings, energy efficiency strategies will require additional effort to yield similar non-residential results.

(Image Credit: GGLO)

Goals:

- Reduce Energy Use by Minimizing Demand and Maximizing Conservation
- Provide New and Expand Existing Options for Improving Energy Efficiency in Buildings and throughout the District
- Optimize Infrastructure Efficiencies at all Scales
- Use Renewable Energy
- Reduce Mix of Energy Generated from Fossil Fuels Consumed in the District | Increase the Mix of Renewable Energy

Suggested Targets:

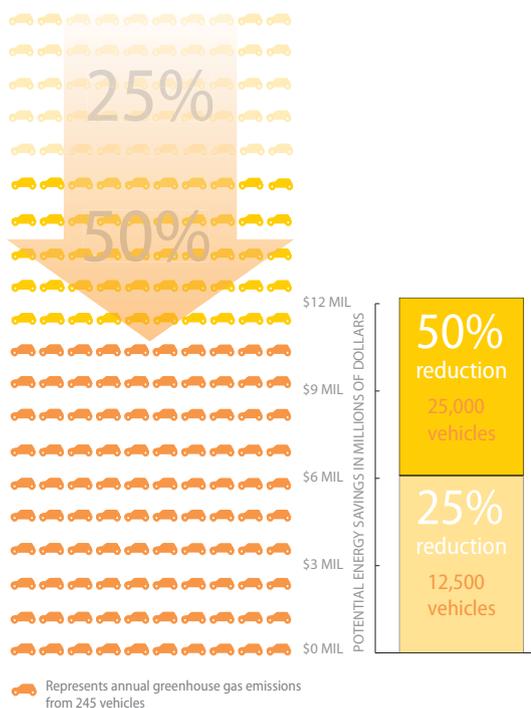
- Existing Buildings & Infrastructure: Decrease Energy Use Intensity by 10% below National average prior to 2015 with incremental targets (20% in 2020, 35% in 2025) reaching 50% by 2030 - based on 2030 Challenge for Planning
- New Buildings & Infrastructure: Decrease Energy Use Intensity by 60% below National average for project constructed prior to 2015 with incremental targets (70% in 2015, 80% in 2020, 90% in 2025) reaching carbon neutral by 2030 - based on 2030 Challenge for Planning
- Decrease Annual Energy Use Intensity by 30% over 2011 baseline by 2030 and 50% by 2050 (per capita in residential and per sf in commercial) - based on Carbon Neutral Seattle.
- Increase Mix of Renewable Energy Supplied to District (whether generated on-site or off-site)
- Reduce Carbon Emissions and/or PM2.5 Emissions from Energy Use
- Retrofit 75% of Eligible Existing Buildings from 2011 baseline by 2030, 90% by 2050 (90% based on Carbon Neutral Seattle)
- Decrease Energy Demand Associated with Water Supply by 50% by 2030
- Have the District be a Net Energy Producer by 2050
- Increase # of LEED Certified or Living Building Challenge (LBC) Certified Buildings to 100% of New Construction by 2030



ENERGY: GOALS | TARGETS | METRICS | BASELINES



(Source: Postcard from the Future, Forum on Capitol Hill's EcoDistrict, December 2011)



Carbon Emissions

Neighborhood baseline carbon footprint is equivalent to the annual greenhouse gas emissions from nearly 50,000 vehicles (average emissions determined by the EPA). If each building targeted a 50% energy savings, it would be the equivalent of removing almost 25,000 vehicles from the road with a potential utility savings of more than \$12 million annually. (Image Credit: GGLO)

Metrics:

- Annual Energy Demand (Baseline & Actual) as measured by an Energy Use Index (kBtu/SF/year) including:
 - Aggregate Building EUI (by Use Type)
 - Aggregate Public Infrastructure EUI (from street lights, etc)
 - Aggregate EUI for the Overall District per capita
- Annual Energy Supply Mix including:
 - Percentage of Energy Supplied by Renewable Resources ($\% = \text{Renewable Supply} \div \text{Total Energy Supply}$)
 - Percentage of Energy Supplied by Renewable Energy Produced On-Site/District ($\% = \text{On-Site/District Renewable Produced} \div \text{Total Energy Supply}$)
 - Percentage of Energy Supplied by Fossil Fuel GHG Emitting Energy ($\% = \text{Fossil Fuel GHG Emitting Supply} \div \text{Total Energy Supply}$) - see Site Assets for city-wide Energy baseline information.
- Net Positive Energy (Total Energy Produced by District - Total Energy Consumed in District)
- Percent Reduction in Energy Demand (Per Capita, Aggregate Building, Public Infrastructure, Overall) ($\% = \text{Energy Demand} \div \text{Baseline Energy Demand}$)
- District Performance Relative to Architecture 2030 Targets and Seattle Climate Action Plan
- Percent of Building Retrofits Completed ($\% = \text{Retrofits Completed} \div \text{Baseline Buildings Eligible for Energy Retrofits}$)
- Carbon Emissions Reduction from Annual Energy Sources ($\% = \text{Tons CO}_2 \div \text{Baseline CO}_2$)
- District Energy Ready - The ability for building systems to connect to future district energy systems (Example: hydronic heating)
- # Buildings / Dwellings with Advanced Metering
- # Buildings Publicly Reporting Energy Use
- # Businesses, Employees, Households with Energy Efficiency Training
- # of LEED Certified Buildings and/or Living Buildings in District
- # of Homes and Businesses Participating in the Community Power Works program

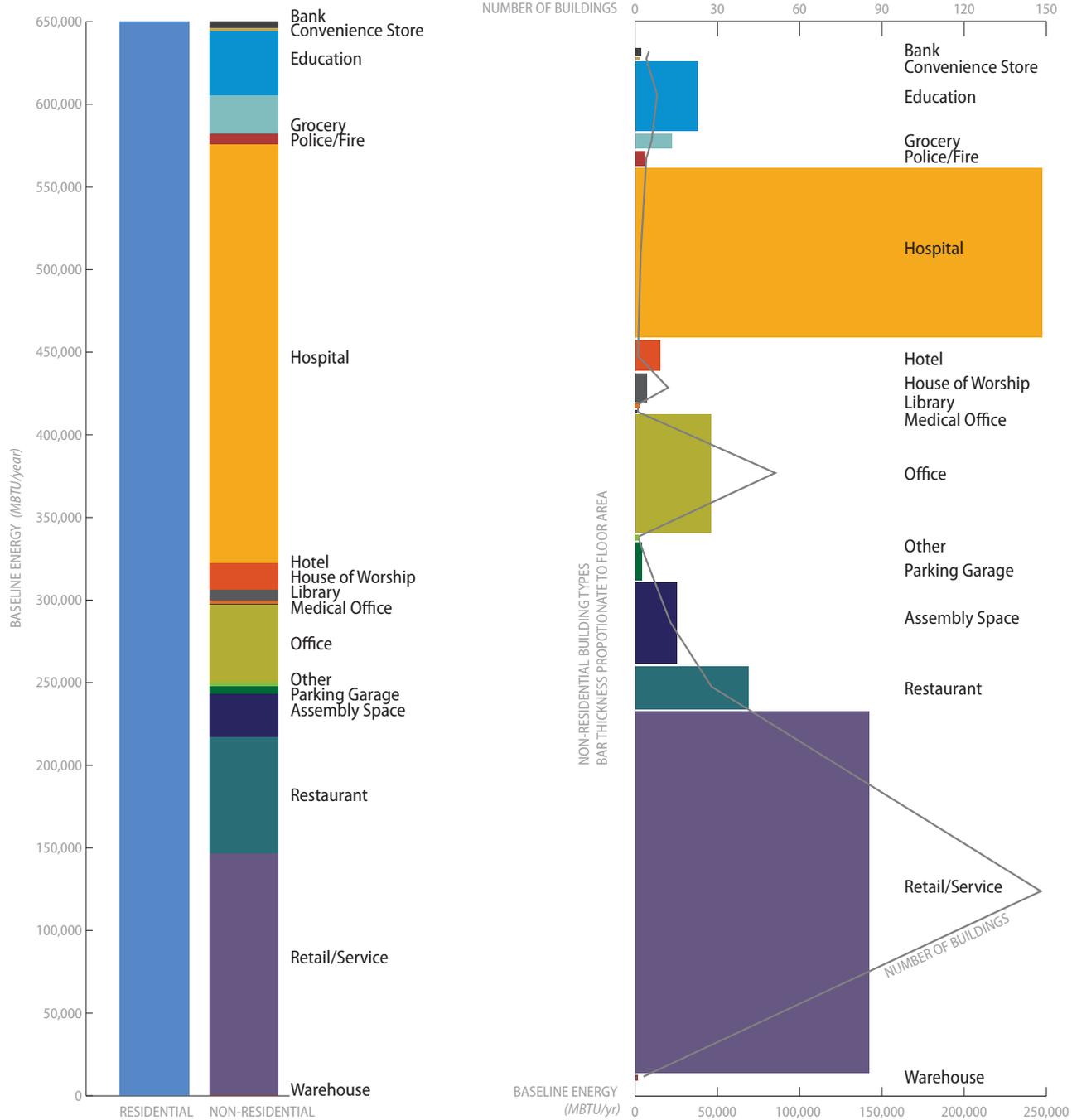
Baselines:

Baseline figures for most of the above metrics appear in the charts and figures in the left margins of this section, and on the "Annual Baseline Energy Budget" diagram on the following page. Other baselines appear in the Site Assets section as indicated above.

Strategies



ENERGY: GOALS | TARGETS | METRICS | BASELINES



Annual Baseline Energy Budget – By Building Type

By setting a baseline for the neighborhood, energy efficiency improvements (including 2030 Challenge progress) can be measured as actual energy use data becomes available. When targeting energy efficiency, programs that focus on Residential buildings, Hospitals, Retail & Services buildings, and Restaurants will yield the greatest return -- these building types have the largest annual energy demand on Capitol Hill. Particular focus should be placed on the two Hospital buildings that consume nearly 20% of the total energy demand and the nearly 150 Retail and Service buildings that consume about 10% of the total energy demand; approaches to energy efficiency for each building type will differ. (Sources: National Average Energy Use Intensity by Building Type - Architecture 2030, Target Finder, and CBECS) (Image Credit: GGLO)

LED Lights = Energy Savings

"The LEDs are expected to last at least 12 years, increasing reliability and lowering maintenance costs. They also are expected to use at least 40 percent less energy than our current lights. Once all 40,000 lights are installed, the combined savings is projected to be \$2.4 million per year."
(Seattle City Light website)

LED Capitol Hill Pilot Project

60% of people surveyed about the Seattle City Light's streetlights program said that they improved their ability to see when walking and driving.

76% of people surveyed said they would like to see LED streetlights more widely used throughout the city.

(Source: Seattle City Light website (<http://www.seattle.gov/light/streetlight/led/>))

1 LEED Certified project - Silver (Broadway Crossing - affordable housing), **7 LEED Registered** Projects, **2 Living Building Challenge**-pursued projects -Bertschi Science Wing (targeting 2012) to the north & Bullitt Center (targeting 2013).

(Source: USGBC Green Buildings Map)

ENERGY: STRATEGIES

When targeting energy efficiency, designs that focus on new and existing **Residential** buildings, **Hospitals, Retail & Services** buildings, and **Restaurants** will yield the greatest return -- these building types have the largest annual energy demand on Capitol Hill (see "Annual Baseline Energy Budget – By Building Type" on opposite page).

Energy-Efficient Building Design (Target Big Users)

Design to meet 2030 Challenge at a minimum (hydronic and electric heat pumps over electric resistance heating will be important for residential development)

Implement on the Station Area Sites and District-wide

Challenges, Opportunities, & Local Resources: UDF: Pursuit of Environmentally Sustainable Design and Programming Solutions (pg 20). Potential funding opportunities associated with the Seattle 2030 District (DPD, OED, Clinton Climate Initiative Preferred Purchasing network)

Energy Retrofits on Existing Buildings (Target Big Users)

Implement District-wide

Challenges, Opportunities, & Local Resources: Community Power Works (CPW) >15% energy efficiency improvements; Home-Wise Weatherization (Office of Housing); Preservation Green Lab

Potential Funding: CPW; Home-Wise Weatherization

Integrate with External District Energy System

Connect EcoDistrict buildings to external district heating/cooling system (Existing System: Seattle Steam or Future System: District Energy being explored by OSE)

Implement on the Station Area Sites and District-wide

Challenges, Opportunities, & Local Resources: Consider 'district energy ready' systems for connections to future systems; Consider connection to Seattle Steam for southern parcels; Preservation Green Lab / City of Seattle Capitol Hill district energy exploration

Building Integrated Renewable Energy Generation

Coordinate solar thermal opportunities with district energy exploration. New construction should be 'renewable ready' at a minimum. Existing buildings should explore opportunities such as timing renewables (solar thermal and photovoltaics) with building upgrades (such as SCCC roof replacement).

Implement on the Station Area Sites and District-wide

Challenges, Opportunities, & Local Resources: Seattle Climate Action Plan; Preservation Green Lab / City of Seattle Capitol Hill district energy exploration; Retrofits & new construction consideration vary.

Potential Funding: Federal and Washington incentives; Power Purchasing Agreement (PPA)

Certify All New Development to LEED Gold Minimum

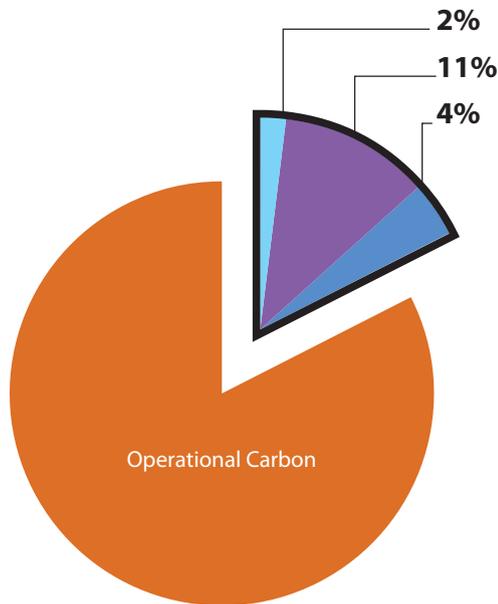
Set minimum standard with aspirations to exceed the Living Building Challenge

Implement on the Station Area Sites and District-wide

Challenges, Opportunities, & Local Resources: Seattle market receptive to Living Building Challenge and LEED certification

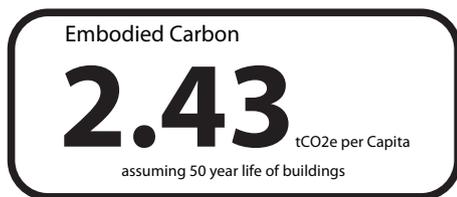
Related Performance Area(s): Water; Materials





Existing Annual Carbon Emissions per Capita
(tons CO₂e)

Embodied Carbon	
Roads	0.23 tCO ₂ e
Road Vehicles	1.58 tCO ₂ e
Buildings	0.57 tCO ₂ e
Subtotal	2.43 tCO₂e



Total annual carbon emissions per capita for the Capitol Hill EcoDistrict, including annual Embodied Carbon expended for the construction and reconstruction of roads, vehicles, and buildings as well as Operational Carbon for transportation, building operations, industry and waste. Capitol Hill Embodied Carbon represents 21% of City-wide Operational carbon (11.3 tCO₂e per capita)
(Sources: City of Seattle 2008 Greenhouse Gas Inventory; 2000 US Census; Sightline Institute; Chester and Horvath, University of California at Berkeley)
(Image Credit: GGLO)

ENERGY: STRATEGIES

Renewable Energy Purchase Agreement

Implement on the Station Area Sites and District-wide

Challenges, Opportunities, & Local Resources: SCL Green-Up; Bellingham example: 2007 EPA's Green Power Partner of the Year for 16% green power commitment

Small-Scale Hydropower

In the past Capitol Hill's stormwater runoff was used to generate power at a generator/Hydro House on Eastlake next to Lake Union.

Implement District-wide

Related Performance Area(s): Water

Participate in the Seattle 2030 District

Promote and identify opportunities for collaboration with the Seattle 2030 District.

Implement on the Station Area Sites and District-wide

Challenges, Opportunities, & Local Resources: The Seattle 2030 District has tools and resources (funding, policy work) that could benefit the Capitol Hill EcoDistrict.

Related Performance Area(s): Transportation; Water

Advanced Metering

Advanced metering supports the gathering of energy use data, which can then be used to fine tune systems, as well as made available for energy visualization strategies (like Dashboards).

Implement on the Station Area Sites and District-wide

Challenges, Opportunities, & Local Resources: Washington State policy HB 2289; SCL / Microsoft Hohm partnership; PSRC BETI Initiative (<http://psrc.org/econdev/beti>)



ENERGY: STRATEGIES



The building energy dashboard at the University of Washington Bothell campus and Cascade Community College displays energy consumption and production online and on monitors in campus buildings. (Image Credit: University of Washington via The Weekly Herald)

Visualize Energy Use - Dashboards & Pavement

Energy monitoring and communication are key strategies for educating people about energy use and encouraging changes in behavior that lead to reduced energy use, particularly during peak load times. Installing energy dashboards or energy generating pavement tiles are two good strategies.

Implement on the Station Area Sites and District-wide

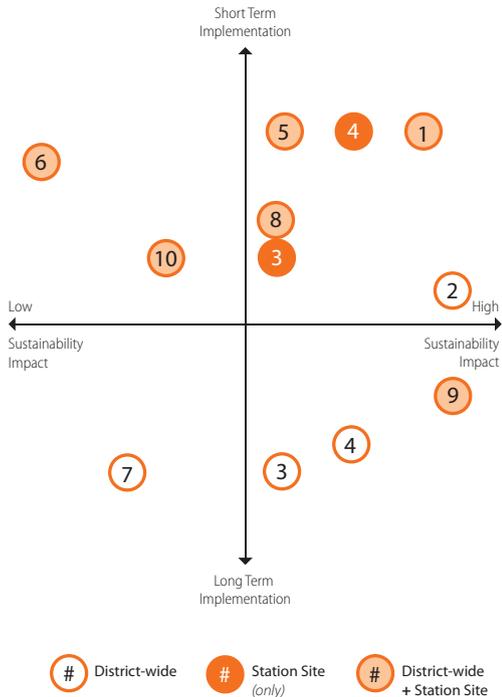
Challenges, Opportunities, & Local Resources: There are a couple of regional examples of "energy dashboards" that could serve as example programs for Capitol Hill's EcoDistrict and provide local expertise: (1) The "Island Energy Dashboard" on Bainbridge Island from Positive Energy and Puget Sound Energy; (2) The Building Dashboard partner program at the University of Washington Bothell and Cascade Community College. Both dashboards display real time energy use data online and on displays in buildings or kiosks, and encourage competition to reduce energy consumption across neighborhoods (Bainbridge Island) and buildings (UW-Bothell and Cascade Community College). "Pavegen" and "Sustainable Dance Floor" are global examples of energy generating pavement.

Related Performance Area(s): Community (Cultural Vibrancy)

Strategies Summary

The Scatter Plot at left summarizes the previously listed strategies and organizes them based on implementation time frame and sustainability impact. The dots signifying each strategy are coded by their implementation area: District-wide, Station Site (only), and District-wide + Station Site. The number of each dot corresponds to the list below:

1. Energy-Efficient Building Design (Target Big Users)
2. Energy Retrofits on Existing Buildings (Target Big Users)
3. Integrate with External District Energy System
4. Building Integrated Renewable Energy Generation
5. Certify All New Development to LEED Gold Minimum
6. Renewable Energy Purchase Agreement
7. Small-Scale Hydropower
8. Participate in the Seattle 2030 District
9. Advanced Metering
10. Visualize Energy Use - Dashboards & Pavement



Implementation Time Frame

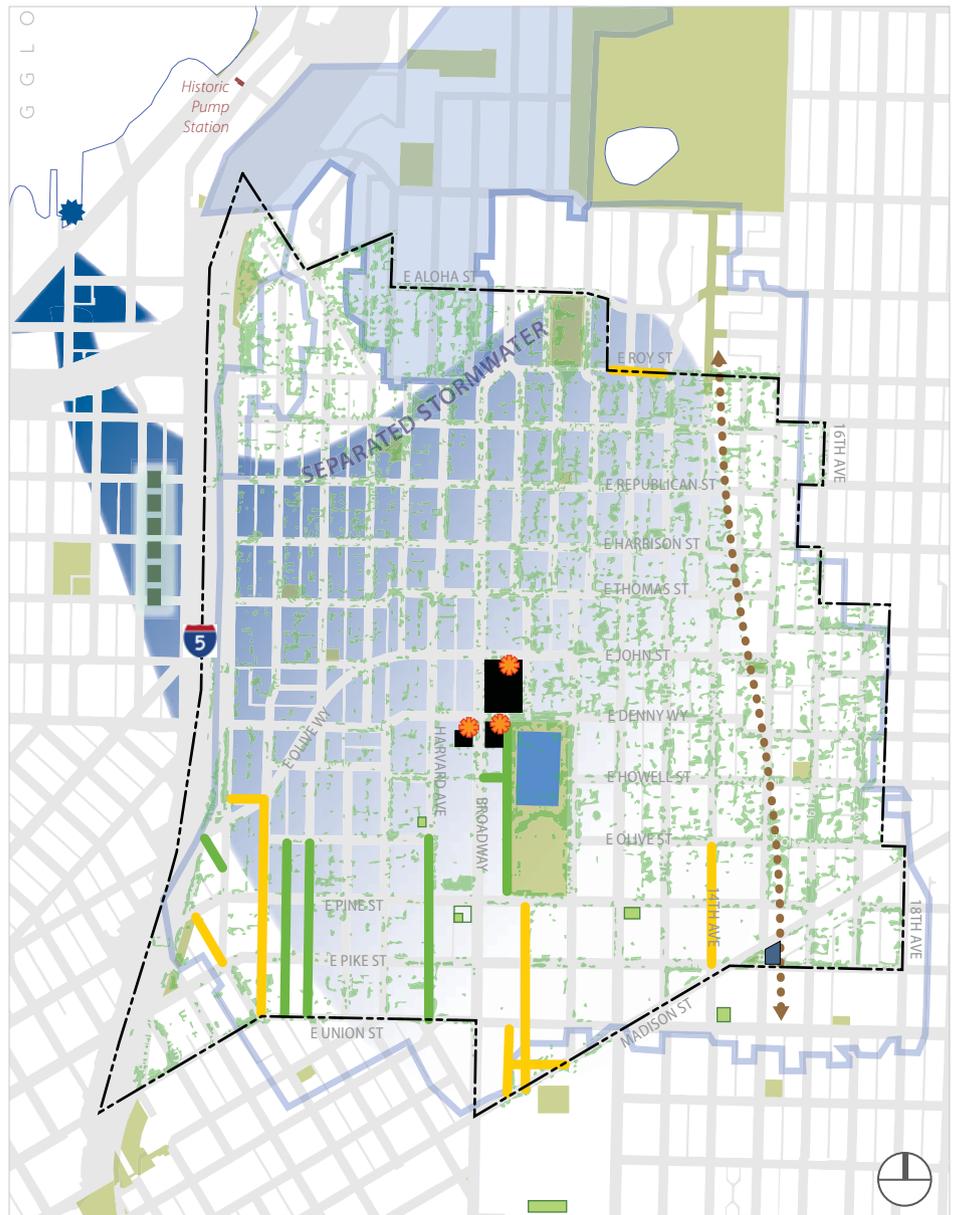
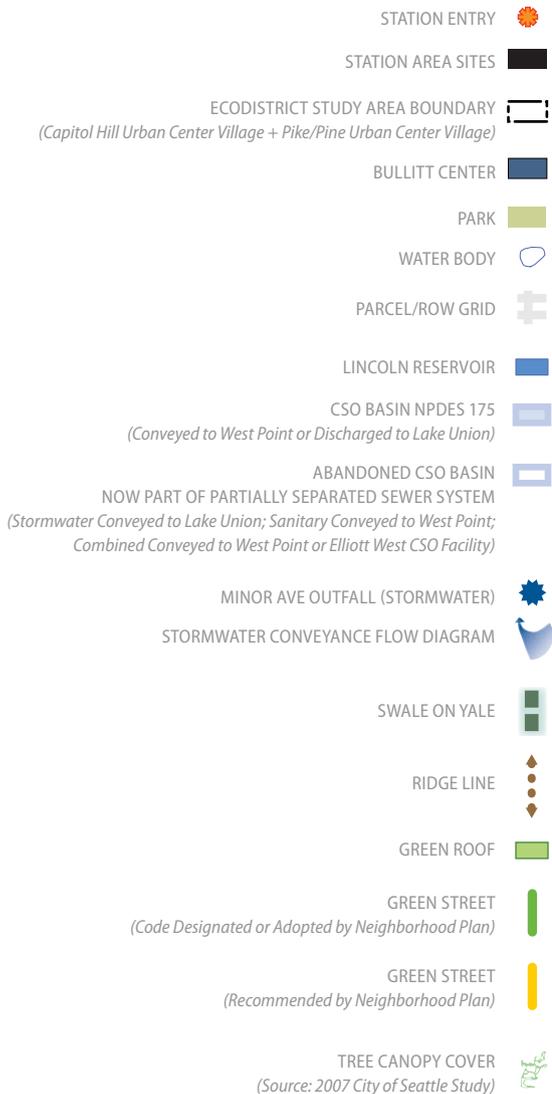
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Sustainability Impact

All recommended strategies can contribute to EcoDistrict success; however, some strategies have increased levels of sustainability impact (shown to the right of the summary graph).



WATER: SITE ASSETS



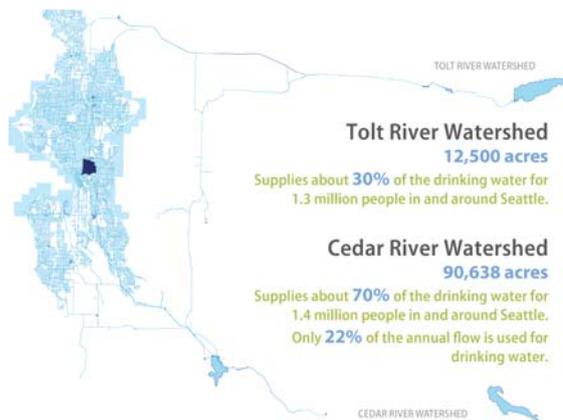
EcoDistrict Water Assets Map Diagram

This map shows the general stormwater flow from the neighborhood to Lake Union via the Swale on Yale, the tree canopy coverage as measured in 2007, designated and recommended Neighborhood Green Streets, and existing parks and green roofs that contribute to the neighborhood's infiltration. The Capitol Hill neighborhood is a predominantly partially separated sewer system, with a mix of combined stormwater and sanitary sewers, and separated stormwater and sanitary sewers. Both the combined and separated sanitary sewers convey water to West Point Treatment Plant. The separated stormwater sewers convey water to Lake Union after treatment at the Swale on Yale ("This project, when completed, will treat an average of 190 million gallons of stormwater annually flowing from Capitol Hill into Lake Union, greatly reducing the amount of pollution flowing into the lake."). (Image Credit: GGLO)



WATER: *SITE ASSETS*

Intent: *Conserve potable water; reduce blackwater production and stormwater runoff.*



Seattle Water Supply Map Diagram

This map shows the water supply lines from Seattle's two primary watersheds. The Capitol Hill EcoDistrict study area is marked in dark blue. (Watershed facts via Seattle Public Utilities)(Image Credit: GGLO with Seattle GIS data)

The Seattle area is famous for its rainfall, and the beauty and bounty of its rivers, lakes, and Puget Sound. As the southwestern U.S. and many parts of the world suffer record breaking droughts, water must be recognized, and better utilized, as a regional asset. The keys to better utilizing water and creating a sustainable water system are water conservation, reducing potable water consumption and increasing efficiency, reducing and cleaning stormwater runoff, and using the right kind of water for each use (such as potable water for drinking and washing versus greywater for irrigation). Capitol Hill has excellent assets for supporting a sustainable water system, including a clean and safe water supply, almost zero combined sewer overflow events, and city support for increasing water conservation. Still, the neighborhood could do much better. For example, the full benefits of rain and stormwater are not often realized; in fact stormwater becomes a liability as it picks up pollutants and taxes infrastructure during storm events. Fortunately, Seattle, and by extension Capitol Hill, has the design expertise and policy support to implement rainwater harvesting systems and green infrastructure projects.

Conservation for a Clean and Safe Water Supply

Seattle's official water supply projections show no need for new water supply sources until 2060 (SPU 2007 Water System Plan). These projections take population growth forecasts and potential climate change impacts into account. Additionally, the projections rely on the continuation of Seattle's overall trend in reducing water demand, even as population grows, through successful water conservation strategies. Conservation is a central strategy of Seattle Public Utilities for reducing potable water use, managing demand during dry seasons, and increasing the capacity of sewer lines. Capitol Hill's EcoDistrict could leverage both residential and commercial water use conservation strategies to support the City's larger goals and contribute to the resilience of the region's water system.

Density: Fewer Pollutant Generating Surfaces

In many urban environments, rain falls on roads and parking lots (or "impervious pollutant generating surfaces"), picks up pollutants, and conveys them to downstream water bodies. On Capitol Hill the neighborhood's density is an asset for reducing the surface area of these pollutant generating surfaces, as it requires far fewer roads and parking lots per person than most places. Continued reduction of these surfaces, and replacement with pervious surfaces (like green infrastructure) and non-polluting surfaces (like building rooftops) would improve the quality of the stormwater that makes its way to Lake Union and other local water bodies via the streets, storm sewers and combined sewers.



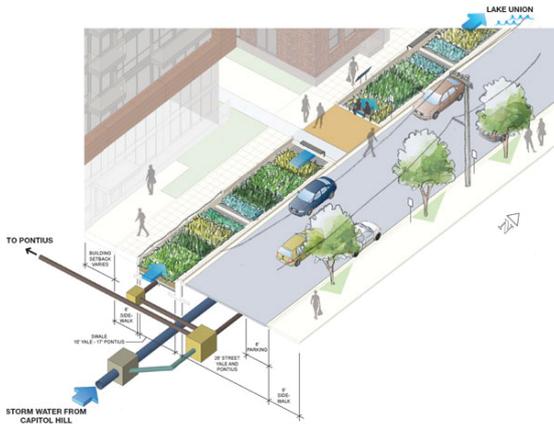
Seattle Rainfall Comparison Diagram

Data Source: NOAA (Image Credit: GGLO with photo from Flickr "Eduardo8s")



"Whenever it rains, untreated stormwater from more than 630 acres of Capitol Hill drains directly into Lake Union via the Minor Avenue outfall. Currently, stormwater flows across the streets of upper Capitol Hill, collecting silts, oils, heavy metals and other pollutants before being piped downhill, under the Cascade neighborhood, and into the lake."

(Source: Swale on Yale website)



Swale on Yale Bird's Eye Diagram

*Shows the stormwater piping that will take a portion of Capitol Hill's stormwater and carry it to the biofiltration swales to cleanse before discharge into Lake Union. The Swale on Yale will create 4 interconnected swales across two blocks in conjunction with future developments.
(Image Credit: City of Seattle, Swale on Yale website)*

WATER: SITE ASSETS

Controlled Combined Sewer Overflows

Capitol Hill contributes to less than one combined sewer overflow event per year on average, which is considered "controlled" by the Washington State Department of Ecology; the CSO basin at the north end of the study area (NPDES Basin 175) only averages 0.7 discharge events per year, and the outfalls for Basins 125 and 126 were plugged and eliminated in 1997 (2010 CSO Reduction Plan Amendment). Consequently, Capitol Hill is not a high priority area for implementing additional CSO reduction strategies; however green infrastructure that helps manage stormwater runoff would help increase the capacity of both the combined sewers and separated storm sewers, as well as clean toxic stormwater runoff before it makes its way into Lake Union or other local water bodies.

Green Infrastructure Policy Support

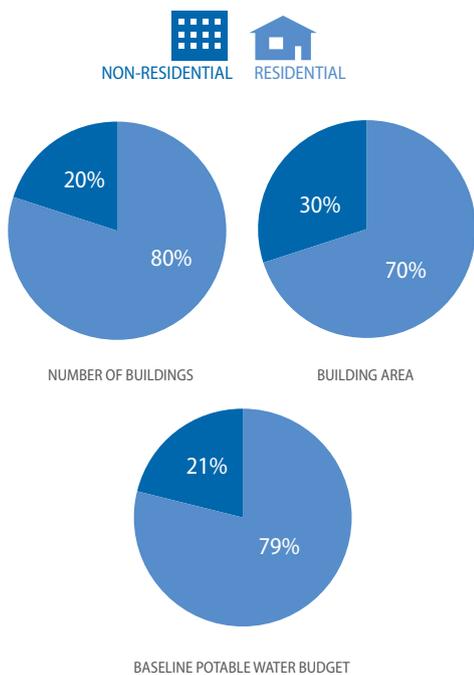
There are a number of City policies and programs that would support green infrastructure development in Capitol Hill's EcoDistrict, including: Seattle's Green Factor program, Green Streets Plan, Sustainable Infrastructure Initiative, Natural Drainage Systems Projects, Green Stormwater Infrastructure program, and the Street Sweep Project.

Local Green Stormwater Treatment

Stormwater runoff is one of the biggest sources of pollution for local water bodies, which is why increasing infiltration and providing green stormwater infrastructure throughout the neighborhood is important. Capitol Hill already has a good start on sustainable stormwater management: much of its stormwater runoff is on track to be treated in a bioswale downhill of the neighborhood at the new "Swale on Yale" west of I-5; electricity was historically generated from stormwater flow through a micro turbine at the pump station located to the northwest (near Lake Union); there are already 13 Neighborhood Green Streets designated or recommended for Capitol Hill (Seattle ROW Improvement Manual); and parks and buildings with green roofs increase the area's overall permeability.



(Source: Postcard from the Future, Forum on Capitol Hill's EcoDistrict, December 2011)



Neighborhood Water Profile
 Of the 1,500 buildings in the neighborhood, 80% (+1,200) are residential, occupy 70% of total floor area, and have an annual baseline potable water budget which is 79% of the neighborhood's total (based on regional average water use intensity by building use).
 (Image Credit: GGLO)

Goals:

- Reduce Stormwater Runoff within and from the District
- Reduce Potable Water Consumption
- Use Potable Water for Highest and Best Use - Utilize Greywater for Appropriate Tasks
- Maintain Availability, Reliability and Affordability of Water

Suggested Targets:

- Decrease Right-Of-Way (ROW) Impervious Area
- Decrease Parcel Impervious Area
- Increase Quantity of Green Roofs
- Existing Buildings & Infrastructure: Decrease Water Use Intensity by 10% below National average prior to 2015 with incremental targets (20% in 2015, 20% in 2020, 35% in 2025) reaching 50% by 2030 - based on 2030 Challenge for Planning
- New Buildings & Infrastructure: Decrease Water Use Intensity by 50% below National average - based on 2030 Challenge for Planning
- Increase Non-Potable Water (greywater or reclaimed water) Use for Toilet Flushing in New Construction by 2015
- Decrease Energy Demand Associated with Water Supply

Metrics:

- Imperviousness / Perviousness

Parcel Impervious Area (% = Acres Impervious ÷ Total Parcel Area)

Parcel Pervious Area (% = Acres Pervious ÷ Total Parcel Area)

ROW Impervious Area (% = Acres Impervious ÷ Total ROW Area)

ROW Pervious Area (% = Acres Pervious ÷ Total ROW Area)

Impervious Per Capita

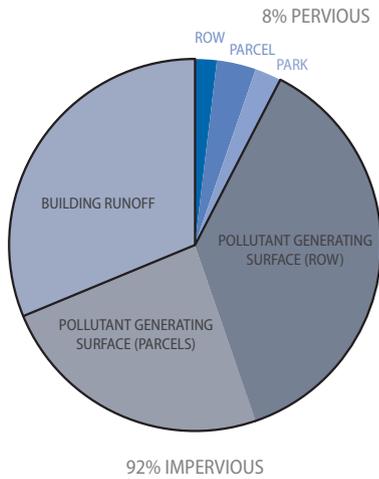
- Green Roofs

EcoDistrict Green Roofs as percent of City Total

(% = Square Feet of Coverage within District ÷ Square Feet Total for Seattle)

http://www.seattle.gov/DPD/cms/groups/pan/@pan/@sustainablebliding/documents/web_informational/dpdp020213.pdf





Neighborhood Baseline Permeability
(Image Credit: GGLO)

"Watery"
a term to describe the relationship
between water and energy —
treatment and distribution of potable water is
an energy intensive activity.

Baselines:

Neighborhood Permeability

Pervious: 8% (40 acres)

- 10 acres ROW
- 18 acres Parcels
- 12 acres Parks

Impervious: 92% (488 acres)

- Two Thirds (323 acres) of Impervious surfaces are from pollutant generating surfaces
 - 196 acres ROW (including 8 acres of alleyways)
 - 127 acres Parcels
- One third (165) acres of impervious surfaces generate runoff from buildings

Total Pervious/Impervious per capita

- Pervious: 0.001 acres per capita
- Impervious: 0.022 acres per capita

Green Roofs

- 19,724 square feet within study area (<1% of the EcoDistrict site area)
- 1, 852,193 square feet City of Seattle Total

Annual Water Flow

- 37" average annual rainfall
- 550 million gallons of rainfall within the neighborhood annually
 - 340 million gallons runoff ROW & pollutant generating surfaces
 - 170 million gallons runoff from buildings
 - 40 million gallons rainfall on pervious areas
- 680 million gallons Annual Baseline Potable Water Budget

Annual Water Demand by Building Use:

- 79% Residential
- 6% Restaurant
- 6% Retail / Service
- 3% Hospital
- 2% Assembly Space
- 1% Office
- 1% Hotel
- 2% Remainder of Other Non-Residential uses

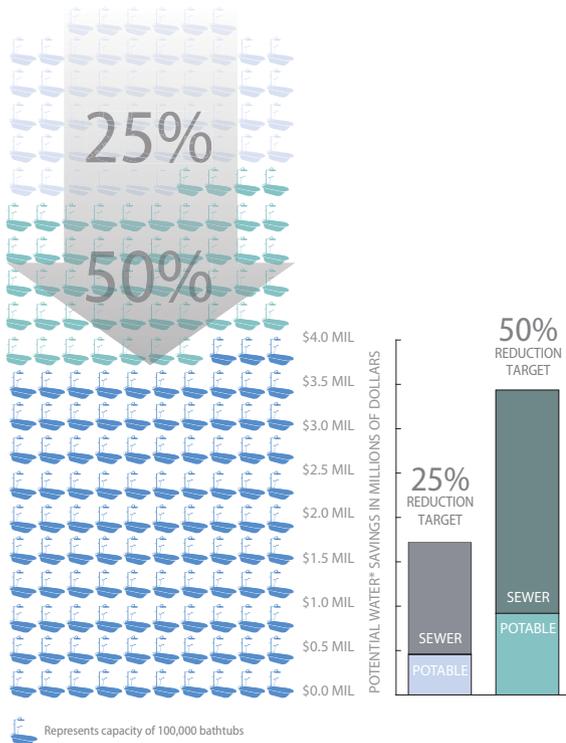
Annual Watery [Water + Energy] Impact

- 15 tons CO₂ emissions associated with water use (decreasing potable water demand by 1 million gallons can reduce electricity use by nearly 1,500 kWh - Source: EPA)
- Equivalent to annual greenhouse gas emissions from 3 vehicles (Source: EPA)

WATER: STRATEGIES

Areas of Focus: ways to visualize water use as educational tool micro hydro power from stormwater and sewage conveyance

(Source: Forum on Capitol Hill's EcoDistrict, December 2011)



Annual Baseline Potable Water Budget

Baseline water demand in the neighborhood is over 680 million gallons annually which is equivalent to the capacity of more than 20 million bathtubs. If every building type targeted a 25% reduction in water use, potential water savings equivalent to the capacity of more than 5 million bathtubs and approximately \$1.7 million potable & sewer utility charges are possible. (Image Credit: GGLO)

Strategies

Convert Underused Pollutant Generating Surfaces (PGS's) to Habitable or Permeable Uses

Convert underused ROW to buildable lots. Additionally, break up the concrete and asphalt of underused lots, ROW areas, and parking lots (aka Pollutant Generating Surfaces) and restore to vegetation while the sites are unbuilt. This could be a temporary intervention and a community building event.

Implement on the District-wide

Challenges, Opportunities, & Local Resources: Portland's "depave" organization has a great store of information on their website about how to remove pavement as a community-driven activity.

Related Performance Area(s): Community (Cultural Vibrancy & Health); Transportation; Habitat

Water Visualization - Education: Residential

Integrate water into public art, and public building disclosure information

Implement on the Station Area Sites and District-wide

Challenges, Opportunities, & Local Resources: Local art schools are a potential partner.

Related Performance Area(s): Community (Cultural Vibrancy)

Water Reuse: New Multi-Family and Non-Residential

Do not use potable water for toilet flushing - use greywater or reclaimed water

Implement on the Station Area Sites

Challenges, Opportunities, & Local Resources: Municipal reclaimed water system is not present on Capitol Hill and this challenge would necessitate the construction of a greywater system. While infrastructure costs can be shared on a district-wide scale, consolidating new construction closely will be key. Residential areas and grey water potential supply are not balanced with existing commercial demand. Bertschi Living Science Wing & Bullitt Center are individual site case studies nearby.

Related Performance Area(s): Energy

Efficient Water Fixture Retrofits & Installations

For new & existing residential and commercial buildings, adopt 2030 Challenge water targets and install plumbing fixtures to exceed current code standards. Additionally, multi-family P-patch areas and single family to install rain barrels. Restaurants to upgrade kitchen equipment.

Implement on the Station Area Sites and District-wide

Challenges, Opportunities, & Local Resources: Multitude of residential, restaurant, retail & service buildings that are not necessarily owner occupied. Seattle Public Utilities (SPU) goals support water conservation and education.

Potential Funding: SPU conservation measures

Related Performance Area(s): Energy



WATER: STRATEGIES



The GGLO designed Green Wall at the Bertschi School Science Wing serves as both infrastructure and education. This project is on target to be the first Living Building in WA. (Image Credit: Benjamin Benschneider)



Rain Garden and Informational Sign in Burien, WA by GGLO. (Image Credit: Derek Reeves)

Stormwater Management - Green Roofs/Walls (New)

For new construction, incorporate green roofs and walls at lower roof levels (podium level) while balancing the possibility for renewable energy generation at upper level roofs.

Implement on the Station Area Sites and District-wide

Challenges, Opportunities, & Local Resources: Green Factor & Priority Green incentives.

Related Performance Area(s): Energy; Habitat

Stormwater Management - Green Roofs/Walls (Retrofit)

Coordinated with major institution roof replacement, retrofit with green roof and/or solar

Implement District-wide

Challenges, Opportunities, & Local Resources: Seattle Central Community College will be reviewing roof replacement in the near future. Green Factor & Priority Green incentives.

Related Performance Area(s): Energy; Habitat

Stormwater Management - Swales/Raingardens

Create a network of swales and raingardens along identified Green Streets to infiltrate stormwater, filter airborne pollutants, increase habitat connectivity. Start at the Station Area Sites and connect throughout the District.

Implement on the Station Area Sites and District-wide

Challenges, Opportunities, & Local Resources: Seattle Green Street program can support efforts. Green Factor & Priority Green incentives.

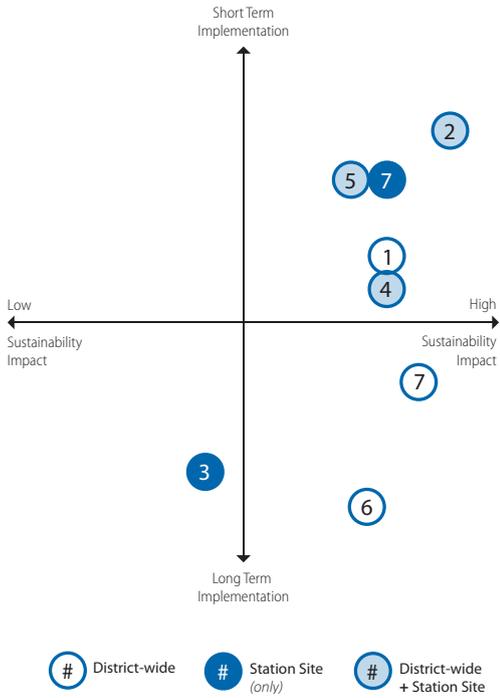
Related Performance Area(s): Energy; Habitat

WATER: STRATEGIES

Strategies Summary

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1. Convert Underused PGS's to Habitable or Permeable Uses
2. Water Visualization - Education: Residential
3. Water Reuse: New Multi-family and Non-Residential
4. Efficient Water Fixture Retrofits & Installations
5. Stormwater Management - Green Roofs/Walls (New)
6. Stormwater Management - Green Roofs/Walls (Retrofit)
7. Stormwater Management - Swales/Raingardens



Implementation Time Frame

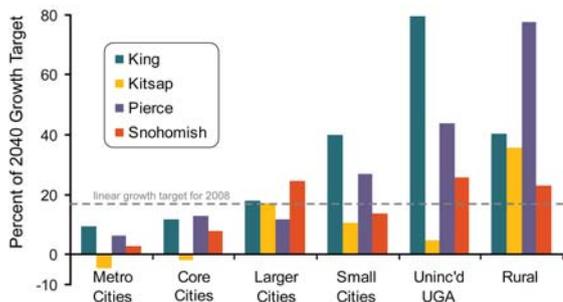
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Sustainability Impact

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HABITAT: *SITE ASSETS*

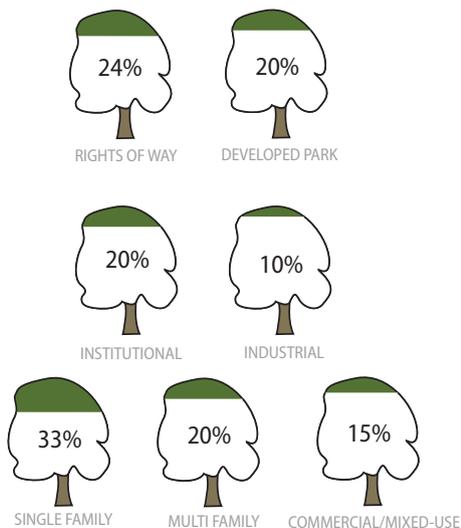


Percentage of allocated 2000-2040 growth achieved in 2000-2008 by county and regional geography from "Transit Oriented Communities: A Blueprint for Washington State". Population growth trends in recent years indicate that "Smaller Cities", "Unincorporated Urban Growth Areas" and "Rural" areas, which were intended to receive less growth, have grown disproportionately quickly - with some areas already achieving in eight years nearly 80% of their allocated growth for the 40 year period. (Image Credit: GGLO)

Vision:

Seattle's urban forest is a thriving and sustainable mix of tree species and ages that creates a contiguous and healthy ecosystem that is valued and cared for by the City and all of its citizens as an essential environmental, economic, and community asset.

(Source: Seattle Urban Forest Management Plan)



City of Seattle Tree Canopy Cover Goals by Land Use Category (Source: Seattle reLeaf Urban Forest Management Plan 5-year Implementation Strategy 2010 - 2014) (Image Credit: GGLO)

Intent: Enrich urban habitat in the district and in the surrounding neighborhoods to promote biodiversity and support the community, even as development increases the intensity of the built environment.

Prioritizing habitat in EcoDistricts is not an "either-or" proposition about buildings and parks, or people versus animals and plants. Local habitat can be protected and strengthened, while also making neighborhoods better places for people. Compact urban neighborhoods provide environmental stewardship by preserving working farms and forestlands while delivering public services and amenities more efficiently. At the same time, urban open space, such as parks and recreation fields, provide safe and welcoming opportunities for play, build community, and increase vegetation. Further, other strategies such as building integrated vegetation, roof gardens, and tree-lined streets can provide habitat, reduce stormwater runoff, filter air pollutants, produce oxygen and sequester carbon.

Density: Preserving Habitat on the Urban Periphery

Re-prioritizing and channeling development to existing areas of development such as Seattle's Urban Center Villages (like the Capitol Hill EcoDistrict study area) will be essential to getting the region's growth management goals back on track and preserving habitat on the urban periphery. The central Puget Sound is striving to integrate the majority of its forecasted growth by 2040 - 1.7 million new residents and 1.3 million new jobs - within designated urban growth areas (as established by the Washington State Growth Management Act), yet actual population growth trends in recent years indicate that "Smaller Cities", "Unincorporated Urban Growth Areas" and "Rural" areas, which were intended to receive less growth, have grown disproportionately quickly. Capitol Hill can embrace its density as an asset for protecting habitat.

Seattle - The Emerald City

Surrounded by Olympic mountains to the west, Cascades to the east, and with views of Mt. Rainier to the south & Mt. Baker to the north, Seattle is idyllically situated in an abundance of natural resources. The Emerald City is rooted in its environment and its strong connection to the surrounding mountains, lush vegetation, hundreds of parks, water bodies and waterfront recreation opportunities.

Parks

Over a dozen parks provide habitat as well as recreation opportunities for healthy living in Capitol Hill, most notably, Cal Anderson Park which includes Bobby Morris Playfield and the Lincoln Reservoir Lid (at the north end of the park) is situated at the heart of the neighborhood. Outside the study area, Volunteer park to the north and Miller Playfield & Community Center to the east provide important connections to additional habitat corridor opportunities.

Tree Canopy Cover

Seattle's trees provide environmental, social and economic benefits while enhancing the livability and health of our city. In addition to providing habitat for pollinator and native species, reducing stormwater runoff and cleaning our air, they have been shown to "increase property values, calm traffic, reduce crime, and improve the walkability of our neighborhoods" as noted in the Urban Forest Management Plan. In 2007, in an effort to increase these benefits, the City of Seattle set the goal of





 EACH TREE ICON REPRESENTS 2 ACRES

 FILLED TREES INDICATE PRESENT COVERAGE

 HOLLOW TREES INDICATE SHORTAGE

*Acres of Tree Canopy Needed to Meet City Tree Canopy Goals
Study Area will need to achieve 21% coverage as a minimum given its
land use area by adding approximately 56 acres of canopy. Currently the
Study Area has a 12.7% Tree Canopy Coverage.
(Image Credit: GGLO)*

HABITAT: GOALS | TARGETS | METRICS | BASELINES

achieving 30% tree canopy cover in 30 years and developed a comprehensive strategy to achieve this target (see Seattle Tree Canopy Cover Goals by Land Use Category on previous page). Capitol Hill has nearly 13% tree canopy coverage providing habitat, stormwater management, air pollutant filtration, and carbon sequestration assets.

Goals:

- Advance Current and Emerging Watershed Goals
- Protect, Regenerate, and Manage Habitat and Ecosystem Function at All Scales
- Prioritize Native and Structurally Diverse Vegetation
- Create Habitat Connectivity within and beyond the District
- Avoid Human-made Hazards to Wildlife and Promote Nature-friendly Urban Design
- Prioritize High-quality, Habitat-creating, Flexible Open Spaces (parks, plazas, community gardens, and recreation fields)

Suggested Targets:

- Decrease ROW Impervious Area
- Decrease Parcel Impervious Area
- Increase Green Roof to 50% of New Construction by 2020
- Increase Tree Canopy to 21% by 2025
- Increase Connectivity of Green Roofs, Canopy and Stormwater Strategies
- Create a Habitat Master Plan
- Create an ongoing "Open Space Program Elements Evaluation" process that measures the quality and amenities of neighborhood open spaces

Metrics:

Imperviousness / Perviousness

- Parcel Impervious Area (% = Acres Impervious ÷ Total Parcel Area)
- Parcel Pervious Area (% = Acres Pervious ÷ Total Parcel Area)
- ROW Impervious Area (% = Acres Impervious ÷ Total ROW Area)
- ROW Pervious Area (% = Acres Pervious ÷ Total ROW Area)

Tree Canopy Cover

- Neighborhood Canopy Cover Table <http://www.seattle.gov/trees/canopycover.htm>
(% = Acres of Coverage ÷ Total Area)
- Canopy Coverage by Use Type (see previous page)

HABITAT: GOALS | TARGETS | METRICS | BASELINES

"I'm sitting here at a cafe in Capitol Hill, enjoying the sunshine filtering down through the maples along the street. The trees and natural vegetation I see all along the streets are now embraced with enthusiasm as critical infrastructure. They are not only valued for aesthetics, but more importantly their ecosystem services!"



"Postcard from the Future"

(Source: Postcard from the Future, Forum on Capitol Hill's EcoDistrict, December 2011)



— GREEN STREET EXPANSION OF HABITAT IN ROW AND TREE CANOPY

■ PIAZZETTE OR PARK OPPORTUNITY - BALANCED MIX OF BOTH

Habitat Opportunity Sites Sketch Map

There are already a number of adopted or recommended green streets in the neighborhood. By expanding the network of green streets, piazzette, and parks, the neighborhood can expand the amount of habitat in public rights of way and increased tree canopy. These opportunity sites are identified on the above map diagram. (Image Credit: GGLO)

Parks & Open Space

- Percentage of Dwellings within 1/8 Mile of Park
- Percent of Area Dedicated to Parks <http://www.seattle.gov/parks/quickfacts.htm>
(% = Acres of Park ÷ Total Area)
- Percentage of Open Space dedicated to outdoor recreation within a 15 min. walk of EcoDistrict residents (baseline requires further study)
- Quality, Diversity of Amenities, and Number of People Using Open Spaces
(baseline requires further study)

Green Roofs

- EcoDistrict Green Roofs as percent of City Total
(% = Square Feet of Coverage within District ÷ Square Feet Total for Seattle)
http://www.seattle.gov/DPD/cms/groups/pan/@pan/@sustainablebldg/documents/web_informational/dpdp020213.pdf

Baselines:

Total Pervious / Impervious:

- 8% Pervious / 92% Impervious (see Water section)

Tree Canopy Cover in Study Area (2007)

- 12.7% Canopy Coverage
- 23% City of Seattle Average

Parks & Open Space

- 5% Parks Area within Study Area
(excludes: Volunteer Park to the north and Miller Playfields to the east)
- 11% City of Seattle Average
- 13 parks within Study Area

Green Roofs

- 19,724 square feet within study area (<1% of the EcoDistrict site area)
- 1,852,193 square feet City of Seattle Total





Screenshot of Pollinator Pathway Website
(<http://www.pollinatorpathway.com>)



National Wildlife Federation Backyard Wildlife Habitat Sign
(Image Credit: Nancy J Ondra, <http://www.hayefield.com>)

HABITAT: STRATEGIES

Strategies:

Create Habitat Corridors

Link all of the strategies below through a corridor master plan that connects individual efforts.

Implement District-wide

Challenges, Opportunities, & Local Resources: Consider partnering with the Pollinator Pathway to create another pollinator corridor on Capitol Hill.

Related Performance Area(s): Water; Community (Cultural Vibrancy)

Increase Tree Canopy

(see sketch plan map diagram on previous page)

Implement on the Station Area Sites and District-wide

Potential Funding: Neighborhood Matching Fund Grants possible for improving the Tree Canopy

Related Performance Area(s): Water

Create Habitat - Parks

(see sketch plan map diagram on previous page)

Implement on the Station Area Sites and District-wide

Related Performance Area(s): Water

Create Habitat - ROW

(see sketch plan map diagram on previous page)

Implement on the Station Area Sites and District-wide

Challenges, Opportunities, & Local Resources: Pollinator pathway; Neighborhood Green Streets

Potential Funding: Neighborhood Matching Fund Grants possible for adding habitat corridors like the Pollinator Pathway

Related Performance Area(s): Water; Transportation

Create Habitat - Green Roofs & Walls

Implement on the Station Area Sites and District-wide

Challenges, Opportunities, & Local Resources: Green Factor & Priority Green incentives.

Related Performance Area(s): Water

Create Habitat - Backyards

Certify the yards of single-family homes in the neighborhood as “habitat” through the National Wildlife Federation.

Implement District-wide

Challenges, Opportunities, & Local Resources: In Seattle, the Woodland Park Zoo hosts a website (<http://backyardhabitatworkshop.blogspot.com/>) for Backyard Habitats with information about partners, resources and workshops.

Related Performance Area(s): Water

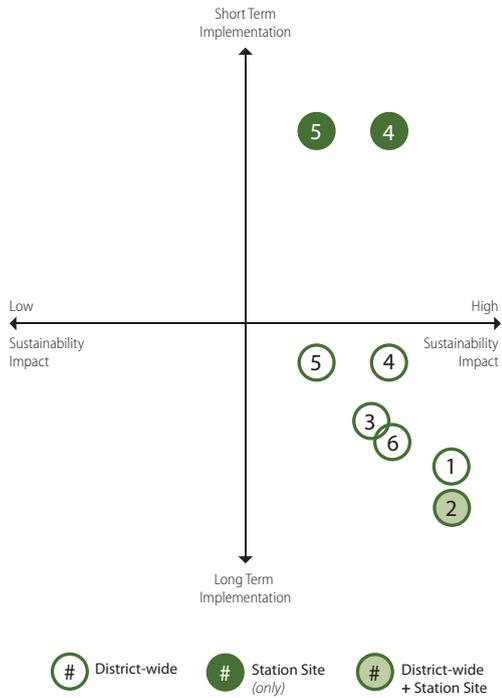


HABITAT: STRATEGIES

Strategies Summary

The Scatter Plot at left summarizes the previously listed strategies and organizes them based on implementation time frame and sustainability impact. The dots signifying each strategy are coded by their implementation area: District-wide, Station Site (only), and District-wide + Station Site. The number of each dot corresponds to the list below:

1. Create Habitat Corridors
2. Increase Tree Canopy
3. Create Habitat - Parks
4. Create Habitat - ROW
5. Create Habitat - Green Roofs & Walls
6. Create Habitat - Backyards



Implementation Time Frame

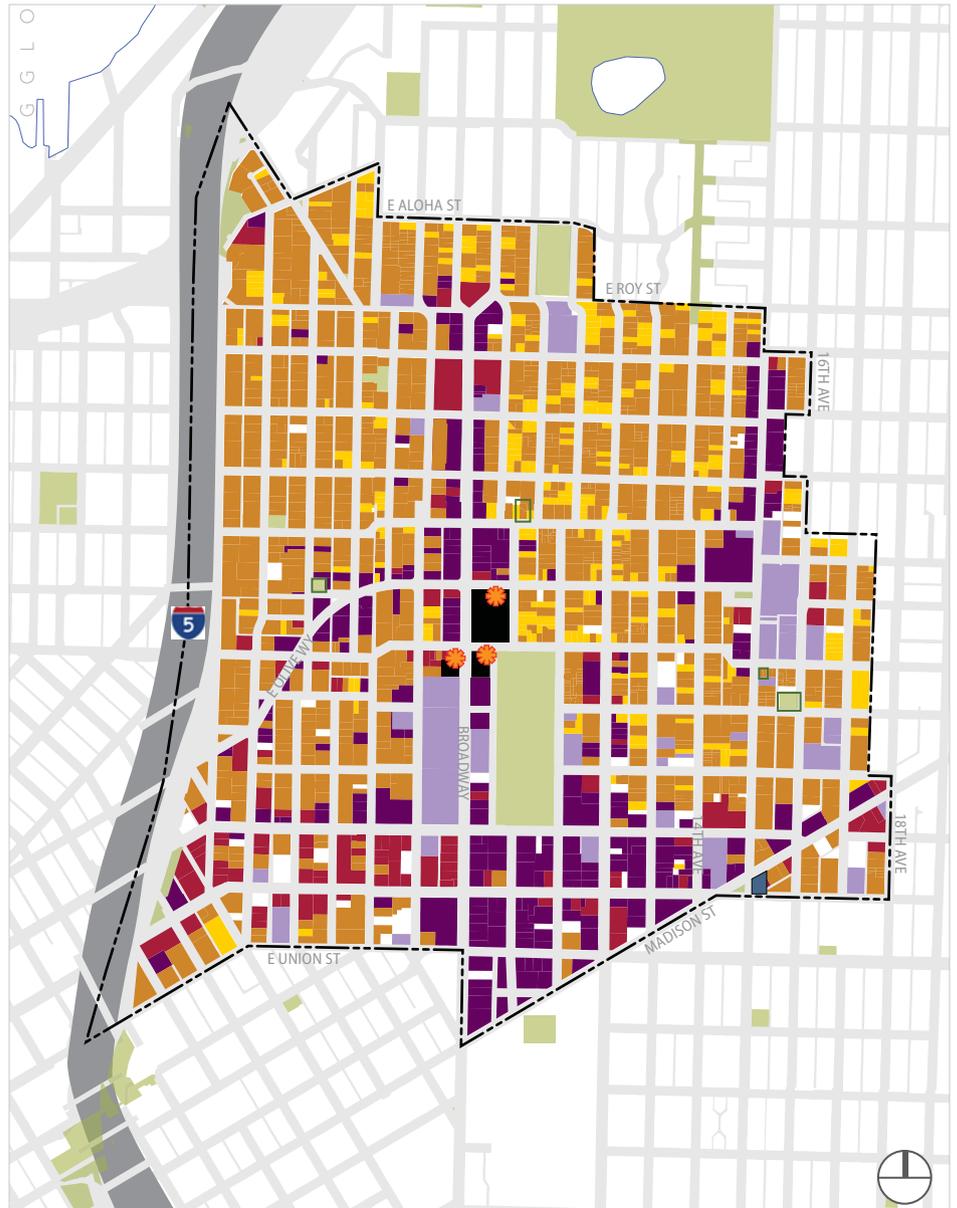
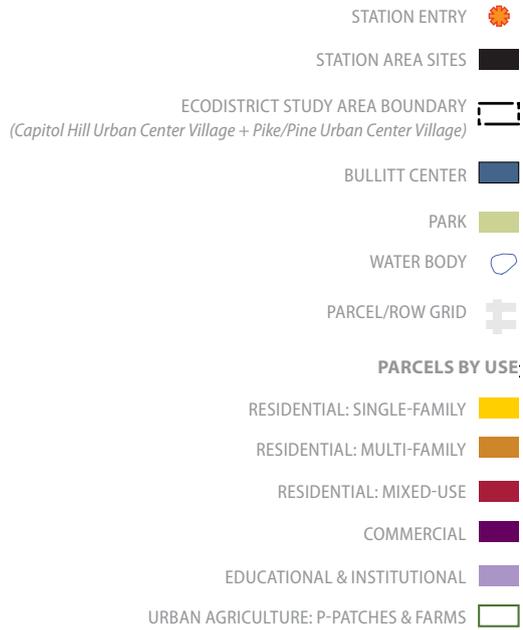
Some strategies are relatively quick to implement, such as many associated with the Station Area Sites due to the imminent development (shown at the top of the summary graph), while other strategies are more long term and will require more time to completely implement and yield full benefits (shown at the bottom of the summary graph).

Sustainability Impact

All recommended strategies can contribute to EcoDistrict success; however, some strategies have increased levels of sustainability impact (shown to the right of the summary graph).



MATERIALS: SITE ASSETS



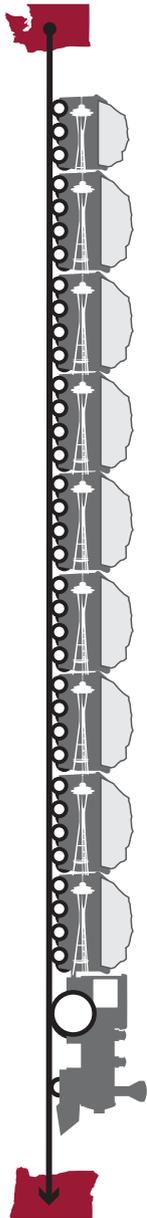
EcoDistrict Materials Assets Map Diagram

This map shows major land uses by parcel as a way of visualizing where the commercial, single family, and multi-family uses are. Municipal solid waste is tracked by use-origin. Seattle's current waste breakdown is: 48% commercial, 30% single family, 10% multi-family, and 12% self haul (which is largely construction and demolition debris).
(Image Credit: GGLO)



A mile-long train of Seattle's waste is transported to Oregon every day

(Source: Arcade Vol 27, Issue 3)



A one-mile long train full of municipal solid waste – equivalent to nearly 9 Space Needles long – departs Seattle daily for an Oregon landfill.
(Image Credit: GGL0)

MATERIALS: *SITE ASSETS*

Intent: Reduce the negative environmental impacts of materials through conservation & diversion.

If everyone on earth lived like North Americans, we would need five planets to sustain our high-waste, high pollution habits.

Materials flow in and out of neighborhoods on a daily basis - from the material goods purchased and discarded, such as groceries, household goods and office supplies - to materials used to construct the built environment. The waste stream is determined by consumption and material recovery (reuse, recycle, and compost). The less people spend on raw materials, the more they can spend on experiences and skill building. The more waste recovered from the waste stream, the more value of that "waste" is captured. Capitol Hill has a variety of assets that can help the community move in both these directions.

Reduce - Reuse - Recycle

There are many ways to reduce waste and make the most of the embodied energy that was created in the extraction, manufacturing, and transportation of materials that constitute the Capitol Hill flow of materials:

- Reduce the amount of materials used and discarded
- Reuse materials, products and household goods (Capitol Hill has approximately 27 thrift stores located within the EcoDistrict Study Area)
- Recycle items that have reached the end of their useful life and purchase materials with recycled content
- Compost organic waste

There are ongoing neighborhood discussions about how to address nightlife related trash and dumpsters in the Pike/Pine area, which may support EcoDistrict waste reduction goals.

Zero Waste

In 2007, the City of Seattle adopted a Zero Waste Resolution such that the City will not dispose of any more total solid waste in future years than went to the landfill in 2006 (438,000 tons of municipal solid waste 'MSW'). As Seattle's population increases, a reduction in municipal solid waste per capita through increased recycling, composting, and overall reduction in consumption will be required to achieve the Zero Waste goal.

Seattle Public Utility's city-wide yard waste and food composting system covers the needs of the EcoDistrict, but given Capitol Hill's land use types have low diversion rates collaborative enhancements may be necessary.

What does "Zero Waste" mean?

"The chances of achieving **100 percent reuse** are challenging, if not impossible, but... if we are short of 100 percent, it means we're not imitating nature and its cycles in the appropriate way."

- Richard Conlin, Seattle Council Member
(Source: Arcade Vol 27, Issue 3)



*The International Sustainability Institute Trash Fashion Bash
An annual Seattle fundraising event created to highlight waste and the need for our community to think about ways we can reduce waste. Civic leaders walk the catwalk wearing haute couture made exclusively from materials diverted from the landfill. (Image Credit: Lindy Gaylord)*

MATERIALS: GOALS | TARGETS | METRICS | BASELINES

Goals:

- Zero Waste
- Reduce Material Use
- Reduce Solid Waste - Maximize Reuse, Salvage, Recycling, and Composting
- Minimize Use of Virgin Materials
- Maximize Use of Recycled and Salvaged Materials
- Make the Local/Regional Product Choice the Easy Choice

Suggested Targets:

- Reduce Total Waste (by average use per: single family, multi-family, commercial)
- At a minimum, no net increase in neighborhood solid waste disposal compared to that sent to landfill in 2006 (2007 City Council Zero Waste Resolution 30990)
- Increase Awareness of Waste Impact
- Increase Recycling Rate to 70% by 2020 (accelerating city-wide target of 70% by 2025)
- Increase Composting Rate
- Increase Construction and Demolition Diversion Rates to 90% by 2015
- Increase # of Buildings Adaptively Reused and Historically Preserved
- Green the Supply Chain and Procurement Procedures of Businesses & Residents in the District
- Increase Retail Resale of Household and Building Materials (at businesses like the ReStore, Second Use, and area thrift stores)
- Increase Online Classified Advertisement Use (such as Craigslist and Freecycle)
- Decrease the Amount of Packaging Used throughout the District

Metrics:

Total Seattle Waste

Multi-Family (% = Tons of Multi-Family Waste ÷ Total Waste)

Commercial (% = Tons of Commercial Waste ÷ Total Waste)

Single Family (% = Tons of Single Family Waste ÷ Total Waste)

(Capitol Hill specific waste baselines are needed. City-wide averages are available)

Total Seattle Waste that could have been Diverted

Multi-Family (% = Tons of Materials that Could Have Been Diverted ÷ Total Multi-Family Waste)

Commercial (% = Tons of Materials that Could Have Been Diverted ÷ Total Commercial Waste)

Single Family (% = Tons of Materials that Could Have Been Diverted ÷ Total Single Family Waste)

(Capitol Hill specific waste baselines are needed. City-wide averages are available)



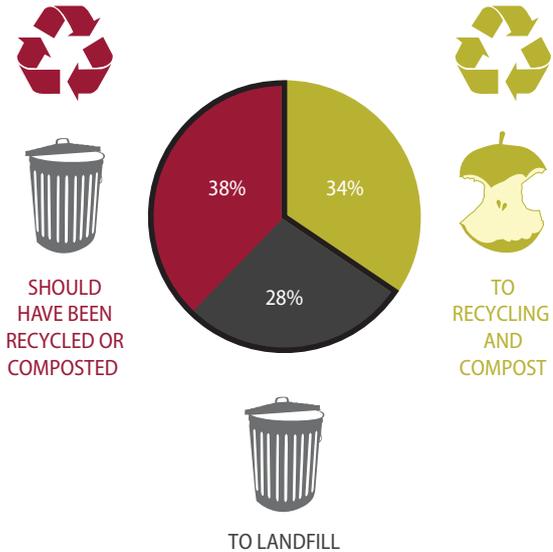
"We have recycling cans on every corner & all restaurants

compost (you can even bring your own to-go containers). Gotta run to the re-use store (where I bring in my own containers) for some quick grocery shopping. P.S. I am so glad I opened the architectural salvage business here!!"



"Postcard from the Future"

(Source: Postcard from the Future, Forum on Capitol Hill's EcoDistrict, December 2011)



Neighborhood Baseline: Residential Waste Profile

When applying city-wide average diversion rates to study area land use mix, over one-third of residential waste within the neighborhood should have been recycled or composted. Given the neighborhood's predominantly residential use, targeting improvement of multifamily diversion rates (29.6%) will be necessary.

Seattle, with a current 53.7% diversion rate, will fall short of its 2012 target of 60%, which was established in 2004. Specific city-wide diversion rate averages (and targets) include: Commercial 58.9% diversion rate (63% target) Single Family 70.3% diversion rate (70% target); Multi-Family 29.6% diversion rate (37% target); Self Haul 13.5% diversion rate (39% target).

(Image Credit: GGLO)

Diversion Rates: Recycling, Composting

Multi-Family (% = Tons of Materials Diverted ÷ Total Waste)

Commercial (% = Tons of Materials Diverted ÷ Total Waste)

Single Family (% = Tons of Materials Diverted ÷ Total Waste)

- # of Adaptive Reuse & Historic Preservation Building Projects (baseline requires further study)
- Point of Sale Rates: New Materials vs. Reused / Salvaged / Thrift Goods (baseline requires further study)
- # of Sharing Programs (tools, office space, etc)
- # of Yard/Garden Shares
- # of Households Using Reusable Containers in lieu of Disposable (Example: milk bottles in lieu of milk cartons) (baseline requires further study)
- # of Disposable Shopping Bags Used within the Neighborhood (baseline requires further study)
- % Compliance with Compostable Food Containers (% = Tons of Containers that should have been composted ÷ Total Containers) (baseline requires further study)

Baselines:

Baseline figures for most of the above metrics require further study, particularly for Capital Hill specific baselines (as opposed to city-side averages). Some baselines appear in the charts and figures in the left margins of this section.

Total Seattle Waste

Commercial - 48% of City Total

Single Family - 30% of City Total

Multi-Family - 10% of City Total

Self Haul - 12% of City Total (a large portion is Construction & Demolition debris)





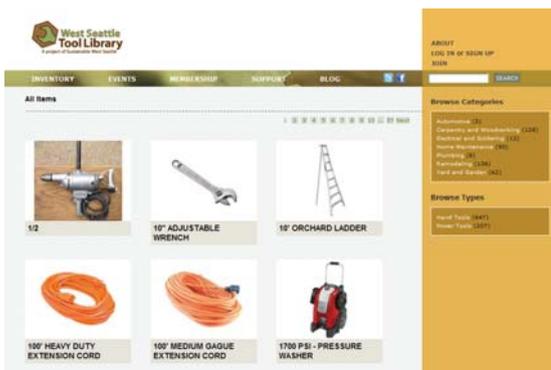
Urban Garden Share Screenshot

Urban Garden Share (<http://www.urbangardenshare.org>)

**Capitol Hill Listings: 5 Gardens
51 Gardeners**

Shared Earth (<http://shareearth.com>)

**Seattle Listings: 2 Gardens
5 Gardeners**



West Seattle Tool Library Screenshot
(<http://wstoolibrary.org>)

MATERIALS: STRATEGIES

Strategies:

Develop Outreach to Reduce Residential Waste & Increase Diversion Rates

Target outreach specific to SPU, Multi-Family Tenants and Landlords. Given the neighborhood's predominantly residential use, targeting improvement of multi-family diversion rates (29.6%) will be necessary. Since existing multi-family retrofits are a challenge, increasing these diversion rates will need to rely more on education and less on infrastructure.

Implement on the Station Area Sites and District-wide

Challenges, Opportunities, & Local Resources: Transient nature of tenants and non-resident building ownership are potential obstacles to tackling residential education.

Provide Ample Space for Recycling, and Organic and Waste Disposal

Provide adequate infrastructure, such as pneumatic tubes or multiple waste chutes, for recycling, and disposing of trash & organic material in multi-family buildings. Also consider neighborhood facilities for composting.

Implement on the Station Area Sites and District-wide

Related Performance Area(s): Community (Health)

Maximize Use of Recycled, Regional & Salvaged Materials in Buildings

Specifying recycled content, regional and salvaged materials in both new construction and building renovations would reduce the environmental impacts of extracting, manufacturing and transporting virgin materials. Recycled, regional and salvaged materials can also contribute to a building's "story."

Implement on the Station Area Sites and District-wide

Challenges, Opportunities, & Local Resources: Sustainable Building Programs like LEED and Living Building Challenge; Local Salvaged and Reused Materials Retailers like "The RE Store", "Earthwise", and "Second Use."

Related Performance Area(s): Transportation; Community (Cultural Vibrancy)

Optimize Procurement Activities through Group Purchasing

Group purchasing can make the green and local/regional choice easier while supporting the greening of the supply chain.

Implement on the Station Area Sites and District-wide

Challenges, Opportunities, & Local Resources: Seattle Climate Partnership

Promote Yard/Garden Shares

Develop outreach to promote programs that match gardeners to land.

Implement on the Station Area Sites and District-wide

Challenges, Opportunities, & Local Resources: Urban Garden Share (<http://www.urbangardenshare.org>); Shared Earth (<http://shareearth.com/>); the British program "Landshare" (<http://www.landshare.net/>) offers a good model for connecting land owners, gardeners, and helpers.

Related Performance Area(s): Community (Health)

Set Up a Neighborhood Tool Library

Implement on the Station Area Sites and District-wide

Challenges, Opportunities, & Local Resources: West Seattle and Phinney Ridge both have tool libraries that can be emulated.

Related Performance Area(s): Community (Equity & Vibrancy)

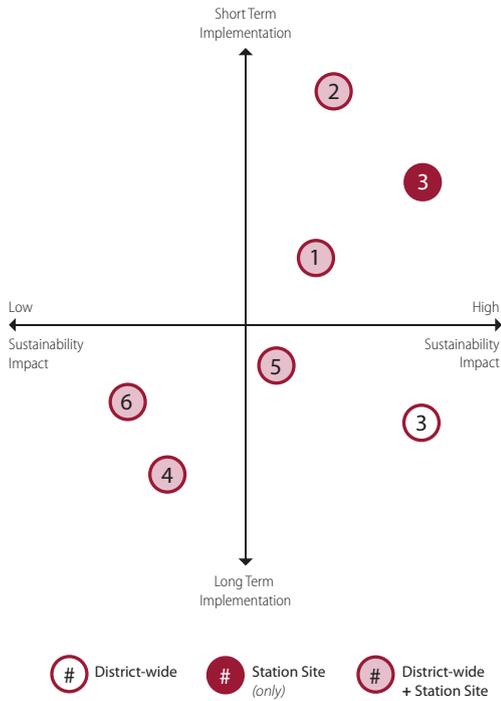


MATERIALS: STRATEGIES

Strategies Summary

The Scatter Plot at left summarizes the previously listed strategies and organizes them based on implementation time frame and sustainability impact. The dots signifying each strategy are coded by their implementation area: District-wide, Station Site (only), and District-wide + Station Site. The number of each dot corresponds to the list below:

1. Develop Outreach to Reduce Residential Waste & Increase Diversion Rates
2. Provide Ample Space for Recycling, and Organic and Waste Disposal
3. Maximize Use of Recycled, Regional & Salvaged Materials in Buildings
4. Optimize Procurement Activities through Group Purchasing
5. Promote Yard/Garden Shares
6. Set Up a Neighborhood Tool Library



Implementation Time Frame

Some strategies are relatively quick to implement, such as many associated with the Station Area Sites due to the imminent development (shown at the top of the summary graph), while other strategies are more long term and will require more time to completely implement and yield full benefits (shown at the bottom of the summary graph).

Sustainability Impact

All recommended strategies can contribute to EcoDistrict success; however, some strategies have increased levels of sustainability impact (shown to the right of the summary graph).





Capitol Hill Housing and GGLO thank the following people for contributing their time and ideas to this project.

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NEXT STEPS & ACKNOWLEDGEMENTS

Next Steps

This report represents the initial phase of the Capitol Hill EcoDistrict. Subsequent phases will: expand public outreach; establish an EcoDistrict management structure within a clear boundary; refine goals, metrics, and strategies; develop an Action Plan; embark on detailed feasibility studies of individual policies and strategies under consideration; implement strategies, policies and projects in support of EcoDistrict goals; measure progress against baselines to assess performance and adjust the EcoDistrict's course as necessary.

Acknowledgements

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Jean Wise

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Jenny Kempson

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[Opposite Page]

*Dancers' Series: Steps, 1982, Public Art by Jack Mackie, on Broadway, Capitol Hill
(Image Credit: Joel Davis-Aldridge)*



Appendix A

EcoDistrict Best Practices

CONCEPTUAL



Rendering of the planned Heudelet 26 EcoDistrict in Dijon, France
(Image Credit: EXP Architects, Studiomustard Architecture,
and Sempervirens Landscape Designers)

CONSTRUCTED



Olympic Village - Southeast False Creek, Vancouver, B.C.
(Image Credit: Don Vehige)



Energy Network Diagram Plan for Southeast False Creek, Vancouver, B.C.
(Image Credit: City of Vancouver)

ECODISTRICT BEST PRACTICES

There are many examples of EcoDistrict-related projects nationally and internationally, both conceptual and constructed. Some are explicitly self-identified as EcoDistricts, and others are more generally categorized as sustainably designed blocks, neighborhoods, and cities. All have the following in common:

- A defined area
- A specific goal or goals around sustainability in the community and built environment
- Metrics for measuring performance and assessing if goals are met
- Community-focused sustainability strategies and sustainable design strategies at the building-scale and district or infrastructure-scale
- A management structure to support initial and ongoing development
- Financing for research, design, and development

A summary of 28 EcoDistrict examples particularly pertinent to this study appears in Appendix B. Each district's size, goals, primary strategies, management and finance structure, implementation status and areas of measurement are highlighted (see Southeast False Creek example at left and below). The list includes examples from the United States, Canada, Europe, Asia and the Middle East. All together, these EcoDistrict case studies provide a global view of EcoDistrict "Best Practices" from which Capitol Hill's EcoDistrict can pull as appropriate.

Note: EcoDistrict creation can be separated into three phases: (1) organization and establishment, (2) pre-assessment and planning, and (3) project implementation and performance monitoring. In the United States, most of the EcoDistrict work to date has only progressed through stages (1) or (2), which are less capital-intensive than stage (3).

EXAMPLE CASE STUDY: Southeast False Creek (Vancouver, BC)

SCALE: 80 acres, eventual build out of 6.3 million sf of residential development (~6,600 units)

GOALS: Create a leading model of sustainability in North America, incorporating forward-thinking infrastructure, strategic energy reduction, high-performance buildings and easy transit access.

METRICS: Energy use 40% Better than ASHRAE 90.1 2001, 50% Reduction in water use, 100% of site stormwater diverted

SUSTAINABILITY STRATEGIES: Passive building design, district energy (neighborhood energy utility, waste heat recovery), rainwater harvesting and reuse, green roofs, LEED-ND Platinum, 1/3 of housing affordable, sustainability indicators and targets adopted

MANAGEMENT: City of Vancouver

FINANCE: Millennium SEFC Properties (private), City of Vancouver (public)

IMPLEMENTATION STATUS: First phase complete (1,100 housing units and 68,000 sf commercial)

ECODISTRICT BEST PRACTICES

BUILDINGS



The upcoming Bullitt Center on Capitol Hill is a great example of sustainability strategies implemented at the building scale. It is designed by Miller Hull to generate all its own energy, collect and reuse rainwater, and support the health of its occupants with non-toxic materials, natural ventilation, and daylighting. (Image Credit: Miller Hull Partnership Architecture; Seattle, Washington)

INFRASTRUCTURE



Bioswales and rain gardens are excellent strategies at the infrastructure scale to sustainably manage district stormwater. (Image Credit: GGLO)

PEOPLE



Community gathering places like Cal Anderson park, events like Outdoor Movies, and neighborhood CSA food deliveries by bike are great strategies for supporting a sustainable and vibrant community. (Image Credit: Fork & Frame)

There are a wide spectrum of sustainable design strategies, management structures, financing options, and policy frameworks that support EcoDistrict development. The most applicable of these to the Station Area Sites, from the 28 national and international examples studied, are summarized in this section and serve as a kind of catalogue of "Best Practices" for creating both physical and operational neighborhood sustainability.

Best Practices: *Built Environment*

Sustainable design strategies at the building-scale or individual site scale are grouped under "Best Practices: Built Environment" and summarize the **energy, water** and **building design** strategies that create *high performance buildings*. EcoDistrict strategies for the built environment apply to specific components or locations on the site and do not require site-wide management or shared ownership, but these strategies should be established, regulated, and measured for progress across an entire EcoDistrict.

Best Practices: *Infrastructure*

Sustainable design strategies at the district-scale are grouped under "Best Practices: Infrastructure" and summarize the *green infrastructure* strategies common in **district energy, district water, habitat** and **transportation** systems. EcoDistrict strategies for infrastructure are shared resources throughout the EcoDistrict, and therefore may require common ownership and/or management.

Best Practices: *People*

People-focused sustainability strategies, or those strategies that encourage *sustainable behavior*, are grouped under "Best Practices: People" and summarize the sustainable design and economic strategies that promote **equity, education**, and a vibrant **culture**. EcoDistrict strategies for sustainable behavior involve people who live and work in the EcoDistrict, as well as members of the surrounding community; they provide an essential balance for EcoDistrict sustainability by directly addressing the social realm; they help ensure that the strategies described in the Built Environment and Infrastructure sections benefit the community in a holistic way and operate to their fullest potential.

Best Practices: *Management, Finance, and Policy*

Management structures, financing options, and policy frameworks that have to do with *implementing* the physical and community sustainability strategies discussed in the Built Environment, Infrastructure, and People sections are summarized in the "Best Practice: Management", "Best Practice: Finance" and "Best Practice: Policy" sections respectively.

Best Practices: *Summary (Potential for Capitol Hill)*

Throughout all of the Best Practices sections specific strategies and frameworks are given a ranking on their *potential* for application on the catalyst Station Area Sites (ranked as "low", "medium" and "high"). These rankings are intended as a first-pass assessment based on knowledge of Station Area Sites. Since the choice of a specific set of appropriate strategies to pursue in any EcoDistrict depends on numerous site specific factors – including community goals, site location, site assets, scale, context, stakeholders, the regulatory environment, economics, demographics, politics, etc. – a final set of District-wide recommended strategies that respond to a deeper site analysis and community visioning process unique to Capitol Hill appears in the *Performance Areas* chapter.

ECODISTRICT BEST PRACTICES: *BUILT ENVIRONMENT*

ENERGY

Building-scale sustainable design energy strategies are **intended** to:
Reduce non-renewable energy use and associated greenhouse gas emissions.

Energy-Efficient Building Design

APPROACH: Require adherence to building energy performance standards
METHODS: Potential standards include the 2030 Challenge, Passivhaus Standard, Living Building Challenge, Net Zero Energy design, LEED; Design options include passive design, natural ventilation, daylighting, envelope, heat recovery ventilation
EXAMPLES: Southeast Falls Creek, Dockside Green, Pringle Creek, and Baltimore State Center (LEED); Freiburg-Vauban (Passivhaus)
LOCAL RESOURCES: 2030 District; Priority Green Permitting; Integrated Design Lab
POTENTIAL: High - Seattle is already a national leader in green building

Energy Retrofits

APPROACH: Retrofit existing buildings for energy efficiency
METHODS: Envelope improvements, upgraded systems
EXAMPLES: Seattle 2030 District, Kansas City Green Impact Zone, Living City Block
LOCAL RESOURCES: Seattle's Community Power Works Program; Preservation Green Lab
POTENTIAL: Medium - It is anticipated that the EcoDistrict will expand beyond the catalyst development at the station area sites, at which point there will be ample retrofitting opportunities, including retrofits for district energy.

Building-Integrated Renewable Generation

APPROACH: Establish a target for energy production on-site
METHODS: Rooftop or facade-mounted photovoltaics, solar hot water
EXAMPLES: BedZED, Freiburg-Vauban, Heudelet 26 EcoDistrict, Malmo Western Harbour
LOCAL RESOURCES: Federal and Washington State incentives
POTENTIAL: High - cost/benefit will improve over time

Advanced Metering

APPROACH: Make energy use data easily accessible to inform users and encourage conservation
METHODS: Individual meters for every unit, publicly visible displays of energy use
EXAMPLES: BedZED, Dockside Green, EVA Lanxmeer
LOCAL RESOURCES: City of Seattle Building Energy Benchmarking and Reporting
POTENTIAL: High - cost effective

Renewable Energy Purchase Agreement

APPROACH: Maximize use of renewable energy from utility
METHODS: Require participation green power programs
LOCAL RESOURCES: Seattle City Light's "Green Up" program
POTENTIAL: High - relatively easy strategy



Rooftop photovoltaic panels cover the Freiburg-Vauban 59 Plus Energy Solar Settlement. (Image Credit: Wikipedia)



A 2.5-acre photovoltaic array was recently installed on the rooftop of the Century Link Field Event Center in Seattle (Image Credit: First & Goal/Vulcan NW)



Electricity use monitor used at Pringle Creek in Salem, Oregon (Image Credit: Pringle Creek)

ECODISTRICT BEST PRACTICES: *BUILT ENVIRONMENT*



Green roof on the Bart Harvey, a low-income apartment in South Lake Union, Seattle (Image Credit: Mike Seidl)



Green wall at Dockside Green, Victoria, B.C. (Image Credit: Hattie Hartman)



Green roofs and courtyards at Southeast False Creek, Vancouver, B.C. (Image Credit: Recollective, <http://recollective.ca/2010/07/21/sefc-certification/>)

WATER

Building-scale sustainable design water strategies are **intended** to:
Conserve potable water; reduce blackwater production and stormwater runoff.

Efficiency

APPROACH: Require high-efficiency fixtures, appliances, and landscape

METHODS: LEED or other established standard, custom standard

EXAMPLES: Southeast Falls Creek, Dockside Green, Pringle Creek, and Baltimore State Center

LOCAL RESOURCES: Multiple LEED projects

POTENTIAL: High - techniques are well established

Reuse

APPROACH: Require systems to capture stormwater and/or greywater to supply toilets or irrigation

METHODS: Storage cisterns, dual piping systems

EXAMPLES: Southeast Falls Creek, Dockside Green

LOCAL RESOURCES: Several local projects provide precedence; Cascadia Green Building Council's water research (<http://cascadiagbc.org/resources/research/>); King County Wastewater Treatment Division Resource Recovery

POTENTIAL: Medium - relatively high cost premium, but the cost/benefit will improve over time; some local precedents

Blackwater Treatment

APPROACH: Reduce blackwater generation, process black water to supply toilets and irrigation

METHODS: Composting toilets, digester, "Living Machine"

EXAMPLES: Treasure Island, Dockside Green

LOCAL RESOURCES: Cascadia Green Building Council's water research (<http://cascadiagbc.org/resources/research/>)

POTENTIAL: Low/Medium - relatively high cost premium for high density projects

Stormwater Management

While stormwater can be addressed on a site by site basis, the probability of success is increased when addressed at the district scale. See "Best Practices: Infrastructure: District Water: Manage Stormwater".

APPROACH: Reduce flows to municipal stormwater system at the building scale level

METHODS: Green roofs and walls

EXAMPLES: Treasure Island, Dockside Green, Pringle Creek, South Lake Union

LOCAL RESOURCES: City of Seattle Green Factor

POTENTIAL: High - the techniques are well established

ECODISTRICT BEST PRACTICES: *BUILT ENVIRONMENT*

BUILDING DESIGN

Sustainable building design strategies, unrelated to water or energy, are **intended** to: *Contribute to a broad range of sustainability goals through good design.*

Optimize Density

APPROACH: Maximizing the number of residences and businesses in the EcoDistrict will enhance neighborhood vitality and economic development and leverage the transit investment
METHODS: Don't allow "underdevelopment," take advantage of all existing density bonuses and transfer of development rights, propose upzones if appropriate, offer density bonuses for participation in the EcoDistrict, minimize space given over to parking, consider small units
LOCAL RESOURCE: "Transit Oriented Communities: A Blueprint for Washington State"
POTENTIAL: Medium - building height to relate to existing neighborhood

Activate the Street

APPROACH: Design building frontages and plan for uses that bring people and activity to the adjacent streets, alleys, plazas, and other areas of the public realm. Thoughtful, district-scale urban design will lay the groundwork for a high-quality public realm and seamless integration with the surrounding context.

METHODS: Ground-related housing, active street-level commercial uses that spill out onto the sidewalk, permeable facades, reinforced pedestrian connections; use form-based codes or similar to regulate frontage. Create urban design plan and require adherence.

EXAMPLES: Southeast False Creek

LOCAL RESOURCES: Capitol Hill Urban Design Framework

POTENTIAL: High - support has been established in the planning process; would be best facilitated by a single master developer

Express Sustainable Design Features

APPROACH: Sustainable design features that are prominently featured as design elements can help educate the public and create a visual identity for the EcoDistrict

EXAMPLES: BedZED

POTENTIAL: High



Cover of TOC Blueprint
(Image Credit: Futurewise, GGLO, Transportation Choices Coalition)



BedZED incorporates colorful passive ventilation cowls
(Image Credit: Bioregional)

ECODISTRICT BEST PRACTICES: *INFRASTRUCTURE*

DISTRICT ENERGY

District-scale energy infrastructure is **intended** to:

Reduce energy use with efficient district energy systems

Integration With External System

APPROACH: Connect EcoDistrict buildings to external district heating/cooling systems (existing or future system)

METHODS: Require buildings designed to integrate with water loops, encourage uses with complementary peak use cycles (e.g. office and residential)

EXAMPLES: Southeast False Creek

LOCAL RESOURCES: City of Seattle District Energy Study (report due July 2011), Seattle Steam

POTENTIAL: Medium/High - Seattle Steam service is nearby, and they are interested in expanding as other infrastructure (streetcar) expands

Dedicated District Heating System

APPROACH: On-site system designed to serve the EcoDistrict buildings, potentially with the option of also serving neighboring buildings

METHODS: Central boilers (biomass, CHP, microturbines), ground-source heat pump/solar hot water system; could be owned and operated by private utility provider or the EcoDistrict itself

EXAMPLES: South Waterfront, BedZED, Dockside Green, EVA Lanxmeer, Freiburg-Vauban, Malmo

LOCAL RESOURCES: City of Seattle District Energy Study

POTENTIAL: Medium - EcoDistrict boundary will need to be enlarged to justify some types of systems

Shared Renewable Energy Generation

APPROACH: Large-scale, on-site generation systems operated by the EcoDistrict or by a third party energy provider, located in commonly owned facilities or shared spaces.

METHODS: Photovoltaics, solar hot water, methane from digester

EXAMPLES: Treasure Island, Masdar City

LOCAL RESOURCES: City of Seattle's Community Solar Project; Large roof area on adjacent SCCC buildings

POTENTIAL: High for solar, Medium for digester (no precedent)



Southeast False Creek's "Neighborhood Energy Utility" mines wastewater heat to provide district heating (Image Credit: Ausenco Sandwell)

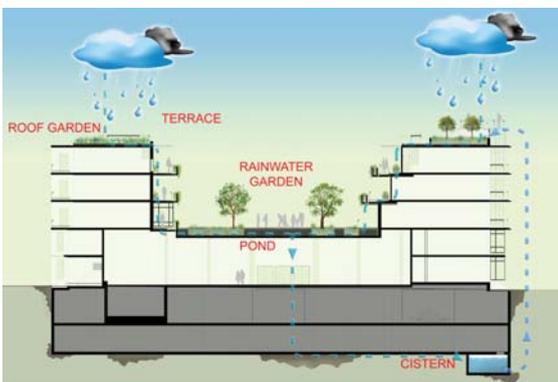


University of Washington Central Power Plant, c.1939
(Image Credit: University of Washington Libraries)

ECODISTRICT BEST PRACTICES: INFRASTRUCTURE



Dockside Green's integrated natural drainage system handles stormwater and treated wastewater. (Image Credit: Erin Wark)



Rainwater harvesting system at Southeast False Creek
(Image Credit: City of Vancouver)



Habitat Island at Southeast False Creek in Vancouver, B.C.
(Image Credit: City of Vancouver)

DISTRICT WATER

District-scale water infrastructure is **intended** to:

Conserve potable water and reduce blackwater production and stormwater runoff by taking advantages of opportunities for district-scale systems.

Water (Rainwater, Greywater, Blackwater)

APPROACH: Supplement potable supply through capture, processing, storage and redistribution

METHODS: Shared, site-wide systems for rainwater harvesting, greywater reuse, blackwater

processing/reuse, centralized, shared storage (cisterns); possible integration with adjacent properties

EXAMPLES: Dockside Green, BedZED

LOCAL RESOURCES: Yesler Terrace District Study; Cascadia Green Building Council's water research

(<http://cascadiagbc.org/resources/research>)

POTENTIAL: Medium - no local precedents for shared systems

Manage Stormwater

APPROACH: Site-wide stormwater management and natural drainage systems to reduce runoff

METHODS: Pervious pavement, rain gardens, and swales in right of way and shared open space, integrate site-wide plan with individual buildings

EXAMPLES: Lloyd District, Portland State, South Waterfront, Pringle Creek, Southeast Falls Creek, Dockside Green, Gateway, South Lake Union

LOCAL RESOURCES: City of Seattle SEA Streets; Seattle Green Factor

POTENTIAL: Medium/High - techniques are well established

HABITAT

Habitat infrastructure is **intended** to:

Enrich urban habitat on site and in the surrounding neighborhood to promote biodiversity even as development increases the intensity of the built environment.

Create Habitat

APPROACH: Create new habitat for insects and birds, enhance urban wildlife corridors

METHODS: Establish wildlife-friendly standards for design and plantings for green roofs, walls, and gardens, maximize use of natives

EXAMPLES: Portland State University, Dockside Green, Southeast False Creek

LOCAL RESOURCES: Cal Anderson Park; Pollinator Pathway

POTENTIAL: Medium - strategies are straightforward but the site has relatively little available area

ECODISTRICT BEST PRACTICES: *INFRASTRUCTURE*

TRANSPORTATION

Transportation infrastructure is **intended** to:

Reduce the negative environmental impact of automobile use by maximizing the opportunities for walking, biking, and transit use.

Minimize Parking

APPROACH: Apply a range of strategies to minimize the use of the site's space and resources for on-site parking stalls

METHODS: Parking maximums, shared parking, parking management district

EXAMPLES: Lloyd District (proposed parking management district and bike sharing)

LOCAL RESOURCES: Seattle zoning code

POTENTIAL: Medium/High - community support is strong, but depends on developer/lenders

Enable Car Free Households

APPROACH: Provide transportation options for residents and neighbors who opt not to own a car and to maximize light rail and streetcar usage, and other modes of transportation

METHODS: Zipcar stalls, car sharing center, bike sharing center, bike storage, transit passes for tenants, separate parking stall cost from unit cost, electric vehicle charging station

LOCAL RESOURCES: City of Seattle electric vehicle charging station program; UPASS program at University of Washington

POTENTIAL: High/Varied - some methods are established, others are more untested



Bikeshare station in Denver, CO (Image Credit: Denver Bike Sharing)

ECODISTRICT BEST PRACTICES: PEOPLE

EQUITY

People-scale community practices that promote equity are **intended** to:
Enable an EcoDistrict to benefit the broadest possible spectrum of people.



Mixed market-rate and affordable housing in Southeast False Creek, Vancouver, B.C. (Image Credit: City of Vancouver - The Village on False Creek)



University of Oregon design studio rendering of a vision for revitalizing the Lents "Town Center," in the heart of the Lents EcoDistrict pilot in Portland Oregon (Image Credit: Renee Wilkinson)

Affordability

APPROACH: Ensure access to the EcoDistrict by people across the full range of incomes

METHODS: Affordable housing, affordable commercial space, affordable artist space, reduction in household transportation expenses associated with excellent access to high-quality transit

EXAMPLES: Treasure Island, Dockside Green, Southeast Falls Creek

LOCAL RESOURCES: Capitol Hill Housing, Low-Income Housing Institute, Housing Resources Group, Artspace, Urban Design Framework

POTENTIAL: High - there is broad support for creating affordable housing on the site

Diversity

APPROACH: Attract a diverse range of residents and users by providing a diversity of housing types and commercial space

METHODS: Provide units designed for families or seniors, and commercial spaces of varying sizes suitable for a wide range of uses, including office

EXAMPLES: Southeast Falls Creek

LOCAL RESOURCES: Artspace

POTENTIAL: Medium/High - depends on perceived market demands

Economic Development

APPROACH: Leverage district sustainability to connect to and support regional green job opportunities, and create high quality, accessible jobs for neighborhood residents

METHODS: Offer opportunities for demonstration and beta-testing of green technologies; tie building and district infrastructure development and operation to workforce training for neighborhood residents; explore economic development co-benefits opportunities in district strategies; provide flexible commercial space that can serve a wide range of business types and sizes.

EXAMPLES: Kansas City Green Impact Zone, Living City Block

LOCAL RESOURCES: Urban Design Framework, PSRC's Building Efficiency Testing and Integration (BETI) Center and Demonstration Network, McKinstry Innovation Center, King County Workforce Development Council Green Jobs Training program, Community Power Works

POTENTIAL: High - Deep local resources and strong support in the Capitol Hill neighborhood

ECODISTRICT BEST PRACTICES: PEOPLE

EDUCATION

People-scale community practices that educate are **intended** to:

Support sustainable behaviors through education on sustainable living for EcoDistrict residents and users, as well as for the community at large.

Tenant/User Education

APPROACH: Educate EcoDistrict residents and commercial tenants on how to best utilize the resources of the EcoDistrict to maximize sustainability performance

METHODS: Demand management, visible meters, conservation competitions, training, workshops

EXAMPLES: BedZED, Pringle Creek

LOCAL RESOURCES: Better Bricks

POTENTIAL: High - user participation is key for EcoDistrict success

Community Education

APPROACH: Utilize the EcoDistrict as a living laboratory to educate the community on how to maximize their sustainable living habits; establish the EcoDistrict as a center for sustainability education

METHODS: On-site learning center, tours, seminars, collaboration with public schools and higher education institutions, youth programs

EXAMPLES: Cleveland Ecovillage, Pringle Creek

LOCAL RESOURCES: Sustainable Capitol Hill, City of Seattle Office of Sustainability and Environment, Seattle Central Community College, Seattle University, University of Washington, Northwest School, Seattle Academy of Arts and Sciences, Lowell Elementary

POTENTIAL: High - there is widespread interest and support for sustainability in Seattle

Assessment

APPROACH: Monitor EcoDistrict performance against goals, provide feedback, and target improvements

METHODS: Post occupancy surveys, transportation surveys, energy and water use audits.

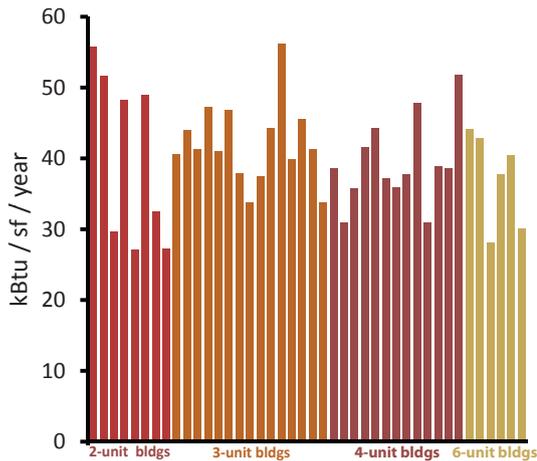
EXAMPLES: Dockside Green, Southeast Falls Creek, BedZED, EVA Lanxmeer

LOCAL RESOURCES: Seattle 2030 District, Green Futures Lab

POTENTIAL: High - assessment is a core component of the EcoDistrict approach



Informative signage at Dockside Green explains the neighborhood's wastewater treatment process. (Image Credit: Erin Wark)



Graph from GGLO Building Performance Evaluation

ECODISTRICT BEST PRACTICES: PEOPLE

CULTURE

People-scale community practices that enrich the neighborhoods culture are **intended** to: *Enrich the social networks and cultural environment of both EcoDistrict residents and the community at large.*



Waterfront public open space in Malmo Western Harbour
(Image Credit: reddit.wired.com)

Community Gathering Places

APPROACH: Involve the surrounding community with the EcoDistrict by providing event and meeting spaces for use by neighborhood groups and the general public

METHODS: Design to include spaces such as a community center, performance space, farmer's market, and plazas; program activities in these places

EXAMPLES: Pringle Creek, Southeast False Creek, Malmo Western Harbour

LOCAL RESOURCES: Seattle Parks and Recreation

POTENTIAL: High - community support is strong; preliminary site design includes a public plaza

Arts

APPROACH: Support the local arts community

METHODS: Subsidized artist housing and studios; exhibition and performance spaces, public art

EXAMPLES: Oberlin Project

LOCAL RESOURCES: Artspace, City of Seattle Office of Arts and Cultural Affairs

POTENTIAL: Medium - community support is strong but depends on developer

Urban Agriculture

APPROACH: Engage residents and the greater community in sustainable urban agriculture

METHODS: Establish common gardening areas for EcoDistrict residents (and also possibly for neighborhood residents), herb gardens for local restaurants, site-wide composting system

EXAMPLES: Pringle Creek, Kansas City Green Impact Zone ("Sowers of Sustainability")

LOCAL RESOURCES: Seattle P-Patch Trust (<http://www.ppatchtrust.org/>),

POTENTIAL: Low/Medium - the station area sites have limited available area for agriculture



Community Greenhouse renovation at Pringle Creek in Salem, Oregon
(Image Credit: Pringle Creek)

Sharing Programs

APPROACH: Reduce consumption of material goods and the associated negative environmental impacts by encouraging sharing of resources

METHODS: EcoDistrict resident sharing systems for space, appliances, tools, recreational gear, food, transportation, childcare, etc.

EXAMPLES: Lloyd District (bike share), Pringle Creek (Bio diesel co-op), Dockside Green, EVA Lanxmeer (car share)

LOCAL RESOURCES: West Seattle Tool Library; Urban Garden Share and Shared Earth; Office Nomads and Agnes Underground; ZipCar, Avego, and PBSC Urban Solutions and Alta Bicycle Share

POTENTIAL: High - Capitol Hill Housing has a history of tool sharing; office and garden sharing are growing in popularity; transportation sharing like bike-shares are starting and car-shares are established

ECODISTRICT BEST PRACTICES: MANAGEMENT

Successful implementation of an EcoDistrict vision requires a management entity that has the authority to act on behalf of the EcoDistrict. The establishment of management is a critical early step in the process of creating an EcoDistrict, and can be expected to require significant effort to accomplish. It is no small task to convince multiple stakeholders and landowners with a variety of interests to cede authority to a common management entity that typically has no precedent.

PoSI's Steps to Governance

Step 1: Engage Stakeholders

*Determine Representatives in your Community
Make an Inventory of Community Resources
Define the Message and Goals*

Step 2: Create an EcoDistrict Steering Committee

Step 3: Develop a Vision and Priorities and Document Commitments

Step 4: Determine Stakeholders' Roles and Responsibilities

Understand that the stakeholder created entity must have the following basic powers: Ability to design an organization, form a Board, and oversee operations; Enter into contracts and agreements with private parties and government agencies; Hold title to real estate; Accept grants and borrow funds; Purchase, construct, improve, operate and maintain sustainability projects within the EcoDistrict

Step 5: Formalize the EcoDistrict Governance Entity

(Source: EcoDistricts Organization, Engagement and Governance, 16/2011, v1.1.)



Capitol Hill Housing with the assistance of a grant from the Bullitt Foundation is spearheading the exploration of creating an EcoDistrict on Capitol Hill.

Role of Management Entity

The key roles of a management entity are to guide the vision and strategies, manage funding and investments, and assess performance. The entity may be a brand new organization, an existing organization expanded to take on the new role, or an alliance of existing organizations. Community Development Corporations, Business Improvement Districts, and Neighborhood Associations are examples of potentially appropriate organizations. The Portland Sustainability Institute's EcoDistricts Toolkit recommends an "Engagement to Governance" process, emphasizing the importance of up front community engagement in determining the optimum management structure.

Examples

Because EcoDistricts are still a relatively new concept, there are limited relevant management examples. Many of the EcoDistrict examples cited in Appendix B deviate from the community-driven EcoDistrict model either because they are privately owned, or because they are managed and funded by municipal governments. Listed below are several examples of EcoDistricts with management entities most relevant to the Capitol Hill EcoDistrict. Note that management may evolve over time.

- **BedZED:** Homeowners Association
- **Cleveland Ecovillage:** Partnership between Community Development Corporation and EcoCity Cleveland (non-profit)
- **Downtown DC EcoDistrict:** Business Improvement District
- **Kansas City Green Impact Zone:** Metropolitan Planning Organization
- **Living City Block:** Initiated by Rocky Mountain Institute, spun-off into new non-profit
- **Seattle 2030 District:** New non-profit to be created to run the project; initial partnership formed with the City of Seattle with Environmental Protection Agency (EPA) funding
- **Oberlin Project:** Partnership between the College and the City
- **EVA Lanxmeer:** Initiated by non-profit foundation, followed by partnership with City

Potential for Capitol Hill

There are several existing neighborhood organizations in Capitol Hill that have the potential to take on the EcoDistrict management role individually, or in alliance, including: the Capitol Hill Chamber of Commerce, the Capitol Hill Community Council, the Capitol Hill Champion, and Capitol Hill Housing.

ECODISTRICT BEST PRACTICES: *FINANCE*

The implementation of district-scale sustainability strategies typically requires substantial financial investment. There are several factors that create challenges for EcoDistrict financing, including multiple stakeholders and property owners, project complexity, risk associated with large up front costs and a long time frame for build out, and the difficulty of separating the public and private benefits provided.

EcoDistrict creation can be separated into three phases: (1) organization and establishment, (2) pre-assessment and planning, and (3) project implementation and performance monitoring. In the United States, most of the EcoDistrict work to date has only progressed through stages (1) or (2), which are less capital-intensive than stage (3). In Europe and Canada, several EcoDistrict-type projects have progressed through stage (3), but the capital-intensive district-scale systems involved were primarily funded by the private sector and/or government. Notable examples include: BedZED, Dockside Green, Southeast False Creek, EVA Lanxmeer, and Malmo Western Harbour.

The Portland Sustainability Institute's EcoDistricts Toolkit identifies a wide range of potential sources of capital, including cost-sharing/partnerships, below-market-rate loans, debt/bonds, grants, impact/service fees, private equity, revolving loans, subsidies, tax assessments, tax increment financing, third party ownership, and voluntary contributions.

District-scale funding mechanisms identified in the Toolkit include Business Improvement Districts; Local Improvement Districts; Property Assessed Clean Energy (PACE) Districts; Parking Benefit Districts; Voluntary Transportation Management Association Contributions; Urban Renewal Areas; and System Development Charges (impact fees). Potential future models include Climate Benefit Districts, Local Commercial REITs for Renters; Local Investing Opportunities Networks (LION), and Community IPOs.

Potential Local Funding Resources

A key local resource for Capitol Hill EcoDistrict funding strategies is the City of Seattle Office of Economic Development (OED). In particular, the OED administers Federal Block Grants, which fund their Community Development Loan Program: "Funding may be available for construction bridge financing, low-income housing development projects and site acquisition through Section 108 Loans and Float Loans."

The Washington State legislature recently passed a bill that links transfer of development rights (TDR) to tax increment financing (TIF). If a development project takes advantage of TDRs to increase density, the jurisdiction can then issue bonds against the additional future property tax revenue generated by the new development. The intention is that the bonds would be used to fund public infrastructure around the development site. It may be possible for this mechanism to be used to finance EcoDistrict infrastructure such as district energy or water systems.

Multiple City Programs Promote Sustainability

The City of Seattle has a range of sustainability-related programs in several departments that could potentially provide guidance or assistance for the proposed EcoDistrict:

Office of Sustainability and Environment: *New study on district energy rates Capitol Hill as Seattle's second-most promising site for district energy; Climate Action Plan, and ongoing programs to reduce Seattle's carbon footprint.*

Department of Planning and Development: *Energy Benchmarking and Disclosure; "Priority Green" permitting; Sustainable Communities; Sustainable Infrastructure; Green Factor*

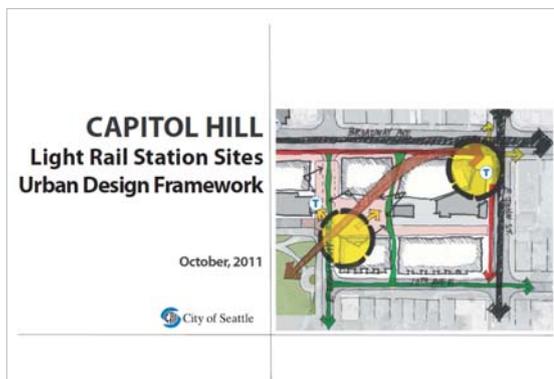
Seattle Planning Commission: *Transit Communities Report issued in 2010; Affordable Housing Report currently in progress*

Department of Economic Development: *Community Development Loan Program; Community Development Block Grant Small Business Loan Fund; Seattle Climate Partnership*

Department of Transportation: *Broadway Streetcar design in progress; Transit Master Plan update in progress; Pedestrian Master Plan and Bicycle Master Plan completed*

City Council: *The Regional Development and Sustainability Committee can be expected to support district-scale sustainability strategies such as district energy*

Mayor's Office: *Walk, Bike, Ride Initiative*



Cover of the Capitol Hill Light Rail Station Sites Urban Design Framework

ECODISTRICT BEST PRACTICES: POLICY

The prospects for EcoDistrict success are strongly influenced by public policy, which includes regulations, incentives, and other government actions. In general, public policy should be crafted to create certainty and reduce financial risk. Almost as importantly, any existing policy that unintentionally creates barriers to EcoDistrict implementation must be addressed.

Because EcoDistricts are a relatively new concept, policy frameworks specifically designed to promote district-scale sustainability strategies do not yet exist in the U.S. But there may be potential opportunities to tap existing policy mechanisms. The Portland Sustainability Institute's EcoDistricts Toolkit provides the following list of public policy actions that have the potential to facilitate EcoDistrict development:

- Regulations, such as zoning codes, building codes, and energy codes
- Public-private partnerships
- Financial incentives and assistance, such as tax credits, grants, subsidies, etc.
- Technical assistance for assessments and projects
- Shared ownership of infrastructure, buildings, or services
- Demand management programs for reduced consumption or use
- Education, such as monitoring programs, resource centers, public outreach, etc.
- Third party certification requirements or incentives for compliance
- Infrastructure and project investment

Potential Local Policy Resources

Currently there is little in the way of existing local policy that would help promote an EcoDistrict on Capitol Hill. Possible new or modified approaches include:

- Adaptation of the City's Priority Green permitting program to fast track permitting for projects that meet sustainability requirements established by the EcoDistrict
- Application of lessons learned from the Bertschi School's Science Wing and Bullitt Foundation's Cascadia Center, both project pursuing living building certification, e.g. code that applies to water reuse
- Application of relevant policy developed for Yesler Terrace
- Pilot project for energy use metering to demonstrate compliance with the City's reporting requirements

The City of Seattle has been proactive about planning for the Capitol Hill light rail station sites that comprise the center of the proposed EcoDistrict. In particular, the *Capitol Hill Light Rail Station Sites Urban Design Framework* (UDF) establishes a vision for the area with many potential synergies to EcoDistrict strategies, though a UDF does not mandate compliance. In June 2011 Sound Transit and the Seattle City Council initiated talks to negotiate a development agreement for the Capitol Hill light rail station sites. The intention of these negotiations is to craft a development agreement that ensures future development responds to the vision of the UDF. It is expected that this process will lead to amendments to the Seattle Land Use Code specific to the sites. This development agreement represents an ideal opportunity to formalize new policy that defines or establishes an EcoDistrict.

ECODISTRICT BEST PRACTICES: SUMMARY

Best Practices		Near-term Potential for Station Area Sites		
BUILT ENVIRONMENT <i>high performance buildings</i>	ENERGY	Energy-Efficient Bldg Design	High	Seattle is already a national leader in green building and has many local resources
		Energy Retrofits	Medium	It is anticipated that the EcoDistrict will expand beyond the catalyst development at the station area sites, at which point there will be ample retrofitting opportunities, including retrofits for district energy
		Bldg Integrated Renewable Generation	High	Incentives available and cost/benefit will improve over time
		Advanced Metering	High	Cost effective and easy to do
		Renewable Energy Purchase Agreement	High	Relatively easy strategy; can work with Seattle's "Green Up" program
	WATER	Efficient Water Fixtures & Landscaping	High	Techniques are well established
		Bldg Water Reuse	Medium	Relatively high cost premium, but the cost/benefit will improve over time; some local precedents are helping to pave the way
		Bldg Blackwater Treatment	Low / Medium	Relatively high cost premium for high density projects, but techniques are well established
	DESIGN	On-Site Stormwater Management	High	Techniques like Green Roofs and Living Walls are well established
		Optimize Density	Medium	Site area already very dense, but high potential to increase density around transit site
Activate the Street		High	Support has been established in the planning process; Would be best facilitated by a single master developer	
		Express Sustainable Design Features	High	Easy to do and helps establish neighborhood identity
INFRASTRUCTURE <i>green infrastructure</i>	DISTRICT ENERGY	Integration w/ External District Energy System	High	Seattle Steam service is nearby, and they are interested in expanding as other infrastructure (streetcar) expands
		Dedicated District Heating System	Medium	EcoDistrict boundary will need to be enlarged to justify some types of systems
		Shared Renewable Energy Generation	Medium / High	High for solar panels on SCCC's roofs; Medium for digester (no precedent)
	DISTRICT WATER	Shared Water Systems	Medium / High	No local precedents for shared systems
		District-Scale Stormwater System	High	Techniques are well established
	TRANSPORTATION	Minimize Parking	Medium / High	Community support is strong, but depends on developer/lenders
		Enable Car-Free Households	High / Varies	Some methods of vehicle sharing are established, others are more untested; great proximity to public transit
	HABITAT	Integrate Habitat	Medium	Strategies are straightforward but the site has relatively little available area
PEOPLE <i>sustainable behavior</i>	EQUITY	Affordability	High	There is broad support for creating affordable housing on the site
		Diversity of Uses and Spaces	Medium / High	Depends on perceived market demands
		Economic Development	High	Successful precedent and strong support in the Capitol Hill neighborhood for supporting local businesses
	EDUCATION	Tenant/User Education	High	Easy to do and user participation is key for EcoDistrict success
		Community Education / Living Laboratory	High	There is widespread interest and support for sustainability in Seattle
		Assessment and Monitoring	High	Assessment is a core component of the EcoDistrict approach
	CULTURE	Community Gathering Places	High	Community support is strong; preliminary site design includes a public plaza
		Arts Support	Medium	Community support is strong but depends on developer
		Urban Agriculture	Low / Medium	The site has limited available area for agriculture, yet programmed for Farmers Market
		Sharing Programs	High	There are many resources and support for sharing programs
MANAGEMENT	Successful implementation of an EcoDistrict vision requires a governance entity that has the authority to act on behalf of the EcoDistrict. There are several existing neighborhood organizations in Capitol Hill that have the potential to take on the EcoDistrict governance role individually, or in alliance, including: the Capitol Hill Chamber of Commerce, the Capitol Hill Community Council, the Capitol Hill Champion, and Capitol Hill Housing.			
FINANCE	A key local resource for Capitol Hill EcoDistrict funding strategies is the City of Seattle Office of Economic Development's (OED). Federal Block Grants, which fund their Community Development Loan Program The Washington State legislature recently passed a bill that links transfer of development rights (TDR) to tax increment financing (TIF). It may be possible for this mechanism to be used to finance EcoDistrict infrastructure.			
POLICY	Currently there is a lack of policy that would help promote an EcoDistrict on Capitol Hill, but potential new or modified approaches include Seattle's Priority Green program, density bonuses, pilot programs, and procedures developed for recent projects such as the Bullitt Foundation Living Building.			

ECODISTRICT BEST PRACTICES: *SUMMARY*

Best Practices: *Summary (Potential for Capitol Hill)*

Clearly, Capitol Hill is a prime location for an EcoDistrict. There are many EcoDistrict Best Practices that have a high potential for application in the neighborhood.

Refer to the research and strategies in the *Performance Areas* chapter in the full report to move from this global review to a deeper look into neighborhood specific, district-wide EcoDistrict values and resources.

Appendix B

EcoDistrict Examples

A broad range of EcoDistrict-related work has been conducted nationally and internationally. A summary of 28 pertinent EcoDistrict examples appears on the following pages organized alphabetically by country or region; each district's size, goals, strategies, management and finance structure, implementation status and areas of measurement are highlighted. The list includes examples from the United States, Canada, Europe, Asia and the Middle East. Some of the examples fit well within the conventional definition of an EcoDistrict, while others serve as case studies of specific features that have relevance to EcoDistricts.

Baltimore State Center	96	Lok Ma Chau Loop	109
BedZED	106	Masdar City	109
Cleveland Ecovillage	96	Malmo Western Harbor	108
Clonburris EcoDistrict	106	Oberlin Project	100
Dockside Green	105	Portland State University (PoSI pilot)	100
Downtown D.C. EcoDistrict	97	Pringle Creek	101
EVA Lanxmeer	107	Project Green	101
Freiburg-Vauban	108	Seattle 2030 District	102
Gateway (PoSI pilot)	97	South Lake Union	102
Heudelet 26 EcoDistrict	107	South Waterfront (PoSI pilot)	103
Kansas City Green Impact Zone	98	Southeast False Creek	105
Lents (PoSI pilot)	98	Southwest EcoDistrict	103
Living City Block	99	Treasure Island	104
Lloyd District (PoSI pilot)	99	Yesler Terrace	104

ECODISTRICT EXAMPLES: UNITED STATES

Baltimore State Center (Baltimore, MD)

SCALE: 28-acre site, \$1.5 billion redevelopment over 15 years, estimated build out of 2 million sf of public and private office space, 1,400 housing units and 250,000 sf of retail.

GOALS: Transform an aging group of state government offices into a vibrant mixed use community.

STRATEGIES:

SUSTAINABILITY: Sustainability Action Plan, LEED Silver buildings, LEED ND Platinum, reuse of buildings, green guidelines for tenants

MANAGEMENT: Public-private partnership

FINANCE: Shared through public-private redevelopment (City of Baltimore and Ekistics LLC)

IMPLEMENTATION STATUS: Planning and design

MEASUREMENT: Baseline assessment in progress



*Rendering of proposed Baltimore State Center redevelopment
(Image Credit: Design Collective)*

Cleveland Ecovillage (Cleveland, OH)

SCALE: Neighborhood centered around a transit station.

GOALS: Demonstration project to redevelop a neighborhood around a transit stop, and “realize the promise of urban life in the most ecological way possible.”

STRATEGIES:

SUSTAINABILITY: Green building, community garden, energy retrofit assistance, education, new rail transit station, and stormwater management.

MANAGEMENT: Detroit Shoreway Community Development Organization

FINANCE: (partial list) George Gund Foundation, the Katherine and Lee Chilcote Foundation, and the Cleveland Cityworks program, U.S. EPA

IMPLEMENTATION STATUS: Ongoing, with several isolated projects completed

MEASUREMENT: Some utility use data has been recorded; transit ridership and traffic data



*Architectural rendering of the Cleveland Ecovillage from visioning process.
(Image Credit: City Architecture)*

ECODISTRICT EXAMPLES: UNITED STATES

Downtown D.C. EcoDistrict (Washington D.C.)

SCALE: Entire downtown D.C. Business Improvement District (BID) area: 68 million sf of office, a dozen civic and cultural institutions, and 6,000 residences

GOALS: Reduce the BID area's carbon footprint and consumption of resources and, at the same time, increase market share and profitability.

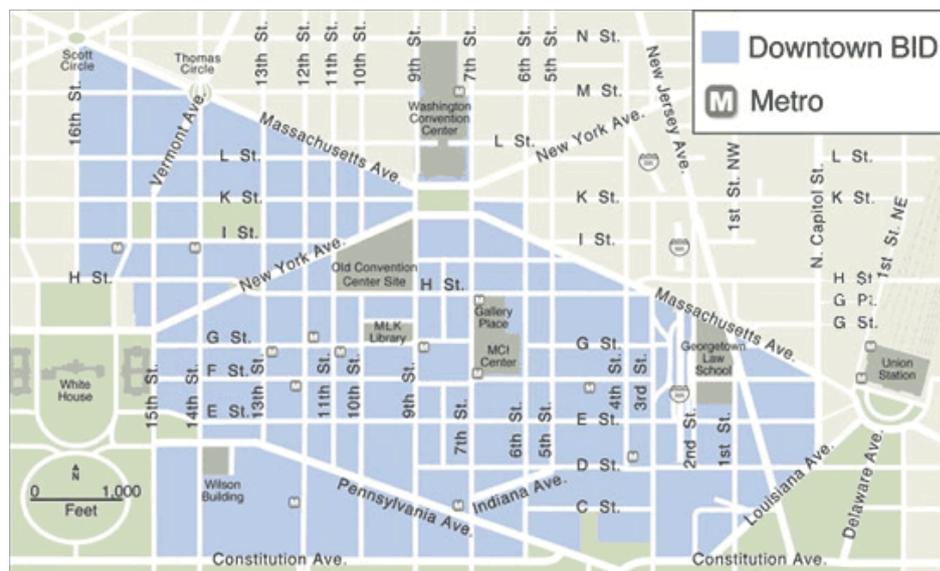
STRATEGIES:

SUSTAINABILITY: Phase 1: Research, benchmarking and tracking, marketing and communications, organizing and cooperation

MANAGEMENT/FINANCE: Business Improvement District

IMPLEMENTATION STATUS: Launched April 2011

MEASUREMENT: N/A



Proposed Downtown D.C. EcoDistrict in Washington, D.C. (Image Credit: Downtown D.C. BID)

Gateway (PoSI pilot, Portland, OR)

SCALE: 658-acre urban renewal area (“the most tangible definition of Gateway”)

GOALS: Explore EcoDistrict potential at underdeveloped transportation crossroads

STRATEGIES:

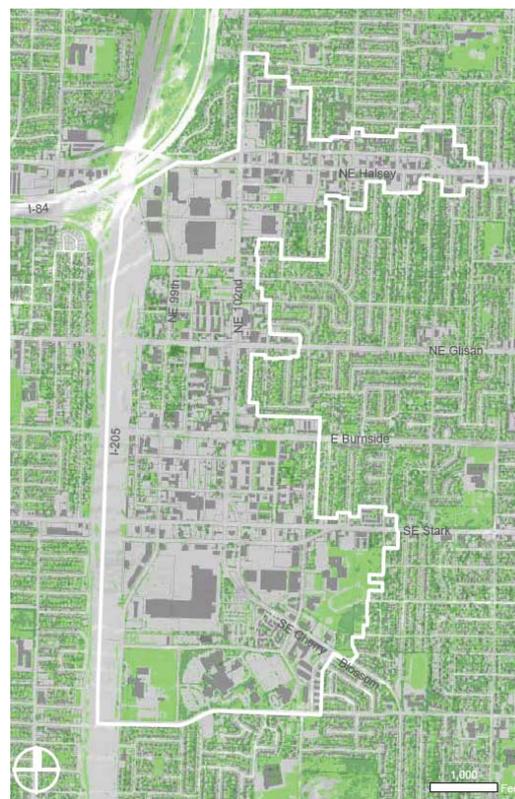
SUSTAINABILITY: Unite multiple initiatives already underway, community behavior project

MANAGEMENT: The existing Gateway Program Advisory Committee is a good candidate to take on a future management role

FINANCE: Not yet identified; potential large-scale private development with Gilbert Brothers

IMPLEMENTATION STATUS: Process initiated in 2009; Series of engagement meetings have been conducted with identified stakeholders

MEASUREMENT: Baseline assessment completed 2010



Boundary of the Gateway urban renewal district, which roughly delineates the Gateway pilot EcoDistrict (Image Credit: University of Oregon)

ECODISTRICT EXAMPLES: UNITED STATES

Kansas City Green Impact Zone (Kansas City, MO)

SCALE: 150-Block Green Impact Zone

GOALS: Revitalize and urban area that has experienced severe abandonment and economic decline.

STRATEGIES:

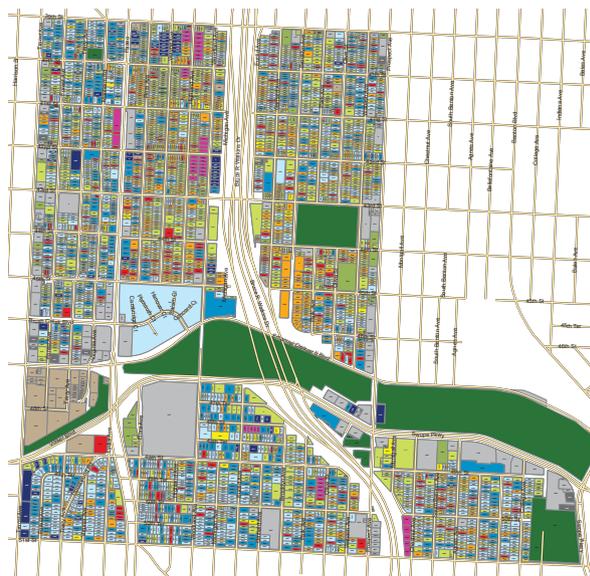
SUSTAINABILITY: Housing rehab, weatherization, community policing and services, job training and placement, health and wellness programs, youth programs, community gardening

MANAGEMENT: The Mid-America Regional Council, in partnership with 10 neighborhoods and community development organizations

FINANCE: \$50 million Federal TIGER grant

IMPLEMENTATION STATUS: Launched in 2009

MEASUREMENT: Baseline demographic data



Map of the Kansas City Green Impact Zone courtesy of MARC (Image Credit: <http://www.greenimpactzone.org/>)

Lents (PoSI pilot, Portland, OR)

SCALE: 3.75 square mile primarily residential neighborhood; part of a larger urban renewal area

GOALS: Explore the challenges associated with creating an EcoDistrict in a diverse neighborhood with higher than average poverty rates, where residents are more concerned with getting their basic needs met.

STRATEGIES:

SUSTAINABILITY: Build neighborhood relationships, bring together multiple initiatives already underway, focus on the “engagement to management” process, build on previous Bullitt funded “EcoDistrict MANAGEMENT Project,” partner on Metro funded green infrastructure strategic plan, integrate Clean Energy Works program

MANAGEMENT: Not yet identified

FINANCE: Bullitt Foundation grant

IMPLEMENTATION STATUS: Process initiated in 2009; fact-finding and relationship-building

MEASUREMENT: Baseline assessment completed 2010



Map of the Lents neighborhood and the Lents pilot EcoDistrict (Image Credit: ilovelents.com)

ECODISTRICT EXAMPLES: UNITED STATES

Living City Block (Denver, CO)

SCALE: One city block (replicated)

GOALS: Create a replicable, exportable, scalable and economically viable framework for the resource efficient regeneration of existing cities, one block at a time.

STRATEGIES:

SUSTAINABILITY: Deep energy retrofits, job creation

MANAGEMENT: 501(c)(3) organization

FINANCE: Originally a program of the Rocky Mountain Institute; currently the non-profit has multiple funding sources

IMPLEMENTATION STATUS: Launched in 2010

MEASUREMENT: Baseline energy use data



Boundary (in yellow) of the Living City Block project in Denver, Colorado (Credit: Color over BING Birds Eye)

Lloyd District (PoSI pilot, Portland, OR)

SCALE: 275-acre neighborhood consisting primarily of commercial buildings

GOALS: Reduce carbon emissions and energy consumption, improve multimodality of transportation, create marketing value with sustainable district brand.

STRATEGIES:

SUSTAINABILITY: Green streets, district energy, food waste composting, bike-sharing

MANAGEMENT: Plan to create Sustainability Management Association, Sustainability Director has been hired, the Lloyd District Transportation Management Association may also be involved

FINANCE: Lloyd BID, City of Portland, Oregon Metro

IMPLEMENTATION STATUS: Process initiated in 2009; declaration of Cooperation signed in 2010, Sustainability Director hired in 2011

MEASUREMENT: Baseline assessment completed 2010



Diagram of the Lloyd District EcoDistrict pilot site in northeast Portland (Image Credit: PoSI)

ECODISTRICT EXAMPLES: UNITED STATES

Oberlin Project (Oberlin, OH)

SCALE: 13-acre block near the city center.

GOALS: Eliminate carbon emissions; create green arts district.

STRATEGIES:

SUSTAINABILITY: Sustainable development or renovation of a dozen buildings during the next five to seven years.

MANAGEMENT: Oberlin College and City of Oberlin

FINANCE: DOE grant, assistance from Clinton Climate Initiative, others sources being sought

IMPLEMENTATION STATUS: Conceptual stages

MEASUREMENT: N/A



Site of proposed Oberlin Project (Image Credit: Oberlin)

Portland State University (PoSI pilot, Portland, OR)

SCALE: Large urban university campus

GOALS: Take advantage of the large amount of property controlled by a single owner, along with the progressive university culture to advance a broad range of sustainability strategies.

STRATEGIES:

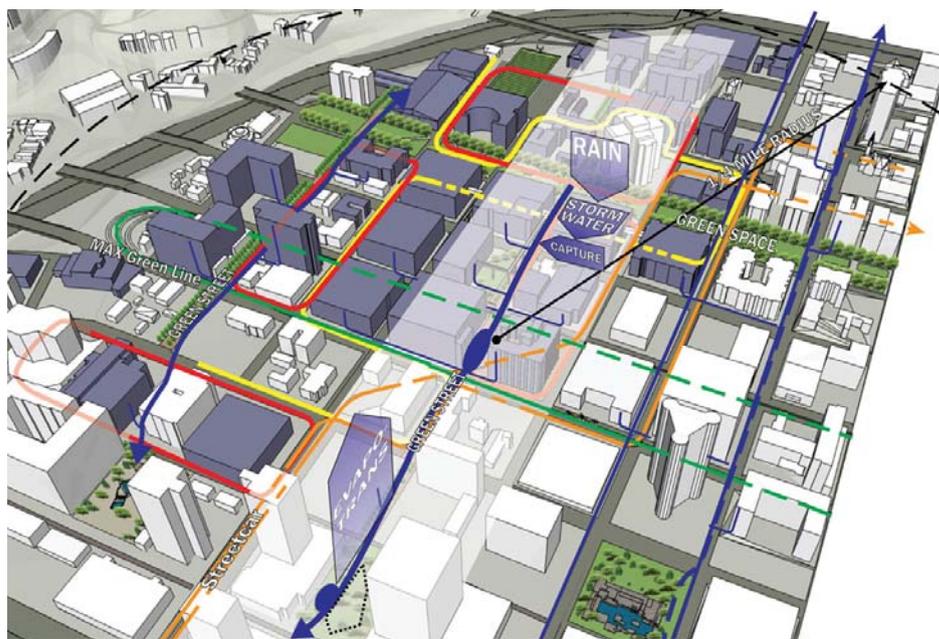
SUSTAINABILITY: Stormwater management, green roofs, habitat provision, pocket parks, and bicycle infrastructure, extension of existing district energy system, Portland State University (PSU) EcoDistrict Engagement Program

MANAGEMENT: PSU, but mechanism to include other property owners not yet determined

FINANCE: PSU earmarked \$10 million for 2011-2013, 26 million for 2013-2015, matching funds from area stakeholders

IMPLEMENTATION STATUS: Process initiated in 2009; EcoDistrict Strategy integrated into the PSU Framework Plan

MEASUREMENT: Baseline assessment completed 2010



Portland State University pilot EcoDistrict systems diagram (Image Credit: SERA)

ECODISTRICT EXAMPLES: UNITED STATES

Pringle Creek (Salem, OR)

SCALE: 32-acres, 139 residential lots, small mixed-use center

GOALS: Develop a new sustainable residential neighborhood.

STRATEGIES:

SUSTAINABILITY: ground-source heat pumps, LEED-ND participant, low-impact development, sustainability living center, community partnerships, community gardens, bio-diesel co-op, planning for some net-zero energy homes, real-time energy monitoring

MANAGEMENT: N/A

FINANCE: Private development

IMPLEMENTATION STATUS: Lots are for sale

MEASUREMENT: Energy use data



Rendered Site Plan for Pringle Creek in Salem, Oregon (Image Credit: Pringle Creek)

Project Green (Austin, TX)

SCALE: Six-acre on five blocks, the site of a decommissioned water treatment plant; 2.5 million square feet of office, hotel, residential, and retail space

GOALS: High density mixed-used redevelopment striving to achieve water and carbon neutrality.

STRATEGIES:

SUSTAINABILITY: Photovoltaics, wind turbines, green roofs, rainwater harvesting, gray water reuse, LEED Gold target, public open space, affordable housing trust fund, public art

MANAGEMENT/FINANCE: Public-private partnership

IMPLEMENTATION STATUS: Project awarded to Trammell Crow in 2008, on hold since then

MEASUREMENT: N/A



Rendering of urban design and redevelopment concept for EcoDistrict implementation by Mithun. (Image Credit: Mithun)

ECODISTRICT EXAMPLES: UNITED STATES

Seattle 2030 District (Seattle, WA)

SCALE: Over 1,100 commercial buildings in downtown Seattle and the First Hill, Denny Triangle, and South Lake Union neighborhoods

GOALS: Develop strategies to assist district property owners, managers, and tenants in meeting aggressive goals that reduce environmental impacts of facility construction and operations.

STRATEGIES:

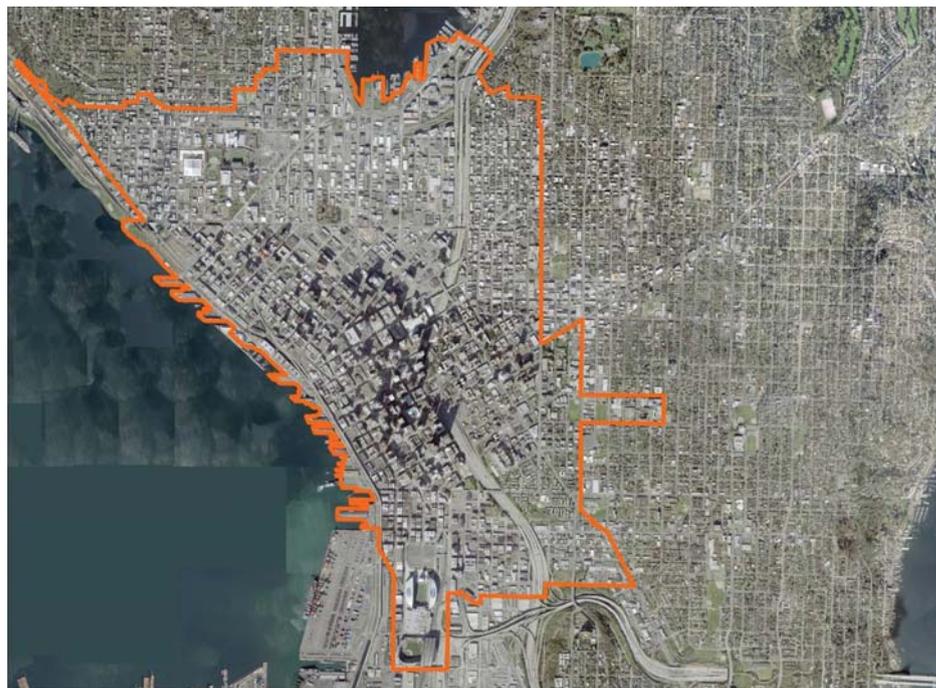
SUSTAINABILITY: Use Architecture 2030 Challenge for Planners as a target for new and existing buildings, master dashboard to track energy and water use for all buildings, standardized audit process, energy efficiency contracting packages

MANAGEMENT: New entity in the process of being created

FINANCE: EPA Climate Showcase Communities Grant

IMPLEMENTATION STATUS: Project initiated in 2009; commitment letters signed by a large consortium of property owners, building operators, professional stakeholders, utilities, and the City of Seattle

MEASUREMENT: Baseline energy use estimates



Seattle 2030 District boundary (Image Credit: GGLO)

South Lake Union (Seattle, WA)

SCALE: 340-acre neighborhood adjacent to downtown Seattle

GOALS: 2002 study commissioned to “identify design and technology solutions appropriate to South Lake Union that will reduce the short and long-term environmental impact of urban development and construction.” LEED ND pilot neighborhood.

STRATEGIES:

SUSTAINABILITY: Wide range of recommendations grouped according to Process, Site, Energy, Water, Materials and Resources

MANAGEMENT: None

FINANCE: Study funded by Vulcan, LEED ND administered by City of Seattle

IMPLEMENTATION STATUS: Report issued in 2002, LEED ND achieved in 2010

MEASUREMENT: Assessment conducted for LEED ND metrics



South Lake Union neighborhood in Seattle (Image Credit: GGLO)

ECODISTRICT EXAMPLES: UNITED STATES

South Waterfront (PoSI pilot, Portland, OR)

SCALE: The South Waterfront District is a 402-acre urban renewal area; focus is on the north end of the district, where land is primarily undeveloped

GOALS: Take advantage of major planned redevelopment to establish district-scale systems.

STRATEGIES:

SUSTAINABILITY: District energy, collective wastewater treatment, greywater, and stormwater management systems, green streets, sustainability master plan, transportation management programs

MANAGEMENT: Oregon Health Sciences University is a major property owner

FINANCE: Not yet identified; private development may contribute

IMPLEMENTATION STATUS: Process initiated in 2009; Stakeholders have been convened, green street priority project identified

MEASUREMENT: Baseline assessment completed 2010



Rendering of the proposed Schnitzer Campus & OHSU Commons, the focus of the Southwest EcoDistrict in Portland
(Image Credit: OHSU)

Southwest Ecodistrict (Washington, D.C.)

SCALE: 110-acres of private and publicly owned land on 15 blocks

GOALS: Advance innovative sustainable development practices for a precinct of buildings, related infrastructure, and open space.

STRATEGIES:

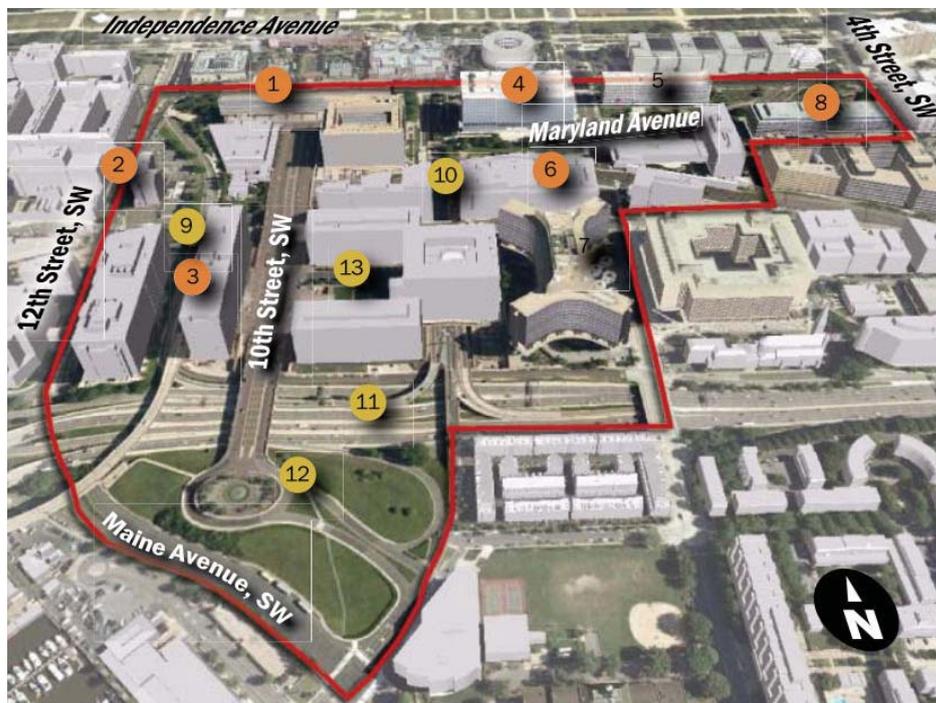
SUSTAINABILITY: Energy and natural drainage retrofits, add retail and housing, create pedestrian-friendly connections, considering a lid on the freeway and railroad tracks

MANAGEMENT: National Capital Planning Commission, with multiple partners

FINANCE: Federal Government

IMPLEMENTATION STATUS: Planning stages; task force convened in spring 2010

MEASUREMENT: N/A



Boundaries of the proposed Southwest Ecodistrict, Washington, D.C.
(Image provided courtesy of The National Capital Planning Commission)

ECODISTRICT EXAMPLES: UNITED STATES

Treasure Island (San Francisco, CA)

SCALE: \$1.5 billion redevelopment with 8,000 housing units (25% affordable), three hotels, a retail/commercial center, an expanded marina, a ferry terminal, and about 300 acres of open space

GOALS: Create the “most sustainable redevelopment in the United States.”

STRATEGIES:

SUSTAINABILITY: Photovoltaics, wind farm, district energy (CHP plant), organic waste digester, pedestrian-oriented urban design, organic farm, 275-acre park.

MANAGEMENT/FINANCE: Joint venture between Lennar Corporation and Kenwood Investments

IMPLEMENTATION STATUS: In final planning stages, ground breaking slated for 2012

MEASUREMENT: Some baseline assessment has been done



Rendering of Treasure Island, San Francisco (Image Credit: Skidmore, Owings & Merrill)

Yesler Terrace (Seattle, WA)

SCALE: 30-acre mixed-income, mixed-use redevelopment

GOALS: “Integrate sustainable design and implement equitable environmental and economic practices to achieve a positive and healthy community for current and future generations living within the Yesler Terrace community while preserving housing affordability.”

STRATEGIES:

SUSTAINABILITY: Smart growth principles, housing diversity, development manual to regulate the public realm, planned action ordinance, Sustainable District Study

MANAGEMENT: Seattle Housing Authority and City of Seattle

FINANCE: Affordable housing to be funded by sale of land for private development, HUD Grants

IMPLEMENTATION STATUS: In master planning phase

MEASUREMENT: Baseline energy and water use were measured for the Sustainable District Study



Rendering of Yesler Terrace, Seattle (Image Credit: GGLO)

ECODISTRICT EXAMPLES: CANADA

Dockside Green (Victoria, B.C)

SCALE: 1.3 million sf mixed-use community on 15-acre former brownfield

GOALS: Create a socially vibrant, ecologically restorative, economically sound and just community.

STRATEGIES:

SUSTAINABILITY: Centralized biomass gasification system; wastewater treatment facility treats 100% of all sewage from the development, treated water used for toilets, irrigation and creek system; user meters for water, heat and electricity; green roofs, car share program, LEED ND, affordable housing program

MANAGEMENT: Privately developed

FINANCE: Privately financed; affordable housing supported by City of Victoria

IMPLEMENTATION STATUS: As of 2011 two residential and two commercial phases complete

MEASUREMENT: 2009 Annual Sustainability Report has limited metrics



Dockside Green, Victoria, B.C. (Image Credit: Dockside Green)

Southeast False Creek (Vancouver, BC)

SCALE: 80-acres, eventual build out of 6.3 million sf of residential development (~6,600 units)

GOALS: Create a leading model of sustainability in North America, incorporating forward-thinking infrastructure, strategic energy reduction, high-performance buildings and easy transit access.

STRATEGIES:

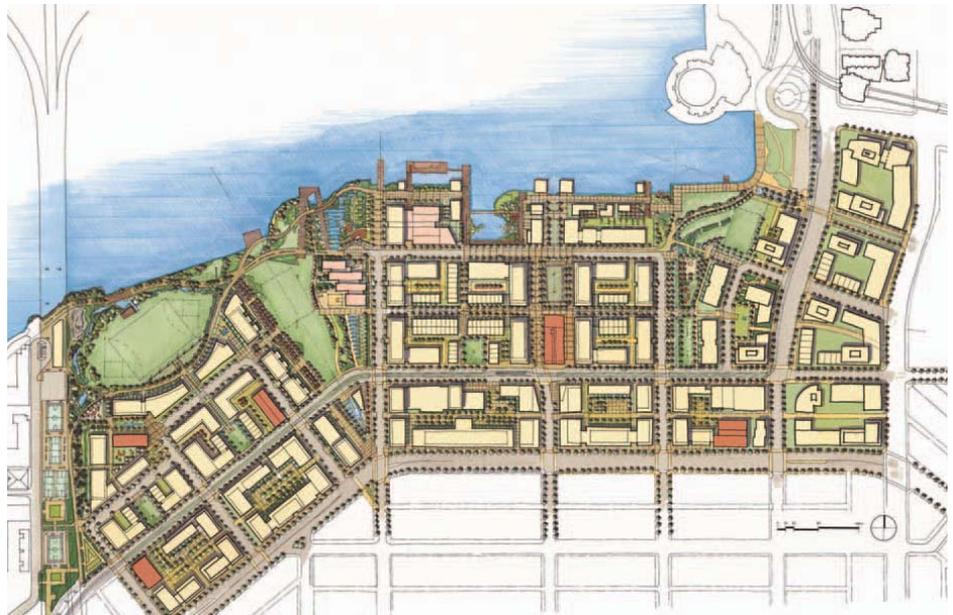
SUSTAINABILITY: Passive building design, district energy (neighborhood energy utility, waste heat recovery), rainwater harvesting and reuse, green roofs, LEED-ND Platinum, 1/3 of housing affordable, sustainability indicators and targets adopted

MANAGEMENT: City of Vancouver

FINANCE: Millennium SEFC Properties (private), City of Vancouver (public)

IMPLEMENTATION STATUS: First phase complete (1,100 units and 68,000 sf commercial)

MEASUREMENT: Energy use 40% Better than ASHRAE 90.1 2001, 50% Reduction in water use, 100% of site stormwater diverted



Concept Plan for Southeast False Creek, Vancouver, B.C. (Image Credit: VIA Architecture; provided courtesy of City of Vancouver)

ECODISTRICT EXAMPLES: EUROPE

BedZED (Beddington, U.K.)

SCALE: 99 low-rise multifamily units and 15,000 sf of work space on 3.5-acres

GOALS: Zero-carbon footprint development.

STRATEGIES:

SUSTAINABILITY: Passive design, photovoltaics, CHP system (not operating), Living Machine (not operating), visible meters, tenant education

MANAGEMENT: Homeowner Association

FINANCE: Peabody Trust (London-based housing association and urban regeneration agency)

IMPLEMENTATION STATUS: Completed in 2002

MEASUREMENT: Post-occupancy studies completed, data available



BedZED (Image Credit: Bill Dunster)

Clonburris EcoDistrict (Dublin, Ireland)

SCALE: 10-15 year phased development of 11,000 -16,000 homes and up to 570,000 sf of commercial eight new neighborhoods on 650-acres

GOALS: Minimize carbon emissions, promote biodiversity and maximize quality of life.

STRATEGIES:

SUSTAINABILITY: Create complete walkable, transit-rich neighborhoods; Incorporate a range of sustainable environmental performance targets

MANAGEMENT/FINANCE: City of Dublin

IMPLEMENTATION STATUS: Planning phase; Sustainability Toolkit and Design Standards published

MEASUREMENT: N/A



Clonburris EcoDistrict master plan (Image Credit: City of Dublin)

ECODISTRICT EXAMPLES: EUROPE

EVA Lanxmeer (Culemborg, Netherlands)

SCALE: 59-acre district in an ecologically sensitive area near railway station, 250 units of low-rise housing, 430,000 sf of commercial (office, restaurants, hotel, community center), and urban farm

GOALS: Create a model for a more sustainable way of building housing in urban areas.

STRATEGIES:

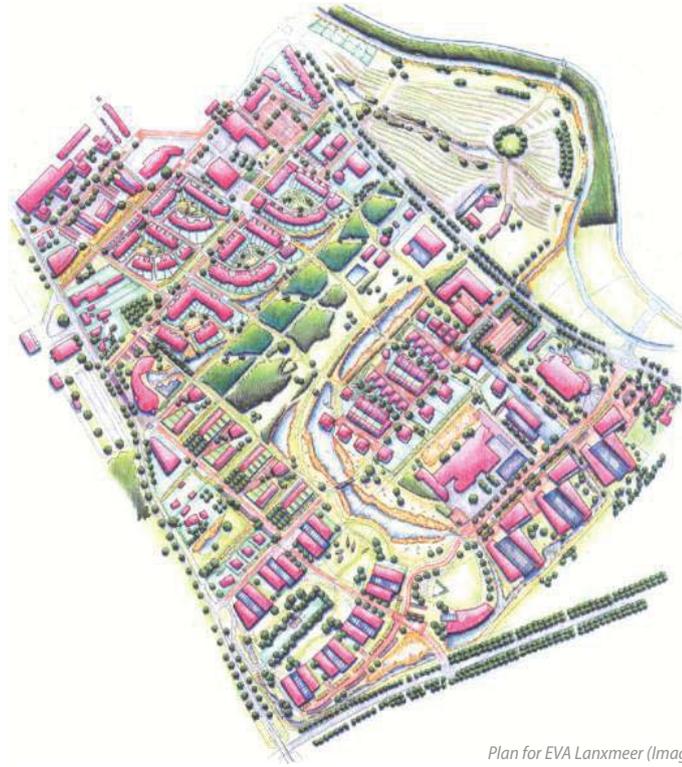
SUSTAINABILITY: Focus on participation of residents; closed water circuit, biogas production facility, CHP plant, use of sustainable building materials, organic food production, car sharing

MANAGEMENT: Initiated by EVA Foundation, and grew into a partnership with Culemborg

FINANCE: German Ministry for Education, Science, Technology and Research, Dutch Ministry for Housing, Spatial Planning and the Environment, multiple private grants

IMPLEMENTATION STATUS: Started in 1994, completed in 2009

MEASUREMENT: Household energy use has been tracked



Plan for EVA Lanxmeer (Image Credit: EVA Lanxmeer)

Heudelet 26 EcoDistrict (Dijon, France)

SCALE: 300 housing units (subsidized, rental, and privately owned), 130,000 sf commercial and services, and nine artist workshops

GOALS: Focus on sustainable mixed-income and mixed-generational housing.

STRATEGIES:

SUSTAINABILITY: Passive building design, on-site renewable generation, below grade parking capped with green corridor

MANAGEMENT/FINANCE: Société d'Economie Mixte d'Aménagement de l'Agglomération Dijonnaise

IMPLEMENTATION STATUS: Planning and design stages

MEASUREMENT: N/A



Rendering of the planned Heudelet 26 EcoDistrict in Dijon, France (Image Credit: EXP Architects, Studioustard Architecture, Sempervirens Landscape Designers)

ECODISTRICT EXAMPLES: EUROPE

Malmö Western Harbour (Malmö, Sweden)

SCALE: 346-acres, 10,000 residents and 20,000 employees and students at full build out

GOALS: Transform a heavy-duty industrial area to a diversified conurbation with homes, businesses, schools, service facilities, parks and green oases.

STRATEGIES:

SUSTAINABILITY: Perhaps the world's most comprehensive implementation of the full range of sustainable development practices

MANAGEMENT/FINANCE: City of Malmö

IMPLEMENTATION STATUS: Ongoing; multiple phases completed

MEASUREMENT: Multiple studies available, see for example <http://www.managenergy.net/resources/199>



Malmö Western Harbour (Image Credit: Joakim Lloyd Raboff)

Freiburg-Vauban (Freiburg, Germany)

SCALE: Neighborhood with 5,000 residents and 600 jobs

GOALS: Create a "sustainable model district."

STRATEGIES:

SUSTAINABILITY: Low-energy consumption standard (100 units designed to Passivhaus), CHP fueled by wood chips, PV, solar hot water, 59 unit PlusEnergy Solar Settlement, 70% of households are car free

MANAGEMENT: Forum Vauban and Freiburg City Council

FINANCE: Private development, co-housing groups, University of Freiburg

IMPLEMENTATION STATUS: Construction began in mid-1990s; built out in 2006.

MEASUREMENT: Multiple studies available, see for example <http://www.vauban.de/info/abstract5.html>.



Freiburg-Vauban (Image Credit: City of Freiburg)

ECODISTRICT EXAMPLES: ASIA & THE MIDDLE EAST

Lok Ma Chau Loop (Hong Kong)

SCALE: The Loop is 87-hectares of undeveloped land, formed by the re-aligned Shenzhen River at the northern boundary of Hong Kong – adjacent on either side to high density urban areas

GOALS: South China's first low-carbon cross-boundary development

STRATEGIES:

SUSTAINABILITY: Wide range of sustainable design strategies

MANAGEMENT: Hong Kong-Shenzhen Joint Task Force on Boundary District Development

FINANCE: Assumed future public-private partnerships

IMPLEMENTATION STATUS: Planning (initiated in 2007)

MEASUREMENT: N/A



Rendering of the vision for Lok Ma Chau Loop in Hong Kong (Image Credit: Arup)

Masdar City (United Arab Emirates)

SCALE: Brand new city

GOALS: Zero-carbon, zero-waste

STRATEGIES:

SUSTAINABILITY: Entirely powered by solar and other renewable energy sources

MANAGEMENT/FINANCE: The Abu Dhabi Government-owned Mubadala Development Company

IMPLEMENTATION STATUS: Initial phases in construction; 10 MW PV plant operational

MEASUREMENT: N/A



Rendering of Masdar City in the United Arab Emirates (Image Credit: Foster + Partners)

Appendix C

EcoDistrict Outreach



(Image Credit: GGLO)



(Image Credit: GGLO)

OUTREACH

Engage partners, resources, stakeholders, and the community to discuss priorities, brainstorm potential strategies, and solicit valuable feedback.

Summary of Outreach Efforts to Date

July 2011 Partnering and Program Opportunities

Given all the work on similar topics such as District Energy, Seattle 2030 District, Capitol Hill Light Rail Station and Street Car extension to Capitol Hill, attendees shared a summary of their initiatives and the group discussed potential synergies and opportunities between the current efforts. Attendees included:

- Capitol Hill Housing & GGLO - Capitol Hill EcoDistrict
- Sound Transit – Capitol Hill Light Rail Station
- Department of Planning and Development – Urban Design Framework
- Department of Planning and Development – Seattle 2030 District streamlining a package of incentives and permitting services
- Office of Economic Development – Seattle 2030 District funding resources such as Clinton Climate Initiative Preferred Purchasing network; OED traditional funding opportunities include Grow Seattle Fund, New Market Tax Credits, Only In Seattle (Community Development Block Grant)
- Office of Sustainability & Environment – Of the ten sites in the District Energy Pre-feasibility Study, First Hill was identified as first priority and Capitol Hill second. Community Power Works program is targeting existing home and business energy retrofits

September 2011 Visioning & Goal Setting

Vision and goal setting meeting on development of EcoDistrict goals in relation to the Urban Design Framework and current Capitol Hill activities and opportunities.

November 2011 Site Inventory Gap Analysis

Working group contributed insight into the neighborhood inventory process around key environmental performance areas: community, transportation, energy, water and habitat. Metrics were identified and recently completed or current activities being planned that will inform opportunities as the EcoDistrict moves forward were discussed.

November 2011 District Energy Charrette

Led by Preservation Green Lab, a group of city agencies, transit agencies, technical partners and neighborhood stakeholders participated in exploring district energy opportunities on Capitol Hill. Thermal energy demand for Capitol Hill, supply (ranging from geothermal, hydro, sewer, waste heat from groceries, hospitals and other industrial uses) and distribution scenarios of demand corridors and clusters were discussed.



(Image Credit: GGLO)



(Image Credit: GGLO)



(Image Credit: GGLO)

OUTREACH

December 2011

Forum on Capitol Hill: 12th Avenue Meets Broadway Advisory Council Annual Meeting

Capitol Hill Housing and the Capitol Hill Chamber of Commerce convened stakeholders in a visioning and goal setting session which started with writing a 'Postcard from the Future'.

Participants were asked to imagine a time in the future, 10- 15- 20- or more years had passed, and write a postcard to a close friend or family member about one specific thing about the EcoDistrict that should be shared. What does the neighborhood look like? What has changed or been enhanced in your daily routine? It was an open exercise in which people wrote about activities, physical characteristics, and touched upon all environmental performance areas before any topics were assigned to breakout groups.

Small breakout groups focused on specific environmental performance area topics were then formed. Groups shared their broad 'Postcard Visions' and then explored visions, goals, and priorities specific to their breakout topic. Summary feedback included (see following page):

Community

- Like an organism
- Gentrification is a concern
- Green space vs. density
- Diversity – “more colors”
- Need better name than “district”

Transportation

- Transportation = “Public Space”
- Time to commute is large impact on lifestyle
- So, increase quality of commute
- How: increase education & coordination of way finding & usability – public awareness

Energy

Postcard Vision in common:

- Walkable
- Loving neighborhood

Vision for Energy:

- Tangible, practical projects – policy & financial for multi-family
- How to make the EcoDistrict real: Access to bike storage; Infrastructure
- Submetering & Education
- Education promote neighborhood regionally

Water

Postcard Vision in common:

- Sustainable ecosystems
- Walkable
- Great place that you don't have to leave, but connected everywhere

Vision for Water:

- Ways to visualize water
- Hydro power from the runoff of sewer

Materials

Postcard Vision in common:

- Food & urban agriculture
- Going car less
- Shopping locally – harvesting & distributing

Vision for Materials:

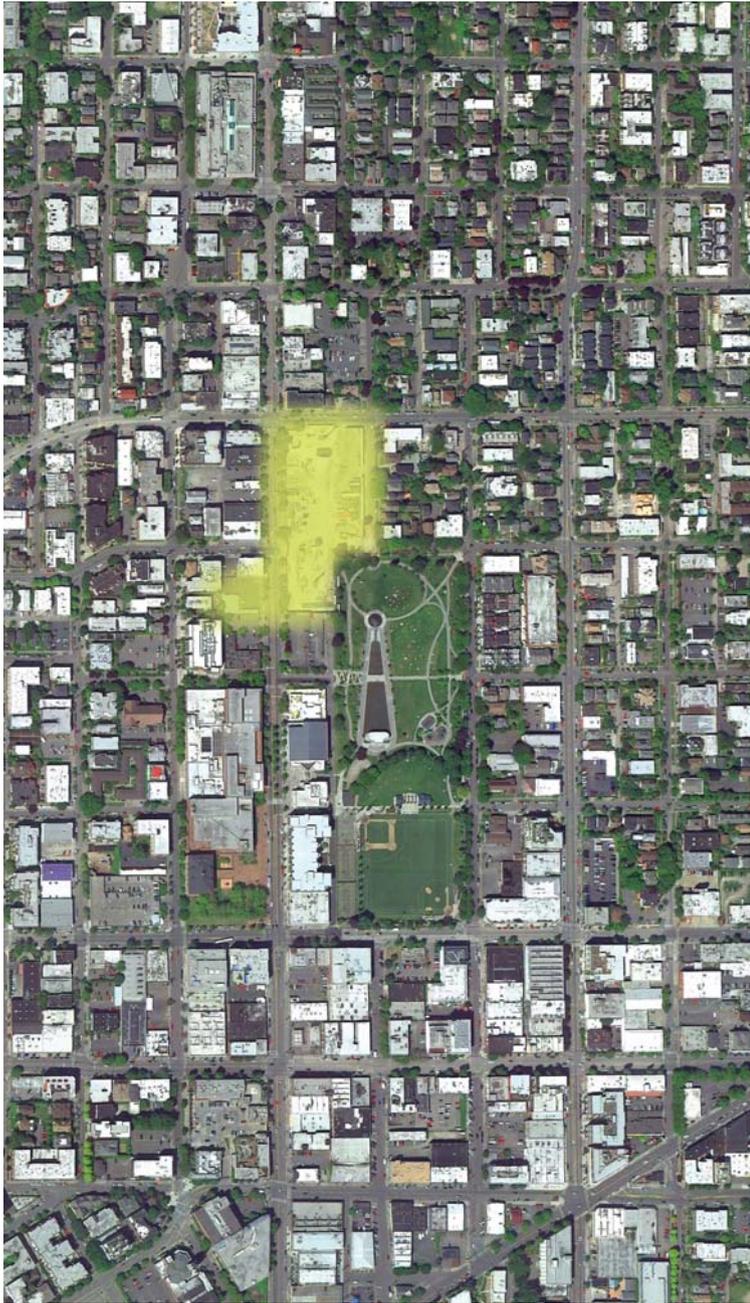
- Reduce materials consumption at front and back end
- Local focus at the appropriate scale
- Metrics based
- Net exporter of materials / energy

Appendix D

EcoDistrict Roadmap

EcoDistrict ROADMAP

This document presents GGLO’s recommended roadmap for the Capitol Hill EcoDistrict Study. In the following pages, we lay out a roadmap that we believe will achieve the goals of the Capitol Hill Ecodistrict Study, consisting of the following six components:



Highlighted Area of Capitol Hill Station Area Sites (Image Credit: GGLO)



RESEARCH



STRATEGIES



OUTREACH



IMPLEMENTATION



VISION



MEASUREMENT

EcoDistrict ROADMAP

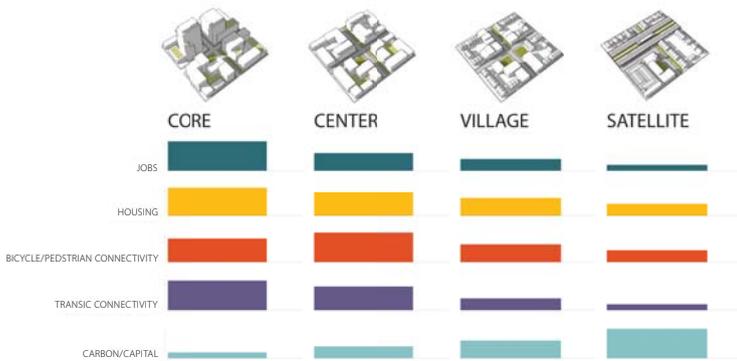
RESEARCH



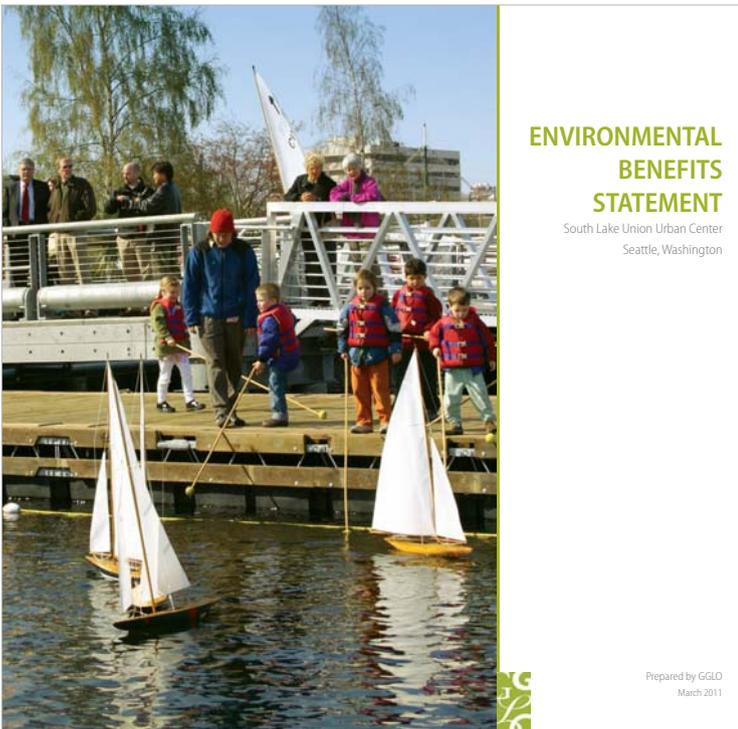
Collect and analyze information on the site context, EcoDistrict best practices nationwide, and relevant related projects and initiatives.

There is a wide spectrum of strategies that can be applied to an EcoDistrict. The choice of an appropriate set of strategies to pursue depends on numerous factors, including site location, scale, context, stakeholders, the regulatory environment, economics, demographics, politics, etc.

To provide a resource for determining the most promising strategies for the Capitol Hill site, a summary of EcoDistrict strategy best practices are divided into six categories: **(1) built environment, (2) infrastructure, (3) people, (4) management, (5) finance, and (6) policy.** Conceptually, these strategies can be grouped according to two basic purposes: those that have to do with creating physical sustainability (1 and 2), and those that have to do with creating operational sustainability (3, 4, 5 and 6).



Station area typology developed for the "Blueprint for Transit Oriented Communities"
(Image Credit: Futurewise, GGLO, and Transportation Choices Coalition)



The "Environmental Benefits Statement" is a tool developed by GGLO to assist developers and communities in identifying and promoting their project's sustainability features.

EcoDistrict ROADMAP

OUTREACH



Engage partners, resources, stakeholders, and the community to discuss priorities, brainstorm potential strategies, and solicit valuable feedback.

Partners

Key departments with which to form partnerships at the City of Seattle are the Office of Sustainability and Environment, the Office of Economic Development, and the Department of Planning and Development. Because Sound Transit controls the property on which the EcoDistrict will be located, the agency will play a critical partnership role in setting up development agreements or other mechanisms to ensure that new owners participate in the EcoDistrict.

Resources

Local resources for that could provide beneficial guidance include the Preservation Green Lab, Cascadia Green Building Council, International Living Building Institute, the Seattle 2030 District, and the TOD Champion.

Stakeholder Engagement

Key stakeholders for the Capitol Hill EcoDistrict site include potential developers of the Sound Transit properties, the Capitol Hill Chamber of Commerce, the Capitol Hill Community Council, Seattle Central Community College, Seattle Steam, and local property owners and business owners.

Community Engagement

Capitol Hill residents are passionate about their neighborhood. It will be important to engage the community at large throughout the process, educate them about the potential, and gather insights and suggestions. An engaged, supportive Capitol Hill community will be a tremendous asset for generating broad stakeholder buy-in on the outcomes from the initial partner/stakeholder engagement.



*Outreach for the North Rainier Neighborhood Plan Update (above), and King County Housing Authority's Greenbridge (left)
(Image Credits: GGLO)*



EcoDistrict ROADMAP

VISION



Define a vision for the EcoDistrict that establishes overarching guiding principles. This vision will provide guiding principles that will not only inform the choice of strategies, but also provide inspiration to the community at large.

EcoDistrict Motivation

The first step in establishing a Vision for the EcoDistrict is to articulate the motivation. Why are we doing this? What are the big-picture end goals, at the site, city-wide, regional, and global scales?

EcoDistrict Scope

The second step in establishing a Vision is to define the scope of the project, which entails determining the physical boundaries, ownership, timeline, authority, requirements for owner participation, role of community, etc. The scope may evolve over time as new participants are identified.



The 2009 North Rainier neighborhood plan update focused on opportunities in the Mount Baker light rail station area. (Image Credit: GGLO)

EcoDistrict ROADMAP

STRATEGIES

Determine a set of EcoDistrict strategies, at a variety of scales, to pursue.



Establish metrics and targets, and current performance baselines to track improvements over time.

Buildings: Energy efficiency, production, and retrofits; design to accommodate future district systems; and building uses and synergies that will best fit the vision and enhance equity.

Infrastructure: District utilities, on-site energy generation, alternative transportation, green infrastructure, greywater/blackwater treatment.

People - Sustainable Behavior: Foster participation by the community in the EcoDistrict over the long term, engagement, marketing, culture of sustainability, demand management, incorporation of community assets, e.g. a community center or community garden.

Management: EcoDistricts require innovative and reliable mechanisms for long-term management. As an established non-profit, Capitol Hill Housing is uniquely poised to establish successful management.

Finance: The Seattle 2030 District is a local resource and potential partner for help on addressing up front costs. They are already working with the City of Seattle, the Clinton Climate Initiative, the Northwest Energy Efficiency Alliance, and Seattle Steam to address EcoDistrict financing challenges.

Policy - Regulatory Mechanisms: Tools to explore include development agreements, incentive zoning, contract rezones, design guidelines; form-based codes; and the City's urban design framework.



*Living Building and Multifamily Conceptual Design for Capitol Hill, "The Future of Sustainable Design," October 2010
(Image Credit: GGLO)*

EcoDistrict ROADMAP

IMPLEMENTATION



Set priorities and implement the strategies. The implementation of the Capitol Hill EcoDistrict would be carried out in a future phase. Implementation would begin with the creation of an action plan that assigns a timeline, baseline, tasks, and management responsibilities for each of the chosen strategies. The scale of time frame of implementation could vary greatly depending on the final choice and definition of strategies.



*Green wall as infrastructure and education at the Bertschi School Science Wing, on target to be the first Living Building in WA.
(Image Credit: Benjamin Benschneider)*

EcoDistrict ROADMAP

MEASUREMENT



Conduct ongoing assessment of EcoDistrict performance, provide feedback, and make improvements. EcoDistrict assessment would occur during future phases of this project. The metrics associated with each of the goals would be periodically measured and analyzed. Results would provide all important feedback on the level of success. Deviations from expected results would inform modifications to methods and process, and provide insight for future work. Ideally measurement would become an established process of the EcoDistrict management structure.



Measuring Performance

GGLO collaborated with Capitol Hill Housing in the design of Broadway Crossing (LEED Silver), and then continued with measuring building performance after building occupancy. Lessons learned allowed the team to fine tune building operations. (Image Credit: William P Wright)



What is an EcoDistrict?

An EcoDistrict is sustainability applied at the neighborhood scale. EcoDistricts provide a framework for realizing advanced sustainability — increasing efficiencies, reducing pollution, restoring ecosystems, and improving communities — through behavior change, building design and infrastructure investments. EcoDistricts are measured for improved performance over time.