



EcoDistricts

A PRIMER

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June 18, 2014

The Pearl District Portland

A Foundation for EcoDistricts



The Pearl District

Portland

**The
Framework Plan**
has guided the
evolution of
a successful
neighborhood



DISTRICT STRATEGY

The Brewery Blocks

Portland

CITY BLOCKS

5

JOBS

200

HOUSING UNITS

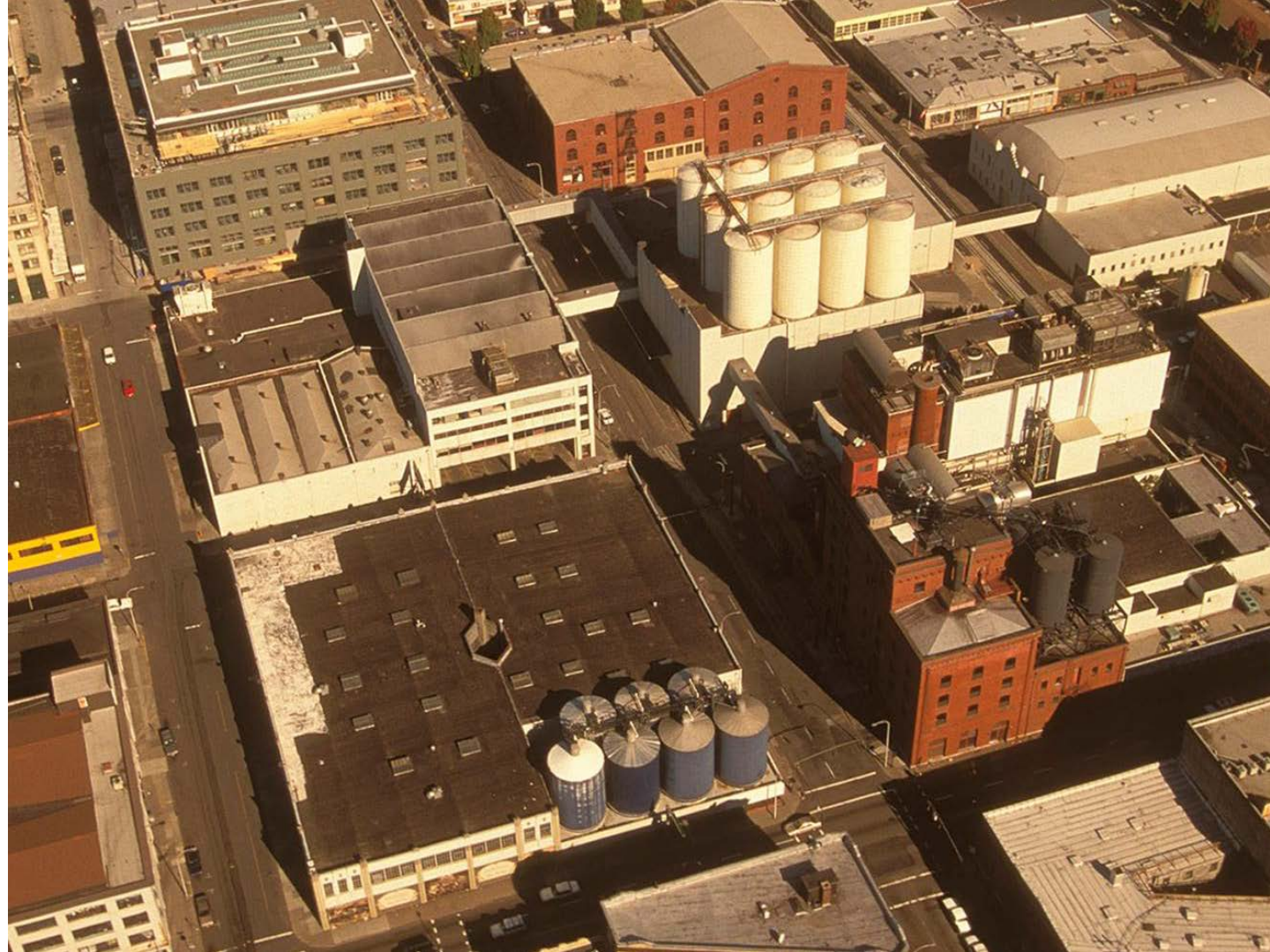
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USES

Brewing

DEVELOPED BY

**Gerding Edlen
Development**



DISTRICT STRATEGY

The Brewery Blocks

Portland

CITY BLOCKS

5

JOBS

7,000

HOUSING UNITS

400

USES

Retail
Housing
Office
Culture



DISTRICT STRATEGY

The Brewery Blocks

Portland

ORIGINAL GOALS

- **Livability, Community, Connectivity, Sustainability**
- **All Buildings LEED Silver Certified**
- **20% Energy Efficiency**
- **20% Water Efficiency**
- **75%+ Construction & Demolition Waste Recycling**

REALIZED

- **Livability, Community, Connectivity, Sustainability**
- **LEED: 1 Platinum, 4 Gold, 1 Silver**
- **Energy Efficiency: 20% in Core & Shell, 30% in Residential, 45% in Theater**
- **Water Efficiency: 20% in Commercial 30% in Residential 40% in Theater**
- **90% Construction & Demolition Waste Recycling**

DISTRICT STRATEGY

The Brewery Blocks

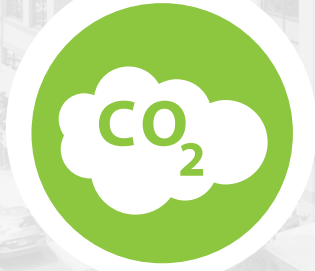
Portland



ANNUAL SAVINGS

4.86 million kwh & \$340,000

Enough energy to power 443 homes.



661 metric tons of CO₂

Equal to taking 135 cars off the road.



3.52 million gallons of water

Enough water for 175,900 showers.

DISTRICT STRATEGY

The Brewery Blocks

Portland

BROADER INFLUENCES

- **Energy Strategies**
BIPV, Waste Heat Recovery,
Chilled Beams, VRF Systems,
Displacement Ventilation,
Wind Turbines
- **Ecoroofs, Rainwater Reuse**
- **Streetscape Improvements**
Underground parking
- **Transit Options**
Bike Parking, Streetcar
& Bus Stops
- **District Strategies**
Chilled Water Plant that also serves
Twelve | West
Centralized
Stormwater Treatment





EcoDistricts



Revitalizing cities from
THE NEIGHBORHOOD UP.

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Districts are the building blocks
of sustainable cities



EcoDistricts



**Economic opportunity,
community well-being,
and ecological health**
are fundamental metrics.

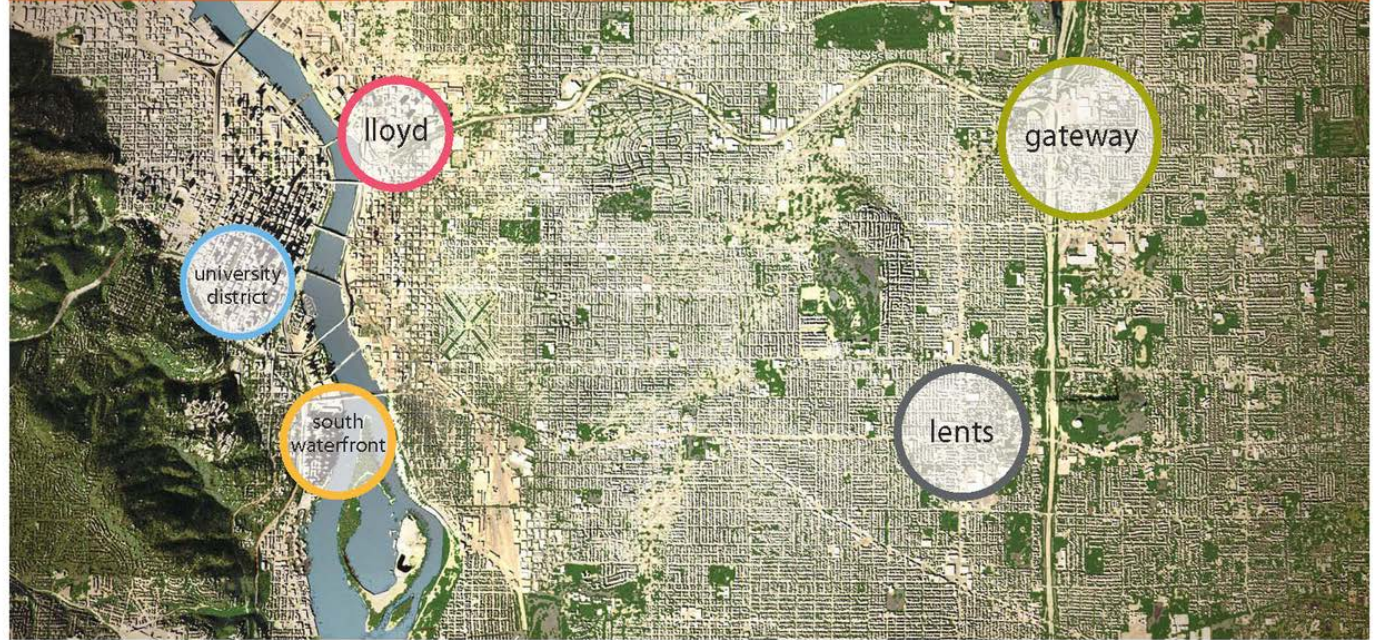


EcoDistricts

Ecodistricts are the integration of **green buildings**, **smart infrastructure** & **community engagement and action**.



PORTLAND SYMBIOTIC DISTRICTS TOWARDS A BALANCED CITY



5

EcoDISTRICTS

Neighborhoods are the right scale to accelerate sustainability – small enough to innovate quickly and big enough to have meaningful impact. Their varied behavior and characteristics are an asset providing resources to share across a city. For example, a district with ample sun exposure can fuel a downtown that consumes more than its solar potential. Together, they create balance and a city in symbiosis whose sum is greater than its parts.

7 PETALS

- 1 site
- 2 water
- 3 energy
- 4 health
- 5 materials
- 6 equity
- 7 beauty



a breath of fresh air re-envisioning main street

Imagine going from an environment full of asphalt and fast moving traffic to a **place for bees, bikes, babies, and birds**. What would that place be like? It would be an ecologically supportive environment teeming with the most vulnerable residents of our planet. It is filled with pedestrians, bicyclists and public transport replacing autos. Copenhagen reminds us that **bicyclists are not part of transport, they are part of public life**. We have accommodations for commuter bicyclists and eight year olds out with their grandparents. One could imagine that **every drop of water that falls on main street stays on main street or leaves cleaner than when it fell**. In that sense, it defines an incremental watershed in anticipation of its role in developing a fully functioning EcoDistrict over a period of time. It is, simply, a place you would rather be that is good for you.

no more silent giants repurposing the big box



A regional transit station with light rail, and streetcar deserves more than surface lots serving big boxes. Such **large expanses of asphalt are ideal for new housing** that brings people closer to transit and accommodates new models for small business. Imagine transforming a super block leftover from a Home Depot by transecting it with walkable green streets that serve bikes, people, urban agriculture, and treat stormwater while repurposing the building for a school, community center, or marketplace. The rooftops alone of this repurposed big box location can produce up to 4,400,000 kWh per year with **solar power that would meet the electrical energy needs of 790 households** (assuming an average daily use of 15 kWh).



feasting on freeways

transforming highways to green spaces & agricultural production

How would you eat up an eight lane freeway? Six lanes of asphalt are digested into a **greenway for biking, walking, and urban agriculture**. Stormwater flows into runnels next to the remaining two lanes to be **collected, treated and reused as freshwater** in the neighborhood. Less pollution from less traffic makes the new natural corridor ideal for a set of plots for growing fruit and vegetables or producing dairy. **Vendors serve food sourced from 100 feet away**. Have you ever tasted a quarter mile carrot? With regional transit and improved bikeways, all Portland residents can access this greenway sans freeway.



EcoDistricts

softer touch living infrastructure

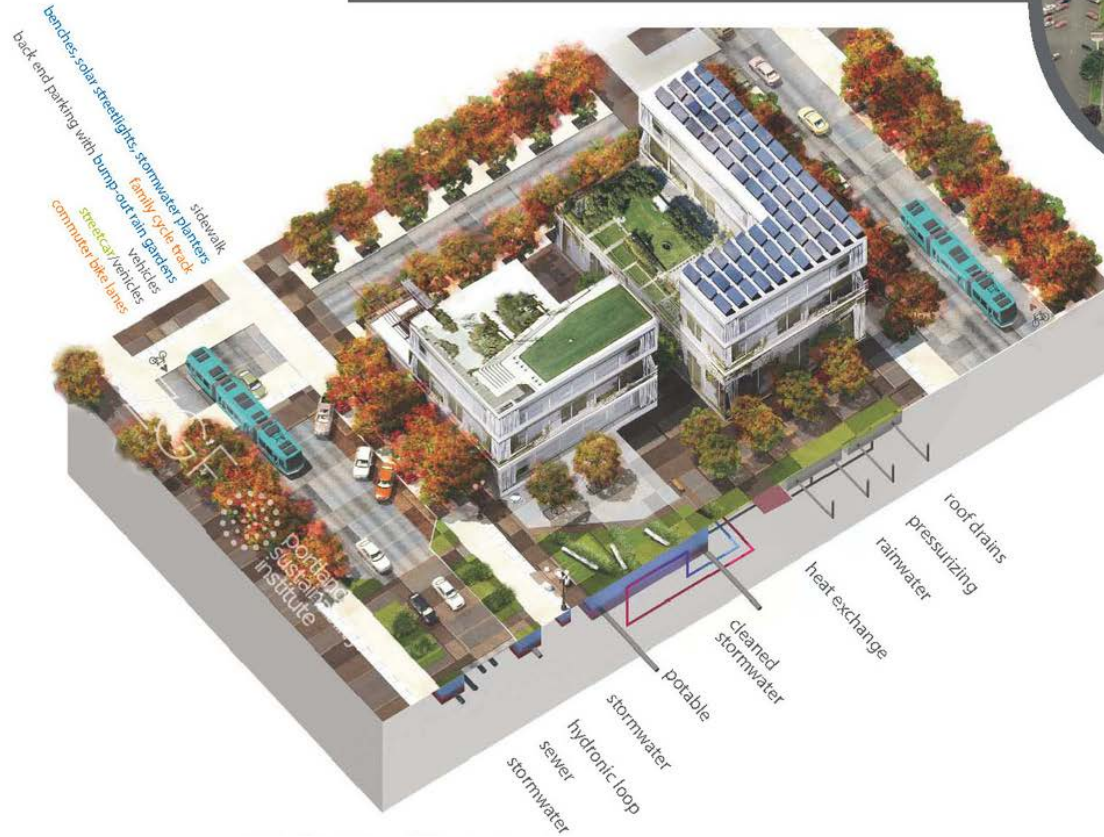
Bold infrastructure interventions build towards a city living in balance. The redevelopment of a main street at the site of a regional transit station provides a rich street life based on pedestrians, bicycles, and public transport. Urban greenways created from abandoned freeways and green streets provide a new green city infrastructure for habitat, food, water and waste. In a net-zero energy and water community, local fuels power nodes of district energy that couple efficient mixed-use structures, and neighborhood water utilities capture, clean and reuse water arriving from the sky. The urban greenways, roof gardens, living walls, and use of the in between green spaces allow agriculture to be embedded into the community.

-  Residential buildings use excess heat captured from supermarket refrigeration systems
-  Geothermal conditioning loops extend across the neighborhood below ground connecting to heat pumps in buildings
-  People, bikes, trains and buses dance in a multi-modal system on streets where cars are prohibited
-  Renewable energy production (solar and wind) integrates into the urban fabric
-  Organic wastes are anaerobically digested to produce energy



EcoDistricts

putting the streets to work above and below the surface



Initiation of the
“EcoDistricts”
Strategy

Neighborhood Typologies



Cities +
Utility Providers



PROJECT SNAPSHOT

1st EcoDistricts director
in the US

60% energy savings by
2035

Comprehensive building
retrofit program

LED street lighting
retrofit

District thermal energy
system

Aggregated renewable
energy - 5% of demand
by 2035



CASE STUDY



Governance Model

The Lloyd EcoDistrict, governed by a new NGO aspires to be the most sustainable business district in North America. The Portland Trail Blazers are helping lead the way with new investments in their sports campus.

PROJECT SNAPSHOT



- 81 acre brownfield site
- Integrated infrastructure: foreshore/habitat water, energy, transportation, waste
- District energy: 6.2K tons/yr. GHG reductions = 65% helping to achieve GHG neutrality
- District energy: 7.2% return compares favorably with the City's cost of debt of approximately 4% (real rates of return)



CASE STUDY

Gold Metal Neighborhood

Vancouver's SE False Creek Neighborhood, home to the 2010 Winter Olympics Athletes' Village, pioneered new strategies in urban design, neighborhood planning, infrastructure and green building performance. It also earned a LEED Platinum designation.

SW
EcoDistrict
Washington DC

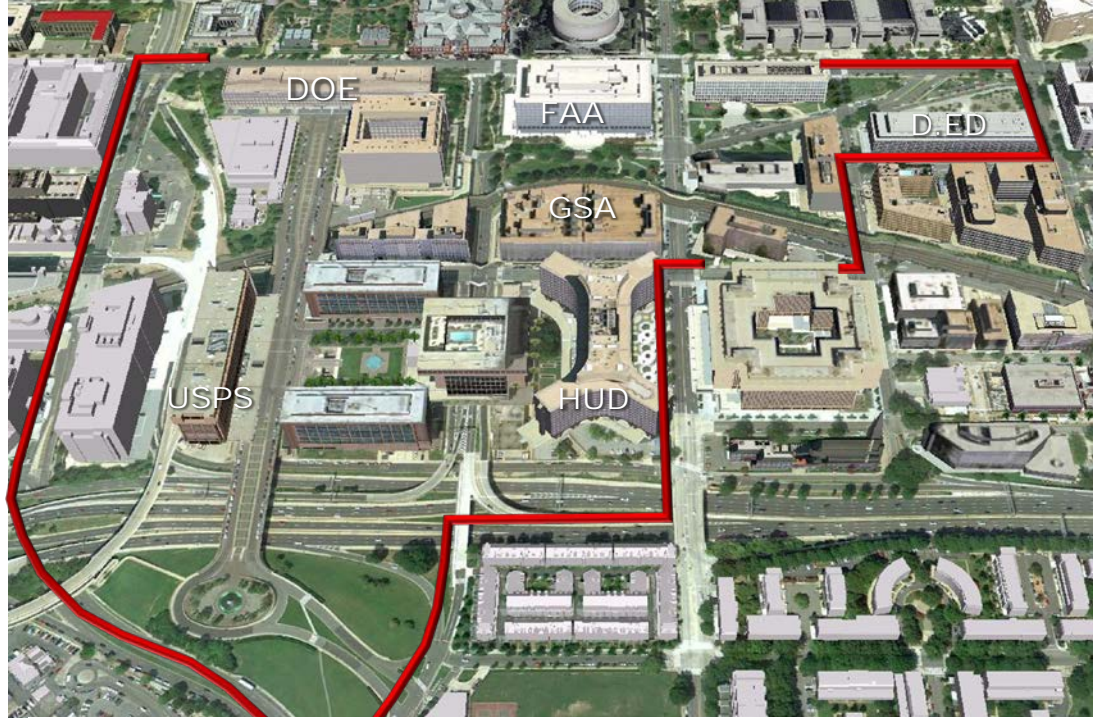
Monumental Core
Framework Plan



Southwest
Rectangle

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Washington DC

Study Area



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Washington DC

Political Initiative

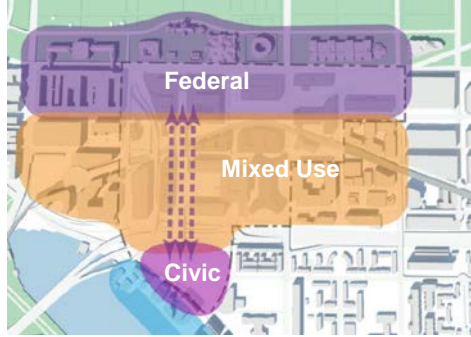
Strategic
Partnerships

Executive Order 13514
Leadership in Environmental,
Energy & Economic Performance

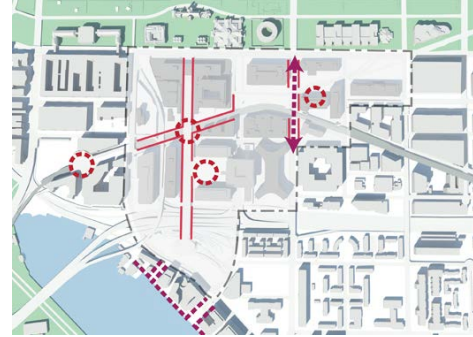
- A transformative shift in how the government does business;
- Makes the reduction of greenhouse gas emissions a priority for Federal agencies;
- It sets targets for energy, water, and waste reduction.



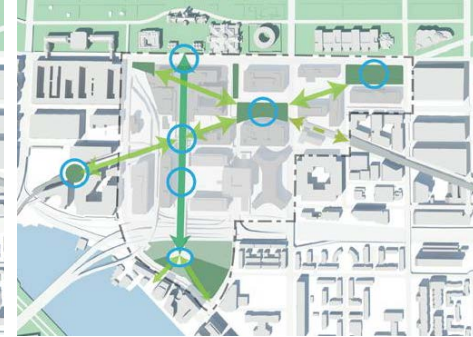
Neighborhood &
Environmental
Frameworks



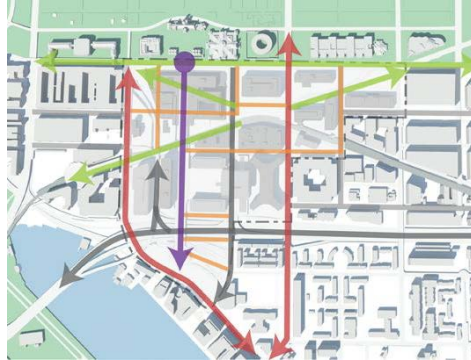
Transformation to
Mixed Use Community



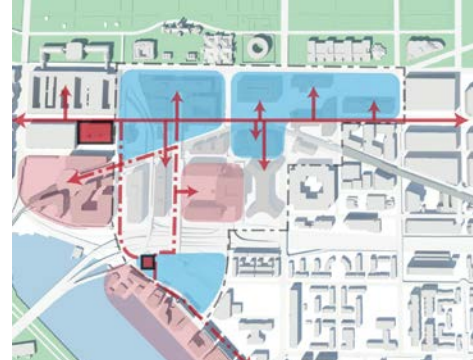
Active Building Frontage
The First 30 Feet



A Sequence of Civic Features
and Open Space



Transit and Multi-Modal
Street Network

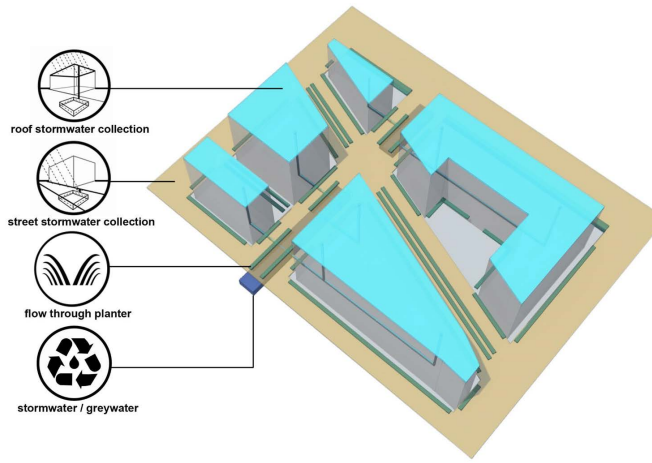


District Energy
and MicroGrids

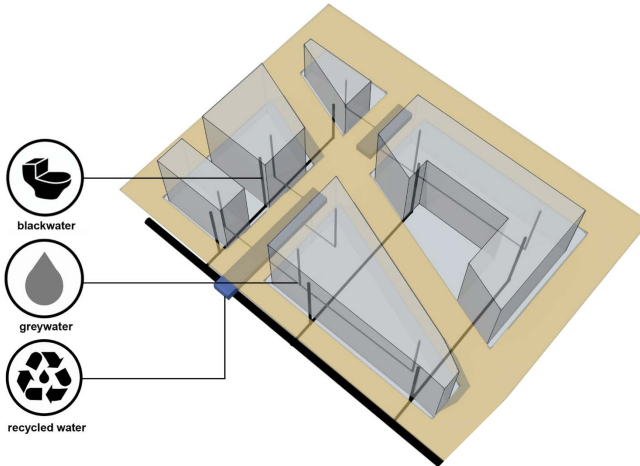


District Water
Collection and Reuse

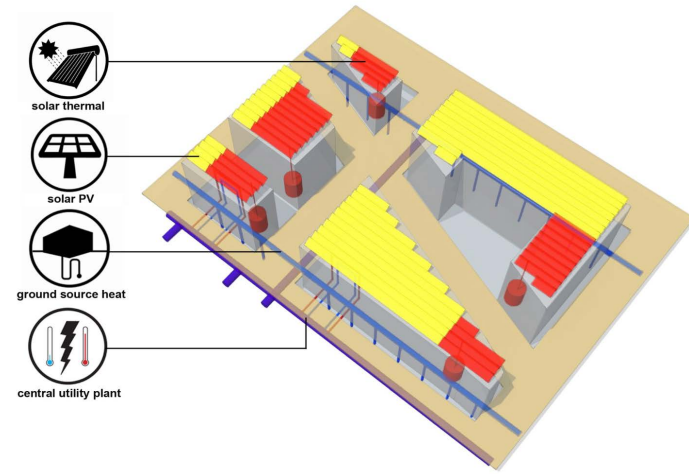
Interventions
At Block Scale



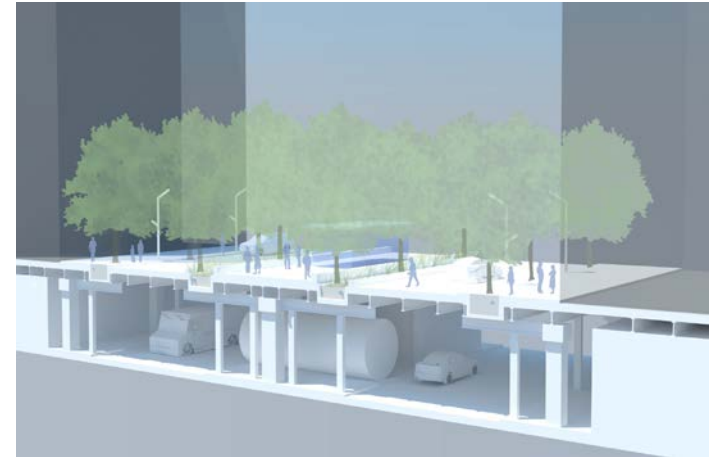
Stormwater Collection and Reuse



Waste Water Systems



Energy Network and Renewables



Optimize Existing Infrastructure

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Washington DC

The Path to
Livability and
Sustainability
Today



SW EcoDistrict

Washington DC

The Path to Livability and Sustainability

Multiple Development
Strategies

- Light rehab
- Full rehab
- Repurpose
- Infill
- Redevelopment
- Park Space
- Central Utility Plant
- Solar canopy



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Washington DC

The Path to
Livability and
Sustainability

Guiding Successful
Revitalization



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10th Street SW
A High-Performance Street



SW
EcoDistrict
Washington DC

10th Street SW
A High-Performance Street



SW
EcoDistrict
Washington DC

Civilizing Transit
L'Enfant Intermodal Transit



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EcoDistrict
Washington DC

Civilizing Transit
L'Enfant Intermodal Transit



SW
Ecodistrict
Washington DC

Banner Overlook
Connecting the Mall to the
waterfront



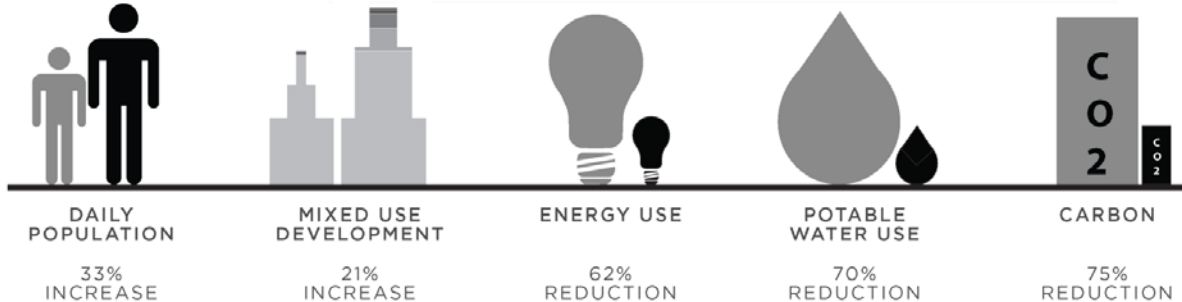
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Washington DC

Banner Overlook
Connecting the Mall to the
waterfront



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Washington DC

A Comparison
Today and in 2030



The Business Case

investments

- Sustainability (Buildings / Utilities)
- Open Space and Streetscapes
- Real Estate and New Development

benefits

- Revenue from sale of excess land for private development.
- Cost savings from energy, water and waste efficiencies.
- Creation of sustainable, mixed-use neighborhood.
- Enhanced opportunities for federal facilities and cultural destinations.

Public and Private Investment Yields Sustainable Benefits



EcoDistricts Framework

The **Framework** offers a process management approach and performance areas to build support, guide investments and measure outcomes.



ECODISTRICTS

The EcoDistricts™ Framework Building Blocks of Sustainable Cities

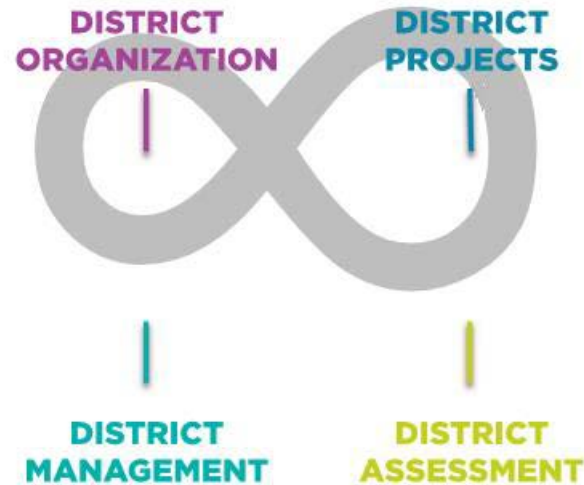
May 2013



EcoDistricts

The EcoDistricts Approach

4-STEP METHODOLOGY



8 PERFORMANCE AREAS



EQUITABLE DEVELOPMENT

Promote equity and opportunity and ensure fair distribution of benefits and burdens of investment and development



HEALTH + WELL BEING

Promote human health and community well being



COMMUNITY IDENTITY

Create cohesive neighborhood identity through the built environment and a culture of community



ACCESS + MOBILITY

Provide access to clean and affordable transportation options.



ENERGY

Achieve net zero energy usage annually



WATER

Meet both human and natural needs through reliable and affordable water management



HABITAT + ECOSYSTEM FUNCTION

Achieve healthy urban ecosystems that protect and regenerate habitat and ecosystem function..



MATERIALS MANAGEMENT

Zero waste and optimized materials management.





EcoDistricts

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June 18, 2014

What is an EcoDistrict?

- > An EcoDistrict includes **transportation** choices and a **mix of uses** within a neighborhood.
- > An EcoDistrict includes **connected** parks, plazas and **open spaces** for a vibrant, green, and **walkable** community.
- > In an EcoDistrict, strategies for **energy reduction, waste and water use** go beyond a single building to develop solutions at the **block and district scale**.
- > In an EcoDistrict, neighbors, community institutions and businesses join with city leaders and utility providers to meet **environmental and economic goals** through **shared implementation** of innovative projects.