Catching Rain:
Low Impact Development & Green Stormwater Strategies *for* Real Estate Professionals

Spring 2013

Presented by:

SOUND NATIVE PLANTS

SEEC LLC Social, Environmental & Economic Consulting

WASHINGTON STATE UNIVERSITY EXTENSION

Funding from:

DEPARTMENT OF ECOLOGY State of Washington

Marketing the Value of LID
Robbi Currey, SEEC LLC

- ❑ LID Benefits -Economic, Environmental & Societal
- ❑ Quantifying the Benefits of LID Practices
- ❑ Case Study 1 - Half Moon Bay, Liberty Lake
- ❑ Case Study 2 - SCC Jenkins Wellness Center – Spokane
- ❑ Case Study 3 – Riverstone Mixed Use Development – Coeur d' Alene
- ❑ Case Study 4 – High Point HOPE VI Redevelopment, West Seattle
- ❑ Case Study 5 – Shamrock Heights, Renton

Marketing Hurdles

"fear about higher costs is cited again and again as one of the top hurdles to more widespread use of green solutions"

Source: Lisa Stiffler:
"Saving cash with green stormwater solutions," *Sightline*

Marketing Hurdles

"78 percent of the American public does not understand that runoff from agricultural land, roads, and lawns, is now the most common source of water pollution; and nearly half of Americans (47 percent) believes industry still accounts for most water pollution"

Source: National Environmental Education & Training Foundation 2005

7. Which of these are you most worried about?

Response Category	Total N=1200	Idaho N=400	Oregon N=400	Washington N=400
The quality of your drinking water	35%	34%	36%	34%
The health of local rivers, streams, and lakes	24%	24%	23%	24%
The air quality in your community	17%	22%	17%	15%
Industrial pollution	11%	5%	11%	13%
Agricultural pollution	5%	4%	3%	6%
The health of area forests	9%	11%	9%	9%

DHM Research | EarthFix Clean Water Act Survey, July 2012
EarthFix Clean Water Act Survey July 9 – July 14, 2012; N=1,200 (N=400 ID, OR, WA)

Marketing Advantages

"In addition to reducing polluted stormwater runoff, GI practices can also positively impact energy consumption, air quality, carbon reduction and sequestration, property prices, recreation and other elements of community health and vitality that have monetary or other social value"

Source: CNT The Value of Green Infrastructure

The Value Add Proposition of LID

Hydrology On Site Management → Protect & Restore Soils → Local Vegetation → Sustainable Materials → Species Health & Well-Being → Hydrology On Site Management

= Economic Environmental Social Benefits

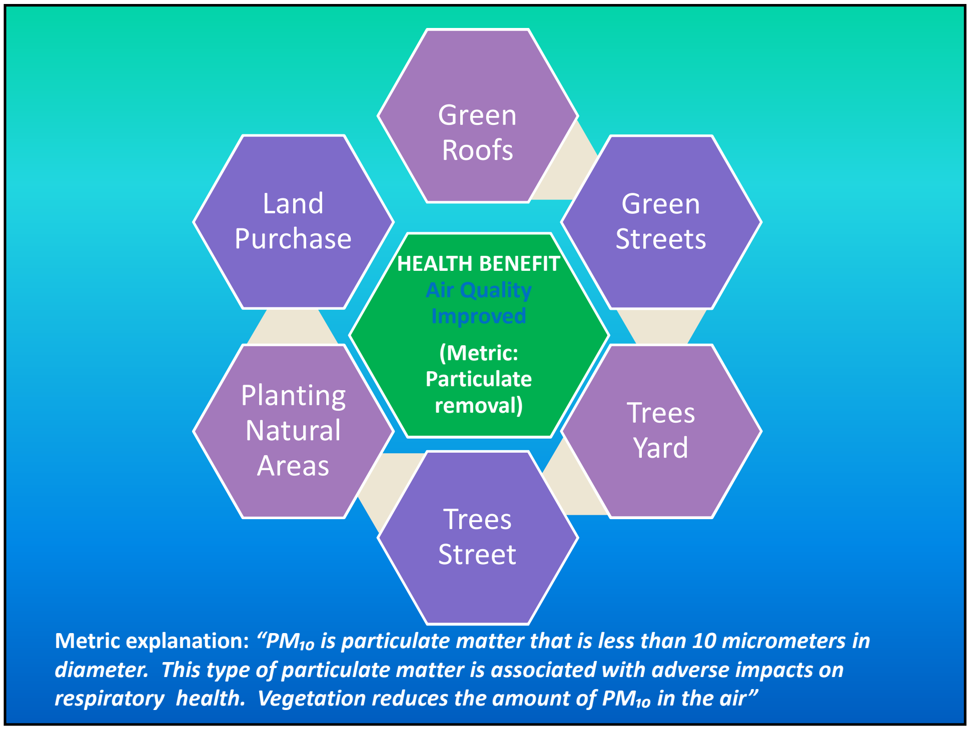
Quantifying The Benefits of LID

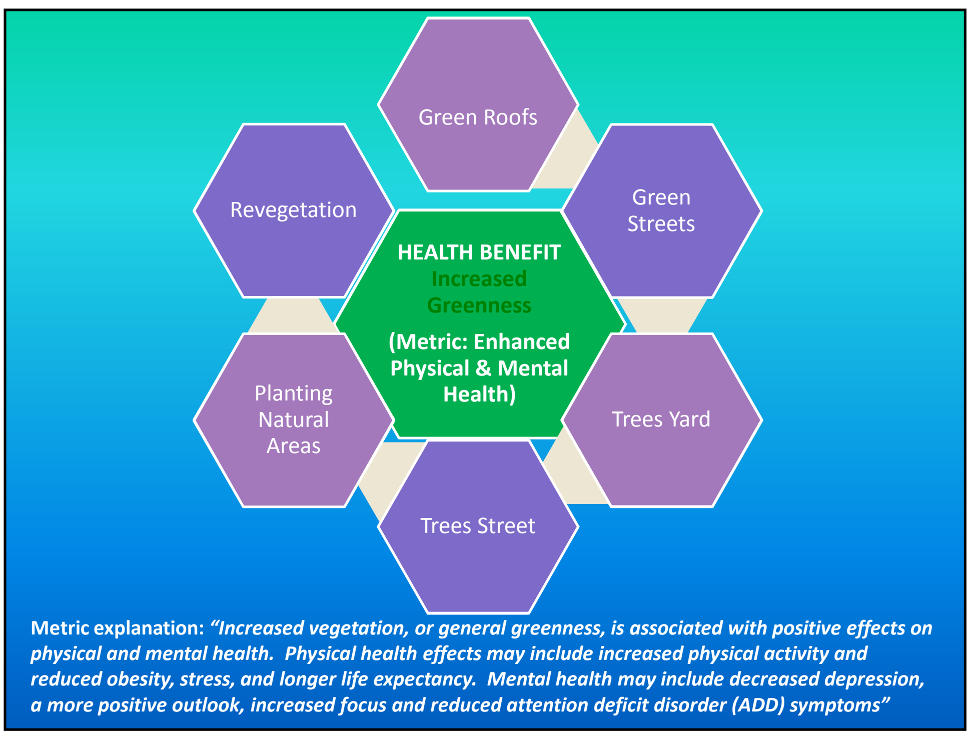
Health Benefits
- Air Quality Improvement
- Increased Greenness

Energy Benefits
- Energy Savings
- Greenhouse Gas Reduction

Community Livability Benefits
- Amenity/Aesthetics Improvement
- Community Cohesion
- Environmental Equity
- Access to Nature

Source: **Portland's Green Infrastructure: Quantifying the Health, Energy, and Community Livability Benefits Report 2010**


Green Roofs
Land Purchase
Green Streets
HEALTH BENEFIT
Air Quality Improved
(Metric: Particulate removal)
Planting Natural Areas
Trees Yard
Trees Street
Metric explanation: *"PM_{10} is particulate matter that is less than 10 micrometers in diameter. This type of particulate matter is associated with adverse impacts on respiratory health. Vegetation reduces the amount of PM_{10} in the air"*


Green Roofs
Revegetation
Green Streets
HEALTH BENEFIT
Increased Greenness
(Metric: Enhanced Physical & Mental Health)
Planting Natural Areas
Trees Yard
Trees Street
Metric explanation: *"Increased vegetation, or general greenness, is associated with positive effects on physical and mental health. Physical health effects may include increased physical activity and reduced obesity, stress, and longer life expectancy. Mental health may include decreased depression, a more positive outlook, increased focus and reduced attention deficit disorder (ADD) symptoms"*

Metric explanation: ***"Property values are determined not only by the value of the property itself, but also the attractiveness of surrounding amenities and aesthetics. Property values can be used to measure the enhanced aesthetics/amenities due to increased levels of vegetation and restored natural areas"***

Property Values Affected by LID BMPs

Numerous studies have been conducted that explore how property values increase in locations near green infrastructure and open space. The approach used considers all properties within an area, and employs regression analysis to isolate the degree of price difference that is attributable to individual property characteristics. The technique is called the hedonic property value method. Fortunately, several hedonic property value studies have been conducted in the Portland area and have addressed the question of how trees, open space, and increased vegetation have an impact on property values in the City. As described above, this report uses property values as a metric or proxy for the benefit of improved aesthetics and amenities within the City, and so hedonic property value studies were sought that linked property values explicitly to G2G BMPs or similar environmental features.

- Donovan, Geoffrey H. and David T. Butry, Market Based Approaches to Tree Valuation, Arborist News 2008(August): 52-55.
- Lutzenhiser, Margot, and Noelwah Netusil, (2001), The Effect of Open Spaces on a Home's Sale Price, *Contemporary Economic Policy* 19(3):291-298.
- Steiner, Carol F. and John B. Loomis (1996) Estimating the Benefits of Urban Stream Restoration using Hedonic Price Method. Rivers 5(4): 267-278.
- Ward, Bryce;MacMullan, Ed;Reich, Sarah, (2008). The Effect Of Low-Impact-Development On Property Values *Proceedings of the Water Environment Federation*, Sustainability 2008 , pp. 318-323(6)

Born in Detroit

The answer, believe it or not, was born in Detroit, in 1938. Andrew Court, an economist for General Motors, was looking for a type of analysis that would compare the prices of cars produced at different times.

He argued that size, power, weight, etc. may vary from year to year, so what he wanted was a control for these changes in order to get a measure of the valuation of each component, and hence the price change, holding them constant.

In the simplest form, you had:

$P = \;_0 + \;_1 Z_1 + \;_2 Z_2 + \ldots + \text{¢}t + \text{£}$,

where your Z_i are component parts, and *t* is your time trend.

Uses

When large databases became available, it became useful to consider the same type of analysis for several reasons:

- Real estate assessment - it could be done quickly.
- Measurement of individual contributions - structure might be easy to measure based on costs, but what about neighborhood?
- Externalities - If air pollution is important, for example, shouldn't we be able to measure its impact on property values?

$$P = \ {}_0 + \ {}_1Z_1 + \ {}_2Z_2 + \ldots + ¢t + £ ,$$

- **Should equation be linear? Does the 10th room impart as much value as the 3rd room, or the 7th?**
- **What is the hedonic price of an attribute?**
  A> ôP/ôZ_i → hedonic price.
- **What is the meaning of a hedonic price? Is it supply, or demand, or what?**
- **Are the coefficients stable over time?**
- **Should the buyer's or seller's characteristics go into the equation?**

The Center for Neighborhood Technology (CNT)

www.cnt.org

Tools for LID Evaluation:

Green Infrastructure Valuation Guide
Green Values® Stormwater Toolbox

Benefit
Measurement & Valuation

- ❑ Step 1
  - ❑ Quantification of Benefit
- ❑ Step 2
  - ❑ Valuation of Quantified Benefits

Benefit / Practice	Reduces Stormwater Runoff											Improves Community Livability						
	Reduces Water Treatment Needs	Improves Water Quality	Reduces Grey Infrastructure Needs	Reduces Flooding	Increases Available Water Supply	Increases Groundwater Recharge	Reduces Salt Use	Reduces Energy Use	Improves Air Quality	Reduces Atmospheric CO_2	Reduces Urban Heat Island	Improves Aesthetics	Increases Recreational Opportunity	Reduces Noise Pollution	Improves Community Cohesion	Urban Agriculture	Improves Habitat	Cultivates Public Education Opportunities
Green Roofs	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Maybe	Yes	Maybe	Maybe	Yes	Yes
Tree Planting	Yes	Yes	Yes	Yes	No	Maybe	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Maybe	Yes	Yes
Bioretention & Infiltration	Yes	Yes	Yes	Yes	Maybe	Maybe	No	No	Yes	Yes	Yes	Yes	Yes	Maybe	Maybe	No	Yes	Yes
Permeable Pavement	Yes	Yes	Yes	Yes	No	Maybe	Yes	Maybe	Yes	Yes	Yes	No	No	Yes	No	No	No	Yes
Water Harvesting	Yes	Yes	Yes	Yes	Yes	Maybe	No	Maybe	Maybe	Maybe	No	No	No	No	No	No	No	Yes

Source: CNT 2010 — Yes / Maybe / No

Review of LID BMP
Plant Trees

Feature: Planting Trees – Step 1 Quantification of Benefit

Economic Measurement	Environmental Benefit	Societal Benefit
Number of trees * av. Annual interception per tree (gal/tree) = total runoff reduction (gal)	-Reduces Stormwater run-off -Increases ground water recharge -Reduces energy use -Improves air quality -Reduces atmospheric C02 -Reduces Urban Heat Island -Improves Habitat	-Improves Community Livability -Cultivates public education opportunities -Improves mental well-being

Review of LID BMP
Plant Trees

Feature: Planting Trees – Step 2 Valuation of Quantified Benefits

Benefit Reduces Stormwater Run-off	Valuation Methodology of Benefit
- Reduced Water Treatment Needs	Runoff reduced (gal) * avoided cost per gallon ($/gal) = avoided stormwater treatment costs ($)
- Reduced Grey Infrastructure Needs	Conventional cost of structure ($/SF) * total area of structure (SF) = total expenditure for conventional approach ($) Total expenditure for conventional approach ($) * % retained = avoided cost savings ($)
- Improved Water Quality	Secchi Disk Test (clarity of water depth) Hedonic Price Method
- Reduced Flooding	Hedonic Price Method; Insurance Premiums; Avoided Damage Cost Approach

Review of LID BMP
Plant Trees

Feature: Planting Trees – Step 2 Valuation of Quantified Benefits	
Benefit Improves Community Livability	**Valuation Methodology of Benefit**
- Improves Aesthetics	Hedonic Price Method -Ward et al (2008) 3.5-5.0% King County -Wachter (2004); Wachter & Wong (2008) 2-10% -Report recommends a mean of 3.5% increase be used
- Increases Recreational Opportunities	User Day Methodology (Stratus 2009)
- Reduces Noise Pollution	Hedonic Price Method Reduction in property value of .55-.86% per 1 decibel increase in noise level
- Improves Community Cohesion	-Increase in social capital -Decrease in crime (Sullivan, Kuo & Depooter 2004)

Example Demonstration 1: Benefit Assessment of a single Green Roof

Benefit	Step 1: Benefit Quantification resource unit(s)	Step 2: Benefit Valuation resource unit * price	Annual Benefit $
Reduces Stormwater Runoff	**Annual Stormwater Retention Performance:** 71,100 gal retained *(Example 1.1)*	**Value of Annual Avoided Treatment Cost:** 71,100 gal * \$0.0000919/gal = \$6.53 *(Example 1.6)*	\$6.53
Reduces Energy Use	**Annual Building's Cooling (electricity) Savings (kWh):** 1,122 kWh *(Example 2.1)*	**Value of Annual Building's Cooling Savings:** 1,122 kWh * \$0.0959/ kWh = \$107.60 *(Example 2.5)*	
	Annual Building's Heating Natural Gas Savings (Btu): 36,158,750 Btu *(Example 2.2)*	**Value of Annual Building's Heating Savings:** 36,158,750 Btu * \$0.0000123/Btu = \$444.75 *(Example 2.5)*	
	Annual Off-site Water Treatment Electricity Savings (reduced treatment needs of 71,100 gal): 110.77 kWh *(Example 2.4)*	Annual Off-site Water Treatment Electricity Savings will not be valued here because the value has already been accounted for above *(Example 1.6)*.	
	Total Annual Electricity Savings (kWh, from on-site and off-site benefits): ∑ 1,122 kWh in cooling savings + 110.77 kWh in water treatment electricity savings = 1,232.77 kWh	The Total Annual Electricity Savings will not be valued here to prevent double counting. Instead, it is used to quantify "Air" and "Climate" benefits.	\$107.60 + \$444.75
Improves Air Quality *Note: The figures used here only account for the benefits of reduced NO_2. Similar steps should be performed for the other criteria pollutants, when possible*	**Annual Direct NO_2 Uptake:** Lower Bound = 1.50 lbs NO_2 Upper Bound = 2.39 lbs NO_2 Average = 1.95 lbs NO_2 *(Example 3.1)*	**Value of Total Annual NO_2 Benefit:** 30.19 lbs NO_2 * \$3.34/lb NO_2 = \$100.83 *(Example 3.6)*	
	Annual Indirect Reduction in NO_2 Emissions (from reduced electricity and natural gas): 28.24 lbs NO_2 *(Example 3.5)*		
	Total Annual NO_2 Benefit (Direct uptake using the average NO_2 uptake value + Indirect avoided emissions): ∑ 1.95 lbs NO_2 + 28.24 lbs NO_2 = 30.19 lbs NO_2 *(Example 3.6)*		\$100.83
Reduces Atmospheric CO_2	**Total Annual Indirect Benefit** (from electricity and heating natural gas savings): 1,639.58 lbs CO_2 + 4,226.6 lbs CO_2 = 5,866.18 lbs CO_2 *(Example 4.5)*	**Value of Total Annual Climate Benefit:** 6,486.41 lbs CO_2 * \$0.00756/ lb CO_2 = \$49.04 in total annual climate benefits *(Example 4.6a)*	
	Annual Direct Carbon Sequestration Benefit in CO_2 Equivalent (multiplying lbs C from Example 4.1 by conversion factor): = 620.23 lbs CO_2 *(Example 4.6)*	*Note: Here the lower bound (EU's ETS Carbon Price) of the range of carbon pricing was used. Keep in mind that this provides a conservative estimate of the economic, environmental and other social values of carbon abatement*	
	Total Annual Climate Benefit (Direct + Indirect): ∑ 620.23 lbs CO_2 + 5,866.18 lbs CO_2 = 6,486.41 lbs CO_2 *(Example 4.6)*		\$49.04
		Total Annual Benefit (∑ Annual Benefits)	**\$708.75**

Example Demonstration 2:

Benefit Assessment of a Neighborhood Scale

Benefit	Annual Benefit ($) per 5,000 SF green roof (Example Demonstration 1)	Annual Benefit ($) from scaled green roof program (= annual benefit per roof * 240 converted roofs)
Reduces Stormwater Runoff	$6.53	$6.53 * 240 = $1,567.20
Reduces Energy Use	$107.60 + $444.75= $552.35	$552.35 * 240 = $132,564.00
Improves Air Quality *Note: The figures used here only account for the benefits of reduced NO_x. Similar steps should be performed for the other criteria pollutants, when possible.*	$100.83	$100.83 * 240 = $24,199.20
Reduces Atmospheric CO_2	$49.04	$49.04 * 240 = $11,769.60
Total Annual Benefit (∑ Annual Benefits)	$708.75	$708.75 * 240 = $170,100.00

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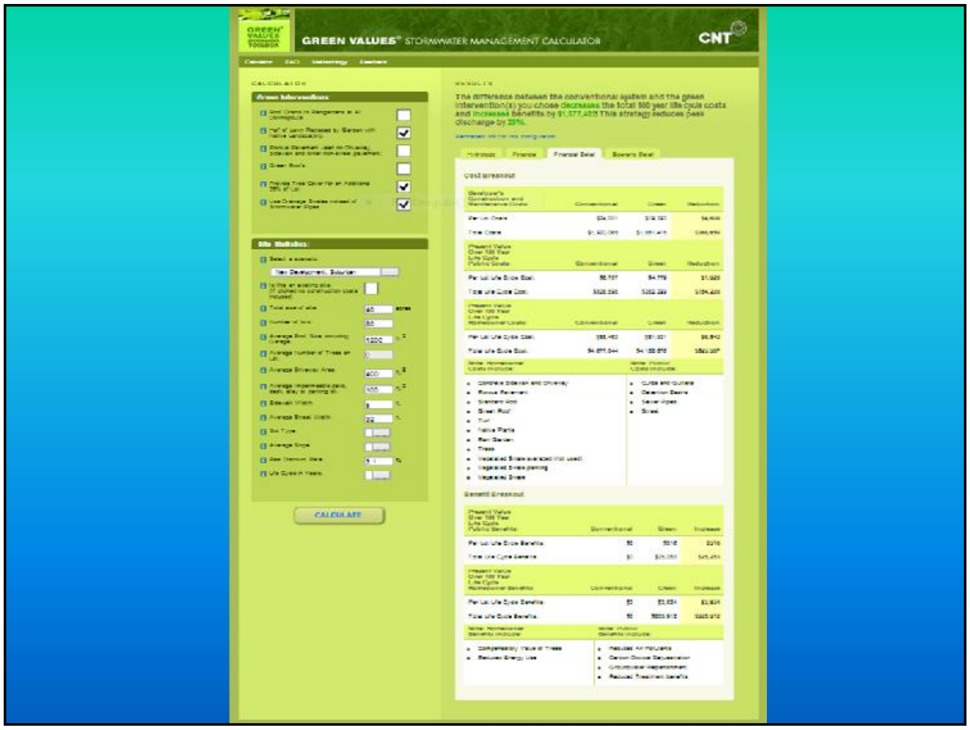
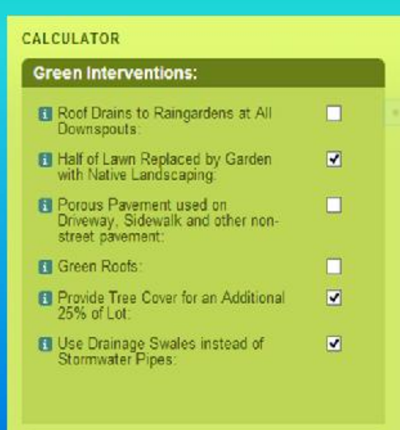
Limitations & Constraints

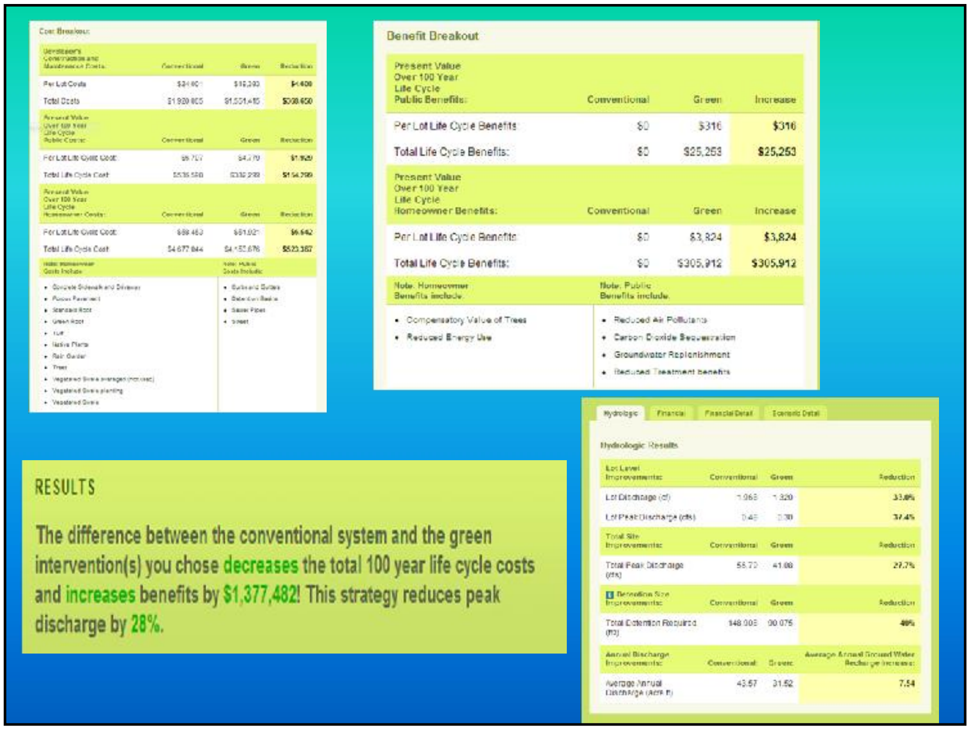
- More research needed to monetize social benefits
- Full life cycle analysis needed re long-term value
- Cost benefit analysis
- Valuation of further LID practices
- Need for more local and regional data
- Standards adopted to assess municipal/regional impacts of LID

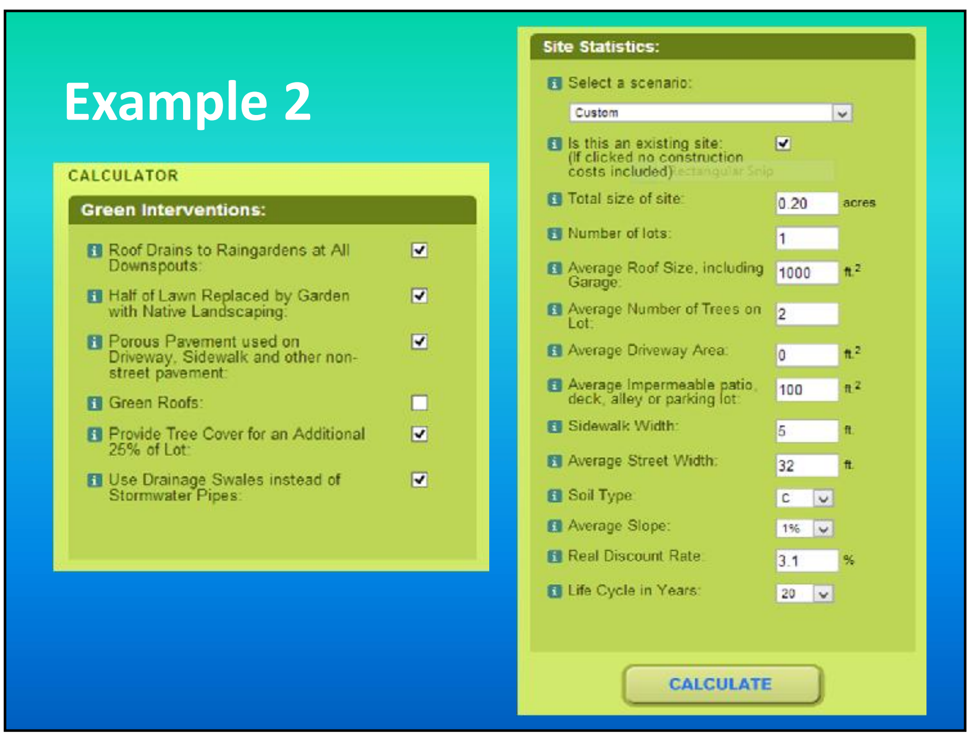

GREEN VALUES® STORMWATER MANAGEMENT CALCULATOR
CNT
CALCULATE

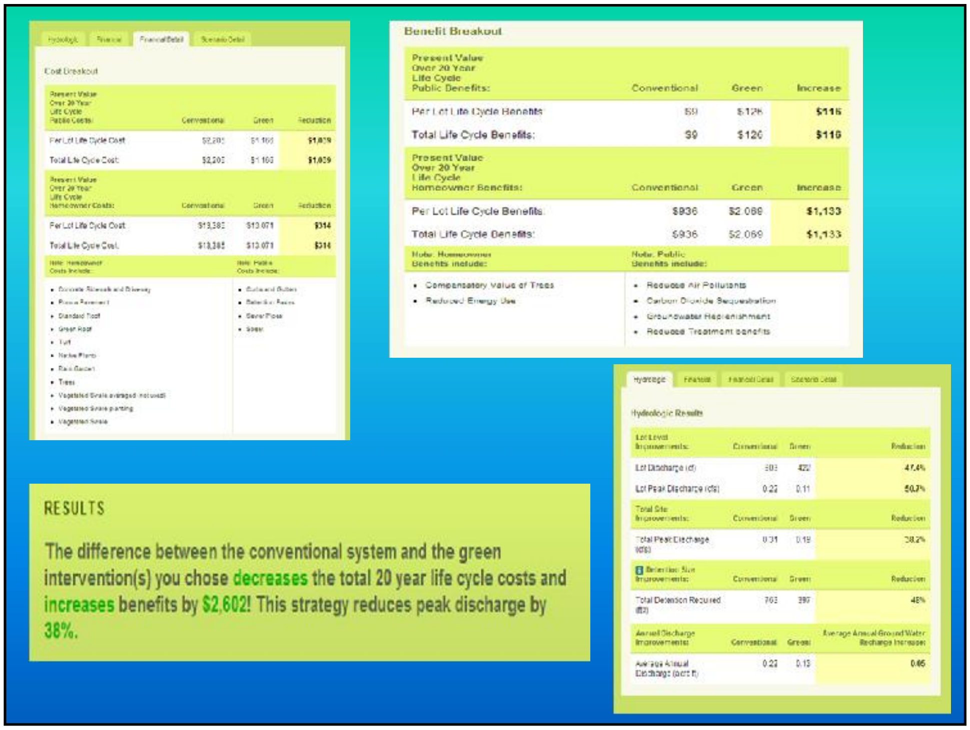
Example 1

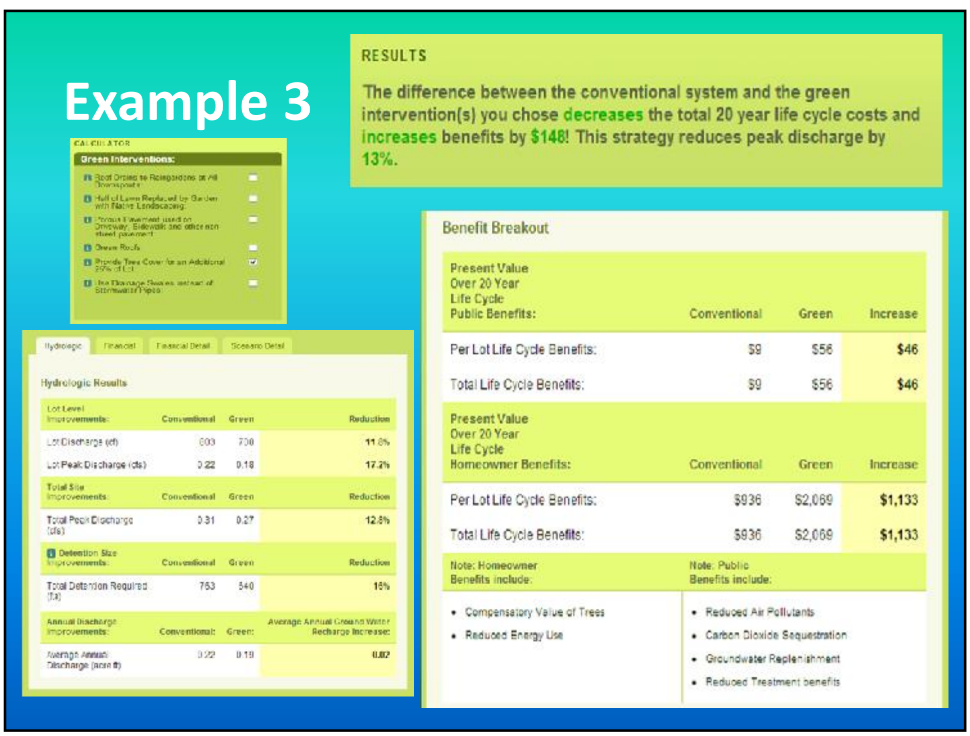

CALCULATOR
Green Interventions:
Roof Drains to Raingardens at All Downspouts:
Half of Lawn Replaced by Garden with Native Landscaping:
Porous Pavement used on Driveway, Sidewalk and other non-street pavement:
Green Roofs:
Provide Tree Cover for an Additional 25% of Lot:
Use Drainage Swales instead of Stormwater Pipes:


Site Statistics:
Select a scenario:
New Development, Suburban
Is this an existing site: (If clicked no construction costs included)
Total size of site: 40 acres
Number of lots: 80
Average Roof Size, including Garage: 1200 ft.²
Average Number of Trees on Lot: 0
Average Driveway Area: 400 ft.²
Average Impermeable patio, deck, alley or parking lot: 100 ft.²
Sidewalk Width: 5 ft.
Average Street Width: 32 ft.
Soil Type: C
Average Slope: 1%
Real Discount Rate: 3.1 %
Life Cycle in Years: 100
CALCULATE


Benefit Breakout
Present Value Over 100 Year Life Cycle Public Benefits: Conventional Green Increase
Per Lot Life Cycle Benefits: $0 $316 $316
Total Life Cycle Benefits: $0 $25,253 $25,253
Present Value Over 100 Year Life Cycle Homeowner Benefits: Conventional Green Increase
Per Lot Life Cycle Benefits: $0 $3,824 $3,824
Total Life Cycle Benefits: $0 $305,912 $305,912
Note: Homeowner Benefits include:
Compensatory Value of Trees
Reduced Energy Use
Note: Public Benefits include:
Reduced Air Pollutants
Carbon Dioxide Sequestration
Groundwater Replenishment
Reduced Treatment benefits
RESULTS
The difference between the conventional system and the green intervention(s) you chose decreases the total 100 year life cycle costs and increases benefits by $1,377,482! This strategy reduces peak discharge by 28%.
Hydrologic
Financial
Financial Detail
Economic Detail
Hydrologic Results
Total Peak Discharge (cfs) 55.72 41.08 27.7%
Average Annual Discharge (acre ft) 43.57 31.52 7.54


Example 2
CALCULATOR
Green Interventions:
Roof Drains to Raingardens at All Downspouts:
Half of Lawn Replaced by Garden with Native Landscaping:
Porous Pavement used on Driveway, Sidewalk and other non-street pavement:
Green Roofs:
Provide Tree Cover for an Additional 25% of Lot:
Use Drainage Swales instead of Stormwater Pipes:
Site Statistics:
Select a scenario:
Custom
Is this an existing site: (If clicked no construction costs included)
Total size of site: 0.20 acres
Number of lots: 1
Average Roof Size, including Garage: 1000 ft 2
Average Number of Trees on Lot: 2
Average Driveway Area: 0 ft 2
Average Impermeable patio, deck, alley or parking lot: 100 ft 2
Sidewalk Width: 5 ft.
Average Street Width: 32 ft.
Soil Type: C
Average Slope: 1%
Real Discount Rate: 3.1 %
Life Cycle in Years: 20
CALCULATE


Cost Breakout
Benefit Breakout
Present Value Over 20 Year Life Cycle Public Benefits: Conventional Green Increase
Per Lot Life Cycle Benefits $0 $126 $116
Total Life Cycle Benefits: $0 $126 $116
Present Value Over 20 Year Life Cycle Homeowner Benefits: Conventional Green Increase
Per Lot Life Cycle Benefits $936 $2,069 $1,133
Total Life Cycle Benefits: $936 $2,069 $1,133
Note: Homeowner Benefits include:
Compensatory Value of Trees
Reduced Energy Use
Note: Public Benefits include:
Reduced Air Pollutants
Carbon Dioxide Sequestration
Groundwater Replenishment
Reduced Treatment benefits
Hydrologic Results
RESULTS
The difference between the conventional system and the green intervention(s) you chose decreases the total 20 year life cycle costs and increases benefits by $2,602! This strategy reduces peak discharge by 38%.


Example 3
RESULTS
The difference between the conventional system and the green intervention(s) you chose decreases the total 20 year life cycle costs and increases benefits by $148! This strategy reduces peak discharge by 13%.
CALCULATOR
Green Interventions:
Hydrologic Results
Lot Level Improvements: Conventional Green Reduction
Lot Discharge (cf) 803 708 11.8%
Lot Peak Discharge (cfs) 0.22 0.18 17.2%
Total Site Improvements: Conventional Green Reduction
Total Peak Discharge (cfs) 0.31 0.27 12.8%
Detention Size Improvements: Conventional Green Reduction
Total Detention Required (ft3) 753 640 15%
Annual Discharge Improvements: Conventional Green Average Annual Ground Water Recharge Increase:
Average Annual Discharge (acre ft) 0.22 0.19 0.02
Benefit Breakout
Present Value Over 20 Year Life Cycle Public Benefits: Conventional Green Increase
Per Lot Life Cycle Benefits: $9 $56 $46
Total Life Cycle Benefits: $9 $56 $46
Present Value Over 20 Year Life Cycle Homeowner Benefits: Conventional Green Increase
Per Lot Life Cycle Benefits: $936 $2,069 $1,133
Total Life Cycle Benefits: $936 $2,069 $1,133
Note: Homeowner Benefits include:
Compensatory Value of Trees
Reduced Energy Use
Note: Public Benefits include:
Reduced Air Pollutants
Carbon Dioxide Sequestration
Groundwater Replenishment
Reduced Treatment benefits

Example 4

RESULTS

The difference between the conventional system and the green intervention(s) you chose **decreases** the total 20 year life cycle costs and **increases** benefits by **$1,641**! This strategy reduces peak discharge by **15%**.

Hydrologic | Financial | Financial Detail | Scenario Detail

Hydrologic Results

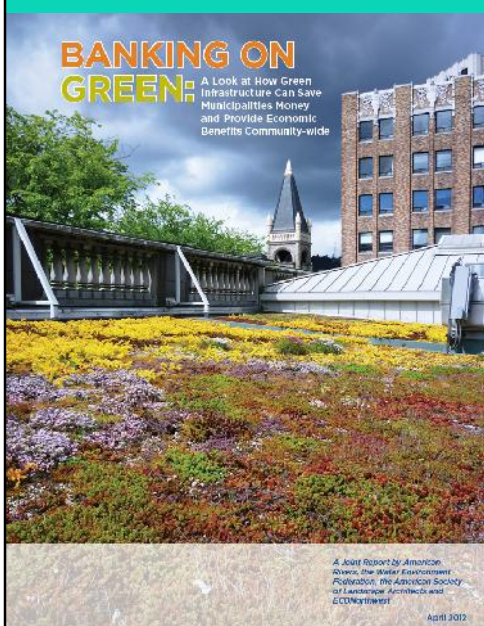
Lot Level Improvements:	Conventional	Green	Reduction
Lot Discharge (cf)	803	598	25.5%
Lot Peak Discharge (cfs)	0.22	0.15	30.1%
Total Site Improvements:	**Conventional**	**Green**	**Reduction**
Total Peak Discharge (cfs)	0.31	0.24	21.8%
Detention Size Improvements:	**Conventional**	**Green**	**Reduction**
Total Detention Required (ft3)	763	554	27%
Annual Discharge Improvements:	**Conventional:**	**Green:**	**Average Annual Ground Water Recharge Increase:**
Average Annual Discharge (acre ft)	0.22	0.17	0.03

Benefit Breakout

Present Value Over 20 Year Life Cycle Public Benefits:	Conventional	Green	Increase
Per Lot Life Cycle Benefits:	$9	$69	$60
Total Life Cycle Benefits:	$9	$69	$60
Present Value Over 20 Year Life Cycle Homeowner Benefits:	**Conventional**	**Green**	**Increase**
Per Lot Life Cycle Benefits:	$936	$3,672	$2,736
Total Life Cycle Benefits:	$936	$3,672	$2,736

Note: Homeowner Benefits include:
- Compensatory Value of Trees
- Reduced Energy Use

Note: Public Benefits include:
- Reduced Air Pollutants
- Carbon Dioxide Sequestration
- Groundwater Replenishment
- Reduced Treatment benefits



Washington

- 14th Avenue Neighborhood Street Fund Project, Seattle
- Cromwell Park, Shoreline
- Extended Wetland Multi-Cell Storm Water Facility for Low Impact Development, Woodinville
- Half Moon Park, Liberty Lake
- High Point HOPE VI Redevelopment, Seattle
- Hockinson Meadows Community Park, Clark County
- James Chase Middle School, Spokane
- Olympia Woodland Trail, Olympia
- Pioneer School Low Impact Development Project, Shelton
- Spokane Community College, Jenkins Wellness Center, Spokane
- Sprinker Recreation Center Low Impact Parking, Spanaway
- Taylor 28, Seattle

Basic Findings

- ❑479 Green Infrastructure (GI) Case Studies
  - ❑41% found grey to green was cheaper than conventional
  - ❑31% found grey to green no cost difference
  - ❑25% found grey to green more expensive

- Green infrastructure can further reduce costs of treating large amounts of polluted runoff.
- Green infrastructure can help municipalities reduce energy expenses.
- Green infrastructure can reduce flooding and related flood damage

Half Moon Park – Liberty Lake

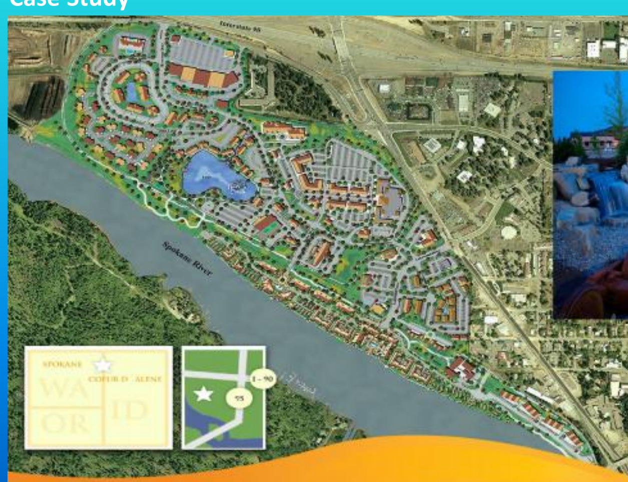
Case Study

SCC Jenkins Wellness Center - Spokane

Case Study

Riverstone, Mixed Use Development-Coeur d' Alene

Case Study



HIGH-POINT HOPE VI REDEVELOPMENT SEATTLE

Case Study

Photo credit: Andrew Buchanan

High-Point Commons Park

Features:
Bioretention facility; rain garden; bioswale; downspout removal; pervious concrete streets, sidewalks, parking; porous paving; preservation of existing trees; amended soils

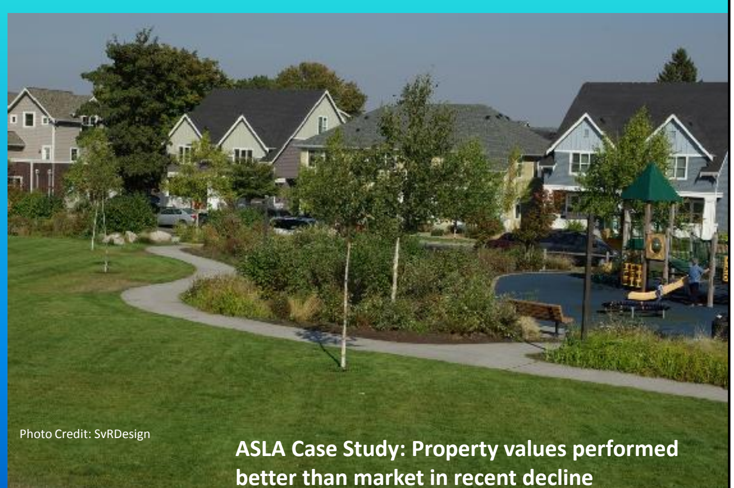


Photo Credit: SvRDesign

ASLA Case Study: Property values performed better than market in recent decline

Hi-Point
32nd Ave Porous Concrete

Stormwater is retained fully onsite

SHAMROCK HEIGHTS
Case Study

Photo Credit: Triad & Associates

SHAMROCK HEIGHTS

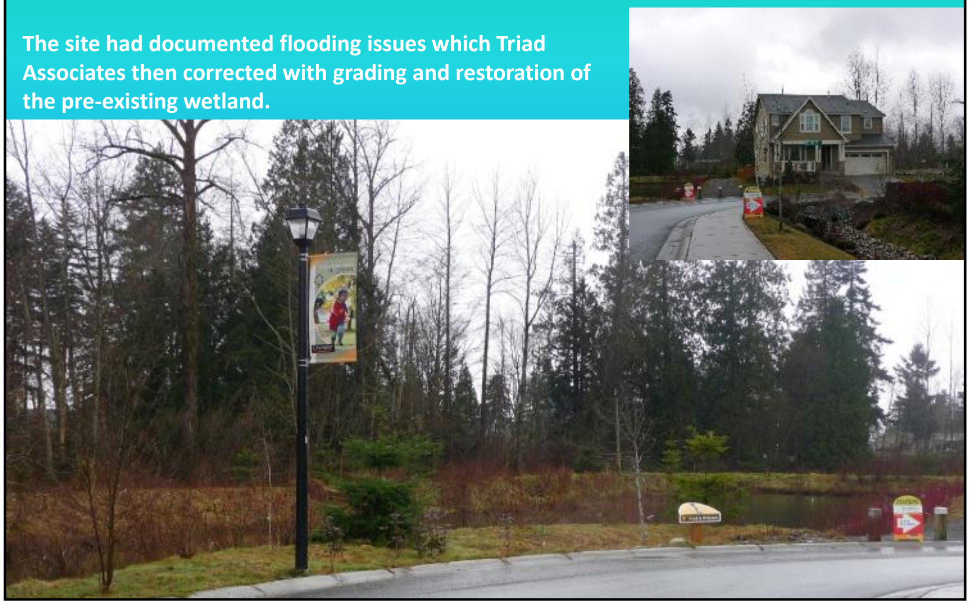
Photo Credit: Triad & Associates

Question	Shamrock Heights	Cascade Crest	Westchester
	Av. Score	Av. Score	Av. Score
Neighborhood is Well Designed	8.8	8.1	8.56
Park(s), Greenbelts, and/or Open Space Add Value	9.45	8.24	5.83
Park, Play Toys, and Sport Court Enjoyed by Community	9.4	3.83	1.72

Provide almost an acre of park centrally located like a commons

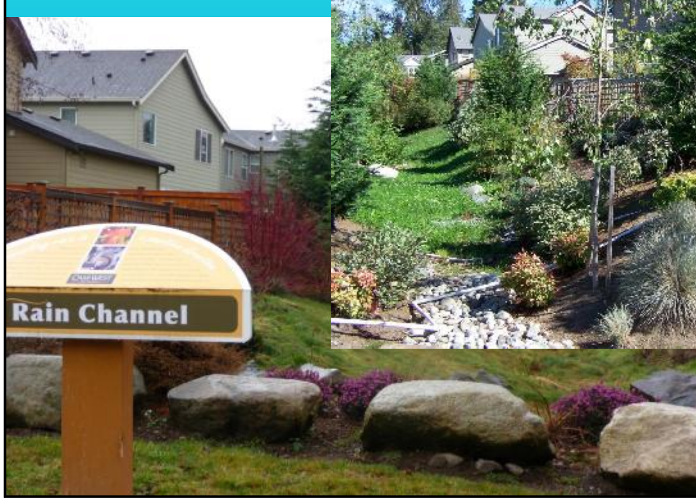
Restore Wetlands

The site had documented flooding issues which Triad Associates then corrected with grading and restoration of the pre-existing wetland.



Rain Channels

CamWest *"buyers are looking for more privacy"*



Windermere *"people were very jazzed by the LID features"*

CanWest *"significant cost reductions only come when the streets can be designed at narrower widths"*

Paired Sales Analyses
2007-2009

Premium for Green Amenities:
$7.50-$12.50 per sq.ft.

Key Points to Remember

- ❑LID = Enhanced community livability
- ❑LID = Reduces flood risk
- ❑LID = cleaner waterways for all
- ❑Green Infrastructure typically costs less than conventional
- ❑LID has environmental, economic and social benefits

"The nation behaves well if it treats the natural resources as assets which it must turn over to the next generation increased, and not impaired, in value."

PRESIDENT THEODORE ROOSEVELT

Field trip transition

- Drivers: remember directions

Everyone:

- Find your carpool group quickly
- Bring your camera & gear