

Does Green Infrastructure Pay?



2006 NEW PARTNERS FOR SMART GROWTH CONFERENCE
JANE KULIK, ASLA
WENK ASSOCIATES, INC
JANUARY 28, 2006

the dollars and sense of green infrastructure: examining costs and benefits



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why choose a green infrastructure approach to stormwater management?

Helps approvals process

- Allows compliance with Federal mandates for water quality treatment
- Preserves integrity of natural systems – can minimize disturbance

Supports marketing and economic goals

- Achieves stormwater goals within customary open space requirements
- Allows for a broad range of landscape types to enhance a community's livability

Saves water and infrastructure costs

- Reuses water on site
- May result in infrastructure cost savings
- Often provides more developable area

why aren't green infrastructure practices more widespread?

Institutional / legal barriers still exist

- Landscape requirements and engineering standards often conflict
- Water rights are an issue in the West
- Agencies must work in new ways

There is still a reluctance to innovate

- Costs and benefits are not well documented
- Public acceptance is mixed, influenced by cultural expectations for "civic" landscapes
- Maintenance / management practices reflect an ingrained "organization of work"

Technical knowledge and practice has not evolved

- Landscape and engineering knowledge must merge

the dollars and sense of green infrastructure:
examining **costs**

- ***"Green infrastructure" can require less expensive capital outlays than traditional systems***

BUT

- ***It's important to fully consider life cycle costs:***
 - ***Routine operations and maintenance***
 - ***Capital repair***



bioretention areas or "rain gardens"



- \$10 - 40/sf to construct
- Up to 25% cost savings vs. Conventional "pipe" infrastructure

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Columbia Boulevard Wastewater Treatment Plant



MURASE ASSOCIATES, INC.

Buckman Heights Apartments



MURASE ASSOCIATES, INC.

Portland Convention Center



MAYER REED AND ASSOCIATES, INC.

potsdamer platz



STUDIO DREISEITL

Seattle Natural Drainages



CITY OF SEATTLE

- routine maintenance similar to any landscaped area
- check underdrains for clogging, remove sediment buildup
- potentially replace soils every 5-10 years

vegetated swales



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- Up to 40% cost savings vs. Conventional "pipe" infrastructure

“green roofs”



CONSERVATION DESIGN FORUM

REI Flagship Store



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- \$15 - 20/SF to construct
- comparable in cost to conventional roof after factoring in deferred maintenance and energy consumption

Bank One roof garden



- routine inspection of drainage system and roof membrane
 - routine maintenance of landscape
- should extend service life by +/- 20 yrs compared to conventional roof

permeable pavement



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- initial installation costs approximately 50% lower than conventional storm drainage systems (\$4.50-6.50/SF vs \$9.50-11.50/SF)
- vacuum sweep and pressure wash to remove sediment and avoid clogging system

“development scale” solutions

Celebration



COOPER ROBERTSON & PARTNERS

Celebration



Aurora Sports Park



- surface storm drainage system saved approximately 30% over conventional system storm drainage systems

Menomonee River Valley Revitalization
Menomonee Valley Redevelopment



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Five-year
storm event



100-year storm event



Menomonee River Valley Revitalization



Menomonee River Valley Revitalization



the dollars and sense of green infrastructure:
examining **benefits**

- **Multiple benefit vs. single benefit**
- **Benefits that provide economic value**



Habitat restoration
Horseshoe Park



open space and recreation
Bible Park



- Quality of life is #1 factor in relocation
- 38% would pay more to live near park or open space
- Over 50% of Denver residents would pay more to live near a park or open space

Community identity
heritage park infill development



LAND USE SUMMARY
51 acres of housing
25 acres of park (33%)
18 units / acre (net)

- Green space and green practices can increase property values by 6 - 10%



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BARR ENGINEERING



public and market acceptance is critical

Lessons learned

Consider costs in a life cycle framework

- Initial construction costs tell only part of the story!
- Maintenance and capital repair are inextricably linked!
- Create a feedback loop

Strive for multiple benefits

- Market acceptance is enhanced with multiple benefits
- Recreation and open space amenities provide significant value
- Address social and cultural expectations for landscapes

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