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

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





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



- MENK ASSOCIATES, INC.
 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

M enom onee River Valley Revita lization $\mbox{Menomonee Valley Redevelopment}$





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Five-year storm event





100-year storm event



M enom onee River Valley Revitalization



M enom onee River Valley Revitalization

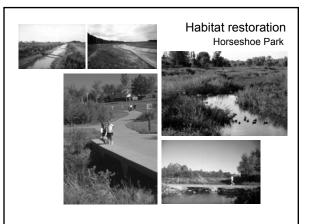


the dollars and sense of green infrastructure: examining **benefits**

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







open space and recreation Bible Park Open space and recreation

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



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



Green space and green practices can increase property values by6 - 10%





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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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