

Green Building Opportunities for Infrastructure



Green Building Context for Infrastructure
(Jim Sussex, KCDOT)

Low Impact Development (LID) Approaches
(Steve Foley, KCWLRD)

Green Building Opportunities Overview
(Frank Overton, KCDOT)

King County Building Summit:
Dollars and Sense Tools to Green Your Project



King County

Green Building Context for Infrastructure

Transportation Infrastructure

Green Building Policy Context

LEED for Infrastructure

Integrating Green Building into Transportation
Infrastructure at KC Roads



TRANSPORTATION INFRASTRUCTURE

LINEAR

EXTENSIVE

ENVIRONMENTALLY
IMPACTFUL

DIVERSE LOCATIONS

VITAL



Mitigation as Green Building

Effective environmental review

Minimize site impacts

Restore/enhance habitat and ecosystem functions

Retain/enhance historical and aesthetic values

Improve stormwater quality

Monitoring and maintenance



Green Building Policy Context

King County Green Building Ordinance (2005)

Section 1(C): Green Building supports broad sustainability goals of King County, including growth management, economic development, environmental protection, access to public transportation, stewardship of lands and wildlife habitat and creating resources from wastes.”

Section 3(C) For all new projects where the scope of the project or type of structure limits the ability to achieve LEED certification, departments and offices shall incorporate cost-effective green building practices based on life cycle cost analysis and the limits of available funding.”

Environmental Regulations

KC Comp Plan -- Sustainable Development

Policy U-601: King County should incorporate sustainable development principles and practices into the design, construction and operation of county facilities and county-funded projects when economically feasible.

Climate Change Policies

Energy Policies



Leadership in Energy and Environmental Design (LEED)



Widely accepted rating system for green building

Architecturally focused on buildings

Needs significant modification for infrastructure

LEED Rating Components

- Sustainable Sites
- Water Efficiency
- Energy & Atmosphere
- Materials & Resources
- Indoor Air Quality
- Innovation & Design Process



King County Wastewater Treatment Division

Top Ten List

Strategies (Based on LEED Principles)

1. **75% Construction Waste Recycling**
2. **Recycled-Content Materials ($\geq 10\%$ Post-Consumer)**
3. **Local Materials ($\geq 20\%$)**
4. **No-Potable Water for Irrigation**
5. **LEED™ Compliant Lighting**
6. **Green Roofs**
7. **Trenchless Technologies**
8. **Bioretention**
9. **Reuse Native Soils**
10. **Pervious Paving**

Criteria

- **Applicability**
- **Environmental Benefits**
- **Cost-Effectiveness**

KC Roads Green Building Strategy

- Considers specific LEED items
- References broader green building principles
- Work in progress

Goals	Green Building Measures	Specific Options
Reduce Waste	Construction Waste Recycling	Recycling initiative
	Use Recycled-Content Materials	
	Reuse native soils	
Protect Water Resources	Minimize water for landscaping	Native plant retention
	Low Impact Development solutions for stormwater management	Bioretention facilities Pervious pavement
Protect Air Quality and Atmosphere	Use alternative fuels	Biodiesel fuel for equipment
	Slag and Fly Ash Cement Substitutes	Maximize use as appropriate
Energy Efficiency	Renewable Energy Sources	Renewable Energy Initiative
Incorporate Green Materials	Green materials and products	Certified & non-toxic wood
	Use green purchasing incentives with suppliers and contractors	Financial incentives Contract specifications
Sustainable Sites	Protect/enhance ecological functions	Minimize site disturbance Develop effective mitigation
Protect Wildlife	Improve wildlife connectivity	Wildlife crossing features
Maintainability	Cost-effective, low-energy maintenance	Use input from maintenance staff

CHALLENGES

- **Budget Constraints**
- **Life-Safety Concerns and Road Standards**
- **Physical Constraints (R-O-W, site limitations)**
- **Lack of Green Building Expertise**
- **Political and Management Support**
- **Uncertainties regarding performance**
- **Maintenance Concerns**
- **Lack of design standards**



REGULATORY ISSUES

LID approaches becoming expectation for stormwater management (EPA, Ecology)

Non-toxic materials over/near water (WDFW)

King County Critical Areas Ordinance (DDES)

Endangered Species Act compliance (NOAA, USFWS)

Bio-diesel recommended to improve air quality (PSCAA)

Green building facilitates environmental compliance.

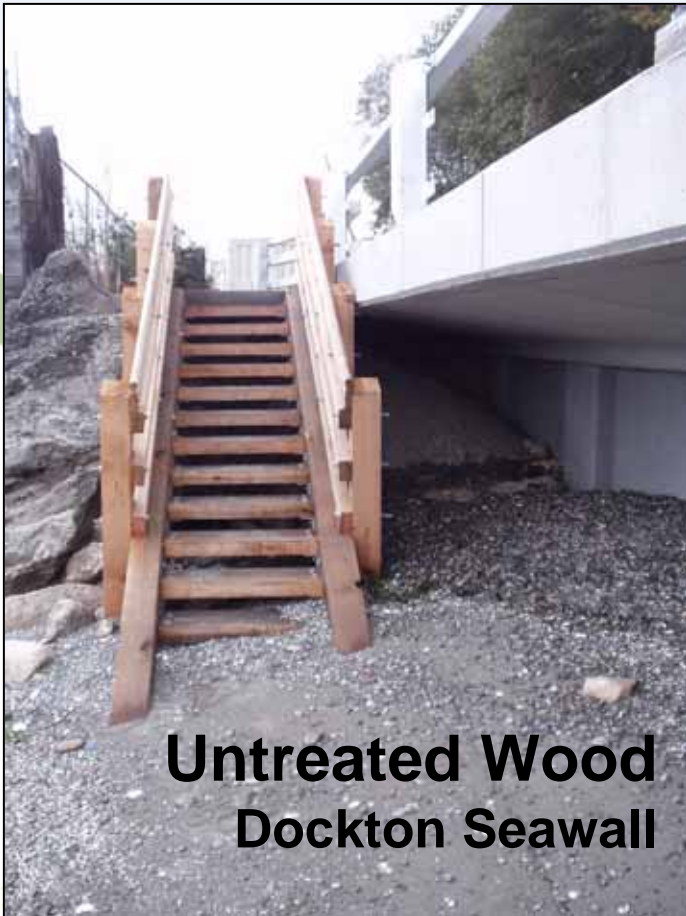


Asphalt Pavement Recycling

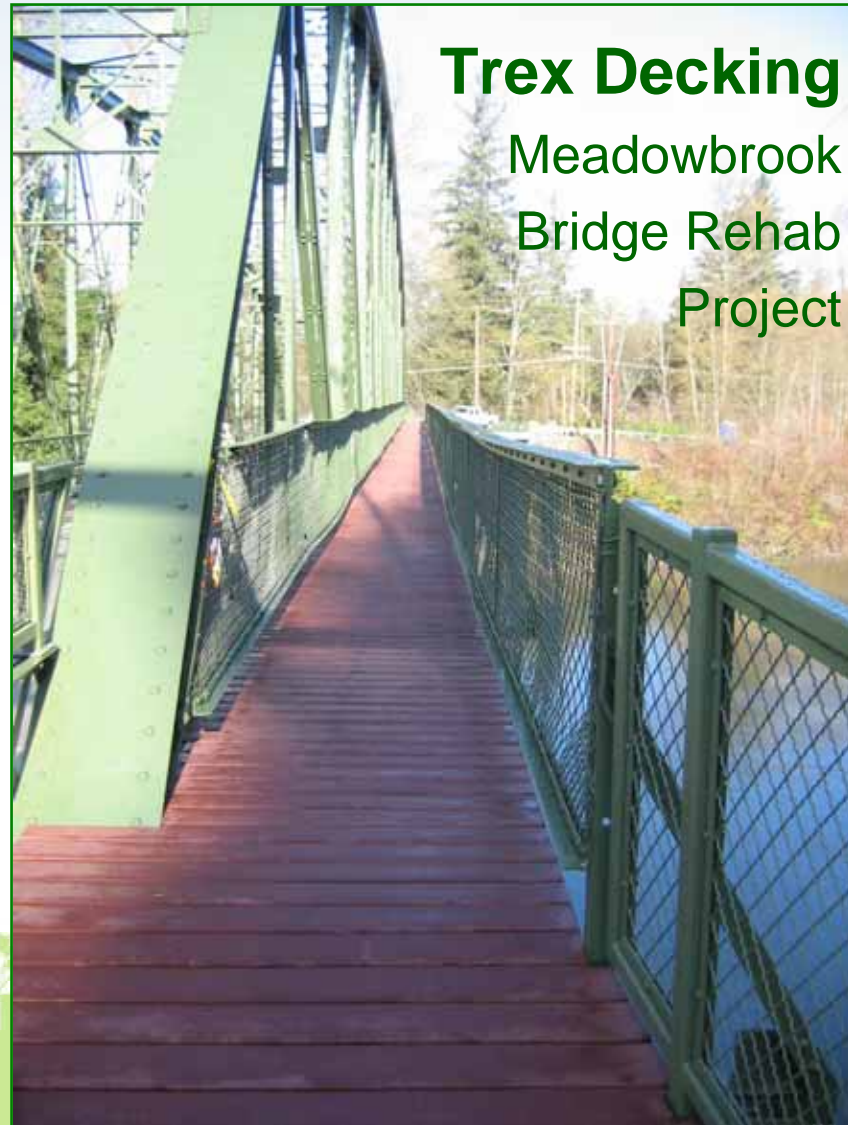
124th Ave NE Road Widening Project
Gravel Borrow (saved 20% at \$35,000)
Crushed Surfacing Base Course
(saved 78% at \$120,000)



Green Materials



**Untreated Wood
Dockton Seawall**



Trex Decking
Meadowbrook
Bridge Rehab
Project

Porous Asphalt Pathway



CONCLUSION

Work collaboratively to increase green building awareness, resources, expertise and effectiveness.

Pursue green building demonstration projects and funding.

Promote information exchange and resource sharing.

Customize green building strategy to individual needs.

Utilize adaptive approach using ongoing experience.

Promote recognition and support for green building for infrastructure as broadly as possible.



BE PERSISTENT



BE CREATIVE

The world we have created today as a result of our thinking thus far has problems that cannot be solved by thinking the way we thought when we created them.

Albert Einstein

