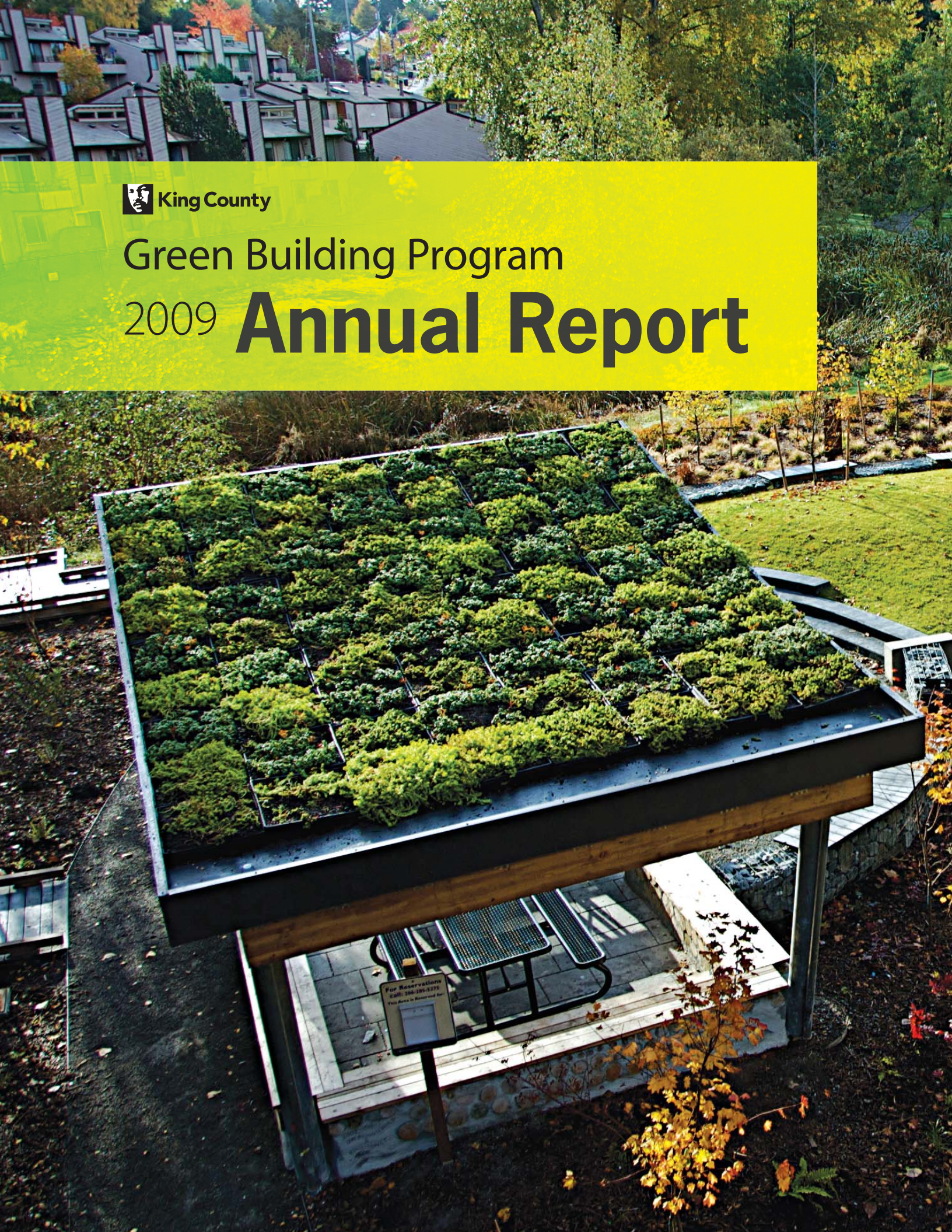

King County

Green Building Program

2009 Annual Report

Contents

Cover photo: *New picnic shelter at Skyway Park. The green roof is comprised of a variety of sedum plants.*
Credit: *Eli Brownell, King County Parks*

2009 Program Accomplishments

As directed in King County Ordinance 16147, *Green Building and Sustainable Development*, we are pleased to submit this 2009 annual report highlighting the accomplishments of the King County Green Building Program. This program supports King County's commitment to minimize the environmental impacts of county sites, facilities, and structures in all phases – from design, construction, operation, renovation, and maintenance to deconstruction.

The intent of the 2008 ordinance is to ensure that the design, construction, maintenance and operation of any King County-owned or financed capital project is consistent with the latest green building and sustainable development practices. Key points of the ordinance are:

- All Leadership in Energy and Environmental Design (LEED®)-eligible capital projects must register with the U.S. Green Building Council and strive to achieve a LEED Gold rating.
- All non-LEED-eligible projects must incorporate sustainable development practices, and project managers must fill out a sustainable infrastructure scorecard that shows the strategies that are being used.
- Projects should incorporate an integrated design process and life-cycle assessment to optimize design approaches.

In 2009, the countywide Green Building Team focused on developing the tools that were required in the 2008 ordinance. These included a Sustainable Infrastructure Scorecard (Scorecard) and Guidelines and the Green Operations and Maintenance Guidelines. The Team worked collaboratively to develop the Scorecard that will be used by county agencies to document green building strategies used in capital projects. The scorecard is designed to be flexible so that it can be adapted for use by a variety of project types. Guidelines that provide information about the scorecard were also compiled. In addition, the Team drafted the Green Operations and Maintenance Guidelines that provide a blueprint for divisions to use when developing operations and maintenance plans that are designed to help existing buildings be operated and maintained with an eye towards resource conservation, using no or lower toxicity materials, and improved waste reduction and recycling.

County departments continued to make strides in developing 18 building projects seeking certification in the LEED process. Some of the buildings are in the initial design phases while others were completed this year. Three LEED projects received their certification in 2009: the Carnation Wastewater Treatment Plant Administration Building – LEED NC Certified; the Atlantic/Central Base Communication and Control Center – LEED NC Gold; and the Atlantic/Central Base Tire and Millwright Shop – LEED NC Certified. There are also a number of county projects where LEED certification is not economically feasible or applicable, but where green building practices are being applied.

LEED Certified Carnation Wastewater Treatment Plant Administration Building

Several projects completed this year were the result of collaboration between county agencies, stakeholders and others. Of note are the two projects described below:

- **Paving Demonstration Using Recycled Asphalt Shingles:** In September 2009, the King County Road Services Division (Roads) paved a two mile stretch of roadway in South King County (416th Street SE near Enumclaw) to evaluate the use of 3 percent recycled asphalt shingles (RAS) and 15 percent recycled asphalt pavement (RAP) in hot mix asphalt. This paving demonstration is the result of a multi-year effort that involved working with the King County Solid Waste Division (SWD), the Washington State Department of Transportation (Wash Dot) and an advisory group comprised of public agency and industry stakeholders. Further testing, analysis, and documentation on the long-term performance of this roadway will continue through 2012 to verify the impact of using RAS on public roadways in King County.

Group photo of Paving Demonstration Project partners standing in front of a pile of processed asphalt shingles (from left to right: Kris Beatty, SWD; Joseph Karahuta, Roads Materials Lab; Kevin Kelsey, Roads Materials Lab; Frank Overton, Roads; Tim Shearer, Woodworth & Company; John Grisham, Woodworth & Company; Paul Moore, Roads; Joe DeVol, WASH DOT Materials Lab).

- **Skyway Park Improvements:** The Parks and Recreation Division (Parks) of the Department of Natural Resources and Parks (DNRP) worked in collaboration with students from the University of Washington and neighborhood groups to make improvements to Skyway Park. The project restored one of the wetlands in the park and designed and built a shelter and plaza. Inspired by the wetland and movement of water through it, the area features a shelter with a vegetated roof, seating, grassy lawn, open plaza, native landscaping, and interpretive signage highlighting wetland plants and animals. This project was completed in June 2009.

(Photo credit: Eli Brownell)

Skyway Park's new plaza and shelter with wetland buffer plantings.

In 2009, the SWD's GreenTools Green Building Program, in partnership with the Wastewater Treatment Division, the Water and Land Resources Division's Grant Exchange Program, and the Built Green™ program, awarded five grants to commercial projects seeking LEED certification and ten grants to residential projects seeking a Built Green rating. Residential projects must meet four- or five-star Built Green certification, while commercial projects must meet Gold or Platinum LEED certification. In addition to receiving a green building certification, the projects must also meet key environmental performance criteria, which include:

- Recycling at least 75 percent of project construction and demolition (C&D) debris
- Meeting or exceeding the King County Post-Construction Soil Standard, which ensures that soil health is maintained or restored when construction projects are complete
- Demonstrating that the King County 2005 Surface Water Design Manual Standards have been met or exceeded; these standards protect streams and wildlife from the potential negative effects of stormwater runoff

The five grants for commercial projects seeking LEED certification were awarded to two affordable housing projects (Bastyr University Housing and Megan's Meadow) and two commercial office buildings (Harley Marine Office Center and Rainier Building) and one institutional building (Navos Mental Health and Wellness Center). The grant awards ranged from $15,000 to $25,000 for a total of $95,000.

The ten Built Green incentives were awarded to a variety of single family housing types. The awards went to one ten-unit affordable housing project, two owner-occupied single family houses, and seven market rate single family developments. The grant awards ranged from $5,000 to $10,000 for a total of $72,500.

What follows is a brief description of the structure and background of the Green Building Program. The remainder of this annual report focuses on two primary areas of progress:

- The status of county projects that qualify for certification or rating under the LEED process.
- The strides made by various agencies of the Green Building Team in integrating green building elements into capital improvement projects.

Basic Elements of the Green Building Program

In accordance with the *Green Building and Sustainable Development Ordinance*, the Solid Waste Division (SWD) of the Department of Natural Resources and Parks (DNRP) manages the Green Building Program. The ordinance requires county departments to incorporate green building elements in all construction projects. It establishes the LEED rating system as the guiding principle for meeting this goal. In cases where LEED certification may not be economically feasible or applicable for a project, such as open-air bus passenger shelters, restroom facilities, pump stations, and conveyance lines, county departments are encouraged to apply as many green building elements as possible.

SWD coordinates the countywide Green Building Team, which provides a forum for exchanging information on green building practices among county agencies and assists in guiding green building practices at county facilities. Team members include representatives from the following agencies throughout the county:

- Executive Services, including –
  - Facilities Management Division (FMD)
- Department of Transportation (DOT), including –
  - Transit Division (Transit)
  - Roads
  - Airport Division (Airport)
- DNRP, including –
  - Wastewater Treatment Division (WTD)
  - SWD
  - Water and Land Resources Division (WLRD)
  - Parks
- Department of Development and Environmental Services (DDES)
- Department of Community and Human Services
  - Community Services Division, Housing and Community Development (HCD)

The Green Building Team is charged with helping countywide project teams achieve the maximum possible standards of green building on their projects. The Team also coordinates and incorporates the mandates of other countywide teams that affect green building such as the Climate Team and the Energy Task Force.

In addition, SWD's GreenTools program provides support to project teams through training and technical assistance. With this support, design teams can achieve the maximum possible standards of green building on their projects by encouraging practices that conserve resources, use recycled-content materials, maximize energy efficiency, and address other environmental and social considerations. These practices result in economic benefits, such as reduced operating costs, enhanced asset value, optimal building performance, and a healthier workplace for employees.

Green Building Projects that Qualify for LEED Certification

Standards for establishing and rating green building practices are based on criteria developed by the U.S. Green Building Council using the nationally recognized LEED rating system. LEED is a point-based system that rates projects according to the number of green building elements incorporated in the project. The types of projects where LEED standards are most readily applied include office buildings, transfer stations, maintenance facilities, recreational facilities, and medical facilities. LEED promotes a whole-building approach to sustainability by recognizing performance in six key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection, indoor environmental quality, and innovation in design. Up until mid-2008, departments were directed to apply LEED criteria in the pre-design and design phases of projects, and were encouraged to seek the highest LEED certification applicable to the project. With the new ordinance now in place, eligible projects are required to seek a LEED Gold rating.

Since its inception, a number of LEED programs have evolved to suit different types of buildings. These include LEED for New Construction and Major Renovation (NC), Existing Buildings (EB), Existing Buildings Operation and Maintenance (EBOM) (an updated version of LEED EB), Core and Shell (CS), and Commercial Interiors (CI). Project managers are encouraged to register with the U.S. Green Building Council early in the project, but a final rating is not awarded until after the project is completed and monitored for compliance.

In 2009, county departments made significant progress on 18 county building projects in various phases of the LEED certification process. These projects are summarized in Table 1 and are described in more detail in this section. The table also lists projects that have completed the LEED certification process since the program's inception.

Table 1. Status of County Buildings in the LEED Certification Process

Project Name	Division	Building Type	Pending Rating	Rating Achieved	Year Rating Achieved
Projects in Design Phase					
1. Atlantic/Central Base Operations Complex	Transit	Office	NC - Gold		
2. Black River Building	FMD/DDES	Office	EBOM - Silver		
3. Factoria Recycling and Transfer Station	SWD	Industrial	NC - Gold		
4. South Regional Roads Maintenance Facility	Roads/FMD	Office/ workshop	NC - Silver		
Projects in the Construction Phase					
5. Bow Lake Recycling & Transfer Station	SWD	Industrial	NC – Gold		
6. Brightwater Environmental Education Center	WTD	Meeting/ community center	NC - Gold		
Projects Completed - Pending Certification					
7. 9th and Jefferson	FMD	Office	NC - Silver		
8. Chinook Building	FMD	Office	CS - Gold CI - Platinum		
9. Ryerson Base Improvements	Transit	Office Renovation	NC- Certified		
10. South Plant Administration Building	WTD	Office/ laboratory	NC - Silver		
Projects Completed and Certified					
11. Atlantic/Central Base Communication and Control Center	Transit	Office		NC - Gold	2009
12. Atlantic/Central Base Tire and Millwright Shop	Transit	Office/ workshop		NC - Certified	2009
13. Carnation Treatment Plant Administration Building	WTD	Industrial		NC-Certified	2009
14. Kent Pullen Regional Communication & Emergency Coordination Center	FMD	Office		NC - Certified	2005
15. King Street Center	FMD	Office		EB - Gold	2004
16. Marymoor Maintenance Facility	FMD/Parks	Office/ workshop		NC - Certified	2008
17. Power Distribution Headquarters	Transit	Office/ workshop		NC - Certified	2007
18. Shoreline Recycling & Transfer Station	SWD	Industrial		NC - Platinum	2008

Green Building Project Descriptions and Accomplishments *(by Department)*

Many of the construction projects undertaken by the county are not the kinds of projects that are eligible for LEED certification; however, county departments are committed to using LEED standards as a guideline for incorporating green building practices into all projects. Such practices include using recycled materials, recycling construction waste, using innovative stormwater control strategies, reducing energy and water use, and other measures that reduce a project's impact on the environment. The projects described below demonstrate the variety of ways in which these strategies are being employed.

Executive Services - Facilities Management Division

FMD staff incorporates green building strategies into projects whenever possible. Many of the FMD projects are focused on replacing individual systems of a facility, so the focus of that project may involve a single strategy. The projects described here were completed in 2009.

FMD, in coordination with DDES, is working to get the DDES Black River Building certified under the LEED for EBOM rating system. The project was started in 2008, and the project team expects to receive LEED EBOM Silver certification in 2011.

Entrance to the DDES Black River Building.

Table 2. Facilities Management Division Projects

Project	Green Building Features	Project Description
Black River Building (DDES Building)	Recycled material, water, energy, and resource conservation	In 2009, the facility's existing methods of operations and maintenance were assessed to create a baseline and to aid in the decision-making of the credits to pursue. This was accomplished through a survey of personnel and building occupants. Plans for capital improvements, policy writing and research have been ongoing in preparation for the upcoming performance period to start in March 2010. This project, together with the facility's lighting upgrade project, was awarded an American Recovery and Reinvestment Act grant in the amount of $245,000 in 2009. This facility achieved Energy Star certification in 2009 and will be applying again for certification in 2010.
White Center Public Health Tenant Improvement	Recycled materials, low Volatile Organic Compound (VOC) adhesives and paints, formaldehyde-free materials, Forest Stewardship Council (FSC) products, salvaged materials	This tenant improvement removed casework and salvaged, reconfigured and reused it for peninsula cabinets. Three perimeter walls were left intact; the ceiling was left in place and was patched where it was damaged by demolition. Vinyl asbestos floor tile was abated with odorless, biodegradable, soy-based mastic remover.
Youth Service Center (YSC) Flood Repairs	Low VOC adhesives and paints	This project involved replacement of floor finishes, wall repairs, and new paint for much of the YSC facility damaged by flooding in a severe storm in 2007. The removal of existing damaged vinyl composition floor tiles and mastics was accomplished with a soy-based mastic remover that had less noxious odors and was safer to use by demolition crews. The project was subdivided into many small pieces in order to minimize impacts to the daily operations of the facility. Though this was a two year project, approximately 60 percent of the work was completed in 2009. Work involved the scheduled vacating of spaces whose occupants could be temporarily relocated while these areas were isolated from the rest of the building.
KC Correctional Facility and Courthouse Steam Conversion Project	Energy efficiency	Based on an audit that was conducted in 2007, the County decided to convert the Correctional Facility and the Courthouse from steam heat to natural gas. The project involved installing highly-efficient natural gas-fired boilers and other energy efficiency facility improvements. The cost of the project was $6.1 million with a projected savings of $880,000 annually equating to a 6.2 year pay back. The annual reduction in energy use will reduce the county's emissions at both facilities by 1700 metric tons of CO2 per year. This project was completed under a performance contract which provides for a guaranteed savings based on engineering design.

Department of Transportation - Transit Division

The Transit Division continues to incorporate green building strategies in its projects. Two buildings at the Atlantic/Central Base received LEED certifications in 2009 – the Communications and Control Center received a LEED Gold and the Tire and Millwright Shop received LEED Certified.

Table 3. Transit Division Projects

Project	Green Building Features	Project Description
Atlantic/Central Base Operations Building (LEED)	Energy efficiency, recycled material, C& D recycled, water efficiency	Some of the innovation credits that this project will seek include green house-keeping, green building education, and 95 percent diversion of construction waste from the landfill.
Improvements to Ryerson Base (LEED)	Energy efficiency, recycled materials, regional materials, C & D recycled, daylighting and views, low Volatile Organic Content (VOC) materials	This building renovation reused the existing building shell. It replaced the Heating, Ventilation and Air Conditioning (HVAC) system with one that is more energy efficient, as well as using recycled content and regional materials. Occupants now have access to views from 94 percent of the regularly occupied spaces and 75 percent of the regularly occupied spaces are naturally lit.
Brickyard Park and Ride Expansion	Pervious asphalt, low impact development, strategies, and reuse of native soils	This park and ride expansion project used low impact development strategies to handle stormwater on-site. It also created wetlands as part of the project. The project is under construction and was completed in March 2010.
Burien Transit Center	Use of recycled pavement as a base material, pervious concrete	This project was completed in July 2009. Pervious concrete was used for sidewalks.
Heat Recovery Unit Replacement	Energy efficiency	The existing worn-out, heat recovery units with indirect fired burners were replaced and will increase efficiency from 80 percent to almost 95 percent. Fan motors with variable drives with sensors were also installed so the system only runs when additional ventilation is required and not just because the space is occupied. New controls were also added to the radiant heat system. These upgrades are expected to save both gas and electricity at the maintenance facility.
Wireless Access Plan Relocations	Energy efficiency	This project supports the implementation of the One Regional Card for All (ORCA) electronic bus pass system, which will reduce the use of paper bus fare tickets, disposable monthly bus passes and paper bus transfer tickets, and reusing the ORCA card by allowing electronic purchase of bus fare payment products.

Architectural rendering of Atlantic/Central Base Operations Building design. This LEED Gold building is scheduled for occupancy in mid-2011.

Ryerson Base skylights for interior daylighting.

Department of Transportation - Road Services Division

Roads continued its efforts to incorporate green building practices into transportation infrastructure projects. A new project this year is the construction of a new maintenance facility. The South Regional Roads Maintenance Facility will be located at 292nd Ave. SE north of SE Kent-Kangley Road. This facility will be replacing the Summit and Black Diamond Pits. The project is now in conceptual design and the project team is anticipating that the administration building will receive a LEED Silver certification at project completion.

Table 4. Roads Services Division Projects

Project	Green Building Features	Project Description
Road Infrastructure – Culvert Replacement	Recycled concrete, asphalt, gravel, metal culverts, and miscellaneous steel products; used fly ash as a cement substitute; reused native soils on-site, used salvaged materials; and used materials sourced within 500 miles	Several culvert replacement projects were completed in 2009. In all, a total of 1,850 linear feet of culvert was replaced. These projects were located at: • 140th Place NE near 148th Ave NE • 318th Ave NE at Mountain View Rd NE to NE 183rd St • SE Middle Fork Road Phase 1 Emergency Slides Repair located at end of pavement to Granite Creek • 15812 Kelly Road NE • 18013 W. Snoqualmie Valley Road • Preston/Fall City Road SE, 40 feet north of the driveway to house #5911 • 15015 444 Avenue SE • 20032 NE Union Hill Road • S. 376th Street, west of #4603 • SE 208th Street, east of Issaquah Hobart Road • 184th Avenue NE, about 300 feet north of NE 116th Street • 184th Avenue, between houses 12011 and 12037
Road Infrastructure - Pedestrian Improvements	Recycled concrete, asphalt, gravel, metal culverts, cast iron catch basin covers, miscellaneous steel products; used fly ash as a cement substitute; reused native soils on-site, salvaged materials; and used materials sourced from within 500 Miles	Several sidewalks were improved in 2009. In all, a total of 3,900 linear feet were constructed. The projects were located at: • S. 128th St. from 69th Ave S. to S. 127th St. In addition to the other green building strategies used in the other pedestrian improvement project listed, this project also installed 435 linear feet of pervious concrete; • 124th Ave SE from SE 202 Pl to SE 208th St • Military Road South from S. 116th St. to Des Moines Memorial Way S.
Road Infrastructure – Pavement Overlay	Recycled asphalt roof shingles, recycled asphalt pavement and all project materials were sourced from within 500 Miles.	This project, located in Enumclaw on SE 416th Street from 212th Ave SE to 244th Ave SE, and completed in cooperation with the Solid Waste Division, was a controlled experimental study to demonstrate the use of recycled asphalt roofing shingles in hot mix asphalt pavement. It incorporated recycled asphalt roofing shingles into paving 10,560 linear feet of roadway. The pavement performance will serve as the basis for future decisions about allowing the use of recycled asphalt shingles in hot mix asphalt. By using recycled asphalt shingles, the project diverted 70 tons from the landfill and saved in the production of virgin asphalt binder. The project also recycled 600 tons of asphalt pavement from roadway grindings, which is standard practice.

Environmentally Responsible Waste Disposal and Use of Recycled Materials Program	Recycled materials, purchased recycled materials	Through the Environmentally Responsible Waste Disposal and Use of Recycled Materials Program, the following materials were sent to seven vendors for reuse and recycling purposes in 2009: • 191 tons of vegetative/green waste • 7,000 cubic yards of materials, broken out as follows: • 4,671 cubic yards of brush and stumps • 2,309 cubic yards of broken concrete/asphalt of various sizes • 20 cubic yards of dry fill with sod In addition, 1,964 cubic yards of recycled materials were purchased from two vendors in 2009: • 652 cubic yards of top soil • 1,029 cubic yards of hog fuel • 191 cubic yards of medium bark • 92 cubic yards of compost
NE Woodinville-Duvall Road at 212th Avenue NE	Materials recycling and reuse	This project, located at the intersection of NE Woodinville-Duvall Road at 212th Avenue NE reused the old roadway. The short segment of new roadway was constructed, in a new alignment, to replace an existing road. The contractor ground up the old roadway and reused approximately 356 cubic yards of ground asphalt and concrete for the new roadbed and embankment.
Low Impact Development (LID) strategies	LID	LID strategies are being applied in Roads projects wherever practicable: • A new rain garden cell was constructed for the LID pilot project at South 272nd Street and Military Road South in order to address problems that occurred with the original design. This project continues to provide valuable practical experience for incorporating LID into other road projects. • Dispersion trenches were installed for the NE Woodinville-Duvall Road at 212th Avenue NE intersection project as a cost-effective alternative to more conventional stormwater management options. • Work continued on three Washington State Department of Ecology LID grants to design, construct, and/or monitor various LID applications for different roadway project contexts.
Cement Substitute Use	Cement substitute	A system was initiated to track the use of cement substitutes used in Roads projects. For contractors using the testing services of King County Materials Labs, records indicated that 128,389 pounds of fly ash and 27,173 pounds of slag were used in lieu of Portland cement. Because of the energy-intensive process required to produce Portland cement, the use of these substitute materials represents a substantial reduction in both embodied energy and greenhouse gas emissions.

A low impact rain garden at the intersection of South 272nd Street and Military Road South. This low impact strategy uses a planted depression that allows stormwater to soak into the ground rather than to run off into the storm drain.

A Washington State Department of Transportation employee inspects the experimental RAS paving.

Department of Transportation – Airport Division

In October 2009, the Airport Division began publication of a quarterly newsletter called "*Inhabit – A new Airport Green Communication Publication*". It is distributed in e-format to Airport tenants and interested individuals and organizations.

Department of Natural Resources and Parks - Wastewater Treatment Division

In 2009, WTD worked on two projects pursuing LEED Certification: the South Treatment Plant Administration Building which was completed in the Spring of 2009 and the Brightwater Treatment Plant Environmental Education and Community Meeting Center which began construction in 2009. The Carnation Treatment Plant Administration Building received a LEED Certified rating in 2009.

The WTD also has an active Green Team which worked on developing an alternate environmental scorecard that is applicable to WTD projects. The Team also completed trainings for WTD project managers and team members on the use of the scorecard as well as the LEED Scorecard and incorporated the Green Building and Sustainable Development Ordinance requirements into their capital project standard processes.

Table 5. Wastewater Treatment Division Projects

Project	Green Building Feature	Project Description
South Treatment Plant (pending Silver Certification)	Energy efficiency, low impact development, recycled material, C&D recycled, water efficiency, local/regional materials, low VOC paints, adhesives, and carpets, daylighting and views, use of greywater	The South Treatment Plant Administration Building was completed in the Spring of 2009. The building houses administrative office space as well as laboratory space. A 1,000 square foot black solar preheating panel was integrated into the south elevation that preheats 6,500 cubic feet per minute of outside air for the laboratory supply air before it enters the air makeup unit heating coil. It was estimated that the panel will provide approximately 15 percent of the building's heating needs.
Brightwater Treatment Plant (pursuing Gold Certification)	Energy efficiency, low impact development, recycled material, C&D recycled, and water efficiency.	The Brightwater Environmental Education and Community Meeting Center is pursuing LEED Gold Certification. Construction on the Center began in 2009. Reclaimed timbers at the Center will support a covered walkway and the main entry to the exhibit hall that will house the exhibits focusing on sustainable design, water and energy conservation, wastewater treatment and environmental protection.

Artist's rendering of the Brightwater Environmental Education and Community Meeting Center.

Hidden Lake Pump Station/ Boeing Creek Trunk	Energy efficiency, low impact development, and water efficiency.	Green building elements include light pollution reduction, native drought tolerant vegetation, trenchless technology, and pervious paving.
Juanita Bay Pump Station	Energy efficiency, low impact development, recycled material, C&D recycled, and water efficiency.	This project included features such as stormwater management resulting in 22-27 percent reduction in stomwater runoff and an improved site storm drainage system compared to previous site conditions, light pollution reduction using a minimum number of exterior, shielded light fixtures, energy-efficient lights with motion sensors, high-efficiency irrigation technology using an irrigation controller, and water-efficient landscaping which includes native, adaptive and drought-tolerant plants. The project also recycled 64 percent of its construction waste.
Lake Hills Interceptor & EBI 2 Rehabilitation	Water efficiency	By using a new method to rehabilitate sewer pipes, water use during construction was reduced from 771,000 gallons to 3,800 gallons. The new method involves inserting a resin-impregnated fabric sock filled with hot water into the pipes. The hot water is circulated inside the sock until the sock cures and hardens into the new pipe. This project saved 767,200 gallons of water.
South Plant Energy Efficient Aeration Blowers	Energy efficiency	This project replaced three existing centrifugal blowers with two new turbo blowers which are significantly more energy efficient. It is estimated that each new blower will use approximately 200,000 less kilowatts per year (about $12,000/year in savings per blower).

(Photo credit: Ned Ahrens)

Exterior of the completed Juanita Bay Pump Station. This project incorporated LID strategies, energy and water efficiencies, and reduced light pollution.

Entrance to the new South Treatment Plant Administration Building. LEED certification of this building is pending.

Department of Natural Resources and Parks - Solid Waste Division

The Solid Waste Division is currently working on the design and construction of two new transfer stations. Both stations are targeting at least a LEED Gold certification. Construction has begun on the new Bow Lake Recycling and Transfer Station and the design for the new Factoria Recycling and Transfer Station has just gotten under way. Other projects that SWD is working on, described below, also incorporate LEED principles.

SWD's GreenTools program has also been providing green building assistance on projects for county residents, businesses, cities, and other agencies. This program includes training, financial incentives, research, project review, and development of strategies and policies to support green building throughout the county.

Table 6. Solid Waste Division Projects

Project	Green Building Features	Project Description
Bow Lake Recycling and Transfer Station (pursuing LEED Gold)	Energy efficiency, recycled material, C&D recycled, and water efficiency.	This new facility is being constructed on the site of the existing Bow Lake Transfer Station in Tukwila. Some of the sustainable features to be incorporated include passive ventilation, natural daylighting, rainwater harvesting, highly-reflective roofs, solar panels, water-efficient landscaping, recycled-content building materials, mitigation of old landfill areas, and restoration of stream buffers on the adjacent property. The first phase of construction began in early 2009 with site preparation.
Houghton Transfer Station Roof Replacement & Site Improvements	Energy efficiency, recycled material, C&D recycled.	This project involves raising and strengthening the existing roof structure and improving site conditions at the Houghton Transfer Station. For the site improvement work, the contractor will be using ecology blocks, made from recycled concrete with 40 percent fly ash as cement substitute. To reduce energy consumption, time controlled lighting will be installed. The project is currently in the design phase and is using the King County Sustainable Infrastructure Scorecard.
Aerator Pump Synchronization	Energy efficiency	Eight aerator pumps at the Cedar Hills Landfill leachate ponds were synchronized to provide proper aeration for the ponds while minimizing run time. In just eight months of synchronized operation, the average monthly energy consumption by the aerators was reduced about 50 percent, resulting in a $45,000 savings on the energy bill for 2009.

Department of Natural Resources and Parks - Water and Land Resources Division

WLRD's capital projects generally involve open space land acquisition, aquatic habitat improvement, river flood control, and/or stormwater flow control and water quality treatment. These projects are not eligible for LEED certification.

As in past years, WLRD staff provided a significant amount of technical support to private project proponents and their consultants in the use of LID techniques. These projects included subdivisions and commercial projects and single-family residences. WLRD staff also provided support to citizens proposing residential and farm projects through the Rural Stewardship and Farm Planning programs. These programs use LID and other green approaches to limit environmental impacts from rural-area projects.

Table 7: Water and Land Resources Division Projects

Project	Green Building Features	Project Description
Fairwood Culvert Replacement	Soil conservation, greenhouse gas reductions	This project replaced an existing failed, large-diameter corrugated metal pipe (CMP) with smooth-wall steel pipe. The new pipe was jacked in place and the old pipe was filled with concrete and abandoned in-place. The use of pipe jacking avoided excavation, import and export of soil material, and avoided generation of sediment that would impact Madsen Creek.
Neighborhood Drainage and Water Quality	Recycled material, C&D recycled, energy efficiency.	WLRD contracts with the King County Roads Division to construct these drainage projects. The Roads Division has a long standing program called Coordinated Reduction of Waste (CROW) which uses strategies that include recycling of excavated soil, pipe and concrete; use of recycled material or materials with recycled content (such as recycled plastic lumber, GROCO made from biosolids, and ground woodwaste as a soil amendment); use of energy efficient equipment or alternative fuels; and use of compost to amend soils and recycled wood instead of straw mulch.

Lower Tolt River Floodplain Reconnection Project	Habitat restoration, material salvage and reuse, native planting	WLRD, in cooperation with King County Parks and the City of Seattle, removed approximately one half mile of levee that constrained the lower reach of the Tolt River through Tolt-MacDonald Park and constructed a new levee about 800 feet further back from the river channel. This allows the river to occupy about 50 acres of high-quality floodplain at its confluence with the Snoqualmie River. This project reused materials from the old levee to construct the new levee, reused topsoil onsite and used logs washed onto the site during the January, 2009 floods to construct many habitat and channel stability elements.

Aerial view of the Lower Tolt River Floodplain Reconnection project. The project reused materials from the old levee to build the new one.

Department of Natural Resources and Parks - Parks and Recreation Division

Many of the Parks projects featured this year were able to reuse and recycle many materials. From the salvage of an old dock to the reuse of bridge decking, Parks, with technical assistance from FMD, conserved many resources. Planning for a new Central Maintenance Facility which will seek to achieve a LEED Gold rating for the building was put on hold pending funding.

Table 8. Parks Division Projects

Project	Green Building Features	Project Description
Maury Island Viewpoint	Salvaged and recycled materials	Timbers from a pier being removed at Maury Island Marine Park were used for the support structure and hand-railings and Trex was used for decking.
Skyway Park Plaza and Shelter	Recycled materials, habitat restoration	Parks worked with students from the University of Washington to restore over a half acre of wetland buffer in Skyway Park as well as to design and build a picnic shelter and plaza. The shelter and plaza incorporated the following: Trex boardwalk, gabion walls, green roof on the shelter, gravel instead of concrete paths, and cord-wood shelter mini-walls/benches.

Cedar River Bridge Improvements	C&D recycled	This project involved the deconstruction/replacement and rehabilitation of two bridges on the Cedar River Trail. It diverted 98 percent of construction waste for reuse.
Soos Creek Trail	Habitat restoration	The Soos Creek Trail project restoration planting effort removed invasive blackberries from native wetland. In total, 740 native willow, red twig dogwood, salmonberry, rose, and snowberry plants were planted in the wetland and wetland buffer.
Aquatic Center lighting	Energy efficiency	This project installed eighty-eight new 1000W fixtures with a lighting control system at the Aquatics Center in Federal Way. The new fixtures are expected to provide 35-50 percent in annual energy savings at the facility. King County has also applied for a $55,000 energy grant from Puget Sound Energy related to this project.
Marymoor Park Baseball Synthetic Turf fields	Water Conservation, Reduction of Green House Gases, Recycled Materials, Water Quality	The replacement of the grass ball fields with synthetic turf has multiple advantages. Synthetic turf: Does not need to be watered like traditional grass, saving hundreds of thousands of gallons of water over the field's lifetime. Does not need to be mowed weekly like traditional grass, reducing greenhouse gas emissions. Does not use chemical fertilizers and herbicides, preventing the possibility of those materials from entering or leaching into our waterways. In addition, the field uses crumb rubber infill made from recycled tires. The field will also be able to be recycled when it is time for replacement. The field is also secured around the perimeter with recycled plastic lumber that will be able to be re-used when the field is replaced in 10-12 years.

New synthetic ball fields at Marymoor Park.

Department Development and Environmental Services

DDES staff worked with FMD staff to prepare their existing building, the Black River Building, to qualify and apply for LEED for Existing Buildings Operation and Maintenance certification. Preparations have included documenting existing operations and maintenance practices and planning for necessary upgrades. The LEED criteria require a performance period under which data for energy and water use will be monitored. The project team expects to submit the documentation in late 2010.

Department of Community and Human Services - Community Services Division

A representative of the County's Housing and Community Development Program spoke at the 2009 Housing Washington Conference in Spokane on the subject of sustainable design in the field of affordable housing. There is already a statewide green building standard in force, but the county's program is encouraging developers of affordable housing to aspire to a much higher standard, informally known as '100-year housing'. This ideal represents housing that is extremely energy-efficient and highly durable, requiring very little maintenance. This type of housing would change today's 50-year contracts to contracts that would last for 100 years. County staff in the Housing Finance Program was recently contacted by a developer interested in being the first to achieve this goal of building 100-year housing, which holds promise to more than double the county's stock of affordable housing over the long term at a relatively minor initial cost premium.

This material will be provided in alternate formats upon request by contacting:

King County Solid Waste Division

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King County

Department of
Natural Resources and Parks
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Green Building Program

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