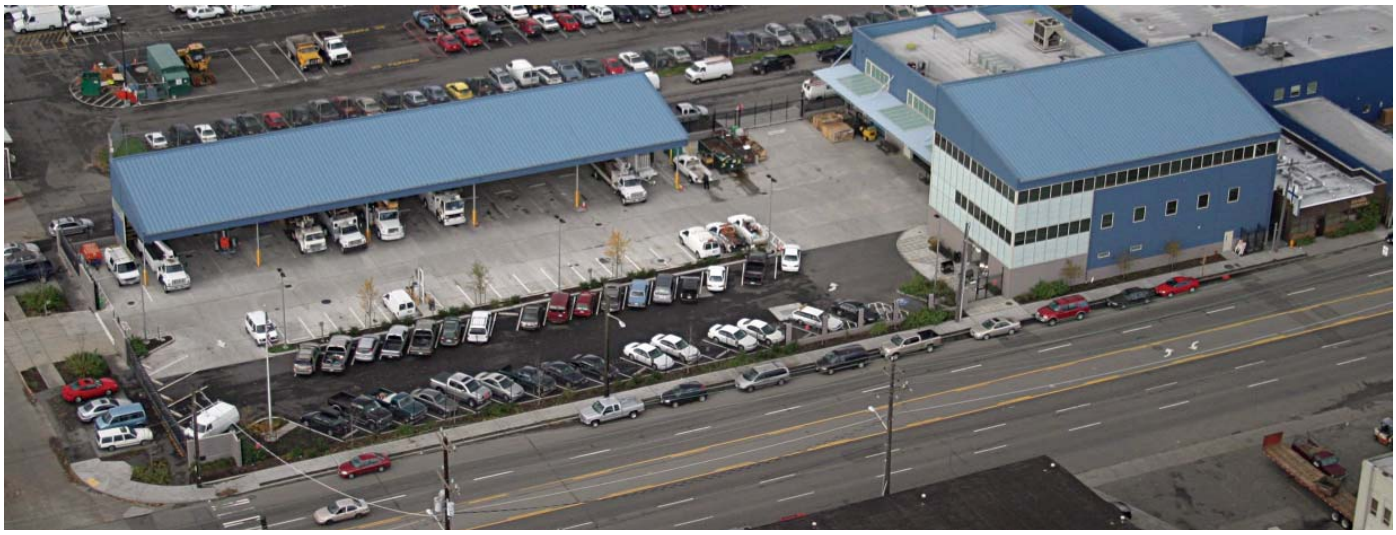
Green Building Program

Annual Report

2007

King County

Contents



Power Distribution Headquarters

2007 Program Accomplishments

As directed in King County Ordinance 15118, *Green Building Practices for County Buildings*, we are pleased to submit this 2007 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.

In 2007, county departments made significant strides in developing 12 building projects seeking certification in the Leadership in Energy and Environmental Design (LEED®) process. Some of the buildings are in the initial design phases while others were completed this year. 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.

In March, the countywide Green Building Team held its second annual Green Building Summit, a highly successful event that provided a venue for sharing green building information among county and city project managers and highlighting project successes. More than 100 project staff attended the event where six *Excellence in Building Green* awards were presented. These awards recognize individuals and projects that exemplify King County's commitment to building green.

The Solid Waste Division'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. In June, GreenTools staff partnered with the Suburban Cities Association to hold a conference for city staff and elected officials. The overarching goal of this event was to inspire King County's cities to adopt and enhance their own green building programs.

In addition, King County's Green Building Grants program expanded significantly in 2007. In all, 13 outstanding green building projects received grant awards, including eight residential projects through the King County/Seattle Built Green Incentive grant program and five commercial projects through the King County LEED Grant program.

On April 1, 2008, the existing green building ordinance is scheduled to sunset. A new ordinance, developed by the countywide Green Building Team, was transmitted to the King County Council in February 2008. The new ordinance builds on the existing ordinance and strengthens green building requirements, standards, and practices for the county.

What follows is a brief description of the structure and background of the Green Building Program. The remainder of this annual report focuses on three 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 the many internal construction projects within the county
- The progress of SWD's GreenTools program in applying green building concepts to county residents, businesses, and other agencies

Basic Elements of the Green Building Program

In accordance with the green building 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 Leadership in Energy and Environmental Design (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 feasible.

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 the Facilities Management Division (FMD)
- Department of Transportation, including –
  - Transit Division (Transit)
  - Road Services Division (Roads)
- DNRP, including
  - Wastewater Treatment Division (WTD)
  - SWD
  - Water and Land Resources Division (WLRD)
  - Parks Division (Parks)
- Department of Development and Environmental Services (DDES)

The Green Building Team is charged with helping countywide project teams achieve the maximum possible standards of green building on their projects.

In addition, SWD's GreenTools program provides support to project

New Shoreline Recycling and Transfer Station

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 ranks sites 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, wastewater treatment plants, 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. Departments are directed to apply LEED criteria in the pre-design and design phases of projects, and are encouraged to seek the highest LEED certification applicable to the project.

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), Core and Shell (CS), and Commercial Interiors (CI). While a project can be registered for LEED, the final rating is not awarded until after the project is completed and monitored for compliance.

In 2007, county departments made significant progress on 12 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
Projects in the Design Phase			
1. Bow Lake Transfer Station	SWD	Industrial	Silver
2. Atlantic/ Central Base Operations Complex	Transit	Office	Platinum
3. Transit Police Building	Transit	Office	Gold
4. Ryerson Base Improvements	Transit	Office	Certified
5. Brightwater Environmental Education Center	WTD	Meeting facility/ community center	Gold
Projects in the Construction Phase			
6. Carnation Treatment Plant	WTD	Industrial	Silver
7. South Plant New Administration Building	WTD	Office/laboratory	Silver
8. 9th and Jefferson Building	FMD	Office	Silver
Projects Completed – Pending Certification			
9. Atlantic/Central Base Tire and Millwright Shop	Transit	Office, millwright machine shop	Silver
10. Atlantic/Central Base Communication and Control Center	Transit	Office	Silver
11. Shoreline Recycling and Transfer Station (formerly First NE TS)	SWD	Industrial	Gold
12. Chinook Building (formerly New County Office Building)	FMD	Office	LEED CS Gold and LEED CI Platinum
Projects Completed and Certified			
13. Kent Pullen Regional Communication & Emergency Coordination Center	FMD	Commercial	LEED NC-Certified
14. King Street Center	FMD	Office	LEED EB – Gold
15. Power Distribution Headquarters	Transit	Office and workshop	LEED NC – Certified
16. Marymoor Maintenance Facility	FMD/Parks	Office and workshop	LEED NC – Certified

KEY: LEED CI – *Commercial Interiors* LEED CS – *Core and Shell* LEED EB – *Existing Buildings* LEED NC – *New Construction*

Project Descriptions

Projects in the Design Phase

1. Bow Lake Transfer Station: SWD is designing a new transfer station at the site of the existing Bow Lake station in Tukwila. The new station will use adjacent property to the north that SWD is purchasing for the project. The State Environmental Protection Act (SEPA) environmental review was completed in January 2007, and the Facility Master Plan was approved by the King County Council in May 2007. Detailed design of the facility is in progress. The first phase of construction is planned to begin in the summer of 2008, pending permit approvals. Some of the sustainable features to be incorporated in the Bow Lake project include passive ventilation, natural daylighting, rainwater harvesting, green roofs, water-efficient landscaping, use of recycled-content building materials, mitigation of old landfill areas, and restoration of stream buffers on the adjacent property. The project team anticipates that the new transfer station will achieve a minimum LEED Silver rating.

2. Atlantic/Central Base Operations Building: This building consists of office spaces, with special driver entry and dispatching areas, as well as driver locker rooms, lunch rooms, and recreational spaces. Larger conference-type spaces are also planned. Due in part to the 2006 Executive Order regarding renewable energy and efficiency goals, it was determined that the Operations building would seek a LEED Platinum rating with an emphasis on energy efficiency. A series of LEED workshops were conducted with key transit staff to determine LEED strategies and to select suitable building systems to meet the Platinum objectives. Design is scheduled to be completed by late fall 2008, with construction completed by early 2010. At present, ground source heat pumps, a raised floor for ventilation, and chilled beams are essential components of the mechanical design. Strategies planned to optimize daylight include orienting the building to take advantage of the best exposure, shaping and sizing the windows correctly, minimizing overhead lighting, and adding task lighting in work spaces.

3. Transit Police Building: This project is a 14,200-square-foot office building, housing all of the Transit police. Because the building is designated as an essential county building in the event of a seismic event, the structural system is designed for immediate occupancy following such an event, with a secure exterior perimeter. Mechanical and electrical systems are designed to support essential functions without commercial power for a period of 72 hours. A raised floor will be used for ventilation in most areas. High-efficiency mechanical systems are planned. The building design is scheduled for completion by fall of 2008, with construction completed by early 2010. This project is targeting a LEED Gold rating.

4. Ryerson Base Improvements: This $14 million project consists of architectural upgrades and expansion to accommodate additional buses and drivers. It also includes a complete heating ventilation and air conditioning (HVAC) system replacement, similar to the Central and Bellevue Base projects, described more extensively later in this report. With the high efficiency HVAC upgrade and measures such as water efficiency improvements, this project is being registered as a LEED Certified project. Design is almost complete and the construction contract is expected to be advertised in early 2008.

5. Brightwater Treatment Plant Environmental Education and Community Center: The Environmental Education/Community Center is an on-site resource for the community that will include features such as natural ventilation, energy-efficient lighting and temperature controls, use of recycled materials and Energy Star appliances, radiant floor heating that uses waste heat from the treatment plant processes, low-flow toilets that use reclaimed water from the treatment plant, and irrigation that uses reclaimed water. The green building features will serve as an educational showcase for the community. The center has targeted a LEED Gold rating.

Projects in the Construction Phase

6. Carnation Treatment Plant: The construction of a new Wastewater Treatment Plant in Carnation will be completed in spring of 2008 and be capable of treating 400,000 gallons of wastewater a day. Some green elements used in the project include materials with low volatile organic compound (VOC) content, natural ventilation, use of innovative stormwater control strategies, reduction of water and power use, use of alternative energy sources, and use of local/regional building materials. One unique green building element planned for the plant is a system for treating secondary treated wastewater using Membrane Bioreactors (MBRs). MBRs produce Class A reclaimed water that is 10 times cleaner than typical reclaimed water. This non-potable reclaimed water will be used to enhance wetlands at the Chinook Bend Natural Area, located adjacent to the river outfall site at the Carnation Farm Road Bridge. The 59-acre property is owned by King County and managed as an open space and habitat protection area by WLRD. Using reclaimed water to enhance an existing wetland area is consistent with the goals established for the site in the Chinook Bend Site Management Guidelines. The project is also designed so that the discharge pipe is located on the underside of the Carnation Farm Road Bridge instead of a trench in the riverbed, reducing construction impacts of the project. The project goal is to achieve a LEED Silver rating.

Carnation Treatment Plant Operations Building

7. South Treatment Plant New Administration Building: WTD is building a new Administration Building at the South Treatment Plant that will house the process laboratory and administrative office space. The project is using the following green elements: construction waste management, bioswales, daylighting, light colored roofs (to reflect light absorbency), water-efficient landscaping, the use of reclaimed water for toilet flushing, and the installation of a SolarWall that will provide air pre-heated by the sun to the HVAC system.

During demolition of the old administration building, 100 percent of the concrete, asphalt, and ferrous and non-ferrous metals were recycled, which equates to 1,416 tons of concrete, 9 tons of asphalt, and 62 tons of ferrous and non-ferrous metals. Many materials were salvaged prior to demolition.

The project is expected to achieve a LEED Silver rating, but could achieve a rating as high as Gold. This project is scheduled for completion in early 2009.

8. Ninth and Jefferson Building: This project is a 14-story, 440,00-square-foot building located on the southeast corner of Ninth Avenue and Jefferson Street, which will include services such as the King County Medical Examiner, research laboratories, dry labs, clinical services, and the county's Involuntary Treatment Act Courtroom. The building will also include retail space and five floors of underground parking. Sustainable building features include the use of water-saving fixtures, recycled-content materials, water-efficient landscaping, bicycle storage, and discounted rates in the parking garage for those driving alternative energy and high-efficiency vehicles. The project is scheduled to be complete in January 2009 and is targeting the LEED Silver rating.

Projects Complete – Pending Certification

9. Atlantic Base/Central Base Tire and Millwright Shop: This project is a new, free-standing building dedicated to serving Transit's specialized service requirements for bus tires. The project was completed in 2007 and is expected to receive a LEED Silver rating.

Atlantic Base/Central Base Tire and Millwright Shop

10. Atlantic Base/Central Base Communications and Control Center: This specialized facility houses equipment for maintaining communication with all 1,400 Transit buses, the downtown Seattle tunnel, and Sound Transit train operations. It is also designed to serve as Transit's Emergency Operations Center. Construction was completed in 2006, and the project is expected to achieve a LEED Silver rating.

Atlantic Base/Central Base Communications and Control Center

11. Shoreline Recycling and Transfer Station (formerly First Northeast Transfer Station): SWD's new Shoreline Recycling and Transfer Station was completed in early 2008. The project team anticipates that the new recycling and transfer station will achieve a LEED Gold rating.

Educational kiosk at Shoreline Recycling and Transfer Station that explains some of the environmental features of the building

Chinook Building

12. Chinook Building (formerly New County Office Building): This project is a new county office building on the site of an old parking garage. Completed in 2007, the project team is seeking a LEED CS (Core and Shell) Gold rating and a LEED CI (Commercial Interiors) Platinum rating.

Additional Green Building Projects (by Department)

Many of the construction projects undertaken by the county do not qualify 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

Auditor's Office Remodel: In this remodel, workstations were reconfigured to maximize the use of existing furniture. Casework, millwork, and doors were salvaged and reused where possible. All paint finishes met Green Seal certification standards, and recycled carpet tile was used where replacement was required. In addition, the existing lighting was modified to add occupancy sensor controls.

Blackriver Office Building: DDES is housed in the Blackriver building, which is managed by FMD. FMD analyzed what would be required for this building to achieve LEED certification for an Existing Building. They drafted a plan that identifies what measures would be required to achieve a Certified, Silver, or Gold status. It also looked at the required funding for each certification level. The plan is currently under consideration.

In 2007, all public areas in the building were re-carpeted with 997 square yards of recycled carpet tiles. The existing carpet was returned to the Lee's Carpet manufacturing plant to be recycled. Concurrent with the carpet replacement, much of the building was painted using paint with low levels of VOCs.

Courthouse Electrical Distribution System Upgrades: For this project, completed in 2007, meters were installed at power feeders to measure consumption trends. Programmable light panels were installed that should reduce lighting needs by 114,000 kilowatts per year.

District Court Southwest Landscaping: The goal of this landscaping project is to save water and staff time, and reduce safety conflicts. The new design will increase the use of drought-tolerant plant species and maintain mature trees and plantings on-site.

Drug Court Tenant Improvements: In this remodel, the office space was carpeted with Carpet and Rug Institute (CRI) Green Label Plus-certified carpet tile. The paint finishes met Green Seal certification standards, and furniture was reused whenever possible.

North District Multi-Service Center: For this project, the exhaust fan was replaced to save energy, and the hot water circulation pump and water heater were placed on a control system to allow them to be turned off when the building is not occupied.

Northshore Public Health: For this project, more than 11,000 square feet of carpet and rubber tiles was installed. The carpet that was removed was returned to Mannington's carpet plant to be recycled. The new carpet installed is CRI Green Label Plus-certified, and the Johnsonite Rubber Flooring has Resilient Floor Covering Institute (RFCI) FloorScore certification.

Precinct 3 HVAC and Flooring Replacement: For this energy-saving project, an inefficient heat wheel system was replaced with a new heat wheel/heat capture assembly. The new assembly will recapture energy more effectively and save energy costs for the facility. In addition, FMD installed all new heavy-duty flooring throughout the precinct building. The new Lee's carpeting contains recycled content, and the Armstrong vinyl flooring was RFCI FloorScore certified. The 830 square yards of carpet removed was reclaimed under Lee's eCover Program.

White Center Public Health: In this project, FMD replaced 2,000 square feet of flooring with RFCI FloorScore-certified resilient products and CRI Green Label Plus-certified carpet tile with 35 percent pre-consumer recycled content backing.

Executive Services, Facilities Management Division and Natural Resources and Parks, Parks Division

Soos Creek Trailhead: In Phase 4 of this project, a trailhead is being constructed within the footprint of a demolished house. Before being demolished, materials that could be salvaged and sold for reuse were recovered. In addition, the existing well and septic system will be used for the new trailhead restroom. The project is under construction and should be completed by mid-2008.

White Center Field Regrade: This field regrading will be accomplished without exporting any soil from the site. A rain garden will be installed that will reduce stormwater runoff on the playing field.

Burke Gilman Trail Improvements: The purpose of this project is to replace the asphalt pavement along two miles of the Burke Gilman trail through the City of Lake Forest Park. Approximately 1,290 cubic yards of the existing asphalt will be recycled, and the existing subgrade gravel and fill will be reused when possible. At four locations adjacent to wetlands, semi-pervious asphalt will be used. The project is expected to be completed in the fall of 2008.

Snoqualmie Valley Trail River Edge Repair: This project entails armoring the riverbank to address some slip failures along the trail. The project also incorporates habitat restoration work along the scoured river edge. Design and follow-up study for this project is expected to be completed in the fall of 2009.

Gateways Regional Trails Study: The design goal of this project is to increase non-motorized transportation within the region by providing greater access to the trail system. The project is expected to be complete in February 2008.

Aquatic Center Lighting Improvements: This project involves changing 85 1,000-watt metal halide fixtures with 87 550-watt pulse-start metal halide fixtures. Because the new fixtures are more efficient, the annual savings is projected to be 210,000 kilowatts per year. This project should be completed in spring 2008.

Maury Island Pier Removal: For this project, a dilapidated pier and creosote pilings will be removed by March 2008. Washington State Parks has agreed to reuse up to 4,500 square feet of timber decking and 3,475 linear feet of the existing railing system on a Camano Island dock project.

Play Area Rehabilitation: The purpose of this project, to be completed in spring 2008, is to replace old playground equipment at three parks – Lake Geneva, Klahanie, and Southern Heights. Ninety-five percent of the construction and demolition waste from this project will be diverted for recycling.

Transportation, Transit Division

Central Base and Bellevue Base HVAC Replacement: These two multi-million dollar projects involve the complete replacement of the HVAC systems with extremely energy-efficient equipment. The heating efficiency and temperature control will be dramatically improved through the use of condensing boilers, hot water circulation pumps controlled by variable fan drives (VFDs), and a complete redesign of rooftop air handling units that use hydronic hot water coils. All air handlers will have VFD fan speed controls, on both supply and return/exhaust fans. In addition, a new air quality sensor system that continuously samples the air, along with other system upgrades, will reduce by up to 50 percent the amount of outside air that needs to be heated in the large bus maintenance bays, while maintaining air quality and code-compliant ventilation. The construction contract was recently awarded for the Central Base project. The Bellevue Base project design will be advertised for construction in the first quarter of 2008.

Redmond Transit Center: The passenger loading and bus layover facilities at the Redmond Park-and-Ride lot were substantially revised under a $7 million project, which included some federal funding. The project provides six bus bays for passenger boarding, two para-transit service parking spaces, six off-street bus layover spaces, turn-around capability for transit operations, enhanced pedestrian access, an enhanced streetscape, 20 bicycle parking spaces, and a transit operator comfort station. In addition to the above features, a portion of the site was sold for development of a mixed-use project. The project, negotiated with Trammel Crow, includes 400 residential units with 10-20 percent of the units designated as affordable. In addition, 11,000 square feet of commercial space will be provided. The remainder of the park-and-ride area will be reconstructed as a new three-story parking structure for transit patrons.

Transit Asset Management Program (TAMP): TAMP is a multi-million dollar fund for replacing building-related equipment and assets. Beginning in 2007, as each TAMP project is reviewed for engineering scope and budget, an energy analysis is added to each pre-design report that identifies energy-efficient options that should be considered for incorporation in project plans, along with potential energy and cost savings. Also, as energy costs become more significant, capital projects are prioritizing energy efficiency improvements.

Park-and-Ride Lighting Revisions: Many of Metro Transit's 50 park-and-ride lots are scheduled to receive lighting retrofits. These retrofits will address out-of-date lighting technology and security concerns. Transit engineers are studying options for installing lighting that is time-controlled to address some of these concerns.

Pervious Pavement Pilot: At the Montlake bike station, adjacent to a surface street bus stop and a Highway 520 transit stop, pavement was added to increase bike storage capacity. Porous concrete was used to reduce surface water runoff and to avoid the potential overloading of the present storm drain system.

Transportation, Road Services Division

Military Road South at South 272nd Street: Roads completed construction of this intersection improvement project. It incorporates low impact development (LID) stormwater management features such as the use of porous concrete sidewalks and a linear bioretention facility (a hybrid rain garden design). This project represents one of the approaches that Roads is taking to integrate green building practices into transportation infrastructure projects. The effectiveness of LID features in an arterial roadway will be monitored for several years using grant money received from the Washington State Department of Ecology. Information gained from applying these green building techniques will be used to inform the design of similar systems for other road projects. This knowledge will also be shared as broadly as possible with others interested in using these techniques for similar applications.

Natural Resources and Parks, Wastewater Treatment Division

Brightwater Treatment Plant: The Brightwater Treatment Plant will incorporate sustainable or green design and building practices in all facets of its construction and operation.

Some of the sustainable design and construction practices include:

- Reducing impervious surface on the 114-acre site by about 50 percent.
- Building an innovative stormwater treatment system that will include multiple stages of filtration through wetlands, which will improve the quality of stormwater flowing to Little Bear Creek.
- Using recycled or green building materials in facility buildings and designing to maximize use of natural light.
- Meeting exceptionally high standards for recycling construction material waste, including salvaging and reusing approximately 75 tons of equipment, building materials, and complete structures, and diverting approximately 350,200 tons of construction and demolition (C&D) debris from landfill disposal.
- Retaining excavated soil on-site to significantly reduce truck trips, and using the excavated soil to create landforms and buffers that will attractively screen the facility's buildings.
- Planting native plants around facility buildings.
- Using crushed asphalt and concrete that has been removed from other areas of the site to construct access and haul roads, as well as material and equipment staging areas. It is estimated that more than 1 million tons of asphalt and concrete will be reused through this process.
- Using 4,800 tons of fly ash as a cement substitute in the construction of the treatment plant, which will require approximately 80,000 cubic yards of concrete. The use of fly ash as a cement substitute replaces a significant percent of the Portland cement used in the concrete mix, which reduces greenhouse gas emissions generated in the production of cement. One thousand tons of fly ash was also used in the tunnel associated with Brightwater in 2007.

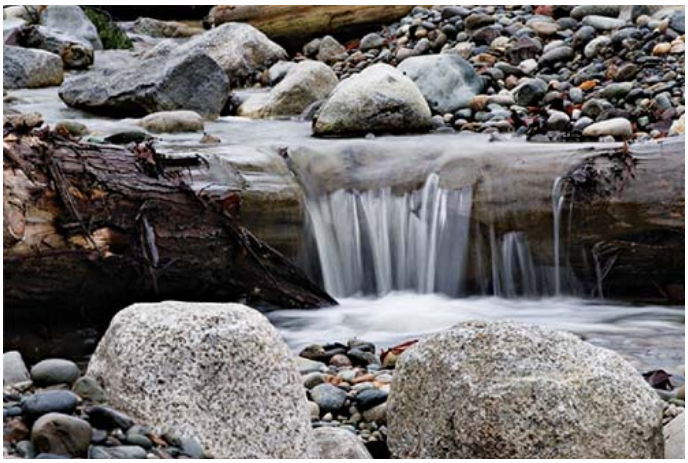
Brightwater North Mitigation Area (NMA): Brightwater will feature 70 acres of open space and enhanced habitat, including 43 acres on the north portion of the site that has been transformed from an underused, environmentally damaged site into a community amenity with open space, trails, and improved habitat. Examples of green building practices in the NMA include:

- Using excavated soil on the site to create hills within the habitat area, reducing traffic impacts, fuel consumption, and greenhouse gas emissions.
- Planting more than 22,000 native plant species, including 5,000 seedling trees that have been grown and purchased through the King County Plant Salvage and Parks Nurseries, and reusing more than 200 trees and root wads cleared from the site during stream and pond salmon habitat reconstruction.
- Recycling approximately 15,000 cubic yards of compost material found on-site and eliminating the need for importing material while also reducing cost.
- Restoring approximately 1,350 feet of stream corridor and adding an additional 350 feet of new stream corridor.
- Creating 29,000 square feet of pond habitat with an amphibian shelf and ladder that connects two open wetland systems.

Constructing more than four acres of additional enhanced emergent and forested wetland habitat.

- Using large sprinklers to provide infiltration for the stormwater runoff from the entire construction area located to the south.
- Building a 1,500-square-foot field house that will include:
  - Composting toilets
  - Partial straw bale construction
  - Solar panels
  - Sustainable and recycled building materials
  - A rainwater catchment system for irrigation of the demonstration gardens
  - Demonstration gardens that will display native plants, edible plants, and drought-tolerant plants to showcase a design that can benefit humans, wildlife (especially native birds), and the environment, without compromising the visual beauty or practical functions of a garden

An aerial picture of the north mitigation area, showing some of the features of the site



Part of the restored stream corridor in the north mitigation area

Juanita Bay Pump Station: The Juanita Bay Pump Station is being replaced to meet future flow projections. The station development incorporated green strategies in the following areas: erosion and sedimentation control, minimal energy use, chlorofluorocarbon (CFC) reduction in the HVAC system, use of recycled content materials, use of local/regional materials in construction, source control of VOCs and other indoor chemical pollutants, energy-efficient lamps, heat island reduction measures, and provisions to add photovoltaic panels on the roof in the future.

Kirkland Pump Station Modifications: The Kirkland Pump Station is located at the corner of 3rd Street and Park Lane in the City of Kirkland. This project was redesigned to increase the peak capacity of the station to 7.7 million gallons a day, after an assessment discovered that the current capacity will not meet projected flows. The project will replace aging equipment with new, higher capacity equipment; replace 2,100 feet of asbestos-cement force main pipe with new, larger diameter pipe; and install 325 feet of new influent pipe to increase influent system capacity. The project is currently in the pre-design phase and is using the LEED checklist as a guide for design.

Bellevue Pump Station Upgrade: This pumping station is an existing facility that will undergo significant renovations and additions. Each disturbed project area will undergo surface improvements and landscaping to restore to original (or better) conditions. The upgrade can be divided into two distinct elements, an upgraded pump station and a new force main. The force main is a 24-inch-diameter, 5,700-foot-long pipeline constructed by horizontal directional drilling and open-cut installation. There are two intermediate locations along the force main alignment where below-grade structures containing air release/vacuum valves and odor control facilities will be constructed.

Hidden Lake/Boeing Creek Trunk Project: Construction of the Hidden Lake/Boeing Creek Trunk project began in May 2006 in the City of Shoreline. While designing the new pump station, storage pipeline, and trunk sewer, the project incorporated the following green elements: planting of native drought tolerant vegetation, use of trenchless technologies, and use of pervious paving.

York Pump Station Solar Panel: The York Pump Station solar panel project is an example of how green technologies have become more and more mainstream and affordable. For this project, it was less expensive to install a solar panel than to install a utility connection with meter and underground power cable in this location. Approximately $5,000 to $10,000 was saved by installing the solar panel, which had an installation cost of less than $3,000.

Solar panel at the York Pump Station

North Mercer Island Interceptor Repair Wetland Restoration: This project was undertaken to repair/replace 2,300 linear feet of pipe that was broken by a past construction incident. The pipe showed fractures and fatigue in areas and required emergency replacement. After the emergency repairs, WTD replanted a wetland with native vegetation. The site is about one-half acre in size and is situated next to a housing development that borders Lake Washington next to Luther Burbank Park. The wetland has been restored to a better condition and will be monitored and maintained for 3 years.

Natural Resources and Parks, Solid Waste Division

Houghton Transfer Station Mitigation and Roof Replacement: This project involves replacing the roof and improving site conditions at the Houghton Transfer Station. The consultant is using the LEED checklist in the design. For the site improvement work, the contractor will be using recycled materials, employing energy reduction strategies, and recycling construction materials. The contractor will be using ecology blocks made from recycled concrete with 40 percent fly ash as a cement substitute. In addition, recycled material may be used in the sound wall along the west property boundary. To reduce energy consumption, timer-controlled lighting will be installed. The contractor is required to have a construction waste recycling plan in place.

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 stormwater flow control and water quality treatment. These projects are not eligible for LEED certification. The Coordinated Reduction of Waste (CROW) program is in place at all of WLRD's facilities, which stresses recycling of excavated soil, pipe, and concrete and use of recycled material or materials with recycled content (such as recycled plastic lumber and GROCO made from biosolids). Wood waste from projects is ground up and used as a soil amendment, and compost is used to amend soils. Specifications for buying compost, tompost (a mixture of topsoil and compost), and Groco are available for project managers.

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 on their projects. These projects included subdivisions and commercial and single-family residences. The GreenTools program partnered with DDES and WLRD to educate the public on rural stewardship through hands-on trainings and the development of brochures and other resources. WLRD staff also provided support to citizens proposing residential and farm projects through the Rural Stewardship (approximately15 plans completed) and Farm Planning programs (43 citizens assisted). These programs use LID and other green approaches to limiting environmental impacts from rural-area projects. In addition, WLRD staff assisted with the GreenTools program training and presentations.

Department of Development and Environmental Services

This year, DDES established a department-wide vision to encourage sustainable development practices for projects permitted in unincorporated King County:

> *DDES is a national leader promoting responsible and sustainable development to foster environmental quality, economic vitality and social benefit.*

In partnership with the GreenTools program, DDES staff provided assistance to more than 70 customers with green building questions, in the form of eco-charettes, pre-application meetings, special reviews, and questions answered through the DDES Web site and telephone help lines. Project assistance was provided for a number of facilities, including:

- Early Learning Center School at Greenbridge in White Center
- O'Dell Education Center near Kent
- TMG Cottage Housing in the Skyway neighborhood
- Technology Access Foundation Center in White Center
- Camwest LID subdivision near Sammamish
- 98th street corridor LID enhancements at White Center
- Brickyard Park and Ride
- Woodinville Community Agricultural Center

DDES staff als provided project management and technical assistance to two 5-star Built Green projects – a rural single-family home on Grand Ridge Drive and Casa Verde, a single-family home near Woodinville.

Continuing assistance was provided under the Built Green™/Low Impact Development Demonstration Ordinance to two affordable housing projects: the Hope VI Greenbridge project in White Center and the Sunflower project on Vashon Island.

Greenbridge Seola Crossing

To provide better assistance to customers, DDES updated the Green Building display in the Permit Center and installed new recycled carpeting. In addition, DDES developed new incentives for DDES customers who build single-family and multi-family projects at a 4- or 5-star Built Green rating. More than 2,500 Green Home Remodel Guides and Construction Recycling Directories were distributed at the DDES Permit Center in 2007.

In concert with the GreenTools team, DDES held green building trainings for approximately 50 DDES staff. Topics included Green Building Case Studies, Green Roofs, Energy Efficient Houses, and Building Deconstruction, as well as a LID field trip.

Working with FMD, staff developed a plan to renovate the DDES building in Renton to achieve a LEED for Existing Buildings Gold rating.

SWD GreenTools Program

SWD's GreenTools program provides assistance to the county Green Building Team, internal county agencies, cities, the building community, and the public in designing buildings and structures that have less impact on the environment, are energy efficient, and use recycled materials. The mission statement of the GreenTools program is "to work toward a model sustainable community where both the public and private sectors seek to balance development and natural resource protection in the built environment."

Green Building Grants Program

Initiated in 2006 in accordance with Ordinance 15118, the King County Green Building Grants program expanded significantly this past year. Grant awards were given to 13 outstanding green building projects, including eight residential projects through the King County/Seattle Built Green Incentive grant and five commercial projects through the King County LEED Grant program. To be eligible for grants, the projects must meet a high certification level (four- or five-star Built Green, or LEED Silver and above). These projects must also meet other key performance criteria, which include:

- Demonstrate that the King County 2005 Surface Water Design Manual Standards have been met or exceeded
- Meet or exceed the King County Post-Construction Soil Standard
- Divert at least 75 percent of construction and demolition debris

SWD, WLRD, and WTD contributed to the King County Green Building grant fund. The Built Green Incentive grants (for residential green buildings) were funded through grants from WLRD and Seattle Public Utilities to the Built Green program of the Master Builders Association of King/Snohomish Counties. The GreenTools team will continue to refine the Green Building Grants program to provide incentives for more advanced green building projects and to identify other sources of funding to increase grant funds available.

Jack Hunter O'Dell Environmental Learning Center – *targeting LEED Platinum A project of the Institute for Community Leadership, 2006 King County LEED Grants Program recipient)*

Suburban Cities Toolkit

With help from a Coordinated Prevention Grant from the Washington Department of Ecology, the GreenTools team compiled a Suburban Cities Toolkit to help cities in King County start or enhance their green building programs. The toolkit is a collection of resources that the cities can adapt to their own programs and use to help initiate green building and development policies within their own cities. It is available on a CD and on the GreenTools Web site. A sample CD is included on the back cover page of this report.

In June, GreenTools staff partnered with the Suburban Cities Association and Bellevue to hold the "GreenTools for the Built Environment" conference. The event was attended by 140 city staff, elected officials, and green building leaders. The overarching goal was to inspire King County's cities to adopt and enhance their own green building programs.

King County Executive Ron Sims gave the opening remarks and stressed the importance of green building and development as it relates to key King County initiatives, such as addressing global warming and protecting critical areas and habitats. The event also included presentations from local business leaders representing companies such as Starbucks, Pagliacci Pizza, and the Environmental Home Center.

In the fall of 2007, the GreenTools program partnered with the Suburban Cities Association to provide technical trainings for city staff and elected officials on low impact development and energy efficiency. Additional training classes for the cities will continue through 2008.

Education and Outreach

The GreenTools program facilitated or collaborated on more than 30 different training sessions attended by more than 3,000 county staff and local, regional, and national green building stakeholders. Trainings ranged in subject matter from general overviews (or "Green Building 101") to detailed, hands-on classroom sessions and tours. Examples of topics included solar walls, sustainable materials, climate change, and designing for disassembly, as well as a tour of Forest Stewardship Council forest and an integrated design process pilot training.

GreenTools
Powered by King County

Construction and Demolition (C&D) Diversion

The purpose of the GreenTools C&D diversion program is to facilitate the diversion of all C&D materials of value from landfills to their highest feasible use. In 2007, a three-pronged approach was used to tackle this goal: general education, in-depth technical assistance, and policy development.

General education on alternatives to the landfilling of C&D materials was provided to contractors, project managers, and project owners through printed and on-line educational outreach materials, including the highly popular *Contractor's Guide*, *Construction Recycling Directory*, and *Design for Disassembly* documents.

In-depth technical assistance was provided to a number of internal county projects, including the South Treatment Plant Administrative Building. Finally, an industry stakeholder group was formed to help inform policy decisions and identify additional opportunities for increasing C&D diversion.

Residential Green Building

The GreenTools program team has successfully collaborated internally and externally on many projects to support residential green building, bringing education and assistance to urban and rural communities.

The GreenTools program and the King County Master Builders Association, through its Education Foundation, have collaborated for the last 8 years on the residential Built Green program in King and Snohomish Counties. This partnership has grown to support the Built Green program and to provide quality education to the residential construction industry and consumers.

In May, a special awards ceremony was held to honor the 10,000th certified home at the Greenbridge affordable housing community. At the event, Executive Ron Sims presented awards to the many different organizations that made this housing community possible. Other 2007 activities included the development of case studies, consumer and builder workshops, and participation in the Built Green executive, ethics, marketing, and checklist review committees.

Technical Assistance

Technical assistance provided by the GreenTools team included responding to calls and inquiries. Some of the calls were from individuals looking for general information, while others involved in-depth technical assistance such as research on technical or engineering issues. Examples of assistance provided by GreenTools staff in 2007 include the following:

- **Issaquah Highlands Zero Energy Project:** The GreenTools team collaborated with staff from the City of Issaquah, Built Green, Washington State University, and Puget Sound Energy to support and establish this first-of-its-kind housing project in King County. Zero energy homes are designed to produce as much electricity as they consume. GreenTools participated in eco-charettes, selection and hiring of the general contractor and architect, and other technical assistance as needed.
- **YWCA Affordable Housing Project in Issaquah**: To assist this affordable housing project being planned for the Issaquah Highlands, staff researched organizations that award grants to complex housing projects that incorporate green building elements. Staff also participated in the initial one-day design charrette.
- **SeaCliff Estates:** GreenTools staff conducted research and talked with engineering experts on LID technology to determine whether pervious asphalt could be paved over and maintain its infiltration characteristics. The research was to assist a five-unit development in Des Moines targeting a 5-star Built Green certification.
- **98th Street Corridor Eco-charrette:** The GreenTools team provided consulting and staff assistance for an eco-charrette designed to identify ways to make the street corridor between the Greenbridge housing development and the commercial district of White Center more walkable. Staff from various departments in the county participated in the charrette and developed ideas to improve the walkability, environmental features, and safety of the corridor.

Participants discuss alternatives for the 98th Street Corridor in White Center

- **White Center Park:** The GreenTools team provided consultant assistance to help identify and incorporate green features in the makeover of the park.
- **Permit Issues for Small Wind Turbines:** GreenTools staff provided in-depth research on SEPA and local permitting issues for a small wind turbine project in Kent.

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

King County Solid Waste Division

206-296-4466,

1-800-325-6165, ext. 6-4466,

TTY Relay: 711,

www.metrokc.gov/dnrp/swd

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

King County Solid Waste Division

206-296-4466,

1-800-325-6165, ext. 6-4466,

TTY Relay: 711,

www.metrokc.gov/dnrp/swd

Department of
Natural Resources and Parks
Solid Waste Division

King County

Green Building Program

Annual Report

2007