

# Green Building Program Annual Report

2006



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## Program Summary

In response to King County Ordinance 15118, we are pleased to submit this 2006 annual report highlighting the King County Green Building Program achievements. The 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 Green Building Program is managed by the Solid Waste Division of the Department of Natural Resources and Parks. Green building professionals within the Solid Waste Division provide technical support to project teams in the form of training, budget analysis, and technical assistance related to green building. The program also helps design teams 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. This includes promoting economic benefits such as the reduction of operating costs, enhanced asset value, optimal building performance, and a healthier workplace for employees.

The Solid Waste Division also 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)
- Department of Natural Resources and Parks (DNRP), including –
  - Wastewater Treatment Division (WTD)
  - Solid Waste Division (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.

Standards for establishing and rating green building practices are based on criteria developed by the U.S. Green Building Council using a nationally recognized rating system called Leadership in Energy and Environmental Design™ (LEED™). 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. Projects can be rated as Certified, Silver, Gold, or Platinum (the highest rating). 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 2006, county departments worked on

15 projects that are either in progress or completed under the LEED™ certification process (discussed in the next section).

There are also various types of projects where LEED™ certification may not be economically feasible or applicable, but where green building practices can be applied, such as open-air bus passenger shelters, restroom facilities, pump stations, and conveyance lines. The Green Building Team has been instrumental in providing assistance with a multitude of these types of projects. This annual report discusses the progress made on these projects as well.

SWD has also been providing green building assistance on projects external to King County government, for residents, businesses, and other agencies throughout the county. This includes training, financial incentives, research, project review, and development of strategies and policies to support green building on a larger scale. In 2006, SWD began a process to re-brand this assistance and identify a new name for the program – GreenTools – to reflect the wide variety of resources available to county agencies and the public. This annual report discusses the progress of efforts to promote public participation in green building, as well as SWD's efforts to promote and enhance the countywide program.

In 2006, the Green Building Team held its first ever 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 the first *Excellence in Building Green* awards were presented. These awards recognize individuals and projects that exemplify King County's commitment to building green.

## **BACKGROUND**

The Green Building Program began with the adoption of an Executive Order in November 2001, which:

- Encouraged and promoted the use of green building practices in all buildings the county constructs, remodels, and renovates
- Incorporated and supported use of the LEED™ green building rating system
- Established a countywide Green Building Team to educate and guide departments in green building practices

In February 2005, the Council furthered this initiative by adopting an ordinance titled *Green Building Practices for County Buildings*, which:

- Requires green building practices in all buildings the county constructs, remodels, and renovates, and directs offices and departments to seek the highest LEED™ certification rating achievable
- Continues the countywide Green Building Team that supports and monitors internal county green building activities
- Designates DNRP to provide technical and policy support for the green building program

## **OUTLOOK FOR 2007**

The current green building ordinance will expire on January 1, 2008. Over the next several months, SWD and the countywide Green Building Team will be developing a new proposed ordinance that will strengthen the county's existing green building efforts. This ordinance will

likely include recommendations to continue the requirement that new county buildings and major remodels seek LEED™ certification, and specify that project managers strive to achieve at least a Gold rating on these projects. Other elements that may be proposed include an emphasis on promoting green building throughout King County, such as requiring LEED™ certification of private construction projects; promoting energy conservation in new and existing buildings; and codifying the county's new grant incentive programs. The ordinance will also be informed by the policy directives in the county's Climate Change and Energy Plans.

## **REPORT ORGANIZATION**

The remainder of this annual report focuses on the three primary areas of progress by the Green Building Team and SWD under the Green Building Program:

- The status of county projects that qualify for certification or rating under the LEED™ process
- The significant strides made by the various agencies of the Green Building Team in integrating green building elements into the many internal construction projects within the county
- SWD's progress in applying green building concepts (GreenTools) to projects external to King County government (i.e., residents, businesses, and other agencies)



## Status of LEED™ Projects

The LEED™ green building rating system is a voluntary, nationally recognized standard for the design, construction, and operation of high-performance, sustainable buildings. 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. A project achieves a LEED™ rating by documenting the number of points it earns in each LEED™ category. Ratings are awarded as follows: Certified, 26 – 32 points; Silver, 33 – 38 points; Gold 39 – 51 points; Platinum 52 – 69 points. 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), and others. Most of the county projects listed below are registered for LEED™ NC. These projects are summarized in Table 1 and described below.

**Table 1. County Buildings Seeking LEED™ Certification**

Project Name	Division	Current Phase	Building Type	Pending Rating
1. Kent Pullen Regional Communication & Emergency Coordination Center	FMD	Complete	Commercial	LEED NC-Certified <sup>1</sup>
2. King Street Center	FMD	Existing Building	Office	LEED EB – Gold <sup>2</sup>
3. Power Distribution Headquarters	Transit	Complete	Office and workshop	Silver
4. Atlantic/Central Base Tire and Millwright Shop	Transit	Under Construction	Office, millwright shop	Silver
5. Atlantic/Central Base Communication and Control Center	Transit	Complete	Office	Silver
6. Marymoor Maintenance Facility	FMD/Parks	Complete	Office and workshop	Silver
7. First NE Transfer Station	SWD	Construction	Industrial	Gold
8. Bow Lake Transfer Station	SWD	Pre-design	Industrial	Silver
9. Brightwater Environmental Education Center	WTD	Design	Meeting facility/ community center	Silver
10. Brightwater Operations/Administration Building	WTD	Design	Industrial/ renovation/ reuse	Silver
11. Carnation Treatment Plant	WTD	Construction	Industrial	Silver
12. South Plant New Administration Building	WTD	Design	Office/ laboratory	Silver
13. New County Office Building	FMD	Construction	Office	Gold
14. Atlantic/ Central Base Operations Complex	Transit	Design	Office	Platinum (registration pending)
15. 9 <sup>th</sup> and Jefferson Building	FMD	Design	Office	Silver (registration pending)

<sup>1</sup> Received LEED™ New Construction (NC) Certified rating in August 2005.

<sup>2</sup> Received LEED™ Existing Building (EB) Gold rating in August 2004.

## PROJECT DESCRIPTIONS

**1. Kent Pullen Regional Communication and Emergency Coordination Center:** This building, which achieved a Certified LEED™ rating in 2005, houses the King County Sheriff's Office 911 Center and the county's Office of Emergency Management. It also includes the Emergency Operations Center. The building's primary purpose is to remain functional after a man-made or natural disaster in order to provide emergency support. Green design features of the building include on-site ponds that provide no increase in the rate or quantity of stormwater runoff, light-colored roof surfaces that help cooling, efficient mechanical and lighting systems, a high-performance building envelope that uses about 25 percent less energy than allowed in the Washington State Energy Code, and use of natural lighting and views.

**2. King Street Center:** Participating in the pilot for the new LEED™ for Existing Buildings, the King Street Center achieved a Gold rating. It received certification in 2004. Offices for DOT and DNRP are located in this 8-story building. The occupants requested that the building include progressive, environmentally friendly approaches in its design, construction, and operation. Green features in the building include a water reclamation system that uses rainwater collected on the roof to flush toilets in the building, high-efficiency lighting with occupant sensors, a bicycle storage room with lockers and shower facilities, use of recycled carpet and other recycled-content materials throughout the building, and natural lighting. In addition, 80 percent of all construction waste was recycled.

**3. Power Distribution Headquarters:** This building provides offices for the managers of the Power Distribution group for the Transit division of DOT. In addition, it provides shop areas for Transit Maintenance electricians and Trolley Overhead maintenance linemen, as well as the specialized maintenance and repair facilities for the entire Transit radio system. Staff from this facility support and provide maintenance for electrical power and lighting systems at all 7 Transit Maintenance bases, more than 40 Park-and-Ride lots and structures, the various rectifier substations for the electric trolley system, and more than 140 miles of trolley overhead wire systems. This project was registered for LEED™ certification, and the construction contractor was monitored for compliance during 2005. The construction was completed and closed out in 2006.

**4. Atlantic Base/Central Base Tire and Millwright Shop:** This is a new, free-standing building dedicated to serve Transit's specialized bus tire service requirements. In addition, a portion of the building was designed to house an integrated machine shop and support offices used by the millwright's supporting maintenance activities at the three adjacent Transit bases, namely Atlantic, Ryerson and Central bases. The project was registered for LEED™ in 2004. During 2006, the construction project was substantially completed, the contractor was monitored for compliance, and construction material documentation was gathered for the submittal as a LEED™-Certified project. Final completion and closeout of the construction project is scheduled for the first half of 2007.

**5. Atlantic Base/Central Base Communications and Control Center:** This specialized mission-critical facility houses the communication equipment for maintaining communication with all 1,400 Transit buses, the downtown Seattle tunnel, and Sound Transit train operations. It has also been designed to serve as Transit's Emergency Operations Center (which was activated during the 2006 fall/winter storms). As such, it houses complete backup emergency power/generator systems and is seismically designed as an essential county building in the

event of an emergency. The project was registered for LEED™, and the construction was completed in 2006. The documentation for LEED™ compliance was compiled during construction and provided to the consultants in the fall of 2006. Transit is still awaiting receipt of certain LEED™ documentation, all of which must be completed by the construction contractor.

**6. Marymoor Maintenance Facility:** Marymoor Park's new Maintenance Facility was completed this past July. The facility consists of an office and adjoining shop and a separate larger equipment storage facility. Rainfall is collected from the roofs of both buildings and saved in water storage tanks. Reclaimed water will be used to clean off lawn and trail maintenance equipment. The office restrooms are equipped with waterless urinals. The larger equipment storage facility houses equipment for the trail crew. Recycled-content materials were used throughout both buildings. The project is targeting a Silver LEED™ rating.

**7. First Northeast Transfer Station:** SWD's First Northeast Transfer station is located on the site of a closed landfill. This project involves deconstructing the old station and excavating part of the closed landfill to accommodate the new station layout. The existing station was closed in May 2006 for construction. When the old station was deconstructed, about 85 percent of the demolition material was recycled. Sustainable design features of the new building include solar panels, a system for harvesting rainwater for dust control and other uses, and the use of recycled-content building materials. It also features expanded recycling areas, including separate yard waste recycling, and a garbage compactor that will lessen truck trips between the station and the landfill. The new station is slated for completion in November 2007. The project team anticipates that the new transfer station will achieve a Gold LEED™ rating.

**8. Bow Lake Transfer Station:** SWD is planning the construction of a new transfer station at the site of the existing Bow Lake Transfer and Recycling Station in Tukwila. The new station will also use adjacent property to the north that the division plans to purchase for this project.

The draft Facility Master Plan was prepared in 2006 for submittal to the King County Council in first quarter 2007, including the environmental review of the plan. Once approved by Council, facility design will begin, with the first phase of construction to start in 2008. Some of the sustainable features to be incorporated in the Bow Lake project include passive ventilation, natural daylighting, rainwater harvesting, water-efficient landscaping, recycled-content building materials, mitigation of old landfilled areas, and restoration of stream buffers on the adjacent property to be purchased for the new station. The project team anticipates that the new transfer station will achieve a Silver LEED™ rating.

**9. and 10. Brightwater Treatment Plant Environmental Education and Community Center and Operations/Administration Building:** By completion in 2010, the Brightwater Treatment Plant will have the capacity to treat 36 million gallons of wastewater per day. LEED™ credits will be achieved in stormwater management, landscape and exterior design to reduce heat islands, light pollution reduction, water-efficient landscaping, innovative water technologies, water use reduction, optimized energy performance, renewable energy, ozone reduction, construction waste management, use of recycled-content materials, carbon dioxide monitoring, use of low toxin-emitting materials, and indoor chemical and pollutant source control. The project is working toward a Silver LEED™ certification for both buildings.

**11. Carnation Treatment Plant:** The construction of a new Wastewater Treatment Plant in Carnation will be completed in February 2008 and be capable of treating 400,000 gallons of wastewater a day. One of the green elements of this project includes treating secondary treated

wastewater with 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 Silver LEED™ rating.

**12. South Treatment Plant New Administration Building:** WTD will be building a new Administration Building that contains a process laboratory as well as administrative office space at the South Treatment Plant. The project team is considering the following green elements for the new building: construction waste management, bioswales, day lighting, 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. Also in planning is to salvage the metal ceiling panels and cabinet door fronts and to creatively reuse them at the Lakewood Community Center Project. The project is targeting a Silver LEED™ rating. The new building is scheduled to begin construction in 2007 and be completed by early 2009.

**13. New County Office Building:** This project is a new county office building on the site of an old parking garage. Upon completion, it will be a 13-story, 296,000-square-foot building. Construction began in 2006. The building will be occupied and major moves completed by the end of 2007. The new building will have many amenities, including a gym facility, indoor bike racks, and showers. In addition, as part of the county's LEED™ certification efforts, the building will be constructed with exterior glass that maximizes natural light, use high-efficiency lighting, and use non-toxic materials on interior finishes. The LEED™-compliant mechanical system will enhance employee comfort. County leaders believe these amenities and construction approaches will make for an efficient and highly functional work environment for county staff, with an added benefit of saving taxpayers dollars. The project is targeting a Gold LEED™ rating.

**14. Atlantic/Central Base Operations Complex:** Planning began in 2005 for an expanded Operations Complex, which houses operations administration and driver support for two bus bases and Transit Police offices. In parallel with the 2006 Executive Order regarding renewable energy and efficiency goals, it was determined that the project would seek a Platinum LEED™ rating with an emphasis on energy efficiency. A series of LEED™ workshops was conducted with key transit staff to determine LEED™ strategies and to select suitable building systems to meet Platinum LEED™ rating objectives. The project will be registered for LEED™ in the spring of 2007. Design will be completed in the spring of 2008. The project is presently scheduled for occupancy in 2009, with completion of site work in 2010.

**15. Ninth and Jefferson Building:** This project is a 14-story, 450,00-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. Turner Construction will construct the building under the direction of developer Wright-Runstad. The project team is targeting the Silver LEED™ rating.

## Green Building Projects by Department

Many of the projects undertaken by the county do not qualify for LEED™ certification. However, departments are encouraged to use these 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

**Synthetic Turf Fields Project at Marymoor Park:** In conjunction with Parks, FMD installed four synthetic-turf soccer fields, which require no maintenance using fossil fuels or greenhouse gas emissions and no water consumption. The installation includes recycled rubber infill mixed with sand, which provides traction for the playing surface. Plastic lumber was also used at the field perimeters as a part of the synthetic turf fastening system. Porous asphalt was used to minimize the amount of stormwater runoff. Water percolates through the asphalt and is absorbed in the sub-grade, which helps to filter contaminants. The flood lighting uses the latest technology, providing adequate illumination for safe play, while using the minimum amount of electricity in conjunction with uniquely designed hoods that reduce light "spillage" or wasted light.

**North District Multi-Service Center HVAC Improvements:** For this project completed in early 2006, FMD had non-chlorofluorocarbon (CFC) refrigerant heat pumps installed, which are the highest efficiency water-source heat pumps on the market. It also installed variable frequency drives on the new hydronic pumps, upgraded direct digital controls for the HVAC equipment operating schedules within specific zones, and scheduled time periods for fresh air delivery and for specific occupant requirements within the medical clinic.

**North District Multi-Service Center Parking Lot Rehab:** FMD rehabilitated planting islands by removing the existing irrigation system and replacing plants with drought tolerant/native plants. It recycled existing signage and reused existing asphalt as a sub-grade for the new asphalt pavement. FMD specified the use of recycled plastic benches and reused surplus Metro bus shelters. This project was completed in October 2006.

**County Correctional Facility Shower Replacement:** FMD installed high-efficiency shower valves, which will earn the project \$180,000 in rebates from the City of Seattle at project completion in October 2007.

**Courthouse Electrical Distribution System Upgrades:** For this project, completed in 2006, meters were installed at power feeders, which identify consumption trends. FMD replaced lighting panels with controllable panels, which should reduce annual lighting costs by 15 percent.

**Yesler Building Lighting Panels Upgrade:** FMD is replacing existing non-controllable lighting panels with ones that can be controlled depending on whether a space is occupied. Replacing the panels will save 10 to 15 percent on the annual energy costs associated with lighting.

**Northshore Athletic Fields Parking Lot Improvements:** FMD is developing a detention pond to regulate surface area runoff from an adjacent arterial into the Sammamish River. Pervious/semi-pervious parking surface was installed to reduce storm water runoff, and native landscaping was added for drought tolerance and filtration.

**Regional Justice Center Energy Savings Project:** For this project, 34 air handling units were replaced to allow for variable frequency drive-compatible air handling. This enables the motors to run at lower rotations per minute during sleeping hours, saving up to 20 percent in energy consumption.

**Courthouse Domestic Violence Tenant Improvements:** This project, completed in September 2006, involved removing asbestos and PCBs and installing 1,000 square feet of recyclable carpet tile (pre-off-gassed). Acrylic paint, low in volatile organic compounds (VOCs), was used to improve the air quality in the building. The Herman Miller modular furniture system was installed, which is reusable and easy to relocate.

**Carpet Replacement Projects:** In 2006, FMD replaced more than 29,250 square feet of carpet in the North District Multi-Service Center, Courthouse 7<sup>th</sup> floor, and the Youth Service Center with modular, broadloom carpet. The carpet has the Carpet and Rug Institute's "Green Label Plus" rating which meets the LEED™ requirement for low-VOC emitting material.

## Transportation, Transit Division

**Issaquah Highlands Park-and-Ride:** The Issaquah Highlands Park-and-Ride project includes a 5-level, 1,000-stall garage with 10,000 square feet of retail shell. One quarter of the site was to be covered with landscaping, as part of an urban village master plan. While this project was not certified or submitted under LEED™ criteria, it was designed under equivalent LEED™ standards. Construction was completed in 2006.

## Transportation, Road Services Division

**Brockway Creek Culvert Replacement Project:** Roads continues to look for opportunities to restore ecosystem functions and improve green infrastructure in conjunction with transportation capital improvement projects. An example, constructed during the summer of 2006, was the Brockway Creek Culvert Replacement Project at 396<sup>th</sup> Drive SE. Brockway Creek is a tributary of the Snoqualmie River. This project replaced a deteriorating 3-foot-diameter steel culvert with a 10-foot-wide, open-bottom concrete box culvert. The existing streambed was also carefully reconfigured by staff ecologists to restore various stream functions.

In addition to restoring important stream functions, this project demonstrates the type of transportation infrastructure retrofits that will be increasingly necessary to adapt to future climate change in a way that enhances ecosystem functions while maintaining public safety and mobility.

**Military Road South at South 272<sup>nd</sup> Street Project:** Staff from Roads worked with stormwater design specialists from WLRD to successfully incorporate low impact development (LID) approaches into the design for this arterial roadway intersection improvement project. Specific LID features to be used in this project include porous concrete sidewalks and a linear bioretention facility (a hybrid "rain garden" design) for stormwater management. Although LID

approaches have been widely applied to residential streets, this effort is significant because it demonstrates the potential for using these techniques in larger scale transportation infrastructure projects.

In recognition of the demonstration value of this project, it received a substantial grant (more than \$400,000) from the Washington State Department of Ecology. As a part of the grant requirements, the project will also implement a water quality monitoring program to evaluate the performance of the porous sidewalks and bioretention facility for a period of three years after construction. Educational information and outreach measures will be used to share the knowledge from this LID pilot project as broadly as possible. Those efforts will include interpretive signage at the project site, a Web site, project tours, public presentations, and articles for publication. Construction is anticipated to start in April 2007.

**148<sup>th</sup> Avenue NE Pedestrian Improvements:** This project, located east of Woodinville along 148<sup>th</sup> Avenue NE and NE 172<sup>nd</sup> Street, improved safety for pedestrians and motorists. Although the project is small, its impact on future construction projects is large. The project used a high percentage of slag, a byproduct of iron production, in the cement mix (50/50), allowing Roads staff to test this material for strength and durability. As a cement substitute, it can replace a significant percent of the Portland cement used in concrete mixes, which reduces greenhouse gas emissions generated in the production of Portland cement. More than 1,250 feet of curb and gutter was constructed using the slag-cement mix, reducing greenhouse gas emissions by an estimated 14,300 pounds.

#### **Natural Resources and Parks, Wastewater Treatment Division**

**Brightwater Treatment Plant:** In 2006 the Brightwater project began using many green or sustainable building practices in design and construction of the Deconstruction/Demolition of Structures, Site Preparation, and North Mitigation Area (NMA) contracts.

The Deconstruction/Demolition of Structures contract promoted diversion of construction, demolition, and land clearing (CDL) debris from landfill disposal. WTD was able to salvage and reuse approximately 75 tons of equipment, building materials, and complete structures, and diverted approximately 180 tons of CDL debris. The Site Preparation contract required a 75 percent diversion rate, which includes the recycling of concrete, land clearing debris on-site, and some construction waste. It is expected that approximately 350,000 tons of CDL debris will be diverted from landfill disposal under the Site Preparation and NMA projects. Under the Deconstruction/Demolition of Structures and Site Preparation contracts, WTD is expected to achieve an overall diversion rate of 99 percent, excluding the NMA.

The NMA project comprises the northern site and has been redeveloped as a restored and much enhanced salmon habitat and reforestation area using many green or sustainable building practices. These practices include the reconstruction of stream and pond salmon habitat by clearing trees and root wads and creating landforms from onsite fill material; use of native plant species through the King County Plant Salvage and Parks Nurseries; and construction of more than four acres of additional and enhanced emergent and forested wetland habitat. In existing forested areas, large water distribution sprayers have been installed and are currently providing biofiltration for the stormwater runoff from the entire treatment plant construction area located to the south of the mitigation area. Construction of a fieldhouse will also feature green building practices.

**Vashon Island Treatment Plant Upgrade:** The goal of this project is to upgrade and expand the existing treatment plant and outfall. The outfall was completed in 2004, and the upgraded plant began to treat wastewater in October 2006. Green features of this project include the site selection, use of alternative transportation, landscaping with native plants, water-efficient landscaping (no irrigation system), methods for wastewater disposed on the site, use of recycled paper in wallboard, ventilation effectiveness, thermal comfort, solar panels for site lighting, and daylight views (direct sunlight for 75 percent of regularly occupied spaces).

**Juanita Bay Pump Station:** The Juanita Bay Pump Station is being replaced to meet future flow projections. Green elements include erosion and sedimentation control, minimum energy performance, CFC reduction in HVAC systems, use of recycled-content materials, the use of local/regional materials in construction, low levels of VOCs and source control for other indoor chemical pollutants, energy-efficient lamps, heat island reduction measures, and provisions to add photovoltaic panels on the roof in the future.

**Murray Ave. Pump Station:** This project is slated to complete basic electrical upgrades, some motor drive replacements, and replacement of main control panels. LEED™ certification is not applicable, but the project manager is incorporating high-efficiency motors in the HVAC system and high-efficiency transformers. This equipment will use less electrical power than general purpose motors and will therefore conserve energy and resources, as well as reduce operating costs. The project is expected to be completed in 2007.

**Hidden Lake/Boeing Creek Trunk Project:** Construction of the Hidden Lake/Boeing Creek Trunk Project began in May 2006. The project is located in the City of Shoreline. While designing the new pump station, storage pipe line, and trunk sewer, the project incorporated the following green elements: light pollution reduction, use of native drought-tolerant vegetation, trenchless technologies, and pervious paving.

**WTD Green Building Specifications:** WTD continues to incorporate new and updated green building specifications into WTD's Guide Specifications. These specifications facilitate the design of green elements in WTD projects.

**Wastewater Water Conservation Program:** The Wastewater Water Conservation Program objectives include working to conserve water and reduce input to the wastewater treatment system. In doing this, the program works with various groups in King County including our own King County facilities such as parks, pools, office buildings, jail facilities, and hospitals; low-income housing providers; and several local non-profit organizations working with the homeless and under-employed to retrofit their locations with low-flow water saving items. The program also provides public education on how to minimize the use of water at home, at work, or outdoors. The Wastewater Water Conservation Program is a resource for other county projects seeking LEED™ certification. Incorporating water conservation is one important aspect of sustainable communities and green building.

In 2006 the Wastewater Water Conservation Program has worked on several projects. Completed in 2006 was a project that installed water-saving toilets and faucets in White Center and Renton health facilities. The estimated savings for these upgrades are one million gallons of water and \$2,000 a year. This will lower water and sewer costs, resulting in the availability of financial resources for other community services.

At the West Point Treatment Plant the installation of a second filtration system was completed for backup to the existing reclaimed water system and to provide additional capacity to cover

high reuse process water demand. This will save an estimated 29,736 ccf of potable water per year at a cost savings of \$72,854.

### **Natural Resources and Parks, Solid Waste Division**

**South Park Custodial Landfill Redevelopment:** In 2006, SWD completed a process to convert a closed landfill to a beneficial use for the area communities. SWD completed a development plan for the landfill property and selected an industrial developer to carry out the plan. This process involved the participation of a wide array of citizen, technical, and government stakeholders.

### **Natural Resources and Parks, Water and Land Resources Division**

WLRD capital projects generally consist of open space land acquisition, aquatic habitat improvement projects, river flood control projects, and stormwater flow control and water quality treatment facilities. 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, topsoil (a mixture of topsoil and compost), and Groco are available for project managers.

### **Natural Resources and Parks, Parks Division**

**Synthetic Turf Fields Project at Marymoor Park:** In conjunction with FMD, Parks installed synthetic turf at four soccer fields (see detailed description under FMD projects).

### **Department of Development and Environmental Services**

In partnership with the SWD's GreenTools program, DDES developed and implemented its 2006 Sustainable Development Work Program. Listed below are some of the accomplishments of the program as it continues to implement the DDES department-wide goal of encouraging sustainable development practices for projects permitted in unincorporated King County.

- The innovative DDES Green Building Program and the DDES Demonstration Gardens featuring sustainable landscape design each received an Excellence in Building Green award.
- DDES, SWD, and WLRD staff provided help to more than 70 green building projects for DDES customers, including in-depth assistance for the Woodinville Agricultural Learning Center, the Lakewood Community Center, and a new cottage housing project.
- DDES staff provided free project management and technical assistance to the first 5-star Built Green™ project at DDES, a single family strawbale house on Vashon.
- DDES staff continued to provide special assistance to the two affordable housing projects specified in the BuiltGreen™/Low Impact Development Demonstration Ordinance projects: Hope VI Greenbridge project in White Center and the Sunflower project on Vashon Island.

- DDES staff completed and sent an interim staff report for the BuiltGreen™/ Low Impact Development Demonstration Ordinance to King County Council.
- DDES critical areas staff partnered with WLRD's Rural Stewardship Program and SWD to develop a new brochure about green building practices for rural areas.
- DDES and SWD staff made a presentation at the national U.S. Green Building Council's GreenBuild conference in Denver. More than 250 people attended an educational session titled "Greening the Permit System," about the DDES Green Building Program.
- DDES and SWD staff partnered to develop guidance and procedures for implementing King County's new post-construction soil standard requirements, as adopted in the Clearing and Grading Ordinance. King County is one of the first, if not the first, jurisdiction in the country to adopt such requirements to improve stormwater management. A guidance booklet for permit applicants, soil management plan form, inspectors' guide, and field verification form were created and integrated into the permitting process. Two training sessions were conducted for DDES staff on how the requirements can be met by those seeking a permit, and how to use the new forms and inspection procedures.

## **SWD GreenTools Assistance**

Since 2001, the SWD has staffed and coordinated the countywide Green Building Team. In addition, SWD has been providing green building technical assistance and policy support to residents, businesses, and other agencies throughout King County. In 2006, SWD began a process to re-brand this assistance and identify a new name for the program – GreenTools – to reflect the wide variety of resources available to county agencies and the public. Other accomplishments of SWD's GreenTools program are described below.

### **GREEN BUILDING TEAM TRAINING AND ASSISTANCE**

As specified by county ordinance, SWD coordinates the county-wide Green Building Team. In 2006, the division initiated the first annual Green Building Summit that was attended by more than 100 county and city employees. Several training classes were also offered to county staff on topics such as green building project management, building materials, solar energy, and deconstruction. The division provided assistance to the county's Marymoor Maintenance Facility and South Treatment Plant New Administration Building to help them achieve LEED™ certification.

### **GREENTOOLS**

SWD's Green Building Program supports 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. In 2006, the GreenTools program completed a five-year strategic plan. As a part of the planning process a mission statement and goals were developed. The mission statement reads:

*The mission 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.*

The goals are to standardize green building practices to develop livable communities.

### **GREEN BUILDING GRANTS**

In accordance with Ordinance 15118, SWD kicked off a new incentive program in 2006 to encourage sustainable building in the private sector by offering grants for commercial projects to help attain LEED™ certification. While 2006 grants were funded through SWD, funds were solicited from several divisions within DNRP for subsequent years. By combining funds, a larger pool of money is available for the grants. The grant committee selected four projects to receive the first round of grant funds in 2006:

- Mercer Slough Environmental Education Center in Bellevue
- O'Dell Environmental Education Center near Kent
- 21 Acres Agricultural Learning Center near Woodinville
- Lofts at Kent Station in Kent

## **RESIDENTIAL GREEN BUILDING**

The Built Green™ program is a voluntary rating system for residential buildings administered by the Master Builder's Association. King County supports this program in a number of ways. In 2006, SWD staff chaired the annual Built Green™ Conference. Six hundred people attended the event, doubling the attendance of the 2005 conference. The division also participated on the Built Green™ executive and steering committees and assisted with developing the newly revised certification checklist. Staff arranged and led a tour of a custom Built Green™ 5-star home and developed material case studies for builders.

The number of Built Green™ homes has increased rapidly since the program's inception in 2000. Since that time, 10,111 homes have been certified. 4000 of those homes were certified in 2006. There are now 435 Built Green™ member companies as well.

## **COMMERCIAL AND INSTITUTIONAL GREEN BUILDING**

SWD provided help to a number of commercial buildings through the assistance program at DDES. In addition, staff assisted several cities that are constructing buildings seeking a LEED™ rating by providing information and training. For example, SWD assisted the City of SeaTac to arrange and hold an eco-charrette for a new fire station. An eco-charrette helps to define the green goals of a project and enables the project team to determine which green strategies to use in their building.

## **CONSTRUCTION AND DEMOLITION DEBRIS MANAGEMENT**

The purpose of this program is to provide education and information to contractors, project managers, and property owners on how to manage construction and demolition debris as a resource rather than a waste. In 2006, the Construction and Demolition Debris Management Program's salvage and deconstruction efforts led to more than 28 tons of building materials being reused rather than being recycled or disposed.

In 2006, the ever-popular Construction Recycling Directory was updated and revised, and 8,000 more copies were printed and distributed. The directory was mailed out to building industry professionals across the county, and made available in the public lobby at King County DDES, as well as on-line. In addition, the Construction and Demolition Debris Management Program published five case studies on deconstruction and salvage and sponsored the development of the *Design for Disassembly* guide, which provides information on how to design a building to make it as adaptable and long lasting as possible and then to make its components as reusable and recyclable as possible once the building has reached the end of its life. This guide has become one of the Key Challenge Guides of the U.S. Environmental Protection Agency's sponsored Lifecycle Building Challenge.



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