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Dear Colleagues,

Colleges and Universities play an important role in protecting the environment. Environmental challenges have been recognized for many years and much has been accomplished through the effort of concerned citizens and organizations. The University of Maryland and many other educational institutions recognize their influence in this area. They serve as sites for education on environmental awareness, dialogue about solutions, and examples of best practices. Leading environmental research programs and learning to be good stewards of our natural resources are other roles they play.

The University just celebrated its 150th year and with this milestone came additional reflections on the importance of the University as a community resource and a model for environmental performance. In 2002, the campus adopted a Facilities Master Plan that includes important environmental goals to guide future development. A new campus Environment Stewardship Committee was established whose role is to advise the Facilities Council on environmental issues. From these efforts, the Facilities Council adopted Environmental Stewardship Guidelines for the campus in 2005 that are a basis for the University's sustainability initiatives.

The University of Maryland is proud to be engaged with other higher education institutions in the discussion of campus sustainability. In April 2007 the University will host the 2nd Smart and Sustainable Campuses Conference in collaboration with the United States Environmental Protection Agency and six national higher education associations. This will be the third major sustainability conference sponsored by the University since 2003. From energy conservation and expanded recycling programs to composting and new educational opportunities, the University of Maryland is committed to campus sustainability. This report further describes some of our recent initiatives. I encourage the greater campus community to commit itself to enlarging our sustainable practices.
“A hundred years after we are gone and forgotten, those who never heard of us will be living with the results of our actions.”

–Oliver Wendell Holmes, U.S. Supreme Court justice

Master Plan

In Fall 2000, President Mote appointed a Facilities Master Plan Steering Committee to work with a group of external experts in the development of a 20-year Facilities Master Plan. The committee was charged with developing a plan that defines the principles and lays the foundation for the orderly development and growth of the campus over the next twenty years.

The planning committee established four principles to guide future development: 1) plan the built and natural environment in a way that preserves the beauty of the campus and protects the environment; 2) reduce the number of automobiles on campus and eliminate vehicular congestion to the extent possible while promoting unimpeded movement across the campus; 3) reinforce the role of the campus as a good neighbor in the larger community through the careful development of sites on the campus periphery or in outlying areas that link us to the community; and 4) preserve the architectural heritage of the campus and enhance it through open spaces, gathering places, vistas of green lawn and trees, and groupings of buildings that promote a sense of community.

The 2001-2020 Facilities Master Plan builds on the work of the 1991 Facilities Master Plan and its 1996 update, but it advances a new vision for the development of the campus. Previous plans concerned themselves with the placement of physical facilities but did not consider much beyond the need to address the urgent requirements for space at a large, thriving, and complex university. The current Plan considers the siting of buildings and the development of the campus from a more holistic perspective. The committee considered ways to preserve our architectural heritage and extend the aesthetic appeal of the grounds and buildings. It looked at problems of balancing appropriate density of buildings with accessibility and attractiveness, and it advocated environmental stewardship. In April 2003, the Master Plan won an award from the National Wildlife Federation for its commitment to sustainability.

Environmental Stewardship

The University’s Master Plan, including the Plan’s broad environmental goals, was adopted in 2002. The Vice President for Academic Affairs and Provost recognized that these goals required further consideration and the development of specific implementation strategies. In 2003, he requested the advisory Environmental Committee that supported the development of the Master Plan provide specific recommendations to the University’s Facilities Council.

The Environmental Committee, co-chaired by Jack Sullivan (Professor, Landscape Architecture) and Allen Davis (Professor, Civil and Environmental Engineering), deliberated for several weeks and concluded that implementation of the environmental goals required a permanent and expanded Environmental Stewardship Committee consisting of faculty, student, and staff representatives who could advise the Facilities Council in an ongoing manner. The Committee also focused on the development of campus Environmental Stewardship Guidelines that were unanimously adopted by the Facilities Council in 2005. These guidelines identify the University’s commitment to responsible environmental management practices on the College Park campus. They provide a framework and an incentive to faculty, staff, and students and encourage the development and implementation of an integrated environmental management system. The guidelines complement existing policies and procedures regarding regulatory compliance and will hopefully inspire the University community to adopt practices and procedures that extend beyond compliance and foster long-term environmental stewardship and sustainability.
In 1969, singer Joni Mitchell lamented, “They paved paradise and put up a parking lot.”

Today, the University of Maryland is displacing parking lots and planting trees and restoring landscapes. The exchange may not restore paradise, but it is a crucial step in the University’s efforts to be a better environmental steward. The University received a “Green Campus Recognition,” from the National Wildlife Federation based on these improvements. From 2000 to the present, 29 projects (16 accomplished, 5 in design, and 8 in the planning stage) have addressed the environmental goals and objectives of the Facilities Master Plan. These are a few of those projects:

**Southwest Campus District**
An extended network of Landscape Open Spaces in the Southwest Campus District began with the replacement of staff and faculty parking lots M and U4 near Van Munching Hall. This transformation from 30,492 square feet of impermeable pavement to green lawns and open space (see pictures on right) is the armature for multiple “in-fill” academic buildings, the Mowatt Lane Parking Garage (1,700+ spaces), and student residential facilities (6 buildings and 1,825 total beds). According to the Master Plan, within 20 years, all parking in the southwest portion of campus will be in garages and most of the surface lots will be replaced with a multi-layered network of spaces linking new academic facilities and student life.

**Northeast Campus District**
New open spaces in the Northeast Campus District have transformed the area once referred to as the “industrial heartland” of campus, the dense cluster of engineering, science, and mathematics buildings. In addition to the “urbane” Kim Engineering Plaza and the plaza adjacent to the Computer Science Instructional Center, the Chemistry Courtyard—space created by the completion of a new wing in 2003—features ornamental trees, shrubs, flowers, and the perfect lawn for an impromptu outdoor class or lunch. The courtyard incorporates brick walkways and a patio outside the new Atrium. This combined open space network shifts pedestrian routes closer to classroom buildings and replaces parking lots that once served as unsightly shortcuts.

**Concept Plan for North Gate Park**
Currently in its final design phase, North Gate Park will be a natural retreat adjacent to the Paint Branch and the University’s main entrance at US Route 1. Landscape architecture students, led by Professor Jack Sullivan, helped design North Gate Park. Shrubs and flower plantings pay respect to the University's historical landscape with an orchard, native grasses, a wildflower meadow, a restored forested stream buffer, and a future planned rain garden to filter stormwater runoff. As called for in the University’s Facilities Master Plan, the park also emphasizes walking, biking, and alternate transportation. There is a bus shelter, a lighted path for pedestrians and cyclists, and a bridge to connect everyone to the heart of campus. Work is expected to begin in 2007 and should help enhance planned private redevelopment along US Route 1. The future looks bright—bright green—for this patch of unused land across from the College Park Fire Department.
Green Planning: Bill Mallari, Coordinator of Campus Development in Facilities Planning

As the Coordinator of Campus Development in Facilities Planning, Bill Mallari is the planner/architect who managed the campus effort to develop the Facilities Master Plan and continuously seeks improvements to the campus, its buildings and open spaces. The University has greatly benefited from Bill’s genuine advocacy of smart growth and environmental principles applied to campus planning and the design of projects. As a member of the University’s Environmental Stewardship Committee and the University’s representative to local and regional environmental organizations, Bill was instrumental in developing the campus Environmental Stewardship Guidelines, particularly in the areas of historic preservation, open space and natural resource protection. According to Bill, “the campus can be an instrument of pedagogy and research where we can carefully balance the growing needs of our community, while creating a beautiful sense of place that preserves our historical and cultural icons and protects our natural resources.”
Protecting the Campus Tree Canopy

The University recognizes that healthy tree crowns buffer the under-canopy microclimate and that proper planting and selection of tree species translates into higher carbon emission sequestration and more effective runoff control.

As stewards of the campus landscape, university planners seek to protect, maintain, and enhance the natural and cultural landscape of the campuses they call home. The Facilities Master Plan 2001-2020, approved in April, 2002 stipulated the goal to preserve and reinforce regional ecological connections with recommendations to:

• Establish greenways
• Manage invasive species
• Protect streams, wetlands
• Protect existing specimen trees
• Restore and enhance forest cover

Long Term Forest Agreement
In April 2001, the University signed a Long Term Protection Forest Conservation Easement with the Maryland Department of Natural Resources providing for permanent protection of designated easement areas and for updates to the easement agreement. Priority protected areas include stream buffers, wetlands, and steep slopes, affecting interconnected green corridors that also enhance water quality and habitat.

Campus Tree Inventory Survey
A fresh approach was taken to further advance the broad environmental principles and goals of the Facilities Master Plan and go beyond regulatory compliance. Through a collaborative partnership effort among Facilities Management, the Urban Forestry program (College of Agriculture and Natural Resources), and a private company, approximately 5,500 trees (to-date) on more than 1,400 acres of the campus have been tagged and inventoried with the help of remarkable student interns. The goal is to keep record of every tree on campus through a GIS database.

Using portable GIS units and innovative remote diagnostic imaging technology, University students recorded and evaluated the trees’ location, size, species, and conditions (e.g., presence of decay, root damage, and cracks). The campus’ Tree Radar Unit (TRU) can determine root and trunk integrity in a non-invasive manner — causing no damage to the trees. The data collected are used to follow individual specimen trees and to guide decisions about selective tree removal for those “at risk” trees that pose potential hazards to buildings and pedestrians.

In addition to facilitating the ongoing maintenance of campus trees, the tree survey has also engaged students, faculty, and allied professionals in teaching and research on and beyond the campus. Updating the land use and physical development portion of the Facilities Master Plan through this inventory has provided a crucial resource to support the University’s administrative and academic leadership in overseeing the long range restoration and enhancement of forest cover. In addition it allows for the conservation and enhancement of the campus’ valued existing natural landscapes.

Giving and Sharing the Forest Resource
With support from friends and alumni, the University is creating an urban forest home that will transform the vista of the campus for generations to come. The need for donor support is great; the state-approved capital budget for University construction lacks significant funds for landscaping. The specific tree donations of alumni, memorial gifts, and outreach programs such as Maryland Day Plant-A-Tree-at-Maryland Campaign play an important role in enhancing the tree canopy. Patronage landscape enhancements have added unique specimen trees and expanded cover around the campus including the Robert H. Smith School of Business and the Clarice Smith Performing Arts Center providing amazing aesthetic and environmental improvements benefitting the entire university community.

Urban forestry resources at the University are expanding the continuing collaborations with external academic, private, and governmental entities and enable the University to make effective use of its landscape by linking pedagogy with research. These efforts have helped to promote a healthier, greener campus.
Water Conservation

Water conservation is important to the University as a means of reducing costs. Given the University is one of the largest consumers of fresh water in the State, conservation on campus can go a long way to reduce environmental stress on our region.

The University has been able to significantly reduce its water usage through specific purchasing decisions and behavioral modification.

Low-Flow Toilets, Showers, and Faucets and Waterless Urinals

Bathrooms across campus are getting a makeover. Low-flow toilets and urinal flushometers are replacing the older fixtures in the residence halls. All showerheads in all non-renovated residence halls have been replaced with low-flow (2.5 gallon per minute) models. Low-flow (1 gallon per minute) sink aerators have been installed on the bathroom and kitchen sinks in all non-renovated halls. Additionally, Dining Services is introducing waterless urinals to some of their facilities. Just one waterless urinal typically saves around 20,000 gallons of water per year.

Brown is Good

The University’s Golf Course has introduced a few different types of grass to the course, each requiring less watering than previous varieties. Bermuda and Zoysia grasses were introduced because of their resilience in warm weather and need for little water. In an effort to create more space for wildlife, native grasses are being encouraged to grow back into select areas. Native grasses are evolutionarily adapted to the varying climate of the mid-Atlantic region and as such, they require little maintenance. Overall, the Golf Course has reduced its water bill by 38 percent, creating a savings of around $30,000 each year. Although the new grass does not maintain its green color throughout the winter, Golf Course managers have realized that brown has its advantages.

Irrigation

Outdoor water conservation is an ongoing challenge at the University. Wet springs, dry summers, and autumns that can go either way keep the grounds crew busy all year. Newly planted trees are hand watered for the first three years as needed. Gator Bags allow water to slowly seep into the ground to water the roots of the plant, as opposed to running down hill away from the tree. Some areas now have automatic irrigation systems that are operated by moisture sensors, such as those installed by Campus Recreation Services on the Engineering Fields. These sensors require water to be used only when the soil is too dry instead of simply running the sprinklers on a timer.

New Dining Services Equipment

All dishwashing machines and warewashing equipment have been replaced with energy efficient steam heated equipment that use only 70 percent of the water required by the old machines. The steam used to heat the water is recycled. This saves approximately 80,000 gallons of water per month. Water-cooled refrigerator systems have been replaced with air cooled systems or closed loop cooling tower systems. This technology eliminates water usage in the refrigeration systems which previously needed over 150,000 gallons of water yearly.
The campus is part of the Paint Branch sub watershed within the Anacostia River watershed, a priority for restoration within the broader watershed of the Chesapeake Bay.

Concurrent with the development of the Facilities Master Plan, the University and the Anacostia Watershed Management Committee entered into a partnership agreement in March 2002. Efforts are underway to better manage runoff of water from impervious surfaces throughout campus. Recently, campus drainage was evaluated comprehensively to identify non-point source storm water pollution and stream degradation. The campus was categorized into 23 sub watersheds delineating storm water drainage systems. Knowing these patterns creates better opportunities for design, funding, and implementation of future water quality improvement projects.

**Low Impact Development (LID) Projects**

Improvements in storm water management can be seen in a variety of decentralized Low Impact Development (LID) projects, like those visible at the south east edge of the Comcast parking lots. These projects catch and filter contaminated runoff from paved surfaces before the runoff reaches Campus Creek. Other areas on campus that serve to filter or catch storm water include a large retrofit bioretention pond behind the Clarice Smith Performing Arts Center and a sand filter on the south lawn of the President’s residence. The field for women's field hockey filters, slows, and reduces the temperature of storm water runoff before it reaches the Paint Branch. Campus Creek, which is a high priority for restoration, includes four LID projects within the stream buffer of the creek. Throughout the campus new plantings and expansion of the riparian buffer are planned.

**Paint Branch Restoration**

Over the years, the Paint Branch has exhibited many problems typically associated with urban streams. In June, 2006, flash floods from upstream storm water flows caused severe erosion of the Paint Branch banks and partially undermined the foundations of the campus pedestrian bridge located west of University View Apartments at U.S. Route 1. The embankments were severely scoured and a number of large, mature trees were felled. The situation required emergency temporary corrective action, including bank stabilization. An assessment by professional engineers was commissioned. Representatives of the Paint Branch Watershed Stakeholders group, including UM Facilities Management, Maryland Natural Capital Park and Planning Commission (M-NCPPC), Maryland Department of Natural Resources (MD-DNR), the US Army Corps of Engineers (USACOE), and University View Partnership, LLC conducted further assessments and deliberated appropriate corrective action.

The University of Maryland and University View, LLC have shared resources to implement restoration of approximately 350 linear feet of the Paint Branch at the confluence with Campus Creek, within University and M-NCPPC property. Restoration work was substantially completed by Openshaw Excavations by the beginning of February 2007.
Mass transit to and from campus represents one of the greatest opportunities for individuals to reduce fossil fuel consumption and traffic congestion.

Over the past four years, ridership on Shuttle UM has doubled. As the University’s vehicle fleet continues to grow, the Department of Transportation Services (DOTS) is taking steps to minimize its environmental impact.

**Bio Diesel Fuel**
All buses in the Shuttle UM fleet now run on a mixture of bio diesel fuel. The “bio” component of bio diesel is manufactured from waste cooking oil, which generates fewer greenhouse gas emissions than petroleum-based diesel alternatives.

To further reduce emissions, DOTS has installed catalytic converters in eight of 33 buses. This EPA verified device eliminates 25 percent of particulate matter, 70 percent of carbon monoxide, and 70 percent of hydrocarbon gases. Along the same vein, DOTS also plans to install crankcase ventilation systems on all of the buses, thereby eliminating crankcase emissions. With this device, byproducts of combustion will no longer be venting into the atmosphere. Instead, the byproducts will go back into the engine to be reused.

**FlexCar**
Faculty, staff, and students can now take mass transit to campus and still have the flexibility of running errands during the day. The FlexCar program allows any member of the campus community to borrow a car when needed (reservations are required). Gas, insurance, and maintenance are included. This is just one more reason not to sit in Beltway traffic.

**Smart Park Carpool Program**
This is a service offered by DOTS to connect commuter students who have similar commuting schedules. Not only do participants in carpools reduce vehicle emissions, but they also save money by benefiting from lower parking permit fees.

**Bicycling**
Many faculty, staff, and students commute to campus by bicycle, but even those who live too far from campus to ride can now take their bicycle on Metrobus, Metrorail, and Shuttle UM. Bike racks have been installed on the front of Shuttle UM buses to make your environmentally-friendly commuting even easier. Additionally, there is a full service bike shop in the Eppley Recreation Center.

**Purple Line**
The Purple Line is a proposed metro or light rail line that would connect stops inside the beltway from Bethesda to New Carrollton, offering an alternative to congested Beltway travel. One proposed alternative includes a stop in College Park and a few proposals include a stop west of the campus. A possible alternative is a light rail system that includes a stop on Route 1, conveniently accessible to both campus and downtown College Park. This will go a long way toward facilitating access to the educational and cultural aspects of campus and could significantly decrease the number of commuters who come to the campus by car.
A major research university such as the University of Maryland requires a lot of energy to operate.

With an energy bill of over $50 million per year, climbing energy rates, and growing concerns about effects of greenhouse gas emissions on our environment, the University is rapidly implementing energy efficiency and conservation upgrades.

**Heat and Power Generation**

The recipient of the EPA’s 2005 Energy Star Award, the University’s Combined Heat and Power Plant was completed in 2003. The system produces all of the steam required for heating and in some cases cooling for the University. The plant is capable of producing up to 90 percent of the University’s electric demand in the winter and about 50 percent of the summer demand. Consisting of two gas-fired combustion turbines, one steam-driven electric turbine, and two heat recovery steam generators, the system operates at efficiencies of about 70 percent, significantly higher than like-sized independent steam boilers and electric generators. The system requires approximately 16 percent less fuel than typical purchased electricity with separate steam generation, resulting in a reduction of nitrous oxide, sulfur dioxide, and roughly 53,000 tons of carbon dioxide annually.

**Thermal Storage**

The University operates a thermal energy storage system that cuts energy costs and reduces energy consumption during hours of peak demand. The system, located underground behind Stamp Student Union, cools water at night, storing it for daytime use. The chilled water is used to cool three major facilities: the Clarice Smith Performing Arts Center, Stamp Student Union, and the Riggs Alumni Center. Chilling water at night cuts down on peak-hour energy costs and reduces the load on the electric generation plant during the day. This helps reduce the plant’s emissions during times of high ozone levels, such as “Code Red” air quality days.

**Lighting**

The University is testing many ways of reducing the amount of electricity used to light campus buildings. Some buildings have new and improved motion sensor devices that turn off lights when rooms are not being used. T-8 florescent lamps are being replaced with T-5 models, which produce a brighter, whiter light, similar to daylight, while using approximately half the energy of the T-8s. In addition to using new lighting technology, customizing the light level in a room to fit the function of the room saves energy. As a trial, the University’s Facilities Management building has adjusted the light on several of its floors to recommended levels.

**Computers and Office Equipment**

Software is being tested that automatically puts office computers in low-power states (such as sleep for monitors and standby, hibernate and shutdown for PCs) when the machines are not being used. The software keeps a running total of the amount of energy being saved. On average, 200 kWh of energy per office computer is conserved, reducing CO2 emissions by as much as 440 lbs per computer per year. In addition, motion sensing power strips underneath desks are being tested which shut down office appliances such as personal printers, coffee makers, fans and radios.

**CO2 Monitors**

Ventilation systems pump air from the outside into campus buildings to replace the CO2 that people exhale with oxygen. The pumps run on electricity. Previously, the pumps ran continuously at the same rate, regardless of whether the building was occupied or needed fresh air. Now, monitors are being installed that can slow or stop the pumps when the buildings contain the correct level of oxygen. The monitors start the pumps again when too much CO2 is detected and fresh air is needed.
Recycling rates at the University greatly increased in recent years from 17 percent in 2003 to nearly 35 percent in 2006.

Some of the efforts which have contributed to the increase in recycling rates are described below. Taken together, they have advanced the University's recycling program and are helping to create a fundamental campus-wide norm of recycling.

Programs and initiatives were implemented to raise awareness of recycling on campus among all students (and resident students, in particular), staff, faculty, and visitors to University facilities and events. Hundreds of recycling containers were installed across campus. Containers can now be found inside residence halls, classroom buildings, administrative buildings, and other facilities (such as the Stamp Student Union, Eppley Recreation Center, and all parking garages). Exterior containers were also installed near housing areas, high-use buildings, and open spaces. The documentation of recycling at the University was expanded to include all campus paper that is shredded and recycled by outside vendors. In 2006, 99 tons of paper was shredded on campus and recycled.

Recyclemania
Recyclemania is a ten-week nationwide recycling contest among colleges and universities which is sponsored by the United States Environmental Protection Agency. The University is participating for the first time along with 200 other institutions. Each week from the end of January through April, the University’s recycling rates for mixed paper, cardboard, bottles and cans, and pre- and post consumer food waste are calculated. The competition allows the University to monitor its progress over time. In addition, the competition allows institutions to compare themselves relative to other institutions. The University has increased recycling each week since the competition began. In addition, it is faring well relative to other institutions in Maryland and within the Atlantic Coast Conference.

Football Games
Recycling at special events was expanded to include football games in fall 2006 as a result of collaboration between the Department of Transportation Services (which has responsibility to clean parking lots after football games) and the Department of Facilities Management (which maintains campus grounds and facilities and transports recyclables and solid waste). An average of two tons of recyclables were collected at each game.

Manager of Recycling and Solid Waste
A new position, Manager of Recycling and Solid Waste, was created within the Department of Facilities Management to develop a new vision for the University’s recycling program and to implement the necessary innovative and effective
outreach programs and operational initiatives to realize that vision.

**Terrapin Trader**
Terrapin Trader, the University’s surplus redistribution operation, plays a major role in the reuse, redistribution, and recycling of used office furniture, lab equipment, and electronics. Through a variety of different programs, Terrapin Trader has been responsible for keeping a wide array of material from ending up in local landfills. Terrapin Trader, which is open to students, staff, faculty, and the general public, sells products, accepts bids on products, and also hosts auctions. In addition to their current clientele, Terrapin Trader hopes to reach out to other USM institutions to provide a more thorough surplus redistribution program.

Terrapin Trader also extends its redistribution efforts to the local Prince George’s County schools. Each year, an elementary, middle, and high school is selected to participate in the Adopt-a-School Program. Throughout the course of the school year, representatives from each school meet with Terrapin Trader staff to discuss their needs. Terrapin Trader donates items from their surplus to the schools based upon those needs.

**Electronics Recycling**
In fall 2006, the Office of Information Technology (OIT) in conjunction with Apple Computer sponsored an electronics recycling campaign to help students, faculty, staff, and the surrounding communities properly dispose of their unwanted electronic material. The event collected electronics, computers and accessories, batteries, and even televisions. People came from neighboring areas and as far away as Baltimore County to recycle their unwanted electronics. By the end of the day, an astonishing three tractor trailers full of computer equipment (over 60 tons) was recycled.

**Move-In, Move-Out**
Two times each year, a tremendous amount of waste is generated by the resident students. During Move-In, Residential Life and Residential Facilities work together to collect all the cardboard boxes discarded by students. In the opening days of the Fall 2005 semester, 11 tons of cardboard were collected and recycled. Move-Out presents a different problem. Students typically throw away sofas, chairs, desks, and anything else they either don’t want or can’t fit in their cars. For the past several years, students and Resident Life staff have implemented “Don’t Waste, Donate!” and have arranged to have trucks from area charitable agencies collect and haul away whatever students don’t want to take with them. In addition, “Terrapin Junktion”, a community yard sale during Move-Out, provides an outlet for unwanted goods and benefits the surrounding College Park community by offering low prices for household goods.
The Grounds Unit within the Department of Building and Landscape Services and the University’s Golf Course are always looking for ways to reduce their environmental footprint.

The use of native species and other techniques have both beautified the University main campus and brought international praise for the Golf Course grounds.

**Golf Course**
The University Golf Course was recently certified as an Audubon International Wildlife Sanctuary. The mature hardwood forest offers many habitats to a diversity of plant and animal species. Trees here are allowed to live their complete lifecycle; a dead tree whose placement does not endanger the public is left to stand and fall on its own becoming a magnet for woodpeckers and other birds. Understory growth is encouraged in the wooded areas as the young trees will be the mature trees of tomorrow.

**Native Plants**
The Grounds crew has been incorporating native plants into established plantings. In addition to being well suited to Maryland’s soil and climate, the reintroduction of native species has increased the campus’s biodiversity and has helped attract beneficial insects.

**Pesticide**
Although the Grounds crew does occasionally use pesticides, these chemicals are used sparingly through an Integrated Pest Management Plan. Some organic products, such as horticultural oil, are used to control unwanted insects.

**Proper Plant Placement**
One of the main concerns of the Grounds Unit is the proper placement of plants at the site. Good decisions prevent many future problems with insects, disease, and death of the plants. For example, the Grounds crew has learned not to plant azalea bushes in the sun because the plants will become infested with Lace bugs. The bugs leave shaded azaleas alone, allowing the plants to grow.

**Housekeeping**

**Green Cleaning Products**
All cleaning agents used by Residential Facilities in the residence halls are certified green products as of the fall of 2006. These products contain no dyes, perfumes, or caustic chemicals and are completely biodegradable. Staff are able to avoid unnecessary exposures. They report that the green cleaning products clean just as well as other products. Facilities Management also uses Green Seal Certified® products in the academic buildings. These products include vacuums that are 99.9 percent efficient at capturing particles one micron or larger, a dry carpet cleaning system, and paper towels and tissues made from recycled content.

**Squares, Not Rolls**
The days of whole carpets are over in the Residential Facilities. Instead of replacing an entire carpet for a single stain, carpets are now made of interlocking squares which together make up an entire floor carpet. Now when there is a stubborn stain, only one piece of the carpet needs to be replaced, dramatically reducing the amount of waste generated.

**Reupholstering**
Keeping with the idea of reducing waste by replacing a part instead of the whole, Residential Facilities is in the habit of reupholstering damaged furniture rather than buying completely new units. This process cuts down on waste and reduces the University’s consumption of wood since the frame of the furniture is reused.
The Department of Dining Services has a strong commitment to environmental protection.

Taken together, the programs initiated by Dining Services have dramatically reduced the amount of waste generated by the University.

**Waste Reduction**
A number of measures have been taken to reduce the amount of waste generated in the dining facilities. Dining hall chefs cook food to order, which is operationally complex but results in higher food quality and dramatically reduces leftovers and waste. Napkins have been relocated to dining room tables instead of the serving line resulting in a 50 percent reduction in usage. Micro-filtration techniques are used to extend the life of cooking oils and the use of those oils has been reduced by half. Even paperwork has been reduced for the department as they have streamlined the accounting process and cut down on the number of paper copies required by the business office.

**Salvage and Reuse**
While Dining Services strives to minimize un-sold leftovers, food that may not be efficiently reused in a timely method but is still safe for consumption is donated to the DC Central Kitchen for distribution to area homeless shelters. Excess equipment and supplies is sent to Terrapin Trader for sale or is recycled within the units. Footnotes Café in McKeldin Library was built entirely from equipment and supplies repaired or modified for the space. Half of the equipment used for expansion of the Commons Shop was reclaimed from other locations. Equipment that out-lives its useful life and cannot be repaired is dismantled and components are recycled.

**Composting and Recycling**
Through a partnership with a contractor, pre- and post-consumer food waste in the Diner and South Campus Dining Hall is taken off campus daily and composted. On average, ten tons of food waste is composted each month. All used cooking oils are collected by a company that converts it to biodiesel. The company strives to educate area school children about the benefits of renewable energy. Currently, the collection program is led by a research fellow in the Dingman Center for
Entrepreneurship in the R.H. Smith School of Business. Dining Service staff, like their colleagues in the Division of Student Affairs, are diligent recyclers of cardboard, mixed paper, bottles, cans, motor oil, tires, batteries, fluorescent light tubes, refrigerants and other chemicals, scrap metals and toner cartridges.

**Green Purchasing**
Dining Services has evaluated the packaging of all its products from the manufacturers. Many suppliers, including Pepsi and Frito Lay, are required to reuse packaging in which their products are delivered. Some products, such as ketchup and pickles, are purchased in pouch packages that are lighter in weight and use less material than traditional packaging. This reduces the amount of waste and the lighter weight saves fuel during shipping. Dining Services has established a requirement for suppliers to pick up and reuse wood shipping pallets.

Retail locations across campus offer fair-trade shade-grown organic coffees at the same price as traditional coffees through a special arrangement with the supplier. Dining rooms serve only fair trade coffee that is produced using environmentally friendly methods.

**Outdoor Environment**
Dining Services switched to biodegradable cleaning products for any areas where the products could reach the environment.Containment devices were constructed to prevent cooking oils from leaking and entering the streams or stormwater collection. The department has converted or purchased over 1000 refrigeration systems to more environmentally friendly HCFC refrigerants.

**Public Education**
Dining Services works with the Residence Hall Association and other student groups to provide information and education on recycling and environmental concerns in general as well as specifically encouraging the guests of the Dining Rooms to use china, glasses, and flatware while eating in the Dining Rooms.

**Short and Long Term Goals**
Dining Services is constantly looking to other areas of their operations where environmental impacts can be reduced. In the near future, polystyrene carryout containers may be replaced with biodegradable paper products and green roof technology may be explored for use at the Diner and Denton Hall. Use of a green roof may result in lowered energy use in these buildings, cool the surrounding areas in the summer, provide a better view to students in nearby resident halls, clean the air, and provide a location to grow organic herbs for use in recipes.

**Green Service: Greg Thompson, Assistant Director of Facilities Maintenance for Dining Services**

Greg Thompson, perhaps better known as the Compost Man, is working hard to make Dining Services one of the greenest dining operations in the nation. Like other managers on campus, Thompson has realized that doing the best thing for the environment is often the same as making the most financially responsible decision. “As soon as we started composting pre- and post-consumer food waste, our maintenance costs dropped. Plumbers used to have to come almost weekly to unplug drains clogged with rice and other food waste. That doesn’t happen anymore.” As a conservationist, Thompson analyzes everything coming into and out of the dining operation and strives to streamline the process and reduce waste. He carries the same reusable cup with him everyday and attempts to get students thinking about simple things they can do to protect our planet.
Many research centers housed at the University of Maryland are involved with finding solutions to environmental problems, in the local community and at global scales.

The following are just a few of these centers.

**Center for Integrative Environmental Research (CIER)**
CIER is dedicated to creating a comprehensive understanding of the complex environmental challenges facing society and to developing valuable tools to inform policy and investment decision-making. CIER researchers and graduate students collaborate at global, national, regional, and local scales to explore issues within and across two major sustainability challenges: Society's use of materials and energy and urban environmental change. Recent projects include the Regional Greenhouse Gas Initiative and Looking Ahead to Maryland 2050: Living in Our Environment, a one-day workshop designed to engage faculty and researchers in long range thinking about environment-related issues. This may include issues that are likely to undergo major changes in the State over the next four decades, the
exploration of issues that are central to protecting Maryland’s environmental future while enhancing the quality of life for its citizens, and the identification of the critical research questions surrounding both global influences and local manifestations of human-environment interactions.

**Center for Environmental Energy Engineering (CEEE)**
The Center for Environmental Energy Engineering is a leader in research and education in environmentally responsible, economically feasible distributed energy conversion systems for buildings and transportation. CEEE provides innovative solutions to industry’s research and development challenges and cost-effective, timely technology transfer. Researchers have developed a highly flexible and task-oriented consortium structure that emphasizes pre-competitive research. Sponsors include industrial companies and government agencies that pool research funds leveraged by additional support from the University of Maryland.

**National Center for Smart Growth Research and Education**
The National Center for Smart Growth is a non-partisan center for research and leadership training on national and international Smart Growth and related land use issues. The Center was founded in 2000 as a cooperative venture of five University of Maryland schools: Architecture, Planning and Preservation, Public Policy, Agriculture and Natural Resources, and Engineering. The mission of the Center is to bring the diverse resources of the University of Maryland and a network of national experts to bear on issues in land development, resource preservation and urban growth – the nature of our communities, our landscape and our quality of life – through interdisciplinary research, outreach and education, thereby establishing the University as the national leader in this field.

**Earth System Science Interdisciplinary Center (ESSIC)**
The Earth System Science Interdisciplinary Center is a joint center between the University of Maryland Departments of Atmospheric & Oceanic Science, Geology, Geography, and the Earth Sciences Directorate at the NASA/Goddard Space Flight Center. ESSIC also administers the Cooperative Institute for Climate Studies (CICS) jointly with the NOAA National Satellite, Data, and Information Services (NESDIS) and the NOAA National Centers for Environmental Prediction (NCEP). The goal of ESSIC is to enhance our understanding of how the atmosphere, ocean, land, and biosphere components of the Earth interact as a coupled system and the influence of human activities on this system. This is accomplished via studies of the interaction between the physical climate system (e.g., El Nino) and biogeochemical cycles (e.g., greenhouse gases, changes in land use and cover).

**Joint Global Change Research Institute (JGCRI)**
The Joint Global Change Research Institute houses an interdisciplinary team dedicated to understanding the problems of global climate change and their potential solutions. Joint Institute staff bring decades of experience and expertise to bear in science, technology, economics, and policy. One of the strengths of the Joint Institute is the network of domestic and international collaborators that encourage the development of global and equitable solutions to the climate change problem. Initiated in early 2001, the Joint Institute brings together the intersecting interests of Pacific Northwest National Laboratory and the University of Maryland. Staff at the Joint Institute are focused on developing new opportunities to train University students in these interdisciplinary areas.

**Solar Decathlon**
For the third time, a research/design/build team from the University of Maryland is participating in the Solar Decathlon, a competition sponsored by the US Department of Energy. This year’s project, called LEAFHouse, embraces the Chesapeake Bay watershed context for a smart, adaptable, resource-efficient home powered by renewable energy. The house demonstrates the design savvy, both traditional and 21st century, that makes solar power an integral part of a sustainable lifestyle. At the conclusion of the competition, LEAFHouse will be displayed on the National Mall in Washington, D.C. along with 19 other solar homes built by university students from around the world.
There exists a strong promise from faculty at the University of Maryland to educate students about global and local environmental concerns, to involve students in research centered around these issues, and to engage students in finding solutions to real world problems.

Evidence of this focus on the environment is apparent by the more than 100 courses offered about environmental issues, faculty who go out of their way to weave environmental awareness into the curriculum, a new living-learning program to help students experience sustainable lifestyles, educational programs/lectures, and outstanding academic departments that are training students to solve some of the biggest problems facing humanity. The following are just a few of the new academic programs at the University of Maryland.

**Environmental Science and Technology (ENST)**
The College of Agriculture and Natural Resources has announced the establishment of a new academic department. The Department of Environmental Science and Technology will focus on four “areas of excellence”:

- Soil and Watershed Sciences,
- Ecosystem Science and Management,
- Ecological Design and Technology, and
- Environmental Health. “These core areas of excellence center on important societal and environmental issues,” says department chair Dr. Frank Coale. “Our goal is to address these issues through high-quality research, undergraduate and graduate instruction and Extension Education and outreach programs.” During the coming year, department faculty will develop exciting new curricula addressing each of the four areas of excellence, with some new majors ready for implementation by the fall 2007 semester.

**Master of Engineering and Public Policy (MEPP)**
“Creating a new kind of leader” is the mantra of this new graduate program. The Master of Engineering and Public Policy program, offered jointly by the University of Maryland's A. James Clark School of Engineering and School of Public Policy, creates unique leaders: engineers who understand and appreciate the social context of their work and policy analysts who know engineering sciences. Students are trained to analyze
issues in light of the latest engineering knowledge, evaluate options considering the interests of citizens, industry and government, and ensure that our decisions and our measurements of results are solidly based on the facts. This program opened its doors to new students in 2006.

**Maryland Institute of Applied Environmental Health (MIAEH)**
The Maryland Institute for Applied Environmental Health was established by the University in July 2006. It serves as the teaching, research and service/outreach function for environmental health in the proposed School of Public Health at UM. The MIAEH vision is to be a world leader in the detection, improvement and prevention of environmental related diseases. The department aims to advance the prominent issue of translating research into effective public health practice. This includes research in environmental public health to address occupational and environmental public health problems and the factors that influence effective environmental public health practice. Education and training is provided to occupational and environmental public health professionals.

This is accomplished through a multi-disciplinary multi-profession collaborative of faculty, students, and researchers, and by applying appropriate technologies to advance environmental public health research and education.

**EcoHouse**
Opening in Fall 2007, EcoHouse will be a Living-Learning Program for undergraduates who are interested in learning about and promoting innovative, ecologically-sound lifestyles and multi-disciplinary exchange. Enrollment by students in all majors and programs will be actively pursued since communication and cooperation across academic disciplines, personal styles, and political/cultural backgrounds are needed to solve the complicated environmental problems confronting us today. The program includes academic, career development and community service/environmental leadership components so that students can engage in on- and off-campus research and learning. Additionally, students will explore the implications of green architecture, energy and water conservation, and other sustainable living practices.

Dr. James is one of the many exceptional educators at the University of Maryland who go out of their way to get students thinking about their relationship with the natural environment. “Environmental ethics,” says James, “is at the center of my teaching. If we can get students thinking about ethics, we get at the root of sustainability.” With so many critical environmental issues facing this and coming generations, it is essential to encourage students to think independently and to work on solutions to our problems. To foster this sort of educational setting, James is careful not to preach to students or even share his personal views. This strategy, according to James, drives the students crazy because they want to know where he stands; however, the open dialogue pervasive in his classroom is where he sees the real learning take place.
College and University Sustainability Conferences
The University has been actively engaged in the broader discussion about campus sustainability. Since 2003, two national sustainability conferences have been hosted at UM and a 3rd conference, the 2nd Smart & Sustainable Campuses Conference, will be held in the Stamp Student Union on April 17-19, 2007. The University has partnered with the U.S. Environmental Protection Agency (USEPA), the National Wildlife Federation (NWF), the Association for the Advancement of Sustainability in Higher Education (AASHE) and a number of other national higher education organizations in sponsoring these events. The conferences provide a forum for institutions to discuss their sustainability initiatives, strategies, and successes.

Engineers Without Borders
Engineers Without Borders – USA (EWB-USA) is a non-profit humanitarian organization established to partner with developing communities worldwide in order to improve their quality of life. This partnership involves the implementation of sustainable engineering projects, while involving and training internationally responsible engineers and engineering students. Since its start in 2004, the University of Maryland chapter has completed five projects and has initiated three others. Around 100 students have participated with the design and planning of sustainability projects and half of those students have traveled around the world to implement their designs.

In January 2007, four UM student teams went to four countries to help communities find new ways of living sustainably. In Brazil, students built a water storage tank and constructed wetlands to help local communities have access to clean drinking water. In Thailand, students engineered a water capture system and pipeline to supply fresh water to the Lahu hill tribe, refugees from Burma. A similar project in Ecuador is now providing two Andes communities with safe drinking water. And in Burkina Faso, Africa, students installed solar panels that are providing lighting for literacy centers used by day laborers.

UM teams are currently working on yet more projects that will be constructed elsewhere around the world this August. Students receive no class credit for their work and must fundraise to support the projects. They are, however, content with the satisfaction of making real differences in the lives of many people.

Wheaton Redevelopment Project
According to Dr. Alex Chen of the Urban Studies and Planning program, “Sustainability is a process of getting people together to discuss solutions,” which is exactly what he and his students have done with the Wheaton community. Wheaton, Maryland is a city that is undergoing massive redevelopment, which is creating stress on its environment and economy. Through a partnership with Northwood High School, students from that school worked with UM students to conduct a field survey of changes taking place in Wheaton. By interviewing shop owners and creating opportunities for communication between them, students uncovered important environmental, social, and economic trends that are creating challenges for various stakeholders in the Wheaton community.

CPEG Elementary School Outreach
Students in the College Park Environmental Group (CPEG) participate every fall and spring in an education outreach program with local elementary schools. CPEG students offer one-hour courses to increase environmental awareness. The fall curriculum teaches students about the importance of worms and using worms to compost waste. In the spring, students are introduced to a lesson called “Who Polluted the Potomac?” During this lesson, students learn how everyday activities can create river water unsuitable for marine life, industrial use, or human recreation. Schools that have participated in the CPEG educational outreach program include the Friends School, Hollywood ES, Holy Redeemer, and St. Mark’s.
### Resources

**University of Maryland (In order of report content)**

Sustainability Website, www.sustainability.umd.edu  
Master Plan, www.facilities.umd.edu/MasterPlan2/index.htm  
Environmental Stewardship Guidelines, www.facilities.umd.edu/MasterPlan2/envguide.htm  
Terrapin Trader, www.purchase.umd.edu/ttrader/  
Recyclemania and Student Affairs Environment Website, www.environment.umd.edu  
Golf Course, www.terpgolf.umd.edu  
Resident Life Recycling, www.resnet.umd.edu/reslife/recycling/  
Dining Services Environmental Initiatives, www.dining.umd.edu/greendining/Env_Prog.cfm  
Center for Integrative Environmental Research, www.cier.umd.edu  
Center for Environmental Engineering, www.enme.umd.edu/ceee  
National Center for Smart Growth Research and Education, www.smartgrowth.umd.edu  
Earth System Science Interdisciplinary Center, www.essic.umd.edu  
Joint Global Change Research Institute, www.globalchange.umd.edu  
Environmental Science and Technology, www.enst.umd.edu  
Center for Environmental Engineering, www.enme.umd.edu/ceee  
National Center for Smart Growth Research and Education, www.smartgrowth.umd.edu  
University Affiliate Program of the National Council for Science and the Environment, www.ncseonline.org

**Sustainability in Higher Education**

ACPA Sustainability Task Force website, www.myacpa.org/task-force/sustainability  
Association for the Advancement of Sustainability in Higher Education (AASHE), www.aashe.org  
Association of University Leaders for a Sustainable Future, www.ulsf.org  
Campus Consortium for Environmental Excellence, www.c2e2.org  
EPA Sector Programs – Colleges and Universities, www.epa.gov/sectors/colleges/  

**Environmental Education**

The Eco League, www.ecoleague.org  
University Affiliate Program of the National Council for Science and the Environment, www.ncseonline.org

**CONTACT US**

If any sustainable practices were missed in this report, we would love to know about them. Please email sustainability@umd.edu with questions or comments.
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Environmental Stewardship Committee
Jack Sullivan, Co-Chair
Allen Davis, Co-Chair
Scott Lupin
Maria Lonsbury
Bill Mallari
Wendy Whittemore
Carl Bovil
David Cosner
Michael Martin
James Stirling
Harry Teabout
Sam Snellings

Facilities Council
William Destler, Chair
Frank Brewer
Melvin Bernstein
Linda Clement
William Remington
Jeffrey Huskamp
Jack Baker
Steven Hurtt
Brenda Testa
Carlo Colella
Julie Phelps
Diane Jones
Steve Fetter
William Montgomery

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Joan Kowal
Marlow Leafy
George Long
Jeff McGee
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University of Victoria Sustainability Report 2006, which inspired the design for this report.

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