Already recognized as a national leader and exemplary model of Army sustainability, Fort Bragg established another benchmark in late 2005 by becoming the first Army installation to integrate all tenets of sustainability and the Triple Bottom Line into the Garrison Strategic Plan. The Fort Bragg Strategic Plan identifies critical tasks that must be performed to sustain the installation as a "Power Projection Platform of Excellence", requiring investment by all Garrison leaders and the installation workforce.

In FY07, Sustainable Fort Bragg solidified it focus with breakthrough efforts to integrate nationally-accepted Leadership in Energy and Environmental Design (LEED) standards in the design, construction, maintenance and operation of installation infrastructure. The ever increasing demand for facilities due to Base Realignment and Closure (BRAC), Grow the Army and other expansive initiatives has provided the impetus for this endeavor. The Facilities objective – one of six sustainability-focused functional area objectives embedded in Garrison Strategic Goal #1 (Sustainable Community) – strives to transform Fort Bragg into "the model sustainable military community of the world by using sustainable principles throughout the life cycle of all facilities and supporting infrastructure." Performance targets for this objective call for the installation to meet at least LEED Silver standards by FY12, Gold by FY17 and Platinum by FY20 for 100 percent of all new MILCON construction. For existing facilities, at least 25 percent of the total square footage (approx. 6.5 million sq. ft.) is to be a minimum of LEED Certified by FY20. These targets affect an estimated 20 million sq. ft. of proposed and existing infrastructure.

With a massive MILCON construction budget of over *$2 billon* in the next three years, efficiency in design and resource usage is critical to the installation. To accommodate this exponential growth, Fort Bragg strives to proactively advance its LEED programs far beyond baseline Army MILCON requirements and timelines through innovation and creativity. While each of Fort Bragg's six sustainability objective areas experienced substantial growth and success within the past fiscal year, FY07 presented unparalleled opportunities for advancement in sustainable design on the installation.

As of June 2007, Fort Bragg remained the only military installation that had both a LEED program for existing buildings (EB) as well as new construction (NC). This is made even more remarkable by the fact that the first phase of Fort Bragg's EB program, with 43 buildings encompassing over 5.2 million sq. ft., is already the second largest contributor of square footage to the U.S. LEED-EB program in the *entire* U.S. Green Building Council (USGBC) inventory. Furthermore, the installation's LEED-NC program has received approval from USGBC to register and certify 27 projects totaling 2.8 million sq. ft. In partnership with the Army Corps of Engineers (Savannah District) each new building in Fort Bragg's 2008-2010 MILCON budget is scheduled to be built to LEED Silver standards.

LEED: Fort Bragg's Unfolding Success Story

Fort Bragg's initial work with LEED has already resulted in fundamental changes to energy and environmental policies and practices both on the installation and across the state and region. However, as the program is only in its adolescence, the most revealing results of Fort Bragg's LEED efforts are reflected in an expanding array of early accomplishments, a rapid learning curve, an extensive network of partnerships, and the benefits consistently cited by a growing cache of LEED-related research nationwide.

Fort Bragg's leadership in innovative sustainable design and development begins with its **people**. With seven LEED accredited professionals on staff in three separate divisions—currently the highest number on staff at an Army installation—Fort Bragg retains an exceptional number of people to carry out its innovative LEED projects and initiatives, and ensures continuity of LEED criteria through the various phases of construction on Fort Bragg. Furthermore, 100 staff members within the Directorate of Public Works and the three local U.S. Army Corps of Engineers (USACE) Area Officers have received training from USGBC LEED professionals, hosted by the installation, to ensure knowledge of LEED principles and concepts throughout the multi-level construction process.

Fort Bragg's commitment to innovation in sustainable design and development is further reflected in its extensive network of **partnerships**. In FY07, the installation registered 43 buildings (over 5.2 million sq. ft.) in the USGBC LEED Portfolio Program. This unique pilot program, developed with significant input from Fort Bragg, assigns "automatic" LEED credits based on the installation's pre-approved baseline standards and policies (e.g., Installation Design Guide). By eliminating the need for supporting documentation on certain pre-specified credits, the Portfolio Program will make it easier for large "campus-like" entities, such as DoD installations, universities and municipalities, to register their buildings under the LEED criteria. For Fort Bragg – slated to receive "automatic" points for soil erosion control, stormwater management (quantity and quality), "green space", and installation-wide policies governing sustainability – development of this program reduces registration and certification costs by about 40 percent for both LEED-NC and LEED–EB, thus reducing initial certification costs from $116,526 to an estimated $69,035. Fort Bragg is the first – and, currently, the only – DoD entity to participate in the LEED-EB Portfolio Program.

Fort Bragg also partnered with USACE to identify over 100 LEED-related specification requirements to be included in USACE standards for all new construction projects in the U.S. As a result of this partnership, over 90 percent of these specifications have now been incorporated as new construction standards *worldwide*.

Wal-Mart is another example of Fort Bragg's partnership in achievement of sustainability best management practices. Senior staff from Wal-Mart's corporate headquarters in Arkansas and staff from regional headquarters traveled to Fort Bragg for a one-day sustainability conference on mutual challenges such as sustainable design and energy efficiency. As a result of this conference, Wal-Mart became the primary sponsor and an active partner in Fort Bragg's "Be Aware of Our Air" month-long energy awareness campaign, donating over 5,000 energy efficient light bulbs for distribution to Fort Bragg facilities.

By leveraging its unique network of partners, Fort Bragg has secured non-traditional funding for the Sustainable Fort Bragg initiative. In FY07, the installation's sustainability initiative applied, with various partners, for $4.6 million in grants from outside funding sources and received approximately $3.2 million. These grants enable Fort Bragg to further its sustainable design and development program through various innovative **projects**.

The single largest grant Fort Bragg received in FY07 came from the Environmental Security Technology Certification Program (ESTCP) – a DoD program that promotes innovative, cost-effective environmental technologies through demonstration and validation at selected DoD sites – in support of a "high performance building" project. The study, which will be conducted with USACE, will generate cost-savings and resource-conservation data analyzing life-cycle savings versus upfront retrofit costs to determine which LEED points are feasible for future construction within the project's budget limitations. Two multi-use Emergency Services Buildings – one of which was built to standard non-LEED specifications and one constructed to meet LEED Platinum standards – will be monitored over an extended period to capture an unprecedented assortment of concrete data on the energy and water efficiency, environmental benefits, quality-of-life improvements and cost-savings LEED generates. The study is projected to generate a uniquely comprehensive data set due to the multi-purpose nature of the facility – a place in which occupants not only work, but recreate, train, prepare meals, store materials, maintain vehicles, etc.

Another FY07 milestone for Fort Bragg's sustainable design and development goals was the groundbreaking construction of a permanent container building on the installation. The two-story, 4,322 square-foot 249th Engineers Company Operations Building was constructed using 12 reclaimed 14-gauge steel shipping containers, each of which is built to hold an impressive 50,000 lbs—almost double that of standard load-bearing construction. While shipping container construction is not an entirely new concept for the U.S. military, this

particular building has the distinction of being the first multi-story commercial structure in the U.S. to use them as an integral building component for permanent infrastructure needs. More importantly, this building was constructed at the same $750,000 upfront cost as standard USACE design. Since steel container buildings boast superior resistance to wind, fire, moisture, mildew and other damaging elements and require only a fraction of the time and materials to construct, Fort Bragg is expected to save tens of thousands of dollars on labor and construction, as well as operation and maintenance costs. In addition to conserving valuable resources, converting used shipping containers conserves substantial energy as only 5 percent of the total energy required to melt down the containers for reuse is needed to convert them. While its structure far exceeds standard military construction in many aspects, Fort Bragg's newest building conforms where it counts—on exterior appearance, lifecycle expectation and construction cost requirements.

Fort Bragg's sustainable design and development goals extend beyond the installation boundaries with the development of various innovative and interactive LEED **tools, resources and applications** to track, educate, and implement LEED goals**.** As an integrated piece of the Garrison's Sustainable Community Strategic goal, Fort Bragg's LEED program requires monitoring across specific indicators, measures and targets to capture the progress and performance of the program for review by Garrison Command. Measures tracked include: percentage of facilities slated for LEED-NC progression from Certified to Platinum, facilities scheduled for LEED-EB Certified status, and total square footage of LEED Platinum facilities. Progress toward these goals is monitored through the revolutionary new environmental module within the Work Coordination System (WCS), Fort Bragg's installation-wide facilities management tool. While every Army installation is required to manage its work effort, Fort Bragg invested $150,000 in the development of a unique and comprehensive environmental module that will coordinate with Fort Bragg's WCS to centrally track LEED credits in order to record sustainability progress and ensure that sustainability best management practices are considered for *all* routine repair, renovation and minor construction projects. Fort Bragg is one of very few agencies nationwide to develop an environmental module to centrally track LEED credits.

Another tool, the Best Practices Database, was developed by Fort Bragg as a resource for project managers and designers unfamiliar with LEED Reference guides. The database provides a digital representation of the USGBC reference guides, as well as detailed information on LEED credits, and is also capable of generating an implementation outline for projects according to specific cost and material requirements. Providing an easy reference database supports project managers and offers another mechanism to ensure LEED principles and concepts are accessible to all personnel involved in all phases of the construction process

A third resource, the LEED Vendor Database, was developed in early FY07 to help Fort Bragg project managers and local Army engineers identify local and regional suppliers of building/construction products and materials that meet LEED requirements. The database also features an electronic LEED training component depicting a graphic cross-sectional view of a typical multi-storied building, with training modules directly related to each area within the building. This multi-use tool provides potential contractors Fort Bragg's requirements for new buildings/retrofits and a list of vendors within a 500 mile radius of Fort Bragg offering LEED-certified materials and products. To maximize utility, the vendor database is searchable by product, vendor, or specific LEED credit point reference number.

An Expanding Sphere of Influence

Fort Bragg's FY07 LEED projects have already prompted many programs installation-wide to incorporate green building practices and design standards into their policies. These programs influence a broad range of areas, including stormwater management, alternative transportation, waste reduction and disposal, use of renewable and recyclable materials, furniture purchasing and disposal, energy conservation, and sustainable lifestyle and

workplace habits. Achieving LEED targets has been a primary driving force behind the implementation of a number of innovative facility-related programs on Fort Bragg in FY07, including the incorporation of Low Impact Design features such as rain barrels, sustainable parking lots, bio-retention cells, and rainwater collection systems for irrigation use.

Fort Bragg's new event recycling initiative is one program through which waste diversion becomes a cultural norm. Introduced at the Fort Bragg 2007 Independence Day celebration – attended by over 40,000 people – collections far exceeded first-year expectations with nearly 1,000 lbs. (5,280 containers) of plastic beverage bottles and aluminum cans collected over the day-long event. Also in FY07, Fort Bragg's construction and demolition (C&D) debris program reached a major milestone by achieving a 56 percent diversion rate, and its concrete crushing operation – a program that has an estimated annual value of $3.35 million – crushed over 121,428 tons for use in erosion control projects, roads, trails, firebreaks, and parking lots. Also during the year, Fort Bragg acquired a salvaged tub grinder for use in its mulching program. Since May 2007, the grinder has generated over 6,250 tons of mulch from non-merchantable tree debris and yard waste from construction projects for free on-post use by all individuals. By acquiring a salvaged grinder, the installation has saved $335,000 in equipment costs and avoided an additional cost of $116,000 in the purchase of mulch.

Under the Utilities objective of the Sustainable Community goal, Fort Bragg was able to pioneer an active daylighting pilot project to demonstrate the viable concept of using sunlight to provide natural lighting within a window-less facility. A mirrored dome installed in a renovated warehouse facility on Fort Bragg tracks the sun across the sky and reflects natural light down into the available light receptacles. Because fewer fixtures are necessary to sufficiently illuminate the facility, the pilot project has resulted in a savings of $16,000. The project has also proven highly popular with occupants of the warehouse, who report higher morale as a result of the retrofits.

In the area of transportation, July 2007 saw the launch of Fort Bragg's Shuttle Bus Trip Planner, a web-based service that provides Soldiers and CAC cardholders up-to-date shuttle bus service schedules and route information in order to maximize use of the installation's alternative transportation. Fort Bragg's Low-sulfur shuttle bus system, a free transportation service, serves over 400 buildings on the installation and connects to neighboring public transportation systems for off-post travel. Since its inception in 2005, the Fort Bragg Shuttle Bus has transported over 61,000 soldiers, dependants, and civilians and currently boasts an average monthly ridership of 12,000.

Extending Beyond Installation Boundaries

While LEED is becoming a widely accepted standard in the U.S. Army, the extent to which Fort Bragg has incorporated this program into its installation guidelines remains a unique and unrivaled accomplishment. Fort Bragg's innovative advancements in the area of sustainability are made even more remarkable by the fact that, with a military population of over 52,000 Soldiers and growing, it is also the largest Army installation in the United States. Because Fort Bragg is such an enormous economic engine and military power, it is both the installation's privilege to be DoD pioneers in program innovation and cutting-edge technology and its duty to effectively model these innovative advancements to create a sustainable Army and a sustainable world. This philosophy is reflected in Fort Bragg's motto: "The Right Way…The Green Way…All the Way!"