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An Army lodge (foreground) and a bowling alley (background) are under construction at U.S. Army Garrison Grafenwoehr, Germany — part of efficient basing efforts in Europe. Photo by Andrea Hoesl, Directorate of Public Works, Grafenwoehr. Page 18

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Sustainable planning techniques, methods

by Mark L. Gillem

Imagine a community where Soldiers can walk along tree-lined streets to their workplaces, children can walk to school, and families can walk to the community center from their homes. Places like this would not be much different than many small towns built before 1930. Nor would they be different from many historic Army installations. This is the vision that sustainable planning principles embrace.

Army planners have been taking on the principles of sustainable planning, and President Obama's recent executive order has re-energized ongoing efforts. Sustainable development is now a requirement for federal installations. The October 2009 Executive Order on *Federal Leadership in Environmental, Energy and Economic Performance* states that —

> *"In order to create a clean energy economy that will increase our Nation's prosperity, promote energy security, protect the interests of taxpayers, and safeguard the health of our environment, the Federal Government must lead by example. It is therefore the policy of the United States that Federal agencies shall increase energy efficiency … reduce their greenhouse gas emissions … and design, construct, maintain, and operate high performance sustainable buildings in sustainable locations."*

The value of sustainability principles as they pertain to the long-term development of installations is recognized. However, getting down to fundamentals, what are some of the basic planning goals on which planners must focus to achieve these principles?

Compact development

Installations must conserve the land resources they have. They have to ensure the limited training land is available not only to support ongoing missions but also the unforeseen future mission needs for the nation. A development strategy that is achieved through compact development patterns supports an appropriate mix of uses, encourages walking and other alternative modes of transportation, accommodates appropriate residential and commercial densities, and incorporates a more integrated grid network of streets and sidewalks, thereby restricting expansive land uses.

Acronyms and Abbreviations	
AT/FP	anti-terrorism and force protection
VMT	vehicle miles travelled

Sustainable densities can be achieved through mixed-use development, like this at Fort Belvoir, Va., with shops below two-level townhomes. Photo by Mark L. Gillem

Compact development patterns may also include proposing multi-story buildings, greater residential densities, mixed uses and minimal spacing between buildings while maintaining consideration of anti-terrorism and force protection requirements. This means it is essential that the planner must focus on well-coordinated, comprehensive area development plans that are formulated early before programming actions are initiated.

Infill Development

Another technique of planning is infill development. Simply put, this strategy means that planners should, to the maximum extent possible, plan development within the installation core — the existing cantonment area — and on previously developed land.

Planners should place buildings in gaps between existing developed areas and buildings. Such infill development results in greater density at the core of the installation and supports more integrated land use and transportation networks. Removal and replacement of aging low-density development with higher density development may also be appropriate.

These principles, when considered early during area development planning formulation, can result in creating great sustainable installations. Sustainable development has a direct impact on an installation's environmental performance.

A town center proposal for Marine Corps Air Station Iwakuni, Japan, supports sustainable development through mixed uses and appropriate densities. Graphic by The Urban Collaborative LLC

A key aspect of sustainability is building at an appropriate commercial and residential density rate that promotes a more walkable installation. In more dense development, people have a wider range of transportation options, and buildings are oftentimes connected, which results in shared walls and improved energy consumption.

Research has found that more dense development uses less energy and emits less greenhouse gas by a factor of 2.0 to 2.5 than less-dense neighborhoods. Environmental performance is enhanced due to the relationship between transportation and land use. ➤

Developments in sustainable master planning

by Andrea Wohlfeld Kuhn

Sustainability continues to be a major focus for planning, design and construction throughout the federal government and private industry. The ever-increasing awareness that we do not have unlimited resources and that our actions and those of others can have global repercussions make sustainable practices even more critical.

Sustainable planning rating system

Of particular relevance to the master planning community is the news that the U.S. Green Building Council recently finalized its sustainable planning rating system, Leadership in Energy and Environmental Design for Neighborhood Development. As is the case with USGBC's other rating systems, LEED certification is structured on a point-based checklist that results in ratings on a scale from Certified to the highest rating, Platinum.

LEED-ND is a result of collaboration among the U.S. Green Building Council,

Andrea Wohlfeld Kuhn
Photo by Mary Beth Thompson

the Congress for the New Urbanism and the Natural Resources Defense Council. It is based on the principles of smart growth, new urbanism and green infrastructure and building. LEED-ND emphasizes the neighborhood elements of site selection, design and construction, and their relationship to the landscape and the local and regional context.

LEED-ND has three environmental categories:

- Smart Location and Linkage
- Neighborhood Pattern and Design
- Green Infrastructure and Buildings

An additional category, Innovation and Design Process, addresses sustainable design and construction issues and measures not covered under the first three categories. In addition, regional bonus credits acknowledge the importance of local conditions in determining the best environmental design and construction practices as well as social and health practices. Striving to meet these standards will ensure a community is on track to attain improved quality of life for its inhabitants, including health and safety benefits, and that the community creates minimal impacts to the environment.

While the Army has adopted LEED for New Construction with attainment of at least a Silver rating as the mandatory standard for all new construction, the principles of LEED-ND can be used to help define and facilitate master ➤

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Of significance is the direct relationship between density, transit options and rates of vehicle miles travelled. One study of 28 communities in California evaluated the effects of neighborhood characteristics on motor vehicle use per household and annual VMT per household. Researchers found that compact communities supported walkability and transit at much higher rates than less dense development.

Using the model developed by these researchers, similar development at military installations could have significant environmental benefits. At Fort Lewis, Wash., for example, by following principles of sustainable development, installation planners concluded that VMT could be reduced by 11.4 million miles per year, which would result in a carbon dioxide emission reduction of 12.9 million pounds per year and a per-family annual savings of more than $1,500.

Compact infill development also preserves installation military capabilities for the long term. By locating new housing and other development in the downtown core and appropriately increasing the density of other neighborhoods, the Fort Lewis installation planning team was able to obtain installation mission capabilities to support an additional 2,000 housing units and two additional brigade combat teams if the Army determines future stationing actions are required.

Sustainable development can significantly reduce land requirements while preserving long-term Army and Department of Defense installation military capabilities. However, it requires an installation to focus on long-term planning strategies and to work early and more closely with the AT/FP experts to forge collaborative solutions for long-term growth.

These principles are not new; they are long-standing practices that previous Army leaders embraced when they directed the building of installations in the early 20th century. The importance of this strategy is being recognized in the proposed update to Army Regulation 210-20, *Real Property Master Planning for Army Installations*, due in early 2010, which will make it policy to embrace these planning principles as much as possible.

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