

# Public Works DIGEST

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Housing, and  
Barracks**

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*At U.S. Army Garrison Hawaii, planners are working to convert existing streets into safe and efficient avenues and boulevards to support multi-modal transit, infill development, and stormwater management.  
(Image courtesy of The Urban Collaborative)*



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# Master planning helps installations follow executive order

by Jerry Zekert and Mark Gillem

The White House's publication of Executive Order 13693 Planning for Federal Sustainability in the Next Decade has identified another significant outcome to achieve real cost savings associated with energy and water reductions. Planners and the plans they create can go a long way in helping military installations meet the order's mandates, which can result in lower operating costs, increased resiliency, and enhanced environmental performance.

While the executive order covers numerous aspects of sustainability, the ones on which planning can have a significant impact relate to energy reduction and recovery, building performance, water reduction, waste minimization, and transit accessibility. The key is to have an actual plan that embeds sustainability strategies throughout all development that translates into projects.

The best scale to do this is by dividing the installation into areas or districts and then creating an Area Development Plan. Once this plan is in place for a district, a follow-on Sustainability Component Plan can be created. In the process of preparing an SCP, installation staff members work together to establish measurable goals in four environmental categories: energy, water, waste, and stormwater. These goals may simply mirror the executive order or they may be more aggressive and call for net zero or net positive in some areas. At a minimum, the goals should reflect the



The planned transit node at Joint Base Pearl Harbor-Hickam integrates planning principles that will help the installation meet Executive Order 13693 goals for energy reduction (through energy efficient construction and renovation), water reduction (through xeriscaping and appropriate permeable paving), and access to transit on and off the installation. (Image courtesy of The Urban Collaborative)

following guidance from Executive Order 13623:

**Solid Waste.** The target is to divert 50 percent of non-hazardous solid waste, to include compostable material, and 50 percent of construction debris from landfills. Many locations only divert about 30 percent, so there is room for improvement.

**Energy.** For energy, the order calls for a 2.5 percent annual reduction for 10 years based on a fiscal year 2015 baseline. So by 2025, installations need to achieve a 25 percent reduction from today's use. It also sets a "clean energy" target of 25 percent by fiscal year 2025, which includes non-electric and alternative

(See Executive Order, page 14)

(ERDC, continued from page 12)

tures. Infrastructure is relatively easy, such as increased water requirements for an updated sprinkler system. But projecting needs for the future is a significant challenge," Cook said.

"For me the really interesting and challenging part is that ERDC is the only Corps of Engineers element with a Directorate of Public Works," he said. "I guess that makes me kind of the last of a breed, but the unique challenges of

supporting a multi-acre, multi-building campus is really special. With an innovative focus, I think we are going to create something quite special."

The U.S. Army Engineer Research and Development Center is one of the most diverse research organizations in the world, with more than 2,100 employees, more than \$1 billion in world class facilities and an annual program exceeding \$1 billion. The U.S. Army Engineer Research and Development Center supports the

Department of Defense and other agencies in military and civilian projects. Principal research mission areas include Soldier support, military installations, environment, water resources and information technology.

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(Executive Order, continued from page 13)

energy and a renewable energy target that calls for 30 percent of energy use coming from renewable electricity by fiscal year 2025. Since many installations already benefit from “picking the low-hanging fruit,” meeting these targets will become increasingly challenging.

**Water.** The executive order calls for a 2 percent annual reduction from a 2007 baseline in order to achieve a 30 percent overall reduction by fiscal year 25. This may be one of the most challenging targets and could require the use of greywater harvesting, rainwater catchment, and investing in purple pipes to carry recycled water through a building.

**Buildings.** Starting in fiscal year 2020, all new construction of federal buildings greater than 5,000 square feet that enters the planning process will be designed to achieve net-zero energy and, where feasible, water or waste net-zero by fiscal year 2030. The “where feasible” language gives installations an out for water and waste but the energy mandate is not optional. This requires a fundamental rethink of how we will design buildings.

Once these framing goals are in place, planners can forecast reduction and recovery metrics using a baseline and then projecting to a base case, better case, and best case in terms of reduction and recovery for each category. The base case uses the installation’s current

baseline use intensities for energy and water consumption as well as waste and stormwater generation and multiplies the use intensity by the applicable area or per capita factors. For example, if current administrative buildings generate five pounds of municipal solid waste per 1,000 square feet, that factor can be applied to all proposed administrative building area to

Hawaii; Fort Hunter Liggett, California; the Presidio of Monterey, California; Parks Reserve Forces Training Area, California; and National Aeronautics and Space Administration’s Lyndon B. Johnson Space Center, Texas. These plans show actual projects needed to meet the framing goals and those projects are in sync with the Area Development Plan.

## The “where feasible” language gives installations an out for water and waste but the energy mandate is not optional. This requires a fundamental rethink of how we will design buildings.

get to a total waste generation in the short term and long term. Then, using tested recycling methods, which represent a better case, buildings may only generate three and one-half pounds of waste per 1,000 square feet. A more aggressive approach would add composting and that may get the intensity down to two and one-half pounds per 1,000 square feet. This would represent the best case. A similar process that starts with a baseline, then forecasts base, better, and best cases using various efficiency measures also works for energy, water, and stormwater. Multiplying these intensities by the total area in each planning phase results in a forecasted total for each category (waste, energy, water, and stormwater).

The U.S. Army Corps of Engineers has developed a state of the art modeling tool that helps plans use computer modeling to forecast energy, water and waste use over time. The Net Zero Planner tool helps installations do the actual forecast modeling. The tool also looks at the lifecycle cost of various efficiency measures and helps identify the most cost effective measures to meet the framing goals. Using the tool has helped planners create Sustainability Component Plans for Fort Hood, Texas; U.S. Army Garrison

**Access to Transit.** The executive order also requires that as agencies plan for new buildings or leases, access to public transit is a desirable strategy. It encourages the development of policies that promote sustainable commuting. Taken together, this means that plans should focus on transit-oriented developments, which means that we locate more intense development around transit stops and along transit lines.

By setting the overarching goals, the administration has established the benchmarks for the military to follow. Using these complementary planning product and services, installations can define the best plan to achieve these goals integrated with their base planning practices.

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