



*Efficient and Integrated  
Military Installations*

Briefing for the  
House Armed Services Committee  
Pursuant to House Report 115-200, page 315,  
Accompanying H.R. 2810, the National Defense  
Authorization Act, 2018



Preparation of this briefing/report cost the  
Department of Defense a total of approximately  
\$5,300 for FY 2018.  
Cost Estimate Generated on 2018Mar19  
RefID: 4-80C43E2



# *Contents*

*Energy, Installations and Environment*

- *Congressional Request*
- *Bottom Line Up Front*
- *Innovative Technologies and Processes*
- *Master Plans*
- *Smart Base Challenges*



# *Congressional Request*

Energy, Installations and Environment

**House Report 115–200, page 315-316**

**Requests the Secretary of Defense to provide a briefing that provides, “an overview of initiatives the Department has undertaken to incorporate a broad range of government, commercial, and other innovative technological and processes that improve the performance, efficiency, and effectiveness of military infrastructure and services provided on military installations and how these initiatives are being incorporated into installation master plans.”**

**The Committee noted the Department of Transportation’s “*Smart City Challenge*” and is interested in how the Department of Defense can leverage Smart City concepts.**



## ***“Bottom Line Up Front”***

Energy, Installations and Environment

- **“Smart City” is the use of electronic data collection to manage assets and resources in order to create a sustainable, resilient and integrated approach to delivering modern and efficient services.**
- **The concept is applicable to a “Smart Base.”**
- **DoD was an early adopter of smart technologies. Since the 1970s, the Military Services have employed the latest technologies to operate infrastructure and provide base services.**
- **DoD recognizes that threats and opportunities from today’s technology applications can have tremendous effects on military installations.**
- **DoD policies and guidance for installation master planning are committed to maximizing efficiencies through the use of technology.**



# *Smart City Concepts*

Energy, Installations and Environment

- **A Smart City is an urban area that uses different types of electronic data collection sensors to supply information to manage assets and resources efficiently.**
  - This includes data collected from citizens, devices, and assets that is processed and analyzed to monitor and manage such things as traffic and transportation systems, power plants, water supply networks, waste management, law enforcement, information systems, schools, libraries, hospitals, and other community services.
  - The Smart City concept integrates information and communication technology (ICT), and various physical devices connected to the network (the Internet of Things or IoT) to optimize the efficiency of city operations and services and connect to citizens.
- **The Department of Transportation’s “Smart City Challenge” program cited in the House Report is an admirable initiative to help cities address their urban mobility challenges. DoD’s concept of a Smart Base is much broader than transportation issues.**



# *Setting the stage for response on Innovative Technologies and Processes*

Energy, Installations and Environment

## *For Infrastructure:*

- Smart bases are largely comprised of smart buildings which depend on intelligent building automation systems.
- DoD maintains over 275K buildings, 107K structures, and 170K linear structures that include or are supported by an estimated 2.5 million unique Industrial Control Systems.

## *For Installations Services:*

- Smart bases deliver all kinds of services to the installation populace that include training, supply, transportation, billeting, food service, contracting, legal and religious council, family support and more.
- Several smart technologies are already being applied to support security, food services, lodging, supply, transportation, health management, etc.



# *Innovative Technologies and Processes*

Energy, Installations and Environment

## **Technologies used to operate and support the management of military infrastructure by Smart Bases throughout the Department include:**

- Energy Management and Controls Systems (EMCS); primarily controls HVAC
- Supervisory Control and Data Acquisition (SCADA); systems to controls energy, water, wastewater, pipeline, airfield lighting, etc.
- Building Control Systems/Building Automation Systems/ Utility Management Control Systems; computer-based control system that control and monitor the building's mechanical and electrical equipment
- Electronic Security Systems; surveillance cameras, access controls, intrusion monitors
- Fire, Life Safety, Emergency Management Systems; provide real-time fire and disaster response capability
- Microgrid Energy Management Systems
- Exterior Lighting and Street Lighting control
- Intelligent Transportation Systems; provide innovative services relating to different modes of transport and traffic management
- Building Information Model (BIM); a digital representation of physical and functional characteristics of a facility
- Sustainment Management System (SMS); facility inspection support software with predictive maintenance and repair schedules and lifecycle replacement of building components.
- Geographic Information Mapping System; a frame work for gathering, managing, and analyzing data; rooted in the science of geography
- Smart Grids; electricity supply network that uses digital communications technology to detect and react to local changes in usage
- Use of drones for “bird’s-eye” inspection of infrastructure such as roofs and water towers



# *Innovative Technologies and Processes*

Energy, Installations and Environment

## **Technologies used or being considered to provide installation services by Smart Bases throughout the Department include:**

- Common Access Card (CAC); "smart" card identification for Military Service personnel, DoD civilian employees, and eligible contractor personnel.
- Command & Control systems
- Emergency Management
- Health Management
- On-Installation Wayfinding; encompasses all of the ways in which people orient themselves in physical space and navigate from place to place.
- Social Listening; monitoring social media channels for ideas or themes that are relevant to the installation.
- Document and Records Management
- Messaging Systems
- Learning Systems
- Visitor Registration
- Vehicle Fleet Management
- Waste Management; trash bin sensors
- Driverless vehicles to transport wounded soldiers
- 3-D printing of equipment repair parts
- Artificial Intelligence for predictive analytics and pre-emptive responses
- Explosives Safety and Munitions Inventory Control Systems



# *Installation Master Plans*

Energy, Installations and Environment

- **Unified Facility Criteria (UFC) 2-100-01, *Installation Master Planning*, prescribes the minimum requirements for master planning processes and products.**
- **The UFC's key planning elements of compact development, on-site renewable energy sources, mixed-use neighborhood centers, and community outreach, all contribute to the concepts of a smart base.**
- **In addition to the UFC on Master Planning, DoD has published a number of Directives, Instructions, and Manuals that establish policy and guidance for the use of smart technologies and address their cyber security risks.**



# *Smart Base Challenges*

Energy, Installations and Environment

- **Security:** In the private sector, convenience often overcomes security. For the Military, convenience will never take priority over security.
  - Smart technology carries a substantial risk in today's environment.
  - DoD must find security solutions that meet cybersecurity protection requirements as it considers technologies to adopt.
- **Cost:** Smart base or smart building technologies often requires investing money upfront for life-cycle savings, and a sustainment tail to maintain and upgrade systems. These investments have not been well sustained in previous years, and are difficult to project.
- **Knowledgeable Staff:** Trained, qualified personnel are essential if an installation expects to achieve efficient and full use of its smart systems. Currently, DoD is struggling to keep up in this area.
- **Disparate Systems:** Federal acquisition rules have led to a proliferation of multiple vendors' solutions at the same base(s). This increases the technical knowledge the staff must possess and limits the ability to implement innovative solutions to those systems.