

**REPORT TO CONGRESS**  
**ON**  
**REQUIREMENTS MODEL FOR**  
**RESTORATION AND MODERNIZATION FUNDS**



**Office of the Under Secretary of Defense for  
Acquisition, Technology, and Logistics**

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**Introduction**

Senate Report 114-255, page 125, to accompany S. 2943 of the National Defense Authorization Act for Fiscal Year, 2017, requests that the Secretary of Defense to,

“develop a model of requirements for R&M funds and provide the congressional defense committees with an initial model to be delivered in conjunction with the budget submission for fiscal year 2018. The model should address both vertical and horizontal infrastructure and include age of facilities, miles of roads, miles on utilities, and acreage in addition to any other appropriate considerations determined by the Secretary. The R&M model should not rely on prior year funding levels to estimate future requirements. Additionally, the Secretary should pilot the use of the initial model in fiscal years 2017 and 2018, request feedback from installations in each of the services on the accuracy and sufficiency of the model to reflect the diverse needs of all installations, and refine the R&M model as necessary. Lastly, once the R&M model is complete, the Secretary shall submit a written plan to the congressional defense committees detailing how the Department will use the model for funding R&M requirements. The plan should include how each military service will resource the personnel for carrying out the modeled requirements including, but not limited to, contract officer staffing to ensure timely use of the funding provided.”

The Department of Defense (DoD) appreciates the Senate’s concern over the fiscal constraints brought on by the Budget Control Act of 2011 that has hampered investments in facility restoration and modernization. In this fiscal environment, other military readiness needs take a higher funding priority over facility investments, which is leading to increased risk in infrastructure. At the heart of the Department’s stewardship problems is the aging infrastructure, inability to divest of excess capacity, facility requirements to support new mission bed-downs that consume Restoration and Modernization (R&M) funds (such as F-35 and KC-46 aircraft facilities), and an inability to properly fund the routine maintenance for the Department’s large real property portfolio due to the budget limits. Our ability to identify sustainment and R&M needs is not a factor.

The Department understands the Senate’s desire to use modeling as a means for estimating facility R&M requirements. It is the Department’s view, however, that modeling R&M for programming and budgeting purposes is disadvantageous for several reasons. Our position stems from past experiences with R&M modeling attempts, the improved asset

management data the Department collects during physical inspections, and the DoD Components' capability to identify and track R&M needs through installation master plans.

Before describing our prior R&M forecasting efforts and our current methodology for identifying R&M needs, it is important to understand what R&M is in context to facilities, and what types of facility work can be modeled.

### **Overview of DoD Facility Programs**

The Department defines "**Restoration**" as the restoration of real property to such a condition that it may be used for its designated purpose. Restoration includes repair or replacement work to restore facilities damaged by inadequate sustainment, excessive age, natural disaster, fire, accident, or other causes. In short, it is work that makes a facility better than it is now. "**Modernization**" is defined as alteration or replacement of facilities solely to implement new or higher standards, to accommodate new functions or missions, or to replace building components that typically last more than 50 years (such as the structural elements). This work is, in most cases, not known or easily predictable. "**Sustainment**" activities include the maintenance and repair necessary to keep facilities in good working order. It includes regularly scheduled adjustments and inspections, routine preventive maintenance tasks, and repairs or replacement of facility components that are expected to occur periodically throughout the life cycle of facilities. These sustainment activities are largely performed by the installation's in-house maintenance personnel (or base maintenance contracts) that have a fairly stable level of effort from year to year. Because of this and the recurring and predictable nature of sustainment, the work lends itself to modeling. R&M work is not recurring on a schedule and, therefore, it is not readily predictable in a facility's life-cycle. Additionally, projecting the scope and cost of an R&M project requires a degree of planning and preliminary design work. For these reasons R&M cannot be simulated through a model to the degree that it can effectively support budget decisions.

### **Past R&M Modeling Attempts**

In 2000, DoD developed a method to quantify annual modernization requirements using a simple depreciation algorithm. The intent was to produce a theoretical fiscal requirement to support budgeting for an inventory of real property assets. The Department used a 67-year average facility service life as a key variable to array/allocate annual requirements. The 67 years represented a weighted average of estimated expected service life values for the mix of facilities and facility types in the DoD inventory, which translates to a 1.5 percent annual depreciation rate. This benchmark was to support a theoretical goal to fully recapitalize assets every 67 years. The benchmark did not mean that all facilities last 67 years (or should), or that every facility gets replaced. Some facilities never get replaced, but are recapitalized through "whole house" renovations (e.g., the Pentagon renovation).

The initial methodology was refined in 2005 by developing a Facilities Modernization Model (FMM) structured in parallel to the Facilities Sustainment Model using the DoD real

property inventory and real property categorization system of facility types. A key element of the refinement was the adoption of a specific service life value for each type of facility (representing the point of functional obsolescence) instead of using a universal 67-year average value for all facilities. This element alone represented an improvement in the perceived accuracy of the methodology. Nonetheless, the Department abandoned FMM in FY 2013 because the assumptions and variables inherent in estimating facility obsolescence were too abstract to drive annual programming and budget requirements. Factors determining obsolescence—such as future mission changes, future new technologies, and future code changes—were considered too unpredictable and speculative upon which to base the model. Therefore, FMM was not deemed a reliable forecasting tool for modernization requirements that would be accepted as part of DoD’s programming and budgeting process.

Another drawback of an R&M budget model is its lack of detail on where and what the projected funding should replace or modernize. In many cases, R&M requirements would need to be budgeted in a Military Construction authorization and appropriation. Those projects require substantial prioritization and planning. Creating R&M projects to meet a modeled budget threshold would likely result in “easy” projects being selected versus projects that have higher mission or quality of life impact. Restoring and modernizing facilities is best accomplished through asset management techniques.

Knowing that R&M is an important component of DoD stewardship, the Department returned to more fundamental methods for identifying requirements and focused on asset management; conducting facility inspections and installation master planning. Since R&M requirements are asset specific, it made sense to reinvigorate the facility inspection and planning processes and, at the same time, standardize the practices across the Department.

### **Facility Condition Inspections**

In September 2013, the Under Secretary of Defense for Acquisition, Technology, and Logistics (USD(AT&L)) established the Sustainment Management System (SMS) developed by the U.S. Army Corps of Engineers – Engineer Research and Development Center (ERDC) - Construction Engineering Research Laboratory (CERL) as the enterprise-wide inspection methodology and support tool. The SMS includes inspection software that enables facility engineers and maintenance technicians to inspect real property assets at the facility component level and identify degradation requiring corrective actions through a mixture of sustainment, restoration, or modernization activities. The SMS is a Government-owned suite of software applications that include modules to support the inspection of pavements, railroad tracks, and buildings. Additional modules are currently under development for inspecting bulk fuel storage and distribution systems, utility systems, and dams and levees. Other modules are planned to enable the inspection of structures (e.g., towers and bridges) with the objective of developing a complete set of facility inspection templates for the variety of asset types in DoD’s inventory.

The SMS is proving to be an important tool in ensuring mission readiness and sustaining infrastructure investments. With SMS providing information about condition, functionality, and remaining service life, short and long-range work plans can be developed based on: proven

sound investment strategies, prioritization criteria, and budget constraints. “Penalty costs” that arise from not doing the maintenance at the most opportune time can be reduced with SMS. This allows work to be accomplished with resulting improvement in mission readiness. SMS includes running simulations which can show the future impact of current facility investment decisions. The result is a flexible list of work items expected to be accomplished based on actual funding levels. In all, the SMS process provides a more proactive means of asset management and resource allocation. In addition, the knowledge-based principles within SMS have been proven to significantly lower the cost of re-inspections while providing more meaningful decision support metrics. (For more information on SMS, see <https://www.sms.erd.c.dren.mil/>.)



Facility inspection being performed with SMS field tablet to record system and component conditions.

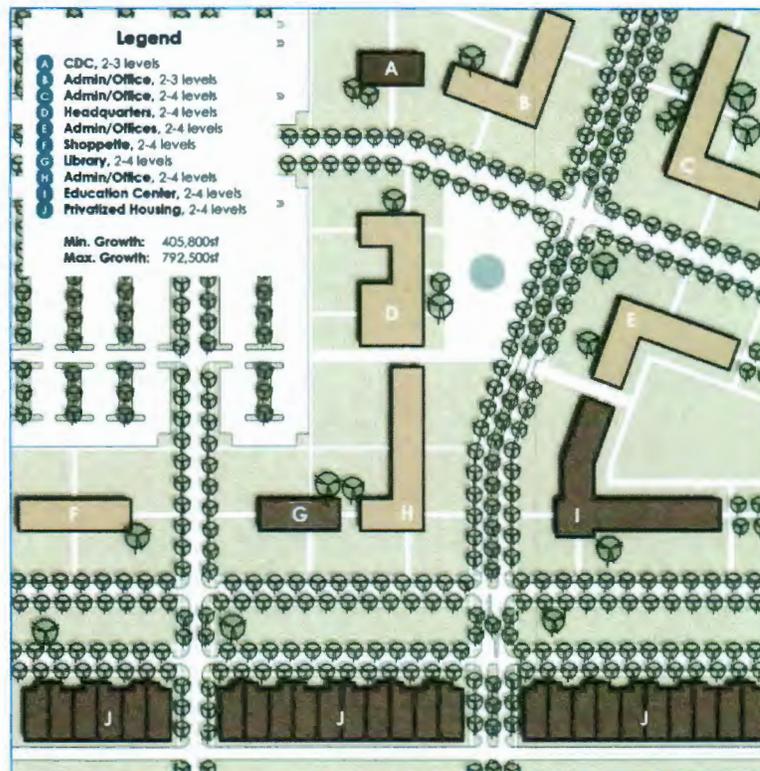
### **Installation Master Planning**

Installation Master Plans are another means for identifying and managing R&M requirements. Title 10, United States Code (U.S.C.), section 2864, *Master Plans for Major Military Installations*, requires the Department to develop installation master plans to address environmental planning, sustainable design and development, sustainable range planning, real property master planning, and transportation planning. DoD Instruction (DoDI) 4165.70, “Real Property Management,” provides the Department’s guidance; and Unified Facility Criteria (UFC) 2-100-01, *Installation Master Planning*, provides the detailed standards for developing the installation master plan.

Master planning is a continuous analytical process that involves evaluation of factors affecting the present and future physical development and operation of an installation. This evaluation forms the basis for determination of development objectives and planning proposals to solve current problems and meet future needs. For military installations, planning is accomplished primarily at the installation level through a comprehensive and collaborative planning process that results in a master plan. This process provides a means for sustainable and energy-efficient installation development that supports mission requirements.

By incorporating today’s facility needs and mission requirements into a compelling vision with clear goals and measurable objectives, installation planners are able to develop and maintain an installation master plan that soundly plans for and accommodates future change.

Facilities and projects are programmed to fulfill the master plan's planning vision. In addition to the facility condition inspections, facility requirements are identified from assessing mission support needs, established service-specific criteria, and by incorporating changes in industry or commercial standards and codes. The installation planning and programming staff capture facility requirements and propose solutions to better utilize existing facilities; renovate or modernize facilities; consolidate functions, and identify new construction and disposal needs. The plans provide a roadmap for the installation's capital investment strategy and document the strategies for fulfilling the facility requirements.



Master Plan: an example of a tab that shows installation development and R&M planned within a district.

### R&M Project Analysis

The Department has policies in place that govern facility investment decisions that an R&M model would not consider. High dollar R&M requirements are put through a rigorous review prior to their inclusion into the budget process. For example, proposed investment requirements with an estimated cost that exceeds \$2 million are required to undergo a life-cycle cost analysis and a review of alternatives in accordance with the Department's Financial Management Regulation (DoD 7000.14-R, Vol. 2B, Chapter 6) and DoDI 7041.3, "Economic Analysis for Decision-making." This level of analysis is generally accomplished prior to the inclusion of a facility project in the DoD Component's execution plan. Funding wedges derived from an R&M model will not reflect this project-level fiscal analysis, which can result in a significant disconnect between the budget amount and the actual facility requirements.

### **Management Oversight of R&M Needs**

One of the facility management metrics that is produced from the SMS condition inspections is the Facility Condition Index (FCI). The FCI is a ratio of repair needs to the asset's Plant Replacement Value. An FCI of 100 percent is a facility in perfect condition. DoD bands FCI results such that 100 percent to 90 percent is a facility in good condition, 89 percent to 80 percent is in fair condition, 79 percent to 60 percent is in poor condition, and a facility that is 59 percent to 0 percent is said to be in a failing condition.

USD(AT&L) memorandum dated April 29, 2014, "Facility Sustainment and Recapitalization Policy," established Departmental policy to set the inventory-wide FCI goal for each DoD component at 80 percent minimum, and directed that DoD Components develop mitigation plans for those facilities with an FCI below 60 percent as reported in their annual Real Property Asset Database. The plans provide the recommended mitigation (repair, replace, mothball, or demolition), estimated cost of the mitigation, and a notional fiscal year for funding the mitigation. The plans are submitted annually to the Assistant Secretary of Defense for Energy, Installations, and Environment in conjunction with the Component's Program Objective Memorandum submissions. These mitigation plans provide senior leaders within the Military Service's headquarters and the Office of the Secretary of Defense with real property portfolio information on those facilities in the worst physical condition that is based on data derived at the individual asset level.

### **R&M Fund Source Impacts**

As noted, Facility Sustainment lends its self to modeling due to the fact that sustainment is generally based on a level of effort that is consistent at the installation level from year to year, and because sustainment activities are entirely funded with Operations and Maintenance appropriations. Even though the result of the sustainment model equates to a funding wedge, it fairly approximates the actual annual requirement. R&M requirements derived from modeling, on the other hand, are not only unpredictable but the funding source is driven by the work classification, project cost, or the need being met.

Modernization work that is classified as construction because of an increase in facility size or a facility replacement, and is in excess of \$1 million must be submitted in a President's Budget for Military Construction (MilCon) authorization and appropriation. Because MilCon projects are competed and prioritized by line item, modeling these types of R&M requirements is impractical.

### **DoD's Capital Planning Process Reviewed by the U.S. Government Accounting Office (GAO)**

An affirmation of DoD's vision and strategic approach to capital planning was acknowledged in a GAO issued report to Congress in July 2015, titled, "Facilities Modernization - DoD Guidance and Processes Reflect Leading Practices for Capital Planning", (GAO-15-489). The

report summarizes DoD's decision to abandon the R&M model, and assessed the Department's current guidance and processes related to capital investment decisions. The GAO report concluded that, ***DoD's guidance and processes related to capital-investment decisions, including modernization funding requirements, reflects key leading practices for capital planning.***

### **R&M Project Execution Personnel**

The following addresses the Senate report request on how military services resource the personnel for carrying out R&M requirements to ensure the timely use of the funding.

R&M projects classified as construction and in excess of \$1 million are managed and executed by the DoD construction agents comprised of the U.S. Army Corps of Engineers, Navy Facilities Engineering Command, and the Air Force Civil Engineer Center pursuant to title 10, U.S.C., section 2851, "Supervision of Military Construction Projects." R&M projects where the work is classified as repair (or construction below the MilCon threshold) are generally managed by the military installation's Department of Public Works (or the Base Civil Engineer in the case of the Air Force).

The construction agent offices or military installations may augment their in-house civilian work force with contractors to provide additional construction management and inspection services as necessary to respond to an increase in construction activity and ensure funds are used in a timely manner. In almost all cases, the design of an R&M project is performed by architectural-engineer firms under contract in accordance with the Federal Acquisition Regulation, Part 36, "Construction and Architect-Engineer Contracts." The same fund source that funds the R&M project is used to fund contracted project management and inspection services.

### **Report Summary**

DoD shares Congress' concern that Budget Control Act reductions are exacerbating the risk to mission accomplishment, impacting quality of life, and will increase long-term costs by deferring sustainment and R&M. The DoD asset management process and the examination of R&M project cost and options have established a framework of procedures, required information, and valuation criteria that aligns with the goals, objectives and values of DoD decision makers to achieve the overall mission. The Department implemented a systematic facilities asset management approach that allows for a broad-based understanding of the condition and functionality of the Department's real property portfolio. Facility investment decisions are integrated into our strategic planning process. In a period where competition is keen for every DoD dollar, the asset management program must be capable of supporting investment decisions about individual R&M projects. Modeling R&M requirements at a portfolio level is incapable of providing the necessary analysis and detail to create budgeting information for making sound investments choices.

## Appendix A

### References

Title 10, U.S.C.: <http://uscode.house.gov/search/criteria.shtml>

GAO Report, *Facilities Modernization - DoD Guidance and Processes Reflect Leading Practices for Capital Planning*, (GAO-15-489): <http://www.gao.gov/products/GAO-15-489>

U.S. Army Corps of Engineers, (ERDC – CERL), *Sustainment Management System*:  
<http://www.sms.erd.cerl.mil/>

UFC 2-100-01, *Installation Master Planning*: <http://www.wbdg.org/>  
(Click on Unified Facilities Criteria under Popular Links at the left margin.)

DoD 7000.14-R, *Financial Management Regulation*: <http://comptroller.defense.gov/FMR.aspx>

DoDI 4165.70, *Real Property Management*:  
<http://www.dtic.mil/whs/directives/corres/ins1.html>

DoDI 7041.3, *Economic Analysis for Decision-making*:  
<http://www.dtic.mil/whs/directives/corres/ins1.html>

*Federal Acquisition Regulation*: <https://www.acquisition.gov/?q=browsefar>

### Abbreviations and Acronyms

CERL – Construction Engineering Research Laboratory  
DoD – Department of Defense  
DoDI – DoD Instruction  
FMM – Facility Modernization Model  
GAO – Government Accounting Office  
MilCon – Military Construction  
R&M – Restoration and Modernization  
SMS – Sustainment Management System  
UFC – Unified Facility Criteria