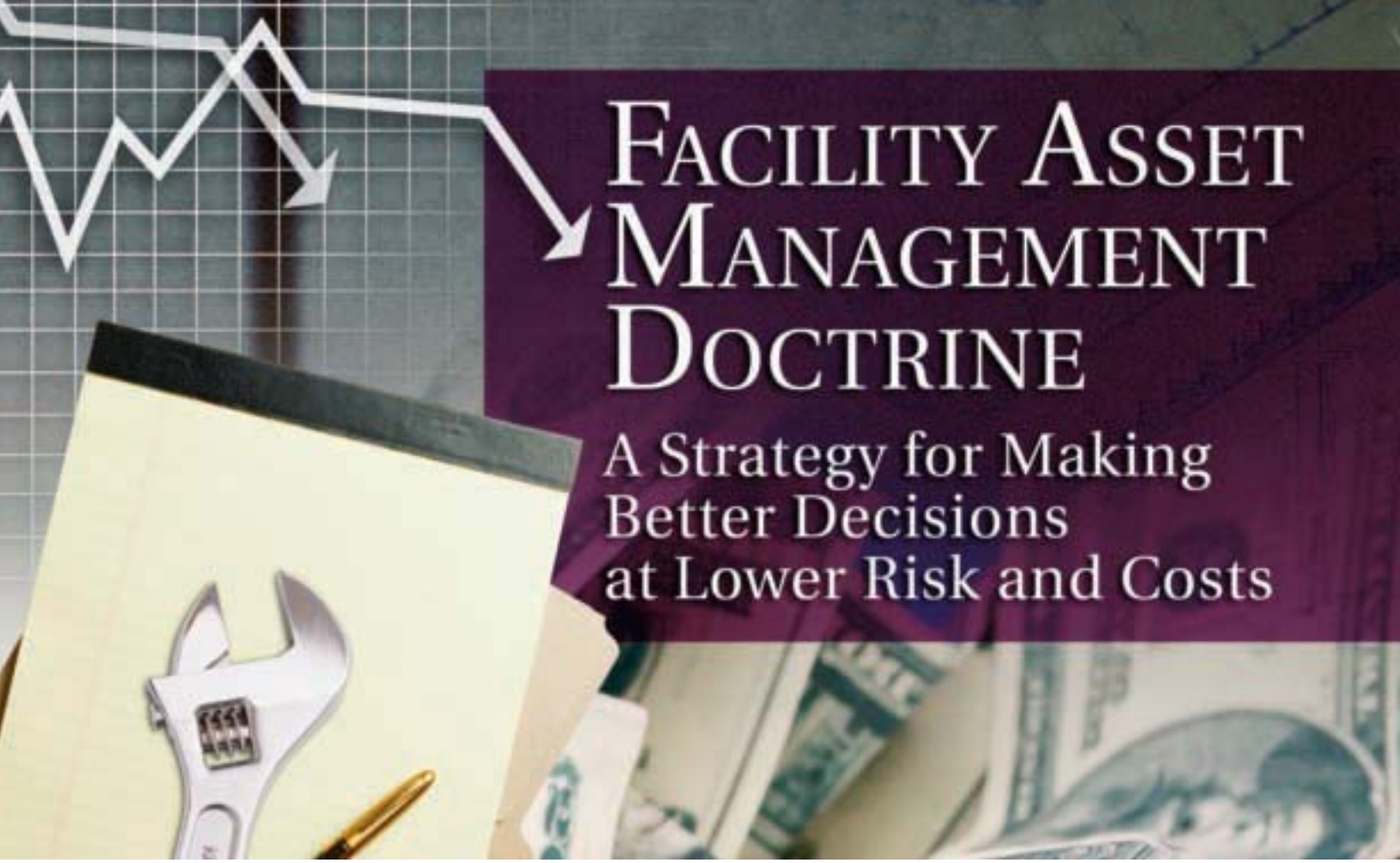


Facility Asset Management Doctrine

A Strategy for Making Better Decisions at Lower Risk and Costs

by James J. Dempsey, P.E., USCG

Facilities typically represent a major, if not the largest, component of an organization's book value. As such, they consume a significant and inescapable portion of the organization's cash flow. Facility asset management (FAM) is a field of management that umbrellas all decisions related to facility investments to include acquisition, construction, operations, maintenance, renewal, and disposal. Where traditional facilities management seeks to ensure the proper working order of a facility portfolio, FAM further incorporates economics; financial, capital, and resource management; and the direct application of many decision and information management practices.

***Jack Dempsey is executive officer for the U.S. Coast Guard's Civil Engineering Unit, Oakland, California; he can be reached at james.j.dempsey@ uscg.mil. He is a member of the Steering Committee for the APPA-CFaR project,* Buildings…The Gifts That Keep on Taking: A Framework for Integrated Decision Making.**
This is his first article for* Facilities Manager *and is excerpted from a paper presented last October to a Federal Facilities Council forum called Engineering, Construction, and Facilities Asset Management: A Cultural Revolution.

The objective of the FAM doctrine is to better achieve the organization's desired mission outcomes by lowering risks and costs associated with facility ownership.

The decision-making strategy presented here is based on extensive observations and lessons learned from the U.S. Coast Guard's Shore Facility Capital Asset Management initiative.[1] The views presented here are those of the author's and not necessarily those of the Coast Guard or any other entity. The organizing principle behind all FAM decision-making is the organization's desired mission outcomes. In order to employ this doctrine, the following prerequisites must be observed:

- Organizational missions and strategic goals and objectives must be clearly stated and documented.
- The facility inventory must be well defined and accurate.
- Mission outcomes and facilities must be linked using metrics or other quantitative or qualitative methods.
- Facility performance and needs must be logically defined in discrete, auditable terms.

Important Facility Asset Management Perspectives

There are three important perspectives to FAM decision-making: facility-mission alignment, facility performance, and financial performance. The first two articulate the organization's mission and facility needs respectively. The third,

financial performance, provides a well-established structure to evaluate competing priorities in a resource-constrained environment. In coordination, these perspectives focus decision-making and methodically evaluate all risks in order to maximize facility performance and achieve desired organizational mission outcomes.

Facility-Mission Alignment

The facility-mission alignment perspective focuses on the relationship facilities have to achieving the organization's desired mission outcomes. These outcomes can be defined in many different ways (e.g., profit making, capital accumulation, providing products or services to include education and learning and even the Coast Guard's life saving and national security missions).

The mission dependency index (MDI), used by the U.S. Coast Guard, contains concepts that go beyond use by the Coast Guard or the military in general. The MDI is a tactical metric that instead of determining the relative importance of individual missions, is used to determine a facility's readiness to perform multiple missions in support of the operational needs of individual units, such as the Coast Guard's ability to receive a call and get a search and rescue boat underway. The MDI accomplishes this by applying the operational risk management terminology of probability and severity to facilities in terms of interruptability, relocateability, and replaceability. The mission dependency index is obtained from interviews conducted once for each unit every two to three years.

Mission Intra-Dependency Score

MD_w		Q1: Interruptability			
		Immediate (24/7)	Brief (min/hrs)	Short (<7days)	Prolonged (>7days)
Q2: Relocateability	Impossible	4.0	3.6	3.2	2.8
	Extremely Difficult	3.4	3.0	2.6	2.2
	Difficult	2.8	2.4	2.0	1.6
	Possible	2.2	1.8	1.4	1.0

MDw = Mission Dependency Within a Command's AoR

One series of MDI questions determines the interruptability and relocateability of each critical "functional entity" to determine its relative importance to mission execution considering facility intra-dependencies within the unit's sphere of control. Answers to these questions are input into the matrix shown. Similar questions are used to calculate mission inter-dependencies between mission-enabling units to specifically include those that provide command and control, communications, and logistical support. Products from both intra- and inter-dependency questions along with the number of inter-dependencies between units are used to calculate the MDI for each facility at each unit. The Coast Guard has already completed MDI acquisitions of all operational buildings and is prepared to use this metric in support of FAM decision-making.

An overlaying index, the mission-alignment index (MAI), is then calculated as a function of both the relative mission importance index and the mission dependency index to be assigned to each facility. This combination reduces decision-making risks through diversification by using both a strategic and tactical perspective to link mission importance scores to facilities. This strategy leverages two core cultural Coast Guard strengths. First, strategic direction is efficiently and uniformly applied across the entire organization by using the relative mission importance index. Second, tactical authority is delegated to local operational commanders who have greater operational awareness of their facilities by equal weight given to the mission dependency index.

Facility Performance

The facility performance perspective focuses on how well a facility is performing its intended purpose in a way generally meant to be independent of the facility's relationship to mission. In brief, facility performance can be separated into three criteria: condition, utilization, and functionality. Each criteria is a product of different data sources and methodologies, and similar to the mission-alignment metric, decision-making risks are reduced by including independent sources of information.

The first criteria, *condition*, is a broad and complex field. There are a number of competing methods to quantify condition ranging from general service life prediction estimates to scientifically defined degradation models. In one method, the sum of "deduct" values is used to calculate a Condition Index (CI), which is typically reported on the scale of 100-0 where 100 is a distress-free system.

This methodology is fundamentally different and vastly superior to a facility condition index (FCI), which is simply calculated as the sum of maintenance project costs divided by the present replacement value of the system, building or portfolio being evaluated.[2] The Achilles heel to the FCI is in the definitions used for the numerator and denominator. Where CI uses very explicit, auditable definitions, FCI definitions are known to vary widely or are inconsistently used across the industry or even at individual locations. This introduces great uncertainty when using FCI in support of decision-making such as funding allocation and project prioritization.

The second facility performance criteria is *utilization*. In pure terms, utilization is independent of condition. Although, there is a commonly observed association between low utilization and poor condition, this is often the result of some third cause and not as a direct cause of the other. Utilization can apply to all types of facilities, but is most often used in space utilization. For many facility users, space utilization criteria will suffice. The calculation of a space utilization

Continued on page 35

Continued from page 33

index is simply a summary comparison between demand and supply.

Space demands or needs can be defined in two ways; the occupant can determine them or they can be established by policy. Having the occupant determine space needs works well when the occupant also directly pays for the space used, creating a self-governing behavior. However, this is not the case for many large and/or public organizations. Most decision-makers making space consumption decisions in these organizations do so without knowledge of the impact these decisions will have on the organization in terms of mission/operational tradeoffs or facility total ownership costs.

This is generally an organizational complexity issue, and in order to adequately address it, many organizations use space utilization guidelines or standards for common space types. When employed, these standards can be used to calculate a space utilization index as the quotient of space used divided by space authorized.

Measuring utilization achieves a number of valuable outcomes in addition to producing a simple metric that can be used for relative comparisons. Valuable outcomes include the equitable distribution of resources and funding, identifying excess space for divestiture, and identifying space needs to avoid or mitigate functional and/or operational impacts—all of which contribute to lowering facility total ownership costs.

The last major criteria used to measure facility performance is *functionality*. One way to view functionality is to consider it covering anything that is not condition or utilization. In more specific terms, functionality rolls up all objectives and criteria used to determine if a facility can acceptably fulfill its needed purpose. This is also a broad area and includes not only functional performance from a mission perspective, but also functional performance from a legal, regulatory, and stewardship perspective as well.

Traditional decision-making forms grossly undervalue this area and by doing so organizations may absorb large and avoidable risks. The simple approach to defining a useable functionality index is to establish a value tree of criteria determined to be important to mission outcomes. This should include compliance with life safety and other building codes. Additionally, required or value-contributing operational parameters should be included such as

Generic FAM Pro Proma	Funding Source			
	Year 1	Year 2	Year 3	Year 4
Location 1				
Facility A	Project ###		Project ###	
	Project ###			Project ###
Facility B			Project ###	
			Project ###	
Facility C		Project ###		
			Project ###	

minimum functional criteria related to a research laboratory, a product manufacturing center, or an equipment maintenance facility.

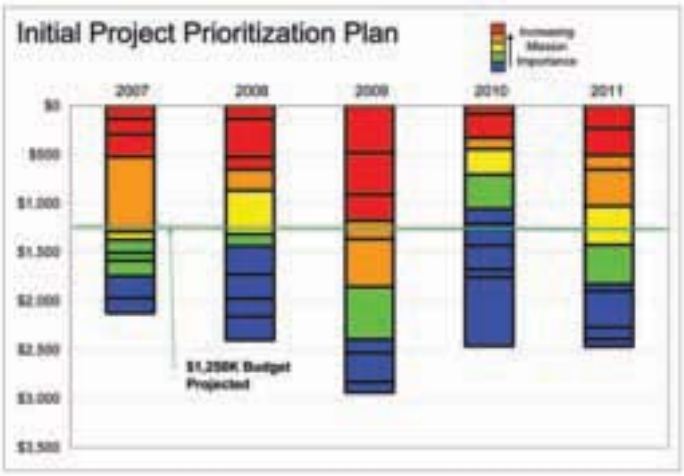
Other notable categories include occupant safety (liability mitigation), productivity, environmental stewardship objectives, energy conservation goals, and public image. In all cases, the qualification and if possible the quantification of categories is best when documented and reinforced by policy, asset configuration profiles, and/or standard operating procedures. If done this way, it is possible to weight the different criteria by using the analytic hierarchy process (AHP) to

Pick the Low Hanging Fruit

- Typical Cleaning Cost: Over $2.00 per Square Foot
- Typical Setup Cost: $0.005 - $0.02 per Square Foot
- Typical Productivity Gains: 4% - 14%
- Five Year ROI: 1,900% - 27,000%
- Typical Conclusions: No Brainer to NO BRAINER

Cleaning Management Software™
for custodial workforce optimization

www.contractron.com

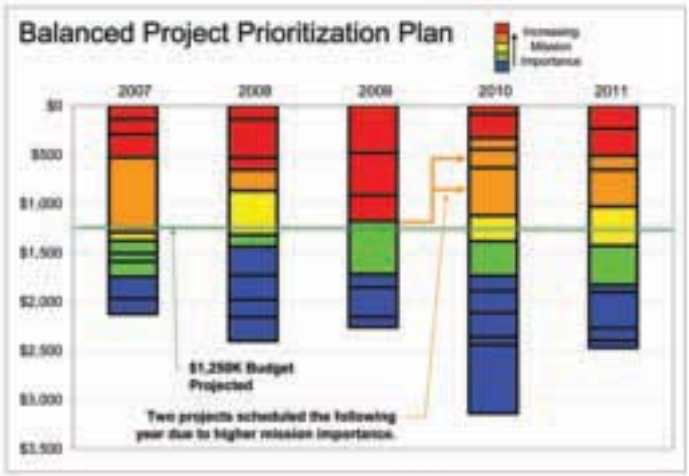


calculate a global functionality index. Given the explicit definitions of each criteria, gaps between actual and desired values can be the sole basis for a facility deficiency that will compete for funding just like condition and utilization deficiencies.

Financial Performance

The last perspective, financial performance, coordinates the first two and complements the discussion with financial data. This respects the reality that all FAM decision-making exists in a resource-constrained environment. The field of financial analysis provides a wealth of capable tools and constructs that can be adapted to organize the complexities of FAM decision-making. Essentially the breakpoint for all FAM decision-making is what investment can or should be made and when. Where critical and non-critical projects are generally obvious, the real battle for funding and resources is in the broad middle ground.

Financial performance is easily organized with financial statements and *pro formas*. This is not to say that all FAM decision-making objectives can be monetized, they cannot. What is meant is that established financial decision-making



strategies can provide a logical and familiar construct to evaluate quantitative and qualitative objectives. In the end, FAM decision-making results in go or no-go decisions related to the expenditure of funding and resources. A business case *pro forma* helps make tactical funding and resource objectives clear within a certain investment period, e.g., a fiscal year. This concept is demonstrated in the summarizing graphics shown above where projects are scheduled in the optimal year of execution, and are scored, sorted and color-coded using the mission-alignment index. In this example, the sum value of the projects is represented by the vertical bar size and the go/no-go decision can be simplified to a block and stacking activity, e.g., projects above the funding line are to be executed in the given fiscal year.

This example demonstrates how mission objectives are used to drive decision-making as opposed to simple facility needs. This is clear in the second graphic where two projects from 2009 are deferred to the next year displacing

lower ranking projects and thus increasing the total 'return on mission' for the proposed facility investment strategy. In reality, this example oversimplifies FAM decision-making, but it does introduce a core principle as to how risk management is employed. The principle is that mission objectives must dominate the prioritization process yet be defined by relevant, executable facility acquisition, construction, maintenance, renewal, and/or disposal objectives.

Enabling Decision-Making Practices and Conclusion

The facility asset management doctrine and the proposed strategy for integrated decision-making are dependent on many things—organizational core competencies, business strategies, the effective application of decision theory, and disciplined use of structured, performance-based decision-making. Of these, the greatest opportunity for aggressive leaps forward is through the use of enabling decision-making practices. Foremost of these is the use of an action-oriented activity-based costing (ABC) system.

An action-oriented ABC system would greatly improve the clarity and creditability of decision-making and performance monitoring. The definition of the ABC system employed should uniquely define and organize both tactical FAM work products (i.e., planning, design, construction, maintenance, and operations, etc.) as well as the root cause for FAM work (i.e., maintenance, alternation, improvement, code compliance, and disposal). This combination not only enables the evaluation of how, but also of why and thus the ability to answer mission-facility value proposition questions.

Lastly, the ultimate criteria for any successful FAM decision-making strategy is that it can consistently achieve the organization's desired mission outcomes by effectively identifying facility deficiencies; quantifying, prioritizing, and approving deficiency solutions in a dynamic yet resource constrained environment; executing the solution; and validating the deficiency's correction with auditable data and a predictable response in facility and mission performance. Essentially, FAM decision-making proactively mitigates risks and lowers costs of facility ownership in order to better utilize facility assets and best achieve desired organizational mission outcomes.

References

[1]The U.S. Coast Guard's Shore Facilities Capital Asset Management (S-F-CAM) initiative was formally commissioned by Admiral Allen as the Coast Guard's Chief of Resources in 1996 and 1997.

[2]Applied Management Engineering and Sean C. Rush. *Managing the Facilities Portfolio*, National Association of College and University Business Officers (NACUBO), 1991.