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INCREASING NAVFAC AGILITY AND SPEED OF RESPONSE FOR THE EXECUTION OF CATEGORY III AND IV FACILITIES REQUIREMENTS

December 2020

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EXECUTION OF CATEGORY III AND IV FACILITIES REQUIREMENTS**

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Submitted in partial fulfillment of the
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December 2020**

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ABSTRACT

The objective of this research is to enhance the ability of Naval Facilities Engineering Systems Command (NAVFAC) to respond to requirements for facilities support in a timely and effective manner to assist the warfighter and the shore enterprise. By conducting an internal and external review of the means and methods of executing Category III and IV requirements employed both by NAVFAC and by other agencies, governmental and non-governmental, the intent was to capture facility management best practices in an effort to reduce cycle time. Also, by analyzing established processes across the NAVFAC enterprise, bottlenecks were identified, and productivity enhancements were recommended. By leveraging existing systems and capitalizing on established processes and industry best practices, NAVFAC can significantly improve its Category III and IV execution capability. Moreover, NAVFAC could greatly benefit from an organizational shift, promoting horizontal integration as it strives to continue to provide its products and services with speed and agility.

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LIST OF ACRONYMS AND ABBREVIATIONS

AOR	Area of Responsibility
APPA	Association of Physical Plant Administrators
APWO	Assistant Public Works Officer
BIM	Building Information Modeling
BMS	Business Management System
BOS	Base Operating Services
BOSC	Base Operating Services Contractor
CAR	Corrective Action Request
CAT	Category
CEC	Civil Engineer Corps
CECOS	Civil Engineer Corps Officer School
CEFP	Certified Educational Facilities Professional
CFMS	Command Financial Management System
CFT	Cross Functional Team
CI	Capital Improvements
CIFS	Copenhagen Institute of Futures Studies
CM	Construction Manager
CNIC	Commander Naval Installations Command
CONOPS	Concept of Operations
CONUS	Continental United States
DFARS	Defense Federal Acquisition Regulation Supplement
DOD	Department of Defense
ECB	Engineering and Construction Bulletin
ET	Engineering Technician
EURAFCENT	Europe, Africa, Central
EV	Environmental
FAR	Federal Acquisition Regulation
FEAD	Facilities Engineering and Acquisition Division
FEC	Facilities Engineering Command
FIAR	Financial Integrity and Audit Readiness

FIS	Facilities Information System
FM	Financial Management
FMD	Facilities Management Division
FMS	Facilities Management Specialist
FOS	Facilities Operations Specialist
FSC	Facilities Support Contracts
FSCA	Facility Services Contract Administrator
FSCM	Facility Services Contract Manager
FSS	Federal Supply Schedules
FTT	FedMall Transition Team
GSA	General Services Administration
IDIQ	Indefinite Delivery, Indefinite Quantity
ieFACMAN	Interoperable Enterprise Facilities Management
inFADS	Internet Navy Facility Assets Data Store
IPT	Integrated Product Team
ISO	In Support Of
NAVFAC	Naval Facilities Engineering Systems Command
NFAS	Naval Facilities Acquisition Supplement
NMCARS	Navy and Marine Corps Acquisition Regulations
NRDE	Naval Research and Development Establishment
NRL	Naval Research Lab
NUMMI	New United Motors Manufacturing Incorporated
NWCF	Navy Working Capital Fund
O&M	Operations and Maintenance
OCONUS	Outside the Continental United States
OPNAV	Office of the Chief of Naval Operations
P&S	Product and Service
PMO	Project Management Office
PPBE	Planning, Programming, Budget, and Execution
PROSPECT	Proponent-Sponsored Engineering Corps Training
PWD	Public Works Department
RAP	Resource Allocation Process

REVIT	Revise Instantly
ROICC	Resident Officer in Charge of Construction
SAT	Simplified Acquisition Threshold
SD	Strategic Design
SECNAV	Secretary of the Navy
SYSCOM	Systems Command
SPM	Single Platform Maximo
SPS	Single Procurement Service
USACE	United States Army Corps of Engineers
USNA	United States Naval Academy
WIP	Work-In-Place

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I. INTRODUCTION

Speed and agility in the facilities management arena have long been sought-after organizational attributes (Global Workplace Solutions, 2017). My own review of emerging trends within the community reveals a progression towards a smarter workplace or a rapid rise in automation. However, as the business world continues to evolve, embracing technology to increase productivity, the government has consistently lagged behind. In a 2018 article titled, “These Tech Problems Could Hurt Government for Years,” Chief Information Officer Suzette Kent says, “There used to be a time when the government was at the leading edge of technological innovation. But federal agencies have fallen so far behind that they will have to work aggressively just to catch up with basic private sector practices” (Bur, 2018, para. 1).

Even as the business world transitions to an increased reliance on technology, technological advances are not the only way a business can gain efficiency. Recapitalizing human capital, incorporating existing tools used by other entities, and instituting industry best practices are a few of the most promising methods to gain efficiency within an organization (Magalhaes, 2017). In a time of rising costs and limited budgets, there may have never been a more opportune time for government processes to be streamlined.

Naval Facilities Engineering Systems Command (NAVFAC) is the Navy’s premier facilities management systems command (Naval Facilities Engineering Command, n.d.-a). With 13 component commands located in the United States, Europe, Southwest Asia, and the Far East, NAVFAC’s mission is to “deliver life-cycle technical and acquisition solutions aligned to Fleet and Marine Corps priorities” (Naval Facilities Engineering Command, n.d.-a, para. 1). Simply, NAVFAC provides facilities management, construction management, and contract support across the globe in support of the Navy and the Marine Corps.

With an aging shore infrastructure combined with a post-COVID budget cycle (Egel et al., 2020), now is a critical time for the shore enterprise to focus on efficiency. As such, it is imperative that NAVFAC be especially proficient in their work, maximizing

productivity while simultaneously delivering high class services to their customers. In addition to a call for efficiency, there is a long standing and strong demand signal from the offices of the Chief of Naval Operations and the Secretary of the Navy, as well as other supported commands, for both improved agility and speed of response across all NAVFAC products and services (R. Roth, personal communication, January 29, 2020).¹ This is especially true regarding requirements that have little to no engineering involved, referred to as Category III and Category IV work.

A. THE WHY

NAVFAC classifies new requirements into one of four categories ranging from most complex, Category I, to least complex, Category IV. A Category I project would require multidiscipline design work and significant oversight, project management, and planning effort, while a Category IV project would typically have very low financial and schedule risk, little design work, and require no permit. I expound more on and provide examples of Categories I through IV in Chapter III of this report.

With a robust understanding of how work was completed within NAVFAC Washington, I decided to focus my data analysis on Public Works Department (PWD) Annapolis at the field level and NAVFAC Washington at the Facilities Engineering Command (FEC) level. Ultimately, Category (CAT) III/IV work makes up a relatively small portion of NAVFAC's execution portfolio but plays a significant role in a unit's day-to-day readiness. Consider this: large projects undergo years of planning with immense effort targeting the minimization of mission disruption. However, many CAT III/IV projects are unexpected and must be scoped, estimated, and awarded in a timely fashion to mitigate any significant effect to the warfighter. Therefore, while speed and agility are pivotal to the enterprise at large, they are especially critical within the CAT III/IV arena.

Based on data extracted from COGNOS, NAVFAC's main data analytics tool, the CAT III/IV workload for NAVFAC Washington in 2019 is displayed in Table 1. Figure 1 provides a breakdown of the total number of work orders for NAVFAC Washington with

¹ This information was included on the thesis scope request from NAVFAC LANT and reiterated in communication with Rick Roth

Figure 2 detailing how many work orders are solely CAT III/IV (i.e., H3/H84 records, roughly 1% per month spiking to 3% in May 2019). To clarify, NAVFAC designates work orders with a letter and a number, also known as a Product and Service (P&S) code, as dictated in NAVFAC Business Management Systems F-30.1 and F-30.2 (NAVFAC Washington, 2018). For example, “H” designates the P&S line as a facility management/sustainment work order, and the number further clarifies the P&S deliverable or method of accomplishing the work with “84” referring to “scheduled project work to sustain facilities with contractor workforce” (NAVFAC Washington, 2018). While CAT III/IV projects make up a relatively small percentage of the overall work orders processed by NAVFAC, the trend from 2019 to 2020 is upward, as can be seen in Table 2, Figure 3, and Figure 4, respectively.

Table 1. NAVFAC Washington CAT III/IV Workload FY19 (Rounded to the Nearest Thousand)

NAVFAC Washington 2019			
	Accepted	Completed/Closed	Hold
PWD Annapolis	\$2,203	\$320	\$433
PWD Bethesda	-	\$10,829	-
PWD BAB	\$2,817	\$5,067	\$11
PWD Pax River	\$337	\$7,248	-
PWD South Potomac (Dahlgren)	-	\$3,126	-
PWD South Potomac (IH)	-	\$6,942	-
PWD Washington	-	\$9,127	-

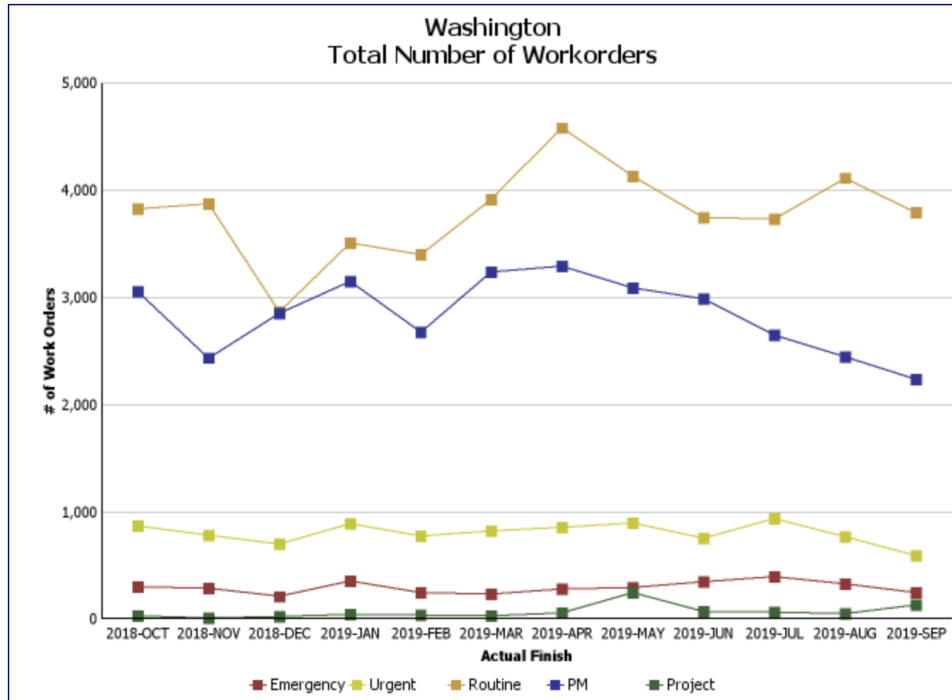


Figure 1. Total Number of Work Orders, NAVFAC Washington FY19

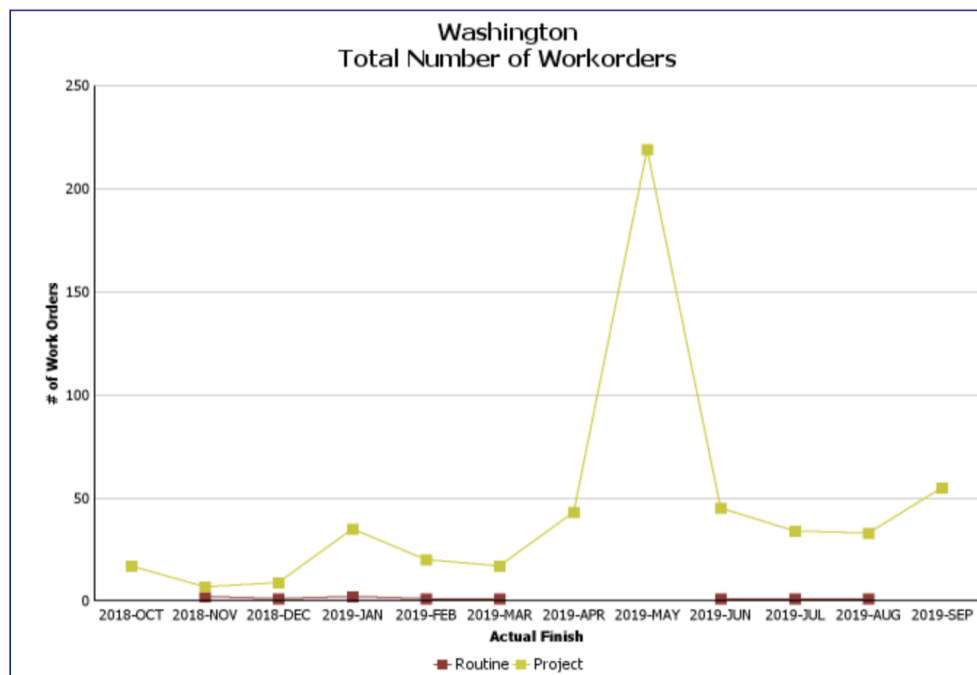


Figure 2. Total Number of H3/H84 Work Orders, NAVFAC Washington FY19

Table 2. NAVFAC Washington CAT III/IV Workload FY20 (Rounded to the Nearest Thousand)

NAVFAC Washington FY2020			
	Accepted	Completed/Closed	Hold
PWD Annapolis	\$3,686	\$3,322	\$1,467
PWD Bethesda	\$3,115	\$3,086	\$364
PWD BAB	\$1,916	\$322	\$26
PWD Pax River	\$7,206	\$3,072	\$28
PWD South Potomac (Dahlgren)	\$2,960	\$3,678	\$80
PWD South Potomac (IH)	\$3,640	\$6,520	-
PWD Washington	\$7,472	\$5,431	\$1,086

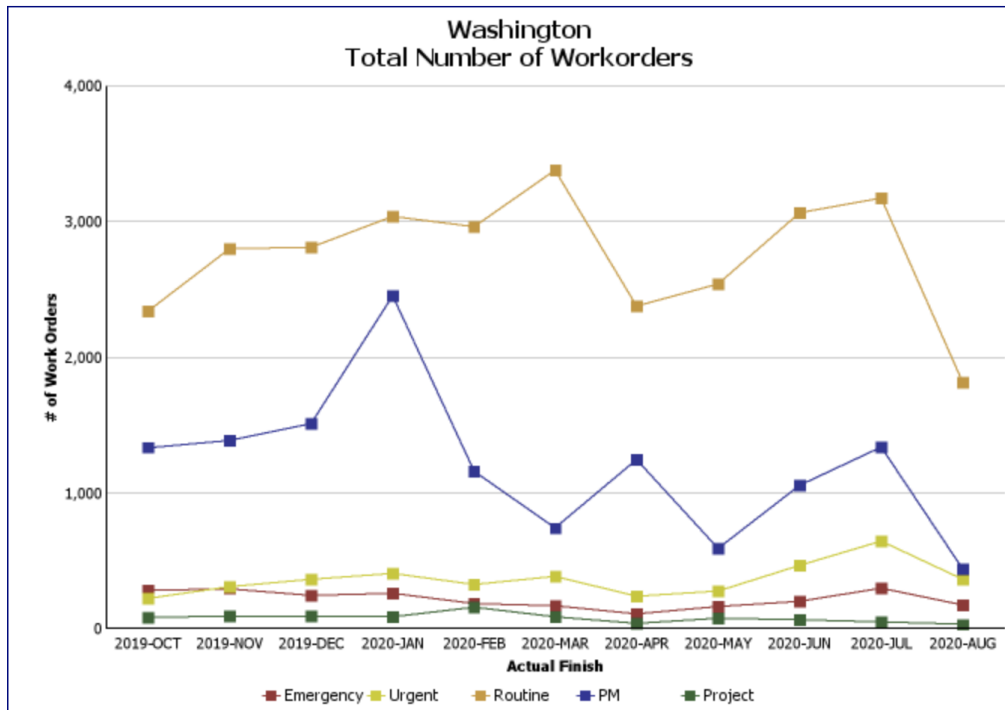


Figure 3. Total Number of Work Orders, NAVFAC Washington FY20

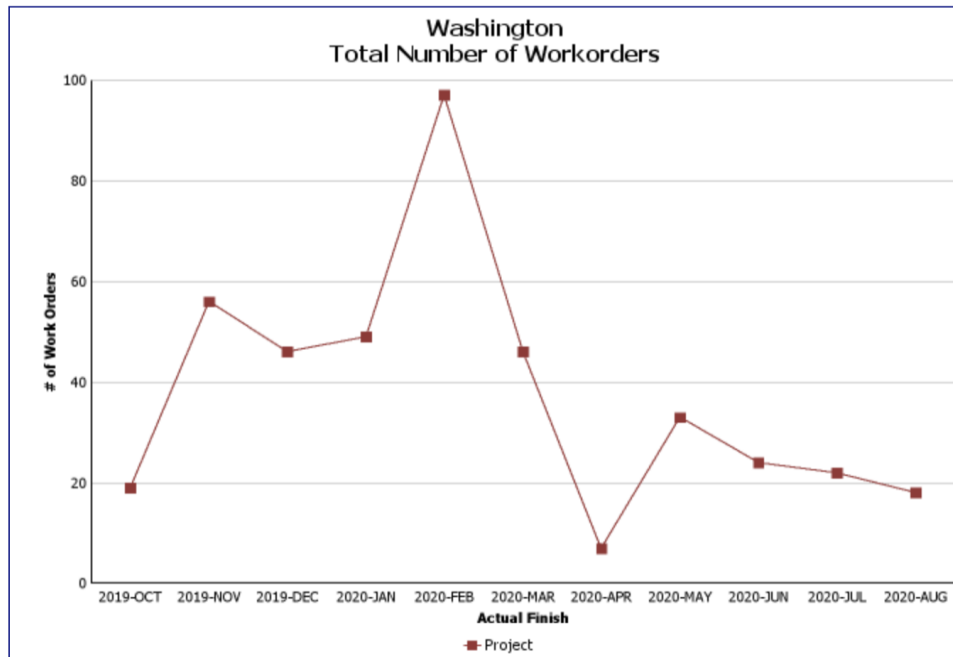


Figure 4. Total Number of H3/H84 Records, NAVFAC Washington FY20

As the Department of Defense continues to emphasize proper data management, NAVFAC has made it clear with the distribution of K-gram 19-02 and 19-02A, included in Appendices A and B, that data completeness is a priority. Therefore, as data continues to be captured and loaded into the different systems, it is reasonable to believe that the actual number of work orders are higher than depicted above and will continue to grow in future years as shore infrastructure continues to age.

While CAT III/IV projects may not make up a significant portion of NAVFAC's overall portfolio, they do have the ability to significantly affect a unit's readiness. While it is prudent, and more than reasonable, to put a great deal of emphasis on major CAT I and II projects, CAT III and IV projects are the lifeblood of the Public Works Department and the field level customer. These smaller projects, typically averaging less than \$250,000 in value, require prioritization, acquisition planning, consistent coordination with customers, and, as I argue, cradle-to-grave project management.

B. RESEARCH OBJECTIVE

The main thrust of this study is to analyze current NAVFAC CAT III and IV work processes as well as to review current policy, regulations, and procedures. I have conducted phone and video interviews to collect data about processes used by other government entities and civilian universities in an attempt to capture best practices as well as gain insight into potential ways for NAVFAC to gain efficiency. I offer recommendations for implementation as well as a cost-benefit analysis, if applicable, as per Department of Defense policy.

C. RESEARCH QUESTIONS

Primary Research Question: How can the current CAT III/IV cycle time be decreased to meet the customers' requirements?

Secondary Questions 1a and 1b: What is the current CAT III/IV work process? After analysis, what are the bottlenecks in the process?

Secondary Questions 2a and 2b: How do other government agencies process similar requirements? What improvements do these processes suggest for NAVFAC's process?

Secondary Questions 3a and 3b: How do non-governmental entities process similar requirements? What improvements do these processes suggest for NAVFAC's process?

Secondary Question 4: Aside from process improvements, are there other changes that can help streamline the NAVFAC organization?

D. LIMITATIONS

Department of Defense protocols limited the number of personnel I could interview on a command basis. Also, the outbreak of COVID-19 restricted travel for interviews. Finally, the Federal Acquisition Regulation (FAR), in conjunction with the Defense Federal Acquisition Regulation Supplement (DFARS), the Navy and Marine Corps Acquisition Regulations, and the Naval Facilities Acquisition Standards (NFAS), introduce regulatory limitations that must be considered when attempting to streamline acquisition procedures.

From a data mining perspective, I used multiple systems to pull data, such as COGNOS, NAVFAC's main data analytics tool; Maximo, NAVFAC's database tool for primarily pre-award CAT III/IV management; and ieFACMAN, NAVFAC's database tool for primarily post-award CAT III/IV management, contract management, and funding request management, to extract data with respect to CAT III/IV projects. While I was unable to gain full NAVFAC-wide access to the systems, my research was focused on PWD Annapolis and from a wider view, NAVFAC Washington. That being said, data pulled out is only as good as the data being put in. I found multiple examples of projects that were located in eProjects, but not represented as H3/H84 project records in Maximo. Furthermore, it is possible, depending on the PWD's organization and policies, that CAT III/IV records are categorized using other P&S codes. Therefore, it is more than possible that there may be inconsistencies when comparing data across the systems and across bases. Nevertheless, time and cost savings will be calculated based on the information extracted from COGNOS, as that is the best representation of data available to NAVFAC currently.

E. SUMMARY

Speed and agility are critical in facilities management. With a demand from both OPNAV as well as reimbursable customers across the enterprise, NAVFAC needs to find ways to enhance speed, while maintaining an ability to quickly respond to urgent or emergency work orders. Albert Lester in his book *Project Management, planning and control: Managing engineering, construction, and manufacturing projects to PMI, APM and BSI standards*, quotes Jim Highsmith who characterizes agility in two statements: "Agility is the ability to both create and respond to change in order to profit in a turbulent business environment. Agility is the ability to balance flexibility and stability" (Lester, 2013, p. 525). NAVFAC's ability to respond to urgent or emergent requirements in a rapid fashion can be a deciding factor in a base's readiness or more importantly its ability to recover from a disaster. By applying process analysis tools to established processes as well as investigating potential organizational changes, I attempt to not only answer the research questions but find and address bottlenecks across the work induction process in an effort to enhance efficiency across the Public Works Department.

II. REVIEW OF CURRENT LITERATURE

A body of literature addresses facilities management and details proposed methods to enhance the ability to oversee a campus of buildings as well as respond accordingly. Most of the research points to technological solutions to streamline productivity. Enhancements revolve around software-based solutions to improve collaboration. However, after reviewing the abundance of literature on facility management including internet articles, journals, and publications to establish a strong foundation of knowledge, I have found very little in regard to a direct analysis of a facilities management organization similar to NAVFAC.

In my review of current literature, I begin with an overview of NAVFAC's *Strategic Design 2.0* and a review of a study which details NAVFAC productivity enhancements in support of the Naval Research and Development Establishment (NRDE). I then review publications and journal articles that specifically address speed and agility in the facilities management arena, as well as providing an introduction to process analytics. It is my belief that processes can be tweaked repeatedly with minor improvements, but to truly gain speed, an organization needs to look outside the proverbial box. Therefore, I conclude the review with an in-depth comparison of strategy versus culture as well as introduce the concept of organizational agility.

A. SPEED AND AGILITY IN FACILITIES MANAGEMENT

In today's increasingly complex environment of uncertainty, speed, and agility are the two distinguishing characteristics that will define us as a SYSCOM Team. Speed in delivery of our products and services, as well as our internal decision-making process. Agility in being able to respond to any unplanned event and quickly change direction, without impacting mission performance or losing momentum. **SPEED** and **AGILITY** must always be at the forefront of our efforts.

–Rear Admiral John Korka, Chief of Civil Engineers
(Naval Facilities Engineering Command, 2019-e, p. 3)

Introduced in January 2019, NAVFAC’s *Strategic Design 2.0* outlines a deliberate course of action, framed by NAVFAC’s mission and vision and anchored by its guiding principles. Figure 5 lays out NAVFAC’s mission and vision, and the alignment of its guiding principles with the core attributes put forth by the chief of naval operations.

MISSION (Why we exist) VISION (To what we aspire)	The Naval Shore Facilities, Base Operating Support, and Expeditionary Engineering Systems Command that delivers life-cycle technical and acquisition solutions aligned to Fleet and Marine Corps priorities We are the Naval Forces’ trusted facilities and expeditionary experts enabling overwhelming Fleet and Marine Corps lethality	
What we expect from individuals and our organization	CNO Core Attributes	NAVFAC Guiding Principles
	Integrity	We serve our warfighters and our nation with Honor, Courage, and Commitment
	Accountability	We operate safely, ethically, and urgently, driven by our Supported Commanders’ priorities
	Initiative	We anticipate and act with agility through teamwork to achieve high velocity outcomes
	Toughness	We promote bold, credible leadership to mitigate risks and overcome challenges in all Phases of operations

Figure 5. NAVFAC Mission, Vision, and Guiding Principles. Source: Naval Facilities Engineering Command (2019-b).

The Strategic Design (SD) has three major lines of effort (LOEs): Enable Warfighter Lethality, Maximize Naval Shore Readiness, and Strengthen the Systems Command (SYSCOM) Team (Naval Facilities Engineering Command, 2019-e). An LOE represents an emphasis area that links multiple focus areas to NAVFAC’s mission (Naval Facilities Engineering Command, 2019-a). Including 37 initiatives, SD 2.0 lays out specific goals, explaining purpose, desired outputs, and scope for a variety of focus areas, from creating a common operating picture of Public Works Department (PWD) Readiness to Improving PWD Agility to rapidly respond to emerging work. PS3.C specifically addresses PWD agility and targets an assessment of an optimal blue-collar workforce, the development of Indefinite Delivery, Indefinite Quantity (IDIQ) contract templates, and the

evaluation of the optimal staffing mix within the PWD (Roth, personal communication, January 29, 2020).²

The Strategic Design has two major themes—delivery and development. In the words of RADM Korke, currently the chief of civil engineers, “Our design will remain focused on ensuring we are prepared and ready to meet the challenges of today and the future” (Naval Facilities Engineering Command, 2019-f, p. 6). By harnessing the power of the digital age, NAVFAC will work to enable the warfighter and deliver state-of-the-art facilities to support mission critical platforms. By clearly defining NAVFAC’s mission and vision, the Strategic Design aims to unify NAVFAC through specific and measurable goals.

In 2018, Craig Prather conducted a study that aimed at improving product and delivery within NAVFAC. I have included selected slides from his study in Appendix E. Prather isolated his efforts directly to the Naval Research and Development Establishment (NRDE) community, which required the execution of more than 3,704 actions at a value of \$2.3 billion in FY17 (Roth, personal communication, January 29, 2020). He found that while NRDE clients valued their PWDs, NAVFAC was consistently underperforming when it came to project delivery. Prather identified 27 primary root causes to the underperformance ranging from inadequate processes to the PWD’s culture and organizational structure. He also singled out FEC Washington as a “unique” situation based not only on the high number of stakeholders involved but the total amount of reimbursable volume which was 250% greater than Commander, Naval Installations Command (CNIC) (Roth, personal communication, January 29, 2020).

Prather proposed many solutions to make FEC Washington more agile, but three in particular I want to highlight are proposing an organization change and alignment in order to more directly support the NRDE, setting up a dedicated project management office/integrated product team (PMO/IPT) to exclusively support NRDE clients, and promoting a joint effort to develop a PPBE-like process including Asset Management

² The information was communicated to me via a PowerPoint presentation sent by email on January 29, 2020.

(AM) and facilities management specialist (FMS) planning support to the NRDE client. These three proposed solutions parallel what I found in my own research and echo what I heard in the interviews I conducted with NAVFAC personnel. In follow-on sections of this report, I discuss in detail the debilitating effects siloing has on functional organizations and highlight the importance of enacting a cultural overhaul across NAVFAC by employing horizontal integration across the field level organization.

In reviewing literature outside of the Navy, two publications that discussed speed and agility in facilities management were the Certified Educational Facilities Professional (CEFP) study guide drafted by the Association of Physical Plant Administrators (APPA) and a report drafted by the International Service System (ISS) titled, *The Future of Service Management*. The CEFP study guide is directly applicable to public works organizations like PWD Annapolis, PWD Newport, and PWD Monterey, which serve higher learning centers like the United States Naval Academy, the Naval War College, and the Naval Postgraduate School respectively, but the CEFP can be expanded to training centers as well, which comprise a large number of bases across both inside and outside the Continental United States (OCONUS).

One of the main ideas highlighted by the APPA is integration. The study guide states, “As a support organization, it is clear that a successful facilities organization must imbed itself into the campus dynamics. Unfortunately, changing an organizational culture takes time. Furthermore, an investment in time is essential to successfully accept the institutional culture” (APPA, 2015, p. 62). Similar to Prather’s findings, APPA argues that it is essential that a support organization imbeds itself into the inner workings of the base and the customer it is serving.

In *The Future of Service Management*, the ISS, based out of Denmark and working with the Copenhagen Institute of Futures Studies (CIFS), collected data from a global survey of 1495 facilities management experts and service professionals. Their intent was to empower companies with a set of recommendations and knowledge, equipping them with the tools to develop robust service strategies in this ever-changing, complex business environment. The white book identifies and elaborates on trends across the entirety of the service management enterprise such as: strategy, touch points, and the development of

technology and its associated acceleration. One key point for facilities management is that across both management and maintenance staff, the adoption of best practices and optimizing processes are suggested to help gain efficiency. In the words of the ISS, “Excellence in service requires agility, relevance, and dynamism - service providers must be prepared and equipped to encounter all emerging service archetypes within any given setting” (ISS World Services A/S, 2018, p. 18). The white book also touched upon a shift across the industry towards user-centric service management. The ISS writes, “The ability to both understand and assist the end-user through her journey throughout the workday and to deliver services in the manner she prefers to consume them will set the bar for Service Management in the FM industry towards the future” (ISS World Services A/S, 2018, p.17).

The criticality of understanding the requirements of the customer cannot be understated, yet continues to be undervalued. While research continues to link speed and agility to culture and organizational change, it is not enough to simply change. The change needs to be with the intent to not only understand the customer, but also entrench the support organization into the organization it is serving. In this case, NAVFAC needs to structure its business model around its customers rather than press their customers to flex to NAVFAC’s own business model.

B. PROCESS ANALYTICS

Sound business processes are essential to both public and private companies. While modern companies have long understood the importance of maximizing efficiencies, early efforts to address this were aimed at process automation, essentially removing the human from the process itself (Beheshti et al., 2016). However, more recently, the focus has shifted to a desire to understand the inefficiencies and analyze the processes in an effort to maximize efficiency (Beheshti et al., 2016). By understanding a business’s processes and using analytical tools to identify bottlenecks, managers cannot only work to increase throughput within their systems, but they can also enhance customer satisfaction.

There are certain basic terms, which would be prudent to define prior to executing process analysis. A process can be defined as a set of interrelated work activities that takes one or more inputs and transforms them into one or more outputs. A process flow chart

depicts steps in a process and the items, which in this case are projects, that are physically moving through the medium. A bottleneck is the production resource that limits the capacity or the maximum output of the whole system (Apte, 2011). The bottleneck is the step in the process I am attempting to speed up if at all possible. The cycle time is the length of time a project spends moving through the system (Apte, 2011). By isolating processes and analyzing them separately, I can help identify individual process bottlenecks in an attempt to enhance efficiency across both processes.

Utilizing Jacobs and Chase's (2011) *Operations and Supply Chain Management*, I apply Little's Law to both the CAT III/IV process as well as the acquisition process. Little's Law defines the "relationship between inventory, throughput, and flow time of a production system in a steady state" (Jacobs & Chase, 2011, p. 273). The relationship is:

$$\text{Inventory (I)} = \text{Throughput rate (R)} \times \text{Flow Time (T)} \text{ (Jacobs \& Chase, 2011)}$$

Little's Law applies to single workstations, factories, or supply chains. In this case, I utilize Little's Law to compare projects completed with time elapsed. By identifying cycle times for process activities and gaining an understanding of the current project inventory of a steady state system, I can analyze the processes, identify potential bottleneck(s), and propose solutions to relieve the bottlenecks and improve efficiency across the NAVFAC enterprise.

C. STRATEGY VERSUS CULTURE

With every turnover of NAVFAC leadership, there is the introduction of a new or modified strategy. Typically, the strategy targets ways for the organization to be more efficient, to do more with less, to continue to enhance the organization's ability to maintain the shore infrastructure in support of the warfighter. New strategies are not a problem per say, as true enhancements will come from *Strategic Design 2.0*, just as tangible improvements have come from *Strategic Design 1.0*. However, I would argue that new strategies can only take the organization so far. Rather than unveiling new strategies aimed at improving processes, NAVFAC really requires a culture turnover.

The need for strategic thinking in business is indisputable. When executives were asked what was the one behavior that was most important to their organization's future

success, 97% of them chose strategic thinking (Kabacoff, 2014). However, the relationship between strategy and culture is less obvious. In *The Leader's Guide to Corporate Culture*, the authors explain that strategy provides direction and acts as a reference point for collective action and decision making. Strategy relies on guidelines aimed to mobilize people, and is frequently encouraged by both tangible rewards for achieving goals and consequences for falling short. Most C-suite personnel understand the significance of strategy, as it is inherent to maintaining continuity and growth in times of turbulence. Culture, on the other hand, is not as easily manipulated, because much of it is affixed in unspoken behaviors, mentalities, and social patterns (Groysberg et al., 2018).

Groysberg et al. write, “Culture is the tacit social order of an organization: shaping attitudes and behaviors in wide-ranging and durable ways” (Groysberg et al., 2018, para. 6). Cultural norms are actions perceived as acceptable across an organization. “When properly aligned with personal values, drives, and needs, culture can unleash tremendous amounts of energy toward a shared purpose and foster an organization’s capacity to thrive” (Groysberg et al., 2018, para. 6).

Culture change can be a powerful catalyst for an organization. Consider the well-known case of the former General Motors, now Tesla, auto plant, then named the New United Motors Manufacturing Incorporated (NUMMI) at Fremont, CA. The following excerpt is taken from Anthony Pollman’s MBA Capstone project as well as originally from Cameron and Quinn’s “Diagnosing and Changing Organizational Culture”:

In the 1950s, General Motors had embarked on what was referred to as a “sunbelt strategy”: plants were built in the southern and western states. Because these are all “right to work” states (with few unions), the United Auto Workers (UAW) viewed this as a union-avoidance move on the part of the company. But, ultimately, not only were the new GM plants organized by the UAW, but they became among the most hostile, conflict-ridden plants in the entire corporation. Particularly troublesome was the plant in Fremont, California, where the Chevrolet Nova was assembled. It was a huge facility with several million square feet under one roof. By 1982, the plant was operating at a disastrously low level. Absenteeism averaged 20 percent per year, and approximately five thousand grievances were filed each year by employees at the plant—the same as the total number of workers. It also translates to about twenty-one formally filed grievances each working day! More than two thousand of those grievances remained unresolved. Three or four times each year, a wildcat strike would occur

(people just walked off the job). Costs of assembling the car were 30 percent above those of Japanese competitors, sales were trending downward, and ratings of both quality and productivity ranked the Fremont plant the worst in the company. Moreover, customer satisfaction with the Chevy Nova had hit rock bottom.

A variety of improvement programs had been tried—quality circles, employee relations initiatives, statistical process control, new incentive systems, tighter controls, downsizing, to name a few. Nothing worked. Quality, productivity, and satisfaction levels remained abysmal. Of course, it doesn't take a rocket scientist to figure out that the company could not afford to continue operating at that level of performance. The reputation of the entire corporation and all its divisions (Cadillac, Buick, Oldsmobile, Pontiac, Chevrolet, and GMC) was being negatively affected by the poor-quality product, the cost of simply keeping the plant running was overly burdensome, and management had nothing but grief from this group of employees. The decision was made to close the plant at the end of 1982.

Then GM did something interesting. The company approached its best competitor, Toyota, and offered to design and build a car together. GM was losing market share to Toyota, the Toyota production system was generally regarded as the best in the world at the time, and GM was having a difficult time trying to figure out how to fix its disastrous performance record, especially with the now-defunct Fremont plant. Toyota jumped at the chance. After all, GM was the world's largest company with the world's largest supplier and dealer networks, and it was a chance for Toyota to establish a firmer foothold on U.S. soil. GM offered to use the Fremont facility, but the plant was not to be remodeled. Old equipment had to be used. Toyota said, "Fine." GM indicated that because of the labor agreement, the joint venture couldn't hire just anyone. UAW workers had to be hired first, and they would come back on the basis of seniority. The oldest and most recalcitrant employees, the ones who had complained about management the longest, were given first crack at jobs. Toyota said, "Fine." Toyota just had one request, and that was to allow Toyota managers to run the place, not GM managers. GM said, "Fine." In late 1985, the plant was opened. The name was changed to NUMMI—New United Motors Manufacturing Incorporated. For the first two years, the Chevy Nova was produced; then it was phased out and replaced by the Geo Prizm and the Toyota Corolla. ...

Sales trends at the NUMMI plant were positive, quality and customer satisfaction were the highest in the company, the Toyota Corolla had fewer glitches than the comparable car produced in Japan, and productivity doubled the corporate average. Two decades later, the NUMMI plant still continues to lead the company in most months in quality and productivity. ... This experiment still serves as an example to GM (and to other manufacturing businesses) of the dramatic improvement that is possible.

How did the turnaround occur? What accounts for the dramatic improvement in performance? Multiple factors were involved, of course, but the best explanation of the most important factor can be illustrated by an interview with one of the production employees at NUMMI. He had worked in the facility for more than twenty years. He was asked to describe the difference he experienced between the plant while it was managed by GM and the plant after the joint venture was formed. This UAW member said that prior to the joint venture he would go home at night chuckling to himself about the things he had thought up during the day to mess up the system. He'd leave his sandwich behind the door panel of a car, for example. "Three months later, the customer would be driving down the road and wouldn't be able to figure out where that terrible smell was coming from. It would be my rotten sandwich in the door," he chuckled to himself. Or he would put loose screws in the compartment frame that was to be welded shut. People riding in the car would never be able to tell exactly where that rattle was coming from because it would reverberate throughout the entire car. "They'll never figure it out," he said.

"Now," he commented, "because the number of job classifications has been so dramatically reduced [from more than 150 to 6], we have all been allowed to have personal business cards and to make up our own titles. The title I put on my card is 'director of welding improvement.'" His job was to monitor certain robots that spot-welded parts of the frame together. "Now when I go to a San Francisco 49ers game or Golden State Warriors game or a shopping mall, I look for Geo Prisms and Toyota Corollas in the parking lot. When I see one, I take out my business card and write on the back of it, 'I made your car. Any problems, call me.' I put it under the windshield wiper of the car. I do it because I feel personally responsible for those cars."

The difference between Fremont in 1982 and Fremont in 1992 ... is a reflection of an organizational culture change. It was a gut-level, values-centered, in-the-bones change from viewing the world in one way in 1982 to viewing it completely differently a decade later. Employees had simply adopted a different way to think about the company and their role in it. (Pollman, 2015, p. 28-30)

As the case study above highlights, it is imperative for members of an organization to not only feel like they belong but also to feel as if the organization's success is their own personal success. When a project finishes on time, under budget, there should be a celebration showcasing those individuals. However, the celebration should not solely be for the construction management team, but rather the entire project team from the initial planner who wrote the initial planning document, the DD-1391, to the engineering technician that completed the final technical inspection before beneficial occupancy. Some projects in the construction industry can take years, spanning multiple planners, numerous

construction managers and a procurement and administrative contract office, but every project affects the entirety of the organization. NAVFAC needs to reestablish itself under the popular slogan of “one team, one fight.” For too long, the organization has engaged in a territorial battle between capital improvements and public works, which is understandable as the organization vies for resources in times of budget uncertainty. However, the reality is that one cannot exist without the other. It stands to reason that if NAVFAC builds the most beautiful, technically advanced building but do not care for it properly, it will not be the most beautiful, technically advanced building for very long. Facilities management is a partnership between public works and capital improvements. The key lies in NAVFAC’s ability to start a culture overhaul within the organization—a culture based in ownership and achieved through integration.

For years, there has been an organizational tug-of-war between strategy and culture. The truth is that organizations should be using strategy to evolve culture rather than solely relying on strategy to modernize the organization. While new strategies are complicated, I would argue that they are easier to come up with than invoking a cultural revolution. For too long, culture has been viewed as too difficult to change. However, while difficult, it is far from impossible. In a world that has never been more connected than today, it is critical that leaders ensure their people embrace the work they do on a day-to-day basis. Similar to the NUMMI case study, in facilities management, that entails establishing a unanimous sense of ownership across an integrated organization.

D. ORGANIZATIONAL AGILITY

“In operational terms, the concept of agility can be defined as employees’ capacity to gather and disseminate information about changes in the environment and respond to that information quickly and expediently” (Gallup, 2018, para. 1). However, there is a difference between personal agility and organizational agility. Walter (2020) attempts to quantitatively and qualitatively define organizational agility in her article, “Organizational agility: ill-defined and somewhat confusing? A systematic literature review and conceptualization.” She writes, “Organizational agility expresses a company’s set of capabilities for thriving and prospering in an unpredictable and rapidly changing

environment” (Walter, 2020, para. 2). It [organizational agility] is a measure of responsiveness and ability to flex to changing conditions. An organization’s adaptability is fully dependent on their ability to respond to and make decisions in the moment (Harraf et al., 2015).

Agility in business is no longer an option. Organizational dexterity and the ability to respond quickly to situations “has become a necessity that distinguishes successful organizations from those that flounder” (Harraf et al., 2015, p. 675). Every business is looking for an edge, which is compounded by a fast-moving business cycle where successful business practices are quickly adopted and put into practice. These constant evolutions require quick response and organizational adaptability, skills inherent to a successful business structure (Harraf et al., 2015).

In the article, “The 3 A’s of Organizational Agility,” Oakes (2018) suggests that perhaps the biggest restrictions to an agile culture can actually be the organizational structure. If a company’s decision-making is too methodical, their ability to rapidly capitalize on market shifts suffers (Oakes, 2018). Oakes states that organizational agility is comprised of three A’s: anticipate, adapt, and act. The three A’s should be utilized in such a way as to cultivate the culture that embraces them. The first “A,” *anticipate*, refers to a company’s ability to expect change. Change should be viewed as not only expected and manageable but embraced by the staff (Oakes, 2018). The second “A,” *adapt*, refers to the need to “break down rigid silos and hierarchies that can inhibit teamwork, and purposefully instill a collaborative spirit in the workforce” (Oakes, 2018, para. 25). Oakes writes, “An organization moves much more quickly when it leverages the collective wisdom of its workforce. Create a learning culture in which employees can easily and freely create and share their knowledge, and recognize or reward them for doing so” (Oakes, 2018, para. 25). Finally, the third and final “A,” *act*, refers to the restructuring of an organization to minimize hierarchy and bureaucracy as well as the empowerment of individuals in an effort to make decisions quicker (Oakes, 2018). Oakes expounds on that idea stating that businesses should explore enhancing productivity with smaller teams who are staffed based on capabilities rather than traditional methods (Oakes, 2018).

While public and private companies alike are required to be flexible with their business model as technology transforms landscapes or sensitive to the changing taste of the almighty consumer, government organizations are not known for their agility. In 2003, Senator Tom Davis, then chairman of the Committee on Government Reform, in a hearing regarding the H.R. 1836, the Civil Service and National Security Personnel Improvement Act of 2003, said, “It takes an average 5 months to hire a new Federal employee, 18 months to fire a Federal employee. Pay raises are based on longevity not performance” (*Instilling Agility*, 2003, p. 2). As Potter (2017) of the University of Virginia states in her paper, “Slow-Rolling, Fast-Tracking, and the Pace of Bureaucratic Decisions in Rulemaking,” “In the United States—and pretty much everywhere else too—the term bureaucracy is synonymous with inefficiency. Traditional explanations for the plodding pace at which government agencies make decisions and respond to public policy problems point to ‘red tape’ and constraints imposed on agencies by the political system” (Potter, 2017, p. 841). Potter also lays out other reasons why bureaucratic organizations are so slow moving such as “bureaucrats’ lack of intrinsic motivation, flaws in agency design that hinder efficiency, resource constraints, and the complexity of tasks” (Potter, 2017, p. 841).

While the idea of bureaucracy continues to garner negative sentiment across the business world as the enemy of progress, it has actually been studied and found to be present in organizations even without them knowing. In *Harvard Business Review*’s “When Bureaucracy is Actually Helpful, According to Research,” Chung and Bechky (2018) explain that ridding companies of all bureaucratic elements would be nearly impossible. They argue, “Projects that involve complex technical work must be tracked and coordinated across departments; budgets must be accounted for; and costs must be kept in line” (Chung & Bechky, 2018, para. 2). In their article, Chung and Bechky analyze two companies, a film set and a semiconductor equipment manufacturing firm. In both, they find plenty of examples of bureaucracy, but instead of complaining, the companies have discovered how to make this “immovable beast” work for them. How? Both organizations realize that making bureaucracy work was all about maintaining a sense of control over the tasks they care about (Chung & Bechky, 2018). “People make bureaucracy work when they treat it as a shared, rather than an individual, burden” (Chung & Bechky, 2018, para. 6).

Expanding on the theory that work should be shared rather than individual, McKinsey, a major consulting firm, identifies the modern transformation of businesses from siloed hierarchies to flexible organisms. In “The Five Trademarks of Agile Organizations,” the McKinsey Agile Tribe, a group of more than 50 global colleagues bringing expertise from a variety of disciplines, describe a shifting paradigm. The old paradigm, modeled after Ford, was birthed from ideas rooted in scientific management, which then was “a breakthrough insight that optimized labor productivity using the scientific method” (Aghina et al., 2018, p. 2). Frederick Taylor, a contemporary of Ford, can be considered the architect of this methodology, instituting modern quality control, total quality management, and through one of Taylor’s students, Henry Gantt, project management (Aghina et al., 2018). For years, organizations embraced this hierarchical model depicting them as machines. However, with the advancement of technology, came the shifting of the paradigm. McKinsey illustrates four current trends that are leading a “digital revolution” transforming industries, economies, and societies. The four trends are the quickly evolving environment, constant introduction of disrupted technology, accelerating digitization and democratization of information, and the new war for talent. The two that appear most applicable to NAVFAC are the quickly evolving environment and the accelerating digitization and democratization of information. Stakeholders’ demands and priorities evolve on a daily basis specifically in the CAT III/IV arena, enhancing the need for agility across the organization. Also, the sheer amount of information, housed in multiple systems, such as the internet Navy Facility Assets Data Store (inFADS), Maximo, and ieFACMAN, require the field office to rapidly engage in multidirectional communication. Moreover, these systems are primarily used by a single branch of the field level organization, such as inFADS by the Facilities Management Division, Maximo by Public Works, and ieFACMAN by the Facilities Engineering and Acquisition Division (FEAD). These isolated systems accentuate the need for enhanced communication across the organization as well as complex collaboration.

McKinsey describes the agile organization, contrary to the old Ford-esque paradigm, as a living organism. Figure 6 provides a pictorial of this organizational paradigm shift.

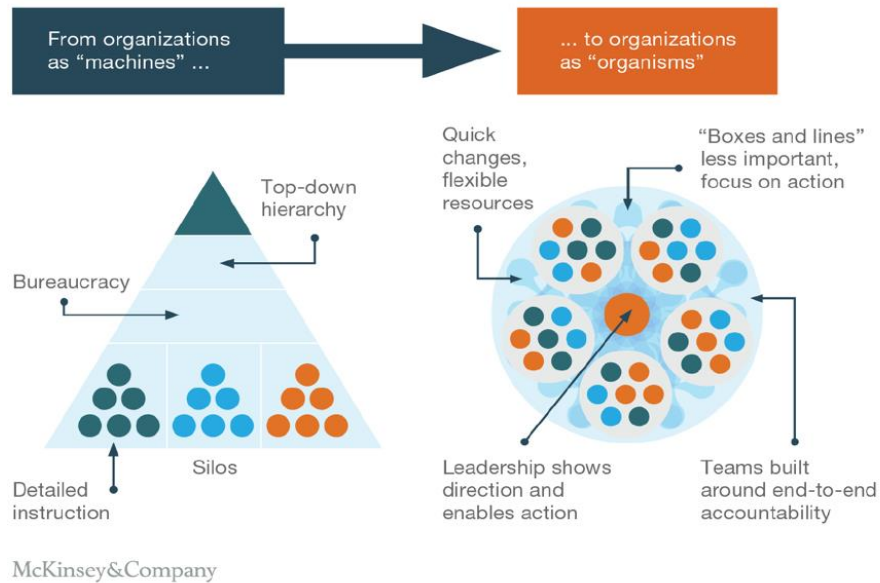


Figure 6. Organizations as Machines versus Organisms.
Source: Aghina et al. (2018).

"Research shows that agile organizations have a 70% chance of being in the top quartile of organizational health, the best indicator of long-term performance" (Aghina et al., 2018, p. 5). Even more impressive is that companies simultaneously achieved a more customer centric and engaged workforce. "Like the cells in an organism, the basic building blocks of agile organizations are small fit-for-purpose performance cells" (Aghina et al., 2018, p. 13). Aghina et al. (2018) compares the smaller cells with antiquated machine models, finding that the smaller cells are more flexible, more multifaceted from a discipline perspective and ultimately more successful when it comes to overall performance. Gallup (2018), in "3 Steps on the Path to Agility," details a roadmap to a more agile organization. Figure 7 breaks down the three steps in an easy-to-read table.

The Path to Agility		
Speed and Efficiency	Freedom to Experiment	Communication and Collaboration
Constantly make every job and process as simple as possible	Determine what risks are necessary and what failures are acceptable	Break down the silos between teams and departments
Use technology to help employees get more done in less time	Help every person in the company feel they should contribute to innovation	Create opportunities for regular idea and knowledge sharing
Remove unnecessary bureaucracy to decision-making		
GALLUP 2018		

Figure 7. The Path to Agility. Source: Gallup (2018).

By breaking down silos between departments, individuals are empowered to freely share information. The question is, “How do we break down the silos?” The answer can be found in two words: Horizontal Integration. A study titled, “Designing Lateral Organizations: An Analysis of the Benefits, Costs, and Enablers of Nonhierarchical Organizational Forms,” conducted by Joyce et al. (1997), analyzed data obtained from 512 employees within eight diverse organizations implementing flexible lateral organizations. Many researchers have suggested that companies should embrace lateral integration in an effort to increase their own capability (Joyce et al., 1997). The group writes, “Lateral mechanisms tend to promote learning that balances synergy with responsiveness” (Joyce et al., 1997, p. 3).

Joyce et al. (1997) found that lateral relations helped integrate organizations by altering “the quantity, quality, and style of communication.” Through integration and following the breaking down of silos, the amount and frequency of formal communication is increased, and coordination is improved. Ultimately, lateral integration enhances “faster information flow across preexisting boundaries” (Joyce et al., 1997, p. 3). Joyce et al. (1997) continues to expound on the advantages of lateral relations writing, “Their [lateral relations] primary advantage is that they enhance communication flow typically absent in bureaucratic organizations, and at the same time, reduce the need for vertical

communication by creating self-contained teams that are focused on a finite task” (Joyce et al., 1997, p. 3). In true literary fashion, Joyce et al. (1997) compare lateral organizations to jazz bands: “Each person plays their special instrument with competence, and coordination is shared, implicit, and flexible among the band members” (Joyce et al., 1997, p. 23). By embracing horizontal integration, an organization can enhance communication across divisions, break down silos and improve efficiency.

Overhauling culture in an established bureaucratic organization is complex. It requires buy-in at all levels and a true understanding of why the organization requires a transformation. Many believe that the only way to overhaul a bureaucratic organization is to get rid of the bureaucracy. Accepting the reality that bureaucracy is never going away (nor should it), I would argue that by instituting lateral integration, NAVFAC can begin to break down the division silos and unify the public works organization around its customers. By establishing a strong, unified, and integrated public works department, NAVFAC can move towards fundamentally changing how it does business in an effort to successfully achieve organizational agility.

E. SUMMARY

NAVFAC stresses the importance of speed and agility in the Strategic Design 2.0, while Prather has identified multiple courses of action to improve these very attributes in support of the NRDE customer base. As technological advancements become more commonplace across the organization, there will be productivity improvements. However, similar to the relationship between culture and strategy, adding technology will introduce minor improvements versus concentrating on overhauling the culture across the organization. Establishing ownership at the lowest levels by horizontally integrating the organization will overcome the divisional silos at the field level and pay dividends for years to come.

III. REVIEW AND ANALYSIS OF CURRENT PROCESSES

Having reviewed how literature defines speed and agility, both from a process as well as an organizational perspective, it is now time to dissect and analyze NAVFAC's processes. In this section, I step through the CAT III/IV process, the acquisition process, and the Public Works Department organization. By applying process analytic concepts to these processes, I can identify bottlenecks and devise solutions to reduce the cycle time and enhance throughput. However, it is important to note that while processes across NAVFAC share commonalities, many processes vary from base to base. This lack of standardization is, in my opinion, part of the problem. Not standardizing processes steepens the learning curve for even the most seasoned NAVFAC employees as they depart one Public Works for another. Moreover, FECs appear to operate without substantial collaboration, relying on the Business Management System for guidance on processes. While some argue that this decentralization from headquarters is an attempt to afford FECs more autonomy, I would argue it introduces more inefficiencies. Nevertheless, much of what is covered in this chapter is the result of a combination of research across the NAVFAC Portal as well as interviews with NAVFAC employees.

A. CATEGORY III/IV PROGRAM BACKGROUND

NAVFAC classifies new requirements into one of four categories. Category I work is defined in Engineering Construction Bulletin 2018-04 as the most complex type, encompassing multi-discipline design work that requires significant oversight, project management, and planning effort (Naval Facilities Engineering Command, 2018). An example of a Category I project would be P-621, Hopper Hall, the new cyber instructional building constructed on the United States Naval Academy (USNA) campus.

Category II work is defined in Engineering Construction Bulletin 2018-04 as more of a tailored design yet still requires robust engineering/technical/acquisition expertise. Category II is often comprised of special projects and large Operations and Maintenance (O&M) projects (Naval Facilities Engineering Command, 2018). An example of a Category II project would be a major HVAC renovation similar to the one being executed

at Rickover Hall on the same USNA campus. Encompassing multiple trades working alongside each other, the project is large and complex, but arguably less complex than the construction of a new facility.

Category III work is defined in Engineering Construction Bulletin 2018–04 as a project that is primarily minor renovation or repair but requires no design. The project may have moderate financial and schedule risk but does not require building or site approval, nor does it require plans or specifications. A few examples of Category III projects are the installation of floor cabinets, the repair or replacement of driveway, or the installation of enclosure/dumpster (Naval Facilities Engineering Command, 2018, pp. 2–9).

Category IV work is defined in Engineering Construction Bulletin 2018–04 as a minor renovation or repair that has no structural, electrical, mechanical, fire protection, or other engineering specialty. The project has very low financial and schedule risk and requires no permit. A few examples of Category IV projects are the installation of a prefabricated carport, the replacement of a 5 ton or less HVAC package unit, and installation of doors to a non-bearing wall (Naval Facilities Engineering Command, 2018, pp. 2–9).

Category I and II work was first established in the late 1990s preceding the unification of Public Works Centers and Resident Officer in Charge of Contracts. Figure 8 illustrates the initial separation of Category/Type I and II with the only reference to Category III/IV being “services.” This reference to “services” is synonymous with “facility services,” such as grounds and janitorial, or what today would be referred to as Base Operating Services (BOS). “Services” at that time were operated under the direction of the Facility Services Contract Administrator (FSCA), now referred to as the Facility Services Contract Manager (FSCM).

ROICC Field Office Model

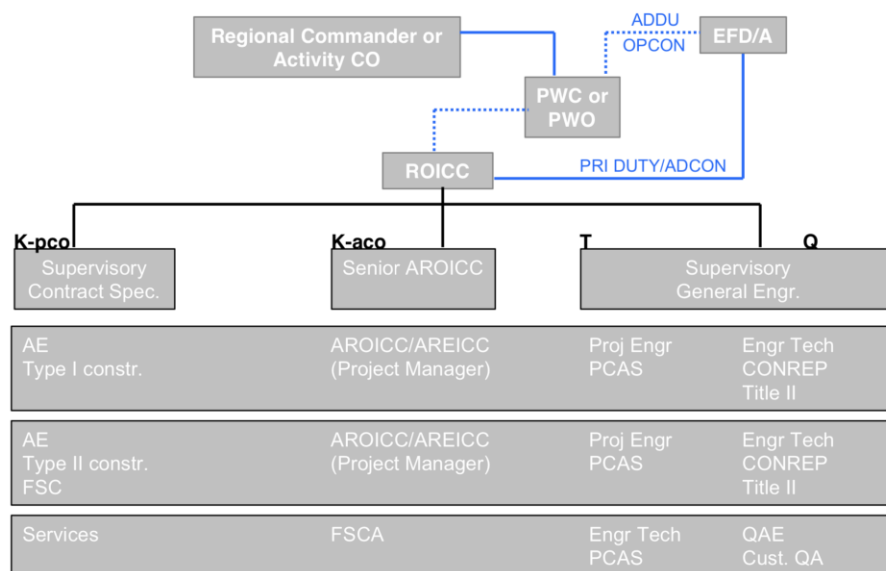


Figure 8. ROICC Field Office Model. Source: Naval Facilities Engineering Command (2000).

CAT III/IV work has a storied history with execution responsibility switching back and forth between different divisions within NAVFAC. The first piece of documentation discussing CAT III/IV was found in Engineering and Construction Bulletin (ECB) 2006–04. Figure 9 lays out the work categories, specifically identifying the level of construction oversight, and the system where scheduling and tracking should be completed. SPM stands for Single Platform Maximo. It is a database, used as a single repository of all projects across NAVFAC. The platform was developed in conjunction with Total Resource Management in 1996 with a goal to “further standardize and streamline Enterprise Asset Management systems associated with all of the Navy’s Public Works Centers to one, single EAM platform with multiple entry points” (Total Resource Management, n.d., p. 2). The system for Category I and II projects, eProjects, is a similar database system and part of a larger ieFACMAN toolbox, which includes eContracts, a contract database, and eTracker, a financial request database. From my research, while it may vary from base-to-base, the “master” record (i.e., the original entry record) is created in Maximo and the project

management, to include scheduling, cost tracking, and individual assignments, is completed in eProjects.

Work Category	Project Management			
	Project Development	Design/Engineering Effort	Construction Oversight	Schedule and Tracking
I	Programmatic	Multi-Discipline Design	Based on BMS	eProjects
II		Tailored Design		eProjects
III	Scoping	Limited Engineering	Limited	SPM
IV		None	By exception	SPM

Figure 9. Project Classification Matrix, ECB 2006–04. Source: Naval Facilities Engineering Command (2006).

In 2018, ECB 2018–04 superseded ECB 2018–04, changing the matrix to match Figure 10. The major change from ECB 2006–04 to ECB 2018–04 was the update to the pre-award schedule and tracking platform for CAT III/IV work from Single Platform Maximo (SPM) to eProjects, as well as delineating Public Works as the lead for CAT III/IV and Capital Improvements as the lead for CAT I/II.

Project Classification Matrix – Four Categories of Work

Work Category	Project Development / Requirements	Pre-Award Design/Engineering Effort (BL Responsible*)	Pre-Award Schedule & Tracking
I	Programmatic (AM)	Multi-Discipline Design (CI)	eProjects
II		Tailored Design (CI)	eProjects
III	Scoping (PW)	Limited Engineering/ No Design (PW)	eProjects*
IV		None (PW)	eProjects*

*NOTE: For CAT I/II/III/IV projects, all pre-award schedules and tracking are done in eProjects by both CIBL and PWBL for work executed by contract. If a CAT III/IV project is to be executed by in-house shop forces, the project is managed in Maximo.

Figure 10. Project Classification Matrix, ECB 2018–04. Source: Naval Facilities Engineering Command (2018).

B. REVIEW AND ANALYSIS OF THE CURRENT NAVFAC CAT III/IV PROCESS

Uday Apte, in his “Note on Process Analysis,” provides this overview of process analytics:

Operations management views an organization as a portfolio of key business processes that add value to customers by transforming inputs into outputs. Process analysis begins with the identification of detailed steps of a process, its customer/s, and the inputs, transformation, and outputs of each step of the process. These steps are configured into a process flow chart. The process is then analyzed by taking into account the performance evaluation carried out in the previous phase. For example, the bottleneck limiting the capacity of the process and the causes leading to variability in its performance are identified and called out. Also analyzed are steps that do not add value and can be eliminated or improved. (Apte, 2011, para. 1)

Aside from analyzing your own internal processes, it is critical to reach to outside organizations in an effort to both discover, if unknown, and subsequently apply best practices. This method, known as benchmarking, is a “continuous, systematic process for evaluating work processes of organizations that are recognized as representing best practices, for the purpose of organizational improvement” (Sarkis, 2001, p. 92). Based on this information and analysis, it still remains important to discuss feasibility as well as

desirability of changes with those personnel on the ground, operating in support of customers on a daily basis (Apte, 2011).

Based on interviews with NAVFAC personnel within the NAVFAC Southwest, NAVFAC Southeast, NAVFAC Washington, and NAVFAC EURAFCENT, the NAVFAC CAT III/IV process is not standardized across the organization. While there are similarities from FEC to FEC, the public works organizations continue to retain the power to deviate from the established process if they see fit. There will be commentary at a later point in the report regarding the importance of decentralization in parallel with standardization. However, due to a lack of an established process across the enterprise, analysis will need to come from one established process. An example of this process comes from NAVFAC Washington and can be seen in Figure 11.



Figure 11. NAVFAC Washington CAT III/IV Process. Source: NAVFAC Washington (2018).

The CAT III/IV process, depicted in Figure 11, is represented as a complicated flow chart. For process analysis purposes, I broke down the process by responsibility, as shown in Figure 12. The responsibility chart helps provide a simple pictorial to see what division owns which part of the process. The study will be broken down into two parts: a CAT III/IV process analysis and an acquisition process analysis. Breaking up the processes should allow for a more in-depth breakdown of the individual processes, specifically identifying multiple bottlenecks, which could be masked if only analyzing a single robust

process. Moreover, by combining activities that were merely decision milestones into single steps, as well as eliminating steps that do not require CAT III/IV input, I was able to simplify the complicated flow chart into a single, dissectible procedure, depicted by Figure 13. This will be the process examined using bottleneck analysis based on the worst-case scenario (i.e., the longest duration per activity). Personnel, durations, and project counts are based on a snapshot from PWD Annapolis as confirmed by contacts within the organization.

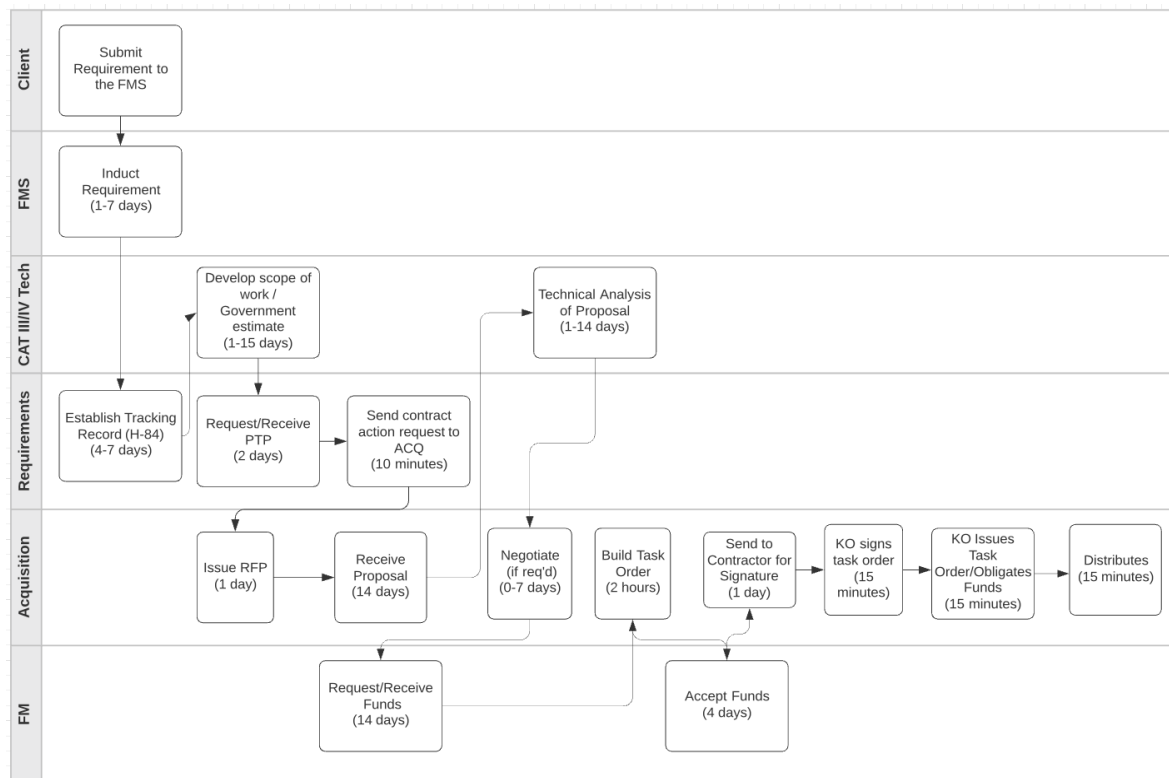


Figure 12. CAT III/IV Process by Responsibility. Adapted from NAVFAC Washington (2018).

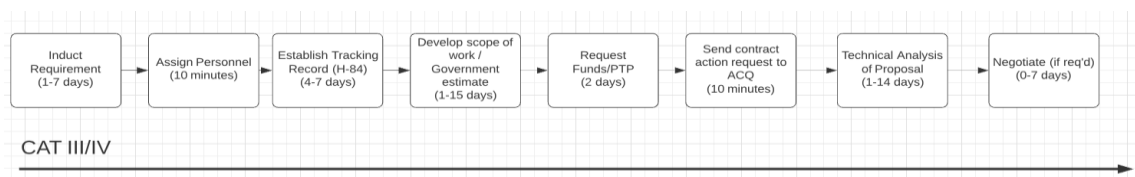


Figure 13. Simplified CAT III/IV Process. Adapted from NAVFAC Washington (2018).

In Table 3, I calculated the duration by taking the longest (i.e., the worst-case) duration in days and dividing it by five to change the units from days to work-weeks. The personnel in each activity are based on the PWD Annapolis organizational chart as well as interviews with PWD Annapolis staff regarding processes and how many personnel are involved. By dividing an activity's duration by the personnel involved in the activity, it is possible to find how many weeks per person the activity takes. To conclude, I took a single project and divided it by the weeks per person to find how many projects per week the team can accomplish (i.e., the R-value).

From Table 3, the bottleneck, the resource with the lowest numerical R-value in the Category III/IV work process is the development of the scope of work and estimate with an R-value of 1.33. Scope development is closely followed by the funds processing step, technical analysis step, and the input of a tracking record step, which all have an R-value of 1.43.

In Table 4, I utilized the bottleneck R-value, as that restricts the entirety of the process, and applied it to all activities. The "I" row represents a snapshot in time for PWD Annapolis. By utilizing Maximo and eProjects, as well as conferring with PWD Annapolis employees, I was able to find the number of projects, "I," currently in the queue at each step in the process. Utilizing the bottleneck R-value and the "I," one can find the "T," or the flow time by using the Little's Law equation that was previously introduced, $R \times T = I$ (Jacobs & Chase, 2011). The "T," represents the flow time, or the amount of time it would take to reduce the current "I" value of that activity to zero.

Table 3. Process Analysis Table of CAT III/IV Process

Process Stage	Induct	Assign Personnel	Establish Tracking Record	Dev. Scope of Work and Estimate	Request / Receive Funds	Send contract request to ACQ	Technical Analysis	Neg
Duration (wk*)	1.4	.0042	1.4	3	.4	.0042	2.8	1.4
Personnel	3	1	2	4	4	1	4	4
R (projects/wk)	2.14	240	1.43	1.33	10	240	1.43	2.86
*Week = 5-day/40-hour work week								

Table 4. Bottleneck Analysis, CAT III/IV Process

Process Stage	Induct	Assign Personnel	Establish Tracking Record	Dev. Scope of Work and Estimate	Request / Receive Funds	Send contract request to ACQ	Technical Analysis	Neg
R (projects/wk)	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33
T (wk*) (hrs)	4.54 (181.6)	.76 (30.4)	3.03 (121.2)	4.54 (181.6)	4.54 (181.6)	3.79 (151.6)	4.54 (181.6)	1.52 (60.8)
I (projects)	6	1	4	6	6	5	6	2
*Week = 5-day/40-hour work week								

Bottlenecks should be viewed as restrictions on the system. Similar to a pipe system, the smaller the pipe gets the less volume of water can flow through it. Even if a user were to increase the flow rate upstream or downstream, the bottleneck would still limit all flow to match its max flow rate. In this case, the CAT III/IV process is restricted by the CAT III/IV technicians' scope of work development.

Prior to attempting to remove the bottleneck, it would prove useful to complete a simulation to see if removal of the bottleneck would translate to sizeable efficiency gains. Assuming that the bottleneck in the CAT III/IV process is removed, the R-value would increase from 1.32 to 1.43, or an 8.3% increase, which would translate into an 83-hour efficiency gain across the system. The efficiency gains are detailed in Table 5.

Table 5. Efficiency Gained by Relieving Bottleneck, CAT III/IV Process

Process Stage	Induct	Assign Personnel	Establish Tracking Record	Dev. Scope of Work and Estimate	Request / Receive Funds	Send contract request to ACQ	Technical Analysis	Neg
R (projects/wk)	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43
T (wk*) (hrs)	4.2 (167.8)	.7 (28)	2.8 (112)	4.2 (167.8)	4.2 (167.8)	3.5 (140)	4.2 (168)	1.4 (56)
I (projects)	6	1	4	6	6	5	6	2
Hours Gained (hrs)	13.8	2.4	9.2	13.8	13.8	11.6	13.6	4.8
*Week = 5-day/40-hour work week								

Comparing the cycle times, addressing the primary bottleneck reduces the cycle time by approximately 2 weeks from 27.3 weeks to 25.2 weeks. These efficiency gains are significant and proposed methods to relieve this bottleneck will be explored in Chapter V. It should be noted that while the bottleneck is the development of the scope of work and estimate, it is more than possible to address the secondary bottlenecks (the technical analysis and the establishment of a tracking record). Addressing these would significantly increase efficiency by increasing the R-value from 1.43 to 2.14, a 33% gain. I address both the primary and secondary bottlenecks and propose methods of enhancing productivity in Chapter V.

C. REVIEW AND ANALYSIS OF THE ACQUISITION PROCESS

As per the FAR, *acquisition* means “the acquiring by contract with appropriated funds of supplies or services (or construction) by and for the use of the Federal Government through purchase or lease. ... Acquisition begins at the point when agency needs are established and includes the description of requirements to satisfy agency needs, solicitation and selection of sources, award of contract, contract financing, contract performance, contract administration” (United States Government, 2020-a, para. 5).

Acquisition is traditionally a cumbersome and methodical process. There are multiple publications that govern a contracting officer’s decisions and actions such as the FAR, Navy and Marine Corps Acquisition Regulations (NMCARS), and Naval Facilities Acquisition Standards (NFAS) to name a few. As such, there are certain limitations put on solicitation timing as well as requirements set for certain levels of competition. Also, depending on the size of the project or prospective award, there is a source selection process that needs to be executed and documented prior to award. While the general NAVFAC acquisition process can be seen in Figure 14, the purpose of this report is to focus on CAT III/IV projects. As such, the process can be somewhat truncated and is reflected in Figure 15. As previously mentioned, all project counts, personnel, and durations are based on a snapshot of PWD Annapolis.

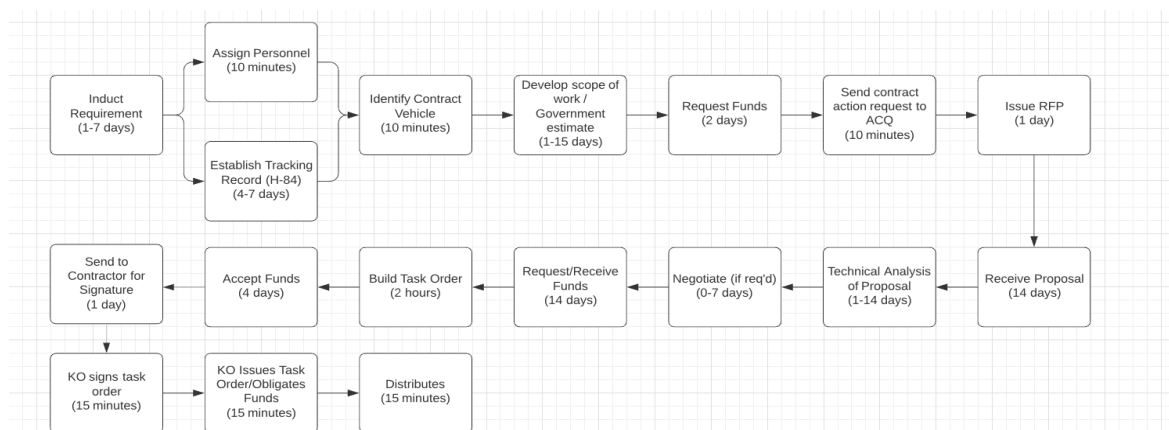


Figure 14. NAVFAC Acquisition Process. Source: FEAD, personal communication, April 21, 2020.

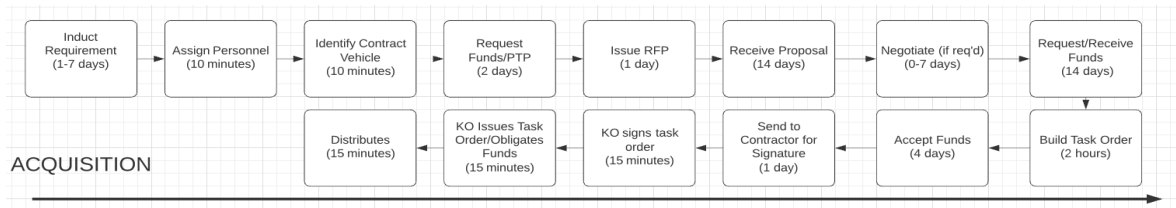


Figure 15. NAVFAC Acquisition Process Simplified. Adapted from FEAD, personal communication, April 21, 2020.

In Table 6 and Table 7, I calculated the duration of each activity by taking the longest, or the worst-case, duration and dividing by five to change the unit into weeks. Work induction for example took a range of 1–7 days, so the longest duration was 7 days. Seven divided by five yields a value of 1.4 weeks. Personnel numbers were extracted from interviews with PWD Annapolis personnel and reflect how many people are involved in the specific process. Finally, the R-value was found by first dividing the duration by the personnel. While an activity will take a certain amount of time for one project, it will take decidedly less time with more people as the team is able to divide up the workload. Therefore, more people yield more productivity for that activity. After finding that value, you divide one by that value. The one represents the single project. The final R-value reflects how many projects that team can accomplish in a given week.

Table 6. Process Analysis of Acquisition Process (1)

Process Stage	Induct	Assign Personnel	Identify Contract Vehicle	Request Funds/PTP	Issue RFP	Receive Proposal
Duration (wk*)	1.4	.0042	.0042	.4	.2	2.8
Personnel	3	1	1	5	6	5
R (project/wk)	2.14	240	240	12.5	30	1.78
*Week = 5-day/40-hour workweek						

Table 7. Process Analysis of Acquisition Process (2)

Process Stage	Negotiate	Request/ Receive Funds	Build Task Order	Accept Funds	Send to KTR	KO Signs/Issues/ Distributes
Duration (wk*)	1.4	2.8	.05	.8	.2	.02
Personnel	6	5	6	5	6	6
R (project/wk)	4.29	1.78	120	6.25	30	300
*Week = 5-day/40-hour work week						

The analysis in Table 6 and Table 7 indicates that the request/receive funds and the proposal reception step, with R-values of 1.78, are the bottlenecks. The reception of proposals and work induction is a close second with an R-value of 2.14. By applying the bottleneck R-values to the other steps in the process, Table 8 and Table 9, we find the total cycle time to be 29.79 weeks. This indicates that a new requirement that came in today would likely take, in the worst case, 30 weeks to be awarded assuming the current workload and that there is no reprioritization of existing requirements. By removing the primary bottleneck, the R-value would increase from 1.78 to 2.14, a 20.2% gain. The tabular results of removing the primary bottleneck can be found in Table 10 and Table 11.

Table 8. Bottleneck Analysis of Acquisition Process (1)

Process Stage	Induct	Assign Personnel	Identify Contract Vehicle	Request Funds/PTP	Issue RFP	Receive Proposal
R w/ BN (project/wk)	1.78	1.78	1.78	1.78	1.78	1.78
T (wk*) (hrs)	3.37 (134.8)	.56 (22.4)	1.69 (67.42)	2.81 (112.4)	6.74 (269.6)	3.37 (134.83)
I (project)	6	1	3	5	12	6
*Week = 5-day/40-hour work week						

Table 9. Bottleneck Analysis of Acquisition Process (2)

Process Stage	Negotiate	Request/ Receive Funds	Build Task Order	Accept Funds	Send to KTR	KO Signs/Issues/ Distributes
R w/ BN (project/wk)	1.78	1.78	1.78	1.78	1.78	1.78
T (wk*) (hrs)	1.69 (67.42)	2.25 (89.89)	1.69 (67.6)	2.25 (89.89)	1.12 (44.95)	2.25 (90)
I (project)	3	4	3	4	2	4
*Week = 5-day/40-hour work week						

Table 10. Efficiency Gained by Relieving Bottleneck (1), Acquisition Process

Process Stage	Induct	Assign Personnel	Identify Contract Vehicle	Request Funds/ PTP	Issue RFP	Receive Proposal
R (projects/wk)	2.14	2.14	2.14	2.14	2.14	2.14
T (wk*) (hrs)	2.8 (112)	.47 (18.7)	1.40 (56)	2.34 (93.6)	5.61 (224.4)	2.8 (112)
I (projects)	6	1	3	5	12	6
Hours Gained (hrs)	22.8	3.7	11.42	18.8	45.2	22.83
*Week = 5-day/40-hour work week						

Table 11. Efficiency Gained by Relieving Bottleneck (2), Acquisition Process

Process Stage	Negotiate	Request/ Receive Funds	Build Task Order	Accept Funds	Send to KTR	KO Signs/Issues/ Distributes
R (projects/wk)	2.14	2.14	2.14	2.14	2.14	2.14
T (wk*) (hrs)	1.40 (56)	1.87 (74.77)	1.40 (56)	1.87 (74.77)	.93 (37.2)	1.87 (74.8)
I (projects)	3	4	3	4	2	4
Hours Gained (hrs)	11.42	15.12	11.6	15.12	7.75	15.2
*Week = 5-day/40-hour work week						

By removing the primary bottleneck, the total cycle time reduces from 29.79 weeks to 24.76 weeks, a 17% decrease. These efficiency gains are significant and proposed methods to relieve the primary and secondary bottlenecks will be explored in Chapter V.

D. REVIEW AND ANALYSIS OF THE PUBLIC WORKS ORGANIZATION

A few of the most prevalent challenges faced at Public Works Organizations are not only timely response to work orders but tracking and following up on work completed. With thousands of work orders submitted on a monthly basis, it is imperative for the Base Operating Service Contractor (BOSC) to take a lead role in not only tracking their work, but ensuring that a robust quality control program is in place to make sure the work being done was completed properly and on time. This can be an issue.

Public Works Departments are typically set up as facility management entities with an emphasis on management. They are not typically equipped with the personnel to properly address a problem, depending on the size of their in-house staff, but rather to manage the problem with the BOSC directly addressing it. However, this relationship between the BOSC and the government is complex. Any business, whether public or private, is driven to maximize profits. The government on the other hand is driven by a desire to be proper stewards of taxpayer funds. This imbalance creates conflicts of interest between the entities. Without question, relationships can grow over time. Many BOSC personnel have been serving the base for years, and my intent is not to undermine that. Rather, the problems that arise on a weekly basis are so vast that follow-up becomes second fiddle to the next problem that surfaces.

Like many other Navy entities, NAVFAC is consistently trying to do more with less. Managing, awarding, and turning over more or larger construction projects on a year-over-year basis is the name of the game. With the addition of more work, the same personnel are not getting more efficient, but instead performing less managing. It stands to reason that there are two ways to allow for the execution of an increased workload without increasing personnel. One is to make the individuals more productive, potentially by introducing new technology, while the other is making processes simpler to allow for a more streamlined execution of requirements. New technology, as mentioned earlier, has

consistently lagged in the government services, while process improvements are consistently submitted and reviewed by Facility Engineering Commands and Product and Service lines respectively. Typically, processes get tweaked or adjusted and populated on the NAVFAC Business Management System (BMS), but field offices end up constructing their own processes and procedures with the BMS used as a guide.

NAVFAC's organization is tiered by echelon. The lowest echelon, also known as the field level, house the Public Works Organization and Resident Officer in Charge of Construction (ROICC); Echelon IV commands are the Facilities Engineering Commands (FEC), who report to the Echelon III commands, either NAVFAC Atlantic or NAVFAC Pacific depending on geographic area, and finally Echelon II is NAVFAC Headquarters. In NAVFAC's Concept of Operations dated 2010, "NAVFAC operates as a matrix organization with integrated 'vertical' and 'horizontal' roles and responsibilities" (Naval Facilities Engineering Command, 2010, p. 7). Figure 16 illustrates the relationship between the business lines and the lower echelons as of 2010.

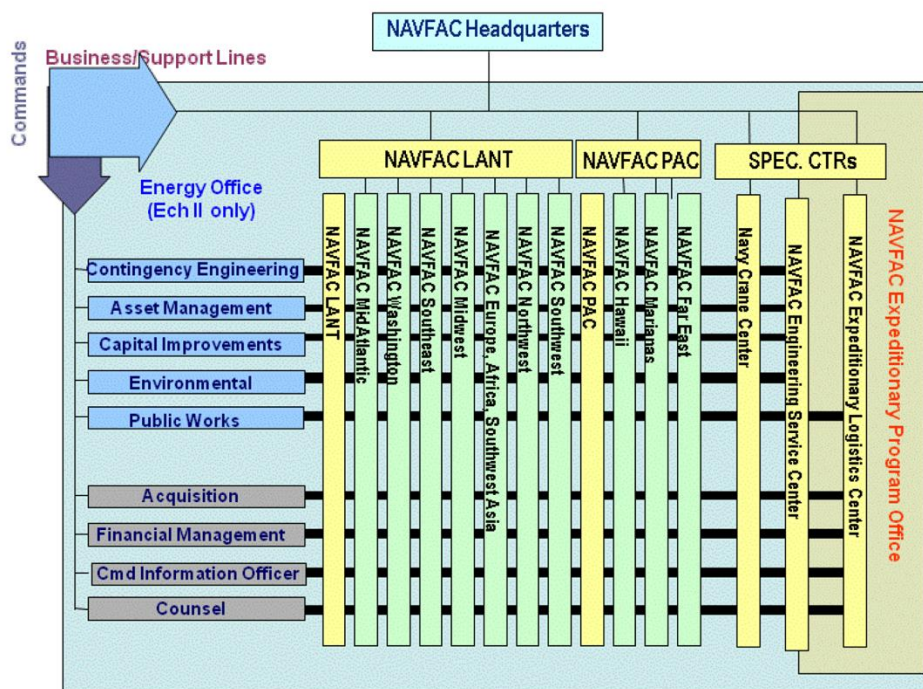


Figure 16. Vertical and Horizontal Roles and Responsibilities of NAVFAC Component Commands and Business/Support Lines. Source: Naval Facilities Engineering Command (2010).

In the 2010 edition of the CONOPS, NAVFAC clarifies the horizontal, vertical relationship, as well as the respective roles and responsibilities. The horizontal roles and responsibilities are held by the business line/support line and include technical/acquisition authority, training, NAVFAC centralized program management and oversight and budget management and resource allocation. The vertical roles/responsibilities include command and execution, mission accountability, execution leadership and management, as well as performance assessment using command metrics. Finally, the integration is handled by the business directors ensuring horizontal functions support short and long-term execution goals, and operations officers ensuring vertical execution follows resource guidance and is in line with the horizontal process.

However, in the 2019 edition of the CONOPS, NAVFAC does not provide an integrated picture of the echelon commands, but rather separate Echelon II, III, and IV organizational charts shown in Figures 17, 18, and 19. There is also no mention of a matrix

relationship as the organization charts show a classic functional structure. The CONOPS does clarify that support for the field level comes from multiple personnel at the Echelon IV and III levels including project managers, the Operations Department, and the Core.

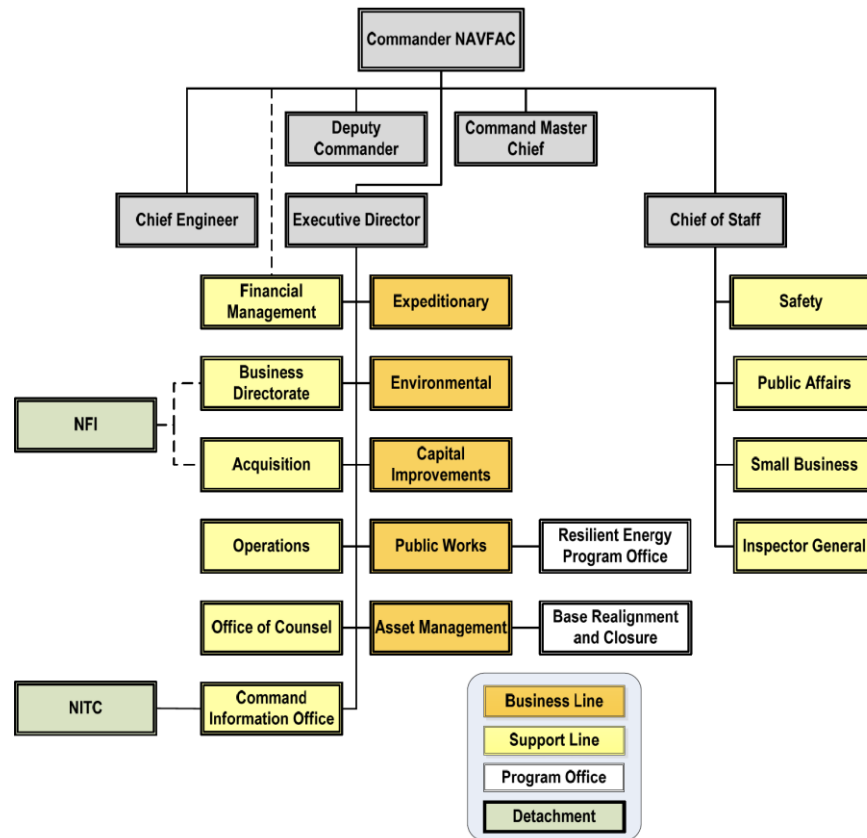


Figure 17. NAVFAC HQ Organizational Chart. Source: Naval Facilities Engineering Command (2019-b).

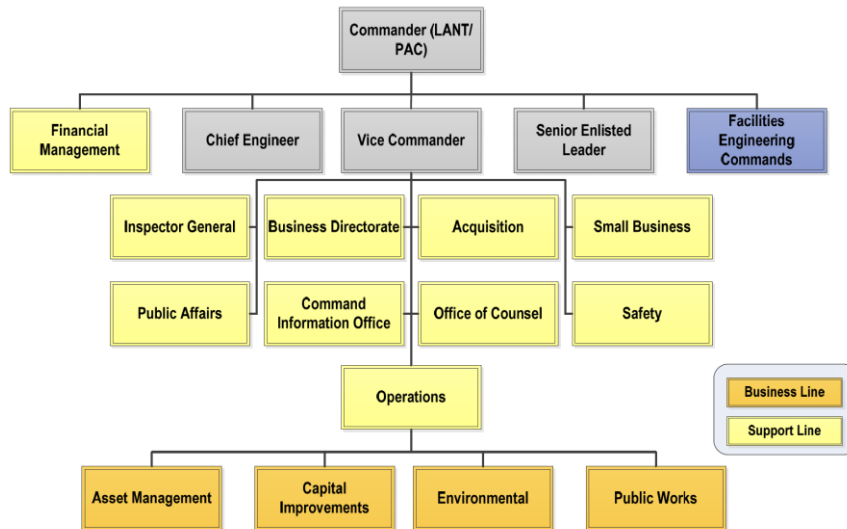


Figure 18. NAVFAC LANT/PAC Organizational Chart. Source: Naval Facilities Engineering Command (2019-b).

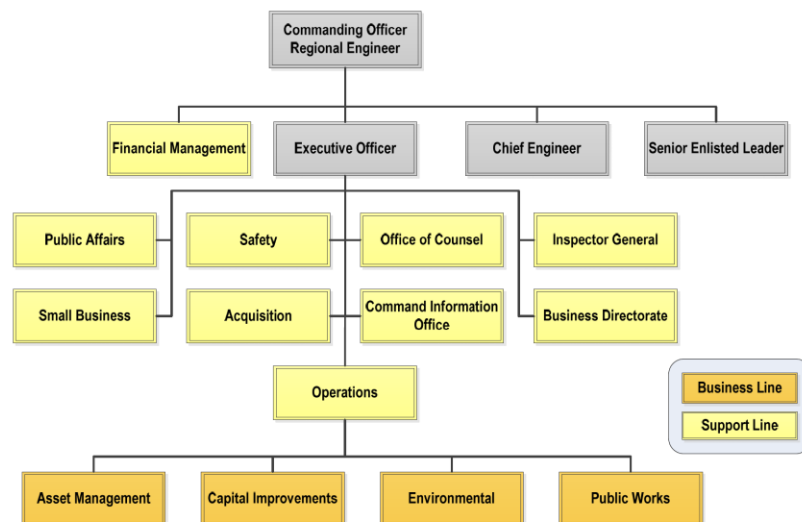


Figure 19. NAVFAC Facilities Engineering Command Organizational Chart. Source: Naval Facilities Engineering Command (2019-b).

Transitioning to field level organizations, there can be some differences and nuisances from base-to-base. That fact aside, a traditional Public Works organization looks like Figure 20.

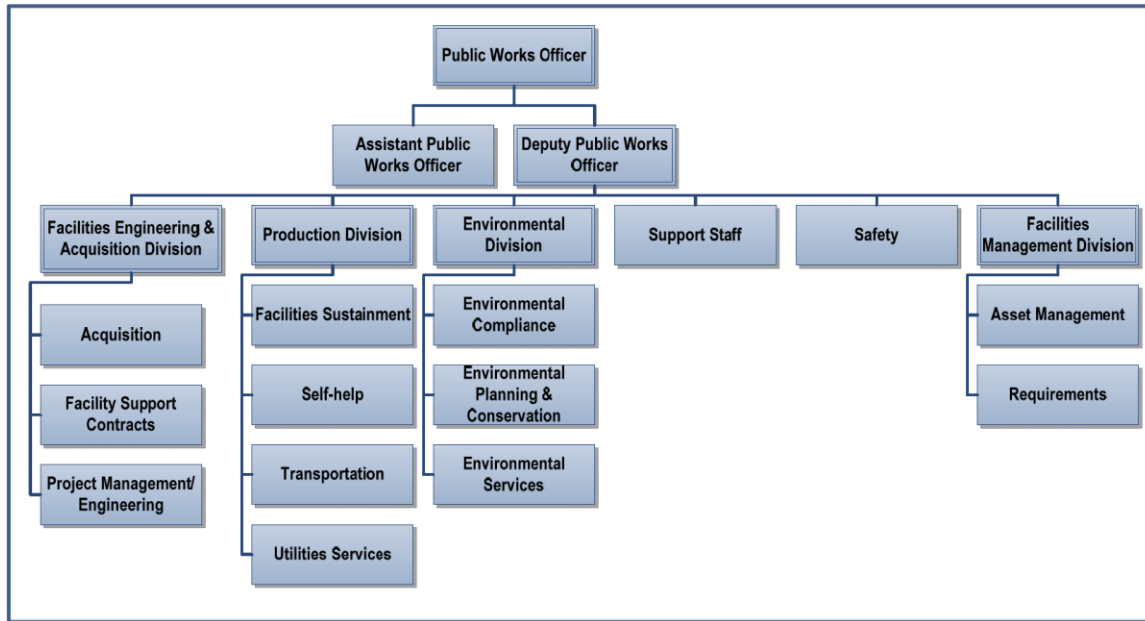


Figure 20. A Standard Public Works Organization. Source: Naval Facilities Engineering Command (2019-b).

A public works department is made up of four core divisions: the Facilities Management Division, the Facilities Engineering and Acquisition Division, the Environmental Division, and the Production Division. The Safety officer typically has a direct line to the public works officer, and depending on the size of the public works department, there can be a separate financial management division and a separate admin/human resources division.

Typically structured vertically, vertically and horizontally, or with open boundaries, “an organizational structure is the method by which work flows through an organization” (SHRM, 2015, para. 2). In a functional structured organization, work and employees are divided by specialization. Each department has a separate focus and as such concentrates on that function. In a typical public works department, each division has a specialty; for example, the facilities management division (FMD) runs point on the maintenance execution plan, maintenance action plan, and long-range maintenance plan in an effort to capture not only a base’s current requirements, but also their future requirements. Supplementing the FMD, the Facilities Engineering and Acquisition Division executes engineering and design, construction management, project management,

and contract solicitation and award. Individual specialties working in concert with each other towards one goal: support the base.

One of the greatest strengths of a functional structured organization is that divisions tend to become very knowledgeable about their individual division. This can be seen very clearly if one were to randomly interview a public works employee. Technically competent, this individual would be expected to know the intricacies of their division or the specifications of the contract they oversee, but when asked about business outside of their division, the questions become more cumbersome. Division directors, for the most part, understand the innerworkings of the NAVFAC organization, but the individual employees lack that same depth. It is not about a lack of training or an apathetic attitude; rather, these individuals are more often the exact opposite of apathetic. Instead, the lack of knowledge is reflective of an absence of synergy within the public works department itself. This lack of synergy brings with it a plethora of meetings: to plan, to organize ideas, to brainstorm, to assess problems, to review reports, and so on. Excessive meetings become the only way to communicate, and when paired with the amount of time it takes to send emails, these unproductive activities begin to encompass the entirety of the day. This brings us to one of the major weaknesses of functionally structured organizations: faltering communication between divisions. In fact, I would go as far as to say, though it has been confirmed in my interviews with NAVFAC employees, that cross-divisional communication is one of the greatest challenges within NAVFAC. The “silo” mentality, which enables personnel within NAVFAC to be extremely knowledgeable about their own individual fields, closes the divisions off from the fully integrated organization.

Matrix organizations, on the other hand, boast “team-oriented arrangements that promote coordinated, multidisciplinary activity across functional areas, broad participation in decisions, and the sharing of knowledge” (Pakarinen & Virtanen, 2017, p. 211). There are many different types of matrix organizations including “cross-functional matrix teams, where team members come from different divisions within the organization and are led by a activity leader who they may not have a formal reporting line to” (Pakarinen & Virtanen, 2017, p. 211); functional matrix teams, “where individuals from the same function need to work together across an internal matrix” (Pakarinen & Virtanen, 2017, p. 211) such as

engineers who normally work alone in different disciplines, but come together for a single purpose; global matrix teams, where individuals from different divisions or even different regions come together to solve a mutual issue; and “extended matrix teams, where individuals from different organizations come together to solve common problems” (Pakarinen & Virtanen, 2017, p. 211). Cross-functional teams, also known as CFTs, are multidisciplinary teams that are typically structured as groups of people brought together from different functions to tackle ongoing tasks, like the support of a customer. Some benefits of CFTs are enhanced coordination and communication, problem-solving capabilities, and ultimately the improvement of quality and productivity (Pakarinen & Virtanen, 2017). CFTs enable employees with a shared understanding of the other divisions by allowing them to work together on a consistent basis. By affording a more in-depth understanding of how the organization does business and how individual employees fit within an organization’s structure, CFTs can help an employee feel more connected to the mission and ultimately achieve a greater self-worth (Pakarinen & Virtanen, 2017).

However, matrix organizations are not without occasional drawbacks. Some noted challenges include execution complexity, ambiguities in chain of command, and uncertainty of work processes post-implementation. However, where functional and global matrix structures struggled, CFTs succeeded. Pakarinen and Virtanen (2017) found that organizations that implemented a matrix structure reported unclear outcomes 73% of the time, providing a clear example of the uncertainty challenge mentioned earlier. However, CFTs were found to be far more effective, enhancing collaboration and information sharing 100% of the time across organizations post-implementation. What motivated these businesses to employ CFTs? The main drivers for employment was a desire to improve productivity, “improve internal and external project coordination, control and accountability, and more effective project management” (Pakarinen & Virtanen, 2017, p. 222). Ironically, all of these drivers are in line with OPNAV and SECNAV’s strong demand signal to improve productivity across the CAT III/IV enterprise.

E. SUMMARY

For the CAT III/IV process, utilizing Little's Law, I found the primary bottleneck to be the development of the scope and estimate, and the secondary bottlenecks to be the technical analysis, the requesting and receiving of funds, and the establishment of the tracking record. While adding more people appears to be an obvious solution, it is rarely the most cost effective. Therefore, I propose alternate recommendations in Chapter V.

For the acquisition process, utilizing Little's Law, I found the primary bottlenecks to be the reception of proposals and the request/receive funds activity, and the secondary bottleneck to be the work induction. Because the financial management team is in a state of flux with the sunseting of the Navy Working Capital Fund (NWCF) and the migration from Facilities Information System (FIS) to Command Financial Management System (CFMS), it was not practical to analyze the funds flow process or the funds acceptance process. However, in Appendix H, I do include a suggestion for future research in this area with current data compiled from COGNOS. Finally, in Chapter V, I make recommendations on how to relieve the other bottlenecks of the acquisition process.

The organizational analysis of NAVFAC field offices was centered around the flaws within a functionally structured organization. By highlighting the benefits and drawbacks of this type of organization and applying the lessons learned from the literature review on organizational agility, I detailed the benefits of a properly horizontally integrated organization completed by employing CFTs. In Chapter V, I go into more detail on how NAVFAC can successfully deploy these CFTs.

IV. INTERVIEW SUMMARIES AND FINDINGS

To aid in the development of end-solutions, I have reached out to other government organizations (the Army Corps of Engineers and General Services Administration [GSA]) as well as civilian facility management firms like the Virginia Polytechnic Institute and State University, the University of Houston, and the Collier County's Facilities Department. By interviewing both governmental and non-governmental entities, I aimed to increase the likelihood for out-of-the-box thinking, which is critical for developing alternate methods to established processes. In order to conduct interviews, I developed two standard question sets. The intent for the question set was more to structure the conversation rather than restrict it. The question sets can be found in Appendices C and D.

A. ARMY CORPS OF ENGINEERS

The Army Corps of Engineers (USACE) has a storied history that dates back to 1802, when the Army established the Corps as an individual and permanent branch, giving the Corps responsibility for founding and operating the U.S. Military Academy at West Point (U.S. Army Corps of Engineers, n.d.). USACE is comprised of eight divisions across the continental United States. Each division can have as many as seven districts with each district covering multiple states. Figure 21 provides a geographical breakdown for the different divisions across the United States.

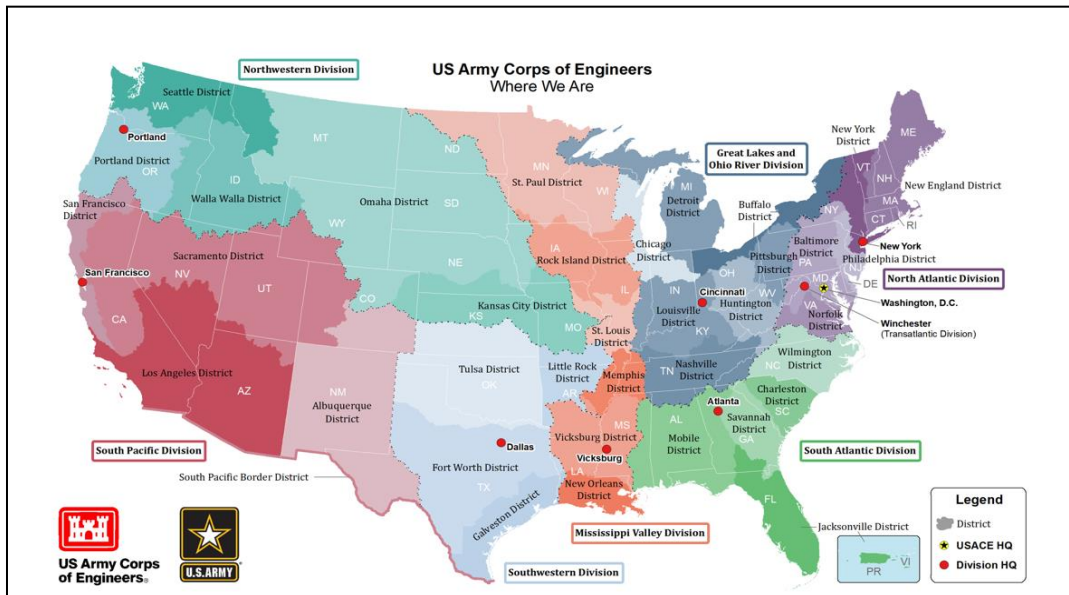


Figure 21. U.S. Army Corps of Engineers CONUS locations. Source: U.S. Army Corps of Engineers (n.d.).

I was afforded the opportunity to interview the navigation chief of the Charleston District, Scott Glass. The interview centered around the Charleston District specifically, but since Glass is a former NAVFAC employee, we were able to elaborate on the similarities and differences between NAVFAC and USACE. The Charleston District’s mission is to deliver comprehensive solutions through exceptional customer service, collaboration, and commitment to quality. They execute construction management, real estate services, environmental oversight, emergency management, and water development activities. Their organizational construct is similar to NAVFAC in that they have divisions dedicated to specific functions. However, while USACE maintains a functional organization, they practice lateral integration by cradle-to-grave project management. Figure 22 provides an overview of the District’s organizational layout.

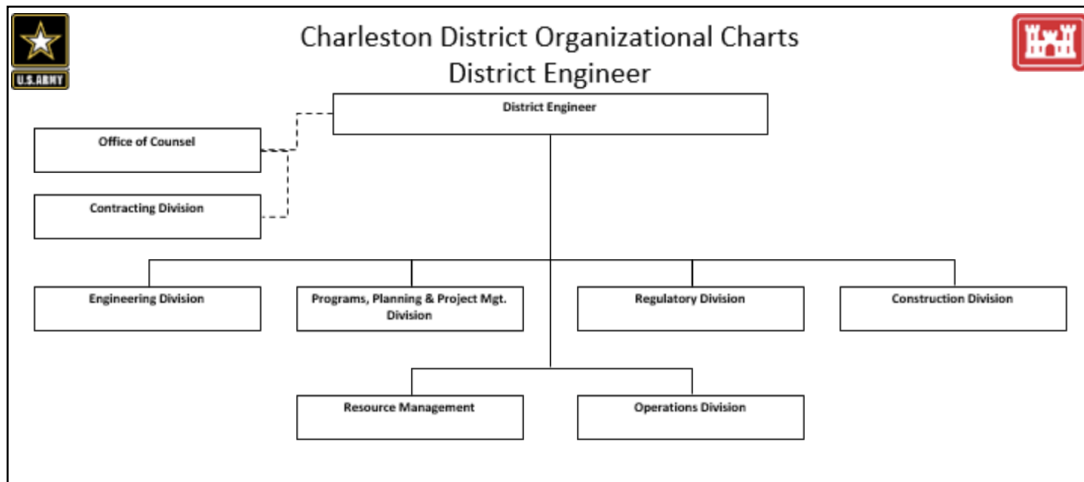


Figure 22. Charleston District Organizational Chart. Source: U.S. Army Corps of Engineers (n.d.).

The Program, Planning, and Project Management Division is charged with management of all projects and requirements. As stated on the USACE website, “Project managers serve as the single point of contact for information” (U.S. Army Corps of Engineers, n.d., para. 1).

Perhaps the greatest advantage USACE maintains is its robust training environment. Their classes are held on Proponent-Sponsored Engineering Corps Training, PROSPECT, and include distance learning classes as well as resident courses. Individual training plans are developed for each employee. PROSPECT training is an integrated training platform available to all USACE employees, as well as others outside of USACE. On the contrary, NAVFAC utilizes multiple platforms to execute their training including eLearning from the NAVFAC Portal and Red Vector for Capital Improvements. The specialized training provided via Red Vector is solely offered to Capital Improvements, although many topics would be fruitful for the CAT III/IV technicians. This isolation of training is a singular example of the siloing that occurs within NAVFAC. While the argument can be made that certain individuals across Facilities Support Contracts and the CAT III/IV division require access to this type of specialized engineer training, the lack of availability of this training across the organization is a weakness. Leveraging USACE for

training opportunities could be a fruitful option for NAVFAC managers to utilize when helping individuals build their training plans.

B. GENERAL SERVICES ADMINISTRATION

The General Services Administration (GSA) was created in 1949, to streamline the administrative work of the federal government (U.S. General Services Administration, 2020). Their mission is, “to deliver value and savings in real estate, acquisition, technology, and other mission support services across Government” (General Services Administration, 2019-a, para. 1).

I was afforded the opportunity to interview. Thomas Terrio, Chief of the Planning Branch in the Office of Planning and Design Quality at Public Buildings Service. Terrio had previously served as Asset Management Branch Head at PWD Annapolis, so the majority of the conversation centered around differences between NAVFAC and the GSA. While I had heard about the GSA, mostly in conversations about vehicle rentals, I had no idea how much work the GSA was responsible for across the United States. The biggest takeaway from the conversation was the plethora of tools that the GSA has to offer. To name a few, the GSA offers an acquisition gateway, GSA Advantage, GSA eLibrary, and GSA Schedules. One of the most promising is the Acquisition Gateway, which was launched in 2016 (GSA Acquisition Gateway Team, n.d.). A description of the Gateway follows:

The Acquisition Gateway is a workspace for acquisition professionals and project teams to research, share information, build, and manage their acquisition projects. On the Gateway, federal buyers connect with peers and experts to collaborate, compare solutions, share templates, study success stories, review prices paid data, and more. We are revamping how the government approaches procurement, replacing a decades-old model of a fragmented and scattered approach to acquisitions. We connect federal acquisition professionals to share advice, success stories, and lessons learned. (GSA Acquisition Gateway Team, n.d., para. 1)

The Acquisition Gateway boasts more than 10,000 users and a document library for performance work statements and scopes of work (GSA, n.d.-b). The Gateway depends on the contributions of its users (i.e., best practices to equip the community with the tools

to enable the best decision making). While limited in scope of how it could assist NAVFAC, the Acquisition Gateway could be a good place to start when beginning acquisition planning.

The next tool that the GSA offers is GSA Advantage. GSA Advantage is “an online shopping and ordering system that provides access to thousands of contractors and millions of supplies (products) and series” (General Services Administration, 2019-b, para. 1). GSA Advantage is similar to Amazon’s platform in that it is a robust eCommerce system, but instead of discounts provided to any and all parties, the discounts are solely for federal buyers. In addition to the platform being a great place to purchase supplies, it also acts a great technique to execute market research, providing a single source of comparative data. In a December 2017 NPS study titled, “Amazon Business and GSA Advantage: A Comparative Analysis,” Holland Canter and Tabitha Gomez found that “of 300 vendors that offered the 60 compared items, GSA Advantage offered the lowest price 80% of the time (241 times out of 300)” (p. 35).

Finally, GSA Schedules are long-term government contracts put into place with commercial firms to allow for federal, state, and local buyers the ease of utilizing the contract without having to go through the acquisition hurdles (GSA, n.d.-a). The advantage of GSA schedules is the streamlined ordering procedures. According to GSA, “the streamlined ordering procedures allow a buyer to purchase commercial supplies and services much faster than buying through open-market procedures” (GSA, n.d.-a, p. 1). While addressed in *FAR 8.4—Ordering Procedures*, the Naval Facilities Acquisition Standards (NFAS) specifically restricts utilization of Federal Supply Schedules (FSS) for “only direct acquisition for services including knowledge based services, roof repairs, and leases at or below the Simplified Acquisition Threshold (SAT), but above the micro-purchase threshold, or for commercial off-the-help items up to and including \$7,000,000” (Naval Facilities Engineering Command, 2019-b, p. 35).

C. VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Located in Blacksburg, VA, boasting over 213 buildings across 2,600 acres, Virginia Tech serves more than 34,400 students both on campus and off. The Facilities

Department is led by Associate Vice President & Chief Facilities Officer Chris Kiwus, PhD, PE, who I was privileged to have the opportunity to interview for this report.

The conversation was fruitful in discussing work induction processes and organization, as well as highlighting similarities and striking differences between Virginia Tech and NAVFAC. While it is important to note that Virginia Tech is obviously not regulated by the FAR, which allows them more flexibility in determining best value on contract awards and to be more decisive when choosing a contractor, their goals and strategic vision are similar to NAVFAC's, highlighting an intent to analyze, plan, maintain, and improve the "physical infrastructure to meet the needs of the institution's programs" (Virginia Tech, 2020-a, para. 3).

Virginia Tech organizes their facility department into nine divisions: University Building Official; University Planning; Real Estate; Facilities Operations; Utilities, Energy, Engineering, & Assessment; Capital Construction; Facilities Contracts; Design & Construction Standards Official; and Chief of Staff. The University Building Official reports to the Board of Visitors and is charged with plan review, inspection, and permitting. The University Planning is in charge of managing the campus master plan and has similar responsibilities to NAVFAC's Asset Management Division. Real Estate, typically managed at the FEC level for NAVFAC, is in charge of leasing, property management, and facility use agreements. Facilities Operations is comprised of two groups: Buildings & Grounds and Renovations. The Buildings & Grounds group is in charge of grounds, housekeeping, and building services, comparable to NAVFAC's Facilities Support Contracts division. The Renovations group is in charge of minor modifications up to \$3 million in value and more complex than routine service calls. This group executes requirements similar to NAVFAC's CAT III/IV project level and was a major part of the conversation. The Utilities, Energy, Engineering, & Assessment division is made up of two groups: Energy, Engineering, and Assessment and Utilities. The Energy, Engineering, and Assessment group is charged with managing site and infrastructure development, automation systems and the chiller plant, and elevator and fire protection. The Utilities group manages the electric service, the power plant, and utility infrastructure. These two groups are most comparable to a Public Works Department's Production Division, but with

far more management personnel as well as a robust in-house workforce. Similar to NAVFAC's Project Management and Engineering division, the Capital Construction division executes design and construction for requirements exceeding \$3 million in value. The Facilities Contracts division is most similar to NAVFAC's Acquisition division executing procurement and contract support for standing contracts as well as stand-alone special projects. Finally, the Design and Construction Standards Official manages design and construction standards and the Chief of Staff division manages administrative operations, sustainability, facilities off-site coordination, and facilities space assignments. Their organization is composed of 500 in-house personnel, further broken down into 100 housekeepers, 300 shops and specialty personnel, and 100 managers and office administrators. Virginia Tech's organizational chart is provided in Figure 23 and the Facilities Operations division can be seen in more detail in Figure 24.

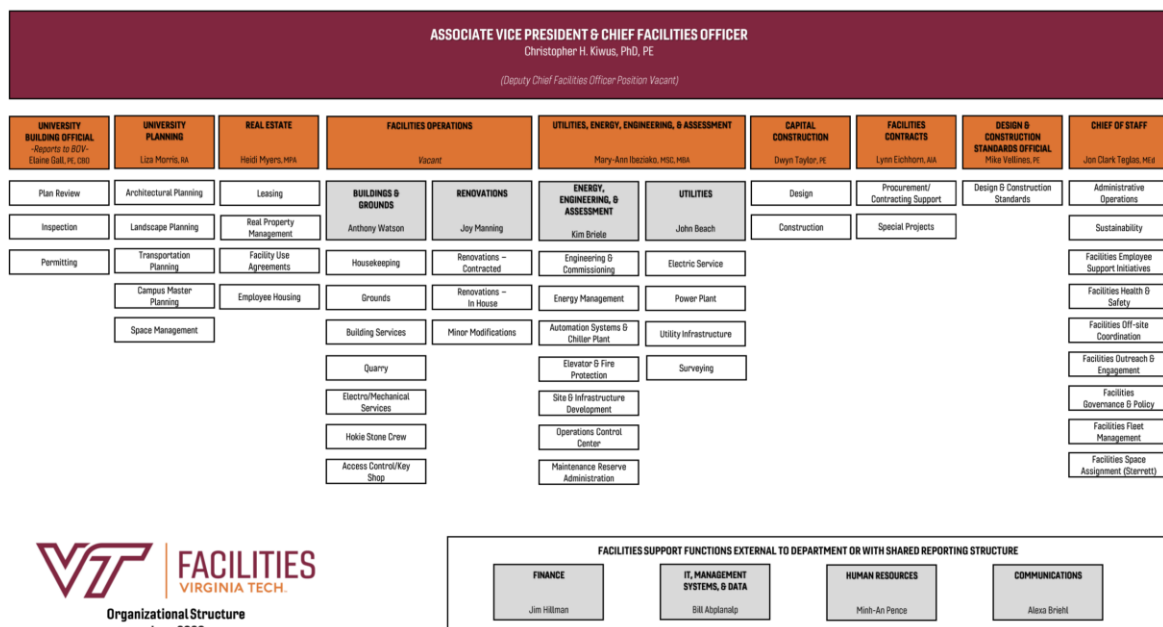


Figure 23. Virginia Tech Facilities Organizational Structure. Source: Virginia Tech (2020-b).

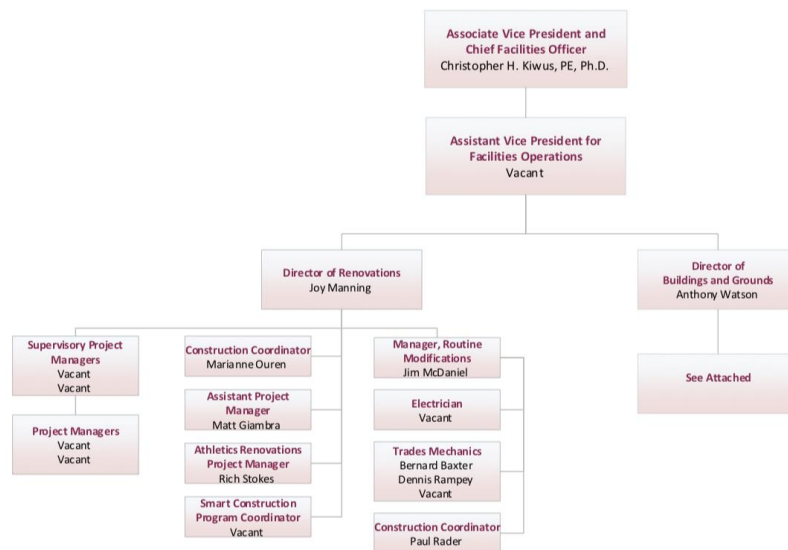


Figure 24. Virginia Tech Facilities Operations Organizational Structure.
Source: Virginia Tech (2020-b).

Virginia Tech utilizes a tier system for work orders. For non-complex and lower dollar value work, they try to maximize the utilization of their robust in-house workforce. In the interview, Kiwus said that this level of work is the majority of work that comes into the facilities department. For more complex requirements or work requiring permitting, the work order is executed by the renovation group with in-house project managers assigned for cradle-to-grave management. Larger than \$3 million requirements, comparable to the CAT I and II level for NAVFAC, are pushed to the Capital Construction division.

Acting as both a FEC and a Public Works Department, Virginia Tech has less reach back capability, but is afforded more autonomy to execute their work. As such, their work induction process is more streamlined than a typical PWD's. For work induction, Virginia Tech utilizes a facilities management software system called AssetWorks (AiM), which is comparable to NAVFAC's Maximo. The minor project will be entered by a building manager and then will be routed to the building trade supervisor for execution by a trade mechanic as necessary. Kiwus stated that their organization was a matrix style, organized

by zone and by specialty. Ultimately, there are a variety of cross-functional teams throughout the organization capable of executing the majority of projects that come through the organization. Cross-functional teams speak to the integration across the organization and falls in line with my earlier literature review.

The biggest takeaway for Virginia Tech was not only how organized they were, but their ability to integrate across the organization. The robust in-house workforce allows the facilities department the flexibility to respond to small issues quickly. Isolating their campus into zones and their shops into specific specialties affords them the ability to disperse workload especially for non-complex work. Moreover, utilizing cross-functional teams with project managers as the horizontal integrators establishes ownership as well enhances communication across the organization. It is my belief that the establishment of cradle-to-grave project management through horizontal integration allows them to operate with speed and agility in both small, non-complex requirements as well as large and multi-discipline renovations.

D. UNIVERSITY OF HOUSTON

Founded in 1927, the University of Houston is home to more than 47,000 undergraduate students and 2,700 faculty (University of Houston, n.d.-a). According to the website, there are 181 buildings and the campus is delineated into maintenance zones, as shown in Figure 25.

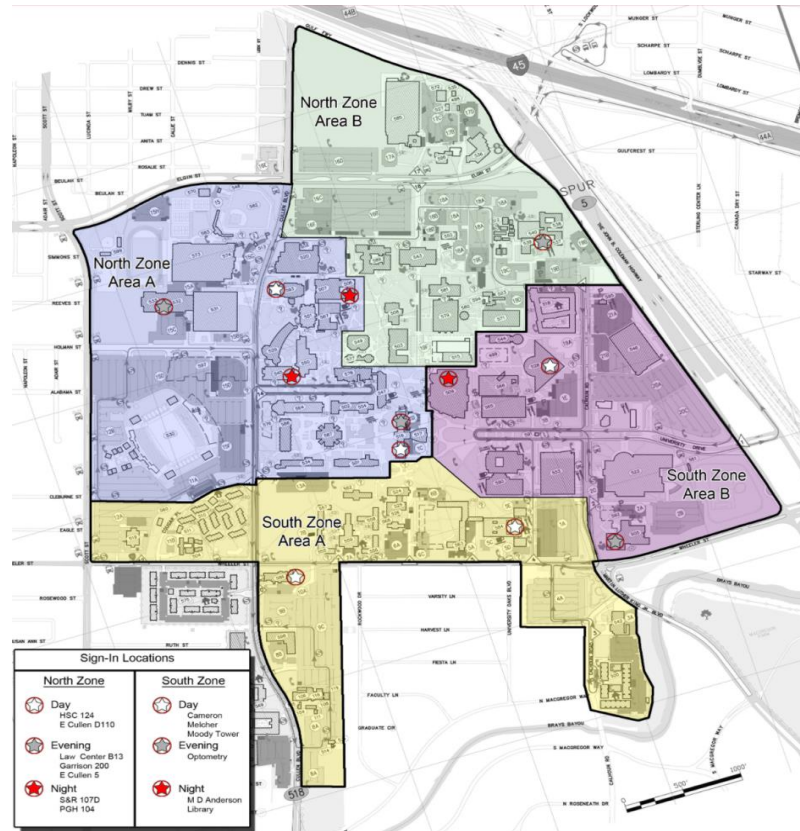


Figure 25. University of Houston Campus Map. Source: University of Houston (n.d.-b).

I was afforded the opportunity to interview the Assistant Vice President for Facilities Services for the University of Houston, Jeff Benjamin. Our conversation centered around work processes, stepping through their work induction process from beginning to end, and the management of projects below \$1 million in value. Similar to NAVFAC, the University of Houston uses a CMMS database, called Fiix, to manage their workload. Their process begins with a facility coordinator, a faculty member's collateral duty, entering a work order either by email or phone call to a central call center. The work order then gets categorized by urgency and farmed out to a specific group depending on its complexity. The University of Houston has recently hired facility zone managers to track work orders from cradle to grave. They are still experiencing growing pains with regards to integrating these individuals across all parts of the organization.

Their organization is functionally structured and hinges on four main divisions: facilities planning, facilities construction, facilities services, and facilities business operations and compliance. Their facilities management organization is shown in Figure 26 and the facilities services division, similar to NAVFAC’s facilities support contracts division, is shown in Figure 27.

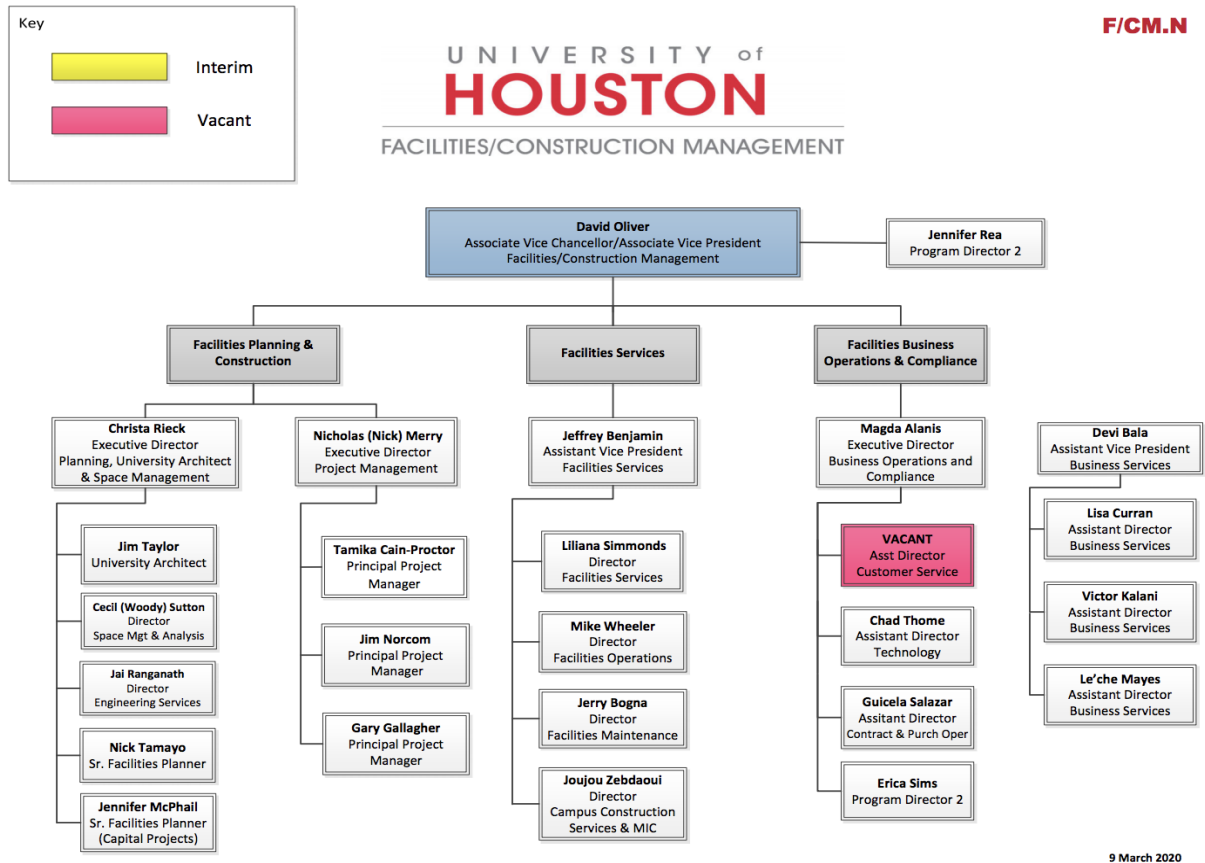
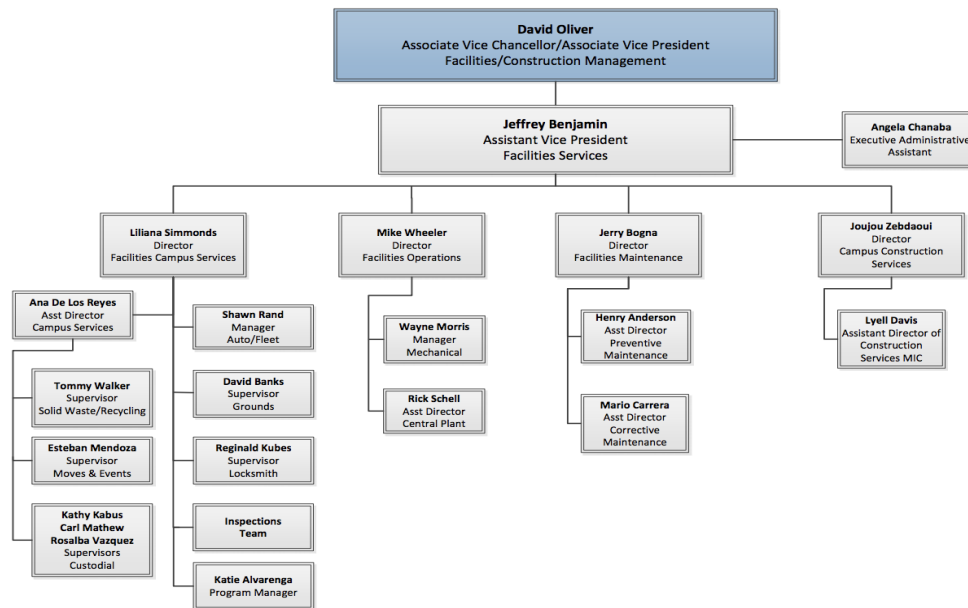


Figure 26. Facilities/Construction Management at University of Houston.
Source: University of Houston (n.d.-c).



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Figure 27. Facilities Services at University of Houston. Source: University of Houston (n.d.-c).

The University of Houston operates with both in-house forces and out-source contracting, and we spoke extensively about the flexibility that having an in-house workforce provides especially in emergent type requirements. From a training perspective, they are currently putting together training pipelines for their personnel as that was considered a shortfall in the last assessment. My interviewee specifically mentioned that he remembered NAVFAC had at one time leveraged the USACE training program, PROSPECT, to train the Inspectors, now the Engineering Technicians.

There were two big takeaways from the interview with University of Houston. First was the facilities department's reliance on technology to integrate their workforce. The University of Houston uses PMWeb, a collaborative tool, to allow seamless communication between the different divisions within their organization. Still relatively early in the adoption process, the University is confident that the incorporation of this tool will help integrate across the organization. The second big takeaway was the cradle-to-

grave management of any and all projects. After a work order reaches a division, it gets assigned a project manager, who is charged with managing that work until completion. The cradle-to-grave management establishes ownership of that requirement and cuts down on projects “falling through the cracks,” although I was assured that communication issues do still occasionally happen.

E. COLLIER COUNTY FACILITIES DEPARTMENT

Collier County was created in 1923 from neighboring Lee County in Southwest Florida (Florida's Paradise Coast, n.d.). World War II introduced hundreds of aviation service members to Collier County, when the U.S. Army Air Field—now Naples Airport—was activated in 1943 (Florida's Paradise Coast, n.d.). I was afforded the opportunity to interview the Principal Project Manager, John McCormick. A graduate of Ohio State University with a Masters in Operational Excellence, McCormick is a student and a proponent of Lean Six Sigma, and as such, our discussion went deep into process improvements and the importance of identifying bottlenecks. A copy of their organizational chart is shown in Figure 28.

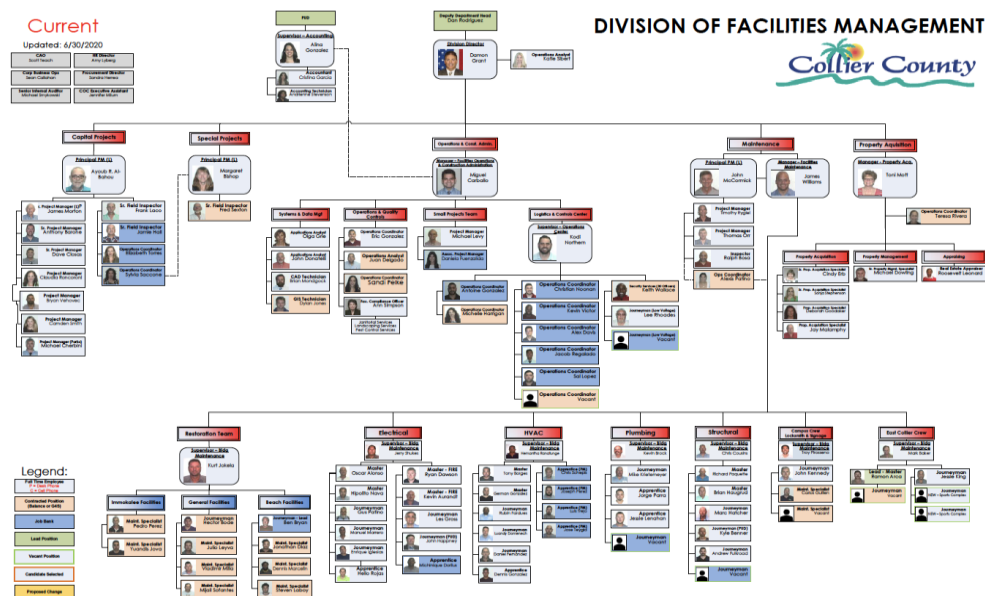


Figure 28. Collier County Facilities Organizational Chart. Source: J. McCormick, personal communication, July 28, 2020.

Collier County's work induction process is similar to other institutions in that a member of the county notices a problem and submits a work authorization electronically via CityWorks, an online database accessible via website. The work order then gets sent to either the in-house workforce or to Capital Improvements depending on size and complexity. McCormick's team manages a lot of the smaller, CAT III/IV-type projects. He also spoke extensively about ProCore Construction Management Software and the productivity benefits that software system brings, as well as the county's slow move to Building Information Modeling (BIM) and REVIT designs. The county has no incentive pay structure, something that we both see benefits in having. Finally, the county does not have an established training pipeline. They hire experienced personnel and encourage people to take the project management professional (PMP) exam, but they have no training structure currently in place.

Interestingly enough, the biggest takeaway I took from this interview was Collier County's acquisition methods. Collier County frequently awards time and material contracts rather than the typical government-preferred firm-fixed price contracts. While time and material contracts are seemingly easier to award with a simpler bidding process, more risk is shifted to the contracting officer and inspector to ensure that not only the bid is fair and reasonable with estimated labor hours and material but that the contractor actually spends those hours in the field. Similar to other organizations' processes, Collier County has been doing this for so long that nobody really asks questions about the methods as long as the quality delivered continues to be good, which it has been.

F. SUMMARY

Over the span of 3 months, I interviewed 18 personnel from six different organizations including NAVFAC itself. A full list of the interviews can be found in Appendix I. While the intent of the interview was to try to find innovative ideas for how to maintain facilities, the reality is that many organizations, government and civilian, suffer the same organizational and bureaucratic struggles as NAVFAC. The three government agencies, USACE, GSA, and Collier County Facilities Department, although at different levels of government, are layered, which creates issues with a lack of autonomy at the

lower levels and communication issues between the divisions. While these agencies may suffer organizational issues, they excel in other areas.

- USACE has a robust training program based out of Huntsville, AL, that I had never heard of before interviewing one of their employees.
- GSA has a wide range of tools available to the federal government in an attempt to speed up procurement.
- Collier County Facilities leans forward with new technology in an attempt to enhance productivity across the organization.

The two universities that I interviewed were the most impressive. Though civilian organizations are not hampered by the same contractual restrictions as NAVFAC, these organizations were more integrated across the divisions, which appeared to dramatically increase their productivity.

- Virginia Tech relies on cradle-to-grave management and cross-functional teams to ensure integration across their organization.
- The University of Houston is following in similar footsteps utilizing facility zone managers to track requirements in their respective areas, as well as establish cradle-to-grave project management.

Perhaps the single greatest difference between government and non-government is the rate of adoption of new technology. For example, entities not restricted by the FAR have the ability of going paperless especially because technology today supports fully digitized files. While new technology may be costly on the front end, embracing programs such as DocuSign could prove extremely beneficial in the long run. DocuSign is an electronic document service that offers a plethora of services to automate and connect agreement processes. The company signed a long-term agreement with Microsoft in 2014 (Microsoft News Center, 2014) and is widely available through Microsoft Office 365 as an add-in. With NAVFAC starting to embrace SharePoint for collaborative work efforts, DocuSign should be a program to consider for eSignature support.

Ultimately, while technology can be helpful in ensuring work does not fall through the cracks, it takes the establishment of ownership to ensure productivity across an organization. There will always be communication issues regardless of how flat an organization is or how many silos are broken down. Furthermore, many of the project flow issues appear to arise at the hand-off between divisions. The application of cradle-to-grave project management may not solve all of the issues, but it does ensure that projects flow at a steady state through the system by requiring an “owner” to follow up on it.

V. RECOMMENDATIONS AND SUGGESTIONS FOR FURTHER ACTION AND RESEARCH

As an organization, NAVFAC has attempted to tweak the work induction process multiple times. Having served previously in NAVFAC Washington, PWD Annapolis was part of a FEC wide study targeting a work induction “best practices” solution. That solution became the NAVFAC Washington solution rather than the NAVFAC wide solution, which I believe is part of the problem. In Ralph Spillinger’s *Adding Value to the Facility Acquisition Process*, the late 1990s saw NAVFAC headquarters shift significant responsibility and authority to field offices affording them a greater degree of autonomy (Spillinger, 2000). Today, NAVFAC operates a centralized control and decentralized execution relationship between headquarters and field offices. By utilizing FECs to support field offices, the end goal is to afford the field offices the flexibility of being able to innovate when it comes to their own processes, offering the Business Management System (BMS) as a baseline. However, this is inefficient for many reasons. Perhaps the largest inefficiency comes from Public Works Departments coming up with their own processes rather than concentrating on maximizing production at their bases. It is my opinion that processes should be standardized and distributed. Public Works Departments that want to deviate from the standard process for whatever reason should submit a waiver to their Echelon III command. The goal though should not be to stymie progress. I suggest there be a process put in place, similar to the current corrective action request (CAR) process for the BMS, for submitting requested changes to NAVFAC-wide processes. It can be reviewed at NAVFAC Headquarters and if approved can be distributed to all of the field offices for implementation. The goal of process management should be standardization across the field offices with an understanding that while some field offices may be “unique,” the vast majority are not precluded from operating like a standard field office.

Finally, the ultimate goal of this project was to step outside of solely analyzing the processes and delve deeper in order to suggest a more systematic change to the organization itself. While there are ways to enhance the process or to increase productivity within the organization (see recommendations one and two) by leveraging existing systems and

upgrading specific information technology tools, after a plethora of interviews with active FEAD Directors and outside organizations, I chose to include recommendations (three and four) that target an organizational enhancement which would not only integrate the field level organization but also help streamline work through the different divisions.

A. RECOMMENDATION ONE: LEVERAGE TECHNOLOGY TO ENHANCE THROUGHPUT

After analysis of the CAT III/IV process, it is clear that the bottlenecks were the development of the scope of work and estimate, the technical analysis, and the establishment of a tracking record. The proposition of leveraging technology has three parts and addresses all the bottlenecks.

A1. ADD A CAT III/IV REPOSITORY TO THE NAVFAC PORTAL.

NAVFAC should develop a repository for CAT III/IV scopes of work, technical analyses, and lessons learned and place it in an accessible location on the NAVFAC Portal. Building scopes require communications with the customer, measurements, code compliance checks, and an understanding of how the contractor would/could execute the project. While a repository of past constructed scopes would not alleviate all of the effort associated with CAT III/IV work, Public Works Departments should not have to start from scratch when building a scope of work. Of note, even at the organization level, PWDs are not capturing lessons learned or identifying robust scopes of work to be used in future projects. To improve speed and better integrate the enterprise, PWDs should collaborate and share scopes of work of successful projects. Since CAT III/IV work is low in complexity, there should be little issue sharing across FECs with an understanding that there may be minor variances in code restrictions from region to region. Also, because access to the portal is limited to NAVFAC employees or approved external users, there is little issue with employees sharing scopes of work. By uploading to a single repository, example scopes of work, lessons learned, and technical analyses can be shared and distributed at the touch of a button. As such, employees should be encouraged to submit scopes of work through their respective FECs for eventual upload into a large repository within the Portal itself. Reducing the duration of these activities and relieving this bottleneck yields an 8.3% increase in efficiency and an estimated 83-hour efficiency gain across the entirety of the

process. After discussion with NAVFAC SW CIO, this idea would not be labor intensive and could be easily implemented.

A2. CREATE A TRAINING PIPELINE FOR CAT III/IV PERSONNEL

There is currently no training pipeline for CAT III/IV personnel. While the intent is to hire qualified, experienced personnel for the CAT III/IV group, it would be beneficial to have technical courses to allow in-house personnel to expand their knowledge base. These courses would help CAT III/IV personnel grow, training them in areas outside their presumptive expertise. The key to this proposition is that NAVFAC does not need to develop their own training program, but rather leverage existing training. In my interview with the Army Corps of Engineers, I learned that USACE has an in-depth technical training located all across the country. The PROSPECT program provides job-related training through technical and professional courses. A proposed list of courses that could benefit the CAT III/IV personnel is included in Appendix F. However, these alone are not enough. NAVFAC as an organization needs to continue to search for beneficial courses for our people, as well as leverage the idea of “train the trainer.” Investing in our people is not a choice, but rather a necessity, as our people remain our greatest asset.

A3. LEVERAGE COLLABORATIVE TECHNOLOGY TO ENHANCE PRODUCTIVITY. In a time of reduced budgets and increased workload, it is imperative that NAVFAC utilize all tangible and intangible resources to their full extent to maximize productivity. Facilitating collaboration across an organization is key to improving employee productivity. “A recent American study of 1,100 companies executed by the Institute for Corporate Productivity and Rob Cross of Babson College in Massachusetts found those companies that encouraged the use of collaborative technology were five times more likely to be high performing” (Frery, 2017, para. 3). “Humans naturally form into small groups (teams) and larger communities (tribes). People will identify with those groups, often more strongly than the wider enterprise in which they work,” says Graham Winter, former chief psychologist for the Australian Olympic team and founder of Think One Team, a consultancy which helps companies work as single teams, regardless of traditional boundaries (Frery, 2017, para. 4). These organizational silos may be inevitable, but with the rise of cell phones and mobile communications, collaboration software has

attempted to break down those silos. The benefits of using collaboration tools have been documented, as companies using Slack, a messaging tool similar to the chat feature in MS Teams, report an average 49% reduction in email volumes, 25% drop in the number of meetings, and perhaps the most important, a 32% increase in productivity (Frery, 2017). With the rise of the coronavirus, NAVFAC employees have been required to be more flexible than ever, working from home, and forcing teams to adapt their communications. This new environment makes it even more essential that NAVFAC capitalize on Microsoft SharePoint to the maximum extent possible. Aside from solely an enhancement of communication, the ability to simultaneously edit a document across an organization could greatly increase productivity and reduce cycle times within the respective PWDs.

B. RECOMMENDATION TWO: LEVERAGE EXISTING SYSTEMS TO IMPROVE THE ACQUISITION PROCESS

Contract management can be defined as “the art and science of managing a contractual agreement through the contracting process” (Rendon & Snider, 2008, p. 164). Government acquisition is slow by design. Plagued with statutory requirements and solicitation timelines, offices are charged with utilizing small business set-asides or sole solicitation awards in an attempt to shorten the timelines in order to meet operational requirements.

From the acquisition process analysis completed in Chapter III Section III.C, I found that the constraints on the acquisition process were the processing of funds, the reception of the proposal, and the work induction process. The processing of funds should be considered a topic in and of itself, and I elaborate on this in Appendix H. Therefore, in this section I focus on reducing the time it takes to receive a proposal.

B1. EXPAND ADOPTION OF FEDMALL AT THE FIELD OFFICE LEVEL. While FAR Part 5, Publicizing Contract Actions, details the restrictions for how long a solicitation needs to be posted in a public setting which varies based on contract type and value (United States Government, 2020-a), sole source procurements can alleviate that requirement. However, those require a tangible justification and approval that require higher echelon approval. Therefore, we are in a position where we need to find different

ways to reduce the time it takes for a proposal turnaround. One potential way is proper utilization of FedMall. My interviews with several FEAD Directors suggest that offices are not taking advantage of FedMall. While the NFAS specifically restricts purchases of construction on FedMall (Naval Facilities Engineering Command, 2019-b, p. 63), seemingly because of the necessity for a scope of work, utilization of this government e-commerce system for services would dramatically decrease the number of task orders that are required to flow out of a contracting office. As previously discussed in Chapter III, reduction of the number of task orders would not alone relieve the bottleneck, simply because the number of task orders cannot be cut enough to matter. However, reducing the inflow would reduce the number of projects in the process queue, relieving congestion and allowing a quicker turnaround for new requirements. Reviewing PWD Annapolis' workload in eContracts for FY19, their FSC processed more than 235 contract actions with 48 being suitable for execution in FedMall. As discussed above, the enhancement of speed would be seen primarily across the FSC landscape within the grounds and custodial contracts as they are typically the major service contracts within a Public Works Department.

The benefits of FedMall are expansive and known throughout the organization. In nearly every interview, there was a consistent desire to shift service contracts to FedMall. However, the problem appears to be setting aside the time to actually complete the turnover. Competing priorities consistently push FedMall down the road until it gets to be just another "good idea" that can be done later. While filling out the information sheet is easy enough, the individual needs access to Single Procurement Service (SPS) to complete the process, so the process needs to be led by somebody that knows how to navigate that system (Defense Logistics Agency, n.d.).

My proposition is for the respective FEC to put together a FedMall Transition Team (FTT) to travel to each field office and transition the contracts themselves. The general idea would be that the process would require three steps: first, the field office needs to brief the FEC as to what contracts are not in FedMall and need to be transitioned; second, the FTT, utilizing only their personnel and one field office person as a point of contact,

completes all efforts necessary to transition the contracts; third, the FTT conducts training on FedMall to the acquisition department and facilities support contract manager (FSCM).

Estimated costs would vary from FEC to FEC as travel requirements would be more robust for a FEC like NAVFAC MIDLANT versus NAVFAC Washington, however as a benchmark, Table 12 contains estimated costs for NAVFAC Washington. I utilized a 5-day working period for a team of three FEC acquisition personnel.

Table 12. Estimated Costs of FedMall Transition Team at NAVFAC Washington (Excluding Labor)

Base	Mileage (round trip)	Days Visiting	Per Diem (\$)	Cost per mi (\$/mi)	Total Cost (\$)
PWD Annapolis	64 mi.	5 days	N/A	\$.125/mi	\$40
PWD Pax River	128 mi.		\$151		\$2,281
PWD Quantico	74 mi.		\$151		\$2,274
PWD JBAB	7 mi.		N/A		Negligible
PWD Washington	-		N/A		Negligible
PWD Dahlgren	98 mi.		\$151		\$2,283
PWD Indian Head	54 mi.		\$151		\$2,271
PWD Bethesda	22 mi.		N/A		\$14

B2. EXPAND THE USE OF GSA ACROSS THE ORGANIZATION. A second suggestion within recommendation two is to expand the use of GSA across the organization. While I am not suggesting that NAVFAC abandon, or even scale back, the creation of FEC-wide multiple award construction contracts or trade specific IDIQ contracts, utilization of GSA is an option, a tool, that should be considered when performing acquisition planning yet appears to be hardly used by the NAVFAC enterprise. While addressed in FAR 8.4—Ordering Procedures, the Naval Facilities Acquisition Supplement specifically restricts utilization of Federal Supply Schedules (FSS) for “only direct acquisition for services including knowledge based services, roof repairs, and leases at or below the Simplified Acquisition Threshold (SAT), but above the micro-purchase threshold, or for commercial off-the-help items up to and including \$7,000,000” (Naval Facilities Engineering Command, 2019-b, p. 35). While it is unclear why NAVFAC steers away from using Federal Supply Schedules for roof repairs or other procurements not specifically restricted by the NFAS, it was suggested during an interview that the exclusion

could be related to self-preservation. Regardless of the reason, it appears fruitful to reassess the language included in the NFAS as it is imperative that acquisition departments across the force utilize all the tools employed by the federal government to maximize productivity.

C. RECOMMENDATION THREE: EXPAND THE ROLE OF THE APWO

In order to pivot a business successfully, first we have to pivot our mindset.

—Simon Sinek (Sinek, 2020)

With more than 17,000 employees and 13 component commands, NAVFAC is a large and diverse organization (Naval Facilities Engineering Command, n.d.-a). Comprised primarily of civilian employees and supervised by military leadership, NAVFAC has clearly laid out a robust strategy in the Strategic Design 2.0 as it strives to evolve in its ability to support the warfighter. The Strategic Design lays out three specific lines of effort: Enable Warfighter Lethality, Maximize Shore Readiness, and Strengthen our SYSCOM Team. Strategy, offering a formal pathway in pursuit of a company's goals while simultaneously orienting people around them, is a "primary lever at top leaders' disposal in their never-ending quest to maintain organizational viability and effectiveness" (Groysberg et al., 2018, para. 1). On the other hand, evolving the culture within an organization can be more confounding. "Culture expresses goals through values and beliefs and guides activity through shared assumptions and group norms" (Groysberg et al., 2018, para. 1). While strategy and culture are inexplicably linked, "as somebody once said, culture eats strategy for breakfast" (Groysberg et al., 2018, para. 4).

Culture shifts are complex for established organizations. They find it very hard to alter their grand strategy without changing its culture first. Not every organization has the option of turning over their field level leadership to reestablish their culture, nor should removing personnel be the prime lever to be pulled by leadership. Moreover, it appears prudent that any attempt to change the culture should start at the ground level, early in the team building process.

NAVFAC's field level employs a functional organization, where each division has a specific set of duties and expertise that they bring to the table. The functional organization

is simple in that the division has one boss, one set of responsibilities, and a single group to engage with. However, groups that are organized in a functional fashion frequently suffer from reduced communications across the workforce. The divisions silo themselves, resulting in reduced teamwork, degraded productivity, and an overall lack of camaraderie. To combat this, NAVFAC should adjust their field level organizations to a cross-functional team-based organization. Employing multiple military officers as the horizontal integrators, field level organizations would restructure their manpower into small teams delineated by a specific customer or a group of buildings they are responsible for. By organizing their office into focused teams, communication would be enhanced, expertise would expand to customers and specific buildings rather than solely to an individual's job, and efficiencies would be gained by working with the same people consistently. Culture does not change overnight, but any dramatic shift in strategy demands a preemptive overhaul of the culture. In the words of Bob Chapek, current CEO of Disney, "It's less about spreadsheets, it is more about the guest, the brand, the franchises, the stewardship. Disney's strength came from the business units working collaboratively instead of working in "a top-down corporate structure where everything is dictated" (Collis & Hartman, 2018, p. 8). By restructuring the organization to revolve around the customer, we can empower NAVFAC personnel to embrace a sense of ownership.

Without question, restructuring the organization would be complex. The last dramatic shift was in the early 2000s with the integration of the Public Works Centers with Engineering Field Divisions and Engineering Field Activities with ROICC offices into FECs and PWDs respectively. That being said, I see two attractive options to organizationally shift NAVFAC. The first option is to institute military officers, Assistant Public Works Officers (APWOs), at every installation and expand their duties to include project management, specifically cradle-to-grave management of requirements. Certain bases are currently employing junior officers as APWOs, typically for high visibility customers. However, my intent is to expand that employment, not by adding Civil Engineering Corps (CEC) officers to PWDs, but rather by altering currently assigned construction manager billets into additional APWO billets.

There are multiple ways of executing this, and my suggestion would be to allow each Public Works Officer the flexibility to determine how they want to accomplish this directive. However, to be clear as to my intent, one such way is to divide a base into geographical regions. Using PWD Annapolis as an example, the base would be broken up into three separate regions: Lower Base, Upper Base and Naval Research Lab at Chesapeake Bay, and North Severn. My recommendation would have an APWO assigned to each region, and they would act as the single touch point for anything and everything within their region. The regions are color-coded for visual aid and can be seen in Figure 29. While a geographic division is “cleaner” with specific facilities being assigned to specific people, dividing up the organization by customer would work as long as the assignments ensured every customer was represented by an APWO. This methodology is expounded on in Recommendation Four.

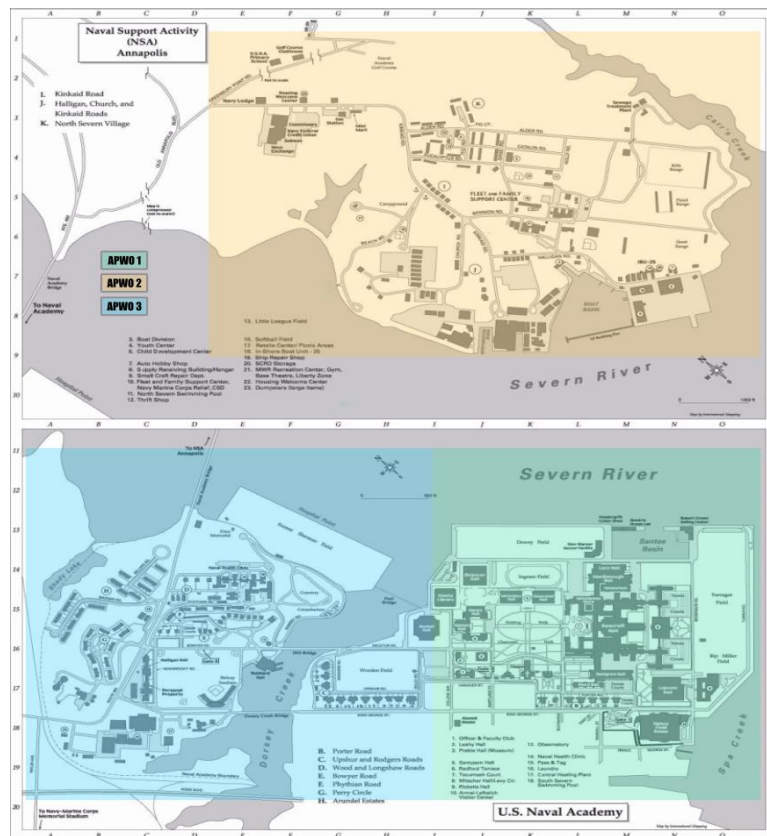


Figure 29. NSA Annapolis Geographically Divided into APWO Assigned regions. Adapted from Commander, Navy Installations Command (n.d.).

The intent behind this reorganization is two-fold. First, junior officers are trained in project management, not construction management, in most undergraduate curriculums, a point I expound upon later in this section. Second, and more importantly, the Public Works Departments desire field-level project managers (FEAD SW, personal communication, May 7, 2020), so why not source them internally? Furthermore, junior officers navigating across the various divisions within Public Works in their first tour as an APWO will pay dividends in their follow-on tours.

While CAT I and II projects typically have project management at the FEC level, there are no dedicated project managers for CAT III/IV work. In my experience, when emergent requirements come through Public Works, they require a “champion” to shepherd the requirement through the NAVFAC system. However, the true inefficiencies can be found by locating the routine requirements that come through the work induction process but remain untouched by the organization for weeks or months. This process stagnation can transform routine requirements into urgent or emergent requirements requiring the organization to drop everything in order to properly execute a project that could have been executed months prior. This lack of tracking is a combination of individual divisions using individual systems, resulting in the silo effect that has been discussed in detail previously, as well as a relative lack of requirement ownership across the PWD. Moreover, the reality is that the sheer amount of work orders and projects that get processed within a typical Public Works Department can be overwhelming. This is why it is so critical to have cradle-to-grave project management within Public Works. With each division working on their own portion of a project, there is no integration. There is no single individual charged with putting the pieces together, tracking step-by-step completion, or ensuring a site approval or an environmental review is completed, entered into eProjects, and the project is handed off to the next individual in the process.

After review of Prather’s research titled “Improving P&S (Product and Service) Delivery ISO NRDE Clients,” I was not surprised to see as a potential solution under Organizational Structure a suggestion to include a “dedicated PMO/IPT to exclusively support NRDE clients” (Prather, 2018, slide 33). At NSA Annapolis, PWD Annapolis is tasked with supporting the Chesapeake Bay Detachment of Naval Research Lab (NRL).

For years, PWD Annapolis struggled with processing and executing NRL's work. It was not until the APWO was directed by the PWO to put together a full assessment of where each project on NRL's integrated priority list that the projects began to start being awarded and executed in an organized fashion. Within the NRDE community alone, there were more than 3,704 actions in FY17 with greater than 84% of the awarded actions falling below \$500,000 (Prather, 2018). Thus, I believe my recommendation would directly aid in the issues facing the NRDE community as well. Within the NAVFAC organization, specifically at the field level, it is essential to have broad based customer representation. The APWOs would not only act as customer representatives but also as project managers, enhancing productivity across the organization.

One expected criticism to this recommendation is, "What about the Facilities Management Specialist (FMS)?" The FMS or Facilities Operations Specialist (FOS), depending on which base you are operating at within NAVFAC, is responsible for the day-to-day operations of individual facilities. Their primary duties entail tracking individual work orders to completion, bringing in new work into the work induction board, and coordinating directly with their respective customers. However, from my interviews with other CEC officers and my own experience, these primary duties preclude these specialists from following up on newly inducted work, relaying the status of CAT III/IV projects to their customers, and following up on funds requests. Moreover, while individual talent varies across individuals, the reality is that one person is not enough to track day-to-day operations as well as big picture project management in support of cradle-to-grave requirements.

The responsibilities of an APWO have evolved over the years as one can see when comparing the 2010 Concept of Operations, which can be found in Figure 30, to the 2019 Concept of Operations, which is represented by Figure 31.

Assistant Public Works Officer (APWO)

(APWOs are established as needed to focus on Supported Commands, geographic area(s), or program director(s)).

- Manage Emergency/Service call/Minor (E/S/M) work requests;
- Coordinate scopes and estimates;
- Plan execution of SRM dollars for Supported Commands;
- Coordinate execution of Maintenance Action Plan (MAP);
- Coordinate all Supported Command facilities requirements/execution;
- Coordinate cradle to grave NAVFAC project management;
- Coordinate energy conservation;
- Support management of Regional budget (Special Interest Codes (SICs));
- Ensure safety of all personnel; and
- Manage product and service delivery within AOR.

Figure 30. Past Duties of an APWO. Source: Naval Facilities Engineering Command (2010).

Assistant Public Works Officer (APWO). The APWO is established as needed to manage P&S delivery, focused on supported commands, geographic areas, or as a program director.

Figure 31. Current Duties of an APWO. Source: Naval Facilities Engineering Command (2019-a).

Adding project management to the list of responsibilities for the APWO would not be a dramatic expansion. Also, while removing military from the construction management role would create a short-term manpower gap in Capital Improvements, these positions are currently over allowances as they are not taken into account during the resource allocation process (RAP). Furthermore, it can be argued that military personnel who are placed into construction management roles are ill prepared to take on such responsibility. This is not to take away from members of the Civil Engineer Corps that excel in these positions, which I am sure is a robust list, though I would argue that these same officers would be better served as APWOs especially early in their CEC careers. Construction management has robust technical requirements that primarily depend on experience with scopes, codes, and contractors. Through experience, construction managers take lessons learned from previous employments as well as specific projects and apply them to new projects. On the contrary, project management is a skill that most college engineering programs teach. Moreover, enabling junior officers to operate across the different divisions of Public Works

will provide them a better understanding of NAVFAC's business model early in their careers, further promoting the Chief of Civil Engineer's current focus on craft expertise.

Finally, with the existence of the Civil Engineer Corps Officer School (CECOS), the CEC community can utilize this platform to train young junior officers in the PMP curriculum. These lessons in scope management, schedule management, and quality management will promote enhancements in project management, and will also teach young junior officers skills that can be carried over to future jobs, both within NAVFAC and in the Expeditionary arena as well. I have included a proposed adjustment to the CECOS curriculum, which can be found in Appendix G.

D. RECOMMENDATION FOUR: RESTRUCTURE THE FIELD LEVEL ORGANIZATION

In 1982, RADM Zobel, then Chief of Civil Engineers, wrote in the Navy Civil Engineer,

[An] organization is like a shrub that grows and must be periodically trimmed and reshaped to assure proper growth and viability. I want our organizations, headquarters and field, to be pruned and reshaped for optimum efficiency. Simplification will be the prime criterion. An intricate and complicated organizational structure breeds intricate and complicated procedures, and these defeat efficiency and productivity. We will reduce vertical layering and horizontal staff "cul de sacs." Our workflow through the organization shall determine its structure, rather than vice versa. Field activity organizational changes will be processed in accordance with current NAVFAC directives. (Zobel, 1982, p. 17)

Even in the early 1980s, NAVFAC leadership saw the importance of aligning an organization's structure with its workflow. APPA wrote, "As a support organization, it is clear that a successful facilities organization must imbed itself into the campus dynamics" (APPA, 2015, p. 62). I have spent a considerable amount of time in this report discussing the necessity for a cultural overhaul across the NAVFAC organization, introducing topics like organizational agility and lateral integration. Confirming this requirement, Prather, in his research on NRDE support, found organizational inefficiencies across NAVFAC related to culture, organizational structure, and business line integration (Prather, 2018). While horizontal integration through the expansion of the APWO role is an initial step

towards integrating the organization, the true methodology to gaining speed and agility in the facilities management arena is to align strategy with the entire operating model—the structure, leadership, planning, and budgeting. NAVFAC can accomplish this by restructuring the field level organization into a customer-centric organization.

Hemel and Rademakers, in their paper “Building Customer-Centric Organizations: Shaping Factors and Barriers,” define a customer-centric organization as

A business approach that places the value perception of the customer at the centre of attention and takes it as the starting point for all organizational activities. Strategy development starts consistently at the customer and flows back to the organization (as opposed to inside-out thinking; that is, from the organization to the customer). The aim is to create an optimal and distinctive fit between the value perception of the customer and the products/services offered. In this way, superior value is created for the customer, and superior value is captured by the organization. (Hemel & Rademakers, 2016, p. 214)

The benefits of such a move could be vast. By realigning the field-level organization to meet the customer’s requirements, the organization can transform into an agile workforce, breaking down the PWD’s functional silos while simultaneously streamlining work processing. Teams would be dedicated to working with specific customers, concentrating on specific buildings. Dedicating the teams to specific customers would establish the ownership that NAVFAC is currently missing outside the Construction Contracting Cell (CCC). As evident in the NUMMI case study, a sense of ownership can have a dramatic effect on an organization’s overall culture.

Creating a customer-centric organization by instituting CFTs makes the most sense for the Public Works portion of the PWD. Grouping FMD, Production, Financial Management, and Environmental into teams to support specific customers provides an expert for each customer, integrates the organization across the different divisions, and allows the APWO to lead the effort on behalf of their respective CFT. However, Capital Improvements (CI) is a bit more cumbersome. Because Work-In-Place (WIP) per customer is more often than not cyclical on a yearly basis, it is difficult to organize CI in such a way to support the customer-centric organization. In Annapolis, like other bases, customer funds ebb and flow frequently, so dividing the Engineers and Designers (E&D) and the Construction Manager (CM) and Engineering Technician (ET) groups would need to be

redone every year to support the proposed yearly workload. That being said, Figure 32 depicts one example of what a customer-centric organization could look like if applied to a Public Works Department.

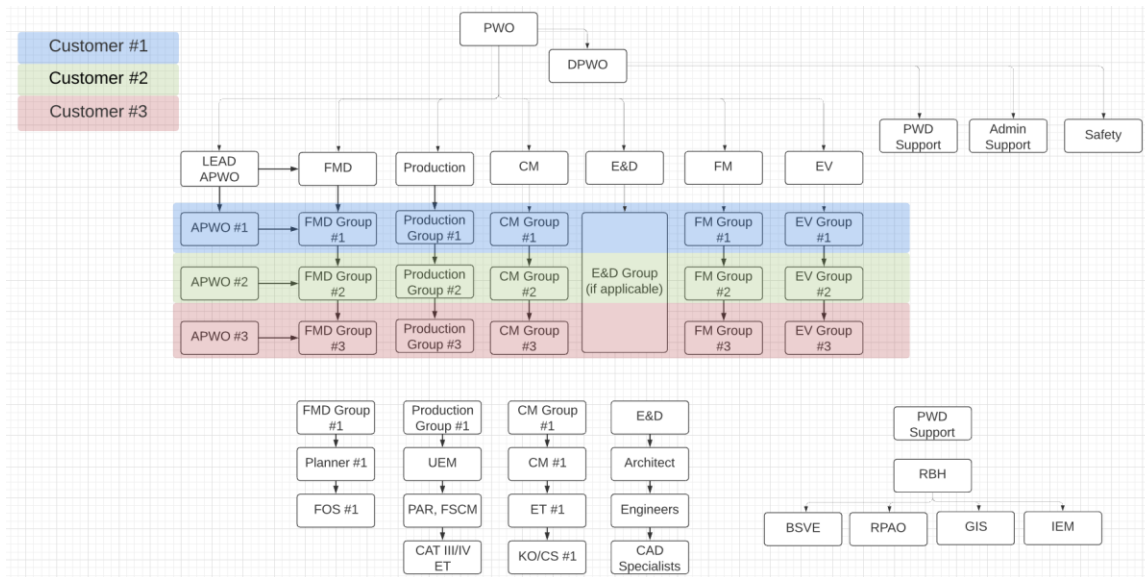


Figure 32. Example of a Customer Centric Organization.

The beauty behind the utilization of agile teams within a customer-centric organization is that they may not even require changing reporting lines. While their managers would act as long-term professional development coaches, their daily activities would be executed and dictated by their teams (Rigby et al., 2020).

This is not a quick fix or a change that can be implemented in a matter of months. Companies like Bosch Power Tools applied agile methods to their organization, piloting it first and then implementing it over three years (Rigby et al., 2020). NAVFAC should follow a similar approach, while taking note of a few suggestions laid out by Satell (2019) in “4 Tips for Managing Organization Change.” The first suggestion is to start with a small group. For this type of large-scale change, NAVFAC would need to beta test this at a PWD, preferably one who is already struggling with a cultural identity. A small group’s success can build momentum for the organizational change in an effort to overcome the systematic

inertia, which will be discussed in next section. Second is to identify a keystone change. While vision and strategy are important, groups need specific goals and data to know if the change is working. This is beneficial because if the data shows little improvement, the changes can be tweaked, or if the data shows significant improvement it can continue to fuel the momentum. Third is to network the movement. NAVFAC leadership needs to put together a transition task force that includes members of the field level organization. “Every large scale change requires both leadership at the top and the widening and deepening of connections through wooing—not coercing—an ecosystem of shareholders” (Satell, 2019, para. 10). Finally, the fourth tip is surviving victory. When the initial goals are met, the organization should not be satisfied. Instead, like with any project or process, NAVFAC should continue to refine and set new goals in an effort to maximize productivity and support the warfighter across the shore enterprise.

E. BARRIERS TO IMPLEMENTATION

People for the most part are comfortable with the status quo...And any time you have a leader who believes change is necessary, that leader is going to have to deal with tremendous inertia, with tremendous resistance to change.

—Former Secretary of Defense Robert Gates
(Guinto, 2016, p. 26)

E1. BUREAUCRATIC INERTIA. In his article, “For Performance, Think Nontraditional,” Dr. Srinkanth states, “Developing a new more effective system is not the hard part. The hard part is getting an organization to let go of its old outdated measures” (Srinkanth, 1992, p. 52). Change is hard for any organization. After years of working a certain way, it is difficult to imagine performing that work any other way. Organizations fall into the “this is the way we have always done it” trap. Also, when working within government, sometimes the sheer size of the organization can be an impediment to change.

To overcome bureaucratic inertia, it is imperative that leadership ensures that there is a clear alignment between accountability and roles and responsibilities. Guidance from leadership needs to be clear even to the point of over-communication, and managers need to be empowered to lead their teams effectively. Change requires embracing the difficult questions as well as being clear in why the organization is instituting the change in the first place. It’s not enough to have a map of where one wants to go. As a leader, one needs to understand the why, for clarity of purpose is the true driver of change.

E2. BIASES. When I began writing this report, I felt it was critical to approach it with a blank slate, absent any preconceived notions of the organization I have spent more than a decade working in. I ask the reader to do the same. It is difficult to divorce one’s self from their confirmation bias, hindsight bias, or status quo bias. Cognitive biases are part of our emotional construct, but it is important that we call out their existence. By identifying them, the reader can take the proverbial “step back” from NAVFAC and its processes, allowing for an objective review of the current landscape as well as my recommendations.

E3. STRUCTURE CHANGE IMPLEMENTATION. Thomas Sy et al., in *Challenges and Strategies of Matrix Organizations: Top-Level and Mid-Level Managers' Perspectives*, details challenges to implementing matrix structures within organizations following surveys, interviews, and workshops with 294 top level and mid-level managers from seven major multinational corporations in six industries. The five major challenges were identified as: misaligned goals, unclear roles and responsibilities, ambiguous authority, lack of a matrix guardian, and silo-focused employees (Sy et al., n.d.). As previously discussed, a matrix structure can create ambiguity especially when transitioning from a traditional hierarchy to a matrix organization. However, the ambiguity in this study was found in the middle management rather than top-level managers as more than 80% of middle managers complained about unclear roles and responsibilities. These challenges are part of the reason for the recommendation for a transition team. Executing a structure change like this cannot come from the top down, but instead requires buy-in at the field office level. To combat the challenges introduced by a matrix organization, Sy introduces four fundamental elements when establishing roles and responsibilities: clear guidelines; assignment of accountability for objectives; a single point of contact for information or approval for areas of responsibility; and a set plan for communication and information sharing (Sy et al., n.d.). These elements can be found in tabular format in Figure 33.

RASIC									
R – Responsible A – Approve S – Supports I – Informed C – Consulted									
	Executives	Directors	SMS	Analyst/ Experts	Special Studies	PM/Buyer RVT/STA	SCT	GC	Supplier
Address executive management strategic inquiries	S	S	RA			S	S	S	S
Conduct strategy initiative workshops	C	C	RA	C	SI	SI	I	I	S
Collect and perform extended data analysis in support of strategy development	CI	CI	RA	C	SI	SI	SI	SI	SI
Provide solutions, strategies, and actions to management executives	I	I	RA	C	C	SI	S	S	S
Capture intellectual capital	CI	CI	RA		I	SI	SI	SI	SI

Figure 33. Responsible, Approval, Support, Inform, Consult (RASIC) Tool.
Source: Sy et al. (n.d).

Finally, Sy et al. writes, “Employee behavior is perhaps the most critical challenge that matrix organizations face” (Sy et al., n.d., p. 46). How can prospective implementers combat this challenge? Sy’s study details three best practices: define expectations of your employees clearly; provide training for how the matrix organization is going to work; and help build personal relationships between the employees. Utilization of the RASIC tool, achieving buy-in at the field level, and using the APWO as the matrix guardian will help NAVFAC successfully navigate this challenge.

F. SUMMARY AND RECOMMENDATIONS FOR FUTURE RESEARCH

NAVFAC is a robust organization with a storied history. With its origin dating back to 1842 when it bore the name the Bureau of Yards and Docks, NAVFAC has met and overcome a multitude of challenges, while experiencing organizational evolutions. Executing more than \$14 billion in fiscal year 2019, NAVFAC has grown to be a major factor in the operational readiness of our shore enterprise. The CAT III/IV program represents a fraction of that portfolio, but as we have discussed, these projects, albeit small, have the ability to significantly affect readiness.

By leveraging technology and existing systems, NAVFAC can enhance project throughput and overall process cycle times. Creating a repository of scopes of work, estimates, and technical analyses will reduce the duration of those associated activities by offering CAT III/IV technicians an approved, successful model for which they can mold to meet the requirements of their specific project. Building a training pipeline and expanding the use of collaborative technology are two ways to invest in our people and increase productivity. Aiding field offices in transition to FedMall as well as expanding the use of GSA contracts will reduce the workload and inflow of contract requests, allowing the acquisition team more time to focus on more complex contracts.

While the adjustments above will enhance productivity, there needs to be a more dramatic change across the organization. Horizontal integration has been successfully applied to many organizations enhancing communication, productivity, and workflow. By increasing the number of APWOs at field offices as well as expanding their duties, the APWO can become the horizontal integrator across the organization. The APWO would

also act as the project manager for all projects within their sector of responsibility or for their assigned customers. This evolution to a matrix organization would integrate the organization, connecting public works personnel directly with customers, building relationships, and tearing down the silos that erode camaraderie and degrade communication. NAVFAC has long supported the shore enterprise with distinction, but it is time to rebuild the organization to more efficiently serve the warfighter with speed and agility.

The single common bottleneck across both the CAT III/IV and the acquisition process is the funds release and acceptance procedure. While I performed preliminary research on the subject, which can be found in Appendix H, NAVFAC is currently undergoing significant changes to their financial management program as well as sunsetting the Navy Working Capital Fund (NWCF). Therefore, it is my suggestion this topic be assigned to another CEC officer in the future, following the completed system migration to the Command Financial Management System (CFMS).

Finally, the recommendations made are only intended for CONUS locations. After multiple conversations with personnel located within NAVFAC EURFACENT, there are several nuisances working overseas that make those field offices unique. That being said, many of the organizational changes recommended, if proven successful, could benefit overseas field offices, and it is my suggestion that further research be done on this topic.

APPENDIX A. K19/02



K19/02
7 Mar 2019

To: Commander, Naval Facilities Engineering Command, Atlantic
Commander, Naval Facilities Engineering Command, Pacific
Commander, Naval Facilities Engineering Command, EXWC
Director, Navy Crane Center

Ref: (a) NAVFAC INSTRUCTION 3354.1, Naval Facilities Engineering Command Work Induction System, Jun 2008
(b) BMS F-30.1 Work Induction System, Jan 2013
(c) NAVFAC NOTICE 7040.5, Naval Facilities Engineering Command (NAVFAC) Products and Services, Nov 2017
(d) BMS S-18.4.2 Access and Management of Electronic Procurement Systems, Apr 2018
(e) BMS S-17.2.1 Purchase Request Review, Apr 2018
(f) Acquisitions eContracts Application Training Manual, Jun 2011
(g) BMS F-30.2 Workload Management, Jan 2013
(h) ieFACMAN eProjects Quality Metric Training Manual, Oct 2017

Subj: EPROJECTS AND ECONTRACTS DATA COMPLETENESS

Encl: (1) eProjects and eContracts Required Data Matrices, Phase 1
(2) Example eSystems Completion Scorecard

1. BACKGROUND. NAVFAC's policy to exclusively use our authoritative data systems, especially ieFACMAN, for the management of all Product and Service (P&S) deliverables is long-standing, see references (a) and (b). The official list of P&S is established by reference (c). References (d), (e), and (f) provide Acquisition Support Line requirements and procedures for receipt of contract support requests from eProjects. Collectively, these references establish NAVFAC's policy to use ieFACMAN as the authoritative data source for all of our analytics efforts.

Reference (g) covers overall work management process from work induction through execution using the eSystems tools. Further, this reference is the basis for a wide variety of Process-Driven Training (PDT) courses covering most areas of NAVFAC's P&S. Reference (h) is a data quality standard for the Capital Improvements Business Line (CIBL) and includes detailed guidance on when and how to populate data fields within eProjects for E and N-line data records. References (g), (h), and associated PDT courses are the primary implementation guidance for our work management systems.



Figure 34. K19/02 EPROJECTS and ECONTRACTS Data Completeness,
Page 1. Source: Korka (2019-a).

Subj: EPROJECTS AND ECONTRACTS DATA COMPLETENESS

NAVFAC eSystems data is the foundation of evaluating performance, tracking work, communicating with supported commands, and making data-driven business decisions. There is a direct tie between business system data and the Strategic Design 2.0 **Product and Service Performance** Focus Area through which NAVFAC aims to achieve the insights, ideas, and expertise to integrate state-of-the-art technology, processes, and efficiencies into our core business.

2. PROBLEM STATEMENT. Recent Commander's Update Briefs and Operations Assessment Briefs have revealed the following:

- a. There is significant missing or erroneous data in our ieFACMAN work management system. Due to incomplete data within ieFACMAN, NAVFAC has difficulty analyzing root causes, seek improvements to productivity, or monitor adherence to project delivery timelines.
- b. NAVFAC elements at all levels continue to maintain standalone work management tools as a work-around for limitations in the ieFACMAN system. Standalone tools prevent multi-echelon data sharing, do not contribute to centrally available metrics, and mask systemic problems with our IT systems.
- c. Only CIBL has a robust data quality guidance document, ref (h). Comparable implementation guidance for data quality for P&S lines other than E and N does not exist at the level of granularity required to support current analytics efforts.

3. POLICY. Effective upon release of this message, I am directing an immediate NAVFAC-wide focus on the eSystems fundamentals in which every employee in the command is involved. Minimum required data fields for eProjects Business Line P&S Deliverables and eContracts are listed in enclosure (1) as *the initial Phase 1 starting point*. Data fields required for E & N line records are based upon reference (h). Data fields required for all other P&S record types are based upon NAVFAC HQ Subject Matter Expertise and will stand until implementation actions per 4.d are complete.

4. IMPLEMENTATION. As a SYSCOM, we must renew and restore the fundamental requirement that all P&S deliverables are input into eProjects and all contract actions route into eContracts through the Electronic Contract Request functionality. As such, I am directing the following immediate actions to restore the proper usage of our eSystems across all levels of NAVFAC.

- a. NAVFAC HQ OPS will distribute a scorecard to be used for bi-weekly progress reports to the Echelon III commands not later than (NLT) 13 Mar. Example attached in enclosure (2).
- b. Echelon III and IV commands will develop an aggressive plan to oversee and monitor progress and submit progress reports every two weeks, using the scorecard summary, enclosure (2), to NAVFAC Headquarters OPS.



Figure 35. K19/02 EPROJECTS and ECONTRACTS Data Completeness, Page 2. Source: Korka (2019-a).

Subj: EPROJECTS AND ECONTRACTS DATA COMPLETENESS

- c. NLT 30 Apr, NAVFAC HQ OPS/BD will update references (a), (b), (c), and (g). All other Business and Support Lines will support this effort.
- d. NLT 30 Jul, as Phase 2 of this effort, NAVFAC HQ OPS/BD will present to me a holistic plan to establish implementation guidance for data quality across NAVFAC. When signed, this guidance is intended to supersede enclosures (1) and (2). All other Business and Support Lines will support this effort.

5. **DESIRED EFFECT.** Conducting analytics to improve quality, speed, and agility in the management of our work is imperative to maintaining the trust and confidence of our Resource Sponsors and Supported Commanders. Our eSystems are designed to empower this analysis and management for all project-related work. Without the use of trustworthy data contained within the authoritative eSystems for execution (eProjects and eContracts), NAVFAC cannot reliably manage our P&S deliverable workload, nor measure our performance to plan. Our goal is to achieve a 90% data completeness score within 90 days of release of this message (07 Jun).



J. W. KORKA
RADM, CEC, USN
Chief of Civil Engineers



Figure 36. K19/02 EPROJECTS and ECONTRACTS Data Completeness,
Page 3. Source: Korka (2019-a).

Encl (1): eProjects Required Data Matrix

DATA COMPLETENESS SUMMARY REPORT BASED ON MATRIX BELOW.													
Query: Date Created: From 10/1/2013 to today's date													
LEGEND: YES--FIELD REQUIRED TO BE FILLED OUT FOR THE P&S LINE. NO--FIELD IS NOT REQUIRED FOR THE P&S LINE. FOR YES CELLS, IF THE FIELD IS BLANK, DATA COMPLETENESS IS NOT COUNTED FOR INDIVIDUAL RECORD. % CALCULATION = TOTAL DATA COMPLETE RECORDS/TOTAL RECORDS IN P&S LINE (BY COMPONENT*)													
FIELDS	CIBL			AMBL		EV		PW					CE
	E Line	N Line	O Line	D Line	V Line	M Line	L Line	H Line	J Line	Z Line	Y Line	X Line	B Line
Workorder #													
Date Created													
Business Line													
P & S Line													
P& S Deliverable													
Project Title													
Business Line													
Responsible Org													
Execution Org													
Supported Command Program													
Status													
Budget Fiscal Year	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Location UIC/Name	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
Special Area	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
Facility Number	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
Using Activity UIC/Name	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
Estimated Cost/PA	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Responsible Component	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Responsible Team	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Execution Component	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Execution Team	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Project Manager (TEAM)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Command Sponsor	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
Classification of Work	Y	N	N	N	N	N	N	Y	N	N	N	N	N
Special Interest Code	Y	N	N	N	N	N	N	Y	N	N	N	N	N
FIS Auth Number	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Fis User Code	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Appropriation	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Latest Statist Note Date	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Latest Status Note	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Design Agent	Y	N	N	N	N	N	N	N	N	N	N	Y	Y
Design Level	Y	N	N	N	N	N	N	Y	N	N	N	Y	Y
Acquisition Method	Y	N	N	N	N	N	N	Y	N	N	N	Y	Y
Acquisition Tool	Y	N	N	N	N	N	N	Y	N	N	N	Y	Y
Construction Office	Y	N	N	N	N	N	N	Y	N	N	N	Y	Y
Environmental Planning	Y	N	N	N	N	N	N	Y	N	N	N	N	N
CE Program	N	N	N	N	N	N	N	N	N	N	N	N	Y
COCOM	N	N	N	N	N	N	N	N	N	N	N	N	Y
Country	N	N	N	N	N	N	N	N	N	N	N	N	Y
Decimal Deg. Latitude	N	N	N	N	N	N	N	N	N	N	N	N	Y
Decimal Deg. Longitude	N	N	N	N	N	N	N	N	N	N	N	N	Y
Source	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Proj Deliv FY	N	N	N	Y	Y	Y	Y	N	N	N	N	N	N
Customer Project Number	Y	N	N	N	N	N	N	Y	N	N	N	N	Y
Funding Activity UIC/Name	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Service Types in Schedules (MSP or Milestones)	CIBL			AMBL		EV		PW					CE
	E Line	N Line	O Line	D Line	V Line	M Line	L Line	H Line	J Line	Z Line	Y Line	X Line	B Line
Primary Project Execution (P)	Y	Y	Y	N	N	N	N	Y	N	Y	N	Y	Y
Primary Project Execution (A)													
Primary Project Design Start (P)	Y	N	N	N	N	N	N	Y	N	N	N	Y	Y
Primary Project Design Start (A)													
P&S Start (P)	N	N	N	Y	Y	Y	Y	N	N	N	Y	N	N
P&S Start (A)													
P&S Delivered (P)	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	N	N
P & S Delivered (A)													
Env Quality Start (P)	N	N	N	N	N	Y	Y	N	N	N	N	N	N
Env Quality Start (A)													
Start (P)	N	N	N	N	N	N	N	N	Y	N	N	N	N
Start (A)													
FSC Contract Award (P)	N	N	N	N	N	N	N	N	Y	N	N	N	N
FSC Contract Award (A)													

* Execution Team rolled up to Execution Component (includes Ech III and FECs)

Figure 37. K19/02 EPROJECTS and ECONTRACTS Data Completeness, Page 4. Source: Korka (2019-a).

Encl (1): eContracts Required Data Matrix

Query: Status = Pre-Award and Active		DATA COMPLETENESS SUMMARY REPORT BASED ON MATRIX BELOW.	
Show Only: Basic + TOs		LEGEND: YES--FIELD REQUIRED TO BE FILLED OUT. NO--FIELD IS NOT REQUIRED. FOR YES CELLS, IF THE FIELD IS BLANK, DATA COMPLETENESS IS NOT COUNTED FOR INDIVIDUAL RECORD. % CALCULATION = TOTAL DATA COMPLETE RECORDS/TOTAL RECORDS (BY ISSUE OFFICE*)	
FIELDS	Pre-Award Data Completeness	ACTIVE (Post-Award) Data Completeness	
ACQR#			
Contract#			
TO#			
Title/Descript			
Status			
Admin Office	Not part of scoring		
Admin Component			
Issue Office			
Issue Component			
Created By			
Created Date			
BOD (A)			
Source	ECR Use Check	ECR Use Check	
Purpose	Y	Y	
Sol Type	Y	Y	
Contr Type	Y	Y	
Acpt By ACQ	Y	Y	
Auth Adv/PTP	Y	Y	
Est Amt	Y	Y	
Final To ACQ (A)	Y	Y	
Initiated	Y	Y	
Business/Support Line	Y	Y	
Execution Component	Y	Y	
Location UIC/Name	Y	Y	
Proc Meth	Y	Y	
Responsible Component	Y	Y	
Set-Aside	Y	Y	
Special Area	Y	Y	
Prop. Rcvd/Bid Open (A)	N	Y	
Issued (A)	N	Y	
Exec (A)	N	Y	
Issued to Ktr	N	Y	
Ktr Signed	N	Y	
Obl. Amt	N	Y	
Est CCD	Y	Y	
Orig CCD	N	Y	
BOD (P)	N	Y	
Prop. Due / Bid Open (P)	Y	Y	
Issued (P)	Y	Y	
Exec (P)	Y	Y	
CS (Contract Specialist) (TEAM)	Y	Y	
PM (Project Manager) (TEAM)	Y	Y	
Project WON#/Name	Y	Y	
*ISSUE OFFICE will be rolled up to ISSUE Component			

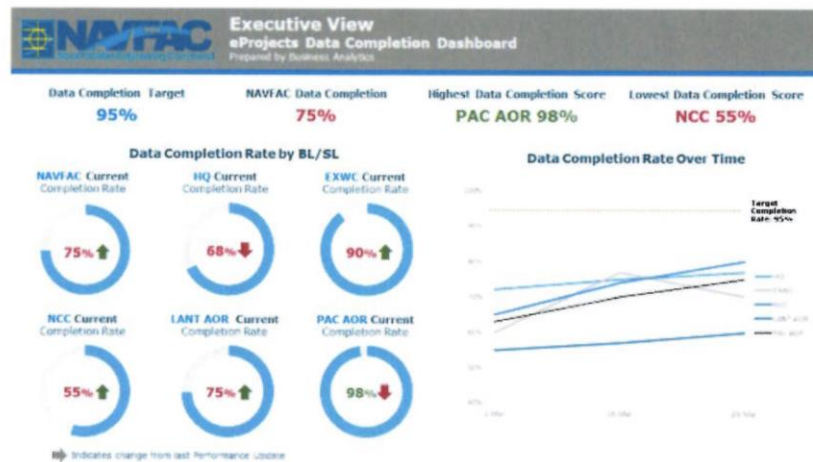
Figure 38. K19/02 EPROJECTS and ECONTRACTS Data Completeness, Page 5. Source: Korka (2019-a).

Encl (2): Example eSystems Completion Scorecards

Calculation:

- If a project record is **missing any field** that has been identified as critical, the record is **scored as not complete**.
- Each P&S is required to complete the fields that are labeled with "yes" on the eProjects and eContracts Required Data Matrix.
- P&S will not be scored on data elements identified with "no" on the matrix.
- Data will be pulled Thursday morning prior to a Bi-Weekly Performance update.

Executive ECH II/III View: Summary of performance measure and trend by ECH II/III



Executive Community View: Summary of Performance measure by Community

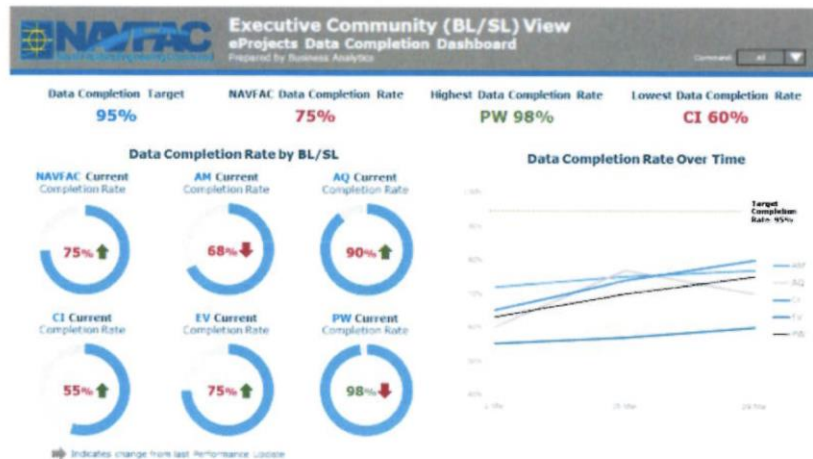
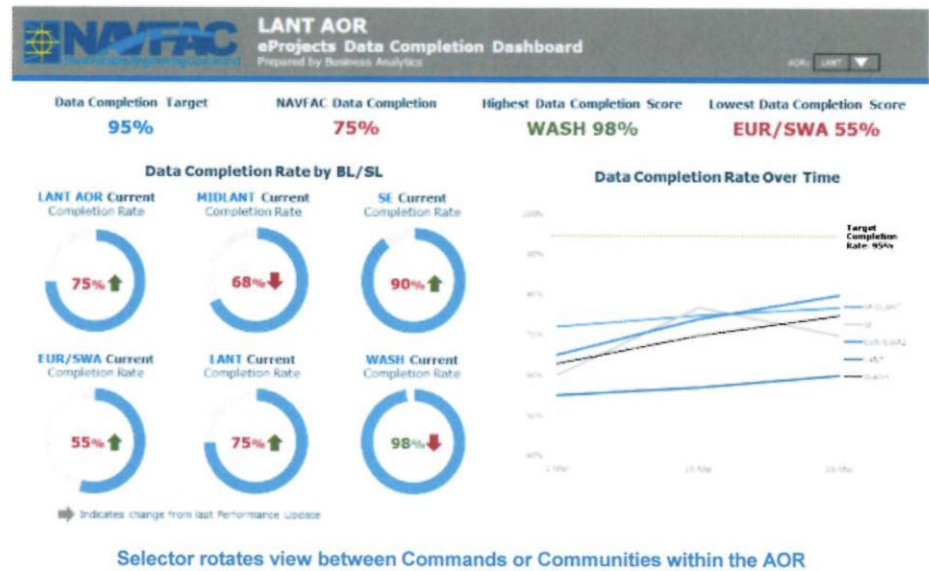


Figure 39. K19/02 EPROJECTS and ECONTRACTS Data Completeness, Page 6. Source: Korka (2019-a).

Encl (2): Example eSystems Completion Scorecards

AOR Views: Flexible to show Commands or Community at AOR level



Command Views: Showing Communities within the Command

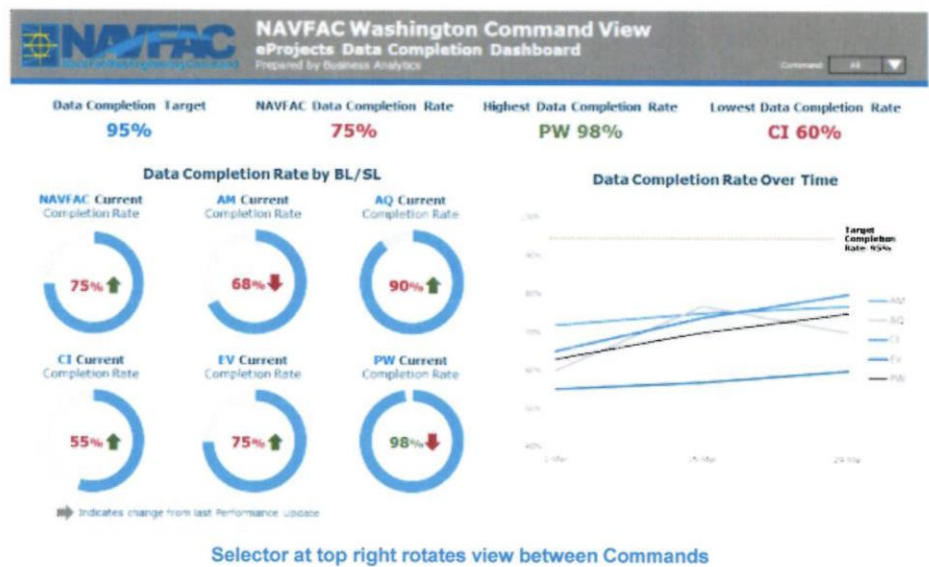
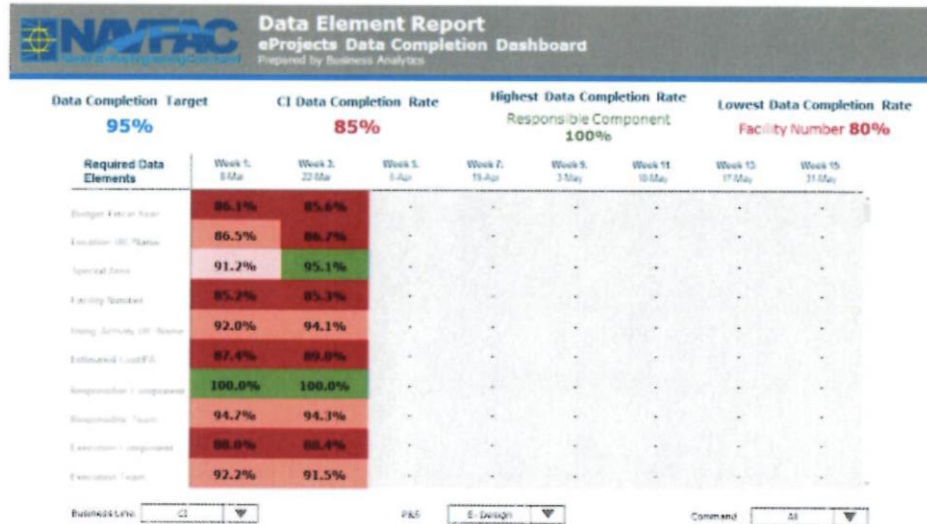


Figure 40. K19/02 EPROJECTS and ECONTRACTS Data Completeness, Page 7. Source: Korka (2019-a).

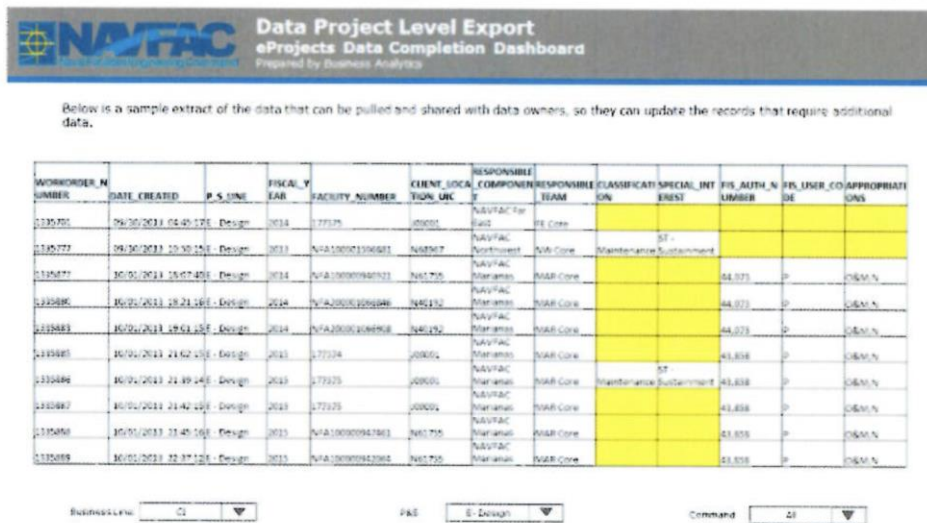
Encl (2): Example eSystems Completion Scorecards

Data Element Summary: Displays any combination of BL / P&S / Command / PWD



Ability to quickly navigate down to the critical fields for a detailed analysis of what needs correcting.

Record Level Views: Quickly access the record level details that need correcting



Ability to quickly navigate down to the record level to tactically correct problems.

Figure 41. K19/02 EPROJECTS and ECONTRACTS Data Completeness, Page 8. Source: Korka (2019-a).

APPENDIX B. K19/02A



K19/02A
25 Apr 2019

To: Commander, Naval Facilities Engineering Command, Atlantic
Commander, Naval Facilities Engineering Command, Pacific
Commander, Naval Facilities Engineering Command, EXWC
Director, Navy Crane Center

Ref: (a) K19-02 EPROJECTS AND ECONTRACTS DATA COMPLETENESS, dtd 7 Mar 2019

Subj: EPROJECTS AND ECONTRACTS DATA COMPLETENESS

Encl: (1) eProjects and eContracts Required Data Matrices, Phase 1 (updated 18 Apr 2019)
(2) Example eSystems Completion Scorecard (updated 18 Apr 2019)
(3) Example eProjects ECR Use Check Scorecard

1. GENERAL: This is an update to Ref (a). After further Business and Support Line reviews, Enclosures (1) through (3) have been updated. Summary of changes include:

1.a Enclosure (1): eProjects Data Matrix.

- Estimated Cost/PA - removed from calculation for L, V and D Lines.
- Classification of Work - removed from calculation for E and H Lines.
- Special Interest Code - removed from calculation for E and H Lines.
- Environmental Planning - removed from calculation for H Line.
- P&S Start (P) - removed from calculation for V, D, L and M Lines.
- ENV Quality Start (P) - removed from calculation.
- EV M Line – Removed from Data Completeness Actions.

1.b Enclosure (1): eContracts Data Matrix.

- Initiated - removed from calculation.
- Issued to Ktr - removed from calculation.
- Ktr Signed - removed from calculation.
- BOD(P) - removed from calculation (future scorecard TBD).

1.c Enclosure (2): Examples of eSystems Completion Scorecards.

- Updated examples of Tableau Scorecard displays.



Figure 42. K19/02A EPROJECTS and ECONTRACTS Data Completeness, Page 1. Source: Korka (2019-b).

Subj: EPROJECTS AND ECONTRACTS DATA COMPLETENESS

1.d Enclosure (3): eProjects ECR Use Check.

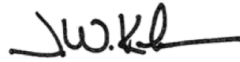
- Added to provide the official scorecard for the “ECR Check” row listed in enclosure (1). Non-use of the eProjects ECR link results in the inability to link pre-award and post-award data for further analytics and affects all BLs.

1.e OPS Portal Page.

- OPS Portal Page created. Business Rules, guidance, documents and dashboards are posted on the HQ OPS Portal Page under Current OPS.

2. DESIRED EFFECT. Achieve 90% data completeness score and 100% eProjects ECR use by 08 July 2019. Bi-weekly reporting remains in effect.

3. ACTION/IMPLEMENTATION: NAVFAC HQ Operations Officer will update BMS F-30.2 Workload Management NLT 30 July 2019 with revised changes and release a NAVFAC All Hands email advising of updated changes.



J. W. KORKA
RADM, CEC, USN
Chief of Civil Engineers



Figure 43. K19/02A EPROJECTS and ECONTRACTS Data Completeness,
Page 2. Source: Korka (2019-b).

Encl (1): eProjects Required Data Matrix

Query: Date Created: From 10/1/2013 to today's date													
DATA COMPLETENESS SUMMARY REPORT BASED ON MATRIX BELOW.													
LEGEND: YES--FIELD REQUIRED TO BE FILLED OUT FOR THE P&S LINE. NO--FIELD IS NOT REQUIRED FOR THE P&S LINE. FOR YES CELLS, IF THE FIELD IS BLANK, DATA COMPLETENESS IS NOT COUNTED FOR INDIVIDUAL FIELD. % CALCULATION = SEE BUSINESS RULES													
FIELDS	CIBL			AMBL		EV		PW					CE
	E Line	N Line	O Line	D Line	V Line	M Line	L Line	H Line	J Line	Z Line	Y Line	X Line	B Line
Workorder #													
Date Created													
Business Line													
P & S Line													
P&S Deliverable													
Project Title													
Business Line													
Responsible Org													
Execution Org													
Supported Command Program													
Status													
Budget Fiscal Year	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
Location UIC/Name	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N
Special Area	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N
Facility Number	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N
Using Activity UIC/Name	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N
Estimated Cost/PA	Y	Y	Y	N	N	N	N	Y	Y	Y	Y	Y	Y
Responsible Component	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
Responsible Team	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
Execution Component	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
Execution Team	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
Project Manager (TEAM)	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
Command Sponsor	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N
Classification of Work	N	N	N	N	N	N	N	N	N	N	N	N	N
Special Interest Code	N	N	N	N	N	N	N	N	N	N	N	N	N
FIS Auth Number	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
FIS User Code	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
Appropriation	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
Latest Status Note Date	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
Latest Status Note	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
Design Agent	Y	N	N	N	N	N	N	N	N	N	N	Y	Y
Design Level	Y	N	N	N	N	N	N	Y	N	N	N	Y	Y
Acquisition Method	Y	N	N	N	N	N	N	Y	N	N	N	Y	Y
Acquisition Tool	Y	N	N	N	N	N	N	Y	N	N	N	Y	Y
Construction Office	Y	N	N	N	N	N	N	Y	N	N	N	Y	Y
Environmental Planning	Y	N	N	N	N	N	N	N	N	N	N	N	N
CE Program	N	N	N	N	N	N	N	N	N	N	N	N	Y
COCOM	N	N	N	N	N	N	N	N	N	N	N	N	Y
Country	N	N	N	N	N	N	N	N	N	N	N	N	Y
Decimal Deg. Latitude	N	N	N	N	N	N	N	N	N	N	N	N	Y
Decimal Deg. Longitude	N	N	N	N	N	N	N	N	N	N	N	N	Y
Source	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
Proj Deliv FY	N	N	N	Y	Y	N	Y	N	N	N	N	N	N
Customer Project Number	Y	N	N	N	N	N	N	Y	N	N	N	N	N
Funding Activity UIC/Name	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
Service Types in Schedules (MSP or Milestones)	CIBL			AMBL		EV		PW					CE
	E Line	N Line	O Line	D Line	V Line	M Line	L Line	H Line	J Line	Z Line	Y Line	X Line	B Line
Primary Project Execution (P)	Y	Y	Y	N	N	N	N	Y	N	Y	N	Y	Y
Primary Project Execution (A)													
Primary Project Design Start (P)	Y	N	N	N	N	N	N	Y	N	N	N	Y	Y
Primary Project Design Start (A)													
P&S Start (P)	N	N	N	N	N	N	N	N	N	N	N	N	N
P&S Start (A)													
P&S Delivered (P)	N	Y	Y	Y	Y	N	Y	N	Y	Y	Y	N	N
P & S Delivered (A)													
Env Quality Start (P)	N	N	N	N	N	N	N	N	N	N	N	N	N
Env Quality Start (A)													
Start (P)	N	N	N	N	N	N	N	Y	N	N	N	N	N
Start (A)													
FSC Contract Award (P)	N	N	N	N	N	N	N	N	Y	N	N	N	N
FSC Contract Award (A)													

Figure 44. K19/02A EPROJECTS and ECONTRACTS Data Completeness, Page 3. Source: Korka (2019-b).

Encl (1): eContracts Required Data Matrix

Query: Status = Pre-Award and Active Show Only: Basic + TOs		
DATA COMPLETENESS SUMMARY REPORT BASED ON MATRIX BELOW. LEGEND: YES--FIELD REQUIRED TO BE FILLED OUT. NO--FIELD IS NOT REQUIRED. FOR YES CELLS, IF THE FIELD IS BLANK, DATA COMPLETENESS IS NOT COUNTED FOR INDIVIDUAL FIELD. % CALCULATION = SEE BUSINESS RULES		
FIELDS	Pre-Award Data Completeness	ACTIVE (Post-Award) Data Completeness
ACQR#		
Contract#		
TO#		
Title (General)		
Status		
Admin Office	Not part of scoring	
Admin Component		
Issue Office		
Issue Component		
Created By		
Created Date		
BOD (A)		
Source	ECR Use Check (End 3) - ECR Use Check Scorecard)	ECR Use Check (End 3) - ECR Use Check Scorecard)
Purpose	Y	Y
Sol Type	Y	Y
Contr Type	Y	Y
Accpt By ACQ	Y	Y
Auth Adv/PTP	Y	Y
Est Amt	Y	Y
Final To ACQ (A)	Y	Y
Initiated	N	N
Business/Support Line	Y	Y
Execution Component	Y	Y
Location UIC/Name	Y	Y
Proc Meth	Y	Y
Responsible Component	Y	Y
Set-Aside	Y	Y
Special Area	Y	Y
Bid Open (A)	N	Y
Issued (A)	N	Y
Exec (A)	N	Y
Issued to Ktr	N	N
Ktr Signed	N	N
Obl. Amt	N	Y
Est CCD	Y	Y
Orig CCD	N	Y
BOD (P)	N	N
Bid Open (P)	Y	Y
Issued (P)	Y	Y
Exec (P)	Y	Y
CS (Contract Specialist) (TEAM)	Y	Y
PM (Project Manager) (TEAM)	Y	Y
Project WON#/Name	Y	Y

Figure 45. K19/02A EPROJECTS and ECONTRACTS Data Completeness,
Page 4. Source: Korka (2019-b).

APPENDIX C. QUESTIONS FOR NAVFAC SPECIFIC PERSONNEL

LCDR John Orr

Questions for NAVFAC Specific Personnel

Thesis Topic: Conduct both an internal review and an external scan of the means and methods employed by other agencies in an effort to significantly improve NAVFAC's ability to respond in a timely and effective manner to emergent requirements for facilities support to installations and other supported commands.

Question 1:

What are the steps for executing a task order within your office?

Question 2:

How long does each step take? Approximate timing using minutes or hours.

Question 3:

How long does executing a task order take?

Question 4:

What are some ways your office tries to expedite emergency task orders?

Question 5:

Does your office utilize GSA in any capacity? If so, where?

Question 6:

Does your office utilize DoD eMall?

Question 7:

Does your office have a CAT III/IV program?

- a. If so, how many CAT III/IV techs do you have?
- b. Who do techs report to? Requirements branch head? FMS? FMD?

Figure 46. Questions for NAVFAC Specific Personnel

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APPENDIX D. QUESTIONS FOR NON-GOVERNMENTAL ORGANIZATIONS

LCDR John Orr

Questions for Non-Governmental Organizations

Thesis Topic: Conduct both an internal review and an external scan of the means and methods employed by other agencies in an effort to significantly improve NAVFAC's ability to respond in a timely and effective manner to emergent requirements for facilities support to installations and other supported commands.

Question 1:

I'd be interested if you had any sort of training pipeline for your people, specifically scope writers, that you would be willing to share. If not a pipeline, do you have specific industry classes that you can suggest that have had the greatest benefit for your people?

Question 2:

Would you be willing to share organizational charts for your staff below the leadership level?

Question 3:

How do you accomplish your facilities maintenance? Do you contract out your maintenance or do you internally hire your maintenance workforce?

Question 4:

Can you step through the process of a minor project (i.e. a roof needs repair, new bathroom needs to be installed) from beginning to end? Who starts the initial requirement? Who builds the scope? Who completes the acquisition? How do you handle the transition between personnel throughout the process? Finally, what is typically the bottleneck of this process?

Question 5:

Would it be possible to get a copy of your Project Request form, if applicable? Who/where does that get sent to when the form is completed? How do you prioritize that request in the queue?

Question 6:

Do you utilize Building Information Modeling (BIM) in your construction efforts? What about in your maintenance efforts?

Figure 47. Questions for Non-Governmental Organizations

Question 7:

Do you have a method of prioritizing work i.e. if you are limited by budget or manpower for a given year and you have two projects both valued at \$250K, how would you decide which project to execute?

Question 8:

If you have a failure of a system i.e. electrical, busted sprinkler head, how do you typically find out? Do you have sensors that alert a central plant that's manned 24/7 or do you depend on a building manager to submit a trouble call? How does your team communicate that failure and timeline for remediation to the customer?

Question 9:

Do you have a system in place to rate your buildings or your buildings' assets from a condition perspective? i.e. the compressor in the gymnasium is 20 years old and we have a maintainer, when doing preventative maintenance, check the condition and rate it with a number 1-100, 1 being emergency replacement and 100 being brand new

Figure 48. Questions for Non-Governmental Organizations (continued)

APPENDIX E. CRAIG PRATHER'S NRDE RESEARCH (SELECTED SLIDES)



Figure 49. Craig Prather NRDE Study, Slide 1. Source: Prather (2018).

- Products & Service Delivery
- Infrastructure Readiness
- Energy Security
- People
- Financial Trust
- Analytical Decision-Making

Executive Overview

Purpose of Brief	Problem Statement & Background
- Provide an Enterprise-Level analysis of the 1st phase of a 4 phase strategic approach to identify "Root Causes" for respective Problem Statement - Obtain Leadership Approval to proceed to Phase 2: COA Development and Assessment	- NAVFAC is under performing project delivery ISO NRDE clients - Provide a strategic level SYSCOM comprehensive review of NAVFAC's support to NR&DE to address meaningful changes to improve the project delivery system ISO NRDE and potentially other REIM clients - C2: ADCON to the Chief, OPCON to RDML Banaji
PS IR ES P FT AD	
Takeaways/ Recommendation	Methodology/ Assessment
- NRDE Clients value their PWDs but require a more effective and agile delivery model and approach - Identified 5 Causal Groups with a total of 27 related Root Causes impacting the project delivery value chain. No single "Silver Bullet" solution. - Intent for "AND" solutions btwn Mission and NRDE clients in lieu of "OR" solutions Recommendation: Pursue COA development for Top 6 Root Causes and unique FEC WASH solutions	4 Phase Strategic Approach with Leadership Decision at the end of each Phase ➢ Phase 1: Exploratory. Deliverable - Root Causes ➢ Phase 2: Assessment. Deliverable - COAs ➢ Phase 3: Implementation. Deliverable - Corrective Actions ➢ Phase 4: Reassessment. Deliverable - Metrics - Review and Assess Critical Elements along the Project Delivery Value Chain and Current Initiatives - Enterprise Strategic Assessment and FEC WASH "Unique" Review

2
5/21/2018

Figure 50. Craig Prather NRDE Study, Slide 2. Source: Prather (2018).

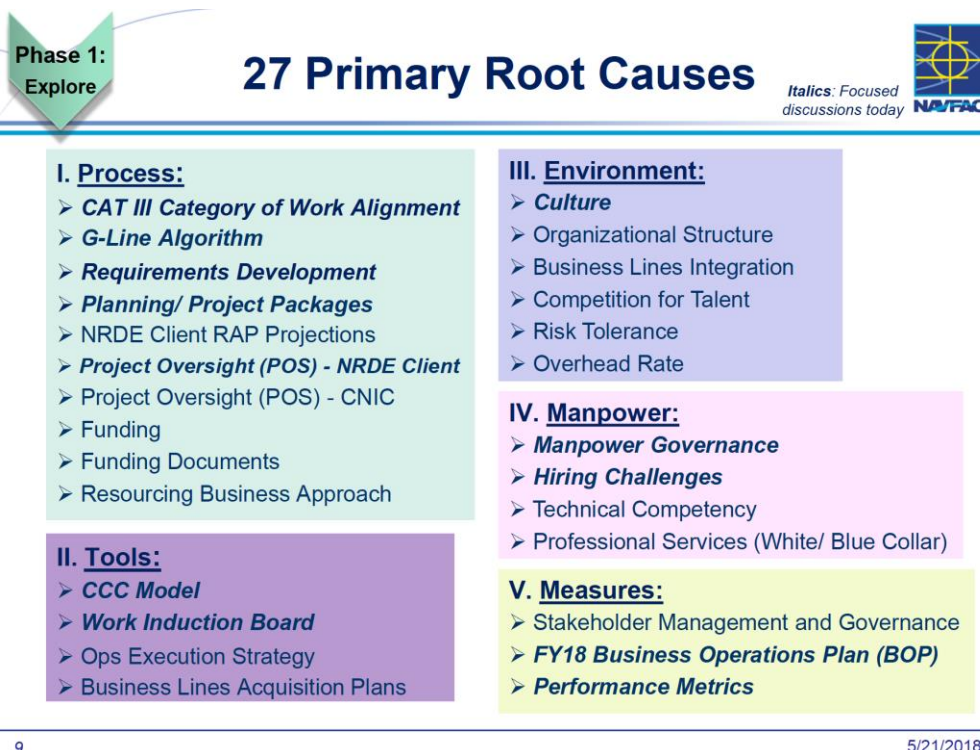


Figure 51. Craig Prather NRDE Study, Slide 9. Source: Prather (2018).

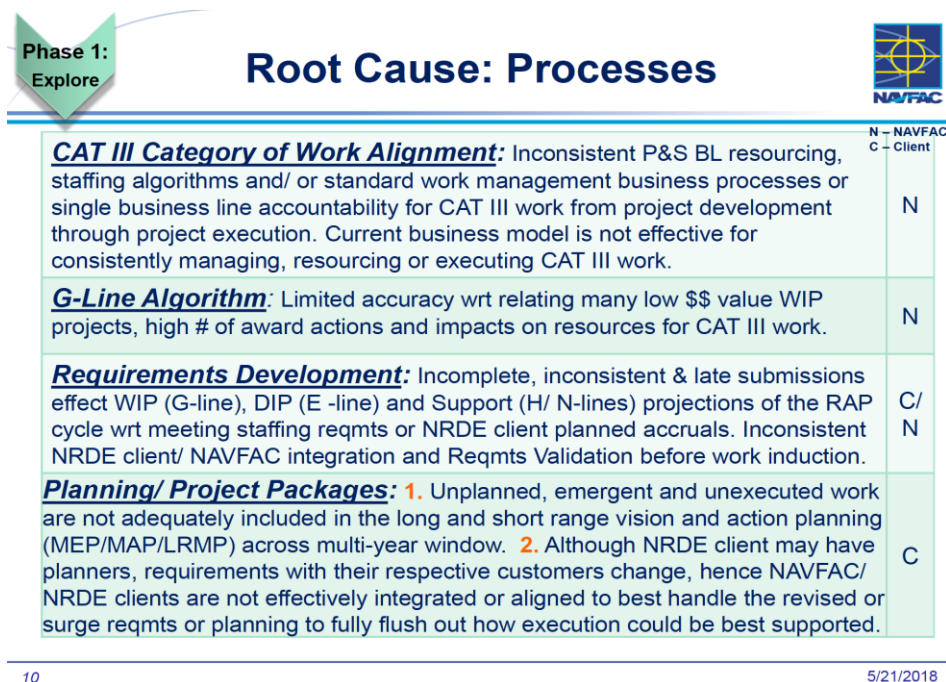


Figure 52. Craig Prather NRDE Study, Slide 10. Source: Prather (2018).

CAT III Category of Work Alignment



➤ CAT III: "Limited Engineering – No Design"

- Limited P&S management & accountability resulting in overall Ineffectiveness
- High % of VOB based on Awarded Actions for NRDE Clients
- Client interface inconsistencies – Pre/ Post award
- Guidance:
 - NAVFAC CONOPS revised FY17
 - Engineering & Construction Bulletin (ECB) of 5 Apr 2018
 - NAVFAC CAT III/IV Project Development Letter of 1 Jul 16

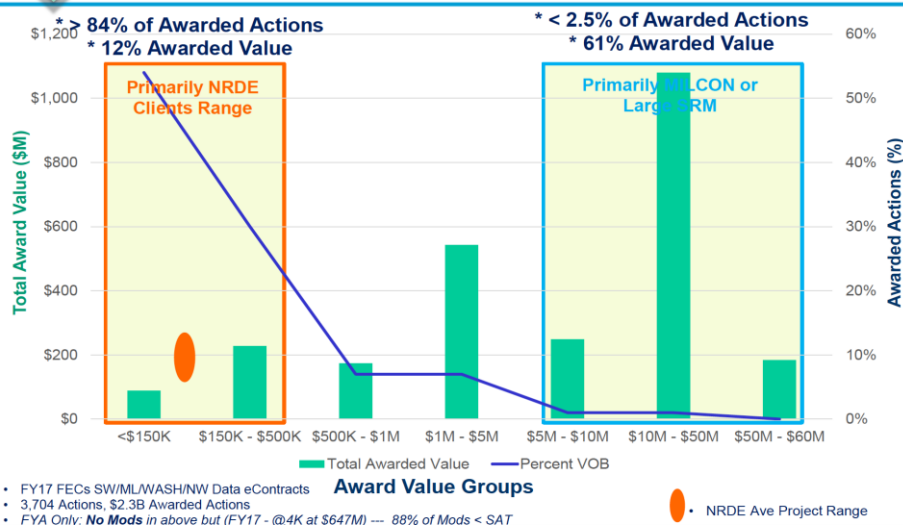


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5/21/2018

Figure 53. Craig Prather NRDE Study, Slide 11. Source: Prather (2018).

Awarded WIP/ Actions Snapshot: RAP Algorithm Dynamic Enough?



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5/21/2018

Figure 54. Craig Prather NRDE Study, Slide 12. Source: Prather (2018).

 Phase 1: Explore	Root Cause: Environment 	
	Culture: 1. Generally, NRDE projects are perceived of having a lower obligation priority as compared to CNIC year-end funded projects (ICO – REGCOM priority). So, in some cases, funding expiration may be considered a greater driver for obligation priority than mission requirement. 2. Not consistently meeting NRDE clients obligation/ expensing plan as required to support their rates development. Organizational Structure: Standard organizational structure for project execution is ineffective for required agility or urgency to support NRDE clients especially at PWDs with a large projects WIP portfolio where REIM VOB >> Non Income VOB or REIM VOB = Non Income VOB. Business Lines Integration: Internal processes, actions and seams across echelons and between the Business Lines wrt CAT III projects execution impacting PWD project execution. Competition for Talent: External factors such as Ech IV command in ECH II/ Ech III AOR, external Employer competition compete for our critical human resources.	N – NAVFAC C – Client N N N N

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5/21/2018

Figure 55. Craig Prather NRDE Study, Slide 17. Source: Prather (2018).

 Pre-Phase 2: Assess	Corrective Action Considerations: FEC WASH 	
Root Causes	Potential Solutions	Stake holder
High Attrition Rates (Critical Series)	1. Create FEC HUBs for high attrite series in lower competition geographical areas 2. TDY Rotation like oversea FECs 3. Move respective work to LANT or other FECs 4. Increase Use of Interns, Retire Annuitants 5. Consider Grade increase for a few critical series in hard to fill locations	LANT/ FEC
Manpower	1. Over-hire beyond AWN 2. Increase use of Professional Service asset (Blue/White collar) 3. Direct hire for dedicated REIM assets for NRDE	LANT/ FEC
Military Turnover Rates	1. Enforce Minimum Activity tour length	LANT/ FEC
Organizational Structure	1. Dedicated PMO/ IPT to exclusively support NRDE clients 2. Reestablish a 2 nd PWD leadership team at PWD South Potomac for one of the installations (Lead-follow relationship)	LANT/ FEC
Engineering Technical Competency	1. MILCON Program Management moves to LANT similar to EURAFSWA 2. Develop IH/ AE plan to best develop and utilize Design Engineers talents	LANT/ FEC

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5/21/2018

Figure 56. Craig Prather NRDE Study, Slide 33. Source: Prather (2018).

APPENDIX F. PROPOSED CAT III/IV CLASSES

Table 13. Proposed CAT III/IV Class List. Source: U.S. Army Corps of Engineers (n.d.).

Title	Location	Delivery	Tuition
Advanced Scheduling for Projects	Huntsville, AL	Classroom	\$1731
Concrete Fundamentals	Vicksburg, MS	Classroom	\$1777
Construction Contract Administration	Online	Classroom	\$1046
Construction Quality Management	-	Distance Learning	\$173
Construction Schedule Performance Management	Huntsville, AL	Classroom	\$1174
Cost Estimating Basics	Alexandria, VA	Classroom	\$1336
Estimating for Construction Modifications	Jacksonville, FL	Classroom	\$1151
HVAC Control Systems: Design-Quality Verification	Champaign, IL	Classroom	\$2252
HVAC Systems Commissioning	Phoenix, AZ	Classroom	\$2438
National Electrical Code	Orlando, FL	Classroom	\$1778
Value Engineering	Huntsville, AL	Classroom	\$2532
Welding – Quality Verification	Portland, OR	Classroom	\$1233

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APPENDIX G. PROPOSED CECOS CURRICULUM CHANGES

Introduction to CEC (1 week)		Construction Safety (1 week)	
• Career management • CEC roles in NAVFAC/NCF • Disciplinary processes		• ORM • Safety plans • EM-385 • AHAs • Construction Project Visit	
Intro to Public Works (2 weeks) (officers w/ NAVFAC orders)		- OR - NCF Operations Basic (2 weeks) (officers w/ NCF orders)	
• NAVFAC organization • BMS • Intro to FEAD, FMD • COAR authority		• Lean and ultra-lean modifications • Leadership perspective from NBVC CO • NCF and NMCB organization • Project management • Defensive operations • Safety • Supply • Equipment management • Training • Readiness • Comms shop visit • NMCB leadership perspectives	
CEC Tactical Training Course (2 weeks)		DIVOLC (1 week)	
• Patrols • Convoys • Land navigation • Engineering Recon		• NMCB TOA warehouse visit, • PGI familiarization • Confirmation briefs • 4-day FTX • Working with the mess and wardroom • Setting professional expectations • Counseling, • CO final brief and expectations • Leadership styles	
CON 91 (3 weeks)		CON 170 (2 weeks)	
• Contract formation • Contract management		• FAR / DFARS • Cost and price analysis • Market research • Acquisition strategies	
Construction Management/Technology (2 weeks)		Character Development (1 week)	
• Introduction to estimating costs, materials, resources required for earthwork, utilities, finishes • Introduction to construction scheduling • NCTC / head facility site visits		• Speed of Trust • Seven Habits • Core Values • Core Attributes • Community Virtues • Practical Exercise	
Other (Integrated throughout the 15 weeks)			
• UCT, EXWC & MUSE tours • Life After the Navy panel • SAME brief • OPLAN briefs • Book Club • CPO Heritage Panel • Leadership Lunches • CMIT Level 1			

Figure 57. Current CEC Officer Basic Course Curriculum. Source: CECOS, personal communication, September 9, 2020.

Introduction to CEC (1 week)		Construction Safety (1 week)	
• Career management • CEC roles in NAVFAC/NCF • Disciplinary processes		• ORM • Safety plans • EM-385 • AHAs • Construction Project Visit	
Intro to Public Works (2 weeks) (officers w/ NAVFAC orders)		NCF Operations Basic (2 weeks) (officers w/ NCF orders)	
• NAVFAC organization • BMS • Intro to FEAD, FMD • COAR authority		• Lean and ultra-lean modifications • Leadership perspective from NBVC CO • NCF and NMCB organization • Project management • Defensive operations • Safety • Supply • Equipment management • Training • Readiness, • Comms shop visit • NMCB leadership perspectives	
CEC Tactical Training Course (2 weeks)		- OR -	
• Patrols • Convoys • Land navigation • Engineering Recon		• NMCB TOA warehouse visit, • PGI familiarization • Confirmation briefs • 4-day FTX • Working with the mess and wardroom • Setting professional expectations • Counseling, • CO final brief and expectations • Leadership styles	
CON 91 (3 weeks)		DIVOLC (1 week)	
• Contract formation • Contract management		• FAR / DFARS • Cost and price analysis • Market research • Acquisition strategies	
Construction Management/Technology (2 weeks)		CON 170 (2 weeks)	
• Introduction to estimating costs, materials, resources required for earthwork, utilities, finishes • Introduction to construction scheduling • NCTC / head facility site visits		• Scope Management • Schedule Management • Quality Management • Resource Management • Communications Management • Stakeholder Management	
Character Development (1 week)			
• Speed of Trust • Seven Habits • Core Values • Core Attributes • Community Virtues • Practical Exercise • Ethical Case Studies* • Emotional Intelligence*			
Other (Integrated throughout the 15 weeks)			
• UCT, EXWC & MUSE tours • Life After the Navy panel • SAME brief • OPLAN briefs • Book Club • CPO Heritage Panel • Leadership Lunches • CMIT Level 1			

Figure 58. Proposed CEC Officer Basic Course Curriculum. Adapted From: CECOS, personal communication, September 9, 2020.

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APPENDIX H. PRELIMINARY RESEARCH: FUNDS FLOW PROCESS

Extracting data from COGNOS, I was able to identify the number of funds requests at the field level (PWD Annapolis) in Table 14, at the FEC level (NAVFAC Washington) in Table 15, and at NAVFAC LANT in Table 16. Looking specifically at Table 16, approximately 41% of funds requests processed by LANT are below \$10,000 in dollar value. This is a staggering number, especially considering that the simplified acquisition threshold and the micro-purchase thresholds have increased in the past few years (McCall, 2020). The numbers, however, are vastly different between FY 2019 and FY 2020. While I cannot be completely sure, I hypothesize the difference to be partly related to the sunseting of the Navy Working Capital Fund (NWCF) and more so to the shift of accounting systems from the Facilities Information System (FIS) to the Command Financial Management System (CFMS).

Table 14. Number of Funds Requests from PWD Annapolis

Funds Requests from PWD Annapolis						
FY	FRs < \$250K	FRs < \$100K	FRs < \$50K	FRs < \$25K	FRs < \$10K	FRs < \$5K
FY 2019	377	331	281	231	166	121
FY 2020*	372	322	263	205	147	107
*As of August 28, 2020						

Table 15. Number of Funds Requests from NAVFAC Washington

Funds Requests from NAVFAC Washington						
FY	FRs < \$250K	FRs < \$100K	FRs < \$50K	FRs < \$25K	FRs < \$10K	FRs < \$5K
FY 2019	1831	1528	1279	981	648	434
FY 2020*	1904	1689	1486	1271	1034	916
*As of August 28, 2020						

Table 16. Funds Requests Processed by NAVFAC LANT

Funds Requests processed by NAVFAC LANT						
FY	FRs < \$250K	FRs < \$100K	FRs < \$50K	FRs < \$25K	FRs < \$10K	FRs < \$5K
FY 2019	23,136	20,369	17,826	14,926	10,818	8,086
<i>% of Total</i>	89.3%	78.6%	68.8%	57.6%	41.7%	31.2%
FY 2020*	7,036	6,257	5,417	4,555	3,338	2,517
<i>% of Total</i>	89.0%	79.1%	68.5%	57.6%	42.2%	31.8%
*As of August 28, 2020						

The current funds request and acceptance process appears to have been created as a result of a Department of Defense requirement to adapt to Financial Integrity and Audit Readiness (FIAR), which was rolled out in 2005 following the identification of several material weaknesses across the Department. Since then, NAVFAC has made many advances in the funds flow process, utilizing a funds work flow team equipped with financial managers, acquisition experts and program managers to develop a standardized funds workflow process as well as training materials for how to use systems like eTracker with online videos and training pamphlets (Naval Facilities Engineering Command, 2019-c). In order to meet the requirements of FIAR, specifically to confirm proper segregation of duties and robust internal controls, and equipped with a robust team of Financial Managers, NAVFAC LANT has retained the responsibility of releasing and validating all funds across their area of responsibility (AOR).

Seeing the workload and knowing the dollar amount, I see an opportunity to streamline a cumbersome process. Moreover, after pulling funds requests cycle times from COGNOS for NAVFAC Washington in FY19 (Figure 59) and FY20 (Figure 60), it is clear that something has to change. As an organization, NAVFAC cannot be satisfied with a 35-day funds request cycle time regardless of how much of that time is the responsibility of the customer. Speed and agility are important in all processes. However, accuracy and internal controls are important as well. Even one dollar is too much taxpayer money to be lost to fraud, but the risk associated with delegating funds approval authority to the FEC or even to the field level is worth the risk. Training individuals at the field level or the FEC level to act as an independent validator of information, conducting audits on a quarterly basis, and setting up automated (computer assisted) controls are just a few ideas of how to stay consistent with FIAR, while gaining long term efficiency. However, as

aforementioned, NAVFAC is currently undergoing significant changes to their financial management program. Therefore, it is my suggestion this topic be assigned to another CEC officer in the future, following the completed system migration to the Command Financial Management System (CFMS).

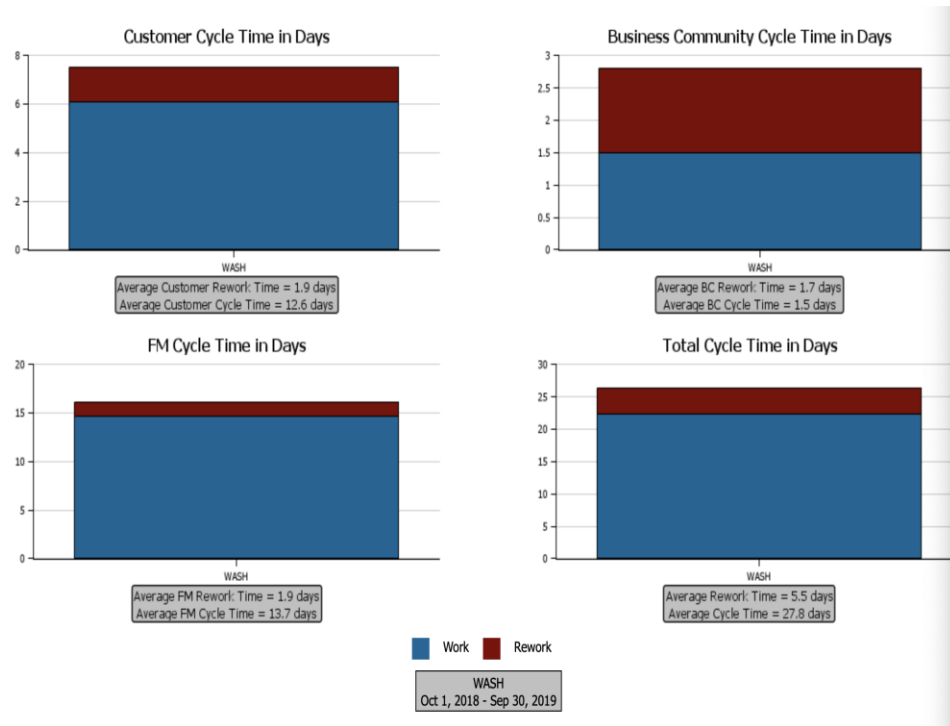


Figure 59. Financial Management's Average Cycle Time for NAVFAC Washington FY19

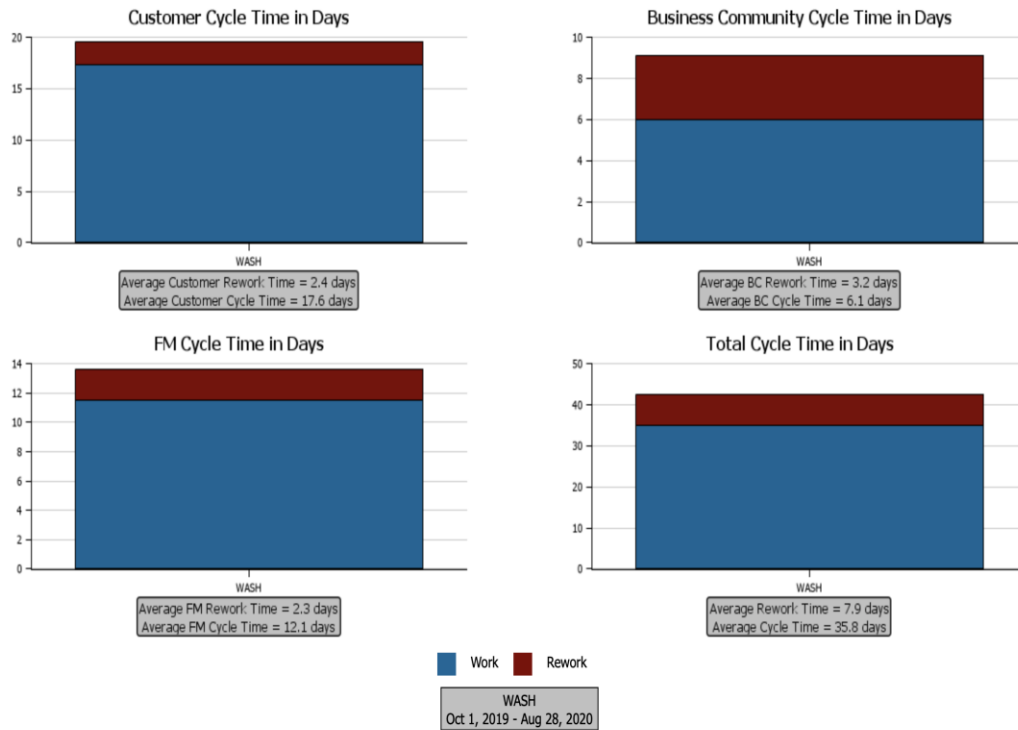


Figure 60. Financial Management’s Average Cycle Time for NAVFAC Washington FY20

APPENDIX I. LIST OF INTERVIEWS

April 21: Interview with FEAD Director—NAVFAC Washington
April 24: Interview with FEAD Director—NAVFAC SW
May 7: Interview with FEAD Director—NAVFAC SW
May 8: Interview with FMD—NAVFAC SW
May 15: Interview with GSA—Public Buildings Service—National Capital Region
June 17: Interview with Army Corps of Engineers—USACE Charleston District
June 26: Interview with NAVFAC SW CIO
July 13: Interview with Production Officer—NAVFAC SW
July 17: Interview with University of Houston
July 24: Interview with Navy Personnel Command
July 26: Interview with Collier County Facilities
July 27: Interview with FEAD Director—NAVFAC SW
July 27: Interview with FEAD Director—NAVFAC SE
July 29: Interview with NAVFAC HQ
July 31: Interview with Construction Manager—NAVFAC EURAFCENT
August 7: Interview with FEAD Director—NAVFAC SE
October 14: Interview with General Manager—GCR Inc.
October 14: Interview with Vice President and Chief Facilities Officer—Virginia Tech

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