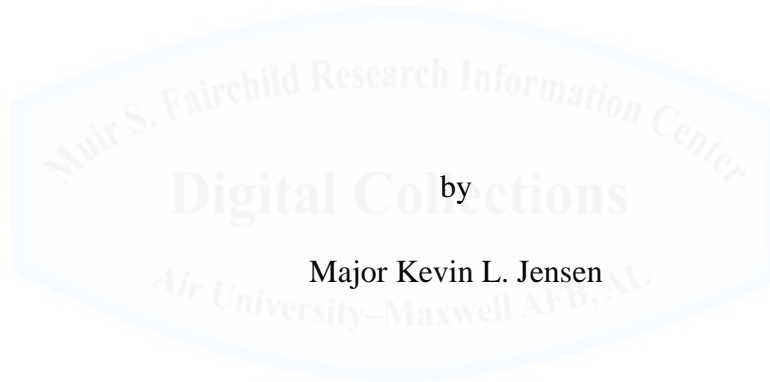


AU/ACSC/2016

AIR COMMAND AND STAFF COLLEGE

AIR UNIVERSITY

MISSION AND COMMUNITY:
THE AIR FORCE SOLUTION TO FUNDING BOTH



A Research Report Submitted to the Faculty

In Partial Fulfillment of the Graduation Requirements

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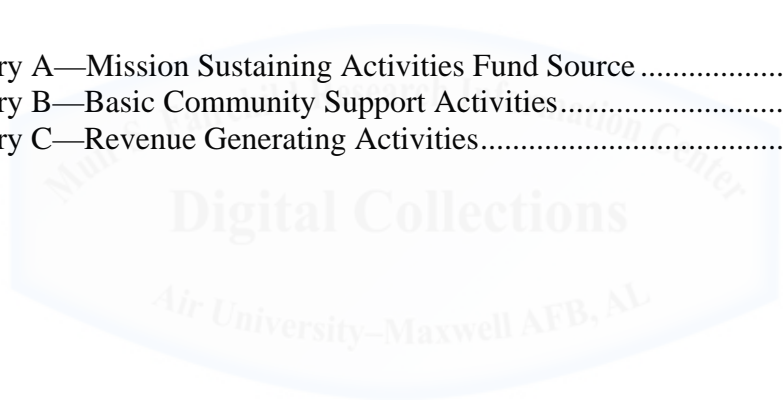
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Preface

I began my career as an enlisted ground radio maintenance apprentice in the late 1990s. I quickly developed an appreciation for the community functions and entitlements that the Air Force provided. The quality of life was outstanding; however, I never paid any attention, at that time, to the burden of associated costs to provide these entitlement until nearly a decade later.

Just over 10 years after I had originally enlisted, I earned a commission as a Civil Engineer (CE) Officer. I have invested another 10 years since my commission learning and executing the policy and requirements surrounding the planning and programming of Air Force installation infrastructure. It was while I was assigned to the Civil Engineer Squadron at Lackland AFB, that I realized the significant appropriated investment into the infrastructure that supported the Air Force's community focus. I also observed at this time, what I considered a lack of utilization of such facilities as the base theater, bowling alley, and golf course. Living off base, I found it not only more convenient but often times less expensive to shop at the local Walmart or Target versus shopping at the base exchange or commissary. Working in the Civil Engineer Squadron, I began to take note of the growing backlog of direct mission related infrastructure requirements that went unfunded simply due to the lack of available budget. I began to wonder why we were investing appropriations in some of the community function infrastructure that rarely seemed to be used on the installation, rather than investing it in our primary work facilities?

Certainly appreciative of the quality of life the Air Force provides, it is time to evaluate if the Air Force is investing its restricted budget in the most economical means. The US Air Force is the world's most powerful air force, in part due to its balanced focus of mission and people. Due to the restricted budget, both mission and people are beginning to suffer. I want to believe

that there must be a better way for the Air Force to provide continued, outstanding community support to Airmen and families while also freeing up limited appropriations to better invest in our installation infrastructure. I understand this research can get emotional as many service members are advocates and supporters of the community functions provided by the Air Force. This research is not advocating for the elimination of any services but rather the economics and means by which they are provided and reasoning behind it.



Abstract

As the platform for Air Force weapon systems, installations serve as the cornerstone for delivering airpower. Failing to adequately invest and recapitalize Air Force infrastructure jeopardizes the readiness of the force and this nation. Yet, the Air Force has assumed risk in its infrastructure in order to fund other competing priorities. The poor condition of Air Force installations and the health of its infrastructure are becoming increasingly worse each year due to underinvestment. The appropriated budget is simply stretched too thin to fund all the requirements. While the Air Force places significant emphasis on providing the highest quality of community support to its Airmen and families, this community focus comes at a great price...an appropriated price. The Air Force must examine alternatives to provide topnotch community support through funding avenues other than appropriations. This research conducts quantitative analysis to highlight opportunities for the Air Force to improve its appropriated investment strategy to more adequately provide both community and mission focus. Public-public and public-private partnerships offer a solution to provide outstanding community support while offsetting the appropriated investment by leveraging private and commercial funding. Eliminating the requirement to invest appropriations into community support allows a more balanced and designed recapitalization strategy for the Air Force's mission essential infrastructure.

Introduction

I find myself in an almost surreal position arguing to divest things I do not want to divest, to pay a bill we were handed in law, and we are not being allowed to pay it by the institution that passed the law.¹

– Gen Mark A. Welsh III, 2016

Installations are the platforms from which the Air Force employs its warfighting capability, such as the B-2s that launch and return to Whiteman Air Force Base (AFB) and the missile fields scattered across Francis E. (F.E.) Warren AFB. The Air Force does not have the available funding to recapitalize its aging fleet, protect human capital, invest in developmental education and proficiency training, sustain infrastructure, and provide the equivalent level of community services that it provided decades ago when the installations the Air Force operate from today were initially designed. Headquarters Air Force (HAF) is continuously discussing and evaluating additional Base Realignment And Closure (BRAC) actions, reductions to the personnel force, eliminating or reducing tuition assistance, restructuring the retirement pension, and many other difficult options. The Air Force needs to determine the feasibility of eliminating or restructuring its military appropriations funded community service functions as a means to reallocate funding to other mission requirements. Although some of these services are supported by Army and Air Force Exchange Service (AAFES), Defense Commissary Agency (DeCA), and Non-Appropriated Fund sources, they in part, as well as the infrastructure supporting them such as utilities, parking lots, and lighting, are also supported by military appropriations. It would be beneficial for the Air Force to determine if there are additional means to deliver equitable levels

of service in terms of community functions and support to Airmen and their families without investment of military appropriations. These are critical questions that the Air Force must examine now as it considers its landscape of the future.

Air Force installations must evolve and modernize in order to maintain peak operational capability as well as provide the best, available service to Airmen and families. The Air Force is seeking solutions to recapitalize its degraded Continental United States (CONUS) installation infrastructure while continuing to invest in community support functions, such as the base exchange, commissary, bowling alleys, theaters, and chapels, which are also provided by neighboring communities. The Air Force will need to define the current and true requirement versus meeting previously established standards. For example, HAF organizations have been working with the Chaplain Corps to determine the true requirement to provide worship and counseling services. The question has been raised if these services necessitate the accustomed, standard chapel or does a conference center with private office areas to accommodate for counseling services suffice. There may be community partnerships or other opportunities that could provide worship services to both the installation and the community through leveraging private sector funding. Similarly, the military services, to include the Air Force, have been challenged to consider if installations truly require a base exchange and commissary when there is a supermarket within five miles outside of the installation gate that can handle the additional growth of servicing the installation populace.² The Air Force must begin examining these difficult scenarios in order to optimize efficient spending while also providing community service functions that enable a stronger, healthier force. The tough dilemma the Air Force may soon face is determining among the options to save installations, save jobs, or save entitlements. As there is no solution that does not inflict some sort of pain, reducing, eliminating, or instituting

new, cost effective solutions to providing community service functions will better posture the Air Force to more efficiently, and effectively, accomplish its mission.

Background

The Office of the Secretary of Defense (OSD) developed a Facility Sustainment Model (FSM) that provides a well-defined process to forecast annual funding requirements to sustain real property at a level that permits the infrastructure to adequately function throughout its service life.³ The Air Force funds installation infrastructure sustainment at approximately 80 percent of the OSD Model recommended level. Risk is assumed to the quality and functionality of infrastructure by deferring sustainment maintenance, compounded each year by continuously not meeting the model target. The Air Force will need to further consider its investment in community support functions, such as the base exchange, commissary, bowling alleys, theaters, and chapels in order to free up much needed funding and reallocate those funds to direct, mission-related functions.

Installations have assumed the responsibility (and the bill) to provide equivalent amenities and support systems similar to the neighboring or off-installation, private communities. While balancing shrinking budgets and competing with private businesses and amenities that are better suited to meet customer demand, installations should examine which services they should provide and the quality of those services in which they offer. The Air Force budget has been significantly reduced and in order to balance shortfalls, it has cut manpower, eliminated benefits, and has already begun discussions to determine the mission need for, and potential impacts of the reduction or elimination of community services such as the base

exchange, commissary, bowling alley, theater and chapel facilities at Air Force installations. While eliminating all community services and amenities will save money and reduce installation footprint, this may not provide the best balance between mission and people. Each location is unique within its geographical location and the services available within the surrounding communities outside of each installation may need to be addressed on case-by-case scenario.

Methodology and Evaluation Criteria

Today's Air Force operates within a data-driven environment. Many budget decisions addressing infrastructure needs are being made today with near complete dependence of statistics, values and numbers. Through continuing centralization efforts, influenced by reduced budgets and human capital end-strengths, the Air Force developed statistical models aimed to calculate and provide mathematical supported solutions to its infrastructure needs. Criteria has been established and software programs have been institutionalized in order to support the Air Force engineering community in producing a model with the purpose of prioritizing the enterprise's infrastructure requirements from a "worst first" order of mission dependency.

The model includes a Mission Dependency Index (MDI). The MDI is a score, given to every real property category code (facility type) that correlates to that specific facility's linkage to enabling the Air Force's core mission. This score is formulated on a range from 25 to 99 and is recorded within the Department of Defense's Real Property Accountability Database.⁴ A high score, 99 for example, is given to what the Air Force as determined to be its most critical

infrastructure. Airfields in general are given a high MDI, above 90, and by comparison facilities such as credit unions, bowling centers, athletic fields, and thrift shops all have MDIs below 40. Also important to note, the Base Exchange and Commissary both earn an MDI score below 60 and the Chapel earns a 62, directly behind a security guard tower, a bunker, vehicle test rack and a dayroom lounge. These scores are a direct indication of the Air Force's prioritization of infrastructure as it relates to consequence of failure (CoF) of the Air Force's core mission execution.

Another key factor of this model is the facility's health. Facility or infrastructure health is assessed and translated into a value or score represented by its Facility Condition Index (FCI). The FCI is a continuously updating score that correlates to its age and its ability to function as designed and intended. As components or functions, such as the roof or utility systems, are identified for repair or replacement, the FCI score decreases, indicating a facility condition with increased risk of out-of-cycle maintenance, emergency repair, or even failure. In simple terms, this means that the facility condition has worsened. FCI scores are assessed through a range of 0-100. The lower FCI scores would indicate a facility is in poor or failing condition and as the facility health improves, the FCI would increase proportionally. A newly constructed facility with no problems could achieve an FCI of 100. The FCI provides an indication of the facility's probability of failure (PoF). Integrating the CoF with the PoF provides an assessment of risk.

$$\text{RISK} = \text{PROBABILITY} \times \text{CONSEQUENCE}$$

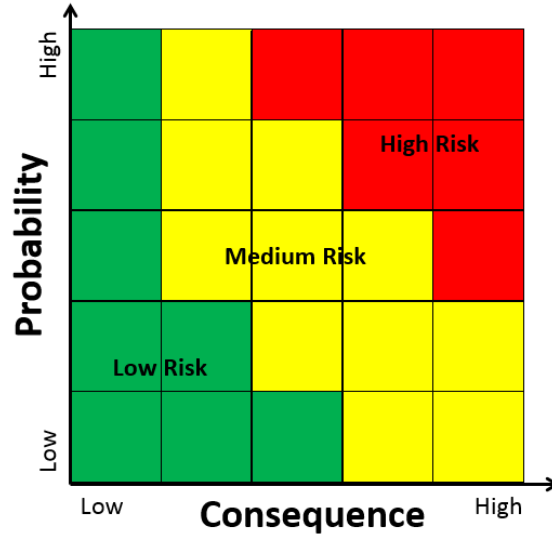


Figure 1: Assessment of Risk based on PoF and CoF

This value-driven model prioritizes the Air Force’s investments from a mission execution, risk-assessed approach. Infrastructure requirements are now modeled and approved through the centralized function of the Air Force Installation Mission Support Center (AFIMSC). Although there is an opportunity for Commander’s to subjectively include their priorities, the AFIMSC utilizes the model to provide an enterprise list of priorities based on scores. The AFIMSC then centrally funds enterprise-wide requirements based on a worst-first outlook. This framework prompts the utilization of quantitative analysis in order to defend the investment, or divestment, of its assets, whether mission or community support related, against a constrained budget.

One specific acknowledgement of gap analysis concerning this approach, directly stemming from the AFIMSC pre-established model, includes the localized inability to influence the MDI, affecting the CoF. As discussed earlier concerning MDI scores, directly correlating to the model’s output, infrastructure that directly ties to providing community services and support

to Airmen and their families, i.e., commissary, Base Exchange, chapel, and facilities supporting recreational activities, is arguably scored low as a baseline. This factor often prevents community service functional requirements from competing well for infrastructure project funding, regardless of the criticality emphasized by the local commander.

Results of Analysis

“Look, the bottom line for the Air Force is that our installations are too old, too big, and too expensive to operate.”⁵ As the Assistant Secretary of the Air Force for Installations, Environment and Energy, Honorable Miranda A. Ballentine, opened her 2016 comments to the Senate Subcommittee on Readiness and Management Support, she continued to address the risks assumed by the Air Force installations. Her comments, in summary, defended the requirement to shrink the Air Force footprint in order to operate within the President’s budget. In part, the requirement to reduce installations that are “too old, too big, and too expensive,” considering the infrastructure was designed decades ago for a much larger force, is based on financial savings and not a more effective or appropriately-sized force to meet today’s threats. Just in terms of the active duty personnel, the force has shrunk by approximately 33 percent in the past two decades and approximately 66 percent over the past three decades, as illustrated in Figure 2.⁶ This means the Air Force is investing sustainment and maintenance funding into installation infrastructure to support a populace that is today fractions less of what it used to be, literally one to two-thirds the size. By analogy, this would be like continuing to drive the gas-guzzling, monster-sized sports utility vehicle after the kids have moved out when the preference may be to downsize to a more efficient vehicle that is less expensive to maintain. Since 2005, accounting for the BRAC commission recommendations, the Air Force has 50,000 fewer total personnel, military and

civilian, and 500 fewer aircraft but still have the same number of installations to operate and maintain.⁷

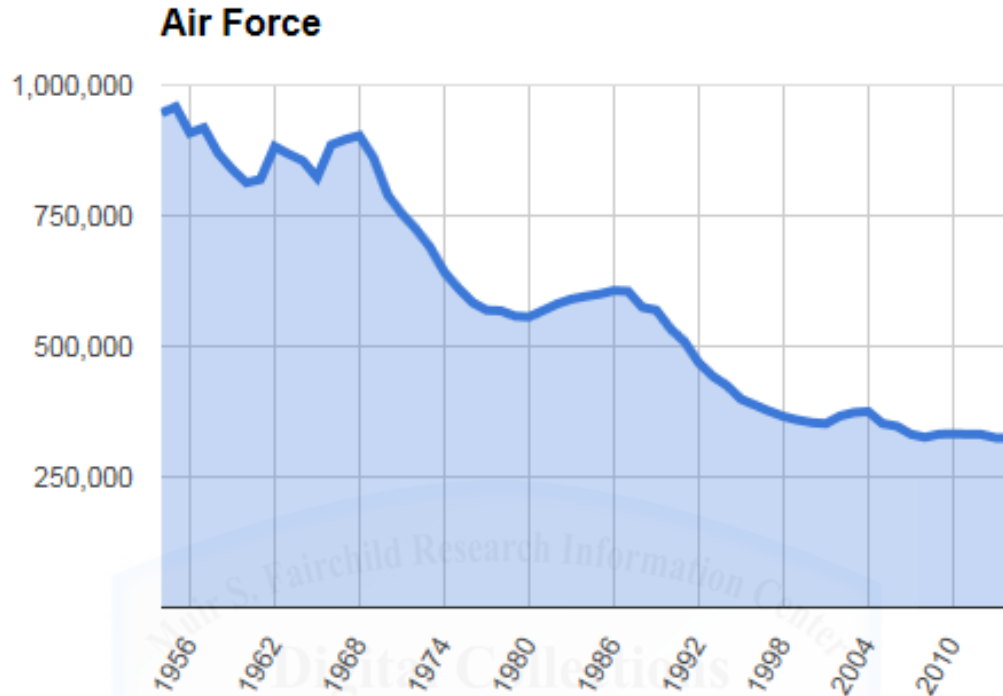


Figure 2: Air Force Active Duty Personnel Size 1954-2014 (Reprinted from David Coleman research outlining military personnel numbers)

Budget-Based Strategy

How installations are shaped, sized, supported and operated is not defined by what Air Force commanders deem as necessary but rather by the budget they are provided to operate within. The Air Force currently operates within a budget-based strategy. Presumably at great risk, the military strategy is constrained and defined by the budget rather than developing the strategy that best meets U.S. national security objectives. A key indicator of the investment into U.S. national defense is the military expenditure measured in terms of percent of the country's gross domestic product (GDP). In the past five years, the United States has seen a decline of

investment from 4.67 percent to 3.32 percent. Both of these percentages are down significantly from the United States' 1988 investment of 5.58 percent.⁸

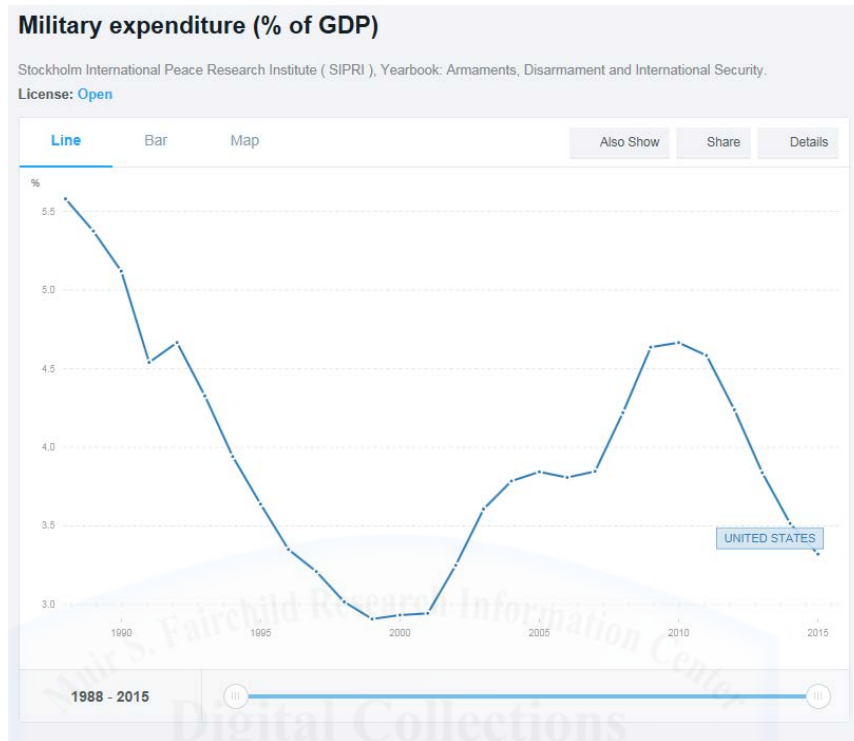


Figure 3: Military Expenditure (percent of GDP) (Reprinted from Stockholm International Peace Research Institute)

The Air Force's greatest asset in the pursuit of meeting national security objectives, regardless of the budget, remains its people. As part of the Air Force culture and one of its Institutional Competencies, the Air Force places great emphasis on taking care of its people.⁹ This means to ensure they have the means to maintain a healthy physical, spiritual, social, and mental fitness. Airmen have come to appreciate and arguably depend on the many of the resources the Air Force provides within its installations. Commissaries, base exchanges, chapels, recreational centers, theaters, bowling alleys, athletic fields, and thrift shops are just a few of the services provided to Airmen and their families that are funded through appropriated dollars and compete against other, more direct mission related requirements. If the Air Force were able to

free up available budget through development of alternative solutions to provide community service functions and benefits to Airmen and their families, the Air Force may be able to transition to more of a strategy-based budget and begin more predictive cost modeling rather than reactive spending.

Costs Data

The Air Force has approximately \$240 billion in Plant Replacement Value (PRV).¹⁰ PRV is a quantity expressed in value of its built infrastructure. This means it would cost \$240 billion to replace all of the current infrastructure. This value shows the magnitude of the infrastructure controlled by the Air Force. As the infrastructure continues to age, it requires continuous investment to prolong its lifespan and maintain its proficiency in enabling mission execution. The overall average age of a facility in the Air Force inventory is 36 years and one-third of the inventory has actually exceeded its intended lifespan of 50 years.¹¹ The fact that the entire Air Force inventory of infrastructure has exceeded two-thirds of its expected lifespan tells a significant story in terms of expected future investments. Approximately 70 percent of facilities have been assessed to be in a “good” condition, while 26 percent are within a “fair” to “poor” condition, and four percent are “failing.”¹² As the budget has tightened and the number of personnel reduced, the Air Force has assumed risk within its infrastructure to fund other requirements. This strategy continues to increase risk to the health of the infrastructure, linearly increasing the PoF and driving even larger bills in the future in order to maintain the same level of service. These decisions have generated a \$22.6 billion deferred maintenance and repair backlog that is typically invested to sustain and prolong infrastructure operability.¹³ This can be compared to not performing scheduled oil changes on a vehicle in accordance with the

manufacturer's recommendation. If the Fiscal Year (FY) 2017 total infrastructure investment were to be spread across the entire inventory, it would require every facility to last 107 years before being replaced, keeping in mind that each facility is typically designed and constructed with a 50-year lifespan.¹⁴ As the Air Force installations function as the service's power projection platform, it is absolutely critical to introduce new approaches to invest, sustain, and maintain its infrastructure to guarantee effective operability.

Recapitalization

General Goldfein said "we project airpower from our bases, and our infrastructure must keep up with modernization and recapitalization to sustain a ready force."¹⁵ Similar to producing the world's most advanced aircraft to maintain the edge over potential and known adversaries, the Air Force must also invest in new and modernized infrastructure that will meet the needs to adequately support these advanced airframes. "As our challengers employ increasingly sophisticated, capable, and lethal systems, we must modernize to deter, deny, and decisively defeat any actor that threatens our homeland and national interests. In order to stall the shrinking capability gap, the Air Force remains committed to our top three conventional acquisition priorities: the F-35A Joint Strike Fighter, the KC-46A Pegasus, and the B-21 long-range bomber."¹⁶ However, modernizing the fleet of aircraft while neglecting the infrastructure that not only supports the asset but also the people that serve the mission, significantly impacts its functionality and will reduce capability. For example, runways that are not sustained at a level to enable the safe and continuous launch and recover of aircraft directly impacts mission execution as does the hangar that experienced an inadvertent discharge from the fire suppression system due to inadequate utilities and temperature control. Taking this hypothetical argument a

bit further and perhaps a slightly more obscure link to infrastructure, let us examine ties to Airmen performance. Airmen dormitories that lack serviceable heating, ventilation, and air conditioning systems (HVAC) resulting in unbearable sleeping conditions, mold, and possibly elevated risk to health, will impact performance as well as morale. The medical clinic that attends to these Airmen's health needs has periodic, unscheduled closures due to unexpected utility failures because the pipes are corroded, frequently burst, and require replacement. Through this short example, it is easier to see how the recapitalization of infrastructure impacts many aspects of the Air Force's ability to project airpower.



Figure 4: Facility Infrastructure Pictures (Reprinted from AF/A4C Database)

Recapitalization of infrastructure can be seen as a three-legged stool that balances the health of installation infrastructure, as pictorially illustrated in Figure 5. In order to keep installations optimally supported for mission execution with minimal interruptions, they must be supported and recapitalized through sustainment, restoration and modernization (R&M), and military construction (MILCON) or new construction. The Air Force must plan, program, and

budget for all three of these funding streams across the Future Years Defense Plan (FYDP) in order to appropriately recapitalize its infrastructure. Sustainment, R&M, and MILCON are fund source categories that are tied to work classifications, as outlined by Air Force Instruction 32-1032, *Planning and Programming Appropriated fund Maintenance, Repair, and Construction Projects*.¹⁷ Sustainment is considered those regularly scheduled preventive actions that are accomplished to prolong an asset's lifespan. "This work includes regular roof replacement, refinishing of wall surfaces, repairing and replacing heating and cooling systems, replacing carpeting, and similar work,"¹⁸ such as rubber removal from runways that accumulates as aircraft touchdown and the resurfacing of roads. R&M funds the repair of a real property system. This can be considered the work accomplished after a real property asset or system has already broke and investment is required to bring it back to its original function.¹⁹ "Military Construction [MILCON], as defined in 10 U.S.C § 2801, Scope of Chapter, Definitions and § 2802, Military Construction Projects include any construction, development, conversion, or extension of any kind carried out with respect to a military installation."²⁰ Collectively, sustainment, R&M, and MILCON extend, restore, or provide new capacity or capability to real property assets. This balanced recapitalization investment ensures consistent and relevant optimization of Air Force weapon systems.

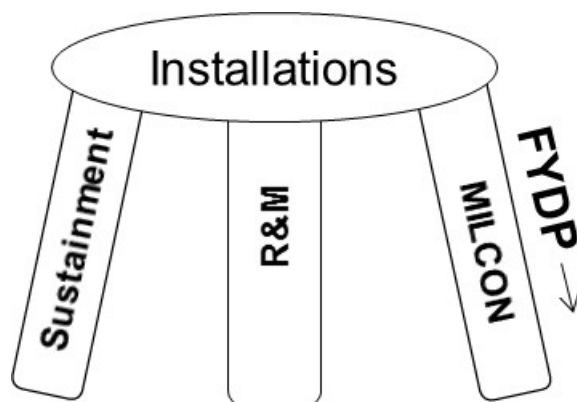


Figure 5: 3-Legged Stool Illustration of Balanced Recapitalization

As an effort to improve the recapitalization of facility infrastructure, OSD generated Facility Sustainment and Recapitalization Policy in 2014 establishing a Department of Defense (DoD) goal to fund sustainment programs at 90 percent or higher of the Facility Sustainment Model.²¹ The key word within this policy is “goal” however, it does provide emphasis, coming from the office of The Under Secretary of Defense, to make a concerted effort to meet investment strategies. There was a decision of implied art that the departments can assume risk of an unfunded 10 percent of the FSM or Facilities Sustainment Model. The services’ inability to meet the 90 percent goal can, and in the case of the Air Force, did in fact compound the pre-existing problem of the under-funded aged and stressed infrastructure. This is to say, that failing to do the small tune-ups that enable an extended lifespan, may eventually result in complete failure of the system, greater expense to repair, and has the potential to impact mission execution. Failure to recapitalize results in good infrastructure becoming poor, the bad becoming worse, and the worse becoming broken. This trend is visually depicted in Figure 6.²² FY2010 to FY2016 represents actual data but FY2017 through FY2022 represents programmed amounts. FY2014 includes an influx of end-of-year funding, partially contributed to

sequestration relief. From FY2010 through 2014, generally, sustainment was funded below the DoD goal of 90 percent. Although Restoration and Modernization (or the funding stream to address repairs after failure has already occurred) is not included within the model's 90 percent goal, it is included within the figure in order to show the overall recapitalization investment. It can be seen that within the FY2018 through FY2022 FYDP, that the Air Force only has the estimated capacity to fund to 75 percent sustainment and even when including the Restoration and Modernization funding stream, the total investment, collectively, is below the 90 percent goal. This figure shows the compounded issues when Sustainment, Restoration and Modernization is funded below DoD's goal of 90 percent and how it impacts the budget.

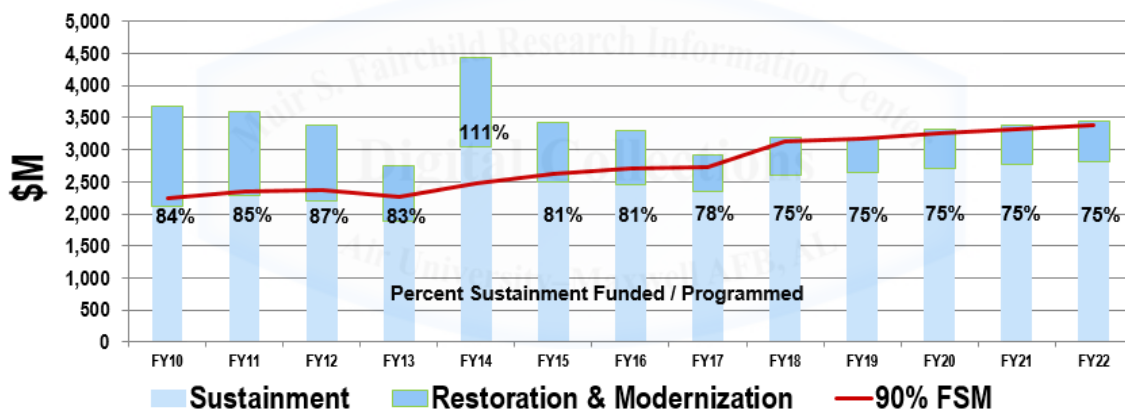


Figure 6: Sustainment, Restoration & Modernization Facility Investment (Reprinted from Colonel James Downs FY18-22 POM Briefing)

Budget

Air Force infrastructure is stressed, aged, and requires recapitalization if it is to remain relevant in pursuit to delivering global vigilance, global reach, and global power.

Acknowledging that Air Force Installations are oversized, over one-third of facilities have exceeded their designed 50-year lifespan, 25 percent of infrastructure has been assessed at a

“fair” to “poor” condition, there is nearly \$23 billion of deferred maintenance, and the current outlook, at best, requires every facility to last 107 years before being replaced, the unfortunate news is that the future budget holds little relief. The Air Force program identified \$11 billion total recapitalization requirement within the FY2016 through FY2020 FYDP. However, only \$6.6 billion was approved and included in the FYDP, due to the available funding cap. There simply was just not enough available funding to include the additional \$4.4 billion of infrastructure requirements. This means that 40 percent of the requirements identified as a mission need were deferred. Although this percentage decreased to about 37 percent within the FY2017 through FY2021 FYDP, the Air Force saw a large increase in requirement submissions for the FY2018 through FY2022 FYDP. Although not yet approved and finalized, the latest FYDP build projects only \$6.4 billion of requirements included, against the \$17.9 billion that were submitted.²³ This projection of only including 36 percent of submitted requirements arguably generates concern as to the health of the service’s infrastructure in the future as well as possibilities in which to improve this trend. As the Air Force juggles many requirements and is currently placing emphasis in the acquisition programs for the F-35A Joint Strike Fighter, the KC-46A Pegasus, and the B-21 long-range bomber, finding the savings to invest within its infrastructure is quickly coming to a tipping point.

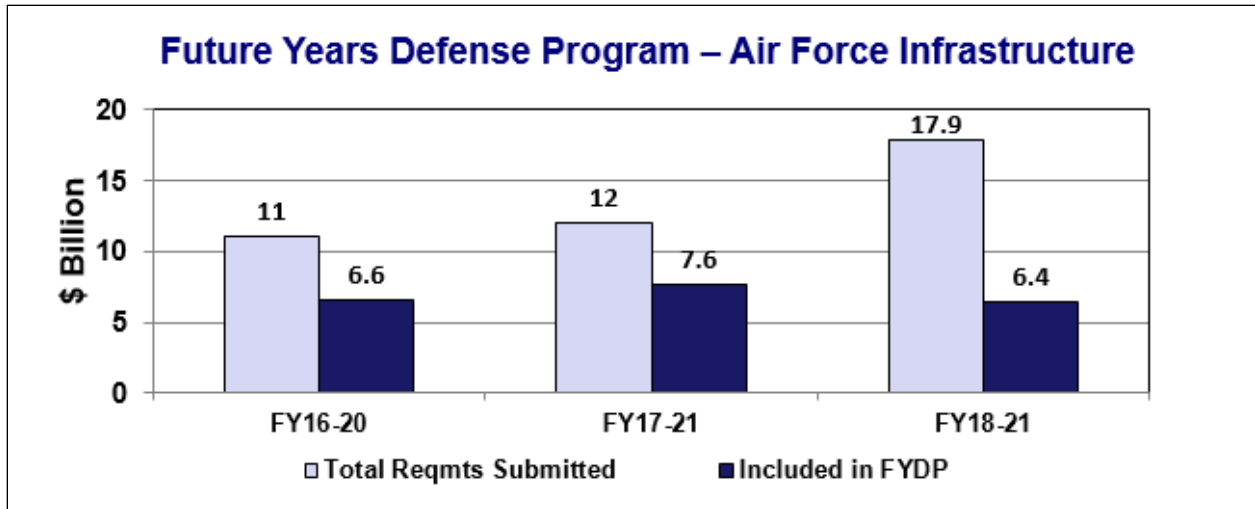


Figure 7: Future Years Defense Program – Air Force Infrastructure

The Price for Air Force Quality of Life

The Air Force will have to be creative in finding solutions that provide continued investment in its Airmen and families, ensuring a healthy force that is ready to fight. The importance of this investment has been captured in the Comprehensive Airman Fitness (CAF) program. “CAF strategy focuses on strengthening fitness, resilience, and readiness in Airmen, families, communities, and organizations through education, resilience building activities, and wellness support programs.”²⁴ As illustrated in Figure 8, CAF is a principle supported by physical, financial, social, mental, and spiritual support networks.²⁵ The Air Force delivers many of these principles through infrastructure on its installations. In addition to fitness centers to support physical wellbeing, it is common to find recreational areas that include sports fields and parks for intramural sports, running tracks, and cross-country tracks for walking, running, and bicycling. Private banks and credit unions provide financial assistance while youth centers, theaters, and bowling alleys provide social opportunities for Airmen and their families.

Installation chapels offer spiritual guidance as well as counseling services for increasing resiliency. Additionally, base exchanges and commissaries provide entitlements that service members have become accustomed to enjoying.



Figure 8: CAF Pillars (Reprinted from AF/A7C Wingman Day 2014)

While proven critically important to building resilient and ready Airmen and families, these Morale, Welfare, and Recreational (MWR) services come with a great financial burden. Air Force policy defines how both appropriated funding and non-appropriated funding support MWR activities.²⁶ Although the commissary is supported by the DeCA and other profit generating functions, such as the base exchange, bowling center, enlisted and officer clubs, and swimming pools are partially supported by the non-appropriated funds earned, all these functions are also supported by appropriated, taxpayer dollars. Policy divides these functions into three separate categories (Cat): Cat A for mission sustaining activities, such as fitness center and library; Cat B for basic community support activities such as swimming pools and bowling

center; and lastly, Cat C for revenue-generating activities such as base exchange and the club. Policy separates the funding of these categories by two main work classifications: (1) new construction and (2) maintenance and repair. Cat A is supported by appropriated dollars for both construction and maintenance and repair. In general, both Cat B and Cat C are supported by non-appropriations for new construction but maintenance and repair is funded by appropriated taxpayer dollars for both categories. A complete list of functions by category can be found within Tables 1-3 of the appendix. “APFs [appropriated funds] are authorized for paying utilities in all Air Force services activities, including golf course clubhouses and their immediate grounds and at all AAFES facilities.”²⁷ Additionally, lodging facilities, such as visiting enlisted and officers’ quarters are completely recapitalized by appropriations.²⁸ Supporting these MWR costs comes at a significant risk to other competing infrastructure requirements.

The Air Force prioritizes MWR investments against all other direct, mission related functions. Over the past decade, according to the Air Force Automated Civil Engineer System (ACES) database, strictly looking at MILCON, or new construction requirements exceeding \$1.0 million (excluding sustainment, maintenance and repair), the Air Force executed \$362.9 million in appropriated requirements toward addressing community functions supporting Airmen and families. These requirements were mostly comprised of child development centers, fitness centers, community centers, and lodging.²⁹ As a snapshot in time, in FY2009, the DoD invested \$2.7 billion in MWR appropriated funding, accounting for 61 percent of the total \$3.7 billion investment. Non-appropriated funding accounted for the remaining 39 percent of the total MWR investment.³⁰ Both the DoD and Air Force MWR investments represent a large portion of the total appropriations budget.

At a time when the budget is already stretched too thin, the Air Force must look at alternative means to prioritize and fund MWR requirements. In 2012, Fairchild AFB opened a new fitness center costing \$18.8 million.³¹ Macdill AFB is currently constructing a new lodging facility costing \$42 million.³² These are just a couple of examples of large, MWR requirements that were approved and funded above other more mission-critical functions, justified by MDIs. Across the DoD, the commissary also competes against other mission functions. Senator Tom A. Coburn, M.D. drew attention to this point in 2012 within his report “Department of Everything: Department of Defense Spending That Has Little to Do with National Security.”³³



Figure 9: Pentagon Commissary Spending (Reprinted from Sen Coburn’s report “Department of Everything”)

Which of the photos [Figure 9] depict where the Pentagon spent more money in 2012? Correct Answer – Grocery Stores [commissaries] received \$1.2 billion in Pentagon funding in 2012. Despite being at war in Afghanistan and continuing to have nearly 30 year old weapons, last year the Army spent less than \$700 million on assault rifles, carbine rifles, sniper rifles, grenade launchers, light and heavy machine guns, and shotguns combined, a little more than half of the sum spent to keep open Pentagon-run grocery stores.³⁴

Although culture and tradition have always been a large part of the military, certainly to include the Air Force, it is time to look for more creative ideas that will continue to provide MWR functions required to strengthen resiliency and build readiness for

Airmen and families but while also freeing up appropriated, taxpayer funding for more direct, mission-related capability.

Discussion of Analysis Results

Recapping the Air Force infrastructure's poor health, the worst-first scoring model, and the overwhelming backlog of deferred maintenance, coupled with the constricted budget, the time is overdue to begin looking for new, innovative ways for the Air force to increase infrastructure capital while continuing to invest in Airmen and families. Examining the scenario of the before-mentioned newly constructed fitness center at Fairchild AFB for \$18.8 million, it is interesting to consider the innovative solution implemented at Nellis AFB. During the early years of 2000, Nellis AFB leadership recognized the decline of MILCON funding potential. Searching for possible solutions to recapitalize the installation's antiquated and undersized fitness center, they engaged with the city of Las Vegas in a DoD initiative called public-public and public-private (P4) partnership. In the early 2000's, Las Vegas was one of the nation's fastest growing municipalities and had determined that a water reclamation facility (WRF) would be needed to support the expanding region. While the city of Las Vegas required land to support their WRF and Nellis AFB had a surplus, it opened an outstanding opportunity for P4 engagement between the two communities. In an exchange for 41 acres located on Nellis AFB to site the future WRF, the city of Las Vegas funded and constructed a \$25 million, 110 thousand square feet, state-of-the-art fitness center on the installation³⁵, as can be seen at Figure 10.³⁶ This new facility was constructed with zero appropriated dollars and is an example of a successful and innovative means to provide a community-focused solution to support Airmen and families while freeing up Air Force budget for other direct, mission required functions.



Figure 10: Nellis AFB Fitness Center (Reprinted from Nellis AFB official website)

A great example of leveraging P4 on an enterprise level, not just across the Air Force but the entire DoD, is housing privatization. During the mid-1990's, the DoD owned approximately 257 thousand family housing units. It was assessed that over 50 percent of the housing units required recapitalization due to nearly 30 years of underinvestment. The initial estimate of this required investment initiative through appropriations was \$25 billion over a 20-year period in order to bring housing back into standard.³⁷ The DoD did not have enough capital to invest this level of appropriations into safe and adequate housing for its service members. The only feasible means for the DoD to bring military family housing back into acceptable standards, was to leverage the investment power of the private sector. The DoD generated the Military Housing Privatization Initiative. Some Air Force privatized partnerships consist of individual bases and others are formed into groups of multiple bases, such as the "Western Group", which consists of Whiteman AFB, Malmstrom AFB, F.E. Warren AFB, and Beale AFB. The general terms of

these deals are to provide the private investor with the required real estate, based on a 50-year lease at minimal or no cost. The rent or lease amount of each housing unit is at the member's Basic Allowance for Housing (BAH) rate. These terms can fluctuate based on specific legal closing documents and financial portfolios at each location or terms agreed upon by each location's private housing partner and the installation leadership. This initiative not only permitted installation housing to be recapitalized at a standard that better mirrored the private sector homes that compete for occupancy off the installation, but also on a timeline that far surpassed the DoD due to its MILCON appropriations approval and execution processes. Through the DoD's initiative to privatize military family housing, the Air Force has eliminated the appropriated investment requirement and subsequently freed up billions of taxpayer dollars over the next couple of decades to reinvest in other more direct, mission related requirements and airframe acquisition programs.³⁸

The Air Force has engaged in other community partnerships that have alleviated appropriated investments while successfully providing community support to its Airmen and families. One such example occurred at Wright-Patterson AFB, in which the installation partnered with the Hope Hotel, allowing the privately funded entity to construct and manage a hotel and conference center on leased, installation property. The installation boundary fence was moved to exclude the hotel, but its close proximity provides great potential to serve both the local community and the installation, especially with the local area's high number of visiting personnel. This partnership benefits not only visiting Airman and families but also offers a strong customer foundation for the hotel, serving as an alternative visiting quarters for the installation and a commercial hotel for the public.

The Air Force, as a means of necessity, could seek other community partnership opportunities that can alleviate appropriated requirements from the Air Force, provide marketable funding opportunities for private sector investor, and also deliver levels of service that the Air Force, in many cases, could not competitively provide. Similar partnerships could be forged to deliver significant savings while continuing to provide of meaningful benefits to Airmen and families. Another suggested opportunity would be to more closely examine the commissary. Debatably, commercial and food retailers, such as Walmart, Target, Meijer, Whole Foods, and Kroger, are better enabled to provide the highest levels of service to shoppers at competitive rates.

DeCA contends it provides more than two dollars in benefits (through lower costs of groceries) to military members and their families for every one dollar it receives in federal funds. However, in the past the Congressional Budget Office (CBO) has questioned DeCA's analysis. The conclusion appears to assume members of the military would have purchased the same items at full retail price at other commercial grocery stores rather than comparison shop or otherwise take advantage of any type of lower prices, coupons, frequent shopper programs, or promotions.³⁹

Senator Coburn contended that the DoD needs to get out of the business of managing grocery stores. The study he published concluded that if the DoD eliminated commissaries and provided an additional \$400 per year of Basic Allowance for Subsistence to each military family, the DoD could still save \$9.1 Billion of appropriated expenses.⁴⁰ This would not only allow Airmen and families to shop at the store of their preference but also "help achieve the original purpose of the commissary benefit: recruitment and retention through higher pay and benefits."⁴¹ The DoD and the Air Force need to ask if the benefit the commissary provides is truly worth the cost.

Recommendation and Conclusion

The Air Force places strong emphasis on building and sustaining resilient and ready Airmen and families. Although the Air Force has been unable to appropriately invest in its mission related infrastructure to sustain it through its designed lifespan, it has also placed strong emphasis on investing in Comprehensive Airman Fitness. There is no tool yet for the Air Force to easily account for the enterprise total of appropriated funds invested in sustainment, restoration and modernization, and utilities strictly toward MWR functions. The nearly \$363 million MILCON investment over the past decade, representing just a single leg of the recapitalization stool shown in Figure 5, is a small indication of the substantial appropriated investment that competed against more mission related infrastructure requirements. It is important to note also, that this investment is not the total requirement that competed for funds but rather the amount that was obligated. Only a fraction of the total requirement has been obligated and not all installations are funded at an equivalent level.

Each location is unique in its own way. The commissary at Holloman AFB or the fitness center at any nuclear base may be assessed to be more critical to the installation in comparison to Joint Base San Antonio or Nellis AFB with competitive markets immediately outside the installation gates. There will not be any common solution to institutionalize across the entire Air Force enterprise, but rather a process to execute on an installation-to-installation basis, to assume the greatest appropriated savings while incurring the least risk to mission, Airmen and families. The facts are that 1) the Air Force installation infrastructure is at risk due to underinvestment and 2) there are other means to provide MWR support to Airmen and families outside of the appropriated channels.

Recommendations

The Air Force must engage in public-public and public-private, or P4, partnerships to reduce appropriated fund investments in MWR functions while providing continued level of service to Airmen and families. More thorough investigation needs to be accomplished to determine 100 percent of appropriated investments in MWR functions prior to establishing reduction goals and milestones. This includes investments not only in MILCON, but also sustainment, restoration and modernization, and utilities. All new MWR infrastructure requirements should be required to be established through P4 initiatives as the first option, and only after proven or failed attempts, should appropriated investments, or even non-appropriated investments with appropriated, follow-on sustainment requirements, be initiated. P4 could be accomplished by several avenues: 1) rely solely on existing, local community functions, 2) private entity to own and operate function for installation populace only (such as privatized housing), 3) private partnership to own and operate function that is open to both installation and local community populace (such as Hope Hotel).

The requirement as well as opportunity may be dependent on each individual installation's location. Several factors would need to be determined prior to engaging in possible solutions:

- Capacity: can off-installation services handle additional customer base
- Distance: how far are installation personnel willing to travel for specific services
- Criticality: how important specific services are to operational mission accomplishment
- Opportunity: financially viable for private sector while beneficial for installation

The off-installation capacity refers to the individual MWR service's current ability to handle the additional customer base of the installation populace. Using the commissary as an example, it

would need to be determined how many commercial grocery stores are located near the installation and if they have the ability to appropriately service the additional customers. The acceptable distance that customers would be expected to commute would also need to be defined, which could vary from location to location or even one MWR function from another. There could be priorities defined in terms of what is more important to the installation for accomplishing its operational mission. Many installations may define a child development center as a priority to enabling the operational mission but likewise, may not determine any mission degradation in association with a recreational field. Opportunities would also need to be recognized to engage in new possibilities to providing services. A couple successful examples include the Nellis AFB Fitness Center as an example of new construction on the installation and the Hope Hotel as another example of new construction that technically was developed outside the installation boundary. As the installation footprints extend beyond the Air Force's current requirement, the installation may be able to provide land-use or a commodity as a potential bargaining chip. This could mean providing land through a low or zero-cost lease, such as in the case of privatized housing, or even the access to commodities, such as water, gas, or electric utility.

The development of a table to first establish potential partnership opportunities would help guide decisions and then adding additional columns to assess costs would help mitigate and analyze risk. Figure 11 presents a draft model using a couple example facility types from each category (Cat A, Cat B, and Cat C) of MWR functions.

"XYZ" Air Force Base												
Facility Type	Distance from base (radius)		# of facilities within radius	Analysis estimate of additional capacity (all facilities within radius)	Criticality to Enabling Operational Msn (1-5)	Opportunity: Land Available for Private Developer	Opportunity: Existing Facility for Private Entity Utilization	Opportunity: Boundary Moved to Accommodate Private Development	Cost: FYDP Sustainment	Cost: FYDP Repair and Modernization	Cost: FYDP MILCON	Estimated Replacement
	(miles)	(quantity)	(quantity)	(Low/Med/High)	(Yes / No)	(Yes / No)	(Yes / No)	(\$)	(\$)	(\$)	(Years)	
Gymnasium/Fitness Center												
Library												
Playing Courts and Fields												
Child Development Center												
Arts and Crafts Skill Development												
Swimming Pool (outdoor)												
Bowling Center												
Car Wash												
AAFES Base Exchange												

Figure 11: Installation-Community Partnership Model

Three separate tables could be generated for each category; however, this table was only generated for visual aid of facility types. The factors measuring capacity, distance, criticality, and opportunity utilize applied art and the cost data utilizes quantitative analysis to assess risk and risk avoidance. The factors to be measured for each facility type include:

- Acceptable distance (radius) from installation to assume personnel to travel
- Number of like-facilities that fall within acceptable radius
- Analysis estimate of those facilities within radius to handle additional capacity
- Criticality of facility-type to enabling the operational mission
- Identify if installation has available land or commodity to provide in trade
- Identify if installation has existing facility for private entity utilization
- Identify potential to move boundary fence to accommodate private development
- Appraise total sustainment cost requirement across FYDP
- Appraise total repair and modernization requirement across FYDP
- Appraise total MILCON requirement across FYDP
- Estimated years remaining in facility's designed lifespan

The table is only intended to provide a baseline as an initiating point for negotiating with the local municipalities.

The focus of this recommendation is to reduce or eliminate appropriated funding to support community functions while continuing to provide adequate levels of service to Airmen and families through private sector funding. Each installation would be responsible for determining which MWR functions are instrumental to executing its operational mission and then placing more dependence on neighboring communities' to reasonably fund all other MWR functions and services. This could be accomplished through complete reliance on existing, off-installation community functions, developing partnerships to serve the installation populace only, or partnerships that support populations both on and off the installation. There may be new inconveniences introduced to Airmen and families, such as additional travel or time constraints, but there may also be increased levels of service provided due to utilizing a business model that is not limited by federal spending limits, government architectural standards, and a restricted customer base. In turn, these P4 partnerships could save billions of appropriated dollars in MWR investments that could be repurposed to fund more critical, mission oriented requirements.⁴²

Conclusion

Installations are the platforms from which the Air Force employs its warfighting capability. The Air Force balances this focus on mission with a strong emphasis on building and sustaining resilient and ready Airmen and families. Due to the downsizing of the force, the Air Force finds itself “too old, too big, and too expensive to operate.”⁴³ Although the Air Force utilizes a scoring model to prioritize funding the worst conditioned infrastructure first, the health

of infrastructure continues to worsen across the enterprise. There is a \$22.6 billion deferred maintenance and repair backlog along with \$17.9 billion of requirements programmed within the FY2018 through FY2022 FYDP.⁴⁴ Non-appropriated infrastructure requirements account for a large part of this growing backlog. In order to correct this increasingly negative trend, the Air Force must become more dependent on P4 relationships.

Establishing a requirement to first seek P4 solutions before investing appropriations will not only provide an answer to recapitalizing Air Force infrastructure but also offer additional, if not improved, alternatives to providing MWR functions and services to Airmen and families. Understanding that each installation and its neighboring communities are unique, identifying and measuring capacity, distance, criticality, and opportunity at each location will assist in defining the feasibility of P4. Utilizing the table at Figure 11 will inform leadership through qualitative and quantitative measurements. Applying the art of assessing capacity, distance, criticality, and opportunity along with the science of cost data will allow leadership to assess risk and risk avoidance in choosing one of three P4 options: 1) rely solely on existing, local community functions, 2) private entity to own and operate function for installation populace only (such as privatized housing), 3) private partnership to own and operate function that is open to both installation and local community populace (such as Hope Hotel).

Appendix

**Table 1. Category A—Mission Sustaining Activities Fund Source
(Reprinted from AFI32-1022)**

Line	Cat Code	Type of Facility	Facility Construction ^{1,3}	Facility Maint & Repair ^{2,3,7}
1	610-243	Administrative Office, Supply Center Services	APF	APF
2	7XX-XXX 740-677 750-81X	Aquatic Training Facility/ Bathhouse for military training, physical fitness, combat training, and therapy (Indoor) (Outdoor)	APF	APF
3	740-873	Auditorium, Theater Multipurpose	APF	APF
4	740-673	Field House, Physical Activities Complex	APF	APF
5	740-674	Gymnasium / Fitness Center / Health & Wellness Ctr	APF	APF
6	740-675	Library	APF	APF
7	750-XXX	Parks and Picnic Areas (including supporting facilities)	APF	APF
8	750-XXX	Playing Courts and Fields ^{4,5} (associated with Physical Conditioning)	APF	APF
9	740-3166	Community Center, Day Room, Multipurpose Recreational Facility	APF	APF

NOTES:

1. OSD(P&R) must approve a waiver to fund source if the construction fund source shown is not used
2. Use of NAFs for maintenance and repair requires a waiver to fund source from SAF/FMC. Send requests to USAF/A4CF for staffing through appropriate offices for SAF/FMC.
3. For environmental compliance work, coordinate with AFCEC environmental offices to determine proper source of funding. SAF/FM will not consider a request for a waiver to the environmental compliance construction fund source.
4. Installations will fund playing courts and fields with APFs, if most of the following conditions exist: a.) They are the only ones on base (i.e., a small installation); b.) Attached to the gym; c.) Detached from the gym, but operated by the gym staff; d.) Reserved for only military personnel during peak use times, e.g., noon hour; e.) Located in the dormitory area for use by active duty military personnel; and f.) Periodically closed to open play to host intramural or varsity-type tournaments. **(T-3)**.
5. Skateboard Parks: if the skateboard park is constructed within an existing park and picnic area, then it is classified as a Category A and APFs are the proper fund source; if constructed as a stand-alone facility (indoor or outdoor) or as part of youth center, installations will classify it as a Category B facility and NAFs are the proper fund source. **(T-3)**.
6. For Cat Code 740-3XX, reference the Type of Facility to determine which Table (3.1, 3.2 or 3.3) to apply.
7. Applies to NAF facilities if title transferred to APF.

**Table 2. Category B—Basic Community Support Activities.
(Reprinted from AFI32-1022)**

Line	Cat Code	Type of Facility	Facility Construction ^{1,3}	Facility Maint & Repair ^{2,3,8}
1	131-114	Amateur Radio Facility	NAF	APF
2	740-664	Arts & Crafts Skill Development	NAF	APF
3	740-665	Automotive Skills Development	NAF	APF
4	740-671	Bowling Center (16 lanes or less-base total must be less than 16)	NAF	APF
5	740-884	Child Development Center	APF	APF
6	740-668	Entertainment Center (music & theater)	NAF	APF
7	740-672	Marina/Boathouse Without Resale or Private Boat Berthing	NAF	APF
8	750-371	Outdoor Recreation (includes small campgrounds)	NAF	APF
9	750-XXX	Playing Courts and Fields ^{4,5}	NAF	APF
10	740-316 ⁶	Recreational Info, Tickets, and Tour Services	NAF	APF
11	740-677	Recreation Swimming Pools & Bathhouses (Indoor)	NAF	APF
12	750-81X	Recreation Swimming Pools & Bathhouses (Outdoor)	NAF	APF
13	740-262	Stars and Stripes	NAF	APF
14	740-883	Youth Facilities ⁷ (Centers, Courts, and Playing Fields)	NAF	APF

NOTES:

- OSD(P&R) must approve a waiver to fund source if the construction fund source shown is not used. AF/A4CF routes waiver requests to SAF/FMC to use NAFs for maintenance and repair.
- Includes the reconfiguration of a facility, e.g., the addition, rearrangement, or removal of non load-bearing walls, modification of Heating, Ventilation, & Air Conditioning (HVAC), electrical, or other systems/components to restore a building to functional standards, i.e., to make a facility fully functional and capable of supporting activities and programs effectively and efficiently. Includes maintenance and repair of bowling lanes and pinsetters at remote and isolated and Category B bowling centers. Per AFI 65-106, addition, rearrangement, or removal of non load-bearing walls is subject to availability of APFs; no SAF/FMC waiver to fund source is needed to use NAFs.
- Except for Child Development Centers and Youth Facilities Overseas, use NAFs for all construction environmental compliance. Use non-environmental quality APFs for all maintenance and repair environmental compliance requirements. SAF/FM will not consider a waiver request to the environmental compliance construction class.
- Installations will fund construction of playing courts and fields with NAFs if most of the following conditions exist: a.) Part of a NAF youth center program. b.) For primary use by residents (not particularly military). c.) Not operated as part of the gym program. d.) Do not offer special times for military preference. **(T-1)**.
- Category A Skateboard Parks: if constructed within an existing park and picnic area APFs are the proper fund source, if constructed as a stand-alone facility (indoor or outdoor) or as part of youth center, installations will classify it as a Category B facility and NAFs are the proper fund source. **(T-1)**.
- For Cat Code 740-3XX, installations will reference the Type of Facility to determine which Table (3.1, 3.2 or 3.3) to apply. **(T-1)**.
- Installations will use APFs for construction, maintenance and repair of youth facilities (youth centers, courts, and playing fields) at overseas locations. **(T-1)**.
- Applies to NAF facilities if title transferred to APF.

Table 3. Category C—Revenue Generating Activities.
(Reprinted from AFI32-1022)

Line	Cat Code	Type of Facility	Facility Construction	Facility Maint & Repair ^{1,5,7}	Functionally Unique Items ^{2,3}
1	NA	Armed Forces Recreation Centers	NAF	APF	NAF
2	740-262	Academic or Recreational Bookstore	NAF	APF	NAF
3	740-668	Amusement & Recreational Machine Locations	NAF	APF	NAF
4	171-151	Bandstand	NAF	APF	NAF
5	740-671	Bowling Center (more than 16 lanes)	NAF	APF	NAF
6	750-42X	Golf Course Grounds/Support Facilities	NAF	NAF	NAF
7	750-42X	Clubhouse, Golf Cart Storage, Parking Lot	NAF	APF	NAF
8	740-672	Marina, Boathouse (resale or private boat berthing)	NAF	APF	NAF
9	750-663	Services Car Wash	NAF	APF	NAF
10	740-XXX	Services Fast Food, Snack Bar, Restaurant	NAF	APF	NAF
11	740-672	Recreation Rental Equipment Checkout Facility	NAF	APF	NAF
12	740-678	Skating Rink	NAF	APF	NAF
13	740-316	Unofficial Commercial Travel Service Facility	NAF	APF	NAF
14	740-615	Collocated or Consolidated Club	NAF	APF	NAF
15	740-612	Enlisted Club	NAF	APF	NAF
16	740-617	NCO	NAF	APF	NAF

		Club			
17	740-618	Officers' Club	NAF	APF	NAF
18	NA	Civilian Dining, Vending & Other Resale Activities and Services	NAF	APF	NAF
19	740-666	Guest Houses, Motels, Hotels	NAF	APF	NAF
20	740-666	Cabins, Cottages, Cabanas	NAF	APF	NAF
21	750-611	FAMCAMPS (including privately owned RVs & trailers)	NAF	APF	NAF
22	740-3XX	AAFES: Exchange logistical, administrative, storage, and maintenance facilities	NAF ⁴	APF	NAF
23	740-3XX	Exchange facilities required in areas of military conflict, wartime deployments, and in support of contingency, humanitarian, and peacekeeping operations	APF	APF	NAF
24	740-3XX	Exchange facilities required as integral parts of air terminal, hospital, housing, or other MILCON projects	APF	APF	NAF
25	740-384	Exchange Laundry and Drycleaning Plant	APF	APF	NAF
26	740-317	Aero Club	NAF	APF	NAF
27	740-668	Audio or Photo Club (resale)	NAF	APF	NAF
28	740-668	Parachute or Sky Diving Club	NAF	APF	NAF
29	740-315	Rod & Gun Club	NAF	APF	NAF
30	740-668	Scuba or Diving Club	NAF	APF	NAF
31	750-583	Riding Clubs and Stables	NAF	APF	NAF
32	740-	AAFES: All other Exchange facilities including CONUS	NAF	APF	NAF

	3XX ⁶	Main Exchanges and Shoppettes			
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NOTES:

1. In accordance with AFI 65-106, APFs are not authorized in Category C facilities, except in Remote and Isolated locations, for rearrangement or removal of non-load-bearing walls to restore a building to functional standards, i.e., to make an existing building fully functional and capable of supporting Category C activities or programs effectively and efficiently. Installations must use NAF to fund this work except in Remote and Isolated locations. (T-1).
2. Installations must use NAFs for the maintenance and repair of functionally unique items required to support activity operations. (T-1). These items make the facility usable for the activity it contains, but are not considered part of the normal facility system. See Attachment 2 for examples.
3. For Remote and Isolated Locations: Installations will use APFs which are authorized for Category C functionally unique items required to support activity operations (see paragraph 3.9). (T-1).
4. Installations shall use APFs outside the United States. (T-1).
5. Installations will use NAF for AAFES-owned real property and equipment not transferred to the installation. (T-1).
6. For Cat Code 740-3XX, installations will reference the Type of Facility to determine which Table (3.1, 3.2 or 3.3) to apply. (T-1).
7. Applies to NAF facilities if title transferred to APF.



Notes

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² Sen Tom A. Coburn, *Department of Everything: Department of Defense Spending That Has Little to Do with National Security*, November 2012.

³ Office of the Secretary of Defense (OSD) User's Manual, *Facility Sustainment Model Version 12*, February 2010, 1.

⁴ Air Force Real Property Assessment Database (RPAD)

⁵ Senate, *Military Construction, Environmental, Energy, and Base Closure Programs: Hearings before the Subcommittee on Readiness and Management Support of the Committee on Armed Services*, 114th Cong., 2d sess., 2016, 26.

⁶ David Coleman, "U.S. Military Personnel 1954-2014," History in Pieces, accessed 17 September 2016, <http://historyinpieces.com/research/us-military-personnel-1954-2014>.

⁷ Briefing, Headquarters Air Force, Directorate of Civil Engineering, subject: HASC-R Skull Slides: Facility MILCON, FSRM, Recapitalization, 2016.

⁸ The World Bank, "Military Expenditure (% of GDP)," World Bank Data, accessed 17 September 2016, <http://data.worldbank.org/indicator/MS.MIL.XPND.GD.ZS?locations=US>.

⁹ Curtis E. LeMay Center for Doctrine Development and Education, *Annex 1-1, Force Development*, 15 December 2014, 16, <https://doctrine.af.mil/download.jsp?filename=1-1-Annex-FORCE-DEVELOPMENT.pdf>.

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¹³ Briefing, Headquarters Air Force, Directorate of Civil Engineering, subject: HASC-R Skull Slides: Facility MILCON, FSRM, Recapitalization, 2016.

¹⁴ Briefing, Headquarters Air Force, Directorate of Civil Engineering, subject: HASC-R Skull Slides: Facility MILCON, FSRM, Recapitalization, 2016.

¹⁵ Senate, *Statement of General David L. Goldfein, Chief of Staff of the Air Force: Long-Term Budgetary Challenges Facing the Military Services and Innovative Solutions for Maintaining Our Military Superiority*, 114th Cong., 2d sess., 2016, 2.

¹⁶ Senate, *Statement of General David L. Goldfein, Chief of Staff of the Air Force: Long-Term Budgetary Challenges Facing the Military Services and Innovative Solutions for Maintaining Our Military Superiority*, 114th Cong., 2d sess., 2016, 2.

¹⁷ AFI 32-1032, *Planning and Programming Appropriated fund Maintenance, Repair, and Construction Projects*, 24 September 2015, 54.

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¹⁸ AFI 32-1032, *Planning and Programming Appropriated fund Maintenance, Repair, and Construction Projects*, 24 September 2015, 75.

¹⁹ AFI 32-1032, *Planning and Programming Appropriated fund Maintenance, Repair, and Construction Projects*, 24 September 2015, 74.

²⁰ AFI 32-1021, *Planning and Programming Military Construction (MILCON) Projects*, 25 February 2016, 17.

²¹ Hon. Frank Kendall, The Under Secretary of Defense, to the Under Secretaries of the Military Departments, memorandum, subject: Facility Sustainment and Recapitalization Policy, 29 April 2014.

²² Briefing, Headquarters Air Force, Directorate of Logistics, Engineering & Force Protection, Installation Support Panel, subject: FY18-22 POM Briefing Energy, Installations and Environment Programs, 14 July 2016.

²³ Briefing, Headquarters Air Force, Directorate of Logistics, Engineering & Force Protection, Installation Support Panel, subject: FY18-22 POM Briefing Energy, Installations and Environment Programs, 14 July 2016.

²⁴ AFI 90-506, *Comprehensive Airman Fitness (CAF)*, 2 April 2014, 3.

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²⁶ AFI 65-106, *Appropriated Fund Support of Morale, Welfare, and Recreation Instrumentalities (NAFIS)*, 6 May 2009.

²⁷ AFI 32-1022, *Planning and Programming Nonappropriated Fund Facility Construction Projects*, 30 December 2015.

²⁸ AFI 23-1022, *Planning and Programming Nonappropriated Fund Facility Construction Projects*, 30 December 2015, 18.

²⁹ Air Force Automated Civil Engineer System (ACES) Database.

³⁰ House, *Statement of Hon. Robert L. Gordon III, Deputy Assistant Secretary of Defense, Military Community and Family Policy*, 112th Cong., 1st sess., 9-10 February 2011, 3.

³¹ "Sky's the Limit: Fairchild Opens New Fitness Center," *Air Force Fitness/Health & Wellness*, June 2012, 1.

³² Alli Knothe, "MacDill Air Force Base's new hotel is good news for taxpayers, but could hurt local hotels," *Tampa Bay Times*, Friday, 20 May 2016.

³³ Sen Tom A. Coburn, *Department of Everything: Department of Defense Spending That Has Little to Do with National Security*, November 2012.

³⁴ Sen Tom A. Coburn, *Department of Everything: Department of Defense Spending That Has Little to Do with National Security*, November 2012, 66.

³⁵ Steve Bonner et al., "Installation-Community Partnerships: A New Paradigm for Collaborating in the 22st Century," *Journal of Defense Communities, Volume 1*, 2012.

³⁶ Nellis Air Force Base website. "Photos."

<http://www.nellis.af.mil/News/Photos.aspx?igpage=1&igsearch=fitness>

³⁷ Office of the Deputy Under Secretary of Defense, Installations and Environment, "Military Housing Privatization," accessed 27 September 2016,

<http://www.acq.osd.mil/housing/faqs.htm#Prog Objectives>

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³⁹ Sen Tom A. Coburn, *Department of Everything: Department of Defense Spending That Has Little to Do with National Security*, November 2012, 67.

⁴⁰ Sen Tom A. Coburn, *Department of Everything: Department of Defense Spending That Has Little to Do with National Security*, November 2012, 68.

⁴¹ Sen Tom A. Coburn, *Department of Everything: Department of Defense Spending That Has Little to Do with National Security*, November 2012, 68.

⁴² Office of the Deputy Under Secretary of Defense, Installations and Environment, “Military Housing Privatization,” accessed 27 September 2016, <http://www.acq.osd.mil/housing/faqs.htm#Prog Objectives>

⁴³ Senate, *Military Construction, Environmental, Energy, and Base Closure Programs: Hearings before the Subcommittee on Readiness and Management Support of the Committee on Armed Services*, 114th Cong., 2d sess., 2016, 26.

⁴⁴ Briefing, Headquarters Air Force, Directorate of Logistics, Engineering & Force Protection, Installation Support Panel, subject: FY18-22 POM Briefing Energy, Installations and Environment Programs, 14 July 2016.



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