



Beyond BRAC: Defining the Path Forward for Installations, Communities and Infrastructure



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INTRODUCTION

Infrastructure recapitalization and facilities maintenance in the Department of Defense (DoD) face enormous funding challenges, which create substantial risks to readiness and missions, and reduce the capability and capacity of defense infrastructure to support the lethality of our fighting forces. DoD has an unfunded backlog of deferred maintenance and repair of over \$116 billion. To place this in context, DoD spending for facility sustainment and recapitalization is about \$13 billion in fiscal 2018¹. The cost to address the unfunded maintenance backlog is many decades worth of spending at current levels. In sum, the facility-related risks to mission readiness and training and equipping our soldiers, sailors, airmen and Marines are at historically high levels, and growing. With no likelihood of a new round of Base Realignment and Closure (BRAC) in the immediate future, DoD is looking for new ways to bridge the funding gap, pursuing new technologies and new ways of doing business, and seeking partnerships between military installations and state or local governments to create efficiencies and realize savings at the installation level.²

1 Written statement of the Honorable Lucian Niemeyer, Assistant Secretary Of Defense for Energy, Installations and Environment before the Senate Appropriations Subcommittee on Military Construction, Veterans Affairs, and Related Agencies, 2018

2 The content of this article is based in part on the results of 2017 ADC Policy Forum held in Washington, DC, on November 2, 2017. Contributors to the event included:

- Honorable Lucian Niemeyer, Assistant Secretary of Defense for Installations, Environment and Energy
- Cord Sterling, Professional Staff for the Senate Armed Services Committee
- Susanna Blume, Fellow, Defense Strategy and Assessments Program, Center for New American Security
- Tom Hicks, Founding Principal, The Mabus Group
- John Conger, ADC National Advisory Board; President, Conger Strategies
- Thomas Spoehr, Director, Center for National Defense, The Heritage Foundation
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- Brig Gen (Ret.) Theresa Carter, CEO, TC3 Solutions

Lucian Niemeyer, assistant secretary of Defense for energy, installations and environment, laid out both the challenges and DoD's plans for addressing the ongoing mission readiness risks presented by the infrastructure and maintenance backlogs in recent congressional testimony. Secretary Niemeyer spoke at length about how to address these issues, and presented Congress with a multi-faceted plan for action that includes significant reductions in total infrastructure, addressing and changing business processes to take advantage of innovations, and using technology to leverage the capabilities of the workforce. He said the department intends to "expand the use of public-private and public-public partnerships," and laid out a vision for benchmarking best practices and innovative technology solutions available through partnership with industry. Secretary Niemeyer highlighted the importance of public-public partnerships, stating, "And last, but definitely not least, we are enhancing our collaboration with the hundreds of dedicated defense communities around the nation supporting our bases."

This paper will explore three major themes and suggest practical short- and long-term actions that DoD, Congress and military communities can take to improve the condition, efficiency, lethality, readiness, and military value of our military installations:

- **Partnerships:** State and local governments have both the capability and interest to help DoD take advantage of partnerships, as does the private sector. DoD should continue to embrace partnerships as a way of doing business, and adjust policy — as well as seek new legislative authority when necessary — to take full advantage of the savings, efficiencies and enhancements to military value possible through partnerships;
- **Technology:** DoD must enhance and ingrain its use of technology to manage and maintain installation infrastructure more efficiently and cost effectively, and embrace new technologies that

are cyber secure and help improve management processes and maintenance outcomes;

- **New ways of doing business:** Demographic and generational megatrends are changing how military members perceive and use the services available on installations. These trends combined with practical considerations of budget and security suggest that now is the time for DoD to aggressively pursue alternative models that can be applied to installation infrastructure management, especially as installations evolve. The department may want to consider reexamining the city-base model.

PARTNERSHIPS AS A FORCE AND RESOURCE MULTIPLIER

Partnerships between communities and military installations are nothing new. If you visit the headquarters for the 502nd Air Base Wing at Joint Base San Antonio (JBSA) you can see a picture on the wall depicting President William Howard Taft dedicating the “Gift Chapel” on Fort Sam Houston in 1909. This building was a gift from the people of San Antonio, and today the community is working with JBSA to renovate the chapel to provide another 100-plus years of service.

Similarly, the private sector and the military have a long history of partnering. Government-owned, contractor-operated (GOCO) facilities provide DoD with access to the latest technologies and best practices of business with considerably fewer bureaucratic obstacles to overcome than would be faced in other types of procurement. Facility use agreements at depots offer the private sector the ability to fully utilize production lines and maintenance facilities, providing for military equipment manufacturing and maintenance during certain hours and production of commercial products during others. These agreements maximize the efficiency of the facility and produce added value for the nation’s economy.

Today through a variety of programs and initiatives, DoD pursues both public-public partnerships — between state or local government entities and military installations — and public-private partnerships — between commercial and DoD entities. The Association of Defense Communities (ADC) has been pivotal in advocating for legislation and policy changes, providing education and services, and encouraging member communities to engage the military services and develop ideas for public-public partnerships. A number of success stories for both public-public and public-private partnerships have emerged in the past two decades and the lessons learned from these endeavors are being implemented elsewhere within DoD, but more could be done with additional policy and cultural changes.

Following the example set by the first privatized military family housing developments, constructed on Fort Ord, Calif., in the 1980s, the Military Housing Privatization Initiative (MHPI) has almost completely recapitalized the housing stock on military installations worldwide. The results of MHPI public-private partnerships are both tangible in the form of reduced operations and maintenance budget demands and vastly improved quality of the housing stock, and intangible in the form of better quality of life for military families and peace of mind for military members.

The integrated solid waste management partnership between Glendale, Ariz., and Luke Air Force Base, and Brooks City Base in San Antonio provide examples of successful public-public partnerships. Glendale and Luke AFB implemented an agreement in early 2017 under which Glendale provides solid waste collection and hauling services for the base. This agreement is saving the Air Force \$56,000 annually over the previous contract and generating \$255,000 in new revenue annually for Glendale. In light of the agreement’s success, the base and community are discussing renewing it and using this experience as a springboard to develop additional base operating support partnerships.

The former Brooks AFB is a great success story for BRAC, but one that stemmed from the Brooks City Base pilot project. By transferring ownership of the installation and responsibility for all installation maintenance and support to a local agency, the Air Force saved \$8 million to \$10 million on base operating support costs on day one. And the community got a two-year head start on creating thousands of new jobs, developing a new hospital and university, attracting quality housing to an underserved area, and expanding both their retail and property tax base. Today Brooks is a powerhouse driving redevelopment across the southeast quadrant of San Antonio.

Other successful partnerships include utility privatization, enhanced use leasing, funding initiatives created by states to support installation infrastructure and missions, compatible land use partnerships to address mission encroachment, and land exchanges between public entities to enhance missions and combat mission encroachment. The best partnerships help DoD enhance the military value of an installation; realize cost efficiencies, avoidance and savings; and extend asset life. The resources freed by these partnerships contribute to the lethality of our military through investments in equipment and readiness. They also help enhance quality of life and retention through investment in family services, such as child care and morale, welfare and recreation services and facilities. But some partnerships face challenges from unanticipated situations.

Housing privatization is an example of a partnership effort that has produced mixed results. The recapitalization of military family housing has vastly improved quality of life for military families and contributed measurably to retention. But the prolonged timeline involved in financing major residential development, uncertainties in military missions and installation populations, and fluctuations in local economies have produced risks for both DoD and their

private partners that were not fully anticipated when the MHPI3 was created.

Some MHPI developments have significant vacancy rates, even after applying all of the “waterfall” decisions built into deals to ensure a viable market size. Loss or downsizing of missions is one cause, but in some cases the desire of military members to purchase their own home as a financial strategy has played a larger role than anticipated. This is particularly true in markets where home ownership became much more affordable as a result of the collapse in housing financial markets in 2008.

Communities have important economic reasons for supporting the mission viability and resilience of their local military installation in addition to their desire to contribute to the national defense and support military families. As installation operations and maintenance, sustainment, restoration and modernization (SRM), and military construction budgets have faced pressure over the past two decades, communities have been anxious to find ways to support the missions and military value of their installations in order to protect local jobs and economic activity. In 2013, ADC engaged with the House Armed Services Committee and congressional leadership to sponsor a new authority for DoD to enter into public-public partnerships. The new authority allows for sole-source agreements between military installations and state or local government entities to provide a wide range of community services. This new authority waives the application of federal wage rules, allowing local rates to prevail. In 2015 Congress amended the law to clarify that agreements fostered under its auspices do not have to follow federal acquisition rules, and in 2018 Congress further amended the authority to allow agreements to last up to 10 years. A part of the reason for doing this was

3 Government Accountability Office. (2009). MILITARY HOUSING PRIVATIZATION: DOD Faces New Challenges Due to Significant Growth at Some Installations and Recent Turmoil in the Financial Markets (GAO Publication No. GAO-09-352). Washington, D.C.: U.S. Government Printing Office

to create a “trusted partner” relationship between military installations and host communities as opposed to a more traditional contracting relationship. This government-to-government approach has eased the way for communities and installations to take advantage of this authority.

The military services embraced this new authority to varying degrees and at varying speed, with the Air Force taking the early lead in exploring its application. Today both the Air Force and Army have successfully completed partnership agreements under this authority, and the Navy and Marine Corps are actively exploring its application. Perhaps more importantly, the new attention generated by this authority has opened the way for many more new partnerships under other authorities. Several community-installations pairs across the nation are well on the way toward developing portfolios of agreements that benefit both DoD and local government. One standout success is a new recreation complex located on Seymour-Johnson AFB that serves the base and the residents of Goldsboro, N.C. Long-term success can be achieved when stakeholders use partnership opportunities as added tools for managing assets and providing services rather than as discrete events.

The recent emphasis on partnerships prompted by the new authority has changed the culture and thinking within DoD and by communities that is helping to shape the base of the future. Still, a vast unrealized potential for partnerships to create efficiencies and reduce costs for installations and communities remains. While the military services have generated a number of successful partnerships, their relatively small scale combined with resistance to change within the military culture have frustrated communities. Most partnerships established to date are of limited scope and impact, generating efficiencies but not at the scale needed to seriously enhance military value. A serious impediment has been a lack of understanding of how to design and execute effective partnerships, particularly among the legal and contracting community for both the military and

local and state governments. Similarly, a failure to grasp partnerships’ potential benefits can restrain leaders and decision makers on both sides of the table from advancing initiatives.

Some policy changes DoD could undertake to ensure the military culture embraces and implements expanded partnerships include:

- Delegating the authority for public-public partnerships. The new partnership authority vests military service secretaries with decision-making authority, but that authority may be delegated. It should be delegated to installation commanders, who make decisions of similar scale routinely, to the greatest degree possible. This will not only streamline the decision-making process, it will also provide those installation commanders with incentive to commit the resources necessary to develop new partnerships.
- Allowing installations to retain savings generated by their public-public partnerships. The centralization of installation support budgets that has occurred in the past two decades has provided new tools for focusing scarce resources where they are most needed. Developing new partnerships requires a base to dedicate considerable staff time to fully explore the feasibility of a given concept. If the concept comes to fruition and generates measurable cost avoidance or savings, the installation which invested the resources should be allowed to retain those savings, even if their use is dictated by a higher headquarters. For instance, benefits generated by a public-public partnership to pave the roads on an installation could be required to be spent on SRM on that facility, as opposed to accruing to some higher headquarters account for reallocation.
- Developing new policy for public-private partnerships. Several legal authorities exist to enable public-private partnerships, and there are many examples of successful partnerships

between defense agencies and the private sector, particularly in relation to the department's many equipment depots and GOCO facilities. DoD should develop policy that translates the lessons learned and best practices developed at GOCOs and depots to authorize new partnerships supporting infrastructure and facilities SRM. These could benefit the management and maintenance of lodging and unaccompanied housing, and support installation energy requirements. Policies should include a clear definition of requirements that may best be met through public-private partnership and how to best identify and manage the risks of partnerships, with an understanding that not all risk can or should be shouldered by the private sector.

- Institutionalizing policy and providing clear implementation guidance. While all the services have put out high-level policy guidance about pursuing new public-public partnerships, this policy has not been added to the formal guidance that middle and line managers at installations depend upon to guide their daily work. For example, only seven positions have been created Air Force wide specifically to foster public-public partnerships, and there are virtually no instances where position descriptions have evolved. The conservative culture within DoD limits innovation that is not supported by policy. The office of the secretary of Defense should address this issue, and ensure that all the services formally embrace a new culture encouraging partnerships. In addition, the services need to provide training, coaching and tools to support installation-level implementation.

TECHNOLOGY INFUSION AS AN ASSET MANAGEMENT FORCE MULTIPLIER

Technology is well known as a “force multiplier” in modern warfare. “Smart” weapons, satellite and drone intelligence gathering, night vision and other advances greatly enhance the lethality of a single

warrior or weapons system. The potential of using related technologies to improve the efficiency and productivity of an installation workforce or support infrastructure asset management decisions is immense, but to date has been largely ignored. Manual inspection of equipment and buildings, data entered by hand into spreadsheets that are not integrated into information management systems, and disconnected budget and facilities management software are the norm at most installations.

Recent advances in technology greatly increase the ability to gather, store, analyze and visualize data. Autonomous (e.g., drone) data collection, remote wireless sensors, machine learning (ML), artificial intelligence (AI), cloud computing and virtual/augmented reality (VR/AR) technologies open the door to numerous applications for managing and optimizing infrastructure to realize cost savings and efficiencies. This is especially true for DoD infrastructure, due to the sheer volume of the portfolio and mission-driven complexities. The potential to streamline and revolutionize the business of installation asset management is tremendous, especially as organizations move up and across the data transformation continuum illustrated in the figure below. This process begins with data for decision-making, and the movement from manual data collection to autonomous data collection, a trend that is increasing rapidly in many industries globally, and more recently in infrastructure management.

DoD has invested in numerous infrastructure management systems and tools to assist in the collection, storage and analysis of data, and these systems and tools have improved decision-making. But they also entail additional data requirements and sometimes more frequent collection.

These specific needs are best met through automation and new technologies, including:

- Autonomous Data Collection Platforms. Unmanned aerial vehicles (UAVs), ground vehicles,

DATA TRANSFORMATION PROCESS CONTINUUM

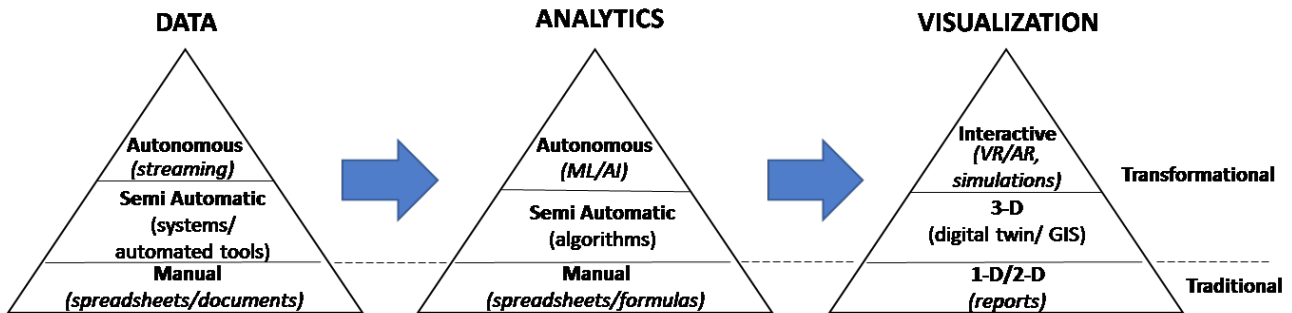


Figure 1: DoD installations are poised to move along this continuum to improve infrastructure management and decision-making, and to do so requires new approaches to data, analytics and visualization.

submersibles and other autonomous platforms equipped with sensors allow easy access to infrastructure assets for rapid mapping, surveys, condition assessments and the creation of digital models that can fill gaps in current data collection.

- Multi-spectral Sensors. Deploying video and photographic imaging, as well as infrared, topographical, acoustical, and light detection and ranging (LIDAR) sensors on fixed assets or mobile autonomous platforms to collect real-time imaging and infrastructure data has proved very effective. Advances in storage and computing power have enhanced the ability of small, sensor-carrying platforms to collect and deliver valuable data.

Better data and powerful analytical tools can improve decision-making. One example of the application of new technology and improved analysis comes from the Air Force. With nearly 50,000 buildings and 920 million square feet of airfield pavement, the Air Force collects millions of data points about its facilities but has struggled to assess this data collectively and in real time. Through the use of advanced drones, sensors and software, the Air Force now can collect, analyze and ultimately predict facility conditions by combining these technologies with advanced data visualization tools. The Air Force Installation and Mission Support Center has a fully functional Installation Health Assessment that allows all decision makers, from senior leaders to field operators, to see data in real time and view

how investment priorities will impact readiness and resiliency at an installation.

Modern decision-making tools integrate and present complex analytic findings in dashboards and other displays, providing officials with a realistic picture of the status of individual facilities in a 3D/4D virtual or alternative visual reality; e.g., simulations, holograms and multidimensional analysis. These kinds of presentations allow for clear analysis and comparison of investment tradeoffs across entire infrastructure portfolios.

- Interactive (e.g., virtual reality/augmented reality). Interactive visualization provides the highest, most flexible form of transferring data into information for decision-making. Scenario-based planning, simulations and training are all possible using interactive platforms. Interactive and immersive tools have long been utilized by DoD for airframe, weapon systems and maintenance training.
- Digital twin/geographic information system. The development of a digital twin — a complete digitized model of an installation and its portfolio of assets based upon geospatial information — allows for simulation, war gaming and scenario-based planning of how infrastructure interacts and reacts to stress tests, varying mission requirements and power needs. These tools not only assist in optimizing efficiencies but allow the user to

quantify the costs and benefits of enhancing resiliency.

Tinker AFB, Okla., and Peterson AFB, Colo., are developing interactive virtual reality models — “digital twins” — of their infrastructure programs using drone-captured imagery to build a virtual installation supported by data capture from various sensors (e.g., acoustical, temperature and energy loads) to key equipment components. Collectively, these real-time data feeds will provide machine intelligence algorithms with the ability to plan for, model, and level energy and maintenance requirements within an interactive visualization dashboard.

Applied together, these advanced technologies offer many opportunities to accelerate the data collection process, generate added value from existing data and create new business models for installation asset management. The goal isn’t simply to collect more data, but to replace outdated practices with more powerful, cost-efficient methods while also leveraging existing data sources. Fully embracing the new tools and approaches laid out above requires investment, time and a cultural change. It also requires careful thinking about how to implement these technologies in a secure manner to prevent use by nefarious actors. The potential payback is a leap toward the installation of the future, creating a more productive, efficient platform from which to project power in service of the national interest. Particularly in the absence of BRAC, DoD needs to find ways to realize efficiencies, and to do so in ways that make installations more resilient with higher military value. An initiative focusing on technology infusion for the base of the future is under way with the Army Science Board which has involved participants from DoD, industry and academia. This initiative, along with similar efforts in the other military services, will provide additional technology best practice applications for DoD and its partners in managing installations.

MEGATRENDS SHAPE EVOLUTION OF INSTALLATIONS

As society evolves due to changes in technology, demographics and the economy, military installations will be forced to change as well. Key megatrends that can be expected to shape installations in the coming decades include:

- **Economic progress will continue to bring development closer to once-isolated military installations.** The resulting mission encroachment is an evolving issue, moving from traditional safety, noise, and natural resources concerns into issues involving the electromagnetic spectrum and energy production. Installations will have to adjust to the resulting impacts of new neighbors on operations, training and testing.
- **Unmanned aerial vehicles, other autonomous systems and new technologies will continue to take on increasingly important military roles.** Installations will need to accommodate these systems in peacetime as well as during conflict, which will require coordination beyond installation fence lines.
- **People use social media to connect and create experiences that in the past required a physical location.** To what extent does social media use by military members eliminate the need for brick-and-mortar facilities such as libraries, community centers and family support centers on bases? To what extent can DoD use social media to make installations more productive?
- **DoD faces serious problems in recruiting and retaining qualified workers.** The current historically low level of unemployment makes it even more difficult to compete for military personnel and skilled civilian workers. Making installations appealing places to live and work would help DoD attract and keep top talent;

installations with substandard facilities are obstacles to recruiting and retention.

- Housing and lodging on installations compete with services provided in host communities, which continue to develop innovative alternatives, from online booking services to highly differentiated hotel brands. The base of the future will have to compete successfully with these alternatives to ensure readiness.
- Online shopping is revolutionizing the entire retail sector. Installations will need to determine how this trend affects DoD's delivery of resale activities, commissaries and exchanges.

Taken together, these and other trends suggest DoD's approach to providing facilities, housing and services on military installations needs to evolve. But evolve in what ways? One panelist at the 2017 ADC Policy Forum said, "We have never really decided what we want our installations to do." Are bases places just to work and platforms for deployments? Are we willing to consider that many services now offered are available elsewhere and stop providing some of them? Another speaker referred to Defense Secretary Jim Mattis' emphasis on the lethality of the force and asked, "What can a base deliver as an effect?" This new yardstick raises the question as to whether the facilities and services installations provide to families and retirees are valued by the Pentagon.

The base of the future must adapt to fundamental changes that are occurring in the broader society to best serve our military personnel and civilian employees, and to provide the trained, ready, and modern military forces required to meet our national security objectives.

SUMMARY AND RECOMMENDATIONS

Embracing changes in military culture

Our warfighters would be better served by approaches and policies governing infrastructure and installation management that are more open to adaptation and innovation. DoD can be slow to embrace new approaches and technologies that could make installation management more efficient and cost effective. DoD faces challenging trends in consumer spending and attitudes that suggest it needs to rethink how it delivers retail and family services on installations. The area of partnerships between communities and bases has experienced significant innovation in recent years, but the pace of change can be accelerated and the scope broadened to create greater efficiencies and benefits to installations, military personnel and their families.

One point that was made during the Policy Forum is that "basing is evolutionary, not revolutionary." It is not reasonable to expect to uproot infrastructure management and services en masse. To be effective in an organization such as DoD, the agents of change need to establish reasonable expectations on the scale and scope of change. They also must be both patient and persistent, taking the long view toward changing hearts, minds and culture. This type of change needs vision and leadership to be set in motion and sustained.

Better understanding and embracing the potential for technology

Leadership also is needed in applying new technology to installation and infrastructure management. But unlike cultural change, we already have data showing the benefits of embracing new technologies. What is needed now is a coherent vision, consistent and aggressive programming of funds, and changes in policy and law to direct military organizations to further embrace innovative technology applications.

Congress has provided such vision and purpose many times in annual national defense authorization acts but should continue to beat the drum. Both the political and military leadership of DoD must also take up the challenge. This should be an effort that is not bound by partisan considerations or changes in administrations, but be an ongoing, sustained investment of leadership and resources. Proof of concept projects should be put in place with in-depth study and widespread publication of results to provide roadmaps for disparate military organizations to follow.

‘Opening the aperture’ to new partnership ideas

Finally, military leaders must open their minds and hearts to not just embrace but to ingrain the concept of partnership in the military culture. Both public-public and public-private partnerships have a place in helping to expand military value, improve resilience and enhance the lethality of installations. Three recommendations to help turn the ship of military bureaucracy include: delegating decision-making authority to the lowest possible levels, allowing savings to be retained and reinvested on the installations where they are generated, and providing clear guidance.

CONCLUSION

DoD installation management faces enormous challenges. Chronic underfunding of installation requirements creates increasing risks to military missions and a growing backlog of critical projects. In addition, postponing needed infrastructure spending today increases the long-term costs of sustaining it over the long run. Shedding unneeded infrastructure can help address today’s problems, but Congress has not authorized a new BRAC round and appears unlikely to do so soon.

There is no silver bullet, be it technological, budgetary or policy-driven, to overcoming the years of underfunding our installations suffer from today. What is needed is ongoing leadership toward a common vision, working together to apply the portfolio of tools and policies described in this paper. Mission readiness, installation resilience and the lethality of the force should be the laser focus for installation commanders and their host communities.

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