



DEPUTY SECRETARY OF DEFENSE  
1010 DEFENSE PENTAGON  
WASHINGTON, DC 20301-1010

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MEMORANDUM FOR SENIOR PENTAGON LEADERSHIP  
COMMANDERS OF THE COMBATANT COMMANDS  
DEFENSE AGENCY AND DOD FIELD ACTIVITY DIRECTORS

SUBJECT: Resilient and Healthy Defense Communities

To meet the objectives of the 2022 National Defense Strategy, the Department of Defense must recruit and retain a strong, healthy, and ready military force. Defense installations are at the core of our Service members' military experience. Installations are built and natural spaces where our people live, work, train, raise their children, and spend time with their families. Ensuring that these spaces are safe; appealing to current and prospective Service members, their families, and the civilian workforce; and supportive of their physical, emotional, and cognitive well-being is therefore a national security imperative. It is also our moral obligation to the people who defend our Nation.

The attached Strategy for Resilient and Healthy Defense Communities will guide the Department's actions to achieve the following objective: healthy, safe, functional, and resilient spaces on defense installations that enhance the quality of life and readiness of our Service members, families, and civilian workforce. We envision an end-state where:

- People living and working on DoD installations thrive as part of happy, productive, and resilient communities.
- The built and natural environment around them meets operational needs and improves their quality of life.
- Installation managers and senior DoD leadership have a common operating picture of the quality of infrastructure to guide timely decisions and resource allocations.
- Installations are integrated with surrounding communities, providing public services and lifestyle-oriented features that build the readiness and resiliency of the Total Force.

I appreciate your hard work in making this strategy a reality.

Attachment:  
As stated



OSD008028-23/CMD013280-23

**Department of Defense  
Strategy for Resilient and Healthy  
Defense Communities**



**Deputy Secretary of Defense  
February 2024**

# RESILIENT AND HEALTHY DEFENSE COMMUNITIES

## *Taking Care of our People Where They Live, Work, and Train*

### END-STATE

This strategy will guide the Department's actions to achieve the following objective: healthy, safe, functional, and resilient spaces on defense installations that enhance the quality of life and readiness of our Service members, families, and civilian workforce. We envision an end-state where

- People living and working on Department of Defense (DoD) installations thrive as part of happy, productive, and resilient communities.
- The built and natural environment around them meets operational needs and improves their quality of life.
- Installation managers and senior DoD leadership have a common operating picture of the quality of infrastructure to guide timely decisions and resource allocations.
- Installations are integrated with surrounding communities, providing public services and lifestyle-oriented features that build the readiness and resiliency of the Total Force.

### I. INTRODUCTION

To meet the objectives of the 2022 *National Defense Strategy*, DoD must recruit and retain a strong, healthy, and ready military force. Defense installations are at the core of our Service members' military experience. They comprise built and natural spaces where our people live, work, train, raise their children, and spend time with their families. Ensuring that these spaces are safe; appealing to current and prospective Service members, their families, and the civilian workforce; and supportive of their physical, emotional, and cognitive well-being is therefore a national security imperative. It is also our moral obligation to the people who defend our Nation.

DoD's ability to support its workforce is unmatched in the federal Government. Today, over 2 million military and civilian personnel live and work on 538 installations across 25 countries. Our installations provide more than 1 million rotational and permanent bed spaces and approximately 250,000 homes for Service members and their families. In addition, they include more than 280,000 buildings and permanent structures, composed of workspaces, schools, commissaries, hospitals, and other facilities. The Department also manages 26 million acres of land and outdoor recreation spaces, including parks, protected areas, waterways, and other natural features that contribute to local economies and communities.

This strategy sets forth the Department's commitment to, and strategy for, ensuring that the built and natural infrastructure on our installations and in our defense communities supports our workforce and their families. We believe that our installations can help deliver superior operational outcomes by being:

- **Healthy**, providing spaces that are comfortable, have exceptional indoor and outdoor environment quality, and offer proximity to open space that contributes to overall well-being.



- **Safe**, designing and sustaining spaces that do not endanger the wellbeing of occupants but rather enhance their ability to succeed.
- **Functional**, enabling the way people want to live and work by offering intuitive, efficient, and user-friendly design and modern amenities and technologies; and
- **Resilient**, delivering continuous service and resilience against climate change, environmental hazards, and other risks that have the potential to disrupt or displace.

### ***Defense Infrastructure Footprint***

- 538 installations – all 50 states and D.C., 2 U.S. territories, 25 foreign countries; 422 are non-virtual installations with a physical presence, while 116 are virtual
- 26 million acres
- 667,760 total assets (buildings, structures and linear structures); grouped by:
  - Housing (250,000 homes, 1 million permanent/rotational beds)
  - Workplace facilities – hangars, shipyards, workshops and garages, dockyards, test and eval ranges, offices, etc.
  - Other facilities – schools, hospitals, community centers, commissaries, etc.
- Utilities (water, wastewater, gas, electricity, Wi-Fi)
- Green spaces and open spaces, including protected areas and key natural features

Improving our vast infrastructure footprint is both a massive opportunity and a significant undertaking. Over the past five years, the Department has invested an average of \$11.4 billion per year to build facilities, \$15.4 billion per year to maintain and repair built infrastructure, and \$2.5 billion per year on environment restoration and conservation efforts. However, this level of investment is insufficient to reverse the decline of our assets. The estimated deferred maintenance backlog, which is based on addressing infrastructure condition deficiencies relative to their original specifications, stands at \$134 billion and continues to accrue faster than our pace of investment.

Moreover, this backlog does not account for upgrades needed to accommodate current standards and Service member preferences or ready our infrastructure to be resilient to changing climate and environmental conditions. Over 79 percent of our installations were established before 1970 and nearly 33 percent of built assets are more than 50 years old. These assets reflect the needs of the time they were constructed, requiring not just regular upkeep, but potentially significant upgrades or outright replacements to meet evolving requirements and preferences. Additionally, the number of incidents where hurricanes, flooding, and wildfire have left billion-plus dollar recovery actions in their wake (e.g., \$1 billion at Offutt Air Force Base, \$3 billion at Marine Corps Base Camp Lejeune, and \$5 billion at Tyndall Air Force Base) is increasing at an unsustainable rate.

The natural infrastructure on which the Department depends will also require significant maintenance investments. Nearly 95 percent of the installation lands are undeveloped or in some form of natural state. This natural infrastructure provides the realistic environmental conditions to develop and test new technologies and train our Warfighters. Just as important, it consists of



diverse ecosystems that supply ecosystem services critical to mission assurance as well as benefits to military communities by reducing risk of wildfire or flooding, improving water quality, reducing heat island effects, sustaining biodiversity, and improving quality of life, including by providing outdoor education and recreation amenities.

Access to outdoor recreation opportunities such as hunting, fishing, wildlife viewing, boating, and camping, as well as to parks and other open spaces, has significant value to installations and surrounding communities, and there is an established and growing body of knowledge demonstrating the benefits of time in nature to both physical and mental health. Numerous factors can affect the quality of an installation's natural infrastructure such as a changing climate, spread of invasive species, and land use changes. The ecosystem service benefits received from natural infrastructure can be enhanced or degraded depending on how ecosystems are managed, both on installation and locally and in partnership with surrounding communities. Maintaining healthy and resilient natural infrastructure will require active, ongoing management focused on reducing environmental risks while simultaneously, improving the quality of the natural environment benefit installation residents and surrounding communities.

The Department recognizes that a significant gap persists between installation conditions today and the quality standards that our Service members and their families expect and deserve. Given the magnitude of the infrastructure funding deficit, it is imperative that we not only invest *more* but also invest *better* to achieve our goal of delivering healthy, safe, functional, and resilient spaces. This strategy proposes three ways for the Department to do so:

***Adopt human-centered requirements:*** To maximize the benefit of our investments, we will implement the installation attributes that our users value most. Our infrastructure design and maintenance requirements will emphasize people and their safety, needs, preferences, and experiences to create spaces that support and protect them. We will invest in technologies to empower users with information and feedback mechanisms about their environment and to allow installation managers to monitor and deliver high-quality assets. We will promote strategies, design, and products that, where possible, avoid the use of harmful chemicals and toxins. We will do so through consistent policy and reliable feedback loops that allow us to recognize and address problems that arise. Our installation design will take into account where our people live and work to make sure they have access to resources, such as food, recreation, and schools, and to ensure that we minimize potential exposure from mission driven hazards, such as emissions from tanks and planes. We will consider how our Service members, their families, and our workforce can benefit further from our 26 million acres of managed, conserved and restored forests, grasslands, wetlands, coastal areas, rivers and streams as well from our local and regional partnerships with public land managers and private working landowners. By emphasizing human well-being, we will seek to create environments that don't just meet utilitarian needs and compliance standards, but promote happiness, productivity, and a sense of belonging.

***Optimize our footprint:*** We will ensure that the scale and scope of our infrastructure footprint is aligned with the needs of our people. We will consolidate underutilized or underperforming assets and ensure that new facilities are built to last and are adaptable to evolving demands and conditions. We will seek targeted opportunities to upgrade and modernize our existing asset portfolio to increase longevity and reduce operating costs. We will also prioritize maintaining a

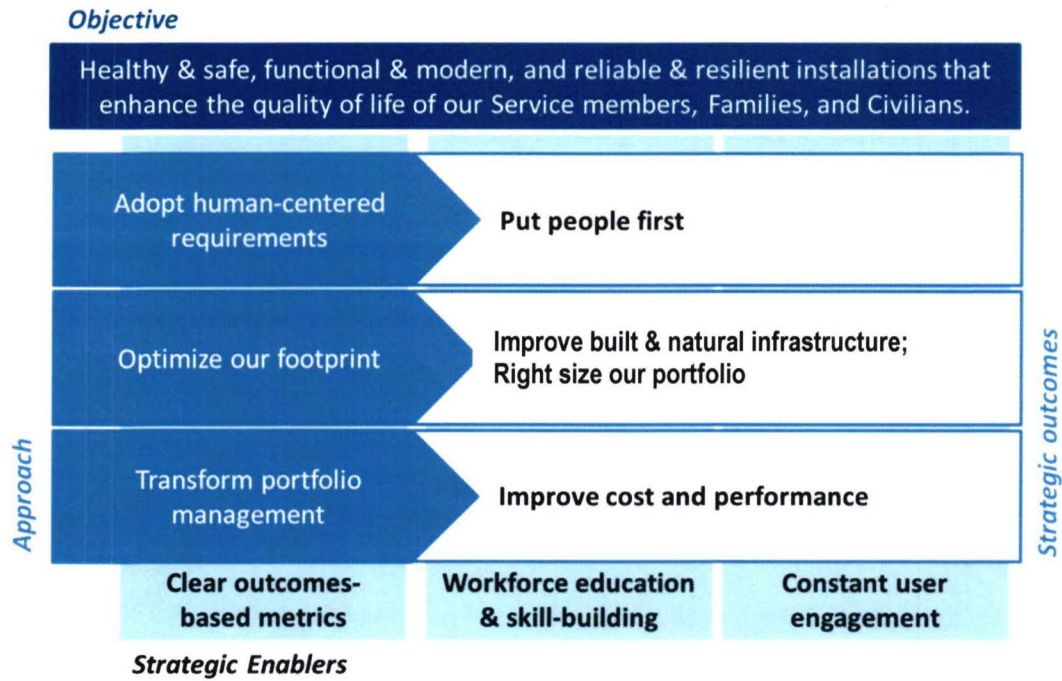
healthy and resilient natural environment and seek opportunities to enhance degraded natural areas on installations and through conservation, restoration and management, create amenities for our service members, their families, and our workforce on existing properties. Our goal will be to create a smaller, higher quality portfolio that is utilized for longer periods of time, thus reducing the total lifecycle cost of infrastructure delivery.

***Transform how we manage our portfolio:*** In addition to optimizing the size and mix of our asset base, we will adopt an asset management strategy that improves performance and places our building and facilities portfolio on a more sustainable financial path. We will also continue to move towards managing natural infrastructure as critical assets for supporting our mission, installation residents and communities. We will deepen partnerships with private industry, local and state governments, and academic and community organizations to leverage their capabilities in infrastructure financing, design, construction, and management. Further, we will update internal construction and maintenance processes to enhance infrastructure quality. Across our portfolio, we will establish meaningful oversight and accountability mechanisms that support consistent delivery of human-centered assets.

Underpinning these three efforts are key strategic enablers: clear and measurable outcomes to track our progress; training and skill-building of our built and natural infrastructure management workforce to better deliver on these commitments; and continuous user engagement with Service personnel and family members to ensure we are capturing and meeting their expectations. These efforts will be done in conjunction with existing Department of Defense quality of life initiatives. Together, these efforts will drive changes across the defense infrastructure enterprise and ensure that it is managed as a strategic asset to promote the well-being of our Total Force.



## Strategic Framework



## II. ADOPT HUMAN-CENTERED REQUIREMENTS

Our Service members and their families spend a significant amount of their time living and working on defense installations. Thus, every design, land use, and construction decision we make – from the ability to walk to access basic amenities, to how much natural light is available in their homes, to the systems that ensure the cleanliness of their water, to how often they pass through communal spaces that facilitate social interaction – has consequences for our people’s physical and mental health and well-being. Similarly, the management and condition of installation lands as well as that of surrounding public and private lands can affect air quality, noise pollution, light pollution, fire risk, flood risk, water quality and access to or quality of outdoor education and recreation opportunities. We must therefore put human needs and values at the center of our approach to delivering and maintaining built and natural infrastructure. We must further ensure that we measure asset performance and prioritize investments based on human welfare and outcomes.

Our approach will leverage the growing body of research that links architecture, design, and urban planning concepts to physiological responses with near- and long-term health outcomes. Working with the foremost industry and Government experts in these fields, the Department will adopt a more human-centered approach to infrastructure delivery through three key initiatives.

**Create livability standards.** We will place “livability” at the heart of our design and planning principles, translating this concept into objective and measurable standards of asset performance along four dimensions: health, safety, functionality, and reliability. Across these categories, specific standards may include: indoor and outdoor environment quality, such as air and water quality and thermal, lighting, and acoustic comfort; availability and reliability of utilities and

amenities; walkability and accessibility; prevalence of shared and community-oriented spaces; and proximity to critical services, such as child development centers, school, healthcare facilities, and dining facilities. These standards will be tailored to, and cover the breadth of, different asset classes, including barracks, family housing, office spaces, urban green spaces, natural areas, and indoor and outdoor recreational spaces.

This approach will extend the Department's traditional focus on the utility and condition of physical infrastructure to also include enhancement of the user experience. We will integrate livability standards into our policies and Unified Facilities Criteria (UFC), which inform the Department's infrastructure planning, design, construction, sustainment, restoration, and modernization efforts. These efforts will take into account where people live and work and promote strategies, design, and products that avoid the use of harmful chemicals and toxins. We will also continue to develop our Integrated Natural Resources Management Plans (INRMPs) in coordination with other programs and offices so that we consider how the management of natural infrastructure can support our Service members, their families, and our workforce.

***Increase digital connectivity.*** Core to the livability concept, new personnel joining the Department will expect greater digital connectivity and access to modern technologies on DoD installations. We will need to ensure that installations are equipped with 5G and next-gen communications networks that can handle massive amounts of data in near real-time. This digital infrastructure will not only enable key military applications, such as augmented and virtual reality training, but also allow Service members and families to access virtual healthcare, remote work and education, smart home technologies, and a range of lifestyle-enhancing applications and services.

At the same time, this infrastructure will be critical to realizing the benefits of "smart cities" technologies and creating connected installations, while strengthening cybersecurity measures. To implement and monitor livability standards, we will equip installations with an array of sensors that enable remote equipment diagnostics, preventive and proactive maintenance, and overall better-informed infrastructure investment decisions.

***Invest in user technology.*** We will further support our Service members, families, and civilian workforce with a variety of digital tools to improve their user experience on defense installations. Unlike workers in many other sectors, our Service members rarely choose where to live and are frequently asked to relocate within the network of defense installations with little information about their future homes and communities. Leveraging best practices from many commercially available services and applications, we will equip our people with critical information about bases and surrounding communities, such as housing floor plans, walkability scores, accessibility features, recreational options, and environmental factors, so they can be better prepared for relocation to any given installation. In addition, we will make available digital tools that allow users to directly report quality issues and provide feedback in real-time or through periodic structured surveys.

These user-centric tools, coupled with sensors and monitors for asset performance, will enable installations managers and senior leaders to make better investment decisions about our installations. Taken together, the data will enable installation managers to identify and remediate



issues, empower users with information about their environment, and increase overall transparency and accountability for the quality of our installations.

### III. OPTIMIZE OUR FOOTPRINT

While the Department evaluates the total number and location of defense installations based on the National Defense Strategy and global posture reviews, this strategy aims to align the scale and scope of assets within installations to our mission and our people's needs. Over the years, the combination of new missions, evolving user preferences and tastes, and changing environmental and climate conditions has naturally resulted in a portfolio size and mix that is not fully optimized to today's demands. As we update this portfolio, we will find opportunities to create a more consolidated and efficient footprint within installations, build high-quality, resilient built and natural infrastructure that lasts, and invest in targeted upgrades that add to the longevity of our assets, all in service of meeting our people's needs while reducing the total lifecycle cost of our infrastructure assets.

***Increase efficient use of our assets.*** While the size of our force has declined over the past 10 years, the size of our defense footprint has remained relatively steady over the same period. The DoD building inventory has an average building condition index below 80, indicating significant investment is required to restore and maintain it at an acceptable level. The Department can no longer afford to invest in excess or underutilized buildings. As a starting point, we will survey the existing footprint to better align supply with demand, identifying opportunities to consolidate, repurpose, and, where applicable, dispose of excess facilities that are no longer necessary to execute the mission or meet our people's needs. We will do so in ways that are safe and sustainable, relying on long-term planning to preserve structures that can be adapted for reuse in the future. We will further leverage lessons from consolidation projects to generally plan better for the end-of-life of all assets. We will also prioritize maintaining a healthy and resilient natural environment, which like built infrastructure, require active and ongoing management to reduce environmental risks and improve the quality of the natural environment. Through conservation, management, and restoration we can enhance benefits to our people by making best use of existing properties.

In line with our focus on user experience, we will fully consider the impacts of these decisions against our goals to accommodate the needs of our personnel and of the surrounding communities. The Department will conduct user experience assessments, which could include on-site observations, interviews, and surveys to better understand how people are using facilities and amenities on and off-base to inform any decision on reducing the size and scope of our infrastructure footprint.

***Build facilities that last.*** Looking ahead, the Department will review all installation master plans to ensure they reflect compact and efficient use of land and assets. For new construction or major renovations, we will explore leading practices for modular, open architecture that can be adapted to a variety of purposes to determine where to incorporate it within our inventory and mission sets. We will also leverage the latest in infrastructure innovation and high-quality, low impact construction materials to build facilities that will be usable, when maintained appropriately, for many decades to come. We will seek opportunities to develop assets that can

be shared between military units, other government agencies, and with the broader defense community.

***Integrate climate and environment risk assessments.*** Across the United States and overseas, our installations and their surrounding communities are vulnerable to rapidly increasing threats of wildfires, floods, and hurricanes as well as the persistent hazards of warming and droughts. These factors will only exacerbate infrastructure deficiencies which, if left unaddressed, will create short-term and permanent disruptions to people's lives, as well as have negative health and safety impacts. The Department has made notable progress in understanding an installation's vulnerability to climate-related hazards, including changes to sea levels, riverine flooding, stormwater management, drought, heat, land degradations, energy demand, and wildfires, through implementation of the DoD Climate Assessment Tool (DCAT). We will integrate climate risk assessments and natural infrastructure resilience strategies, such as nature-based solutions, into design and construction processes, understanding that proactive management of our infrastructure to adapt to or mitigate against evolving risks will have significant impacts on our people.

We will further work to expand DCAT with new predictive models, decision tools, and technologies that capture various climate scenarios and associated ecological and human impacts, to better equip our installation managers to plan for an uncertain future, and to inform installation master plans that drive design, construction, and maintenance decisions, including which materials to use and where to locate new infrastructure. Similarly, these scenarios and impacts shall inform installation integrated natural resource management plans to develop actions to reduce environmental risks, improve environmental quality, and promote health, wellbeing and recreational opportunities.

***Increase energy and water resilience.*** We will continue to utilize all available acquisition methods, especially those that leverage third party financing, to improve energy and water resilience at our installations. We will focus research and innovation towards improving electrical and water system quality, reliability and resilience through integration of new technologies and improved operational approaches. The Department will further extend our energy resilience investments, such as microgrids, beyond our most critical operational facilities to include those facilities that most impact our personnel's day-to-day quality of life, including housing, commissaries, and other priority assets. Similarly, the DoD will continue to work to maintain and create the natural infrastructure needed for water resilience both on and off installation.

The Department will support the robust private-sector innovation in energy resilience and adapt new technologies and electrical-system designs to increase system reliability, provide long-duration backup power when required, and provide greater flexibility in the control and delivery of power. We will similarly continue to invest in technologies that ensure installations have reliable and secure sources of water during times of water scarcity and extreme weather events, including consideration of natural infrastructure or nature-based solutions to reduce energy and water demand.



#### IV. TRANSFORM HOW WE MANAGE OUR PORTFOLIO

Achieving the ambitious commitments set out in this strategy will require an effective asset management strategy that leverages the suite of government and external stakeholder capabilities to maximize our return on investment. We will need to approach design, construction, maintenance, and project development differently, both in terms of seeking new and innovative ways to partner with industry, communities, and other external stakeholders and reforming internal construction processes and maintenance regimes. Our asset management approach will need to be supported by meaningful oversight and accountability mechanisms as well as accurate cost and performance data to help balance cost, performance, and risk.

***Explore privatization opportunities.*** The Department has implemented various approaches to design, build, and operate our infrastructure, ranging from full government control across all three dimensions to full privatization, and combinations in between. This menu of options allows the Department to make different trade-offs when it comes to the level of financial risk versus the amount of direct control over design, build, and maintenance decisions. The Department has realized significant benefits from privatization in the case of family housing. 99 percent of U.S.-based family housing is privatized under the Military Housing Privatization Initiative (MHPI). After an initial series of reforms focused on strengthening DoD oversight and tenant rights, these privatization projects have yielded consistently higher quality assets on shorter construction and delivery timelines resulting in higher user satisfaction.

The Department will explore where private contractors, through outsourcing and other available tools, may be well-positioned to provide solutions at similar or better quality on a more cost-effective basis other asset types, such as ancillary support facilities, office buildings, barracks, guest lodging, and utilities. Relatedly, we will review authorities to allow greater flexibility in management models in international locations, where the Department is currently restricted to fully Government-owned and -operated facilities.

In constrained budget environments, third party financing through privatization or performance contracting can decrease the impact of the risk assumed in trade-offs between mission and Service member support. The Department will seek to integrate authorities for privatization and performance contracting to deliver benefit across multiple outcomes simultaneously.

***Build strong external partnerships.*** In addition to industry, we have strong and long-established partnerships with other Government agencies, state and local governments, academic institutions, and civil society organizations in the communities in which we operate. We will continue to explore ways of collaborating with these stakeholders to deliver high-quality infrastructure in cost effective ways, including maximizing the use of Intergovernmental Support Agreements (IGSA) with state and local governments to provide, receive, or share installation-support services. We will also continue to partner with academic and research institutions on areas such as ecosystem conservation, sustainable design, and climate change risk assessment. We will also continue to work on natural infrastructure beyond the fence line through the Readiness and Environmental Protection Integration (REPI) program and Sentinel Landscapes Initiative, partnering with other federal government agencies, state and local governments as well

private conservation organizations to avoid land use conflicts, address environmental restrictions that limit military activities, and increase resilience to climate change.

***Optimize construction and project delivery.*** Military construction or large-scale maintenance projects currently start at the local level with the requirement identified in the installation master planning process. Depending on the specific Military Department's priorities, a project can take five years to be incorporated in a budget request to Congress and once funded, can take potentially another four years to obtain beneficial use.

The Department must develop more timely and flexible processes and organizational structures to enable more agile delivery of infrastructure needs. We will continue to work with industry to incorporate best practices on planning, design, and construction activities into Government efforts. The Department has already issued policies that better align roles and responsibilities of project sponsors, installation managers, and construction agents to deliver better outcomes, such as early involvement by DoD construction agents with project sponsors to inform project scope, cost, and schedule. We will undertake additional efforts such as developing guidance for risk management in cost estimating; adopting a data dictionary that crosses project management, acquisition, financial, and real property data systems; and providing guidance on when the various types of project delivery and acquisition methods should be considered based on the unique characteristics of a project. We must also develop solutions and guidance to expedite environmental reviews and permitting to achieve more timely infrastructure delivery, as well as incorporate strategies to not only minimize environmental impacts, but sustain or improve environmental quality.

Maintenance and improvement of our natural infrastructure likewise starts at the local level, through the development of Integrated Natural Resource Management Plans. The plans, developed with State and Federal resource management agencies, outline overall goals and objectives regarding the management of our lands and waters, including those aspects related to access and recreation. Current policies require integration with other installation plans and processes, such as master plans, and consideration of the landscapes surrounding the installations. Additional guidance, training and resources will need to be provided to more directly incorporate established livability considerations into the development and implementation of the installation INRMPs.

***Develop targeted maintenance regimes.*** Currently, the Department utilizes the Facility Sustainment Model (FSM) to provide sustainment budget requirements at the portfolio level. The FSM generates aggregate sustainment requirements that treat facilities similarly for investment purposes regardless of age, condition, or maintenance history. As the Department works toward the replacement of the FSM, it will build a process that derives a sustainment requirement at the individual asset level and incorporates asset age, functionality, and condition as well as building system, component, and subcomponent condition (e.g., HVAC, plumbing, electrical, etc.). The replacement process will optimize limited FSRM budgets by recommending investments that maximize condition of facilities in a component's portfolio. Further, the Department will set condition goals for different facility categories to ensure that quality of life is not short-changed at the expense of mission needs. This process will also ensure transparency across infrastructure investments and allow full consideration of trade-offs.



Similar consideration for how to prioritize improvements of our natural infrastructure, while aligning it with established livability standards, will need to be developed, as management of our natural areas is currently driven primarily by compliance requirements established through federal laws and regulations. Additional criteria addressing current and desired condition of our natural infrastructure will assist in developing budget requests incorporating quality of life considerations along with mission needs and regulatory requirements.

***Increase oversight and accountability.*** The Department will need to establish authoritative cost and performance data sources to continuously evaluate and update our asset management approach. We will update our condition assessment processes to prioritize human-centered requirements, leverage digital diagnostic tools, and deploy expert inspectors. Together, these will enable a common operating picture of our built and natural infrastructure that can guide decision-making. We will further centralize information on infrastructure project costs as well as ongoing operating and maintenance expenses to inform decisions on optimal asset management approaches and resources allocations. We will ensure all planning, development, and operations will incorporate metrics as it relates to health, safety, and environmental quality.

## V. STRATEGIC ENABLERS

This strategy aims to transform the ways in which the Department manages and assesses the performance of our infrastructure to focus first and foremost on our people. Achieving this transformation will require not just a realignment of priorities and resources, but a wholesale cultural shift toward elevating people as our most important asset, and the physical and mental well-being of our people as our most critical capability in any warfighting domain.

Key to the implementation and delivery of the strategy will be:

- (1) Clear and measurable outcomes to track our progress;
- (2) Workforce education, focused on training and skill-building to better deliver our human-centered approach; and
- (3) Frequent user engagement with Service personnel and family members to ensure we are meeting expectations.

***Metrics and outcomes.*** While specific lines of effort will have more targeted metrics, we expect to measure progress against the holistic strategy across the key dimensions of (1) health, (2) functionality, and (3) reliability, along with (4) overall user satisfaction and (5) aggregate portfolio quality. The Department will develop the appropriate mechanisms, including user surveys, on-site visits, and deployment of sensors and other technologies to measure our progress in these five areas. We will further invest in the necessary data and analytics capabilities to aggregate these metrics across our widespread installations footprint, report them in senior governance forums, and use them to inform budget decisions. Specific metrics may include:

<b>Key outcome</b>	<b>Sample outcome metrics</b>
<b><i>Health</i></b>	<ul style="list-style-type: none"> <li>▪ Average temperature, humidity, and air quality in buildings</li> <li>▪ Water quality</li> <li>▪ Installation walkability score</li> <li>▪ Access to recreational activities</li> </ul>
<b><i>Functionality</i></b>	<ul style="list-style-type: none"> <li>▪ Asset mix that supports needs and preferences of personnel</li> <li>▪ Accessibility</li> <li>▪ Number of installations with next-gen Wi-Fi coverage</li> <li>▪ Availability of modern appliances</li> </ul>
<b><i>Resilience</i></b>	<ul style="list-style-type: none"> <li>▪ Utilities up-time</li> <li>▪ Building availability</li> <li>▪ Mean time between failures</li> </ul>
<b><i>User satisfaction</i></b>	<ul style="list-style-type: none"> <li>▪ % users satisfied with various aspects of housing conditions</li> <li>▪ % users satisfied with workplace conditions</li> <li>▪ Mean time to repair</li> <li>▪ Wait times to qualify for military housing</li> </ul>
<b><i>Aggregate portfolio quality</i></b>	<ul style="list-style-type: none"> <li>▪ Asset utilization rates</li> <li>▪ Value of accumulated infrastructure deficit</li> <li>▪ Number of vacant/low occupancy buildings</li> <li>▪ Lifecycle cost of key assets</li> </ul>

***Workforce education.*** We will ensure that we have an appropriately sized and skilled workforce of engineers, public works specialists, natural resource managers, financial analysts, contracting officers, and other personnel to deliver infrastructure to the standards we require. We will review and, as necessary, enhance skill development opportunities, including apprenticeship and secondment opportunities with industry and academic institutions. We will particularly invest in training and skill-building on concepts of human-centered design and delivery, leveraging partnerships with universities, design firms, and other stakeholders to incorporate leading practices into the Department’s approach to infrastructure delivery.

***User engagement.*** Our military personnel and their families are at the heart of this strategy. We will continue listening and learning about issues that are critical to their health and well-being and seeking opportunities to better support their quality of life. We will elicit user feedback through regular engagements at various levels of the installation's governance enterprise, including through digital touchpoints, installation townhalls, and on-site interviews and observations. We will use this feedback to evolve our strategy as we continue to modernize and transform our infrastructure portfolio.

## **VI. CONCLUSION**

The places people work and live have a direct impact on their wellbeing and quality of life, and the failure to adequately invest in necessary infrastructure hinders DoD’s ability to recruit and retain a strong, healthy, and ready military workforce in support of the National Defense Strategy. Implementing a human-centered approach to the built and natural environment will provide healthy, safe, functional, and resilient spaces, which will improve the quality of life and readiness of our Service members, families, and civilian workforce.