



# Defining the Army Installations of the Future

Final Deliverable

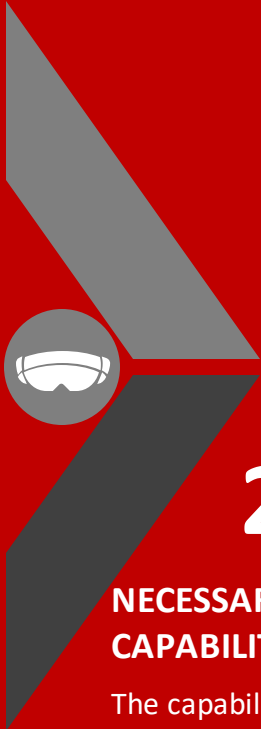
# Executive Summary for the Army Installations of the Future



1

## STRATEGIC CONSIDERATIONS

Drivers of Change and three impacts that should be considered for the future installation



2

## NECESSARY CAPABILITIES

The capabilities which installations must deliver to enable the Army to accomplish future missions



3

## FUTURE STATES FOR INSTALLATIONS

Guiding principles, attributes, and features of modern installations



4

## STRATEGIC ROADMAP

The steps that enable Army to drive forward the delivery of modern installations

# Interconnected Drivers of Change will inform Future Needs

Considerations for the Army are influenced by four Drivers of Change that shape the future operating environment. These macro forces are interconnected and will impact one another, ultimately having both immediate and long-term impacts on Army operations, Soldier and family well-being, and the future installation.




### Geopolitical Competition

- Anonymous or untraceable cyber attacks
- Hybrid/deniable warfare
- Economic warfare / trade disruptions
- Hypersonic weapons
- Contestation of troop deployments
- Adversary breakthroughs in warfighting or dual-use technologies
- Uncertain funding and strategic policy



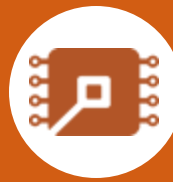
### Disruptive Technology

- Miniaturization of disruptive technologies
- Attacks on energy infrastructure
- Doxing and exposure of personal data
- Drone swarms and UAV reconnaissance
- Non-state armed groups
- Microwave weapons<sup>1</sup>
- Deep fakes / information warfare



### Ecosystem Convergence

- Extreme weather disruptions drive human migration and conflict
- Storm and flooding impacts on installations
- Vulnerable infrastructure in civilian communities
- Opening or evolving of combat theaters due to climate change



### Societal Evolution

- Divergent backgrounds of prospective Soldiers
- Demand for flexible work arrangements
- Evolving definitions of gender and identity
- Genetic engineering
- Pushback against installation land use, sustainability, data collection



# Drivers of Change inform three considerations the Army must address to deliver the installation of the future

## Army Modernization is here:

The installation must be prepared

- The future installation will possess the flexibility to support new weapons systems and types of combat
- Several of the "Big 6" Army Modernization Priorities are complex, networked systems which demand specific resources and infrastructure – installations must provide this essential capabilities
- The pace of innovation is staggering – future installations must be able to support various technology applications, including those which have yet to be invented
- “You can’t have a Modern Army without a Modern Installation”

## Current technology is mature:

Technology Readiness Levels (TRLs) can successfully deliver a smart environment

- Installations must adapt at the rate of rapidly-urbanizing external societies
- Smart environment technologies generate resilient installations and can produce cost and time efficiencies
- Smart installations will attract and retain the future force, build Soldier cohesion, and enhance readiness
- Most Smart City technology is currently available for delivering connected environments

## Platforms are catalysts for Army readiness:

Modular installations deliver adaptability and flexibility

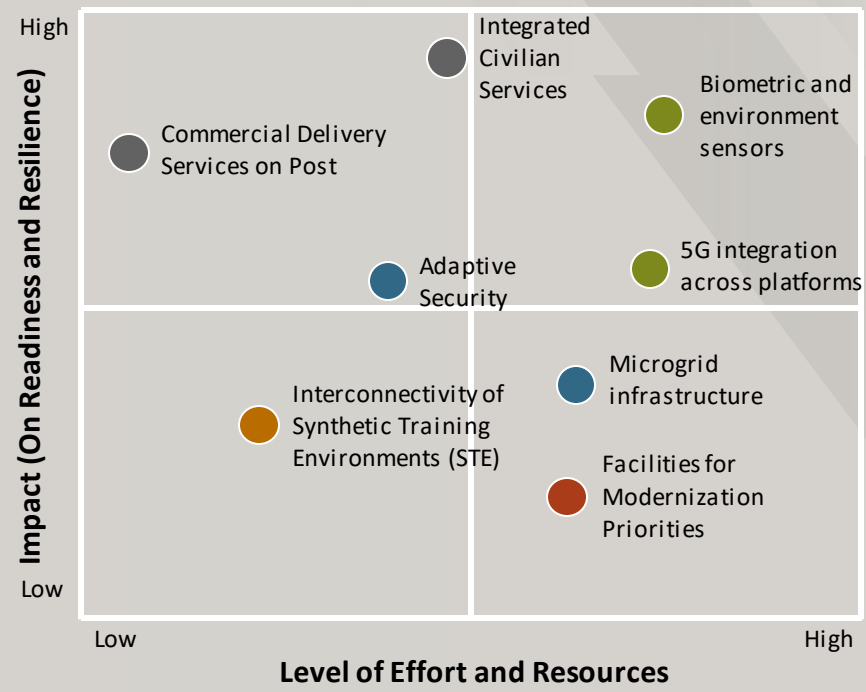
- The future installation will leverage a range of smart city initiatives, processes, sensors, and technologies designed with the deliberate purpose of enabling Soldiers, families, and Army employees to deliver the Army mission
- Networked, smart installations will enable readiness by facilitating virtual and in-person training
- The portfolio of installations will deliver usability of existing personnel, materiel, and data across the installation portfolio



# There are five categories of future capabilities to consider investing in for modern installations

- **Scale Functions and Operations** – enabling the ability of single installations to expand capacity and output according to mission needs; the ability of the Constellation of Installations to combine assets and capabilities according to mission needs
- **Maneuver with Speed** – ensuring that installations respond to mission and operational requirements with agility
- **Develop Esprit de Corps** – supporting a vibrant Army culture with capabilities, services, and amenities enabled by both physical and virtual facilities, training, communications, etc.
- **Provide a Positive Installation Experience** – delivering environment where the Soldier, family, and collective unit can operate and live with amenities commonly found in society; productive spaces and interoperable systems that enable individual mobility and mission success
- **Enable the Modern Army** – reframing installations as warfighting platforms at the forefront of the future combat environment

## Examples of Capabilities and Subjective Assessments\*



\*NOTE: Assessed during installation of the Future Visioning and Strategy Sessions

# Investing in future capabilities will support the development of two future states for installations

## Installation as a Platform

- Modularity to Customize
  - Components can be substituted, replaced, or built upon without disrupting other components
  - Example: Addition of additional sensor capabilities to infantry kit without disrupting / modifying underlying IT system
- Flexibility to Scale
  - Platforms respond to new inputs, stakeholders, and missions gradually over time and as necessitated by contingencies
  - Example: Vertical lift platforms support various sizes and versions of drones and aerial vehicles



**Constellation of Installations**


- Adaptability to Respond
  - The network of installations respond to shutdowns or disruptions (i.e., installations are a network, not a circuit)
  - Example: Storm impacts Ft. Bragg, Ft. Stewart automatically identifies logistics requirements to support soldiers and community
- Interoperability to Deliver
  - Installations adapt to new missions and use personnel and data across installation portfolio
  - Example: Virtual training data collected at one installation flows to others and is immediately comprehensible, enhancing readiness




# Five strategic outcomes guide Army towards investments in future installation capabilities

 **Align to Mission**  
Emphasize installations' support of specific Army Modernization Priorities

 **Support Personnel and Community**  
Provide Soldiers and civilians flexible work and lifestyle options

 **Modernize Infrastructure**  
Utilize prototypes to test smart environment capabilities

 **Enable Information Sharing**  
Build connectivity between installations

 **Deliver Return on Investment**  
Articulate a business case for installation modernization



# Roadmap to the Future Army installation



**Near-Term**  
(1-2 Years)



**Mid-Term**  
(3-5 Years)



**Long-Term**  
(6-10 Years)

<p><b>Align to Mission</b></p>	<ul style="list-style-type: none"> <li>Integrate with Army stakeholders (FORSCOM, TRADOC, AMC, AFC etc.)</li> <li>Generate Army Leadership and Stakeholder alignment with identify installation modernization priorities</li> </ul>	<ul style="list-style-type: none"> <li>Coherently articulate installations' support of readiness and resilience</li> </ul>	<ul style="list-style-type: none"> <li>Integrate Future Warfighter Capabilities/Enable a Multi-Domain Capable Force by 2028* (per AMS 1.5)</li> </ul>
<p><b>Support Personnel and Community</b></p>	<ul style="list-style-type: none"> <li>Define role of community inside and outside of the wire</li> <li>Identify policies to influence and change</li> </ul>	<ul style="list-style-type: none"> <li>Leverage Soldier / family databases to match talent to installation needs</li> <li>Achieve Initial Operating Capability (IOC) for access to community services</li> </ul>	<ul style="list-style-type: none"> <li>Fully integrate community and civilian-level services for service members and families</li> </ul>
<p><b>Modernize Infrastructure</b></p>	<ul style="list-style-type: none"> <li>Outline the specific capabilities to implement across Army installations</li> <li>Define IoT/sensorification capabilities</li> </ul>	<ul style="list-style-type: none"> <li>Select a flagship installation to build prototype platform and conduct modernization pilots</li> </ul>	<ul style="list-style-type: none"> <li>Fully implement predictive maintenance and Soldier Monitoring capabilities</li> </ul>
<p><b>Enable Information Sharing</b></p>	<ul style="list-style-type: none"> <li>Design Platform architecture (Internet of Things, connectivity, policies, etc.) including strategic visualization (installation dashboards)</li> <li>Develop standards for protocols and modular plug-and-play capabilities</li> </ul>	<ul style="list-style-type: none"> <li>Begin buildout of platform smart buildings as prototype on selected installation(s)</li> <li>Determine and begin connecting cluster of installations</li> </ul>	<ul style="list-style-type: none"> <li>Move towards implementation of Constellation across installation enterprise</li> <li>Connect digital installation twins to unified network (i.e. Vtime)</li> </ul>
<p><b>Deliver Return on Investment</b></p>	<ul style="list-style-type: none"> <li>Develop an OPEX business case for installation modernization</li> <li>Build engagement and outreach plan for stakeholders (Army and Community)</li> </ul>	<ul style="list-style-type: none"> <li>Involve installations in capabilities requirements, DOTMLPF process</li> <li>Integrate community services</li> </ul>	<ul style="list-style-type: none"> <li>Begin large-scale implementation of Installation as a Platform (IaaP) and Constellation of Installations (COI) capabilities</li> </ul>





# Details to Deliver the Installation of the Future

Insights collected through research, interviews, and visioning and strategy sessions

1. Drivers of Change
2. Future Considerations
3. Future Capabilities
4. Future State
5. Strategic Roadmap

# Geopolitical Competition

Adversaries will target U.S. vulnerabilities, including civilian entities which remain outside of the Army's authority but on which the Army depends for services, funding, resources, and overall readiness

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- Hypersonic weapons compress the Army's response times and their ranges eventually will encompass entire CONUS
- Proliferation of disparate threats will add complexity to resource prioritization and allocation processes
- "Our adversaries' goal is to keep us off-balance. A big catastrophic thing is less likely than incremental disruption preventing readiness standards. We're pretty well suited for catastrophic thing."<sup>2</sup>
- "Our greatest weakness right now is that we're a CONUS-based force."<sup>3</sup>
- Russian websites have exploited erroneous research to sow fear of health risks posed by 5G technology<sup>4</sup>
- "Industrial control systems are vulnerable to attack and intrusion, but DoD has no inventory of the systems inside its facilities. New guidance has been issued to govern the cybersecurity of these systems, but installation personnel do not always have the specialized expertise needed to deal with cyber threats."<sup>5</sup>



# Disruptive Technology

Great-power, sub-state, and individual adversaries alike will leverage emerging, low-cost technologies and tactics to disrupt installation operations and degrade Army readiness

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- Sound-proofing material technology advancing at a high rate and could minimize noise from drones and other vehicles<sup>6</sup>
- Manufacturing production lines will become so flexible and modular that even the smallest lot size can be produced under conditions of highly flexible mass plug-and-play integration production<sup>7</sup>
- Miniaturization of batteries and other technologies will allow adversaries to subvert traditional defenses (e.g. fences, CCTV)
- Unknown actors likely targeted U.S. embassy in Havana, Cuba with microwave weapons in late 2016<sup>8</sup>



## Societal Evolution

Governments and hierarchical entities will struggle to stay ahead of divisive media information campaigns and shifting cultural norms and expectations

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- “We get kids from cities with very modern capabilities like scooters, motorized bikes, etc. and they come to an installation and they feel isolated. We need to understand what will it take to attract the future force and look at providing commercial levels of support.”<sup>9</sup>
- “In 1990, 40% of young Americans had a military veteran for a parent; in 2014 only 16% did.”<sup>10</sup>
- “For millennials, work is a thing, not a place.”<sup>11</sup>
- “68% of total population is expected to live in urban areas by 2050”<sup>12</sup>
- 51.2% of the world’s population had internet access in 2018, up from 23.1% ten years ago.<sup>13</sup>
- Army personnel and missions vulnerable to tribalization of society and divisive media narratives
- “We’re losing more people to HMMWV accidents in CENTCOM than from bullets; kids don’t know how to drive if they’re coming from cities.”<sup>14</sup>



# Ecosystem Convergence

Storms, heat waves, and other unpredictable weather events will combine with human ecological systems to impact Army operations and magnify the threats posed by adversaries and competitors

- Climate change is creating new combat theaters, notably in the Arctic region, and transforming existing ones like South Asia<sup>15</sup>
- “The International Energy Agency (IEA), a research group, estimates that putting up and running buildings consumes 36% of the world’s energy and produces some 40% of energy-related carbon emissions.”<sup>16</sup>
- Congressional gridlock delayed recovery funding for Tyndall Air Force Base following Hurricane Michael<sup>17</sup>
- In 2017, the United States scored a D+ on the American Society of Civil Engineers’ Infrastructure Report Card – struggling outside infrastructure poses vulnerabilities to installations<sup>18</sup>
- A 2019 DoD report lists 17 out of 21 surveyed Army installations as vulnerable to flooding within the next 20 years<sup>19</sup>



# Army Modernization is Here

Army modernization will not occur without a concurrent paradigm shift concerning the roles and capabilities of installations

A substantial portion of current and future conflict is virtual, shifting the location of the battlefield: “The Meades and Gordons will be the Bagrams and Kandahars of the future”<sup>20</sup>

Future warfighting technologies will be highly networked, integrated, and sensor-rich – installations will play critical roles in enabling, operating, and securing these technologies

Army modernization will not prove successful without a concurrent paradigm shift regarding the roles and capabilities of installations. Future warfighting technologies will be highly networked, integrated, and sensor-rich. Installations will play essential roles in storing, tracking, maintaining, and operating the current Modernization Priorities and technologies.

# Installations are Catalysts for Readiness



Readiness encompasses recruitment of quality personnel, retention of Soldiers and families, and cutting-edge training – installations enable all three

High-quality physical training ranges will remain essential, particularly as the Army implements next-generation vehicles and weapons systems and adopts the Combat Fitness Test (CFT)

Installations will lead the way in implementing effective and networked Synthetic Training Environments across the Army

Installations will continue to serve as the generators of Army readiness. The definition of readiness and metrics to measure it are rapidly evolving as the Army prepares for new types of combat. Installations must support Synthetic Training Environments which enable virtual collaboration and conduct frequent stress-test exercises to assess real-time readiness.

# Current TRLs Support Smart Environments

“4/5 of the future needs of smart cities are technologically capable today. We don’t need high bandwidth, low latency of 5G to do many of the functions.”<sup>21</sup>

“The cost of lithium-ion batteries has plunged 85 percent in a decade, and 30 percent in just the past year...”<sup>22</sup>

Dense smart environments will struggle with the needs to construct data centers and implement edge computing infrastructure to process data at the source.<sup>23</sup>

Installations can become smart environments that support two goals of facilitating installation operations and awareness of various facets of the smart environment and empowering the Units, Soldiers, and families of the environment by giving them access to data and information and increasing their input and ability to customize at the lowest possible levels.



# Scale Functions and Operations

## SCALING TO WIN

Networked installations will coordinate and leverage the total Army inventory and allow the Army to maximize its warfighting, materiel, and Total Force resources.

### *SUPPORTING FINDING*

“Installations today end up creating a crisis because we put too many troops and too much equipment in one place and then we have trouble mobilizing it in a timely way, hindering throughput.”<sup>24</sup>

## COMBINING COMBAT POWER

Army installations will not only enable power projection and build readiness but serve as warfighting platforms by jointly conducting aerial operations and cyberwarfare and integrating with deployed Soldiers.

### *SUPPORTING FINDING*

“If the future battlefield is fluid, where are the forces going to be controlled from? Static locations in the continental US! These won’t be outside of the war fight either.”<sup>25</sup>

## KEY CAPABILITIES

Real-time, virtual supply chain across enterprise  
Dashboard/backbone of core metrics across constellation (e.g. energy, resources, data, soldier information)  
Ability to ramp up security as needed (i.e., drone / airspace safe zones)  
Unified standards to support Total Force (Active, Reserve, and Guard components)

# Maneuver with Speed

## WARFARE OF THE FUTURE

Future combat will occur at unprecedented speeds and demand highly-complex warfighting systems. To support this future environment, installations must be networked and operate with agility.

### *SUPPORTING FINDING*

“In many cases, new weapon systems have not been deconflicted with what is needed on an installation to support. The speed and velocity of new weapons systems could quickly outpace an installation’s ability to support.”<sup>26</sup>

## CONNECTIVITY

Sensor proliferation on installations and among personnel will democratize data and other information, push decision making to the edge, and enable rapid operations.

### *SUPPORTING FINDING*

ARM, a semiconductor designer, estimates that by 2035 there could be 1 trillion networked IoT chips<sup>27</sup>

“Researchers have built a new type of computer chip that boosts the performance and slashes the energy demands of systems used for AI.”<sup>28</sup>

## KEY CAPABILITIES

Data management and sharing standards  
Just-in-time materiel delivery between platforms leveraging drones and autonomous capabilities  
On-site manufacturing (i.e., 3-D printing) and repair  
Cybersecurity standards within built into buildings and products

# Develop Esprit de Corps

## COHESIVENESS IN A VIRTUAL AGE

Installations must leverage technologies and virtual capabilities to maintain cohesiveness despite increased physical distances between and divergent needs of Soldiers and personnel.

### *SUPPORTING FINDING*

“Communities used to form because of shared experiences in a physical place, now the Garrison Commander (GC) needs to think about a hybrid: some things pull people into post, but how do you have a virtual presence as well?”<sup>29</sup>

## MODERNIZING TRAINING

Installations must continue to support physical training and accompanying ranges, but must also prioritize building readiness for less-traditional combat personnel like cyber operators and drone pilots.

### *SUPPORTING FINDING*

Synthetic Training Environments (STEs) will supplement in-person training, allow for increased reps, and reduce environmental and transportation burdens.

## KEY CAPABILITIES

- Networked Synthetic Training Environments (STEs) across installation landscape
- Robust AR/VR capabilities to enable adaptive training
- Flexible work and communication options to maintain cohesiveness across physical distances
- Talent management system to align personnel with ideal assignments

# Provide a Positive Installation Experience

## “THE INSTALLATION” TO “MY INSTALLATION”

Younger Americans increasingly expect flexible, customizable workspaces and lifestyles. Relatively minor policy changes and physical upgrades to installations could significantly improve retention.

### *SUPPORTING FINDING*

“When you talk to corporate CEOs, the more enlightened ones regard workspace as a recruiting and retention factor.”<sup>30</sup>

## FAMILY EXPERIENCE

Families play critical roles in enabling readiness and contribute to Army talent retention. Livable installations will benefit families and take advantage of the talents which dependents may offer.

### *SUPPORTING FINDING*

“Millennials in particular want to be great parents. Army life is very difficult for families, and installations could help or hinder this.”<sup>31</sup>

## KEY CAPABILITIES

- Diverse personal mobility options (including without cars)
- Fence line designed around only critical assets with virtual security / awareness
- Integration with commercial vendors and delivery services
- Unified IT systems at base level and across enterprise (including with other services)
- Comfortable and flexible office spaces and abundant outdoor amenities (trails, etc.)

# ENABLE THE MODERN ARMY

## REFRAMING INSTALLATION ROLES

Installations must articulate visions in which they are central platforms in prosecuting Multi-Domain Operations and generating readiness. This requires a substantial cultural shift within the Army.

### *SUPPORTING FINDING*

“A major cultural challenge is that people don’t think of installations as operational, even if they say that they do.”<sup>32</sup>

## OVERCOMING DINOSAURS

Redefine installation management from a managerial task to an operational one to change paradigms and generate buy-in for evolving legacy installation features and transitioning certain services to the commercial sector.

### *SUPPORTING FINDING*

“Installations were built on an industrial age model... a physical environment to execute a static mission. This worked for many years but is not suitable for the future.”<sup>33</sup>

## KEY CAPABILITIES

- Support of next-generation weapons and Army Modernization priorities
- Cutting-edge facilities for drone and cyber operators
- Virtual integration with and tracking of all Soldiers under installation purview
- Autonomous and routine stress-testing to tangibly demonstrate existing vulnerabilities

# INSTALLATION AS A PLATFORM

## MODULARITY TO CUSTOMIZE

Ability of individual installation components to be substituted, replaced, or built upon without disrupting other components.

### *Supporting Finding*

“One building is a robotics lab: different projects all the time, modular power systems, tech guys working on stuff, cruise missile component, easy for team to claim its area without building a wall, plug-and-play electronics. Once you can get in there, everyone can get synergy from innovation.”<sup>34</sup>

## FLEXIBILITY TO SCALE

Ability of individual platforms to respond to new inputs, stakeholders, and missions gradually over time and as necessitated by contingencies.

### *Supporting Finding*

Today’s teams “have 60-day product development cycles and draw people from different components. How do spaces adapt, how to create a series of spaces to accommodate different sized teams without rebuilding the space?”<sup>35</sup>

“Buildings become flexible platforms and ‘wicked simple’ to configure”<sup>36</sup>

## KEY CAPABILITIES

- Multi-purpose facilities and infrastructure to accommodate multiple weapons systems and missions
- Common protocols to support virtual communication between personnel, buildings, and command
- Integrated with commercial service providers and civil authorities
- Supports seamless additions of mission-centric and lifestyle-oriented additions (e.g., drone launch zones, micro-mobility options, solar panels on residences)

# CONSTELLATION OF INSTALLATIONS

## ADAPTABILITY TO RESPOND

Ability of installation network to respond to shutdowns or disruptions of any single node.

### *Supporting Finding*

“Every autonomous system will be able to process and make sense of the information it gathers on its own, without relying on a command hub. This will enable the creation of radically distributed networks that are resilient and reconfigurable.”<sup>37</sup>

## INTEROPERABILITY TO DELIVER

Ability to adapt to new missions and use personnel and data across installation portfolio.

### *Supporting Finding*

Air Force recently demonstrated mission and personnel interoperability by switching control of Persian Gulf aerial assets from the Qatar-based Combined Air and Space Operations Center to CONUS Shaw Air Force Base<sup>38</sup>

## KEY CAPABILITIES

Assured internet and cellular capabilities across all installations

Common IT standards to enable Soldiers and civilians to plug-in and work regardless of physical location  
Common Operating Picture accessible by stakeholders across installation enterprise (GCs, Pentagon, etc.)

Ability of Constellation to form and reform based on function and as necessitated by contingencies

Interconnected exercises at training installations and knowledge sharing / collaboration at R&D facilities

Autonomous Delivery Vehicle

JIT Drone Package Delivery




Ft. Bragg

Airborne and  
Special Forces  
Deployment  
Distribution  
Services



## ALIGN TO MISSION

- IE&E should emphasize modern installations' impact while making the case for the installation of the future. installation prototypes (Platform / Constellations) align especially well with the following Army Modernization Priorities:
  - Assured Position, Navigation, and Timing
  - Synthetic Training Environment (STE)
  - Army Network Modernization




2020 ACTION ITEMS	STRATEGY/OUTCOME		
	 Near-Term (1-2 years)	 Mid-Term (3-5 years)	 Long-Term (5-10 years)
Organize and/or participate in wargame initiative to test alignment of Modernization Priorities with installations within the context of Multi-Domain Operations	<p><b><i>Highlight the Modernization Priorities for which future installations add most value</i></b></p> <ul style="list-style-type: none"> <li>• Use wargame findings to engage Army Futures Command Cross-Functional Teams for APNT, STE, and Army Network</li> <li>• Emphasize installations' ability to deliver AFC quick wins</li> </ul>	<p><b><i>Coherently articulate installations' support of readiness and resilience</i></b></p> <ul style="list-style-type: none"> <li>• Leverage Army partnerships (FORSCOM, TRADOC, AMC, AFC, etc.) to shift entrenched cultural attitudes within Army</li> </ul>	<p><b><i>Integrate Future Warfighter Capabilities</i></b></p> <ul style="list-style-type: none"> <li>• Implement capabilities across installation enterprise to support the various warfighting systems and joint-force partnerships which enable MDO</li> </ul>
<b>Considerations and Challenges</b>		<ul style="list-style-type: none"> <li>• Need to quickly identify potential MDO-focused wargames and integrate with relevant CFTs</li> <li>• Wargame should incorporate representatives from across DoD services</li> </ul>	





## SUPPORT PERSONNEL AND COMMUNITY

- Soldier and family welfare are essential enablers of the Army's readiness and mission success
- By providing flexible lifestyle options and efficient services, installations will deliver the welfare needed to recruit and retain current and future Army talent
- People are demanding flexible, virtual options in Professional Military Education: "Younger people don't want to move to Syracuse just to take a course"<sup>39</sup>

2020 ACTION ITEMS	STRATEGY/OUTCOME		
	 Near-Term (1-2 years)	 Mid-Term (3-5 years)	 Long-Term (5-10 years)
Conduct a study/survey or analyze data on Soldier and family installation facility and amenity preferences	<p><b><i>Define role of community inside and outside of the wire</i></b></p> <ul style="list-style-type: none"> <li>• Use survey results and site visits to inform decisions on features to keep versus evolve</li> <li>• Produce data-driven, installation-by-installation assessment of community integration and service evolution</li> </ul>	<p><b><i>Leverage Soldier / family databases to match talent to installation needs</i></b></p> <ul style="list-style-type: none"> <li>• Take advantage of increased Army information sharing to sponsor a portal giving garrison commanders insights into the skills and capabilities of existing and incoming installation personnel</li> </ul>	<p><b><i>Fully integrate community available services for service members and families</i></b></p> <ul style="list-style-type: none"> <li>• Leverage flexible working options, installation networks, and personnel management systems to deliver Soldiers and families flexibility in training, education, and community services</li> </ul>
<b>Considerations and Challenges</b>		<ul style="list-style-type: none"> <li>• Overcoming dinosaurs and entrenched stakeholders</li> <li>• Difficulty of capturing and organizing personnel data</li> </ul>	



# MODERNIZE INFRASTRUCTURE – INSTALLATION AS A PLATFORM



- Army’s championing of smart capabilities will generate maximal input and Army buy-in if this implementation occurs on a single, flagship installation
- Focusing on a single prototype versus various installations will generate comprehensive, “installation experience” data which IE&E can wield as it makes the case for budget prioritization

2020 ACTION ITEMS	STRATEGY/OUTCOME		
	Near-Term (1-2 years)	Mid-Term (3-5 years)	Long-Term (5-10 years)
<p>Begin scanning for potential prototype installations and partner organizations</p> <p>Determine high win-probability initiatives, technologies, and systems to introduce to a single platform</p>	<p><b><i>Outline the specific capabilities and technologies to implement across Army installations</i></b></p> <ul style="list-style-type: none"> <li>• Partner with internal stakeholder(s) (FORSCOM, TRADOC, USACE) to identify installation which will readily support Installation as a Platform applications</li> <li>• Identify promotable GC willing to steer installation’s transition to an operational platform</li> </ul>	<p><b><i>Select a flagship installation on which to build prototype platform and conduct high-win probability pilots</i></b></p> <ul style="list-style-type: none"> <li>• Measure impact of modernization efforts on prototype installation through longitudinal studies which track Soldier and family sentiments</li> <li>• Analyze prototype findings to inform the specific capabilities which should be introduced across the installation enterprise</li> </ul>	<p><b><i>Redefine installations as Operational Platforms within the context of Multi-Domain Operations</i></b></p> <ul style="list-style-type: none"> <li>• Use output and momentum generated from AFC collaboration and prototype findings to redefine installations in operational terms as enablers of Multi-Domain Operations</li> </ul>
<b>Considerations and Challenges</b>		<ul style="list-style-type: none"> <li>• Difficulties identifying and/or engaging prototype partners</li> <li>• Prototype features should be “two-door initiatives”</li> </ul>	



# ENABLE INFORMATION SHARING – CONSTELLATION OF INSTALLATIONS




- Interviewees and participants from the Visioning and Strategy Sessions emphasized the importance of connectivity across the installation spectrum to enable training, ensure readiness, and drive efficiency and cost savings
- Similar to the buildout of the Installation as a Platform, this Constellation should likewise proceed as a prototype, this time among a cluster of installations

2020 ACTION ITEMS	STRATEGY/OUTCOME		
	 Near-Term (1-2 years)	 Mid-Term (3-5 years)	 Long-Term (5-10 years)
<p>Assess Wi-Fi and 4G/LTE coverage capabilities across installation portfolio</p> <p>Scan for a regional or functional cluster of suitable installations (i.e., possessing baseline network capabilities) in which to pilot information-sharing</p>	<p><b><i>Design Platform architecture with protocols and modular plug-and-play capabilities</i></b></p> <ul style="list-style-type: none"> <li>• Partner with Cross-Functional Team responsible for Army Network</li> <li>• Develop digital twin models of installations within cluster</li> <li>• Build channels for information, readiness, and STE data sharing between platforms</li> </ul>	<p><b><i>Determine and begin connecting cluster of 3-4 installations</i></b></p> <ul style="list-style-type: none"> <li>• Conduct stress-test exercises and simulations</li> <li>• Analyze findings from installation cluster and develop network standards to implement across installation enterprise</li> <li>• Continue to develop digital twins for remainder of installations</li> </ul>	<p><b><i>Move towards Roll-out of Constellation across installation enterprise</i></b></p> <ul style="list-style-type: none"> <li>• Operationalize single pane enabling integration of data feeds across entire Constellation</li> <li>• Connect digital installation twins to unified network</li> </ul>
<b>Considerations and Challenges</b>		<ul style="list-style-type: none"> <li>• Difficulties determining suitable installations for cluster</li> <li>• Challenges partnering with Army Futures Command</li> </ul>	



# DELIVER RETURN ON INVESTMENT

- Outreach to and integration with resource and program management personnel will be essential in implementing smart environment capabilities and modernizing installations

2020 ACTION ITEMS	STRATEGY/OUTCOME		
	 Near-Term (1-2 years)	 Mid-Term (3-5 years)	 Long-Term (5-10 years)
<p>Engage and build partnerships with resource and program management stakeholders, including private sector partners</p> <p>Partner with Air Force, Navy, and Marine Corps counterparts to identify shared areas of opportunity, particularly at joint bases (i.e., Joint Base Lewis-McChord, Joint Base San Antonio)</p>	<p><b><i>Develop an Operating Expense (OPEX) business case for installation modernization</i></b></p> <ul style="list-style-type: none"> <li>• Emphasize the “F” component’s impact on Army readiness, resilience, and support of MDO</li> <li>• Contribute to PPBE process/POM for late-2020s timeline</li> </ul>	<p><b><i>Involve installations in capabilities requirements, DOTMLPF process</i></b></p> <ul style="list-style-type: none"> <li>• Consolidate and analyze preliminary results from installation prototypes</li> <li>• Use prototype findings and associated financial data to inform the specific initiatives to be implemented across the installation enterprise</li> </ul>	<p><b><i>Begin large-scale implementation of IaaP and Col capabilities</i></b></p> <ul style="list-style-type: none"> <li>• Execute fully-budgeted modernization initiatives across the installation enterprise</li> </ul>
<b>Considerations and Challenges</b>		<ul style="list-style-type: none"> <li>• Difficulty articulating operational value of installations</li> <li>• Communication issues across DoD services</li> </ul>	

# An Installation Investment Strategy brings stakeholders together to define and deliver installation of the future requirements

Components of an Investment Strategy	<p><b>Enabling the mission and modern Army</b></p> <p>Define in terms of the installations' role in generating comprehensive readiness and resilience</p>	<p><b>Alignment to NDS / AMS</b></p> <p>Scope and scale pilot activities for installations' enablement of MDO and great power competition</p>	<p><b>Capital Expenses</b></p> <p>Communicate returns in investments that drive large-scale modernization</p>	<p><b>Operational Expenses</b></p> <p>Communicate reinvestment of maintaining facilities and providing quality services to installation users demonstrated through deliberate prototypes</p>	<p><b>Value to community and legislative body</b></p> <p>Recast the installation as means for Protection and an Economic Driver for the Army and local communities</p>
Key Themes	<p>Investment initiatives for the installation of the future must be made in terms of readiness and resilience</p>	<p>Positive Soldier and employee installation experiences are directly tied to the Army's readiness and capabilities</p>	<p>Don't wait to be directed to implement the modern Army – make the opportunity to shape the Modern Army through prototypes of installations as Platforms</p>		<p>Leverage surrounding communities to maximize installation value to Soldiers, civilians, and families</p>

Back up  
slides



NOTES



RESEARCH



INTERVIEWS

# Notes

- (1) NYT
- (2) Internal Interview
- (3) Internal Interview
- (4) NYT
- (5) Heritage Foundation
- (6) Mother Nature Network
- (7) Toffler Associates Research
- (8) NYT
- (9) Internal Interview
- (10) The Economist
- (11) PWC, NYT
- (12) McKinsey
- (13) International Telecommunications Union
- (14) Internal Interview
- (15) DoD Arctic Strategy
- (16) The Economist, IEA
- (17) NPR
- (18) American Society of Civil Engineers
- (19) Report on Effects of a Changing Climate to the DoD
- (20) Internal Interview
- (21) External Interview
- (22) Politico
- (23) GCN
- (24) Internal Interview
- (25) Internal Interview
- (26) Internal Interview
- (27) ARM, The Economist
- (28) Princeton University
- (29) External Interview
- (30) External Interview
- (31) External Interview
- (32) External Interview
- (33) External Interview
- (34) External Interview
- (35) External Interview
- (36) External Interview
- (37) Foreign Affairs
- (38) Washington Post
- (39) Strategy Session Participant

# Visioning Session Output





# Strategy Session Output (1)

## ARMY INSTALLATION OF THE FUTURE STRATEGY SESSION

### INSIGHTS

IT'S NOT GOING TO HAPPEN OVERNIGHT, HOWEVER, THE KEY INGREDIENTS ARE COMING TOGETHER - AND WILL HAVE A RIPPLE EFFECT ACROSS THE MILITARY.

**9/11** The HOMETOWN IS NO LONGER SAFE, NO LONGER A SANCTUARY. NEW THREATS. VECTOR OF ATTACK.

**REACTIVELY IS KEY** REQUIREMENTS HAVE CHANGED.

**THE PROMISE OF TECHNOLOGY**

**KINETIC UAS Threat** CYBER: WHERE CYBER ON CYBER. A REPTRODGE CAN KILL DATA THEFT.

WE NEED THE ARMY OF TOMORROW TODAY! BUILDINGS & BASES WILL BE RATED.

HOW DO WE ATTRACT AND RETAIN MILLENNIALS? MEET PERSONAL NEEDS. (WELCOME!)

**WE NEED MORE POWER!**

### CONSTITUTION OF INSTALLATIONS

INTERRELATION LEVERAGING THE POWER OF THE COMPLETE INVENTORY

RAISING MILITARY VALUE BY SHARING ACROSS INSTALLATIONS + REDUCES REDUNDANCY "STRATEGIC REDUNDANCY"

**SCALE** THE TYRANNY OF DISTANCE. PREDICTIVE ANALYTICS DRIVING 6 HOURS/DAY. AGGREGATED MARKETS, CLUSTERS ANYONE?

**Resilience AS A SERVICE** Enabled SUPPLY CHAIN

**SYNTHETIC ENVIRONMENT** ENABLES REMOTE COLLECTIVE TRAINING

### INSTALLATION AS PLATFORM

**FRictionless ENTRY** FACIAL WEARABLE SUPPLANTED.. NO FENCE. WHAT STOPS YOU? HOW QUICKLY CAN WE MODERNIZE? HOW DO WE DIFFERENTIATE RISKS?

**TREND** COMMUNAL ENVIRONMENT SPIRIT of Collaboration TRANSCENDING THE HOME, INTO THE WORKPLACE.

**CONSIDER FACILITY STICKER SHOCK!** THERE'S NOTHING LIKE THE FEEL OF PULLING A LAMPARD. SENDING A ROUND DOWN RANGE.

**GARRISON COMMANDER OF THE FUTURE IS AN INTEGRATOR OF ARMY AND COMMUNITY**

**WE HAVE EXCESS AND UNDERUTILIZED** "INSTALLATION SERVICE (VS MISSION"

**SECURE WHAT NEEDS TO BE SECURED** THIS BASE FEELS LIKE A JAIL

**PROTOCOLS THAT DRIVE INTEROPERABILITY**

**3 LENSES**

- INDIVIDUAL TRAINING
- COLLECTIVE TRAINING SERVICES SIDE
- INTELLECTUAL EXPERIENTIAL

**IMMERSIVE TRAINING**

- COLLABORATION
- VIRTUAL ROLE
- AUGMENTED REALITY
- BUILDING/MAINTAINING SENSE OF COMMUNITY

HOW CAN WE ACCELERATE SENSE OF COHESION?

**MONROE** How do you CREATE EFFICIENCY?

**ONE ARMY SCHOOL SYSTEM** YOU CAN SHIP THE VIRTUAL SCHOOL SYSTEM ANYWHERE.

**OUR Napoleonic WAY OF COMBAT WON'T CHANGE BY 2030**

**D.R. AS A SERVICE**

**DATA ENABLER FOR FACILITIES MANAGEMENT**

**MULTI-FUNCTION SOLDIERS ALLOW FOR X-TRAINING CAPABILITIES**

# Strategy Session Output (2)

## ARMY INSTALLATIONS OF THE FUTURE

**Sharing ACROSS SERVICES**

**Surplus (WHERE???)**  
MATERIALS??

**Enabling the MODERN ARMY**

**STRATEGY MEANS NOTHING WITHOUT RESOURCES**

**SPEED**

**Tyndall AFB REBUILDING**

**NO FENCE LINE**

**Sensors**

**CONNECTED DIGITAL TWIN**  
MANAGING VIRTUALLY

**DATA FUSION**

**ENABLING the DIB**

**PROACTIVE @ Reactive**  
DESIGNED WITH PURPOSE

**INSTALLATION INVESTMENT STRATEGY**

**CHILD CARE**

**HEALTH IS THE NEW WEALTH**

**PEOPLE (FAMILIES) AS ASSETS**

**BEING A DRIVER OF CHANGE**

**NEED SAME CAPABILITY AS PRIVATE SECTOR**  
... WE KNOW YOU DID X, Y AND Z ... WE CAN USE YOU IN ...

**CATALYST FOR MOVE TO SMART BUILDINGS?**

**IS THERE A RATIONAL BUSINESS CASE FOR IT?**

**VALUE!**

**TWO-WAY**

**ONE-WAY**

**REINVEST SMARTER ARMY**

**BUDGET**

**MODERN INSTALLATION**

**CYCLE OF IMPROVEMENT**

**COST SAVINGS**

## SUMMARY!!

**the FUTURE IS TODAY**

**From The INSTALLATION to My INSTALLATION**

**Supporting Readiness & Resilience**

**RECRUITING CAPABILITIES**

**then ROCK**

**Now: MIA**

**LAUNCH PAD TO OPPORTUNITY**

**BUILDING-IN FLEXIBILITY**

**27% INSTALLED!**  
MAINTAINED?  
ENERGY  
WATER  
ELECTRICITY

**ACCOUNTABILITY!**

**COMMON OPERATING PICTURE**

**LAYERED SECURITY**

**OPPORTUNITIES**

- Flexibility
- Lower cost
- Ability to Pivot
- Reduced Footprint
- BECOME MORE OPERATIONALLY DENSE
- Shrink PRB  
— Toward an evolutionary model
- IDENTIFY Dinosaurs
- COMMON OPERATING FUNCTION
- Transform SUPPLY CHAIN
- INTEGRATION w/ COMMERCIAL
- PREDICTIVE MAINTENANCE TRANSFORMS THE CULTURE
- CREATE ENVIRONMENT TO Thrive
- IDEA! IDEA! IDEA!
- BUILD A CULTURE
- CONTINUE TO LEARN & ITERATE
- DEPTH AND BREADTH NEEDED
- DATA SHARING E-

**HAVE A PLACE PICK FLAGSHIP**

**DO IT!**

**FAIL FAST**

**091019 GREG GERSCH.COM OFFER**

# Who We Have Spoken To

## External Interviews



**43** EXTERNAL INTERVIEWS



ACADEMIA, NON-PROFIT, PRIVATE, & PUBLIC SECTOR



USMC, USN, AND USAF PERSPECTIVES

## Internal Interviews



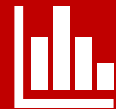
**20** INTERNAL INTERVIEWS



*Organizations are listed above are not comprehensive of all interviews*

# Our Research

## Secondary Research











**QUALITATIVE  
ANALYSIS**

## Parallel Industries



**DIVERSE  
PERSPECTIVES**

		
<b>900+ CODED SEGMENTS</b>	<b>250+ BOOKS, ARTICLES, AND REPORTS</b>	<b>60+ INTERVIEW TRANSCRIPTS</b>
Journalistic Sources		Government Reports
Academia		Think Tank Research

		
Telecom	Environmental Science	Transportation
		Manufacturing
Energy		
		
Urban Studies	Technology	Aerospace

# Capabilities deliver outcomes for the future installation – Tenets for the Future

## *Installation as a Platform*

### • **Platform Modularity**

- Ability of individual installation components to be substituted, replaced, or built upon without disrupting other components
- Example: Defective or compromised solar panels replaced without impacting energy flows

### • **Flexibility**

- Ability of individual platforms to respond to new inputs, stakeholders, and missions gradually over time and as necessitated by contingencies
- Example: Installation motor pools designed for various sizes and models of Next Generation Combat Vehicles

## *Constellation of Installations*

### • **Adaptability**

- Ability of installation network to respond to shutdowns or disruptions of any single node
- Example: Storm impacts Ft. Bragg, Ft. Stewart automatically integrates digital personnel profiles and provides support

### • **Interoperability**

- Usability of existing personnel, materiel, and data across installation portfolio
- Example: Virtual training data collected at one installation flows to other training bases and is immediately comprehensible

