

# The U.S. Army Functional Concept for

# Mission Command

2020-2040

February 2017

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## Foreword

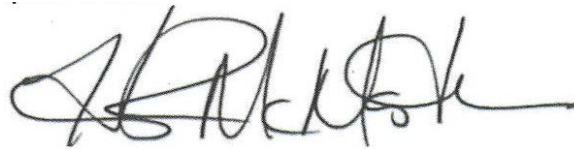
*From the Director  
United States (U.S.) Army Capabilities Integration Center*

The U.S. Army is the Nation's principal land force organized, trained, and equipped for prompt and sustained combat on land. Today's adversaries have studied how the U.S. Joint Force prefers to operate and adapted to develop capabilities that contest our operations on land, at sea, in the air, in space and cyberspace, as well as the electromagnetic spectrum. Enemies and adversaries operate beyond the physical battleground on battlegrounds of information, perception, political subversion, and criminality. Defeating future enemies requires land forces operating as integrated joint teams that conduct simultaneous and sequential operations across multiple domains. Future Army forces will create temporary windows of superiority across multiple domains to enable Joint Force freedom of action. This requires flexible and resilient ground formations that conduct reconnaissance and maneuver across domains to seize positions of relative advantage, control key terrain, defeat enemy forces, and consolidate gains.

U.S. Army Training and Doctrine Command (TRADOC) Pamphlet (TP) 525-3-3, *The U.S. Army Functional Concept for Mission Command (AFC-MC)*, expands on the Army's overarching leadership philosophy presented in TP 525-3-0, *The U.S. Army Capstone Concept* and TP 525-3-1, *The U.S. Army Operating Concept: Win in a Complex World (AOC)*. The AFC-MC refines the mission command warfighting function to emphasize the need for Army forces to operate across multiple domains and as part of joint, interorganizational, and multinational teams.

The main requirement to realizing mission command is leaders capable of understanding, visualizing, describing, directing, leading, and assessing operations. Realizing mission command also requires systems and command posts capable of operating on the move in contested and congested environments. There is much work to do as current systems are cyber-only, vulnerable, and incomplete, while command posts are too large, easily identifiable, and lack the agility to support commands in the conduct of multi-domain battle (MDB). The Army's ability to conduct MDB depends on a mission command network that is assured, interoperable, tailorable, collaborative, identity based, and accessible at the point of need. Realizing mission command will require focused and sustained collaboration across the Army as well as with Joint Force and multinational partners. It will not be easy. The Army must evaluate and prioritize network-related efforts based on the degree to which they contribute to this concept and how network-related capabilities effect the Army's ability to operate consistent with the AOC and TP 525-3-6, *The U.S. Army Functional Concept for Movement and Maneuver*.

This concept serves as a foundation for developing future mission command and helps Army leaders *think* clearly about future armed conflict, *learn* about the future through the Army's campaign of learning, *analyze* future capability gaps and identify opportunities, and *implement* interim solutions to improve current and future force combat effectiveness. The Army must think clearly; analyze current and future network requirements, and assess requirements against current and planned capabilities; research, develop, and implement solutions to capability gaps across the force.

A handwritten signature in black ink, appearing to read 'H. R. McMaster', with a long horizontal flourish extending to the right.

H. R. McMASTER  
Lieutenant General, U.S. Army  
Director, Army Capabilities  
Integration Center

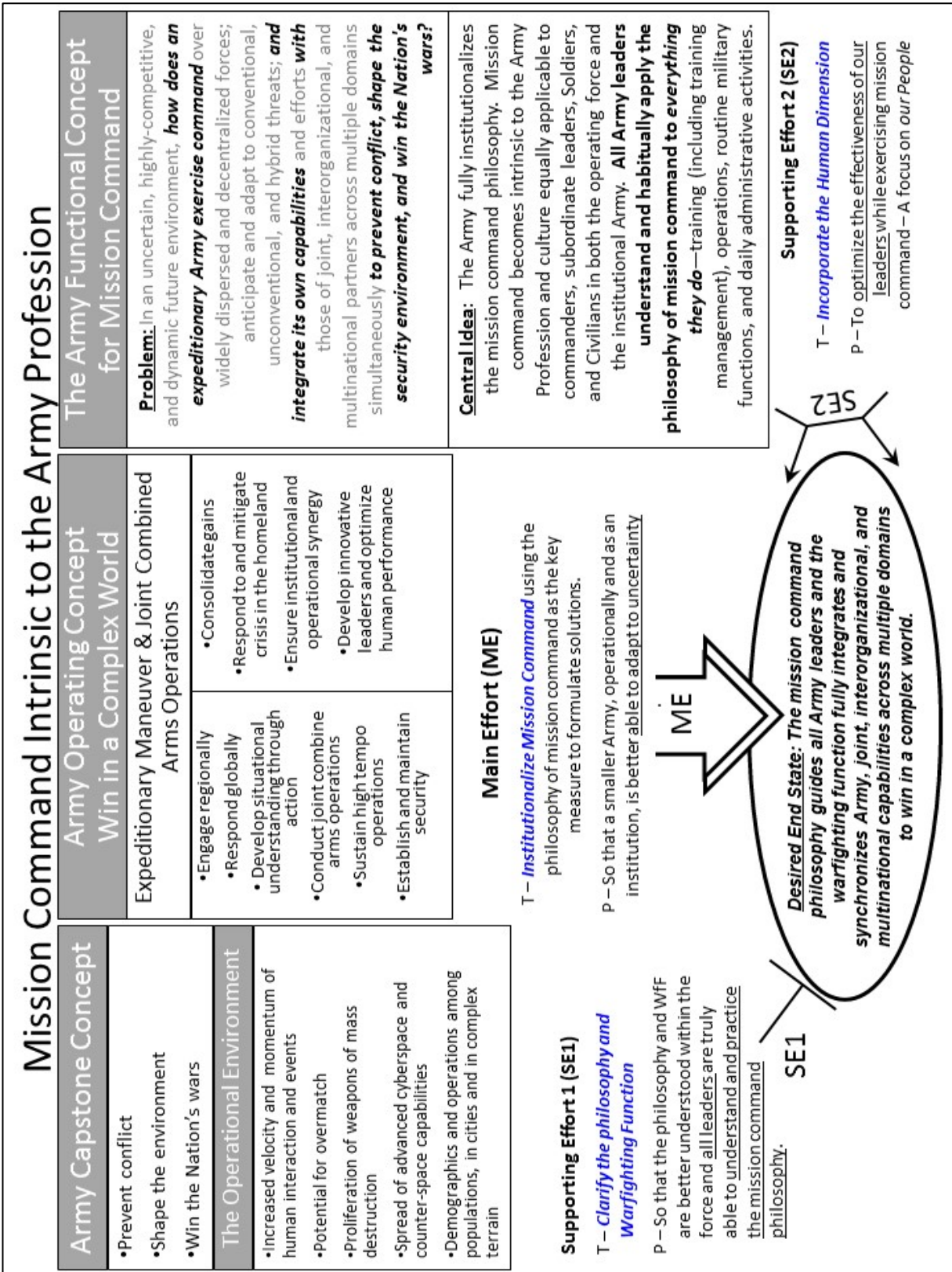


Figure 1. Mission command logic chart intrinsic to the Army Profession

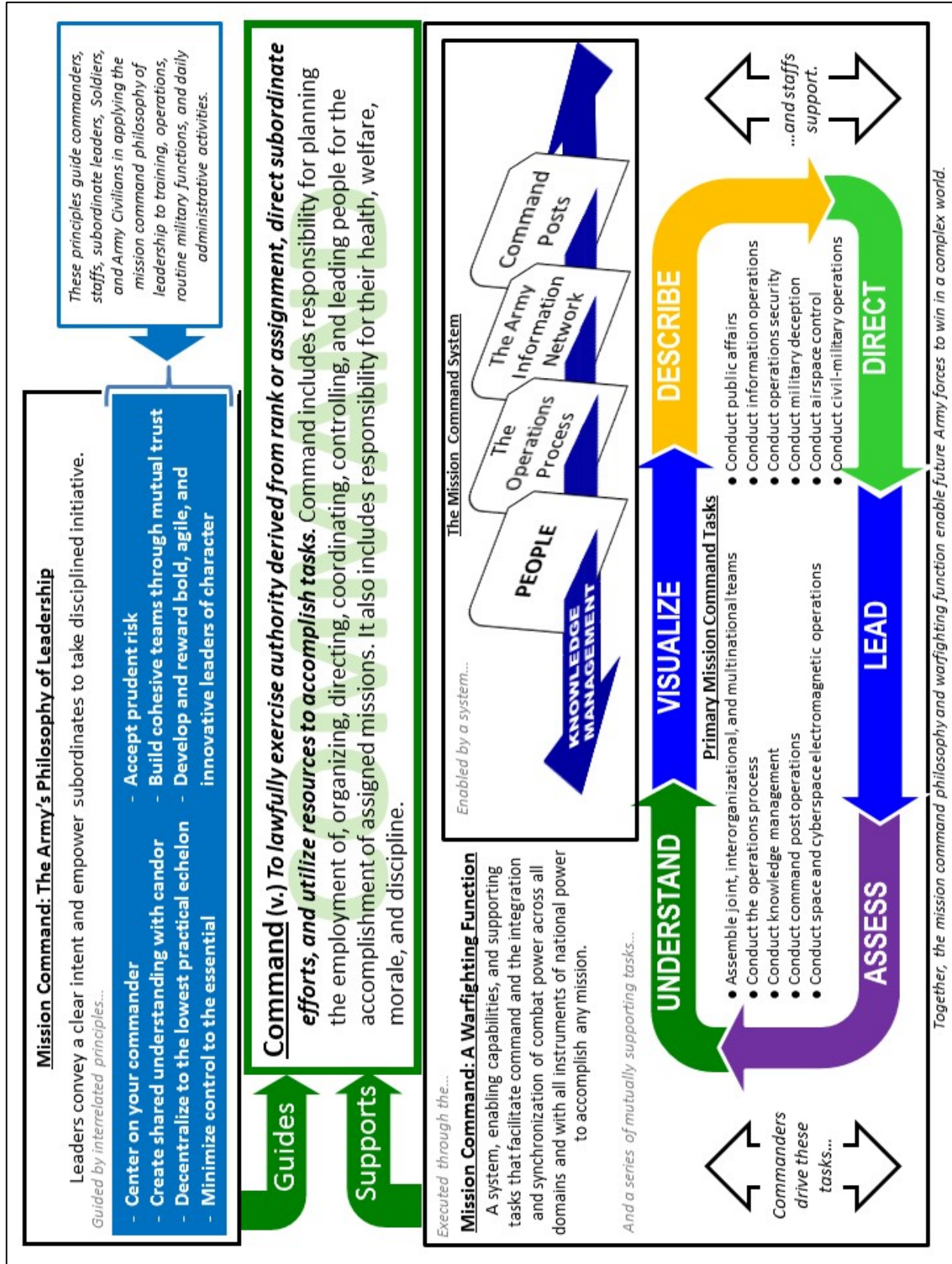


Figure 2. Clarifying mission command

Department of the Army  
Headquarters, United States Army  
Training and Doctrine Command  
Fort Eustis, VA 23604

\*TRADOC Pamphlet 525-3-3

6 February 2017

Military Operations

THE U.S. ARMY FUNCTIONAL CONCEPT FOR MISSION COMMAND

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**History.** This pamphlet is a major revision of United States Army Training and Doctrine Command (TRADOC) Pamphlet (TP) 525-3-3 dated 13 OCT 2010. Because this publication is revised extensively, not all changed portions are highlighted in the summary of change.

**Summary.** TP 525-3-3 describes broad capabilities the Army will require in 2020-2040 to enable the exercise of mission command. This concept will lead force development and modernization efforts by establishing a common framework within which to develop the specific capabilities required to realize mission command during the conduct of future joint combined arms operations in uncertain, highly-competitive, and dynamic operational environments.

**Applicability.** This concept guides future force development and supports the Joint Capabilities Integration and Development System process. It also supports Army capabilities development processes described in the Army Capabilities Integration Center (ARCIC) Concepts and Capabilities Guidance, and functions as the conceptual basis for developing affordable options for the future force pertaining to mission command across the realms of doctrine, organization, training, materiel, leadership and education, personnel, and facilities (DOTMLPF) and within policy. This concept applies to all Department of Army (DA) activities that develop DOTMLPF requirements.

**Proponent and supplementation authority.** The proponent of this pamphlet is the Director, ARCIC. The proponent has the authority to approve exceptions or waivers to this pamphlet that

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\*This publication supersedes TRADOC Pamphlet 525-3-3, dated 13 October 2010.

are consistent with controlling law and regulations. Do not supplement this pamphlet without prior approval from Director, ARCIC (ATFC-ED), 950 Jefferson Avenue, Fort Eustis, VA 23604.

**Suggested improvements.** Users are invited to submit comments and suggested improvements via The Army Suggestion Program online at <https://armysuggestions.army.mil> (Army Knowledge Online account required), or via DA Form 2028 to Director, ARCIC (ATFC-ED), 950 Jefferson Avenue, Fort Eustis, VA 23604. Suggested improvements may also be submitted using DA Form 1045.

**Availability.** This TRADOC pamphlet is available on the TRADOC homepage at <http://www.tradoc.army.mil/tpubs/>.

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## Summary of Change

TRADOC Pamphlet 525-3-3  
U.S. Army Functional Concept for Mission Command

This revision, dated 6 February 2017-

- o Changes the applicability period to 2020-2040 and revises the foreword (title page and i).
- o Updates the background, assumptions, and operational context, that provide the basis for the concept's solutions (paras 1-4, 1-5, and chap 2).
- o Updates the military problem, central idea, and conceptual solutions (paras 3-1, 3-2, and 3-3).
- o Proposes refinements to mission command's definitions as a philosophy and warfighting function, enhancements to the philosophical principles, revisions to the key components of the mission command system, and adjustments to the warfighting function's tasks (paras 3-4b(1) and (2), and app E).
- o Replaces the chapter discussing mission command's role in the Army's core operational actions with one discussing its contribution to the Army's landpower roles of preventing conflict, shaping the security environment, and winning the nation's wars (chap 4).
- o Revises the summary and the required capabilities statements (chap 5 and app B).
- o Adds appendices on Army science and technology (app C), risk (app D), Army information network attributes and command posts key characteristics (app F), and human dimension implications (app G).



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## Chapter 1 Introduction

### 1-1. Purpose

a. United States (U.S.) Army Training and Doctrine Command (TRADOC) Pamphlet (TP) 525-3-3, *The U.S. Army Functional Concept for Mission Command* (AFC-MC) describes mission command as both a philosophy of leadership and a warfighting function. It hones the fundamental principles of the philosophy that guide the application of the warfighting function and identifies those capabilities the Army needs to realize mission command successfully in joint combined arms operations.<sup>1</sup> The AFC-MC builds on the ideas presented in TP 525-3-0 *The U.S. Army Capstone Concept* (ACC) and TP 525-3-1, *The U.S. Army Operating Concept: Win in a Complex World* (AOC) detailing further how the Army will operate as an indispensable member of the Joint Force.

b. This concept poses and answers the following questions:

(1) What are the key challenges and conditions of the future strategic environment that influence how Army commanders exercise authority, direct action, and control the employment of Army forces in joint combined arms operations?

(2) How can mission command be clarified to facilitate understanding and application by all members of the Army Profession, and guide the development of future command capabilities?<sup>2</sup>

(3) What refinements to the mission command system and tasks are needed to fully enable interoperability and the integration and synchronization of combat power across all domains and with all elements of national power?<sup>3</sup>

(4) What capabilities must the Army possess to realize mission command during joint combined arms operations in 2020-2040?<sup>4</sup>

c. The AFC-MC consists of five chapters and seven supporting appendices.

(1) [Chapter 1](#) establishes the purpose, the background of Army mission command, linkage to the Army concept framework, and underlying assumptions. [Chapter 2](#) provides the operational context that forms the basis for proposed solutions. [Chapter 3](#) presents the military problem, central idea, and solutions. [Chapter 4](#) explains how realized mission command contributes to the Army's future roles of preventing conflict, shaping the security environment, and winning the Nation's wars. [Chapter 5](#) briefly summarizes the pamphlet's main ideas.

(2) [Appendix B](#) lists mission command required capabilities. [Appendix C](#) addresses future mission command science and technology investment areas. [Appendix D](#) discusses potential risks to future Army forces adopting this concept and suggests mitigation strategies. [Appendix E](#) discusses the logic behind proposed refinements to the mission command philosophy and warfighting function. [Appendix F](#) details essential future Army information network attributes and supporting characteristics of future command posts (CPs). [Appendix G](#) highlights key ideas

from Army human dimension initiatives and describes how this concept applies those ideas to optimize the effectiveness of Army leaders.

## **1-2. References**

[Appendix A](#) lists required and related publications.

## **1-3. Explanation of abbreviations and terms**

The [glossary](#) explains abbreviations and important terms used in this concept.

## **1-4. Background**

a. The 1990s defense transformation hypothesized that emerging technologies would lift the fog of war to allow unprecedented understanding, permit near-perfect decisions, and facilitate absolute precision.<sup>5</sup> However, the last decade and a half has reinforced that operations are foremost a human undertaking. It has shown that what matters most are the intentions, relationships, and actions of groups that are difficult to understand and mostly invisible to technology.<sup>6</sup> Further, an expanding reliance on technology threatens to become a vulnerability that threats will seek to exploit, often in covert or indirect ways.<sup>7</sup> Consequently, the Army's ability to seize, retain, and exploit the initiative and gain a landpower advantage rapidly is dependent upon a dynamic philosophy and a uniting warfighting function that emphasizes the following.

(1) The human dimension—Army leaders of character grounded in the competencies of the Army Profession able to anticipate and adapt quickly to changing conditions.

(2) Maintaining shared understanding of the environment, problems, and potential solutions among a collaborative and diverse array of joint, interorganizational, and multinational partners.<sup>8</sup>

(3) An Army culture that fosters candor, trust, initiative, innovation, and prudent risk-taking.<sup>9</sup>

(4) The physical, temporal, and psychological synergies created through the integration and synchronization of all available destructive, constructive, and information capabilities across all domains.<sup>10</sup>

b. Accordingly, the Army adopted mission command as an overarching command philosophy to guide how it trains and fights, and as a warfighting function to integrate all elements of combat power during operations. This change endeavored to move the Army beyond a technological focus, strike a balance between the art and science of command, and reestablish the importance of people over enabling technologies.<sup>11</sup> Fundamentally, this shift sought to make the act of command less about controlling and more about empowering. However, the Army has yet to fully understand, embrace, and therefore realize mission command within its operational and institutional forces and, subsequently, into its culture and ethos.<sup>12</sup>

c. While the Army has made progress inculcating mission command, major hurdles remain. Among these is a cultural bias that mission command is “commanders business” when in fact, mission command applies to all Army professionals—not just commanders—and in all situations.<sup>13</sup> A contributing factor is a persistent misperception that mission command is

synonymous with command and control.<sup>14</sup> Building on the current doctrinal foundation, the Army must clarify and take steps to affect a culture of mission command into institutional and operational Army activities.<sup>15</sup>

### **1-5. Assumptions**

a. The assumptions from the ACC and AOC apply equally to this pamphlet, and similarly, the ideas in this pamphlet are equally applicable to those hypotheses.<sup>16</sup>

b. The following additional assumptions apply.

(1) The Army will be able to identify, recruit, develop, assess, and retain sufficient talent with the necessary character, competence, and commitment to realize the mission command philosophy.<sup>17</sup>

(2) All Soldiers and Army Civilians will lead teams, units, or organizations.

(3) The Army will be able to instill and preserve a culture of candor, mutual trust, and prudent risk-taking indispensable to exercising mission command.<sup>18</sup>

(4) Army leaders and organizations developed, prepared, organized, trained, and equipped to operate highly decentralized can operate effectively under centralized control; however, the reverse is less likely to be true.

(5) While the Army seeks greater interoperability, it will continue to provide unique capabilities to the joint force and the multi-domain battle.<sup>19</sup>

(6) An intelligent, learning, and adaptive enemy will be able to counter or degrade the Army's current and future technological advantages.

### **1-6. Linkage to the Army Concept Framework (ACF)**

a. The ACF comprises the ACC, the AOC, subordinate functional concepts, and other leadership-directed concepts and studies.<sup>20</sup> These concepts describe how commanders might employ future capabilities against anticipated threats and establishes the intellectual foundation for Army modernization. The ACF re-examines fundamental ideas and provides a basis to develop doctrine, organization, training, materiel, leadership and education, personnel, and facilities (DOTMLPF) solutions that lead to a highly-capable and expeditionary Army that is lethal, responsive, adaptive, and durable.<sup>21</sup>

b. The ACC reflects the Army's vision of future armed conflict. It asserts that future success depends on resilient Soldiers and cohesive teams. Operationally adaptable leaders, organizations, and institutions support combatant commanders by providing land forces tailorable for a wide range of missions and able to adjust rapidly to prevent conflict, shape the operational environment, and win the Nation's wars.<sup>22</sup> These three roles bind all the concepts within the ACF.<sup>23</sup>

c. Building on the ACC's ideas, the AOC describes how the Army, as part of joint, interorganizational, and multinational teams, protects the homeland and engages regionally to prevent conflict, shape security environments, and create multiple options for responding to and resolving crises.<sup>24</sup> The AOC envisions globally-responsive combined arms teams that maneuver from multiple locations and across all domains to present multiple dilemmas to the enemy, limit enemy options, avoid enemy strengths, and attack enemy weaknesses. Through realized mission command, Army forces integrate partner capabilities and adapt quickly to defeat enemy organizations, control terrain, secure populations, consolidate gains, and preserve joint force freedom of movement in multiple domains.<sup>25</sup> To this end, the AOC proposes joint combined arms operations as the Army's future operational approach. Joint combined arms operations allow the Army to respond quickly and conduct operations of significant scale and duration to accomplish missions across the range of military operations. The AOC describes how Army forces win in a complex world.

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## **Chapter 2**

### **Operational Context**

#### **2-1. Introduction**

Five key future strategic environmental challenges form the causal framework for this concept and the subsequent solutions that follow in chapter 3: uncertain, highly-competitive, and dynamic future operational environments; a wider range of clever, adaptive, and networked threats; a broad range of potential missions; unfamiliar and emergent mission situations; and greater cognitive and social demands for future Soldiers and Army Civilians.<sup>26</sup>

#### **2-2. Uncertain, highly-competitive, and dynamic future operational environments**

a. The ACC and AOC forecast an increasingly unstable strategic environment marked by pervasive globalization and its effects. They envisage reduced defense spending, intense competition for resources, accelerated urbanization, increased migration of disaffected populations, growing ideological and economic friction, disruptive environmental changes, rapid diffusion of information and propaganda, persistent media scrutiny, and an increased proliferation of weapons of mass destruction. Conditions vary radically between operational areas requiring leaders to make decisions in ambiguous circumstances rapidly. In this complex environment, Army forces must question their understanding continually and be prepared to quickly, and more frequently, adapt their approach. A constantly changing and evolving operational environment is not conducive to the centralization of information, decision-making authority, and warfighting capabilities.<sup>27</sup>

b. The Army develops capabilities necessary to impose the Nations' will on an enemy and win the lethal fight. However, recent conflicts reaffirm that defeating an enemy in battle does not guarantee success.<sup>28</sup> As part of a broader interorganizational undertaking, the Army maintains trust and support at home and abroad, and helps to shape conditions that support U.S. interests. The hyper-connected, information-saturated environment increases the speed and frequency of human interaction and events. Appreciating and leveraging available media—social and public—is critical to developing situational understanding, gaining and maintaining support, and shaping

the information environment.<sup>29</sup> Past experience and future expectations of the strategic environment demand that Army leaders and forces dominate in the contest of wills, the competition in space, cyberspace, and the electromagnetic spectrum (EMS), and in sustained security cooperation. These activities directly affect the Army's ability to realize mission command.

(1) The contest of wills.<sup>30</sup> Army forces must be able to defeat determined enemies through the lawful, ethical, and discriminant use of force.<sup>31</sup> Lethality is the currency of warfare; yet, the purpose of military action is never purely destructive. Force, or the threat of force, compels adversaries toward some purpose. Therefore, bending, breaking, or destroying the opponent's will—and winning—requires Army leaders expert in using overwhelming force, appropriate restraint, and information-related capabilities.<sup>32</sup> This requires understanding the political underpinnings for using force and the human aspects of military operations (including non-Western philosophies, motives, methodologies, and doctrine).<sup>33</sup>

(2) The competition in space, cyberspace, and the EMS. Army forces must gain and maintain advantage in the increasingly contested, and potentially game-changing, domains of space and cyberspace, and the EMS.<sup>34</sup> Threats, unfettered by bureaucracy, law, or morality, are developing their own competitive technologies, stealing or transferring technology, or simply have easy access to current commercial technologies with the funds and determination to harness them for nefarious use.<sup>35</sup> Compounding these competitive challenges, adversaries will use civil infrastructure to conceal, deceive, and protect.<sup>36</sup> At increasingly lower echelons, commanders and staffs must discern threats and their capabilities, know when adversaries attack or compromise assets, determine attribution, and possess the right capabilities, authorities, and expertise to respond accordingly as an integral part of joint combined arms operations.<sup>37</sup> As important, Army forces must train and prepare to operate effectively under degraded conditions.<sup>38</sup>

(3) Sustained security cooperation activities.<sup>39</sup> Army conventional and special operations forces must contribute to a whole-of-government approach to develop and maintain relationships based upon shared interests, respect, and trust.<sup>40</sup> Army forces engage forward and seek to improve partners' abilities for self-defense, thereby contributing to the security of key regions consistent with U.S. interests.<sup>41</sup> Thoughtful and sustained security cooperation sets conditions for access, improves partner interoperability and resiliency to crisis response events, contributes to understanding and the development of appropriate operational approaches, and supports power projection.<sup>42</sup> Security cooperation and building partner capacity is an enduring part of the Army's global mission to prevent conflict.<sup>43</sup>

### **2-3. A wider range of clever, adaptive, and networked threats**

Globalization has produced a multi-polar world with a wide range of threats. These include militaries, irregular forces, terrorists, cyberspace threats, criminal enterprises, religious extremists, empowered groups and individuals, or any combinations. These capable threats employ anti-access, area denial, and other hybrid strategies and tactics.<sup>44</sup> Their approaches include advanced weapons and technology applied and mixed innovatively with crude, simple, and unsophisticated means to create overmatch against Army forces.<sup>45</sup> They skirt "gray areas" of international law and capitalize on war-averse attitudes that make countries hesitant to enter conflict when legitimacy questions persist.<sup>46</sup> Threats use information and psychological warfare to influence populations to support or allow aggression even to the detriment of their own country.<sup>47</sup> This shift in the

character of future warfare reinforces the need for tailorable and scalable combinations of conventional and special operations forces to counter hybrid tactics and conduct persistent information operations.<sup>48</sup>

#### **2-4. A broad range of potential missions**

The U.S. Army is the Nation's principal military force organized, trained, and equipped for prompt and sustained operations on land.<sup>49</sup> The Army provides the joint force with essential capabilities to change conditions on land, set conditions for conflict resolution, and enforce and sustain meaningful outcomes. As future environments become more unpredictable, the Army must prepare for diverse arrays of missions and remain ready to protect U.S. interests through the full range of military operations.<sup>50</sup> Army forces must quickly respond and conduct operations anywhere, among populations, across multiple domains, and through the EMS to defeat threats. While the Army prepares for combat, other crises, such as natural or manmade disasters and domestic emergencies, may require the Army to support civil authorities and adapt warfighting capabilities to help relieve suffering, protect property, and restore stability.<sup>51</sup>

#### **2-5. Unfamiliar and emergent mission situations**

a. The broad range of potential operations coupled with the uncertainty of the future strategic environment will present commanders, leaders, and staffs with unfamiliar and ill-structured situations requiring them to operate in unanticipated ways.<sup>52</sup> The Army will know less about threats and how they might fight. Leaders will encounter situations fraught with moral and ethical dilemmas, complicated by dense urban areas and other complex terrain, that introduce extraordinary complexity.<sup>53</sup> In these environments, success may depend more on interactions with leaders and populations, either directly or through media, while building and focusing an evolving team of partners toward a common purpose.<sup>54</sup> Diverse partners bring diverse political and social dynamics that Army leaders must consider to build trust. This requires cultural finesse, candor, and precise descriptions of objectives, interests, and policy constraints.<sup>55</sup> Ensuring the viability of an Army force's joint, interorganizational, and multinational partners and gaining support for the mission introduces countless variables, tensions, and actors.<sup>56</sup>

b. Many operational and mission variables will only be discovered by executing a provisional solution, continually fighting for information, and then adapting quickly according to what is learned.<sup>57</sup> Commanders and their staffs require the new knowledge revealed by subordinate units during operations, while subordinate commanders and leaders need the higher headquarters' broad mission purpose and context to help understand and shape the development of solutions or courses of action.<sup>58</sup> The unclear future strategic environment disallows any degree of certainty in preparing for future conflicts, but ardent investment in developing a mission command culture and climate enables successful adaptation to any operational challenge.<sup>59</sup>

#### **2-6. Greater cognitive and social demands**

In the future, leaders at all levels will be expected to take on more responsibility, find innovative solutions to complex problems, navigate diverse relationships, and resolve more ethical dilemmas than their counterparts today.<sup>60</sup> Even junior leaders will require the ability to sort through and interpret vast amounts of information, and think critically and creatively to solve problems. Moreover, all Army leaders will require deeper understanding of the human aspects of conflict,



and possess higher social and emotional intelligence and interpersonal skills to foster positive relationships in a diverse team.<sup>61</sup> To win in a complex world, junior leaders will need many of the same abilities and competencies historically found only in more senior and seasoned leaders.<sup>62</sup>

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## **Chapter 3**

### **Institutionalize Mission Command**

#### **3-1. Military problem**

In an uncertain, highly-competitive, and dynamic future environment, how does an expeditionary Army exercise command over widely dispersed and decentralized forces; anticipate and adapt to conventional, unconventional, and hybrid threats; and integrate its own capabilities and efforts with those of joint, interorganizational, and multinational partners across multiple domains simultaneously to prevent conflict, shape the security environment, and win the Nation's wars?

#### **3-2. Central idea**

The Army institutionalizes the mission command philosophy fully.<sup>63</sup> Mission command becomes intrinsic to the Army Profession recognized as equally applicable to commanders, subordinate leaders, Soldiers, and Army Civilians of both the operational and institutional Army. All Army leaders understand and apply the mission command philosophy habitually to everything they do—training (including training management), operations, routine military functions, and daily administrative activities.<sup>64</sup>

#### **3-3. Solution synopsis**

a. To develop bold, agile, and innovative leaders and flexible, adaptive, and responsive organizations, the Army adopted mission command as its command philosophy and the primary integrating warfighting function. This idea remains the overall solution to the enduring military problem presented above. However, mission command cannot exist simply by order or doctrinal decree; much more is needed.

b. For mission command to be instinctive, Army capabilities, processes, and policies must complement and reinforce the mission command philosophy; at a minimum, they must not contradict. They must create a natural bias toward decentralization, initiative, and freedom to exploit opportunity. The AFC-MC main effort is recasting capability development deliberately through the mission command philosophy lens to develop leaders, organizations, and institutions necessary to meet the future demands.<sup>65</sup> How the Army describes mission command affects both understanding and capability development. Therefore, this concept proposes refining and clarifying mission command so Army leaders and capability developers understand better both the philosophy and warfighting function. This concept also recognizes the true power of mission command rests with people. The best way to counter a highly adaptive threat is to enhance the abilities of people so they are more adaptive and capable.<sup>66</sup> This concept proposes utilizing human dimension advances to optimize Army leader effectiveness.<sup>67</sup> (See figure 1).

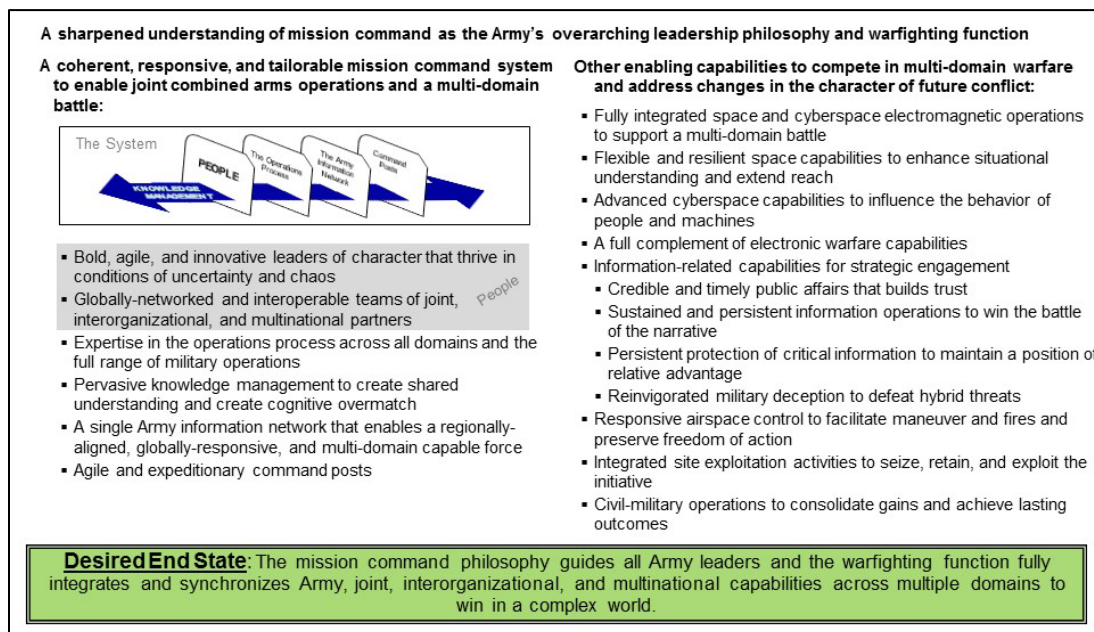
c. Mission command is founded on leaders, not equipment or procedures. Mission command is based on the belief that commanders are most effective when they articulate a clear intent to

empowered subordinates who understand the environment, problems, and potential solutions to those problems collectively. Commanders’ decisions, integrated through the operations process and communicated within a framework of shared understanding, promote a bias for action and the offensive spirit to succeed and win. Realized mission command enables Army leaders to understand, decide, and act faster and more decisively than any threat in any future operational environment.

d. Army forces wholly embrace the mission command principles. These principles, along with the mission command warfighting function’s expanded purpose to enable command and integrate land combat power across all domains and with all elements of national power, guide analysis and capabilities development.<sup>68</sup> While not all solutions support these principles directly, no solution contravenes them. Realized mission command exists where commanders develop competent and committed leaders of character and cohesive teams founded on shared understanding, mutual trust, and creative initiative.<sup>69</sup> Future Army leaders minimize surprise, promote adaptability, and succeed in any mission by using mission command principles during combat power integration and application.

### 3-4. Military solutions and supporting ideas

a. The following are the conceptual solutions and supporting ideas that generate the required capabilities to facilitate realized mission command. These do not prescribe specific DOTMLPF solutions but, identify the broad, interrelated capabilities needed for the future force. From these, subject-matter experts develop specific solutions through outcomes-based, integration-focused, and resource-informed analysis. The first solution provides the overarching developmental framework and metrics for all future mission command capabilities. All subsequent solutions tie directly to the required capability statements found in [appendix B](#). Analysts must consider these solutions collectively to avoid individual, and potentially conflicting, interpretations.<sup>70</sup> (Figure 3-1. contains components of the solution, supporting ideas, and desired end state.)



### Figure 3-1. Components of the solution

b. A sharpened understanding of mission command. Mission command has two critical roles. It is the Army's overarching leadership philosophy and the integrating warfighting function. The integrating warfighting function supports and operates under the leadership philosophy.<sup>71</sup> Understanding is necessary to practice mission command and develop supporting capabilities. (See figure 2 for a graphic summary of proposed revisions to mission command and [appendix E](#) for supportive logic and reasoning behind those proposals.)

(1) To clarify and sharpen understanding, the mission command philosophy is redefined to be more inclusive and concise as: *leaders convey a clear intent and empower subordinates to take disciplined initiative*. This deliberately expands the philosophy's applicability from a command philosophy (as currently described in doctrine) to a leadership philosophy. It applies to all Army leaders and guides how commander's exercise authority and direction. Critical to understanding this philosophy is a thorough understanding and appreciation for the elemental underpinnings of clear intent and disciplined initiative.

(2) Based upon a shared understanding of the environment, problems, and approaches to solving them, leaders convey the broad purpose and desired military end state as their intent.<sup>72</sup> Leaders craft intent to provide the reason for the campaign, operation, battle, engagement, or task so that subordinates understand the why, and what success looks like.<sup>73</sup> Moving from higher to lower echelon, intent starts with a strategic focus, transitions to operational, and then to a tactical focus; the higher-level leader always thinks and plans farther out in time and space than subordinates.<sup>74</sup> Each leader's intent must remain clear and unambiguous, and it must nest with and support the higher-echelon intent.<sup>75</sup> This creates a shared purpose for subordinates to exercise initiative and make confident decisions applicable to individual circumstances. A clear intent helps subordinates determine courses of action for individual situations and gauge the potential effectiveness of actions. Intent is direct, clearly articulated, and easily remembered under stress.<sup>76</sup>

(3) An unambiguous and tangible intent provides the basis for disciplined initiative and the cognitive framework to adapt and innovate. A clear intent is critical to empowering subordinates to take action in uncertain, highly-competitive, and dynamic operational environments; it empowers subordinates to act quickly or seize fleeting opportunities even without reliable communications or other enabling technologies.

(4) In general terms, initiative is the willingness and desire to act purposefully.<sup>77</sup> Disciplined initiative implies that subordinates demonstrate a duty to act in the absence of orders, when existing orders no longer fit the situation, or when unforeseen opportunities or threats to mission success arise.<sup>78</sup> It is a commitment by all members of the Army Profession to find or create windows of opportunity, solve problems, and take action to accomplish the mission. Initiative is an offensive spirit to win, the basis for good followership, and a vital component of an expeditionary mindset.<sup>79</sup> However, initiative remains bounded first by the Army Ethic and second by the commander's overall intent.<sup>80</sup> Disciplined initiative is bolstered by effective education and training, reinforcing experiences, and a climate of candor and trust. Subordinates will seek greater responsibility and be comfortable taking initiative only in an environment of trust where superiors communicate expectations clearly and provide necessary resources. In a trusting climate, subordinates discuss concerns and risks frankly, develop confidence in their own abilities, and know that leaders will

support well-intentioned mistakes and failures made within the scope of their commander's intent.<sup>81</sup> Subordinates take disciplined initiative readily when their leaders empower them and they are valued and trusted as part of a team.

(5) A set of mutually supportive and interdependent principles guide the practice of the mission command philosophy. Leaders use judgment and consider the sensitivities of contributing partners in their application.

(a) Center on the commander. The commander is responsible for all that does or does not occur within the command. The most effective way to achieve unity of effort is to give a single commander the authority to accomplish the mission and clearly define command and support relationships. Subordinate teams help a commander get the big ideas right, communicate those ideas, and free the commander to focus on the larger goals instead of subordinates' decision space. Subordinate leaders and supporting staffs anticipate the commander's information needs, convert data into relevant information, and provide assessments, options, and recommendations in a manner best suited for the commander to understand, use, and share with all mission partners.<sup>82</sup>

(b) Subordinate leaders collaborate to develop shared understanding and create maximum flexibility to execute branches and sequels or respond to unanticipated opportunities and threats. Commanders do not center on themselves. Commanders center on their higher-echelon commander by providing relevant information, thoughtful assessments, and actively seeking opportunity to achieve the higher commander's intent. Applying other mission command principles, commanders empower their subordinates to take disciplined initiative to accomplish their own well-thought-out intent. This principle creates an overmatching decision-to-action cycle against threats by increasing the speed and quality of decision making and, consequently, the speed and relevance of action.<sup>83</sup> While critical to realizing mission command, improper application of this principle creates risk. (See [appendix D](#) for a discussion of risks.)

(c) Create shared understanding with candor. Commanders, subordinate leaders, and staffs continuously collaborate with joint, interorganizational, and multinational partners (including political leaders) to co-create and maintain a shared understanding of the operational environment, underlying problems, and approaches to solving them.<sup>84</sup> Shared understanding allows commanders and their subordinates to create unity of effort, build teams and trust, anticipate and lead transitions, identify risks, and determine what risk is acceptable to create opportunity. Shared understanding bridges political objectives, the commander's intent, and disciplined initiative. Commanders who value and embrace truthfulness and candor, who do not regard reasoned dissent as a threat to leadership, are critical to realizing this principle.<sup>85</sup> They create the environment to empower teams that review and challenge their understanding constantly as they learn more about operational and mission variables collectively, and the cause and effect relationships among them.

(d) Decentralize to the lowest practical echelon. Army leaders retain only those decision authorities, capabilities, and resources necessary at their echelon. They delegate all others, with informed reason, to empower subordinate leaders who possess closer-to-the-action situational understanding to make timely decisions, exploit fleeting opportunities, react quickly, and combine capabilities and resources creatively against threats.<sup>86</sup>

(e) Minimize control to the essential. Control is inherent in command and remains essential to successful operations. Army leaders establish only the minimum controls necessary creating simple plans and establishing command and support relationships that allow for the greatest freedom of action. Commanders develop control measures to synchronize and empower subordinates to seize, retain, and exploit the initiative.<sup>87</sup> Effective control and appropriate allocation of resources enable subordinates to adapt to changing circumstances.

(f) Accept prudent risk. Army leaders understand that uncertainty exists in all operations and accept potential injury or loss when they judge the outcomes, in terms of mission accomplishment, are worth the cost. In collaboration with superiors and subordinates and within available time, Army leaders carefully determine, analyze, and minimize as many hazards as possible, and then courageously accept the residual risk and act to exploit opportunities. While a deliberate part of the operations process, risk management does not need to be slow. Army leaders avoid delaying action while waiting for perfect information and synchronization. Leaders must understand that risk is inherent to all operations and that prudent risk does not mean zero risk. Accepting prudent risk acknowledges that some things will go wrong. Planning and leader preparation assist adapting to these eventualities.<sup>88</sup> Failure to recognize this leads to a “no faults” mentality and a risk-averse culture. (See [appendix D](#) for a discussion of risks.)

(g) Build cohesive teams through mutual trust. Army leaders plan and create meaningful learning, training, and team-building experiences and establish multi-way communication among themselves, their subordinates, and joint, interorganizational, and multinational partners that develop cohesion and cultivate mutual trust. They establish purpose and intent then set and model high standards of conduct and individual and unit performance. They build trust by making decisions and taking action consistent with the Army Ethic and expecting the same of subordinates. However, they do not simply demand adherence to values and attainment of standards; they coach, counsel, mentor, and provide time, materiel resources, and any other assistance necessary to help subordinates believe and achieve them.<sup>89</sup> Army leaders create safe learning and working environments for their subordinates and seek, value, and respect others’ ideas even when they are not accepted.<sup>90</sup> Army leaders build their own cohesive teams internally and ensure their teams are cohesive members of the larger organization. Through character, competence, and commitment, Army leaders reinforce mutual trust and build cohesive, multifunctional teams.

(h) Develop and reward bold, agile, and innovative leaders of character. Army leaders are responsible for developing subordinates with the attributes essential to realizing mission command. They value and encourage subordinates who avoid complacency, question norms, speak with candor, practice humility, adapt to uncertain or changing situations, anticipate problems while seeking resourceful solutions, and find or create new and better ways to train their teams.<sup>91</sup> Leaders are measured by and rewarded for their ability to learn, achieve, build cohesive teams, and develop future leaders with the character and attributes conducive to realized mission command.<sup>92</sup>

(6) The mission command warfighting function is modified to emphasize the two main purposes of facilitating command and integrating and synchronizing combat power across all domains and with all instruments of national power.<sup>93</sup> Thus, the mission command warfighting function’s definition is revised as: *a system, enabling capabilities, and supporting tasks that*

*facilitate command and the integration and synchronization of combat power across all domains and with all instruments of national power to accomplish any mission.*<sup>94</sup> Similar to the philosophy, the mission command warfighting function components—the system and supporting tasks—are clarified to improve understanding.

(a) The mission command system is a system-of-systems.<sup>95</sup> It is a single system with interdependent and overlapping subsystems (people, the operations and knowledge management processes, the Army information network, and CPs) that support commanders in decision-making and executing commander activities.<sup>96</sup> Through comprehensive knowledge management, commanders and their supporting staffs gain an improved understanding of how to align the people, processes, and tools within their organizational structure and culture to increase collaboration and shared understanding and facilitate decision making.

(b) Commanders and their staffs assemble and reassemble people inside and outside their organization and from multiple locations into globally-networked and interoperable joint, interorganizational, and multinational teams. They modify, improve, and sequence the supporting processes and procedures that contribute to their organization's ability to plan, prepare, execute, and assess. Commanders and staffs work together to configure and reconfigure the Army information network to accommodate changes in task organization, partner needs, the mission, and the operational environment. Finally, they organize, operate, distribute, and physically and electronically protect CPs to facilitate and maintain uninterrupted mission command.<sup>97</sup> An organized and tailored mission command system enables commanders and subordinate leaders to apply the mission command philosophy, and contributes directly to successful joint combined arms operations. When commanders, staffs, and capability developers make changes or design modifications to one component of the system, they consider the potential second, third, and higher-order effects on other parts of the system, the system as a whole, the commander's ability to command, and the Soldier's ability to take disciplined initiative, fight, and win.<sup>98</sup>

(c) The AFC-MC proposes to combine the commander, staff, and additional tasks—currently enumerated in doctrine—into a single set of primary mission command tasks (listed in figure 2). The commander and staff perform these tasks to facilitate the command activities of understanding, visualizing, describing, directing, leading, and assessing.<sup>99</sup> The commander does not merely observe; the commander drives all tasks and the staff, as physical and intellectual extensions of the commander, supports and executes.

c. A coherent, responsive, and tailorable mission command system to enable joint combined arms operations and multi-domain battle. Commanders and their supporting staffs organize their mission command system flexibly into a globally-networked arrangement of subordinate leaders, Soldiers, and Army Civilians; joint, interorganizational, and multinational partners; CPs; ground, aerial, and waterborne platforms; and manned and unmanned sensors to conduct joint combined arms operations and multi-domain battle.<sup>100</sup> Commanders use a weapon-systems approach employing their mission command system and, together with capability developers, seek to reduce complexity, augment Soldier abilities, and maintain the ability to operate degraded.

(1) Army forces organize, train, and employ the mission command system as a weapon system, employing its capabilities fully as an element of combined arms. This approach includes

manning and tracking assigned operators, and ensuring they are trained to established, measureable standards—a crew-based mindset. Each mission command system’s crew includes a vehicle commander, the commander and staff who control operations; drivers who plan, install, operate, defend, and maintain the Army information network; and gunners who exploit and attack threat networks.<sup>101</sup> This weapon-system approach includes managing and characterizing information systems, services, sensors, and transport nodes as pacing items; network bandwidth as a critical class of supply; and data, information, and knowledge as intellectual ammunition.<sup>102</sup>

(2) Five precepts guide mission command system capabilities development and any future changes to the system’s components: simplify, facilitate training and operations, enhance interoperability, minimize sustainment demands, and reduce the tactical warfighter burden.<sup>103</sup> Technological and procedural changes to the system will complement and augment leader, Soldier, and Army Civilian abilities, decrease their cognitive burden, increase trainability, and enhance—not inhibit or distract—tactical units in close combat.<sup>104</sup> No component of the system will slow decision making and hinder adaptability or initiative by its design or employment.<sup>105</sup> Army forces take advantage of technology but are not over-reliant on technology; Army forces are capable of operating degraded and in remote environments and rugged terrain for extended periods.<sup>106</sup>

(3) Bold, agile, and innovative leaders of character that thrive in conditions of uncertainty and chaos.<sup>107</sup> Realized mission command calls for Army leaders grounded in the science and sociopolitical dynamics of warfare, committed to the moral and ethical application of force, dedicated to applying mission command principles, and capable of employing mission command systems skillfully in operations. This solution recognizes that the most vital component of any organization’s mission command system is the quality, talents, and cognitive abilities of its people, the human dimension of combat power.<sup>108</sup> Leader development, organizational training, and a trusted and disciplined force remain the Army’s enduring investment areas. The Army must pursue the optimization of human performance aggressively as its key competitive advantage for creating overmatch against hybrid threats and winning in a complex world.<sup>109</sup>

(a) Mission command philosophy becomes ingrained in the Army ethos and culture primarily through leader development and organizational training.<sup>110</sup> All Army leaders (Soldiers and Army Civilians) intuitively apply mission command philosophy when conducting operations, military functions, and daily administrative activities throughout the operating and institutional force.<sup>111</sup> Comprehensive, realistic, and challenging education and training develops the knowledge and experience necessary to create trusted leaders, Soldiers, and teams with an expeditionary mindset capable of conducting joint combined arms operations under all conditions.<sup>112</sup> Leader development is critical as Army leaders will ultimately determine whether mission command will, or will not, thrive and flourish.<sup>113</sup> Leaders who are skilled trainers, teachers, and communicators and that build a candid and collaborative climate among a diverse group of joint, interorganizational, and multinational partners; that develop bold, agile, and innovative subordinates; and that demonstrate and model the courage to trust, the confidence to delegate, calmness in the face of adversity, the patience and restraint to allow lower echelons to develop the situation through decisive action, and the moral nerve to underwrite honest mistakes can achieve extraordinary results.<sup>114</sup>

(b) The Army develops leaders with the attributes and competencies to realize mission command through an equal commitment by commanders, the institution, and the individual to lifelong learning and career-long professional development.<sup>115</sup> A relevant, rigorous, and agile military and civilian education system designed to promote holistic learning through a blend of formal education, technical training, and military operations—balancing education and experience effectively—facilitates lifelong learning. Quality leaders cannot be mass-produced.<sup>116</sup> The Army education system must balance Army manpower demands with individual talents, needs, and desires for schooling or other broadening experiences critical to future leadership and staff assignments. The Army places renewed emphasis on preparing strategic, deep-thinking, and reflective leaders for responsibility at joint and national levels.<sup>117</sup>

(c) The most effective way to prepare Army leaders is to replicate the relevant aspects of the complex future environments accurately. Whether in the classroom, at home station, in combat training centers (CTCs), or within a synthetic training environment, each learning experience is fashioned as a context-based, problem-solving exercise against a top-tier, free-thinking opponent to challenge and develop critical and creative thinking, and ethical decision-making.<sup>118</sup> The overabundance of information is also replicated; leaders become skilled at identifying, prioritizing, and analyzing the most important data and information from the vast quantities available.

(d) To achieve this level of sophisticated education and training, the Army revitalizes and invests in the continuous development of its faculties at its leader development institutions and its observer-coach-trainers at its CTCs to ensure and exploit institutional and operational unity of effort.<sup>119</sup> Proven leaders, tacticians, and logisticians skilled in applying the mission command principles are selected to teach, coach, train, and develop future commanders, leaders, Soldiers, and Army Civilians. Moreover, a sustained faculty and CTC trainer education program (as a close partnership) keeps pace with change and ensures that the professional military and civilian education system and CTC exercises deliver the outcomes required to support the Army's current and future needs.

(e) By following the mission command principles, instructors and trainers are empowered and rewarded for their creativity and imagination in developing future leaders that frame their situation and problem; make sound and ethical decisions; develop and turn a vision into action; build globally-networked and interoperable teams of joint, interorganizational, and multinational partners; think, plan, and act across multiple domains; and adapt for success continually. Good leaders selected, educated, and prepared as trainers and teachers produce good training and education; good training and education produces competent leaders. Similarly, bold, agile, and innovative institutions help to develop bold, agile, and innovative leaders. Together, Army leaders and institutions partner with and complement each other in the development of leaders that apply mission command and thrive in conditions of uncertainty and chaos.<sup>120</sup>

(f) Recognizing that people acquire and develop knowledge, skills, and abilities in different ways and at different rates, the training and education infrastructure is tailored to individual needs whether in a field or classroom environment, on a major installation or remote site, or in the continental U.S or an overseas location. Individual accommodations help expand learning and leader development beyond episodic attendance in formal schools allowing individuals to reach their unique potential.<sup>121</sup> This infrastructure includes a robust capability for mobile and



collaborative, peer-to-peer learning and tutoring, and the flexibility to adjust quickly and accommodate initial feedback from students undergoing training. Further, the infrastructure is able to adapt to feedback from reality-based assessments of earlier program graduates serving in subsequent leader and staff positions, and to lessons learned from operational unit training or real-world activities. This is applying mission command philosophy to create a shared understanding of individual and operational training requirements between the operational and institutional Army, and to encourage and empower individuals to take the initiative for self-development and as stewards of the Army Profession.<sup>122</sup>

(g) Leader commitment to developing subordinates with strength of character and the ability to operate under the mission command philosophy is made clear through teaching, coaching, mentoring, and counseling subordinates; however, the ability to execute these responsibilities is also taught, developed, and rewarded.<sup>123</sup> Fundamental reform and revitalization of Army talent management policies and procedures (including accessions, education, assignments, position tenure, time-in-grade requirements, certifications, evaluations, promotions, command selections, and compensation) reflect the commitment to progressive and sustained leader development; to cultivate the leader attributes and competencies essential to the mission command philosophy; to balance individual talents to Army needs; and to challenge, inspire, and retain the Army's best and brightest leaders capable of transforming the Army to meet the demands of the future.<sup>124</sup> Without these changes, the Army is unlikely to imbue the mission command philosophy within the force successfully.<sup>125</sup> With these changes, the Army's future leaders, Soldiers, and Army Civilians will possess the cognitive abilities, knowledge, diverse experience, judgment, emotional and social intelligence, and warfighting skills necessary to build and sustain cohesive teams, make rapid decisions, adapt, and act to create decisive overmatch against any future threats.<sup>126</sup>

(4) Globally-networked and interoperable teams of joint, interorganizational, and multinational partners.<sup>127</sup> The Army provides mission-tailorable, globally-networked, and interoperable teams of active and reserve component Army forces and joint, interorganizational, and multinational partners (networked socially and technologically) that are deployable rapidly and responsive to combatant commander needs and the Army's enduring requirements across the range of military operations.<sup>128</sup> In a technological environment with low barriers to entry, future Army forces achieve decisive advantage over enemies and adversaries by forming cohesive, multifunctional teams rapidly and combining their diverse knowledge, expertise, and capabilities across multiple domains to create physical and cognitive overmatch.<sup>129</sup>

(a) In resource-constrained environments, the services (conventional and special operations) will be increasingly interdependent as each force element relies on the other for specialized capabilities. This interdependence increases the range of situations where joint forces, overseen by a joint task force (JTF) headquarters tailored uniquely to meet regional challenges, work together to accomplish a mission. These forces include joint teams formed primarily from and led by special operations forces. Furthermore, in uncertain, highly-competitive, and dynamic environments, these joint headquarters will likely be established with short notice under crisis-action planning conditions. While JTFs are purposefully built and often temporary in nature, they are not completely ad hoc, forming only as crises emerge. Instead, the Army prepares its regionally aligned senior headquarters as the foundation for a trained, ready, and rapidly-deployable JTF headquarters to meet combatant commander and national requirements and timelines.<sup>130</sup> A

regionally aligned corps headquarters is the Army's principal organization for forming a JTF for major operations, while a regionally aligned division headquarters forms a JTF for smaller-scale operations (or when all corps headquarters are committed).<sup>131</sup>

(b) The capability to transition to a joint headquarters to support expeditionary maneuver and joint combined arms operations rapidly is achieved by an adequately sourced and continuous joint manning, equipping, education, and training program. This sustained training program includes the routine integration of senior Army headquarters into their aligned combatant command's planning efforts and joint, special operations, and multinational exercises, and extensive participation in joint and combined leader exchange programs. In Army-only exercises and CTC rotations, senior headquarters regularly request joint, special operations forces, interorganizational, and multinational partners, using each opportunity to receive and integrate them as augmentees; develop common coordinating procedures, interoperability standards, and agreements; and cultivate mutual understanding of each other's domain or functional area capabilities and organizational cultures.<sup>132</sup>

(c) To facilitate transition to joint warfighting, senior Army headquarters organize their staff at home station much as they do for actual operations including the habitual use of joint and Army information systems, and the routine employment of integrating cells, centers, boards, bureaus, and working groups, conducted physically or virtually. Senior Army headquarters are prepared to begin crisis-action planning using the joint operations planning process even while in transition to a JTF headquarters. As necessary, senior Army headquarters employ network-enabled liaison elements to facilitate shared understanding, collaboration, and coordination and build teamwork and unity of effort among mission partners. As training on joint force information systems is essential to sustaining joint-capable readiness, increased access to or availability of joint systems and applications is established.

(d) The Army resources key corps, division, and theater army positions with joint professional military educated and trained personnel. Other staff personnel participate in individual and group classroom and distributed learning as part of their corps, division, or theater army headquarters' sustained training program.<sup>133</sup> These efforts are integral to the Army's overall professional development program. Ultimately, Army leaders are educated and trained progressively to think, plan, and operate simultaneously across all warfighting domains (land, air, maritime, space, and cyberspace), with sufficient understanding of the information environment and the human aspects of military operations, and as contributing members of joint, interorganizational, and multinational teams.<sup>134</sup>

(e) Achieving national aims in future operational environments requires the integration and synchronization of all elements of power as part of a combined, whole-of-government approach that avoids redundant and competing efforts.<sup>135</sup> The military defeat of an enemy is only a phase in a larger campaign. The overall objective is to create a secure environment to facilitate a better political, social, or economic situation. Accordingly, the Army assembles or joins joint, interorganizational, and multinational teams to generate the breadth and depth of knowledge and capabilities necessary to achieve clearly identified, mutual objectives. In defense support of civil authorities (DSCA), the Army joins with and supports other federal agencies. Army forces contribute to joint interoperability across all warfighting functions; form habitual partner

relationships; and seamlessly combine, coordinate, synchronize, and integrate with partners, either as the lead or in support, to promote unity of effort, and create a qualitative advantage.<sup>136</sup>

(f) Army forces integrate with partners early in mission planning, training, and rehearsals; thoroughly understand joint, special operations forces, and other partner capabilities; and encourage mission partners to advocate for their competencies and capabilities where they best serve the mission. Recognition of partner limitations is vital to realized mission command and maximizing the contribution of partner capabilities. (Misapplication of mission command is discussed in [appendix D](#).) Similarly, Army forces, operating in a supporting role, are proactive in determining how to adapt warfighting capabilities to the unique stability or civil support situation they may face. Collegiate and consultative partner relationships and procedures are cultivated before the onset of operations, that is, before Soldiers and coalition counterparts make decisions—many with strategic implications and often when under fire. Global networking and interoperability expand the people component of the mission command system, taking full advantage of, and contributing to, joint, interorganizational, and multinational capabilities, knowledge, and expertise. A well-coordinated, synchronized, and mutually-reinforcing civil-military effort is essential to winning in a complex world.<sup>137</sup>

(5) Expertise in the operations process across all domains and the full range of military operations. Due to the uncertain future environment and the Army's previous focus on counterinsurgency and other operations dominated by stability tasks, the Army must regain its expertise in conducting the operations process at all echelons, with joint, interorganizational, and multinational partners, and across the full range of military operations.<sup>138</sup> This includes crisis-action planning; large-scale, joint combined arms operations characterized by lethal and destructive offensive and defensive tactical tasks; and operations in and around large urban areas.<sup>139</sup> For the future, it includes integrating and synchronizing joint, interorganizational, and multinational capabilities to create temporary windows of superiority across multiple domains and throughout the depth of the battlefield to seize, retain, and exploit the initiative, defeat enemies, and achieve military objectives.

(a) While rebalancing its operational expertise, the Army simultaneously ensures that lessons learned, particularly its understanding of the whole-of-government approach to strategic and operational planning, the criticality of the human aspects of military operations, the proper use of restraint, and special operations and conventional forces interdependence and integration, are institutionalized in the Army Profession to safeguard against individual and organizational memory loss.<sup>140</sup> Army commanders and staffs understand fully the differences between domestic and overseas operations based on applicable laws and Department of Defense (DOD) policies. This includes the distinctions between components of the Army (authorities, domestic support capabilities, requirements, and restrictions) as they task organize and establish clear command and support relationships to accomplish assigned missions.<sup>141</sup> As the primary engine of the mission command warfighting function, commanders and their staffs employ the operations process expertly to integrate all elements of national and coalition power in time, space, and purpose. They achieve this by integrating joint, interorganizational, and multinational partners into the process, and applying their knowledge and capabilities into conducting operations across multiple domains simultaneously.<sup>142</sup>

(b) Driving the operations process, commanders identify intelligence gaps and determine priorities rapidly to focus intelligence, reconnaissance, and surveillance capabilities.<sup>143</sup> Army commanders and their staffs are tactical and technical experts, skilled in operational art, capable of framing complex problems, can think, plan, and operate across multiple domains, and able to adapt quickly to changes in the situation or new information. Army commanders are extremely proficient at formulating and articulating effective planning guidance and preparing a clear, mission statement, intent, and concept of operations to guide action.<sup>144</sup> Comfortable with ambiguity, Army commanders, staffs, and subordinate leaders make timely decisions and take appropriate action without complete information or perfect synchronization.<sup>145</sup>

(6) Pervasive knowledge management to create shared understanding and create cognitive overmatch. Knowledge management streamlines the flow of information and intelligence and ensures commanders, staffs, and subordinates are not overwhelmed by the volume and availability of information but, instead, are provided the knowledge required to solve problems and make sound, ethical decisions. Knowledge management is applied to optimize how information is collected, developed, and shared throughout the operations process (and supporting processes, activities, and procedures), within and among CPs, across echelons, and with joint, interorganizational, and multinational partners.<sup>146</sup> Knowledge management is also employed to streamline an organization's battle rhythm and decision cycles across time zones, planning and event horizons, and with partners.

(a) The routine application of knowledge management ensures that required information is validated, assimilated, organized, and shared by leaders, Soldiers, Army Civilians, and other mission partners so that it is easily discovered, accessed, and applied when needed. Further, the disciplined employment of knowledge management improves every Soldier's ability to understand the operational and mission variables within a given environment (and the relationship among the variables), and enables commanders to visualize an operational approach and end state rapidly to any mission under any conditions. Knowledge management encourages subordinates to act within their commander's intent and fosters mutual trust, cohesive teams, and unity of effort among all partner organizations.

(b) Knowledge management is embedded into all underlying operational and institutional Army processes and activities, and generates and enhances shared understanding, accelerates learning, improves and speeds decision making, increases collaboration, and, thereby, improves operational effectiveness across and among all echelons and mission partners. Knowledge management helps leaders develop mental agility and an cognitive edge against highly-competitive threats.<sup>147</sup>

(7) A single Army information network that enables a regionally-engaged, globally-responsive, and multi-domain capable force. The Army information network is the Army's contribution to the DOD information network and consists of all Army information capabilities and associated procedures for collecting, processing, storing, disseminating, and managing information.<sup>148</sup> From the highest Army echelons to the individual Soldier or Army Civilian, it is the Army's single, protected, and standards-based technological network. The Army information network is composed of an integrated and distributed architecture of subordinate network segments and nodes, transport, supporting infrastructure, platforms, devices, sensors, warfighting and

business applications, services, and data arranged throughout bases, posts, camps, stations, facilities, and deployed locations that connect and support the entire Army. The Army information network provides the Army's (active, and reserve) non-stop, day-to-day communications needs, and is flexible, tailorable, responsive, and resilient enough to support an expeditionary Army operating in any environment. Compatibility and interoperability between Army components and with joint, interorganizational, and multinational partners is essential to maintain flexibility in a reduced force structure. (See [appendix D](#) for a discussion of risks.)

(a) The Army information network links leaders, Soldiers, and Army Civilians; CPs; ground, aerial, and waterborne platforms; and sensors to help create a synergistic, globally-connected total Army force.<sup>149</sup> The Army information network is simple, reliable, mission-tailorable, and allows commanders to expand the people component of their mission command system by connecting joint, interorganizational, and multinational partners over greater distances and in urban and other complex terrain, within and between the operating force and the strategic sustainment base, during all phases of an operation, and across all security enclaves. It enables Army forces and mission partners to collaborate, create shared understanding, sustain high-tempo operations, and continually increase the depth of their organizations' knowledge and expertise. With primacy to facilitating mission command, the Army information network also provides the warfighting platforms to conduct cyberspace operations and other network-based activities. While an essential combat multiplier, overreliance on technical capabilities provided by the Army information network may lead to atrophy of traditional skills. (See [appendix D](#) for risks.)

(b) The Army information network is designed and built holistically to operate with mission command principles, supporting warfighting processes, and necessary business procedures.<sup>150</sup> The Army information network is defensible and maintains critical functionality even when large portions are destroyed or rendered inoperative. Applications, interfaces, and visualization tools are simple, intuitive, and tailorable to the natural aptitudes and limitations of each operator; in other words, they are user-friendly.<sup>151</sup> While standardizing data, applications, and information systems to develop a common user experience, the Army information network maintains the flexibility to incorporate emergent technology quickly. Investment strategies for the Army information network include sustained leader development and organizational and technical training.<sup>152</sup> The Army information network specifically facilitates the following. (See [appendix F](#) for a detailed discussion of these essential attributes.)

- Uninterrupted mission command.
- Expeditionary, dispersed, and decentralized operations.
- Interoperability with joint, interorganizational, and multinational partners.
- Dynamic network management.
- Access, availability, and protection of data and information.
- A tailorable common operational picture.
- A standard and shareable geospatial foundation.
- Collaborative development of shared understanding.
- Planning and order development and dissemination.
- Fusion of logistic and operational information with intelligence.
- Training, wargaming, rehearsals, and in-stride decision-making.

(8) Agile and expeditionary CPs.

(a) Independent programs, rapidly evolving technology, and focus towards relatively fixed locations during the last decade and a half of combat made it difficult for capability developers to pursue integrated and compatible information systems and infrastructure. The Army development strategy did not support mobile, agile, and quickly assembled and disassembled combinations of distributed and linked command nodes (home station, enroute, early entry, and others), and a command group operating dismounted or from mounted command platforms.<sup>153</sup> Due to the relatively fixed nature of operations, units did not train routinely to displace, distribute, or disperse their CPs.<sup>154</sup> This lack of training contributed to atrophy of leader and Soldier skills to deploy, construct, camouflage, operate, protect, maintain, echelon, position, and displace CPs rapidly in austere environments and complex terrain.

(b) To incorporate the network attributes discussed above and the four additional CP-specific characteristics below, Army CPs are designed as fully-integrated, sociotechnical systems of vehicles, energy-efficient shelters and workspace, information systems, power generation and distribution equipment, and other supporting infrastructure.<sup>155</sup> CPs are fielded as complete capability packages that include long-term education, training, and sustainment strategies. To increase agility, realize mission command, and enable expeditionary operations, future Army CPs are smaller, less complex, automate routine functions, decrease the cognitive load on commanders and staffs, optimize human interaction, and support self-forming teams. They are mobile and deployable rapidly, modular, scalable, and survivable. (See [appendix F](#) for discussion of these characteristics.)

d. Other enabling capabilities. The Army needs other mission command capabilities to compete in multi-domain warfare and address changes in the character of future conflict. The spread of space, cyberspace, and electronic warfare capabilities; state and non-state access to advanced technology; the increased velocity and momentum of human interaction; an ever-present media; the need to operate among populations and in cities and other complex terrain; the rise in the use of precision and loitering munitions and unmanned aerial systems; and the proliferation of weapons of mass destruction drive these changes.<sup>156</sup> The additional capabilities include the following.

(1) Fully integrated space and cyberspace electromagnetic operations to support multi-domain battle.

(a) The space and cyberspace domains and the EMS are important to realizing mission command and each of the other warfighting functions, landpower projection, and multi-domain battle. In the future, space, cyberspace, and the EMS are more congested and contested, and capability development and operations conducted within these realms are relentlessly competitive. As technology advances, space (including high altitude), cyberspace, and EMS capabilities become more interrelated and interdependent requiring greater integration and synchronization.<sup>157</sup> Future Army forces integrate and synchronize space, cyberspace, and EMS capabilities with intelligence and fires to protect friendly capabilities, including positioning, navigation, and timing (PNT) data, while disrupting, degrading, or destroying enemy capabilities.<sup>158</sup> Capability integration allows Army forces to collect, move, deliver, and protect data, information, and knowledge among echelons and joint, interorganizational, and multinational partners.

(b) An integrated approach, including the ability to leverage joint and national assets, allows Army forces to repair, fight through, or bypass network problems or intrusions, and adapt the Army information network to support an expeditionary Army, realize mission command, and employ all warfighting capabilities throughout all domains and phases of joint combined arms operations. However, to direct their full employment, make informed risk decisions, and maneuver to create simultaneous and complementary effects, Army commanders, planners, and subordinate leaders must understand fully their space, cyberspace, and EMS capabilities, vulnerabilities, increasing interdependencies, and technical, legal, and policy limitations, including those of multinational partners.<sup>159</sup> Critically, space and cyberspace experts must translate technical jargon into effects that commanders can understand and relate to achieving their intent.

(2) Flexible and resilient space capabilities. The Army transitioned from a force that applied space capabilities selectively to a force empowered by, and reliant upon, space capabilities for situational understanding and all forms of reach (intelligence and operational reach and reachback).<sup>160</sup> Space capabilities facilitate realized mission command significantly during expeditionary, dispersed, and decentralized joint combined arms operations as future satellite communications remain the backbone of a beyond-line-of-sight, layered transport capability.<sup>161</sup> The mission command system extends or expands space capabilities to the lowest practical echelon operating anywhere in the world, while simultaneously maintaining security and protection from external jamming and other interference.

(a) Improved space-based and high-altitude sensors and imaging systems combine with satellite communications in the mission command system to provide the fidelity necessary to support a standard and shareable geospatial foundation, provide enhanced missile indications and warning, and enable the receipt and dissemination of relevant information (such as, space-based weather, terrain, imagery, and others) for display on the common operational picture. Improved PNT data and technology, the ability to detect and distinguish between intentional and unintentional interference, and an increased ability to conduct navigation warfare support enhanced situational understanding and realized mission command. Navigation warfare encompasses offensive, defensive, and support operations that enable friendly forces to characterize the PNT environment, ensure unimpeded availability, and deny PNT information to an adversary.<sup>162</sup> Future PNT capabilities include augmentations or alternatives that enable operations in dense urban (including subsurface) and other severely-restrictive terrain. Space capabilities are critical to Army forces' situational understanding, precision fires, and maneuver. These capabilities support the protection of all mission partners, aid in countering enemy anti-access and area denial activities, and, overall, help achieve friendly-force overmatch.

(b) Space and high-altitude capabilities are key resources requiring protection; therefore, when these capabilities are under attack or compromised, Army commanders know how to react to and mitigate these threats. Conversely, Army forces deny, degrade, or disrupt threat access to these same capabilities at the time and place of their choosing. Integrating space capabilities into joint combined arms operations depends on Army leaders that understand the space domain and the capabilities of space forces and systems (friendly and enemy), and on the ability of Soldiers to operate effectively in a degraded space environment.<sup>163</sup> Space operations integrate into institutional training at all levels, and units routinely train at the tactical level in contested

environments where critical space capabilities are degraded, denied, or disrupted allowing the development and practice of effective mitigation strategies, techniques, and procedures.

(3) Advanced cyberspace capabilities to influence the behavior of people and machines. An array of threats are pervasive in cyberspace. Threats avoid challenging the U.S. military where it dominates in the physical domains and, instead, strike at U.S. national interests through cyberspace. Threats are constantly probing, spying on, stealing from, and attacking U.S. government, military, industrial, and commercial technological networks to gain political, military, and economic advantage.<sup>164</sup> As the Nation's reliance on cyberspace grows, particularly to monitor and control critical infrastructure and store intellectual property and personal wealth, so do cyberspace vulnerabilities that opportunistic threats, growing in capability and technological sophistication, create, causing possible devastating and long-term consequences to national security. Army forces increase the capability and capacity to train, using sophisticated laboratories, training facilities, and ranges, plan, and conduct continuous cyberspace operations as a fundamental part of joint combined arms operations.

(a) Success in the cyberspace domain necessitates a collaborative, combined arms approach to integrate and synchronize cyberspace activities and capabilities across multiple warfighting functions and with joint, interorganizational, and multinational partners to help gain access and ensure freedom of action in cyberspace and on land, while denying threats to the same.<sup>165</sup> In addition to dynamic network management and a robust network transport to support expeditionary, dispersed, and decentralized operations, Army forces develop greater cyberspace warfare capabilities and authorities, and increased cyberspace situational understanding, extended to lower operational and tactical echelons.<sup>166</sup> These advanced cyberspace capabilities facilitate the mission command warfighting function through defense of the Army information network and the equipment and weapons systems that use it.<sup>167</sup> Army forces integrate cyberspace operations into all experimentation, wargames, training, leader development, and routine activities. As active and passive insider threats remain a vulnerability, cybersecurity awareness, training, and discipline extends to the individual Soldier and Army Civilian conducting the daily cyberspace fight.

(b) Army forces will gain, maintain, and exploit advantages over threats that operate increasingly in cyberspace and other ungoverned spaces. Army forces identify, recruit, develop, and retain sufficient cyberspace expertise and capacity to respond rapidly and support national requirements, combatant commanders, and Army commanders at all levels. Army cyberspace expertise is generated through joint cyberspace training, qualification, and certification standards.<sup>168</sup> Army cyberspace experts can create a multitude of lethal and nonlethal effects in and through cyberspace and can build, operate, maintain, and defend in depth the Army information network and, as needed, other friendly networks. Through cyberspace, trained experts can take actions to influence the behavior of people and machines to advantage.<sup>169</sup> They can analyze forensically, fight through, and restore capabilities due to attacks and intrusions.<sup>170</sup> Cyberspace experts can conduct active reconnaissance (or counter-reconnaissance) and surveillance to find and track intruders and attackers both inside and outside the Army information network and collect information to develop situational understanding of threat capabilities, dispositions, and intentions. As necessary, Army cyberspace experts can conduct timely virtual offensive activities (or determine the decisive points against which to conduct physical offensive



tasks) to deceive, degrade, deny, disrupt, or destroy cyberspace threats, degrade their command and control systems, and enable actions in all domains and across all warfighting functions.

(c) Defensive cyberspace expertise includes the ability to secure data and information, protect information systems, probe the Army information network (or other friendly networks) for vulnerabilities, and test future capabilities to identify and mitigate risk before equipment or applications are fielded. Information systems, hardware and software, are designed with a greater ability to troubleshoot, self-defend, and recover with little or no human intervention.<sup>171</sup> Defensive cyberspace expertise also includes the ability to test institutional and operational Army organizations against phishing and other social-engineering attacks during training and their routine activities, and, as part of home station and training center exercises, the expertise and capacity to conduct force-on-force cyberspace engagements to help develop Army forces' abilities to operate in a contested cyberspace domain.

(d) As part of DSCA, Army forces support federal, state, and local governments with critical infrastructure protection by sharing information and providing cyberspace capabilities and expertise to detect, warn against, deter, and, when needed and authorized by civil authority, respond to cyberspace threats. Highly-skilled Army cyberspace forces, as part of each geographic combatant command's security cooperation efforts, assist global partners develop the capability to build or restore, operate, test, defend, and secure their own military networks, and mitigate shared cyberspace threats through mutual action.<sup>172</sup>

(e) Army forces increase their overall situational understanding with the inclusion of cyberspace and the EMS as an essential part of the common operational picture allowing commanders to visualize and map operationally relevant cyberspace and electromagnetic activity across both physical and virtual domains. Cyberspace situational understanding includes visibility of friendly, threat, and other specified cyberspace and cyberspace warfighting capabilities, and is highly dependent upon the ability to conduct accurate cyberspace analytics and battle-damage assessments.<sup>173</sup> Army forces filter cyberspace "noise" and detect and recognize quickly when experiencing a cyberspace attack; recognize the depth, intent, and effectiveness of the attack; determine attribution or origin; and assess, manage, and mitigate the risks and operational impacts. Army forces achieve greater understanding of the effects of offensive and defensive cyberspace activities conducted against threats, including potential second, third, and higher-order effects of those activities, and have greater means to constrain cyberspace effects to those intended.

(f) The capability to conduct reconnaissance and security operations to overcome deception, find and identify cyberspace threats, and forensically analyze an attack or intrusion are central to accurate friendly or enemy battle-damage assessments and the determination of appropriate offensive or defensive responses. As with most aspects of mission command, robust all-source intelligence support to cyberspace electromagnetic operations reduces uncertainty, mitigates risk, improves cyberspace threat awareness, and, on the whole, supports commanders and subordinate leaders in making quality decisions.

(4) A full complement of electronic warfare (EW) capabilities. For more than a decade, the Army focused much of its EW developmental efforts on improving signals intelligence and

creating electronic attack capabilities to counter remotely-controlled improvised explosive devices. However, electronic hardware and software are increasingly embedded in everything from manned and unmanned vehicles to robots to sensors and guided munitions, creating weakness and military opportunity.<sup>174</sup> Consequently, the Army prepares its future forces to win in a highly-contested EMS environment.<sup>175</sup>

(a) In the future, the Army achieves greater capacity and balance by broadening its capabilities to plan and manage friendly force use of the EMS and oppose the strengths and exploit vulnerabilities of an evolving and increasing range of threat EW capabilities—to deny opponents an actual or perceived advantage in the EMS and support friendly freedom of action and positions of advantage across the EMS, and in space and cyberspace.<sup>176</sup> An automatic electronic battle management capability senses, intercepts, identifies, locates, and distinguishes between the sources of intentional and unintentional radiated electromagnetic energy with increased precision. With this improved understanding, Army forces can sort and prioritize threats and then make full use of electromagnetic energy, directed-energy, and anti-radiation weapons to target the enemy in the land, air, maritime, space, and cyberspace domains, while simultaneously protecting Army Soldiers, facilities, and equipment from the adverse effects of enemy (or friendly) use of the EMS or from naturally-occurring electromagnetic incidents.<sup>177</sup> Further, Army forces are able to obscure any portion of the EMS selectively to defeat or degrade enemy electronic detection, observation, and engagement capabilities thereby maintaining operations security, enabling military deception, and improving survivability.

(b) Army forces develop a greater situational understanding of the EMS and friendly and threat EW capabilities and activities as a fundamental part of the common operational picture. Through the mission command warfighting function, Army forces integrate (or de-conflict) joint, Army, interorganizational, and multinational EW capabilities rapidly to shape the electromagnetic environment for success in joint combined arms operations. Mobile Army EW capabilities, extended to lowest practical echelon, allow the continued operation of the mission command system, particularly the Army information network, its manned and unmanned sensors, and its ground, aerial, waterborne, and space platforms.

(5) Information-related capabilities for strategic engagement.<sup>178</sup> Army leaders plan, integrate, and synchronize information-related capabilities routinely to inform domestic and foreign-friendly audiences, influence foreign neutrals, counter propaganda, affect threat decision making, and shape the larger information environment to gain an operational advantage as a critical element of joint combined arms operations.<sup>179</sup> While public affairs and Army information operations are integral parts of a geographic combatant command's long-term security cooperation plans to enhance regional stability, a continuous and ongoing activity, Army forces can surge to support targeted activities in support of expeditionary forces and operational and tactical objectives. Words and actions (lethal and nonlethal), including the expanded interaction with and use of local and global social and traditional public media, serve to influence the behavior of threats and foreign audiences in ways that directly affect mission accomplishment either intentionally or unintentionally. Every leader understands the media and employs information operations to enhance intended consequences and mitigate unintended ones.<sup>180</sup>

(a) Soldier, Army Civilian, leader, and unit actions—which may be amplified or subdued by media images and reporting—remain the most powerful activities for influencing audiences, maintaining legitimacy, and gaining understanding of key audiences’ beliefs and perceptions. Leader development and organizational training prepare leaders, Soldiers, and Army Civilians, to understand the information environment and the combined effects of an ubiquitous media, social networks, personal interactions, civil-military operations, and unit tactical actions when operating in and among populations, and, on the whole, aid them in aligning their words and actions effectively. To support this understanding, Army forces increase their ability to monitor and participate in public media forums and accurately measure or gauge the impact of their application of information-related capabilities and the effect of military operations on people’s perceptions and behavior. Additionally, education, training, and experience enable leaders, Soldiers, and Army Civilians to apply an acute social and cultural understanding to determine key individuals and audiences and, as appropriate, the most effective ways and means of engaging, informing, persuading, or influencing them, both on land and through cyberspace.

(b) The Army’s integrated training environment closely replicates the effects of employing information-related capabilities on key audiences, the effects of key audiences and the viral nature of social media on Army operations and, how well these capabilities are being employed for effect.

(6) Persistent protection of critical information to maintain a position of relative advantage. Commanders and staffs persistently employ operations security to deny enemies and adversaries knowledge of friendly operations, protect decision making, reduce predictability, and preserve the element of surprise. Future Army forces habitually apply operations security to their virtual activities within the space and cyberspace domains and the EMS. Similarly, Army forces carefully review plans and monitor their operations in the physical domains to assess potential exposure of indicators and vulnerabilities in the information environment and implement appropriate mitigation strategies. Army forces continue to develop operations security capabilities with joint combined arms applicability at all practical echelons and across multiple domains to gain and maintain a position of relative advantage over future threats. Commanders and staffs closely synchronize and integrate operations security with military deception and other information-related capabilities as part of the broader information operations effort.

(7) Reinvigorated military deception to defeat hybrid threats. Commanders employ military deception and counter-deception to deliberately mislead enemy and adversary decision makers (military, paramilitary, or violent extremist organizations), as to friendly military capabilities, intentions, and operations, thereby causing these threats to take specific actions or inactions during joint combined arms operations. Future military deception will span the physical domains, cyberspace, and the EMS and include the use of robotics and unmanned ground and aerial systems to create advanced decoy systems that replicate friendly physical, cyberspace, electronic, thermal, and acoustic signatures to complicate enemy targeting. The Army develops, resources, and provides military deception and counter-deception capabilities to fulfill Army and combatant command, service, and other partner agency requirements, and aligns Army capabilities with joint capabilities.

(8) Responsive airspace control to facilitate maneuver and fires and preserve freedom of action. Army forces exploit the benefits gained by making maximum, simultaneous use of the

airspace over an area of operations by Army forces and other joint, interorganizational, and multinational partners conducting missions to support both the joint and Army force commander. Improved precision and loitering munitions; new weapon systems; large numbers of manned military (including coalition and special operations forces), civilian, and other government agency aircraft; and the proliferation of unmanned aerial systems by these same organizations, particularly to lower tactical echelons, greatly increase the challenges in identification, deconfliction, airspace management, and air-ground integration and synchronization.<sup>181</sup>

(a) Army airspace control develops the responsiveness required to exploit opportunities created through dispersed and decentralized joint combined arms operations. Army airspace control remains a specific task within the mission command warfighting function and is integrated into operations through the overarching operations process. Army airspace control integrates all airspace users in near-real time according to the commander's intent, priorities, and risk guidance to optimize aerial capabilities and airspace use and minimize adverse impacts. Airspace control contributes to the rapid, effective, and continuous synchronization of joint combined arms operations from early entry onward.

(b) During DSCA, Army airspace control interfaces and supports federal agencies. Rapid collaboration and increased interoperability between Army airspace users and other mission partners, (enabled by the mission command system including a common operational picture that displays relevant airspace information to the lowest practical echelon), facilitate dynamic adjustments to airspace plans and rapid dissemination of those changes to all affected users. Airspace control affords subordinate leaders responsiveness, flexibility, and freedom of action to defeat air, ground, and maritime threats, exploit fleeting opportunities, and accomplish missions.

(9) Integrated site exploitation activities to seize, retain, and exploit the initiative.

(a) The requirement to counter the proliferation of weapons of mass destruction, combat improvised explosive devices, understand and target insurgent networks, and conduct investigations to support host-nation civil prosecutions drive the Army's need to conduct specific activities to gather and analyze material and question people on an objective for information or evidence. In the past, Army forces often established ad hoc organizations responsible for employing such varied site exploitation capabilities as crime scene investigations, explosive ordnance disposal, forensics, biometrics, and other capabilities to positively determine identities.

(b) Army forces develop the enduring capability to integrate and synchronize site exploitation enablers and processes rapidly to answer information requirements, facilitate subsequent operations, and support host-nation rule of law.<sup>182</sup> Well-planned and executed site exploitation activities support fusing the operations, intelligence, targeting, and criminal prosecution processes necessary to defeat threat networks, support the rule of law, and improve the security of coalition and civilian personnel. Integrated site exploitation activities aid in creating situational understanding, protecting the force, consolidating gains, and identifying opportunities by which Army forces seize, retain, and exploit the initiative during joint combined arms operations.<sup>183</sup>

(10) Civil-military operations to consolidate gains and achieve lasting outcomes. Compelling sustainable outcomes in war requires land forces to defeat enemy organizations, establish security,

and consolidate gains. In complex future operational environments and while operating against hybrid threats, Army forces project national power through support for diplomatic, political, law enforcement, economic development, and other efforts.<sup>184</sup> Civil-military operations are critical to these efforts during joint combined arms operations across the conflict continuum. Civil affairs forces assist Army and joint force commanders in planning and executing stability operations, transitional military authority, and the transition of administration and infrastructure responsibilities to legitimate civilian authorities. Civil affairs forces conduct detailed civil infrastructure assessments and, based on those assessments and in conjunction with joint, interorganizational, and multinational partners, develop, synchronize, and execute appropriate remediation, including governance and rule of law tasks, to support the establishment or reestablishment of a stable, credible, and legitimate host-nation government.

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## **Chapter 4**

### **Support to the Army's Landpower Roles: Prevent, Shape, and Win**

#### **4-1. Introduction**

a. The Army prepares future forces to fight and win the Nation's wars in any operational environment and achieve decisive results across multiple domains and the full range of military operations. The three interrelated Army roles in applying landpower, prevent conflict, shape the security environment, and win the Nation's wars, provide a broader mental framework within which to prepare leaders, Soldiers, Army Civilians, and organizations to realize mission command and support capability development.<sup>185</sup> Success in any future landpower role requires the considered application of the mission command principles and the knowledgeable employment of the mission command system including the establishment, operation, and maintenance of a unified Army information network that is simple, reliable, secure, and defended in space, cyberspace, and the EMS, that facilitates interoperability, and that ensures uninterrupted global connectivity.

b. Essential to fulfilling all Army landpower roles are conducting the operations process to frame and understand each mission; applying critical and creative thinking to developing a multi-domain operational approach; making sound, ethical decisions; directing decisive action; assessing progress and the plan; and adapting military action to changing circumstances continuously and quicker than threats. Leveraging the talents, abilities, and imaginations of every Soldier and Army Civilian is a critical component to anything the Army will do in the future.

#### **4-2. Prevent conflict**

a. The Army prevents conflict by maintaining credibility based on sufficient capacity, capability, and readiness to win in sustained land combat. As a predominantly continental U.S.-based and expeditionary force, developing regionally-engaged, globally-responsive, and mission-tailorable units manned by competent leaders and Soldiers prepared to win any fight prevents miscalculations by opportunistic threats who might choose to engage Army forces in a lethal contest of wills. While well-equipped units with significant technological overmatch are essential to preventing and deterring would-be opponents from engaging in conflict, future deterrence remains capable organizations manned by morally, intellectually, and physically strong leaders

and Soldiers who apply mission command fully.<sup>186</sup> Whether through the media or by personal observation, partners and threats recognize and respect the ability of Soldiers to act independently, take immediate action, and expertly employ the tools of warfare.<sup>187</sup>

b. Putting Soldiers in harm's way remains the greatest symbol of the Nation's resolve and commitment. To maintain this military credibility, the Army trains and develops leaders to apply joint combined arms capabilities, think and operate across all domains, and exercise disciplined initiative to develop the situation through action, adapt, and act decisively in uncertain and chaotic situations. The ability to apply landpower rapidly delays, impedes, or halts the enemy's initial aggression, denies initial objectives, and ends crises earlier and on terms acceptable to U.S. authorities—often before any Soldiers' lives are lost.

#### **4-3. Shape the security environment**

a. As part of a whole-of-government approach to achieving national and theater objectives, the Army, working as interdependent, multifunctional teams of conventional and special operations forces, shapes operational environments by establishing and sustaining strong alliances and partnerships with other militaries and supporting their requirements and efforts to build their capacity to protect and govern, particularly important in any future resource-constrained environment.<sup>188</sup>

b. Advanced cyberspace capabilities may allow Army forces to establish a virtual presence and virtual partnerships to build relationships well in advance of deployments, to maintain relationships between deployments, and, in some cases, to substitute for deployments. When conflict arises, strong, capable partners may preclude the employment of U.S. forces to key regions affecting national interests and, if not, these partners may help facilitate operational access or share the responsibility and burden for creating a mutually beneficial outcome, or both.

c. As part of a long-term security investment strategy, these sustained cooperative efforts also serve to provide developing crises early warning (reducing the prospect of strategic surprise) and deepen the Army and Joint Force's overall situational understanding of the operational variables (particularly their human context) that, should prevention fail, guide the development of an operational approach and the execution of tactical tasks that address root causes of regional instability and address host country security concerns and capability gaps.

d. Credible and timely public affairs and sustained and persistent information operations, physical and virtual, communicate the reasons for U.S. engagement in a region and establish the long-term dialogue to develop and sustain partner relationships, win the battle of the narrative, and consolidate gains.<sup>189</sup> To be effective, Army leaders develop cultural acuity and strong interpersonal, communications, collaboration, and negotiation skills. Army forces apply knowledge management to harness information, create shared understanding, and facilitate learning, innovation, and adaptation with and among joint, interorganizational, and multinational partners to aid in establishing mutual trust, cooperation, collaboration, and unity of effort.

#### **4-4. Win the Nation's wars**

a. If prevention fails, leaders, Soldiers, and organizations integrate and synchronize combined arms capabilities to fight and win on land and the airspace above; in and through space, cyberspace, and the EMS; as part of a joint, interorganizational, and multinational team; and under degraded space and network conditions. Army forces project power outward from land into other domains and contested spaces to support joint force freedom of maneuver and action. To win decisively in war against any enemy—the ultimate contest of wills, leaders, Soldiers, Army Civilians, and organizations are grounded in military tactical and technical competencies and skilled in applying mission command principles.<sup>190</sup>

b. Through effective mission command system employment, commanders create, rehearse, disseminate, and distribute orders with associated graphics between CPs; ground, aerial, and waterborne platforms; and dismounted leaders and Soldiers, and direct action to break an enemy's will to continue the fight. Rapidly configurable, deployable, mobile, and survivable CPs, with capabilities that facilitate interoperability and sustain uninterrupted mission command, support joint entry operations and a fluid mix of reconnaissance, offensive, defensive, and stability or DSCA tasks appropriate to the mission and environment. Realized mission command empowers subordinates to seize, retain, and exploit the initiative to gain and maintain a position of relative advantage in sustained, high-tempo, land operations.<sup>191</sup>

c. Army forces attack and exploit threat systems and protect friendly individuals, weapon systems, and critical infrastructure through the flexible integration of space and cyberspace electromagnetic operations. Together with space and cyberspace electromagnetic operations to destroy, disrupt, degrade, deny and deceive, and exploit in the information environment, Army forces conduct sustained information operations, operations security, and military deception to create disparity between the information quality available to friendly forces and that available to threats.

d. Commanders and staffs apply knowledge management to tailor and organize their mission command system to generate cognitive synergy and an intellectual edge against future opponents. Army commanders and staffs conduct the operations process to integrate and synchronize multi-domain capabilities and the Army's decisive action tasks as part of an interoperable, joint, interorganizational, and multinational team. Army forces seize, retain, and exploit the initiative and accept prudent risk to create opportunities to defeat and destroy conventional, irregular, and hybrid threats; seize and hold terrain, resources, and population centers; and maintain or reestablish a safe and secure environment to allow the restoration, development, or provision of essential governmental services, humanitarian relief, and emergency infrastructure reconstruction; and, overall, to win in a complex world.

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## Chapter 5 Conclusion

a. The Army faces uncertain, highly-competitive, and dynamic operational environments and prepares to conduct the full range of military operations against a multitude of threats anywhere in the world. The nature of the future security environment and the broad range of potential missions combine to present Army forces with unfamiliar, ill-structured, and emergent situations requiring them to operate in unanticipated ways. These conditions and challenges require the intuitive application of mission command's fundamental principles and the shrewd integration and artful application of available destructive, constructive, and information capabilities throughout all domains. Realized mission command overcomes surprise and uncertainty, promotes initiative and adaptability, and facilitates success in any of the Army's roles: preventing conflict, shaping the security environment, and winning the Nation's wars.

b. The AFC-MC proposes refinements to mission command's philosophical definition, fundamental principles, its warfighting function definition, system description, and tasks. These adjustments seek to clarify understanding; account for strategic trends, operational insights, and lessons learned from the Army's continuing campaign of learning; support the AOC's future multi-domain operational approach; and provide the framework and metrics for developing supporting capabilities. The proposed adjustments broaden mission command philosophy applicability to all Army leaders, officers, warrant officers, noncommissioned officers, and Army Civilians. All leaders—not just commanders—convey a clear intent and empower subordinates to take disciplined initiative. These adjustments expand the warfighting function's role to facilitate interoperability and joint combined arms operations. This concept proposes that the warfighting function expand beyond integrating warfighting functions to combining and synchronizing Army combat power across all domains and with all instruments of national power, U.S., and coalition.<sup>192</sup>

c. Formal adoption of mission command alone is insufficient. Through the lens of the future strategic environment and a refined understanding of mission command, this concept identifies the broad capabilities and associated policy changes required in 2020-2040 to truly realize mission command and allow Army forces to adapt continuously to seize, retain, and exploit the initiative and preserve joint force freedom of movement and action in the land, air, maritime, space, and cyberspace domains and the EMS. While the AFC-MC addresses capabilities across all aspects of mission command, it prioritizes the human dimension and the changes necessary for bold, agile, and innovative leaders, Soldiers, and Army Civilians and cohesive joint, interorganizational, and multinational teams to win in a complex environment. Technological tools and effective processes remain critical enablers but optimization of Army leaders will be the key competitive advantage for creating overmatch against future threats.

d. Ultimately, the extent to which mission command is realized within Army forces is determined by the decisions, actions, and influence of all Army's leaders, from the Secretary and Chief of Staff of the Army to team and section leaders.<sup>193</sup> History is replete with examples of forces that achieved extraordinary results when inspired with the proper application of mission command.<sup>194</sup>



## **Appendix A References**

### **Section I**

#### **Required references**

Across all references: Army regulations (ARs), Department of the Army (DA) pamphlets, Army doctrine publications (ADPs), Army doctrinal reference publications (ADRP), Army field manuals (FMs), Army techniques publications (ATPs), and DA forms are available at Army Publishing Directorate Home Page <http://www.usapa.army.mil>. TRADOC publications, TPs and forms are available at TRADOC Publications website at <http://www.tradoc.army.mil/tpubs/tpubs>. Joint publications (JPs) are available at the Joint Electronic Library at <http://www.dtic.mil/doctrine>.

TP 525-3-0

The U.S. Army Capstone Concept

TP 525-3-1

The U.S. Army Operating Concept: Win in a Complex World

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Operations

ADP 5-0

The Operations Process

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## **Appendix B**

### **Required Capabilities**

#### **B-1. Introduction**

a. The AFC-MC capabilities are based on the broad ideas and required capabilities from the ACC and AOC, proponent analytical work, lessons learned from the last decade of conflict, and the solutions found in [chapter 3](#) of this pamphlet.

b. Except for two, the mission command required capabilities end with the phrase “during joint combined arms operations” to emphasize that future capabilities must support the Army’s role in unified action; capability developers must systematically consider the future Army force’s ability to plan, coordinate, integrate, synchronize, and operate across multiple domains and the full range of military operations effectively, and as part of joint, interorganizational, and multinational teams during the analysis and formulation of future DOTMLPF solutions.<sup>195</sup>

c. The required capabilities that address globally-networked and interoperable teams and the operations process do not follow this convention; instead, they specifically emphasize the joint, interorganizational, and multinational, multi-domain, and full range of military operations aspects within each of these capability statements. As this concept addresses the total Army, subsequent capability analysis must routinely include interoperability and integration between active and reserve components and conventional and special operations forces.<sup>196</sup> These capabilities are closely interrelated and, therefore, potential DOTMLPF solutions may fulfill more than one required capability simultaneously.

d. Development of future force mission command capabilities adhere to the capability development principles outlined in the AOC and restated below.<sup>197</sup>

- (1) Ensure capacity and readiness to accomplish missions that support national objectives.
- (2) Build new capacity or adjust existing capabilities to cope with emerging threats or achieve overmatch.
- (3) Maintain U.S. Army asymmetrical advantages.

- (4) Maintain essential theater foundational and enabling capabilities.
- (5) Prioritize those organizations and competencies most difficult to train and regenerate.
- (6) Cut unnecessary overhead to retain fighting capacity and decentralize capabilities whenever possible.
- (7) Maintain and expand synergies between the operating force and institutional Army.
- (8) Optimize performance of the Army through a force mix that accentuates relative strengths and mitigates weaknesses of each component.

## **B-2. Required capability statements**

a. The following capability statements are not stand-alone; they must be understood based upon this concept and not the reader's own interpretation. Each required capability is followed by reference paragraphs from this concept, the AOC, and the ACC. These references are termed integrity of intent and are included to help readers understand the context and intent of the required capability, thereby reducing the likelihood of misinterpretation during subsequent capability analysis and development.

b. Developing, preparing, and equipping future Army leaders, Soldiers, Army Civilians, and organizations to apply mission command fundamental principles and integrate and synchronize combat power fully across all domains and with all elements of national power to help prevent conflict, shape the security environment, and win the Nation's wars requires the following capabilities.

(1) Bold, agile, and innovative leaders of character that thrive in conditions of uncertainty and chaos. Future Army forces require leaders, Soldiers, and Army Civilians grounded in the Army Ethic, fundamental leader attributes, and tactical and technical competencies; skilled in applying the principles of mission command; and capable of organizing and employing the mission command system effectively and efficiently during joint combined arms operations (AFC-MC: 3-4.c.(3) & appendix G; AOC: 3-3.d., 3-3.g., 3-3.i., & 3-3.j.; and ACC: B-1.b.).

(2) Globally-networked and interoperable teams of joint, interorganizational, and multinational partners. Future Army forces require the ability to form and deploy rapidly multifunctional, globally-networked, and interoperable teams of Army forces and joint, interorganizational, and multinational partners that are responsive regionally to the combatant commanders' needs and the Army's institutional requirements across multiple domains and the range of military operations (AFC-MC: 3-4.c.(4); AOC: 3-3.a., 3-3.b., 3-3.d., & 3-3.g.; and ACC: B-7.c.).

(3) Expertise in the operations process across all domains and the full range of military operations. Future Army forces require leaders able to conduct the operations process to integrate and synchronize Army and joint, interorganizational, and multinational capabilities to create unity

of effort and seize, retain, and exploit the initiative across all domains and the full range of military operations (AFC-MC: 3-4.c.(5); AOC: 3-3.d., 3-3.e., & 3-3.f.; and ACC: B-1.d.).

(4) Pervasive knowledge management to create shared understanding and create cognitive overmatch. Future Army forces require the ability to manage knowledge to accelerate learning, facilitate collaboration, create shared understanding, and enable decision making during joint combined arms operations (AFC-MC: 3-4.c.(6); AOC: 3-3.c.; and ACC: B-1.g.).

(5) A single Army information network that enables a regionally-engaged, globally-responsive, and multi-domain capable force. Future Army forces require a single, secure, and reliable network of command posts; air, ground, and waterborne platforms; dismounted leaders and Soldiers; and sensors linked by a tailorable suite of mission command applications, information services, and communications infrastructure to enable expeditionary movement and maneuver, dispersion, decentralization, interoperability, collaboration, and uninterrupted mission command during joint combined arms operations (AFC-MC: 3-4.c.(7) & F-2; AOC: 3-3.c., 3-3.e., 3-3.h., & 3-3.i.; and ACC: B-1.g.).

(6) Agile and expeditionary command posts. Future Army forces require scalable, modular, Soldier-operated and maintained, deployable, mobile, and survivable command posts that enable commanders, supported by their staffs, to understand, visualize, describe, direct, lead, and assess continuously during training, deployment, early-entry operations, and all subsequent phases of joint combined arms operations. (AFC-MC: 3-4.c.(8) & F-3; AOC: 3-3.b.; and ACC: B-1.g.)

(7) Fully integrated space and cyberspace electromagnetic operations to support multi-domain battle. Future Army forces require leaders, Soldiers, and Army Civilians who understand space, cyberspace, and electromagnetic spectrum capabilities, limitations, vulnerabilities, and interdependencies and who can integrate space and cyberspace electromagnetic operations to disrupt, degrade, or destroy enemy space and cyberspace electromagnetic capabilities and gain and maintain a technological advantage during joint combined arms operations (AFC-MC: 3-4.d.(1) & E-2.c.(4); AOC: 3-3.c.; ACC: B-1.c).

(8) Flexible and resilient space capabilities to enhance situational understanding and extend reach. Future Army forces require the ability to gain and maintain assured access to space capabilities, protect space assets and capabilities, and deny or disrupt the threat's access to space capabilities during joint combined arms operations (AFC-MC: 3-4d(2); AOC: 3-3.c.; and ACC: B-1.l, B-1.m, B-1.n, & B-1.o).

(9) Advanced cyberspace capabilities to influence the behavior of people and machines. Future Army forces require the ability to build, operate, maintain, and defend friendly cyberspace, shape neutral cyberspace, and influence, attack, and exploit threat cyberspace to enable mission command and other network-based activities during joint combined arms operations (AFC-MC: 3-4.d.(3); AOC: 3-3h; and ACC: B-1.i., B-1.j., & B-1.k.).

(10) A full complement of electronic warfare capabilities. Future Army forces require electronic warfare capabilities to gain or maintain advantage and freedom of action across all domains, and combat threats' strengths, exploit their vulnerabilities, and deny them advantage



across the electromagnetic spectrum during joint combined arms operations (AFC-MC: 3-4.d.(4) and AOC: 3-3.h.).

(11) Credible and timely public affairs that builds trust. Future Army forces require the ability to inform domestic and foreign-friendly audiences rapidly, accurately, and reliably through all forms of public communications to gain and maintain trust, build cohesive teams, and develop and preserve mission support during joint combined arms operations. (AFC-MC: 3-4.d.(5) & E-3.c.(3); AOC: 3-3a, 3-3.g.; and ACC: B-1.d. & B-1.e.)

(12) Sustained and persistent information operations to win the battle of the narrative. Future Army forces require the capability to influence threat decision making while protecting their own and to shape the perceptions and behaviors of foreign-neutral audiences during joint combined arms operations (AFC-MC: 3-4.d.(5) & E-3.c.(3); AOC: 3-3.a.; and ACC: B-1.d. & B-1.e.).

(13) Persistent protection of critical information to maintain a position of relative advantage. Future Army forces require the capability to deny unauthorized persons, enemies, and adversaries knowledge of friendly plans, operations, programs, and activities to protect decision making, reduce predictability, preserve secrecy and the element of surprise, and maintain a position of relative advantage during joint combined arms operations (AFC-MC 3-4.d.(6); AOC: 3-4.b.(4); and ACC: B-1.d.).

(14) Reinvigorated military deception to defeat hybrid threats. Future Army forces require the ability to employ deception and counter-deception to mislead enemy, adversary military, paramilitary, or violent extremist organization decision makers deliberately as to friendly military capabilities, intentions, and operations and cause them to take specific actions (or inactions) to friendly advantage during joint combined arms operations. (AFC-MC: 3-4.d.(7); AOC: 3-3.d.; and ACC: B-1.d.)

(15) Responsive airspace control to facilitate maneuver and fires and preserve freedom of action. Future Army forces require the ability to integrate Army and joint, interorganizational, and multinational partner use of airspace following the commander's intent, priorities, and risk guidance to optimize all aerial capabilities while minimizing adverse impacts during joint combined arms operations (AFC-MC: 3-4.d.(8) and AOC: 3-3.d & 3-3.e).

(16) Integrated site exploitation activities to seize, retain, and exploit the initiative. Future Army forces require the ability to integrate and synchronize site exploitation activities to derive facts, actionable information, or intelligence to support decisive action, targeting, enhanced situational understanding, and criminal prosecution during joint combined arms operations (AFC-MC: 3-4.d.(9) and AOC: 3-3.f.).

(17) Civil-military operations to consolidate gains and achieve lasting outcomes. Future Army forces require the capability to support U.S. Government agency led efforts to enhance partner governance, economic development, essential services, rule of law, and other critical government functions to resolve or mitigate factors of instability during joint combined arms operations (AFC-MC: 3-4.d.(10); AOC: 3-3.a, 3-3.g, 3-4.b.(1), & 3-4.b.(3)-(5); and ACC: 3-1.b, 3-5.c.(3)-(5), 3-5.d.(3).(a)-(b), & 3-6.a.(c).(3)).

**B-3. Linkage to the Army warfighting challenges**

As an Army warfighting challenge and integrating warfighting function, mission command contributes to all Army operations and activities and all warfighting challenges. Thus, to maintain a more focused approach to developing future capabilities, table B-1 identifies the greatest contributing mission command required capabilities for each of the warfighting challenges. The four shaded required capabilities fall to the purview of other centers of excellence responsible for semi-independent capabilities-based assessments (CBA). However, the results and insights for all contributing CBAs are collected and integrated within the overall mission command capability portfolio.

**Table B-1  
Warfighting challenge crosswalk**

Army Warfighting Challenge		Required Capability																
		Bold, agile and innovative leaders of character	Globally-networked teams	Expertise in the operations process	Knowledge management	Army information network	Command posts	Integrated space and cyberspace electromagnetic operations	Space capabilities	Cyberspace capabilities	EW capabilities	Public affairs	Information operations	Operations security	Military deception	Airspace control	Site exploitation	Civil-military operations
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
1	Develop Situational Understanding				X												X	
2	Shape the Security Environment																	
3	Provide Security Force Assistance		X									X					X	
4	Adapt the Institutional Army	X																
5	Counter Weapons of Mass Destruction		X		X		X					X				X		
6	Conduct Homeland Operations		X															
7	Conduct Space, Cyberspace, Electronic Warfare, and Communications Operations		X		X		X	X	X			X						
8	Enhance Training	X					X											
9	Improve Soldier, Leader, and Team Performance	X	X															
10	Develop Agile and Adaptive Leaders	X																
11	Conduct Air-Ground Reconnaissance														X			
12	Conduct Entry Operations					X												
13	Conduct Wide Area Security										X							
14	Ensure Interoperability and Operate in Joint, Interorganizational, and Multinational (JIM) Environment		X	X	X												X	
15	Conduct Combined Arms Maneuver												X	X				
16	Set the Theater, Sustain Operations, and Maintain Freedom of Movement				X													
17	Integrate Fires			X	X													
18	Deliver Fires																	
19	Exercise Mission Command	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
20	Develop Capable Formations		X															

## **Appendix C**

### **Science and Technology to Support Mission Command**

#### **C-1. Introduction**

a. This appendix aligns key science and technology (S&T) capabilities with the capabilities the Army must possess to realize mission command during joint combined arms operations in 2020-2040. The Army works with joint partners, industry, and key stakeholders to develop future force capabilities with the following technological first principles in mind.<sup>198</sup>

- (1) Emphasize integration of technology with Soldiers and teams.
- (2) Simplify systems and integrate Soldier training into design.
- (3) Maximize reliability and reduce life cycle costs.
- (4) Design redundant systems that improve effectiveness under conditions of uncertainty.
- (5) Develop systems that degrade gracefully.
- (6) Maintain foundational knowledge to reduce the opportunity for surprise.
- (7) Reduce logistical demands.
- (8) Anticipate enemy countermeasures.
- (9) Ensure interoperability.
- (10) Consider scale and organizational implications.

b. Highlighting the dynamic relationship between the S&T developments in mission command and those in other Army warfighting functions is important. This relationship requires near-constant assessment and consideration between capability developers and material developers to ensure synchronized capability development. The technologies identified here are not prescriptive, but act as guides in developmental efforts.

c. The window of influence for system development is important. The acquisition system, program budgets, and schedules provide the developmental path for current mission command programs through the next seven to ten years of technical development. Consequently, this appendix focuses on S&T capabilities and developing technological trends that could be mature in 2025-2040. This includes technologies currently available, but requiring additional development to be adapted to the operational environment.

d. Several of the technologies discussed in the AFC-MC may apply to more than one challenge area identified; however, for clarity, they are presented in a single challenge area only. The

following sections highlight the technologies that require additional development and investment to help the Army mitigate future operational challenges.

## **C-2. Uncertain, highly-competitive, and dynamic future operational environments**

a. The U.S. and its allies cannot avoid or control the complexities of the future operational environment. Rather, the Army strives to gain and maintain an understanding of the operational environment in which it operates. Understanding the operational environment requires sensors coupled with deep-learning technologies capable of broad and far-reaching data analysis. The ability to sense and understand the operational environment will allow leaders to make more informed decisions and enable them to take disciplined initiative.

b. Big data analysis is one of the most relevant development and exploitation technologies that enables a deep understanding of the operational environment. In this concept, big data is defined as extremely large data sets that may be analyzed computationally to reveal patterns, trends, and associations. The world's capacity to exchange information via telecommunications networks has grown by over 3,000 percent from 1986 to 2014 highlighting the potential of big data.<sup>199</sup> This data includes information that may appear unrelated and random.

c. Leveraging emerging commercial tools will help the Army understand human motivations and actions around the world. The list below are examples of big data sets to which the Army needs access to understand potential operational environments throughout the world. Collecting this data is the responsibility of agencies other than the Army, but the data sets should be made available to the Army (and the DOD) to inform tools capable of supporting operational design and contingency planning processes and products. Potential data sets of interest include:

- International, national, corporate, and individual financial transaction information.
- Social media trends, behaviors, and preferences.
- International, national, state, and local criminal activity patterns and police records.
- National, state, and local retail purchase information.
- National, state, and local web search patterns.
- National, state, and local website usage trends.
- National, state, and local commercial travel and passport information.
- National, state, and local cell phone use and location information.
- Location and movement of specific people of interest.

d. The availability of large data sets requires new tools; autonomy at rest that can collect, process, and sort information effectively. Powered by a new generation of high-performance computing providing quantum power-like capability, these tools will recognize patterns and detect anomalies alerting users to make decisions in anticipation of problems, instead of simply reacting to them. Social network analysis (SNA) is the mapping and measuring of relationships and information flows between people, groups, organizations, computers, websites, social media applications, and other connected information or knowledge entities (figure C-1. highlights one example). The nodes in these networks are people, groups, and organizations while the links show relationships and flows between the nodes. SNA provides a visual and a mathematical understanding of human relationships.<sup>200</sup> The information can be incorporated into Army

applications and interfaces to allow leaders to grasp relevant environmental factors, such as population groups, emergent leaders, and critical infrastructure, quickly. Large data sets and SNA technologies are the foundation of social and cultural models. These models are critical to understanding the operational environment and providing realistic training and actionable information to Soldiers.



**Figure C-1. The Facebook social network**

f. Work in SNA research is being conducted now but requires additional research and investment to ensure a capability is available to address Army operational requirements needed during the timeframe of this concept. Additional technology and applied research areas requiring investment include sensor and data fusion and integration; genetic and sentiment algorithms; machine learning; natural language processing; signal processing; simulations; and time series analysis.

### **C-3. A wider range of clever, adaptive, and networked threats**

a. Future threats fall into two broad categories: traditional military forces and combinations of non-traditional adversaries. The Army must prepare to operate against both categories and continue to provide Soldiers and organizations with equipment and systems that provide a decisive technological edge. Regardless of the operational environment or tactical situation, new materials and advanced network technologies for communication and collaboration will be required.

b. Network technologies. The Army requires robust and reliable network capabilities to transport large data sets needed for future analytic and predictive tools. These capabilities support communication and collaboration between installations positioned permanently in the U.S., through each command echelon, to the individual, forward-deployed Soldier to ensure the actionable information needed is always available. Examples of these capabilities include investments in the following.

(1) Ground and aerial robotic and autonomous systems to help establish the Army information network during early entry operations and support mission command on-the-move during subsequent movement and maneuver. Robotic and autonomous systems are required to reduce

cognitive burden, aid in decision making, improve situational awareness, and provide persistent monitoring of the operational environment.<sup>201</sup>

(2) Ad-hoc mesh networking capabilities to provide consistent and reliable digital communications to the lowest tactical echelon. These next-generation networks will provide high quality service and power savings to reduce logistical demand.

(3) Spectrum analysis and management tools to assist commanders understand the electromagnetic environment and to visualize and control how networks will support the mission.

(4) Enhanced telepresence technologies to enable collaboration among dispersed members of an organization. This includes technologies such as holographic video-teleconferencing that allows persons to feel as if they are present, or gives the appearance of being present. These enhanced technologies allow collaboration among dispersed individuals as if they were in the same location.

(5) System-on-a-chip. These self-contained systems can be inserted into many physical objects to add large quantities of data that creates greater opportunity as well as risk. Investments should focus on applying and integrating this technology into mission command information systems.

(6) Print-your-own-device. When combined with technologies like system-on-a-chip, print-your-own-device capabilities allow leaders and Soldiers to create expedient devices to meet situational demands.

c. Advanced technology and materials. Future technology represents both opportunity and risk for the Army during 2020-2040. These will provide Soldiers and units with capabilities that give them decisive advantages. However, capabilities that exact costs in weight and power requirements must aim to decrease overall load and overhead. Advanced material research could mitigate these risks with capabilities that provide the following.

(1) Energy. This includes power cells that improve energy density for dismounted or remote operations; ambient power generation sufficient to enable burst communications; and wireless power that supplies nearby user needs to reduce or eliminate the Soldier's burden.

(2) Camouflage. Other materials must enable forces to remain unseen or avoid detection from threat forces. Smart ink and paints will camouflage forces from all manner of detection, not just visual, and will deny the enemy targeting CPs effectively.

(3) Armor. Future armor will include materials that provide greater protection with reduced weight for Soldiers and systems. These materials may be rigid, or have properties that enable them to redirect forces to reduce or eliminate harm to friendly forces. These could be applied to CPs to make them more survivable after detection.

(4) Directed energy weapons to defeat unmanned aerial systems and counter rocket, mortar, and other indirect fire attacks on deployed CPs and tactical units.

- (5) Satellite alternatives for location and navigation.

#### **C-4. Range of potential missions and unfamiliar and emergent mission situations**

a. As part of joint, interorganizational, and multinational teams, the Army must prepare to deploy and execute operations ranging from military engagement, security cooperation, deterrence, crisis response, to major operations and campaigns. The nature of future operations includes missions and tasks with which units have little experience or training prior to deployment.

b. Commanders and Soldiers must learn, integrate knowledge, adapt tactics, prepare plans, and tailor supporting mission command systems rapidly to the unique situations. Consequently, optimizing human performance and abilities (physical, cognitive, and social) is central to effective mission command. Optimizing human performance requires focused investment in the human dimension and advanced systems engineering to achieve integrated development of these capabilities. S&T initiatives that support future mission command across the broad range of potential missions include the following.

- c. Social science theory and applications.

(1) Trust, cohesion, and candor measures and metrics to enhance team building within and between units and mission partners. This includes training interventions to improve these attributes when shortcomings are identified.

(2) Social and cultural models and simulations that create realistic training environments for human behavior and interaction.

(3) Tools that enable Army forces to generate messages directed at engendering trust and favorable perceptions and opinions within American, global, and host nation populations.

#### **C-5. Greater cognitive and social demands**

a. Regardless of S&T advances, humans will remain the center of conflict and the force behind winning the contest of wills. This task creates new responsibilities and reframes old ones.

b. Technology assists in preparing future leaders, Soldiers, and Army Civilians for unfamiliar missions through immersive simulation environments. Technology provides realistic training for lethal engagements requiring correct individual actions and leader decision making. This technology provides challenging nonlethal, human, social, and cultural engagements requiring critical thinking and well-developed emotional intelligence.

c. S&T also makes contributions beyond the training domain. In 2020-2040, the ability to modify human performance significantly is a real possibility.<sup>202</sup> Examples of these technologies include the following.

(1) Pharmaceuticals. Nootropic drugs and nutraceuticals may improve mental functions such as cognition, memory, intelligence, concentration, and attention allowing Soldiers to function with

little sleep, make better decisions under stressful conditions, and improve learning speed dramatically.

(2) Neural prosthetics. Wearable and implanted neuro-stimulation devices may improve brain function and allow Soldiers to interface directly with information, computers, and other machines.

(3) Computer displays embedded in contact lenses. These contact lenses may allow immersive access to data and enhanced perception, such as night vision and augmented reality.

d. Applying human-oriented technologies requires the Army to overcome potential criticism that the technologies might be used without careful consideration of the long-term consequences on Soldiers and society. The discussion on the ethics of manipulating or altering human biology needs to begin now as a first step in leveraging these capabilities.<sup>203</sup>

## **C-6. Conclusion**

a. Predicting technological developments that might impact future Army operations is difficult. The uncertainty, competitiveness, and dynamic nature of future operational environments, the array of threats, the range of potential future missions and their emergent nature provide the basis for this appendix.

b. The Army focus is on advanced technological capabilities that provide commanders and staffs with the tools necessary to understand and operate within the environment in 2020-2040. The capabilities and technologies discussed are purposely broad, serve as a general guide, and allow for unforeseen technological advances or breakthroughs. Therefore, the capabilities and technologies identified are not prescriptive in nature. They fuel the dialogue between user representatives, research and development organizations, and systems developers.

c. The Army's ability to address the commander's future needs is predicated on capability and system developers working together across organizational boundaries. Success will happen through the efforts of dedicated professionals more concerned with providing leaders, Soldiers, and Army Civilians with mission command capabilities and less concerned with organizational goals.

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## **Appendix D**

### **Risks of Adopting this Concept**

#### **D-1. Risks from concept hierarchy**

The implementation risks stated in the Capstone Concept for Joint Operations, ACC, and AOC, apply equally to this concept.<sup>204</sup> The AFC-MC has identified the following additional risks.

#### **D-2. Risks within the Army functional concept for mission command (AFC-MC)**

a. Commanders centering on themselves and their own ideas.



(1) The Army force requires commanders and leaders with strong character, presence, and intellect. They must be confident in their own tactical and technical expertise, judgment, and thinking abilities. While the commander may be the wisest and most experienced person in an organization, excessive confidence in, and insistence upon acceptance of, their own understanding is as detrimental as too little confidence.<sup>205</sup> Instead, competent and confident leaders display intellectual humility, are approachable, encourage reasoned candor and open dialogue, listen actively to all perspectives, and ensure others voice honest opinions without fear of negative consequences.<sup>206</sup> An open and candid environment is key in creating a unit that recognizes and adapts to change.<sup>207</sup> Approachable commanders show respect for other opinions, even if contrary or against mainstream thought. Commanders designate others to offer differing viewpoints and perspectives to guard against groupthink and the tendency to adopt the accepted viewpoint blindly.

(2) Commanders operating under the mission command philosophy put leader development, cohesive team building, organizational improvement, and mission accomplishment ahead of ego and self-promotion.<sup>208</sup> Success bred from arrogance does not prepare future leaders, Soldiers, and Army Civilians to recognize opportunity, take disciplined initiative, and win in a complex world.<sup>209</sup>

b. Imprudent application of the mission command philosophy.

(1) Mission command must be understood accurately to be employed properly. Mission command cannot be reduced to simple formulas. Its fundamental principles require varying amounts of judgment in their application. For example, the amount of control, the echelon to which decision-making authority and warfighting capabilities are decentralized, and the level of prudent risk are dependent on the operational environment, situation, and how well leaders have developed their subordinates and applied the other mission command principles.

(2) Army leaders cannot apply the mission command philosophy directly to other joint, interorganizational, and multinational partners that have not trained and prepared for its use. Many future partners may operate under centralized control only and by following detailed orders and instructions; disciplined initiative may not be part of their organizational culture. Army leaders must prepare to adjust their leadership to accommodate partner capabilities and needs.<sup>210</sup> However, creating shared understanding; providing a clear intent, purpose, and priorities; promoting boldness, agility, and innovation; building a networked, cohesive team; and cultivating candor and trust are applicable to conducting any operation with any group of mission partners.

c. Regression to a risk-averse environment.

(1) Returning to a risk-avoidance or “zero-defects” command climate creates an environment in which junior leaders are reluctant to take initiative or exercise individual judgment for fear of being punished for failure.<sup>211</sup> Some senior leaders in this setting might seek to protect subordinates by not allowing them to undertake opportunities where they might fail. However, not allowing subordinate leaders opportunities to push limits, make mistakes, and learn by the results, stunts junior leader growth and inhibits experience necessary to accomplish missions in future environments.<sup>212</sup> Instead of developing leaders who identify opportunities, weigh and accept risk,

achieve advantage, and learn and recover from honest mistakes, the Army could create leaders who find success by seeking to avoid all risk. These leaders may be forced later to make difficult decisions in unfavorable circumstances. Lacking experiential judgment, they may make poor decisions and fail to recover from mistakes. What might only be a temporary setback for a trained, experienced, and resilient risk-taker could become a permanent mission failure for the risk-averse.<sup>213</sup>

(2) To diminish the potential for regression to a risk-averse environment, senior leaders exercise moral courage and underwrite honest mistakes made as subordinates take disciplined initiative. Senior leaders must remain proactively involved in leader development (including the establishment of a rigorous unit professional development program); monitoring, assessing, and improving command climates; and assigning and positioning personnel appropriately.<sup>214</sup> Commanders can make full use of organizational climate surveys, routine exit interviews, and multi-source evaluation and assessment tools to assist in maintaining a culture and command climate that promotes disciplined initiative and prudent risk-taking.<sup>215</sup> Additionally, a comprehensive, meaningful, and individualized counseling program will help drive self-development and improve performance. Future leaders must be assessed by their ability to empower subordinates to take disciplined initiative and by their ability to develop, encourage, and reward bold, agile, and innovative leaders of character.

d. Overreliance on technological capabilities. The Army may become overly reliant on technological capabilities limiting its ability to operate in a degraded environment. Units effective at maximizing the capabilities of technological enablers may also be at-risk by their loss. In the past, operating degraded included continuing to operate in the complete absence of certain enablers. The increased use of and reliance on the Army information network and other technological enablers may create situations where organizations perceive that without certain enablers, operations are no longer possible. Organizations that allow the atrophy of non-network-enabled skills will require a minimum capability to remain effective. This minimum defines what it means to operate degraded. Training and routine practice on analog and manual systems and processes helps mitigate this risk. Units need to incorporate events that practice analog or manual techniques routinely to ensure in the absence of space enablers, the Army information network, and other technology, they remain combat effective and able to accomplish assigned missions.<sup>216</sup>

e. Incompatible information systems between active and reserve components. As the Army moves toward downsizing active component corps and division headquarters, the Army may employ a multi-component approach to manning these headquarters; thus, the need for interoperability between the active and reserve components increases. Ensuring multi-component staff sections have access to compatible hardware and software in sufficient quantities is necessary.<sup>217</sup> However, individual and collective training, standard operating procedures, habitual relationships, collaborative knowledge management, and a mirror-like increase in joint professional military education will be required to facilitate the effective integration of active and reserve elements into a single, cohesive staff and, overall, one Army.<sup>218</sup>

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## Appendix E Clarifying Mission Command

### E-1. Introduction

The AFC-MC proposes to broaden the mission command philosophy to encompass all Army leaders and expand the mission command warfighting function to include integration of all domain capabilities and elements of national power to win in a complex environment. This concept also suggests several refinements to improve clarity, ease and complete understanding, and thereby contribute to its inculcation into the Army Profession. While these refinements serve as the framework for this concept and future capability development, concepts are not doctrine. This concept presents emerging ideas that, after further experimentation and DOTMLPF analysis, may generate solutions to identified capability gaps; some of these solutions could be modifications to doctrine.<sup>219</sup>

### E-2. Clarifying the mission command philosophy

a. Current doctrine defines mission command as: *the exercise of authority and direction by the commander using mission orders to enable disciplined initiative within the commander's intent to empower agile and adaptive leaders in the conduct of unified land operations*. This definition combines a philosophy (for all Army leaders) with elements of the definition of command (applicable only to commanders). This combination can result in confusion where subordinate leaders, not titled commanders, foster the misconception that the philosophy is not applicable to them, or only applicable tangentially as they follow their commander's orders.<sup>220</sup> However, the mission command philosophy is wholly applicable to all Army leaders.<sup>221</sup>

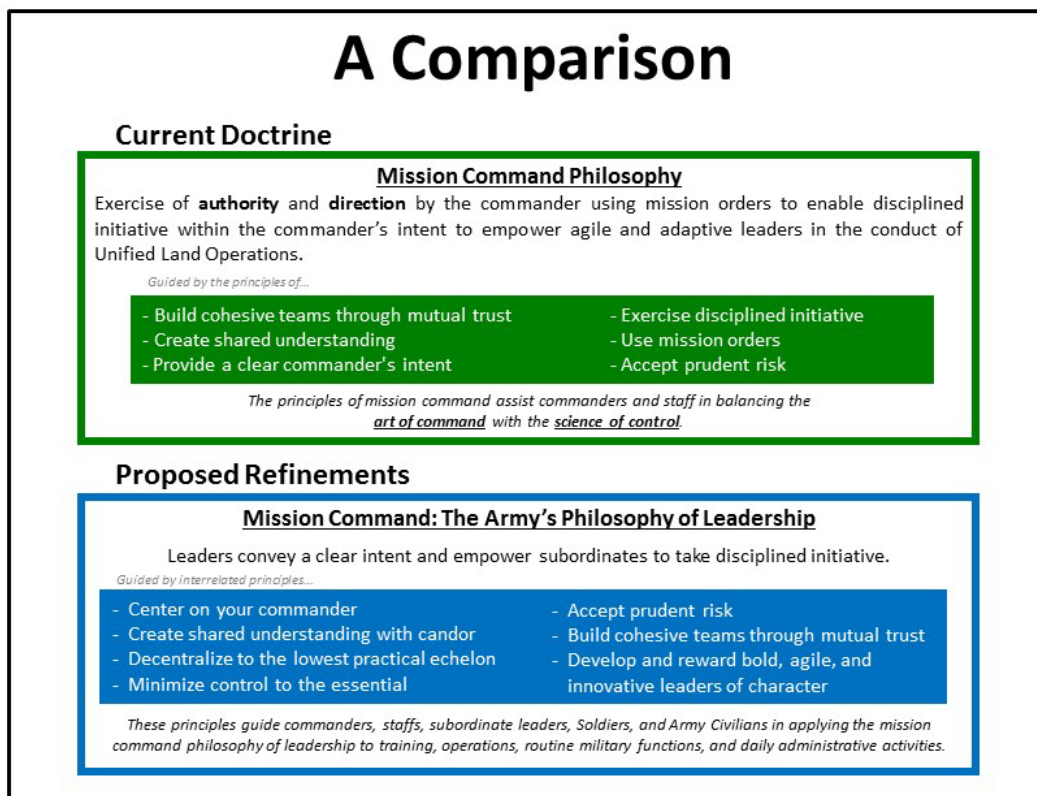
b. To improve understanding of its applicability, the AFC-MC offers a modification to the current definition of the mission command philosophy to make clear that, while mission command is commander-centric, all Army leaders, Soldiers and Army Civilians, are guided by these ideals during training, operations, routine military functions, and daily administrative activities. This concept proposes that the mission command philosophy be defined more simply and inclusively as: *leaders convey a clear intent and empower subordinates to take disciplined initiative*.

(1) The philosophical definition proposed drops the phrase: exercise of authority and direction by the commander. These two functions, the exercise of authority and the provision of direction, are inherent command responsibilities. These are what commanders and *assigned* Army leaders do as part of command.<sup>222</sup> In applying mission command, commanders exercise command to mitigate the effects of uncertainty and create more responsive organizations. All Army leaders (including commanders) use mission command to solve ill-structured problems, develop and harness subordinate talent, and improve their organizations continually.

(2) The proposed definition of the mission command philosophy drops the adjectives agile and adaptive as modifiers for leaders, and changes leaders to subordinates within the definition. The AFC-MC also recommends a new principle (see below) which captures and highlights the need to develop and reward bold, agile, and innovative leaders of character. Mission command is applied to empower all subordinates, not just those that are already agile and adaptive. The mission

command philosophy encourages the development of bold, ethical leaders with the mental agility to anticipate change, innovate, and adapt.

(3) This proposed definition drops or deletes the ending phrase of *in the conduct of unified land operations* to make the definition more enduring in view of any future doctrinal changes. (See figure E-1 for a comparison between the current and proposed refinements to the philosophy’s definition and supporting principles.)



**Figure E-1. Comparing current doctrine with proposed conceptual refinements**

c. The AFC-MC advocates clarifying the mission command philosophical principles, through deletions, retentions (with one modification), and additions, to capture fully the essentials that improve understanding, guide its employment, and form the basis for supporting capabilities development. The intent is to sharpen mission command philosophy understanding so that all Army leaders can readily apply it to training, operations, routine military functions, and daily administrative activities. Greater understanding leads to proper execution and to developing capabilities that enable mission command.

(1) Deletions. This concept proposes deleting the following three principles currently contained in doctrine as the ideas are covered in the definition and other principles. The principles recommended for deletion are: *provide a clear commander’s intent; exercise discipline initiative; and use mission orders.*

(a) *Provide a clear commander’s intent and exercise disciplined initiative.* The AFC-MC contends that the definition and mission command principles combine together as a unified,

holistic philosophy. The definition should state the key and essential nature of mission command succinctly. The principles should then serve as the fundamentals that guide leaders in employing that philosophy. Including intent and disciplined initiative in the definition and having two principles that say subordinates must follow the definition is redundant. However, subordinates should understand clearly what intent and disciplined initiative mean; but, the definition is justification enough that intent should be carefully crafted and conveyed and that all subordinates are dutifully bound to seek opportunities to take disciplined initiative.

(b) *Use mission orders.*<sup>223</sup> In the past, the Army described two methods of command: detailed command and mission command. Commanders would issue detailed orders if employing the first method of command, and mission orders if employing the second. While mission command was described as the preferred method, either method was acceptable. As long as the mission was accomplished, a micromanaging commander employing detailed command, regardless of the situation, could be judged a greater success than one who employed mission command and allowed their subordinates greater freedom to act, which may have resulted in initial missteps.

(c) As the Army's overarching leadership philosophy, all orders and directives must follow mission command principles to include minimizing controls and details to the essentials. Based on the situation, the minimum essential controls required may be great and necessitate detailed orders. In other situations, the minimum required may be considerably less. However, commanders seek to influence the situation to minimize the amount of control they provide, thus allowing subordinates the greatest freedom to act. While detailed orders and tight control may be essential for the existing circumstances, Army leaders will not be content operating centralized; centralization will be viewed as a temporary state. Future uncertain, highly-competitive, and dynamic future operational environments require leaders prepare subordinates to think and operate independently. Accepting less is a failure in leadership at multiple levels.

(2) Retentions. This concept proposes to retain the following three principles: create shared understanding with candor; accept prudent risk; and, build cohesive teams through mutual trust.<sup>224</sup>

(a) *Create shared understanding with candor.* Creating and maintaining shared understanding of the operational environment, underlying problems, and approaches to solving them is a continuous, iterative, and candidly collaborative process, and critical to realizing mission command.<sup>225</sup> Shared understanding is founded in Army doctrine, the profession's common values, lexicon, and approach to conducting operations. Army professionals know doctrine and use it as an informed starting point to guide individual and unit action; however, they also understand that new situations may require deviation from doctrine, training, and individual experience, so they exercise mental agility and adapt accordingly.<sup>226</sup>

(b) Shared understanding is not just the outcome of close, frank dialogue between commanders and their staffs; but, it results from and is enhanced by simultaneously sharing information and developing a common, contextual understanding laterally and vertically between echelons and joint, interorganizational, and multinational partners.<sup>227</sup> Commanders, subordinate leaders, and staffs at each echelon add analysis and context to the situation to help clear fog and friction and mitigate uncertainty. Shared information does not diffuse power, it multiplies power. Shared understanding empowers subordinates and helps build teams and trust. Those practicing

shared understanding are transparent and inclusive, and ask and answer the questions: “who else might need to know?” and “who else might have relevant knowledge and information to contribute?”<sup>228</sup> Because mission command is commander-centric, the commander will have a more complete situational understanding than staff and subordinates.<sup>229</sup>

(c) The commander must foster continuous and candid commander-staff-subordinate-partner dialogue to ensure that the organization maintains the best possible shared understanding.<sup>230</sup> This dialogue, a combination of forthright, open, and productive discussions, is essential to a commander’s understanding of subordinates’ or partners’ unique situations and concerns and how their actions and activities contribute to achieving intent.<sup>231</sup> Fostering candor is especially important among mission partners of different organizational and social cultures whose differences may cause confusion and discord. Shared understanding of the operational environment leads to improved understanding of the problem, which facilitates better courses of action, decisions, and actions at all echelons and among all joint, interorganizational, and multinational partners. An improved situational understanding developed through professional candor also allows commanders and their subordinate leaders to anticipate and lead transitions, clarify risks, and decide what risks should be accepted to create opportunity.

(d) *Accept prudent risk.* This principle recognizes that friction and chance can influence events radically and that actions leading to success—often taken during disciplined initiative—frequently involve a higher level of risk. The decision to accept prudent risk is a deliberate exposure to potential injury or loss when the objective is judged to be worth the costs of life, equipment, or other resources. Prudent risk requires open dialogue between commanders and subordinates when deciding how much risk is acceptable, and how to minimize hazards. Commanders must establish a climate that promotes candor and frankness between themselves and their subordinates for dialogue to be successful; subordinates must also promote dialogue with those below them.<sup>232</sup> Shared understanding and clear intent help subordinates determine if planned actions are practical even when communication is lost. Deciding whether to accept a risk highlights the indivisible relationship between the art and science of command during this military cost-benefit analysis. While expertise in the science of warfare is important to employing forces and capabilities, military risk decisions can never be reduced solely to a mathematical or physics problem.<sup>233</sup>

(e) *Build cohesive teams through mutual trust.* Cohesive and trained units and organizations are essential components for successful military operations, particularly in conditions of uncertainty, when operating decentralized or dispersed over wide areas, and when employing lethal capabilities in close proximity to civilian populations. Realized mission command requires Soldiers be experts in fundamental warfighting skills and the ethical application of tools, processes, systems, and external capabilities. The mission command philosophy is unsustainable without this foundation.<sup>234</sup> Cohesive teams understand the strengths and weaknesses of their key leaders, learning to mitigate their weaknesses while capitalizing on their strengths. Cohesion aids in and is aided by creating shared understanding. However, during the decision-making process, effective teams avoid cohesion or unity of thought. Instead, they use cohesive bonds to promote reasoned candor and the bold development of innovative courses of action.

(f) Truly cohesive teams view frank communication, professional disagreement, divergent thinking, and debate as desired organizational characteristics, not as dissension or disloyalty; subordinates become vested in achieving the course of action that they helped to shape, whether or not it is the one they suggested. Cohesive teams develop within a climate of mutual trust between and among Soldiers and Army Civilians; Army leaders, Soldiers and Army Civilians; Army leaders and other joint, interorganizational, and multinational partners; and, between Army and governmental leaders within domestic and foreign populations. This contract of trust does not simply occur. Trust is founded in the Army Ethic, cultivated, and protected.<sup>235</sup> Trust is developed through education, standards-based training, experience, and mentoring. Leaders and subordinates learn to trust each other's abilities and judgment; thus, becoming trustworthy.

(g) Judgment is developed by presenting subordinate leaders with challenging situations or scenarios and allowing them to develop their own courses of action, make decisions and then learn how the decisions might have been better with other options.<sup>236</sup> Often decisions that fail or produce less desirable outcomes provide powerful lessons. Judgment and capability-based trust begins at the Army institutional level. A commander task-organized with a subordinate organization with which the commander has never trained, must trust that Army institutional processes (leader development, command selection, and others) have produced a competent leader and capable organization able to accomplish assigned missions.<sup>237</sup> Commanders and Soldiers alike trust that the Army has developed leaders able to operate under the mission command philosophy. Trust of Army leaders and organizations by joint, interorganizational, and multinational partners is gained and preserved by capable organizations and competent leaders whose words and actions are congruent, that is, Army leaders and organizations that can and will follow through on agreements.<sup>238</sup>

(h) Trust among mission partners is based on an ability to identify common goals and objectives, and safeguard entrusted information against insider threats and external intrusions.<sup>239</sup> How well the Army and its commanders develop cohesive teams built on a bedrock of mutual trust determines how well leaders, Soldiers, Army Civilians, and organizations adapt and respond to challenges.

(3) Additions. This concept proposes to add four principles: center on the commander; decentralize to the lowest practical echelon; minimize control to the essential; and develop and reward bold, agile, and innovative leaders of character.

(a) *Center on the commander.* This addition captures the belief that a commander is responsible for all the command does or fails to do, establishes the unifying, long-term vision, and makes the moral and ethical decisions that prepare and guide the organization toward mission accomplishment. Subordinate commanders and leaders, staffs, and supporting processes, procedures, tools, and future capabilities assist commanders with understanding, visualizing, describing, directing, leading, and assessing. Subordinates assist commanders in making the best decisions with the information available at the time. In uncertain, highly-competitive, and dynamic operational environments, best decisions are not perfect decisions based on perfect information. Instead decisions are workable, implemented rapidly, and adapted as commanders, staffs, and subordinates learn more through action.

(b) Based upon unity of command. This proposed principle had unity of command as its base. Unity of command is an enduring principle of joint operations. It means that a single commander, assisted by the staff, develops a unifying vision and then directs and synchronizes the actions of all forces and capabilities toward that common vision.<sup>240</sup> Coordination may produce cooperation, but giving a single commander the authority required to accomplish assigned missions is the most effective way to achieve unity of effort and create synergy through the actions and activities of subordinates. The staff anticipates the commander's current and future information needs and within time and resources available, organizes and provides the information in a manner which the commander can receive, understand, use, and share best.<sup>241</sup> The staff then helps formulate, describe, and translate the informed decisions, priorities, and intent through well-written and communicated orders into decisive action, integrated and synchronized in time, space, and purpose and with allocation of appropriate capabilities and resources.<sup>242</sup>

(c) Requires intellectual humility.

(1) Future Army commanders recognize that they are not infallible and that their ideas may not be the best. The best courses of action are the result of leveraging the analytical abilities of staffs and subordinates and making the most of available knowledge and cognitive resources from joint, interorganizational, and multinational partners. With intellectual humility, commanders promote candor and intellectual debate, and remain open to diverse points of view and the possibility that the best idea may come from a subordinate leader, staff officer, or other mission partner with less experience.<sup>243</sup> Commanders recognize the soundness of an idea instead of focusing on rank or position. Subordinates must possess the moral courage to provide unbiased information, subject matter expertise, and functional area advice and assessments they consider necessary to properly inform their commanders' understanding and decision making.<sup>244</sup> Understanding their own commander's intent and how it nests with the intent of their next higher-level commander, subordinates must continually think ahead in time and space to find or create opportunities to contribute to achieving their commander's vision and end state.

(2) Good decisions, properly analyzed, debated, and refined to account for potential risks and weaknesses, are easier to explain and understand and allow subordinates to grasp their roles quickly, mitigate risks, and take initiative to achieve success. Intellectual humility establishes the conditions for commanders to make and communicate good decisions quickly, execute a viable course of action for existing circumstances, and conduct meaningful assessments that inform future decisions and necessary corrections.

(d) Commander versus leader. During the center on the commander principle development, extensive consideration was given to the use of commander versus leader. While the debate is ongoing, commander was chosen to emphasize that, within the Army Profession, subordinates focus on leaders that by rank or assignment, exercise command. Subordinates focus on those having the authority and responsibility for using available resources effectively and planning, organizing, directing, controlling, and leading to accomplish assigned missions. Commanders also have the responsibility for health, welfare, morale, and discipline. Commanders are leaders and have responsibility for accomplishing the mission and taking care of their subordinates; leaders that are not commanders may be solely responsible for completing the mission or task at hand.<sup>245</sup>



(e) The AFC-MC broadens the applicability of the term commander (and command) to include both Soldier and Army Civilian leaders. An assigned Army Civilian leading a military organization is a commander. Both Soldiers and Army Civilians can be granted authority and assigned responsibility, although these authorities and responsibilities may emanate from different sources and vary considerably in scope, scale, and purpose (for example Title 10 or Title 5 of the United States Code). Uniformed military members of the Army Profession (with few exceptions) are the only commanders granted the authority and responsibility to direct the employment of lethal force or to place subordinates at risk to accomplish the mission.<sup>246</sup> Commander, in this principle, recognizes the Army Profession, unlike other non-military professions, is responsible for preparing and winning the Nation's wars. This concept does not change commanding officer as it applies to Army leaders that have specific authorities under the Uniformed Code of Military Justice. Broadening the idea of command and commander does not weaken the authorities or take away the responsibilities of those Army commanders historically titled company commander, battalion commander, brigade commander, and others.

(f) Decentralize to the lowest practical echelon. This second principle guides commanders to entrust the appropriate decision-making authority and associated capabilities to the level possessing the relevant situational understanding needed to make those decisions.

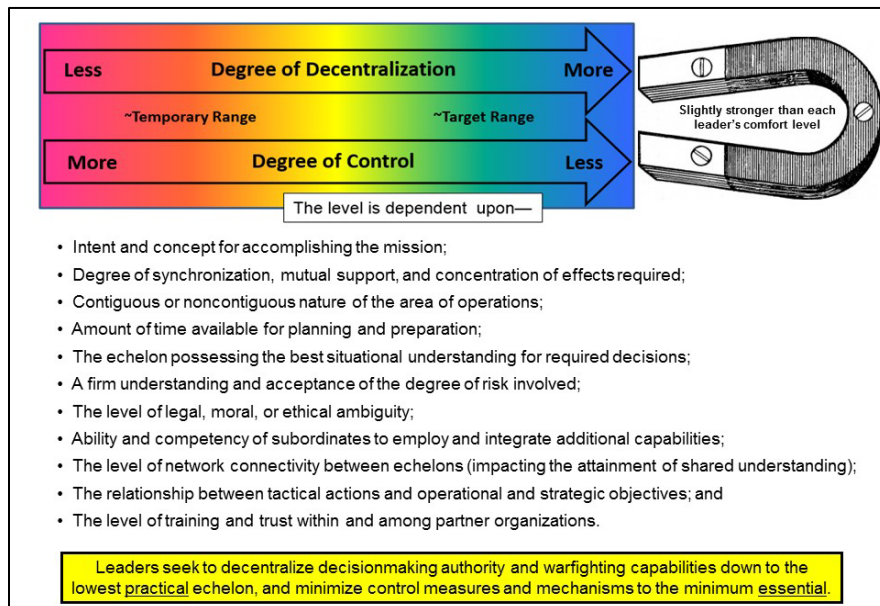
(g) This approach is not laissez-faire. Though senior leaders may want to hand well-structured-problems to subordinates, mission success in future uncertain, highly-competitive, and dynamic operational environments will rest on the ability of lower echelons, possessing the necessary authorities and capabilities, to frame their own mission problems and act decisively to seize, retain, and exploit the initiative. This principle is not advocating a laissez-faire or hands-off form of leadership wherein all authority and power is in the hands of subordinates who determine their goals. Decentralization requires accountability. Senior leaders monitor and assess how well subordinates progress within the broad purpose contained in their intents, how well they use the authority and resources provided them, how well they capitalize on decentralization of authority to seize advantage, and to what extent they use the opportunity to develop individual and subordinate competencies.

(h) Decentralizing to the lowest practical echelon requires patience and restraint. Decentralizing decision making authority, warfighting capabilities, information, and other resources to the lowest practical echelon empowers subordinates and enables adaptation in uncertain, highly competitive, and rapidly changing environments.<sup>247</sup> Given access, competency, and authority to employ combined arms capabilities (including joint enablers), junior leaders possessing closer-to-the-action situational understanding can make timely decisions, exploit fleeting opportunities, react quickly to the demands of armed conflict, and combine capabilities and resources creatively to achieve local overmatch against threats.<sup>248</sup> This proposed principle requires Army leaders at every echelon to exercise varying degrees of patience and restraint to allow subordinate commanders, leaders, and staff officers the opportunity to act and develop situations instead of succumbing to the perceived comfort of centralized direction.<sup>249</sup>

(i) Decentralizing to the lowest practical echelon aids reach, durability, simultaneity, and cohesion. Decentralization extends the commander's reach and increases the organization's endurance. Subordinates can apply ingenuity to solve problems and manipulate available combat

power across multiple domains to counter and defeat enemy actions and take other measures to achieve the desired end state for longer periods without additional direction and materiel resources. Decentralization is also a means by which the commander creates simultaneity and greater tempo, attacking enemy centers of gravity through multiple, simultaneous actions that overwhelm an enemy's ability to respond effectively.<sup>250</sup> Decentralization helps insulate friendly cohesion from the effects of enemy activity as there is no single point of failure.

(j) Applying this principle, specifically the lowest level to which decision-making authority and combined arms capabilities are decentralized, requires a combination of logic and seasoned judgment (see figure E-2).<sup>251</sup> To grow trust and develop professional competency and confidence needed to employ this principle to its fullest, subordinates must be provided with decision-making authority routinely. They must be trained in all the capabilities they are expected to employ, placed in demanding situations, coached during formal training and education, and mentored throughout their entire career.<sup>252</sup>



**Figure E-2. Factors affecting decentralization and control**

(k) Minimize control to the essential. The third principle establishes the conditions necessary for Army leaders to apply the mission command philosophy freely to all they do in training, operations, routine military functions, and daily administrative activities.

(l) Minimizing control is not formulaic. This principle advises leaders to establish minimum control measures and mechanisms that give the greatest freedom of action and initiative by subordinates.<sup>253</sup> Minimizing control requires leaders to exercise judgment. Unlike decentralization, which gives subordinates more authorities and capabilities, minimizing control empowers subordinates by limiting the constraints placed upon them. Establishing control mechanisms and measures is prescriptive; that is, they are requirements that subordinates must follow. Therefore, from the subordinate's perspective, control measures constrain courses of action. Since mission command allows subordinates the greatest flexibility in accomplishing a commander's intent, senior leaders should strive for simplicity and only seek to establish the

control necessary to synchronize combat power at the decisive time and place while allowing subordinates prudent autonomy and freedom of action.<sup>254</sup>

(m) Minimizing control leads to control that empowers. Some degree of control is always necessary; however, commanders give subordinates wide latitude to accomplish their missions, enabling them to adapt the capabilities and talents at their disposal to the task and situation at hand. Rapid deployment activities, initial phases of a forcible entry, or a river crossing operation (as examples), may temporarily require tight control and a high level of synchronization of subordinate activities (and less decentralized authorities and capabilities). When fighting a highly dispersed, adaptive, and networked enemy, subordinate leaders may be granted greater freedom of action and independence to facilitate greater initiative and the force's agility despite being dispersed over wide areas. Effective control measures and mechanisms actually empower subordinates by reducing some elements of uncertainty with respect to friendly forces and create conditions under which subordinates can focus their capabilities to accomplish the commander's intent. Minimization of control promotes greater opportunity to seize, maintain, and exploit advantage, but must balance against risk, especially when tactical actions directly support or influence operational objectives or strategic goals.<sup>255</sup>

(n) Develop and reward bold, agile, and innovative leaders of character. The final additional principle emphasizes that the Army as an institution (and commanders at all echelons) must aggressively commit to developing leadership attributes and competencies essential to realized mission command. This principle provides an essential link between mission command and the principles of leadership, unit training, and leader development.<sup>256</sup> It underscores a values-based approach to leadership and leadership development.

(o) Developing and rewarding leaders are keys to generating overmatch against future opponents. While self-development and personal study are essential, this principle places responsibility on all leaders for the cultivation of these fundamental qualities essential to realizing mission command in their subordinates. Mission command does not exist unless leaders actively develop these traits. The greatest variable on the battlefield is the performance of the people (the human dimension) and forces pitted against one another; consequently, this principle generates future advantages through exploitation of subordinate commanders' and leaders' imaginations and talents to create opportunity. The cultivation of these qualities generate ethical leaders who avoid complacency, are inquisitive and proactive, speak with thoughtful candor, and act with speed and creativity to solve problems and find new ways to train Soldiers, improve organizations, maintain readiness, and accomplish missions. These leaders constantly question the status quo, but discern when changes are unnecessary. This principle promotes self-reliance, novel and independent thinking, and the moral courage necessary to anticipate and adapt to uncertain or changing situations, understand problems and identify solutions, and act boldly to gain advantage and degrade enemy cohesion through surprise, speed, and force.

(p) Developing leaders described in the principle requires will and commitment. These individual attributes are the center of the Army's ability to seize, retain, exploit the initiative and win decisively.<sup>257</sup> These qualities thrive in units and organizations with leaders who model and develop them in every Soldier and Army Civilian as a part of organizational and institutional leader development.<sup>258</sup> Without active leader commitment and constant attention to this principle,

mission command has little chance of realizing its potential.<sup>259</sup> Adopting this principle helps institutionalize the Army's dedication to the intellectual growth of Soldiers in all components and Army Civilians as a priority above developing enabling equipment and technology. While maintaining technological superiority is important, it is the courage, competence, and commitment of Soldiers and Army Civilians that have the greatest impact on the outcome of future conflict.

### **E-3. Clarifying the mission command warfighting function**

#### **a. Defining the mission command warfighting function.**

(1) The AFC-MC proposes streamlining the mission command's second role as a warfighting function to highlight its two main purposes: enabling a commander's ability to command; and, integrating and synchronizing all elements of combat power to prevent or deter conflict, prevail in war, and create the conditions for favorable conflict resolution. This recommended change incorporates the responsibility for controlling military forces as an inherent part of command. This change also reflects that, while mission command execution is both an art and science, this dichotomy is not integral to its definition or application. It validates the idea that the Army will always operate as part of a joint, interorganizational, or multinational team. The Army force must build the capacity to integrate and synchronize the effects of all joint, interorganizational, and multinational partners and capabilities, which are crucial to achieving outcomes across all domains.

(2) The mission command warfighting function integrates and synchronizes all elements of combat power, and integrates that combat power across all domains and with all instruments of national power, U.S. and coalition, to accomplish the mission.<sup>260</sup> With this change, the focus becomes the command function and not the means for controlling forces. Consequently, the proposed definition of the mission command warfighting function becomes: *a system, enabling capabilities, and supporting tasks that facilitate command and the integration and synchronization of combat power across all domains and with all instruments of national power to accomplish any mission.*

#### **b. The mission command system.**

(1) Two of the primary components of the mission command system outlined in doctrine are networks and information systems. The AFC-MC recommends combining them into a single Army information network. This change emphasizes there is only one unified Army technical network. The Army information network is the term to describe how the Army works to employ current communication technologies. This holistic system-of-systems or enterprise approach provides the intellectual framework for network capability development. Changes or modifications to any of the Army information network's components made to generate or increase capabilities in a particular area, (for example, to close a gap in communications capabilities required for current and future operations), must be weighed against potential negative effects on other parts of the Army information network, other components of the mission command system (people, the operations and knowledge management processes, and CPs), and the whole mission command system. Changes should be made to improve the commander's, staff's, and subordinates' ability to realize mission command; decrease cognitive load; enhance a Soldier's

ability to move, fight, take disciplined initiative, and win; and allow for integration and synchronization of combat power across multiple domains.

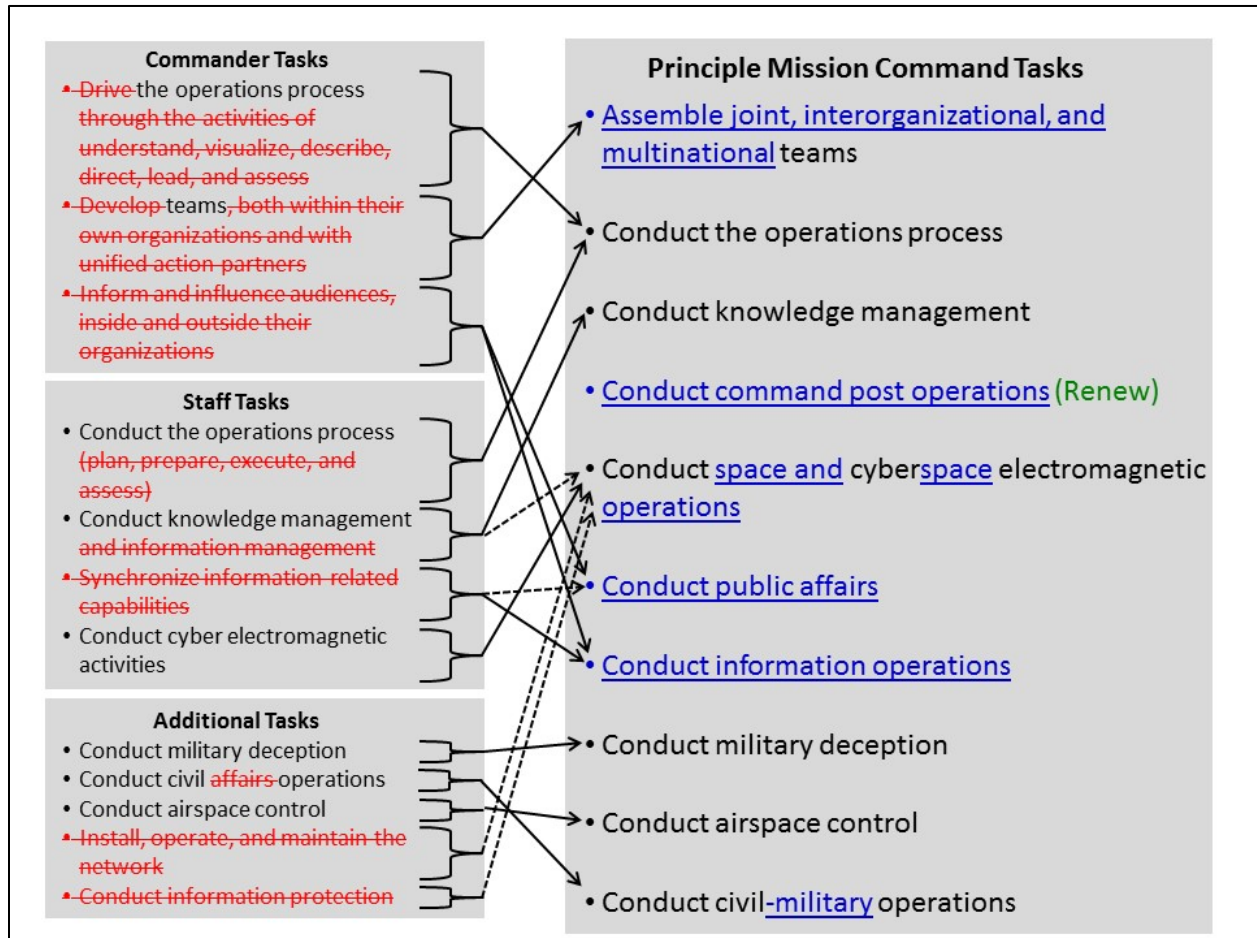
(2) In current doctrine, the networks component of the mission command system is plural to account for human or social context. This remains an important consideration. The human aspect of networks is considered more appropriately as a critical facet of how commanders assemble and link members of the personnel component of their mission command system into effective, cohesive, and trusted teams to accomplish a purpose. However, changing from *personnel* to *people* is recommended to improve understanding that personnel includes more than people under a commander's direct authority; it also includes all relevant mission partners that commanders link or network to build effective teams. The associated mission command task dealing with the development of teams is modified to account for the human context. Commanders *assemble joint, interorganizational, and multinational teams* and then apply the principle *build cohesive teams through mutual trust*. Here, this emphasizes that a commander's team can, through the application of technology, extend beyond boundaries of assigned physical area of operations.

(3) The mission command system's *facilities and equipment* component is recommended changed to *command posts* to highlight the primary purpose of mission command facilities and equipment is to establish locations from which commanders, assisted by their staffs, exercise command activities. This change also supports the idea that wherever a commander and staff are located (home station, deployed, within a building, tent, and others) becomes a CP or one of several command nodes within the organization's "collective command post" that may extend from home station, enroute, through an intermediate staging base, and into the area of operations. Consequently, this change helps to extend "train as you fight" to establishing and employing home-station and forward-deployed CPs.<sup>261</sup> The mission command system, with its CP component, exists to support mission accomplishment. Commanders and staffs organize and employ mission command system components to run daily activities at home station facilities the same as they would when training or operationally deployed. Therefore, home station headquarters buildings should be considered, organized, and operated as CPs.<sup>262</sup>

(4) The current doctrinal *processes and procedures* component is recommended to be changed to reflect its two key processes: the *operations process* and *knowledge management*. This change emphasizes the operations process is the primary engine by which the mission command warfighting function integrates combat power across domains, in time, space, purpose, and with appropriate resources. Other warfighting and integrating processes, continuing activities, and procedures feed, support, and enable this overarching process. Utilizing the results of the supporting knowledge management process, the commander and staff organize the operations process with other contributing processes, procedures, and activities (including those of the other warfighting functions), and arrange the other components of the system to support the flow of information that leads to knowledge, shared understanding, improved decision making, and decisive action.

c. The mission command tasks.

(1) The AFC-MC proposes combining commander, staff, and additional tasks into a single set of mission command tasks (see figure E-3). Each of these proposed tasks is driven by the commander and supported by staff. The commander and supporting staff perform these tasks to facilitate and support the command activities of understanding, visualizing, describing, directing, leading, and assessing. The commander drives each of these tasks and the staff, as an extension of the commander, supports and executes. This proposed change mirrors how other warfighting functions categorize tasks into a single set of tasks rather than splitting them into separate commander, staff, and additional tasks. It also helps to alleviate the criticism that commander and staff tasks should parallel each other directly.



**Figure E-3. A single set of primary mission command tasks**

(2) Commander task of *develop teams, both within their own organization and with unified action partners* is proposed to be revised as *assemble joint, interorganizational, and multinational teams*. Joint, interorganizational, and multinational partners can be inside or outside the organization so the phrase *both within their own organization* is redundant or confusing. The verb *assemble* conveys the idea of identifying and bringing together a diverse array of potential joint, interorganizational, and multinational partners. These multifunctional teams do not need to physically assembled in one location but can be assembled virtually and linked through the Army information network. In the future, teams may form and operate without face-to-face interaction

between leaders and subordinates. Once teams assemble and link, leaders apply mission command philosophy and principles to team development and employment.

(3) Current doctrine explains the legal and moral separation established between the distinct inform and influence lines of effort in the employment of information-related capabilities. In the inform line of effort, truth and transparency are paramount and never compromised. While truth is still foremost in shaping, swaying, and altering many foreign-neutral audiences, the influence line of effort does allow for employing deception and misinformation to affect threat decision making. While separate lines of effort, the need for their careful integration and synchronization to help prevent information fratricide led to the development of a single task of *conduct inform and influence activities*. However, for many key audiences outside the Army, this combined task contributed to an inaccurate perception that Army forces employ deceptive measures toward domestic and foreign-friendly audiences.<sup>263</sup> To minimize this false perception, the Army modified doctrine and replaced this task with *synchronize information-related capabilities*.

(4) The AFC-MC proposes separating the two lines of effort into two different tasks. One task would be *conduct public affairs* to indicate plainly that all commanders, staffs, Soldiers, and Civilians, (tempered by operational security concerns and within their echelon and area of expertise), provide accurate and truthful information to inform domestic and foreign-friendly audiences. The other task would be *conduct information operations* and this task would focus on threats and foreign-neutral audiences. This second task would also include synchronizing information-related capabilities to achieve unity of effort and prevent information fratricide.

(5) The success or failure of operations security is ultimately the responsibility of the commander. Failure to implement adequate operations security measures can result in serious injury or death to Soldiers and Army Civilians; damage to weapons systems, equipment, and facilities; loss of sensitive technologies; and mission failure. Operations security must be integrated into the operations and knowledge management processes and fully coordinated and synchronized with other security programs to be effective.<sup>264</sup> *Conduct operations security* is recommended moved from maneuver support and protection to the mission command warfighting function because of its interconnected relationship to other information-related mission command tasks. Placement of operations security under the mission command warfighting function aligns future Army forces with joint combined arms staff structures during operations.

(6) Due to technological convergence, space, cyberspace, and EMS capabilities interdependence, and the effects of one technological capability on another, space is included in the task that previously only included cyberspace electromagnetic activities to create the *conduct space and cyberspace electromagnetic operations* task.<sup>265</sup> Cyberspace electromagnetic operations includes network operations; offensive and defensive cyberspace warfare tasks; EW, electronic protection, and EW support tasks; and spectrum management operations. The two *additional tasks of install, operate, and maintain the network* and *conduct information protection* are critical subtasks of this modified space, cyberspace, and EMS task, but not stand-alone, higher-level tasks as currently depicted in doctrine.<sup>266</sup>

(7) The staff task of *conduct knowledge management and information management* becomes simply the mission command task of *conduct knowledge management*. Information management is a critical supporting subtask of how commanders and staffs manage information to generate and share knowledge.

(8) The task of *conduct civil affairs operations* is absorbed into the larger task of *conduct civil-military operations*; the use of civil affairs forces is a means to accomplish this task. Army civil affairs personnel continue to provide the staff expertise to integrate and synchronize civil-military operations for Army and Joint Force commanders.

(9) The AFC-MC proposes adding *conduct command post operations* as a key task to ensure all commanders and staffs understand how they contribute to organizing, integrating, and synchronizing people, the operations and knowledge management processes, and the Army information network within and between distributed command nodes, to support commander's decision making and conducting mission command for their particular mission or situation.<sup>267</sup>

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## **Appendix F**

### **The Army's Future Information Network and Command Posts**

#### **F-1. Introduction**

The Army information network is the Army's contribution to the DOD information network and consists of all Army information capabilities and associated procedures for collecting, processing, storing, disseminating, and managing information. CPs integrate the Army information network with supporting infrastructure and provide places from which the commander and staff conduct the operations process, the knowledge management process, and other mission command tasks and warfighting activities.

#### **F-2. Essential attributes of the future Army information network**

a. The Army information network is designed and built holistically to operate with mission command principles, supporting warfighting processes, and business procedures. The Army information network provides the warfighting platforms for cyberspace operations and other network-based activities. The Army information network enables future Army forces to outmaneuver adversaries physically and cognitively through extension of combined arms across all domains. To enable realized mission command across the entire Army, the Army information network facilitates the following.

(1) *Uninterrupted mission command*.<sup>268</sup> The Army information network facilitates the ability for commanders, staffs, and subordinate leaders to communicate together and with higher, lower, and adjacent units and other mission partners (digitally or by voice) and monitor, feed, and modify a common operational picture to enhance and maintain shared understanding. The Army information network facilitates these abilities during daily home station activities, training, and operational deployments; from the continental U.S.; to and throughout the area of operations; and across warfighting functions. It supports Army leaders and Soldiers while they move on the ground (dismounted or mounted and in all types of terrain), in the air, or on the water.<sup>269</sup> The



Army information network allows globally-responsive Army forces to exercise mission command anytime, anywhere, against any enemy. Uninterrupted mission command includes continuous planning among globally-dispersed command nodes and forces and throughout all phases of preparation, deployment, entry, and joint combined arms operations.

(a) Regardless of the mode of intertheater or intratheater movement and maneuver (ground, air, or sea), uninterrupted mission command includes a full enroute mission command capability, including access to real-time, all-source intelligence to support joint-expeditionary and multiple, simultaneous, and dispersed entry operations (forcible or permissive) into remote areas with little infrastructure.<sup>270</sup> Enroute or on-the-move mission command capabilities include integrated maneuver (ground and air), fires, and intelligence collaboration and planning tools and applications, the ability to view the air defense picture, the capacity to view real-time, full-motion video gathered from any collection platform, and the ability to provide updates to unit mobile devices while in transit.

(b) Uninterrupted mission command supports the rapid deployment and employment of combat-ready forces directly into noncontiguous areas of operations and the continuity between early-entry, follow-on, and rotational forces. It also supports joint combined arms maneuver by allowing the commander to exercise authority, direct action toward accomplishment of intent (including during planning and rehearsals), assess effects, and make timely and informed decisions in response to changing conditions.<sup>271</sup> Uninterrupted mission command across the range of military operations is achieved by integrating mobility platforms, computing environments, and supporting infrastructure carefully; a robust network transport that can leverage what is commercially available securely to augment organic Army assets; and proactive network management.<sup>272</sup>

(2) Expeditionary, dispersed, and decentralized operations.<sup>273</sup> The Army information network has ample capacity and robustness to support expeditionary, dispersed, and decentralized joint combined arms operations in remote, austere environments, dense urban areas, and other complex terrain. The Army information network connects air and ground maneuver, intelligence, fires, maneuver support, and sustainment elements; adjacent, subordinate, and higher echelons; and relevant joint, interorganizational, and multinational partners.<sup>274</sup>

(a) The Army information network provides a converged transport configuration, voice, data, imagery, and video. This transport configuration consists of a balanced continuum of line-of-sight and beyond-line-of-sight means that are reliable, layered (land, air, and space), and defended in cyberspace and the EMS, as well as the physical domains in which it exists. The Army information network provides multiple paths for information to take. When one path is disrupted, data or communications is automatically re-routed through another path or transport mechanism to the intended recipient. The Army's future transport is resilient and self-healing, and provides automatic and uniform access and updates to information, applications, and services, whether inside or outside the theater of operations, in garrison or at home station training facilities and field locations, or at CTCs. However, when the Army information network is severely disrupted, units and individuals can disconnect information systems, continue to conduct operations on individual systems or as part of a smaller closed network, and reconnect and resynchronize later within the Army information network when connectivity is restored.

(b) The Army leverages existing technologies to achieve required characteristics while reducing the Army's communications architecture footprint and reliance on fixed infrastructure. Robust and resilient transport is critical to the extension of a commander's reach, and the overwhelming synergy that can be created through shared understanding and synchronized warfighting capabilities. It enables leaders to have the right information at the right time to make the right decisions. It also enables the Army's future holistic training environment; supports continuous learning and adaptation by providing all Army leaders, Soldiers, Army Civilians, and organizations access to knowledge and educational opportunities (including the ability to create and participate in learning networks); and facilitates the ability to train and exercise command regardless of physical location or phase within the Army's future sustainable readiness process.<sup>275</sup>

(3) Interoperability with, and joint, interorganizational multinational partners. The Army information network supports dynamic and rapid forming and reforming of human and organizational networks among joint, interorganizational, and multinational partners and enables coordination, cooperation, and the secure exchange of real-time intelligence and relevant information to achieve unity of command or, with partners not under a commander's direct authority, unity of effort. Improving systems interoperability and creating a mission partner environment has priority over improving individual systems capabilities.<sup>276</sup>

(a) Interoperability enables synchronization of joint and coalition partners' lethal and nonlethal activities and capabilities through sharing and exchanging information and collaboratively creating, communicating, and rehearsing plans and orders.<sup>277</sup> Army mission command information systems enable senior Army headquarters to work, operate, and plan easily within a joint and coalition environment and transition rapidly to or join a JTF or joint force land component command.<sup>278</sup> The Army information network allows Army forces to establish or integrate into joint and combined fires and airspace control networks easily, greatly expanding munition, aerial, and sensor capabilities. Sharing sustainment data and information among mission partners enhances sustainment visibility and improves resource utilization.

(b) Technical interoperability with joint, interorganizational, and multinational partners (and the Army's own information systems) is attained through shared network services, infrastructure, and security architecture; establishing common data requirements and formats; and strict adherence to a common operating environment—a universal set of computing technologies and standards. Computing standards adhere to industry best practices to facilitate the integration and adaptation of future technology. However, the Army information network allows Army forces to share information rapidly, collaborate, and establish an unclassified common operational picture with mission partners that do not have clearance for classified information but are critical to accomplishment of the mission or in the lead (for example, interorganizational partners during a natural disaster or other DSCA or stability missions).<sup>279</sup>

(4) Dynamic network management. The Army information network is configured and reconfigured easily, secured, operated, maintained, and sustained to enable freedom of action and the exercise of disciplined initiative on land and through cyberspace. As bandwidth is considered a critical class of supply, the Army information network facilitates the visualization, and agile, responsive, and informed management of its voice and data transport resources to scale and align

with the commander's changing intent and priorities, modifications to task organization and scheme of maneuver, and evolving mission requirements rapidly.<sup>280</sup> Along with a robust network capacity, dynamic network management contributes to the establishment and maintenance of reliable and ultra-low latency communications to support fires, medical, and other selected mission requirements where accuracy and timeliness are essential to mission success. Dynamic network management also includes signature management to reduce susceptibility to signals intercept and enemy countermeasures. As part of DSCA or stability operations, the Army extends its network resources to other interorganizational partners when needed. Semiautonomous network management optimizes applications, service levels, and system performance to meet the commander's intent under all network conditions, across computing environments, and throughout all phases of an operation.<sup>281</sup>

(5) Access, availability, and protection of data and information. Characterizing data and information as intellectual ammunition, the Army information network establishes a single network identity for each individual or organization and allows timely, reliable access to data and information services for all Soldiers, Army Civilians, and authorized mission partners appropriate to their security clearance and need to know.

(a) Soldiers and Army Civilians access non-sensitive, distributed learning content anywhere and on any device. The Army information network bridges classification and allows visibility across multiple security levels without segregating hardware systems. However, the Army information network automatically blocks sensitive data, information, or network access to unauthorized individuals, processes, or devices, and detects and protects against modifications or destruction of data and information. This includes the capability to self-destruct, thereby preventing data and system capture by potentially successful attackers; to back-up data; and to allow remote locations to operate from back-ups to maintain uninterrupted mission command.<sup>282</sup> Cybersecurity for the Army information network keeps pace with evolving threats.

(b) Following threat attacks, debilitating environmental effects, or other operational hazards, the Army information network facilitates restoration of data, information, and information systems lost, damaged, or destroyed. In an information environment characterized by competing demands for limited network resources and combinations of space, cyberspace, and EW attacks, clear visibility and assessment of the status and functionality of the Army information network, coupled with agile network management, facilitate the availability, protection, and integrity of critical data and information to support mission requirements.<sup>283</sup>

(6) A tailorable common operational picture. The Army information network enables the receipt and dissemination of relevant information from all operational domains and warfighting functions for synthesis and display or overlay on a common operational picture available to the mounted or dismounted commander, leader, and Soldier; all higher-echelon CPs; and appropriate joint, interorganizational, and multinational partners.<sup>284</sup> This attribute supports battlefield visualization; enhanced collaboration and shared understanding; effective coordination; synchronized and timely action; and the establishment and maintenance of ready and globally-responsive units.<sup>285</sup> A single, standard data input into a unified database is accessed and shared among all Army information systems and applications at all echelons and across all functional

formations, and is directly attributable to the reporting organization for rapid verification in case of a perceived discrepancy.

(7) A standard and shareable geospatial foundation. To support interoperability and a real-time common operational picture, mission command information systems employ an accurate, high-resolution, standard, sharable geospatial foundation that enables all elements of the Army force (and other ground, supporting forces, and national agencies) to reference the same location no matter the map, device, or application used. This facilitates coordination, integration, shared understanding, interoperability, maneuver, targeting, and reporting.<sup>286</sup>

(8) Collaborative development of shared understanding. While a common operational picture is essential to generating shared understanding, screen icons, charts, and tabulated data, no matter how accurate, cannot describe a vision or idea, communicate intent and purpose, articulate prudent risk, and build consensus among a diverse range of joint, interorganizational, and multinational partners.<sup>287</sup> Achieving shared understanding and solving complex problems requires dialogue and collaboration.

(a) The Army information network provides a common suite of tools and processes that allow multi-form collaboration internally and externally to enable and speed shared understanding, cultivating trust and encouraging disciplined initiative. This attribute includes sharing ideas and developing understanding between superiors, subordinates, and peers in the form of sketching, highlighting, talking, listening, and gesturing through voice and voice-recognition, text, chat, video, white boarding, map boarding, messages, three-dimensional representations, virtualization, and other common applications. The right mixture of collaborative applications and devices allows mission partners to find the nexus where they can communicate and describe their ideas best, and others can best receive, understand, and contribute to their development or refinement.

(b) Advances in computing power and technologies allow Army forces to collate, sort, cross-reference, and analyze huge volumes of data to glean relevant information to inform understanding and decision making. Commanders, staffs, subordinate leaders, and other joint, interorganizational, and multinational partners operating from widely dispersed and constantly changing geographic locations gather relevant information, plan, collaborate, and learn from each other as effectively as if they were co-located and stationary. Effective collaboration generates the solutions to unfamiliar and emergent mission situations that no single individual or organization could independently develop.

(9) Planning and order development and dissemination. The Army information network allows Army forces to solve problems and make good decisions rapidly, and create, change, and distribute plans and orders (voice, written, and graphical) between CPs; ground, air, and waterborne platforms; dismounted leaders and Soldiers; and mission partners, collaboratively and dynamically. During rapidly-changing, decentralized, and dispersed operations, this attribute promotes parallel planning, teamwork, and unity of effort, and provides the means to communicate the commander's intent (purpose, key tasks, and end state) to the lowest tactical levels clearly and accurately. During more centralized operations requiring greater massing of effects and precision synchronization (high-intensity, major combat operations against large enemy formations, for example), this attribute allows commanders and staffs to convey greater levels of detail needed to

integrate and synchronize warfighting functions and the activities of all subordinate forces rapidly. To support a rapidly-responsive, expeditionary Army, this capability includes enroute mission planning. The Army information network links and enables all aspects of the operations process, and supports its various planning methodologies, such as troop leading procedures, the military decision-making process, and Army design methodology.

(10) Fusion of logistic and operational information with intelligence. The Army information network enables the commander and staff to gather, track, analyze, and fuse logistic and operational information with intelligence to generate shared understanding of the situation, environment, assumptions, problems, multi-domain operational approaches, risks, gains, and desired end state. This fusion also contributes to effective and continuous assessment of understanding. Risk management is used by leaders to identify, assess, and control risks from operational factors and in making decisions that balance risk cost with mission benefits. Staffs use running estimates to assess the current operation to determine whether it is unfolding as intended and determine any necessary course corrections and actions required to consolidate gains, and assess if planned future operations are supportable. After action reviews are used at all echelons to gather and share observations, insights, and lessons learned during or after a training event or operation to improve performance within each unit, across the Army, and with mission partners. Future assessments determine if needed information was available when and where it was needed to make a decision and, if not, why. This assessment determines network connectivity, knowledge flow, shared understanding, and interoperability.

(11) Training, wargaming, rehearsals, and in-stride decision making. Mission command warfighting applications contain embedded training, wargaming, rehearsal, and in-stride decision-making functions that support live and synthetic constructs for unit (individual and collective) and institutional training and education, and real-world joint combined arms operations.<sup>288</sup>

(a) These warfighting applications include reconfigurable and mobile simulation and stimulation tools.<sup>289</sup> These tools model and replicate the threats, environmental conditions, and current technological capabilities and limitations in, through, and from space, cyberspace, and the EMS that Army forces will encounter, the effects of Army operations on influential leaders, audiences, and other stakeholders, and the effects of these individuals and groups on Army operations. These applications enable geographically-dispersed, multifunctional teams to train, rehearse, and operate together.

(b) All applications are simple, intuitive, backwards-compatible between versions or improvements, and standardized with a common look and feel across all systems and warfighting functions. This minimizes training requirements, decreases training time, sustains perishable skills, and facilitates CP operations. This attribute supports or nests within a larger, immersive integrated training environment and approximates future operational environments across all domains and the EMS (including the information environment) to create realism and facilitate mastery of the mission command principles, tasks, processes, procedures, and applications required to succeed in joint combined arms operations.<sup>290</sup>

c. The Army information network is a critical enabler of command and an integral component of the mission command system. The Army information network is a sociotechnical system-of-

systems that enhances the way that humans, think, make decisions, operate, and interact with one another.<sup>291</sup> However, the Army information network is not a prerequisite for realized mission command. Well-trained and prepared Army leader, Soldiers, and Army Civilians are necessary preconditions for successful mission command. Even under severely degraded network conditions, future Army leaders can act in the absence of orders, when existing orders no longer fit the situation, or when unforeseen opportunities or threats arise.

### **F-3. Key characteristics of future Army CPs**

a. Achieving integration and proper balance of all Army information network attributes described above, and the CP-specific characteristics described below, require Army CPs designed and engineered as fully-integrated systems of vehicles, shelters and workspace, information systems, power generation and distribution, and other supporting infrastructure.<sup>292</sup> They are fielded together as comprehensive packages that include long-term education, training, and sustainment strategies. To generate agility, support expeditionary Army forces, and realize mission command, CPs are smaller, reduce physical and technical complexity, automate routine staff functions, decrease the cognitive burden on commanders and staffs, optimize human interaction, support self-forming teams, and possess the following key characteristics.

b. Mobile and deployable rapidly. Army CPs are untethered from fixed operating bases. They are highly mobile; allow quick set-up, tear-down, and displacement; and are vehicle-based or fully integrated into each unit's organic transportation to enhance mobility, deployability, survivability, and overall agility.<sup>293</sup> When needed, Army CPs integrate easily into existing urban infrastructure or other fixed facilities. Army CPs are Soldier operated and maintained. Contractors or field service representatives are not required for installation and operation, including training and maintenance.<sup>294</sup> As part of the Army's continuing modernization and investment strategy, Army CPs minimize size, weight, and power requirements and take advantage continuously of advancements in miniaturization, cellular and wireless technologies, cloud-computing, mobile or wearable devices, lightweight protective materials, and energy efficiencies and breakthroughs in sources, production, distribution, management, and storage.<sup>295</sup>

c. Modular. Army CPs are designed with common, standardized, and interchangeable components to support scalability, cross-leveling, and training. These uniform components can be added or removed to support combinations of decisive action from peacetime engagement to major combat operations, rapid changes in task organization, and reconstitution. Modular CP components support the formation of a single, cohesive headquarters and staff from active and reserve component elements. While standardized, Army CPs maintain an open system architecture to allow insertion of future technology innovations rapidly.

d. Scalable. Army CPs are composed of a flexible suite of systems tailored and configured to minimize the physical footprint and decrease threat detection while meeting enduring CP functions and other demands driven by echelon, type of unit, task organization, specific mission requirements, and commander's preference.<sup>296</sup> Scalability includes a feature for ease of installation and employment on strategic and operational deployment platforms (air and sea), and immediately transitions to or supplements an assault or early-entry CP to enable expeditionary movement and maneuver and achieve uninterrupted mission command. Modular components, a

robust and dependable transport network, enhanced collaborative capabilities, and scalability allow commanders to tailor, echelon, and distribute their CPs into appropriate nodes positioned at multiple locations from home station to intermediate staging bases or other sanctuary locations, and throughout the area of operations to enable maneuver, increase protection, manage transitions between phases, sustain high-tempo operations, maintain uninterrupted mission command, and adapt to meet changing missions and situational demands.<sup>297</sup>

e. Survivable. CPs remain high-payoff targets for threats particularly those possessing advanced intelligence, surveillance, reconnaissance, long-range fires, and offensive cyberspace and EW capabilities.<sup>298</sup> Ensuring the continuity and survivability of critical CP functions and capabilities is obtained by balancing multiple materiel and nonmateriel considerations to include leaner design; hardening and protection from enemy and weather effects (component information systems as well as CP infrastructure); camouflage and concealment; decreasing or obscuring the visual, cyberspace, electromagnetic, acoustic, and thermal signature; early detection and identification of threats; intentional capability duplication and diversification; a robust network transport; the ability to displace rapidly; and deception, dispersion, node positioning, and other innovative employment tactics and techniques.<sup>299</sup>

## **Appendix G**

### **The Human Dimension**

#### **G-1. Introduction**

a. This appendix highlights the key components of the Army's human dimension concept and supporting strategy. It underscores the efforts by the Army to optimize the performance of its Soldiers and Army Civilians utilizing a holistic vision of the human dimension, and how these efforts serve to improve the performance of leaders exercising mission command.

b. The Army recognizes volatility, uncertainty, complexity, and ambiguity in the future environment. These potential challenges require new approaches. TP 525-3-7, *The U.S. Army Human Dimension Concept*, emphasizes that technology is no substitute for competent, committed, and professional Soldiers and Army Civilians. People remain the Army's number one capital investment; therefore, the Army must seek and employ innovative techniques that enable professionals to learn faster, retain information better, and perform at higher levels.

c. *The Army Human Dimension Strategy* presents the ends, ways, and means for future investment in its most valuable resource—its people. The Army implements the human dimension strategy through three lines of effort: agile and adaptive leaders, realistic training, and institutional agility. Overall, the strategy strives to produce a Total Army of trusted professionals and cohesive teams who thrive and win in a complex world.

#### **G-2. TP 525-3-7**

a. The human dimension concept recognizes that the complex future operational environment, changing fiscal realities, and continuous engagement as part of all Army operations require a

unifying, holistic vision to enhance capabilities in the cognitive, physical, and social components of Soldier and Army Civilian performance. Each interdependent component contributes to human performance optimization and, taken together, organize the way the Army views and develops its human capital.

b. The cognitive component. The cognitive component refers to the mental activity pertaining to the act or processes of perception, memory, judgment, and reasoning. Many factors influence cognition, such as individual traits and emotional processes. Learning, training, repetition, and practice affect cognition, as well as physical states such as exercise, exertion, fatigue, and sleep. The cognitive component is measured in various ways, using tools such as intelligence and aptitude tests. Cognition is a key contributor to adaptability. It supports learning, critical and creative thinking, multitasking, and rapid, effective decision making in the operational and institutional Army. The cognitive component includes initiatives to accelerate learning and compress the time it takes to accumulate experiential competence.

c. The physical component. The pace and complexity of joint combined arms operations will likely escalate, requiring Soldiers and deployed Army Civilians to face greater physical challenges. To optimize Soldier physical fitness in a more complex environment, Soldiers must be physically adaptable and resilient. Adaptability and resilience are critical to future mission success. Attributes of adaptability include mental, interpersonal, and physical adaptability.

d. The social component. How well Soldiers and Army Civilians interact with others is influenced by beliefs, behaviors, feelings, and interpersonal interactions—the social component of human dimension. Social fitness consists of individual well-being through self-discipline; developing and maintaining trusted, valued relationships; and fostering communication with others. People with diverse and positive social networks are more resistant to the adverse effects of stress and are more likely to show a resilient response or post-adversity growth. Social fitness is related to emotional, spiritual, and family fitness and, together with physical fitness, they comprise the five strengths of comprehensive Soldier, Army Civilian, and family fitness.

### **G-3. The Army Human Dimension Strategy**

a. The human dimension strategy brings together multiple Army efforts and represents the continued evolution of long-standing programs such as leader development, education, and training. Implementation of this strategy is essential to the Force 2025 and Beyond initiative and enhances the Army's ability to prevent conflict, shape the strategic environment, and win decisively, thereby providing combatant commanders the landpower they need to win. This strategy reframes the Army's previous human-dimension-related programs within the context of the emerging requirements described in the AOC through three lines of effort (see figure G-1).

b. Developing bold, agile, and innovative leaders of character that thrive in conditions of uncertainty and chaos is achieved by creating innovative and individualized learning and developmental programs that develop trusted Army professionals as effective team members, enhance Army health and readiness, and improve decision-making ability and ethical conduct.



c. Realistic training accelerates team learning through innovative training management and improved training capabilities. Realistic training, guided by the mission command leadership philosophy, forges diverse individuals and organizations into cohesive, multifunctional teams based on mutual trust and unity of effort. Future training integrates all aspects of training support and development, including a synthetic training environment that replicates a complex reality and enables geographically dispersed teams to train together.

d. Institutional agility develops the institutional capability to anticipate changing conditions and innovate in advance of need, and maintain the Army as a profession. Talent management and education play key roles by developing leaders with the competencies and abilities to execute the responsibilities given them under the mission command philosophy.

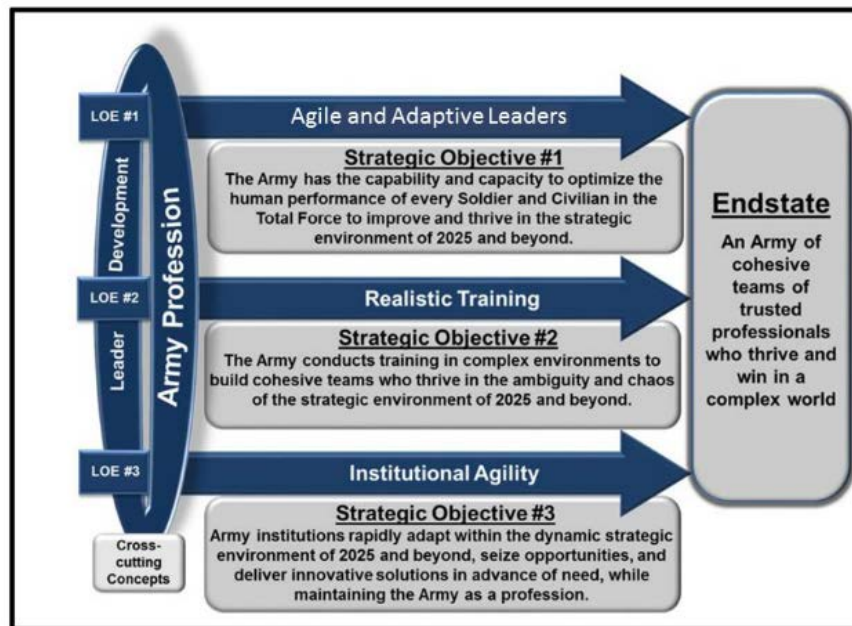


Figure G-1. A strategic approach to improving the human dimension

#### G-4. Human dimension implications for mission command

a. People are the most essential component to the mission command system. The study and incorporation of the human dimension provides the necessary tools to improve the health and performance of the Army's people, and by extension, the mission command system. As a philosophy, mission command requires leaders with the following attributes.

- (1) Leaders that possess emotional maturity and professional judgment critical for decision making.
- (2) Leaders that thrive under conditions of uncertainty and chaos.
- (3) Leaders that are agile; this is, leaders that anticipate change and adapt quickly to fast-paced events. Future Army leaders possess the abilities to outmaneuver an adversary in the cognitive dimension of conflict and war.

b. Within mission command, the cognitive and social components of the human dimension provide promising investment areas for potential benefits. The cognitive component supports decision making, determining prudent risk, and recognizing or creating opportunities to take disciplined initiative. The social component supports mission command primarily by building cohesive teams with trust and facilitating shared understanding with candor.

c. Overall, the Army's strategic approach to optimizing human performance through developing bold, agile, and innovative leaders, executing realistic training, and driving institutional agility helps create leaders that are better prepared to meet the challenges of the future operational environment.

### **G-5. Conclusion**

The Army's human dimension concept and supporting strategy provide the intellectual construct, ends, ways, and means to create competent and committed Army leaders of character. Improving cognitive performance, social and interpersonal capabilities, and ethical decision making; enhancing physical, mental and emotional health; and accelerating the ethical maturity and inculcation of Army values, optimizes the effectiveness of all Army leaders across the Total Army.

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### **Glossary**

The glossary contains acronyms and terms with Army or joint definitions. The special terms section has those definitions unique to this concept.

### **Section I**

#### **Abbreviations**

ACC	Army Capstone Concept
ACF	Army concept framework
ADP	Army doctrine publication
ADRP	Army doctrine reference publication
AFC-MC	Army functional concept for mission command
AOC	Army Operating Concept
ARCIC	Army Capabilities Integration Center
ATP	Army techniques publication
CAC	Combined Arms Center
CCJO	Capstone Concept for Joint Operations
CP	command post
CTC	combat training center
DA	Department of the Army
DOD	Department of Defense
DOTMLPF	doctrine, organization, training, materiel, leadership and education, personnel, facilities
DSCA	defense support of civil authorities
EMS	electromagnetic spectrum
EW	electronic warfare
FM	field manual
G-2	assistant chief of staff, intelligence

G-6	assistant chief of staff, signal
JP	joint publication
JTF	joint task force
PNT	positioning, navigation, and timing
SNA	social network analysis
S&T	science and technology
TP	TRADOC pamphlet
TRADOC	U.S. Army Training and Doctrine Command
U.S.	United States

## Section II

### Terms

#### **actionable information**

Unevaluated data gathered by or provided directly to the commander which, due to its highly perishable nature or the criticality of the situation, cannot be processed into intelligence in time to satisfy the user's priority intelligence requirements. (Army Unified Exploitation Concept of Operations 2012-2018)

#### **airspace control**

Process used to increase operational effectiveness by promoting the safe, efficient, and flexible use of airspace. (JP 3-52)

#### **all-source intelligence**

Integration of intelligence and information from all relevant sources in order to analyze situations or conditions that impact operations. (ADRP 2-0)

#### **anti-access**

Actions and capabilities, usually long-range, designed to prevent an opposing force from entering an operational area. (Joint Operational Access Concept)

#### **area denial**

Actions and capabilities, usually of shorter range, designed to limit an opposing force's freedom of action within an operational area. (Joint Operational Access Concept)

#### **Army Civilian Corps**

Community within the Army Profession composed of civilians serving in the Department of the Army. (ADRP 1)

#### **Army concept framework**

The body of work (capstone concept, operating concept, and functional concepts) describing fundamental ideas about future Army operations and key required capabilities. (TP 71-20-3)

#### **Army design methodology**

Applying critical and creative thinking to understand, visualize, and describe unfamiliar problems and approaches to solving them. (ADP 5-0)

**Army Ethic**

Evolving set of laws, values, and beliefs, embedded within the Army culture of trust that motivates and guides the conduct of Army professionals bound together in common moral purpose. (ADRP 1)

**Army Profession**

Vocation of experts certified in the ethical design, generation, support, and application of land power, serving under civilian authority and entrusted to defend the Constitution and the rights and interests of the American people. (ADRP 1)

**Army professional**

Soldier or Army Civilian who meets the Army Profession's certification criteria in character, competence, and commitment. (ADRP 1)

**assemble**

Bring together (as in a particular place or for a particular purpose) or fit together the parts of an item. (TP 350-70-1)

**assessment**

Continuous process that measures the overall effectiveness of employing joint force capabilities during military operations;. determination of the progress toward accomplishing a task, creating a condition, or achieving an objective; analysis of the security, effectiveness, and potential of an existing or planned intelligence activity; judgment of the motives, qualifications, and characteristics of present or prospective employees or "agents." (JP 3-0)

**assumption**

Supposition on current situation or a presupposition on the future course of events, assumed to be true in the absence of positive proof, necessary to enable commander in planning to complete an estimate of the situation and make a decision on the course of action. (JP 5-0)

**asymmetric**

In military operations, application of dissimilar strategies, tactics, capabilities, and methods to circumvent or negate an opponent's strengths while exploiting his weaknesses. (JP 3-15.1)

**authority**

Delegated power to judge, act, or command. (ADP 6-0)

**biometrics**

Process of recognizing an individual based on measureable anatomical, physiological, and behavior characteristics. (JP 2-0)

**capabilities development**

Identifying, assessing, and documenting changes in DOTMLPF that collectively produce the force capabilities and attributes prescribed in approved concepts, concept of operations, or other authoritative sources. (TP 71-20-3)

**capability**

Ability to achieve a desired effect under specified standards and conditions through a combination of means and ways across DOTMLPF to perform a set of tasks to execute a specified course of action. (DOD Directive 7045.20)

**capability developer**

Person involved in analyzing, determining, prioritizing, and documenting requirements for doctrine, organizations, training, leadership and education, materiel, personnel, and facilities within the context of the force development process and ensures all enabling capabilities are known, affordable, budgeted, and aligned for synchronous fielding and support. (TP 71-20-3)

**capacity**

Capacity with sufficient scale to accomplish the mission; actual or potential ability to perform. (TP 525-3-1)

**character**

Dedication and adherence to the Army Ethic, including Army Values, as consistently and faithfully demonstrated in decisions and actions. (ADRP 1)

**civil affairs**

Designated forces and units organized, trained, and equipped specifically to conduct civil affairs operations and to support civil-military operations. (JP 3-57)

**civil affairs operations**

Actions planned, executed, and assessed by civil affairs forces that enhance awareness of and manage the interaction with the civil component of the operational environment; identify and mitigate underlying causes of instability within civil society; or involve the application of functional specialty skills normally the responsibility of civil government. (JP 3-57)

**civil-military operations**

Activities of a commander performed by designated civil affairs or other military forces that establish, maintain, influence, or exploit relations between military forces, indigenous populations, and institutions, by directly supporting the attainment of objectives relating to the reestablishment or maintenance of stability within a region or host nation. (JP 3-57)

**close combat**

Warfare carried out on land in a direct-fire fight, supported by direct and indirect fires and other assets. (ADRP 3-0)

**cognitive component**

States, traits, and processes that make up subjective experience, and include typical ways of problem solving, framing events in life, intelligence, and emotional self-regulation. (TP 525-3-7)

**cohesion**

The bonding together of members of an organization through shared experiences in such a way as to sustain their will and commitment to each other, their unit, and the mission. (TP 525-3-7)

**combat power**

Total means of destructive, constructive, and information capabilities that a military unit or formation can apply at a given time. (ADRP 3-0)

**combined arms**

Synchronized and simultaneous application of all elements of combat power that together achieve an effect greater than if each element was used separately or sequentially. (ADRP 3-0)

**commitment**

Resolve to contribute honorable service to the Nation and accomplish the mission despite adversity, obstacles, and challenges. (ADRP 1)

**common operating environment**

Approved set of computing technologies and standards that enable secure and interoperable applications to be developed rapidly and executed across a variety of computing environments. (U.S. Army Chief Information Officer/G-6 Annex B to LandWarNet 2020 and Beyond Enterprise Architecture Version 2.0: Definitions and Guidance for the Common Operating Environment)

**common operational picture**

Single display of relevant information within a commander's area of interest tailored to the user's requirements and based on common data and information shared by more than one command. (ADRP 6-0)

**competence**

Demonstrated ability to successfully perform duty with discipline and to standard. (ADRP 1)

**complex terrain**

Geographical area consisting of an urban center larger than a village and/or of two or more types of restrictive terrain or environmental conditions occupying the same space. Restrictive terrain or environmental conditions include, but are not limited to, slope, high altitude, forestation, severe weather, and urbanization. (ATP 3-34.80)

**computing environment**

Logical grouping of systems with similar characteristics used to organize the [common operating environment] (deployment, echelonment, environmental, transport dependencies, form factors, and others.) A computing environment comprises the necessary hardware, operating system, libraries and software required to run applications within the [common operating environment]. (U.S. Army Chief Information Officer/G-6 Annex B to LandWarNet 2020 and Beyond Enterprise Architecture Version 2.0: Definitions and Guidance for the Common Operating Environment).

**concept of operations**

Statement that directs the manner in which subordinate units cooperate to accomplish the mission and establishes the sequence of actions the force will use to achieve the end state. (ADRP 5-0)

**consolidate gains**

Activities to make permanent any temporary operational success and set the conditions for a sustainable stable environment allowing for a transition of control to legitimate civil authorities. (ADRP 3-0)

**control**

The regulation of forces and warfighting functions to accomplish the mission in accordance with the commander's intent. (ADP 6-0)

**control measure**

Means of regulating forces or warfighting functions. (ADRP 6-0)

**conventional forces**

Forces capable of conducting operations using nonnuclear weapons and forces other than designated special operations forces. (JP 3-05)

**course of action**

Scheme developed to accomplish a mission. (JP 5-0)

**critical information**

Information important to achieving U.S. objectives and missions, or which may be of use to an adversary of the U.S.; vital to a mission that if an adversary obtains it, correctly analyzes it, and acts upon it will prevent or seriously degrade mission success. (AR 530-1)

**cybersecurity**

Prevention of damage to, protection of, and restoration of computer, electronic communications systems, electronic communications services, wire communication, and electronic communication, including information contained therein, to ensure its availability, integrity, authentication, confidentiality, and nonrepudiation. (DOD Instruction 8500.01)

**cyberspace**

Global domain within the information environment consisting of the interdependent network of information technology infrastructures, including the Internet, telecommunications networks, computer systems, and embedded processors and controllers. (JP 3-12)

**cyberspace operations**

Employment of cyberspace capabilities where the primary purpose is to achieve military objectives in or through cyberspace. (JP 3-0)

**data**

Unprocessed signals communicated between any nodes in an information system, or sensing from the environment detected by a collector of any kind. (ADRP 6-0)

**defensive cyberspace operations**

Passive and active cyberspace operations intended to preserve the ability to utilize friendly cyberspace capabilities and protect data, networks, net-centric capabilities, and other designated systems. (JP 3-12)

**defensive task**

Task conducted to defeat an enemy attack, gain time, economize forces, and develop conditions favorable for offensive or stability tasks. (ADRP 3-0)

**Department of Defense information network**

Set of information capabilities, and associated processes for collecting, processing, storing, disseminating, and managing information on-demand to warfighters, policy makers, and support personnel, whether interconnected or stand-alone, including owned and leased communications and computing systems and services, software (including applications), data, security services, other associated services, and national security systems. (JP 6-0)

**directed energy**

Umbrella term covering technologies that relate to the production of a beam of concentrated electromagnetic energy or atomic or subatomic particles. (JP 3-13.1)

**dispersion**

Deliberate or accidental reaction to adversary capabilities to spread out or break up forces, reduce the targetable mass of friendly forces, more effectively cover terrain in an area of operations, and gain operational and tactical flexibility. (TP 525-3-1)

**domain**

Area of activity within the operating environment (land, air, maritime, space, and cyberspace) in which operations are organized and conducted by components. (TP 525-3-1)

**domestic emergencies**

Civil defense emergencies, civil disturbances, major disasters, or natural disasters affecting the public welfare and occurring within the United States and its territories. (JP 3-27)

**electronic warfare**

Military action involving the use of electromagnetic and directed energy to control the electromagnetic spectrum or to attack the enemy. (JP 3-13.1)

**end state**

Set of required conditions that defines achievement of the commander's objectives. (JP 3-0)

**expeditionary**

The ability to deploy task-organized forces on short notice to austere locations, capable of conducting operations immediately upon arrival. (TP 525-3-1)

**expeditionary maneuver**

Rapid deployment of task-organized combined arms forces able to transition quickly and conduct operations of sufficient scale and ample duration to achieve strategic objectives. (TP 525-3-1)

**external trust**

Confidence and faith that the American people have in the Army to serve the Nation ethically, effectively, and efficiently. (ADRP 1)



**forensic science**

Application of multidisciplinary scientific processes to establish facts. Also called forensics. (DOD Directive 5205.15E)

**geospatial information**

Information that identifies the geographic location and characteristics of natural or constructed features and boundaries on the Earth, including: statistical data and information derived from, among other things, remote sensing, mapping, and surveying technologies; and mapping, charting, geodetic data and related products. (JP 2-03)

**graphic control measure**

Symbol used on maps and displays to regulate forces and warfighting functions. (ADRP 6-0)

**human dimension**

Cognitive, physical, and social components of Soldier, civilian, leader, and organizational development and performance essential to raise, prepare, and employ the Army in unified land operations. (TP 525-3-7)

**human performance optimization**

Process of applying knowledge, skills, and emerging technologies to improve and preserve the capabilities of Department of Defense personnel to execute essential tasks. (TP 525-3-7)

**hybrid threat**

Diverse and dynamic combination of regular forces, irregular forces, terrorist forces, and/or criminal elements unified to achieve mutually benefitting effects. (ADRP 3-0)

**information environment**

Aggregate of individuals, organizations, and systems that collect, process, disseminate, or act on information. (JP 3-13)

**information fratricide**

Result of employing information-related capabilities in a way that causes effects in the information environment that impede the conduct of friendly operations or adversely affect friendly forces. (FM 3-13)

**information protection**

Active or passive measures used to safeguard and defend friendly information and information systems. (ADRP 6-0)

**institutional agility**

Ability of the larger Army institution to anticipate changing conditions in stride, lead through innovation, develop a culture that values life-long learning, and demonstrate crucial capabilities in advance of need. (CAC Human Dimension White Paper)

**integration**

Arrangement of military forces and their actions to create a force that operates by engaging as a whole. (JP 1)

**integrated capabilities development team**

Team of key stakeholders and subject matter experts from multiple disciplines chartered by the Director, ARCIC to initiate the joint capabilities integration and development system process through conduct of the capabilities-based assessment to identify capability gaps in a functional area, identify nonmaterial and/or materiel approaches to resolve or mitigate those gaps, and develop an integrated capabilities document and/or a DOTMLPF change recommendation (joint document) or a DOTMLPF integrated capabilities recommendation (Army document), when directed. (TP 71-20-3)

**intelligence reach**

Activity by which intelligence organizations proactively and rapidly access information from, receive support from, and conduct direct collaboration and information sharing with other units and agencies, both within and outside the area of operations, unconstrained by geographic proximity, echelon, or command. (ADRP 2-0)

**internal trust**

Reliance on the character, competence, and commitment of Army professionals to live by and uphold the Army Ethic. (ADRP 1)

**interorganizational**

Elements of U.S. government agencies; state, territorial, local, and tribal agencies; foreign government agencies; intergovernmental, nongovernmental, and commercial organizations. (Does not include forces.) (TP 525-3-1)

**joint combined arms operations**

Synchronized and simultaneous or sequential application of two or more arms or elements of one service, along with joint, interorganizational, and multinational capabilities combined with leadership and education across services to ensure unity of effort and create multiple dilemmas for the enemy to seize, retain, and exploit the initiative. (TP 525-3-1)

**joint information environment**

Secure environment, composed of shared [information technology] infrastructure, enterprise services, and a single security architecture, to achieve full-spectrum superiority, improve mission effectiveness, increase security, and realize [information technology] efficiencies. (DOD Instruction 8320.02)

**knowledge management**

Process of enabling knowledge flow to enhance shared understanding, learning, and decision making. (ADRP 6-0)

**land domain**

Earth's physical surface located above the high water mark and inclusive of the physical, cultural, social, political, and psychological aspects of human populations that reside upon it. (TP 525-3-1)

**landpower**

Ability—by threat, force, or occupation—to gain, sustain, and exploit control over land, resources, and people. (ADRP 3-0)

**leader broadening**

The purposeful expansion of a leader's capabilities and understanding provided through opportunities internal and external to the Army throughout his or her career, that are gained through experiences and/or education in different organizational cultures and environments resulting in a leader who can operate up to and including the strategic level in multiple environments. (TP 525-8-2)

**leader development**

Deliberate, continuous, sequential, progressive process—founded in Army values—that grows Soldiers and Army Civilians into competent and confident leaders capable of decisive action, and achieved through the life-long synthesis of the knowledge, skills, and experiences gained through the training and educational opportunities in the institutional, operational, and self-development domains. (AR 350-1)

**leadership**

Process of influencing people by providing purpose, direction, and motivation to accomplish the mission and improve the organization. (ADP 6-22)

**line of effort**

Line that links multiple tasks using the logic of purpose rather than geographical reference to focus efforts toward establishing a desired end state. (ADRP 3-0)

**major operation**

Series of tactical actions (battles, engagements, strikes) conducted by combat forces of a single or several services, coordinated in time and place, to achieve strategic or operational objectives in an operational area. (JP 3-0)

**mentorship**

Voluntary developmental relationship that exists between a person of greater experience and a person of lesser experience that is characterized by mutual trust and respect. (TP 525-8-2)

**military deception**

Actions executed to deliberately mislead adversary military, paramilitary, or violent extremist organization decision makers, thereby causing the adversary to take specific actions (or inactions) that will contribute to the accomplishment of the friendly mission. (JP 3-13.4)

**military expertise**

The design, generation, support, and ethical application of landpower, primarily in unified land operations, and all supporting capabilities essential to accomplish the mission in defense of the American people. (ADRP 1)

**mission orders**

Directives that emphasize to subordinates the results to be attained, not how they are to achieve them. (ADP 6-0)

**mission partner environment**

Capability framework in which combatant command partners plan, prepare, and execute operations at an appropriate, single security classification level, with a common language; provides strategic, operational, and tactical flexibility for all commanders to execute command and control by providing the means to clearly communicate commander's intent to achieve maximized operational effects with all mission partners. (AR 34-1)

**mission variables**

Categories of specific information needed to conduct operations. (ADP 1-01)

**multinational**

Two or more forces or agencies of two or more nations or coalition partners. (JP 5-0)

**network transport**

System of systems including the people, equipment, and facilities that provide end-to-end communications connectivity for network components. (FM 6-02)

**neutral**

Party identified as neither supporting nor opposing friendly, adversary, or enemy forces. (ADRP 3-0)

**offensive cyberspace operations**

Cyberspace operations intended to project power by the application of force in or through cyberspace. (JP 3-12)

**offensive task**

Task conducted to defeat and destroy enemy forces and seize terrain, resources, and population centers. (ADRP 3-0)

**operational adaptability**

Ability to shape conditions and respond effectively to changing threats and situations with appropriate, flexible, and timely actions. (TP 525-3-0)

**operational approach**

Description of the broad actions the force must take to transform current conditions into those desired at end state. (JP 5-0)

**operational art**

Cognitive approach by commanders and staffs—supported by their skill, knowledge, experience, creativity, and judgment—to develop strategies, campaigns, and operations to organize and employ military forces by integrating ends, ways, and means. (JP 3-0)

**operational environment**

Composite of conditions, circumstances, and influences that affect the employment of capabilities and bear on the decision of the commander. (JP 3-0)

**operational reach**

Distance and duration across which a joint force can successfully employ military capabilities. (JP 3-0)

**operational training domain**

Training activities organizations undertake while at home station, combat training centers, during joint exercises, at mobilization centers, and while operationally deployed. (ADP 7-0)

**operational variables**

Comprehensive set of information categories used to define an operational environment. (ADP 1-01)

**operations process**

Major mission command activities performed during operations: planning, preparing, executing, and continuously assessing the operation. (ADP 5-0)

**operations security**

Process of identifying critical information and subsequently analyzing friendly actions attendant to military operations and other activities. (JP 3-13.3)

**overmatch**

Application of capabilities or unique tactics either directly or indirectly, with the intent to prevent or mitigate opposing forces from using their current or projected equipment or tactics. (TP 525-3-1)

**phase**

Planning and execution tool used to divide an operation in duration or activity. (ADRP 3-0)

**physical component**

Aspects of physical fitness and holistic health and fitness, with an approach that considers the mental and medical contributions to physical performance. (TP 525-3-7)

**planning**

Art and science of understanding a situation, envisioning a desired end future, and laying out effective ways of bringing that future about. (ADP 5-0)

**planning horizon**

Point in time commanders use to focus the organization's planning efforts to shape future events. (ADRP 5-0)

**position of relative advantage**

Location or the establishment of a favorable condition within the area of operations that provides the commander with temporary freedom of action to enhance combat power over an enemy or influence the enemy to accept risk and move to a position of disadvantage. (ADRP 3-0)

**power projection**

Ability of a nation to apply all or some of its elements of national power—political, economic, informational, or military—to deploy and sustain forces rapidly and effectively in and from multiple dispersed locations to respond to crises, to contribute to deterrence, and to enhance regional stability. (JP 3-35)

**principle**

Comprehensive and fundamental law or an assumption of central importance that guides how an organization or function approaches and thinks about the conduct of operations. (ADP 1-01)

**priority intelligence requirement**

An intelligence requirement, stated as a priority for intelligence support, that the commander and staff need to understand the adversary or the operational environment. (JP 2-01)

**Profession of Arms**

A community within the Army Profession composed of Soldiers of the Regular Army, Army National Guard, and U.S. Army Reserve. (ADRP 1)

**project national power**

Ability to deploy and sustain landpower rapidly and effectively in and from multiple locations and domains. (TP 525-3-1)

**public affairs**

Those public information, command information, and community engagement activities directed toward both the external and internal publics with interest in the Department of Defense. (JP 3-61)

**reach**

Collaboration, information sharing, and capability integration with any organization and/or individuals, regardless of location, echelon, or affiliation. (CAC & ARCIC The Mission Command Network: Vision & Narrative.)

**reachback**

Process of obtaining products, services, and applications, or forces, or equipment, or material from organizations that are not forward deployed. (JP 3-30)

**regionally aligned forces**

Army units assigned to combatant commands, allocated to a combatant command, and those capabilities service retained, combatant command aligned, and prepared by the Army for combatant command missions. (TP 525-3-1)

**risk management**

Process of identifying, assessing, and controlling risks arising from operational factors and making decisions that balance risk cost with mission benefits. (JP 3-0)

**running estimate**

Continuous assessment of the current situation used to determine if the current operation is proceeding according to the commander's intent and if planned future operations are supportable. (ADP 5-0)

**security cooperation**

All DOD interactions with foreign defense establishments to build defense relationships that promote specific U.S. security interests, develop allied and friendly military capabilities for self-defense and multinational operations, and provide U.S. forces with peacetime and contingency access to a host nation. (JP 3-22)

**shape the security environment**

Combinations of activities that reassure partners, curtail aggression, and influence local perceptions, while establishing conditions that support the employment of Army forces. (TP 525-3-1)

**site exploitation**

Synchronized and integrated application of scientific and technological capabilities and enablers to answer information requirements, facilitate subsequent operations, and support host-nation rule of law. (ATP 3-90.15)

**social component**

Elements that allow Army professional to serve the Nation honorably. (TP 525-3-7)

**space operations**

U.S. space operations are comprised of the following mission areas: space situational awareness, space force enhancement, space support, space control, and space force application. (JP 3-14)

**special operations and conventional forces interdependence**

Deliberate and mutual reliance by one force on another/s inherent capabilities designed to provide complementary and reinforcing effects; integration and interoperability are subsets of interdependence. (TP 525-3-0)

**stability tasks**

Tasks conducted as part of operations outside the U.S. in coordination with other instruments of national power to maintain or reestablish a safe and secure environment and provide essential government services, emergency infrastructure reconstruction, and humanitarian relief. (ADRP 3-07)

**strategic environment**

Global conditions, circumstances, and influences that affect the employment of all elements of national power; contains multiple potential operational environments from a locale as small as a village to entire regions of the globe. (TRADOC G-2 Operational Environments to 2028)

**strategic movement**

Changing physical location or position to achieve important objectives, goals, or interests. (TP 525-3-1)

**survivability**

Quality or capability of military forces which permits them to avoid or withstand hostile actions or environmental conditions while retaining the ability to fulfill primary mission. (ATP 3-37.34)

**synchronization**

Arrangement of military actions in time, space, and purpose to produce maximum relative combat power at a decisive place and time. (JP 2-0)

**targeting**

Process of selecting and prioritizing targets and matching the appropriate response to them, considering operational requirements and capabilities. (JP 3-0)

**task-organizing**

Act of designing a force, support staff, or sustainment package of specific size and composition to meet a unique task or mission. (ADRP 3-0)

**trainability**

Set of principles that simplifies system design so that Soldiers can easily learn and retain the knowledge to effectively operate the system without requiring frequent refresher training to meet training standards. (TRADOC Regulation 71-20)

**troop leading procedures**

Dynamic process used by small-unit leaders to analyze a mission, develop a plan, and prepare for an operation. (ADP 5-0)

**unified action**

Synchronization, coordination, and/or integration of the activities of governmental and nongovernmental entities with military operations to achieve unity of effort (JP 1)

**unity of effort**

Coordination and cooperation toward common objectives, even if the participants are not part of the same command or organization—the product of successful unified action. (JP 1)



### **Section III**

#### **Special terms**

##### **agility**

Flexibility of mind and an ability to anticipate and adapt to uncertain or changing situations. (Adapted from ADP 6-22 mental agility description.)

##### **Army information network**

Army's portion of the DOD information network; encompasses all Army information management systems and information systems that collect, process, store, display, disseminate, and protect information worldwide. (Adapted from FM 6-02 LandWarNet definition.)

##### **Army leader**

Any Soldier or civilian who by virtue of assumed role or assigned responsibility inspires and influences people to accomplish organizational goals. Army leaders motivate people both inside and outside the chain of command to pursue actions, focus thinking, and shape decisions for the greater good of the organization. (Adapted from ADP 6-22 definition.)

##### **big data**

Extremely large data sets that may be analyzed computationally to reveal patterns, trends, and associations, especially relating to human behavior and interactions.

##### **collaborative planning**

Commanders, subordinate leaders, staffs, and other trusted partners sharing information, knowledge, perceptions, ideas, and concepts regardless of physical location throughout the planning process. (Adapted from ADRP 5-0 definition.)

##### **command**

To lawfully exercise authority derived from rank or assignment, direct subordinate efforts, and utilize resources to accomplish tasks. Command includes the responsibility for planning the employment of, organizing, directing, coordinating, controlling, and leading people for the accomplishment of assigned missions. It includes responsibility for their health, welfare, morale, and discipline. (Adapted from JP 1 definition.)

##### **command group**

Commander and selected staff members who assist the commander in controlling operations away from a relatively stationary command post. (Adapted from FM 6-0 definition.)

##### **command post**

Locations from which a commander and staff perform their tasks and activities; may consist of multiple command nodes. (Adapted from FM 6-0 definition.)

##### **conduct**

Direct or take part in the operation or management of an organization, unit, mission, task, or activity. (Adapted from TP 350-70-1 definition.)

**cyberspace electromagnetic operations**

Cyberspace, electronic warfare, and spectrum management capabilities leveraged to seize, retain, and exploit an advantage over threats in both cyberspace and the electromagnetic spectrum, while simultaneously denying and degrading threat use of the same and protecting the mission command system. (Adapted from ADRP 3-0 definition.)

**decentralized**

Delegation of authority, information, warfighting capabilities, and other resources to subordinates at the lowest practical level which enables aggressive, independent, and disciplined initiative to develop the situation; seize, retain, and exploit the initiative; and cope with uncertainty to accomplish the mission within the Army Ethic and the commander's intent.

**disciplined initiative**

Duty and willingness to act in the absence of orders, when existing orders no longer fit the situation, or when unforeseen opportunities or threats arise, according to the Army Ethic and commander's intent. (Adapted from ADRP 6-0 description.)

**early-entry command post**

Lead element of a headquarters designed to control operations until the remaining portion of the deployed headquarters arrives and becomes operational. The early-entry command post could be the only portion of the headquarters that is deployed. (Adapted from FM 6-0 definition.)

**emotional intelligence**

Capacity to be aware of, control, and express emotions, and handle interpersonal relationships judiciously and empathetically; component of social intelligence. (Adapted from Merriam-Webster Online Dictionary definition.)

**information operations**

Integrated employment, during military operations, of information-related capabilities along with other lines of operation to influence, disrupt, corrupt, or usurp threat decision making while protecting U.S. capabilities. (Adapted from JP 3-13 definition.)

**information-related capabilities**

Capabilities, techniques, or activities that create or employ information to shape the information environment toward a desired outcome. (Adapted from FM 3-13 definition.)

**institutional Army**

Army organizations whose primary mission is to generate and sustain the operating forces of the Army by manning, training, equipping, deploying, and ensuring the readiness of all Army forces. (Adapted from ADP 1 generating force description.)

**institutionalize**

To deliberately translate an organization's code of conduct, mission, policies, vision, and strategic plans into guidelines and practices applicable to the daily activities of its leaders and subordinates;

integrate fundamental values and objectives into the organization's culture, structure, and operating capabilities. (Adapted from Merriam-Webster Online Dictionary definition.)

**integrated training environment**

The linkage of selected training aids, devices, simulators, simulations, gaming technologies, infrastructure, and information systems within an overall training framework to approximate the conditions of an operational environment for training and education for decisive action in the operational, institutional, or self-development training domains.

**intent**

Leader's clear, concise, and personal expression of the end state that describes the desired conditions of the friendly force in relationship to the enemy, terrain, or civil considerations. The intent provides focus and helps subordinates and supporting leaders act to achieve the desired results without further direction, even when the plan does not unfold as designed. (Adapted from JP 3-0 commander's intent definition.)

**interoperability**

Ability of two or more organizations to operate together effectively and efficiently as an integrated team to accomplish a common goal. Interoperability includes human, procedural, and technical considerations. (Adapted from JP 3-0 and JP 6-0 definitions, and North Atlantic Treaty Organization Administrative Publication 06)

**mission command**

Overarching leadership philosophy and an integrative command warfighting function. (Adapted from ADP 6-0 definition.)

**mission command philosophy**

Leaders convey a clear intent and empower subordinates to take disciplined initiative. (Adapted from ADP 6-0 description.)

**mission command system**

The responsive arrangement of people, the operations process, the Army information network, and command posts integrated and organized through knowledge management to facilitate the exercise of command. (Adapted from ADP 6-0 definition.)

**mission command warfighting function**

A system, enabling capabilities, and supporting tasks that facilitate command and the integration and synchronization of combat power across all domains and with all instruments of national power to accomplish any mission. (Adapted from ADP 3-0 definition.)

**multi-form collaboration**

Sharing thoughts and thought processes between superiors, subordinates, and peers in the form of sketching, highlighting, talking, listening and gesturing through voice and voice recognition, text, chat, data, video, white boarding, map boarding, messages, and shared applications. (Adapted from Mission Command Center of Excellence Initial Capabilities Document for Network-Enabled Mission Command)

**national power**

All resources available to a nation in the pursuit of national objectives, including diplomatic, informational, military, economic, financial, intelligence, and law enforcement elements. (Adapted from JP 1 definition and AOC national power description.)

**navigation warfare**

Deliberate defensive and offensive action to assure friendly use and prevent adversary use of positioning, navigation, and timing information through coordinated space, cyberspace, and electronic warfare capabilities. (Adapted from JP 3-14 description.)

**network operations**

Activities conducted to operate and defend the DOD information network. (Adapted from JP 6-0 definition.)

**operating force**

Units organized, trained, and equipped to deploy and fight. (Adapted from ADP description)

**prudent risk**

Deliberate exposure to potential injury or loss when the outcome in terms of mission accomplishment is judged to be worth the cost. (Adapted from ADP 6-0 definition.)

**range of military operations**

Activities, tasks, missions, and operations along the continuum of conflict from peace to war that vary in purpose, scale, risk, and combat intensity and which can be grouped into military engagement, security cooperation, and deterrence; crisis response and limited contingency operations; and major operations and campaigns. (Adapted from JP 3-0 discussion.)

**reconnaissance**

Mission undertaken to obtain, by visual observation or other detection methods, information about the activities and resources of a threat, or to secure data concerning the meteorological, hydrographical, or geographical characteristics and the indigenous population of a particular area. (Adapted from JP 2-0 definition.)

**shared understanding**

A collaboratively-developed and shared mental model of the environment, problems, and approaches to solving them. (Adapted from ADRP 6-0 discussion.)

**social intelligence**

Ability to effectively negotiate complex social environments and form rewarding relationships with others. (Adapted from Merriam-Webster Online Dictionary definition.)

**sociotechnical**

The careful and thoughtful integration of humans and technology so that technology compliments human attributes—cognitive and physical—for greatest benefit.

**spectrum management operations**

Interrelated functions of spectrum management, frequency assignment host nation coordination, and policy that together enable the planning, management, and execution of operations within the electromagnetic operational environment during all phases of military operations. (Adapted from FM 6-02 definition.)

**synthetic training environment**

Convergence of virtual, constructive, gaming, and augmented reality training environments into a single synthetic environment. (Adapted from TP 525-8-2 definition)

**system**

System is a group of interacting, interrelated, and interdependent components or subsystems that form a complex and unified whole. Systems have a purpose with their parts arranged in a way (structure) to carry out their purpose. (Adapted from TP 525-8-2 definition)

**talent management**

Deliberate and coordinated process to optimize leader development practices and align talent with current and future requirements to improve the individual and the organization. Talent management is guided by the mission command philosophy and is complementary to leader development. (Adapted from ATP 5-0)

**task organization**

Temporary grouping of joint, interorganizational, and multinational partners designed to accomplish a particular mission or pursue a mutual line of effort. (Adapted from ADRP 5-0 definition.)

**visualization**

Mental process of developing situational understanding, determining a desired end state, and envisioning an operational approach by which the organization will achieve that end state. (Adapted from ADP 5-0 definition.)

**warfighting function**

A system (people, processes, and tools), other enabling capabilities, and group of tasks united by a common purpose that leaders use to accomplish missions and train objectives. (Adapted from ADRP 3-0 definition.)

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**Endnotes**

<sup>1</sup> Joint combined arms operations is “the synchronized and simultaneous or sequential application of two or more arms or elements of one service, along with joint, interorganizational, and multinational capabilities combined with leadership and education across services to ensure unity of effort and create multiple dilemmas for the enemy to seize, retain, and exploit the initiative.” TP 525-3-1, The U.S. Army Operating Concept: Win in a Complex World, p. 47, hereafter referred to as the AOC.

<sup>2</sup> Control is inherent in command. Therefore, this concept also seeks, as necessary, to develop or modify control capabilities as a specific subset of command capabilities. Also, “the Army Profession has two broad categories of professionals—Soldiers and Civilians....” ADRP 1, *The Army Profession*, p. 5-4. These two professional categories are the Profession of Arms and the Army Civilian Corps, respectively.

<sup>3</sup> “The Army is the only element of the Joint Force with the capability to integrate national power and the capacity to conduct sustained, campaign-quality land operations.” AOC, p. 23.

<sup>4</sup> Based on the AOC’s definition of joint combined arms operations, this question addresses how future Army forces facilitate interorganizational and multinational interoperability as well as joint.

<sup>5</sup> “The intellectual foundation for building tomorrow’s military force rests on the unfounded assumption that technologies emerging from the ‘information revolution’ will lift the fog of war and permit U.S. forces to achieve a very high degree of certainty in future military operations....The first step is to abandon explicitly the assumptions that future war will lie mainly in the realm of certainty and that American forces will be able to achieve and maintain information dominance during combat operations.” McMaster, H. (2003, April 7). *Crack in the Foundation: Defense Transformation and Underlying Assumption of Dominant Knowledge in Future War*. U.S. Army War College Strategy Research Project. Carlisle Barracks, PA, pp 1-2. “Fog of war” is a term used to describe ambiguity experienced by participants in military operations. It is ascribed to the Prussian military theorist Carl von Clausewitz, who wrote: “The great uncertainty of all data in war is a peculiar difficulty, because all action must, to a certain extent, be planned in a mere twilight, which in addition not infrequently—like the effect of fog or moonshine—gives to things exaggerated dimensions and unnatural appearance.” von Clausewitz, C. (1975). *On War*. (Ed. and trans. Michael Howard and Peter Paret). NJ: Princeton University Press. Book 2, chapter 2, para 24.

<sup>6</sup> See TP 525-3-0, The U.S. Army Capstone Concept, hereafter referred to as the ACC, p. 34.

<sup>7</sup> “Adversaries may even elect to attack only in cyberspace, where military networks and critical infrastructure are vulnerable to remote attack, and actions remain difficult to trace.” DOD, Joint Staff. (2012, September 10). *Capstone Concept for Joint Operations: Joint Force 2020*, p. 2. Hereafter referred to as CCJO. Additionally, harsh and complex terrain and bad weather can have significant adverse effects on the employment of technology.

<sup>8</sup> It is recognized that not all organizations operating within a unit’s area of operations will want to be considered “partners.” Future Army forces should refrain from referring to those organizations as partners. However, future Army forces must be adept at establishing working relationships with them.

<sup>9</sup> Without the exercise of moral nerve and restraint by Army commanders, the use of modern information systems (including the proliferation of personal communications and computing devices) can become a liability. Information systems can create the illusion of perfect clarity from a distance and entice commanders to penetrate to lower levels of command and take over the fight. This micromanagement of the fight inhibits trust and can undercut the speed of operations as subordinates begin to become accustomed to waiting to be told what they must do. See Dempsey, M. (2012, April 3). *Mission Command White Paper*, hereafter referred to as MCWP, pp. 3 & 7. “...as is imbuing commanders with restraint as communications technologies could increase the propensity for micromanagement.” CCJO, p. 8. “Now their Army and their lives will be dominated by policies, regulations—and e-mail. Of course, modern communications technology has enabled remarkable connectivity on the battlefield during the past decade’s wars, but its unintended and corrosive effects in peacetime will rapidly wear down the initiative required by Mission Command.” Barno, D. (2014, July 10). The Army’s next enemy? Peace. *The Washington Post*.

<sup>10</sup> Combat power is “the total means of destructive, constructive, and information capabilities that a military unit or formation can apply at a given time.” ADRP 3-0, p. 3-1.

<sup>11</sup> As is often the case, this was not a new revelation. “War is, above all things, an art, employing science in all its branches as its servant, but depending first and chiefly upon the skill of the artisan. It has its own rules, but not one of them is rigid and invariable. As new implements are devised, new methods result in mechanical execution; but over and above all its mechanical appliances, it rests upon the complex factors of human nature, which cannot be reduced to formulas and rules.” Greene, F. (1883). The important improvements in the art of war during the past twenty years and their probable effect on future military operations. *Journal of the Military Service Institution of the United States 4 (13)*, p. 41.

<sup>12</sup> “No one at any level of the Army has conducted the difficult analysis of how Mission Command would be implemented across the operational and, more important, the institutional or generating forces. Implementing Mission Command as a powerful combat multiplier must begin at the top and filter down by example to all ranks, military as well as civilian.” Vandergriff, D. (2013, February). Misinterpretation and confusion: What is mission command and can the U.S. Army make it work? *The Land Warfare Papers*, (94). Arlington, VA: The Institute of Land Warfare, Association of the United States Army, p. 5. “Mission command must be institutionalized and operationalized into all aspects of the joint force—our doctrine, our education, our training, and our manpower and personnel processes. It must pervade the force and drive leader development, organizational design and inform material acquisitions.” MCWP, p. 6.

<sup>13</sup> “Doctrine describes how the principles of mission command assist commanders and staff; however, it specifies very little about how those principles apply to sergeants major.” Eger, D. (2014, September-October). Noncommissioned officers and mission command. *Military Review*, XCIV (5), pp. 7-8. “Now codified in Army doctrine, Mission Command provides the right command concept for the times, yet it is not well understood in the total force or how it applies in non-tactical duties.” Department of the Army. (2013, June). U.S. Army Mission Command Strategy FY 13-19, p. i

<sup>14</sup> “At a 2013 Association of the United States Army meeting, then-LTG Perkins acknowledged that there was “some significant misunderstanding or lack of complete understanding.” He believed some of the confusion centered on the misinterpretation that mission command replaced command and control. The Army still commands and controls forces, but does it for the sake of empowerment, not compliance. “You cannot control the exploitation of initiative; you empower exploitation of initiative.” Perkins, D. (2013, June 18). [Briefing]. *Implementing Mission Command*. Briefing presented as part of the 2013 Association of the United States Army’s Mission Command Symposium. Then-LTG David Perkins as commander of the Combined Arms Center at Fort Leavenworth, Kansas explains why the Army chose to change its command and control warfighting function to mission command.

<sup>15</sup> “It is not enough to write new doctrine, if the purpose is to change the way an army will fight. Ultimately, an army’s behavior will almost certainly be more a reflection of its character or culture than of the contents of its doctrine manuals....Deeper questions must be asked [and answered] about how to push the new doctrine into the collective mindset of the army.” Johnston, P. (2000, Autumn). Doctrine is not enough: The effect of doctrine on the behavior of armies. *Parameters*, XXX (3), p. 38.

<sup>16</sup> ACC, p. 5 and AOC, p. 8.

<sup>17</sup> “As the economy improves and recruitment standards increase, the Army will be challenged by a shortage of qualified personnel to meet the new standards. Similarly, a reduction in military force, potential changes to benefits, and the uncertainty of a continuing military career could impact retention of the best and brightest.” ACC, p. 19. An implication of this assumption is that adherence to the mission command philosophy can create a positive, challenging, and rewarding environment in which quality Soldiers and Army Civilians will more likely want to remain. Arguably, an authentic mission command culture can also help reduce toxic leadership and contribute to Soldier resiliency.

<sup>18</sup> “Those who serve should wonder aloud whether the Army really means to embrace mission command or whether the risks will exceed the senior leadership’s capacity to absorb the effects of accepting risks.” Fontenot, G. (2011, March). Mission command: An old idea for the 21st century. *Army Magazine*, 61(3), p. 70.

<sup>19</sup> “While the Army fights alongside the Navy, Air Force, Marines, Coast Guard, and our allies, the Nation also relies on a ready Army to provide unique capabilities for the Nation’s defense. Unique to the Army is the ability to conduct sustained land campaigns in order to destroy or defeat an enemy, defend critical assets, protect populations, and seize positions of strategic advantage. Additionally, as the foundation of the Joint Force, the Army provides critical capabilities—command and control, communications, intelligence, logistics, and special operations—in support of Joint operations.” Murphy, P. & Milley, M. (2016, April 7). [Record Version]. Statement by the Honorable Patrick J. Murphy, Acting Secretary of the Army and General Mark A. Milley, Chief of Staff United States Army before the Committee on Armed Services United States Senate. Washington, DC, p. 5.

<sup>20</sup> TP 71-20-3, *The U.S. Army Training and Doctrine Command Concept Development Guide*, pp. 4-11.

<sup>21</sup> “My intent is to sustain a high-quality All-Volunteer Army that remains the most decisive land force in the world; provides depth and versatility to the Joint Force; is agile, responsive, and effective for Combatant Commanders; and ensures flexibility for national security decision-makers in defense of the Nation at home and abroad.” Odierno, R. (2012, January). *Marching Orders. 38<sup>th</sup> Chief of Staff, U.S. Army. America’s Force of Decisive Action*, p. 2.

<sup>22</sup> “Operational adaptability requires resilient Soldiers and cohesive teams that are able to overcome the psychological and moral challenges of combat, proficient in the fundamentals, masters of the operational art, and cognizant of the human aspects of conflict and war. It also requires flexible organizations and adaptable institutions that are tailored and scaled to support a wide variety of missions and adjust focus rapidly to prevent conflict, shape the operational environment, and win the Nation’s wars.” ACC, p. 24.

<sup>23</sup> The ACC is the Army’s holistic future concept that is a primary reference for all other concept development and drives the development of subordinate concepts. This overarching concept provides direct linkages to national and defense level planning documents. TP 71-20-3, p. 45.

<sup>24</sup> The AOC defines interorganizational as “elements of U.S. government agencies; state, territorial, local, and tribal agencies; foreign government agencies; intergovernmental, nongovernmental, and commercial organizations. (Does not include forces.)” AOC, p. 46.

<sup>25</sup> Realizing mission command means commanders enable agile and adaptive leaders and organizations to take dutiful initiative within the commander’s intent to exploit opportunities.

<sup>26</sup> See DA, TRADOC, Army Capabilities Integration Center (ARCIC). (2012, August 20). *Operational Environments to 2028: The Strategic Environment for Unified Land Operations*. Fort Eustis, VA. Hereafter referred to as OEs to 2028. “This is the strategic environment estimate TRADOC will use as the foundation to build, train and educate the U.S. Army.” OEs to 2028, p. 1.

<sup>27</sup> “A key factor in developing adaptive capacity in junior officers is the ability to actually lead and make decisions rather than merely to execute the orders of higher commanders.” Wong, L. (2004, July). Strategic Studies Institute, U.S. Army War College. *Developing Adaptive Leaders: The Crucible Experience of Operation Iraqi Freedom*. Carlisle, PA, p. 13.

<sup>28</sup> “Win” occurs at the strategic level and involves more than just firepower. It involves all elements of national power.” AOC, p. iii.

<sup>29</sup> “Throughout the course of history, world events have always presented militaries with both complexity and unpredictability. Today’s environment sustains this norm, but adds the unprecedented speed at which events unfold and information travels. The pace of change is accelerating. . . . The sheer number of connections between people and societies has increased exponentially. An ever-present global media can instantly elevate local actions to matters of strategic import. Technology and weapons once reserved to states can now find their way into the hands of disaffected individuals and disruptive groups.” Odierno, R. (2013, February 4). The force of tomorrow. *Foreign Policy*.

<sup>30</sup> “As we relearned in Afghanistan and Iraq, the United States should not enter a conflict with a strategic plan that amounts to little more than engaging and destroying the enemy order of battle. Lasting strategic success is not a function of enemy units eliminated or targets destroyed. A successful strategic outcome rests, as it has from time immemorial, on winning the contest of will.” Odierno, R., Amos, J., & McRaven, W. (2013, May). *Strategic Landpower: Winning the Clash of Wills*, p. 7.

<sup>31</sup> Army professionals are charged to operate within the law but, importantly, what is legal may not be morally or ethically correct.

“Understanding that their actions will finally be judged by standards set by law, commanders logically seek legal direction to better assure themselves of legal compliance and avoid liability. . . . What is legal is not necessarily moral, and the law does not address many moral issues at all.” Major, A. (2012, May-June). Law and ethics in command decision making. *Military Review*, XCII (3), pp. 61, 62.

<sup>32</sup> “The speed, complexity, and scrutiny of modern warfare demands professional soldiers and exceptionally well-trained forces. The Army can no longer compensate for tactical inexperience because the international community condemns extensive collateral damage.” Lewis, L., Sondheimer, R., & Peterson, J. (Eds.). (2015, February). Strategic Studies Institute, U.S. Army War College. *Senior Conference 50, The Army We Need: The Role of Landpower in an Uncertain Strategic Environment, June 1-3, 2014*. Carlisle, PA, p. 19. American Soldiers must remain unparalleled warfighters.

<sup>33</sup> “Skilled military leaders have always understood that war has both a physical and a psychological dimension. The physical dimension allows an army, navy, and air force to compel enemies and noncombatants to act in a specific way, either by fear of what will happen to them if they do not or the promise of reward if they do. The two dimensions overlap: physically compelling enemies to do something, or killing them, has psychological effects on anyone who observes or hears about it. But skill in one dimension does not automatically equate to success in the other.” Metz, S. (2013, October 3). U.S. Army War College, Strategic Studies Institute. *Strategic Landpower Task Force Research Report*. Failure to consider all of the elements affecting human behavior in the battle for the narrative will cede initiative to the threat, place future missions at risk, and potentially increase conflict. Elements affecting human behavior include cognitive, informational, social, cultural, political, and physical aspects of the environment.

<sup>34</sup> See “Spread of advanced cyberspace and counter-space capabilities.” AOC, pp. 11-12. “While the nature of war is enduring, the character of war today is extraordinarily dynamic. Information operations, cyber, space, and counter-space capabilities, and ballistic missile technology are among the true game changers on the modern battlefield.” Dunford, J. (2016, 1<sup>st</sup> Qtr). From the chairman: Our force and our fight. Joint Force Quarterly, 80, p.2.

<sup>35</sup> “A range of foreign states use definitions for cyber conflict that are entirely different from our own, extending to different concepts of what constitutes on-line hostilities and even a state of war. This leads to a potentially dangerous situation where an adversary could be operating

according to an entirely different understanding of international law to that followed by the United States.” Giles K. & Monaghan A. (2014, March). Strategic Studies Institute, U.S. Army War College. *Legality in Cyberspace: An Adversary View*. Carlisle, PA, p. v.

<sup>36</sup> An individual’s cyberspace persona (IP or email address, website, phone number, social media account, avatar, etc.) is not tightly coupled with reality. An individual can have multiple personas and multiple individuals can use one persona. Therefore, linking this virtual identification to an actual individual is often not feasible as the Internet inherently provides a level of anonymity to those who seek it.

<sup>37</sup> As U.S. technological advantages decline, the chance of technological surprise increases. The prevailing side of the technological struggle gains a significant advantage over the loser who, degraded or disrupted, must struggle simply to operate effectively. “Authorities are a complex problem... While Title 10 authorities are clear, Title 32 and State Active Duty status require the application of varied State constitutional, legislative, and executive authorities and coordination with state agencies and officials.” Cardon, E. (2015, April 14). [Official Statement]. *Operationalizing Cyberspace for the Services*. Statement before the Senate Armed Services Committee Subcommittee on Emerging Threats and Capabilities. Washington, DC, p. 8.

<sup>38</sup> “All components of a hybrid threat will use cyber operations to either degrade U.S. mission command capabilities, or to conduct global perception management campaigns.” *OEs to 2028*, p. 5. However, the cause of this degradation may not be technological. The use of chemical, biological, radiological, nuclear, and high-yield explosives, coupled with adverse weather, may create physical conditions that degrade the Soldier’s ability to use advanced technology.

<sup>39</sup> “Security cooperation is all Department of Defense interactions with foreign defense establishments to build defense relationships that promote specific US security interests, develop allied and friendly military capabilities for self-defense and multinational operations, and provide US forces with peacetime and contingency access to a host nation.” JP 3-22: *Foreign Internal Defense*. p. I-10.

<sup>40</sup> “[General Martin E. Dempsey] said he believes in the whole-of-government approach with economic, diplomatic, law enforcement, energy and the military instruments of power working together to confront problems and issues, and he’s pushed for that approach many times during his tenure.” Garamone, J. (2015, September 22). Dempsey talks caution, whole-of government approach. *DoD News*. See also the AOC’s discussion of *engage regionally*, p. 17, as well as its complete discourse on the proposed Army core competency of shape the security environment, p. 22.

<sup>41</sup> “Only by working to create a more shared sense of action can burdens of global norms be spread.” Mazarr, M. & the NDU Strategy Study Group. (2013, May). Foreign Policy Research Institute. *Discriminate Power: A Strategy for a Sustainable National Security Posture*. The Philadelphia Papers, No. 2, Philadelphia, PA, p. 6. “For example, the Army trains partner militaries to participate and operate together in regional organizations like the African Union or global organizations like United Nations peacekeeping operations. Even though these ground forces are unlikely to participate in coalition operations with the Army, their ability to interoperate with regional partners can further U.S. security interests.” AR 34-1, *Multinational Force Interoperability*, p. 2.

<sup>42</sup> Power projection is “the ability of a nation to apply all or some of its elements of national power—political, economic, informational, or military—to rapidly and effectively deploy and sustain forces in and from multiple dispersed locations to respond to crises, to contribute to deterrence, and to enhance regional stability.” AOC, p. 45.

<sup>43</sup> “The Army must integrate and maximize cooperation missions as part of enduring operations and activities to enhance responsiveness and support Combatant Commanders and Army readiness.” DA. (2014, August). *Army Strategic Guidance for Security Cooperation: An Enduring Mission for “Prevent, Shape, and Win,”* p. 2.

<sup>44</sup> “Army forces must be prepared to defeat future threats including those that continuously adapt to avoid U.S. strengths and attack what they perceive as weaknesses.” ACC, pp. 9-10. See the AOC’s discussion of “harbingers of future conflict” for its description of enemies and adversaries. AOC, pp. 12-14. Importantly, enemies and adversaries will use urban areas for camouflage, concealment and protection from advanced U.S. technology. They will routinely position command posts and other military targets in dense urban environments and deliberately endanger civilians to create international sympathy and support.

<sup>45</sup> As an example, the growing use of tunnels and underground facilities by military and irregular forces to gain a tactical advantage is becoming more sophisticated and increasingly effective, making the likelihood of U.S. forces encountering military-purposed subterranean structures on future battlefields very high.

<sup>46</sup> In Ukraine, for example, Russia annexed Crimea by operating below the threshold that might have elicited a North Atlantic Treaty Organization response and maintained confusion through information and psychological warfare. AOC, p. 13.

<sup>47</sup> Bērziņš, J. (2014, April). *Russia’s New Generation Warfare in Ukraine: Implications for Latvian Defense Policy*. Center for Security and Strategic Research, National Defence Academy of Latvia, p. 5.

<sup>48</sup> “Conventional and special operations forces work together to understand, influence, or compel human behaviors and perceptions.” AOC, p. 19. Hybrid tactics, however, is simply using all available means (to include exploiting civilian casualties and ignoring the laws of armed conflict) to achieve desired outcomes.

<sup>49</sup> ADP 1, *The Army*, p. 1-8.

<sup>50</sup> “In short, the Army becomes the nation’s utility player and is expected to conduct operations anywhere, anytime, against anyone.” Lewis, L. (2004, July). Lewis, L., Sondheimer, R., & Peterson, J. (Eds.). (2015, February). Strategic Studies Institute, U.S. Army War College. *Senior Conference 50, The Army We Need: The Role of Landpower in an Uncertain Strategic Environment, June 1-3, 2014*. Carlisle, PA, p. 5.

<sup>51</sup> “The Army remains ready to protect the American people and respond to crises in the homeland. The homeland is a unique theater of operations for the Joint Force and the Army. Homeland defense and defense support of civil authorities remain critical missions for the Army as demands on the Army to protect the homeland continue to grow.” AOC, p. 19. Natural and manmade disasters include extreme weather events, wildfires, riots, pandemics, and industrial accidents involving toxic materials.

<sup>52</sup> “...it is inevitable that there will be a next crisis at an unanticipated time, in an unforeseen place, unfolding in an unforeseen manner, requiring the rapid commitment of Army forces.” DA. (2014, Undated). *2014 Army Strategic Planning Guidance*, p. 3.

<sup>53</sup> While complicated, the urban terrain will be relatively straightforward in comparison to comprehending the complex nature of an urban society and the multiple and competing sources of power that can rival that of existing governing officials. See FM 3-06, *Urban Operations*.

“Understanding the technological, geographic, political, and military challenges of the urban environment will require innovative, adaptive leaders and cohesive teams who thrive in complex and uncertain environments.” AOC, p. 12.

<sup>54</sup> Social media is becoming a major input for traditional public media.

<sup>55</sup> War is the most difficult and consequential endeavor a society can undertake. It transforms governments, economies, social norms, and political systems deliberately and in ways that cannot be accurately predicted at the outset. War—and preparations for war that credibly deter threats—demands that the Army build and lead teams of joint and coalition military units, U.S. government agencies (and those of partner governments), and private industry to generate, train, equip, employ, and sustain forces in pursuit of campaign objectives. Each organization or agency brings specific expertise and capabilities to bear on the problem. They also bring a unique suite of equipment—including weapons, information systems, sustainment, and information operations—that must be integrated into the overall operations. The challenges are significant and change with each



campaign; no two coalitions will be the same, and the demands of each theater require different capabilities in both scope and scale. The only viable approach is effective exercise of the mission command. The mission command approach applies each capability in a way that optimizes its strength and sequences outcomes through bold, agile, and innovative leadership and disciplined initiative across all warfighting functions.

<sup>56</sup> It is understood that Army forces must also be prepared to work with and establish relationships with neutral organizations that may be working in the area of operations and not want to associate or “partner” with military forces.

<sup>57</sup> “Army forces as part of joint teams see, fight, learn, and adapt operations across wide areas while maintaining contact with the enemy across land, air, maritime, space, and cyberspace domains.” AOC, p. 18. Here, “fighting for information” connotes both lethal and nonlethal actions to obtain relevant information and create situational understanding.

<sup>58</sup> In mission command, there will always exist a mutual dependency between good guidance and timely and insightful feedback.

<sup>59</sup> “Success goes to those who master the skills necessary to act, react, and adapt with speed and creativity.” *OEs to 2028*, p. 4.

<sup>60</sup> “In time-stressed situations, common to the Mission Command environment, the performance of the entire networked organization can be constrained by the ability of a single Soldier’s ability to process information in a timely manner. Marusich, L., Buchler, N., & Bakdash. (2014, June). U.S. Army Research Laboratory, Human Research and Engineering Directorate. *Human Limits to Cognitive Information Fusion in a Military Decision-Making Task*. 19th International Command and Control Research Technology Symposium, Paper No. 38, Alexandria, VA, p. 2.

<sup>61</sup> “We must also improve and enhance the military judgement of junior leaders to make difficult, real-time decisions that account for both tactical and strategic contexts. Increased training related to interpersonal dynamics, organizational psychology, and negotiating to achieve desired outcomes with governments and indigenous populations will be essential.” DA. (2015). *The Army Vision: Strategic Advantage in a Complex World*, p. 8.

<sup>62</sup> “The implication of this strategic environment is that going forward we will ask our soldiers, noncommissioned officers, and junior officers to do not less, but much more.” Ghikas, D. (2013, November-December). Taking ownership of mission command. *Military Review*, XCIII(6), p. 25. “Sustainable competitive advantage depends on having people that know how to build relationships, seek information, make sense of observations and share ideas through an intelligent use of new technologies.” Mikkelsen, K. & Jarche, H.. (2015, October 16). The best leaders are constant learners. *Harvard Business Review*.

<sup>63</sup> Institutionalize is to deliberately translate an organization’s code of conduct, mission, policies, vision, and strategic plans into guidelines and practices applicable to the daily activities of its leaders and subordinates. It is to integrate fundamental values and objectives into the organization’s culture, structure, and operating capabilities.

<sup>64</sup> “We cannot consider ourselves ready or sufficiently adaptable until mission command is fully integrated into all aspects of our DOTMLPF.” Caslen, R., & Flynn, C. (2011, February). Introducing the mission command center of excellence. *Army Magazine*, 61(2), p. 53.

<sup>65</sup> “What all Army operations will have in common is a need for innovative and adaptive leaders and cohesive teams that thrive in conditions of complexity and uncertainty.” AOC, p. 16.

<sup>66</sup> DA, TRADOC, CAC. (2014, October 14). *The Human Dimension Whitepaper: A Framework for Optimizing Human Performance*, p. 7. Hereafter referred to as HDWP.

<sup>67</sup> The human dimension consists of three interdependent components (cognitive, physical, and social); this concept seeks to optimize the effectiveness of Army leaders primarily through advancements in the cognitive and social arenas of decision making and team building.

<sup>68</sup> Three of the principles listed below were adopted by ADP 6-0 based, in large measure, on the original seven tenets from the 13 October 2010 version of TP 525-3-3, pp. 1-18. The original tenets were (1) mutual trust, understanding, and dutiful initiative; (2) appropriately delegated decision making; (3) decentralized combined arms capabilities; (4) adaptive, bold, audacious, and imaginative leaders; (5) well-trained, cohesive units; (6) nerve and restraint; and (7) calculated risk.

<sup>69</sup> “The Army is committed to build leaders of character who are technically and tactically proficient, adaptive, innovative, and agile.” Murphy, P. & Milley, M. (2016, April 7). [Record Version]. Statement by the Honorable Patrick J. Murphy, Acting Secretary of the Army and General Mark A. Milley, Chief of Staff United States Army before the Committee on Armed Services United States Senate. Washington, DC, p.6.

<sup>70</sup> This does not mean that the capabilities and associated characteristics and attributes described within this concept cannot be later modified during the integrated capabilities development team’s analysis. It does mean, however, that the entire concept should be understood as a baseline before deviations are made based on new information and insights obtained during the subsequent analysis. The campaign of learning for mission command is continuous; it does not end upon publication of this document.

<sup>71</sup> Some have suggested that to avoid confusion and improve understanding that the philosophy and warfighting function are “two sides of the same coin,” the philosophy should be labeled “mission command” and the warfighting function simply “command.” Commanders then exercise authority, provide direction, allocate resources, and take care of their people—they command—in accordance with the mission command philosophy of leadership.

<sup>72</sup> “Every Army leader uses his or her vision of future conflict as a basis for how he or she trains soldiers and units.” McMaster, H. (2015, March-April). Continuity and change: The Army operating concept and clear thinking about future war. *Military Review*, XCIV(2), p. 7.

<sup>73</sup> The ability to craft and communicate or describe a clear and concise intent warrants focus during leader development and organizational training.

<sup>74</sup> “Because military operations are a series of temporary conditions, commanders think ahead in time and space to retain and exploit the initiative.... To achieve depth, commanders think ahead in time and determine how to connect tactical and operational objectives to strategic goals.” AOC, p. 21.

<sup>75</sup> “A fuzzy idea coming out of the four-star headquarters did not get clearer as it was transmitted through the chain of command.” Casey, G. Volatile, uncertain, complex, and ambiguous: Leadership lessons from Iraq. *Changing Mindsets to Transform Security: Leadership Development for an Unpredictable and Complex World*. Ed. Wells, L., Hailes, T., & Davies M. Center for Technology and National Security Policy, National Defense University, Washington, DC, p. 8.

<sup>76</sup> However, it is incumbent upon commanders to revisit their intent as often as necessary to help subordinates see and understand how their specific activities can contribute to achieving the envisioned end state.

<sup>77</sup> “In 1962, GEN Lyman L. Lemnitzer offered the following assessment, which still applies: ‘Initiative is the agent which translates imagination into action. It must be used intelligently lest it becomes irresponsibility or even insubordination, but it must be used courageously when the situation warrants. Military history provides innumerable examples of commanders who, confronted with unforeseen circumstances, have adhered slavishly to instructions and, at best, have lost an opportunity; at worst, they have brought on defeat.’” Fontenot, G. (2011, March). Mission command: An old idea for the 21st century. *Army Magazine*, 61(3), P. 68.

<sup>78</sup> Previous concepts used the term “dutiful” initiative to advocate the ideas of loyalty and commitment, where subordinates willingly act for a higher purpose, versus “disciplined” initiative that connoted compliance where subordinates merely fulfill requests and act in response to a

leader's positional or coercive power. While still a valid point of concern, disciplined initiative is used in this version to align with current doctrine as the term has evolved with an understanding that this initiative will be regulated more by self- than imposed discipline.

<sup>79</sup> "And no matter the challenge, no matter how complex the environment or how dangerous the situation, our soldiers win wherever they are. We are—and must remain—the world's premier ground combat force, ready to fight today and prepared to fight tomorrow. Milley, M. (2015, October). Winning matters: Especially in a complex world. *Army Magazine*, 65(10), p. 21. Part of this expeditionary mindset is a "fight-tonight" mentality. Leaders prioritize training and maintenance and make other readiness decisions by asking and answering the question, "if we were to fight tonight, what is most important to accomplish right now?"

<sup>80</sup> "Retaining initiative requires decentralization consistent with the philosophy of mission command, focused commander's intent, and clear concepts of operation." AOC, p. 21. The AFC-MC recommends redefining disciplined initiative to include the Army Ethic as the first guide to action. The recommended definition is: "in accordance with the Army Ethic and the commander's intent, the duty and willingness to act in the absence of orders, when existing orders no longer fit the situation, or when unforeseen opportunities or threats arise."

<sup>81</sup> "How commanders shape behavior through reaction to failure is critical; mistakes of subordinates that nonetheless demonstrate responsible initiative guided by intent should be seen as building blocks in the development of mission command." MCWP, p. 8. Leaders can let subordinates fail without letting them be failures.

<sup>82</sup> Staffs and supporting tools must be capable of analyzing and sifting through large volumes of information to filter critical information from the merely informative. Staffs center on their commanders' information needs and create products (visual or textual) that help them understand the operational environment and underlying problems and make decisions, not just present them information to know. Of course, this also requires that commanders listen and value their subordinates' input.

<sup>83</sup> "...the quality of those decisions is based upon the input they receive from civil and military subordinates and the robustness of the dialogue those leaders have among themselves leading up to those decisions. Skew the input or shortchange the dialogue, and the decision quality suffers." Dubik, J. (2014, November). Winning battles, losing wars. *Army Magazine*, p. 15.

<sup>84</sup> It is important to understand that subordinate leaders and organizations are not simply recipients of a higher leader's understanding. Subordinates push their knowledge and understanding upward, downward, and laterally to actually help create it.

<sup>85</sup> On the other hand, subordinates must be taught how to effectively speak with candor including how to apply interpersonal tact and criticize without being caustic. Overall, candor must become an integral part of the Army's mission command culture.

<sup>86</sup> "Commanders decentralize combined arms and other capabilities so subordinate units have the resources to act immediately." AOC, p. 21.

<sup>87</sup> "Synchronize" in this discussion refers primarily to deconflicting the efforts of subordinate forces so that they are able to operate freely without interfering or threatening each other. Examples would be unit boundaries, fire control measures, or air corridors.

<sup>88</sup> "The measure of a good plan is not whether execution transpire as planned, but whether the plan facilitates effective action in the face of unforeseen events." ATP 5-0.1, *Army Design Methodology*, p. 1-2.

<sup>89</sup> "Leaders foster discipline, confidence, and cohesion through innovative, realistic training." AOC, p. 20.

<sup>90</sup> "[Chris Forsythe of the Human Factors organization at Sandia Laboratories] presented several findings from neuroscience that can apply directly to military training....In a team environment, the team's performance is boosted by more verbal interaction rather than less. Words spoken and ideas shared among team members should be encouraged, because the more widespread the interaction, the more successful the team is likely to be." Curthoys, K. (2014, December 2). Study: Mental cues, conditions that affect performance. *Army Times*.

<sup>91</sup> Arguably, humility is one of the key and essential attributes of future Army leaders of character. "Leaders who learn to be more humble will gain a decisive edge when practicing Mission Command." Brown, R. & Taradash, R. (2015, May). Humility: A mission command essential. *Army Magazine*, 65(5), p. 23.

<sup>92</sup> "The SCARF model [status, certainty, autonomy, relatedness, and fairness] points to more creative ways of motivating that may not just be cheaper, but also stronger and more sustainable. For example, success could be rewarded by increasing people's autonomy by allowing them to have greater flexibility in their work hours. Or, rewards could be provided via increasing the opportunity for learning new skills, which can increase a sense of status. Or, people could be rewarded through increasing relatedness through allowing more time to network with peers during work hours." Rock, D. (2008, June). SCARF: A brain-based model for collaborating with and influencing other. *NeuroLeadership Journal*, (1), p. 8.

<sup>93</sup> The AOC expands the description of national power beyond the traditional "DIME" construct. "Responding to crises, addressing the drivers of conflict, and achieving sustainable political outcomes require the application of all elements of national power (diplomatic, information, military, economic, financial, intelligence, and law enforcement)." AOC, p. 23.

<sup>94</sup> The current doctrinal definition for the mission command warfighting function is: "the related tasks and systems that develop and integrate those activities enabling a commander to balance the art of command and the science of control in order to integrate the other warfighting functions." ADRP 3-0, p. 3-3.

<sup>95</sup> "A system is a group of interacting, interrelated, and interdependent components or subsystems that form a complex and unified whole....Systems have a purpose with their parts arranged in a way (structure) to carry out their purpose. Understanding why a system exists, how the parts of the system serve that purpose, and appreciating how that system interacts with its broader environment helps develop ways to change that system." ATP 5-0.1, *Army Design Methodology*, p. 1-7.

<sup>96</sup> "Commanders understand, visualize, describe, direct, lead, and assess throughout operations." ADRP 6-0, p. 3-3.

<sup>97</sup> Much deliberation was given to the proper term for the Army's technological network. In earlier draft versions, the term LandWarNet was chosen. However, many leaders held a cognitive bias with that term. They could not break with what LandWarNet had meant to them in the past and understand how it was intended to be in the future. Therefore, the term *Army information network* was subsequently chosen to align with the joint term of DOD information network. This term reflects the Army's contribution to the DOD information network and clearly differentiates it as a technological network rather than a social or human network.

<sup>98</sup> "Systems thinking is a process of understanding how parts of a system work and influence each other as part of a greater whole. By understanding components and problems in a system in relation with each other (as opposed to in isolation), problem solvers are better equipped to develop a holistic approach to solving or managing identified problems." ATP 5-0.1, *Army Design Methodology*, p. 1-7. For example, the extension of network connectivity down to the individual Soldier level combined with a trend towards integration of commercial products such as personal mobile devices (i.e. tablets and smart phones) can also introduce security vulnerabilities that threaten the Army's entire information network. A system-of-system vulnerability analysis is required to ensure that flaws within independent systems do not compound into major system-wide vulnerabilities when connected to the Army information network. What may initially look like a good engineering design on paper or in the laboratory, may not add to the effectiveness of what the Soldier needs in the fight.

<sup>99</sup> The staff is a necessary extension of a commander. The staff allows for the conduct of a detailed analysis and the careful coordination, synchronization, and integration of activities that the commander at that echelon cannot do for him- or herself. Staff members contribute directly

to the commander's activities of understanding, visualizing, describing, directing, and assessing. In doing so, they allow the commander to focus on leading.

<sup>100</sup> Mobile command platforms and sensors can be viewed as extensions or elements of the command post. Also, advances in robotic and autonomous systems teamed with humans may expand and enhance the mission command system.

<sup>101</sup> "This begins by creating a new paradigm in our force—that the network is a weapon system. We would not send our soldiers to war without the ability to shoot and maintain their small arms, nor should we shortchange their proficiency in creating, maintaining and using their network. In today's information-dominated environment, how we connect, acquire and distribute information is as powerful a determinant of unit performance as the ability to fire ballistic weapons systems or maneuver forces. Furthermore, considering it to be a weapon system facilitates the integration of the network into each warfighting function and during operations." Flynn, C., & Grigsby, W. (2012, February). The mission command center of excellence: Driving institutional adaptability. *Army Magazine*, 62, p. 42. This concept treats the mission command system holistically and views the Army information network as one component of the system. As such, it applies the "weapon-system" approach to the entire system—not just the Army information network component.

<sup>102</sup> See Flynn, C., Grigsby, W., & Witsken, J. (2012, May). Fighting in the clouds: The network in military operations. *Army Magazine*, 62, p. 34.

<sup>103</sup> "Our modernization strategy builds from the Soldier out, equipping our squads for tactical overmatch in all situations, connected to an integrated network, and operating in vehicles that improve mobility and lethality while preserving survivability." Odierno, R. (2013, January). *38<sup>th</sup> CSA Marching Orders, Waypoint #1*, p. 3.

<sup>104</sup> "...planners must keep the soldier at the top of the priority list when making program choices. Soldiers will continue to be our most effective weapons system." Goure, D. (2012, September). Investing in the warfighter of 2020. *Army Magazine*, 62(9), p. 58.

<sup>105</sup> "In integrating the new systems, even with their faults, into the maneuver plan, many times the system itself dictates how we're going to maneuver versus the other way around. That can make it very difficult to do some of this stuff," CPT Cerami said." Gourley, S. (2014, January). Network Integration Evaluation 14.1. *Army Magazine*, 64(1), p. 47.

<sup>106</sup> Future Army forces will operate primarily through digital means but must be equally adept at operating in a degraded or disconnected network environment. "In lieu of that partnered network, the staff should be prepared to go where partners are most comfortable—that is, move to analog [or manual] versus digital systems if needed. This can require a return to basics and training on skills which have atrophied in the Army's move away from map boards and overlays to digital common operation picture." Grigsby, W., Matlock, P., Norrie, C., & Radka, K. (2013, November-December). Mission command in the regionally aligned division headquarters. *Military Review*, XCIII(6), p.7.

<sup>107</sup> "We will enhance the development and education of our leadership at all levels to produce adaptive, agile, innovative and flexible leaders of character and competency. And we will do so as a total force to win anywhere, anytime, against any enemy." Milley, M. (2015, October). Winning matters: Especially in a complex world. *Army Magazine*, 65(10), p. 23. This concept defines agility as a *flexibility* of mind and an ability to anticipate and *adapt* to uncertain or changing situations. The attribute of agile captures the need for flexibility and adaptability.

<sup>108</sup> "It is not enough for leaders to tolerate or even grow comfortable with the uncertainty described in the future environment. Operating in this complex environment requires agile, adaptive, and ethical leaders trained and educated to *improve and thrive* in uncertainty." DA, TRADOC, CAC. (2014, October 14). *The Human Dimension Whitepaper: A Framework for Optimizing Human Performance*, p. 10.

<sup>109</sup> "The minds of our officers are the most lethal weapon in gray zone competitions." Kay, L. (2016, July 27). Managing the Gray Zone is a gray matter challenge. *Small Wars Journal*.

<sup>110</sup> "Leader development is the fundamental basis for a U.S. Army that practices mission command in everything it does. Mission command and leader development are interdependent. Mission command is how we fight, and leader development is part of how we prepare to fight. Leader development that excludes the principles of mission command, or worse, that preaches mission command without putting it into practice, is missing out on the exploitation of human potential, knowledge, and experience that mission command allows. However, a U.S. Army that operates according to the principles of mission command does not just happen naturally, especially in peacetime. How effectively the Army applies the principles of mission command will be the product of leader development in a peacetime environment." Whitford, A. (2015, May-June). The path to Mission Command. *Military Review*, XCV(3), p. 40.

<sup>111</sup> "We will spend billions of dollars researching how to improve the network, but it will mean little if we don't focus our energies on command climates and environments—trust, initiative, dialogue and freedom of action within intent—that will allow mission command to thrive throughout our Army and our institutions to become as agile as our operating force." Guthrie, T. (2012, June). Mission command: Do we have the stomach for what is really required? *Army Magazine*, 62(6), p. 28

<sup>112</sup> "Experienced leaders make fewer mistakes; the risk averse will make none. However, the absence of mistakes is a deceptive metric for judging and selecting leaders. What is far more significant is the ability of leaders to learn and adapt from mistakes and discern and avoid the patterns that led to failure. Leaders who have not made mistakes have not demonstrated the ability to recover and adapt. The future leader development process must offer opportunities to refine judgment in the face of risk, with wide potential for failure in training to identify and develop resilient leaders capable of coping with setbacks." Corbett, A. (Undated). *Mission Command*. Norfolk, VA: Naval Warfare Development Command, p. 16.

<sup>113</sup> "Unfortunately, in survey after survey, Army officers report that their leaders' greatest shortcoming is the failure to develop subordinates." Pryer, D. (2013, November-December). Growing leaders who practice mission command and win the peace. *Military Review*, XCIII(6), p. 36.

<sup>114</sup> "What I'm suggesting here, however, is that our leader-development programs must also produce and reward leaders who are inquisitive, creative and adaptable." Dempsey, M. (2011, February). Leader development. *Army Magazine*, 61(2), p. 26.

<sup>115</sup> See ADP 6-22, pp. 6-8 for a discussion of leader competencies and attributes. Army leader development must foster an unending intellectual curiosity, an openness to new ideas, and a constant desire to improve upon the status quo.

<sup>116</sup> "It takes time to develop Soldiers who can successfully lead, train, and equip a unit for combat. Leader development starts with a framework of formal training coupled with professional education and operational assignments." Murphy, P. & Milley, M. (2016, April 7). [Record Version]. Statement by the Honorable Patrick J. Murphy, Acting Secretary of the Army and General Mark A. Milley, Chief of Staff United States Army before the Committee on Armed Services United States Senate. Washington, DC, p. 6.

<sup>117</sup> "To run the Army and provide senior executive leadership, lieutenant colonels, colonels and generals—regardless of component—need experience in major headquarters and an education in how the Army runs; how the Army fits into the larger set of national security institutions; how leadership requirements change from the tactical, through the operational, to the strategic levels; and how, as an institution, the Army contributes at the community and national levels in a civil-military environment. Similarly, NCOs without varied experiences and appropriate professional education are also handicapped relative to the demands of senior leadership. Sergeants major and command sergeants major with very narrow developmental and educational experiences simply cannot serve at senior levels as effectively as these positions demand." Dubik, J. (2012, June). Education, experience, and training: Responsibilities to the Army profession. *Army Magazine*, 62(6), 23. See also Dubik, J. (2013, January). On becoming a strategic leader. *Army Magazine*, 63(1), pp. 16-18 and Cavanaugh, M. (2014, July-August). On strategic understanding:

Teaching strategy from the ground up. *Military Review*, 94(4), pp 12-17. Critically, future Army leaders should find it impossible to think of applying military force extrinsic to the social and political environment and desired strategic outcomes.

<sup>118</sup> “Finally, leaders and soldiers who have met the challenge of conflict in the 21st century, where they served, learned and excelled, will not be satisfied with a return to routine garrison operations. They will demand a training environment that is as complex as the situations they have seen in real life.” Wallace, W. (2013, November). Another training revolution coming. *Army Magazine*, 63(11), p. 40. “Meaningful training needs context.” Wallace, p. 42.

<sup>119</sup> “As we look to reinvigorate wargaming across the defense enterprise, there is another lesson from the inter-war period that we would do well to heed. In the years leading up to the Second World War, we energized our war colleges and schools to think about how we would fight differently in future conflicts, and wargaming was central to this effort. All students and officers returning as instructors were taught how to run a wargame. The constant cycling of officers from the schoolhouse to the operating forces not only created great wargames, but great wargamers—many of whom turned out to be great wartime commanders.” Work, B. & Selva, P. (2015, December 8). Revitalizing wargaming is necessary to be prepared for future wars. *War on the Rocks*, p. 5. Faculties must include the correct balance of military and civilian instructors, curriculum developers, and researchers.

<sup>120</sup> “Innovation is important in organizations that develop capabilities as well as those that train, equip, and sustain forces.” AOC, p. 22.

<sup>121</sup> Training and education must be provided at the point and time of need and accommodate Soldier and Civilian proclivities based on the way they were “raised to learn.”

<sup>122</sup> “The institutional Army adapts quickly to changes in the character of warfare with revised institutional training and education for leaders across the Army.” AOC, p.20

<sup>123</sup> “Formal counseling and informal mentoring are clearly Army weaknesses that limit the ability of Army leaders to reach their full potential in all areas, to include their personal character.” Michelson, B. (2013, September-October). Character development of U.S. Army leaders: The laissez-faire approach. *Military Review*, XCIII (5), p. 36.

<sup>124</sup> See U.S. Army Combined Arms Center. (2015, September). *Talent Management Concept of Operations for Force 2025 and Beyond*. Fort Leavenworth, KS. Appendix A to this Concept of Operations covers these issues under its problem area discussions of talent requirements; talent inventory; evaluations, promotions, and succession planning; and assignments, development, and career management, pp. 23-25.

<sup>125</sup> “This legacy [personnel management] system is woefully archaic in the 21st century—and far removed from the best talent-management practices of the private sector. It may well be the last untransformed segment of an otherwise modern, flexible, and adaptable U.S. military. Yet the personnel system touches every single person in the military every single day of their career—and determines how much they are paid, where they live, what kind of jobs they perform, and how often they move or get promoted. Neither officers nor enlisted troops have any substantial input in how they fit into this system—nor how to maximize their talents for the greater good.” Barno, D. & Bensahel, N. (2015, November 5). Can the U.S. military halt its brain drain? *The Atlantic*. “In the command processes and professional structures that create generation after generation of warriors that tacitly reinforce and defend the centralized hierarchy, this sort of change will be near impossible. It requires the awakening of a senior level of defense leadership at the right moment, with the strength and agility to purge what will inevitably be multiple generations of those still shackled to the centralized hierarchical form. Those that prosper under the traditional form will find it most hard to abandon, as change ushers in uncertainty and the greater potential for loss of power and prosperity for those expecting it under the current form.” Zweibelson, B. (2016, January 12). US, allies must ‘stop fixating’ on ISIL & friends; ‘frankly, we are losing.’ *Breaking Defense*.

<sup>126</sup> “Army personnel management policies will require significant modification to accommodate these demands.” ACC, p. 23. “While new capabilities will be essential, many of our most important advancements will come through innovations in training, education, personnel management, and leadership development.” CCJO, p. iii.

<sup>127</sup> “A focus on the individual alone is not sufficient, however. The Army must forge these individuals into cohesive teams who gain and maintain a position of advantage in persistent conflict to prevent, shape, and win in the future.” The Army Human Dimension Strategy 2015, hereafter referred to as AHDS, p.4. “While optimizing the human performance of every Soldier and Army Civilian is necessary for future success, the Army must also build these individuals into cohesive teams. These teams, like the individuals that form them, must improve and thrive in ambiguity and chaos of the future and innovate rapidly in the face of uncertainty. Forging these teams requires a culture of trust enabled by the philosophy of Mission Command.” AHDS, p. 5.

<sup>128</sup> “The Joint Force requires the Army to deploy credible and reliable combined arms teams across the range of military operations.” AOC, p. 16. “...Army headquarters provide joint, interorganizational, and multinational teams with the ability to plan, execute, and assess operations in complex environments.” AOC, p. 23.

<sup>129</sup> “As the foundation upon which other U.S., allied and multinational capabilities will operate, the Army of 2025 must be interoperable by easily supporting and enabling joint, whole-of-government and multinational land-based operations.” DA. (2015). *The Army Vision: Strategic Advantage in a Complex World*, p. 9. “The changing security environment presents a complex range of threats, challenges, and opportunities, making it likely U.S. forces will be called on to operate under a broad variety of conditions and with many foreign partners. U.S. forces will mitigate risks through better force management and increased military-to-military interoperability with allies and foreign partners.” AR 34-1, *Multinational Force Interoperability*, p. 1.

<sup>130</sup> “Army forces provide foundational capabilities to integrate the efforts of multiple partners.” AOC, p. 23.

<sup>131</sup> “Complex missions may require one [headquarters] for JTF and one [headquarters] for ARFOR/JFLCC. Designating a division commander to be the de facto JFLCC for two or more other divisions across a wide [area of operations] is unrealistic and will lead to failure due to competing and at times conflicting requirements of both time and missions.” DA, U.S. Army Combined Arms Center, Mission Command Center of Excellence, Capabilities Development Integration Directorate, Mission Command Battle Lab. (2012, August 8). [Briefing]. *Gain and Maintain Operational Access Experiment Emerging Insights*. Briefing presented to Director, Concept Development and Learning Directorate, Army Capabilities Integration Center. Fort Leavenworth, KS, slide 9.

<sup>132</sup> New or improved JTF headquarters training facilities may allow corps and divisions greater ability to rapidly organize and train as a JTF during exercises and in actual preparation for real-world contingencies. These same facilities should be capable of serving as the JTF’s main command post or a critical command node. Additionally, the Army’s future information network must allow for more extensive use of on-line training and greater distributed participation by joint staff augmentees and other joint, interorganizational, and multinational partners during exercises and real-world contingencies.

<sup>133</sup> This should include training and use of the joint operations planning process. “Although exposed to this during Intermediate-Level Education, few Army majors know it well.” Grigsby, W., Matlock, P., Norrie, C., & Radka, K. (2013, November-December). Mission command in the regionally aligned division headquarters. *Military Review*, XCIII (6), p. 6.

<sup>134</sup> The U.S. national military strategy emphasizes six attributes for tomorrow’s joint leaders that are fully compatible with the principles of mission command. “Our leaders will: • Strive to understand the environment in which they operate and the effect of applying all instruments of

national power; • Anticipate and adapt to surprise, uncertainty, and chaos; • Work to recognize change and lead transitions; • Operate on intent through trust, empowerment, and understanding; • Make ethical decisions based on the shared values of the Profession of Arms; and • Think critically and strategically in applying joint warfighting principles and concepts to joint operations.” DOD. (2015, June). *The National Military Strategy of the United States of America 2015*, p. 14.

<sup>135</sup> “Operational success...relies upon the performance of ground forces enabled by robust and Joint-Interagency efforts to affect activities occurring in finite amounts of time and discrete amounts of space.” DA, Chief of Staff of the Army Strategic Studies Group-I. (2013, July). *Testing Assumptions about the Role of Land Power in 2030 Final Report*, p. 15.

<sup>136</sup> One aspect of creating networked joint, interorganizational, and multinational partners is technological interoperability—covered later as an Army information network attribute essential to enabling mission command. While network-enabling technologies can assist in communications, they cannot ensure understanding. Well trained, culturally astute, and adequately resourced liaison teams (including skilled linguists when necessary) having and maintaining a clear understanding of their commander’s intent will remain critical to joint, interorganizational, and multinational partner interoperability.

<sup>137</sup> “Expeditionary joint task force headquarters help integrate and synchronize the efforts of multiple partners.” AOC, p. 17.

<sup>138</sup> “Today, most leaders of combat formations have limited experience with combined arms operations against enemy conventional or hybrid forces.” Murphy, P. & Milley, M. (2016, April 7). [Record Version]. Statement by the Honorable Patrick J. Murphy, Acting Secretary of the Army and General Mark A. Milley, Chief of Staff United States Army before the Committee on Armed Services United States Senate. Washington, DC, p. 5.

<sup>139</sup> “Our approach to readiness recognizes that after a decade of focus on counter-insurgency operations, the U.S. armed forces must re-hone other capabilities needed for a wider spectrum of missions and [threats].” DOD. (2012, January). *Defense Budget Priorities and Choices*, p. 2.

<sup>140</sup> “These tactics presented IDF commanders with dilemmas US commanders have and will continue to confront: either maximize the effect of our combat power against an enemy force to minimize our casualties, or forgo the military advantage to avoid civilian casualties.” Caldwell, W. (2015, March 23). Hybrid threats pose new challenge. *Defense News*. “Interdependence gained by the right mix of complementary conventional and special operations forces enhances success throughout the range of military operations and all phases of joint campaigns.” AOC, p. 24.

<sup>141</sup> “During defense support of civil authorities operations, Army leaders at corps and division levels organize teams to support interorganizational partners. Army forces ensure unity of effort through dual-status commanders who respond to state and national chains of command and lead Army forces operating under authorities of Titles 10 and 32 U.S. Code.” AOC, p. 19.

<sup>142</sup> “Army forces contribute to joint force mission accomplishment by providing foundational capabilities that permit effective integration of military, interorganizational, and multinational efforts.” AOC, p. iv. Although doctrine may need to be revised to emphasize the point, the operations process itself is sufficiently broad to allow the incorporation of joint, interorganizational, and multinational partners into planning, preparation, execution, and assessment. Specific methodologies like the military decision making process, on the other hand, may need careful revision to ease and facilitate greater whole-of-government and partner integration.

<sup>143</sup> Commander’s prioritization of his or her information needs provides a critical filter for the information inputs into the command post and helps reduce the staff’s cognitive burden and prevent information overload.

<sup>144</sup> “Prepare a clear mission statement, intent, and concept of operations. Focus on key tasks for intent. Make the concept of operations - the how, when and where of the plan -the centerpiece of your orders and assure it is understood two levels down. The concept guides your subordinates for as long as the plan holds up. It preempts a lot of questions and uncertainty if it is well done. We have put so much emphasis on commander’s intent, and more recently on over-abbreviated mission templates, that our ability to articulate clearly how we will execute operations is diminished. The cost is that we fail to get the most out of our organizations initially and we deviate from our plans prematurely.” McMaster, H. (2016, March 31). Lieutenant General Don Holder’s free, non-binding advice for battalion and squadron commanders. *The Strategy Bridge*.

<sup>145</sup> “Army leaders think critically, are comfortable with ambiguity, accept prudent risk, assess the situation continuously, develop innovative solutions to problems, and remain mentally and physically agile to capitalize on opportunities.” AOC, p. 21.

<sup>146</sup> As command posts and nodes become widely distributed over greater and greater distances, knowledge management becomes even more critical to the development of shared understanding.

<sup>147</sup> “This [mission] vagueness means that a campaigning military organization must learn and adapt as fast as it can, at multiple levels at once, and it must learn and adapt in ways that are unique to every echelon while drawing on knowledge and support from peers, superiors, and subordinates alike.” Wass de Czege, H. (2012, May-June). Difficult missions: What logic to apply and what action to take. *Military Review*, XCII(3), p. 57.

<sup>148</sup> “Second, the Army must maintain a robust *Network* that is not vulnerable to cyber-attacks. This network provides the ability for the Joint Force to assess reliable information on adversaries, the terrain, and friendly forces. This information provides a decisive advantage by enabling the Joint Force commander to make accurate and timely decisions, ultimately, hastening the defeat of an adversary.” Murphy, P. & Milley, M. (2016, April 7). [Record Version]. Statement by the Honorable Patrick J. Murphy, Acting Secretary of the Army and General Mark A. Milley, Chief of Staff United States Army before the Committee on Armed Services United States Senate. Washington, DC, p. 9.

<sup>149</sup> Sensors include those that future Army forces use to see (or sense) themselves. For example, this includes sensors used to monitor Soldier health status or the maintenance status of vehicles and equipment.

<sup>150</sup> While allowing for a rapid and responsive acquisition process, the Army must establish unity of effort in materiel development for the Army information network to enable integrated and synchronized research, development, and acquisition efforts within the Army, across the Department of Defense, and in conjunction with our partners in industry and academia.

<sup>151</sup> “The Army must fit machines to Soldiers rather than the other way around. The Army will pursue advances in human sciences for cognitive, social, and physical development and emphasize engineering psychology and human factors engineering in the design of weapons and equipment.” AOC, p. 36.

<sup>152</sup> “Plans to increase technical training are in place, [General David Perkins, head of Army Training and Doctrine Command], said, but it’s not enough to keep up with the speed of technology. ‘You have to realize that the Army is going to field new systems before we get [warrant officers] back into the school system again,’ he said. ‘We just can’t bring you back every time a new system comes in.’ One solution: Increased efforts to push updated maintenance tutorials and requirements into the field alongside the new gear. ”Lilley, K. (2016, February 16), Warrant officer forecast: What’s in store for the Army’s technical experts. *Army Times*.

<sup>153</sup> From this, it should be understood that an organization’s command post need not be considered as a single location from which the commander and staff operate, but can be multiple locations—stationary or moving and on the land or water or in the air—perhaps separated by vast distances. The key is that these combinations are communicatively linked and allow for the exercise of mission command. Also, this list of types of command posts is not made to suggest that these are separate and distinct. The home-station CP can also be the main CP. Similarly, the early-entry CP could also be considered as the tactical CP. The home-station or main CP and the early-entry or tactical CP can both scale up or down based on the needs of the commander. Lastly if the commander needed, the main CP could fully deploy to an area of operations.

<sup>154</sup> Distribution encompasses determining personnel and system composition and responsibilities for each command node.

<sup>155</sup> The AFC-MC defines sociotechnical as “the careful and thoughtful integration of humans and technology so that technology complements human attributes—cognitive and physical—for greatest benefit.” CP infrastructure includes the environmentally controlled workspace and lighting necessary to house and protect Soldiers and systems from the environment; the visualization and collaboration devices that allow the commander and staff to view the common operational picture and communicate internally and externally (large-scale displays and intercom); as well as the necessary power generation and distribution equipment to establish and manage the power grid to enable continued, sustained operations.

<sup>156</sup> The AOC enumerates five key challenges for the future Army: 1) increased velocity and momentum of human interaction and events; 2) potential for overmatch; 3) proliferation of weapons of mass destruction; 4) spread of advanced cyberspace and counter-space capabilities; and 5) demographics and operations among populations, in cities, and in complex terrain. AOC, pp. 11-12.

<sup>157</sup> For example, it is expected that future satellite systems will continue to serve as a transport medium to support cyberspace operations, which includes support of common routing protocols (e.g. IPv4 and IPv6). The use of these publicly- or commercially-available, Internet-based protocols as part of satellite-based communications increases the potential for more advanced forms of cyberspace attack.

<sup>158</sup> “Key investments supporting the network are...assured position, navigation, and timing; communications security; and defensive and offensive cyberspace operations.” Murphy, P. & Milley, M. (2016, April 7). [Record Version]. Statement by the Honorable Patrick J. Murphy, Acting Secretary of the Army and General Mark A. Milley, Chief of Staff United States Army before the Committee on Armed Services United States Senate. Washington, DC, p. 9.

<sup>159</sup> “As cyberspace operations are now fully embedded in military operations, it is imperative that academic institutions provide cyberspace education opportunities for our future commanders as well as government and private sector leaders.” Waddell, W., Smith, D., Shufelt, J., & Caton, J. (2011, March). Center for Strategic Leadership, U.S. Army War College. *Cyberspace operations: What senior leaders need to know about cyberspace*. CSL Study 1-11. Carlisle, PA, p. 1. This includes an understanding of joint and other government agency capabilities and interdependencies that could be leveraged to accomplish the mission.

<sup>160</sup> Reach is “collaboration, information sharing, and capability integration with any organization and/or individuals, regardless of location, echelon, or affiliation.” DA, TRADOC, U.S. Army Combined Arms Center (CAC) and ARIC. (2015, October 1). *The Mission Command Network: Vision & Narrative*, pp. 6-7 & 23.

<sup>161</sup> High-altitude, long-endurance unmanned aerial systems and other persistent communications and surveillance platforms are a promising complement to satellite capabilities.

<sup>162</sup> Navigation warfare “refers to the deliberate defensive and offensive action to assure friendly use and prevent adversary use of PNT information through coordinated space, cyberspace, and EW capabilities.” DOD. (2013, May 29). JP 3-14: *Space Operations*, p. II-6.

<sup>163</sup> “During joint combined arms operations Army forces maneuver and project power across all domains to ensure joint force freedom of action and deny the enemy the ability to operate freely across domains.” AOC, p. 18.

<sup>164</sup> “Threats may emanate from nation states or nonstate actors such as transnational terrorists, insurgents, and criminal organizations.” AOC, p. 10. Cyberspace threats also include insiders and independent hackers. Some hackers conduct their disruptive activities simply for entertainment.

<sup>165</sup> “The Army integrates maneuver in cyberspace with the other forms of maneuver to deny the enemy’s ability to conduct operations in cyberspace while preserving U.S. freedom of action.” AOC, p. 24

<sup>166</sup> “Though cyber operations continue to enjoy relative priority as defense resources shrink, one area of relative ambiguity is the degree to which the military services can or should invest in developing cyber capabilities to support military operations below the COCOM level.” Leed, M. (2013, September). *Offensive Cyber Capabilities at the Operational Level*. Washington, DC: Center for Strategic and International Studies, p. 2.

<sup>167</sup> For example, “officials are trying to keep an eye on cybersecurity features of future robots, whose electronic circuits could be disabled or hijacked by adversaries.” Sprenger, S. (2015, October 20). Army official ties future of robotics revolution to open systems. *Inside Defense*.

<sup>168</sup> “To operate effectively in the current operational environment, we need a single, integrated force to conduct full spectrum cyberspace operations; ensure reliable, secure information flow; and perform intelligence operations across all disciplines.” Alexander, K. (2013, August). The Army’s way ahead in cyberspace. *Army Magazine*, 63 (8), p. 24. The Army must correctly balance cyberspace expertise among Soldiers and Civilians and its active and reserve components.

<sup>169</sup> Digital public affairs and information operations are two key capabilities reliant on the Army information network. In addition, robots and increasingly autonomous or semi-autonomous weapon systems must be considered in the development of future cyberspace capabilities.

<sup>170</sup> Digital forensic science is the structured analysis of any digital device to extract, preserve (including chain of custody), recover, and analyze digital data to obtain information and determine the origin or attribution for the data or for a network intrusion, attack, or other digital event in order to develop intelligence to support military operations or for use as evidence in support of the rule of law.

<sup>171</sup> “You cannot have a human operator operating at human speed fighting back at determined cyber tech,” [Deputy Defense Secretary Robert Work said. ‘You are going to need have a learning machine that does that...’ ‘We believe strongly that humans should be the only ones to decide when to use lethal force. But when you’re under attack, especially at machine speeds, we want to have a machine that can protect us.’” Tucker, P. (2015, December 14). These are the decisions the Pentagon wants to leave to robots. *Defense One*.

<sup>172</sup> ACC, p. 18.

<sup>173</sup> “To improve our situational awareness in cyberspace, we are aggressively pursuing foundational cyber analytics capabilities.” Cardon, E. (2015, April 14). [Official Statement]. *Operationalizing Cyberspace for the Services*. Statement before the Senate Armed Services Committee, Subcommittee on Emerging Threats and Capabilities. Washington, DC, p. 9.

<sup>174</sup> “These factors present new vulnerabilities and pose new threats to our warfighting capabilities.” Cardon, E. (2015, April 14). [Official Statement]. *Operationalizing Cyberspace for the Services*. Statement before the Senate Armed Services Committee, Subcommittee on Emerging Threats and Capabilities. Washington, DC, p. 8.

<sup>175</sup> “[Army ground and aviation] units now train on the assumption they can run rings around any enemy when it comes to knowing what is happening in the fog of war, and using that knowledge to defeat elusive adversaries. There’s only one problem: in future wars, the Army is likely to face enemies far better equipped than it is to seize control of the electromagnetic spectrum and exploit it to tactical advantage.” Thompson, L. (2016, March 15). Electronic warfare: How the U.S. Army could lose its next war. *Forbes*.

<sup>176</sup> “We actually don’t have the luxury of choosing between a force that can fight (the Islamic State group) and one that has a modern nuclear enterprise, robust cyber capabilities, conventional and special operations capabilities,” [General Joseph F. Dunford Jr., Chairman of the Joint Chiefs of Staff] said. ‘We as the United States have to have a complete inventory and balanced capability.’” Dickstein, C. (2016, March 29). Dunford: Changes needed to prepare for ‘dynamic and complex’ future wars. *Stars and Stripes*. For example, the use of laser-based communications mechanisms versus traditional radio frequency energy will enable new capabilities and create new vulnerabilities. Wireless technologies present similar opportunities and vulnerabilities.

<sup>177</sup> “To this end, the Army will invest in innovative technologies focused on...directed energy weapons, cyber, and integrated electronic warfare.” Murphy, P. & Milley, M. (2016, April 7). [Record Version]. Statement by the Honorable Patrick J. Murphy, Acting Secretary of the Army and General Mark A. Milley, Chief of Staff United States Army before the Committee on Armed Services United States Senate. Washington, DC, p. 9.

<sup>178</sup> Strategic engagement refers to the activities to sustain public support at home, gain allies abroad, and generate support for the mission in the area of operations.

<sup>179</sup> “I will increasingly turn to our military to take the lead and provide information to the public about our efforts. Our intelligence community has done outstanding work, and we have to continue to protect sources and methods. But when we cannot explain our efforts clearly and publicly, we face terrorist propaganda and international suspicion, we erode legitimacy with our partners and our people, and we reduce accountability in our own government.” Obama, B. (2014, May 28). Remarks by the President at the United States Military Academy Commencement Ceremony. West Point, NY.

<sup>180</sup> “Enabled by universally accessible and scalable communication techniques, social media has substantially changed the way organizations, communities, and individuals communicate. Social media is a potentially valuable tool for information engagement.” ACC, p. 35. See also CCJO, pp. 2-3. Today’s global information environment means that messages and actions delivered to one audience will reach other audiences.

<sup>181</sup> Lethal miniature aerial munitions is one example of precision munitions that are complicating airspace control.

<sup>182</sup> “The Army will need to maintain and improve our human and technical collection, and, more importantly, the speed and accuracy of our analysis process to address this increasingly complex environment.” DA. (2014, Undated). *2014 Army Strategic Planning Guidance*, p. 11.

<sup>183</sup> See the AOC’s discussion of *consolidate gains*, p. 19

<sup>184</sup> AOC, p. 16.

<sup>185</sup> “Our benchmark of success is to: sustain and improve our capabilities to prevent conflict; shape the environment by building partner capacity; win the current war against terrorists in Iraq, Afghanistan, and elsewhere; and prepare ourselves to win the next war decisively.” Murphy, P. & Milley, M. (2016, April 7). [Record Version]. Statement by the Honorable Patrick J. Murphy, Acting Secretary of the Army and General Mark A. Milley, Chief of Staff United States Army before the Committee on Armed Services United States Senate. Washington, DC, pp. 1-2.

<sup>186</sup> “Although important, it is not just the size of the Army that matters, but rather the right mix of capacity, readiness, skill, superior equipment, and talented Soldiers, which in combination, are the key to ground combat power and decision in warfare.” Murphy, P. & Milley, M. (2016, April 7). [Record Version]. Statement by the Honorable Patrick J. Murphy, Acting Secretary of the Army and General Mark A. Milley, Chief of Staff United States Army before the Committee on Armed Services United States Senate. Washington, DC, p. 4.

<sup>187</sup> “Additionally, the Army must act to leverage its greatest war dividend, the experienced leaders and Soldiers who have learned invaluable lessons and gained irreplaceable experience during the last decade of extended conflict.” ACC, p. 22

<sup>188</sup> “Army forces partner with ministries of defense to develop and shape the environment and establish strategic frameworks that employ forces, build professional military institutions, and partner with European Allies to achieve shared strategic objectives.” Murphy, P. & Milley, M. (2016, April 7). [Record Version]. Statement by the Honorable Patrick J. Murphy, Acting Secretary of the Army and General Mark A. Milley, Chief of Staff United States Army before the Committee on Armed Services United States Senate. Washington, DC, p. 3.

<sup>189</sup> “Leaders exert influence on key individuals, organizations, and institutions through cooperative and persuasive means. For example, when mission accomplishment requires strengthening partner institutions, Army forces exert influence to convince those partners that undertaking necessary reforms and strengthening critical institutions are in their interest.” AOC, p. 19.

<sup>190</sup> “However, should war occur, we must terminate the conflict on terms favorable to the United States—this requires significant ready forces and the operational use of the Army National Guard and Army Reserve. Only the Army provides the President and the Secretary of Defense the ability to rapidly deploy ground forces, ranging in decisive ground capabilities from Humanitarian Assistance and Countering Terrorism to high-end decisive operations. Moreover, the Army conducts these operations in unilateral, bilateral, or coalition environments across the range of conflict from unconventional warfare to major combat operations. In the end, the deployment of the American Army is the ultimate display of American resolve to assure allies and deter enemies.” Murphy, P. & Milley, M. (2016, April 7). [Record Version]. Statement by the Honorable Patrick J. Murphy, Acting Secretary of the Army and General Mark A. Milley, Chief of Staff United States Army before the Committee on Armed Services United States Senate. Washington, DC, pp. 4-5.

<sup>191</sup> “Additionally, as the foundation of the Joint Force, the Army provides critical capabilities—command and control, communications, intelligence, logistics, and special operations—in support of Joint operations.” Murphy, P. & Milley, M. (2016, April 7). [Record Version]. Statement by the Honorable Patrick J. Murphy, Acting Secretary of the Army and General Mark A. Milley, Chief of Staff United States Army before the Committee on Armed Services United States Senate. Washington, DC, p. 5.

<sup>192</sup> “Opportunities to create a less dangerous world through diplomacy, economic stability, collective security, and national example exist, but military strength is both a complementary and foundational element of National power in a dangerous world. Each element is necessary in combination with the others; however, each alone is insufficient to win a war or maintain a peace.” Murphy, P. & Milley, M. (2016, April 7). [Record Version]. Statement by the Honorable Patrick J. Murphy, Acting Secretary of the Army and General Mark A. Milley, Chief of Staff United States Army before the Committee on Armed Services United States Senate. Washington, DC, p. 2.

<sup>193</sup> “...but it will be our commanders who will execute these mission command principles each day and who will continue to shape the Army we build for the future.” Perkins, D. (2012, June). Mission command: Reflections from the combined arms center commander. *Army Magazine*, 62(6), p. 34. “Its senior officers need to take on this challenge directly. They must embrace and protect a leadership philosophy anchored in trust—one that imbues the Army’s peacetime operations with wartime precepts of Mission Command.” Barno, D. (2014, July 10). The Army’s next enemy? Peace. *The Washington Post*.

<sup>194</sup> The philosophy of mission command will not be imbued within the Army without constant and continuous leadership emphasis particularly at senior levels.

<sup>195</sup> Unified action is the synchronization, coordination, and/or integration of the activities of governmental and nongovernmental entities with military operations to achieve unity of effort. ADRP 3-0, p. 1-3.

<sup>196</sup> “The Army National Guard and Army Reserve are experienced and ready, and have never been as completely integrated within the total Army.” ADP 1, p. 4-3. In the future, this integration should be as good as or better than today.

<sup>197</sup> AOC, p. 35.

<sup>198</sup> AOC, pp. 40-41.

<sup>199</sup> The world’s effective capacity to exchange information via telecommunications networks was estimated at 281 petabytes in 1986 and grew to 667 exabytes in 2014.

<sup>200</sup> Wikipedia.

<sup>201</sup> “Secondly, robots and autonomy-enabled systems can help improve situational awareness and provide persistent monitoring of the environment [LTG H.R. McMaster] added. However, this doesn’t just mean to transmit visual observations, McMaster said, but will also have ‘other means of information collection so you can understand your environment better.’” Judson, J. (2016, March 17). US Army putting finishing touches on autonomous systems strategy. *Defense News*.

<sup>202</sup> “Culturally, DOD is comfortable undertaking [human performance modification] activity to return individuals to their baseline performance following injuries or the general degrading effects of conducting operations. DOD is less comfortable increasing individuals’ performance beyond their baseline by, for example, improving IQ or night vision.” Brimley, S., FitzGerald, B., & Saylor, K. (2013, September). *Game Changers: Disruptive Technology and U.S. Defense Strategy*. Center for a New American Security. Washington, DC, pp. 17-18.

<sup>203</sup> “Patrick Lin, lead author of the report, doesn’t offer conclusive answers to these and other ethical questions but insists that it’s time for an in-depth discussion. ‘Given a significant lag time between ethics and technology, it is imperative to start considering their impacts before technologies fully arrive on the scene and in the theater of war,’ Lin writes.” Matthews, W. (2015, April). Supersoldiers: Can science and technology deliver better performance? *Army Magazine*, 65(5), p. 41.

<sup>204</sup> CCJO, pp. 14-15; ACC, pp. 34-36; and AOC, pp. 41-43.

<sup>205</sup> “It’s time to end the myth of the complete leader: the flawless person at the top who’s got it all figured out. In fact, the sooner leaders stop trying to be all things to all people, the better off their organizations will be. In today’s world, the executive’s job is no longer to command and control but to cultivate and coordinate the actions of others at all levels of the organization. Only when leaders come to see themselves as incomplete—as having both strengths and weaknesses—will they be able to make up for their missing skills by relying on others.” Ancona, D. et al. (2007, February). In praise of the incomplete leader. *Harvard Business Review*.

<sup>206</sup> “Leading truthfully may also involve brutally honest reporting from subordinates who risk being labeled malcontents or slackers because of their candor.” Wong, L. & Gerras S. (2015, February). Strategic Studies Institute, U.S. Army War College. *Lying to Ourselves: Dishonesty in the Army Profession*. Carlisle, PA. p. 32.

<sup>207</sup> “In a time where the half-life of any skill is about five years, leaders bear a responsibility to renew their perspective in order to secure the relevance of their organizations...What matters today is being connected to a wise network of trusted individuals who can help us filter useful information, expose blind spots and open our eyes.” Mikkelsen, K. & Jarcho, H.. (2015, October 16). The best leaders are constant learners. *Harvard Business Review*.

<sup>208</sup> “However, authentic and transformational leadership is about more than just accomplishing the mission and getting a promotion. It also includes developing and empowering subordinates, building trust, and leaving a unit better than it was before. Toxic and narcissistic leaders do not do that.” Doty, J. & Fenalson, J. (2013, January-February). Narcissism and toxic leaders. *Military Review*, XCIII (1), p. 60.

<sup>209</sup> “Leaders that fully develop subordinates during their Army career leave a legacy that is enduring and far exceed any impact they could make through their own individual accomplishments.” U.S. Army Forces Command. (2015, October 19). Enclosure 1 (Leader Development) to FORSCOM Command Training Guidance (CTG)—Fiscal Year 2016. Fort Bragg, NC, p. 2.

<sup>210</sup> “Even if the Army is able to implement [mission command] perfectly, it will still need to be able to communicate in a [joint, interagency, intergovernmental, and multinational] environment to successfully complete operations and support national objectives. “ DA, Chief of Staff of the Army Strategic Studies Group-I. (2013, July). *Testing Assumptions about the Role of Land Power in 2030 Final Report*, p. 31.

<sup>211</sup> “Culturally, the Army has seen a rise in risk aversion over the course of the last decade that has prompted many leaders to spend considerable time trying to avoid making decisions and pass that responsibility further up the chain of command. The logical outcome is something with which most soldiers are all too familiar: micromanagement.” Doty, J. & Fenalson, J. (2013, July). Mission command and mission accomplishment. *Army Magazine*, 59(9), p. 16.

<sup>212</sup> Failure should never be viewed as permanent or representative; instead, it is an opportunity to remediate.

<sup>213</sup> “A further threat to Mission Command lies in the twin areas of blame culture and litigation. Their combined effects are insidious and potentially corrosive. On the one hand, if something goes wrong, somebody is usually blamed. There is a ‘fall guy’, not least because the Media, with their need for immediate but often simplistic messages, want someone to be seen to be blamed. Mission Command only works in an environment of mutual trust. One important element of that trust is acceptance by the superior of well-intentioned mistake.” Storr, J. (2003, Autumn). A command philosophy for the information age: The continuing relevance of mission command. *Defence Studies*, 3 (3), p. 125. The Army must develop leaders with the moral courage to resist the current culture of blame and litigation.

<sup>214</sup> “Directed reading and study, coupled with the training and education of our leaders in the institutional Army and their self-study, will create the warrior that is needed for the remainder of the 21st century and beyond.” Shaw, S. (2013, October-December). Rally point for leaders: Building an organization’s mission command culture. *Infantry*, 102(4), p. 25.

<sup>215</sup> “Although they may seem inconsequential, exit interviews can have a profound impact. Leaders have the rare opportunity to get unfiltered feedback from their soldiers, and soldiers get confirmation that their superiors care enough to ask for their opinion. This small, seemingly simple act can have a great impact on an organization. Machak, J. (2015, June). Better exit interviews: Opportunities for organizational improvement. *Army Magazine*, 65(6), 56-57.

<sup>216</sup> “Similar to other domains, Army leaders and organizations must be capable of employing capabilities in cyberspace, but not to the point of dependency should those capabilities be negated.” DA. (2014, Undated). *2014 Army Strategic Planning Guidance*, p. 17.

<sup>217</sup> Information system updates, modernization, and fielding schedules will have to consider how best to support maintaining interoperability between active and reserve components. While real-world operational priorities should remain paramount, organizational continuity and training sustainability should become larger considerations.

<sup>218</sup> “There’s one Army; that’s it. There’s one Army. We all wear the same uniform. I mean it says United States Army on our chest and that’s the way we have to approach it. The United States Army cannot conduct combat operations in a sustained way overseas without use of the National Guard and Reserve. We just can’t do it. We can do short term operations. But sustained ops cannot be done without the Guard and Reserve. There’s one Army; they’re critical to our success.” Milley, D. (2015, August 6). [Remarks to a Committee Member’s Question]. Senate Armed Services Committee’s Chief of Staff of the Army Nomination Hearing. Washington, DC.

<sup>219</sup> “Concepts establish the intellectual foundation for Army modernization and help Army leaders identify opportunities to improve future force capabilities.” AOC, p. 7.

<sup>220</sup> “Mission command: The words alone can cause an NCO to tune out. Often, as soon as the word ‘command’ is heard, NCOs think of ‘commander’ and decide that’s officer business outside their lane.” Koester, J. (2013, September). NCOs have important roles in mission command. *NCO Journal*.

<sup>221</sup> All Army commanders are leaders; however, not all Army leaders are commanders.

<sup>222</sup> This concept emphasizes and modifies the definition of command as a verb. To command is to lawfully exercise authority derived from rank or assignment, direct subordinate efforts, and utilize resources to accomplish tasks. Command includes responsibility for planning the



employment of, organizing, directing, coordinating, controlling, and leading people for the accomplishment of assigned missions. It also includes responsibility for their health, welfare, morale, and discipline.

<sup>223</sup> Doctrine currently directs that mission orders follow the five-paragraph operations order format as described in the Army Tactics, Techniques, and Procedures Manual 5-0.1 and that they state the task organization, commander's intent and concept of the operations, missions, tasks to subordinate units, and minimum essential coordinating instructions. ADRP 6-0, p. 2-5.

<sup>224</sup> Importantly, this principle is modified to include the quality of candor that is absolutely essential to the proper exercise of mission command.

<sup>225</sup> Effective collaboration requires leaders who can listen as well as they speak.

<sup>226</sup> While a shared lexicon is important to ensure that Army professionals use precise terms to describe what needs to be accomplished, Army professionals avoid using jargon and acronyms to the greatest extent possible. This will aid in communicating and creating shared understanding with other joint, interorganizational, and multinational partners.

<sup>227</sup> Bottom-up input and accurate reporting is critical for the commander to understand the environment and the friendly and enemy situation.

Shared understanding is not just ensuring that everyone has the same understanding; it is also working together to collaboratively and continuously develop that understanding. In the past, it has been termed the "co-creation of context." Shared understanding can be viewed as a prerequisite to developing (and, as this shared understanding is later improved and refined, modifying) the commander's vision articulated in his or her intent and desired end state.

<sup>228</sup> Who information is actually shared with is, of course, tempered by the sensitivity and classification of information—operational security concerns. However, Army commanders—at the very outset of the creation of information and knowledge—must seek to extend this inclusiveness to all joint, interorganizational, and multinational partners.

<sup>229</sup> Through battlefield circulation, the commander can visit locations throughout his or her area of operations and see ongoing activities and discuss issues personally with superiors, subordinates, and other joint, interorganizational, and multinational partners to gain a broader perspective—a supporting staff will not have this freedom of movement and subordinates are limited to their smaller portion of the area of operations. The commander then compares his or her firsthand information against the understanding developed through a supporting staff to test and, as necessary, refine his or her understanding. If time is available, the commander still seeks to obtain his or her staff's subject-matter expertise to help interpret and apply judgment to what he or she has observed.

<sup>230</sup> Again, the "best" understanding is not "perfect" understanding. Future Army commanders must be comfortable operating under various levels of uncertainty and ambiguity. Otherwise, they risk establishing demands for vast amounts of information from which they can make statistical, quantitative, scientific, and mathematical assessments and decisions. An obsession for data and information can result in operational and tactical paralysis, lost opportunities, and failure.

<sup>231</sup> "Welcoming candor is not a license to be brash, angry, or habitually wrong; it is the constructive contribution to communication that builds transparency." Paolozzi, P. (2013, September). *Closing the Candor Chasm: The Missing Element of Army Professionalism*. Professional Military Ethics Monograph Series, Volume 5. Carlisle Barracks, PA: United States Army War College Press, p. 1.

<sup>232</sup> "Routinely, candor is understood within an archetypal framework: a subordinate summoning the courage to express genuine thought to a senior. Subordinate to senior candor is commonly addressed, but three additional types of candor are particularly relevant to the Army context: senior to subordinate candor; peer candor; and self-candor." Paolozzi, p. 4.

<sup>233</sup> Above all, it is the human aspects of military operations that complicates all risk decisions.

<sup>234</sup> For example, mission command and operating decentralized make "battle drills" more important than ever to successful armed conflict and preservation of life. Battle drills are trained responses to enemy actions or leader's orders that are executed rapidly without the need to apply a deliberate decision-making process. See FM 7-0, pp. 2-4 for a discussion of battle drills.

<sup>235</sup> See, for example, Covey, S.M.R. (2006). *The Speed of Trust: The One Thing That Changes Everything*. New York, NY: Free Press.

<sup>236</sup> Senior leaders must avoid the desire to make decisions for their subordinates (unless in the commander's judgment the risk of potential injury or damage is too high). They must underwrite honest mistakes and allow subordinates to try their ideas thereby gaining experience and becoming habituated to making decisions in the absence of command.

<sup>237</sup> "...proficiency-based trust is one of the most necessary components of mission command." Dubik, J. (2012, September). Mission command and Army training doctrine. *Army Magazine*, 62(9), p. 22.

<sup>238</sup> "When deciding whether or not to trust, a person typically assesses the other person's ability, benevolence, and integrity (ABI)." DA, TRADOC, CAC, Mission Command Center of Excellence, Capabilities Integration and Development Directorate, Human Dimension Capabilities Development Task Force. (2015, January 2015). *Building Mutual Trust Between Soldiers and Leaders White Paper*, p. 3.

<sup>239</sup> For example, entrusted information may include candid assessments of the effects that national caveats and policy constraints have on the employment of multinational forces and capabilities.

<sup>240</sup> Inherent in this principle is the reality that subordinate commanders "nest" their intent and purpose with their own commander's intent and purpose thereby centering on their own commander and not on themselves.

<sup>241</sup> "We also find the requirement to determine which touch points a commander deems necessary to support their specific style of decision making. These are commander-centric and based on the decision making style of the commander. Some like big meetings to make decisions; others like to make decisions in smaller meetings." Luck, G. (2013, March). U.S. Joint Staff J7, Deployable Training Division. *Insights and Best Practices: Joint Operations, Fourth Edition*, pg. 41. The information that a commander requires includes that which challenges the commander's and staff's current assumptions and situational understanding, favored course of action under consideration, or current operational approach.

<sup>242</sup> "The commander is the central figure in mission command. To the commander comes the mission for the unit; in the commander resides the authority and responsibility to act and to lead so that the mission may be accomplished. In mission command, the commander must blend the art of command and the science of control, as he, supported by the staff, integrates all joint warfighting functions." MCWP, p. 4.

<sup>243</sup> Commanders do not maintain a monopoly on good ideas. Sometimes inexperience can lead to novel ideas untainted by preconceived notions and "in-the-box" thinking—this "box" often having been created by the commander. And, of course, the amount of debate is partly based on the time available for planning. Debate must be purposeful—contributing to the best course of action. Commanders and staffs avoid over analyzing and the pitfall sometimes known as "paralysis by analysis."

<sup>244</sup> "Personal courage takes two forms: physical and moral...Moral courage is the willingness to stand firm on values, principles, and convictions. It enables all leaders to stand up for what they believe is right, regardless of the consequences. Leaders, who take full responsibility for their decisions and actions even when things go wrong, display moral courage. Moral courage also expresses itself as candor. Candor means being frank, honest, and sincere with others. It requires impartiality and fairness." ADRP 6-22, p. 3-3. Personal courage is one of seven espoused Army values. In turn, these values combine as one of four foundational elements forming Army leaders of character. ADRP 6-22, p. 3-1.

<sup>245</sup> This is not to say that leaders who are not commanders do not show concern for people. They do; they just do not have the *responsibility* for their health, welfare, morale, and discipline.

<sup>246</sup> Consider the President of the United States in his or her role as Commander-in-Chief.

<sup>247</sup> “To facilitate the necessary level of adaptation, Army forces empower increasingly lower echelons of command with the capabilities, capacities, authorities, and responsibilities needed to think independently and act decisively, morally, and ethically. Decentralized execution guided by the [principles] of mission command places increased responsibility on Soldiers to make decisions with strategic, operational, and tactical implications.” ACC, p. 22.

<sup>248</sup> However, providing subordinates with capabilities with which they are not trained to employ does not contribute to empowerment, but may have, instead, the opposite effect.

<sup>249</sup> “The philosophy of Mission Command must empower both the commander and his [or] her staff. The devices related to Mission Command warfighting function must enable both the commander and his [or] her staff to attain a greater degree of situational awareness and understanding in order to know when to use the reins of control.” Fontenot, G. & Benson, K. (2013, June). The conundrum of mission command. *Army Magazine*, 63(6), p. 35.

<sup>250</sup> Multiple, simultaneous actions make it more difficult for threats to determine a pattern which can, in turn, serve to mask intent and help achieve tactical and operational surprise.

<sup>251</sup> This concept takes the perspective that all operations are decentralized and it is the degree of decentralization that varies based upon the circumstances. This is in contrast with a perspective that views operations varying between centralization and decentralization. The underlying premise for the first viewpoint is that leaders should seek to establish the conditions that allow the greatest degree of decentralization which will in turn foster the greatest amount of disciplined initiative.

<sup>252</sup> “Perhaps it is counterintuitive, but commanders who distribute their authority multiply their capability, perhaps exponentially, while those who hoard decision authority reject the potential of the massed cognition of talented subordinates they fail to engage. Such leaders may have the potential for great singular effort, but lack the nerve to trust. The failure is not method, but in character.” Corbett, p. 17.

<sup>253</sup> The minimum control measures for any operation include intent, maneuver boundaries, fire control measures, and rules of engagement.

<sup>254</sup> “An order should not trespass on the province of the subordinate. It should contain everything which is beyond the independent authority of the subordinate, but nothing more. When transmission of orders involves a considerable period of time, during which the situation may change, detailed instructions are to be avoided. The same rule holds when orders may have to be carried out under circumstances which the originator of the order cannot completely forecast; in such cases *letters of guidance* is more appropriate. It should lay stress upon the *object to be attained* and leave open the means to be employed.” 1905 U.S. Army Field Service Regulations, pp. 29-30 as quoted in Ancker, C. (2013, March-April). The evolution of mission command in U. S. Army doctrine, 1905 to the present. *Military Review*, XCIII (2), p. 43

<sup>255</sup> “The means to effect positive control as a consequence of instantaneous communications will act as a powerful drag on initiative when coupled with nearly simultaneous capacity to criticize decisions without understanding context.” Fontenot, G. (2011, March). Mission command: An old idea for the 21st century. *Army Magazine*, 61(3), p. 68.

<sup>256</sup> “Firstly, that much of our motivation driving social behavior is governed by an overarching organizing principle of minimizing threat and maximizing reward [Gordon, 2000].” Rock, D. (2008, June). SCARF: A brain-based model for collaborating with and influencing other. *NeuroLeadership Journal*, (1), p. 1.

<sup>257</sup> “A further issue is the need to sustain the human quality of our armed forces...If we are to retain high-caliber people capable of thinking and acting quickly and effectively under stress, we need to retain a doctrine or philosophy (such as Mission Command) that supports those characteristics. If we do not, the good will leave and only the obedient, subservient and unimaginative will stay.” Storr, J. (2003, Autumn). A command philosophy for the information age: The continuing relevance of mission command. *Defence Studies*, (3) 3, p. 126.

<sup>258</sup> Innovation and creative thinking—creating something new or original—is an additional competency and not a replacement for critical thinking—a deliberate, methodical process of thought whose purpose is to discern. ADRP 6-0, pp. 2-7 through 2-8.

<sup>259</sup> “The primary conclusion of this paper is that the Army’s current laissez-faire approach is insufficient to effectively meet the challenges posed by implementation of either mission command or the principles presented in ADRP 1-0, *The Army Profession*.” Michelson, B. (2013, September-October). Character development of U.S. Army leaders: The laissez-faire approach. *Military Review*, XCIII (5), p. 37.

<sup>260</sup> “Army leaders integrate and synchronize warfighting functions and joint, interorganizational, and multinational capabilities such that they achieve complementary effects.” AOC, p. 23.

<sup>261</sup> ADRP 7-0, p. 2-2.

<sup>262</sup> In the future, an organization’s main operational command post may remain at home station throughout the entire campaign or operation.

<sup>263</sup> Grouping and classifying information-related activities by their purpose of informing and influencing has always been problematic. In an effort to avoid the perception that Army leaders improperly influence their civilian leadership or allied and coalition partners, the discussion of influence activities was oriented at the enemy and neutral-foreign audiences. This viewpoint approached influence as a negative activity. However, information can be applied to influence people to either their detriment or benefit. For example, Army leadership is the process of influencing people by providing purpose, direction, and motivation to accomplish the mission and improve the organization. Therefore, Army leaders would use influence to benefit.

<sup>264</sup> While many other security programs (for example, information security, cybersecurity, program protection planning, and industrial security) focus on protecting classified information, operations security focuses on eliminating, reducing, or concealing the unclassified indicators that can compromise classified information, especially critical information. Despite these differences, operations security and all other security programs are related and must be mutually supporting in order to ensure maximum protection of classified as well as critical information.

<sup>265</sup> “Integrate space operations” had already been included as a mission command task within the current ADRP 1-03, *The Army Universal Task List*, p. 5-51.

<sup>266</sup> This is simply a matter of categorizing or “binning” to improve logic and understanding. It should not be interpreted as diminishing the importance of these sub-tasks.

<sup>267</sup> “Conduct command post operations” is codified as a higher-level task of the mission command warfighting function within current ADRP 1-03, *The Army Universal Task List*, p. 5-27.

<sup>268</sup> In other capability development documents, this has been termed “mission command on-the-move.” However, that term was used differently dependent on the specific community of interest. The phrase “uninterrupted mission command” is deemed to be more inclusive and overarching. It implies that commanders must be able to exercise command during strategic, operational, or tactical movement and maneuver; while at the halt, quick halt, or long halt; or during any phase of an operation (including deployment). The term is not meant to be hubristic. It seeks to connote the ability to exercise mission command across multiple locations, with continuity of purpose, despite discrete breaks in connectivity and services. It includes the ability to operate degraded.

<sup>269</sup> Not every Soldier needs the full complement of network capabilities. The Army information network must achieve the right balance of voice and data capabilities tailored to each echelon.

<sup>270</sup> “Some portion of the joint force will be able to maneuver directly against key objectives from ports of embarkation, without reliance on fixed intermediate or forward bases, identifying and changing those objectives enroute. This will put a premium on enroute communications for command and control.” DOD, Joint Staff. (2012, January 17). *Joint Operational Access Concept, Version 1.0*, p. 31. See also Flynn, C. & Richardson, J. (2013, July-August). Joint operational access and the global response force: Redefining readiness. *Military Review*, *XCIII* (4), p. 40 and the AOC’s discussion of *respond globally*, pp. 17-18.

<sup>271</sup> “The forward presence of the commander on the battlefield remains critical for ensuring mutual trust between commanders and subordinates in executing mission command. While digital technologies enable commanders to attain unprecedented levels of situational awareness, nothing substitutes for the physical and moral presence of the commander on the battlefield.” Higginbottom, M., & Adkison, R. (2012, July). At the tip of the spear: Mission command on the move in a networked force. *Army Magazine*, *62*(7), p. 32.

<sup>272</sup> The Office of the Assistant Secretary of the Army for Acquisition, Logistics, and Technology (ASA[ALT]) recognizes that a single technical solution for the common operating environment is unachievable in the near and mid-term; therefore, it categorizes the common operating environment into six overlapping computing environments: 1) data center/cloud/geospatial foundation, 2) command post, 3) mounted, 4) mobile/handheld, 5) sensor, and 6) real-time/safety critical/embedded. DA, ASA (ALT). (2011, November). *Common Operating Environment Implementation Plan Core, Draft v 3.0*, pp. 1-10 through 1-12. However, cross-cutting capabilities that span multiple computing environments eliminate redundancies, reduce materiel footprints, increase cost saving, and improve operational efficiencies.

<sup>273</sup> “Expeditionary capability is the ability to promptly deploy combined arms forces worldwide into any area of operations and conduct operations upon arrival. Expeditionary operations require the ability to deploy quickly with little notice, rapidly shape conditions in the operational area, and operate immediately on arrival exploiting success and consolidating tactical and operational gains.” ADRP 3-0, p. 1-7. In future operations, physical distances between units, even at lower tactical echelons, will likely increase.

<sup>274</sup> “A significant part of this strategy requires advancing and adopting spectrum-dependent technologies that will lead to more spectrally efficient, flexible, and adaptable [spectrum-dependent system] capabilities.” DOD, Chief Information Officer. (2013, September 11). *Electromagnetic Spectrum Strategy 2013: A Call to Action*, p. 6. Greater dispersion may negatively affect ground units’ ability to provide mutually supporting direct fires necessitating a greater dependence on the simultaneous employment of ground forces with manned and unmanned, rotary-, and fixed-wing aviation and fires to seize, retain, and exploit the initiative.

<sup>275</sup> The Army’s future holistic training environment will integrate live and synthetic (the combination of virtual, constructive, gaming, and augmented reality) training with the training information infrastructure to enable commanders to plan, prepare, execute, and assess training faster, more effectively, at lower cost, and with greater realism. DA, TRADOC, CAC-T. (2014, February 19). [Briefing]. *Training In-Process Review*. Briefing presented to Commander, CAC. Fort Leavenworth, KS, slide 37.

<sup>276</sup> Mission partner environment is “the capability framework in which combatant command partners plan, prepare, and execute operations at an appropriate, single security classification level, with a common language. It provides strategic, operational, and tactical flexibility for all commanders to execute command and control by providing the means to clearly communicate commander’s intent to achieve maximized operational effects with all mission partners.” AR 34-1, *Multinational Force Interoperability*, p. 26.

<sup>277</sup> “The burden thus falls on the Joint Force to create the information environment that will facilitate partner integration. Any such environment should provide the ability to collaborate across multiple security levels without the need for segregated hardware systems.” CCJO, p. 13.

<sup>278</sup> The synchronization of joint and multinational partners’ activities with Army operations is important regardless of whether the Army headquarters is operating as a JTF or JFLCC headquarters, or simply a subordinate organization within the JTF or JFLCC.

<sup>279</sup> “...headquarters need a cross-domain architecture that allows for rapid transfer of information. They also need hardware, such as additional server stacks, to establish a partnered mission command network.” Grigsby, W., Matlock, P., Norrie, C., & Radka, K. (2013, November-December). Mission command in the regionally aligned division headquarters. *Military Review*, *XCIII* (6), p.7.

<sup>280</sup> “DOD will also continue to adopt new tools and techniques to manage the spectrum more effectively, making our spectrum operations more agile.” DOD, Chief Information Officer. (2013, September 11). *Electromagnetic Spectrum Strategy 2013: A Call to Action*, p. 6. This may be achieved through greater automated or autonomous capabilities which can also reduce the network management burden on units.

<sup>281</sup> The delivery of software patches and version updates will be simplified and eased across entire Army.

<sup>282</sup> Department of the Army, Chief Information Officer/G-6. (2016, March). *Shaping the Army Network: 2025-2040*, p. 12.

<sup>283</sup> As the Army seeks a resource-informed network approach, a promising materiel solution with efficiency and feasibility appears to be “cloud computing.” This solution would place computing capabilities and data storage physically separate from users. It would allow resources to be shared, information to be more easily protected, and infrastructure to be more easily updated. Currently, however, cloud computing relies on high bandwidth with virtually no delay for information exchange. To retain functionality during degraded conditions, compartmentalization, or creating layers or echelons (clouds within clouds) may be a necessary design feature to allow units to continue to operate in isolation. See Flynn, C., Grigsby, W., & Witsken, J. (2012, May). Fighting in the clouds: The network in military operations. *Army Magazine*, *62*, pp. 32-34.

<sup>284</sup> Relevant information is accurate, timely, usable, complete, precise, and reliable. See ADRP 6-0, p. 2-13. Relevant information includes position location information; symbols; graphic control measures; intelligence, operational, and unit status information; civil considerations; and information on the operational environment including political, military, economic, social, information, infrastructure, physical environment, time; area, structure, construction, organization, people, events; and sewage, water, electricity, academics, trash, medical, security variables from disparate information and intelligence systems. Relevant information must also include those portions of space, cyberspace, the EMS, and the information environment that are relevant to shared understanding and decision making.

<sup>285</sup> A common operational picture will be critical to achieving these operational and readiness qualities. However, a common operational picture does not equate to an omniscient picture. While everyone may have the same picture, the information displayed will never represent all operational and mission variables relevant to decision making and at each echelon. What is relevant to a particular situation may not be common. Hence, decentralized decision making by empowered subordinates with greater situational understanding of their particular area of operation will remain essential to success in future joint combined arms operations.

<sup>286</sup> Other ground forces include the U.S. Marines Corps and elements of U.S. Special Operations Forces. This can also extend to coalition ground forces.

<sup>287</sup> A common operational picture leads to shared awareness, while collaboration leads to shared understanding.

<sup>288</sup> Future decision-support tools will be designed to provide staff-like functions such as resource allocation and positioning, question answering, mission planning, execution monitoring, risk and opportunity recognition, and recommendations allowing commanders to operate above their experience level.

<sup>289</sup> Mobile and personal computing continues to grow. Army applications must embrace this trend.

<sup>290</sup> Training for space and cyberspace electromagnetic operations may require a more sophisticated training environment that will enable space, cyberspace, and EW Soldiers to conduct the same kind of practice that kinetic shooting ranges afford combat arms Soldiers.

<sup>291</sup> Humans do not and cannot think like machines.

<sup>292</sup> CP infrastructure includes the environmentally controlled workspace and lighting necessary to house and protect Soldiers and systems from the environment; the visualization and collaboration devices that allow the commander and staff to view the common operational picture and communicate internally and externally (large-scale displays and intercom); as well as the necessary power generation and distribution equipment to establish and manage the power grid to enable continued, sustained operations.

<sup>293</sup> Vehicle-based command posts can help eliminate the requirement for transit cases and cabling associated with today's command posts and can help minimize the number of tents, trailers, and supporting environmental control systems.

<sup>294</sup> "In a decisive-action fight with a peer-level competitor, when we're taking ground and moving, when bullets start flying, how willing will these civilian contractors be to fix that digital system" as movement into harm's way commences, [Chief Warrant Officer 3 Heath Stamm] asked. "We haven't fought a frontline fight in a long time," he pointed out. "People say we were in Afghanistan, but we were static. When we start moving and taking ground again, that's going to change the dynamics. Everywhere you see a contractor in the field, you should probably look and say 'where's the warrant officer that needs to replace him,'" he continued. Stamm summed up his feelings for warrants taking control: "I'm the technical expert on that system. One, I'm cheaper; two, when bullets start flying, I'll continue working on that system." Vergun, D. (2016, January 19). Solarium: Warrants need training, Army over-relies on contractors. *Army.mil*.

<sup>295</sup> However, size, weight, and power considerations must be balanced against performance requirements and fiscal realities. Critical decisions will need to be made as to what level of performance is "good enough." Energy efficiencies are critical to the establishment of early-entry command posts in austere environments. Increasing the battery duration for digital systems and developing small, lightweight, and mobile generators (possibly including a solar array) will be key to maintaining uninterrupted mission command.

<sup>296</sup> Enduring CP functions include: 1) receiving information, 2) distributing or sharing information, 3) analyzing information, 4) making anticipatory and proactive recommendations to the commander, 5) integrating resources, and 6) synchronizing resources.

<sup>297</sup> In conjunction with a robust, beyond-line-of-sight network transport, this characteristic could allow the largest portion of the commander's staff to operate from home station.

<sup>298</sup> The proliferation and use of unmanned aerial systems to conduct reconnaissance, surveillance, and targeting increases the threat to command post survivability.

<sup>299</sup> Robotics and autonomous systems will improve the agility and mobility of command posts and reduce the signatures of command nodes by dispersing the emitters normally associated with them.