



The Operational Environment (2021-2030):

Great Power Competition,
Crisis, and Conflict

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Foreword

Two years have passed since the publication of TRADOC Pamphlet 525-92, *The Operational Environment and the Changing Character of Warfare*, which presented the Operational Environment (OE) in terms of an increasingly contested battlespace dominated by new technologies and new approaches to warfare. It highlighted the need for a multi-domain approach to a developing threat, and allowed us to examine our own assumptions about warfare, force design, and capabilities requirements. This OE was a guidepost for the Army's historic modernization efforts that have been underway for the past several years. But the OE is dynamic and ever-changing. Dramatic discontinuities, particularly the COVID-19 pandemic and its effects, are fundamentally reshaping the OE in ways we did not foresee two years ago. The need to contain and recover from the pandemic has strained military budgets, complicated established ties between nations, as well as altered perceptions of the role of governments and the viability of the existing international order. More predictably, our key adversaries have embarked on their own modernization efforts designed specifically to overcome the United States. As we often are reminded, our adversaries have a vote. This document, informed by the Interim National Security Strategy and two years of research and analysis, is designed to expand on three primary concepts that supplement *The Operational Environment and the Changing Character of Warfare*:

- 1) **China has emerged as the United States' Pacing Threat. It is our most technologically advanced adversary and a near-peer in political and economic power with global influence.**
- 2) **The COVID-19 pandemic changed how governments, organizations, and individuals think about and approach economics, work, communication, and even warfare.**
- 3) **The modernization and transformation approaches employed by our key adversaries challenge the Army's conventional strengths and ways of war in a dynamic and often chaotic OE.**

Indeed the three pillars to the Army's post-DESERT STORM dominance have been:

- 1) **That we are the best equipped;**
- 2) **That we have the best trained Soldiers and leaders; and**
- 3) **That we are the best at maneuver warfare.**

Our adversaries are not just thinking in terms of matching us in materiel, but also in terms of people and approaches to warfare. They are challenging each of these pillars, which for many in the Army have become cherished truisms. The dominance that we achieved is not a fact of life, but is instead a contest in which we engage each day. We cannot rest on our laurels, but must instead find new ways to **equip, train, and lead** the greatest fighting force in the world.



PAUL E. FUNK II
General, U.S. Army
Commanding

WINNING MATTERS. PEOPLE WIN. VICTORY STARTS HERE!

Key Judgments



Soldiers of the Chinese People's Liberation Army 1st Amphibious Mechanized Infantry Division prepare to provide Chairman of the Joint Chiefs of Staff Adm. Mike Mullen with a demonstration of their capabilities during a visit to the unit in China on July 12, 2011. (DoD photo by Mass Communication Specialist 1st Class Chad J. McNeeley/Released)

This document is intended to build on the Operational Environment (OE) analysis found in [TRADOC Pamphlet 525-92, *The Operational Environment and the Changing Character of Warfare*](#). While that document focused heavily on OE conditions, namely on the development of new technologies and their impact on warfare, it paid less attention to the activities of our Pacing Threat, China, and our other near-peer threat, Russia. Furthermore, although it referenced pandemics as a possible threat to the Homeland, the impacts of the COVID-19 pandemic on the OE represent a significant shock to the system that required new analysis, the context of which is addressed in Chapter 1.

Chapter 2 presents the efforts of China and Russia to develop and modernize their militaries and focus on prevailing in Competition, Crisis, and Conflict against the United States.

- While the United States was engaged in counterinsurgency operations in Iraq and Afghanistan, our adversaries studied us and determined that the best way to defeat the United States is to **win without fighting**.
- In Conflict, our adversaries want to use **stand-off capabilities** to fracture the U.S. population internally, separate the elements of the Joint Force, and divide us from our allies and partners.
 - China and Russia will contest us in every domain and across the diplomatic, information, military, and economic (DIME) spheres in *Competition, Crisis, and Conflict*.
- While the United States invested in equipment and capabilities for the counterinsurgency fight, our most formidable adversaries invested in capabilities that provide them with a degree of **overmatch** in a few key areas.
- **China and Russia are global powers.** China is our designated Pacing Threat and most technologically sophisticated adversary, while Russia remains a near-peer threat with global reach and a large, highly capable nuclear arsenal.
- Technology among peer and near-peer competitors will be roughly equivalent; the side with the **best people and the best approach** to Competition, Crisis, and Conflict will have the advantage.

Chapter 3 focuses on the COVID-19 pandemic, and most importantly, on its impact on the OE in terms of the power dynamic between the United States, China, and Russia. It offers four potential alternative futures—called worlds—to consider the impact of the pandemic in terms of Competition, Crisis, and Conflict.

- The **Status Quo Reprieve** world represents a continuation of the pre-COVID-19 OE with little real change resulting from the pandemic. This means

China and Russia will continue to develop their capabilities along a steady track toward contested equality around 2030.

- The **Relative Advantage** world postulates a future in which the impacts of the pandemic on the United States, China, and Russia are relatively equal, but the centralized authorities and economies of China and Russia allow them to focus more on defense than a general recovery, as in the United States. In this case, the OE speeds up, and China and Russia pose a significant challenge by 2025-2028. We view this as the **most likely outcome**.
- The **most dangerous outcome** is the **Mind the Gap** world, in which our adversaries recover quickly, while the United States craters. Under these conditions, our adversaries' modernization programs rocket forward, posing a direct challenge to the United States in the next few years.
- Finally, the **best case (but least likely) outcome** is the **New Renaissance** world, in which the United States' ability to innovate allows it to recover more quickly, while our adversaries struggle. This allows the United States to outpace its rivals across the DIME spheres.

Chapter 4 provides a deeper insight into the impact of our adversaries' modernization efforts, which directly challenge the key pillars of the U.S. Army's post-DESERT STORM dominance in the land power domain.

- Our dominance rested on **three assumptions**:
 - We are the best equipped Army in the world;
 - We have the best trained Soldiers and the most dynamic leaders; and
 - Our ability to conduct maneuver warfare is unmatched.

- This dominance was the result of efforts the Army made **across doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy (DOTMLPF-P)**.
- While there is much focus on the materiel aspects of our adversaries' modernization efforts, **materiel advantage may be fleeting**.
- Our adversaries understand this and **are contesting us across the other factors that deal with human capital**; these advances may be more long-lasting.
- Our adversaries have conceived of **new approaches to warfare**, namely China's "intelligentized warfare" and Russia's "New Generation Warfare" concepts. Both adversaries hold **large-scale exercises** designed to practice these approaches and to improve their forces. They have emulated the U.S. military in developing **new combat training centers** and are designing new **professional military education** systems that aim to create a culture of learning.

Opportunities exist for the U.S. Army to future-proof the force. For instance, the Army can potentially overcome materiel capacity challenges from our adversaries by reshaping the force to be faster, more adaptive, more lethal, and one equipped with cost-informed systems more easily produced at scale.

The U.S. military can lean on the unique strengths of its allies in NATO and throughout the INDOPACOM region. Common purpose with like-minded states adds significant value in Competition, Crisis, and Conflict—particularly when many of the adversaries' allies are the victims of coercion.

Introduction

In October 2019, the U.S. Army Training and Doctrine Command published [TRADOC Pamphlet 525-92, *The Operational Environment and the Changing Character of Warfare*](#). This seminal document defined the Operational Environment (OE) from the present through the deep future and served as the starting point for Army activities relating to leader development, training and education, concept and doctrine writing, and materiel acquisition.

A great deal has occurred since the publication of that document, including a revolutionary move by the Army to establish Army Futures Command (AFC), whose mission is “to lead a continuous transformation of Army modernization to provide future warfighters with the concepts, capabilities, and organizational structures they need to dominate a future battlefield.” To support this effort, AFC recently published [AFC Pamphlet 525-2, *Future Operational Environment: Forging the Future in an Uncertain World 2035-2050*](#), which focuses with far more detail on the deep future OE. In light of the publication of this foundational product by AFC, TRADOC equally understands the need to provide focus on the period 2021-2030.

The Army must prepare for the future, but it also must be prepared to fight and win today and in the near-to-midterm, with a mixed fielded force featuring legacy platforms and emerging technologies. Moreover, although the basic tenets found in *The Operational Environment and the Changing Character of Warfare* remain valid, the study of the OE is a continuous process, and the OE has shifted in several ways since the initial drafting of TRADOC Pamphlet 525-92. For example, the initial analysis found in the Pamphlet focused more on underlying OE conditions than on the activities of China and Russia. TRADOC and its partners across the Army, Department of Defense, and Intelligence Community over the course of two years of analytic effort, focused on how these adversaries will challenge the United States across Competition, Crisis, and Conflict. This analytic work has more closely aligned the Army with the [2021 Interim National Security Strategy](#) while serving as the baseline for TRADOC’s efforts to establish the Waypoint Force. Furthermore, DIA and the Joint Staff last year published [The Joint Operating Environment 2040 \(JOE 2040\)](#), which also focuses on China and Russia.

A further shock to the OE came in the form of the COVID-19 pandemic, which shook, or perhaps even altered the international order. The effects of the pandemic in terms of human loss, economic decline, and political/social instability are still not clearly understood.



Soldiers with the People’s Liberation Army prepare an attack exercise demonstration for Marine Corps Gen. Joseph F. Dunford Jr., Chairman of the Joint Chiefs of Staff, and Gen. Song Puxuan, Commander, Northern Theater Command, at a PLA base in Shenyang, China, Aug. 16, 2017. (DOD photo by U.S. Navy Petty Officer 1st Class Dominique A. Pineiro)

In September 2020, the TRADOC G-2 led an analytic effort from across the Command to publish a white paper titled the “Post-COVID-19 Analysis of the 2020-2028 Operational Environment.” This analysis aimed to discern possible outcomes of the pandemic and what these would mean for TRADOC, the Army, and the Joint Force. This analysis offered four alternative futures leading to 2028 in terms of the impact of the pandemic on the Army and on China and Russia.

This work also needed to be added to our understanding of the OE. As we delved deeper into the meaning of the post-COVID timeframe, particularly looking at the potential implications for China and Russia, TRADOC G-2 analysts realized that our adversaries were working to match the United States and the Army in more than materiel. Our adversaries know that technology itself is not enough to ensure victory over the United States. Rather, the true U.S. edge comes from our ability to wage our preferred way of war and in the quality of the Soldiers, Sailors, Airmen, Marines and Guardians, and their leaders who comprise the Joint Force.

Our adversaries now are engaged in a race to compete with the United States globally—which includes competing directly with the Army—and that Competition has extended to the two areas where the Army has enjoyed its historical advantages: in the ability to fight the way we wish to fight and in human capital. Indeed, China’s and Russia’s challenges to the Army are more than a multi-domain challenge on the battlefield; they are also a challenge across doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy (DOTMLPF-P), and it is clear that these challenges have significant impacts on their ability to operate within Competition, Crisis, and Conflict. It is with these events and changes in mind that TRADOC produced this document. This assessment provides an addendum to our previous analysis and fully demonstrates the dynamic nature of the OE.

» COMPETITION, CRISIS + CONFLICT

Great Power rivalry plays out through a spectrum of activities, actions, policies, and strategies characterized as *Competition, Crisis, and Conflict*. For China and Russia, who are committed to “winning without fighting,” this continuum offers a framework for challenging the United States across the DIME spheres, often at thresholds below armed conflict.

For the Army, this continuum does more than define Great Power rivalry. In the words of GEN Charles Flynn, while serving as the Department of the Army G-3/5/7, they are readiness conditions.

According to GEN Flynn, it is people that drive each readiness pillar. “They are the foundation of the Army. Ready people equals a ready Army.”¹

¹ Sean Kimmons, “Army Continuously Operates on Four Fronts of Readiness,” *Army News Service*, 24 July 2020



Competition

is framed as having access, presence, and influence at every echelon.



Crisis

is the result of dynamic force employments that lead to large-scale, multi-domain operations short of actual conflict. In 2020, the Army operated in three crises: deployments to the Middle East in response to Iranian aggression, the COVID-19 pandemic, and in support to civil authorities within the Homeland.



Conflict

is when the Army engages in war.

Our Pacing Threat, a More Familiar Adversary, + the OE

While the United States was engaged for almost 20 years in counterinsurgency operations in the Middle East and Southwest Asia, China and Russia studied our past and ongoing military operations and independently arrived at two general conclusions about how they could defeat the United States in a Great Power conflict.

First, in light of overwhelming U.S. military capabilities demonstrated from 1990-2018, particularly in the ability to employ long-range, precision strike weapons, they determined that instead of engaging the United States in traditional military conflict, their best opportunity to defeat the United States is to do so without fighting. Instead, they would use all elements of national power—diplomatic, information, military, and economic (DIME)—to achieve national objectives in what is now called the Competition stage, right up through Crisis, and just to the edge of outright Conflict.

Second, if actual conflict becomes inevitable, then it is best to prevent the United States from entering a close fight with overwhelming capabilities by relying on stand-off capabilities, both kinetic and non-kinetic, to separate the United States internally among its own population, to prevent the U.S. Joint Force from converging capabilities, and to divide it from its allies and partners.

Both China and Russia watched the United States build combat power against Iraq in DESERT STORM and IRAQI FREEDOM and against Serbia in ALLIED FORCE before launching an attack, and realize that allowing the United States to marshal its forces in an uncontested manner, build up logistics and combat power over time, and then conduct operations on timelines of its choosing would be a recipe for disaster.

The answer they derived was to establish sophisticated, multi-domain, anti-access/area denial (A2/AD) capabilities that could be used to prevent the United States from repeating these successes, and challenge the ability of the U.S. Joint Force to deploy forces from its CONUS-based facilities, installations, and mobilization sites—across the maritime and air domains—to the theater of conflict.

These capabilities include electronic warfare (EW), integrated air defenses, counter-space and precision navigation and time, cyber and social media, reconnaissance-information strike complexes, UAVs, massed artillery and fires, protection, the use of proxies, deception and ambiguity, and chemical, biological, radiological, and nuclear (CBRN) weapons.

The result is that both China and Russia either developed, or came near to developing, overmatch in several key areas, including EW, cyber and space, fighting vehicles, air defenses, rockets, and artillery. This has created a problem for a U.S. Army that has grown accustomed to possessing technological advantages over its enemies. **For the first time since arguably the Second World War, the U.S. Army faces adversaries with more capable equipment than it fields.**

» KEY ADVERSARIES' OVERMATCH CAPABILITIES

» China and Russia have steadily increased their abilities to win without fighting and to use stand-off capabilities to target the U.S. national will, to deter the United States from entering into conflicts, to prevent the deployment of U.S. forces to a threatened region, and to effectively mitigate U.S. advantages. To do this, our adversaries have developed certain overmatch capabilities, which include cyberattacks; long-range, precision strike weapons; land-based air defense weapons; and electronic warfare (EW) systems.

» **Cyberattacks** gather intelligence, steal technology, spread misinformation, and potentially damage key infrastructure. An example is the recent Russia-attributed “SolarWinds” intrusion, which affected more than 250 federal agencies and 18,000 government and private networks.

» New families of **long-range, precision strike weapons** can be launched against targets across the battlespace. These include weapons like China’s land-based DF-21 and DF-26 ballistic missiles, which include variants capable of targeting maneuvering ships at sea, or Russia’s Kalibr-family of cruise missiles.

» **Land-based air defense weapons**, such as the Russian S-400 or the Chinese HQ-9, can contest control of the air domain from the ground, creating veritable no-fly zones.

» New **EW systems** are designed to target U.S. command, control, and communications, as well as to sever vital U.S. “kill chains.” China’s newly formed Strategic Support Force (SSF) is assigned to carry out this mission with its variety of systems, jammers, and other capabilities, including EW-variant UAVs. The SSF focuses on information warfare, space operations, and cyber activities, to back its intelligentized warfare approach.

So why do we consider China to be our Pacing Threat?

China is a rapidly modernizing nuclear-armed near-peer on a trajectory to become a peer power to the United States. It harbors global ambitions and is increasingly assertive in the Competition space, using its economic clout and information operations to bolster its position and undermine its adversaries. China's People's Liberation Army (PLA) lacks combat experience but is a formidable force that is working diligently to not only introduce new capabilities, but also to improve its training and leader development. It is our most technologically sophisticated adversary.

China is active in the Competition space across the global commons. China wishes to prevail in the Competition or Crisis phase through an integrated use of its national power across the DIME spectrum. If Crisis shifts to Conflict, Beijing hopes to win the first battle as overwhelmingly as possible, thereby ensuring that an opponent has no desire for a second battle. China will contest us in all domains in Competition, Crisis, and Conflict, and its nuclear deterrent provides a factor that U.S. defense planning has not had to truly consider since the Cold War. The vast distances involved to move a CONUS-based U.S. force to the so-called Chinese First Island Chain present a host of logistical and organizational challenges. These challenges are worsened by long-range precision weapons, sensors, and systems that will track and engage U.S. forces in all domains—cyber included—from home stations to overseas staging areas.

China is investing heavily in force modernization, and just like the United States, it too is focused on key emerging technologies. Looking out to 2028, there likely will be a rough general technological equivalency between the United States and China, with both nations having certain relative advantages in some areas but facing disadvantages in others. The notion of Contested Equality, which first was established in Pamphlet 525-92, likely remains valid.

Russia: A Diminishing Power but Enduring Threat

Despite a lagging economy and diminishing international influence, Russia remains a conventionally capable, nuclear-armed near-peer adversary with global reach. It effectively employs a whole-of-government approach to Competition and excels at the use of cyber and information warfare capabilities. Russia's military has significant combat experience, fighting in Chechnya, Crimea, Donbass, Georgia, and Syria. However, Russia is technologically inferior to China and has been surpassed as a global power.

Russia is adept at manufacturing a Crisis that it can quickly resolve militarily short of the Conflict phase with



the United States. It conducts a rapid military operation designed to quickly achieve a result and then seeks a diplomatic resolution before the United States can generate combat power and move to the affected theater. It essentially creates facts on the ground over an issue that it judges likely is more relevant to Moscow than it is to Washington, and then it seeks to find a negotiated solution, offering the United States a choice between acceptance or large-scale war to overturn the gain.

Russia seeks to maintain global relevance and will try to influence the United States, fracture Western alliances, and deter the expansion of NATO in Eastern Europe. It will use its extensive arsenal of long-range precision fires, massed indirect fires, and EW systems coupled with cyberattacks and information operations to contest, degrade, and deny any perceived incursion into its “near abroad” sphere of influence.

The Two Near-Peer Threats and Their Way Forward

Both Moscow and Beijing understood that their continued rise would lead to an outright rivalry and perhaps even an adversarial relationship with the United States and its Allies and partners. From a military perspective, both began studying the U.S. approach to warfare and began broad modernization efforts to challenge the post-Cold War U.S. dominance.

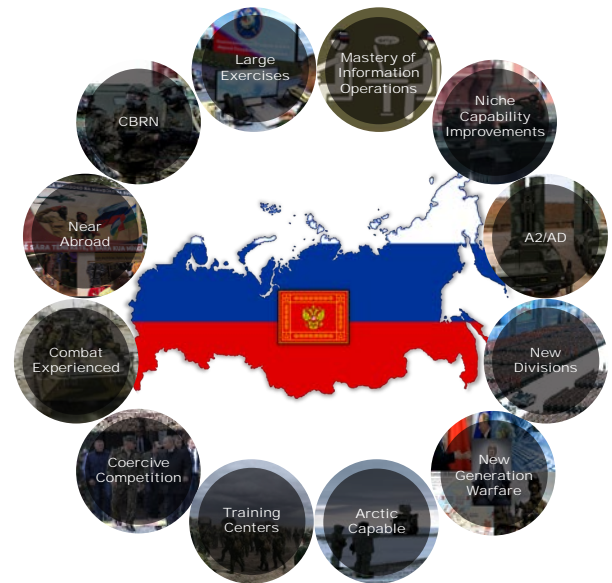
A great deal of attention is focused on China's and Russia's materiel progress, which provide them an overmatch capability under certain conditions or in niche areas. They have fires systems that outrange our own; they have focused on EW capabilities; they have developed sophisticated integrated air defense systems. At the same time, we stripped many of these capabilities from our force due to the demands of counterinsurgency. Moving forward, our adversaries are focusing on cutting-edge technologies, such as artificial intelligence,

quantum computing, hypersonics, and robotics—among others—to extend their ability to challenge us into the future. This directly challenges the first assumption that underlies Army thinking. Our adversaries' equipment is as good as ours, and in some cases better.

When we look at China and Russia and how they have modernized their forces, their progress in the materiel sphere gets the lion's share of the attention. But they also are working across DOTMLPF-P not only to contest us materially, but to directly challenge us in the human capital realm and in how we wage war. New equipment will facilitate the effort, but if the adversary is to defeat the United States, they need well-trained soldiers and dynamic, thoughtful leaders. Both China and Russia have worked to modernize their training and are trying to instill new cultures of learning into their forces. Both have established combat training centers similar to our own. They have professionalized their leader development efforts and are working to develop effective professional military education programs that cultivate more agile leaders.

China and Russia have designed new doctrine and new approaches to warfare that specifically challenge our own. China's "intelligentized warfare" is the uniquely Chinese concept of applying artificial intelligence's machine speed and processing power to military planning, operational command, and decision support. Meanwhile, Russia's "New Generation Warfare" is defined as Russia's integration of all instruments of national power (i.e. diplomatic, informational, military, and economic) to achieve its objectives. New Generation Warfare entails Russia taking asymmetric actions to achieve its ends, including political subversion to undermine and weaken a targeted government and its institutions; economic warfare; and, prominently, information-psychological operations to pressure, disorient, and manipulate a target population. Russia accepts higher levels of collateral damage and states openly a willingness to escalate to achieve its ends. Both adversaries routinely put together their respective approaches by conducting large-scale exercises designed to test their progress. But we have also seen more specific evidence of both countries' focus beyond materiel.

China's PLA has reorganized its ground forces into a variety of combined arms brigades that are smaller and more maneuverable, yet designed to compete with U.S. forces. The PLA hopes to complete a massive transformation of its force, whereby these brigades and their parent group armies field modern, mechanized forces by 2030. While China has indeed focused on developing sophisticated A2/AD capabilities, it also has taken unique approaches to expand its reach outside of materiel. In terms of facilities, the PLA has created a number of man-made islands in the South China Sea where it can deploy these systems and increase



its reach, allowing for overmatch within its so-called First Island Chain. Additionally, China continues with its broader approach to modernization, which began in 2015. It has created a whole new branch of service—the Strategic Support Force—that focuses on information warfare, space operations, and cyber activities, to back its intelligentized warfare approach. Joint Theater Commands were established, and China continues to develop new doctrine and approaches to joint operations.

Meanwhile, Russia has sensed the importance of developing an Arctic capability for its force. While some of this has included new equipment, Russia also has improved its facilities in the Arctic. The Russian military has increased its regular deployments in the region and has conducted training and exercises in those harsh conditions. Over the past decade, Russia also has adopted new capabilities based on information confrontation approaches, while Russian private military companies have become useful proxies to expand Russian influence in Competition and Crisis. Russia has decided to create new high readiness divisions as the organizational construct best able to focus on high-intensity warfare. Finally, Russia continues to conduct large combined annual exercises, which rotate through its military districts each year. These exercises not only allow Russia to test all elements of its force across DOTMLPF-P, but also focus on Russia's foreign partnerships, including large Chinese participation.

These military modernization efforts our adversaries have undertaken are aimed directly at the three assumptions that have been the foundation of the U.S. Army's position of dominance. Both China and Russia will continue to seek methods to disrupt our national cohesion, erode our conventional strengths, and stymie our ability to compete and win.

Climate Change Will Strain U.S. Military Capacity, Shape Character of War

Climate change over the next decade is likely to impact the U.S. military in three major ways:

01

Increase Operational Requirements

- Climate change will create resource scarcity and food insecurity that overwhelm the governing capacity of weak states, increasing the number of refugees and internally displaced people along with conflict and extremism abroad.
- Melting Arctic ice will continue to open the region to commerce and military activity, creating a new and potentially volatile theater for Great Power competition.
- Domestically, demand for the Army National Guard, the Corps of Engineers, and civil authorities will increase in responding to damage from severe weather.

02

Increase Vulnerability of Installations

Prevalence and intensity of floods, erosion, drought, fires, wind shear, and sea level rise will grow as a result of climate change, threatening military installations.

03

Degrade Performance

Performance parameters of both people and equipment will be challenged as they are forced to operate in extreme temperatures, including in the Arctic. Keeping Soldiers alive in an increasingly hostile climate will challenge the U.S. Army.

Climate change will almost certainly alter the character of warfare in the twenty-first century. These changes to warfare will be insidious, slow, and intransigent. The character of war is defined as passion and primordial violence, chance and uncertainty, and controlling the hand of policy. As the global landscape is altered by climate change, access to natural resources—such as clean water and arable land—will become increasingly scarce, panicking humans and most likely causing governments to behave in increasingly bold and risky ways. Commodities that were previously thought secure will now be threatened and their possession will define the objective of state strategy. Governments and non-state actors could resort to ways and means that are currently eschewed, such as the use of chemical, biological, and nuclear weapons. From a nationalistic perspective, the psychological justification for war is likely to shift from one of “good versus bad” to “live or perish.”

In order to manage the threat posed by climate change, the U.S. Army and DoD must prepare strategies for both adaptation and mitigation. Adapting to climate change will focus on ‘managing the unavoidable’ aspects of climate change, such as building sea walls, developing new land use patterns, and moving vulnerable power lines underground. Whereas, mitigating climate change will focus on ‘avoiding the unmanageable’ by reducing current greenhouse gas emissions.

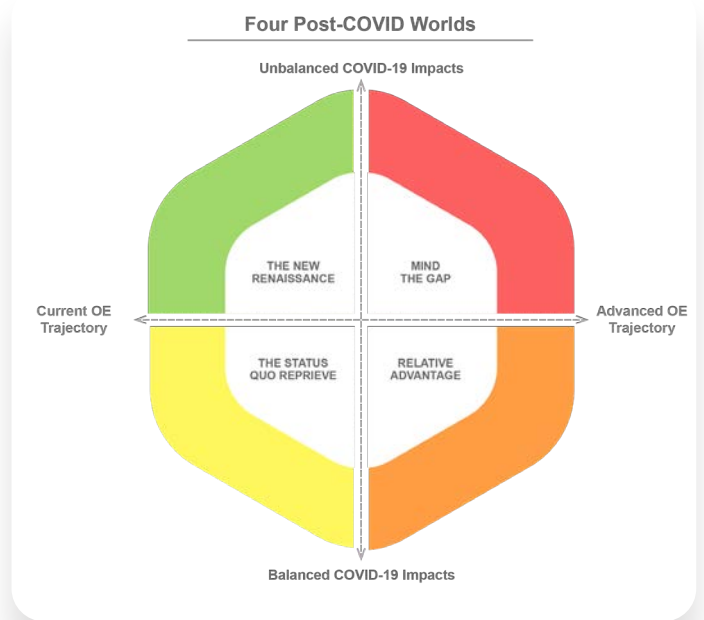
COVID-19 + Its Potential Impact on the OE

The COVID-19 pandemic arrived as the OE was already moving in a direction in which our adversaries were making gains in their systems, capabilities, and approaches to warfare. The effects of the pandemic will have a detrimental effect on the Army's ability to address these areas moving forward, particularly if difficult resource decisions need to be made between military modernization and enabling a broader domestic recovery. Under such circumstances, COVID-19 could be considered gasoline thrown on an already roaring OE.

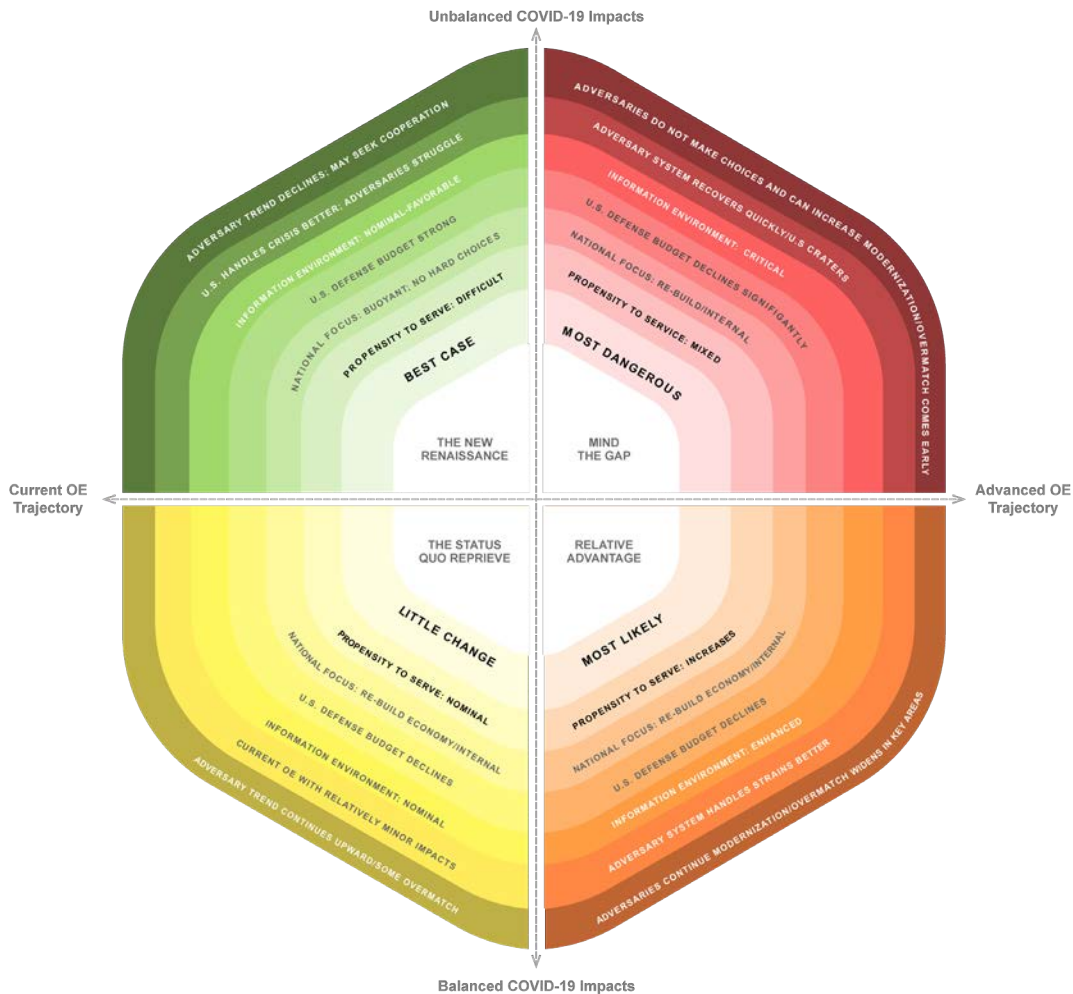
This first driver of the pandemic's impact on the OE is represented by the horizontal axis in the figure on the right. On its left end is the OE that existed before pandemic, with its slowly evolving new states restrained by the normal resistance of organizations to dramatic change. On the right end is an OE with rapid adjustments to continue necessary functions and operations resulting from the pandemic. These demands cause changes to the interactions and linkages among the OE variables at a dizzying pace, either by accelerating trends or implications for the OE or potentially even by slowing down progress and creating bottlenecks or brakes that disrupt the current OE. They impact organizations like the U.S. Army, whose processes and structure are built around a definitive culture and age-old traditions. The impact of the pandemic on the Competition that exists between the Great Powers is the second driver. As the saying goes, the enemy gets a vote.

This analysis must also include an understanding of how COVID-19 impacts the United States in comparison with key adversaries—China and Russia—if we are to more fully comprehend the impact of the pandemic on the Army. This driver is represented by the vertical axis of the quad chart. On the lower end, the impact—considered largely in terms of effects across the DIME spheres—is relatively balanced, with no one side accruing significant advantages in terms of global Competition. The effect is uneven on the upper end with one side or another gaining significant competitive advantages.

It is likely that the effects of the pandemic, particularly in the medium-to-long term, will fall relatively evenly among the United States and its two primary adversaries, China



and Russia. However, while we expect that the overall effects will be balanced, it is highly likely that Chinese and Russian public sector technology investment and defense spending—including military modernization—will suffer less, in relative terms, than they will in the United States or among its Western allies. China's and Russia's centralization of authority and their focus on security over individual liberty enable these adversaries to maintain their current priorities without having to be responsive to their respective publics by diverting resources to a general recovery. When the two drivers are combined, we are left with four alternative futures for the post-COVID world.



The Status Quo Reprieve

This world represents the pre-COVID OE, with some exceptions. It assumes that the impact of COVID-19 is relatively balanced between the United States, China, and Russia so that there are no great system altering changes that occur.

Relative Advantage

We assess this world is the most likely outcome of the COVID-19 pandemic. It represents a departure from the assessed OE and assumes that the impacts of the COVID-19 pandemic are not as severe or system altering as initially feared. However, the United States and its Western allies are less able to handle the stresses and shocks imposed by the pandemic when compared to the centralized systems of China and Russia, whose pace of military modernization quickens over the next 10 years in relation to the United States.

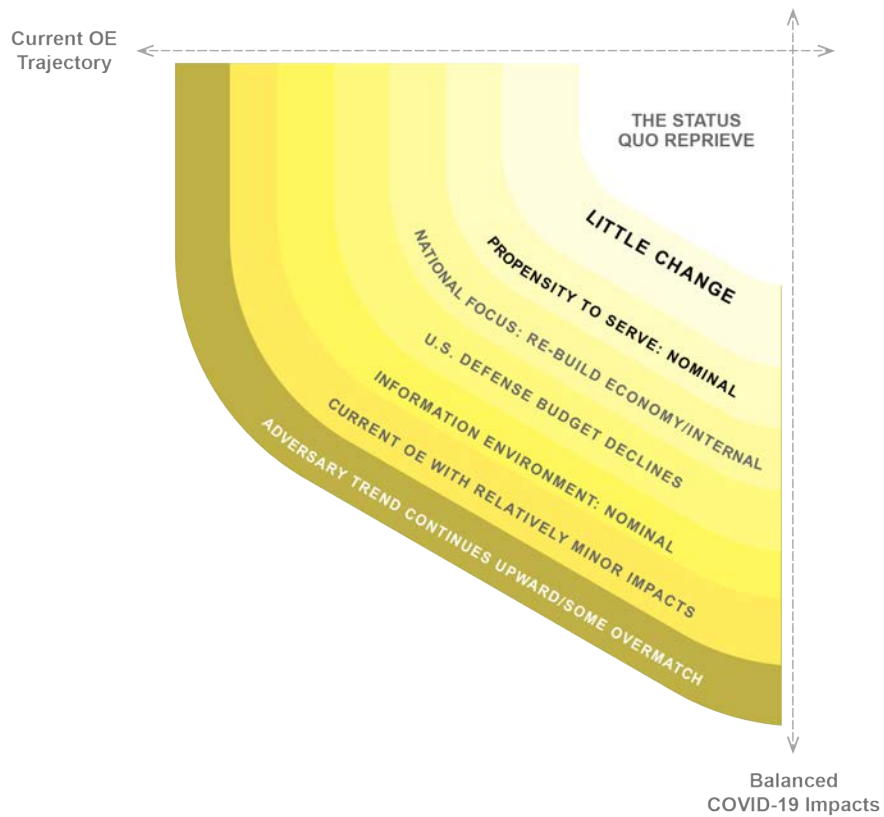
Mind the Gap

This world represents a clear worst-case scenario in which the COVID-19 pandemic implications are unbalanced in favor of our adversaries.

The New Renaissance

This world represents an unlikely best-case scenario in which there is an unbalanced impact of COVID-19 across our key adversaries, but one dramatically favoring the United States

The Status Quo Reprieve



This world represents the pre-COVID OE, with some exceptions. It assumes that the impact of COVID-19 is relatively balanced between the United States, China, and Russia so that there are no great system-altering changes that occur. Our adversaries will continue to develop their forces achieving selective overmatch in some capabilities and technologies by 2025-2028. The United States likely will retain an overall military advantage due to capabilities integration and human capital advantages, even if some of our adversaries' weapon systems may be superior to our own.

This advantage, however, will lessen by 2028 as our adversaries work on their own advanced training and education efforts, as well as develop and practice new concepts and doctrine. Our adversaries will remain assertive in the Competition space as they sense opportunity in this below-armed-conflict realm. While open Conflict between Great Powers remains relatively unlikely, the chance for miscalculation may be heightened. COVID-19 will not change the fundamental nature of DIME as the toolbox for national strategy. It will, however, offer possibilities for unexpected shifts in national, regional, and global relationships.

One of the most notable changes is virtual communications becoming a common part of everyday life. With so much social, business, and governance activity becoming reliant on online communications (e.g. Zoom, Skype, Hangouts, Teams, etc.), business practices and traditional ways of communicating will be altered and new norms will be established. Internally, the divisions that have occurred in terms of political

outlook, social views, and debate between collective security and individual liberty will continue and be intensified to some degree by reaction to the pandemic. As the Government focuses on rebuilding the economy, the DoD and Army likely will face budget reductions, although in this scenario the reductions are less severe than anticipated.

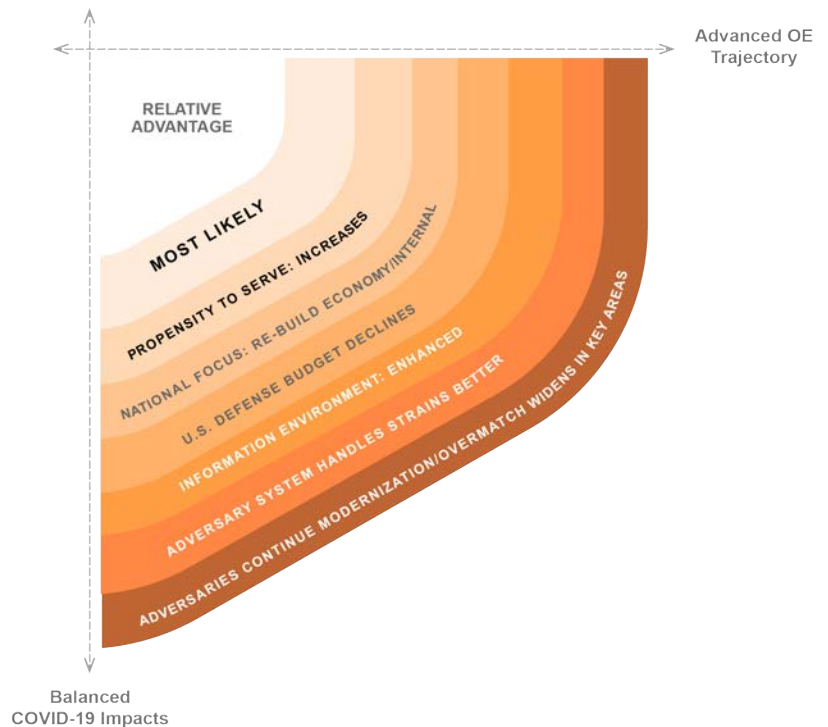
Some plans will nevertheless impact both Army readiness and modernization. Modernization may be delayed, which in turn will impact the Army's training and education budget.

The job market and landscape is transforming dramatically in the wake of COVID-19 with fewer people wanting to work in the service and manual labor industries. As a result, the Army may be presented with new recruiting opportunities and talent pools.

Relative Advantage

This world, which we assess to be the most likely outcome of the pandemic, represents a departure from the assessed OE and assumes that the impacts of the COVID-19 pandemic fall evenly across China, Russia, and the United States, but that the United States and its Western allies are less able to handle the stresses and shocks imposed by the pandemic when compared to the centralized systems of China and Russia. While there is greater balance in the impacts and stresses on the United States and our adversaries' abilities to act than in the "Mind the Gap" (worst-case) world, the consequences do not fall equally on all. In this world, our adversaries are better able to keep a focus on readiness and military modernization due to their ability to give priority to defense and security issues over the reconstruction of the civilian economy. As a result, our adversaries' modernization efforts will continue to outpace our own, and in some ways, will expand the gaps that already were developing in the pre-COVID-19 OE. Some of their more advanced capabilities may enter service either more quickly than our own or on schedule, whereas many U.S. efforts may be delayed. This will create significant challenges for the Joint Force and Army as our adversaries accelerate their own capabilities and develop overmatch in key areas more rapidly, or at a relative advantage to the United States. The previously assessed land combat gaps will widen in select areas as our adversaries—especially China—start to outpace the United States more quickly than originally anticipated. Adversaries could develop true overmatch as early as 2023 in some key areas, particularly if anticipated U.S. capabilities are delayed or cancelled. Additionally, our adversaries will recognize these relative, and likely fleeting, advantages causing them to become bolder, particularly in the Competition space. In some cases, they may consider actions right up to the point of Conflict to secure their national objectives.

The United States will retain critical advantages, particularly in terms of human capital, experience, and in the ability to conduct Joint operations, but these will lessen as our adversaries continue their own efforts to improve. The economic recovery within the United States in this scenario raises problems for the Army and Joint Force. Overall budgetary reductions to DoD will likely be limited, but they will not allow the Army or Joint Force to keep pace with gains by Beijing and perhaps Moscow. As a result, DoD and the Army will have to make hard choices between readiness and modernization that could become even more difficult if adversaries begin to flex their growing muscles. The hard choices that need to be made will also be impacted by the economic needs of the nation. This means that materiel solutions—which provide jobs to



many Americans—may take precedence over readiness, requiring some creativity to ensure that other areas of importance across DOTMLPF-P are not left to wither. The same focus on high-tech/online communications and collaboration tools will be in effect here as the American populace becomes more attuned to the virtual world. Internal divisions will continue, placing further stresses on the DoD budget as politicians grapple with the need to jump-start the economy. Although this does not represent a worst-case scenario, many segments of the population—based on region, class, and industry—will face very real challenges. These in turn could present opportunities for Army recruiting. The Army will, however, face challenges in the competition for talent with emerging lines of work, including data science, biotechnological research, and even e-commerce.

Mind the Gap

This world represents a clear worst-case scenario in which the COVID-19 pandemic implications are unbalanced in favor of our adversaries and current OE trends accelerate. The U.S. economy is savaged by the pandemic and the recovery takes more than a decade. DoD budgets will face severe pressures, challenging both readiness and modernization simultaneously.

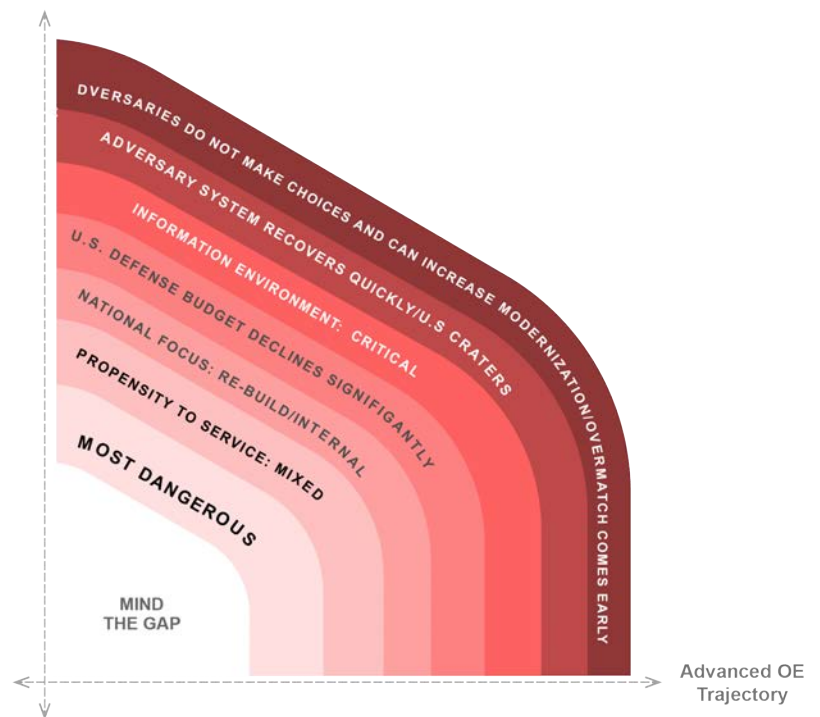
Conversely, nations with centralized decision-making processes and societies that tend to focus on security over individual liberty are able to weather the storm posed by COVID-19 and even prosper. The net result is a significant advantage that accelerates their modernization efforts in comparison with the flat-lining United States and widens overmatch/reduces U.S. advantages in key areas much quicker than initially anticipated.

The United States will be compelled to turn inward to deal with faltering economic progress and widespread divisions within an increasingly restive society. Our adversaries will take advantage of this situation in several ways.

First, they will further increase their information campaigns against the United States to reinforce societal divisions and create rifts between and within the population and with U.S. allies. Second, as they quickly grasp the disadvantaged position into which the United States is falling, they will become more active in pursuing their own national goals and use all elements of the DIME to demonstrate to the world their rise in the face of a U.S. retreat. Third, they will become more aggressive in the Competition space to further the American turn inward and compel regional states to accede to their wishes. This will largely focus on issues short of war; in some cases this will involve threats of military force, armed demonstrations, and perhaps combat.

At a minimum, the chance of Conflict increases as our adversaries see new freedom of action. U.S. societal divisions will make it difficult for the nation to recover from the COVID-19-inspired decline as it will be difficult to agree on ways forward.

Unbalanced
COVID-19 Impacts



The DoD budget will suffer dramatically, even in the face of renewed threats, as taxpayer dollars are redirected to jump-start the economy. Information technology, the medical sector, and other technological fields will be at the forefront of bringing the nation out of the morass, but it will take time. In essence, DoD and the Army will need to make do with the capabilities that exist today. These include difficult trade-offs between force structure, readiness, and modernization through 2028 and beyond.

Additionally, it will be increasingly difficult for our military to consistently retain an overseas presence. The military's end-strength numbers may decline as a result of the budgetary cuts; yet the Army will likely be able to take advantage of a weakening economy to recruit high-quality new personnel. Indeed, human capital may be our best investment in such a situation, possibly acting as a hedge against our adversaries and a springboard for modernization, although this likely will be after 2028.

Training and education will suffer, but creative approaches, particularly in distance learning and virtual education, may provide advantages. The United States will be in an increasingly difficult position through 2028 and beyond. Laying the ground work for a new kind of force that would mature in the mid-to-late 2030s may become necessary.

A New Renaissance

This world represents an unlikely best-case scenario in which there is an unbalanced impact of COVID-19 across our key adversaries, but one dramatically favoring the United States. The United States becomes the post-COVID-19 world leader.

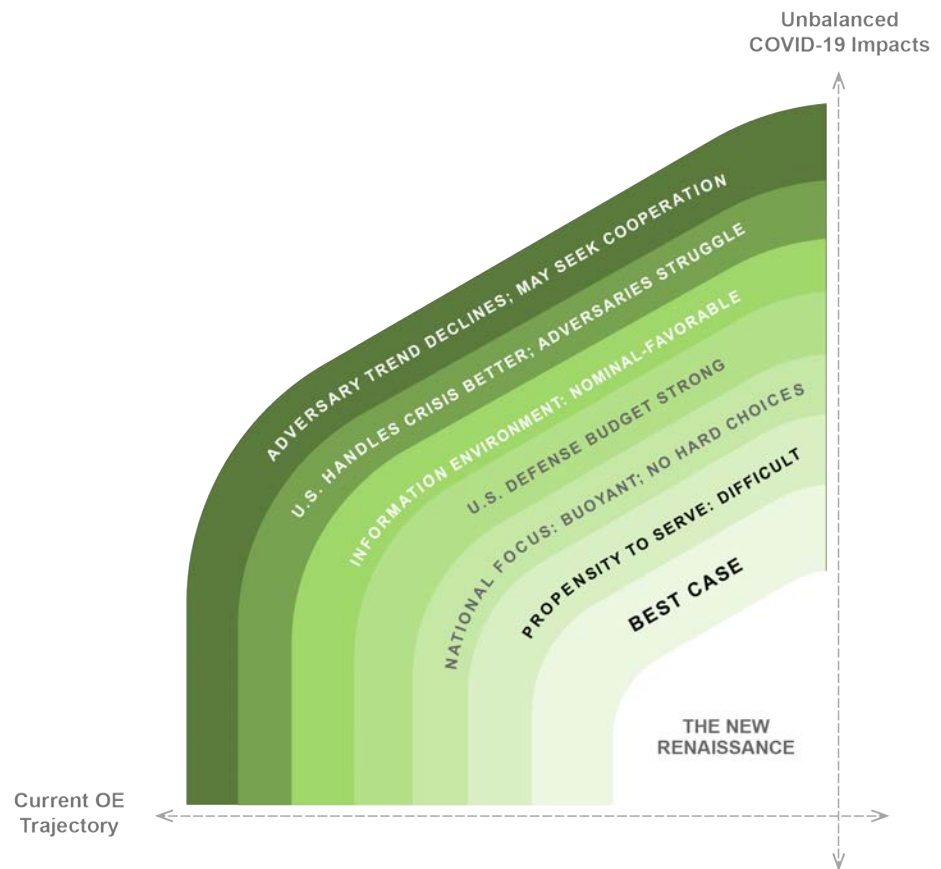
The centralized systems of China and Russia do not keep pace in terms of innovation and development. Global supply chains and investment shift away from China as countries seek greater diversity in sourcing, slowing China's economic expansion and technological development. Furthermore, the initial shocks of the COVID-19 virus to the U.S. economy are reduced in a wave of optimism that follows the rapid introduction of vaccines and medicines that counter the disease.

The nation rallies together in a newfound wave of cooperation not seen since the early days after 9/11 or even in the dark days of the Second World War. The common good prevails and the nation takes off, leaving China and Russia behind in the distance, who become reliant on the United States and the West for the medical capabilities to combat the disease and its successors. As a result, DoD budgets are not impacted in any meaningful way and in some cases may even advance (particularly in terms of military medicine, CBRN defense, biotechnology, and information technology).

Our adversaries' military modernization efforts lag; the United States is therefore able to remain comfortably ahead through 2028. China and Russia will only be able to get back on track toward the end of the period (2025 at the earliest, 2028 or later more likely). The outright advantages accrued to the United States could lead to broader global cooperation, including a stronger U.S.-led alliance in the Indo-Pacific to contain China's ambitions.

The U.S. military would be spared the hard choices between readiness, force structure, and modernization. Yet these new OE realities will have a significant impact on the Army. The drive toward the virtual world will continue to accelerate. New business practices forged during the pandemic will increasingly take root.

Previous divisions within the nation will shrink, with the vast majority of the population enjoying the benefits of the newfound optimism, collaborative spirit, and focus on the common good. A new focus on science, technology, and the objective world will make the nation more resilient



in the face of our adversaries' information warfare capabilities. Although defense budgets will be relatively untouched, DoD and the Army will nevertheless still face some significant challenges. The most critical will be in the human capital world. With the economy taking off and new businesses, industries, and opportunities arising quickly, the Army will be forced into an even deeper competition for human capital. The Army will have to be very creative in demonstrating the type of opportunities it offers and may require rethinking some of its long-held beliefs and practices.

The Army will need to consider what it offers potential recruits in terms of access to high technology, virtual opportunities, and world-class installations that offer as much in terms of living conditions, recreation opportunities, access to information technology, and training and education opportunities as competitors in the private sector. The Army will be competing with high-tech industry, the medical and information technology fields, and the best universities in the nation. It will therefore need to rethink how it recruits, trains, educates, and houses its troops. Installations, for example, may need to look more like university campuses or professional sports training complexes.

Additionally, the Army may need to think about additional flexibility in how Soldiers serve to be more in line with developments in the civilian world.

Challenges + Opportunities in a Variable Future

No matter what form the post-COVID-19 world takes, it is apparent that the United States already is locked in a form of Great Power rivalry with China and Russia; even our regional threats seek to challenge U.S. leadership across the DIME. From a military perspective, our adversaries will continue to modernize their forces, bringing new systems into service and challenging U.S. technological superiority. They also will attempt to challenge us in other ways. They will design doctrine and approaches to warfare that mitigate our advantages and allow them to achieve their national objectives. They will attempt to prevent us from waging our preferred way of war, and to challenge us with theirs. New equipment, technology, and capabilities will in part, drive their efforts. But our adversaries understand that the key to achieving this goal is not materiel, but instead lies in human capital. New equipment will facilitate the effort, but if the adversary is to defeat the United States, they need well-trained soldiers and dynamic, thoughtful leaders. As such, China and Russia are working to improve not only their capabilities and materiel, but also are directly challenging the United States in the leader development, training, and professional military education realm.

Since the end of the Cold War, and maybe more appropriately, since the conclusion of Operation DESERT STORM, the U.S. Army has positioned itself as the world's preeminent ground combat force. Its ability to conduct large-scale ground combat operations, carrying out its preferred way of war as part of a dynamic and highly capable Combined and Joint Force, was demonstrated decisively in the deserts of Iraq and Kuwait and paved the way for many years of dominance.

This dominance rests on three increasingly tenuous assumptions:

1. The U.S. Army has the best equipment in the world;
2. The Army produces the world's best trained, best educated, and most capable Soldiers and leaders; and,
3. The Army's ability to conduct maneuver warfare under AirLand Battle is unmatched.

In essence, Army dominance over its potential nation-state adversaries was demonstrated across DOTMLPF-P. From the end of DESERT STORM through the second decade of the 21st Century, even as the United States became involved in counterinsurgency operations in the Middle East and South Asia, the Army and the wider DoD continued to trust in these assumptions. As the counterinsurgency campaigns continued, DoD and the Army began shifting their approach to warfare. For very good reason, DOTMLPF-P transitioned to focus on the counterinsurgency efforts in Iraq and Afghanistan.

A key change was focused on a capabilities-based approach to defense planning, which prioritized DOTMLPF-P solutions for the counterinsurgency campaign. The lack of a true Pacing Threat rival enabled this switch. While this shift was occurring, a fundamental geopolitical change was taking shape. Russia was awakening from its post-Soviet malaise and began asserting itself regionally and then globally. Furthermore, China began a rise predicated on a burgeoning economy and a focus on technological advancement that catapulted it into an increasingly prominent global role.

China and Russia both understood that to challenge the dominant position of the U.S. military would require a significant modernization effort. It would require a whole new approach to warfare, where armed confrontation is not necessarily the dominant form of Conflict between nation states. It would first focus on whole-of-government efforts to use all elements of national power to prevail in what we now call the Competition phase, where their goal is to "win without fighting."

They will continue efforts in the Crisis period, right up to the line of Conflict. If it comes to Conflict, our adversaries understand that they need to mitigate U.S. advantages by preventing us from waging our preferred way of war. To achieve this end, China's and Russia's modernization programs must work directly to contest the three aforementioned assumptions

A great deal of attention is focused on our adversaries' materiel progress, which provide them an overmatch capability under certain conditions. They have fielded fires systems that outrange our own, focused on EW capabilities, and developed sophisticated integrated air defense systems.

THE U.S. ARMY HAS POSITIONED ITSELF AS THE WORLD'S PREEMINENT GROUND COMBAT FORCE.

This dominance rests on three increasingly tenuous assumptions.



At the same time, we stripped many of these capabilities from our force due to the demands of counterinsurgency. Moving forward, our adversaries are focusing on disruptive technologies to extend their ability to challenge us into the future. This directly challenges the first assumption that underlies Army thinking. Our adversaries' equipment is as good as ours, and in some cases better.

As we progress through 2030, it is likely that neither the United States nor our Pacing Threats will have a true advantage in materiel. The rapid pace of technological innovation, the second-mover advantage,² and the continued development of countermeasures to any technological advance likely mean that any advantage will be fleeting. Instead, a rough equivalency in capabilities is the likely outcome moving forward from 2021.

Perhaps a more dangerous and longer lasting threat is our adversaries' effort to challenge the other two assumptions. The truest competitive edge of the United States military resided in our human capital—our Soldiers and leaders—which enabled our ability to wage our preferred way of war. These two advantages were based on investments in training and leader development—our combat training centers, schools, and centers of excellence—that created thinkers who developed a winning approach to war (concepts and doctrine). Counterinsurgency made us shift away from this formula. Army Force Generation was a necessity, and so we paid less attention to large-scale ground combat operations. Our adversaries took a different path.

When we look at China and Russia and how they have modernized their forces, their progress in the materiel sphere gets the lion's share of the attention. But they also are working across DOTMLPF-P to directly challenge us in the human capital realm and in how we wage war.

Our adversaries are modernizing more than just their materiel, they are investing in their human capital as well. Additionally, the OE is most likely evolving faster than we previously assessed. Training our Soldiers, equipping them with the best materiel possible, and enabling them to employ the most lethal and effective ways of war is paramount. This challenge falls to TRADOC, AFC, and our other partners across the Joint Force and DoD.

Winning matters and we must act now to achieve victory.

² The second-mover advantage is the idea that it is more economical to allow a rival to invest in all of the research and development that leads to the introduction of a new technology, and then soon after copy or acquire the technology for your own use.

Challenges:

The U.S. Army faces a materiel capacity challenge. Our adversaries—especially our Pacing Threat, China—have developed the capability to produce mass amounts of munitions and inexpensive systems, sometimes achieving overmatch with quantity over quality.



The likelihood of flat or declining defense budgets will challenge the balance between Army modernization and readiness—potentially degrading both—leading to China and possibly Russia outpacing us technologically.



The effects of climate change will increase demand for the Army National Guard and the Corps of Engineers, increase the vulnerability of Army installations, and degrade the performance of both Soldiers and equipment.



Vast distances coupled with threats to home station and expeditionary basing—cyberattacks, proxy forces, long-range precision fires, unmanned systems—introduce complex dilemmas to the conventionally long, methodical Army forward deployment and marshalling of forces in the EUCOM and especially INDOPACOM theaters of operation.



Based on where their interests lie, China and Russia can often lean on the defender's advantage that makes their large stockpiles of A2/AD weaponry extremely valuable and force the United States and its allies to make tough strategic choices when many of their traditional strengths are degraded or negated.



The U.S. Army—and the entire Joint Force—will be challenged outside of large-scale combat operations in ways that are difficult to attribute to state actors and increasingly difficult to respond to, including cyberattacks, disinformation, and use of proxy forces and private military contractors.



Our adversaries are increasingly exploring ways of war that may not require the kind of professionalized non-commissioned officer corps built and trained in the U.S. military.

Opportunities:

The U.S. Army can potentially overcome materiel capacity challenges from our adversaries by reshaping the force to be faster, more adaptive, more lethal, and one equipped with cost-informed systems more easily produced at scale.



A reinvigorated relationship between the U.S. military and the American technology sector, coupled with crackdowns on Chinese industrial espionage, could enable a technology surge and significant leap ahead of our adversaries even with potential budget cuts and constraints.



The U.S. Army has the opportunity to exploit the vulnerabilities inherent in operating in increasingly hostile climates by using advanced technologies to operate in austere climate conditions and “Own the Heat” while adversaries struggle in these conditions similar to historical adversarial struggles in night operations.



The U.S. military can lean on the unique strengths of its allies in NATO and throughout the INDOPACOM region. Common purpose with like-minded states adds significant value in Competition, Crisis, and Conflict—particularly when many of the adversaries' allies are the victims of coercion. United, a common front can stand stronger against attempts to mislead through disinformation, defend our critical networks and infrastructure, and offer a freer and more prosperous vision for the world compared to China and Russia. In Crisis and Conflict, strong, capable alliances will help to erode the distance advantage enjoyed by Russia and even more so China, create multiple dilemmas that they must solve, and provide a stronger suite of deterrence options to prevent crises from becoming wars. Foreign military sales and technology exchanges of advanced robotic and autonomous systems with allies could serve as a potential future deterrent in lieu of expensive forward deployment of Soldiers and materiel.



There is an opportunity for the U.S. Army and Joint Force to engage proactively in narrative warfare to neutralize the first-mover advantage often capitalized on by China and Russia in the information environment. A whole-of-government approach to narrative warfare—with counter-narratives built in—could “immunize” U.S. forces against previously “non-attributable” actions below the threshold of Conflict.



The U.S. Army has an opportunity to retain and even increase its advantage in human capital by embracing emerging technologies—such as mixed reality, immersive haptics, advanced modeling and simulations, and artificial intelligence/machine learning—in training, planning, and even recruiting.

WINNING MATTERS AND WE MUST ACT NOW TO ACHIEVE VICTORY.

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