The Financial Impact of Corona Virus Disease 19 on Department of Defense Telework Capability

Michael P. McGarvey

SSC-Fellow

Defense Acquisition University (DAU) – South Region
Senior Service College Fellowship 2020-2021
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Author: Michael P. McGarvey

Organization: Defense Acquisition University -South, SSCF

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Research advisor: Mr. Michael Thorne Approval Date: TBD

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The views and opinions expressed or implied in this research are those of the author; no agency or department of the United States Government has officially sanctioned any of these views and opinions.

Abstract

The research presented in the paper evaluates the financial impact of Corona Virus Disease 19 on the Department of Defense Telework System. According to a survey and interviews with DoD officials, the Department of Defense Inspector General (DoDIG) (Defense, 2021), initial challenges occurred because components had not tested their information systems and network access. However, testing was a requirement of the DoD Implementation Plan and DoD Telework Policy. As a result, some components were unprepared given the limitations of their networks and communications, and equipment. In addition, the quantity of personnel who instantly migrated into a telework status caused significant challenges for many organizations throughout the Department of Defense.

Acknowledgments

I want to thank my wife, Lisa, for her support and love during the late nights and weekend work I have spent in my professional career. The many anniversaries, birthdays, and holidays I missed while our children grew up due to numerous deployments. You and our children made innumerable sacrifices to support me, the Army, the Department of Defense, and the United States. The sacrifice you and our children made can never be repaid. You are the best soldier I know.

Keywords: CARES ACT, Cloud Base Internet Isolation, Commercial Virtual Remote, contingency telework, Continuity Of Operations Plan, Corona Virus Disease -19, Coronavirus, COVID-19, CVR, DISN Access, DoD, Force Protection, Pandemic, Remote Access Point, SSCF, Telework, Virtual Private Network, WAN Access

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Chapter 1 - Introduction

In 2020 the United States and the World experienced an unprecedented pandemic. The real impact of this virus is still too early to tell. The United States and most countries implemented immediate action to prevent the spread of the Corona Virus. Specific measures called for increasing separation, isolation, and personal protective equipment. The U.S. Army and the U.S. Department of Defense's efforts to maintain operational capability increase civilians and military telework. In addition, the Department of Defense and the United States Army are diligently working to standardize applications used to collaborate with coworkers regardless of their geographical locations.

Millions of employees across the nation went from working in the office to working from home. Prolonged quarantine measures in response to the current global health crisis have forced businesses and the DoD, both essential and non-essential, to adapt to their workforces stuck at home. The history of working from home, also commonly referred to as telework or telecommuting, is one with mixed success and mixed support; however, when left with few alternatives, businesses and the Government are forced to embrace the potential of a remote workforce (Curtis, 2020).

Background

"In late 2019, a novel Coronavirus (SARS-CoV-2, Corona Virus Disease -19) outbreak began in Wuhan, China, and by Jan 21, 2020, the first case was in the United States (Patel, Jerrigan, & 2019 nCOV, 2020, pp. 147-146)."

On Mar 12, 2020, The Acting Director of the Office of Management and Budget (OMB) issued a memorandum to the heads of Executive departments and agencies to use telework flexibilities (Vought).

Mr. Vought's memorandum provided the following;

> He encouraged all Agencies to maximize telework flexibilities for telework eligible employees within those who have a higher risk of severe complications from COVID-19. OMB authorized weather and safety leave to be leveraged for those higher-risk employees who are not eligible for telework. OMB also encouraged agencies to consider extending telework flexibility more broadly to all telework-eligible employees in areas of high COVID community transmission. Base decisions on consultations with the center for disease control and prevention (CDC) and local public health officials and taking into account State and local responses to the outbreak (including school closures). (Vought, 2020, p. 1).

On Mar 15, 2020, The Acting Director of OMB issued a second memorandum (Vought), which provided updated telework flexibilities in the National Capital Region (NCR). This memorandum encouraged all NCR agencies to offer maximum telework flexibilities to all telework-eligible employees. In addition, this memorandum reminded agencies of their ability to authorize weather and safety leave to those not eligible for telework.

On Mar 17, 2020, The Acting Director issued the third memorandum to the heads of executive departments and agencies that provide updated guidance related to COVID-19 for the **Federal Government:**

Agencies should, within 48 hours, begin taking the following actions concerning their employees:

Ensure that employees can perform mission-critical functions and adjust employee and work units' work assignments as necessary to higher-priority activities and activities that can be performed remotely.

Maximize telework for the entire Federal workforce while maintaining mission-critical functions.

Adjust operations and services to minimize face-to-face interactions, including at offices where an employee would generally be gathered nearby. These operational adjustments could include directing certain employees not to report to the regular work site or an altered work schedule. Some of those employees would be expected to perform their assigned work remotely. Other employees may not be able to work remotely due to their job function, in which case, the agency would provide a portable work assignment. For those unable to have mobile work, their leaders could use weather and safety leave.

Determine which employees can telework, consistent with the OMB guidance. Under normal conditions, employees have an established status as voluntary telework program participants. Telework-eligible employees may request to become a telework program participant at any time, including in response to an emergency such as the COVID-19 outbreak. However, if necessary, under a Continuity of Operations Plan (COOP) and/or

> by agency action under the evacuation pay regulations in 5 CFR 550.409, an agency may direct employees to perform telework (i.e., mandatory telework) even if they have not been a telework program participant or previously designated as telework-eligible, including for duties that were not typically within an employee's purview under "normal" circumstances. Additional information on evacuation pay is provided further below. (Vought, pp. 1-2)

"A traditional COOP scenario involved something more concrete – a prolonged power outage or flooding – a sudden event that prevents us from using our first-line tools and resources. Our standard setup is to have backups and alternate locations, and we shift to our secondary site" (Jennifer Schwab, 2020, p. 1). This was the standard for COOPs planning before the Pandemic. COOP Planning for the Pandemic, however, was teleworking.

The Department of Defense Inspector General's (DoDIG) report (Defense, 2021) confirmed some employees could successfully perform their tasks while on maximum telework. The Pandemic COOP depending on their DoD Components' ability to provide enough network capacity, communications tools, and equipment necessary to enable personnel to stay mission-ready. However, some personnel reported that they found alternative solutions, including using non-approved video teleconferencing applications, personal laptops, printers, and cell phones to complete their work because their components were not prepared for maximum telework.

This research paper provides initial insight into funding supplied by the Coronavirus Aid, Relief, and Economic Security (CARES) Act. It covers what the Department of Defense has spent to date and the remaining budget available. There is an expectation the virus may return

for a second wave early in 2021 (Global Data Healthcare, 2020), requiring continued use of social distancing and commit to a long round of lockdowns.

Significance of the Research

This study reviewed over 35 journal articles, memos, websites, and information papers to help summarize what has successfully been done to date within the DoD to support the expansion of telework recommended by OPM and OMB. The study also looks at funding provided to the DoD under the CARES Act, which is to help resolve the needs in response to COVID. The DoD focuses on the budget spent on increased network capacity, remote access points, and Information Technology.

Problem Statement

Given the U.S. Department of Defense has had to respond rapidly to the Pandemic called COVID-19 to ensure the protection of its personnel. This research will look at the challenges and opportunities, and long-term benefits of responding successfully to COVID-19.

Research Questions

The research found within the paper will help to answer the following questions:

1. What financial impact did COVID-19 have on the Department of Defense and its workforce?
2. What did the Department of Defense learn about teleworking during the Pandemic?

Chapter 2 - Literature review

The purpose of this literature review is to research relevant and critical documents that provide details of actions taken by the Department of Defense to protect employees. Identification and assessment of pertinent literature related to responding or providing answers to the research questions within this document. The primary search engines used to collect literature for this research paper were Google and Google Scholar using the following keyword and phrase search and results; DoD response to COVID-19 Google provided 9,110,000 results, and Google Scholar provided 6220 results. DoD emergency funding to support COVID-19 response Google provided 1,930,000, and Google Scholar provided 6,040 results.

Research Methodology

This paper reviews the literature on information publicly available to support answers to the research questions within this study. Attempt to analyze data collected and examine other reports, specifically addressing telework during the Corona Virus Disease 19 crisis focusing on successes, shortfalls, or lessons learned about meeting mission requirements while teleworking. During preparation, over 35 memorandums, websites, papers, articles, and other materials were reviewed and analyzed to provide a view of the DoD's current state, additional ongoing efforts to improve collaboration and security, and possible recommendations to continue to utilize telework beyond today.

Identification of these elements will help provide a consolidated report with the specific financial cost of telework changes. The DoD must support the mass increase in the number of government employees now teleworking. Understand the organizational and economic impacts of infrastructure enhancements, laptop purchases, security implementation costs, bandwidth upgrades increase costs and other variables the DOD may discover. When finished, the intent is

to give the audience a comprehensive document that provides sufficient information to support commanders in making future telework proposals. The study will provide recommendations for continued efforts.

Corona Virus Disease -19 Telework impact on the Department Of Defense

According to the Office of Personnel Management, more than 100,000 federal employees were working remotely during 2009. By 2010, the Government had passed the Telework Enhancement Act, which sought to make telecommuting more secure and effective for Federal employees (Allied Telecom, 2016).

Brynjolfsson's survey results provided the following:

> We report the results of a nationally representative sample of the US population on how they are adapting to the COVID-19 Pandemic. The survey ran from April 1-5, 2020. Of those employed four weeks earlier, 34.1% report they were commuting and are now working from home. In addition, 11.8% report being laid-off or furloughed in the last four weeks. There is a strong negative relationship between the fraction in a state still commuting to work and the fraction working from home, suggesting that many workers currently commuting could be converted to remote workers. We find that the incidence of COVID-19 can predict the share of people switching to remote work and that younger people were more likely to change to remote work. (Brynjolfsson, 2020, p. 1)

Dr. Anita Kamouri, Co-Founder of Lometrics, and Kate Lister, President of Global Workplace Analytics (Lister, 2020), surveyed close to 3000 employees who responded to the Global Work-from-Home Experience Survey between Mar 30 and Apr 24, 2020. The number of respondents makes this survey one of the most extensive global post-COVID employee surveys

to date. The survey revealed that 73% of respondents replied that they were very successful working from home. An exciting fact identified within the survey results was that 97% of North American office workers worked from home more than one day a week. Of that number, 67% had never performed from home regularly before the Pandemic. 78% of North American workers report they have the resources they need to be successful at home. In addition, people feel they perform equally well at home as they do in the office 70% are satisfied in both places. The report also concluded that people prefer to collaborate in person. The information also discovered that managers are just as satisfied with the work performed as employees. Of the respondents, 86% feel fully productive at home. Respondents gain back 35 minutes a day due to fewer unwanted interruptions.

During Mr. Deasy and Mr. Schwedo's talk telework briefing (Williams, DoD's Telework surge could be permanent, 2020), Mr. Dana Deasy verified The Department of Defense has always been telework-ready long before the Pandemic. However, full-time telework was the exception, not the norm. The rapid addition of personnel new to teleworking left an education void as employees needed training on the collaboration tools. There was a need to develop new best practices associated with teleworking both on the personnel and network side to ensure mission success. Mr. Deasy continued to state, “There will be some permanency to the current situation. The network side enhancements and the need to create a base of teleworking equipment.” (Williams, DoD's Telework surge could be permanent, 2020)

According to a briefing given by the Honorable Dana Deasy, the Department Of Defense Chief Information Officer and Air Force Lieutenant General B.J. Shwedo, Director for command control and communications and computer/cyber, and the chief information officer, Joint Staff,

Communications-Electronics Directorate, on Apr 30, 2020 (Dana Deasy, 2020). She reaffirmed the priorities were protecting the health of DoD workers and military force was the critical decision for the maximum telework flexibility. They also announced the creation of the Corona Virus Disease Readiness Task Force. Its membership includes supply chain, financial requirements, cyber-security, Intel, and high-interest items. It included Cyber Command, Joint Force Headquarters Department of Defense Information Network, the National Security Agency, the Defense Information Systems Agency, the joint staff, and the military services. This Task Force is focused on technical issues and requests as they arise. It will discuss several areas: equipment needs, network capacity, operational readiness, Information Technology personnel, contracting readiness, supply chain, financial requirements, cyber-security, Intel, and high-interest items. For example, the unprecedented demand for new equipment. Defense Department CIO and Joint Staff CIO Brief Reporters on DOD Communication Efforts Regarding COVID-19 also confirmed the Pentagon issued 2000 pieces of equipment to support teleworking. Defense Information Systems Agency and the Joint Service Provider raised virtual internet service providers' capacity by 30 percent. Defense Information Systems Agency also increased additional onboarding endpoints by 300 percent, and the Army increased its network access by 400 percent. (Dana Deasy, 2020)

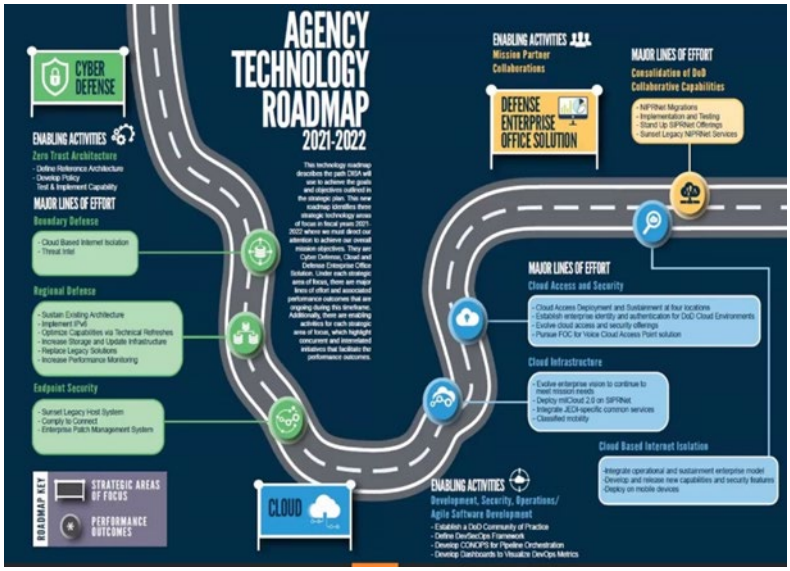

Figure 1 Defense Information System Agency's Enhanced Collaboration Cloud-based internet Isolation Roadmap (Defense Information Systems Agency, pp. 28-29)

Figure 1 shows the road map Navy Vice Admiral Nancy Norton used to brief the attendees at the Armed Forces Communications and Electronics Association's virtual luncheon. Defense Information Systems Agency Director shows this chart depicting the agency's roadmap at an Armed Forces Communications and Electronics Association virtual luncheon on Jan 7, 2021. The slide shows the Defense Information Systems Agency implemented the Virtual Private Network (VPN) upgrades to help support the pandemic response by the Department of Defense, which experienced more than 1000% increase in telework connections for joint mission partners around the globe (Vergun, 2021, p. 1).

DoD investments in Telework capacity

The DoD with the help of CARES provided:

The Coronavirus Aid, Relief, and Economic Security (CARES) Act provided $10.5 billion to the Department of Defense to support the Corona Virus Disease -19 response. According to a summary of the bill released Mar 25 2020 by the Senate Appropriations

> Committee, the $10.5 billion allocated for the Department of Defense includes: $1.45 billion to mitigate the impact of Corona Virus Disease -19 on production lines, supply chain, military depots, and labs. $1 billion for the Defense Production Act to increase access to materials necessary for national security and pandemic recovery. $300 million to procure IT equipment and increase bandwidth and $20 million for the office of the Inspector General for additional personnel to conduct audits and evaluations of Corona Virus Disease -19 emergency funding. (Erwin, 2020, p. 1)

> In response to the COVID -19 pandemic, The Department of Defense Components began transitioning to maximum telework in mid-March 2020. On Mar 18, 2020, the Deputy Assistant Secretary of Defense issued a memorandum stating that DoD components could execute their pandemic plans, or portions of their plans, at any time to ensure the ability to perform their essential functions. (Defense, 2021, p. 3)

"In early 2020, the U.S. Congress appropriated funds in response to the COVID-19 Pandemic. These funds were made possible through the CARES Act and other supplemental legislation. In response to guidance from the Office of Management and Budget (OMB)" (USASPENDING.gov, 2020), spending data from the Federal Government's response to COVID-19 is now available to view and download at USAspending.gov. Learn more about the updates made across the site related to COVID-19 spending. As of Apr 25, 2021, the Department of Defense has spent $5.7B of its $9.49B allotments from the $3T amount made available as part of the federal response to COVID-19 (USASPENDING.gov, 2020).

According to the Department of Defense News, “the DoD responds to the impact of mandatory telework took on many projects to expand the telework capabilities. Per the DoDs Chief Information Officer. They created a more robust telework capability multiplying the quantity and types of services such as collaboration tools.” (Lopez, Growth in DOD Telework Capability May Outlive Coronavirus Pandemic, 2020)

During Coronavirus Disease (Lopez, Growth in DOD Telework Capability May Outlive Coronavirus Pandemic, 2020), the DoD implemented a massive telework campaign directive to ensure the protection of both military and civilian workforce. Air Force Lieutenant General B.J. Shwedo, the Joint Staff's director for Command, Control, Communications, and Computers/cyber and the Chief Information Officer, said, “as many as 4 million Department of Defense military and civilian workers are now teleworking. The Army has about 800,000 telework-enabled members using remote access to the Defense Information Security Networks (DISN), and the demand is increasing daily.” (Lopez, Growth in DOD Telework Capability May Outlive Coronavirus Pandemic, 2020) LT Gen Shwedo also stated that new collaboration tools exist, the commercial virtual remote, a rapid implementation toolset was created due to the Corona Virus Disease -19 national emergency.

On May 26, 2020, the Pentagon issued an immediate release called the Pentagon Reservation Plan for Resilience and Aligning with National Guidelines for Opening up America Again. The Secretary of Defense delegated decision authority for changing Health Protection Condition to the Chief Management Officer. The CMO will decide when to move from one Health Protection Condition level to another as outlined in the Secretary of Defense Memorandum, "Guidance for Commanders on Risk-Based Changing of Health Protection

Condition Levels During the Coronavirus Disease 2019 Pandemic," dated May 19, 2020. This document identified the plan to support Open America (Office of the Chief Management Officer, 2020). Within this five-phase plan, specific guidance to allow workers to return to DoD facilities. Attachment 1 provides background and alignment with the White House and other agencies. Attachment 2 provides recommendations for commanders and supervisors for each phase as the workforce returns to office spaces in the Pentagon. While primarily focused on the National Capital Region, the guidelines are applicable towards military installation commanders. While the effort to return most employees to office space, many will not return if they fall into the Vulnerable Population and High-Risk Employees as defined by the CDC High-Risk Population. The guidance for these employees' states commanders and supervisors should maximize telework for DoD personnel who self-identify as being at higher risk in duty locations in States or regions that remain in the gating period Phase 1, or Phase 2.

The Center for Disease Control and Prevention (Centers for Disease Control and Prevention, 2020), identified people at increased risk and other people who need extra precautions. Many DoD employees will meet the CDC criteria for High Risk. The DoD will need to continue having, at a minimum, these employees teleworking as they progress through the phases of reopening America. Those specifically identified were: Older Workers; medical conditions such as people with Asthma, Pregnant people, Alcohol, drug & substance abuse disorder; breastfeeding & caring for Newborns, Caregivers for people living with Dementia, People with Disabilities, or those caring for people with disabilities. Not to mention people who have been exposed or possibly exposed or those who are sick.

Corona Virus Disease -19 has been a persistent threat to the Department of Defense and has impacted operations much longer than expected. On Nov 20, 2020, the Under Secretary of Defense Issued a memorandum subject to Extension of Maximum Telework Flexibilities from Dec 30, 2020, until Jun 30, 2021.

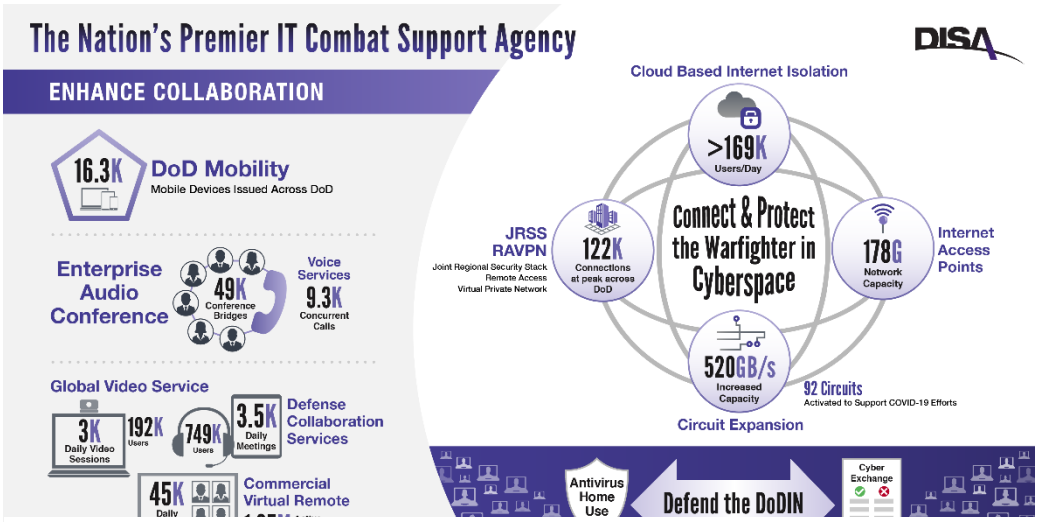

Figure 2 Defense Information System Agency's Enhanced Collaboration Cloud-based internet Isolation (Vergun, 2021, p. 1)

Figure 2 focuses on "DISA's effort over the last ten months to create this Cloud Based Internet Isolation (CBII) aring industry-leading technologies with a rapid acquisition strategy. It's a significant game-changer in our ability to protect department networks against web browser-based threats, making them more secure from the office or home. (Vergun, 2021, p. 1)

Mr. Deasy said during this briefing:

Virtual internet service provider connections are increasing 30% as of April 2020, which was certainly early in the pandemic response. Call capacity at the Pentagon has increased

50%, and the Defense Information Systems Agency has increased endpoint capability three-fold. The Navy's telework capacity has exploded with 65,000 new telework users on mobile and desktops. The Navy's telework capacity grew 150% to 250,000 workers due to COVID-19 measures, and there are additional plans to bring the total to 500,000 remote workers. The Marines increased their virtual private network capacity to 60,000 simultaneous workers, up about 80%. (Williams, DoD's Telework surge could be permanent, 2020, p. 1)

Lessons from Teleworking

Unfortunately, the work-from-home experience has been less than ideal for many. In addition to the threat of illness, employees struggle with home-schooling, finding a quiet place to work, inadequate broadband, inferior technology, and more. Surprisingly, however, most managers and employees have quickly adapted to this new way of working. (U.S. Senate Committee on Environment and Public Works, 2020, p. 2)

Kate Lister's analysis effort:

The Federal Work-Life Survey (FWLS), and Federal Employee Viewpoint Survey (FEVS) document significant positive impacts on people. Compared to non-telecommuters, telecommuters are more engaged (+16%), more satisfied (+19%), and less likely to leave their agency (-11%). Teleworking supervisors and non-supervisory say telework;

	Supervisors	Non-Supervisors
Improves performance	63%	76%
Increases desire to stay with agency	65%	76%

Improves morale	77%	83%
Improves health	58%	67%
Helps employees manage stress	67%	74%

Furthermore, 87% of respondents said the telework rollback in 2018 had hurt morale. (Analytics, 2020, p. 3 and 4 of 11)

E-Leadership- The DoD learned there is a need for a different type of leadership

With the massive and rapid migration to telework, leadership practices must adapt to new remote or virtual conditions for effective leadership and sustainable performance (Conteras, 2020). There are risks and opportunities as the DOD embraces the post-pandemic world of teleworking. The Department of Defense personnel proved they could accomplish the mission and provide sufficient evidence for managers to increase the trust relationship.

> In the telework environment, brings more challenges for leaders than managers. In other words, teleworking is more feasible. It even improves the efficiency of the traditional role of management (i.e., planning, budgeting, control, and establishing administrative procedures) than exerting effective leadership (i.e., influence others to achieve organizational goals) through electronic devices. (Conteras, 2020, p. 4)

The authors of Defining E-leadership as Competence in ICT mediated Communications - An Exploratory Assessment (Roman, 2019), certainly have the potential to carry over into any business where employees operate virtually. Employees do not have the same access to their supervisor and colleagues to support problem-solving when they were physically present at the office. In this context, the role of e-leadership lies in facilitating the virtual work conditions and keeping employees motivated toward achieving the desired goals. This new leadership style calls for a different type of leadership, known as e-leadership, which entails developing distinct

abilities to improve organizational functioning in virtual and remote work environments. E-Leadership as a Competence is an exciting concept which could be leveraged by the DoD; as an initial analysis to begin developing new management training to enhance leader's ability to lead virtually.

Not all DoD employees can qualify for a tax deduction what options exists to help.

Qualifying for a tax deduction of your home has specific requirements; not every employee can meet the needs in the Internal Revenue Publication 587 (Service, 2020). To qualify to deduct expenses for business use of your home, you must use part of your home exclusively and regularly as your principal place of business. The requirement mandates a specific area; it can be a room or other designated space. If you use the place for both business and recreation, you do not qualify. For example, setting up a computer and a desk in your living room will not entitle you to the deduction.

If the employee doesn't qualify for the deduction, then the cost of doing business at home is an additional burden on the worker for which today there is no compensation. Deductions, if employees qualify, are a percentage of utilities such as utilities, heat, air conditioning, electricity, water, internet, etc. All these things would be deductible in part under the IRS publication.

Can the DoD offer other forms of compensation for use of the home? This will require additional research.

Security

Cybersecurity during the Corona Virus Disease -19 created risk for the Department of Defense Information system across the services. The impact of having the maximum number of employees' telework with equipment issues and lack of collaboration tools created this situation.

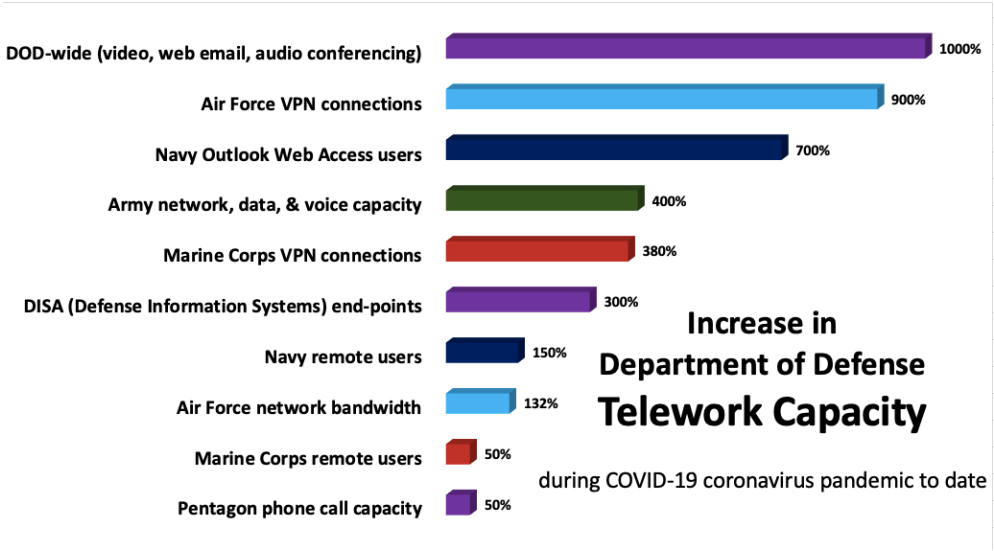

Figure 3 Breaking Defense Graphic from Defense Department data (Freedberg, 2020, p. 1)

Figure 3 shows how DoD remote access capacity has increased exponentially. With tens of thousands of military and civilian personnel working from home, Information Technology projects that typically take years to grind through the bureaucracy are now happening in weeks. – but cybersecurity concerns persist. Remote access to email, video teleconferencing, and conference calls, and collaboration tools are included in the Commercial Virtual Remote Environment (CVR). CVR began to roll out on Mar 27, 2020, and 17 days later, DoD activated over 900,000 user accounts (Freedberg, 2020).

The increase in telework within the Department of Defense resulting from Corona Virus Disease 19 related social distancing has provided U.S. adversaries more attack services to cause harm to the defense networks. Cyber-attacks have increased the department's focus on zero trust architecture; the move said Defense Information Systems Agency Vice Admiral. Nancy A. Norton during a keynote address today and the Armed Forces Communications and Electronics Association's virtual TectCyber 2020 conference. "The Defense Information System Agency

assumes all Department of Defense networks are as risky as working on the public internet." (Lopez, United States Department of Defence News, 2020, p. 1)

The IG's report (Defense, 2021) provided information that some personnel using unapproved applications and personal equipment such as laptops, printers, and cell phones which increases the vulnerability to DoD networks on which they are used. Security risks increased due to unauthorized devices being improperly secured and not maintained up to DoD standards. Thus, even temporarily increasing the risk of exposing sensitive departmental information which could impact national security and DoD missions.

The Defense Information Systems Agency has been working on the Cloud-Based Internet Isolation project since 2019.

According to Federal Computer Week, "When mass telework began a year ago in response to the COVID-19 pandemic, the Defense Department faced a sharp spike in a cyber-attack against its networks" (Williams, Can DISA CBII make DoD telework more secure, 2021, p. 1). Cloud-Based Internet Isolation (CBII) allows DoD users to access the internet while protecting endpoint attacks.

Laurel Lashley, Defense Information Systems Agency Cloud-Based Internet program manager, told FCW:

> CBII has been the solution that enables mission partners to solve their bandwidth constraints, especially in response to mass telework due to COVID-19. For mission partners operating in low-bandwidth, high-latency environments, CBII has been the solution for them to conserve bandwidth for their mission-essential functions. (Williams, Can DISA CBII make DoD telework more secure, 2021, p. 1)

According to the article, DISA plans to migrate 11 combatant commands, and the remaining licenses are for services.

Cloud-Based Internet Isolation is only one tool as part of DISA's effort to provide cybersecurity solutions for the DoD's workforce, including adopting the zero trust methods.

Chapter 3 – Methodology

Research Methodology

This paper provides a qualitative research methodology. Information reviewed was collected from open-source (publicly available) data, which documented how the Department of Defense responded to COVID-19. The research was to support answers to the research questions within this paper. The research attempts to analyze data collected and examine other reports, specifically addressing telework during the Corona Virus Disease 19 crisis. During preparation, over 35 memorandums, websites, papers, articles, and other material were reviewed and analyzed to provide a view of the DoD's current state, additional ongoing efforts to improve collaboration and security, and possible recommendations to continue to utilize telework beyond today.

Chapter 4 – Analysis and Findings

According to Kate Lister's (YEAR) testimony on teleworking to the Senate Committee on Environment and Public Works, her company, GlobalWorkplaceAnalytics.com, provided an estimate based on conservative assumptions that a government-wide impact of half-time telework could total over $11B per year – nearly $13K per teleworker in savings per year. Over $1.7B of that would come from reductions in real estate costs.

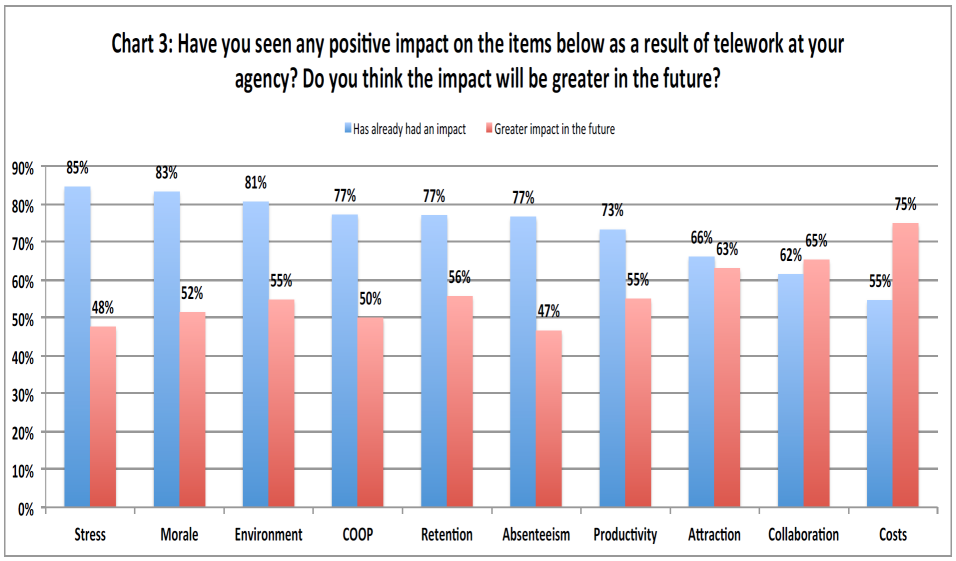

Figure 4 Telework Obstacles and Opportunities Aug 2013 (Harnish, 2013, p. 10)

Figure 4 shows the response from a telework survey back in 2013, where 73% of those felt telework has already positively impacted the factors identified above (Harnish, 2013, p. 10). "A vast majority of the Department of Defense employees found themselves at least as productive teleworking than working in an office. A plurality said their production increased, according to the Pentagon's official watchdog." (Maucione, 2021, p. 1)

According to the Department of Defense Inspector General's report:

> The ability of the Department of Defense personnel to remotely perform essential and non-essential tasks depends on remote access availability. The Department of Defense can provide enough network capacity, communication tools, and equipment to enable continued operations during the Corona Virus Disease -19 crisis and beyond. The Department of Defense's essential and non-essential personnel stay mission-ready and productive while in a telework status. Some teleworking personnel reported that they found alternative solutions, including the use of unauthorized video conferencing applications and personal laptops, printers, and cell phones to complete their work because some Department of Defense Components were unprepared for maximum telework. However, using unauthorized applications or sharing Department of Defense information over improperly secured devices, even temporarily, increases the risk of exposing sensitive departmental details that could impact national security and Department of Defense missions. (Defense, 2021, p. ii)

As documented by the Department of Defense Inspector General report (Defense, 2021), teleworking personnel found their solutions. Certainly, worrying about demonstrating value and performing work from home was their priority.

Identification of the number of employees migrated to telework status, increased technology required to support the move to telework, and the cost of the migration. Identification of the increase in information technology services, equipment, collaboration environments, and security enhancements will help provide a consolidated report with the specific financial cost of telework changes. The DoD had to support the mass increase in the number of government employees using this status. Organization impacts such as infrastructure

enhancements, laptop purchases, security implementation costs, bandwidth increase costs, and other variables we may discover. The intent is to give the audience a comprehensive document that provides sufficient baseline information to support commanders in making decisions about future telework proposals. This paper will also provide recommendations related to enhancing telework, security, and COOP planning.

Chapter 5 Conclusion/Recommendations

Conclusions:

As a result of COVID-19, the Department of Defense needed to create separation between personnel to protect the force's health. Without this action, conditions in which the virus could spread rapidly would threaten the workforce. Most DoD offices provide less than 6 ft separation between workers. The easiest option was to allow those who could telework to migrate to full-time telework.

Congress understood the need for emergency funding in support of the Government and all its departments and agencies. As a result, Congress passed the Coronavirus Aid, Relief, and Economic Security (CARES) Act and other supplemental legislation to provide emergency funding. The Department of Defense received $9.49B from the CARES Act (USASPENDING.gov, 2020), to support urgent requirements to support their Continuity Of Operations Plans throughout the DoD. Based on guidance from the OMB and OPM, more workers began to telework. The number of Defense employees who started telework due to COVID-19 exceeded 4 million, with over 800,000 Army military and civilian personnel included in this figure.

The Defense Information Systems Agency (DISA) had to develop and field a set of collaboration tools and provide training to enable the defense workforce to meet mission requirements. DISA also had to overcome many challenges to rapidly provide new circuits, bandwidth, and conference call capabilities. DISA provisioned circuits that increase network capacity by nearly 500 gigabits per second. Since the start of the Pandemic, 63 circuits were added, and 39 more are pending activation. DISA increased the Army's Virtual Private Network (VPN) access by nearly 300%

The DoD realized the ability to continue operations with many employees teleworking. Before COVID, managers were not confident or lacked trust that employees would be productive and effectively complete their work from home. Managers now realize that working from home has increased the productivity of many workers.

Recommendation:

1. The DoD components need to update their plans to include new assumptions related to telework personnel and the resources necessary to support the teleworking employees.
2. Employees need to be trained on the latest approved collaboration tools and exercise use of those tools even when in the office to maintain their skills and update them with new applications.
3. Frequently exercise the component implementation plan for telework.
4. Design a new leadership program to enhance the leadership skills required to maintain and improve virtual teams and ensure the wellbeing of employees.

5. Conduct an After Action Review (AAR) to capture lessons learned in a non-attribution fashion at every command level.
6. Leaders at each level should summarize their business's impact due to the Pandemic, look holistically and report on all issues associated with financial resources, Human Capital, Technology, and Computers. Each level in the chain of command should compile these reports and elevate them to the Headquarters Department of the Army.

The DoD is are in a new era of fighting an unseen enemy, soldiers, airmen, sailors, and marines are not the weapon of choice. Human Health Care Services is the new front-line combatants in this type of germ warfare. Force dispersion to equal the Health Protection Condition Level HPCON at each geographical area determined by the infection rate for that area.

The DoD should invest the financial resources to ensure Information Technology equipment, network capacity, and other items will support any contingency plan, including force disbursement, to protect the force's health and wellbeing.

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Acronyms

AAR	After Action Review
CARES	Coronavirus Aid, Relief, and Economic Security
CBII	Cloud Based Internet Isolation
CDC	Center for Disease Control
CMO	Chief Management Officer
COOP	Continuity Of Operation Plan
Coronavirus	(SARS-CoV-2, Corona Virus Disease -19)
COVID-19	Corona Virus Disease 19
CVR	Commercial Virtual Remote
DAU	Defense Acquisition University
DISA	Defense Information System Agency
DISN	Defense Information System Networks
DoD	Department of Defense
DoDIG	Department of Defense Inspector General
FEVS	Federal Employee Viewpoint Survey
FWLS	Federal Work Life Survey
NCR	National Capital Region
OMB	Office of Management and Budget
OPM	Office of Personnel Management
OPSEC	Operational Security
PPE	Personnel Protective Equipment

SSCF	Senior Service College Fellowship
VPN	Virtual Private Network