

UNCLASSIFIED

DEPARTMENT OF DEFENSE  
DEFENSE SCIENCE BOARD

TASK FORCE ON

# SURVIVABLE LOGISTICS

EXECUTIVE SUMMARY



November 2018

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This report is a product of the Defense Science Board (DSB). The DSB is a Federal Advisory Committee established to provide independent advice to the Secretary of Defense. Statements, opinions, conclusions, and recommendations in this report do not necessarily represent the official position of the Department of Defense (DoD). The DSB Study on Survivable Logistics completed its information-gathering in April 2018. The Executive Summary is unclassified and was cleared for open publication by the DoD Office of Prepublication and Security Review on October 26, 2018.



**DEFENSE SCIENCE  
BOARD**

**OFFICE OF THE SECRETARY OF DEFENSE  
3140 DEFENSE PENTAGON  
WASHINGTON DC 20301-3140**

**MEMORANDUM FOR THE UNDER SECRETARY OF DEFENSE FOR RESEARCH AND  
ENGINEERING**

**SUBJECT: Final Report of the Defense Science Board (DSB) Task Force on Survivable Logistics  
– Executive Summary**

I am pleased to forward the final report of the Defense Science Board Task Force on Survivable Logistics, co-chaired by General Paul Kern, USA (Ret.) and General Duncan McNabb, USAF (Ret.).

For decades, the ability of the Department of Defense (DoD) to transport, supply, and resupply our soldiers, sailors, airmen, and marines anywhere in the world has been assumed. The United States maintained such superiority over its competitors that strategic threats to DoD logistics were rarely considered by military planners. However, though in the past we have been relatively unchallenged in this regard, it is now time to evaluate our abilities to project forward and freely operate in contested environments. Our logistics capabilities need improvement, underpinned by stable funding streams dedicated to logistics.

This study examines the threats posed by strategic competitors to U.S. military logistics and provides recommendations for remedying the challenges that could be exploited in a strategic competition. The future of warfare is rapidly changing, and the DoD will need to adapt quickly to prepare for conditions less favorable to the United States than existed in the past. Modernizing the joint logistics enterprise is a necessary and critical first step toward that goal.

Survivable logistics is the key enabler underpinning all U.S. military power. Without the ability to provide our soldiers, sailors, airmen, and marines with the resources needed to win on the battlefield, the development of advanced tactics and technologies will not have the opportunity to matter.

I agree with the recommendations detailed in this report and urge the DoD to move quickly towards their adoption.

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Craig Fields  
Chairman, Defense Science Board

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DEFENSE SCIENCE  
BOARD

OFFICE OF THE SECRETARY OF DEFENSE  
3140 DEFENSE PENTAGON  
WASHINGTON DC 20301-3140

SUBJECT: Final Report of the Defense Science Board (DSB) Task Force on Survivable Logistics  
– Executive Summary

Attached is the final report of the Defense Science Board Task Force on Survivable Logistics. The Task Force was commissioned to accomplish the following objectives:

1. Evaluate the implications of current and emerging threats to the DoD logistics enterprise, particularly high-end threats from Russia and China;
2. Develop concepts to mitigate emerging threats to the DoD logistics enterprise;
3. Create actionable recommendations that will reduce significant vulnerabilities;
4. Consider applications of emerging technology, including autonomous systems, artificial intelligence, and information technology; and
5. Evaluate concepts that can enhance survivability of the logistics enterprise, such as disaggregation, deception, and hardening.

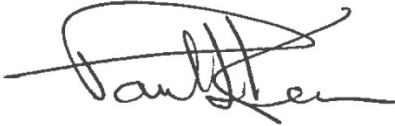
The Task Force found significant shortfalls that, if left unaddressed, will put at risk U.S. ability to project power and sustain the fight against a strategic competitor. There are four main areas that require attention. First, the United States must start survivable logistics at home. This includes conducting realistic wargames and exercises that accurately reflect the threats to and capabilities of the joint logistics enterprise, as well as addressing longstanding issues with the defense industrial base.

Second, the United States must protect, modernize, and leverage the mobility triad (i.e., surface, air, prepositioning). New concepts of operations are needed to ensure that ground, air, and sea lines of communication remain open while under attack. Better prepositioning and enhanced cooperation with commercial partners will be needed.

Third, protecting and enhancing logistics information is paramount. Military and commercial networks are susceptible to espionage, manipulation, and attack by adversaries. Logistics data is neither as accessible nor used as efficiently as it should be. Technological solutions to these problems already exist, or will exist in the near future. The DoD must adopt them quickly.

Finally, the United States must exploit globally integrated logistics to support the *2018 National Defense Strategy*. U.S. military units will need to be restructured to better balance Active and Reserve Component capabilities. Logistics demand must be reduced, and research, development, technology, and engineering (RDT&E) funding must be increased to meet this need. To enable resiliency and complicate an adversary's targeting, it is imperative that logistics concepts of operations (CONOPs) be revised to align with anticipated future joint operating concepts.

The Task Force has provided a series of recommendations the DoD should adopt without delay. Doing so will lay the foundation for the United States to continue operating reliably on the global stage to pursue its interests and protect its allies. We hope this report finds a receptive audience among the Nation's top military and policy leaders.

A handwritten signature in black ink, appearing to read "Paul Kern". The signature is stylized with a large, sweeping initial "P" and "K".

General Paul Kern, USA (Ret.)  
Co-Chair

A handwritten signature in black ink, appearing to read "Duncan J. McNabb". The signature is written in a cursive style with a large "D" and "M".

General Duncan McNabb, USAF (Ret.)  
Co-Chair

# DSB Task Force on Survivable Logistics

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## DSB Task Force on Survivable Logistics

### Introduction

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The Defense Science Board (DSB) Task Force on Survivable Logistics was established to evaluate the current state of the U.S. military's Joint Logistics Enterprise (JLEnt), to assess high-end threats to the JLEnt from strategic competitors such as Russia and China, and to provide recommendations for securing and sustaining the JLEnt in an increasingly contested global security environment.

Since the end of the Cold War, the United States has not fought an adversary capable of the catastrophic disruption of military supply chains and deployment of personnel and materiel. As a result, the JLEnt has suffered neglect and chronic underfunding relative to other DoD priorities. Simultaneously, the ability of strategic competitors to threaten the JLEnt has increased as they invest in anti-access/area denial (A2AD) capabilities and gray zone tactics.

Upon completion of the study, the Task Force found that survivable logistics are essential for continued U.S. power projection and readiness against strategic competitors. However, DoD logistics capabilities require renewed attention to ensure they will be able to achieve mission success in a contested environment. Without a demonstrably resilient and survivable logistics capability, U.S. deterrence will suffer and the ability of the U.S. military to operate globally will be at stake.

## Scope of Study

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From May 2017 to July 2018, the Survivable Logistics Task Force convened to receive briefings and to collect information about the state of the JLEnt and adversary threats to our military logistics. Experts consulted included active duty logistics professionals from the Army, the Navy, the Air Force, and the Marines; retired senior military leadership; members of the Intelligence Community; scholars; and industry leaders focusing on the development of technologies relevant to the future of the JLEnt.

After assessing the full scope of challenges facing the JLEnt, the Task Force identified four main priorities the DoD must address to assure survivable logistics in the future:

- ◆ Start Survivable Logistics at Home
- ◆ Protect, Modernize, and Leverage the Mobility Triad
- ◆ Protect and Enhance Logistics Information
- ◆ Exploit Globally Integrated Logistics to Support the *2018 National Defense Strategy* (NDS)

The Task Force developed a set of associated recommendations that, if implemented, will address the funding, readiness, capability, and technology gaps currently plaguing the JLEnt, which are enumerated below. The DoD must act quickly to ensure these recommendations are realized. Failure to enact these necessary reforms will have dire consequences on the Nation's power projection capability, deterrence posture, and ability to achieve success on the battlefield.

A classified version of the full report on Survivable Logistics can be obtained through the DSB office.

## Findings and Recommendations

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### Finding 1: Start Survivable Logistics at Home

Taking the fight to the enemy is predicated on being able to muster the necessary troops, equipment, and supplies at airfields and seaports for deployment overseas, and ensuring the proper functioning of the aircraft and vessels needed to transport them. If the homeland industrial base, electrical grid, or any other critical infrastructure is compromised, military forces will not be able to arrive in theater on time or at all. Therefore, it is critical that attention to survivable logistics begin at home.

In the past few decades, readiness has severely decayed due to budget cuts, misaligned funding priorities, lack of incentives for the industrial base, and insufficient wargaming, among other causes. The Task Force found that reversing course at once will enable the DoD to address the Secretary of Defense James Mattis's highest priority to rebuild "military readiness as we build a more lethal Joint Force."<sup>1</sup>

**Recommendation 1.1** The Deputy Secretary of Defense direct the Military Departments to program/fund readiness accounts (i.e., operations and maintenance (O&M), Procurement) at "maximum executable levels" in the base and contingency budgets through the Future Years Defense Program (FYDP) until the Military Departments meet required fully mission capable rates across their forces, and once achieved, sustain for the life of the weapon system.

**Recommendation 1.2** The Chairman of the Joint Requirements Oversight Council (JROC) include the two mandatory sustainment Key Performance Parameters (e.g., Materiel and Operational Availability) and two mandatory Key System Attributes (e.g., Reliability and Operations and Sustainment (O&S)) costs into all acquisition programs through incentivizing industry to continuously drive reliability growth throughout the life cycle.

**Recommendation 1.3** The Under Secretary of Defense for Acquisition and Sustainment (USD(A&S)) fully implement Performance Based Logistics (per *Department of Defense Instruction (DoDI) 5000* series) strategies that optimize total system readiness, and minimize costs and logistics footprint.

**Recommendation 1.4** The Joint Staff Director for Joint Force Development (J7) develop integrated wargames at global, combatant command (CCMD), and Military Department levels with the logistics fidelity to identify logistics constraints to operations.

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<sup>1</sup> Department of Defense, *Summary of the 2018 National Defense Strategy of the United States of America*, 5, <https://www.defense.gov/Portals/1/Documents/pubs/2018-National-Defense-Strategy-Summary.pdf>.

**Recommendation 1.5** The Joint Staff Director for Joint Force Development (J7) – in concert with the Director for Logistics (J4) and USTRANSCOM – conduct annual combatant exercises, incorporating all joint logistics functions – including medical logistics and major commercial partners.

**1.5-1** The CCMD components conduct smaller scale exercises at least semi-annually and ensure development of a feedback loop to fix shortcomings and provide direction for the program managers to correct. A trusted agent group of commercial logistics partners with security clearances should be included to leverage existing commercial logistics networks during the development of operational plans (OPLANs).

**Recommendation 1.6** The Joint Staff Director for Operations (J3) develop a logistics red-teaming capability within the CCMD J3s to expose vulnerabilities that are then integrated into the CCMD Joint Targeting Cycle.

**Recommendation 1.7** The USD(A&S) direct multi-year contracting and acquisition for surge and stockpile of strategic components (e.g., electronic components and chips, specialized metals, and ammunition and precision munitions).

**Recommendation 1.8** The Secretary of Defense advocate to protect, detect, respond, and recover civil and military logistics networks to include the electrical grid, other critical utilities, key ports, and cyberspace. This is a “whole-of-nation” problem and required funding could be approved in a national infrastructure bill.

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## **Finding 2: Protect, Modernize, and Leverage the Mobility Triad**

The mobility triad, which includes sealift, airlift, and prepositioned assets, is plagued by readiness issues and shortages that must be addressed in order for the United States to defeat a strategic competitor. The commercial sealift fleet that assists military logistics has been shrinking for decades and, left to current plans, the organic (i.e., government-owned) fleet will decrease 50 percent by 2033. The Civil Reserve Airlift Fleet (CRAF) is a key component of the JLEnt, and the DoD relies on it as the primary means of delivering passengers and bulk air cargo. However, the importance of both airlift and sealift are not properly wargamed to determine the impact of highly likely adversary intervention. Accounting for attrition, A2AD threats, and risks to commercial civilian airmen and mariners requires wargaming and solutions.

The current DoD prepositioning strategy does not accommodate the demands of the *NDS* and must be updated. The use of deception and “hiding in plain sight” by our adversaries should be considered. Opportunities exist to leverage commercial networks and vessels for DoD prepositioning.

**Recommendation 2.1** The Vice Chief of Staff of the Air Force and the Vice Chief of Naval Operations develop CONOPs and tactics, techniques, and procedures (TTPs) with U.S. flag carriers for convoy

operations (long-range maritime patrol, etc.) to protect mobility forces and secure air and sea lines of communication against A2AD.

**Recommendation 2.2** The Director (J4) and the U.S. Transportation Command (USTRANSCOM) Director for Strategic Plans, Policy, and Logistics (J5/J4), with Combatant Commanders, develop requirements and CONOPs for innovative and long-range theater distribution assets (e.g., mobile basing, airships, joint high-speed vessels, autonomous barges, and precision airdrop).

**Recommendation 2.3** The USTRANSCOM Director J5/J4 account for attrition and evaluate “art-of-the-possible” to solve the shortage problem. To account for airlift attrition, the Task Force believes a minimum of the following options should be examined: (a) reopen the cargo aircraft production line to increase numbers of aircraft; (b) leverage the commercial fleet to a greater extent to preserve life of the organic fleet; and/or (c) plan and acquire a new military cargo aircraft. Similar mitigation strategies should be developed for sealift attrition.

**Recommendation 2.4** The USTRANSCOM Director J5/J4 develop war risk and weapons of mass destruction (WMD) insurance (i.e., enables commercial participation).

**Recommendation 2.5** The Director of the Office of the Secretary of Defense (OSD) Cost Assessment and Program Evaluation (CAPE), in coordination with USTRANSCOM and the Joint Staff Director (J4), develop CONOPs and calculate mobility requirements against strategic competitors.

**Recommendation 2.6** The Vice Chief of Staff of the Army and the Assistant Commandant of the Marine Corps develop an afloat and ashore preposition (PREPO) strategy (i.e., locale, mode, force structure), including commercial capabilities to meet requirements against strategic competitors.

**Recommendation 2.7** The USTRANSCOM Director (J5/J4) and the Deputy Chief of Naval Operations (DCNO) (N4) develop CONOPs for afloat PREPO (e.g., put one infantry brigade combat team (IBCT) (300,000) aboard Maritime Security Program (MSP) roll-on/roll-offs (ROROs) and 6,800 20-foot Equivalent Units (TEUs) aboard MSP container ships) and liaise with MSP carriers to increase ashore PREPO in support of U.S. European Command (USEUCOM) (Army PREPO Sets (APS)-2), U.S. Central Command (USCENTCOM) (APS-5), and U.S. Indo-Pacific Command (USINDOPACOM) (APS-4).

**Recommendation 2.8** The DCNO (N4) seek legislative relief and acquire foreign-built vessels (i.e., 20–25 years old) being replaced in the MSP to recapitalize the Ready Reserve Force (RRF) in U.S. shipyards. A used, foreign-built RORO vessel costs around \$20-\$30 million, while a new, U.S. built RORO costs around \$850 million.

**Recommendation 2.9** The USTRANSCOM Director (J5/J4) determine optimal RRF fleet vessel mix (i.e., RORO, RORO/container/ammo ship hybrids, crane ships, etc.) as part of recapitalization efforts, and include commercial partners in operations planning and mobility studies. Specifically, replace

steam vessels with 26 used, foreign-built vessels, which costs around \$880 million total compared to one U.S.-built large, medium-speed roll-on/roll-off (LMSR) that costs \$850 million.

**Recommendation 2.10** The Deputy Secretary of Defense create MSP stability with multi-year funding to keep pace with the increasing costs and inflation and incentivize long-term investment.

**Recommendation 2.11** The USINDOPACOM and USEUCOM Directors (J4) expand access to and establish new lines of communication (LOCs) (i.e., for seaports, airfields, overflight).

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### Finding 3: Protect and Enhance Logistics Information

Competitors and adversaries have already disrupted commercial logistics information technology (IT) systems. Military and commercial logistics networks are at risk. Conflict against a strategic competitor will demand a dispersed and survivable logistics structure and robust IT systems capable of not only defending against cyber-attacks, but also safely sharing logistics information across military and commercial elements. To project the force, the DoD depends on information sharing with private industry and needs to develop reliable cyber-protected communications in conjunction with supporting policies.

Artificial intelligence (AI) and machine learning (ML) have the potential to vastly enhance the DoD's logistics enterprise network. Predictive analytics, demand forecasting, production scheduling, anomaly detection, and supply chain/inventory optimization are just some of the ways these technologies can enhance logistics.

**Recommendation 3.1** The Under Secretary of Defense for Policy (USD(P)) direct the Assistant Secretary of Defense for Homeland Defense and Global Security (ASD(HD&GS)) to update the 2006 DoDI 3020.42 (*Defense Continuity Plan Development*) and provide specific resiliency guidance, and mandate all future joint exercises identify, develop, and practice alternate operating procedures for the most important mission-enabling activities.

**Recommendation 3.2** The DoD Chief Information Officer (CIO) implement blockchain-like technologies and direct the Director of the Defense Information System Agency (DISA) to stand up a proof-of-concept blockchain-like infrastructure. This Infrastructure enables the DoD to evaluate potential offensive and defensive cyber applications of blockchain-like technology and other distributed database technologies (required in the *2018 National Defense Authorization Act's (NDAA) Modernizing Government Technology Act*).

**3.2-1** The Commander of USTRANSCOM conduct a proof-of-concept with blockchain and/or blockchain-like technology, incorporating commercial logistics partners.

**3.2-2** The Director of DLA and Commander USINDOPACOM each conduct a proof-of-concept with blockchain-like technology (i.e., smart contract) to improve contract oversight to streamline efficiency and enhance supply chain security.

**Recommendation 3.3** The Deputy Secretary of Defense direct the Military Departments to accelerate moving logistics information systems to the cloud to create an enterprise data lake with compartments for each Military Department and commercial partner. Doing so will facilitate and optimize decision making through efficient access and data analysis, sharing, and visualization to connect tactical and enterprise logistics systems to enable optimal data use.

**Recommendation 3.4** The Under Secretary of Defense for Research and Engineering (USD(R&E)) demonstrate/prototype the capabilities of AI and ML coupled with big data analytics to collect, correct, and format large-scale enterprise data.

**Recommendation 3.5** The USD(R&E) and the USD(A&S) leverage technology to “unbundle” and protect sensitive information disseminated throughout the supply chain.

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#### **Finding 4: Exploit Globally Integrated Logistics to Support the *National Defense Strategy***

The Active/Reserve mix and readiness of Reserve Component (RC) units are out of balance given required wartime timelines. Army and Air Force Reserve unit activation is not aligned with the *NDS* and OPLAN-contingency plan (CONPLAN) deployment timelines.

The DoD has not provided sufficient focus and funding for logistics research, development, test, and evaluation (RDT&E). Reversing this trend will enable new, agile technology to be developed, which will greater influence future logistical operations. Logistics demand has continuously increased and must be reduced to enable 21<sup>st</sup> century dynamic and agile CONOPs.

In order to support deployment and sustainment operations, logistics CONOPs must be revised to include dispersion, deception, and multiple avenues of approach, in order to complicate targeting and increase flexibility and resiliency.

**Recommendation 4.1** The Secretary of Defense direct Military Departments to balance their active-reserve/contractor mix consistent with rapid deployment requirements and operational agility demanded in the National Military Strategy, to include providing additional full-time reserve manning for early force flow reserve units.

**4.1-1** The Military Departments provide additional full-time reserve manning for early force flow reserve units, as required.

**4.1-2** Ensure supporting contingency contractors (e.g., Logistics Civil Augmentation Program (LOGCAP)) are included in the planning process.

**Recommendation 4.2** The Chairman of the Joint Chiefs of Staff direct a review of all RC activation timelines to align and synchronize these activations with the *NDS* and current OPLANs and CONPLANs.

**Recommendation 4.3** The Secretary of Defense provide activation pre-approval for the early force flow of reserve units that provide enabling capabilities for command and control, reception, and onward movement of deploying forces to meet compressed timelines.

**Recommendation 4.4** The Deputy Secretary of Defense direct the Military Departments to increase RDT&E investment, within the current FYDP, in legacy logistics systems to adapt and incorporate commercial and emerging capabilities (i.e., AI, additive manufacturing (AM), autonomous systems) in order to reduce costs and improve logistics support (i.e., demand reduction, reliability, and speed). Appropriate and similar RDT&E major investments must be secured to incorporate similar technologies in all future logistics systems in the current FYDP.

**Recommendation 4.5** The Deputy Secretary of Defense designate lead Military Departments to focus RDT&E on high impact capabilities:

- ◆ fuel demand reduction
- ◆ local generation of electricity
- ◆ increase battery storage and decrease battery weight
- ◆ additive manufacturing

**Recommendation 4.6** The Deputy Secretary of Defense direct the OSD to develop policy to establish a Logistics RDT&E Board to synchronize Military Departments RDT&E investments.

**Recommendation 4.7** The USD(R&E):

- ◆ direct focused science and technology (S&T) on reducing demand for high volume and high weight commodities (e.g., fuel and water);
- ◆ prototype very small nuclear reactors for expeditionary power generation in coordination with the Department of Energy (DOE);



- ◆ maintain required RDT&E to continue to refine the utility of hybrid airships and USTRANSCOM demonstrate military effectiveness of hybrid airships and potential CRAF- and Voluntary Intermodal Sealift Agreement (VISA)-like programs for airships.
- ◆ Conduct focused research and development (R&D) on autonomous systems to assess the maintainability, reliability, and supportability parameters; and
- ◆ Exploit renewable deployable power plants to support austere locations with the USD(A&S).

**Recommendation 4.8** The Military Departments designate a high-priority system/program to demonstrate expeditionary utility of AI, AM, and autonomous systems, especially long-range theater connectors (e.g., autonomous barges, airships, high-speed vessels, and precision airdrop).

**Recommendation 4.9** The Combatant Commanders implement protection of critical logistics assets (e.g., deception, dispersion, use of commercial service networks and infrastructure to “hide in plain sight”) to increase resiliency.

**4.9-1** The Military Departments develop deception capabilities for CCMD service components.

**Recommendation 4.10** The Director of DLA:

- ◆ fully fund and widely disperse outside continental United States (OCONUS) fuel stock position from its three major locations to reduce the air- and sea-lines-of-communication (ALOC and SLOC) burden and complicate others’ targeting; and
- ◆ increase sourcing from allied and regional suppliers to improve responsiveness, mitigate risk, and use multiple LOCs.

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## Appendix A: Task Force Terms of Reference

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ACQUISITION,  
TECHNOLOGY,  
AND LOGISTICS

### THE UNDER SECRETARY OF DEFENSE

3010 DEFENSE PENTAGON  
WASHINGTON, DC 20301-3010

DEC 15 2016

MEMORANDUM FOR CHAIRMAN, DEFENSE SCIENCE BOARD

SUBJECT: Terms of Reference – Survivable Logistics

Logistics is an area of critical importance to the Department of Defense (DoD). The United States military has excelled in providing and moving forces, equipment and sustainment around the world, for operations and for humanitarian relief. In the most recent conflicts, however, our adversaries have had limited potential to disrupt our logistics enterprise.

As we consider the potential for conflict against a peer or near peer competitor, logistics operations have several potential challenges and vulnerabilities to include:

- Some operations will have no secure rear areas from which to provide logistics support. In addition support may have to be provided closer to the areas of active combat and on a much more distributed or disaggregated basis.
- The reliance on forward logistics support from contractors has become the norm for US forces, but this may not be possible on future battlefields. The cost of maintaining greater organic capability within the government and within the military may be prohibitive, however.
- Logistics Information Systems are potentially vulnerable to cyberattacks. The wide use of non-secure (i.e. NIPRnet) information technology across the logistics enterprise (both military and commercial) makes the military's systems more susceptible to enemy activity as does the integration with commercial networks for suppliers and mobility.
- Mobility assets, forward-deployed stock, ports, assembly areas, and multiple lines of communication located across the globe are vulnerable to attacks by a range of threats, but particularly by precision weapons.
- Limitations on the interoperability and capability of joint logistics information systems and joint processes/solutions across the military affects our logistics forces' efficiency and effectiveness.

In order to combat these and other vulnerabilities, we need to clearly understand the 21<sup>st</sup> century battlefield and the implications of the threats to our ability to provide the required logistics support to operations against peer and near peer adversaries. This study should focus on high-end threats, particularly Russia and China, and how their activities could challenge future logistics systems and operations.

The study will evaluate the implications of the current and emerging threats to the DoD logistics enterprise, develop concepts to mitigate these threats, and make prioritized actionable recommendations for steps that will reduce the most significant vulnerabilities. Applications of emerging technology, to include autonomous systems, applications of artificial intelligence, and information technology will be considered. Concepts that can enhance survivability of the logistics enterprise such as disaggregation, deception, and hardening will be developed and evaluated for cost effectiveness.

I will sponsor the study. General (Ret) Paul Kern and General (Ret) Duncan McNabb will serve as Co-chairmen of the study. Mr. Gary Motsek will serve as the Executive Secretary. Lt Col Victor Osweiler, U.S. Air Force, will serve as the Defense Science Board Secretariat representative.

The task force members are granted access to those DoD officials and data necessary for the appropriate conduct of their study. The Under Secretary of Defense for Acquisition, Technology, and Logistics will serve as the DoD lead for the matter under consideration and will coordinate decision-making as appropriate with the other stakeholders identified by the study's findings and recommendations. The nominal start date of the study period will be within 3 months of signing this Terms of Reference, and the study period will be between 9 to 12 months. The final report will be completed within 6 months from the end of the study period. Extensions for unforeseen circumstances will be handled accordingly.

The study will operate in accordance with the provisions of Public Law 92-463, the "Federal Advisory Committee Act," and DoD Directive 5105.04, the "DoD Federal Advisory Committee Management Program." It is not anticipated that this study will need to go into any "particular matters" within the meaning of title 18, United States Code, section 208, nor will it cause any member to be placed in the position of action as a procurement official.



Frank Kendall

## Appendix B: Task Force Membership

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### Chairs

General Paul Kern (USA, Ret.)

*The Cohen Group*

General Duncan McNabb (USAF, Ret.)

*Private Consultant*

### Members

Lieutenant General Brooks Bash  
(USAF, Ret.)

*Western Global Airlines*

Lieutenant General Christopher Kelly  
(USAF, Ret.)

*Private Consultant*

Lieutenant General Robert Dail  
(USA, Ret.)

*Private Consultant*

Mr. William Kenwell

*Private Consultant*

Mr. John Dietrich

*Atlas Air Worldwide*

Major General Earl Matthews  
(USAF, Ret.)

*Verodin, Inc.*

Mr. Eric Ebeling

*American Roll-on Roll-off Carrier*

Lieutenant General Mark Ramsay  
(USAF, Ret.)

*Private Consultant*

Mr. William Flynn

*Atlas Air Worldwide*

Lieutenant General Mitchell Stevenson  
(USA, Ret.)

*Leidos*

Vice Admiral Mark Harnitchek  
(USN, Ret.)

*Héroux-Devtek*

Vice Admiral Edward Straw  
(USN, Ret.)

*Osprey Venture Partners*

Mr. Paul “Page” Hoeper

*Private Consultant*

### Government Advisors

Lieutenant Colonel Jason Okumura, USAF

*Joint Staff J4*

### Executive Secretary

Mr. Gary Motsek

*Office of the Assistant Secretary of Defense for  
Logistics and Materiel Readiness  
(OASD(L&MR))*

Captain Jeffrey Ragghianti, USN  
*Military Assistant, OASD(L&MR)*

### Defense Science Board Secretariat

Lieutenant Colonel Milo Hyde, USAF  
Executive Director, Acting  
*(beginning July 2018)*

Mr. Edward C. Gliot  
Executive Director, Acting  
*(October 2017-July 2018)*

Lieutenant Colonel Victor Osweiler, USAF  
Deputy for Operations  
*(October 2016-August 2017)*

### Study Support

Ms. Brenda Poole  
SAIC

Ms. Clare Mernagh  
SAIC

Mr. Daniel Rauscher  
SAIC

Mr. Ari Kattan  
SAIC

## Appendix C: Briefings Received

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### 30-31 May, 2017 Meeting

Update on Threat Environment

*Joint Staff J2*

Joint Staff Perspective

*Joint Staff J4*

Service 4s Perspectives

*J4; A4; N4; G4; U.S. Marine Corps Installations and Logistics*

### 28-29 June, 2017 Meeting

Middle East and North Africa (MENA) Threat Briefing

*MENA Regional Center*

Asia-Pacific Threat Briefing #1

*Asia Pacific Regional Center*

Asia-Pacific Threat Briefing #2

*Asia Pacific Regional Center*

U.S. Transportation Command (USTRANSCOM) Discussion

*USTRANSCOM*

Defense Logistics Agency (DLA) Discussion

*DLA*

### 26-27 July, 2017 Meeting

Joint Staff Perspective

*Joint Staff J4, J5, J7, and J8*

Vice Chairman of the Joint Chiefs of Staff (VCJCS) Perspective

*VCJCS*

USTRANSCOM Perspective

*USTRANSCOM*

Foreign Threats to Global Military Operations

*USTRANSCOM J23C*

Cyber Threat Briefing #1

*Defense Intelligence Agency (DIA)*

Cyber Threat Briefing #2

*DIA*

**23-24 August, 2017 Meeting**

## Threat Briefing

*DIA; National Air and Space Intelligence Center; Office of Naval Intelligence*

## Ground Combat Discussion

*Ground Combat Systems, U.S. Army*

## European Tabletop Exercises, TTX, Joint Staff Innovation Group

*Joint Staff J8*

## Joint Logistics Estimate

*Joint Staff J4*

## Air Force Sustainment Center (AFSC) Perspective

*AFSC***13-14 September, 2017 Meeting**

## Local Motors Perspective

*Local Motors*

## U.S. Marine Corps Logistics Science and Technology (S&amp;T) Trends and Potential Vulnerabilities

*Office of Naval Research (ONR)*

## Additive Manufacturing; Medium Displacement Unmanned Surface Vehicle (MDUSV); Rearm at-Sea

*ONR*

## Autonomous Aerial Cargo/Utility System (AACUS)

*Office of Naval Research*

## Review of DSB Task Force on Energy Systems for Forward/Remote Operating Bases

*Survivable Logistics Task Force Co-Chair*

## Defense Advanced Research Projects Agency (DARPA) Perspective

*DARPA***18-19 October, 2017 Meeting**

## SAS Institute Prediction Analytics

*SAS Institute Inc.*

## Office of the Assistant Secretary of Defense for Logistics and Materiel Readiness (OASD(L&amp;MR))

Perspective

*OASD(L&MR)*

## Surface Deployment and Distribution Command Transportation Engineering Agency (SDDCTEA)

Perspective

*SDDCTEA*



Operations Research Applications for Logistics  
*Naval Postgraduate School*

DLA Fuels Update  
*DLA Energy*

U.S. Army Research, Development, and Engineering Command (RDECOM) Perspective  
*RDECOM*

Office of the Assistant Secretary of Defense for Research and Engineering (OASD(R&E)) Perspective  
*OASD(R&E)*

### **17-18 January, 2018 Meeting**

Cryptographic Data Attribution  
*Guardtime Federal*

Air Platform Concepts and Impacts  
*U.S. Air Force Research Laboratory*

Blockchain Presentation  
*International Business Machines*

Assistant Secretary of Defense for Logistics and Materiel Readiness (ASD(L&MR)) Discussion  
*ASD(L&MR)*

Joint Staff J4 Discussion  
*Joint Staff J4*

### **15-16 February, 2018 Meeting**

Cost Analysis and Program Evaluation (CAPE)  
*CAPE*

China's One Belt, One Road Strategy  
*U.S. Air Force Office of Commercial Economic Analysis*

### **20-21 March, 2018 Meeting**

National Defense Strategy Discussion  
*Office of the Deputy Assistant Secretary of Defense for Strategy and Force Development (DUSD SPF)*

## Appendix D: Acronyms

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A2AD	anti-access/area denial
AACUS	autonomous aerial cargo/utility system
AFSC	Air Force Sustainment Center
AI	artificial intelligence
ALOC	air line of communication
AM	additive manufacturing
APS	Army PREPO Set
ASD(HD&GS)	Assistant Secretary of Defense for Homeland Defense and Global Security
ASD(L&MR)	Assistant Secretary of Defense for Logistics and Materiel Readiness
CAPE	Cost Assessment and Program Evaluation
CCMD	Combatant Command
CIO	chief information officer
CONOPs	concept of operations
CONPLAN	contingency plan
CRAF	Civil Reserve Airlift Fleet
DARPA	Defense Advanced Research Projects Agency
DCNO	Deputy Chief of Naval Operations
DIA	Defense Intelligence Agency
DISA	Defense Information System Agency
DLA	Defense Logistics Agency
DoD	Department of Defense
DoDI	Department of Defense Instruction
DOE	Department of Energy
DSB	Defense Science Board
DUSD SPF	Deputy Assistant Secretary of Defense for Strategy and Force Development
FYDP	Future Years Defense Program
IBCT	infantry brigade combat team
IT	information technology
JLEnt	Joint Logistics Enterprise
JROC	Joint Requirements Oversight Council
LMSR	large, medium speed roll-on/roll-off

LOC	line of communication
LOGCAP	Logistics Civil Augmentation Program
MDUSV	medium displacement unmanned surface vehicle
MENA	Middle East and North Africa
ML	machine learning
MSP	Maritime Security Program
NDAAs	National Defense Authorization Act
NDS	National Defense Strategy
O&M	operations and maintenance
O&S	operations and sustainment
OASD(L&MR)	Office of the Assistant Secretary of Defense for Logistics and Materiel Readiness
OASD(R&E)	Office of the Assistant Secretary of Defense for Research and Engineering
OCONUS	outside continental United States
ONR	Office of Naval Research
OPLANS	operational plans
OSD	Office of the Secretary of Defense
PREPO	preposition
R&D	research and development
RC	Reserve Component
RDECOM	U.S. Army Research, Development, and Engineering Command
RDT&E	research, development, technology, and engineering
RORO	roll-on, roll-off
RRF	Ready Reserve Force
S&T	science and technology
SDDCTEA	Surface Deployment and Distribution Command Transportation Engineering Agency
SLOC	sea line of communication
TEU	20-foot equivalent unit
TTP	tactics, techniques, and procedures
USA	U.S. Army
USAF	U.S. Air Force
USCENTCOM	U.S. Central command

USD(A&S)	Under Secretary of Defense for Acquisition and Sustainment
USD(P)	Under Secretary of Defense for Policy
USD(R&E)	Under Secretary of Defense for Research and Engineering
USEUCOM	U.S. European Command
USINDOPACOM	U.S. Indo-Pacific Command
USN	U.S. Navy
VCJCS	Vice Chairman of the Joint Chiefs of Staff
VISA	Voluntary Intermodal Sealift Agreement
WMD	weapons of mass destruction

